



COMMERCIAL HVAC COMPONENTS —
ENGINEERED FOR SUCCESS

Application And Selection Guide

About valve selection

The valve selection section is constructed in one of two ways:

For unassembled product:

As a reference, pictures will represent the valves and actuators separately; and part numbers are highlighted in blue. To order a complete product one OS# must be chosen from each blue box.

For factory assembled product:

The complete assembled OS# will be displayed in the body of the chart (except for cartridge cage valves, both an actuator and valve must be chosen). Pictures will also reference the factory assembled configuration.

Additional product information

To find more detailed information on the individual products included in this document, go to: <http://customer.honeywell.com> and use the search text box to quickly locate product specific content.

SUPPORT

Contact Information

Commercial Components

Technical Hotline

Phone

888-516-9347

Fax

Customer Care

Order Entry

888-793-8193

800-356-0149

Product Drop-Ship Team

763-954-4140

800-356-0149

Butterfly & Flanged Control Ball Valve Ordering

Take-Off Service

Let Honeywell Take-Off Service provide a complete job schedule for your projects for dampers, actuators, valves and VFDs.

888-664-4092

Online Resources

Honeywell Product Ordering

Get the information you want and order the products you need.

<http://customer.honeywell.com>

Honeywell Partner Web Site

A web site developed for our partners. Get product information, guide specs, wiring diagrams and more.

<http://buildingcontrols.honeywell.com>

Honeywell eLearning

A convenient and smart way of learning about our products with 10 to 20 minute training modules.

<http://customer.honeywell.com/learning>

Register at the Honeywell customer website above for access.

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Damper, Valve and VFD Pricing/ Job Estimating Tools

These tools can be used for the selection and pricing of dampers, valves and VFDs. Click on the “Commercial Components Estimating Tools” link at customer.honeywell.com.

Product Selection Tool

Available for sizing and estimating of valves, dampers and actuators. Click on the “Product Selection Tool” link at customer.honeywell.com.

Fast Track Program

Reduce the amount of time. The easy-to-use project management and product configuration tool can help you turn estimates into orders while reducing application engineering, delivery and installation time.



- The Fast Track project management and specification tool simplifies valve/actuator assembly selection
- Estimates can be easily compiled and shared or saved for additional editing
- Project data flows into your submittal documentation or transferred to other users

Specification Take-Off Service

The Honeywell Take-Off Service can create product schedules from:

- Product specifications
- Existing schedules
- Drawings
- Obsolete or competitive schedules

Our goal is to help provide you with the best possible solution for each job.



Products Supported by the Take-Off Service

- Commercial Water and Steam Valves
- Valve Actuators (Electric or Pneumatic)
- Commercial Control Dampers
- Custom Dampers
- Damper Actuators (Electric or Pneumatic)
- Variable Frequency Drives

1. Submit your information in one of the following ways:
 - a) Email to takeoff.service@honeywell.com (preferred)
 - b) Fax toll-free to 1-877-880-3386
2. Include your desired turn-around time.
3. Take-Off Service staff will send you a confirmation that your email or fax was received. We always attempt to have your request finished as soon as possible. Please note, however, that the quality of the submitted information largely determines the turn-around time. We will work closely with you to ensure that we have enough information to move forward as quickly as possible.
4. A final product schedule document will be returned to you following take-off completion.

Included In the Final Take-Off Document

We send a comprehensive spreadsheet, which contains:

- A complete product schedule
- Base price
- Directions on how to order Honeywell products
- Links to product submittals
- Quote identification number

Questions

If you have questions about the Honeywell Take-Off Service, please call the dedicated Take-Off Service phone number at 1.888.664.4092 or email us at takeoff.service@honeywell.com.

Section 1: Dampers

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Use the following guidelines to determine the actuator quantity and torque requirements for your damper configuration.

Determine Damper Actuator Locations

Use the following configuration to determine the amount of actuator locations your damper will require.

Single Section $\leq 48 \times 74$ D2, D3
 $\leq 60 \times 74$ D1

Dampers will never ship more than 2 sections wide and one section high.

Configuration

Dampers less than 96x74 inch size have a single actuator location. Dampers 96x74 and less than 144x74 are made of three sections, and have two actuator locations, one with two thirds of the area (and torque), and the other with one third.

Exception: Three section wide dampers that are less than 42 square feet, have a single actuator location.

If damper exceeds 74" height a second row is necessary. Apply the same logic above to each row of dampers.

For dampers larger than 144 x 144, please contact the Take-Off Service (takeoff.service@honeywell.com) for a quote and actuator location.

Mounting

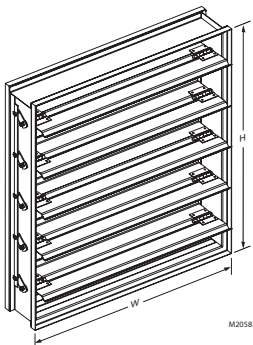
Internal Mount: Only blade drive lever provided. Customer is responsible for providing actuator mounting hardware, and linkage.

External Mount: Actuator shaft will be provided as extension pin to be mounted on side or with jackshaft pre-mounted on damper.

Determining Damper Actuator Torque Requirements

Use the following procedure to determine the required torque for your damper.

NOTE: Damper area is measured using the W and H dimensions.



Measuring Damper Area and Torque Requirements

1. Calculate the damper area by multiplying width by height in inches and divide by 144 to obtain square feet.
2. Multiply the area by the correct torque factor from Table 2 below, to show total torque required.
3. Select an actuator with torque higher than the calculated value.

EXAMPLE:

W dimension = 96 in.

H dimension = 48 in.

$48 \text{ in.} \times 96 \text{ in.} \div 144 = 32 \text{ sq. ft.}$

$32 \text{ sq. ft.} \times 7 \text{ lb-in./sq. ft.} = 224 \text{ lb-in.}$

In this example you need one or more actuators with a combined torque of 224 lb-in or more. Sometimes it's necessary to use more than one actuator in the same actuator location, in which case extra hardware must be used, such as a tandem mounting kit.

Table 2. Approximate industry standard damper lb-in. per sq ft value.

		Face Velocity (fpm)/ Static Pressure (in. wc)				
		500/ 1	1000/ 2	1500/ 3	2000/ 4	2500/ 5
D1 & D2	Parallel	4	7	10.5	12	14
	Opposed	3	5	7.5	8.5	10
D3	Parallel	3	4.5	6.5	7	8
	Opposed	2	3	4.5	5	6

Damper Sizing

Dampers can be sized using two methods; actual sizing or nominal sizing.

Dampers with actual sizing are made exactly to the dimensions specified, meaning a 24x24 damper is exactly 24x24 inches when built.

Nominally sized dampers are undersized by one quarter inch in both dimensions, meaning a 24x24 damper will be 23.75x23.75 inches when built.

Nominal sizing is the most common method, since that is how dampers destined for duct installation should be sized to fit. Actual sizing is more common with flange or wall mounting

Nominal sizing is Honeywell's default method of manufacturing. If actual sizing is required, please specify accordingly at the time of ordering.

Product Selection - Dampers

Standard Rectangular Dampers

HVAC performance is largely dependent on airflow, and Honeywell Control Dampers are built to support improved airflow and heavy use. Honeywell has long been a leading source for commercial control dampers, with products that meet the benchmark AMCA 500D air performance standards. With excellent leakage performance and manufacturing standards, Honeywell control dampers provide efficient and trouble free operation.

Standard Rectangular Dampers



Honeywell D1, D2, and D3 Control Dampers are constructed to be durable. They feature a symmetrical blade design that translates into a damper that is not flow directional, has maximized free area, and reduced actuator torque compared to asymmetrical blade designs.

The Right Choice

There's a Honeywell Control Damper that's just right for your application. The D1 ultra-low leakage airfoil damper has low airflow resistance for a more efficient system, and is typically used in high pressure and velocity applications, such as fan isolation. The D2 model is an ultra-low leakage damper with blade and jamb seals, and it's designed for medium pressure and velocity systems, like outdoor air intake or exhaust. The D3 control damper is built for applications with medium pressure and velocity, and where low leakage is not important, like return air.

Blade Design

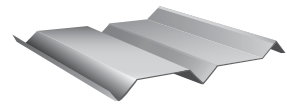
Airfoil Blades - D1 Dampers

Honeywell Airfoil Control Dampers have blades constructed of double skin galvanized steel. Its shape results in increased strength, but also a lower resistance to airflow, which makes it ideal for high pressure systems.

3V Blades - D2 and D3 Dampers

The D2 and D3 models feature a 3V blade design, with three V-grooves that run the length of the blade for structural rigidity and strength. The 3V

blade is primarily designed to be used in low to medium pressure and velocity applications.



Applications And Operation

Honeywell Commercial Control Dampers are designed for isolation or airflow control in medium- to high-pressure and velocity HVAC systems. Typical use includes volume control in zone applications and air handling units, generator room ventilation, stand-alone exhaust air units, or economizer applications. Operating range is from 2000 to 4000 fpm maximum velocity, and 2.5 to 10 inch wg pressure.

Dampers are designed to operate with a wide range of Honeywell actuators and accessories. Spring return and non-fail-safe actuators are available with a wide range of control options and output torque, to insure precise control of your damper application.

Performance

Honeywell certifies that the D1, D2, and D3 models of control dampers are tested according to AMCA Publication 511 and Standard 500D for air performance in pressure drop and leakage.

Both D1 and D2 offer leakage ratings equivalent to both AMCA Class 1A and Class 1. The Class 1A rating offers IECC (International Energy Conservation Code) leakage compliance.

				Material		Frame Gauge		Blade Seals		Jamb Seals	Blade Axle Bearings		Axles		Linkage Material		Flange		
				Galvanized	Stainless	16	12	TPE	Silicone	Stainless	Synthetic	Bronze, Stainless	Galvanized	Stainless	Galvanized	Stainless	None	Single, Double, Reverse	
S — Standard O — Optional	Leakage @ 1 in wg	Max Velocity fpm	Max Pressure in wg																
	cfm/ft2																		
	D1 Ultra-Low Leakage	3	4000	10	S	O	S	O	S	O	S	S	O	S	O	S	O	S	O
	D2 Ultra-Low Leakage	3	3000	5	S	O	S	O	S	O	S	S	O	S	O	S	O	S	O
D3 Control Damper	120	3000	5	S	O	S	O	n/a	n/a	n/a	S	O	S	O	S	O	S	O	

For a copy of the specification sheet the D1 (63-2671) or D2 and D3 (63-2398), visit customer.honeywell.com.

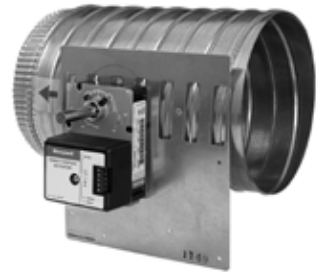
Standard Round Dampers



D690

The D690 round control dampers are available in sizes from 6 to 16 inches, and are used in zone applications controlling airflow in round duct. The dampers are constructed with neoprene and silicone seals for tight close off and low leakage. The DM7600 model consists of a D690 damper, but includes a factory mounted actuator.

- Oilite bearings for durability
- 90 degree damper travel
- Designed to accept Honeywell direct coupled actuators up to 44 lb-in torque
- Maximum velocity 2,500 fpm
- Temperature range 32°F to 130°F (0°C to 54°C)



DM7600

D690 ROUND DAMPERS SELECTION GUIDE

Product Number	Damper Diameter	
	(inch)	(mm)
D690A1002	6	152
D690A1010	8	203
D690A1028	10	254
D690A1036	12	305
D690A1044	14	356
D690A1051	16	406

DM7600 ROUND DAMPERS SELECTION GUIDE

Product Number	Damper Diameter		Input Signal	Timing (sec, min.)
	(inch)	(mm)		
DM7600A1005	6	152	2 to 10 Vdc or 4 to 20 mA	90 sec
DM7600A1013	8	203	2 to 10 Vdc or 4 to 20 mA	90 sec
DM7600A1021	10	254	2 to 10 Vdc or 4 to 20 mA	90 sec
DM7600A1039	12	305	2 to 10 Vdc or 4 to 20 mA	90 sec
DM7600A1047	14	356	2 to 10 Vdc or 4 to 20 mA	90 sec
DM7600A1054	16	406	2 to 10 Vdc or 4 to 20 mA	90 sec
DM7600B1004	6	152	SPDT floating	90 sec
DM7600B1012	8	203	SPDT floating	90 sec
DM7600B1020	10	254	SPDT floating	90 sec
DM7600B1038	12	305	SPDT floating	90 sec
DM7600B1046	14	356	SPDT floating	90 sec
DM7600B1053	16	406	SPDT floating	90 sec

Custom Dampers

Need a custom damper? Contact the Take-Off Service: 1-888-664-4092 or takeoff.service@honeywell.com.

Below is a sample list of the products we frequently provide.

CUSTOM RECTANGULAR DAMPERS

Number	Description
VCD34	Galvanized Insulated Airfoil Damper
VCD40	Aluminum Narrow Frame Airfoil Damper
VCD42	Aluminum Airfoil Damper (Galvanized Frame)
VCD43	Aluminum Airfoil Damper
VCD45	Aluminum thermally broken insulated Damper

CUSTOM ROUND DAMPERS

Number	Description
VCDR53	Galvanized Round Damper – to 24 inches
VCDRM53	Galvanized Round Multi-Blade Damper – to 36 inches

Submittal Data - Dampers

D1 Series Rectangular Volume Control Dampers



The D1 series control damper is an ultra-low leakage damper, with rugged steel airfoil blades designed to meet the highest standards established. It is leakage and pressure drop tested according to the AMCA 500D standard, and meets leakage Class 1 and Class 1A, which also qualifies the damper for the International Energy Conservation Code (IECC). It is intended for application in medium to high pressure and velocity systems.

PERFORMANCE DATA

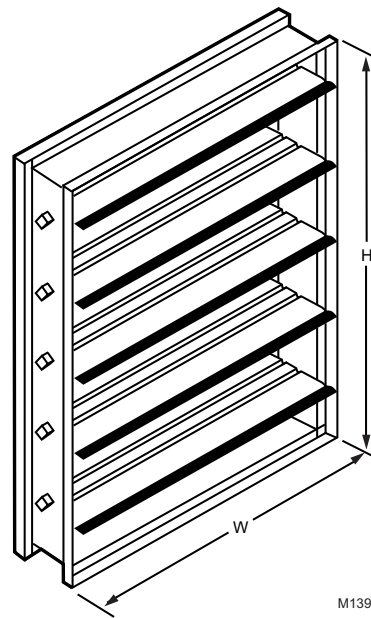
D1 Velocity Limits.

Damper Width (in.)	Maximum Velocity (fpm)
12	4000
24	4000
36	3500
48	3000
60	2500

SPECIFICATIONS

Size Range ¹	
Minimum Size	
One Blade	6 in. wide by 6 in. high
Two Blade	6 in. wide by 10 in. high
Maximum Size	
Single Section	60 in. wide by 74 in. high
Multiple Section.....	Unlimited
Temperature Rating.....	180 °F (82 °C) maximum ²
Maximum Pressure.....	10 in. wg.
Standard Construction ³	14 gauge galvanized steel, airfoil shaped
Blade Action.....	Parallel or Opposed
Frame ³	16 gauge galvanized steel Hat-channel
Blade Axle Bearings	Synthetic (Acetal)
Linkage ³	Steel Side linkage out of airstream (concealed in frame)
Axles ³	1/2 in. diameter plated steel
Jamb Seals ³	304 Stainless Steel
Blade Edge Seals ³	TPE
¹ Width and height dimensions furnished 1/4 in. undersized - standard	
² Temperature rating with standard options	
³ Customized options are available	

DIMENSIONS DIAGRAM



M13905

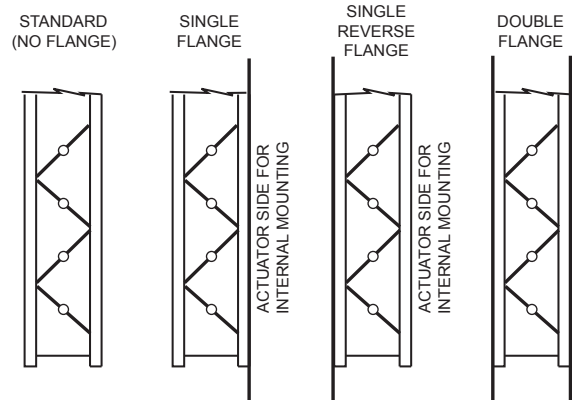
LEAKAGE RATE

Leakage Class Definitions

The *maximum* allowable leakage is defined by AMCA as the following:

- Leakage Class 1A-3 cfm/ft² @ 1 in. wg (class 1A is only defined at 1 in. wg).
- Leakage Class 1
 - 4 cfm/ft² @ 1 in. wg
 - 8 cfm/ft² @ 4 in. wg
 - 11 cfm/ft² @ 8 in. wg
 - 12.6 cfm/ft² @ 10 in. wg

FLANGE OPTIONS



M18986

D2 and D3 Series Rectangular Volume Control Dampers



The D2 series control damper is an ultra-low leakage damper, with strong 3V blades. It is leakage and pressure drop tested according to the AMCA 500D standard, and meets leakage Class 1 and Class 1A, which also qualifies the damper for the International Energy Conservation Code (IECC).

The D3 series features the same blades and hardware as the D2 damper, but lacks the seals, making it a damper intended for applications where low leakage performance is not necessary. D2 and D3 dampers are intended for application in low to medium pressure and velocity systems.

The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to air performance ratings only.

PERFORMANCE DATA

D2, D3 Velocity Limits.

Damper Size in inches.	Maximum Velocity (fpm)
12	3000
24	3000
36	2500
48	2000

Same logic as D1 window above.

SPECIFICATIONS

Size Range ¹	
Minimum Size	
One Blade.....	6 in. wide by 6 in. high
Two Blade.....	6 in. wide by 10 in. high
Maximum Size	
Single Section.....	48 in. wide by 72 in. high
Multiple Section.....	Unlimited
Temperature Rating.....	180 °F (82 °C) maximum
Maximum Pressure	5 in. wg.
Standard Construction ²	Blade: 16 gauge galvanized steel 3-V
Blade Action	Parallel or Opposed
Frame ²	16 gauge galvanized steel Hat-channel
Blade Axle Bearings	Synthetic (Acetal)
Linkage	Side linkage out of airstream (concealed in frame)
Axles.....	1/2 in. square plated steel
Jamb Seals ³	Compression-type Stainless Steel

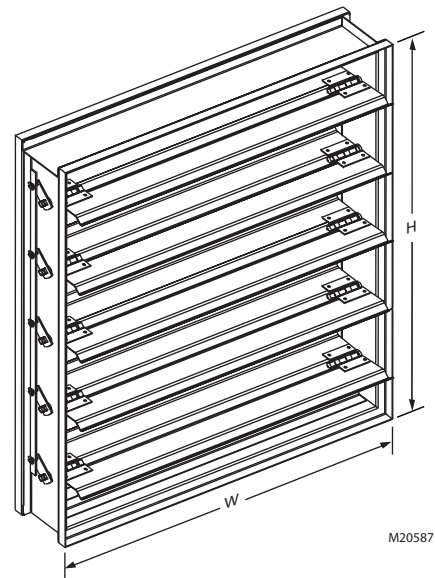
Blade Edge Seals²TPE

¹ Width and height dimensions furnished 1/4 in. undersized - standard

² Customized options are available

³ D2 Dampers only

DIMENSIONS DIAGRAM



M20587

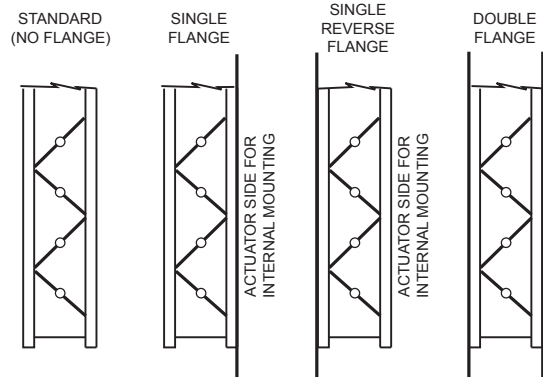
LEAKAGE RATE (Applies to D2 only)

Leakage Class Definitions

The *maximum* allowable leakage is defined by AMCA as the following:

- Leakage Class 1A-3 cfm/ft² @ 1 in. wg (class 1A is only defined at 1 in. wg).
- Leakage Class 1
 - 4 cfm/ft² @ 1 in. wg
 - 8 cfm/ft² @ 4 in. wg

FLANGE OPTIONS



M18986

Submittal Data - Dampers

D690 Round Volume Control Dampers



The D690 Round Control Damper is used in commercial air handling system zone applications to control airflow, but is also suitable for residential zoning applications where the ML6161 actuator is used. The damper is designed for use with all low torque Honeywell Direct Coupled Actuators.

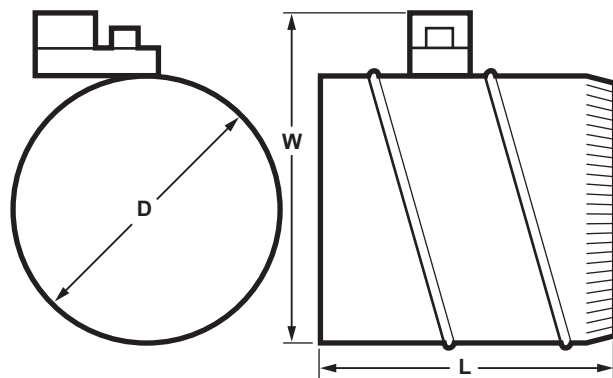
FEATURES

- Neoprene seal for tight closing and low leakage.
- Oilite bearings for long life.

SPECIFICATIONS

ApplicationHeating, cooling, ventilating
 Type of BladeSingle-blade, round
 Temperature Range.....32 °F to 130 °F (0 °C to 54 °C)
 Used With.....All Honeywell direct coupled actuators up to 44 lb-in torque.

DIMENSIONS DIAGRAM



DAMPER DIAMETER (D)		WIDTH (W)		LENGTH (L)	
in.	mm	in.	mm	in.	mm
6	152	9-1/2	241	12	305
8	203	11-1/2	292	12	305
10	254	13-1/2	343	12	305
12	305	15-1/2	394	13	330
14	356	17-1/2	445	15	381
16	406	19-1/2	495	17	432

M17412

Submittal Data - Dampers

DM7600 Round Volume Control Dampers



The DM7600 Commercial Zone Damper is used in zoning systems to control airflow. The damper consists of a D690 Control damper, with a Honeywell floating ML6161 or modulating ML7161 Direct Coupled Actuator that is factory mounted to simplify field installation.

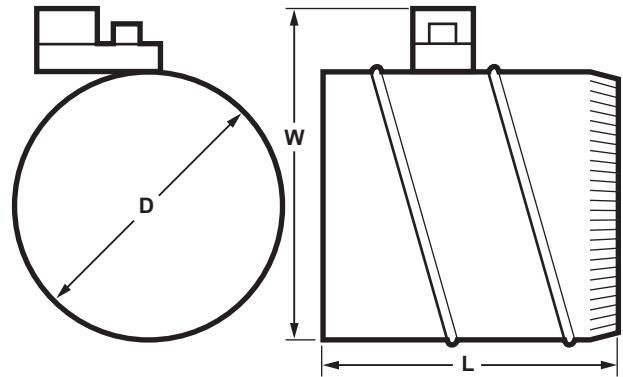
FEATURES

- Neoprene seal for tight closing and low leakage.
- Oilite bearings for long life.
- Magnetic coupling requires no limit switches or mechanical stops.

SPECIFICATIONS

ApplicationHeating, cooling, ventilating
 Type of Blade.....Single-blade, round
 Temperature Range.....32 °F to 130 °F (0 °C to 54 °C)
 Voltage.....24 Vac
 Frequency50 Hz; 60 Hz

DIMENSIONS DIAGRAM



DAMPER DIAMETER (D)		WIDTH (W)		LENGTH (L)	
in.	mm	in.	mm	in.	mm
6	152	9-1/2	241	12	305
8	203	11-1/2	292	12	305
10	254	13-1/2	343	12	305
12	305	15-1/2	394	13	330
14	356	17-1/2	445	15	381
16	406	19-1/2	495	17	432

M17412

Section 2: Actuators

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Accessories	40	Spring Return MS4109F, MS4609F, MS8109F	
Non-spring Return ML6161; ML7161		Product Selection	18
Product Selection	17	Submittal Data.....	30
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Accessories	40	Spring Return MS4120F; MS4620F; MS8120F	
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Overview - Actuators

Direct Coupled Actuators



Spring Return,
Low Torque

Precise, reliable performance. Lasting value. Ease of installation. Everything you look for in direct-coupled actuators hinges on quality. And quality engineering is what makes Honeywell's complete line of actuators the top performers in the industry. Our global engineering team designs and tests our direct-coupled actuators to exceed rigorous global standards — and to meet Honeywell's own demanding life testing.

But we don't stop there. Thanks to our continuous improvement process, Honeywell actuators are now easier than ever to install. You'll also benefit from consistent wiring regardless of signal type, common accessories and a simplified selection process.

Honeywell's complete line of building control products, including valves and actuators, are already proven in more than three million buildings worldwide. So when you need spring or non-spring return actuators for your damper and valve applications, specify Honeywell. We make precision easy.



Spring Return,
High Torque

Improve Installation Time

- Self-centering shaft adapter provides mounting flexibility and greater clamping force.
- Common wiring among families for every signal saves installation time.

Decrease Material Cost

- Detachable access cover allows direct wiring without a junction box.

Reduce Inventory

- Signal mode switch adapts models to two-position, floating (tri-state) or modulating (proportional) applications.

Increase Control and Accuracy

- More than 200 reposition steps for modulating models provide precise control.

Increased Flexibility

- Select models are available with or without three foot actuator whips cable.



EASY-TO-SELECT MODEL NUMBERS

MS and MN Families

MS 75 10 A 2 2 XX

Fail Safe Mode

- MS Spring Return
- MN Non-Spring Return

Input Signal Type

- 31 - Communicating, 24 Vac/dc
- 41 - Two-Position, 100-250 Vac
- 61 - Floating, 24 Vac/dc
- 71/72 - Modulating only, 24 Vac/dc
- 74 - Economizer & Modulating, 24 Vac/dc
- 75 - Modulating & Floating, 24 Vac/dc
- 81 - Two-Position, 24 Vac/dc

Torque

- 03 Nm = 27 lb-in
- 05 Nm = 44 lb-in
- 10 Nm = 88 lb-in
- 20 Nm = 175 lb-in
- 34 Nm = 300 lb-in

System Controlled Numbers

Auxiliary Switches

- 0 No Internal Switches
- 1 One Internal Switch
- 2 Two Internal Switches

Feedback

- 1 No Feedback
- 2 Voltage Feedback

Application Type

- A Standard Model
- H Enhanced Model
- W Model with Whips Cable
- J Sylk Enabled



Non-Spring Return,
Low Torque

ML Family

ML 61 61 B 2 XXX

Fail Safe Mode

- ML Non-Spring Return

Input Signal Type

- 61 Floating, 24 Vac
- 71 Modulating, 24 Vac

Torque

- 61 (4 Nm) = 35 lb-in
- 74 (8 Nm) = 70 lb-in

System Controlled Numbers

Declutch

- 1 Standard
- 2 Includes Declutch Function

Feedback & Conduit

- A Feedback w/Accessory
- B Standard
- C Feedback w/Accessory and Cover w/Conduit Connections
- D Cover w/Conduit Connections







Non-Spring Return,
High Torque







Product Selection - Actuators

Direct Coupled Actuators

SPRING RETURN

Order Specification Number (without whips)	Order Specification Number (with whips)	Damper Area (4.5 lb-in/sq. ft.)	Running Time		Power Supply			Control Input/Output						Auxiliary Knob	
			Drive (sec)	Spring Return (sec)	24 Vac/dc	120-230 Vac	VA Rating (Running)	Sylk-Enabled	On/Off	0/2-10 Vdc, Floating	3 kOhm NTC, 3-Position	Feedback (0/2-10 Vdc)	Adj. Zero and Span	SPDT Auxiliary Switches	IMPP*
S03 Series (3 Nm, 27 lb-in)															
	MS4103A1030	6	45	<25		•	9		•					0	
	MS4103A1130	6	45	<25		•	9		•					1	
	MS8103A1030	6	45	<25	•		6		•					0	
	MS8103A1130	6	45	<25	•		6		•					1	
	MS3103J1030	6	90	<25	•		6	•						0	
	MS7503A2030	6	90	<25	•		6			•				0	
	MS7503A2130	6	90	<25	•		6			•				1	
	MS7403A2030*	6	90	<25	•		6			•				0	
S05 Series (5 Nm, 44 lb-in)															
	MS4105A1030	10	45	<25		•	9		•					0	
	MS4105A1130	10	45	<25		•	9		•					1	
	MS8105A1030	MS8105W1030	10	45	<25	•		6		•				0	
	MS8105A1130	MS8105W1130	10	45	<25	•		6		•				1	
	MS3105J3030		10	90	<25	•		6	•					0	
	MS3105J3130		10	90	<25	•		6	•					1	
	MS7505A2030	MS7505W2030	10	90	<25	•		6			•			0	
	MS7505A2130	MS7505W2130	10	90	<25	•		6			•			1	
	MS7405A2030*		10	90	<25	•		6			•			0	
S10 Series (10 Nm, 88 lb-in)															
	MS4110A1002	20	45	<25		•	45		•					0	
	MS4110A1200	20	45	<25		•	45		•					2	
	MS8110A1008	MS8110W1008	20	45	<25	•		30		•				0	
	MS8110A1206	MS8110W1206	20	45	<25	•		30		•				2	
	MS3110J1008		20	90	<25	•		14	•					0	
	MS3110J1206		20	90	<25	•		14	•					2	
	MS7510A2008	MS7510W2008	20	90	<25	•		14			•			0	
	MS7510A2206	MS7510W2206	20	90	<25	•		14			•			2	
	MS7510H2209		20	90	<25	•		14			•		•	2	
S20 Series (20 Nm, 175 lb-in)															
	MS4120A1001	39	45	<25		•	60		•					0	
	MS4120A1209	39	45	<25		•	60		•					2	
	MS8120A1007	MS8120W1007	39	45	<25	•		40		•				0	
	MS8120A1205	MS8120W1205	39	45	<25	•		40		•				2	
	MS3120J1007		39	90	<25	•		16	•					0	
	MS3120J1205		39	90	<25	•		16	•					2	
	MS7520A2007	MS7520W2007	39	90	<25	•		16			•			0	
	MS7520A2205	MS7520W2205	39	90	<25	•		16			•			2	
	MS7520H2208		39	90	<25	•		16			•		•	2	

NON-SPRING RETURN

Order Specification Number (without whips)	Order Specification Number (with whips)	Damper Area (4.5 lb-in/sq. ft.)	Running Time	Power Supply		VA Rating (Running)	On/Off, Floating	Control Input/Output			SPDT Auxiliary Switches
				24 Vac/dc	24 Vac			0/2-10 Vdc	2-10 Vdc	Feedback (0/2-10 Vdc)	
N05 Series (5 Nm, 44 lb-in)											
	MN6105A1011	MN6105W1011	10	90	•		5	•			0
	MN6105A1201		10	90	•		5	•			2
	MN7505A2001	MN7505W2001	10	90	•		5	•	•		0
	MN7505A2209		10	90	•		5	•	•		2
N10 Series (10 Nm, 88 lb-in)											
	MN6110A1003		20	90	•		5	•			0
	MN6110A1201		20	90	•		5	•			2
	MN7510A2001		20	90	•		5	•	•		0
	MN7510A2209		20	90	•		5	•	•		2
N20 Series (20 Nm, 175 lb-in)											
	MN6120A1002		39	90	•		6	•			0
	MN6120A1200		39	90	•		6	•			2
	MN7220A2007		39	90	•		6		•		0
	MN7220A2205		39	90	•		6		•		2
N34 Series (34 Nm, 300 lb-in)											
	MN6134A1003		67	90	•		9	•			0
	MN7234A2008		67	90	•		8		•		0
ML6161/7161 (4 Nm, 35 lb-in)											
	ML6161A2009		8	90		•	1.8	•		w/ accessory	0
	ML6161A2017		8	420		•	1.8	•		w/ accessory	0
	ML6161A2025		8	180		•	1.8	•		w/ accessory	0
	ML6161B2024		8	90		•	1.8	•			0
	MS6161B2032		8	420		•	1.8	•			0
	ML6161B2073		8	180		•	1.8	•			0
	ML6161C2007		8	90		•	1.8	•		w/ accessory	0
	ML6161D2006		8	90		•	1.8	•			0
	ML7161A2008		8	90		•	5.4		•		0
ML6174/7174 (8 Nm, 70 lb-in)											
	ML6174A2002		16	90		•	2.4	•		w/ accessory	0
	ML6174A2010		16	180		•	2.4	•		w/ accessory	0
	ML6174B2019		16	90		•	2.4	•			0
	ML6174B2035		16	420		•	2.4	•			0
	ML6174D2009		16	90		•	2.4	•			0
	ML6174E2008		16	90		•	2.4	•			0
	ML7174A2001		16	90		•	5.4	•			0
	ML7174E2007		16	90		•	5.4	•			0

* Model includes Internal Minimum Position Potentiometer

Product Selection - Actuators

Fire and Smoke Damper Actuators

Honeywell's complete line of two position, fast-acting spring-return actuators meets all of your needs for fire and smoke control applications. All models are designed to meet the UL-555 and UL-555S high temperature requirements for fire dampers and combined fire and smoke dampers.

Safety First

As a life safety system component Honeywell is dedicated to meeting the UL-555 and UL-555S requirements. The elevated temperature test can be performed at the temperature ratings of 250°F or 350°F. Honeywell only offers models at 350°F to meet UL-555 and UL-555S for fire and combined fire and smoke applications to support the highest level of safety for building occupants.

Largest Torque Range in the Industry

Honeywell's fire and smoke actuators are available in 30, 80 and 175 lb-in with the 175 lb-in being the highest torque commercial fire and smoke actuator available on the market today.

Features

- Integral spring return that ensures the proper level of torque
- Patented design that eliminated limit switches, reducing power consumption
- Reliable service in smoke control systems requiring Underwriter's Laboratories Inc. UL-555 and UL-555S
- Robust die-cast aluminum housing ensures the proper level of torque
- Full life of two-position spring return fire and smoke actuators rated up to 350°F for all critical applications
- Fast acting with a maximum spring return timing of 15 seconds
- No audible noise during holding
- Reversible ("flippable") design enables one model to be used for both clockwise and counterclockwise spring return applications

Fire and Smoke Spring Return Actuators



Torque	Model Number	Voltage	SPST Aux Switch	Legacy Honeywell	Belimo Cross	Siemens Cross
30 lb-in (3.4 Nm)	MS4104F1010	120 Vac	0	ML4115A1009 ML4115A1017 ML4115B1008 ML4115B1016 ML4115H1002 ML4115J1009 ML4202F1000 ML4302F1008	FSLF120 US	None
	MS4104F1210	120 Vac	2 Internal	None	FSLF120-S US	None
	MS4604F1010	230 Vac	0	ML4115C1007 ML4115C1015 ML4115D1006 ML4115D1014 ML4702F1009 ML4802F1007	FSLF230 US	None
	MS4604F1210	230 Vac	2 Internal	None	FSLF230-S US	None
	MS8104F1010	24 Vac	0	ML8115A1005 ML8115A1013 ML8115B1004 ML8115B1012 ML8115H1008 ML8115J1005 ML8202F1006 ML8302F1004	FSLF24 US	None
	MS8104F1210	24 Vac	2 Internal	None	FSLF24-S US	None
80 lb-in (9 Nm)	MS4109F1010	120 Vac	0	MS4209F1007 MS4309F1005	FSNF120 US	GND221.1U
	MS4109F1210	120 Vac	2 Internal	None	FSNF120-S US	GND226.1U
	MS4609F1010	230 Vac	0	MS4709F1014 MS4809F1012	FSNF230 US	GND321.1U
	MS4609F1210	230 Vac	2 Internal	None	FSNF230-S US	GND326.1U
	MS8109F1010	24 Vac	0	MS8209F1003 MS8309F1001	FSNF24 US	GND121.1U
	MS8109F1210	24 Vac	2 Internal	None	FSNF24-S US	GND126.1U
175 lb-in (20 Nm)	MS4120F1006	120 Vac	0	None	FSAF120 US	GGD221.1U
	MS4120F1204		2 Internal		FSAF120-S US	None
	MS4620F1005	230 Vac	0		FSAF230 US	GGD321.1U
	MS4620F1203		2 Internal		FSAF230-S US	None
	MS8120F1002	24 Vac	0		FSAF24 US	GGD121.1U
	MS8120F1200		2 Internal		FSAF24-S US	None

Note: Honeywell's spring return fire and smoke actuators are designed to pass UL-555 and UL-555S 350°F requirements. They are not designed for HVAC applications. UL-555 and UL-555S requires that all new construction fire and smoke damper jobs have the actuator assembled and tested at the damper manufacturer. A like for like retrofit replacement or technically equal UL-555 and UL-555S approved device is recommended.



MS4103, MS7403, MS7503 and MS8103 Spring Return Direct Coupled Actuators (DCA) are used within heating, ventilating and air-conditioning (HVAC) systems. They can drive a variety of quarter-turn, final control elements requiring spring return fail-safe operation.

FEATURES

- Brushless DC submotor with electronic stall protection on all models
- Self-centering shaft adaptor (shaft coupling) for wide range of shaft sizes
- Models available for use with two-position, SPST, line- (Series 40) or low- (Series 80) voltage controls
- Models available for use with floating or switched SPDT (Series 60) controls
- Models available for use with proportional current or voltage (Series 70) controls
- Models available with combined floating and modulating control in a single device
- Models available with an internal end switch
- Access cover to facilitate connectivity
- Durable plastic housing with built-in mechanical end limits
- Spring return direction field selectable
- Shaft position indicator and scale
- UL (cUL) listed and CE compliant
- All models are plenum rated per UL873

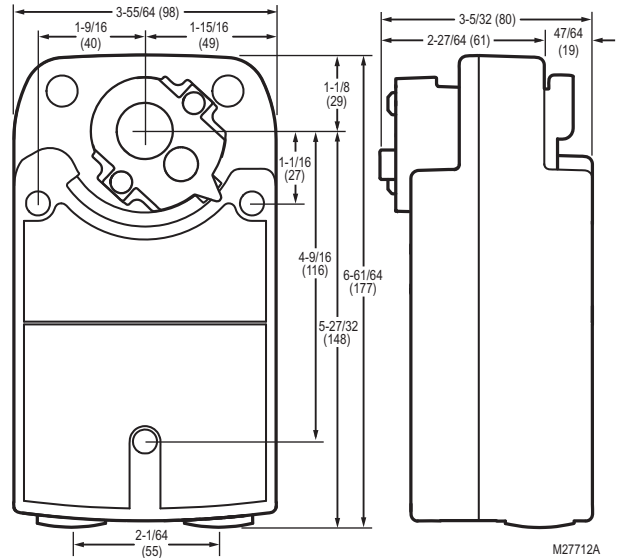
SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Spring Return
Torque	27 lb-in. (3 Nm)
Spring Return Torque	27 lb-in (3 Nm)
Spring Return Direction.....	By orientation
External Auxiliary Switches Available...	No
Electrical Connections	Enclosed screw terminal strip (22 to 14 AWG)
Ingress Protection Rating	IP54
Environmental Rating	NEMA2
Frequency	50 Hz; 60 Hz
Mounting	Direct Coupled
Maximum Noise Rating, Holding (dBA @ 1m)	20 (no audible noise)
Maximum Noise Rating, Driving (dBA @ 1m)	50
Rotation to Open	By switch
Rotational Stroke Adjustment	Mechanically limited 5 degree increments
Compatible Damper Shafts.....	3/8 to 5/8 in. round or 1/4 to 1/2 in. square (9 to 16 mm round or 6 to 13 mm square)
Shaft Adapter Type	Self-centering clamping
Materials.....	Plenum rated plastic housing
Operating Humidity Range (% RH).....	5 to 95% RH, non-condensing
Ambient Temperature Range	-40 F to +149F (-40 C to +65 C) -22 F to +149F (-30 C to +65 C) for two-position actuators only
Temperature Ratings (Shipping)	-40 F to +150F (-40 C to +65 C)
Storage Temperature Range	-40 F to +150F (-40 C to +65 C)
Weight	3.5 lb (1.6 kg)
Includes.....	Mounting bracket, self-centering shaft adapter

APPROVALS

CE.....	EMC 2004/108/EC; Certification Low Voltage Directive 2006/95/EC; IEC 60730-1 and Part 2-14
C-Tick	N314
Underwriters Laboratories, Inc.....	UL 873
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

DIMENSIONS DIAGRAM



Submittal Data - Actuators

Spring Return S05 Series



MS4105, MS7405, MS7505, and MS8105 Spring Return Direct Coupled Actuators (DCA) are used within heating, ventilating and air-conditioning (HVAC) systems. They can drive a variety of quarter-turn, final control elements requiring spring return fail-safe operation.

FEATURES

- Brushless DC submotor with electronic stall protection on all models
- Self-centering shaft adaptor (shaft coupling) for wide range of shaft sizes
- Models available for use with two-position, SPST, line- (Series 40) or low- (Series 80) voltage controls
- Models available for use with floating or switched SPDT (Series 60) controls
- Models available for use with proportional current or voltage (Series 70) controls
- Models available with combined floating and modulating control in a single device
- Models available with an internal end switch
- Access cover includes enclosed screw terminal strip (22 to 14 AWG) for electrical connections.
- Models available with 3 foot 18 AWG color-coded cable
- Durable plastic housing with built-in mechanical end limits
- Spring return direction field selectable
- Shaft position indicator and scale
- UL (cUL) listed and CE compliant
- All models are plenum rated per UL873

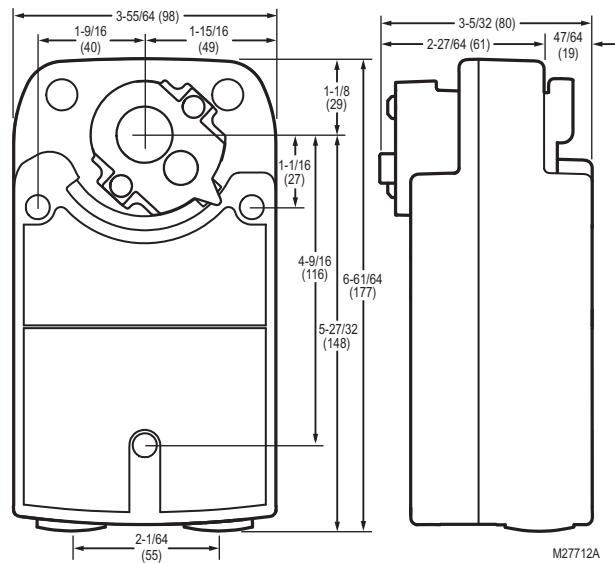
SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Spring Return
Torque	44 lb-in. (5 Nm)
Spring Return Torque	44 lb-in. (5 Nm)
Spring Return Direction	By orientation
External Auxiliary Switches Available	No
Environmental Rating	NEMA2
Ingress Protection Rating	IP54
Frequency	50 Hz; 60 Hz
Mounting	Direct Coupled
Maximum Noise Rating, Holding (dBA @ 1m)	20 (no audible noise)
Maximum Noise Rating, Driving (dBA @ 1m)	50
Rotation to Open	By switch
Rotational Stroke Adjustment	Mechanically limited 5 degree increments
Compatible Damper Shafts	3/8 to 5/8 in. round or 1/4 to 1/2 in. square (9 to 16 mm round or 6 to 13 mm square)
Shaft Adapter Type	Self-centering clamping
Materials	Plenum rated plastic housing
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Ambient Temperature Range	-40 F to +149F (-40 C to +65 C) -22 F to +149F (-30 C to +65 C) for two-position actuators only
Temperature Ratings (Shipping)	-40 F to +150F (-40 C to +65 C)
Storage Temperature Range	-40 F to +150F (-40 C to +65 C)
Weight	3.5 lb (1.6 kg)
Includes	Mounting bracket, self-centering shaft adapter

APPROVALS

CE	EMC 2004/108/EC; Certification Low Voltage Directive 2006/95/EC; IEC 60730-1 and Part 2-14
C-Tick	N314
Underwriters Laboratories, Inc.	UL 873
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

DIMENSIONS DIAGRAM





MS4110, MS7510 and MS8110 Spring Return Direct Coupled Actuators (DCA) are used within heating, ventilating and air-conditioning (HVAC) systems. They can drive a variety of quarter-turn, final control elements requiring spring return fail-safe operation.

SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Spring Return
Torque	88 lb-in. (10 Nm)
Spring Return Torque	88 lb-in. (10 Nm)
Spring Return Direction.....	By orientation
External Auxiliary Switches Available...	Yes, SW2-US
Environmental Rating	NEMA2
Frequency	50 Hz; 60 Hz
Manual operation	Manual crank
Mounting	Direct Coupled
Maximum Noise Rating, Holding (dBA @ 1m)	20 (no audible noise)
Maximum Noise Rating, Driving (dBA @ 1m)	40
Rotational Stroke Adjustment.....	Mechanically limited 5 degree increments
Compatible Damper Shafts.....	3/8 to 1.06 in. round or 3/8 to 1 1/16 in. square (10 to 27 mm round or 10 to 18 mm square)
Shaft Adapter Type	Self-centering clamping
Materials.....	Aluminum housing, Plenum rated plastic access cover
Operating Humidity Range (% RH).....	5 to 95% RH, non-condensing
Ambient Temperature Range	-40 F to +140 F (-40 C to +60 C)
Storage Temperature Range	-40 F to +158 F (-40 C to +70 C)
Weight	6 lb (2.72 kg)
Includes.....	Mounting bracket, self-centering shaft adapter, 3mm crank
Comments.....	Integral 1/2 in. NPSM conduit connection.

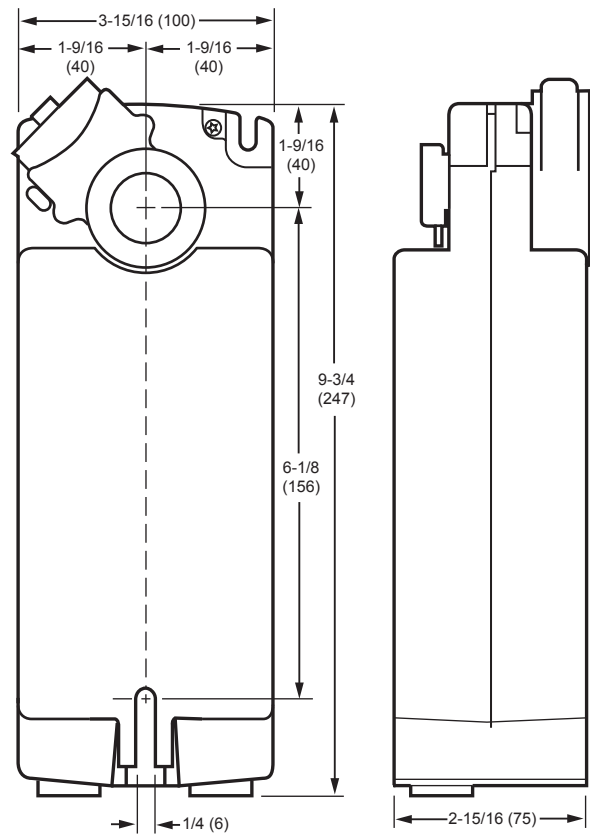
APPROVALS

CE.....	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc.....	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

FEATURES

- Brushless DC submotor with electronic stall protection for floating/modulating models.
- Brush DC submotor with electronic stall protection for 2-position models.
- Self-centering shaft adapter (shaft coupling) for wide range of shaft sizes.
- Models available for use with two-position, single pole single throw (spst), line- (Series 40) or low- (Series 80) voltage controls.
- Models available for use with proportional current or voltage (Series 70) controls.
- Models available with combined floating/modulating control in a single device.
- Models available with adjustable zero and span.
- Models available with line-voltage internal end switches.
- Access cover includes enclosed screw terminal strip (22 to 14 AWG) for electrical connections.
- Models available with 3 foot 18 AWG color-coded cable.
- Metal housing with built-in mechanical end limits.
- Spring return direction field-selectable.
- Shaft position indicator and scale.
- Manual winding capability with locking function.
- UL (cUL) listed and CE compliant.
- All Models are plenum-rated per UL873.

DIMENSIONS DIAGRAM



M20952

Submittal Data - Actuators

Spring Return S20 Series



MS4120, MS7520 and MS8120 Spring Return Direct Coupled Actuators (DCA) are used within heating, ventilating and air-conditioning (HVAC) systems. They can drive a variety of quarter-turn, final control elements requiring spring return fail-safe operation.

SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode.....	Spring Return
Torque.....	175 lb-in. (20 Nm)
Spring Return Torque	175 lb-in. (20 Nm)
Spring Return Direction	By orientation
External Auxiliary Switches Available...	Yes, SW2-US
Environmental Rating	NEMA2
Frequency	50 Hz; 60 Hz
Manual operation.....	Manual crank
Mounting.....	Direct Coupled
Maximum Noise Rating, Holding (dBA @ 1m).....	20 (no audible noise)
Maximum Noise Rating, Driving (dBA @ 1m).....	40
Rotational Stroke Adjustment	Mechanically limited 5 degree increments
Compatible Damper Shafts	3/8 to 1.06 in. round or 3/8 to 1 1/16 in. square (10 to 27 mm round or 10 to 18 mm square)
Shaft Adapter Type.....	Self-centering clamping
Materials	Aluminum housing, Plenum rated plastic access cover
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Ambient Temperature Range	-40 F to +140 F (-40 C to +60 C)
Storage Temperature Range	-40 F to +158 F (-40 C to +70 C)
Weight	6 lb (2.72 kg)
Includes.....	Mounting bracket, self-centering shaft adapter, 3mm crank
Comments	Integral 1/2 in. NPSM conduit connection.

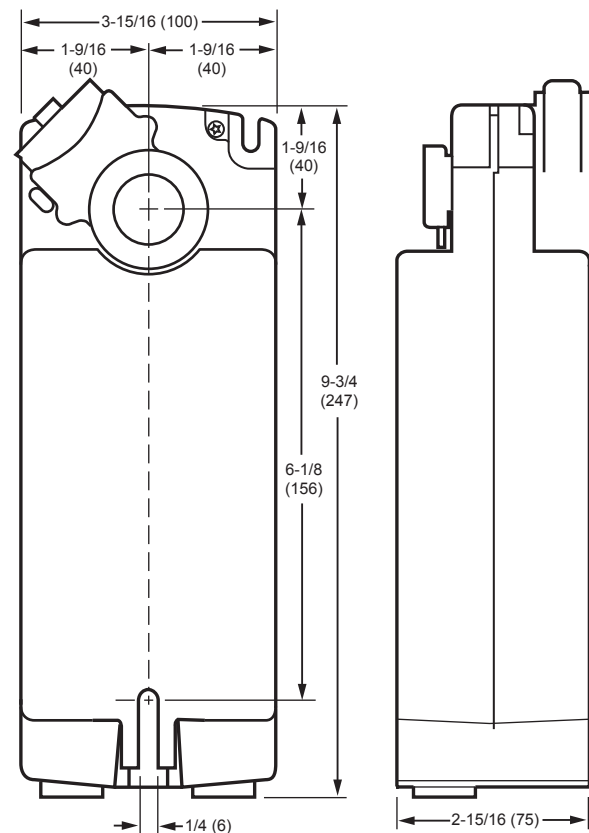
APPROVALS

CE.....	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc.....	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

FEATURES

- Brushless DC submotor with electronic stall protection for floating/modulating models.
- Brush DC submotor with electronic stall protection for 2-position models.
- Self-centering shaft adapter (shaft coupling) for wide range of shaft sizes.
- Models available for use with two-position, single pole single throw (spst), line- (Series 40) or low- (Series 80) voltage controls.
- Models available for use with proportional current or voltage (Series 70) controls.
- Models available with combined floating/modulating control in a single device.
- Models available with adjustable zero and span.
- Models available with line-voltage internal end switches.
- Access cover includes enclosed screw terminal strip (22 to 14 AWG) for electrical connections.
- Models available with 3 foot 18 AWG color-coded cable.
- Metal housing with built-in mechanical end limits.
- Spring return direction field-selectable.
- Shaft position indicator and scale.
- Manual winding capability with locking function.
- UL (cUL) listed and CE compliant.
- All models are plenum-rated per UL873.

DIMENSIONS DIAGRAM



M20952

Submittal Data - Actuators

Non-spring Return ML6161; ML7161



Used to control dampers in applications such as variable air volume (VAV) terminal units and for mounting on ball valves; suitable for use with SPDT or floating thermostats or building automation controls.

FEATURES

- Control for air damper applications with up to 10 sq.ft. assuming 3.5 in-lb per sq.ft. of damper area, velocity independent.
- Superior A/C synchronous submotor for consistent timing and actuator longevity.
- Eliminate need for limit switches or mechanical stops by providing magnetic coupling.
- All models include manual declutch lever and bag assembly with two minimum position setscrews.
- Mount directly on 3/8 inch or 1/2 inch square or round damper shaft.
- Selectable 45, 60 and 90 stroke in either clockwise or counterclockwise direction.

ACTUATORS

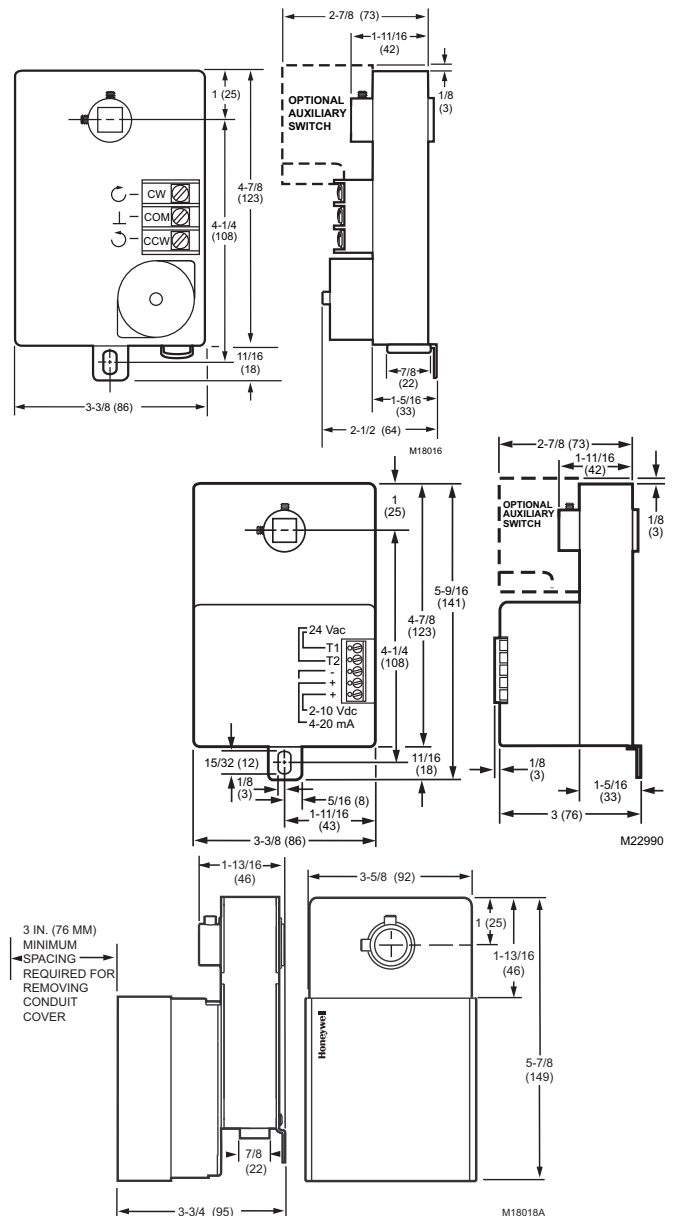
SPECIFICATIONS

Actuator Type	Damper
Rotational Stroke	90 degrees
Fail Safe Mode	Non-Spring Return
Torque	35 lb-in. (4 Nm)
External Auxiliary Switches Available... Yes, 201052B	
Electrical Connections	Screw terminals
Environmental Rating	NEMA 1
Feedback	With accessory
Frequency	50 Hz; 60 Hz
Manual operation	Declutch mechanism
Mounting	Direct Coupled
Maximum Noise Rating, Driving (dBA @ 1m).....	45
Rotation to Open	By wiring
Rotational Stroke Adjustment	Mechanically limited at 45 or 60 degrees in cw or ccw directions
Compatible Damper Shafts	3/8 to 1/2 in. square or round (10 to 13 mm square/round)
Shaft Adapter Type	Aluminum Hub, two set screws
Supply Voltage	24 Vac ±20%
Materials	Steel plate and Plenum rated plastic
Operating Humidity Range (% RH).....	5 to 95% RH, non-condensing
Ambient Temperature Range	20 F to 125 F (-18 C to +50 C)
Storage Temperature Range	20 F to 130 F (-18 C to +54 C)
Weight	1.5 lb (0.68 kg)
Includes.....	4074ENY Bag Assembly

APPROVALS

CE.....	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc.....	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.cUL	C22.2 No. 24-93

DIMENSIONS DIAGRAMS



Submittal Data - Actuators

Non-spring Return ML6174; ML7174



Used to control dampers in applications such as variable air volume (VAV) terminal units and for mounting on ball valves; suitable for use with SPDT or floating thermostats or building automation controls.

FEATURES

- Control for air damper applications with up to 20 sq.ft. assuming 3.5 in-lb per sq.ft. of damper area, velocity independent.
- Magnetic coupling eliminates the need for mechanical stops or limit switch adjustments by limiting stall torque to 130 lb-in. maximum.
- Mount directly on 3/8 to 1/2 in. round and square damper shafts. All models include manual declutch lever for ease of mounting and bag assembly with two minimum position setscrews. 90 second timing models are suitable for use with pressure independent VAV systems.
- Selectable 45, 60, and 90 degree stroke in either clockwise or counterclockwise direction.

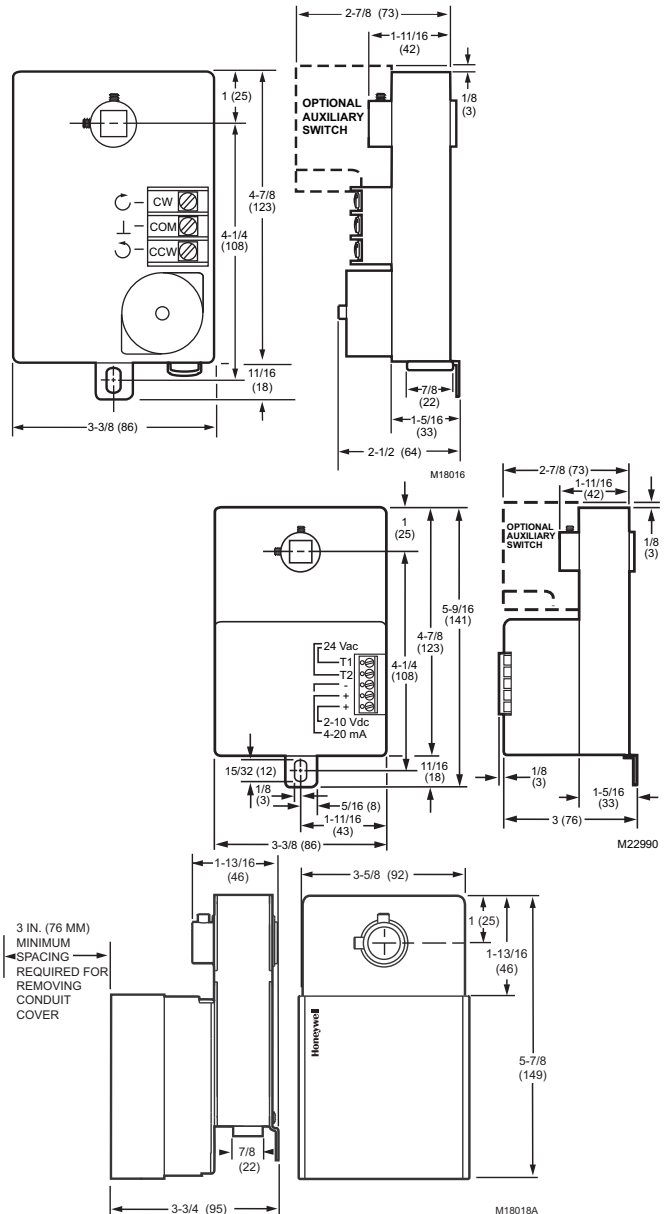
SPECIFICATIONS

Actuator Type	Damper
Rotational Stroke	90 degrees
Fail Safe Mode	Non-Spring Return
Torque	70 lb-in (8 Nm)
External Auxiliary Switches Available	Yes, 201052B
Environmental Rating	NEMA1
Feedback	With accessory
Frequency	50 Hz; 60 Hz
Manual operation	Declutch mechanism
Mounting	Direct Coupled
Maximum Noise Rating, Driving (dBA @ 1m)	45
Rotation to Open	By wiring
Rotational Stroke Adjustment	Mechanically limited at 45 or 60 degrees in cw or ccw directions
Compatible Damper Shafts	3/8 to 1/2 in. square or round (10 to 13 mm square/round)
Shaft Adapter Type	Aluminum Hub, two set screws
Supply Voltage	24 Vac \pm 20%
Materials	Steel plate and Plenum rated plastic
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Ambient Temperature Range	20 F to 125 F (-18 C to +50 C)
Storage Temperature Range	20 F to 130 F (-18 C to +54 C)
Weight	1.5 lb (0.68 kg)
Includes	4074ENY Bag Assembly

APPROVALS

Underwriters Laboratories, Inc.UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc. cUL C22.2 No. 24-93

DIMENSIONS DIAGRAMS





This non-spring return direct-coupled damper actuator provides modulating and floating/2-position control for: air dampers, air handlers, ventilation flaps, louvers and reliable control for air damper applications with up to 10 sq. ft./44lb.-in. (5 Nm) and 20 sq. ft./88 lb.-in. (10 Nm) (seal-less damper blades; air friction-dependent).

FEATURES

- Declutch for manual adjustment
- Adjustable mechanical end limits
- Access cover includes enclosed screw terminal strip (22 to 14 AWG) for electrical connections
- Models available with 3 foot 18 AWG color-coded cable
- Mountable in any orientation
- Function selection switch for selecting modulating or floating/2-position control

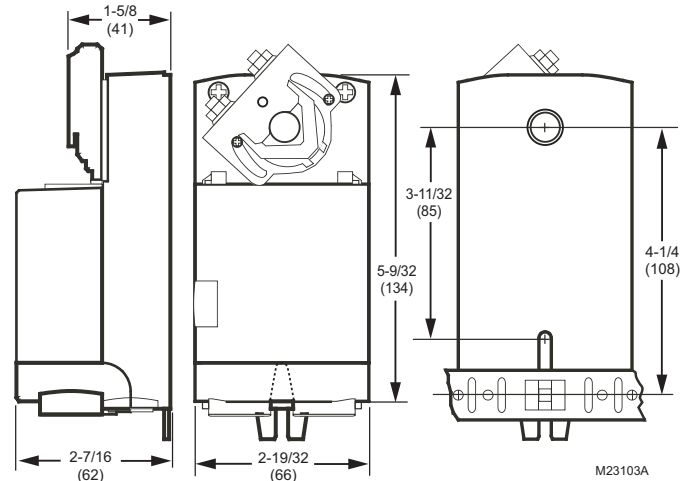
SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Non-Spring Return
Torque	44 lb-in. (5 Nm)
External Auxiliary Switches Available...	Yes, SSW2-1M
Environmental Rating	NEMA2
Frequency	50 Hz; 60 Hz
Manual operation	Declutch mechanism
Mounting	Direct Coupled
Maximum Noise Rating, Driving (dBA @ 1m).....	35
Rotation to Open	By switch
Rotational Stroke Adjustment	Dual Integral Adj. Stops (3 degree increments)
Compatible Damper Shafts.....	1/4 to 1/2 in. square or 3/8 to 5/8 in. round (6 to 13 mm square or 8 to 16 mm round)
Shaft Adapter Type	U-bolt clamp
Supply Voltage	24 Vac +20%, -15%, 24 Vdc
Materials.....	Plenum rated plastic housing
Ingress Protection Rating.....	IP54
Operating Humidity Range (% RH).....	5 to 95% RH, non-condensing
Ambient Temperature Range	-5 F to +140 F (-20 C to +60 C)
Storage Temperature Range	-22 F to +176 F (-30 C to +80 C)
Weight	1 lb (0.45 kg)
Includes.....	Mounting bracket, screws, shaft adapter, water-tight strain-relief cable fittings
Comments	Integral 1/2 in. NPSM conduit connection.

APPROVALS

CE.....	89/336/ECC, 73/23/EEC
C-Tick.....	N314
Underwriters Laboratories, Inc.....	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.cUL	C22.2 No. 24-93

DIMENSIONS DIAGRAM



Submittal Data - Actuators

Non-spring Return N10 Series



This non-spring return direct-coupled damper actuator provides modulating and floating/2-position control for air dampers, air handlers, ventilation flaps, louvers and reliable control for air damper applications with up to 20 sq ft/88 lb-in. (10 Nm) (seal-less damper blades; air friction-dependent).

FEATURES

- Declutch for manual adjustment
- Adjustable mechanical end limits
- Removable access cover for direct wiring
- Mountable in any orientation
- Function selection switch for selecting modulating or floating/2-position control

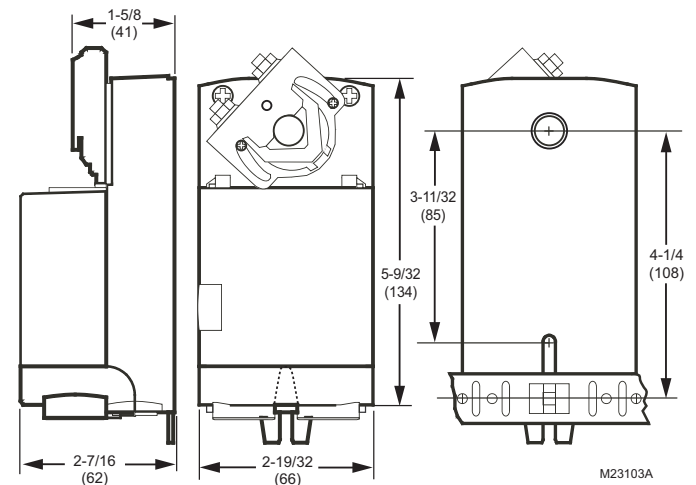
SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Non-Spring Return
Torque	88 lb-in. (10 Nm)
External Auxiliary Switches Available	Yes, SSW2-1M
Electrical Connections	Enclosed screw terminal strip (22 to 14 AWG)
Environmental Rating	NEMA2
Frequency	50 Hz; 60 Hz
Manual operation	Declutch mechanism
Mounting	Direct Coupled
Maximum Noise Rating, Driving (dBA @ 1m)	35
Rotation to Open	By switch
Rotational Stroke Adjustment	Dual Integral Adj. Stops (3 degree increments)
Compatible Damper Shafts	1/4 to 1/2 in. square or 3/8 to 5/ 8 in. round (6 to 13 mm square or 8 to 16 mm round)
Shaft Adapter Type	U-bolt clamp
Supply Voltage	24 Vac +20%, -15%, 24 Vdc
Materials	Plenum rated plastic housing
Ingress Protection Rating	IP54
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Ambient Temperature Range	-5 F to +140 F (-20 C to +60 C)
Storage Temperature Range	-22 F to +176 F (-30 C to +80 C)
Weight	1 lb (0.45 kg)
Includes	Mounting bracket, screws, shaft adapter, water-tight strain-relief cable fittings
Comments	Integral 1/2 in. NPSM conduit connection.

APPROVALS

CE	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc.	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

DIMENSIONS DIAGRAM





These direct-coupled damper actuators provide adjustable modulating control for: air dampers, air handling units, ventilation flaps, louvers and reliable control for air damper applications with up to 4.6 m²/50 sq ft (seal-less dampers; air friction-dependent).

FEATURES

- Control for air damper applications with up to 50 sq ft assuming 3.5 in-lb per sq ft of damper area, velocity independent.
- Patented self-centering shaft adapter.
- Access cover to facilitate connectivity.
- Declutch for manual adjustment.
- Mechanical end limits.
- Field-installable auxiliary switches.
- Rotation direction selectable by switch.
- Mountable in any orientation (no IP54 if upside down).
- Mechanical position indicator.
- CE approved. UL approved.

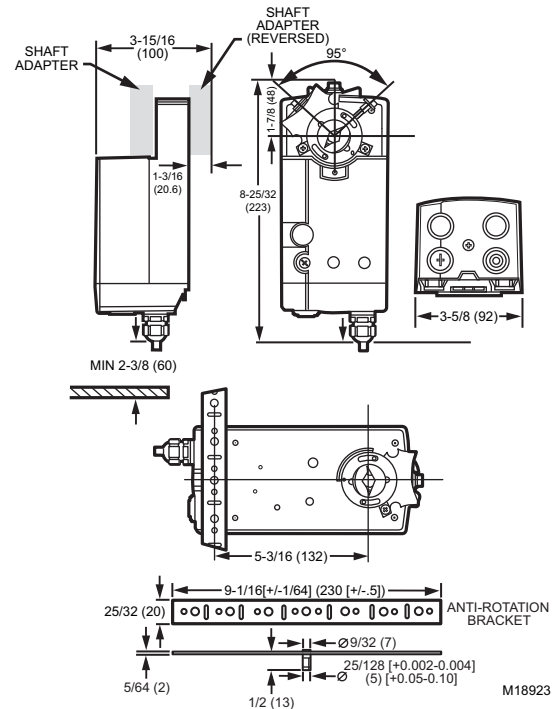
SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Non-Spring Return
Torque	175 lb-in. (20 Nm)
External Auxiliary Switches Available...	Yes, SW2-US
Electrical Connections	Enclosed screw terminal strip (22 to 14 AWG)
Environmental Rating	NEMA2; IP54
Frequency	50 Hz; 60 Hz
Manual operation	Declutch mechanism
Mounting	Direct Coupled
Maximum Noise Rating, Driving (dBA @ 1m).....	40
Rotation to Open	By switch
Rotational Stroke Adjustment.....	Dual Integral Adj. Stops (3 degree increments)
Compatible Damper Shafts.....	3/8 to 1.06 in. round or 3/8 to 11/16 in. square (10 to 27 mm round or 10 to 18 mm square)
Shaft Adapter Type	Self-centering clamping
Materials.....	Plenum rated plastic housing
Operating Humidity Range (% RH).....	5 to 95% RH, non-condensing
Ambient Temperature Range	-5 F to +140 F (-20 C to +60 C)
Storage Temperature Range	-40 F to +175 F (-40 C to +80 C)
Weight	3.2 lb (1.45 kg)
Includes.....	Mounting bracket, self- centering shaft adapter
Comments.....	Integral 1/2 in. NPSM conduit connection.

APPROVALS

CE.....	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc.....	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.cUL	C22.2 No. 24-93

DIMENSIONS DIAGRAM



Submittal Data - Actuators

Non-spring Return N34 Series



These direct coupled damper actuators provide adjustable modulating control for air dampers, air handling units, ventilation flaps, louvers and reliable control for air damper applications with up to 7.9 m²/85 sq ft (seal-less dampers; air friction-dependent).

FEATURES

- Control for air damper applications with up to 85 sq ft assuming 3.5 in-lb per sq ft of damper area, velocity independent.
- Patented self-centering shaft adapter.
- Access cover to facilitate connectivity.
- Declutch for manual adjustment.
- Mechanical end limits.
- Field-installable auxiliary switches.
- Rotation direction selectable by switch.
- Mountable in any orientation (no IP54 if upside down).
- Mechanical position indicator.
- CE approved. UL approved.

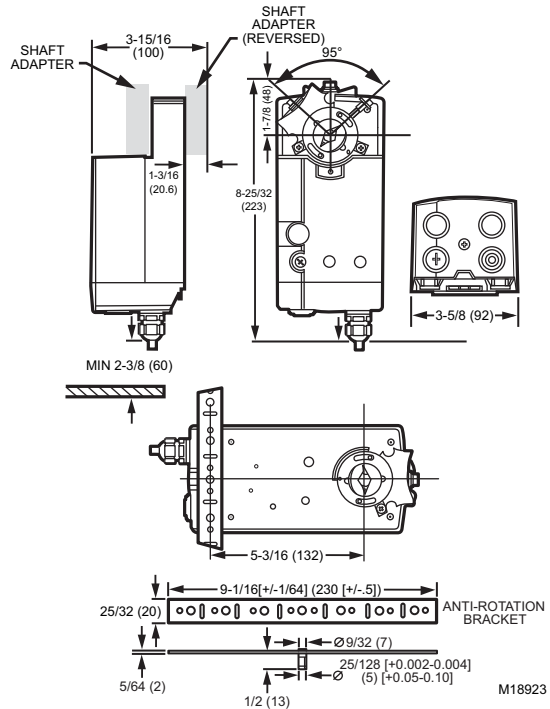
SPECIFICATIONS

Actuator Type	Damper; Valve
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Non-Spring Return
Torque	300 lb-in. (34 Nm)
External Auxiliary Switches Available	Yes, SW2-US
Electrical Connections	Enclosed screw terminal strip (22 to 14 AWG)
Environmental Rating	NEMA2
Frequency	50 Hz; 60 Hz
Manual operation	Declutch mechanism
Mounting	Direct Coupled
Maximum Noise Rating, Driving (dBA @ 1m)	40
Rotation to Open	By switch
Compatible Damper Shafts	3/8 to 1.06 in. round or 3/8 to 11/16 in. square (10 to 27 mm round or 10 to 18 mm square)
Shaft Adapter Type	Self-centering clamping
Materials	Plenum rated plastic housing
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Ambient Temperature Range	-5 F to +140 F (-20 C to +60 C)
Storage Temperature Range	-40 F to +175 F (-40 C to +80 C)
Weight	3.2 lb (1.45 kg)
Includes	Mounting bracket, self-centering shaft adapter
Comments	Integral 1/2 in. NPSM conduit connection.

APPROVALS

CE	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc.	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

DIMENSIONS DIAGRAM





Fire and Smoke Damper Actuator

Spring return direct coupled actuators (DCA) for on/off damper control. The actuator accepts an on/off signal from a single-pole, singlethrow (SPST) controller. They are designed to operate reliably in smoke control systems requiring Underwriters Laboratories Inc. UL555S ratings up to 350 F.

SPECIFICATIONS

Actuator Type	Damper
Rotational Stroke	95 +/- 3 degrees
Fail Safe Mode	Spring Return
Torque	30 lb-in. (3.4 Nm)
Minimum Driving Torque at 350 F	30 lb-in.
Spring Return Torque	30 lb-in. (3.4 Nm)
Number of Internal Auxiliary Switches:	2
Electrical Connections	Color-coded leads
Electrical Connection Length	32 in. (0.8 m)
Environmental Rating	NEMA 1, IP40
Frequency	60 Hz
Mounting	Direct Coupled
Maximum Noise Rating, Holding (dBA @ 1m) ...	20 (no audible noise)
Maximum Noise Rating, Driving (dBA @ 1m)	80
Compatible Damper Shafts	3/8 to 1/2 in. round (10 to 13 mm square/round)
Shaft Adapter Type	Aluminum Hub, two set screws
Materials	Aluminum housing
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Ambient Temperature Range	0 F to +130 F (-18 C to +55 C)
Storage Temperature Range	-40 F to 140 F (-40 C to +60 C)
Weight	5 lb (2.27 kg)
Comments	Two integral 3/8 in. clip-in flexible conduit connections

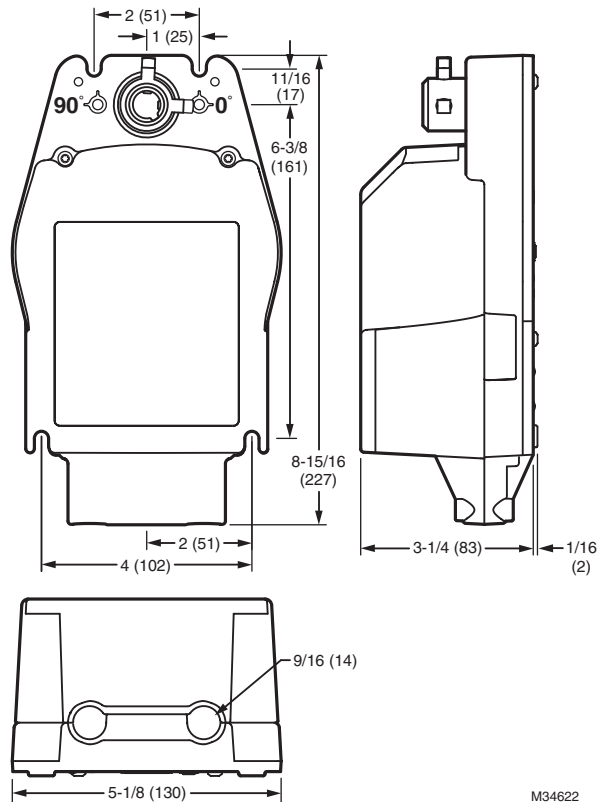
APPROVALS

CE	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

FEATURES

- Reversible mounting facilitates use in either clockwise (cw) or counterclockwise (ccw) spring rotation.
- Integral spring return ensures level of return torque.
- Fifteen-second spring return timing.
- No special cycling required during long-term holding. (See Operation section.)
- No audible noise during holding.
- Patent pending design eliminates need for limit switches to reduce power consumption.
- Models available for 24, 120, and 230 Vac.
- Ninety-five degree angle of rotation.
- Actuator holds rated torque at reduced power level.
- Die-cast aluminum housing.
- Housing design allows flush mounting to damper.
- Designed to operate reliably in smoke control systems requiring Underwriters Laboratories Inc. UL555S ratings up to 350°F.
- Models available with SPST position-indicating switches (7°, 85° stroke).

DIMENSIONS DIAGRAM



M34622

Submittal Data - Actuators

Spring Return MS4109F, MS4609F, MS8109F



Fire and Smoke Damper Actuator

Spring return direct coupled actuators (DCA) for on/off damper control. The actuator accepts an on/off signal from a single-pole, singlethrow (SPST) controller. They are designed to operate reliably in smoke control systems requiring Underwriters Laboratories Inc. UL555S ratings up to 350 F.

FEATURES

- Reversible mounting facilitates use in either clockwise (cw) or counterclockwise (ccw) spring rotation.
- Integral spring return ensures level of return torque.
- Fifteen-second spring return timing.
- No special cycling required during long-term holding. (See Operation section.)
- No audible noise during holding.
- Patent pending design eliminates need for limit switches to reduce power consumption.
- Models available for 24, 120, and 230 Vac.
- Ninety-five degree angle of rotation.
- Actuator holds rated torque at reduced power level.
- Die-cast aluminum housing.
- Housing design allows flush mounting to damper.
- Designed to operate reliably in smoke control systems requiring Underwriters Laboratories Inc. UL555S ratings up to 350°F.
- Models available with SPST position indicating switches (7°, 85° stroke).

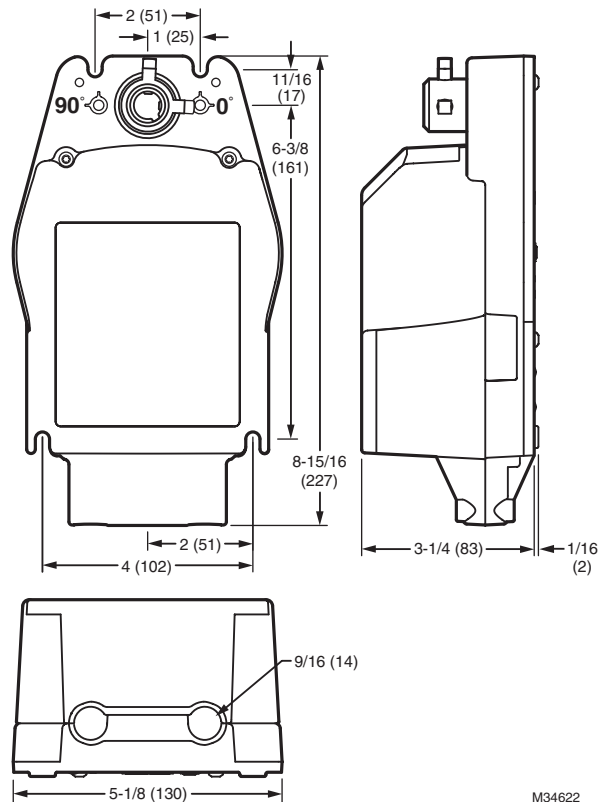
SPECIFICATIONS

Actuator Type	Damper
Rotational Stroke	95 +/- 3 degrees
Fail Safe Mode	Spring Return
Torque	80 lb-in. (9 Nm)
Minimum Driving Torque at 350 F	80 lb-in.
Spring Return Torque	80 lb-in. (9 Nm)
Number of Internal Auxiliary Switches:	2
Environmental Rating	NEMA 1, IP40
Frequency	60 Hz
Mounting	Direct Coupled
Maximum Noise Rating, Holding (dBA @ 1m)	20 (no audible noise)
Maximum Noise Rating, Driving (dBA @ 1m)	80
Compatible Damper Shafts	3/8 to 1/2 in. round (10 to 13 mm square/round)
Shaft Adapter Type	Aluminum Hub, four set screws
Supply Voltage	120 Vac +10%, -15%
Materials	Aluminum housing
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Ambient Temperature Range	0 F to +130 F (-18 C to +55 C)
Storage Temperature Range	-40 F to 140 F (-40 C to +60 C)
Weight	5 lb (2.27 kg)
Comments	Two integral 3/8 in. clip-in flexible conduit connections

APPROVALS

CE	89/336/ECC, 73/23/EEC
C-Tick	N314
Underwriters Laboratories, Inc	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.	cUL C22.2 No. 24-93

DIMENSIONS DIAGRAM



M34622

Spring Return MS4120F; MS4620F; MS8120F



Fire and Smoke Damper Actuator

Spring return direct coupled actuators (DCA) for on/off damper control with an integral junction box. The actuator accepts an on/off signal from a single-pole, single-throw (SPST) controller. They are designed to operate reliably in smoke control systems requiring Underwriters Laboratories Inc. UL555S ratings up to 350 F.

FEATURES

- Brush DC submotor with electronic stall protection for 2-position models
- Self-centering shaft adapter (shaft coupling) for wide range of shaft sizes
- Models available for use with two-position, single pole single throw (spst), line- (Series 40) or low- (Series 80) voltage controls
- Metal housing with built-in mechanical end limits
- Spring return direction field-selectable
- Shaft position indicator and scale
- Manual winding capability with locking function
- UL (cUL) listed and CE compliant
- All models are plenum-rated per UL873

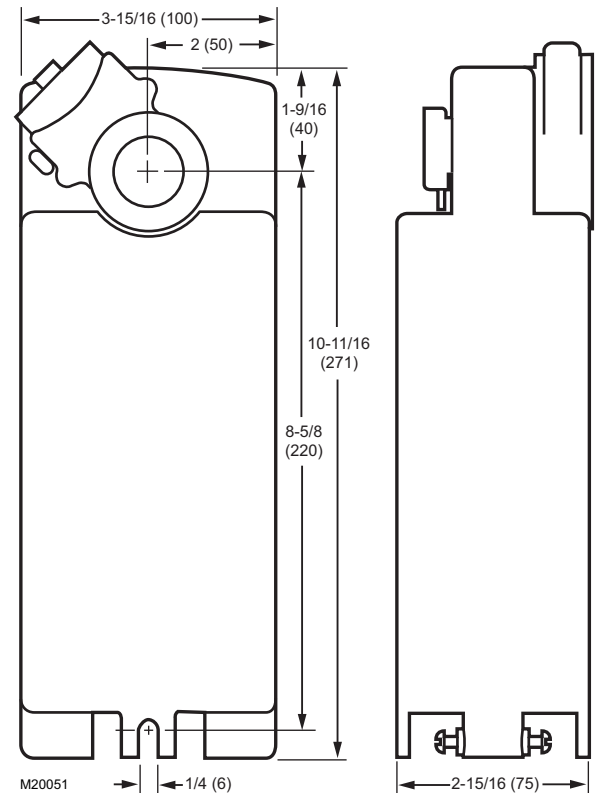
SPECIFICATIONS

Actuator Type	Damper
Rotational Stroke	95 ±3 degrees
Fail Safe Mode	Spring Return
Torque	175 lb-in. (20 Nm)
Minimum Driving Torque at 350 F	175 lb-in.
Spring Return Torque	175 lb-in. (20 Nm)
Spring Return Direction:.....	By orientation
External Auxiliary Switches Available.....	No
Electrical Connections	Teflon-jacketed cable
Electrical Connection Length.....	40 in. (1 m)
Environmental Rating	NEMA2
Ingress Protection Rating.....	IP54
Frequency	60 Hz
Manual operation	Manual crank
Mounting	Direct Coupled
Maximum Noise Rating, Holding (dBA @ 1m)	20 (no audible noise)
Maximum Noise Rating, Driving (dBA @ 1m).....	70
Compatible Damper Shafts.....	3/8 to 1.06 in. round or 3/8 to 1 1/16 in. square (10 to 27 mm round or 10 to 18 mm square)
Shaft Adapter Type	Self-centering clamping
Supply Voltage	120 Vac ±10%
Materials.....	Aluminum housing
Operating Humidity Range (% RH).....	5 to 95% RH, non-condensing
Ambient Temperature Range	-40 F to +130 F (-40 C to +55 C)
Storage Temperature Range	-40 F to +140 F (-40 C to +60 C)
Weight	8 lb (3.63 kg)
Includes.....	Self-centering shaft adapter, 3mm crank
Comments.....	Two integral 3/8 in. flexible conduit connections

APPROVALS

CE.....	89/336/ECC, 73/23/EEC
C-Tick.....	N314
Underwriters Laboratories, Inc.....	UL873, Plenum Rated
Canadian Underwriters Laboratories, Inc.cUL	C22.2 No. 24-93

DIMENSIONS DIAGRAM

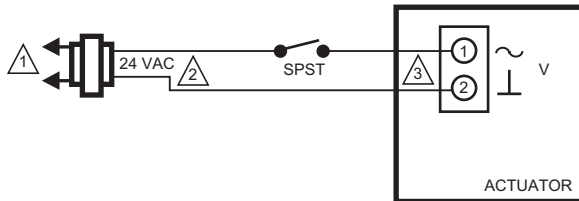


Wiring Diagrams - Actuators

Spring Return S03 and S05 Series

S03 Series (MS4103, MS7403, MS7503, MS8103) and
S05 Series (MS4105, MS7105, MS7405, MS7505, MS8105)

Wiring for low-voltage two-position control



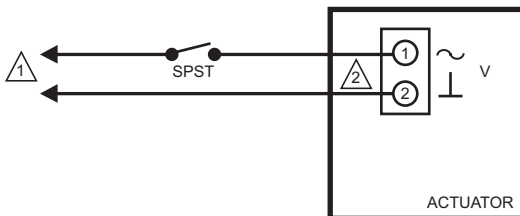
1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 24 VDC SUPPLY ACCEPTABLE.

3 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

M19718C

Wiring for line-voltage two-position control

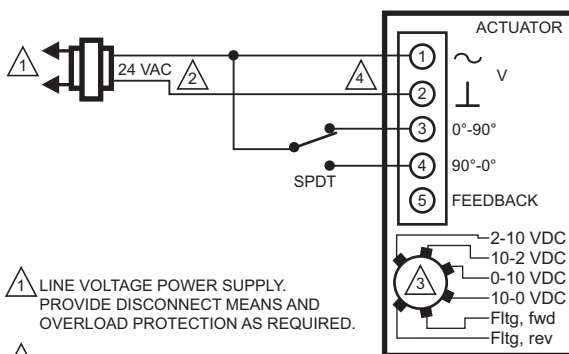


1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

M22289A

Wiring for SPDT on/off Control



1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

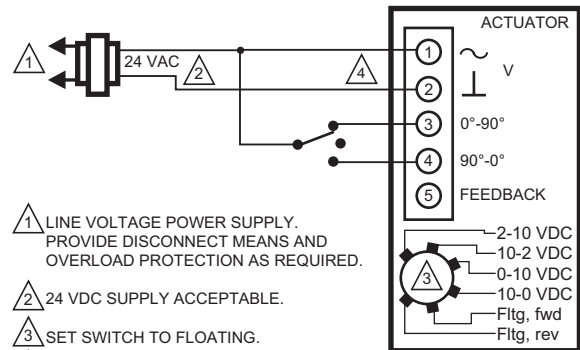
2 24 VDC SUPPLY ACCEPTABLE.

3 SET SWITCH TO FLOATING.

4 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

M27822

Wiring for floating control



1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

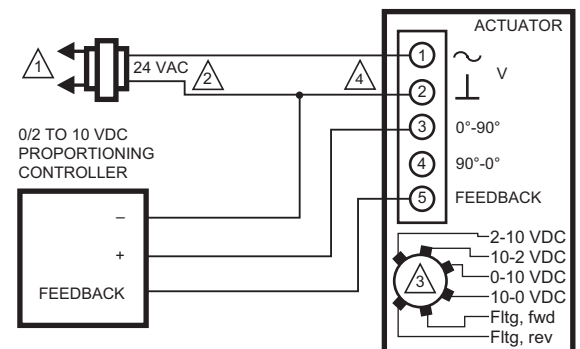
2 24 VDC SUPPLY ACCEPTABLE.

3 SET SWITCH TO FLOATING.

4 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

M27823

Wiring for (0)2-10 VDC proportioning controllers



1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

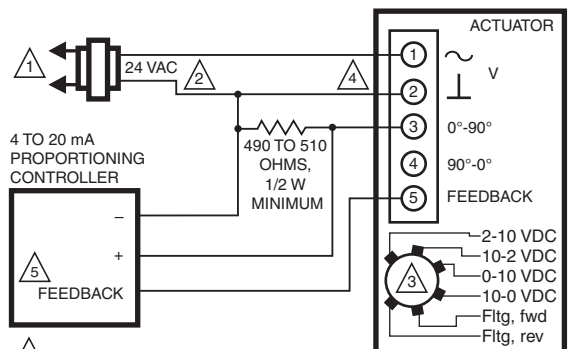
2 24 VDC SUPPLY ACCEPTABLE.

3 SET SWITCH TO MODULATING.

4 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

M27824

Wiring for 4-20 mA proportioning controllers



1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 24 VDC SUPPLY ACCEPTABLE.

3 SET SWITCH TO MODULATING.

4 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

5 FEEDBACK WILL BE A 2-10 VDC.

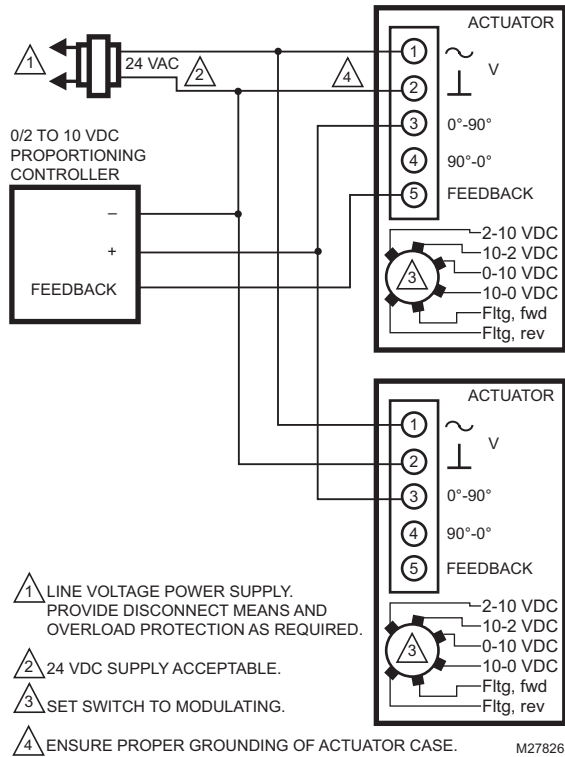
M27825A

Wiring Diagrams - Actuators

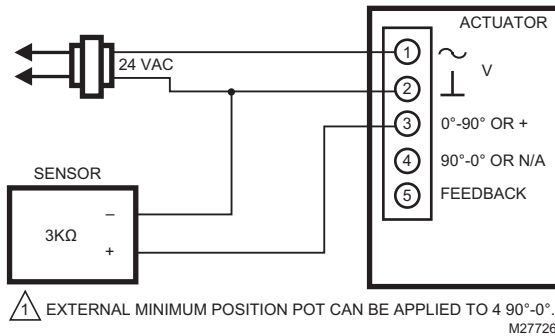
Spring Return S03 and S05 Series

ACTUATORS

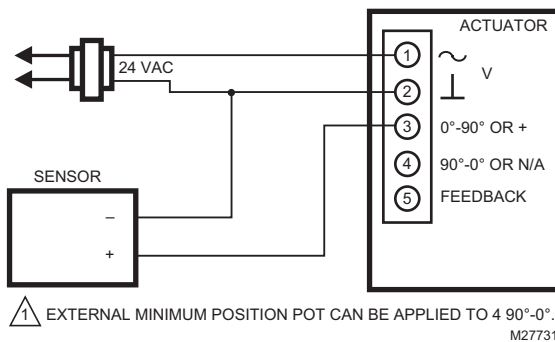
Wiring for (0)2-10 Vdc proportioning controller operating multiple actuators



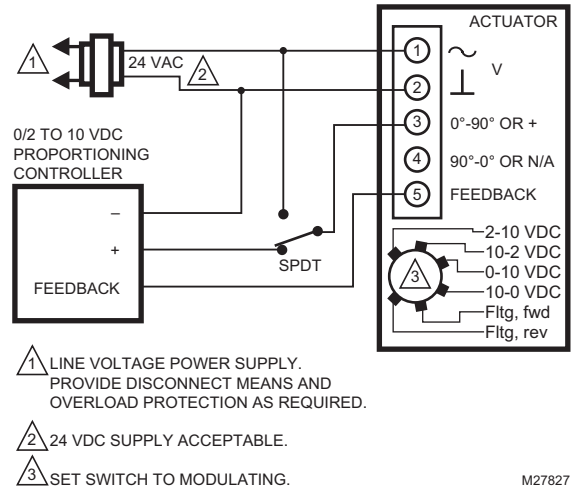
Wiring for 3 kOhm Economizer controllers



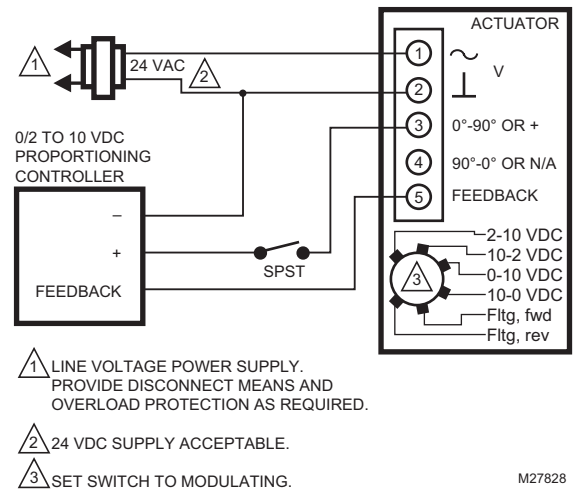
Wiring for 3 position Economizer controllers



Override to full open



Override to full close

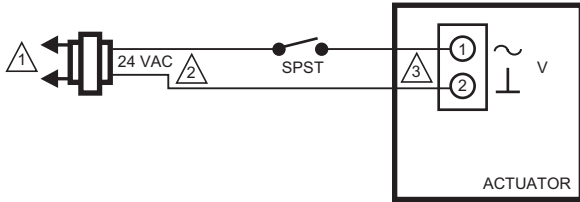


Wiring Diagrams - Actuators

Spring Return S10 and S20 Series

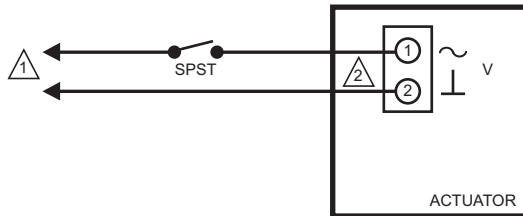
S10 Series (MS4110, MS7510, MS8110) and S20 Series (MS4120, MS7520, MS8120)

Wiring for On/Off Control



- 1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 24 VDC SUPPLY ACCEPTABLE.
- 3 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

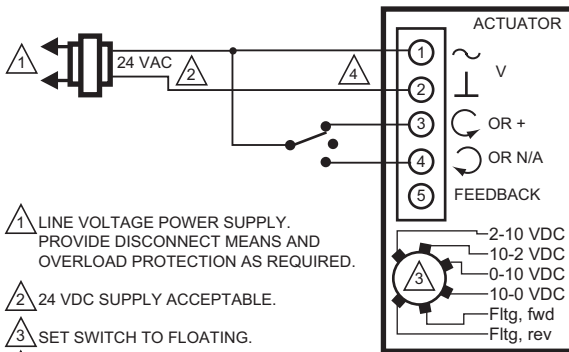
M19718C



- 1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

M22289A

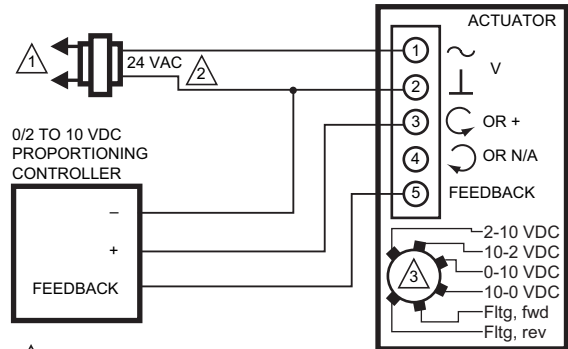
Wiring for Floating Control (Floating mode setting)



- 1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 24 VDC SUPPLY ACCEPTABLE.
- 3 SET SWITCH TO FLOATING.
- 4 ENSURE PROPER GROUNDING OF ACTUATOR CASE.

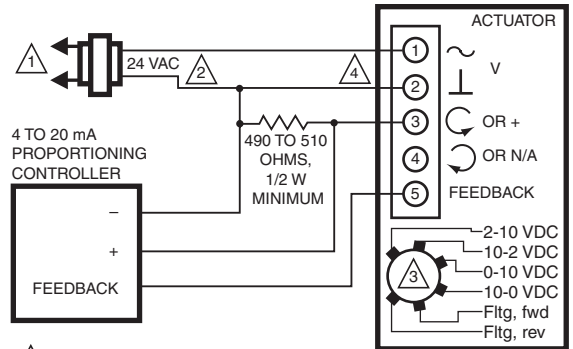
M19573B

Wiring for Proportioning controllers (Modulating mode setting)



- 1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 24 VDC SUPPLY ACCEPTABLE.
- 3 SET SWITCH TO MODULATING.

M19574A



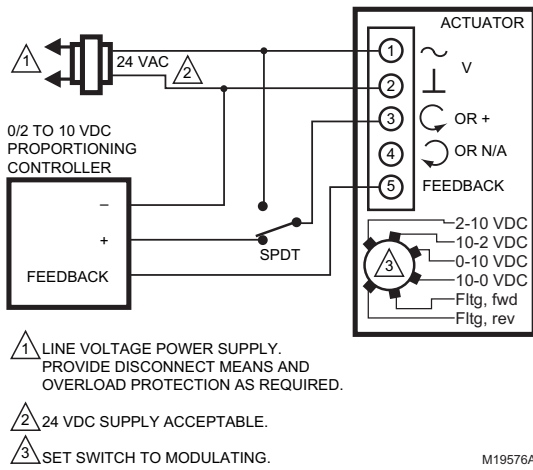
- 1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 24 VDC SUPPLY ACCEPTABLE.
- 3 SET SWITCH TO MODULATING.
- 4 ENSURE PROPER GROUNDING OF ACTUATOR CASE.
- 5 FEEDBACK WILL BE A 2-10 VDC.

M22282C

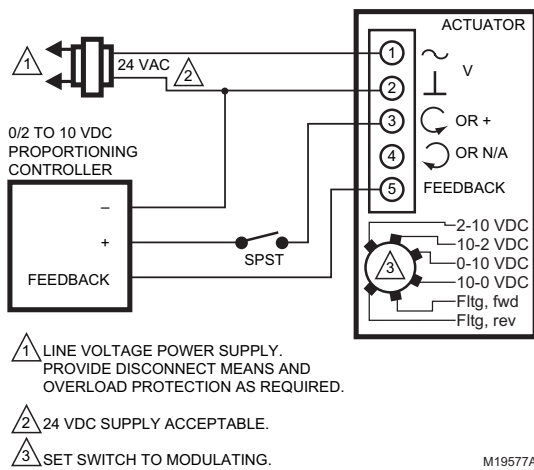
Wiring Diagrams - Actuators

Spring Return S10 and S20 Series

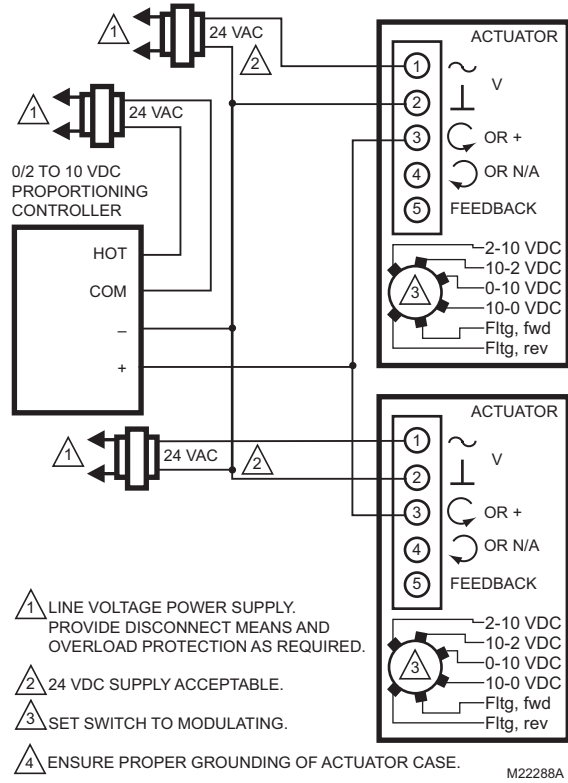
Override to full open (Modulating mode setting)



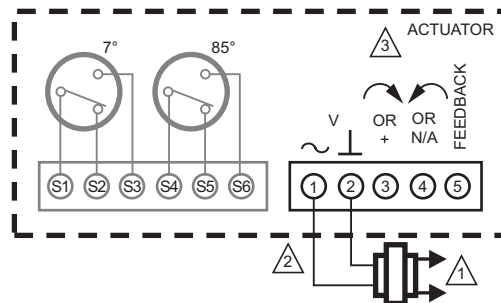
Override to full closed (Modulating mode setting)



Wiring for Proportioning controllers operating multiple actuators (Modulating mode setting)



Terminal Block Details



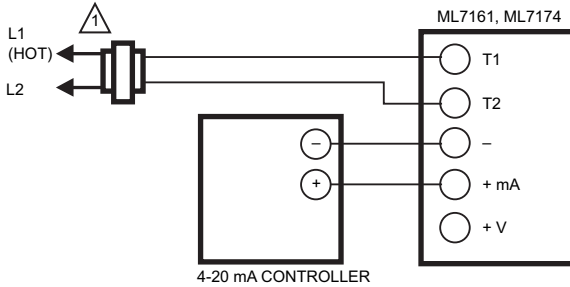
- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
 - 2 THE INTERNAL AUXILIARY SWITCHES MUST BE CONNECTED TO THE SAME POWER SOURCE; OR THE AUXILIARY SWITCHES SHALL BE CONNECTED TO THE SAME POLE OF THE SAME SUPPLY CIRCUIT, CONNECTED IN A SAME POLARITY MANNER.
 - 3 ENSURE PROPER GROUNDING OF ACTUATOR CASE.
- M19571B

Wiring Diagrams - Actuators

Non-spring Return ML6161; ML7161

ML6161 and ML7161

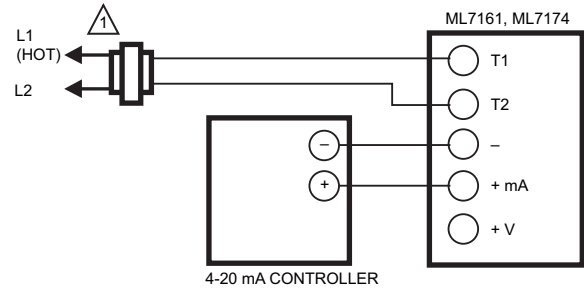
ML7161 used with 4-20 mA control



1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. M18071

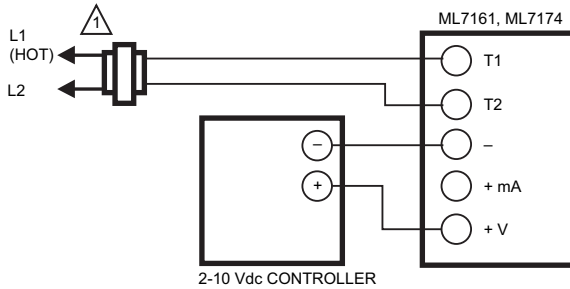
ML6174 and ML7174

ML7174 used with 4-20 mA control



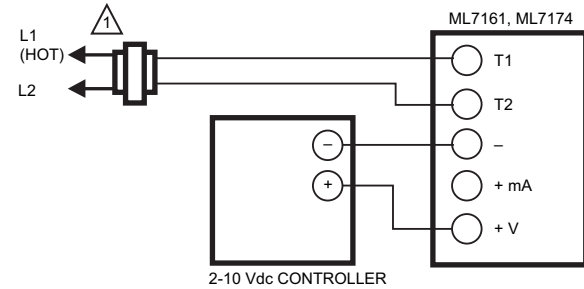
1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. M18071

ML7161 used with 2-10 Vdc control



1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. M18072

ML7174 used with 2-10 Vdc control



1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. M18072

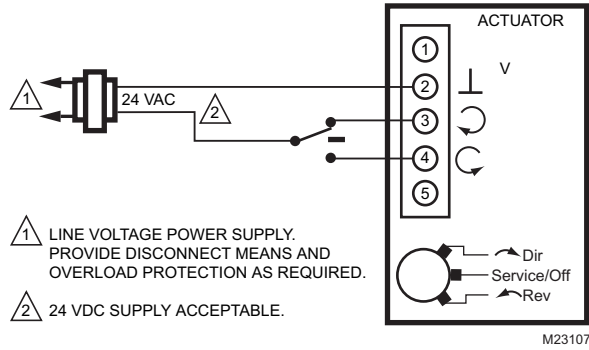
Wiring Diagrams - Actuators

Non-spring Return N05 and N10 Series

N05 Series (MN6105, MN7505) and N10 Series (MN6110, MN7510)

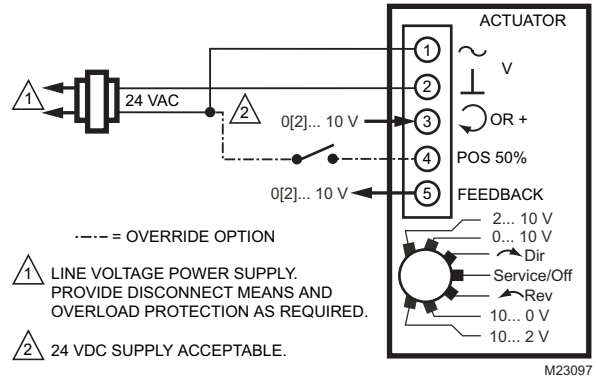
Wiring for Floating Control

MN6105, MN6110
FLOATING: DIR ↺



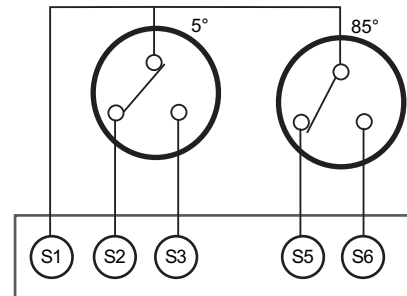
Wiring for Voltage Control

MN7505, MN7510
MODULATING: 0[2]... 10 V, 10... 0[2] V



Wiring for Auxiliary Switches

END SWITCHES (CLASS II-ONLY)

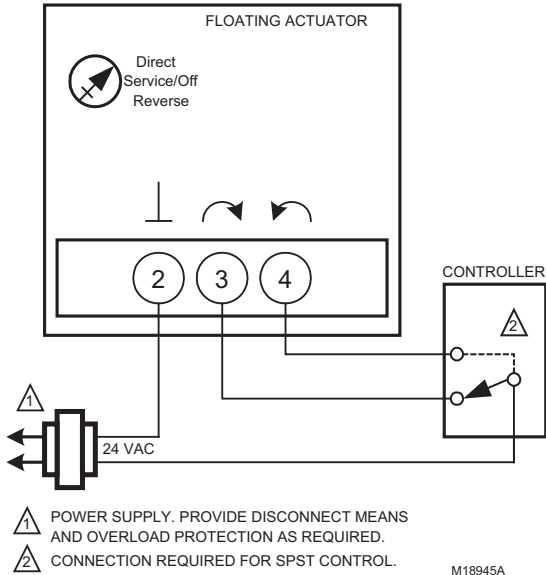


Wiring Diagrams - Actuators

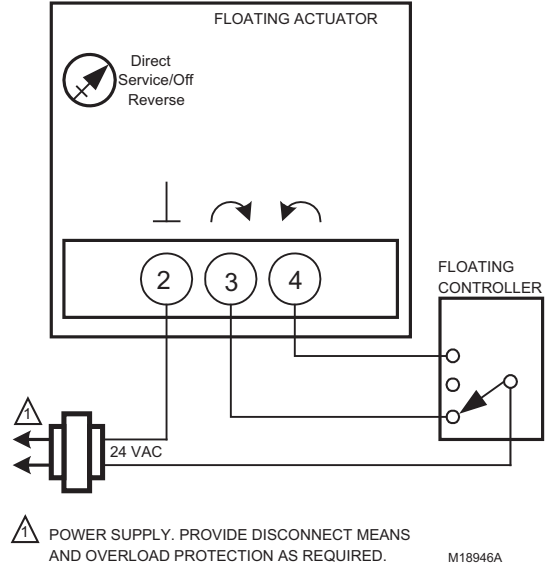
Non-spring Return N20 and N34 Series

N20 Series (MN6120, MN7220) and N34 Series (MN6134, MN7234)

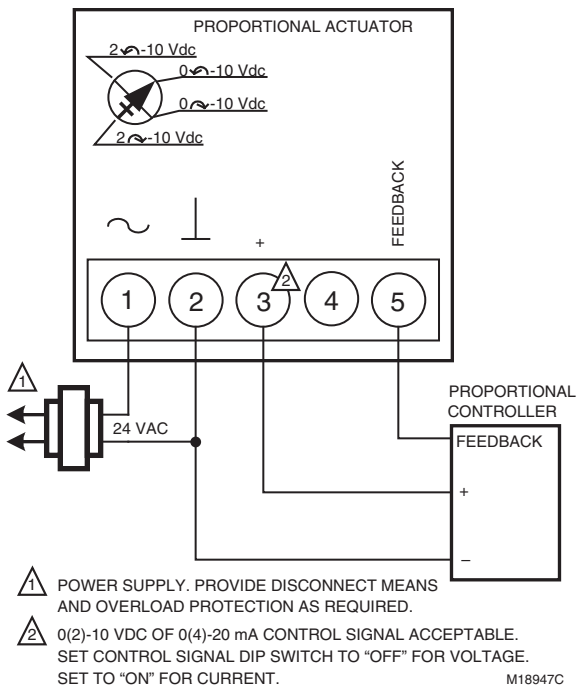
Used for On/Off Control



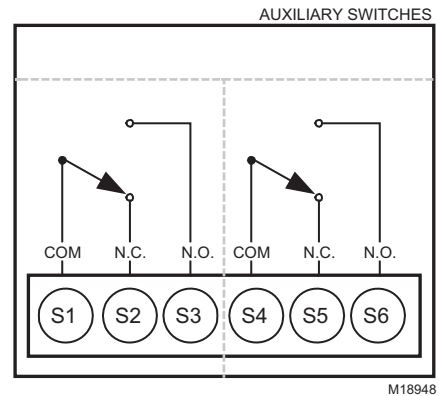
Wiring for Floating Control



Wiring for Modulating Control



Wiring for Auxiliary Switches

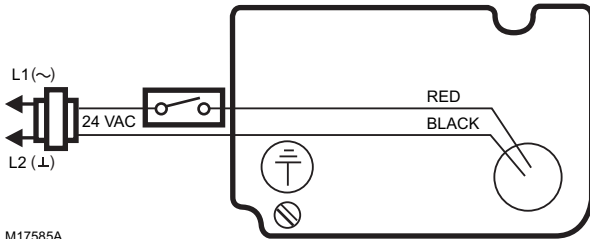


Wiring Diagrams - Actuators

Fire and Smoke Damper Actuators

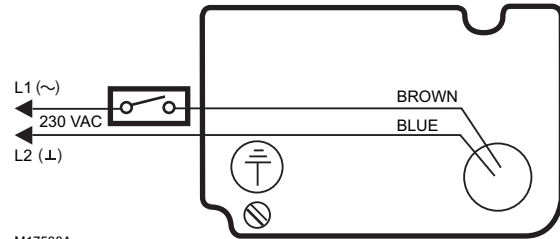
MS4209F, MS4309F, MS4709F, MS4809F, MS8209F and MS8309F

Typical 24 Vac wiring



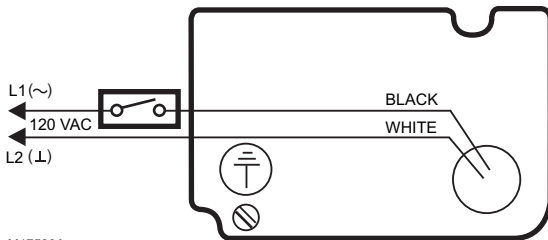
M17585A

Typical 230 Vac Wiring



M17588A

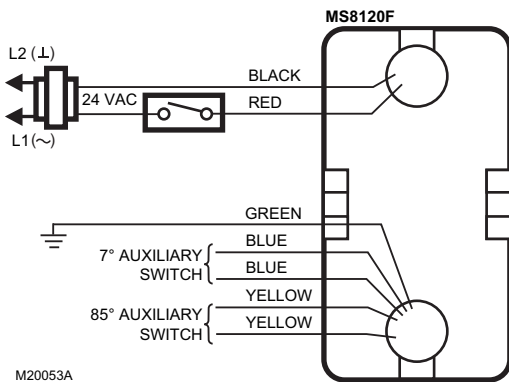
Typical 120 Vac wiring



M17589A

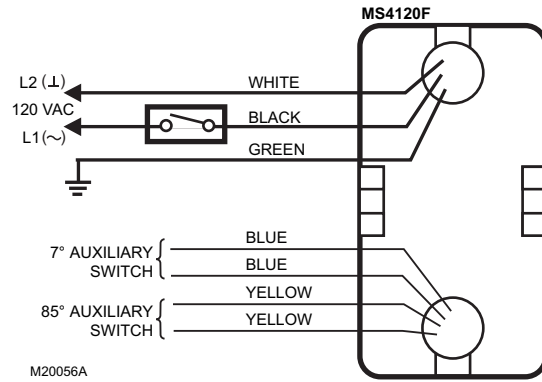
MS4120F, MS4620F, MS8120F, MS4109F, MS4609F and MS8109F

Wiring for 24V Control



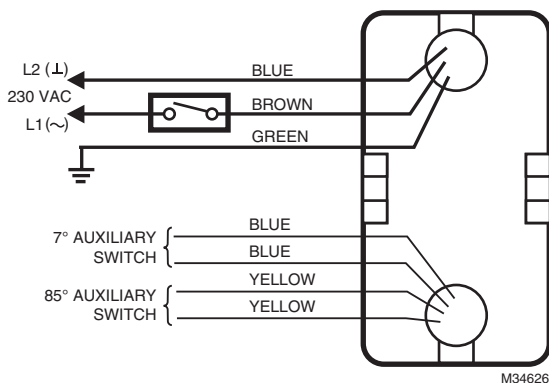
M20053A

Wiring for 120V Control



M20056A



Wiring for 230V Control







M34626


Accessories - Actuators

Ball Joints, Push Rod Accessories


	Product Number	Description	Used With
	27518	Crankarm balljoint with 1/4 - 28 UNF male threads, fits 5-16 inch diameter push rods	All Actuators and Dampers
	27520A	Push Rod (5/16 in. dia., 5 in. length)	All Actuators and Dampers
	27520B	Push Rod (5/16 in. dia., 10 in. length)	All Actuators and Dampers
	27520C	Push Rod (5/16 in. dia., 12 in. length)	All Actuators and Dampers
	27520D	Push Rod (5/16 in. dia., 15 in. length)	All Actuators and Dampers
	27520E	Push Rod (5/16 in. dia., 18 in. length)	All Actuators and Dampers
	27520G	Push Rod (5/16 in. dia., 24 in. length)	All Actuators and Dampers
	27520H	Push Rod (5/16 in. dia., 28 in. length)	All Actuators and Dampers
	27520K	Push Rod (5/16 in. dia., 36 in. length)	All Actuators and Dampers
	27520L	Push Rod (5/16 in. dia., 48 in. length)	All Actuators and Dampers
	27520Q	Push Rod (5/16 in. dia., 8 in. length)	All Actuators and Dampers

Control, Positioning, Feedback Accessories



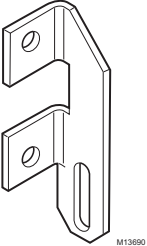
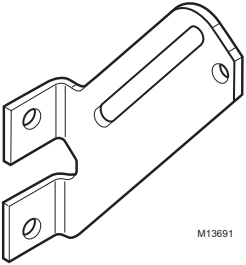

	Product Number	Description	Used With
	200976A	Auxiliary Feedback Potentiometer (0 to 500 ohm)	ML6161, ML6174, ML7161, ML7174
	200976C	Auxiliary Feedback Potentiometer (0 to 2000 ohm)	ML6161, ML6174, ML7161, ML7174
	201052A	Auxiliary Switch Package, Single	ML6161, ML6174, ML7161, ML7174
	201052B	Auxiliary Switch Package, Double	ML6161, ML6174, ML7161, ML7174
	205860	Electronic Remote Minimum Position Potentiometer	Proportional Actuators
	32003532-005	High Temperature Dual Switch Assembly	ML4105, ML8105, ML4115, ML8115, ML4125, ML8125, ML4135, ML8135, MS4209, MS4309, MS4709, MS4809, MS8209, MS8309

	32006306-001	Resistor Kit (500 ohm, converts 4-20mA to 2-10Vdc)	Proportional Actuators
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Control, Positioning, Feedback Accessories (cont.)

	Product Number	Description	Used With
	SW2-US	Auxiliary Switch Package (2 adjustable SPDT switches)	MS and MN Series High Torque Actuators (MNXX20 and XX34)

Mounting Accessories

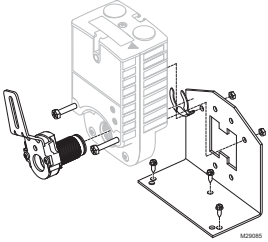
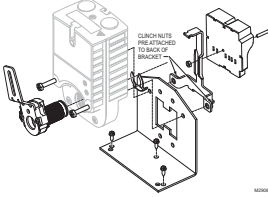
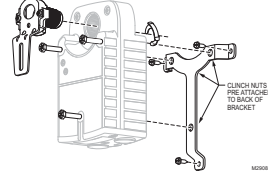
	Product Number	Description	Used With
	205649	Mounting Bracket	150 and 300 lb-in. NSR and SR (except 25, 53 and 142 lb-in) Actuators
	32007205-001	Direct Coupled Actuator Mounting Bracket	Damper with External Actuator Mounting (i.e., 32007205-005 Kit)
	32007205-002	Damper Blade Drive Lever (Small)	All Actuators and Dampers
	32007205-003	Damper Blade Drive Lever (Large)	All Actuators and Dampers
	32007205-004	Retaining Clip, Damper External Drive Pin	Damper with External Actuator Mounting (i.e., 32007205-005 Kit)

Accessories - Actuators


Mounting Accessories (cont.)

	Product Number	Description	Used With
	32007205-005	Damper External Drive Pin Kit	Damper with External Actuator Mounting (i.e., 32007205-005 Kit)
	32007205-006	Damper Axle Coupling	Multi-Section Dampers
	32007205-007	Jumper Bracket	Multi-Section Dampers
	50000407-001	Actuator Tandem Mounting Kit	N20, N34 Actuators; S05, S10, S20 Actuators
	50001194-001	Foot Mounting Kit	MS and MN Series High Torque Actuators (MNXX20 and MNXX34) MSxx10 and MSxx20, but not for MSxx20F
	50006427-001	Flexible Anti-Rotation Bracket	N20, N34 Actuators; S05, S10, S20 Actuators
	STRN-BRKT	Anti-rotation Bracket for S03 and S05 Series Actuators	S03, S05 Actuator

Mounting Accessories (cont.)



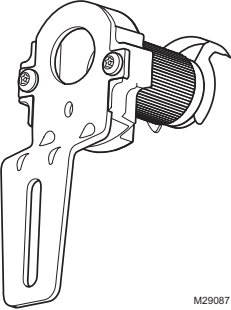
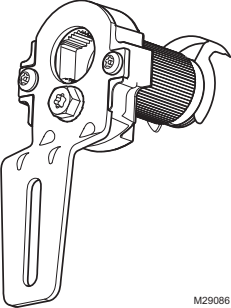
	Product Number	Description	Used With
	STRN-CRK-01	Crank arm kit for S03 and S05 Series Actuators	S03, S05 Actuators
	STRN-ECONO-01	Economizer Retrofit Kit for S03 and S05 Series Actuators	S03, S05 Actuators
	STRN-WMK-01	Wall mount kit for S03 and S05 Series Actuators	S03, S05 Actuators

Rotational Limiters, Position Indicators



	Product Number	Description	Used With
	4074ENJ	Minimum Position Kit	ML6161, ML6174, ML7161, ML7174

Accessories - Actuators



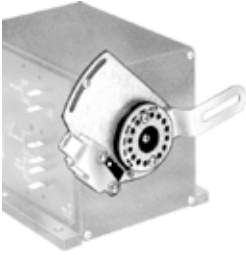
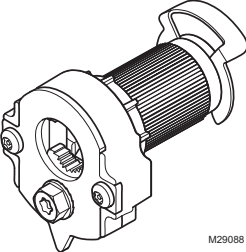
Crankarms

	Product Number	Description	Used With
	205830A	Rotary-to-Linear Kit Used With: 35 and 70 lb-in NSR Actuators	35 and 70 lb-in.NSR
	26026G	Damper Crank Arm, 1/2 in. damper shaft	All Actuators and Damper
 <small>M29087</small>	STRN-CA-01	Non Self-centering Crank Arm for S03 and S05 Series Actuators	S03, S05 Actuators
 <small>M29086</small>	STRN-CA-02	Self-centering Crank Arm for S03 and S05 Series Actuators	S03; S05 Actuators

Shaft Adapter Accessories




	Product Number	Description	Used With
	32003167-001	3/8 in. Shaft Adapter	ML6161; ML6174; ML7161; ML7174; ML7999
	32003168-001	Short Shaft Adapter (3/4 in. to 1/2 in.)	All Actuators and Dampers
	32003168-002	Short Shaft Adapter (5/8 in. to 1/2 in.)	All Actuators and Dampers
	32003168-003	Short Shaft Adapter (9/16 in. to 1/2 in.)	All Actuators and Dampers
	32003168-004	Short Shaft Adapter (1/2 in.)	All Actuators and Dampers

Shaft Adapter Accessories (cont.)


	Product Number	Description	Used With
	32004254-001	Self-Centering Shaft Adapter	N20 Actuators
	32004254-002	Self-Centering Shaft Adapter	S10, S20 Actuators
	32004254-003	Self-Centering Shaft Adapter	N34 Actuators
	4074ENY	3/8 in. Shaft Kit	ML6161, ML6174, ML7161, ML7174
	4074EVK	Short Shaft Kit	ML6161, ML6174, ML7161, ML7174
 <p>M29088</p>	STRN-SCSA	Self-centering Shaft Adapter	S03, S05 Actuators

Accessories - Actuators


Enclosure Accessories

	Product Number	Description	Used With
	32003036-001	Weather Enclosure	All Actuators
	50005859-001	NEMA 4 Enclosure for Direct Coupled Actuator	ML6161, ML6174, ML7161, ML7174; 150 lb-in. NSR Actuators (ML Series); N20, N34 Actuators; S03, S05, S10, S20 Actuators
	7640QW	Enclosure for Conduit Connection	ML6161, ML6174, ML7161, ML7174

Q7002 Interface Modules

	Product Number	Description	Used With
	Q7002B1009	Transducer, Accepts dc voltage, current or resistive input and provides a voltage or current output	Direct Coupled Proportional Actuators and Modutrol Motors
	Q7002C1007	Transducer, Accepts a pulse-width modulation (PWM) signal and provides a voltage output	Direct Coupled Proportional Actuators and Modutrol Motors

Miscellaneous Accessories

	Product Number	Description	Used With
	32000085-001	Strain Relief Fitting (10 pack)	MS and MN Series Actuators
	STRN-STRNRLF	Strain Relief Fitting for S03 and S05 Series Actuators	S03; S05 Actuators

Damper and Linkage Accessories

Product Number	Description	Used With
102546	Ball Joint, 5/16 in.	Damper Linkages
101662A/0021	Motor Mounting Bracket Assembly for Q605	Q605
102931/0021	Adapter arm for less than 90 degree rotation for the Q605	Q605
104643A	Adapter for driving 2 dampers from 1 crank arm	Kit Mounted Motors; Modutrol IV Motors
26025F	Damper Arm, 3/8 in. shaft	—
26026B	Damper Arm, 1/2 in. shaft, 3 in. long	—
7617ACL	Bag Assembly	Q605

Cross Reference - Actuators

Direct Coupled Actuators

Belimo Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
CMB24-3	NSR	18 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	35	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac	—	—	90
CMB120-3	NSR	18 lb-in	On/Off, Floating	100-240 Vac	—	—	35	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac	—	—	90
CMB24-SR-R	NSR	18 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	35	ML7161A2008	35 lb-in	On/Off, Floating	24 Vac	—	—	90
CMB24-SR-L	NSR	18 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	35	ML7161A2008	35 lb-in	On/Off, Floating	24 Vac	—	—	90
LMB24-3-P5-T	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	0-5 kOhm	—	95	ML6174A2002 + 200976A	70 lb-in	On/Off, Floating	24 Vac	500 kOhm	—	90
								ML6174A2002 + 200976C	70 lb-in	On/Off, Floating	24 Vac	2 kOhm	—	90
LMB24-3-P10-T	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	0-10 kOhm	—	95	ML6174A2002 + 200976A	70 lb-in	On/Off, Floating	24 Vac	500 kOhm	—	90
								ML6174A2002 + 200976C	—	On/Off, Floating	24 Vac	2 kOhm	—	90
LMB24-3	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
LMB24-3-T	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
LMB24-3-S	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	—	1	95	MN6105A1201	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
LMB24-SR	NSR	45 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMX24-SR	NSR	45 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMB24-SR-T	NSR	45 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	—	95	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMX24-SR-T	NSR	45 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	—	95	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMB24-MFT	NSR	45 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMX24-MFT	NSR	45 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMX24-MFT	NSR	45 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	Add-On	150	MN7505A2209	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
LMCB24-3	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	35	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
LMCB24-3-T	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	35	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
LMX24-3	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
LMX24-3-T	NSR	45 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
LMCB24-SR	NSR	45 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	35	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMCB24-SR-T	NSR	45 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	—	35	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMX120-SR	NSR	45 lb-in	2-10 Vdc (4-20 mA)	100-240 Vac	2-10 Vdc	—	95	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LMX120-3	NSR	45 lb-in	On/Off, Floating	100-240 Vac	—	—	150	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
LMQX24-MFT	NSR	35 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	ML6161A2009	35 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac	—	—	90
NMB24-3	NSR	90 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
NMCB24-3	NSR	90 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	45	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
NMX24-3	NSR	90 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
NMX24-3-T	NSR	90 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
NMX120-3	NSR	90 lb-in	On/Off, Floating	100-240 Vac	—	—	150	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
NMX120-SR	NSR	90 lb-in	2-10 Vdc (4-20 mA)	100-240 Vac	2-10 Vdc	—	150	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NMCX24-MFT	NSR	90 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NMQX24-MFT	NSR	70 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	ML7174A2001	70 lb-in	(0) 2-10 Vdc	24 Vac/Vdc	—	—	90
NMB24-SR	NSR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	—	95	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NMCB24-SR	NSR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	45	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NMX24-SR	NSR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NMX24-SR-T	NSR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	—	95	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NMB24-MFT	NSR	90 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NMX24-MFT	NSR	90 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AMB24-3	NSR	180 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
AMX24-3	NSR	180 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
AMX24-3-T	NSR	180 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	95	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
AMB24-3-S	NSR	180 lb-in	On/Off, Floating	24 Vac/Vdc	—	1	95	MN6120A1200	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
AMB24-SR	NSR	180 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MN7220A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AMX24-SR	NSR	180 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MN7220A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AMX24-SR-T	NSR	180 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	—	95	MN7220A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AMB24-MFT	NSR	180 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7220A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AMX24-MFT	NSR	180 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7220A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AMX120-3	NSR	180 lb-in	On/Off, Floating	100-240 Vac	—	—	95	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
AMX120-SR	NSR	180 lb-in	2-10 Vdc (4-20 mA)	100-240 Vac	2-10 Vdc	—	95	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AMQX24-MFT	NSR	140 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7220A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMB24-3	NSR	360 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	150	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GMX24-3	NSR	360 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	150	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90

Cross Reference - Actuators

Direct Coupled Actuators

Belimo Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
GMB24-SR	NSR	360 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	150	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMX24-SR	NSR	360 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	150	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMB24-MFT	NSR	360 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	150	MN6134A2008	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GMX24-MFT	NSR	360 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMX120-3	NSR	360 lb-in	On/Off, Floating	100-240 Vac	—	—	150	MN6134A2008	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
TFB24	SR	22 lb-in	On/Off	24 Vac/Vdc	—	—	75	MS8103A1030	27 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
TFB24-S	SR	22 lb-in	On/Off	24 Vac/Vdc	—	1	75	MS8103A1130	27 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	1	45
TFLB24	SR	22 lb-in	On/Off	24 Vac/Vdc	—	—	75	MS8103A1030	27 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
TFB120	SR	22 lb-in	On/Off	100-240 Vac	—	—	75	MS4103A1030	27 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
TFB120-S	SR	22 lb-in	On/Off	100-240 Vac	—	1	75	MS4103A1130	27 lb-in	Two-Position (SPST)	100-250 Vac	—	1	45
TFLB120	SR	22 lb-in	On/Off	100-240 Vac	—	—	75	MS4103A1030	27 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
TFCB120-S	SR	22 lb-in	On/Off	100-240 Vac	—	1	30	MS4103A1130	27 lb-in	Two-Position (SPST)	100-250 Vac	—	1	45
TFB24-SR	SR	22 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	—	95	MS7503A2030	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
TFB24-SR-S	SR	22 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	—	1	95	MS7503A2130	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
TFB120-SR	SR	22 lb-in	2-10 Vdc (4-20 mA)	100-240 Vac	2-10 Vdc	—	95	MS4103A1030	27 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
TFB24-3	SR	22 lb-in	Floating	24 Vac/Vdc	—	—	95	MS7503A2030	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
TFB24-3-S	SR	22 lb-in	Floating	24 Vac/Vdc	—	1	95	MS7503A2130	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
TFB24-MFT	SR	22 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	95	MS7503A2030	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
TFB24-MFT-S	SR	22 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	1	95	MS7503A2130	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
TFX24	SR	22 lb-in	On/Off	24 Vac/Vdc	—	—	<75	MS8105W1030	44 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
TFX24-S	SR	22 lb-in	On/Off	24 Vac/Vdc	—	1	<75	MS8105W1130	44 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	1	45
TFX24-SR	SR	22 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MS7505W2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
TFX24-SR-S	SR	22 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	1	95	MS7505W2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
TFX24-3	SR	22 lb-in	Floating	24 Vac/Vdc	—	—	95	MS7505W2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
TFX24-3-S	SR	22 lb-in	Floating	24 Vac/Vdc	—	1	95	MS7505W2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
TFX24-MFT	SR	22 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MS7505W2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
TFX24-MFT-S	SR	22 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	1	150	MS7505W2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
LF24-S US	SR	35 lb-in	On/Off	24 Vac/Vdc	—	1	40-75	MS8105A1130	44 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	1	45
LF120 US	SR	35 lb-in	On/Off	120 Vac	—	—	40-75	MS4105A1030	44 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
LF120-S US	SR	35 lb-in	On/Off	120 Vac	—	1	40-75	MS4105A1130	44 lb-in	Two-Position (SPST)	100-250 Vac	—	1	45
LF230 US	SR	35 lb-in	On/Off	230 Vac	—	—	40-75	MS4105A1030	44 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
LF230-S US	SR	35 lb-in	On/Off	230 Vac	—	1	40-75	MS4105A1130	44 lb-in	Two-Position (SPST)	100-250 Vac	—	1	45
LF24-3 US	SR	35 lb-in	Modulating	24 Vac/Vdc	—	—	150	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LF24-3-S US	SR	35 lb-in	Modulating	24 Vac/Vdc	—	1	150	MS7505A2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
LFC24-3-R US	SR	35 lb-in	Floating	24 Vac/Vdc	—	—	90	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LFC24-3-S US	SR	35 lb-in	Floating	24 Vac/Vdc	—	1	90	MS7505A2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
LF24-SR US	SR	35 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	150	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LF24-SR-S US	SR	35 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	1	150	MS7505A2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
LF24-SR-E US	SR	35 lb-in	2-10 Vdc, Built-in minimum position	24 Vac/Vdc	2-10 Vdc	—	150	MS7405A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc, Economizer (3 kOhm, 3-Position)	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LF24-MFT US	SR	35 lb-in	MFT	24 Vac/Vdc	2-10 Vdc	—	150	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
LF24-MFT-S US	SR	35 lb-in	MFT	24 Vac/Vdc	2-10 Vdc	1	150	MS7505A2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
LF24-MFT-20 US	SR	35 lb-in	MFT	24 Vac/Vdc	2-10 Vdc	—	150	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90

Cross Reference - Actuators

Direct Coupled Actuators

Belimo Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
NFB24	SR	90 lb-in	On/Off	24 Vac/Vdc	—	—	<75	MS8110A1008	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
NFB24-S	SR	90 lb-in	On/Off	24 Vac/Vdc	—	2	<75	MS8110A1206	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
NFBUP	SR	90 lb-in	On/Off	24-240Vac	—	—	<75	MS41101002	88 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
NFBUP-S	SR	90 lb-in	On/Off	24-240Vac	—	2	<75	MS4110A1200	88 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
NFB24-SR	SR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NFB24-SR-S	SR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	2	95	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
NFB24-MFT	SR	90 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NFB24-MFT-S	SR	90 lb-in	0-135 kOhm	24 Vac/Vdc	Variable (0-10 Vdc)	2	150	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
NFX24	SR	90 lb-in	On/Off	24 Vac/Vdc	—	—	<75	MS8110W1008	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
NFX24-S	SR	90 lb-in	On/Off	24 Vac/Vdc	—	2	<75	MS8110W1206	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
NFX24-SR	SR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MS7510W2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NFX24-SR-S	SR	90 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	2	95	MS7510W2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
NFX24-MFT	SR	90 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MS7510W2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
NFX24-MFT-S	SR	90 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	2	150	MS7510W2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
AF24 US	SR	133 lb-in	On/Off	24 Vac/Vdc	—	—	150	MS8120A1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
AF24-S US	SR	133 lb-in	On/Off	24 Vac/Vdc	—	2	150	MS8120A1205	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
AF120 US	SR	133 lb-in	On/Off	120 Vac	—	—	150	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
AF120-S US	SR	133 lb-in	On/Off	120 Vac	—	2	150	MS4120A1209	175 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
AF230 US	SR	133 lb-in	On/Off	230 Vac	—	—	150	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
AF230-S US	SR	133 lb-in	On/Off	230 Vac	—	2	150	MS4120A1209	175 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
AF24-SR US	SR	133 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	150	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AF24-MFT US	SR	133 lb-in	MFT	24 Vac/Vdc	2-10 Vdc	—	150	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AF24-MFT-S US	SR	133 lb-in	MFT	24 Vac/Vdc	2-10 Vdc	2	150	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
AF24-MFT-S US	SR	133 lb-in	MFT	24 Vac/Vdc	2-10 Vdc	2	150	MS7520H2208	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
AF24-MFT95 US	SR	133 lb-in	0-135 kOhm	24 Vac/Vdc	—	—	150	MS7520A2007 + Q7002B1009	175 lb-in	0-135 kOhm	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AFB24	SR	180 lb-in	On/Off	24 Vac/Vdc	—	—	<75	MS8120A1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
AFB24-S	SR	180 lb-in	On/Off	24 Vac/Vdc	—	2	<75	MS8120A1205	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
AFBUP	SR	180 lb-in	On/Off	24-240Vac	—	—	<75	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
AFBUP-S	SR	180 lb-in	On/Off	24-240Vac	—	2	<75	MS4120A1209	175 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
AFB24-SR	SR	180 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AFB24-SR-S	SR	180 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	2	95	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
AFB24-MFT	SR	180 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AFB24-MFT-S	SR	180 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	2	150	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
AFB24-MFT95	SR	180 lb-in	0-135 kOhm	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MS7520A2007 + Q7002B1009	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AFX24	SR	180 lb-in	On/Off	24 Vac/Vdc	—	—	<75	MS8120W1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
AFX24-S	SR	180 lb-in	On/Off	24 Vac/Vdc	—	2	<75	MS8120W1205	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
AFX24-SR	SR	180 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	—	95	MS7520W2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AFX24-SR-S	SR	180 lb-in	2-10 Vdc (4-20 mA)	24 Vac/Vdc	2-10 Vdc	2	95	MS7520W2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
AFX24MFT	SR	180 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MS7520W2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
AFX24-MFT-S	SR	180 lb-in	MFT	24 Vac/Vdc	Variable (0-10 Vdc)	2	150	MS7520W2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
AFX24-MFT95	SR	180 lb-in	0-135 kOhm	24 Vac/Vdc	Variable (0-10 Vdc)	—	150	MS7520W2007 + Q7002B1009	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90

Belimo Notes: All models described as (0) 2-10 Vdc can be used with a 4-20 mA control input. Shunt a 500 kOhm, 1/2 W resistor across the input at the actuator.

Cross Reference - Actuators

Direct Coupled Actuators

Johnson Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
M9102-AGA-2S	NSR	18 lb-in	Floating	18 to 30 Vac at 50/60 Hz	—	—	30	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9102-AGA-3S	NSR	18 lb-in	Floating	18 to 30 Vac at 50/60 Hz	—	—	30	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9102-IGA-2S	NSR	18 lb-in	On/Off, Floating	18 to 30 Vac at 50/60 Hz	—	—	30	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9102-IGA-3S	NSR	18 lb-in	On/Off, Floating	18 to 30 Vac at 50/60 Hz	—	—	30	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9104-AGA-2S	NSR	35 lb-in	Floating	18 to 30 Vac at 50/60 Hz	—	—	60	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9104-AGA-3S	NSR	35 lb-in	Floating	18 to 30 Vac at 50/60 Hz	—	—	60	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9104-IGA-2S	NSR	35 lb-in	On/Off, Floating	18 to 30 Vac at 50/60 Hz	—	—	60	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9104-IGA-3S	NSR	35 lb-in	On/Off, Floating	18 to 30 Vac at 50/60 Hz	—	—	60	ML6161A2009	35 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9104-GGA-2S	NSR	35 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	18 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	60	ML7161A2008 + 200976C	35 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	0-2 kOhm	—	90
M9104-GGA-3S	NSR	35 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	18 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	60	ML7161A2008 + 200976C	35 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	0-2 kOhm	—	90
M9104-AGA-2N	NSR	35 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	—	90/108 (at 60/50 Hz)	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9104-AGS-2N	NSR	35 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	—	90/108 (at 60/50 Hz)	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9106-IGA-2	NSR	53 lb-in & 35 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	Selectable: 60, 90, 120, 330, or 660 (at 60 Hz). 72, 108, 144, 396, or 792 (at 50 Hz).	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9106-IGC-2	NSR	53 lb-in & 35 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	Selectable: 60, 90, 120, 330, or 660 (at 60 Hz). 72, 108, 144, 396, or 792 (at 50 Hz).	MN6105A1201	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
M9106-AGA-2	NSR	53 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	—	60/72 (at 60/50 Hz)	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9106-AGA2N01	NSR	53 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	—	60/72 (at 60/50 Hz)	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9106-AGA2N02	NSR	53 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	—	120/144 (at 60/50 Hz)	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9106-AGC-2	NSR	53 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	2	60/72 (at 60/50 Hz)	MN6110A1201	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
M9106-AGF-2	NSR	53 lb-in	Floating	20 to 30 Vac at 50/60 Hz	0-10 kOhm	—	60/72 (at 60/50 Hz)	ML6174B2019 + 200976C	70 lb-in	On/Off, Floating	24 Vac	0-2 kOhm	—	90
M9106-GGA-2	NSR	53 lb-in	(0) 2-10 Vdc, (0) 4 to 20 mA	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	60/72 (at 60/50 Hz)	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9106-GGC-2	NSR	53 lb-in	(0) 2-10 Vdc, (0) 4 to 20 mA	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	60/72 (at 60/50 Hz)	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9108-AGA-2	NSR	70 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	25-50 for 0-70 lb-in, 30 at 50% load.	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9108-AGC-2	NSR	70 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	25-50 for 0-70 lb-in, 30 at 50% load.	MN6110A1201	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90

Cross Reference - Actuators

Direct Coupled Actuators

Johnson Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
M9108-AGD-2	NSR	70 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	0-135 kOhm	—	25-50 for 0-70 lb-in, 30 at 50% load.	ML6174B2019 + 200976A	70 lb-in	On/Off, Floating	24 Vac	0-500 kOhm	—	90
M9108-AGE-2	NSR	70 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	0-1 kOhm	—	25-50 for 0-70 lb-in, 30 at 50% load.	ML6174B2019 + 200976C	70 lb-in	On/Off, Floating	24 Vac	0-2 kOhm	—	90
M9108-GGA-2	NSR	70 lb-in	0-20 Vdc (selectable zero and span), (0) 4 to 20 mA, Reversible.	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	25-50 for 0-70 lb-in, 30 at 50% load.	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9108-GGC-2	NSR	70 lb-in	0-20 Vdc (selectable zero and span), (0) 4 to 20 mA, Reversible.	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	25-50 for 0-70 lb-in, 30 at 50% load.	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9108-HGA-2	NSR	70 lb-in	0-20 Vdc (adjustable zero and span), (0) 4 to 20 mA, Reversible.	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	25-50 for 0-70 lb-in, 30 at 50% load.	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9108-HGC-2	NSR	70 lb-in	0-20 Vdc (adjustable zero and span), (0) 4 to 20 mA, Reversible.	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	25-50 for 0-70 lb-in, 30 at 50% load.	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9109-AGA-2	NSR	80 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	—	60/72 (at 60/50 Hz)	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9109-AGC-2	NSR	80 lb-in	Floating	20 to 30 Vac at 50/60 Hz	—	2	60/72 (at 60/50 Hz)	MN6110A1201	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
M9109-GGA-2	NSR	80 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	60/72 (at 60/50 Hz)	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9109-GGC-2	NSR	80 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	60/72 (at 60/50 Hz)	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9116-AGA-2	NSR	140 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	70-115 for 0-140 lb-in, 80 at 50% load.	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9116-AGC-2	NSR	140 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	70-115 for 0-140 lb-in, 80 at 50% load.	MN6120A1200	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
M9116-AGD-2	NSR	140 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	0-135 kOhm	—	70-115 for 0-140 lb-in, 80 at 50% load.	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9116-AGE-2	NSR	140 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	0-1 kOhm	—	70-115 for 0-140 lb-in, 80 at 50% load.	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9116-GGA-2	NSR	140 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	70-115 for 0-140 lb-in, 80 at 50% load.	MN7220A2007	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9116-GGC-2	NSR	140 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	70-115 for 0-140 lb-in, 80 at 50% load.	MN7220A2205	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9116-HGA-2	NSR	140 lb-in & 280 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	70-115 for 0-140 lb-in, 80 at 50% load.	MN7220A2007	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90

Cross Reference - Actuators

Direct Coupled Actuators

Johnson Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
M9116-HGC-2	NSR	140 lb-in & 280 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	70-115 for 0-140 lb-in, 80 at 50% load.	MN7220A2205	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9124-AGA-2	NSR	210 lb-in & 420 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	115-175 for 0-210 lb-in, 130 at 50% load.	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9124-AGC-2	NSR	210 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	115-175 for 0-210 lb-in, 130 at 50% load.	MN6134A1003 + SW2-US	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
M9124-AGD-2	NSR	210 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	0-1 35 kOhm	—	115-175 for 0-210 lb-in, 130 at 50% load.	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9124-AGE-2	NSR	210 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	0-1 kOhm	—	115-175 for 0-210 lb-in, 130 at 50% load.	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9124-GGA-2	NSR	210 lb-in & 420 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	115-175 for 0-210 lb-in, 130 at 50% load.	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9124-GGC-2	NSR	210 lb-in & 420 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	115-175 for 0-210 lb-in, 130 at 50% load.	MN7234A2008 + SW2-US	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9124-HGA-2	NSR	210 lb-in & 420 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	—	115-175 for 0-210 lb-in, 130 at 50% load.	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9124-HGC-2	NSR	210 lb-in & 420 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span selection.	2	115-175 for 0-210 lb-in, 130 at 50% load.	MN7234A2008 + SW2-US	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9132-AGA-2	NSR	280 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	115-205 for 0-280 lb-in, 140 at 50% load.	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9132-AGC-2	NSR	280 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	115-205 for 0-280 lb-in, 140 at 50% load.	MN6134A1003 + SW2-US	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
M9132-AGE-2	NSR	280 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	0-1 kOhm	—	115-205 for 0-280 lb-in, 140 at 50% load.	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
M9132-GGA-2	NSR	280 lb-in & 560 lb-in	(0) 2-10 Vdc, (0) 4 to 20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span and stroke limits	—	115-205 for 0-280 lb-in, 140 at 50% load.	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9132-GGC-2	NSR	280 lb-in & 560 lb-in	(0) 2-10 Vdc, (0) 4 to 20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc for 90 (1 mA at 10 Vdc). Corresponds to span and stroke limits	2	115-205 for 0-280 lb-in, 140 at 50% load.	MN7234A2008 + SW2-US	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9203-AGA-2	SR	27 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	150	MS7503A2030	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9203-AGB-2	SR	27 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	1	150	MS7503A2130	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
M9203-AGA-2Z	SR	27 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	90	MS7503A2030	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9203-AGB-2Z	SR	27 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	1	90	MS7503A2130	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
M9203-BGA-2	SR	27 lb-in	On/Off	20 to 30 Vac at 50/60 Hz	—	—	< 75	MS8103A1030	27 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45

Cross Reference - Actuators

Direct Coupled Actuators

Johnson Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
M9203-BGB-2	SR	27 lb-in	On/Off	20 to 30 Vac at 50/60 Hz	—	1	< 75	MS8103A1130	27 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	1	45
M9203-BUA-2	SR	27 lb-in	On/Off	85 to 264 Vac at 50/60Hz	—	—	< 75	MS4103A1030	27 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
M9203-BUB-2	SR	27 lb-in	On/Off	85 to 264 Vac at 50/60Hz	—	1	< 75	MS4103A1130	27 lb-in	Two-Position (SPST)	100-250 Vac	—	1	45
M9203-GGA-2	SR	27 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	150	MS7503A2030	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9203-GGB-2	SR	27 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	1	150	MS7503A2130	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
M9203-GGA-2Z	SR	27 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	90	MS7503A2030	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9203-GGB-2Z	SR	27 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	1	90	MS7503A2130	27 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
M9208-AGA-2	SR	70 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9208-AGA-3	SR	70 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9208-AGC-3	SR	70 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	150	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9208-BGA-3	SR	70 lb-in	On/Off	18 to 30 Vac at 50/60 Hz	—	—	< 75	MS8110A1008	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
M9208-BGC-3	SR	70 lb-in	On/Off	18 to 30 Vac at 50/60 Hz	—	2	< 75	MS8110A1206	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
M9208-BAA-3	SR	70 lb-in	On/Off	102 to 132 Vac at 50/60 Hz	—	—	< 75	MS4110A1002	88 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
M9208-BAC-3	SR	70 lb-in	On/Off	102 to 132 Vac at 50/60 Hz	—	2	< 75	MS4110A1200	88 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
M9208-BDA-3	SR	70 lb-in	On/Off	198 to 264 Vac at 50/60 Hz	—	—	< 75	MS4110A1002	88 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
M9208-BDC-3	SR	70 lb-in	On/Off	198 to 264 Vac at 50/60 Hz	—	2	< 75	MS4110A1200	88 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
M9208-GGA-2	SR	70 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9208-GGA-3	SR	70 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9208-GGC-3	SR	70 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	2	150	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9210-AGA-3	SR	89 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9210-AGC-3	SR	89 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	150	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9210-BGA-3	SR	89 lb-in	On/Off	20 to 30 Vac at 50/60 Hz	—	—	24 to 57	MS8110A1008	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
M9210-BGC-3	SR	89 lb-in	On/Off	20 to 30 Vac at 50/60 Hz	—	2	24 to 57	MS8110A1206	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
M9210-BAA-3	SR	89 lb-in	On/Off	102 to 132 Vac at 50/60 Hz	—	—	24 to 57	MS4110A1002	88 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
M9210-BAC-3	SR	89 lb-in	On/Off	102 to 132 Vac at 50/60 Hz	—	2	24 to 57	MS4110A1200	88 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
M9210-BDA-3	SR	89 lb-in	On/Off	198 to 264 Vac at 50/60 Hz	—	—	24 to 57	MS4110A1002	88 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45

Cross Reference - Actuators

Direct Coupled Actuators

Johnson Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
M9210-BDC-3	SR	89 lb-in	On/Off	198 to 264 Vac at 50/60 Hz	—	2	24 to 57	MS4110A1200	88 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
M9210-GGA-3	SR	89 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9210-GGC-3	SR	89 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	2	150	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9210-HGA-3	SR	89 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	150	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9210-HGC-3	SR	89 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	2	150	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9220-AGA-3	SR	177 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	—	150	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9220-AGC-3	SR	177 lb-in	On/Off, Floating	20 to 30 Vac at 50/60 Hz	—	2	150	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9220-BGA-3	SR	177 lb-in	On/Off	20 to 30 Vac at 50/60 Hz	—	—	24 to 57	MS8120A1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
M9220-BGC-3	SR	177 lb-in	On/Off	20 to 30 Vac at 50/60 Hz	—	2	24 to 57	MS8120A1205	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
M9220-BAA-3	SR	177 lb-in	On/Off	102 to 132 Vac at 50/60 Hz	—	—	24 to 57	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
M9220-BAC-3	SR	177 lb-in	On/Off	102 to 132 Vac at 50/60 Hz	—	2	24 to 57	MS4120A1209	175 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
M9220-BDA-3	SR	177 lb-in	On/Off	198 to 264 Vac at 50/60 Hz	—	—	24 to 57	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
M9220-BDC-3	SR	177 lb-in	On/Off	198 to 264 Vac at 50/60 Hz	—	2	24 to 57	MS4120A1209	175 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
M9220-GGA-3	SR	177 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	150	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9220-GGC-3	SR	177 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	2	150	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
M9220-HGA-3	SR	177 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	—	150	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
M9220-HGC-3	SR	177 lb-in	(0) 2-10 Vdc, (0) 4-20 mA, Reversible	20 to 30 Vac at 50/60 Hz	(0) 2-10 Vdc	2	150	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90

Johnson Notes: All models described as (0) 2-10 Vdc can be used with a 4-20 mA control input. Shunt a 500 kOhm, 1/2 W resistor across the input at the actuator.

Cross Reference - Actuators

Direct Coupled Actuators

Invensys Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
MF41-6043	NSR	35 lb-in	Floating	24 Vac	—	—	< 90	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
MF41-6043-502	NSR	35 lb-in	Floating	24 Vac	—	2	< 90	MN6105A1201	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
MF41-6043-510	NSR	35 lb-in	Floating	24 Vac	0-1 kOhm	—	< 90	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF41-6083	NSR	70 lb-in	Floating	24 Vac	—	—	< 125	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
MF41-6083-502	NSR	70 lb-in	Floating	24 Vac	—	2	< 125	MN6110A1201	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
MF41-6083-510	NSR	70 lb-in	Floating	24 Vac	0-1 kOhm	—	< 125	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF41-6153	NSR	133 lb-in	Floating	24 Vac	—	—	< 125	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
MF41-6343	NSR	300 lb-in	Floating	24 Vac	—	—	< 145	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
MF4D-6043-100	NSR	35 lb-in	Floating	24 Vac, 20-30 Vdc	—	—	< 85	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF4D-6083-100	NSR	70 lb-in	Floating	24 Vac, 20-30 Vdc	—	—	< 85	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF4E-60430-100	NSR	35 lb-in	Floating	24 Vac	—	—	90	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
MF4E-60830-100	NSR	70 lb-in	Floating	24 Vac	—	—	90	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
MS41-6043	NSR	35 lb-in	0-10 Vdc	24 Vac	0-10 Vdc	—	< 90	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-6043-502	NSR	35 lb-in	0-10 Vdc	24 Vac	0-10 Vdc	2	< 90	MN7505A2209	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MS41-6043-520	NSR	35 lb-in	0-10 Vdc (adjustable)	24 Vac	0-10 Vdc	—	< 90	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-6043-522	NSR	35 lb-in	0-10 Vdc (adjustable)	24 Vac	0-10 Vdc	2	< 90	MN7505A2209	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MS41-6083	NSR	70 lb-in	0-10 Vdc	24 Vac	0-10 Vdc	—	< 125	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-6083-502	NSR	70 lb-in	0-10 Vdc	24 Vac	0-10 Vdc	2	< 125	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MS41-6083-520	NSR	70 lb-in	0-10 Vdc (adjustable)	24 Vac	0-10 Vdc	—	< 125	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-6083-522	NSR	70 lb-in	0-10 Vdc (adjustable)	24 Vac	0-10 Vdc	2	< 125	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MS41-6153	NSR	133 lb-in	0-10 Vdc	24 Vac	0-10 Vdc	—	< 125	MN7220A2007	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-6153-502	NSR	133 lb-in	0-10 Vdc	24 Vac	0-10 Vdc	2	< 125	MN7220A2205	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MS41-6340	NSR	300 lb-in	2-10 Vdc, 4-20 mA	120 Vac	—	—	< 145	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-6341	NSR	300 lb-in	2-10 Vdc, 4-20 mA	240 Vac	—	—	< 145	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-6343	NSR	300 lb-in	2-10 Vdc, 4-20 mA	24 Vac	—	—	< 145	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-6043-100	NSR	35 lb-in	2-10 Vdc	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-6043-150	NSR	35 lb-in	0-10 Vdc	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-6043-160	NSR	35 lb-in	4-20 mA	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-6083-100	NSR	70 lb-in	2-10 Vdc	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-6083-150	NSR	70 lb-in	0-10 Vdc	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-6083-160	NSR	70 lb-in	4-20 mA	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS50-H2001	NSR	300 lb-in	1-5 Vdc, 4-20 mA	120 Vac	—	—	145	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS50-H2101	NSR	300 lb-in	1-5 Vdc, 4-20 mA	240 Vac	—	—	145	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS50-H2301	NSR	300 lb-in	1-5 Vdc, 4-20 mA	24 Vac	—	—	145	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MA40-7043	SR	35 lb-in	On/Off	24 Vac, 22-30 Vdc	—	—	< 50	MS8105A1030	44 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
MA40-7043-501	SR	35 lb-in	On/Off	24 Vac, 22-30 Vdc	—	1	< 50	MS8105A1130	44 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	1	45
MA40-7170	SR	150 lb-in	On/Off	120 Vac	—	—	< 145	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
MA40-7171	SR	150 lb-in	On/Off	240 Vac	—	—	< 145	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
MA40-7173	SR	150 lb-in	On/Off	24 Vac, ±20%	—	—	< 145	MS8120A1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
MA41-7073	SR	60 lb-in	On/Off	24 Vac, 22-30 Vdc	—	—	< 80	MS8110A1008	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45

Cross Reference - Actuators

Direct Coupled Actuators

Invensys Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
MA41-7073-502	SR	60 lb-in	On/Off	24 Vac, 22-30 Vdc	—	2	< 80	MS8110A1206	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
MA41-7153	SR	133 lb-in	On/Off	24 Vac, 22-30 Vdc	—	—	< 190	MS8120A1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
MA41-7153-502	SR	133 lb-in	On/Off	24 Vac, 22-30 Vdc	—	2	< 190	MS8120A1205	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
MA4D-7030-000	SR	30 lb-in	On/Off	120 Vac	—	—	< 56	MS4105A1030	44 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
MA4D-7031-000	SR	30 lb-in	On/Off	230 Vac	—	—	< 56	MS4105A1030	44 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
MA4D-7033-100	SR	30 lb-in	On/Off	24 Vac, 20-30 Vdc	—	—	< 56	MS8105A1008	44 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
MA4D-8030-000	SR	30 lb-in	On/Off	120 Vac	—	—	< 56	MS4105A1030	44 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
MA4D-8031-000	SR	30 lb-in	On/Off	230 Vac	—	—	< 56	MS4105A1030	44 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
MA4D-8033-100	SR	30 lb-in	On/Off	24 Vac, 20-30 Vdc	—	—	< 56	MS8105A1008	44 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
MF40-7043	SR	35 lb-in	Floating	24 Vac, 22-30 Vdc	—	—	< 130	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF40-7043-501	SR	35 lb-in	Floating	24 Vac, 22-30 Vdc	—	1	< 130	MS7505A2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
MF40-7173	SR	150 lb-in	Floating	24 Vac, ±20%	—	—	< 145	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF41-7073	SR	60 lb-in	Floating	24 Vac, 22-30 Vdc	—	—	< 195	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF41-7073-502	SR	60 lb-in	Floating	24 Vac, 22-30 Vdc	—	2	< 195	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MF41-7153	SR	133 lb-in	Floating	24 Vac, 22-30 Vdc	—	—	< 190	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF41-7153-502	SR	133 lb-in	Floating	24 Vac, 22-30 Vdc	—	2	< 190	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MF4D-7033-100	SR	30 lb-in	Floating	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MF4D-8033-100	SR	30 lb-in	Floating	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS40-7043	SR	35 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	—	< 130	MS7505A2030	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS40-7043-501	SR	35 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	1	< 130	MS7505A2130	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
MS40-7170	SR	150 lb-in	2-10 Vdc, 4-20 mA	120 Vac	—	—	< 145	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS40-7171	SR	150 lb-in	2-10 Vdc, 4-20 mA	240 Vac	—	—	< 145	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS40-7173	SR	150 lb-in	2-10 Vdc, 4-20 mA	24 Vac, ±20%	—	—	< 145	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-7073	SR	60 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	—	< 195	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-7073-502	SR	60 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	2	< 195	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MS41-7153	SR	133 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	—	< 190	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS41-7153-502	SR	133 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	2	< 190	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
MS4D-7033-100	SR	30 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-7033-150	SR	30 lb-in	0-10 Vdc, 4-20 mA	24 Vac, 20-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-7033-160	SR	30 lb-in	4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-8033-100	SR	30 lb-in	2-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-8033-150	SR	30 lb-in	0-10 Vdc, 4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS4D-8033-160	SR	30 lb-in	4-20 mA	24 Vac, 22-30 Vdc	2-10 Vdc	—	< 85	MS7505A2008	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS50-E2001	SR	150 lb-in	1-5 Vdc, 4-20 mA	120 Vac	—	—	145	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS50-E2101	SR	150 lb-in	1-5 Vdc, 4-20 mA	240 Vac	—	—	145	MS7520A2007	175 lb-in	On/Off	24 Vac/Vdc	(0) 2-10 Vdc	—	90
MS50-E2301	SR	150 lb-in	1-5 Vdc, 4-20 mA	24 Vac	—	—	145	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90

Invensys Notes: All models described as (0)2-10 Vdc can be used with a 4-20 mA control input. Shunt a 500 kOhm, 1/2 W resistor across the input at the actuator.

Cross Reference - Actuators

Direct Coupled Actuators

Siemens Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
GDE131.1U	NSR	44 lb-in	Floating	24 Vac	—	—	90	MN6105A1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GDE131.1P	NSR	44 lb-in	Floating	24 Vac	—	—	90	MN6105W1011	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GDE161.1P	NSR	44 lb-in	0-10 Vdc	24 Vac	0-1 kOhm	—	90	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GDE132.1P	NSR	44 lb-in	Floating	24 Vac	0-1 kOhm	—	90	MN7505A2001	44 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GDE136.1P	NSR	44 lb-in	Floating	24 Vac	—	2	90	MN6105A1201	44 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
GLB131.1P	NSR	88 lb-in	Floating	24 Vac	—	—	125	MN6110A1003	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GLB161.1P	NSR	88 lb-in	0-10 Vdc	24 Vac	—	—	125	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GLB132.1P	NSR	88 lb-in	Floating	24 Vac	0-1 kOhm	—	125	ML6174A2002 + 200976C	70 lb-in	On/Off, Floating	24 Vac	0-2 kOhm	—	90
GLB136.1P	NSR	88 lb-in	Floating	24 Vac	—	2	125	MN6110A1201	88 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
GLB163.1P	NSR	88 lb-in	0-10 Vdc	24 Vac	—	—	125	MN7510A2001	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GLB164.1P	NSR	88 lb-in	0-10 Vdc	24 Vac	—	2	125	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GLB166.1P	NSR	88 lb-in	0-10 Vdc	24 Vac	—	2	125	MN7510A2209	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GEB131.1U	NSR	132 lb-in	Floating	24 Vac	—	—	125	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GEB136.1U	NSR	132 lb-in	Floating	24 Vac	—	2	125	MN6120A1200	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
GEB161.1U	NSR	132 lb-in	0-10 Vdc	24 Vac	—	—	125	MN7220A2007	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	—	—	90
GBB171.1P	NSR	221 lb-in	On/Off, Floating	24 Vac	—	—	150	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GBB131.1U	NSR	221 lb-in	Floating	24 Vac	—	—	150	MN6120A1002	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GBB136.1U	NSR	221 lb-in	Floating	24 Vac	—	—	150	MN6120A1200	175 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GBB161.1U	NSR	221 lb-in	0-10 Vdc	24 Vac	—	—	150	MN7220A2007	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GBB166.1U	NSR	221 lb-in	0-10 Vdc	24 Vac	—	2	150	MN7220A2205	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GBB151.1P	NSR	221 lb-in	4-20 mA	24 Vac	—	—	150	MN7220A2007	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GBB166.1P	NSR	221 lb-in	0-10 Vdc	24 Vac	—	2	150	MN7220A2205	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GBB156.1P	NSR	221 lb-in	4-20 mA	24 Vac	—	2	150	MN7220A2205	175 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GIB131.1U	NSR	310 lb-in	Floating	24 Vac	—	—	150	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GIB136.1U	NSR	310 lb-in	Floating	24 Vac	—	2	150	MN6134A1003 + SW2-US	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	2	90
GIB171.1U	NSR	310 lb-in	On/Off, Floating	24 Vac	—	—	150	MN6134A1003	300 lb-in	On/Off, Floating	24 Vac/Vdc	—	—	90
GIB161.1U	NSR	310 lb-in	0-10 Vdc	24 Vac	—	—	150	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GIB151.1U	NSR	310 lb-in	4-20 mA	24 Vac	—	—	150	MN7234A2008	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GIB166.1U	NSR	310 lb-in	0-10 Vdc	24 Vac	—	2	150	MN7234A2008 + SW-US2	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GIB156.1U	NSR	310 lb-in	4-20 mA	24 Vac	—	2	150	MN7234A2008 + SW2-US	300 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GQD121.1P	SR	20 lb-in	On/Off	24 Vac/dc	—	—	30	MS8103A1030	27 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
GQD126.1P	SR	20 lb-in	On/Off	24 Vac/dc	—	2	30	MS8103A1130	27 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	1	45
GQD221.1U	SR	20 lb-in	On/Off	120 Vac	—	—	30	MS4103A1030	27 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
GQD226.1U	SR	20 lb-in	On/Off	120 Vac	—	2	30	MS4103A1130	27 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
GQD131.1P	SR	20 lb-in	Floating	24 Vac/dc	—	—	30	MS7503A2030	27 lb-in	Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GQD136.1P	SR	20 lb-in	Floating	24 Vac/dc	—	2	30	MS7503A2130	27 lb-in	Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
GQD151.1P	SR	20 lb-in	2-10 Vdc	24 Vac/dc	2-10 Vdc	—	30	MS7503A2030	27 lb-in	Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GQD156.1P	SR	20 lb-in	2-10 Vdc	24 Vac/dc	2-10 Vdc	2	30	MS7503A2130	27 lb-in	Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	1	90
GMA121.1U	SR	62 lb-in	On/Off	24 Vac/dc	—	—	90	MS8110A1008	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
GMA121.1P	SR	62 lb-in	On/Off	24 Vac/dc	—	—	90	MS8110W1008	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
GMA126.1U	SR	62 lb-in	On/Off	24 Vac/dc	—	2	90	MS8110A1206	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
GMA126.1P	SR	62 lb-in	On/Off	24 Vac/dc	—	2	90	MS8110W1206	88 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
GMA221.1U	SR	62 lb-in	On/Off	120 Vac	—	—	90	MS4110A1002	88 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
GMA226.1U	SR	62 lb-in	On/Off	120 Vac	—	2	90	MS4110A1200	88 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
GMA131.1U	SR	62 lb-in	Floating	24 Vac/Vdc	—	—	90	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMA131.1P	SR	62 lb-in	Floating	24 Vac/Vdc	—	—	90	MS7510W2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90

Cross Reference - Actuators

Direct Coupled Actuators

Siemens Model	Fail Safe	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)	Honeywell Model	Torque (lb-in)	Control Signal	Power	Feedback	Switches	Timing (sec)
GMA132.1U	SR	62 lb-in	Floating	24 Vac/Vdc	0-1 kOhm	—	90	MS7510A2008	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMA136.1U	SR	62 lb-in	Floating	24 Vac/dc	—	2	90	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GMA151.1U	SR	62 lb-in	2-10 Vdc	24 Vac/Vdc	0-1 kOhm	—	90	MS7510A2008	88 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMA151.1P	SR	62 lb-in	2-10 Vdc	24 Vac/Vdc	0-1 kOhm	—	90	MS7510W2008	88 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GMA156.1U	SR	62 lb-in	2-10 Vdc	24 Vac/Vdc	0-1 kOhm	2	90	MS7510A2206	88 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GMA156.1P	SR	62 lb-in	2-10 Vdc	24 Vac/Vdc	0-1 kOhm	2	90	MS7510W2206	88 lb-in	(0) 2-10 Vdc, (0) 4-20 mA	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA121.1U	SR	160 lb-in	On/Off	24 Vac/dc	—	—	90	MS8120A1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
GCA121.1P	SR	160 lb-in	On/Off	24 Vac/dc	—	—	90	MS8120W1007	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	—	45
GCA126.1U	SR	160 lb-in	On/Off	24 Vac/dc	—	2	90	MS8120A1205	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
GCA126.1P	SR	160 lb-in	On/Off	24 Vac/dc	—	2	90	MS8120W1205	175 lb-in	Two-Position (SPST)	24 Vac/Vdc	—	2	45
GCA221.1U	SR	160 lb-in	On/Off	120 Vac	—	—	90	MS4120A1001	175 lb-in	Two-Position (SPST)	100-250 Vac	—	—	45
GCA226.1U	SR	160 lb-in	On/Off	120 Vac	—	2	90	MS4120A1209	175 lb-in	Two-Position (SPST)	100-250 Vac	—	2	45
GCA131.1U	SR	160 lb-in	Floating	24 Vac/dc	—	—	90	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA131.1P	SR	160 lb-in	Floating	24 Vac/dc	—	—	90	MS7520W2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA136.1U	SR	160 lb-in	Floating	24 Vac/dc	—	2	90	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA136.1P	SR	160 lb-in	Floating	24 Vac/dc	—	2	90	MS7520W2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA132.1U	SR	160 lb-in	Floating	24 Vac/dc	0-1 kOhm	—	90	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA132.1P	SR	160 lb-in	Floating	24 Vac/dc	0-1 kOhm	—	90	MS7520W2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA151.1U	SR	160 lb-in	4-20 mA	24 Vac/dc	—	—	90	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA151.1P	SR	160 lb-in	4-20 mA	24 Vac/dc	—	—	90	MS7520W2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA156.1U	SR	160 lb-in	4-20 mA	24 Vac/dc	—	2	90	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA156.1P	SR	160 lb-in	4-20 mA	24 Vac/dc	—	2	90	MS7520W2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA161.1U	SR	160 lb-in	0-10 Vdc	24 Vac/dc	—	—	90	MS7520A2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA161.1P	SR	160 lb-in	0-10 Vdc	24 Vac/dc	—	—	90	MS7520W2007	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	—	90
GCA166.1U	SR	160 lb-in	0-10 Vdc	24 Vac/dc	—	2	90	MS7520A2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA166.1P	SR	160 lb-in	0-10 Vdc	24 Vac/dc	—	2	90	MS7520W2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA163.1U	SR	160 lb-in	0-10 Vdc	24 Vac/dc	—	—	90	MS7520H2208	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA164.1U	SR	160 lb-in	0-10 Vdc	24 Vac/dc	—	2	90	MS7520H2208	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90
GCA166.1P	SR	160 lb-in	0-10 Vdc	24 Vac/dc	—	2	90	MS7520W2205	175 lb-in	On/Off, Floating, (0) 2-10 Vdc	24 Vac/Vdc	(0) 2-10 Vdc	2	90

Siemens Notes: All models described as (0) 2-10 Vdc can be used with a 4-20 mA control input. Shunt a 500 kOhm, 1/2 W resistor across the input at the actuator.

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Control Valve Applications													
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Unitary Equipment	Fan Coil Units	Fan coil/zone valves											
		Cartridge cage valves											
		Pressure regulated valves											
	Unit Heaters	Fan coil/zone valves											
		Cartridge cage valves											
		Pressure regulated valves											
	Convectors	Fan coil/zone valves											
		Cartridge cage valves											
		Cartridge globe valves											
		Pressure regulated valves											
Radiant Panels	Fan coil/zone valves												
	Cartridge cage valves												
	Cartridge globe valves												
	Pressure regulated valves												
Unit Ventilators	Cartridge cage valves												
	Cartridge globe valves												
	Control ball valves												
	Pressure regulated valves												
Reheat Coils	Cartridge cage valves												
	Cartridge globe valves												
	Control ball valves												
	Pressure regulated valves												
Water Source Heat Pump	Cartridge cage valves												
	Control ball valves												
	Pressure regulated valves												
Blower Coil	Cartridge cage valves												
	Cartridge globe valves												
	Control ball valves												
Pressure regulated valves													
Air Handling Units	Heating & Cooling Coils	Threaded globe valve											
		Threaded control ball valves											
									Flanged globe valve				
											Flanged ball valve		
Pressure regulated valves													
Chilled Ceiling	Threaded globe valve												
	Threaded control ball valves												
	Pressure regulated valves												
Humidifiers	Threaded globe valve												
								Flanged globe valve					
Central Plant	Outdoor reset	Threaded globe valve											
		Threaded control ball valves											
									Flanged globe valve				
										Flanged ball valve			
	Boiler Bypass	Threaded globe valve											
		Threaded control ball valves											
									Flanged globe valve				
										Flanged ball valve			
	Resilient seat butterfly valves												
	Heat reclaim	Threaded globe valve											
Threaded control ball valves													
Steam Heat Exchangers	Threaded globe valve												
								Flanged globe valve					
Greenhouse	Threaded globe valve												
	Threaded control ball valves												
								Flanged globe valve					
										Flanged ball valve			
Resilient seat butterfly valves													
Thermal Storage	Threaded globe valve												
	Threaded control ball valves												
								Flanged globe valve					
Resilient seat butterfly valves													
Chillers	Threaded globe valve												
	Threaded control ball valves												
								Flanged globe valve					
										Flanged ball valve			
Resilient seat butterfly valves													
Pressure regulated valves													
Cooling Towers	Threaded globe valve												
	Threaded control ball valves												
							Resilient seat butterfly valves						
Isolation valves	Threaded control ball valves												
								Resilient seat butterfly valves					

Product Selection - Valves

2-Way Control Valves

Attribute	Specification	Unitary				Globe					
		Fan Coil		Cartridge Cage	Cartridge Globe	Threaded			Flanged		
		VU52	VU53	VCzA/B	V58x2	V5011N	V5011F	V5011G	V5011A	V5011B	VGf2xS
Pipe Size	1/2" [DN15]	•	•	•	•	•					
	3/4" [DN20]	•	•	•	•	•					
	1" [DN25]	•	•	•		•					
	1-1/4" [DN32]			•		•					
	1-1/2" [DN40]					•					
	2" [DN50]					•					
	2-1/2" [DN65]						•	•	•		•
	3" [DN80]						•	•	•		•
	4" [DN100]								•	•	•
	5" [DN125]								•	•	•
6" [DN150]								•	•	•	
Other (maximum size)											
Pipe Fittings	Sweat	•	•	•	•						
	NPT Internal Thread	•	•	•	•	•	•	•			
	Inverted Flare	•	•	•							
	ANSI Flange								•	•	•
Static Pressure	ANSI 125/150					•	•	•	•	•	•
	ANSI 250/300										•
	Other	300 psi		300 psi	230 psi						
Media	Chilled Water	•	•	•	•	•	•	•	•	•	•
	Hot Water	•	•	•	•	•	•	•	•	•	•
	Low Pressure Steam					N1, N3	•	•	•	•	•
	High Pressure Steam					N2		•			•
Flow Capacity, Cv	Multiple ratings per pipe size	•	•	•	•	•	•	•	•	•	•
	One rating/size above 1/2"					•	•	•	•	•	•
Valve Action	Direct Acting (Stem down to close)					N1, N2	•	•	•	•	•
	Reverse Acting (Stem up to close)			•	•	N3				•	
	Rotary N.O.	•									
	Rotary N.C.		•								
Flow Characteristic	Equal Percentage				•	•	•		•	•	•
	Modified Equal Percentage			•							
	Linear			•		•		•			•
	Quick Open	•	•	•							
Close-off pressure***	High** (100 psid minimum)				•						
	Medium (40 psid minimum)			•	•						
	Varies with actuator	•	•			•	•	•	•	•	•
Maximum Seat Leakage	ANSI Class III (0.10% Cv max.)				0.02%	0.05%					•
	ANSI Class IV (0.01% Cv max.)								•	•	
	Bubble-tight design			•							
	Other (see product data literature)	33 mL/m					0.5%	0.5%			
Rangeability	High (50:1 minimum)	N/A			•	•	•	•	•	•	•
	Medium* (15~50:1)			•							
	Low (under 15:1)										
Trim	Brass, plated brass, bronze					N3	•			•	
	Brass plug /Stainless seat					N1					
	Stainless Steel					N2		•			•
	Resilient materials	•	•	•	•						
In-line Serviceability	Cartridge	•	•	•	•						
	Packing					•	•	•	•	•	•
	Rebuild					•	•	•	•	•	•
Actuation Options	Electronic Modulating			•	•	•	•	•	•	•	•
	Tri-state floating			•	•	•	•	•	•	•	•
	Pulse Width Modulation			•							
	2-position low voltage	•	•	•	0	•	•	•	•	•	•
	2-position line voltage	•	•	•		•	•	•	•	•	•
	Electric Spring Return	•	•		•	•	•	•	•	•	•
	Electronic Fail Safe			•							
	Pneumatic, low pressure				•	•	•	•	•	•	•
	Pneumatic bidirectional (Hi-Pr)										
Pneumatic spring return (Hi-Pr)											

Notes
 * Best used with supply water reset from outdoor air temperature.
 ** Can dead-head pumps. Use with VFD-controlled pumps with maximum pressure cut-out
 *** Maximum operating differential pressure. Static close-off pressure may be higher. Maximum pressure for quiet service may be less.

Product Selection - Valves

2-Way Control Valves

Attribute	Specification	Globe		Control Ball		Pressure-Regulated		Butterfly	
		Pressure-Balanced		Threaded	Flanged	Threaded	Wafer Flanged	Resilient Seat	
		V5862A3	VGf2xP	VBN2	VBF2	VRN2	VRW2	VFF1	VFF2
Pipe Size	1/2" [DN15]			•		•			
	3/4" [DN20]			•		•			
	1" [DN25]	•		•		•			
	1-1/4" [DN32]	•		•		•			
	1-1/2" [DN40]	•		•		•			
	2" [DN50]			•		•		•	•
	2-1/2" [DN65]		•	•		•	•	•	•
	3" [DN80]		•	•		•	•	•	•
	4" [DN100]		•		•		•	•	•
	5" [DN125]		•		•		•	•	•
6" [DN150]		•		•		•	•	•	
Other (maximum size)								20" [DN500]	
Pipe Fittings	Sweat								
	NPT Internal Thread	•		•		•			
	Inverted Flare								
	ANSI Flange		•		•		•	•	•
Static Pressure	ANSI 125/150		•		•		•		
	ANSI 250/300						•		
	Other		230 psi		360 psi		360 psi		250 psi
Media	Chilled Water	•	•	•	•	•	•	•	•
	Hot Water	•	•	•	•	•	•	•	•
	Low Pressure Steam		•						
	High Pressure Steam		•						
Flow Capacity, Cv	Multiple ratings per pipe size	•		•	•	x (gpm)	x (gpm)		
	One rating/size above 1/2"		•					•	•
Valve Action	Direct Acting (Stem down to close)	•	•						
	Reverse Acting (Stem up to close)								
	Rotary N.O.			0	0	0	0	•	0
	Rotary N.C.			•	•	•	•		•
Flow Characteristic	Equal Percentage		•			•	•		
	Modified Equal Percentage			•	•			•	•
	Linear	•	•			•			
	Quick Open								
Close-off pressure***	High** (100 psid minimum)	•	•	•	•	•	•	•	•
	Medium (40 psid minimum)							•	•
	Varies with actuator								
Maximum Seat Leakage	ANSI Class III (0.10% Cv max.)					•			
	ANSI Class IV (0.01% Cv max.)	•	•	•	•			•	•
	Bubble-tight design							•	•
	Other (see product data literature)						< 0.2%		
Rangeability	High (50:1 minimum)	•	•	•	•	•	•		
	Medium* (15~50:1)			0		< 10 gpm			
	Low (under 15:1)							•	•
Trim	Brass, plated brass, bronze			•		•			
	Brass plug /Stainless seat								
	Stainless Steel	•	•	•	•	•	•		
	Resilient materials					•	•	•	•
In-line Serviceability	Cartridge					•	•		
	Packing	•	•	•	•	•	•		
	Rebuild				•	Regulator			
Actuation Options	Electronic Modulating	•	•	•	•	•	•	•	•
	Tri-state floating	•	•	•	•	•	•	•	•
	Pulse Width Modulation								
	2-position low voltage		•	•	•	0	0	Limited	
	2-position line voltage		•	0	0	0	0	•	•
	Electric Spring Return	•	•	•	•	•		Limited	
	Electronic Fail Safe						•		
	Pneumatic, low pressure		•					Limited	
	Pneumatic bidirectional (Hi-Pr)							•	•
Pneumatic spring return (Hi-Pr)							•	•	

Notes * Best used with supply water reset from outdoor air temperature.
 ** Can dead-head pumps. Use with VFD-controlled pumps with maximum pressure cut-out
 *** Maximum operating differential pressure. Static close-off pressure may be higher. Maximum pressure for quiet service may be less.

Product Selection - Valves

3-Way Control Valves

Attribute	Specification	Unitary				Globe				
		Fan Coil	Cartridge Cage	Cartridge Globe		Threaded	Flanged			
		VU54	VCzM/N	V58x3	V5863A3	V5013N...	V5013B	V5013C	VGf3xLD	VGf3xEM
Pipe Size	1/2" [DN15]	•	•	•		•				
	3/4" [DN20]	•	•	•		•				
	1" [DN25]	•	•		•	•				
	1-1/4" [DN32]		•		•	•				
	1-1/2" [DN40]				•	•				
	2" [DN50]					•				
	2-1/2" [DN65]						•		•	•
	3" [DN80]						•		•	•
	4" [DN100]						•	•	•	•
	5" [DN125]						•	•	•	•
6" [DN150]						•	•	•	•	
Other (maximum size)										
Pipe Fittings	Sweat	•	•	•						
	NPT Internal Thread	•	•	•	•	•				
	Inverted Flare	•	•							
	ANSI Flange						•	•	•	•
Static Pressure	ANSI 125/150					•	•	•	•	•
	ANSI 250/300								•	•
	Other	300 psi	300 psi	230 psi	230 psi					
Media	Chilled Water	•	•	•	•	•	•	•	•	•
	Hot Water	•	•	•	•	•	•	•	•	•
Flow Capacity, Cv	Multiple ratings per pipe size	•	•	•	•	•				
	One rating/size above 1/2"					•	•	•	•	•
Valve Action	Mixing A-B-AB porting			•	•	•	•			•
	Mixing A-AB-B porting		•							
	Diverting AB-B-A porting	•						•	•	
	Diverting A-AB-B porting		•							
A-port Flow Characteristic	Equal Percentage			•		•				•
	Modified Equal Percentage		•							
	Linear		•		•		•	•	•	
	Quick Open	•	•							
B-port Flow Characteristic	Modified Equal Percentage									
	Linear		•			•	•	•	•	•
	Linear, Reduced Cv			•	•					
	Total Constant Flow			•	•	•	•	•	•	
	Quick Open	•								
Close-off pressure***	High (60 psid minimum)		•	•	•					
	Medium (30 psid minimum)			•						
	Varies with actuator	•				•	•	•	•	•
Maximum Seat Leakage**	ANSI Class III (0.10% Cv max.)			•	•	•			•	
	ANSI Class IV (0.01% Cv max.)						•	•		
	Bubble-tight design		•							
	Other (see product data literature)	33 mL/m								A = 0.5%
Rangeability	High (50:1 minimum)			•	•	•	•	•	•	•
	Medium* (15-50:1)	N/A	•							
	Low (under 15:1)									
Trim	Brass, plated brass, bronze			•	•	•	•	•	•	•
	Stainless Steel					0			•	•
	Resilient materials	•	•	•						
In-line Serviceability	Cartridge	•	•	•						
	Packing				•	•	•	•	•	•
	Rebuild					•	•	•	•	•
Actuation Options	Electronic Modulating		•	•	•	•	•	•	•	•
	Tri-state floating		•	•	•	•	•	•	•	•
	Pulse Width Modulation		•							
	2-position low voltage	•	•	0	0	•	•	•	•	•
	2-position line voltage	•	•			•	•	•	•	•
	Electric Spring Return	•		•	•	•	•	•	•	•
	Electronic Fail Safe		•							
	Pneumatic, low pressure			•		•	•	•	•	•
	Pneumatic bidirectional (Hi-Pr)									
Pneumatic spring return (Hi-Pr)										

Notes * Best used with supply water reset from outdoor air temperature.

** A port specification

*** A-port maximum operating differential pressure. Static close-off pressure may be higher. Maximum pressure for quiet service may be less.

**** Stem down to close

***** Stem up to close

"Limited" = not available in large sizes

Product Selection - Valves

3-Way Control Valves

Attribute	Specification	Control Ball		Butterfly	
		Threaded	Flanged	Resilient Seat	
		VBN3	VBF3	VFF3	VFF6
Pipe Size	1/2" [DN15]	•			
	3/4" [DN20]	•			
	1" [DN25]	•			
	1-1/4" [DN32]	•			
	1-1/2" [DN40]	•			
	2" [DN50]	•		•	•
	2-1/2" [DN65]	•		•	•
	3" [DN80]			•	•
	4" [DN100]		•	•	•
	5" [DN125]		•	•	•
6" [DN150]		•	•	•	
Other (maximum size)				20" [DN500]	
Pipe Fittings	Sweat				
	NPT Internal Thread	•			
	Inverted Flare				
	ANSI Flange		•	•	•
Static Pressure	ANSI 125/150		•		
	ANSI 250/300				
	Other	360 psi		250 psi	
Media	Chilled Water	•	•	•	•
	Hot Water	•	•	•	•
Flow Capacity, Cv	Multiple ratings per pipe size	•	•		
	One rating/size above 1/2"			•	•
Valve Action	Mixing A-B-AB porting	•	•	•	
	Mixing A-AB-B porting				•
	Diverting AB-B-A porting	•	o	•	
	Diverting A-AB-B porting				•
A-port Flow Characteristic	Equal Percentage				
	Modified Equal Percentage	•	•	•	•
	Linear				
	Quick Open				
B-port Flow Characteristic	Modified Equal Percentage			•	•
	Linear				
	Linear, Reduced Cv	•	•		
	Total Constant Flow				
	Quick Open				
Close-off pressure***	High (60 psid minimum)		•	•	•
	Medium (30 psid minimum)	•		•	•
	Varies with actuator				
Maximum Seat Leakage**	ANSI Class III (0.10% Cv max.)				
	ANSI Class IV (0.01% Cv max.)	•	A-port	•	•
	Bubble-tight design			•	•
	Other (see product data literature)		B-port		
Rangeability	High (50:1 minimum)	•	•		
	Medium* (15-50:1)	o			
	Low (under 15:1)			•	•
Trim	Brass, plated brass, bronze	•			
	Stainless Steel		•		
	Resilient materials			•	•
In-line Serviceability	Cartridge				
	Packing	•	•		
	Rebuild		•		
Actuation Options	Electronic Modulating	•	•	•	•
	Tri-state floating	•	•	•	•
	Pulse Width Modulation				
	2-position low voltage	•	•	Limited	
	2-position line voltage	o	o	•	•
	Electric Spring Return	•	•	Limited	
	Electronic Fail Safe				
	Pneumatic, low pressure			Limited	
	Pneumatic bidirectional (Hi-Pr)			•	•
Pneumatic spring return (Hi-Pr)			•	•	

Notes

- * Best used with supply water reset from outdoor air temperature.
- ** A port specification
- *** A-port maximum operating differential pressure. Static close-off pressure may be higher. Maximum pressure for quiet service may be less.
- **** Stem down to close
- ***** Stem up to close
- "Limited" = not available in large sizes

Product Selection - Valves

Fan Coil and Zone Valves

Honeywell Fan Coil and Zone Valves family (VU Series) have withstood the test of time as a reliable and dependable product.

With a Cv range suitable for anything from radiator panels to fan coil units and both normally open and normally closed spring return functions, it's easy to select a model that fits your needs. Additionally you can choose between line voltage or low voltage actuators as well as three different types of pipe fittings: Female NPT, Sweat and Inverted flare.

Common Features

- Maximum static water pressure: 300 psig
- Ambient temp range: 34-104°F (at 34-250°F medium temperature)
- 3-way valve is diverting type
- Long service life with patented ball seal
- Quick opening / soft closing for optimal 2-position control
- Manual opener

Actuator O.S. Number		VU443A1008	VU443A1024	VU443A1115	VU443A1180	VU443E1009	VU444A1007
Power Supply	Voltage	120 Vac	208 Vac	230 Vac	120 Vac	120 Vac	120 Vac
	Frequency	60 Hz	60 Hz	50 / 60 Hz	60 Hz	60 Hz	60 Hz
	Power (60 Hz)	5 VA	5 VA	5 VA	5 VA	5 VA	5 VA
Control	2-Position SPST	•	•	•	•	•	•
Aux Switch	SPST					2.2 A/120 Vac	
Maximum Timing	Seconds @ 60 Hz, Driving	15	15	15	15	15	15
	Fail Safe	6	6	6	6	6	6
Fail Safe Action		N.C.	N.C.	N.C.	N.C.	N.C.	2-way N.O. 3-way N.O./N.C.
Electrical Connections	Leadwire Length, in.	6	18	6	6	18	6
	1/2 in. flexible conduit hole	•	•	•	•	•	•
Manual Override	(on power failure, auto reset)	•	•	•	•	•	•
Nickel plated motors	Condensing Atmosphere				•		

Valve Size (inches)	Connection Type	Flow Capacity (Cv)	Valve Action	Valve O.S. Number	2-way Valves Close-off						
1/2"	f NPT	1.0	Normally Open	VU52N1027						50	
	Sweat	1.0		VU52S2002						50	
	f NPT	2.5		VU52N1035						30	
	Sweat	2.5		VU52S2010						30	
	f NPT	3.5		VU52N1019						20	
	Sweat	3.5		VU52S2028						20	
3/4"	f NPT	3.5		VU52N1076						20	
	Sweat	3.5		VU52S2036						20	
	Sweat	5.0		VU52S2044						15	
	f NPT	8.0		VU52N1001						10	
1"	Sweat	8.0		VU52S2051						10	
	f NPT	8.0		VU52N1068						10	
1/2"	f NPT	1.0	Normally Closed	VU53N1041	50	50	50	50	50		
	Sweat	1.0		VU53S2018	50	50	50	50	50		
	f NPT	2.5		VU53N1058	30	30	30	30	30		
	Sweat	2.5		VU53S2026	30	30	30	30	30		
	Inverted Flare	3.5		VU53F1024	20	20	20	20	20		
	f NPT	3.5		VU53N1009	20	20	20	20	20		
3/4"	Sweat	3.5		VU53S2034	20	20	20	20	20		
	f NPT	3.5		VU53N1033	20	20	20	20	20		
	Sweat	3.5		VU53S2042	20	20	20	20	20		
	f NPT	5.0		VU53N1066	15	15	15	15	15		
	Sweat	5.0		VU53S2075	15	15	15	15	15		
	f NPT	8.0		VU53N1017	10	10	10	10	10		
	Sweat	8.0		VU53S2059	10	10	10	10	10		
	f NPT	8.0		VU53N1026	10	10	10	10	10		
	1"	Sweat		8.0	VU53S2000	10	10	10	10	10	
		f NPT		8.0							
Valve Size (inches)	Connection Type	Flow Capacity (Cv)		Valve Action	Valve O.S. Number	3-way Valves Close-off					
1/2"	Inverted Flare	4.0		Diverting	VU54F1022						20
	f NPT	4.0	VU54N1007							20	
	Sweat	4.0	VU54S2008							10	
3/4"	f NPT	4.0	VU54N1031							20	
	f NPT	5.0	VU54N1049							15	
	Sweat	5.0	VU54S2057							15	
	f NPT	7.0	VU54N1015							10	
	Sweat	7.0	VU54S2016							10	
	f NPT	7.0	VU54N1023							10	
1"	Sweat	7.0	VU54S2024							10	
	f NPT	7.0									



2-Way



3-Way

Product Selection - Valves

Fan Coil and Zone Valves



Actuator O.S. Number		VU444A1098	VU444A1106	VU444A1155	VU843A1004	VU843A1087	VU844A1003	VU844A1060
Power Supply	Voltage	227 Vac	230 Vac	120 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	60 Hz	50 / 60 Hz	60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power (60 Hz)	5 VA	5 VA	5 VA	0.32 A	0.32 A	0.32 A	0.32 A
Control	2-Position SPST	•	•	•	•	•	•	•
Aux Switch	SPST							
Maximum Timing	Seconds @ 60 Hz, Driving	15	15	15	15	15	15	15
	Fail Safe	6	6	6	6	6	6	6
Fail Safe Action		2-way N.O. 3-way N.O./N.C.	2-way N.O. 3-way N.O./N.C.	2-way N.O. 3-way N.O./N.C.	N.C.	N.C.	2-way N.O. 3-way N.O./N.C.	2-way N.O. 3-way N.O./N.C.
	Electrical Connections	Leadwire Length, in.	18	6	6	6	6	6
	1/2 in. flexible conduit hole	•	•	•	•	•	•	•
Manual Override	(on power failure, auto reset)	•	•	•	•	•	•	•
Nickel plated motors	Condensing Atmosphere			•		•		•

Valve Size (inches)	Connection Type	Flow Capacity (Cv)	Valve Action	Valve O.S. Number	2-way Valves Close-off						
2-Way	1/2"	f NPT	Normally Open	VU52N1027	50	50	50		50	50	
		Sweat		VU52S2002	50	50	50		50	50	
		f NPT		VU52N1035	30	30	30		30	30	
		Sweat		VU52S2010	30	30	30		30	30	
		f NPT		VU52N1019	20	20	20		20	20	
		Sweat		VU52S2028	20	20	20		20	20	
	3/4"	f NPT	Normally Open	VU52N1076	20	20	20		20	20	
		Sweat		VU52S2036	20	20	20		20	20	
		Sweat		VU52S2044	15	15	15		15	15	
		f NPT		VU52N1001	10	10	10		10	10	
		Sweat		VU52S2051	10	10	10		10	10	
	1"	f NPT	Normally Closed	VU52N1068	10	10	10		10	10	
	1/2"	f NPT		VU53N1041			50	50			
		Sweat		VU53S2018			50	50			
		f NPT		VU53N1058			30	30			
Sweat		VU53S2026				30	30				
Inverted Flare		VU53F1024				20	20				
f NPT		VU53N1009				20	20				
3/4"	Sweat	VU53S2034				20	20				
	f NPT	VU53N1033				20	20				
	Sweat	VU53S2042				20	20				
	f NPT	VU53N1066				15	15				
	Sweat	VU53S2075				15	15				
	f NPT	VU53N1017				10	10				
1"	Sweat	VU53S2059				10	10				
	f NPT	VU53N1026				10	10				
	Sweat	VU53S2000			10	10					
Valve Size (inches)	Connection Type	Flow Capacity (Cv)	Valve Action	Valve O.S. Number	3-way Valves Close-off						
3-Way	1/2"	Inverted Flare	Diverting	VU54F1022	20	20	20		20	20	
		f NPT		VU54N1007	20	20	20		20	20	
		Sweat		VU54S2008	10	10	10		10	10	
	3/4"	f NPT		VU54N1031	20	20	20		20	20	
		f NPT		VU54N1049	15	15	15		15	15	
		Sweat		VU54S2057	15	15	15		15	15	
		f NPT		VU54N1015	10	10	10		10	10	
		Sweat		VU54S2016	10	10	10		10	10	
		f NPT		VU54N1023	10	10	10		10	10	
	1"	Sweat		VU54S2024	10	10	10		10	10	

VALVES

Product Selection - Valves

Cartridge Cage Valves

Honeywell Cartridge Cage Valves family (VC Series) are highly serviceable and completely rebuildable.

Select from 2-position (both low and line voltage), floating and modulating actuators, and fail safe actuators with configurable open/closed functionality on power failure depending on the application. Since these valves are not sensitive to flow direction; they can do both mixing and diverting without changing anything except the piping.



Actuator O.S. Number		Non-Fail Safe						
		VC6834ZZ11	VC6934ZZ11	VC7934ZZ11	VC4011ZZ11	VC4013ZZ11	VC8114ZZ11	VC8714ZZ11
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	100-130 Vac	200-240 Vac	24 Vac	24 Vac
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	60 Hz	60 Hz
	Power	6 VA	6 VA	6 VA	6 VA	6 VA	6 VA	6 VA
Control	2-10 Vdc			•				
	4-20 mA (external 500 Ohm resistor)			•				
	Floating	•	•					
	2-Position SPDT	•	•					
	2-Position SPST				•	•	•	•
	Pulse Width Modulation							
Aux Switch	SPDT Class II	2.2 A						2.2 A
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place
Reversible Operation	Wiring Change	•	•					
	DIP Switch							
Stroke Timing	Seconds @ 60 Hz (Drive)	120	120	120	6	6	6	6
	Fail Safe							
Electrical Connection	Cable length, in.	60	60	60	39.4	39.4	60	60
	Plenum-rated cable	•	•	•			•	•
	1/2 in. flexible conduit adapter	•	•	•			•	•



2-Way

Valve Size (inches)	Connection Type	Flow Capacity (Cv)	Flow Characteristic	Valve O.S. Number									
1/2"	f NPT	0.7	Modified Equal %	VCZBB3500	VCZBB3500	VCZBB3500							
	Sweat	0.7		VCZAA3500	VCZAA3500	VCZAA3500							
	f NPT	1.3		VCZBB3600	VCZBB3600	VCZBB3600							
	Sweat	1.3		VCZAA3600	VCZAA3600	VCZAA3600							
	Sweat	1.9		VCZAA3800	VCZAA3800	VCZAA3800							
	f NPT	1.9		VCZBB3800	VCZBB3800	VCZBB3800							
	Sweat	2.3		VCZAA3400	VCZAA3400	VCZAA3400							
	f NPT	2.3		VCZBB3400	VCZBB3400	VCZBB3400							
	f NPT	3.5	Linear	VCZBB3100	VCZBB3100	VCZBB3100	VCZBB1100	VCZBB1100	VCZBB1100	VCZBB1100			
	Sweat	3.5	Linear	VCZAA3100	VCZAA3100	VCZAA3100	VCZAA1100	VCZAA1100	VCZAA1100	VCZAA1100			
	3/4"	f NPT	3.9	Modified Equal %	VCZAL3400	VCZAL3400	VCZAL3400						
		Sweat	3.9	Modified Equal %	VCZAM3400	VCZAM3400	VCZAM3400						
f NPT		4.7	Linear	VCZAL3100	VCZAL3100	VCZAL3100	VCZAL1100	VCZAL1100	VCZAL1100	VCZAL1100			
Sweat		4.7	Linear	VCZAM3100	VCZAM3100	VCZAM3100	VCZAM1100	VCZAM1100	VCZAM1100	VCZAM1100			
1"	f NPT	4.2	Modified Equal %	VCZAR3400	VCZAR3400	VCZAR3400							
	Sweat	4.2	Modified Equal %	VCZAS3400	VCZAS3400	VCZAS3400							
	f NPT	6.6	Linear	VCZAR3100	VCZAR3100	VCZAR3100	VCZAR1100	VCZAR1100	VCZAR1100	VCZAR1100			
	Sweat	6.6		VCZAS3100	VCZAS3100	VCZAS3100	VCZAS1100	VCZAS1100	VCZAS1100	VCZAS1100			
f NPT	7	VCZBD3100		VCZBD3100	VCZBD3100	VCZBD1100	VCZBD1100	VCZBD1100	VCZBD1100				
Sweat	7	VCZBE3100		VCZBE3100	VCZBE3100	VCZBE1100	VCZBE1100	VCZBE1100	VCZBE1100				



3-Way Mixing/ Diverting

Valve Size (inches)	Connection Type	Flow Capacity (Cv)	Flow Characteristic	Valve O.S. Number									
1/2"	f NPT	0.7	Modified Equal %	VCZNB7500	VCZNB7500	VCZNB7500							
	Sweat	0.7		VCZMA7500	VCZMA7500	VCZMA7500							
	f NPT	1.5		VCZNB7600	VCZNB7600	VCZNB7600							
	Sweat	1.5		VCZMA7600	VCZMA7600	VCZMA7600							
	f NPT	1.5		VCZNB7800	VCZNB7800	VCZNB7800							
	Sweat	1.5		VCZMA7800	VCZMA7800	VCZMA7800							
	f NPT	2.7		VCZNB7400	VCZNB7400	VCZNB7400							
	Sweat	2.7		VCZMA7400	VCZMA7400	VCZMA7400							
	f NPT	3.7	Linear	VCZNB7100	VCZNB7100	VCZNB7100	VCZNB6100	VCZNB6100	VCZNB6100	VCZNB6100			
	Sweat	3.7	Linear	VCZMA7100	VCZMA7100	VCZMA7100	VCZMA6100	VCZMA6100	VCZMA6100	VCZMA6100			
	3/4"	f NPT	4.2	Modified Equal %	VCZMK7400	VCZMK7400	VCZMK7400						
		Sweat	4.2	Modified Equal %	VCZML7400	VCZML7400	VCZML7400						
f NPT		6.6	Linear	VCZMK7100	VCZMK7100	VCZMK7100	VCZMK6100	VCZMK6100	VCZMK6100	VCZMK6100			
Sweat		6.6		VCZML7100	VCZML7100	VCZML7100	VCZML6100	VCZML6100	VCZML6100	VCZML6100			
f NPT	8.3	VCZMR7100		VCZMR7100	VCZMR7100	VCZMR6100	VCZMR6100	VCZMR6100	VCZMR6100				
Sweat	8.3	VCZMS7100		VCZMS7100	VCZMS7100	VCZMS6100	VCZMS6100	VCZMS6100	VCZMS6100				
1-1/4"	f NPT	9	Linear	VCZND7100	VCZND7100	VCZND7100	VCZND6100	VCZND6100	VCZND6100	VCZND6100			
	Sweat	9		VCZNE7100	VCZNE7100	VCZNE7100	VCZNE6100	VCZNE6100	VCZNE6100	VCZNE6100			

Common Features

- 2-way straight-through or 3-way mixing/diverting body configurations
- Corrosion resistant, engineered plastic actuator housing
- 60 psid close-off on all models
- Fast acting 2-position actuator with soft close technology
- Position indicator/manual override lever standard
- Replaceable cartridge rebuilds valve to factory specifications without removing valve body from piping
- 300 psi operating pressure
- Combination position indicator/manual flush-and-fill manual lever on all actuators



		Fail Safe	
Actuator O.S. Number		VC6936ZZ11-530	VC7936ZZ11-529
Power Supply	Voltage	24 Vac	24 Vac
	Frequency	50/60 Hz	50/60 Hz
	Power	12 VA	12 VA
Control	2-10 Vdc		•
	4-20 mA (external 500 Ohm resistor)		•
	Floating	•	•
	2-Position SPDT	•	•
	2-Position SPST		•
	Pulse Width Modulation	•	•
Aux Switch	SPDT Class II		
Fail Safe Action		Electronic NO/NC	Electronic NO/NC
	Reversible Operation	Wiring Change	•
	DIP Switch		•
Stroke Timing	Seconds @ 60 Hz (Drive)	120	60 / 120
	Fail Safe	12	12
Electrical Connection	Cable length, in.	60	60
	Plenum-rated cable	•	•
	1/2 in. flexible conduit adapter	•	•



Honeywell's Cartridge Cage Valves feature a field replaceable cartridge for all working parts

Valve Size (inches)	Connection Type	Flow Capacity (Cv)	Flow Characteristic	Y-pack O.S. Number		Replacement Cartridge Floating / Modulating	Replacement Cartridge Electronic Fail Safe			
2-Way	1/2"	f NPT	0.7	Modified Equal %	VC6936BB1500	VC7936BB1500	VCZZ3500	VCZZ1500		
		Sweat	0.7		VC6936AA1500	VC7936AA1500	VCZZ3500	VCZZ1500		
		f NPT	1.3		VC6936BB1600	VC7936BB1600	VCZZ3600	VCZZ1600		
		Sweat	1.3		VC6936AA1600	VC7936AA1600	VCZZ3600	VCZZ1600		
		Sweat	1.9		VC6936AA1800	VC7936AA1800	VCZZ3800	VCZZ1800		
		f NPT	1.9		VC6936BB1800	VC7936BB1800	VCZZ3800	VCZZ1800		
		Sweat	2.3		VC6936AA1400	VC7936AA1400	VCZZ3400	VCZZ1400		
		f NPT	2.3		VC6936BB1400	VC7936BB1400	VCZZ3400	VCZZ1400		
	3/4"	f NPT	3.5	Linear	VC6936BB1100	VC7936BB1100	VCZZ3100	VCZZ1100*		
			3.5	Linear	VC6936AA1100	VC7936AA1100	VCZZ3100	VCZZ1100*		
			3.9	Modified Equal %	VC6936AL1400	VC7936AL1400	VCZZ3400	VCZZ1400		
			3.9	Modified Equal %	VC6936AM1400	VC7936AM1400	VCZZ3400	VCZZ1400		
		Sweat	4.7	Linear	VC6936AL1100	VC7936AL1100	VCZZ3100	VCZZ1100*		
			4.7	Linear	VC6936AM1100	VC7936AM1100	VCZZ3100	VCZZ1100*		
			1"	f NPT	4.2	Modified Equal %	VC6936AR1400	VC7936AR1400	VCZZ3400	VCZZ1400
				Sweat	4.2	Modified Equal %	VC6936AS1400	VC7936AS1400	VCZZ3400	VCZZ1400
1-1/4"	f NPT	6.6	Linear	VC6936AR1100	VC7936AR1100	VCZZ3100	VCZZ1100*			
		6.6		VC6936AS1100	VC7936AS1100	VCZZ3100	VCZZ1100*			
	Sweat	7		VC6936BD1100	VC7936BD1100	VCZZ3100	VCZZ1100*			
	Sweat	7		VC6936BE1100	VC7936BE1100	VCZZ3100	VCZZ1100*			
3-Way Mixing / Diverting	1/2"	f NPT	0.7	Modified Equal %	VC6936NB6500	VC7936NB6500	VCZZ7500	VCZZ6500		
		Sweat	0.7		VC6936MA6500	VC7936MA6500	VCZZ7500	VCZZ6500		
		f NPT	1.5		VC6936NB6600	VC7936NB6600	VCZZ7600	VCZZ6600		
		Sweat	1.5		VC6936MA6600	VC7936MA6600	VCZZ7600	VCZZ6600		
		f NPT	1.5		VC6936NB6800	VC7936NB6800	VCZZ7800	VCZZ6800		
		Sweat	1.5		VC6936MA6800	VC7936MA6800	VCZZ7800	VCZZ6800		
		f NPT	2.7		VC6936NB6400	VC7936NB6400	VCZZ7400	VCZZ6400		
		Sweat	2.7		VC6936MA6400	VC7936MA6400	VCZZ7400	VCZZ6400		
		f NPT	3.7		Linear	VC6936NB6100	VC7936NB6100	VCZZ7100	VCZZ6100*	
		Sweat	3.7		Linear	VC6936MA6100	VC7936MA6100	VCZZ7100	VCZZ6100*	
		3/4"	f NPT		4.2	Modified Equal %	VC6936MK6400	VC7936MK6400	VCZZ7400	VCZZ6400
					4.2	Modified Equal %	VC6936ML6400	VC7936ML6400	VCZZ7400	VCZZ6400
	Sweat		6.6	Linear	VC6936MK6100	VC7936MK6100	VCZZ7100	VCZZ6100*		
			6.6		VC6936ML6100	VC7936ML6100	VCZZ7100	VCZZ6100*		
	f NPT		8.3		VC6936MR6100	VC7936MR6100	VCZZ7100	VCZZ6100*		
	Sweat		8.3		VC6936MS6100	VC7936MS6100	VCZZ7100	VCZZ6100*		
	1-1/4"		f NPT		9	VC6936ND6100	VC7936ND6100	VCZZ7100	VCZZ6100*	
					9	VC6936NE6100	VC7936NE6100	VCZZ7100	VCZZ6100*	
			Sweat		9	VC6936ND6100	VC7936ND6100	VCZZ7100	VCZZ6100*	
					9	VC6936NE6100	VC7936NE6100	VCZZ7100	VCZZ6100*	

* Also applies to 2-position valve-actuator applications

Product Selection - Valves

Cartridge Globe Valves

For more than 50 years, Honeywell has manufactured the V58 series of premium Cartridge Globe Valves. The compact size and replacement capabilities make it a great choice for controlling modulating unitary equipment.

Valves 1" and larger feature a pressure balanced design with enhanced close-off (levels).

Common Features

- Maximum static pressure 235 psi
- Long stroke allows for a wide range of control
- Leakage rate: 0.02% of Cv
- Insert replacement tool allows for the valve cartridge to be replaced or changed without draining the system (1/2" and 3/4" models only)
- Brass body and stainless steel stem
- Threaded plastic valve cover/manual handle allows for manual operation
- Corrosion resistant



Actuator O.S. Number		Non-Fail Safe			
		M6410A1029	M6410A3017	M7410F1000	M7410F3006
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Power	0.7 VA	0.7 VA	1.4 VA	1.4 VA
Control	Stem Force (lb.)	40.5	67.5	40.5	67.5
	2-Position SPDT	•	•		
	Floating	•	•		
	0(2)-10 Vdc			DIP Switch	DIP Switch
4-20 mA (external 500 Ohm resistor)				•	•
	Pneumatic Spring Range				
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place
Reversible Operation	Wiring Change	•	•		
	DIP Switch			•	•
Stroke Timing	Seconds @ 60 Hz (Drive)	125	125	125	125
	Fail Safe				
Manual Override	(Use valve dust cap)	•	•	•	•
Position Indicator		•	•	•	•
Electrical Connection	Cable length, in.	36	36	36	36
	Plenum-rated Cable	•	•	•	•
	Screw terminals				
	1/2 in. flexible conduit hub	•	•	•	•



2-Way

Valve Size (inches)	Pipe Connection Type	Flow Capacity (Cv)	Flow Characteristic	Valve Closes	Valve O.S. Number	Close-off Pressure, psid			
1/2"	f NPT	0.19	Equal%	Stem Down ²	V5862A2005	232		232	
	Sweat	0.19			V5852A2007	232		232	
	f NPT	0.29			V5862A2013	232		232	
	Sweat	0.29			V5852A2015	232		232	
	f NPT	0.47			V5862A2021	232		232	
	Sweat	0.47			V5852A2023	232		232	
	f NPT	0.74			V5862A2039	232		232	
	Sweat	0.74			V5852A2031	232		232	
	f NPT	1.2			V5862A2047	174		174	
	Sweat	1.2			V5852A2049	174		174	
	f NPT	1.9			V5862A2054	174		174	
	Sweat	1.9			V5852A2056	174		174	
	f NPT	2.9			V5862A2062	58		58	
	Sweat	2.9			V5852A2064	58		58	
1"	f NPT	4.9	Linear	Stem Up	V5862A2070	58		58	
	Sweat	4.9			V5852A2072	58		58	
	f NPT	5.5			V5862A3003		232		232
	Sweat	7.8			V5862A3011		232		232
1-1/4"	f NPT	11	Linear	Stem Up	V5862A3029		232	232	
	Sweat	18			V5862A3037		174		174
1-1/2"	f NPT	25			V5862A3045		145	145	



3-Way

Valve Size (inches)	Pipe Connection Type	Flow Capacity (Cv) ¹	Flow Characteristic	Valve Closes	Valve O.S. Number	Close-off Pressure, psid			
1/2"	f NPT	0.29	A-AB Equal%, B-AB Linear	Port A to AB Stem up	V5863A2004	116		116	
	Sweat	0.29			V5853A2006	116		116	
	f NPT	0.47			V5863A2012	116		116	
	Sweat	0.47			V5853A2014	116		116	
	f NPT	0.74			V5863A2020	116		36	
	Sweat	0.74			V5853A2022	116		36	
	f NPT	1.2			V5863A2038	36		36	
	Sweat	1.2			V5853A2030	36		36	
	f NPT	1.9			V5863A2046	34		34	
	Sweat	1.9			V5853A2048	34		34	
	f NPT	2.9			V5863A1006	34		34	
	Sweat	2.9			V5853A1008	34		34	
	f NPT	4.9			V5863A1014	34		34	
	Sweat	4.9			V5853A1016	34		34	
3/4"	f NPT	2.9	Linear	Stem up	V5863A2053	7.25		7.25	
	Sweat	2.9			V5853A2055	7.25		7.25	
	f NPT	4.9			V5863A2061	7.25		7.25	
	Sweat	4.9			V5853A2063	7.25		7.25	
	f NPT	5.5			V5863A3002		232		232
	Sweat	7.8			V5863A3010		232		232
	f NPT	11			V5863A3028		232		232
	Sweat	18			V5863A3036		174		174
1-1/2"	f NPT	25			V5863A3044		145	145	

¹ B port Cv is 20% less

² Fail safe position for 1/2" and 3/4" 2-way is Normally Open with Mx435 and MP958 spring return actuators. All other valves fail safe closed.

Product Selection - Valves

Cartridge Globe Valves



Actuator O.S. Number		Fail Safe				Pneumatic		
		M6435A1004	M6435A3000	M7435F1001	M7435F3007	MP958A1009	MP958A1017	MP958A1025
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac			
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz			
	Power	10 VA	10 VA	5 VA	5 VA			
Control	Stem Force (lb.)	40.5	90	40.5	90			
	2-Position SPDT	•	•					
	Floating	•	•					
	0(2)-10 Vdc			DIP Switch	DIP Switch			
	4-20 mA (external 500 Ohm resistor)			•	•			
Pneumatic Spring Range						2-5 psi	3-10 psi	8-11 psi
Fail Safe Action		Stem Up	Stem Up	Stem Up	Stem Up	Stem Up	Stem Up	Stem Up
Reversible Operation	Wiring Change	•	•					
	DIP Switch			•	•			
Stroke Timing	Seconds @ 60 Hz (Drive)	50	50	50	50			
	Fail Safe	10	10	10	10			
Manual Override (Use valve dust cap)		•	•	•	•	•	•	•
Position Indicator		•	•	•	•			
Electrical Connection								
Cable length, in.		—	—	—	—	—	—	—
Plenum-rated Cable								
Screw terminals		•	•	•	•			
1/2 in. flexible conduit hub		•	•	•	•			

Valve Size (inches)	Pipe Connection Type	Flow Capacity (Cv)	Flow Characteristic	Valve Closes	Valve O.S. Number	Close-off Pressure, psid				A-port Close-off Pressure, psid Full air pressure ³			Replacement Insert ⁴	
2-Way	1/2"	f NPT	Equal%	Stem Down ²	V5862A2005	232		232		232	232	232	0902812	
		Sweat			V5852A2007	232		232		232	232	232	0902812	
		f NPT			V5862A2013	232		232		232	232	232	0902811	
		Sweat			V5852A2015	232		232		232	232	232	0902811	
		f NPT			V5862A2021	232		232		232	232	232	0902810	
		Sweat			V5852A2023	232		232		232	232	232	0902810	
		f NPT			V5862A2039	232		232		232	232	232	0902809	
		Sweat			V5852A2031	232		232		232	232	232	0902809	
		f NPT			V5862A2047	174		174		232	140	120	0902808	
		Sweat			V5852A2049	174		174		232	140	120	0902808	
	3/4"	f NPT	V5862A2054	174		174		232	140	120	0902807			
		Sweat	V5852A2056	174		174		232	140	120	0902807			
		f NPT	V5862A2062	58		58		90	50	40	0902814			
		Sweat	V5852A2064	58		58		90	50	40	0902814			
		f NPT	V5862A2070	58		58		90	50	40	0902815			
		Sweat	V5852A2072	58		58		90	50	40	0902815			
		1"	f NPT	V5862A3003				232		232			0903827	
			f NPT	V5862A3011				232		232			0903827	
			f NPT	V5862A3029				232		232			0903827	
			1-1/4"	f NPT	V5862A3037				174		174		0903828	
1-1/2"	f NPT		V5862A3045				145		145		0903829			
3-Way	1/2"	f NPT	A-AB Equal%, B-AB Linear	Port A to AB Stem up	V5863A2004	116		116		20	80	232	0902821	
		Sweat			V5853A2006	116		116		20	80	232	0902821	
		f NPT			V5863A2012	116		116		20	80	232	0902822	
		Sweat			V5853A2014	116		116		20	80	232	0902822	
		f NPT			V5863A2020	36		36		20	80	232	0902823	
		Sweat			V5853A2022	36		36		20	80	232	0902823	
		f NPT			V5863A2038	36		36		N/A	10	100	0902824	
		Sweat			V5853A2030	36		36		N/A	10	100	0902824	
		f NPT			V5863A2046	34		34		N/A	10	100	0902825	
		Sweat			V5853A2048	34		34		N/A	10	100	0902825	
	3/4"	f NPT	V5863A1006				34		34				0902826	
		Sweat	V5853A1008				34		34				0902826	
		f NPT	V5863A1014				34		34				0902827	
		Sweat	V5853A1016				34		34				0902827	
		f NPT	V5863A2053	7.25		7.25		N/A	N/A	35			0902818	
		Sweat	V5853A2055	7.25		7.25		N/A	N/A	35			0902818	
		f NPT	V5863A2061	7.25		7.25		N/A	N/A	35			0902819	
		Sweat	V5853A2063	7.25		7.25		N/A	N/A	35			0902819	
		1"	f NPT	V5863A3002					232		232			0903827
			f NPT	V5863A3010					232		232			0903827
	f NPT		V5863A3028					232		232			0903827	
	1-1/4"		f NPT	V5863A3036				174		174			0903828	
	1-1/2"		f NPT	V5863A3044				145		145			0903829	

VALVES

¹ B port Cv is 20% less
² Fail safe position for 1/2" and 3/4" 2-way is Normally Open with Mx435 and MP958 spring return actuators. All other valves fail safe closed.
³ 20 psi for 2-way; 0 psi for 3-way
⁴ Insert determines Cv for 1/2" and 3/4" bodies. Grouped inserts are interchangeable.

Product Selection - Valves

2-Way Control Ball Valves With MVN Actuators 1/2"-1 1/4"



Example of complete orderable part number: **VBN2A000.38SA+MVN643A0000+C1**

Control Ball Valve, Female NPT Thread, 2-way, 1/2", CV .38, Stainless Steel, Standard Profile with MVN643A0000 Actuator, Fail in place and 1 meter cable.

**5-YEAR
LIMITED
WARRANTY**

Standard profile provides clearance between valve and actuator for insulation.
Low profile enables installation of valve and actuator in tight spaces.

If the complete orderable part number is too long for your ordering system, please refer to the Short Order Codes on pg 78 to 89.

Valve Specification		Valve Profile	Standard Profile		Low Profile	
		Valve Trim	Plated Brass	Stainless Steel	Plated Brass	Stainless Steel
Valve Size (inches)	Close-off Differential Pressure (psi)	Cv	Valve Body Model Number			
1/2"	130	0.38	VBN2A000.38PA	VBN2A000.38SA	VBN2A000.38PL	VBN2A000.38SL
		0.68	VBN2A000.68PA	VBN2A000.68SA	VBN2A000.68PL	VBN2A000.68SL
		1.3	VBN2A001.30PA	VBN2A001.30SA	VBN2A001.30PL	VBN2A001.30SL
		2	VBN2A002.00PA	VBN2A002.00SA	VBN2A002.00PL	VBN2A002.00SL
		2.6	VBN2A002.60PA	VBN2A002.60SA	VBN2A002.60PL	VBN2A002.60SL
		4.7	VBN2A004.70PA	VBN2A004.70SA	VBN2A004.70PL	VBN2A004.70SL
		8	VBN2A008.00PA	VBN2A008.00SA	VBN2A008.00PL	VBN2A008.00SL
		11.7	VBN2A011.70PA	VBN2A011.70SA	VBN2A011.70PL	VBN2A011.70SL
3/4"	130	0.31	VBN2B000.31PA	VBN2B000.31SA	VBN2B000.31PL	VBN2B000.31SL
		0.63	VBN2B000.63PA	VBN2B000.63SA	VBN2B000.63PL	VBN2B000.63SL
		1.2	VBN2B001.20PA	VBN2B001.20SA	VBN2B001.20PL	VBN2B001.20SL
		2.5	VBN2B002.50PA	VBN2B002.50SA	VBN2B002.50PL	VBN2B002.50SL
		4.3	VBN2B004.30PA	VBN2B004.30SA	VBN2B004.30PL	VBN2B004.30SL
		7.4	VBN2B007.40PA	VBN2B007.40SA	VBN2B007.40PL	VBN2B007.40SL
		10.1	VBN2B010.10PA	VBN2B010.10SA	VBN2B010.10PL	VBN2B010.10SL
		14.7	VBN2B014.70PA	VBN2B014.70SA	VBN2B014.70PL	VBN2B014.70SL
1"	100	29	VBN2B029.00PA	VBN2B029.00SA	VBN2B029.00PL	VBN2B029.00SL
		4.4	VBN2C004.40PA	VBN2C004.40SA	VBN2C004.40PL	VBN2C004.40SL
		9	VBN2C009.00PA	VBN2C009.00SA	VBN2C009.00PL	VBN2C009.00SL
		15.3	VBN2C015.30PA	VBN2C015.30SA	VBN2C015.30PL	VBN2C015.30SL
		26	VBN2C026.00PA	VBN2C026.00SA	VBN2C026.00PL	VBN2C026.00SL
		44	VBN2C044.00PA	VBN2C044.00SA	VBN2C044.00PL	VBN2C044.00SL
1-1/4"	100	54	VBN2C054.00PA	VBN2C054.00SA	VBN2C054.00PL	VBN2C054.00SL
		4.4	VBN2D004.40PA	VBN2D004.40SA	VBN2D004.40PL	VBN2D004.40SL
		8.3	VBN2D008.30PA	VBN2D008.30SA	VBN2D008.30PL	VBN2D008.30SL
		14.9	VBN2D014.90PA	VBN2D014.90SA	VBN2D014.90PL	VBN2D014.90SL
		25	VBN2D025.00PA	VBN2D025.00SA	VBN2D025.00PL	VBN2D025.00SL
		37	VBN2D037.00PA	VBN2D037.00SA	VBN2D037.00PL	VBN2D037.00SL
		41	VBN2D041.00PA	VBN2D041.00SA	VBN2D041.00PL	VBN2D041.00SL
102	VBN2D102.00PA	VBN2D102.00SA	VBN2D102.00PL	VBN2D102.00SL		

2-Way

Actuator Features						
MVN				Standard Profile		Low Profile
Actuator Type	Control Signal	Timing	Voltage	Enclosure	Actuator Model Number	
Fail-in-Place	Floating	90 sec.	24 VAC	NEMA 2	+MVN613A0000	+MVN613L0000
	Fast SPDT	30 sec.	24 VAC/DC		+MVN643A0000	+MVN643L0000
	Modulating	90 sec.	24 VAC/DC		+MVN713A0000	+MVN713L0000
Accessories	1 meter cable				+C1	

2-Way Control Ball Valves With Direct Coupled Actuators 1/2"-3"



Example of complete orderable part number: **VBN2E030.00SX+MN7505A2001**
 Control Ball Valve, Female NPT Thread, 2-way, 1-1/2", CV 30, Black Bracket, Stainless Steel with
 MN7505A2001 Actuator, Fail in place.

**5-YEAR
 LIMITED
 WARRANTY**

If the complete orderable part number is too long for your ordering system, please refer to the Short Order Codes on pg 78 to 89.

2-Way

Valve Specification		Valve Profile	Black Bracket	
Valve Size (inches)	Close-off Differential Pressure (psi)	Valve Trim	Plated Brass	Stainless Steel
		Cv	Valve Body Model Number	
1/2"	130	0.38	VBN2A000.38PX	VBN2A000.38SX
		0.68	VBN2A000.68PX	VBN2A000.68SX
		1.3	VBN2A001.30PX	VBN2A001.30SX
		2	VBN2A002.00PX	VBN2A002.00SX
		2.6	VBN2A002.60PX	VBN2A002.60SX
		4.7	VBN2A004.70PX	VBN2A004.70SX
		8	VBN2A008.00PX	VBN2A008.00SX
3/4"	130	11.7	VBN2A011.70PX	VBN2A011.70SX
		0.31	VBN2B000.31PX	VBN2B000.31SX
		0.63	VBN2B000.63PX	VBN2B000.63SX
		1.2	VBN2B001.20PX	VBN2B001.20SX
		2.5	VBN2B002.50PX	VBN2B002.50PSX
		4.3	VBN2B004.30PX	VBN2B004.30SX
		7.4	VBN2B007.40PX	VBN2B007.40SX
1"	100	10.1	VBN2B010.10PX	VBN2B010.10SX
		14.7	VBN2B014.70PX	VBN2B014.70SX
		29	VBN2B029.00PX	VBN2B029.00SX
		4.4	VBN2C004.40PX	VBN2C004.40SX
		9	VBN2C009.00PX	VBN2C009.00SX
		15.3	VBN2C015.30PX	VBN2C015.30SX
		26	VBN2C026.00PX	VBN2C026.00SX
1-1/4"	100	44	VBN2C044.00PX	VBN2C044.00SX
		54	VBN2C054.00PX	VBN2C054.00SX
		4.4	VBN2D004.40PX	VBN2D004.40SX
		8.3	VBN2D008.30PX	VBN2D008.30SX
		14.9	VBN2D014.90PX	VBN2D014.90SX
		25	VBN2D025.00PX	VBN2D025.00SX
		37	VBN2D037.00PX	VBN2D037.00SX
1-1/2"	100	41	VBN2D041.00PX	VBN2D041.00SX
		102	VBN2D102.00PX	VBN2D102.00SX
		23	VBN2E023.00PX	VBN2E023.00SX
		30	VBN2E030.00PX	VBN2E030.00SX
		41	VBN2E041.00PX	VBN2E041.00SX
		74	VBN2E074.00PX	VBN2E074.00SX
		172	VBN2E172.00PX	VBN2E172.00SX
2"	100	42	VBN2F042.00PX	VBN2F042.00SX
		57	VBN2F057.00PX	VBN2F057.00SX
		71	VBN2F071.00PX	VBN2F071.00SX
		100	VBN2F100.00PX	VBN2F100.00SX
		108	VBN2F108.00PX	VBN2F108.00SX
		210	VBN2F210.00PX	VBN2F210.00SX
		266	VBN2F266.00PX	VBN2F266.00SX
2-1/2"	100	45	VBN2G045.00PX	VBN2G045.00SX
		55	VBN2G055.00PX	VBN2G055.00SX
		72	VBN2G072.00PX	VBN2G072.00SX
		101	VBN2G101.00PX	VBN2G101.00SX
		162	VBN2G162.00PX	VBN2G162.00SX
		202	VBN2G202.00PX	VBN2G202.00SX
		3"	100	49
63	VBN2H063.00PX			VBN2H063.00SX
82	VBN2H082.00PX			VBN2H082.00SX
124	VBN2H124.00PX			VBN2H124.00SX
145	VBN2H145.00PX			VBN2H145.00SX

Actuator Features

Direct Coupled Actuators					Model Number
Actuator Type	Control Signal	Timing	Voltage	Enclosure	
Fail-in-Place	Floating	95 sec.	24 VAC/DC	NEMA 2	+MN6105A1011
Fail-in-Place	Modulating, Floating	95 sec.			+MN7505A2001
Fail Safe	Modulating, Floating	95 sec.			+MS7505A2030
Fail Safe	2-Position	95 sec.			+MS8105A1030
Fail Safe Position (MS actuators only - open, closed, A-AB, B-AB)	FSC - Fail Safe Open FSC - Fail Safe Closed				FSC or FSC
Accessories	3R enclosure				+3R

VALVES

Product Selection - Valves

3-Way Control Ball Valves With MVN Actuators 1/2"-1 1/4"



Example of complete orderable part number: **VBN3A000.33PA+MVN613A0000+C1**
 Control Ball Valve, Female NPT Thread, 3-way, 1-1/2", CV .33, Plated Brass, with MVN613A0000 Actuator, Fail in place and 1 meter cable.

**5-YEAR
 LIMITED
 WARRANTY**

Standard profile provides clearance between valve and actuator for insulation.
 Low profile enables installation of valve and actuator in tight spaces.

If the complete orderable part number is too long for your ordering system, please refer to the Short Order Codes on pg 78 to 89.

Valve Specification		Valve Profile	Standard Profile	Low Profile
		Valve Trim	Plated Brass	Plated Brass
Valve Size (inches)	Close-off Differential Pressure (psi)	Cv	Valve Body Model Number	
1/2"	50	0.33	VBN3A000.33PA	VBN3A000.33PL
		0.59	VBN3A000.59PA	VBN3A000.59PL
		1	VBN3A001.00PA	VBN3A001.00PL
		2.4	VBN3A002.40PA	VBN3A002.40PL
		4.3	VBN3A004.30PA	VBN3A004.30PL
		8	VBN3A008.00PA	VBN3A008.00PL
3/4"	50	0.4	VBN3B000.40PA	VBN3B000.40PL
		0.66	VBN3B000.66PA	VBN3B000.66PL
		1.3	VBN3B001.30PA	VBN3B001.30PL
		2.4	VBN3B002.40PA	VBN3B002.40PL
		3.8	VBN3B003.80PA	VBN3B003.80PL
		7	VBN3B007.00PA	VBN3B007.00PL
		11	VBN3B011.00PA	VBN3B011.00PL
1"	50	0.4	VBN3C000.40PA	VBN3C000.40PL
		0.65	VBN3C000.65PA	VBN3C000.65PL
		1.3	VBN3C001.30PA	VBN3C001.30PL
		2.3	VBN3C002.30PA	VBN3C002.30PL
		3.5	VBN3C003.50PA	VBN3C003.50PL
		4.5	VBN3C004.50PA	VBN3C004.50PL
		8.6	VBN3C008.60PA	VBN3C008.60PL
		14.9	VBN3C014.90PA	VBN3C014.90PL
		22	VBN3C022.00PA	VBN3C022.00PL
		31	VBN3C031.00PA	VBN3C031.00PL
1-1/4"	40	4.1	VBN3D004.10PA	VBN3D004.10PL
		8.7	VBN3D008.70PA	VBN3D008.70PL
		12.7	VBN3D012.70PA	VBN3D012.70PL
		19.4	VBN3D019.40PA	VBN3D019.40PL
		27	VBN3D027.00PA	VBN3D027.00PL
		34	VBN3D034.00PA	VBN3D034.00PL

3-Way

Actuator Features					Standard Profile	Low Profile
MVN					Actuator Model Number	
Actuator Type	Control Signal	Timing	Voltage	Enclosure		
Fail-in-Place	Floating	90 sec.	24 VAC	NEMA 2	+MVN613A0000	+MVN613L0000
	Fast SPDT	30 sec.	24 VAC/DC		+MVN643A0000	+MVN643L0000
	Modulating	90 sec.	24 VAC/DC		+MVN713A0000	+MVN713L0000
Accessories	1 meter cable				+C1	

3-Way Control Ball Valves With Direct Coupled Actuators 1/2"-2 1/2"



Example of complete orderable part number: **VBN3E032.00PX+MN7505A2001**

Control Ball Valve, Female NPT Thread, 3-way, 1-1/2", CV 32, Black Bracket, Plated Brass with MN7505A2001 Actuator, Fail in place.

**5-YEAR
LIMITED
WARRANTY**

If the complete orderable part number is too long for your ordering system, please refer to the Short Order Codes on pg 78 to 89.

3-Way

Valve Specification		Valve Profile	Black Bracket
		Valve Trim	Plated Brass
Valve Size (inches)	Close-off Differential Pressure (psi)	Cv	Valve Body Model Number
1/2"	50	0.33	VBN3A000.33PX
		0.59	VBN3A000.59PX
		1	VBN3A001.00PX
		2.4	VBN3A002.40PX
		4.3	VBN3A004.30PX
		8	VBN3A008.00PX
3/4"	50	0.4	VBN3B000.40PX
		0.66	VBN3B000.66PX
		1.3	VBN3B001.30PX
		2.4	VBN3B002.40PX
		3.8	VBN3B003.80PX
		7	VBN3B007.00PX
1"	50	11	VBN3B011.00PX
		0.4	VBN3C000.40PX
		0.65	VBN3C000.65PX
		1.3	VBN3C001.30PX
		2.3	VBN3C002.30PX
		3.5	VBN3C003.50PX
		4.5	VBN3C004.50PX
		8.6	VBN3C008.60PX
		14.9	VBN3C014.90PX
		22	VBN3C022.00PX
		31	VBN3C031.00PX
1-1/4"	40	4.1	VBN3D004.10PX
		8.7	VBN3D008.70PX
		12.7	VBN3D012.70PX
		19.4	VBN3D019.40PX
		27	VBN3D027.00PX
		34	VBN3D034.00PX
1-1/2"	40	4	VBN3E004.00PX
		8.3	VBN3E008.30PX
		13.4	VBN3E013.40PX
		24	VBN3E024.00PX
		32	VBN3E032.00PX
		61	VBN3E061.00PX
2"	100	24	VBN3F024.00PX
		38	VBN3F038.00PX
		57	VBN3F057.00PX
		83	VBN3F083.00PX
		109	VBN3F109.00PX
2-1/2"	100	38	VBN3G038.00PX
		74	VBN3G074.00PX
		100	VBN3G100.00PX

Actuator Features

Direct Coupled Actuators					Model Number
Actuator Type	Control Signal	Timing	Voltage	Enclosure	
Fail-in-Place	Floating	95 sec.	24 VAC/DC	NEMA 2	+MN6105A1011
Fail-in-Place	Modulating, Floating	95 sec.			+MN7505A2001
Fail Safe	Modulating, Floating	95 sec.			+MS7505A2030
Fail Safe	2-Position	95 sec.			+MS8105A1030
Fail Safe Position (MS actuators only - open, closed, A-AB, B-AB)		FSA - A-AB Open FSB - B-AB Open			FSA or FSB
Accessories		3R enclosure			+3R

VALVES

Product Selection - Valves

MVN Actuator With Standard Profile, 2-Way NPT Valves 1/2"-1 1/4"


**5-YEAR
LIMITED
WARRANTY**

Common Features

- Max static pressure 360 psi (250°F)
- Medium: Water/glycol solutions up to 50%. Use globe valves for steam control.
- Fluid temperature range: -22 to +250°F
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe.

VBN2 (Two-way)

- Equal % flow insert. Largest Cv rating in each valve size is full port, as noted
- Nickel-chrome plated brass or 316 stainless steel ball and stem
- ANSI class IV leakage (0.01% of Cv)

Actuator Features		Non-Fail Safe				Valve Only	
Actuator O.S Number/ Short Order Code		MVN613A0000	MVN613A0000+C1	MVN613A0000	MVN613A0000+C1	N/A	N/A
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac		
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz		
	Power	1.5 VA	1.5 VA	1.5 VA	1.5 VA		
Actuator Torque (lb.-in.)		27	27	27	27		
Control	Modulating (0)2-10Vdc						
	Floating	•	•	•	•		
	Fast acting SPDT						
Fail Safe Action		Fail in Place	Fail in Place	Fail in Place	Fail in Place		
Actuator Stroke (degrees)		90 ±3	90 ±3	90 ±3	90 ±3		
Timing (seconds)		90	90	90	90		
Valve Features	Trim	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass	Stainless Steel	Plated Brass

Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes					
			No Cable		1 Meter Cable		Valve Only	
1/2"	0.38	130	VBN2ABSA1000	VBN2ABSA1001	VBN2ABPA1000	VBN2ABPA1001	VBN2ABSA0000	VBN2ABPA0000
	0.68		VBN2ADSA1000	VBN2ADSA1001	VBN2ADPA1000	VBN2ADPA1001	VBN2ADSA0000	VBN2ADPA0000
	1.3		VBN2AESA1000	VBN2AESA1001	VBN2AEP1000	VBN2AEP1001	VBN2AESA0000	VBN2AEP10000
	2		VBN2AFSA1000	VBN2AFSA1001	VBN2AFP1000	VBN2AFP1001	VBN2AFSA0000	VBN2AFP10000
	2.6		VBN2AGSA1000	VBN2AGSA1001	VBN2AGP1000	VBN2AGP1001	VBN2AGSA0000	VBN2AGP10000
	4.7		VBN2AHSA1000	VBN2AHSA1001	VBN2AHP1000	VBN2AHP1001	VBN2AHSA0000	VBN2AHP10000
	8		VBN2AJSA1000	VBN2AJSA1001	VBN2AJPA1000	VBN2AJPA1001	VBN2AJSA0000	VBN2AJPA0000
	11.7		VBN2AKSA1000	VBN2AKSA1001	VBN2AKPA1000	VBN2AKPA1001	VBN2AKSA0000	VBN2AKPA0000
3/4"	0.31	130	VBN2BBSA1000	VBN2BBSA1001	VBN2BBPA1000	VBN2BBPA1001	VBN2BBSA0000	VBN2BBPA0000
	0.63		VBN2BDSA1000	VBN2BDSA1001	VBN2BDPA1000	VBN2BDPA1001	VBN2BDSA0000	VBN2BDPA0000
	1.2		VBN2BESA1000	VBN2BESA1001	VBN2BEP1000	VBN2BEP1001	VBN2BESA0000	VBN2BEP10000
	2.5		VBN2BGSA1000	VBN2BGSA1001	VBN2BGP1000	VBN2BGP1001	VBN2BGSA0000	VBN2BGP10000
	4.3		VBN2BHSA1000	VBN2BHSA1001	VBN2BHP1000	VBN2BHP1001	VBN2BHSA0000	VBN2BHP10000
	7.4		VBN2BJS1000	VBN2BJS1001	VBN2BJPA1000	VBN2BJPA1001	VBN2BJS10000	VBN2BJPA0000
	10.1		VBN2BKSA1000	VBN2BKSA1001	VBN2BKPA1000	VBN2BKPA1001	VBN2BKSA0000	VBN2BKPA0000
	14.7		VBN2BLSA1000	VBN2BLSA1001	VBN2BLPA1000	VBN2BLPA1001	VBN2BLSA0000	VBN2BLPA0000
29*	VBN2BMSA1000	VBN2BMSA1001	VBN2BMP1000	VBN2BMP1001	VBN2BMSA0000	VBN2BMP10000		
1"	4.4	100	VBN2CHSA1000	VBN2CHSA1001	VBN2CHPA1000	VBN2CHPA1001	VBN2CHSA0000	VBN2CHPA0000
	9		VBN2CJSA1000	VBN2CJSA1001	VBN2CJPA1000	VBN2CJPA1001	VBN2CJSA0000	VBN2CJPA0000
	15.3		VBN2CLSA1000	VBN2CLSA1001	VBN2CLPA1000	VBN2CLPA1001	VBN2CLSA0000	VBN2CLPA0000
	26		VBN2CMSA1000	VBN2CMSA1001	VBN2CMP1000	VBN2CMP1001	VBN2CMSA0000	VBN2CMP10000
	44		VBN2CNSA1000	VBN2CNSA1001	VBN2CNPA1000	VBN2CNPA1001	VBN2CNSA0000	VBN2CNPA0000
	54		VBN2CPSA1000	VBN2CPSA1001	VBN2CPP1000	VBN2CPP1001	VBN2CPSA0000	VBN2CPP10000
	54		VBN2DHPA1000	VBN2DHPA1001	VBN2DHPA1000	VBN2DHPA1001	VBN2DHPA0000	VBN2DHPA0000
1-1/4"	4.4	100	VBN2DHSA1000	VBN2DHSA1001	VBN2DHPA1000	VBN2DHPA1001	VBN2DHSA0000	VBN2DHPA0000
	8.3		VBN2DJS1000	VBN2DJS1001	VBN2DJPA1000	VBN2DJPA1001	VBN2DJS10000	VBN2DJPA0000
	14.9		VBN2DKSA1000	VBN2DKSA1001	VBN2DKPA1000	VBN2DKPA1001	VBN2DKSA0000	VBN2DKPA0000
	25		VBN2DLSA1000	VBN2DLSA1001	VBN2DLPA1000	VBN2DLPA1001	VBN2DLSA0000	VBN2DLPA0000
	37		VBN2DMSA1000	VBN2DMSA1001	VBN2DMP1000	VBN2DMP1001	VBN2DMSA0000	VBN2DMP10000
	41		VBN2DNSA1000	VBN2DNSA1001	VBN2DNPA1000	VBN2DNPA1001	VBN2DNSA0000	VBN2DNPA0000
	102		VBN2DSSA1000	VBN2DSSA1001	VBN2DSPA1000	VBN2DSPA1001	VBN2DSSA0000	VBN2DSPA0000



2-Way

Product Selection - Valves

MVN Actuator With Standard Profile 2-Way NPT Valves 1/2"-1 1/4"

Actuator Features			Non-Fail Safe						
Actuator O.S Number/ Short Order Code	MVN643A0000	MVN643A0000+C1	MVN643A0000	MVN643A0000+C1	MVN713A0000	MVN713A0000+C1	MVN713A0000	MVN713A0000+C1	
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	
Actuator Torque	Power	6 VA	6 VA	6 VA	6 VA	5 VA	5 VA	5 VA	
	(lb.-in.)	27	27	27	27	27	27	27	
Control	Modulating (0)2-10Vdc					•	•	•	
	Floating								
	Fast acting SPDT	•	•	•	•				
Fail Safe Action	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	
Actuator Stroke (degrees)	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	
Timing (seconds)	30	30	30	30	90	90	90	90	
Valve Features	Trim	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass

Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes							
			No Cable	1 Meter Cable	No Cable	1 Meter Cable	No Cable	1 Meter Cable	No Cable	1 Meter Cable
1/2"	0.38	130	VBN2ABSA2000	VBN2ABSA2001	VBN2ABPA2000	VBN2ABPA2001	VBN2ABSA3000	VBN2ABSA3001	VBN2ABPA3000	VBN2ABPA3001
	0.68		VBN2ADSA2000	VBN2ADSA2001	VBN2ADPA2000	VBN2ADPA2001	VBN2ADSA3000	VBN2ADSA3001	VBN2ADPA3000	VBN2ADPA3001
	1.3		VBN2AESA2000	VBN2AESA2001	VBN2AEPA2000	VBN2AEPA2001	VBN2AESA3000	VBN2AESA3001	VBN2AEPA3000	VBN2AEPA3001
	2		VBN2AFSA2000	VBN2AFSA2001	VBN2AFPA2000	VBN2AFPA2001	VBN2AFSA3000	VBN2AFSA3001	VBN2AFPA3000	VBN2AFPA3001
	2.6		VBN2AGSA2000	VBN2AGSA2001	VBN2AGPA2000	VBN2AGPA2001	VBN2AGSA3000	VBN2AGSA3001	VBN2AGPA3000	VBN2AGPA3001
	4.7		VBN2AHSA2000	VBN2AHSA2001	VBN2AHPA2000	VBN2AHPA2001	VBN2AHSA3000	VBN2AHSA3001	VBN2AHPA3000	VBN2AHPA3001
	8		VBN2AJSA2000	VBN2AJSA2001	VBN2AJPA2000	VBN2AJPA2001	VBN2AJSA3000	VBN2AJSA3001	VBN2AJPA3000	VBN2AJPA3001
	11.7		VBN2AKSA2000	VBN2AKSA2001	VBN2AKPA2000	VBN2AKPA2001	VBN2AKSA3000	VBN2AKSA3001	VBN2AKPA3000	VBN2AKPA3001
3/4"	0.31	130	VBN2BBSA2000	VBN2BBSA2001	VBN2BBPA2000	VBN2BBPA2001	VBN2BBSA3000	VBN2BBSA3001	VBN2BBPA3000	VBN2BBPA3001
	0.63		VBN2BDSA2000	VBN2BDSA2001	VBN2BDPA2000	VBN2BDPA2001	VBN2BDSA3000	VBN2BDSA3001	VBN2BDPA3000	VBN2BDPA3001
	1.2		VBN2BESA2000	VBN2BESA2001	VBN2BEPA2000	VBN2BEPA2001	VBN2BESA3000	VBN2BESA3001	VBN2BEPA3000	VBN2BEPA3001
	2.5		VBN2BGSA2000	VBN2BGSA2001	VBN2BGPA2000	VBN2BGPA2001	VBN2BGSA3000	VBN2BGSA3001	VBN2BGPA3000	VBN2BGPA3001
	4.3		VBN2BHSA2000	VBN2BHSA2001	VBN2BHPA2000	VBN2BHPA2001	VBN2BHSA3000	VBN2BHSA3001	VBN2BHPA3000	VBN2BHPA3001
	7.4		VBN2BJS A2000	VBN2BJS A2001	VBN2BJPA2000	VBN2BJPA2001	VBN2BJS A3000	VBN2BJS A3001	VBN2BJPA3000	VBN2BJPA3001
	10.1		VBN2BKSA2000	VBN2BKSA2001	VBN2BKPA2000	VBN2BKPA2001	VBN2BKSA3000	VBN2BKSA3001	VBN2BKPA3000	VBN2BKPA3001
	14.7		VBN2BLSA2000	VBN2BLSA2001	VBN2BLPA2000	VBN2BLPA2001	VBN2BLSA3000	VBN2BLSA3001	VBN2BLPA3000	VBN2BLPA3001
29*	VBN2BMSA2000	VBN2BMSA2001	VBN2BMPA2000	VBN2BMPA2001	VBN2BMSA3000	VBN2BMSA3001	VBN2BMPA3000	VBN2BMPA3001		
1"	4.4	100	VBN2CHSA2000	VBN2CHSA2001	VBN2CHPA2000	VBN2CHPA2001	VBN2CHSA3000	VBN2CHSA3001	VBN2CHPA3000	VBN2CHPA3001
	9		VBN2CJSA2000	VBN2CJSA2001	VBN2CJPA2000	VBN2CJPA2001	VBN2CJSA3000	VBN2CJSA3001	VBN2CJPA3000	VBN2CJPA3001
	15.3		VBN2CLSA2000	VBN2CLSA2001	VBN2CLPA2000	VBN2CLPA2001	VBN2CLSA3000	VBN2CLSA3001	VBN2CLPA3000	VBN2CLPA3001
	26		VBN2CMSA2000	VBN2CMSA2001	VBN2CMPA2000	VBN2CMPA2001	VBN2CMSA3000	VBN2CMSA3001	VBN2CMPA3000	VBN2CMPA3001
	44		VBN2CNSA2000	VBN2CNSA2001	VBN2CNPA2000	VBN2CNPA2001	VBN2CNSA3000	VBN2CNSA3001	VBN2CNPA3000	VBN2CNPA3001
	54		VBN2CPSA2000	VBN2CPSA2001	VBN2CPPA2000	VBN2CPPA2001	VBN2CPSA3000	VBN2CPSA3001	VBN2CPPA3000	VBN2CPPA3001
1-1/4"	4.4	100	VBN2DHSA2000	VBN2DHSA2001	VBN2DHPA2000	VBN2DHPA2001	VBN2DHSA3000	VBN2DHSA3001	VBN2DHPA3000	VBN2DHPA3001
	8.3		VBN2DJSA2000	VBN2DJSA2001	VBN2DJPA2000	VBN2DJPA2001	VBN2DJSA3000	VBN2DJSA3001	VBN2DJPA3000	VBN2DJPA3001
	14.9		VBN2DKSA2000	VBN2DKSA2001	VBN2DKPA2000	VBN2DKPA2001	VBN2DKSA3000	VBN2DKSA3001	VBN2DKPA3000	VBN2DKPA3001
	25		VBN2DLSA2000	VBN2DLSA2001	VBN2DLPA2000	VBN2DLPA2001	VBN2DLSA3000	VBN2DLSA3001	VBN2DLPA3000	VBN2DLPA3001
	37		VBN2DMSA2000	VBN2DMSA2001	VBN2DMPA2000	VBN2DMPA2001	VBN2DMSA3000	VBN2DMSA3001	VBN2DMPA3000	VBN2DMPA3001
	41		VBN2DNSA2000	VBN2DNSA2001	VBN2DNPA2000	VBN2DNPA2001	VBN2DNSA3000	VBN2DNSA3001	VBN2DNPA3000	VBN2DNPA3001
	102		VBN2DSSA2000	VBN2DSSA2001	VBN2DSPA2000	VBN2DSPA2001	VBN2DSSA3000	VBN2DSSA3001	VBN2DSPA3000	VBN2DSPA3001

2-Way

VALVES

Product Selection - Valves

MVN Actuator With Low Profile 2-Way NPT Valves 1/2"-1 1/4"

Common Features

- Max static pressure 360 psi (250°F)
- Medium: Water/glycol solutions up to 50%. Use globe valves for steam control.
- Fluid temperature range: -22 to +250°F
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe.

VBN2 (Two-way)

- Equal % flow insert. Largest Cv rating in each valve size is full port, as noted
- Nickel-chrome plated brass or 316 stainless steel ball and stem
- ANSI class IV leakage (0.01% of Cv)



2-Way

Actuator Features		Non-Fail Safe				Valve Only	
Actuator O.S Number/ Short Order Code		MVN613L0000	MVN613L0000+C1	MVN613L0000	MVN613L0000+C1	N/A	N/A
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac		
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz		
	Power	1.5 VA	1.5 VA	1.5 VA	1.5 VA		
Actuator Torque (lb.-in.)	27	27	27	27			
Control	Modulating (0)2-10Vdc						
	Floating	•	•	•	•		
	Fast acting SPDT						
Fail Safe Action		Fail in Place	Fail in Place	Fail in Place	Fail in Place		
Actuator Stroke (degrees)		90 ±3	90 ±3	90 ±3	90 ±3		
Timing (seconds)		90	90	90	90		
Valve Features	Trim	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass	Stainless Steel	Plated Brass

Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes				Valve Only	
			No Cable	1 Meter Cable	No Cable	1 Meter Cable		
1/2"	0.38	130	VBN2ABSL1000	VBN2ABSL1001	VBN2ABPL1000	VBN2ABPL1001	VBN2ABSL0000	VBN2ABPL0000
	0.68		VBN2ADSL1000	VBN2ADSL1001	VBN2ADPL1000	VBN2ADPL1001	VBN2ADSL0000	VBN2ADPL0000
	1.3		VBN2AESL1000	VBN2AESL1001	VBN2AEPL1000	VBN2AEPL1001	VBN2AESL0000	VBN2AEPL0000
	2		VBN2AFSL1000	VBN2AFSL1001	VBN2AFPL1000	VBN2AFPL1001	VBN2AFSL0000	VBN2AFPL0000
	2.6		VBN2AGSL1000	VBN2AGSL1001	VBN2AGPL1000	VBN2AGPL1001	VBN2AGSL0000	VBN2AGPL0000
	4.7		VBN2AHSL1000	VBN2AHSL1001	VBN2AHPL1000	VBN2AHPL1001	VBN2AHSL0000	VBN2AHPL0000
	8		VBN2AJSL1000	VBN2AJSL1001	VBN2AJPL1000	VBN2AJPL1001	VBN2AJSL0000	VBN2AJPL0000
	11.7		VBN2AKSL1000	VBN2AKSL1001	VBN2AKPL1000	VBN2AKPL1001	VBN2AKSL0000	VBN2AKPL0000
	3/4"		0.31	130	VBN2BBSL1000	VBN2BBSL1001	VBN2BBPL1000	VBN2BBPL1001
0.63		VBN2BDSL1000	VBN2BDSL1001		VBN2BDPL1000	VBN2BDPL1001	VBN2BDSL0000	VBN2BDPL0000
1.2		VBN2BESL1000	VBN2BESL1001		VBN2BEPL1000	VBN2BEPL1001	VBN2BESL0000	VBN2BEPL0000
2.5		VBN2BGPL1000	VBN2BGPL1001		VBN2BGPL1000	VBN2BGPL1001	VBN2BGPL0000	VBN2BGPL0000
4.3		VBN2BHSL1000	VBN2BHSL1001		VBN2BHPL1000	VBN2BHPL1001	VBN2BHSL0000	VBN2BHPL0000
7.4		VBN2BJSL1000	VBN2BJSL1001		VBN2BJPL1000	VBN2BJPL1001	VBN2BJSL0000	VBN2BJPL0000
10.1		VBN2BKSL1000	VBN2BKSL1001		VBN2BKPL1000	VBN2BKPL1001	VBN2BKSL0000	VBN2BKPL0000
14.7		VBN2BLSL1000	VBN2BLSL1001		VBN2BLPL1000	VBN2BLPL1001	VBN2BLSL0000	VBN2BLPL0000
29*		VBN2BMSL1000	VBN2BMSL1001		VBN2BMPL1000	VBN2BMPL1001	VBN2BMSL0000	VBN2BMPL0000
1"	4.4	100	VBN2CHSL1000	VBN2CHSL1001	VBN2CHPL1000	VBN2CHPL1001	VBN2CHSL0000	VBN2CHPL0000
	9		VBN2CJSL1000	VBN2CJSL1001	VBN2CJPL1000	VBN2CJPL1001	VBN2CJSL0000	VBN2CJPL0000
	15.3		VBN2CLSL1000	VBN2CLSL1001	VBN2CLPL1000	VBN2CLPL1001	VBN2CLSL0000	VBN2CLPL0000
	26		VBN2CMSL1000	VBN2CMSL1001	VBN2CMPL1000	VBN2CMPL1001	VBN2CMSL0000	VBN2CMPL0000
	44		VBN2CNLSL1000	VBN2CNLSL1001	VBN2CNPL1000	VBN2CNPL1001	VBN2CNLSL0000	VBN2CNPL0000
	54		VBN2CPSL1000	VBN2CPSL1001	VBN2CPPL1000	VBN2CPPL1001	VBN2CPSL0000	VBN2CPPL0000
	1-1/4"		4.4	100	VBN2DHSL1000	VBN2DHSL1001	VBN2DHPL1000	VBN2DHPL1001
8.3		VBN2DJSL1000	VBN2DJSL1001		VBN2DJPL1000	VBN2DJPL1001	VBN2DJSL0000	VBN2DJPL0000
14.9		VBN2DKSL1000	VBN2DKSL1001		VBN2DKPL1000	VBN2DKPL1001	VBN2DKSL0000	VBN2DKPL0000
25		VBN2DLSL1000	VBN2DLSL1001		VBN2DLPL1000	VBN2DLPL1001	VBN2DLSL0000	VBN2DLPL0000
37		VBN2DMSL1000	VBN2DMSL1001		VBN2DMPL1000	VBN2DMPL1001	VBN2DMSL0000	VBN2DMPL0000
41		VBN2DNSL1000	VBN2DNSL1001		VBN2DNPL1000	VBN2DNPL1001	VBN2DNSL0000	VBN2DNPL0000
102		VBN2DSSL1000	VBN2DSSL1001		VBN2DSPL1000	VBN2DSPL1001	VBN2DSSL0000	VBN2DSPL0000

Product Selection - Valves

MVN Actuator With Low Profile 2-Way NPT Valves 1/2"-1 1/4"

Actuator Features		Non-Fail Safe							
Actuator O.S Number/ Short Order Code		MVN643L0000	MVN643L0000+C1	MVN643L0000	MVN643L0000+C1	MVN713L0000	MVN713L0000+C1	MVN713L0000	MVN713L0000+C1
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Power	6 VA	6 VA	6 VA	6 VA	5 VA	5 VA	5 VA	5 VA
Actuator Torque	(lb.-in.)	27	27	27	27	27	27	27	27
Control	Modulating (0)2-10Vdc					•	•	•	•
	Floating								
	Fast acting SPDT	•	•	•	•				
Fail Safe Action		Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place
Actuator Stroke (degrees)		90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3
Timing	(seconds)	30	30	30	30	90	90	90	90
Valve Features	Trim	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass

Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes											
			No Cable		1 Meter Cable		No Cable		1 Meter Cable		No Cable		1 Meter Cable	
1/2"	0.38	130	VBN2ABSL2000	VBN2ABSL2001	VBN2ABPL2000	VBN2ABPL2001	VBN2ABSL3000	VBN2ABSL3001	VBN2ABPL3000	VBN2ABPL3001				
	0.68		VBN2ADSL2000	VBN2ADSL2001	VBN2ADPL2000	VBN2ADPL2001	VBN2ADSL3000	VBN2ADSL3001	VBN2ADPL3000	VBN2ADPL3001				
	1.3		VBN2AESL2000	VBN2AESL2001	VBN2AEPL2000	VBN2AEPL2001	VBN2AESL3000	VBN2AESL3001	VBN2AEPL3000	VBN2AEPL3001				
	2		VBN2AFSL2000	VBN2AFSL2001	VBN2AFPL2000	VBN2AFPL2001	VBN2AFSL3000	VBN2AFSL3001	VBN2AFPL3000	VBN2AFPL3001				
	2.6		VBN2AGSL2000	VBN2AGSL2001	VBN2AGPL2000	VBN2AGPL2001	VBN2AGSL3000	VBN2AGSL3001	VBN2AGPL3000	VBN2AGPL3001				
	4.7		VBN2AHL2000	VBN2AHL2001	VBN2AHPL2000	VBN2AHPL2001	VBN2AHL3000	VBN2AHL3001	VBN2AHPL3000	VBN2AHPL3001				
	8		VBN2AJSL2000	VBN2AJSL2001	VBN2AJPL2000	VBN2AJPL2001	VBN2AJSL3000	VBN2AJSL3001	VBN2AJPL3000	VBN2AJPL3001				
	11.7		VBN2AKSL2000	VBN2AKSL2001	VBN2AKPL2000	VBN2AKPL2001	VBN2AKSL3000	VBN2AKSL3001	VBN2AKPL3000	VBN2AKPL3001				
3/4"	0.31	130	VBN2BBSL2000	VBN2BBSL2001	VBN2BBPL2000	VBN2BBPL2001	VBN2BBSL3000	VBN2BBSL3001	VBN2BBPL3000	VBN2BBPL3001				
	0.63		VBN2BDSL2000	VBN2BDSL2001	VBN2BDPL2000	VBN2BDPL2001	VBN2BDSL3000	VBN2BDSL3001	VBN2BDPL3000	VBN2BDPL3001				
	1.2		VBN2BESL2000	VBN2BESL2001	VBN2BEPL2000	VBN2BEPL2001	VBN2BESL3000	VBN2BESL3001	VBN2BEPL3000	VBN2BEPL3001				
	2.5		VBN2BGSL2000	VBN2BGSL2001	VBN2BGPL2000	VBN2BGPL2001	VBN2BGSL3000	VBN2BGSL3001	VBN2BGPL3000	VBN2BGPL3001				
	4.3		VBN2BHSL2000	VBN2BHSL2001	VBN2BHPL2000	VBN2BHPL2001	VBN2BHSL3000	VBN2BHSL3001	VBN2BHPL3000	VBN2BHPL3001				
	7.4		VBN2BJSL2000	VBN2BJSL2001	VBN2BJPL2000	VBN2BJPL2001	VBN2BJSL3000	VBN2BJSL3001	VBN2BJPL3000	VBN2BJPL3001				
	10.1		VBN2BKSL2000	VBN2BKSL2001	VBN2BKPL2000	VBN2BKPL2001	VBN2BKSL3000	VBN2BKSL3001	VBN2BKPL3000	VBN2BKPL3001				
	14.7		VBN2BLSL2000	VBN2BLSL2001	VBN2BLPL2000	VBN2BLPL2001	VBN2BLSL3000	VBN2BLSL3001	VBN2BLPL3000	VBN2BLPL3001				
29*	VBN2BMSL2000	VBN2BMSL2001	VBN2BMPL2000	VBN2BMPL2001	VBN2BMSL3000	VBN2BMSL3001	VBN2BMPL3000	VBN2BMPL3001						
1"	4.4	100	VBN2CHSL2000	VBN2CHSL2001	VBN2CHPL2000	VBN2CHPL2001	VBN2CHSL3000	VBN2CHSL3001	VBN2CHPL3000	VBN2CHPL3001				
	9		VBN2CJSL2000	VBN2CJSL2001	VBN2CJPL2000	VBN2CJPL2001	VBN2CJSL3000	VBN2CJSL3001	VBN2CJPL3000	VBN2CJPL3001				
	15.3		VBN2CLSL2000	VBN2CLSL2001	VBN2CLPL2000	VBN2CLPL2001	VBN2CLSL3000	VBN2CLSL3001	VBN2CLPL3000	VBN2CLPL3001				
	26		VBN2CMSL2000	VBN2CMSL2001	VBN2CMPL2000	VBN2CMPL2001	VBN2CMSL3000	VBN2CMSL3001	VBN2CMPL3000	VBN2CMPL3001				
	44		VBN2CNLSL2000	VBN2CNLSL2001	VBN2CNPL2000	VBN2CNPL2001	VBN2CNLSL3000	VBN2CNLSL3001	VBN2CNPL3000	VBN2CNPL3001				
	54		VBN2CPSL2000	VBN2CPSL2001	VBN2CPPL2000	VBN2CPPL2001	VBN2CPSL3000	VBN2CPSL3001	VBN2CPPL3000	VBN2CPPL3001				
1-1/4"	4.4	100	VBN2DHSL2000	VBN2DHSL2001	VBN2DHPL2000	VBN2DHPL2001	VBN2DHSL3000	VBN2DHSL3001	VBN2DHPL3000	VBN2DHPL3001				
	8.3		VBN2DJSL2000	VBN2DJSL2001	VBN2DJPL2000	VBN2DJPL2001	VBN2DJSL3000	VBN2DJSL3001	VBN2DJPL3000	VBN2DJPL3001				
	14.9		VBN2DKSL2000	VBN2DKSL2001	VBN2DKPL2000	VBN2DKPL2001	VBN2DKSL3000	VBN2DKSL3001	VBN2DKPL3000	VBN2DKPL3001				
	25		VBN2DLSL2000	VBN2DLSL2001	VBN2DLPL2000	VBN2DLPL2001	VBN2DLSL3000	VBN2DLSL3001	VBN2DLPL3000	VBN2DLPL3001				
	37		VBN2DMSL2000	VBN2DMSL2001	VBN2DMPL2000	VBN2DMPL2001	VBN2DMSL3000	VBN2DMSL3001	VBN2DMPL3000	VBN2DMPL3001				
	41		VBN2DNSL2000	VBN2DNSL2001	VBN2DNPL2000	VBN2DNPL2001	VBN2DNSL3000	VBN2DNSL3001	VBN2DNPL3000	VBN2DNPL3001				
	102		VBN2DSSL2000	VBN2DSSL2001	VBN2DSPL2000	VBN2DSPL2001	VBN2DSSL3000	VBN2DSSL3001	VBN2DSPL3000	VBN2DSPL3001				

2-Way

VALVES

Product Selection - Valves


MVN Actuator With Standard Profile 3-Way NPT Valves 1/2"-1 1/4"

Common Features

- Max static pressure 360 psi (250°F)
- Medium: Water/glycol solutions up to 50%. Use globe valves for steam control.
- Fluid temperature range: -22 to +250°F
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe.

VBN2 (Two-way)

- Equal % flow insert. Largest Cv rating in each valve size is full port, as noted
- Nickel-chrome plated brass or 316 stainless steel ball and stem
- ANSI class IV leakage (0.01% of Cv)

Actuator Features		Non-Fail Safe						Valve Only
Actuator O.S Number/ Short Order Code		MVN613A0000	MVN613A0000+C1	MVN643A0000	MVN643A0000+C1	MVN713A0000	MVN713A0000+C1	N/A
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	
	Power	1.5 VA	1.5 VA	6 VA	6 VA	5 VA	5 VA	
Actuator Torque	(lb.-in.)	27	27	27	27	27	27	
Control	Modulating (0)2-10Vdc					•	•	
	Floating	•	•					
	Fast acting SPDT			•	•			
Fail Safe Action		Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	
Actuator Stroke (degrees)		90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	
Timing	(seconds)	90	90	30	30	90	90	
Valve Features	Trim	Plated Brass	Plated Brass	Plated Brass	Plated Brass	Plated Brass	Plated Brass	Plated Brass




3-Way

Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes							
			No Cable		1 Meter Cable		No Cable		1 Meter Cable	
1/2"	0.33	50	VBN3ABPA1000	VBN3ABPA1001	VBN3ABPA2000	VBN3ABPA2001	VBN3ABPA3000	VBN3ABPA3001	VBN3ABPA0000	
	0.59		VBN3ACPA1000	VBN3ACPA1001	VBN3ACPA2000	VBN3ACPA2001	VBN3ACPA3000	VBN3ACPA3001	VBN3ACPA0000	
	1		VBN3AEP A1000	VBN3AEP A1001	VBN3AEP A2000	VBN3AEP A2001	VBN3AEP A3000	VBN3AEP A3001	VBN3AEP A0000	
	2.4		VBN3AFPA1000	VBN3AFPA1001	VBN3AFPA2000	VBN3AFPA2001	VBN3AFPA3000	VBN3AFPA3001	VBN3AFPA0000	
	4.3		VBN3AHP A1000	VBN3AHP A1001	VBN3AHP A2000	VBN3AHP A2001	VBN3AHP A3000	VBN3AHP A3001	VBN3AHP A0000	
	8		VBN3AJPA1000	VBN3AJPA1001	VBN3AJPA2000	VBN3AJPA2001	VBN3AJPA3000	VBN3AJPA3001	VBN3AJPA0000	
3/4"	0.4		VBN3BCPA1000	VBN3BCPA1001	VBN3BCPA2000	VBN3BCPA2001	VBN3BCPA3000	VBN3BCPA3001	VBN3BCPA0000	
	0.66		VBN3BDPA1000	VBN3BDPA1001	VBN3BDPA2000	VBN3BDPA2001	VBN3BDPA3000	VBN3BDPA3001	VBN3BDPA0000	
	1.3		VBN3BEP A1000	VBN3BEP A1001	VBN3BEP A2000	VBN3BEP A2001	VBN3BEP A3000	VBN3BEP A3001	VBN3BEP A0000	
	2.4		VBN3BFPA1000	VBN3BFPA1001	VBN3BFPA2000	VBN3BFPA2001	VBN3BFPA3000	VBN3BFPA3001	VBN3BFPA0000	
	3.8		VBN3BGPA1000	VBN3BGPA1001	VBN3BGPA2000	VBN3BGPA2001	VBN3BGPA3000	VBN3BGPA3001	VBN3BGPA0000	
	7		VBN3BJPA1000	VBN3BJPA1001	VBN3BJPA2000	VBN3BJPA2001	VBN3BJPA3000	VBN3BJPA3001	VBN3BJPA0000	
	11		VBN3BKPA1000	VBN3BKPA1001	VBN3BKPA2000	VBN3BKPA2001	VBN3BKPA3000	VBN3BKPA3001	VBN3BKPA0000	
1"	0.4		VBN3CCPA1000	VBN3CCPA1001	VBN3CCPA2000	VBN3CCPA2001	VBN3CCPA3000	VBN3CCPA3001	VBN3CCPA0000	
	0.65		VBN3CDPA1000	VBN3CDPA1001	VBN3CDPA2000	VBN3CDPA2001	VBN3CDPA3000	VBN3CDPA3001	VBN3CDPA0000	
	1.3		VBN3CEPA1000	VBN3CEPA1001	VBN3CEPA2000	VBN3CEPA2001	VBN3CEPA3000	VBN3CEPA3001	VBN3CEPA0000	
	2.3		VBN3CFPA1000	VBN3CFPA1001	VBN3CFPA2000	VBN3CFPA2001	VBN3CFPA3000	VBN3CFPA3001	VBN3CFPA0000	
	3.5		VBN3CGPA1000	VBN3CGPA1001	VBN3CGPA2000	VBN3CGPA2001	VBN3CGPA3000	VBN3CGPA3001	VBN3CGPA0000	
	4.5	VBN3CHPA1000	VBN3CHPA1001	VBN3CHPA2000	VBN3CHPA2001	VBN3CHPA3000	VBN3CHPA3001	VBN3CHPA0000		
	8.6	VBN3CJPA1000	VBN3CJPA1001	VBN3CJPA2000	VBN3CJPA2001	VBN3CJPA3000	VBN3CJPA3001	VBN3CJPA0000		
	14.9	VBN3CKPA1000	VBN3CKPA1001	VBN3CKPA2000	VBN3CKPA2001	VBN3CKPA3000	VBN3CKPA3001	VBN3CKPA0000		
	22	VBN3CLPA1000	VBN3CLPA1001	VBN3CLPA2000	VBN3CLPA2001	VBN3CLPA3000	VBN3CLPA3001	VBN3CLPA0000		
	31	VBN3CMP A1000	VBN3CMP A1001	VBN3CMP A2000	VBN3CMP A2001	VBN3CMP A3000	VBN3CMP A3001	VBN3CMP A0000		
1-1/4"	4.1	VBN3DHPA1000	VBN3DHPA1001	VBN3DHPA2000	VBN3DHPA2001	VBN3DHPA3000	VBN3DHPA3001	VBN3DHPA0000		
	8.7	VBN3DJPA1000	VBN3DJPA1001	VBN3DJPA2000	VBN3DJPA2001	VBN3DJPA3000	VBN3DJPA3001	VBN3DJPA0000		
	12.7	VBN3DKPA1000	VBN3DKPA1001	VBN3DKPA2000	VBN3DKPA2001	VBN3DKPA3000	VBN3DKPA3001	VBN3DKPA0000		
	19.4	VBN3DLP A1000	VBN3DLP A1001	VBN3DLP A2000	VBN3DLP A2001	VBN3DLP A3000	VBN3DLP A3001	VBN3DLP A0000		
	27	VBN3DMP A1000	VBN3DMP A1001	VBN3DMP A2000	VBN3DMP A2001	VBN3DMP A3000	VBN3DMP A3001	VBN3DMP A0000		
	34	VBN3DNPA1000	VBN3DNPA1001	VBN3DNPA2000	VBN3DNPA2001	VBN3DNPA3000	VBN3DNPA3001	VBN3DNPA0000		

Product Selection - Valves

MVN Actuator With Low Profile 3-Way NPT Valves 1/2"-1 1/4"

Actuator Features		Non-Fail Safe						Valve Only
Actuator O.S Number/ Short Order Code		MVN613L0000	MVN613L0000+C1	MVN643L0000	MVN643L0000+C1	MVN713L0000	MVN713L0000+C1	N/A
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	
	Power	1.5 VA	1.5 VA	6 VA	6 VA	5 VA	5 VA	
Actuator Torque	(lb.-in.)	27	27	27	27	27	27	
Control	Modulating (0)2-10Vdc					•	•	
	Floating	•	•					
	Fast acting SPDT			•	•			
Fail Safe Action		Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	
Actuator Stroke (degrees)		90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	
Timing	(seconds)	90	90	30	30	90	90	
Valve Features	Trim	Plated Brass	Plated Brass	Plated Brass	Plated Brass	Plated Brass	Plated Brass	Plated Brass

Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes								
			No Cable		1 Meter Cable		No Cable		1 Meter Cable		Valve Only
			No Cable	1 Meter Cable	No Cable	1 Meter Cable	No Cable	1 Meter Cable	No Cable	1 Meter Cable	Valve Only
1/2"	0.33	50	VBN3ABPL1000	VBN3ABPL1001	VBN3ABPL2000	VBN3ABPL2001	VBN3ABPL3000	VBN3ABPL3001	VBN3ABPL0000		
	0.59		VBN3ACPL1000	VBN3ACPL1001	VBN3ACPL2000	VBN3ACPL2001	VBN3ACPL3000	VBN3ACPL3001	VBN3ACPL0000		
	1		VBN3AEPL1000	VBN3AEPL1001	VBN3AEPL2000	VBN3AEPL2001	VBN3AEPL3000	VBN3AEPL3001	VBN3AEPL0000		
	2.4		VBN3AFPL1000	VBN3AFPL1001	VBN3AFPL2000	VBN3AFPL2001	VBN3AFPL3000	VBN3AFPL3001	VBN3AFPL0000		
	4.3		VBN3AHPL1000	VBN3AHPL1001	VBN3AHPL2000	VBN3AHPL2001	VBN3AHPL3000	VBN3AHPL3001	VBN3AHPL0000		
	8		VBN3AJPL1000	VBN3AJPL1001	VBN3AJPL2000	VBN3AJPL2001	VBN3AJPL3000	VBN3AJPL3001	VBN3AJPL0000		
3/4"	0.4		VBN3BCPL1000	VBN3BCPL1001	VBN3BCPL2000	VBN3BCPL2001	VBN3BCPL3000	VBN3BCPL3001	VBN3BCPL0000		
	0.66		VBN3BDPL1000	VBN3BDPL1001	VBN3BDPL2000	VBN3BDPL2001	VBN3BDPL3000	VBN3BDPL3001	VBN3BDPL0000		
	1.3		VBN3BEPL1000	VBN3BEPL1001	VBN3BEPL2000	VBN3BEPL2001	VBN3BEPL3000	VBN3BEPL3001	VBN3BEPL0000		
	2.4		VBN3BFPL1000	VBN3BFPL1001	VBN3BFPL2000	VBN3BFPL2001	VBN3BFPL3000	VBN3BFPL3001	VBN3BFPL0000		
	3.8		VBN3BGPL1000	VBN3BGPL1001	VBN3BGPL2000	VBN3BGPL2001	VBN3BGPL3000	VBN3BGPL3001	VBN3BGPL0000		
	7		VBN3BJPL1000	VBN3BJPL1001	VBN3BJPL2000	VBN3BJPL2001	VBN3BJPL3000	VBN3BJPL3001	VBN3BJPL0000		
	11		VBN3BKPL1000	VBN3BKPL1001	VBN3BKPL2000	VBN3BKPL2001	VBN3BKPL3000	VBN3BKPL3001	VBN3BKPL0000		
1"	0.4		VBN3CCPL1000	VBN3CCPL1001	VBN3CCPL2000	VBN3CCPL2001	VBN3CCPL3000	VBN3CCPL3001	VBN3CCPL0000		
	0.65		VBN3CDPL1000	VBN3CDPL1001	VBN3CDPL2000	VBN3CDPL2001	VBN3CDPL3000	VBN3CDPL3001	VBN3CDPL0000		
	1.3		VBN3CEPL1000	VBN3CEPL1001	VBN3CEPL2000	VBN3CEPL2001	VBN3CEPL3000	VBN3CEPL3001	VBN3CEPL0000		
	2.3		VBN3CFPL1000	VBN3CFPL1001	VBN3CFPL2000	VBN3CFPL2001	VBN3CFPL3000	VBN3CFPL3001	VBN3CFPL0000		
	3.5		VBN3CGPL1000	VBN3CGPL1001	VBN3CGPL2000	VBN3CGPL2001	VBN3CGPL3000	VBN3CGPL3001	VBN3CGPL0000		
	4.5	VBN3CHPL1000	VBN3CHPL1001	VBN3CHPL2000	VBN3CHPL2001	VBN3CHPL3000	VBN3CHPL3001	VBN3CHPL0000			
	8.6	VBN3CJPL1000	VBN3CJPL1001	VBN3CJPL2000	VBN3CJPL2001	VBN3CJPL3000	VBN3CJPL3001	VBN3CJPL0000			
	14.9	VBN3CKPL1000	VBN3CKPL1001	VBN3CKPL2000	VBN3CKPL2001	VBN3CKPL3000	VBN3CKPL3001	VBN3CKPL0000			
	22	VBN3CLPL1000	VBN3CLPL1001	VBN3CLPL2000	VBN3CLPL2001	VBN3CLPL3000	VBN3CLPL3001	VBN3CLPL0000			
	31	VBN3CMPL1000	VBN3CMPL1001	VBN3CMPL2000	VBN3CMPL2001	VBN3CMPL3000	VBN3CMPL3001	VBN3CMPL0000			
1-1/4"	4.1	40	VBN3DHPL1000	VBN3DHPL1001	VBN3DHPL2000	VBN3DHPL2001	VBN3DHPL3000	VBN3DHPL3001	VBN3DHPL0000		
	8.7		VBN3DJPL1000	VBN3DJPL1001	VBN3DJPL2000	VBN3DJPL2001	VBN3DJPL3000	VBN3DJPL3001	VBN3DJPL0000		
	12.7		VBN3DKPL1000	VBN3DKPL1001	VBN3DKPL2000	VBN3DKPL2001	VBN3DKPL3000	VBN3DKPL3001	VBN3DKPL0000		
	19.4		VBN3DLPL1000	VBN3DLPL1001	VBN3DLPL2000	VBN3DLPL2001	VBN3DLPL3000	VBN3DLPL3001	VBN3DLPL0000		
	27		VBN3DMPL1000	VBN3DMPL1001	VBN3DMPL2000	VBN3DMPL2001	VBN3DMPL3000	VBN3DMPL3001	VBN3DMPL0000		
	34		VBN3DNPL1000	VBN3DNPL1001	VBN3DNPL2000	VBN3DNPL2001	VBN3DNPL3000	VBN3DNPL3001	VBN3DNPL0000		

3-Way

VALVES

Product Selection - Valves

2-Way NPT Valves 1/2" - 3", NEMA 2

Common Features

- Max static pressure 360 psi (250°F)
- Medium: Water/glycol solutions up to 50%. Use globe valves for steam control.
- Fluid temperature range: -22 to +250°F
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe.

VBN2 (Two-way)

- Equal % flow insert. Largest Cv rating in each valve size is full port, as noted
- Nickel-chrome plated brass or 316 stainless steel ball and stem
- ANSI class IV leakage (0.01% of Cv)



2-Way

Actuator Features			Non-fail Safe				Valve Only	
Actuator O.S. Number	MN6105A1011	MN6105A1011	MN7505A2001	MN7505A2001	N/A	N/A		
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac			
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
	Power	5 VA	5 VA	5 VA	5 VA			
Actuator Torque	(lb.-in.)	44	44	44	44			
Control	(0)-2-10 Vdc			•	•			
	4-20 mA (external 500 Ohm Resistor)			•	•			
	Floating	•	•	•	•			
	Two-Position SPDT	•	•	•	•			
	Two-Position SPST			•	•			
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place			
Normal Position (no signal)		Closed	Closed	Closed	Closed			
Actuator Stroke	(degrees)	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°			
Timing	(drive/spring return, seconds)	95	95	95	95			
Aux Switch	2 x SPDT Add-on	SSW2-1M	SSW2-1M	SSW2-1M	SSW2-1M			
Feedback	2-10 Vdc Built In	-	-	•	•			
Valve Features	Trim	Nickel-Plated Brass	Stainless Steel	Nickel-Plated Brass	Stainless Steel	Nickel-Plated Brass	Stainless Steel	
Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes					
1/2"	0.38	130	VBN2ABPX4000	VBN2ABSX4000	VBN2ABPX5000	VBN2ABSX5000	VBN2ABPX0000	VBN2ABSX0000
	0.68		VBN2ADPX4000	VBN2ADSX4000	VBN2ADPX5000	VBN2ADSX5000	VBN2ADPX0000	VBN2ADSX0000
	1.3		VBN2AEPX4000	VBN2AESX4000	VBN2AEPX5000	VBN2AESX5000	VBN2AEPX0000	VBN2AESX0000
	2		VBN2AFPX4000	VBN2AFSX4000	VBN2AFPX5000	VBN2AFSX5000	VBN2AFPX0000	VBN2AFSX0000
	2.6		VBN2AGPX4000	VBN2AGSX4000	VBN2AGPX5000	VBN2AGSX5000	VBN2AGPX0000	VBN2AGSX0000
	4.7		VBN2AHPX4000	VBN2AHSX4000	VBN2AHPX5000	VBN2AHSX5000	VBN2AHPX0000	VBN2AHSX0000
	8		VBN2AJPX4000	VBN2AJSX4000	VBN2AJPX5000	VBN2AJSX5000	VBN2AJPX0000	VBN2AJSX0000
11.7*	VBN2AKPX4000		VBN2AKSX4000	VBN2AKPX5000	VBN2AKSX5000	VBN2AKPX0000	VBN2AKSX0000	
0.31	VBN2BBPX4000		VBN2BBSX4000	VBN2BBPX5000	VBN2BBSX5000	VBN2BBPX0000	VBN2BBSX0000	
0.63	VBN2BDPX4000		VBN2BDSX4000	VBN2BDPX5000	VBN2BDSX5000	VBN2BDPX0000	VBN2BDSX0000	
1.2	VBN2BEPX4000		VBN2BESX4000	VBN2BEPX5000	VBN2BESX5000	VBN2BEPX0000	VBN2BESX0000	
2.5	VBN2BGPX4000		VBN2BGSX4000	VBN2BGPX5000	VBN2BGSX5000	VBN2BGPX0000	VBN2BGSX0000	
4.3	VBN2BHPX4000		VBN2BHSX4000	VBN2BHPX5000	VBN2BHSX5000	VBN2BHPX0000	VBN2BHSX0000	
7.4	VBN2BJPX4000		VBN2BJSX4000	VBN2BJPX5000	VBN2BJSX5000	VBN2BJPX0000	VBN2BJSX0000	
10.1	VBN2BKPX4000	VBN2BKSX4000	VBN2BKPX5000	VBN2BKSX5000	VBN2BKPX0000	VBN2BKSX0000		
14.7*	VBN2BLPX4000	VBN2BLSX4000	VBN2BLPX5000	VBN2BLSX5000	VBN2BLPX0000	VBN2BLSX0000		
29*	VBN2BMPX4000	VBN2BMSX4000	VBN2BMPX5000	VBN2BMSX5000	VBN2BMPX0000	VBN2BMSX0000		
1"	4.4	100	VBN2CHPX4000	VBN2CHSX4000	VBN2CHPX5000	VBN2CHSX5000	VBN2CHPX0000	VBN2CHSX0000
	9		VBN2CJPX4000	VBN2CJSX4000	VBN2CJPX5000	VBN2CJSX5000	VBN2CJPX0000	VBN2CJSX0000
	15.3		VBN2CLPX4000	VBN2CLSX4000	VBN2CLPX5000	VBN2CLSX5000	VBN2CLPX0000	VBN2CLSX0000
	26		VBN2CMPX4000	VBN2CMSX4000	VBN2CMPX5000	VBN2CMSX5000	VBN2CMPX0000	VBN2CMSX0000
	44*		VBN2CNPX4000	VBN2CNSX4000	VBN2CNPX5000	VBN2CNSX5000	VBN2CNPX0000	VBN2CNSX0000
	54*		VBN2CPPX4000	VBN2CPSX4000	VBN2CPPX5000	VBN2CPSX5000	VBN2CPPX0000	VBN2CPSX0000
	4.4		VBN2DHPX4000	VBN2DHSX4000	VBN2DHPX5000	VBN2DHSX5000	VBN2DHPX0000	VBN2DHSX0000
8.3	VBN2DJPX4000		VBN2DJSX4000	VBN2DJPX5000	VBN2DJSX5000	VBN2DJPX0000	VBN2DJSX0000	
14.9	VBN2DKPX4000		VBN2DKSX4000	VBN2DKPX5000	VBN2DKSX5000	VBN2DKPX0000	VBN2DKSX0000	
25	VBN2DLPX4000		VBN2DLSX4000	VBN2DLPX5000	VBN2DLSX5000	VBN2DLPX0000	VBN2DLSX0000	
37	VBN2DMPX4000		VBN2DMSX4000	VBN2DMPX5000	VBN2DMSX5000	VBN2DMPX0000	VBN2DMSX0000	
41*	VBN2DNPX4000		VBN2DNSX4000	VBN2DNPX5000	VBN2DNSX5000	VBN2DNPX0000	VBN2DNSX0000	
102*	VBN2DSPX4000		VBN2DSSX4000	VBN2DSPX5000	VBN2DSSX5000	VBN2DSPX0000	VBN2DSSX0000	
23	VBN2ELPX4000		VBN2ELSX4000	VBN2ELPX5000	VBN2ELSX5000	VBN2ELPX0000	VBN2ELSX0000	
30	VBN2EMPX4000	VBN2EMSX4000	VBN2EMPX5000	VBN2EMSX5000	VBN2EMPX0000	VBN2EMSX0000		
41	VBN2ENPX4000	VBN2ENSX4000	VBN2ENPX5000	VBN2ENSX5000	VBN2ENPX0000	VBN2ENSX0000		
74*	VBN2ERPX4000	VBN2ERSX4000	VBN2ERPX5000	VBN2ERSX5000	VBN2ERPX0000	VBN2ERSX0000		
172*	VBN2E1PX4000	VBN2E1SX4000	VBN2E1PX5000	VBN2E1SX5000	VBN2E1PX0000	VBN2E1SX0000		
2"	42	100	VBN2FNPX4000	VBN2FNSX4000	VBN2FNPX5000	VBN2FNSX5000	VBN2FNPX0000	VBN2FNSX0000
	57		VBN2FPPX4000	VBN2FPSX4000	VBN2FPPX5000	VBN2FPSX5000	VBN2FPPX0000	VBN2FPSX0000
	71		VBN2FRPX4000	VBN2FRSX4000	VBN2FRPX5000	VBN2FRSX5000	VBN2FRPX0000	VBN2FRSX0000
	100		VBN2FSPX4000	VBN2FSSX4000	VBN2FSPX5000	VBN2FSSX5000	VBN2FSPX0000	VBN2FSSX0000
	108*		VBN2FTPX4000	VBN2FTSX4000	VBN2FTPX5000	VBN2FTSX5000	VBN2FTPX0000	VBN2FTSX0000
	210		VBN2F1PX4000	VBN2F1SX4000	VBN2F1PX5000	VBN2F1SX5000	VBN2F1PX0000	VBN2F1SX0000
	266*		VBN2F2PX4000	VBN2F2SX4000	VBN2F2PX5000	VBN2F2SX5000	VBN2F2PX0000	VBN2F2SX0000
45	VBN2GNPX4000		VBN2GNSX4000	VBN2GNPX5000	VBN2GNSX5000	VBN2GNPX0000	VBN2GNSX0000	
55	VBN2GPPX4000		VBN2GPSX4000	VBN2GPPX5000	VBN2GPSX5000	VBN2GPPX0000	VBN2GPSX0000	
72	VBN2GRPX4000		VBN2GRSX4000	VBN2GRPX5000	VBN2GRSX5000	VBN2GRPX0000	VBN2GRSX0000	
101	VBN2GSPX4000		VBN2GSSX4000	VBN2GSPX5000	VBN2GSSX5000	VBN2GSPX0000	VBN2GSSX0000	
162	VBN2GUPX4000		VBN2GUSX4000	VBN2GUPX5000	VBN2GUSX5000	VBN2GUPX0000	VBN2GUSX0000	
202*	VBN2G1PX4000		VBN2G1SX4000	VBN2G1PX5000	VBN2G1SX5000	VBN2G1PX0000	VBN2G1SX0000	
3"	49		VBN2HNPX4000	VBN2HNSX4000	VBN2HNPX5000	VBN2HNSX5000	VBN2HNPX0000	VBN2HNSX0000
	63	VBN2HPPX4000	VBN2HPSX4000	VBN2HPPX5000	VBN2HPSX5000	VBN2HPPX0000	VBN2HPSX0000	
	82	VBN2HRPX4000	VBN2HRSX4000	VBN2HRPX5000	VBN2HRSX5000	VBN2HRPX0000	VBN2HRSX0000	
	124	VBN2HTPX4000	VBN2HTSX4000	VBN2HTPX5000	VBN2HTSX5000	VBN2HTPX0000	VBN2HTSX0000	
	145*	VBN2HUPX4000	VBN2HUSX4000	VBN2HUPX5000	VBN2HUSX5000	VBN2HUPX0000	VBN2HUSX0000	

* Full port ball. No flow characterizing insert.

Product Selection - Valves

2-Way NPT Valves 1/2" - 3", NEMA 2

Actuator Features			Fail Safe							
Actuator O.S. Number			MS8105A1030	MS8105A1030	MS8105A1030	MS8105A1030	MS7505A2030	MS7505A2030	MS7505A2030	MS7505A2030
Power Supply	Voltage		24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Actuator Torque	Power		8VA	8VA	8VA	8VA	7.5 VA	7.5 VA	7.5 VA	7.5 VA
	(lb.-in.)		44	44	44	44	44	44	44	44
Control	(0)2-10 Vdc						•	•	•	•
	4-20 mA (external 500 Ohm Resistor)						•	•	•	•
Fail Safe Action	Closed		•	•	•	•	•	•	•	•
	Open		•	•	•	•	•	•	•	•
Normal Position (no signal)	Closed		•	•	•	•	•	•	•	•
	Open		•	•	•	•	•	•	•	•
Actuator Stroke	(degrees)		95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°
	(drive/spring return, seconds)		45/25	45/25	45/25	45/25	45/25	45/25	45/25	45/25
Aux Switch	2 x SPDT Add-on									
Feedback	2-10 Vdc Built In									
Valve Features		Trim	Nickel-Plated Brass	Nickel-Plated Brass	Stainless Steel	Stainless Steel	Nickel-Plated Brass	Nickel-Plated Brass	Stainless Steel	Stainless Steel
Valve Size (Inches)	Cv	Close-off Pressure (psid)	Short Order Codes							
			2-Way	1/2"	130	VBN2ABPX7200	VBN2ABPX7100	VBN2ABSX7200	VBN2ABSX7100	VBN2ABPX6200
VBN2ADPX7200	VBN2ADPX7100	VBN2ADXS7200				VBN2ADXS7100	VBN2ADPX6200	VBN2ADPX6100	VBN2ADXS6200	VBN2ADXS6100
VBN2AEPX7200	VBN2AEPX7100	VBN2AESX7200				VBN2AESX7100	VBN2AEPX6200	VBN2AEPX6100	VBN2AESX6200	VBN2AESX6100
VBN2AFPX7200	VBN2AFPX7100	VBN2AFSX7200				VBN2AFSX7100	VBN2AFPX6200	VBN2AFPX6100	VBN2AFSX6200	VBN2AFSX6100
VBN2AGPX7200	VBN2AGPX7100	VBN2AGSX7200				VBN2AGSX7100	VBN2AGPX6200	VBN2AGPX6100	VBN2AGSX6200	VBN2AGSX6100
VBN2AHPX7200	VBN2AHPX7100	VBN2AHSX7200				VBN2AHSX7100	VBN2AHPX6200	VBN2AHPX6100	VBN2AHSX6200	VBN2AHSX6100
VBN2AJPX7200	VBN2AJPX7100	VBN2JXSX7200				VBN2JXSX7100	VBN2AJPX6200	VBN2AJPX6100	VBN2JXSX6200	VBN2JXSX6100
VBN2AKPX7200	VBN2AKPX7100	VBN2AKSX7200				VBN2AKSX7100	VBN2AKPX6200	VBN2AKPX6100	VBN2AKSX6200	VBN2AKSX6100
VBN2BBPX7200	VBN2BBPX7100	VBN2BBSX7200				VBN2BBSX7100	VBN2BBPX6200	VBN2BBPX6100	VBN2BBSX6200	VBN2BBSX6100
VBN2BDPX7200	VBN2BDPX7100	VBN2BDSX7200				VBN2BDSX7100	VBN2BDPX6200	VBN2BDPX6100	VBN2BDSX6200	VBN2BDSX6100
VBN2BEPX7200	VBN2BEPX7100	VBN2BESX7200				VBN2BESX7100	VBN2BEPX6200	VBN2BEPX6100	VBN2BESX6200	VBN2BESX6100
VBN2BGPX7200	VBN2BGPX7100	VBN2BGSX7200				VBN2BGSX7100	VBN2BGPX6200	VBN2BGPX6100	VBN2BGSX6200	VBN2BGSX6100
VBN2BHPX7200	VBN2BHPX7100	VBN2BHSX7200				VBN2BHSX7100	VBN2BHPX6200	VBN2BHPX6100	VBN2BHSX6200	VBN2BHSX6100
VBN2BJPX7200	VBN2BJPX7100	VBN2BJSX7200	VBN2BJSX7100	VBN2BJPX6200	VBN2BJPX6100	VBN2BJSX6200	VBN2BJSX6100			
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VBN2BMPX7200	VBN2BMPX7100	VBN2BMSX7200	VBN2BMSX7100	VBN2BMPX6200	VBN2BMPX6100	VBN2BMSX6200	VBN2BMSX6100			
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VBN2CJXP7200	VBN2CJXP7100	VBN2CJSX7200	VBN2CJSX7100	VBN2CJXP6200	VBN2CJXP6100	VBN2CJSX6200	VBN2CJSX6100			
VBN2CLPX7200	VBN2CLPX7100	VBN2CLSX7200	VBN2CLSX7100	VBN2CLPX6200	VBN2CLPX6100	VBN2CLSX6200	VBN2CLSX6100			
VBN2CMPX7200	VBN2CMPX7100	VBN2CMSX7200	VBN2CMSX7100	VBN2CMPX6200	VBN2CMPX6100	VBN2CMSX6200	VBN2CMSX6100			
VBN2CNPX7200	VBN2CNPX7100	VBN2CNSX7200	VBN2CNSX7100	VBN2CNPX6200	VBN2CNPX6100	VBN2CNSX6200	VBN2CNSX6100			
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VBN2DHPX7200	VBN2DHPX7100	VBN2DHSX7200	VBN2DHSX7100	VBN2DHPX6200	VBN2DHPX6100	VBN2DHSX6200	VBN2DHSX6100			
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VBN2DSPX7200	VBN2DSPX7100	VBN2DSSX7200	VBN2DSSX7100	VBN2DSPX6200	VBN2DSPX6100	VBN2DSSX6200	VBN2DSSX6100			
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VBN2HNPX7200	VBN2HNPX7100	VBN2HNSX7200	VBN2HNSX7100	VBN2HNPX6200	VBN2HNPX6100	VBN2HNSX6200	VBN2HNSX6100			
VBN2HPPX7200	VBN2HPPX7100	VBN2HPSX7200	VBN2HPSX7100	VBN2HPPX6200	VBN2HPPX6100	VBN2HPSX6200	VBN2HPSX6100			
VBN2HRPX7200	VBN2HRPX7100	VBN2HRSX7200	VBN2HRSX7100	VBN2HRPX6200	VBN2HRPX6100	VBN2HRSX6200	VBN2HRSX6100			
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VBN2HUPX7200	VBN2HUPX7100	VBN2HUSX7200	VBN2HUSX7100	VBN2HUPX6200	VBN2HUPX6100	VBN2HUSX6200	VBN2HUSX6100			

* Full port ball. No flow characterizing insert.

Product Selection - Valves

2-Way NPT Valves 1/2" - 3", NEMA 3R

Common Features

- Max static pressure 360 psi (250°F)
- Medium: Water/glycol solutions up to 50%.
- Temperature range: -22 to +250°F
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe.
- Removable handle for manual operation
- ANSI class IV leakage (0.01% of Cv)

VBN2 (Two-way):

- Equal % flow insert. (Largest Cv rating in each valve size is full port, as noted.)
- Nickel-chrome plated brass or 316 stainless steel ball and stem

With optional NEMA 3R actuator enclosure.



2-Way

Actuator Features			Non-fail Safe				
Actuator O.S. Number			MN6105A1011	MN6105A1011	MN7505A2001	MN7505A2001	
Power Supply	Voltage	24 Vac		24 Vac	24 Vac	24 Vac	
	Frequency	50 / 60 Hz		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	
Actuator Torque	Power	5 VA		5 VA	5 VA	5 VA	
	(lb.-in.)	44		44	44	44	
Control	(0)-2-10 Vdc				•	•	
	4-20 mA (external 500 Ohm Resistor)				•	•	
Fail Safe Action	Normal Position (no signal)	Stay in Place		Stay in Place	Stay in Place	Stay in Place	
	Actuator Stroke	Closed		Closed	Closed	Closed	
	(degrees)	95° ± 3°		95° ± 3°	95° ± 3°	95° ± 3°	
Timing	(drive/spring return, seconds)	95		95	95	95	
Aux Switch	2 x SPDT Add-on	SSW2-1M		SSW2-1M	SSW2-1M	SSW2-1M	
Feedback	2-10 Vdc Built In				•	•	
Valve Features			Trim	Nickel-Plated Brass	Stainless Steel	Nickel-Plated Brass	Stainless Steel
Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes				
1/2"	0.38	130	VBN2ABPX4002	VBN2ABSX4002	VBN2ABPX5002	VBN2ABSX5002	
	0.68		VBN2ADPX4002	VBN2ADSX4002	VBN2ADPX5002	VBN2ADSX5002	
	1.3		VBN2AEPX4002	VBN2AESX4002	VBN2AEPX5002	VBN2AESX5002	
	2		VBN2AFPX4002	VBN2AFSX4002	VBN2AFPX5002	VBN2AFSX5002	
	2.6		VBN2AGPX4002	VBN2AGSX4002	VBN2AGPX5002	VBN2AGSX5002	
	4.7		VBN2AHPX4002	VBN2AHSX4002	VBN2AHPX5002	VBN2AHSX5002	
	8		VBN2AJPX4002	VBN2AJSX4002	VBN2AJPX5002	VBN2AJSX5002	
11.7*	VBN2AKPX4002		VBN2AKSX4002	VBN2AKPX5002	VBN2AKSX5002		
3/4"	0.31		VBN2BBPX4002	VBN2BBSX4002	VBN2BBPX5002	VBN2BBSX5002	
	0.63		VBN2BDPX4002	VBN2BDSX4002	VBN2BDPX5002	VBN2BDSX5002	
	1.2		VBN2BEPX4002	VBN2BESX4002	VBN2BEPX5002	VBN2BESX5002	
	2.5		VBN2BGPX4002	VBN2BGSX4002	VBN2BGPX5002	VBN2BGSX5002	
	4.3		VBN2BHPX4002	VBN2BHSX4002	VBN2BHPX5002	VBN2BHSX5002	
	7.4		VBN2BJPX4002	VBN2BJSX4002	VBN2BJPX5002	VBN2BJSX5002	
	10.1	VBN2BKPX4002	VBN2BKSX4002	VBN2BKPX5002	VBN2BKSX5002		
14.7*	VBN2BLPX4002	VBN2BLSX4002	VBN2BLPX5002	VBN2BLSX5002			
29*	VBN2BMPX4002	VBN2BMSX4002	VBN2BMPX5002	VBN2BMSX5002			
1"	4.4	VBN2CHPX4002	VBN2CHSX4002	VBN2CHPX5002	VBN2CHSX5002		
	9	VBN2CJPX4002	VBN2CJSX4002	VBN2CJPX5002	VBN2CJSX5002		
	15.3	VBN2CLPX4002	VBN2CLSX4002	VBN2CLPX5002	VBN2CLSX5002		
	26	VBN2CMPX4002	VBN2CMSX4002	VBN2CMPX5002	VBN2CMSX5002		
	44*	VBN2CNPX4002	VBN2CNSX4002	VBN2CNPX5002	VBN2CNSX5002		
	54*	VBN2CPPX4002	VBN2CPSX4002	VBN2CPPX5002	VBN2CPSX5002		
	4.4	VBN2DHPX4002	VBN2DHSX4002	VBN2DHPX5002	VBN2DHSX5002		
1-1/4"	8.3	VBN2DJPX4002	VBN2DJSX4002	VBN2DJPX5002	VBN2DJSX5002		
	14.9	VBN2DKPX4002	VBN2DKSX4002	VBN2DKPX5002	VBN2DKSX5002		
	25	VBN2DLPX4002	VBN2DLSX4002	VBN2DLPX5002	VBN2DLSX5002		
	37	VBN2DMPX4002	VBN2DMSX4002	VBN2DMPX5002	VBN2DMSX5002		
	41*	VBN2DNPX4002	VBN2DNSX4002	VBN2DNPX5002	VBN2DNSX5002		
	102*	VBN2DSPX4002	VBN2DSSX4002	VBN2DSPX5002	VBN2DSSX5002		
	23	VBN2ELPX4002	VBN2ELSX4002	VBN2ELPX5002	VBN2ELSX5002		
1-1/2"	30	VBN2EMPX4002	VBN2EMSX4002	VBN2EMPX5002	VBN2EMSX5002		
	41	VBN2ENPX4002	VBN2ENSX4002	VBN2ENPX5002	VBN2ENSX5002		
	74*	VBN2ERPX4002	VBN2ERSX4002	VBN2ERPX5002	VBN2ERSX5002		
	172*	VBN2E1PX4002	VBN2E1SX4002	VBN2E1PX5002	VBN2E1SX5002		
	42	VBN2FNPX4002	VBN2FNSX4002	VBN2FNPX5002	VBN2FNSX5002		
2"	57	VBN2FPPX4002	VBN2FPSX4002	VBN2FPPX5002	VBN2FPSX5002		
	71	VBN2FRPX4002	VBN2FRSX4002	VBN2FRPX5002	VBN2FRSX5002		
	100	VBN2FSPX4002	VBN2FSSX4002	VBN2FSPX5002	VBN2FSSX5002		
	108*	VBN2FTPX4002	VBN2FTSX4002	VBN2FTPX5002	VBN2FTSX5002		
	210	VBN2F1PX4002	VBN2F1SX4002	VBN2F1PX5002	VBN2F1SX5002		
	266*	VBN2F2PX4002	VBN2F2SX4002	VBN2F2PX5002	VBN2F2SX5002		
	45	VBN2GNPX4002	VBN2GNSX4002	VBN2GNPX5002	VBN2GNSX5002		
	55	VBN2GPPX4002	VBN2GPSX4002	VBN2GPPX5002	VBN2GPSX5002		
2-1/2"	72	VBN2GRPX4002	VBN2GRSX4002	VBN2GRPX5002	VBN2GRSX5002		
	101	VBN2GSPX4002	VBN2GSSX4002	VBN2GSPX5002	VBN2GSSX5002		
	162	VBN2GUPX4002	VBN2GUSX4002	VBN2GUPX5002	VBN2GUSX5002		
	202*	VBN2G1PX4002	VBN2G1SX4002	VBN2G1PX5002	VBN2G1SX5002		
	49	VBN2HNPX4002	VBN2HNSX4002	VBN2HNPX5002	VBN2HNSX5002		
3"	63	VBN2HPPX4002	VBN2HPSX4002	VBN2HPPX5002	VBN2HPSX5002		
	82	VBN2HRPX4002	VBN2HRSX4002	VBN2HRPX5002	VBN2HRSX5002		
	124	VBN2HTPX4002	VBN2HTSX4002	VBN2HTPX5002	VBN2HTSX5002		
	145*	VBN2HUPX4002	VBN2HUSX4002	VBN2HUPX5002	VBN2HUSX5002		

* Full port ball. No flow characterizing insert.

Product Selection - Valves

2-Way NPT Valves 1/2" - 3", NEMA 3R

Actuator Features			Fail Safe								
Actuator O.S. Number	MS8105A1030	MS8105A1030	MS8105A1030	MS8105A1030	MS7505A2030	MS7505A2030	MS7505A2030	MS7505A2030			
Power Supply	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac			
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Power	8VA	8VA	8VA	8VA	7.5 VA	7.5 VA	7.5 VA	7.5 VA			
Actuator Torque (lb.-in.)	44	44	44	44	44	44	44	44			
Control	(0)2-10 Vdc				•	•	•	•			
4-20 mA (external 500 Ohm Resistor)					•	•	•	•			
Floating					•	•	•	•			
Two-Position SPDT					•	•	•	•			
Two-Position SPST	•	•	•	•	•	•	•	•			
Fail Safe Action	Closed	Open	Closed	Open	Closed	Open	Closed	Open			
Normal Position (no signal)	Closed	Open	Closed	Open	Closed	Open	Closed	Open			
Actuator Stroke (degrees)	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°			
Timing (drive/spring return, seconds)	45/25	45/25	45/25	45/25	90/25	90/25	90/25	90/25			
Aux Switch	2 x SPDT Add-on										
Feedback	2-10 Vdc Built In				•	•	•	•			
Valve Features			Trim	Nickel-Plated Brass	Nickel-Plated Brass	Stainless Steel	Stainless Steel	Nickel-Plated Brass	Nickel-Plated Brass	Stainless Steel	Stainless Steel
Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes								
1/2"	0.38	130	VBN2ABPX7202	VBN2ABPX7102	VBN2ABSX7202	VBN2ABSX7102	VBN2ABPX6202	VBN2ABPX6102	VBN2ABSX6202	VBN2ABSX6102	
	0.68		VBN2ADPX7202	VBN2ADPX7102	VBN2ADSX7202	VBN2ADSX7102	VBN2ADPX6202	VBN2ADPX6102	VBN2ADSX6202	VBN2ADSX6102	
	1.3		VBN2AEPX7202	VBN2AEPX7102	VBN2AESX7202	VBN2AESX7102	VBN2AEPX6202	VBN2AEPX6102	VBN2AESX6202	VBN2AESX6102	
	2		VBN2AFPX7202	VBN2AFPX7102	VBN2AFSX7202	VBN2AFSX7102	VBN2AFPX6202	VBN2AFPX6102	VBN2AFSX6202	VBN2AFSX6102	
	2.6		VBN2AGPX7202	VBN2AGPX7102	VBN2AGSX7202	VBN2AGSX7102	VBN2AGPX6202	VBN2AGPX6102	VBN2AGSX6202	VBN2AGSX6102	
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	8		VBN2AJPX7202	VBN2AJPX7102	VBN2AJSX7202	VBN2AJSX7102	VBN2AJPX6202	VBN2AJPX6102	VBN2AJSX6202	VBN2AJSX6102	
	11.7*		VBN2AKPX7202	VBN2AKPX7102	VBN2AKSX7202	VBN2AKSX7102	VBN2AKPX6202	VBN2AKPX6102	VBN2AKSX6202	VBN2AKSX6102	
	0.31		VBN2BBPX7202	VBN2BBPX7102	VBN2BBSX7202	VBN2BBSX7102	VBN2BBPX6202	VBN2BBPX6102	VBN2BBSX6202	VBN2BBSX6102	
	0.63		VBN2BDPX7202	VBN2BDPX7102	VBN2BDSX7202	VBN2BDSX7102	VBN2BDPX6202	VBN2BDPX6102	VBN2BDSX6202	VBN2BDSX6102	
3/4"	1.2	VBN2BEPX7202	VBN2BEPX7102	VBN2BESX7202	VBN2BESX7102	VBN2BEPX6202	VBN2BEPX6102	VBN2BESX6202	VBN2BESX6102		
	2.5	VBN2BGPX7202	VBN2BGPX7102	VBN2BGSX7202	VBN2BGSX7102	VBN2BGPX6202	VBN2BGPX6102	VBN2BGSX6202	VBN2BGSX6102		
	4.3	VBN2BHPX7202	VBN2BHPX7102	VBN2BHSX7202	VBN2BHSX7102	VBN2BHPX6202	VBN2BHPX6102	VBN2BHSX6202	VBN2BHSX6102		
	7.4	VBN2BJPX7202	VBN2BJPX7102	VBN2BJSX7202	VBN2BJSX7102	VBN2BJPX6202	VBN2BJPX6102	VBN2BJSX6202	VBN2BJSX6102		
	10.1	VBN2BKPX7202	VBN2BKPX7102	VBN2BKSX7202	VBN2BKSX7102	VBN2BKPX6202	VBN2BKPX6102	VBN2BKSX6202	VBN2BKSX6102		
	14.7*	VBN2BLPX7202	VBN2BLPX7102	VBN2BLSX7202	VBN2BLSX7102	VBN2BLPX6202	VBN2BLPX6102	VBN2BLSX6202	VBN2BLSX6102		
	29*	VBN2BMPX7202	VBN2BMPX7102	VBN2BMSX7202	VBN2BMSX7102	VBN2BMPX6202	VBN2BMPX6102	VBN2BMSX6202	VBN2BMSX6102		
	4.4	VBN2CHPX7202	VBN2CHPX7102	VBN2CHSX7202	VBN2CHSX7102	VBN2CHPX6202	VBN2CHPX6102	VBN2CHSX6202	VBN2CHSX6102		
	9	VBN2CJPX7202	VBN2CJPX7102	VBN2CJSX7202	VBN2CJSX7102	VBN2CJPX6202	VBN2CJPX6102	VBN2CJSX6202	VBN2CJSX6102		
	15.3	VBN2CLPX7202	VBN2CLPX7102	VBN2CLSX7202	VBN2CLSX7102	VBN2CLPX6202	VBN2CLPX6102	VBN2CLSX6202	VBN2CLSX6102		
1"	26	VBN2CMPX7202	VBN2CMPX7102	VBN2CMSX7202	VBN2CMSX7102	VBN2CMPX6202	VBN2CMPX6102	VBN2CMSX6202	VBN2CMSX6102		
	44*	VBN2CNPX7202	VBN2CNPX7102	VBN2CNSX7202	VBN2CNSX7102	VBN2CNPX6202	VBN2CNPX6102	VBN2CNSX6202	VBN2CNSX6102		
	54*	VBN2CPPX7202	VBN2CPPX7102	VBN2CPSX7202	VBN2CPSX7102	VBN2CPPX6202	VBN2CPPX6102	VBN2CPSX6202	VBN2CPSX6102		
	4.4	VBN2DHPX7202	VBN2DHPX7102	VBN2DHSX7202	VBN2DHSX7102	VBN2DHPX6202	VBN2DHPX6102	VBN2DHSX6202	VBN2DHSX6102		
	8.3	VBN2DJPX7202	VBN2DJPX7102	VBN2DJSX7202	VBN2DJSX7102	VBN2DJPX6202	VBN2DJPX6102	VBN2DJSX6202	VBN2DJSX6102		
	14.9	VBN2DKPX7202	VBN2DKPX7102	VBN2DKSX7202	VBN2DKSX7102	VBN2DKPX6202	VBN2DKPX6102	VBN2DKSX6202	VBN2DKSX6102		
	25	VBN2DLPX7202	VBN2DLPX7102	VBN2DLSX7202	VBN2DLSX7102	VBN2DLPX6202	VBN2DLPX6102	VBN2DLSX6202	VBN2DLSX6102		
	37	VBN2DMPX7202	VBN2DMPX7102	VBN2DMSX7202	VBN2DMSX7102	VBN2DMPX6202	VBN2DMPX6102	VBN2DMSX6202	VBN2DMSX6102		
	41*	VBN2DNPX7202	VBN2DNPX7102	VBN2DNSX7202	VBN2DNSX7102	VBN2DNPX6202	VBN2DNPX6102	VBN2DNSX6202	VBN2DNSX6102		
	102*	VBN2DSPX7202	VBN2DSPX7102	VBN2DSSX7202	VBN2DSSX7102	VBN2DSPX6202	VBN2DSPX6102	VBN2DSSX6202	VBN2DSSX6102		
1-1/4"	23	VBN2ELPX7202	VBN2ELPX7102	VBN2ELSX7202	VBN2ELSX7102	VBN2ELPX6202	VBN2ELPX6102	VBN2ELSX6202	VBN2ELSX6102		
	30	VBN2EMPX7202	VBN2EMPX7102	VBN2EMSX7202	VBN2EMSX7102	VBN2EMPX6202	VBN2EMPX6102	VBN2EMSX6202	VBN2EMSX6102		
	41	VBN2ENPX7202	VBN2ENPX7102	VBN2ENSX7202	VBN2ENSX7102	VBN2ENPX6202	VBN2ENPX6102	VBN2ENSX6202	VBN2ENSX6102		
	74*	VBN2ERPX7202	VBN2ERPX7102	VBN2ERSX7202	VBN2ERSX7102	VBN2ERPX6202	VBN2ERPX6102	VBN2ERSX6202	VBN2ERSX6102		
	172*	VBN2E1PX7202	VBN2E1PX7102	VBN2E1SX7202	VBN2E1SX7102	VBN2E1PX6202	VBN2E1PX6102	VBN2E1SX6202	VBN2E1SX6102		
	42	VBN2FNPX7202	VBN2FNPX7102	VBN2FNSX7202	VBN2FNSX7102	VBN2FNPX6202	VBN2FNPX6102	VBN2FNSX6202	VBN2FNSX6102		
	57	VBN2FPPX7202	VBN2FPPX7102	VBN2FPSX7202	VBN2FPSX7102	VBN2FPPX6202	VBN2FPPX6102	VBN2FPSX6202	VBN2FPSX6102		
	71	VBN2FRPX7202	VBN2FRPX7102	VBN2FRSX7202	VBN2FRSX7102	VBN2FRPX6202	VBN2FRPX6102	VBN2FRSX6202	VBN2FRSX6102		
	100	VBN2FSPX7202	VBN2FSPX7102	VBN2FSSX7202	VBN2FSSX7102	VBN2FSPX6202	VBN2FSPX6102	VBN2FSSX6202	VBN2FSSX6102		
	108*	VBN2FTPX7202	VBN2FTPX7102	VBN2FTSX7202	VBN2FTSX7102	VBN2FTPX6202	VBN2FTPX6102	VBN2FTSX6202	VBN2FTSX6102		
1-1/2"	210	VBN2F1PX7202	VBN2F1PX7102	VBN2F1SX7202	VBN2F1SX7102	VBN2F1PX6202	VBN2F1PX6102	VBN2F1SX6202	VBN2F1SX6102		
	266*	VBN2F2PX7202	VBN2F2PX7102	VBN2F2SX7202	VBN2F2SX7102	VBN2F2PX6202	VBN2F2PX6102	VBN2F2SX6202	VBN2F2SX6102		
	45	VBN2GNPX7202	VBN2GNPX7102	VBN2GNSX7202	VBN2GNSX7102	VBN2GNPX6202	VBN2GNPX6102	VBN2GNSX6202	VBN2GNSX6102		
	55	VBN2GPPX7202	VBN2GPPX7102	VBN2GPSX7202	VBN2GPSX7102	VBN2GPPX6202	VBN2GPPX6102	VBN2GPSX6202	VBN2GPSX6102		
	72	VBN2GRPX7202	VBN2GRPX7102	VBN2GRSX7202	VBN2GRSX7102	VBN2GRPX6202	VBN2GRPX6102	VBN2GRSX6202	VBN2GRSX6102		
	101	VBN2GSPX7202	VBN2GSPX7102	VBN2GSSX7202	VBN2GSSX7102	VBN2GSPX6202	VBN2GSPX6102	VBN2GSSX6202	VBN2GSSX6102		
	162	VBN2GUPX7202	VBN2GUPX7102	VBN2GUSX7202	VBN2GUSX7102	VBN2GUPX6202	VBN2GUPX6102	VBN2GUSX6202	VBN2GUSX6102		
	202*	VBN2G1PX7202	VBN2G1PX7102	VBN2G1SX7202	VBN2G1SX7102	VBN2G1PX6202	VBN2G1PX6102	VBN2G1SX6202	VBN2G1SX6102		
	49	VBN2HNPX7202	VBN2HNPX7102	VBN2HNSX7202	VBN2HNSX7102	VBN2HNPX6202	VBN2HNPX6102	VBN2HNSX6202	VBN2HNSX6102		
	63	VBN2HPPX7202	VBN2HPPX7102	VBN2HPSX7202	VBN2HPSX7102	VBN2HPPX6202	VBN2HPPX6102	VBN2HPSX6202	VBN2HPSX6102		
3"	82	VBN2HRPX7202	VBN2HRPX7102	VBN2HRSX7202	VBN2HRSX7102	VBN2HRPX6202	VBN2HRPX6102	VBN2HRSX6202	VBN2HRSX6102		
	124	VBN2HTPX7202	VBN2HTPX7102	VBN2HTSX7202	VBN2HTSX7102	VBN2HTPX6202	VBN2HTPX6102	VBN2HTSX6202	VBN2HTSX6102		
	145*	VBN2HUPX7202	VBN2HUPX7102	VBN2HUSX7202	VBN2HUSX7102	VBN2HUPX6202	VBN2HUPX6102	VBN2HUSX6202	VBN2HUSX6102		

* Full port ball. No flow characterizing insert.

VALVES

Product Selection - Valves

3-Way NPT Control Ball Valves 1/2"-2-1/2", NEMA2

Common Features

VBN3 (Three-way):

- Equal % A to AB, linear B to AB
- B-port Cv reduction of 20% approximates constant total loop flow
- Nickel-chrome plated brass ball and stem
- Convert to 2-way by plugging B port (plug not provided)
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe.
- Mixing or diverting control with the same valve
- ANSI Class IV (0.01%) seat leakage on both A and B ports
- Available with NEMA 3R actuator enclosure



3-Way



Actuator Features			Non-fail Safe		Fail Safe			Valve Only	
Actuator O.S. Number	MN6105A1011	MN7505A2001	MS8105A1030	MS8105A1030	MS7505A2030	MS7505A2030	N/A		
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac		
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz		
Actuator Torque	Power	5 VA	5 VA	8 VA	8 VA	7.5 VA	7.5 VA		
	(lb.-in.)	44	44	44	44	44	44		
Control	(0)2-10 Vdc		•			•	•		
	4-20 mA (external 500 Ohm Resistor)		•			•	•		
Fail Safe Action	Floating	•	•			•	•		
	Two-Position SPDT	•	•			•	•		
	Two-Position SPST		•	•	•	•	•		
Normal Position (no signal)	A-AB Open	A-AB Open	B-AB Open (FSB)	A-AB Open (FSA)	B-AB Open (FSB)	A-AB Open (FSA)	A-AB Open		
Actuator Stroke	(degrees)	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°		
Timing	(drive/spring return, seconds)	95	95	45/25	45/25	90/25	90/25		
Aux Switch	2 x SPDT Add-on	SSW2-1M	SSW2-1M						
Feedback	2-10 Vdc Built In		•			•	•		
Valve Features	Trim	Nickel-Plated Brass	Nickel-Plated Brass	Nickel-Plated Brass	Nickel-Plated Brass	Nickel-Plated Brass	Nickel-Plated Brass		
Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes						
1/2"	0.33	50	VBN3ABPX4000	VBN3ABPX5000	VBN3ABPX7400	VBN3ABPX7300	VBN3ABPX6400	VBN3ABPX6300	VBN3ABPX0000
	0.59		VBN3ACPX4000	VBN3ACPX5000	VBN3ACPX7400	VBN3ACPX7300	VBN3ACPX6400	VBN3ACPX6300	VBN3ACPX0000
	1		VBN3AEPX4000	VBN3AEPX5000	VBN3AEPX7400	VBN3AEPX7300	VBN3AEPX6400	VBN3AEPX6300	VBN3AEPX0000
	2.4		VBN3AFPX4000	VBN3AFPX5000	VBN3AFPX7400	VBN3AFPX7300	VBN3AFPX6400	VBN3AFPX6300	VBN3AFPX0000
	4.3		VBN3AHPX4000	VBN3AHPX5000	VBN3AHPX7400	VBN3AHPX7300	VBN3AHPX6400	VBN3AHPX6300	VBN3AHPX0000
	8*		VBN3AJPX4000	VBN3AJPX5000	VBN3AJPX7400	VBN3AJPX7300	VBN3AJPX6400	VBN3AJPX6300	VBN3AJPX0000
3/4"	0.4		VBN3BCPX4000	VBN3BCPX5000	VBN3BCPX7400	VBN3BCPX7300	VBN3BCPX6400	VBN3BCPX6300	VBN3BCPX0000
	0.66		VBN3BDPX4000	VBN3BDPX5000	VBN3BDPX7400	VBN3BDPX7300	VBN3BDPX6400	VBN3BDPX6300	VBN3BDPX0000
	1.3		VBN3BEPX4000	VBN3BEPX5000	VBN3BEPX7400	VBN3BEPX7300	VBN3BEPX6400	VBN3BEPX6300	VBN3BEPX0000
	2.4		VBN3BFPX4000	VBN3BFPX5000	VBN3BFPX7400	VBN3BFPX7300	VBN3BFPX6400	VBN3BFPX6300	VBN3BFPX0000
	3.8		VBN3BGPX4000	VBN3BGPX5000	VBN3BGPX7400	VBN3BGPX7300	VBN3BGPX6400	VBN3BGPX6300	VBN3BGPX0000
	7		VBN3BJPX4000	VBN3BJPX5000	VBN3BJPX7400	VBN3BJPX7300	VBN3BJPX6400	VBN3BJPX6300	VBN3BJPX0000
1"	11*		VBN3BKPX4000	VBN3BKPX5000	VBN3BKPX7400	VBN3BKPX7300	VBN3BKPX6400	VBN3BKPX6300	VBN3BKPX0000
	0.4		VBN3CCPX4000	VBN3CCPX5000	VBN3CCPX7400	VBN3CCPX7300	VBN3CCPX6400	VBN3CCPX6300	VBN3CCPX0000
	0.65		VBN3CDPX4000	VBN3CDPX5000	VBN3CDPX7400	VBN3CDPX7300	VBN3CDPX6400	VBN3CDPX6300	VBN3CDPX0000
	1.3		VBN3CEPX4000	VBN3CEPX5000	VBN3CEPX7400	VBN3CEPX7300	VBN3CEPX6400	VBN3CEPX6300	VBN3CEPX0000
	2.3		VBN3CFPX4000	VBN3CFPX5000	VBN3CFPX7400	VBN3CFPX7300	VBN3CFPX6400	VBN3CFPX6300	VBN3CFPX0000
	3.5		VBN3CGPX4000	VBN3CGPX5000	VBN3CGPX7400	VBN3CGPX7300	VBN3CGPX6400	VBN3CGPX6300	VBN3CGPX0000
	4.5	VBN3CHPX4000	VBN3CHPX5000	VBN3CHPX7400	VBN3CHPX7300	VBN3CHPX6400	VBN3CHPX6300	VBN3CHPX0000	
	8.6	VBN3CJPX4000	VBN3CJPX5000	VBN3CJPX7400	VBN3CJPX7300	VBN3CJPX6400	VBN3CJPX6300	VBN3CJPX0000	
	14.9	VBN3CKPX4000	VBN3CKPX5000	VBN3CKPX7400	VBN3CKPX7300	VBN3CKPX6400	VBN3CKPX6300	VBN3CKPX0000	
	22*	VBN3CLPX4000	VBN3CLPX5000	VBN3CLPX7400	VBN3CLPX7300	VBN3CLPX6400	VBN3CLPX6300	VBN3CLPX0000	
1-1/4"	31*	VBN3CMPX4000	VBN3CMPX5000	VBN3CMPX7400	VBN3CMPX7300	VBN3CMPX6400	VBN3CMPX6300	VBN3CMPX0000	
	4.1	VBN3DHPX4000	VBN3DHPX5000	VBN3DHPX7400	VBN3DHPX7300	VBN3DHPX6400	VBN3DHPX6300	VBN3DHPX0000	
	8.7	VBN3DJPX4000	VBN3DJPX5000	VBN3DJPX7400	VBN3DJPX7300	VBN3DJPX6400	VBN3DJPX6300	VBN3DJPX0000	
	12.7	VBN3DKPX4000	VBN3DKPX5000	VBN3DKPX7400	VBN3DKPX7300	VBN3DKPX6400	VBN3DKPX6300	VBN3DKPX0000	
	19.4*	VBN3DLPX4000	VBN3DLPX5000	VBN3DLPX7400	VBN3DLPX7300	VBN3DLPX6400	VBN3DLPX6300	VBN3DLPX0000	
	27	VBN3DMPX4000	VBN3DMPX5000	VBN3DMPX7400	VBN3DMPX7300	VBN3DMPX6400	VBN3DMPX6300	VBN3DMPX0000	
1-1/2"	34*	VBN3DNPX4000	VBN3DNPX5000	VBN3DNPX7400	VBN3DNPX7300	VBN3DNPX6400	VBN3DNPX6300	VBN3DNPX0000	
	4	VBN3EHPX4000	VBN3EHPX5000	VBN3EHPX7400	VBN3EHPX7300	VBN3EHPX6400	VBN3EHPX6300	VBN3EHPX0000	
	8.3	VBN3EJPX4000	VBN3EJPX5000	VBN3EJPX7400	VBN3EJPX7300	VBN3EJPX6400	VBN3EJPX6300	VBN3EJPX0000	
	13.4	VBN3EKPX4000	VBN3EKPX5000	VBN3EKPX7400	VBN3EKPX7300	VBN3EKPX6400	VBN3EKPX6300	VBN3EKPX0000	
	24	VBN3ELPX4000	VBN3ELPX5000	VBN3ELPX7400	VBN3ELPX7300	VBN3ELPX6400	VBN3ELPX6300	VBN3ELPX0000	
	32*	VBN3EMPX4000	VBN3EMPX5000	VBN3EMPX7400	VBN3EMPX7300	VBN3EMPX6400	VBN3EMPX6300	VBN3EMPX0000	
2"	61*	VBN3EPPX4000	VBN3EPPX5000	VBN3EPPX7400	VBN3EPPX7300	VBN3EPPX6400	VBN3EPPX6300	VBN3EPPX0000	
	24	VBN3FLPX4000	VBN3FLPX5000	VBN3FLPX7400	VBN3FLPX7300	VBN3FLPX6400	VBN3FLPX6300	VBN3FLPX0000	
	38	VBN3FNPX4000	VBN3FNPX5000	VBN3FNPX7400	VBN3FNPX7300	VBN3FNPX6400	VBN3FNPX6300	VBN3FNPX0000	
	57*	VBN3FPPX4000	VBN3FPPX5000	VBN3FPPX7400	VBN3FPPX7300	VBN3FPPX6400	VBN3FPPX6300	VBN3FPPX0000	
	83	VBN3FRPX4000	VBN3FRPX5000	VBN3FRPX7400	VBN3FRPX7300	VBN3FRPX6400	VBN3FRPX6300	VBN3FRPX0000	
2-1/2"	109*	VBN3FTPX4000	VBN3FTPX5000	VBN3FTPX7400	VBN3FTPX7300	VBN3FTPX6400	VBN3FTPX6300	VBN3FTPX0000	
	38	VBN3GNPX4000	VBN3GNPX5000	VBN3GNPX7400	VBN3GNPX7300	VBN3GNPX6400	VBN3GNPX6300	VBN3GNPX0000	
	74	VBN3GRPX4000	VBN3GRPX5000	VBN3GRPX7400	VBN3GRPX7300	VBN3GRPX6400	VBN3GRPX6300	VBN3GRPX0000	
100*	VBN3GSPX4000	VBN3GSPX5000	VBN3GSPX7400	VBN3GSPX7300	VBN3GSPX6400	VBN3GSPX6300	VBN3GSPX0000		

* Full port ball. No flow characterizing insert.

Product Selection - Valves

3-Way NPT Control Ball Valves 1/2"-2-1/2", NEMA 3R

Actuator Features			Non-fail Safe		Fail Safe			
Actuator O.S. Number			MN6105A1011	MN7505A2001	MS8105A1030	MS8105A1030	MS7505A2030	MS7505A2030
Power Supply	Voltage	24 Vac		24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Actuator Torque	Power	5 VA		5 VA	8 VA	8 VA	7.5 VA	7.5 VA
	(lb.-in.)	44		44	44	44	44	44
Control	(0)2-10 Vdc			•			•	•
	4-20 mA (external 500 Ohm Resistor)			•			•	•
Fail Safe Action	Normal Position (no signal)	Stay in Place		Stay in Place	B-AB Open (FSB)	A-AB Open (FSA)	B-AB Open (FSB)	A-AB Open (FSA)
	Actuator Stroke (degrees)	95° ± 3°		95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°	95° ± 3°
Timing (drive/spring return, seconds)	95		95	45/25	45/25	90/25	90/25	
Aux Switch	2 x SPDT Add-on		SSW2-1M	SSW2-1M				
Feedback	2-10 Vdc Built In			•			•	•
Valve Features			Trim	Nickel-Plated Brass	Nickel-Plated Brass	Nickel-Plated Brass	Nickel-Plated Brass	Nickel-Plated Brass
Valve Size (inches)	Cv	Close-off Pressure (psid)	Short Order Codes					
			1/2"	0.33	50	VBN3ABPX4002	VBN3ABPX5002	VBN3ABPX7402
0.59	VBN3ACPX4002	VBN3ACPX5002		VBN3ACPX7402		VBN3ACPX7302	VBN3ACPX6402	VBN3ACPX6302
1	VBN3AEPX4002	VBN3AEPX5002		VBN3AEPX7402		VBN3AEPX7302	VBN3AEPX6402	VBN3AEPX6302
2.4	VBN3AFPX4002	VBN3AFPX5002		VBN3AFPX7402		VBN3AFPX7302	VBN3AFPX6402	VBN3AFPX6302
4.3	VBN3AHPX4002	VBN3AHPX5002		VBN3AHPX7402		VBN3AHPX7302	VBN3AHPX6402	VBN3AHPX6302
3/4"	8*	50	VBN3AJPX4002	VBN3AJPX5002	VBN3AJPX7402	VBN3AJPX7302	VBN3AJPX6402	VBN3AJPX6302
	0.4		VBN3BCPX4002	VBN3BCPX5002	VBN3BCPX7402	VBN3BCPX7302	VBN3BCPX6402	VBN3BCPX6302
	0.66		VBN3BDPX4002	VBN3BDPX5002	VBN3BDPX7402	VBN3BDPX7302	VBN3BDPX6402	VBN3BDPX6302
	1.3		VBN3BEPX4002	VBN3BEPX5002	VBN3BEPX7402	VBN3BEPX7302	VBN3BEPX6402	VBN3BEPX6302
	2.4		VBN3BFPX4002	VBN3BFPX5002	VBN3BFPX7402	VBN3BFPX7302	VBN3BFPX6402	VBN3BFPX6302
	3.8		VBN3BGPX4002	VBN3BGPX5002	VBN3BGPX7402	VBN3BGPX7302	VBN3BGPX6402	VBN3BGPX6302
	7		VBN3BJPX4002	VBN3BJPX5002	VBN3BJPX7402	VBN3BJPX7302	VBN3BJPX6402	VBN3BJPX6302
1"	11*	50	VBN3BKPX4002	VBN3BKPX5002	VBN3BKPX7402	VBN3BKPX7302	VBN3BKPX6402	VBN3BKPX6302
	0.4		VBN3CCPX4002	VBN3CCPX5002	VBN3CCPX7402	VBN3CCPX7302	VBN3CCPX6402	VBN3CCPX6302
	0.65		VBN3CDPX4002	VBN3CDPX5002	VBN3CDPX7402	VBN3CDPX7302	VBN3CDPX6402	VBN3CDPX6302
	1.3		VBN3CEPX4002	VBN3CEPX5002	VBN3CEPX7402	VBN3CEPX7302	VBN3CEPX6402	VBN3CEPX6302
	2.3		VBN3CFPX4002	VBN3CFPX5002	VBN3CFPX7402	VBN3CFPX7302	VBN3CFPX6402	VBN3CFPX6302
	3.5		VBN3CGPX4002	VBN3CGPX5002	VBN3CGPX7402	VBN3CGPX7302	VBN3CGPX6402	VBN3CGPX6302
	4.5		VBN3CHPX4002	VBN3CHPX5002	VBN3CHPX7402	VBN3CHPX7302	VBN3CHPX6402	VBN3CHPX6302
	8.6		VBN3CJPX4002	VBN3CJPX5002	VBN3CJPX7402	VBN3CJPX7302	VBN3CJPX6402	VBN3CJPX6302
	14.9		VBN3CKPX4002	VBN3CKPX5002	VBN3CKPX7402	VBN3CKPX7302	VBN3CKPX6402	VBN3CKPX6302
	22*		VBN3CLPX4002	VBN3CLPX5002	VBN3CLPX7402	VBN3CLPX7302	VBN3CLPX6402	VBN3CLPX6302
1-1/4"	31*	40	VBN3CMPX4002	VBN3CMPX5002	VBN3CMPX7402	VBN3CMPX7302	VBN3CMPX6402	VBN3CMPX6302
	4.1		VBN3DHPX4002	VBN3DHPX5002	VBN3DHPX7402	VBN3DHPX7302	VBN3DHPX6402	VBN3DHPX6302
	8.7		VBN3DJPX4002	VBN3DJPX5002	VBN3DJPX7402	VBN3DJPX7302	VBN3DJPX6402	VBN3DJPX6302
	12.7		VBN3DKPX4002	VBN3DKPX5002	VBN3DKPX7402	VBN3DKPX7302	VBN3DKPX6402	VBN3DKPX6302
	19.4*		VBN3DLPX4002	VBN3DLPX5002	VBN3DLPX7402	VBN3DLPX7302	VBN3DLPX6402	VBN3DLPX6302
	27		VBN3DMPX4002	VBN3DMPX5002	VBN3DMPX7402	VBN3DMPX7302	VBN3DMPX6402	VBN3DMPX6302
	34*		VBN3DNPX4002	VBN3DNPX5002	VBN3DNPX7402	VBN3DNPX7302	VBN3DNPX6402	VBN3DNPX6302
1-1/2"	4	40	VBN3EHPX4002	VBN3EHPX5002	VBN3EHPX7402	VBN3EHPX7302	VBN3EHPX6402	VBN3EHPX6302
	8.3		VBN3EJPX4002	VBN3EJPX5002	VBN3EJPX7402	VBN3EJPX7302	VBN3EJPX6402	VBN3EJPX6302
	13.4		VBN3EKPX4002	VBN3EKPX5002	VBN3EKPX7402	VBN3EKPX7302	VBN3EKPX6402	VBN3EKPX6302
	24		VBN3ELPX4002	VBN3ELPX5002	VBN3ELPX7402	VBN3ELPX7302	VBN3ELPX6402	VBN3ELPX6302
	32*		VBN3EMPX4002	VBN3EMPX5002	VBN3EMPX7402	VBN3EMPX7302	VBN3EMPX6402	VBN3EMPX6302
	61*		VBN3EPPX4002	VBN3EPPX5002	VBN3EPPX7402	VBN3EPPX7302	VBN3EPPX6402	VBN3EPPX6302
2"	24	40	VBN3FLPX4002	VBN3FLPX5002	VBN3FLPX7402	VBN3FLPX7302	VBN3FLPX6402	VBN3FLPX6302
	38		VBN3FNPX4002	VBN3FNPX5002	VBN3FNPX7402	VBN3FNPX7302	VBN3FNPX6402	VBN3FNPX6302
	57*		VBN3FPPX4002	VBN3FPPX5002	VBN3FPPX7402	VBN3FPPX7302	VBN3FPPX6402	VBN3FPPX6302
	83		VBN3FRPX4002	VBN3FRPX5002	VBN3FRPX7402	VBN3FRPX7302	VBN3FRPX6402	VBN3FRPX6302
	109*		VBN3FTPX4002	VBN3FTPX5002	VBN3FTPX7402	VBN3FTPX7302	VBN3FTPX6402	VBN3FTPX6302
2-1/2"	38	40	VBN3GNPX4002	VBN3GNPX5002	VBN3GNPX7402	VBN3GNPX7302	VBN3GNPX6402	VBN3GNPX6302
	74		VBN3GRPX4002	VBN3GRPX5002	VBN3GRPX7402	VBN3GRPX7302	VBN3GRPX6402	VBN3GRPX6302
	100*		VBN3GSPX4002	VBN3GSPX5002	VBN3GSPX7402	VBN3GSPX7302	VBN3GSPX6402	VBN3GSPX6302

* Full port ball. No flow characterizing insert.

Product Selection - Valves

2-Way Flanged Control Ball Valves 4"-6", NEMA 2+3R

Common Features

- Maximum static pressure 240 psi (-22°F to 250°F)
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe
- Use globe valves for steam ratings
- Medium: Water/glycol solutions up to 50%
- ANSI class 125 flanged connections
- ANSI class IV leakage (0.01% of Cv)
- Valve ball and stem 316 stainless steel
- Equal percentage flow (laser-milled stainless steel ball)
- Cast iron body construction -- not for use with open systems such as cooling towers

5-YEAR LIMITED WARRANTY



2-Way

Actuator Features		Non-fail Safe		Fail Safe		Valve Only
Actuator O.S. Number		MN6110A1003 4 to 5 in.	MN7510A2001 4 to 5 in.	MS8110A1008 4 to 5 in.	MS7510A2008 4 to 5 in.	N/A
		MN6134A1003 6 in.	MN7234A2008 6 in.	MS8120A1007 6 in.	MS7520A2007 6 in.	
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	
	Power	5 / 9 VA	5 / 9 VA	30 / 40 VA	14 / 16 VA	
Actuator Torque	(lb.-in.)	88/300	88/300	88/175	88/175	
Control	(0)2-10 Vdc		•		•	
	4-20 mA (external 500 Ohm Resistor)		•		•	
	Floating	•	•		•	
	Two-Position SPDT	•	•		•	
	Two-Position SPST	•	•	•	•	
Fail Safe Action	(field configurable)	Stay in Place	Stay in Place	A-AB Closed	A-AB Closed	
Normal Position (no signal)	(field configurable)	Closed	Closed	Closed	Closed	
Actuator Stroke	(degrees)	95°	95°	95°	95°	
Timing	(drive/spring return, seconds)	95	95	45/20	90/20	
Aux Switch	2 x SPDT Add-on	SW2-US	SW2-US	SW2-US	SW2-US	
Feedback	2-10 Vdc Built In		•		•	
Valve Features	Trim	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel


Valve Size (inches)	Cv*	Close-off Pressure (psid)	Valve O.S. Number				
NEMA 2 Actuator							
4"	91	70	VBF2JS1SOA	VBF2JS1SOB	VBF2JS1SOC	VBF2JS1SOD	VBF2JS1SOX
	118		VBF2JT1SOA	VBF2JT1SOB	VBF2JT1SOC	VBF2JT1SOD	VBF2JT1SOX
	152		VBF2JU1SOA	VBF2JU1SOB	VBF2JU1SOC	VBF2JU1SOD	VBF2JU1SOX
	197		VBF2J11SOA	VBF2J11SOB	VBF2J11SOC	VBF2J11SOD	VBF2J11SOX
	254		VBF2J21SOA	VBF2J21SOB	VBF2J21SOC	VBF2J21SOD	VBF2J21SOX
5"	144		VBF2KU1SOA	VBF2KU1SOB	VBF2KU1SOC	VBF2KU1SOD	VBF2KU1SOX
	185		VBF2K11SOA	VBF2K11SOB	VBF2K11SOC	VBF2K11SOD	VBF2K11SOX
	240		VBF2K21SOA	VBF2K21SOB	VBF2K21SOC	VBF2K21SOD	VBF2K21SOX
	309		VBF2K31SOA	VBF2K31SOB	VBF2K31SOC	VBF2K31SOD	VBF2K31SOX
	400		VBF2K41SOA	VBF2K41SOB	VBF2K41SOC	—	VBF2K41SOX
6"	208		VBF2L11SOA	VBF2L11SOB	VBF2L11SOC	VBF2L11SOD	VBF2L11SOX
	268		VBF2L21SOA	VBF2L21SOB	VBF2L21SOC	VBF2L21SOD	VBF2L21SOX
	346		VBF2L41SOA	VBF2L41SOB	VBF2L41SOC	—	VBF2L41SOX
	441		VBF2L51SOA	VBF2L51SOB	VBF2L51SOC	—	VBF2L51SOX
	577		VBF2L61SOA	VBF2L61SOB	VBF2L61SOC	—	VBF2L61SOX
650	VBF2L71SOA	VBF2L71SOB	VBF2L71SOC	—	VBF2L71SOX		
NEMA 3R Actuator							
4"	91	VBF2JC1SRA	VBF2JC1SRB	VBF2JC1SRC	VBF2JC1SRD	—	
	118	VBF2JT1SRA	VBF2JT1SRB	VBF2JT1SRC	VBF2JT1SRD	—	
	152	VBF2JU1SRA	VBF2JU1SRB	VBF2JU1SRC	VBF2JU1SRD	—	
	197	VBF2J11SRA	VBF2J11SRB	VBF2J11SRC	VBF2J11SRD	—	
	254	VBF2J21SRA	VBF2J21SRB	VBF2J21SRC	VBF2J21SRD	—	
5"	144	VBF2KU1SRA	VBF2KU1SRB	VBF2KU1SRC	VBF2KU1SRD	—	
	185	VBF2K11SRA	VBF2K11SRB	VBF2K11SRC	VBF2K11SRD	—	
	240	VBF2K21SRA	VBF2K21SRB	VBF2K21SRC	VBF2K21SRD	—	
	309	VBF2K31SRA	VBF2K31SRB	VBF2K31SRC	VBF2K31SRD	—	
	400	VBF2K41SRA	VBF2K41SRB	VBF2K41SRC	—	—	
6"	208	VBF2L11SRA	VBF2L11SRB	VBF2L11SRC	VBF2L11SRD	—	
	268	VBF2L21SRA	VBF2L21SRB	VBF2L21SRC	VBF2L21SRD	—	
	346	VBF2L41SRA	VBF2L41SRB	VBF2L41SRC	—	—	
	441	VBF2L51SRA	VBF2L51SRB	VBF2L51SRC	—	—	
	577	VBF2L61SRA	VBF2L61SRB	VBF2L61SRC	—	—	
650	VBF2L71SRA	VBF2L71SRB	VBF2L71SRC	—	—		

* Maximum flow 700 gpm

3-Way Flanged Control Ball Valves 4"-6", NEMA 2+3R

Common Features

- Mixing or diverting with the same 3-way valve
- Spring return actuators field-configurable for A-port normally open or normally closed fail safe
- Globe valve A-B-AB flow pattern (side B port)
- Valve ball and stem 316 stainless steel
- Three-way: A-AB equal percentage, B-AB linear (80% of Cv on B-port) (laser-milled ball)
- ANSI Class IV (0.01%) seat leakage on A port, only
- Cast iron body construction -- not for use with open systems such as cooling towers

Actuator Features		Non-fail Safe		Fail Safe		Valve Only
Actuator O.S. Number		MN6110A1003 4 to 5 in.	MN7510A2001 4 to 5 in.	MS8110A1008 4 to 5 in.	MS7510A2008 4 to 5 in.	N/A
		MN6134A1003 6 in.	MN7234A2008 6 in.	MS8120A1007 6 in.	MS7520A2007 6 in.	
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	
	Power	5 / 9 VA	5 / 9 VA	30 / 40 VA	14 / 16 VA	
Actuator Torque	(lb.-in.)	88/300	88/300	88/175	88/175	
Control	(0)2-10 Vdc		•		•	
	4-20 mA (external 500 Ohm Resistor)		•		•	
	Floating	•	•		•	
	Two-Position SPDT	•	•		•	
	Two-Position SPST	•	•	•	•	
Fail Safe Action	(field configurable)	Stay in Place	Stay in Place	A-AB Closed	A-AB Closed	
Normal Position (no signal)	(field configurable)	A-AB Closed	A-AB Closed	A-AB Closed	A-AB Closed	
Actuator Stroke	(degrees)	95°	95°	95°	95°	
Timing	(drive/spring return, seconds)	95	95	45/20	90/20	
Aux Switch	2 x SPDT Add-on	SW2-US	SW2-US	SW2-US	SW2-US	
Feedback	2-10 Vdc Built In		•		•	
Valve Features	Trim	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

Valve Size (inches)	Cv*	Close-off Pressure (psid)	Valve O.S. Number				
			NEMA 2 Actuator				
4"	91	70	VBFB3JS1S0A	VBFB3JS1S0B	VBFB3JS1S0C	VBFB3JS1S0D	VBFB3JS1S0X
	118		VBFB3JT1S0A	VBFB3JT1S0B	VBFB3JT1S0C	VBFB3JT1S0D	VBFB3JT1S0X
	152		VBFB3JU1S0A	VBFB3JU1S0B	VBFB3JU1S0C	VBFB3JU1S0D	VBFB3JU1S0X
	197		VBFB3J11S0A	VBFB3J11S0B	VBFB3J11S0C	VBFB3J11S0D	VBFB3J11S0X
	254		VBFB3J21S0A	VBFB3J21S0B	VBFB3J21S0C	VBFB3J21S0D	VBFB3J21S0X
	327		VBFB3J31S0A	VBFB3J31S0B	VBFB3J31S0C	VBFB3J31S0D	VBFB3J31S0X
5"	144		VBFB3KU1S0A	VBFB3KU1S0B	VBFB3KU1S0C	VBFB3KU1S0D	VBFB3KU1S0X
	185		VBFB3K11S0A	VBFB3K11S0B	VBFB3K11S0C	VBFB3K11S0D	VBFB3K11S0X
	240		VBFB3K21S0A	VBFB3K21S0B	VBFB3K21S0C	VBFB3K21S0D	VBFB3K21S0X
	309		VBFB3K31S0A	VBFB3K31S0B	VBFB3K31S0C	VBFB3K31S0D	VBFB3K31S0X
	400		VBFB3K41S0A	VBFB3K41S0B	VBFB3K41S0C	—	VBFB3K41S0X
6"	208		VBFB3L11S0A	VBFB3L11S0B	VBFB3L11S0C	VBFB3L11S0D	VBFB3L11S0X
	268		VBFB3L21S0A	VBFB3L21S0B	VBFB3L21S0C	VBFB3L21S0D	VBFB3L21S0X
	346		VBFB3L41S0A	VBFB3L41S0B	VBFB3L41S0C	—	VBFB3L41S0X
	441		VBFB3L51S0A	VBFB3L51S0B	VBFB3L51S0C	—	VBFB3L51S0X
	577		VBFB3L61S0A	VBFB3L61S0B	VBFB3L61S0C	—	VBFB3L61S0X
	650		VBFB3L71S0A	VBFB3L71S0B	VBFB3L71S0C	—	VBFB3L71S0X
			NEMA 3R Actuator				
4"	91	70	VBFB3JS1SRA	VBFB3JS1SRB	VBFB3JS1SRC	VBFB3JS1SRD	—
	118		VBFB3JT1SRA	VBFB3JT1SRB	VBFB3JT1SRC	VBFB3JT1SRD	—
	152		VBFB3JU1SRA	VBFB3JU1SRB	VBFB3JU1SRC	VBFB3JU1SRD	—
	197		VBFB3J11SRA	VBFB3J11SRB	VBFB3J11SRC	VBFB3J11SRD	—
	254		VBFB3J21SRA	VBFB3J21SRB	VBFB3J21SRC	VBFB3J21SRD	—
	327		VBFB3J31SRA	VBFB3J31SRB	VBFB3J31SRC	VBFB3J31SRD	—
5"	144		VBFB3KU1SRA	VBFB3KU1SRB	VBFB3KU1SRC	VBFB3KU1SRD	—
	185		VBFB3K11SRA	VBFB3K11SRB	VBFB3K11SRC	VBFB3K11SRD	—
	240		VBFB3K21SRA	VBFB3K21SRB	VBFB3K21SRC	VBFB3K21SRD	—
	309		VBFB3K31SRA	VBFB3K31SRB	VBFB3K31SRC	VBFB3K31SRD	—
	400		VBFB3K41SRA	VBFB3K41SRB	VBFB3K41SRC	—	—
6"	208		VBFB3L11SRA	VBFB3L11SRB	VBFB3L11SRC	VBFB3L11SRD	—
	268		VBFB3L21SRA	VBFB3L21SRB	VBFB3L21SRC	VBFB3L21SRD	—
	346		VBFB3L41SRA	VBFB3L41SRB	VBFB3L41SRC	—	—
	441		VBFB3L51SRA	VBFB3L51SRB	VBFB3L51SRC	—	—
	577		VBFB3L61SRA	VBFB3L61SRB	VBFB3L61SRC	—	—
	650		VBFB3L71SRA	VBFB3L71SRB	VBFB3L71SRC	—	—

**5-YEAR
LIMITED
WARRANTY**



3-Way

VALVES

* Maximum flow 700 gpm

Product Selection - Valves

Flanged Control Ball Valves 2½" - 6"

Common Features

- Sizes from 2-1/2" to 6" with ANSI Class 125 flanged connections
- Equal percentage or linear flow characteristics
- Choice of four actuator mounting positions on the 4", 5" and 6" valve
- Field configurable for normally open or normally closed fail safe position
- Removable manual operating handle to control valve during installation or in event of power failure (2-1/2" and 3" models)
- ANSI Class leakage specifications:
 - 2-way; ANSI Class IV leakage (0.01% of Cv)
 - 3-way; A to AB; ANSI Class IV leakage (0.01% of Cv)
 - 3-way; B to AB; ANSI Class III leakage (0.1% of Cv)
- Wide range of Cv choices from 63 to 360
- Valve ball and stem 316 stainless steel (4" to 6" models)



**5-YEAR
LIMITED
WARRANTY**

Actuator Features		Non-fail Safe							
Actuator O.S. Number		MN7505A2001	MN7510A2001	MS7505A2030	MS7510A2008	MS7520A2007	MS8105A1030	MS8110A1008	MS8120A1007
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Power	5/9 VA	5/9 VA	7.5 VA	14 VA	16 VA	8 VA	30 VA	40 VA
	(lb.-in.)	44	88	44	88	175	44	88	175
Linkage Stem Force	(lbs.)	58	117	58	17	234	58	117	234
Control	(0)2-10 Vdc	•	•	•	•	•			
	4-20 mA (external 500 Ohm Resistor)	•	•	•	•	•			
	Floating	•	•	•	•	•			
	Two-Position SPDT	•	•	•	•	•			
	Two-Position SPST	•	•	•	•	•	•	•	•
Fail Safe Action		Stay in place	Stay in place	Open or Closed (config)/ A to AB Open or Closed (config)				A-AB Open	Open or Closed (config)
	Normal Position (no signal) (field configurable)	A to AB Closed	Closed/A to AB Closed						
Actuator Stroke	(degrees)	95	95	95	95	95	95	95	95
Timing	(seconds)	95	95	90	90	90	45	45	45
High Temperature Kit	Steam Application								
Aux Switch	SPDT Built In	SSW2-1M	SW2-US		SW3-US	SW2-US		SW2-US	
	1 x SPDT Add-On								
	2 x SPDT Add-On								
Feedback	(0)2-10 Vdc Built In		•	•	•	•			SW-US
	500 Ohm Add-On								
	2 kOhm Add-On								

	Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Flow Characteristic	Valve Trim	Valve OS Number	Close-off Pressure, psid				
2-Way	2-1/2"	63	On/Off, Mod	125	360 psi @ 250°F	Equal %	Stainless Steel	VBF5011A1734		100			
			On/Off, Mod	125	360 psi @ 250°F	Equal %	Stainless Steel	VBF5011A1734			100		
	3"	100	On/Off, Mod	125	360 psi @ 250°F	Equal %	Stainless Steel	VBF5011A1767		100			
			On/Off, Mod	125	360 psi @ 250°F	Equal %	Stainless Steel	VBF5011A1767			100		
	4"	160	On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1858		70			
			On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1858			70		
			On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1858				70	
	5"	250	On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1882		70			
			On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1882			70		
			On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1882				70	
	6"	360	On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1916			70		
			On/Off, Mod	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5011A1916					70
3-Way	2.5	63	Mixing, Diverting	125	360 psi @ 250°F	Equal %	Brass	VBF5013B1003		40			
			Mixing, Diverting	125	360 psi @ 250°F	Equal %	Brass	VBF5013B1003			40		
	3	100	Mixing, Diverting	125	360 psi @ 250°F	Equal %	Brass	VBF5013B1011	70				
			Mixing, Diverting	125	360 psi @ 250°F	Equal %	Brass	VBF5013B1011		70			
	4	160	Mixing, Diverting	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5013B1029		70			
			Mixing, Diverting	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5013B1029			70		
	5	250	Mixing, Diverting	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5013B1037		70			
			Mixing, Diverting	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5013B1037			70		
	6"	360	Mixing, Diverting	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5013B1045			70		
			Mixing, Diverting	125	240 psig @ 250°F	Equal %	Stainless Steel	VBF5013B1045					70

Product Selection - Valves

Pressure Independent Control Valves, NPT 1/2"-1 1/4"



Example of complete orderable part number: **VRN2A000.38SA + MVN643A0000 + C1**
 Pressure Independent Control Valve, Female NPT Thread, 2-way, 1/2", CV .38, Stainless Steel with MVN643A0000 Actuator,
 Fail in place and 1 meter.

**5-YEAR
 LIMITED
 WARRANTY**

If the complete orderable part number is too long for your ordering system, please refer to the Short Order Codes on pg 95 to 100.

Valve Specification					Valve Profile	Standard Profile		Black Bracket	
					Valve Trim	Plated Brass	Stainless Steel	Plated Brass	Stainless Steel
Valve Size (inches)	Max. gpm	Differential Pressure, psid		Close-off	Valve Body Model Number				
		Min	Max						
1/2"	1.0	3.0	35	100	VRN2A001.00PA	VRN2A001.00SA	VRN2A001.00PX	VRN2A001.00SX	
	2.0				VRN2A002.00PA	VRN2A002.00SA	VRN2A002.00PX	VRN2A002.00SX	
	3.0				VRN2A003.00PA	VRN2A003.00SA	VRN2A003.00PX	VRN2A003.00SX	
	4.0				VRN2A004.00PA	VRN2A004.00SA	VRN2A004.00PX	VRN2A004.00SX	
	5.0				VRN2A005.00PA	VRN2A005.00SA	VRN2A005.00PX	VRN2A005.00SX	
	6.0				VRN2A006.00PA	VRN2A006.00SA	VRN2A006.00PX	VRN2A006.00SX	
	7.0				VRN2A007.00PA	VRN2A007.00SA	VRN2A007.00PX	VRN2A007.00SX	
3/4"	1.0	3.0	35	100	VRN2B001.00PA	VRN2B001.00SA	VRN2B001.00PX	VRN2B001.00SX	
	2.0				VRN2B002.00PA	VRN2B002.00SA	VRN2B002.00PX	VRN2B002.00SX	
	3.0				VRN2B003.00PA	VRN2B003.00SA	VRN2B003.00PX	VRN2B003.00SX	
	4.0				VRN2B004.00PA	VRN2B004.00SA	VRN2B004.00PX	VRN2B004.00SX	
	5.0				VRN2B005.00PA	VRN2B005.00SA	VRN2B005.00PX	VRN2B005.00SX	
	6.0				VRN2B006.00PA	VRN2B006.00SA	VRN2B006.00PX	VRN2B006.00SX	
	7.0				VRN2B007.00PA	VRN2B007.00SA	VRN2B007.00PX	VRN2B007.00SX	
	8.0	6.0			VRN2B008.00PA	VRN2B008.00SA	VRN2B008.00PX	VRN2B008.00SX	
	9.0				VRN2B009.00PA	VRN2B009.00SA	VRN2B009.00PX	VRN2B009.00SX	
	10.0				VRN2B010.00PA	VRN2B010.00SA	VRN2B010.00PX	VRN2B010.00SX	
1"	1.0	3.0	35	100	VRN2C001.00PA	VRN2C001.00SA	VRN2C001.00PX	VRN2C001.00SX	
	2.0				VRN2C002.00PA	VRN2C002.00SA	VRN2C002.00PX	VRN2C002.00SX	
	3.0				VRN2C003.00PA	VRN2C003.00SA	VRN2C003.00PX	VRN2C003.00SX	
	4.0				VRN2C004.00PA	VRN2C004.00SA	VRN2C004.00PX	VRN2C004.00SX	
	5.0				VRN2C005.00PA	VRN2C005.00SA	VRN2C005.00PX	VRN2C005.00SX	
	6.0				VRN2C006.00PA	VRN2C006.00SA	VRN2C006.00PX	VRN2C006.00SX	
	7.0				VRN2C007.00PA	VRN2C007.00SA	VRN2C007.00PX	VRN2C007.00SX	
	8.0	6.0			VRN2C008.00PA	VRN2C008.00SA	VRN2C008.00PX	VRN2C008.00SX	
	9.0				VRN2C009.00PA	VRN2C009.00SA	VRN2C009.00PX	VRN2C009.00SX	
	10				3.0	VRN2C010.00PA	VRN2C010.00SA	VRN2C010.00PX	VRN2C010.00SX
	15	VRN2C015.00PA				VRN2C015.00SA	VRN2C015.00PX	VRN2C015.00SX	
	20	VRN2C020.00PA				VRN2C020.00SA	VRN2C020.00PX	VRN2C020.00SX	
	1-1/4"	10			3.0	50	100	VRN2D010.00PA	VRN2D010.00SA
15		VRN2D015.00PA	VRN2D015.00SA	VRN2D015.00PX				VRN2D015.00SX	
20		VRN2D020.00PA	VRN2D020.00SA	VRN2D020.00PX				VRN2D020.00SX	
25		5.0	VRN2D025.00PA	VRN2D025.00SA	VRN2D025.00PX			VRN2D025.00SX	
30			VRN2D030.00PA	VRN2D030.00SA	VRN2D030.00PX			VRN2D030.00SX	
35			VRN2D035.00PA	VRN2D035.00SA	VRN2D035.00PX			VRN2D035.00SX	

Actuator Features					Standard Profile	Low Profile	
MVN					Actuator Model Number		
Actuator Type	Control Signal	Timing	Voltage	Enclosure			
Fail-in-Place	Floating	90 sec.	24 VAC	NEMA 2	+MVN613A0000	+MVN613L0000	
	Fast SPDT	30 sec.	24 VAC/DC		+MVN643A0000	+MVN643L0000	
	Modulating	90 sec.	24 VAC/DC		+MVN713A0000	+MVN713L0000	
Accessories	1 meter cable						+C1

VALVES

Product Selection - Valves

Pressure Independent Control Valves, NPT 1½"-3"



Example of complete orderable part number: **VRN2E020.00PX + MN6105A1011**
 Pressure Independent Control Valve, Female NPT Thread, 2-way, 1-1/2", CV 20, Black Bracket,
 Plated Brass with MN6105A1011 Actuator, Fail in place.

**5-YEAR
 LIMITED
 WARRANTY**

If the complete orderable part number is too long for your ordering system, please refer to the Short Order Codes on pg 95 to 100.

Valve Specification				Valve Trim	Plated Brass	Stainless Steel	
Valve Size (inches)	Max. gpm	Differential Pressure, psid		Close-off	Valve Body Model Number		
		Min	Max				
1-1/2"	10	3.0	50	100	VRN2E010.00PX	VRN2E010.00SX	
	15				VRN2E015.00PX	VRN2E015.00SX	
	20				VRN2E020.00PX	VRN2E020.00SX	
	25				VRN2E025.00PX	VRN2E025.00SX	
	30	4.0	58		VRN2E030.00PX	VRN2E030.00SX	
	35				VRN2E035.00PX	VRN2E035.00SX	
	40				VRN2E040.00PX	VRN2E040.00SX	
	45				VRN2E045.00PX	VRN2E045.00SX	
50	6.0	VRN2E050.00PX	VRN2E050.00SX				
2"	25	4.0	58	100	VRN2F025.00PX	VRN2F025.00SX	
	30				VRN2F030.00PX	VRN2F030.00SX	
	35				VRN2F035.00PX	VRN2F035.00SX	
	40				VRN2F040.00PX	VRN2F040.00SX	
	45	6.0	58		VRN2F045.00PX	VRN2F045.00SX	
	50				VRN2F050.00PX	VRN2F050.00SX	
	55				VRN2F055.00PX	VRN2F055.00SX	
	60				VRN2F060.00PX	VRN2F060.00SX	
	65	7.0	58		VRN2F065.00PX	VRN2F065.00SX	
	70				VRN2F070.00PX	VRN2F070.00SX	
75	VRN2F075.00PX			VRN2F075.00SX			
25	4.0			58	100	VRN2G025.00PX	VRN2G025.00SX
30		VRN2G030.00PX	VRN2G030.00SX				
35		VRN2G035.00PX	VRN2G035.00SX				
40		VRN2G040.00PX	VRN2G040.00SX				
45	6.0	58	VRN2G045.00PX	VRN2G045.00SX			
50			VRN2G050.00PX	VRN2G050.00SX			
55			VRN2G055.00PX	VRN2G055.00SX			
60			VRN2G060.00PX	VRN2G060.00SX			
65	7.0	58	VRN2G065.00PX	VRN2G065.00SX			
70			VRN2G070.00PX	VRN2G070.00SX			
75			VRN2G075.00PX	VRN2G075.00SX			
80			VRN2G080.00PX	VRN2G080.00SX			
85	10	58	VRN2G085.00PX	VRN2G085.00SX			
95			VRN2G095.00PX	VRN2G095.00SX			
25			4.0	58	100	VRN2H025.00PX	VRN2H025.00SX
30						VRN2H030.00PX	VRN2H030.00SX
35	VRN2H035.00PX	VRN2H035.00SX					
40	VRN2H040.00PX	VRN2H040.00SX					
45	6.0	58	VRN2H045.00PX	VRN2H045.00SX			
50			VRN2H050.00PX	VRN2H050.00SX			
55			VRN2H055.00PX	VRN2H055.00SX			
60			VRN2H060.00PX	VRN2H060.00SX			
65	7.0	58	VRN2H065.00PX	VRN2H065.00SX			
70			VRN2H070.00PX	VRN2H070.00SX			
75			VRN2H075.00PX	VRN2H075.00SX			
80			VRN2H080.00PX	VRN2H080.00SX			
85	10	58	VRN2H085.00PX	VRN2H085.00SX			
95			VRN2H095.00PX	VRN2H095.00SX			

Actuator Features					
Direct Coupled Actuators					
Actuator Type	Control Signal	Timing	Voltage	Enclosure	Model Number
Fail-in-Place	Floating	95 sec.	24 VAC/DC	NEMA 2	+MN6105A1011
Fail-in-Place	Modulating, Floating	95 sec.			+MN7505A2001
Fail Safe	Modulating, Floating	95 sec.			+MS7505A2030
Fail Safe	2-Position	95 sec.			+MS8105A1030
Fail Safe Position (MS actuators only - open, closed, A-AB, B-AB)	FSO - Fail Safe Open FSC - Fail Safe Closed				FSO or FSC
Accessories					+3R

Product Selection - Valves

Pressure Independent Control Valves, NPT 1/2"-1 1/4"

Common Features

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 1 to 95 gpm.
- Differential pressure regulator for constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design for long service life for flow control accuracy of ±5% over specified control range.
- Equal percentage flow characteristic using patented flow control ball insert.



Actuator Features	Non-Fail Safe						Valve Only	
Actuator O.S Number/ Short Order Code	MVN613A0000	MVN613A0000+C1	MVN613A0000	MVN613A0000+C1	MVN643A0000	MVN643A0000+C1	N/A	N/A
Power Supply	Voltage		24 Vac		24 Vac			
	Frequency		50/60 Hz		50/60 Hz			
	Power		1.5 VA		6 VA			
Actuator Torque (lb.-in.)	27		27		27			
Control	Modulating (0)2-10Vdc							
	Floating		•		•			
	Fast acting SPDT							
Fail Safe Action	Fail in Place		Fail in Place		Fail in Place			
Actuator Stroke (degrees)	90 ±3		90 ±3		90 ±3			
Timing (seconds)	90		90		30			
Valve Features	Trim		Plated Brass		Plated Brass		Plated Brass Stainless Steel	

Valve Size (inches)	Max. GPM	Min. Differential Pressure** (psid)	Max. Differential Pressure** (psid)	Close-off Pressure (psid)	Short Order Codes							
					No Cable	1 Meter Cable	No Cable	1 Meter Cable	No Cable	1 Meter Cable	Valve Only	
1/2	1	3.0	35	100	VRN2ABPA1000	VRN2ABPA1001	VRN2ABSA1000	VRN2ABSA1001	VRN2ABPA2000	VRN2ABPA2001	VRN2ABPA0000	VRN2ABSA0000
	2				VRN2ADPA1000	VRN2ADPA1001	VRN2ADSA1000	VRN2ADSA1001	VRN2ADPA2000	VRN2ADPA2001	VRN2ADPA0000	VRN2ADSA0000
	3				VRN2AEP1000	VRN2AEP1001	VRN2AESA1000	VRN2AESA1001	VRN2AEP2000	VRN2AEP2001	VRN2AEP0000	VRN2AESA0000
	4				VRN2AFPA1000	VRN2AFPA1001	VRN2AFSA1000	VRN2AFSA1001	VRN2AFPA2000	VRN2AFPA2001	VRN2AFPA0000	VRN2AFSA0000
	5				VRN2AGPA1000	VRN2AGPA1001	VRN2AGSA1000	VRN2AGSA1001	VRN2AGPA2000	VRN2AGPA2001	VRN2AGPA0000	VRN2AGSA0000
	6				VRN2AHPA1000	VRN2AHPA1001	VRN2AHPA1000	VRN2AHPA1001	VRN2AHPA2000	VRN2AHPA2001	VRN2AHPA0000	VRN2AHPA0000
	7				VRN2AJPA1000	VRN2AJPA1001	VRN2AJSA1000	VRN2AJSA1001	VRN2AJPA2000	VRN2AJPA2001	VRN2AJPA0000	VRN2AJSA0000
3/4	1	3.0	35	100	VRN2BBPA1000	VRN2BBPA1001	VRN2BBSA1000	VRN2BBSA1001	VRN2BBPA2000	VRN2BBPA2001	VRN2BBPA0000	VRN2BBSA0000
	2				VRN2BDPA1000	VRN2BDPA1001	VRN2BDSA1000	VRN2BDSA1001	VRN2BDPA2000	VRN2BDPA2001	VRN2BDPA0000	VRN2BDSA0000
	3				VRN2BEP1000	VRN2BEP1001	VRN2BESA1000	VRN2BESA1001	VRN2BEP2000	VRN2BEP2001	VRN2BEP0000	VRN2BESA0000
	4				VRN2BFPA1000	VRN2BFPA1001	VRN2BFSA1000	VRN2BFSA1001	VRN2BFPA2000	VRN2BFPA2001	VRN2BFPA0000	VRN2BFSA0000
	5				VRN2BGPA1000	VRN2BGPA1001	VRN2BGSA1000	VRN2BGSA1001	VRN2BGPA2000	VRN2BGPA2001	VRN2BGPA0000	VRN2BGSA0000
	6				VRN2BHPA1000	VRN2BHPA1001	VRN2BHSA1000	VRN2BHSA1001	VRN2BHPA2000	VRN2BHPA2001	VRN2BHPA0000	VRN2BHSA0000
	7				VRN2BJPA1000	VRN2BJPA1001	VRN2BJS1000	VRN2BJS1001	VRN2BJPA2000	VRN2BJPA2001	VRN2BJPA0000	VRN2BJS1000
	8	VRN2BKPA1000	VRN2BKPA1001	VRN2BKSA1000	VRN2BKSA1001	VRN2BKPA2000	VRN2BKPA2001	VRN2BKPA0000	VRN2BKSA0000			
	9	VRN2BLPA1000	VRN2BLPA1001	VRN2BLSA1000	VRN2BLSA1001	VRN2BLPA2000	VRN2BLPA2001	VRN2BLPA0000	VRN2BLSA0000			
	10*	6.0	VRN2BMPA1000	VRN2BMPA1001	VRN2BMSA1000	VRN2BMSA1001	VRN2BMPA2000	VRN2BMPA2001	VRN2BMPA0000	VRN2BMSA0000		
1	1	3.0	35	100	VRN2CBPA1000	VRN2CBPA1001	VRN2CBSA1000	VRN2CBSA1001	VRN2CBPA2000	VRN2CBPA2001	VRN2CBPA0000	VRN2CBSA0000
	2				VRN2CDPA1000	VRN2CDPA1001	VRN2CDSA1000	VRN2CDSA1001	VRN2CDPA2000	VRN2CDPA2001	VRN2CDPA0000	VRN2CDSA0000
	3				VRN2CEPA1000	VRN2CEPA1001	VRN2CESA1000	VRN2CESA1001	VRN2CEPA2000	VRN2CEPA2001	VRN2CEPA0000	VRN2CESA0000
	4				VRN2CFPA1000	VRN2CFPA1001	VRN2CFSA1000	VRN2CFSA1001	VRN2CFPA2000	VRN2CFPA2001	VRN2CFPA0000	VRN2CFSA0000
	5				VRN2CGPA1000	VRN2CGPA1001	VRN2CGSA1000	VRN2CGSA1001	VRN2CGPA2000	VRN2CGPA2001	VRN2CGPA0000	VRN2CGSA0000
	6				VRN2CHPA1000	VRN2CHPA1001	VRN2CHSA1000	VRN2CHSA1001	VRN2CHPA2000	VRN2CHPA2001	VRN2CHPA0000	VRN2CHSA0000
	7				VRN2CJPA1000	VRN2CJPA1001	VRN2CJSA1000	VRN2CJSA1001	VRN2CJPA2000	VRN2CJPA2001	VRN2CJPA0000	VRN2CJSA0000
	8	VRN2CKPA1000	VRN2CKPA1001	VRN2CKSA1000	VRN2CKSA1001	VRN2CKPA2000	VRN2CKPA2001	VRN2CKPA0000	VRN2CKSA0000			
	9	VRN2CLPA1000	VRN2CLPA1001	VRN2CLSA1000	VRN2CLSA1001	VRN2CLPA2000	VRN2CLPA2001	VRN2CLPA0000	VRN2CLSA0000			
	10	4.0	VRN2CMPA1000	VRN2CMPA1001	VRN2CMSA1000	VRN2CMSA1001	VRN2CMPA2000	VRN2CMPA2001	VRN2CMPA0000	VRN2CMSA0000		
1 1/4	15	5.0	50	100	VRN2CNPA1000	VRN2CNPA1001	VRN2CNPA1000	VRN2CNPA1001	VRN2CNPA2000	VRN2CNPA2001	VRN2CNPA0000	VRN2CNPA0000
	20				VRN2CPPA1000	VRN2CPPA1001	VRN2CPSA1000	VRN2CPSA1001	VRN2CPPA2000	VRN2CPPA2001	VRN2CPPA0000	VRN2CPSA0000
	10				VRN2DMPA1000	VRN2DMPA1001	VRN2DMSA1000	VRN2DMSA1001	VRN2DMPA2000	VRN2DMPA2001	VRN2DMPA0000	VRN2DMSA0000
	15				VRN2DNPA1000	VRN2DNPA1001	VRN2DNPA1000	VRN2DNPA1001	VRN2DNPA2000	VRN2DNPA2001	VRN2DNPA0000	VRN2DNPA0000
	20				VRN2DPPA1000	VRN2DPPA1001	VRN2DPPA1000	VRN2DPPA1001	VRN2DPPA2000	VRN2DPPA2001	VRN2DPPA0000	VRN2DPPA0000
	25				VRN2DQPA1000	VRN2DQPA1001	VRN2DQSA1000	VRN2DQSA1001	VRN2DQPA2000	VRN2DQPA2001	VRN2DQPA0000	VRN2DQSA0000
	30				VRN2DRPA1000	VRN2DRPA1001	VRN2DRSA1000	VRN2DRSA1001	VRN2DRPA2000	VRN2DRPA2001	VRN2DRPA0000	VRN2DRSA0000
35*	6.5	VRN2DSPA1000	VRN2DSPA1001	VRN2DSSA1000	VRN2DSSA1001	VRN2DSPA2000	VRN2DSPA2001	VRN2DSPA0000	VRN2DSSA0000			

* Full port ball

** Differential pressure regulator operating range, ±5%

Product Selection - Valves

Pressure Independent Control Valves, NPT 1/2"- 1 1/4"

Common Features

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 1 to 95 gpm.
- Differential pressure regulator for constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design for long service life for flow control accuracy of ±5% over specified control range.
- Equal percentage flow characteristic using patented flow control ball insert.



Actuator Features		Non-Fail Safe					
Actuator O.S Number/ Short Order Code		MVN643A0000	MVN643A0000+C1	MVN713A0000	MVN713A0000+C1	MVN713A0000	MVN713A0000+C1
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Power	6 VA	6 VA	5 VA	5 VA	5 VA	5 VA
Actuator Torque (lb.-in.)		27	27	27	27	27	27
Control	Modulating (0)2-10Vdc			•	•	•	•
	Floating						
	Fast acting SPDT	•	•				
Fail Safe Action		Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place	Fail in Place
Actuator Stroke (degrees)		90 ±3	90 ±3	90 ±3	90 ±3	90 ±3	90 ±3
Timing (seconds)		30	30	90	90	90	90
Valve Features		Trim	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass	Stainless Steel

Valve Size (inches)	Max. GPM	Min. Differential Pressure** (psid)	Max. Differential Pressure** (psid)	Close-off Pressure (psid)	Short Order Codes					
					No Cable	1 Meter Cable	No Cable	1 Meter Cable	No Cable	1 Meter Cable
1/2"	1	3.0	35	100	VRN2ABSA2000	VRN2ABSA2001	VRN2ABPA3000	VRN2ABPA3001	VRN2ABSA3000	VRN2ABSA3001
	2				VRN2ADSA2000	VRN2ADSA2001	VRN2ADPA3000	VRN2ADPA3001	VRN2ADSA3000	VRN2ADSA3001
	3				VRN2AESA2000	VRN2AESA2001	VRN2AEP3000	VRN2AEP3001	VRN2AESA3000	VRN2AESA3001
	4				VRN2AFSA2000	VRN2AFSA2001	VRN2AFPA3000	VRN2AFPA3001	VRN2AFSA3000	VRN2AFSA3001
	5				VRN2AGSA2000	VRN2AGSA2001	VRN2AGPA3000	VRN2AGPA3001	VRN2AGSA3000	VRN2AGSA3001
	6				VRN2AHTA2000	VRN2AHTA2001	VRN2AHPA3000	VRN2AHPA3001	VRN2AHTA3000	VRN2AHTA3001
	7				VRN2AJSA2000	VRN2AJSA2001	VRN2AJPA3000	VRN2AJPA3001	VRN2AJSA3000	VRN2AJSA3001
3/4"	1	6.0	35	100	VRN2BBSA2000	VRN2BBSA2001	VRN2BBPA3000	VRN2BBPA3001	VRN2BBSA3000	VRN2BBSA3001
	2				VRN2BDSA2000	VRN2BDSA2001	VRN2BDPA3000	VRN2BDPA3001	VRN2BDSA3000	VRN2BDSA3001
	3				VRN2BESA2000	VRN2BESA2001	VRN2BEP3000	VRN2BEP3001	VRN2BESA3000	VRN2BESA3001
	4				VRN2BFSA2000	VRN2BFSA2001	VRN2BFPA3000	VRN2BFPA3001	VRN2BFSA3000	VRN2BFSA3001
	5				VRN2BGS2000	VRN2BGS2001	VRN2BGPA3000	VRN2BGPA3001	VRN2BGS3000	VRN2BGS3001
	6				VRN2BHTA2000	VRN2BHTA2001	VRN2BHPA3000	VRN2BHPA3001	VRN2BHTA3000	VRN2BHTA3001
	7				VRN2BHTA2000	VRN2BHTA2001	VRN2BHPA3000	VRN2BHPA3001	VRN2BHTA3000	VRN2BHTA3001
	8				VRN2BKSA2000	VRN2BKSA2001	VRN2BKPA3000	VRN2BKPA3001	VRN2BKSA3000	VRN2BKSA3001
	9				VRN2BLSA2000	VRN2BLSA2001	VRN2BLPA3000	VRN2BLPA3001	VRN2BLSA3000	VRN2BLSA3001
	10*				VRN2BMSA2000	VRN2BMSA2001	VRN2BMPA3000	VRN2BMPA3001	VRN2BMSA3000	VRN2BMSA3001
1"	1	3.0	50	100	VRN2CBSA2000	VRN2CBSA2001	VRN2CBPA3000	VRN2CBPA3001	VRN2CBSA3000	VRN2CBSA3001
	2				VRN2CDSA2000	VRN2CDSA2001	VRN2CDPA3000	VRN2CDPA3001	VRN2CDSA3000	VRN2CDSA3001
	3				VRN2CESA2000	VRN2CESA2001	VRN2CEPA3000	VRN2CEPA3001	VRN2CESA3000	VRN2CESA3001
	4				VRN2CFA2000	VRN2CFA2001	VRN2CFPA3000	VRN2CFPA3001	VRN2CFA3000	VRN2CFA3001
	5				VRN2CGSA2000	VRN2CGSA2001	VRN2CGPA3000	VRN2CGPA3001	VRN2CGSA3000	VRN2CGSA3001
	6				VRN2CHSA2000	VRN2CHSA2001	VRN2CHPA3000	VRN2CHPA3001	VRN2CHSA3000	VRN2CHSA3001
	7				VRN2CJSA2000	VRN2CJSA2001	VRN2CJPA3000	VRN2CJPA3001	VRN2CJSA3000	VRN2CJSA3001
	8				VRN2CKSA2000	VRN2CKSA2001	VRN2CKPA3000	VRN2CKPA3001	VRN2CKSA3000	VRN2CKSA3001
	9				VRN2CLSA2000	VRN2CLSA2001	VRN2CLPA3000	VRN2CLPA3001	VRN2CLSA3000	VRN2CLSA3001
	10				VRN2CMSA2000	VRN2CMSA2001	VRN2CMPA3000	VRN2CMPA3001	VRN2CMSA3000	VRN2CMSA3001
1 1/4"	10	4.0	50	100	VRN2CNSA2000	VRN2CNSA2001	VRN2CNPA3000	VRN2CNPA3001	VRN2CNSA3000	VRN2CNSA3001
	15				VRN2CPSA2000	VRN2CPSA2001	VRN2CPPA3000	VRN2CPPA3001	VRN2CPSA3000	VRN2CPSA3001
	20				VRN2DMSA2000	VRN2DMSA2001	VRN2DMPA3000	VRN2DMPA3001	VRN2DMSA3000	VRN2DMSA3001
	25				VRN2DNSA2000	VRN2DNSA2001	VRN2DNPA3000	VRN2DNPA3001	VRN2DNSA3000	VRN2DNSA3001
	30				VRN2DPSA2000	VRN2DPSA2001	VRN2DPPA3000	VRN2DPPA3001	VRN2DPSA3000	VRN2DPSA3001
	35*				VRN2DQSA2000	VRN2DQSA2001	VRN2DQPA3000	VRN2DQPA3001	VRN2DQSA3000	VRN2DQSA3001
	35*				VRN2DRSA2000	VRN2DRSA2001	VRN2DRPA3000	VRN2DRPA3001	VRN2DRSA3000	VRN2DRSA3001
					VRN2DSSA2000	VRN2DSSA2001	VRN2DSPA3000	VRN2DSPA3001	VRN2DSSA3000	VRN2DSSA3001

* Full port ball

** Differential pressure regulator operating range, ±5%

Product Selection - Valves

Pressure Independent Control Valves, NPT 1/2" - 1 1/4"

Common Features

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 1 to 95 gpm.
- Differential pressure regulator for constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design for long service life for flow control accuracy of ±5% over specified control range.
- Equal percentage flow characteristic using patented flow control ball insert.



Actuator Features		Non-Fail Safe			
Actuator O.S Number		MN6105A1011	MN6105A1011	MN7505A2001	MN7505A2001
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Enclosure Rating	Power	5 VA	5 VA	5 VA	5 VA
		NEMA 2	NEMA 2	NEMA 2	NEMA 2
Actuator Torque (lb.-in.)		44	44	44	44
Control	(0)2-10Vdc			•	•
	4-20 mA (w/ external 500 Ohm Resistor)			•	•
	Floating	•	•	•	•
	Two-Position SPDT	•	•	•	•
	Two-Position SPST	•	•	•	•
Fail Safe Action (field configurable)		Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position (no signal) (field configurable)		Closed	Closed	Closed	Closed
Actuator Stroke (degrees)		95°	95°	95°	95°
Timing (seconds, 60 Hz)		90	90	90	90
Aux Switch	2 x SPDT Add-on	SSW2	SSW2	SSW2	SSW2
Feedback	2-10 Vdc Built In			•	•
Valve Features	Trim	Stainless Steel	Plated Brass	Stainless Steel	Plated Brass

Valve Size (inches)	Max. GPM	Min. Differential Pressure** (psid)	Max. Differential Pressure** (psid)	Close-off Pressure (psid)	Short Order Codes			
1/2"	1	3	35	100	VRN2ABSX4000	VRN2ABPX4000	VRN2ABSX5000	VRN2ABPX5000
	2				VRN2ADSX4000	VRN2ADPX4000	VRN2ADSX5000	VRN2ADPX5000
	3				VRN2AESX4000	VRN2AEPX4000	VRN2AESX5000	VRN2AEPX5000
	4				VRN2AFSX4000	VRN2AFPX4000	VRN2AFSX5000	VRN2AFPX5000
	5				VRN2AGSX4000	VRN2AGPX4000	VRN2AGSX5000	VRN2AGPX5000
	6				VRN2AHSX4000	VRN2AHPX4000	VRN2AHSX5000	VRN2AHPX5000
	7				VRN2AJSX4000	VRN2AJPX4000	VRN2AJSX5000	VRN2AJPX5000
3/4"	1	6	35	100	VRN2BBSX4000	VRN2BBPX4000	VRN2BBSX5000	VRN2BBPX5000
	2				VRN2BDSX4000	VRN2BDPX4000	VRN2BDSX5000	VRN2BDPX5000
	3				VRN2BESX4000	VRN2BEPX4000	VRN2BESX5000	VRN2BEPX5000
	4				VRN2BFSX4000	VRN2BFPX4000	VRN2BFSX5000	VRN2BFPX5000
	5				VRN2BGSX4000	VRN2BGPX4000	VRN2BGSX5000	VRN2BGPX5000
	6				VRN2BHSX4000	VRN2BHPX4000	VRN2BHSX5000	VRN2BHPX5000
	7				VRN2BJSX4000	VRN2BJPX4000	VRN2BJSX5000	VRN2BJPX5000
	8				VRN2BKSX4000	VRN2BKPX4000	VRN2BKSX5000	VRN2BKPX5000
	9				VRN2BLSX4000	VRN2BLPX4000	VRN2BLSX5000	VRN2BLPX5000
	10*				VRN2BMSX4000	VRN2BMPX4000	VRN2BMSX5000	VRN2BMPX5000
1"	1	3	35	100	VRN2CBSX4000	VRN2CBPX4000	VRN2CBSX5000	VRN2CBPX5000
	2				VRN2CDSX4000	VRN2CDPX4000	VRN2CDSX5000	VRN2CDPX5000
	3				VRN2CESX4000	VRN2CEPX4000	VRN2CESX5000	VRN2CEPX5000
	4				VRN2CFSX4000	VRN2CFPX4000	VRN2CFSX5000	VRN2CFPX5000
	5				VRN2CGSX4000	VRN2CGPX4000	VRN2CGSX5000	VRN2CGPX5000
	6				VRN2CHSX4000	VRN2CHPX4000	VRN2CHSX5000	VRN2CHPX5000
	7				VRN2CJSX4000	VRN2CJPX4000	VRN2CJSX5000	VRN2CJPX5000
	8				VRN2CKSX4000	VRN2CKPX4000	VRN2CKSX5000	VRN2CKPX5000
	9				VRN2CLSX4000	VRN2CLPX4000	VRN2CLSX5000	VRN2CLPX5000
	10				VRN2CMSX4000	VRN2CMPX4000	VRN2CMSX5000	VRN2CMPX5000
1-1/4"	15	4	50	100	VRN2CNSX4000	VRN2CNPX4000	VRN2CNSX5000	VRN2CNPX5000
	20				VRN2CPSX4000	VRN2CPPX4000	VRN2CPSX5000	VRN2CPPX5000
	25				VRN2DMSX4000	VRN2DMPX4000	VRN2DMSX5000	VRN2DMPX5000
	30				VRN2DNSX4000	VRN2DNPX4000	VRN2DNSX5000	VRN2DNPX5000
	35*				VRN2DPSX4000	VRN2DPPX4000	VRN2DPSX5000	VRN2DPPX5000
					VRN2DQSX4000	VRN2DQPX4000	VRN2DQSX5000	VRN2DQPX5000
					VRN2DRSX4000	VRN2DRPX4000	VRN2DRSX5000	VRN2DRPX5000
	VRN2DSSX4000	VRN2DSPX4000	VRN2DSSX5000	VRN2DSPX5000				

* Full port ball
 ** Differential pressure regulator operating range, ±5%

VALVES

Product Selection - Valves

Pressure Independent Control Valves, NPT 1/2"- 1 1/4"

Common Features

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 1 to 95 gpm.
- Differential pressure regulator for constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design for long service life for flow control accuracy of ±5% over specified control range.
- Equal percentage flow characteristic using patented flow control ball insert.



Actuator Features		Fail Safe				Valve Only	
Actuator O.S Number		MS7505A2030	MS7505A2030	MS7505A2030	MS7505A2030	N/A	N/A
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac		
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz		
Enclosure Rating	Power	8 VA	8 VA	8 VA	8 VA		
	NEMA 2	NEMA 2	NEMA 2	NEMA 2	NEMA 2		
Actuator Torque (lb.-in.)		44	44	44	44		
Control	(0)2-10Vdc	•	•	•	•		
	4-20 mA (w/ external 500 Ohm Resistor)	•	•	•	•		
Fail Safe Action (field configurable)	Floating	•	•	•	•		
	Two-Position SPDT	•	•	•	•		
	Two-Position SPST	•	•	•	•		
Normal Position (no signal) (field configurable)		Open (FSO)	Closed (FSC)	Open (FSO)	Closed (FSC)		
Actuator Stroke (degrees)		95°	95°	95°	95°		
Timing (seconds, 60 Hz)		90	90	90	90		
Aux Switch	2 x SPDT Add-on						
Feedback	2-10 Vdc Built In	•	•	•	•		
Valve Features	Trim	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass	Stainless Steel	Plated Brass

Valve Size (inches)	Max. GPM	Min. Differential Pressure** (psid)	Max. Differential Pressure** (psid)	Close-off Pressure (psid)	Short Order Codes					
1/2"	1	3	35	100	VRN2ABSX6100	VRN2ABSX6200	VRN2ABPX6100	VRN2ABPX6200	VRN2ABSX0000	VRN2ABPX0000
	2				VRN2ADSX6100	VRN2ADSX6200	VRN2ADPX6100	VRN2ADPX6200	VRN2ADSX0000	VRN2ADPX0000
	3				VRN2AESX6100	VRN2AESX6200	VRN2AEPX6100	VRN2AEPX6200	VRN2AESX0000	VRN2AEPX0000
	4				VRN2AFSX6100	VRN2AFSX6200	VRN2AFPX6100	VRN2AFPX6200	VRN2AFSX0000	VRN2AFPX0000
	5				VRN2AGSX6100	VRN2AGSX6200	VRN2AGPX6100	VRN2AGPX6200	VRN2AGSX0000	VRN2AGPX0000
	6				VRN2AHSX6100	VRN2AHSX6200	VRN2AHPX6100	VRN2AHPX6200	VRN2AHSX0000	VRN2AHPX0000
	7				VRN2AJSX6100	VRN2AJSX6200	VRN2AJPX6100	VRN2AJPX6200	VRN2AJSX0000	VRN2AJPX0000
3/4"	1	6	35	100	VRN2BBSX6100	VRN2BBSX6200	VRN2BBPX6100	VRN2BBPX6200	VRN2BBSX0000	VRN2BBPX0000
	2				VRN2BDSX6100	VRN2BDSX6200	VRN2BDPX6100	VRN2BDPX6200	VRN2BDSX0000	VRN2BDPX0000
	3				VRN2BESX6100	VRN2BESX6200	VRN2BEPX6100	VRN2BEPX6200	VRN2BESX0000	VRN2BEPX0000
	4				VRN2BFSX6100	VRN2BFSX6200	VRN2BFPX6100	VRN2BFPX6200	VRN2BFSX0000	VRN2BFPX0000
	5				VRN2BGSX6100	VRN2BGSX6200	VRN2BGPX6100	VRN2BGPX6200	VRN2BGSX0000	VRN2BGPX0000
	6				VRN2BHSX6100	VRN2BHSX6200	VRN2BHPX6100	VRN2BHPX6200	VRN2BHSX0000	VRN2BHPX0000
	7				VRN2BJSX6100	VRN2BJSX6200	VRN2BJPX6100	VRN2BJPX6200	VRN2BJSX0000	VRN2BJPX0000
	8				VRN2BKSX6100	VRN2BKSX6200	VRN2BKPX6100	VRN2BKPX6200	VRN2BKSX0000	VRN2BKPX0000
	9				VRN2BLSX6100	VRN2BLSX6200	VRN2BLPX6100	VRN2BLPX6200	VRN2BLSX0000	VRN2BLPX0000
	10*				VRN2BMSX6100	VRN2BMSX6200	VRN2BMPX6100	VRN2BMPX6200	VRN2BMSX0000	VRN2BMPX0000
1"	1	4	50	100	VRN2CBSX6100	VRN2CBSX6200	VRN2CBPX6100	VRN2CBPX6200	VRN2CBSX0000	VRN2CBPX0000
	2				VRN2CDSX6100	VRN2CDSX6200	VRN2CDPX6100	VRN2CDPX6200	VRN2CDSX0000	VRN2CDPX0000
	3				VRN2CESX6100	VRN2CESX6200	VRN2CEPX6100	VRN2CEPX6200	VRN2CESX0000	VRN2CEPX0000
	4				VRN2CFSX6100	VRN2CFSX6200	VRN2CFPX6100	VRN2CFPX6200	VRN2CFSX0000	VRN2CFPX0000
	5				VRN2CGSX6100	VRN2CGSX6200	VRN2CGPX6100	VRN2CGPX6200	VRN2CGSX0000	VRN2CGPX0000
	6				VRN2CHSX6100	VRN2CHSX6200	VRN2CHPX6100	VRN2CHPX6200	VRN2CHSX0000	VRN2CHPX0000
	7				VRN2CJSX6100	VRN2CJSX6200	VRN2CJPX6100	VRN2CJPX6200	VRN2CJSX0000	VRN2CJPX0000
	8				VRN2CKSX6100	VRN2CKSX6200	VRN2CKPX6100	VRN2CKPX6200	VRN2CKSX0000	VRN2CKPX0000
	9				VRN2CLSX6100	VRN2CLSX6200	VRN2CLPX6100	VRN2CLPX6200	VRN2CLSX0000	VRN2CLPX0000
	10				VRN2CMSX6100	VRN2CMSX6200	VRN2CMPX6100	VRN2CMPX6200	VRN2CMSX0000	VRN2CMPX0000
1-1/4"	15	5	50	100	VRN2CNSX6100	VRN2CNSX6200	VRN2CNPX6100	VRN2CNPX6200	VRN2CNSX0000	VRN2CNPX0000
	20				VRN2CPSX6100	VRN2CPSX6200	VRN2CPPX6100	VRN2CPPX6200	VRN2CPSX0000	VRN2CPPX0000
	25				VRN2DMSX6100	VRN2DMSX6200	VRN2DMPX6100	VRN2DMPX6200	VRN2DMSX0000	VRN2DMPX0000
	30				VRN2DNSX6100	VRN2DNSX6200	VRN2DNPX6100	VRN2DNPX6200	VRN2DNSX0000	VRN2DNPX0000
	35*				VRN2DPSX6100	VRN2DPSX6200	VRN2DPPX6100	VRN2DPPX6200	VRN2DPSX0000	VRN2DPPX0000
					VRN2DQSX6100	VRN2DQSX6200	VRN2DQPX6100	VRN2DQPX6200	VRN2DQSX0000	VRN2DQPX0000
					VRN2DRSX6100	VRN2DRSX6200	VRN2DRPX6100	VRN2DRPX6200	VRN2DRSX0000	VRN2DRPX0000
	VRN2DSSX6100	VRN2DSSX6200	VRN2DSPX6100	VRN2DSPX6200	VRN2DSSX0000	VRN2DSPX0000				

* Full port ball

** Differential pressure regulator operating range, ±5%

Product Selection - Valves

Pressure Independent Control Valves, NPT 1½"-3"

Common Features

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 1 to 95 gpm.
- Differential pressure regulator for constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design for long service life for flow control accuracy of ±5% over specified control range.
- Equal percentage flow characteristic using patented flow control ball insert.

Actuator Features		Non-Fail Safe			
Actuator O.S Number		MN6105A1011	MN6105A1011	MN7505A2001	MN7505A2001
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Enclosure Rating	Power	5 VA	5 VA	5 VA	5 VA
	Enclosure Rating	NEMA 2	NEMA 2	NEMA 2	NEMA 2
Actuator Torque	(lb.-in.)	44	44	44	44
Control	(0)2-10Vdc			•	•
	4-20 mA (w/ external 500 Ohm Resistor)			•	•
Floating	•	•	•	•	•
	Two-Position SPDT	•	•	•	•
	Two-Position SPST	•	•	•	•
Fail Safe Action	(field configurable)	Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position (no signal)	(field configurable)	Closed	Closed	Closed	Closed
Actuator Stroke	(degrees)	95°	95°	95°	95°
Timing	(seconds, 60 Hz)	90	90	90	90
Aux Switch	2 x SPDT Add-on	SSW2	SSW2	SSW2	SSW2
Feedback	2-10 Vdc Built In			•	•
Valve Features	Trim	Stainless Steel	Plated Brass	Stainless Steel	Plated Brass

Valve Size (inches)	Max. GPM	Min. Differential Pressure** (psid)	Max. Differential Pressure** (psid)	Close-off Pressure (psid)	Short Order Codes
1-1/2"	10	4	50	100	VRN2EMSX4000
	15				VRN2EMPX4000
	20				VRN2EMXS5000
	25	VRN2ENPX4000			
	30	VRN2ENSX5000			
	5	35			VRN2EPX4000
		40			VRN2EPPX5000
		45			VRN2EQSX4000
	6	50			VRN2EQPX5000
		55			VRN2ERSX4000
		60			VRN2ERPX5000
	7	65			VRN2ERSX5000
		70			VRN2ERPX5000
		75			VRN2ESSX4000
80		VRN2ESPX5000			
85		VRN2ETSX4000			
90		VRN2ETPX5000			
95		VRN2ETXS5000			
2"	25	4	58	100	VRN2E1SX4000
	30				VRN2E1PX5000
	35				VRN2E2SX4000
	40	VRN2E2PX5000			
	6	45			VRN2E2SX5000
		50			VRN2E2PX5000
		55			VRN2E3SX4000
	7	60			VRN2E3PX5000
		65			VRN2E4SX4000
		70			VRN2E4PX5000
	75	VRN2E5SX4000			
	80	VRN2E5PX5000			
	85	VRN262SX4000			
	90	VRN262PX5000			
95	VRN262SX5000				
2-1/2"	25	4	58	100	VRN2E7PX4000
	30				VRN2E7PX5000
	35				VRN2E8SX4000
	40	VRN2E8PX5000			
	6	45			VRN2E9SX4000
		50			VRN2E9PX5000
		55			VRN2E9SX5000
	7	60			VRN2E9PX5000
		65			VRN2F0SX4000
		70			VRN2F0PX5000
	75	VRN2FRSX4000			
	80	VRN2FRPX5000			
	85	VRN2FRSX5000			
	90	VRN2FRPX5000			
95*	VRN2FQSX4000				
95*	VRN2FQPX5000				
3"	25	4	58	100	VRN2F3SX4000
	30				VRN2F3PX5000
	35				VRN2F3SX5000
	40	VRN2F3PX5000			
	6	45			VRN2F4SX4000
		50			VRN2F4PX5000
		55			VRN2F4SX5000
	7	60			VRN2F4PX5000
		65			VRN2F5SX4000
		70			VRN2F5PX5000
	75	VRN2F6SX4000			
	80	VRN2F6PX5000			
	85	VRN2F6SX5000			
	90	VRN2F6PX5000			
95*	VRN2G0SX4000				
95*	VRN2G0PX5000				
3"	25	4	58	100	VRN2G2SX4000
	30				VRN2G2PX5000
	35				VRN2G2SX5000
	40	VRN2G2PX5000			
	6	45			VRN2G3SX4000
		50			VRN2G3PX5000
		55			VRN2G3SX5000
	7	60			VRN2G3PX5000
		65			VRN2G4SX4000
		70			VRN2G4PX5000
	75	VRN2G5SX4000			
	80	VRN2G5PX5000			
	85	VRN2G6SX4000			
	90	VRN2G6PX5000			
95*	VRN2G6SX5000				
95*	VRN2G6PX5000				
3"	25	4	58	100	VRN2G8SX4000
	30				VRN2G8PX5000
	35				VRN2G8SX5000
	40	VRN2G8PX5000			
	6	45			VRN2G9SX4000
		50			VRN2G9PX5000
		55			VRN2G9SX5000
	7	60			VRN2G9PX5000
		65			VRN2H0SX4000
		70			VRN2H0PX5000
	75	VRN2H0SX5000			
	80	VRN2H0PX5000			
	85	VRN2H0SX5000			
	90	VRN2H0PX5000			
95*	VRN2H1SX4000				
95*	VRN2H1PX5000				
3"	25	4	58	100	VRN2H2SX4000
	30				VRN2H2PX5000
	35				VRN2H2SX5000
	40	VRN2H2PX5000			
	6	45			VRN2H3SX4000
		50			VRN2H3PX5000
		55			VRN2H3SX5000
	7	60			VRN2H3PX5000
		65			VRN2H4SX4000
		70			VRN2H4PX5000
	75	VRN2H5SX4000			
	80	VRN2H5PX5000			
	85	VRN2H6SX4000			
	90	VRN2H6PX5000			
95*	VRN2H7SX4000				
95*	VRN2H7PX5000				
3"	25	4	58	100	VRN2H8SX4000
	30				VRN2H8PX5000
	35				VRN2H8SX5000
	40	VRN2H8PX5000			
	6	45			VRN2H9SX4000
		50			VRN2H9PX5000
		55			VRN2H9SX5000
	7	60			VRN2H9PX5000
		65			VRN2H9SX5000
		70			VRN2H9PX5000
	75	VRN2H9SX5000			
	80	VRN2H9PX5000			
	85	VRN2H9SX5000			
	90	VRN2H9PX5000			
95*	VRN2H9SX5000				
95*	VRN2H9PX5000				



* Full port ball
 ** Differential pressure regulator operating range, ±5%

VALVES

Product Selection - Valves

Pressure Independent Control Valves, NPT 1½"-3"

Common Features

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 1 to 95 gpm.
- Differential pressure regulator for constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design for long service life for flow control accuracy of ±5% over specified control range.
- Equal percentage flow characteristic using patented flow control ball insert.



Actuator Features		Fail Safe				Valve Only	
Actuator O.S Number	MS7505A2030	MS7505A2030	MS7505A2030	MS7505A2030	N/A	N/A	
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac		
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz		
Enclosure Rating	Power	8 VA	8 VA	8 VA	8 VA		
	NEMA 2	NEMA 2	NEMA 2	NEMA 2	NEMA 2		
Actuator Torque (lb.-in.)	44	44	44	44			
Control	(0)2-10Vdc	•	•	•	•		
	4-20 mA (w/ external 500 Ohm Resistor)	•	•	•	•		
	Floating	•	•	•	•		
	Two-Position SPDT	•	•	•	•		
Two-Position SPST	•	•	•	•			
Fail Safe Action (field configurable)	Open (FSO)	Closed (FSC)	Open (FSO)	Closed (FSC)			
Normal Position (no signal) (field configurable)	Open	Closed	Open	Closed			
Actuator Stroke (degrees)	95°	95°	95°	95°			
Timing (seconds, 60 Hz)	90	90	90	90			
Aux Switch	2 x SPDT Add-on						
Feedback	2-10 Vdc Built In	•	•	•	•		
Valve Features	Trim	Stainless Steel	Stainless Steel	Plated Brass	Plated Brass	Stainless Steel	Plated Brass



Valve Size (inches)	Max. GPM	Min. Differential Pressure** (psid)	Max. Differential Pressure** (psid)	Close-off Pressure (psid)	Short Order Codes			
1-1/2"	10	4	50	100	VRN2EMSX6100 VRN2EMSX6200 VRN2EMPX6100 VRN2EMPX6200 VRN2EMXSX0000 VRN2EMPX0000			
	15				VRN2ENSX6100 VRN2ENSX6200 VRN2ENPX6100 VRN2ENPX6200 VRN2ENSX0000 VRN2ENPX0000			
	20				VRN2EPSX6100 VRN2EPSX6200 VRN2EPPX6100 VRN2EPPX6200 VRN2EPSX0000 VRN2EPPX0000			
	25	5			VRN2EQSX6100 VRN2EQSX6200 VRN2EQPX6100 VRN2EQPX6200 VRN2EQSX0000 VRN2EQPX0000			
	30				VRN2ERSX6100 VRN2ERSX6200 VRN2ERPX6100 VRN2ERPX6200 VRN2ERSX0000 VRN2ERPX0000			
	35				VRN2ESSX6100 VRN2ESSX6200 VRN2ESPX6100 VRN2ESPX6200 VRN2ESSX0000 VRN2ESPX0000			
	40	4			VRN2ETSX6100 VRN2ETSX6200 VRN2ETPX6100 VRN2ETPX6200 VRN2ETSX0000 VRN2ETPX0000			
	45				VRN2EUSX6100 VRN2EUSX6200 VRN2EUPX6100 VRN2EUPX6200 VRN2EUSX0000 VRN2EUPX0000			
	50				VRN2E1SX6100 VRN2E1SX6200 VRN2E1PX6100 VRN2E1PX6200 VRN2E1SX0000 VRN2E1PX0000			
	55	7			VRN2E2SX6100 VRN2E2SX6200 VRN2E2PX6100 VRN2E2PX6200 VRN2E2SX0000 VRN2E2PX0000			
	60				VRN2E3SX6100 VRN2E3SX6200 VRN2E3PX6100 VRN2E3PX6200 VRN2E3SX0000 VRN2E3PX0000			
	65				VRN2E4SX6100 VRN2E4SX6200 VRN2E4PX6100 VRN2E4PX6200 VRN2E4SX0000 VRN2E4PX0000			
	70	VRN2E5SX6100 VRN2E5SX6200 VRN2E5PX6100 VRN2E5PX6200 VRN2E5SX0000 VRN2E5PX0000						
	75	VRN2E6SX6100 VRN2E6SX6200 VRN2E6PX6100 VRN2E6PX6200 VRN2E6SX0000 VRN2E6PX0000						
	80	VRN2E7SX6100 VRN2E7SX6200 VRN2E7PX6100 VRN2E7PX6200 VRN2E7SX0000 VRN2E7PX0000						
85	VRN2E8SX6100 VRN2E8SX6200 VRN2E8PX6100 VRN2E8PX6200 VRN2E8SX0000 VRN2E8PX0000							
95	11	VRN2E9SX6100 VRN2E9SX6200 VRN2E9PX6100 VRN2E9PX6200 VRN2E9SX0000 VRN2E9PX0000						
2"	25	4	58	100	VRN2FQSX6100 VRN2FQSX6200 VRN2FQPX6100 VRN2FQPX6200 VRN2FQSX0000 VRN2FQPX0000			
	30				VRN2FRSX6100 VRN2FRSX6200 VRN2FRPX6100 VRN2FRPX6200 VRN2FRSX0000 VRN2FRPX0000			
	35				VRN2FSSX6100 VRN2FSSX6200 VRN2FSPX6100 VRN2FSPX6200 VRN2FSSX0000 VRN2FSPX0000			
	40	6			VRN2FTSX6100 VRN2FTSX6200 VRN2FTPX6100 VRN2FTPX6200 VRN2FTSX0000 VRN2FTPX0000			
	45				VRN2FUSX6100 VRN2FUSX6200 VRN2FUPX6100 VRN2FUPX6200 VRN2FUSX0000 VRN2FUPX0000			
	50				VRN2F1SX6100 VRN2F1SX6200 VRN2F1PX6100 VRN2F1PX6200 VRN2F1SX0000 VRN2F1PX0000			
	55	7			VRN2F2SX6100 VRN2F2SX6200 VRN2F2PX6100 VRN2F2PX6200 VRN2F2SX0000 VRN2F2PX0000			
	60				VRN2F3SX6100 VRN2F3SX6200 VRN2F3PX6100 VRN2F3PX6200 VRN2F3SX0000 VRN2F3PX0000			
	65				VRN2F4SX6100 VRN2F4SX6200 VRN2F4PX6100 VRN2F4PX6200 VRN2F4SX0000 VRN2F4PX0000			
	70	VRN2F5SX6100 VRN2F5SX6200 VRN2F5PX6100 VRN2F5PX6200 VRN2F5SX0000 VRN2F5PX0000						
	75	VRN2F6SX6100 VRN2F6SX6200 VRN2F6PX6100 VRN2F6PX6200 VRN2F6SX0000 VRN2F6PX0000						
	2-1/2"	25			4	58	100	VRN2GQSX6100 VRN2GQSX6200 VRN2GQPX6100 VRN2GQPX6200 VRN2GQSX0000 VRN2GQPX0000
		30						VRN2GRSX6100 VRN2GRSX6200 VRN2GRPX6100 VRN2GRPX6200 VRN2GRSX0000 VRN2GRPX0000
		35						VRN2GSSX6100 VRN2GSSX6200 VRN2GSPX6100 VRN2GSPX6200 VRN2GSSX0000 VRN2GSPX0000
		40			6			VRN2GTSX6100 VRN2GTSX6200 VRN2GTPX6100 VRN2GTPX6200 VRN2GTSX0000 VRN2GTPX0000
45		VRN2GUSX6100 VRN2GUSX6200 VRN2GUPX6100 VRN2GUPX6200 VRN2GUSX0000 VRN2GUPX0000						
50		VRN2G1SX6100 VRN2G1SX6200 VRN2G1PX6100 VRN2G1PX6200 VRN2G1SX0000 VRN2G1PX0000						
55		7	VRN2G2SX6100 VRN2G2SX6200 VRN2G2PX6100 VRN2G2PX6200 VRN2G2SX0000 VRN2G2PX0000					
60			VRN2G3SX6100 VRN2G3SX6200 VRN2G3PX6100 VRN2G3PX6200 VRN2G3SX0000 VRN2G3PX0000					
65			VRN2G4SX6100 VRN2G4SX6200 VRN2G4PX6100 VRN2G4PX6200 VRN2G4SX0000 VRN2G4PX0000					
70		VRN2G5SX6100 VRN2G5SX6200 VRN2G5PX6100 VRN2G5PX6200 VRN2G5SX0000 VRN2G5PX0000						
75		VRN2G6SX6100 VRN2G6SX6200 VRN2G6PX6100 VRN2G6PX6200 VRN2G6SX0000 VRN2G6PX0000						
80		VRN2G7SX6100 VRN2G7SX6200 VRN2G7PX6100 VRN2G7PX6200 VRN2G7SX0000 VRN2G7PX0000						
85		VRN2G8SX6100 VRN2G8SX6200 VRN2G8PX6100 VRN2G8PX6200 VRN2G8SX0000 VRN2G8PX0000						
95*		11	VRN2G9SX6100 VRN2G9SX6200 VRN2G9PX6100 VRN2G9PX6200 VRN2G9SX0000 VRN2G9PX0000					
3"		25	4	58	100			VRN2HQSX6100 VRN2HQSX6200 VRN2HQPX6100 VRN2HQPX6200 VRN2HQSX0000 VRN2HQPX0000
	30	VRN2HRSX6100 VRN2HRSX6200 VRN2HRPX6100 VRN2HRPX6200 VRN2HRSX0000 VRN2HRPX0000						
	35	VRN2HSSX6100 VRN2HSSX6200 VRN2HSPX6100 VRN2HSPX6200 VRN2HSSX0000 VRN2HSPX0000						
	40	6	VRN2HTSX6100 VRN2HTSX6200 VRN2HTPX6100 VRN2HTPX6200 VRN2HTSX0000 VRN2HTPX0000					
	45		VRN2HUSX6100 VRN2HUSX6200 VRN2HUPX6100 VRN2HUPX6200 VRN2HUSX0000 VRN2HUPX0000					
	50		VRN2H1SX6100 VRN2H1SX6200 VRN2H1PX6100 VRN2H1PX6200 VRN2H1SX0000 VRN2H1PX0000					
	55	7	VRN2H2SX6100 VRN2H2SX6200 VRN2H2PX6100 VRN2H2PX6200 VRN2H2SX0000 VRN2H2PX0000					
	60		VRN2H3SX6100 VRN2H3SX6200 VRN2H3PX6100 VRN2H3PX6200 VRN2H3SX0000 VRN2H3PX0000					
	65		VRN2H4SX6100 VRN2H4SX6200 VRN2H4PX6100 VRN2H4PX6200 VRN2H4SX0000 VRN2H4PX0000					
	70	VRN2H5SX6100 VRN2H5SX6200 VRN2H5PX6100 VRN2H5PX6200 VRN2H5SX0000 VRN2H5PX0000						
	75	VRN2H6SX6100 VRN2H6SX6200 VRN2H6PX6100 VRN2H6PX6200 VRN2H6SX0000 VRN2H6PX0000						
	80	VRN2H7SX6100 VRN2H7SX6200 VRN2H7PX6100 VRN2H7PX6200 VRN2H7SX0000 VRN2H7PX0000						
	85	VRN2H8SX6100 VRN2H8SX6200 VRN2H8PX6100 VRN2H8PX6200 VRN2H8SX0000 VRN2H8PX0000						
	95*	1	VRN2H9SX6100 VRN2H9SX6200 VRN2H9PX6100 VRN2H9PX6200 VRN2H9SX0000 VRN2H9PX0000					

* Full port ball

** Differential pressure regulator operating range, ±5%

Pressure Independent Control Valves, Flanged 2½"-6"

Common Features

- Multi-sized bodies from 2-1/2 to 6 inch pipes with wafer flanged connections.
- Combination ANSI/ASME Class 150/300 pressure rating.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 39 to 469 gpm.
- Stainless steel pressure regulator maintains constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design provides flow control accuracy of ±5% over specified pressure range.
- Equal percentage flow characteristic using multi turn, nonrising, characterized plug.
- High close-off rating.
- 50 discrete, selectable flow rates available per valve size.
- Stainless steel trim.
- Six-turn actuator with floating or modulating inputs available with stay-in-place or electronic fail safe action.
- Fail safe actuators field-configurable for normally open or normally closed power failure return position.
- Two Test Ports for venting or pressure gauge attachment.



Flanged Pressure Independent Control Valves							
Actuator Features			Non-Fail Safe		Fail Safe		
Power Supply	Voltage		24 Vac/30 Vdc		24 Vac/30 Vdc		
	Frequency		50 / 60 Hz		50 / 60 Hz		
	Power		20 VA		20 VA		
Enclosure	(ingress protection)		IP44		IP44		
Control	2-10 Vdc		•		•		
	4-20 mA (w/external 500 Ohm Resistor)		•		•		
	Pulse-width Modulating		•		•		
	Floating		•		•		
	Two-Position SPDT		•		•		
Fail Safe Action	(field configurable*)		Stay in Place		Open/Closed*		
Normal Position (no signal)	(field configurable)		Open/Closed		Open/Closed		
Actuator Stroke	(degrees)		6 x 360°		6 x 360°		
Timing	(seconds, 60 Hz)		150		150		
Feedback	4-20 mA (2-10 Vdc) Built in		•		•		
			Trim		Stainless Steel		
			Body		Cast Iron		
			Pressure Ratings		ANSI 150/300		
			Test Ports		Two - 1/4" ISO		
Valve Features							
Valve Size	Flow, gpm*		Differential Pressure (psid)			Valve O.S. Number	
	Min.	Max.	Min.**	Max.**	Close-off		
2-1/2 and 3 in. [DN65-DN80]	39	112	5.1	58	100	VRW2JV4SMB	VRW2JV4SMD
	56	155	11.6			VRW2JW4SMB	VRW2JW4SMD
3 and 4 in. [DN80-DN100]	55	147	5.1			VRW2KV4SMB	VRW2KV4SMD
	73	222	8.6			VRW2KW4SMB	VRW2KW4SMD
5 and 6 in. [DN125-DN150]	103	370	5.1			VRW2LV4SMB	VRW2LV4SMD
	118	469	8.6			VRW2LW4SMB	VRW2LW4SMD

* Field adjustable

** Differential pressure regulator operating range, ±5%

Product Selection - Valves

NPT Globe Valves 1/2" - 3", With Dedicated Valve Actuators

For more than 50 years, Honeywell Globe Valves (V5011/13, VGF) have provided precise control for most applications.

Globe valves provide the rangeability and close-off needed to keep tight control of the environment.

Valve and Actuator Assemblies available.

Full part numbers are **valve part number+actuator part number**

Example of complete orderable part number: **V5011N1008+ML7984A4009**



Actuator Features		Non-Fail Safe					
Actuator O.S. Number		ML7984A4009	ML6984A4000	ML7420A3065	ML7420A3063	ML6420A3049	ML6420A3066
Power Supply	Voltage	24 Vac / 28 Vdc	24 Vac / 28 Vdc	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	0 / 50 / 60 Hz	0 / 50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	12 VA	12 VA	7 VA	7 VA	6 VA	6 VA
Stem Force	(lbs.)	160	160	135	135	135	135
Control	(0)2-10 Vdc	•		•	•		
	4-20 mA (external 500 Ohm Resistor)	Built-in		•	•		
	Floating		•			•	•
	Two-Position SPDT		•			•	•
	Two-Position SPST						
	135 Ohm	•					
Fail Safe Action		Stay in place	Stay in place	Stay in place	Stay in place	Stay in place	Stay in place
Normal Position (no signal)	(field configurable)	Stem Up	Stem Up	Stem Up	Stem Up	Stem Up	Stem Up
Actuator Stroke	(inches)	0.5 - 1 self adj	0.5 - 1 self adj	0.75	0.75	0.75	0.75
Timing	(seconds at 0.75" stroke)	63	63	60	30	60	30
Aux Switch	1 x SPDT Add-On	272630D	272630D				
	2 x SPDT Add-On					43191680-105	43191680-105
Feedback	2-10 Vdc Built-in			•	•		
	2-10 Vdc Add-On	272630D	272630D	•	•		
	220 Ohm Add-On			43191679-112	43191679-112	43191679-112	43191679-112
	10 kOhm Add-On			43191679-111	43191679-111	43191679-111	43191679-111

Valve Size (inches)	Cv	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid						
2-Way Water Valves Straight Through	1/2"	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1008	230	230	230	230	230	230	
					Stem down to close	V5011N1016	230	230	230	230	230	230	
					Stem down to close	V5011N1024	230	230	230	230	230	230	
					Stem down to close	V5011N1032	230	230	230	230	230	230	
					Stem up to close	V5011N3004	230	230	230	230	230	230	
					Stem down to close	V5011N1040	230	230	230	230	230	230	
	3/4"	250 psi @ 100F	100 psig / 337 F	Linear	Stem down to close	Stem up to close	V5011N3012	230	230	230	230	230	230
						Stem down to close	V5011N1057	230	230	230	230	230	230
						Stem up to close	V5011N3020	230	230	230	230	230	230
						Stem down to close	V5011N1065	193	193	163	163	163	163
						Stem up to close	V5011N3038	193	193	163	163	163	163
						Stem down to close	V5011N1073	123	123	104	104	104	104
						Stem up to close	V5011N3046	123	123	104	104	104	104
						Stem down to close	V5011N1081	79	79	67	67	67	67
						Stem down to close	V5011N1099	44	44	37	37	37	37
						Stem down to close	V5011F1105	33	33	28	28	28	28
2"	250 psi @ 100F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	Stem down to close	V5011F1113	19	19	16	16	16	16	
					Stem down to close	V5011N2006	100	100	100	100	100	100	
3-Way Water Valves Mixing	1/2"	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	Stem down to close	V5011N2014	100	100	100	100	100	
						Stem down to close	V5011N2022	100	100	100	100	100	100
						Stem down to close	V5011N2030	100	100	100	100	100	100
						Stem down to close	V5011N2048	100	100	100	100	100	100
						Stem down to close	V5011N2055	100	100	100	100	100	100
						Stem down to close	V5011N2063	100	100	100	100	100	100
	3/4"	250 psi @ 100F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	Stem down to close	V5011N2071	100	100	100	100	100	
						Stem down to close	V5011N2089	79	79	67	67	67	67
						Stem down to close	V5011N2097	44	44	37	37	37	37
						Stem down to close	V5011G1111	33	33	28	28	28	28
						Stem down to close	V5011G1129	19	19	16	16	16	16
						Stem down to close	V5013N1030	230	230	230	230	230	230
1"	250 psi @ 100F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	Stem down to close	V5013N1048	230	230	230	230	230		
					Stem down to close	V5013N1055	230	230	230	230	230	230	
					Stem down to close	V5013N1063	193	193	163	163	163	163	
					Stem down to close	V5013N1071	123	123	104	104	104	104	
					Stem down to close	V5013N1089	79	79	67	67	67	67	
					Stem down to close	V5013N1097	44	44	37	37	37	37	

NPT Globe Valves 1/2" - 3", With Dedicated Valve Actuators

Common Features

- ANSI body class 150
- Close-off pressure = maximum differential pressure
- Maximum static water pressure (250°F): 240 psi
- Maximum steam pressure
- 2-way steam valves, 337°F: 100 psi
- 2-way water valves: 15 psi
- Stem travel: 0.75"
- Rangeability: 50:1
- Leakage < 0.05% of Cv
- Body material: Red brass, stainless steel stem (steam valve has stainless steel trim.)

Valve and Actuator Assemblies available.

Full part numbers are **valve part number+actuator part number**

Example of complete orderable part number: **V5011N1008+ML7421A1032**



Actuator Features		Non-Fail Safe		Fail Safe			
Actuator O.S. Number		ML7421A1032	ML6421A1017	ML7425A3013	ML7425B3012	ML6425A3022	ML6425B3013
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	12 VA	11 VA	12 VA	12 VA	11 VA	11 VA
Stem Force	(lbs.)	404	404	135	135	135	135
Control	(0)2-10 Vdc	•		•	•		
	4-20 mA (external 500 Ohm Resistor)	•		•	•		
	Floating		•			•	•
	Two-Position SPDT		•			•	•
	Two-Position SPST					•	•
	135 Ohm						
Fail Safe Action		Stay in place	Stay in place	Stem Down	Stem Up	Stem Down	Stem Up
Normal Position (no signal)	(field configurable)	Stem Up	Stem Up	Stem Up	Stem Up	Stem Up	Stem Up
Actuator Stroke	(inches)	0.75	0.75	0.75	0.75	0.75	0.75
Timing	(seconds at 0.75" stroke)	90	90	90	90	90	90
Aux Switch	1 x SPDT Add-On						
	2 x SPDT Add-On		43191680-102			43191680-105	43191680-105
Feedback	2-10 Vdc Built-in	•		•	•		
	2-10 Vdc Add-On						
	220 Ohm Add-On			43191679-112	43191679-112	43191679-112	43191679-112
	10 kOhm Add-On	43191679-101	43191679-101	43191679-111	43191679-111	43191679-111	43191679-111

Valve Size (inches)	Cv	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid						
2-Way Water Valves Straight Through	1/2"	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1008			230*	230**	230*	230**	
					Stem down to close	V5011N1016			230*	230**	230*	230**	
					Stem down to close	V5011N1024			230*	230**	230*	230**	
					Stem down to close	V5011N1032			230*	230**	230*	230**	
					Stem up to close	V5011N3004			230**	230*	230**	230*	
					Stem down to close	V5011N1040			230*	230**	230*	230**	
	3/4"	7.3	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem up to close	V5011N3012			230*	230**	230*	230**
						Stem down to close	V5011N1057			230*	230**	230*	230**
						Stem up to close	V5011N3020			230**	230*	230**	230*
						Stem down to close	V5011N1065	230	230	163*	163**	163*	163**
						Stem up to close	V5011N3038	230	230	163**	163*	163**	163*
						Stem down to close	V5011N1073	230	230	104*	104**	104*	104**
	1-1/4"	18.7	250 psi @ 100F	15 psi (2-position)	Equal %	Stem up to close	V5011N3046	230	230	104**	104*	104**	104*
						Stem down to close	V5011N1081	221	221	67*	67**	67*	67**
						Stem down to close	V5011N1099	126	126	37*	37**	37*	37**
						Stem down to close	V5011F1105	100	100	28*	28**	28*	28**
Stem down to close						V5011F1113	61	61	16*	16**	16*	16**	
Stem down to close						V5011N2006			100*	100**	100*	100**	
2-Way Steam Valves Straight Through	1/2"	217 psi @ 248 F	100 psig / 337 F	Linear	Stem down to close	V5011N2014			100*	100**	100*	100**	
						V5011N2022			100*	100**	100*	100**	
						V5011N2030			100*	100**	100*	100**	
						V5011N2048			100*	100**	100*	100**	
						V5011N2055			100*	100**	100*	100**	
						V5011N2063	100	100	100*	100**	100*	100**	
	3/4"	7.3	217 psi @ 248 F	100 psig / 337 F	Linear	Stem down to close	V5011N2071	100	100	100*	100**	100*	100**
							V5011N2089	100	100	67*	67**	67*	67**
							V5011N2097	100	100	37*	37**	37*	37**
							V5011G1111	100	100	28*	28**	28*	28**
							V5011G1129	61	61	16*	16**	16*	16**
							V5011N2006			100*	100**	100*	100**
	1-1/4"	18.7	250 psi @ 100F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1030			230	230	230	230
							V5013N1048			230	230	230	230
							V5013N1055			230	230	230	230
							V5013N1063	230	230	163	163	163	163
V5013N1071							230	230	104	104	104	104	
V5013N1089							221	221	67	67	67	67	
2"	46.8	250 psi @ 100F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1097	126	126	37	37	37	37	

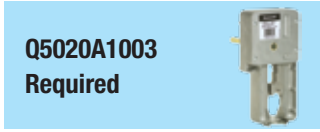
* valve is Normally Closed on loss of power
** valve is Normally Open on loss of power.

Product Selection - Valves

NPT Globe Valves 1/2" - 3", With DCA and Valve Linkage

Common Features

- ANSI body class 150
- Close-Off pressure = maximum differential pressure
- Maximum static water pressure (250°F): 240 psi
- Maximum steam pressure
2-way steam valves, 337°F: 100 psi
2-way water valves: 15 psi
- Stem travel: 0.75"
- Rangeability: 50:1
- Leakage < 0.05% of Cv
- Body material: Red brass, stainless steel stem (steam valve has stainless steel trim.)



Actuator Features		Non-Fail Safe					
Actuator O.S. Number		ML7161A2008	ML6161B2024	ML7174A2001	ML6174B2019	MN7505A2001 MN7505A2209	MN6105A1011 MN6105A1201
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	5.4 VA	1.8 VA	5.4 VA	2.4 VA	5 VA	5 VA
Actuator Torque	(lb.-in.)	35	35	70	70	44	44
Linkage Stem Force	(lbs.)	46	46	93	93	58	58
Control	(0)2-10 Vdc	•		•		•	
	4-20 mA (external 500 Ohm Resistor)	•		•		•	
	Floating		•		•	•	•
	Two-Position SPDT		•		•	•	•
	Two-Position SPST					•	•
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(inches)	90°	90°	90°	90°	95°	95°
Timing	(seconds at 0.75" stroke)	90	90	90	90	95	95
Aux Switch	2 x SPDT Built In					0 / 2	0 / 2
	1 x SPDT Add-On	201052A	201052A	201052A	201052A		
	2 x SPDT Add-On	201052B	201052B	201052B	201052B	SSW2	SSW2
Feedback	(0)2-10 Vdc Built In					•	
	500 Ohm Add-On	200976A	200976A	200976A	200976A		
	2 kOhm Add-On	200976B	200976B	200976B	200976B		

2-Way Water Valves Straight Through

Valve Size (inches)	Cv	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid						
1/2"	0.73	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1008	230	230	230	230	230	230	
	1.16					V5011N1016	230	230	230	230	230	230	
	1.85					V5011N1024	230	230	230	230	230	230	
	2.9					V5011N1032	230	230	230	230	230	230	
	2.9					V5011N3004	230	230	230	230	230	230	
	4.7					V5011N1040	143	143	230	230	188	188	
	4.7					V5011N3012	143	143	230	230	188	188	
	3/4"					7.3	V5011N1057	69	69	156	156	91	91
	3/4"					7.3	V5011N3020	69	69	156	156	91	91
	1"					11.7	V5011N1065	47	47	109	109	63	63
	1"					11.7	V5011N3038	47	47	109	109	63	63
	1-1/4"					18.7	V5011N1073	29	29	69	69	39	39
1-1/4"	18.7	V5011N3046	29	29	69	69	39	39					
1-1/2"	29.3	V5011N1081	17	17	44	44	24	24					
2"	46.8	V5011N1099	8	8	24	24	12	12					
2-1/2"	63	V5011F1105	5	5	16	16	7	7					
3"	100	V5011F1113	2	2	9	9	3	3					
1/2"	0.73	217 psi @ 248 F	100 psig / 337 F	Linear	Stem down to close	V5011N2006	100	100	100	100	100	100	
	1.16					V5011N2014	100	100	100	100	100	100	
	1.85					V5011N2022	100	100	100	100	100	100	
	2.9					V5011N2030	100	100	100	100	100	100	
	4.7					V5011N2048	100	100	100	100	100	100	
	4.7					V5011N2055	69	69	100	100	91	91	
	3/4"					7.3	V5011N2063	47	47	100	100	63	63
	1"					11.7	V5011N2071	29	29	69	69	39	39
	1-1/4"					18.7	V5011N2089	17	17	44	44	24	24
	1-1/2"					29.3	V5011N2097	8	8	24	24	12	12
	2"					46.8	V5011G1111	5	5	16	16	7	7
	2-1/2"					63	V5011G1129	2	2	9	9	3	3
3"	100												
1/2"	2.9	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1030	230	230	230	230	230	230	
	4.7					V5013N1048	143	143	230	230	188	188	
	7.3					V5013N1055	69	69	156	156	91	91	
	11.7					V5013N1063	47	47	109	109	63	63	
	18.7					V5013N1071	29	29	69	69	39	39	
	29.3					V5013N1089	17	17	44	44	24	24	
	46.8					V5013N1097	8	8	24	24	12	12	

Product Selection - Valves

NPT Globe Valves 1/2" - 3", With DCA and Valve Linkage

**Q5020A1003
Required**



Actuator Features		Non-Fail Safe					
Actuator O.S. Number		MN7510A2001 MN7510A2009	MN6110A1003 MN6110A1201	MN7220A2007 MN7220A2205	MN6120A1002 MN6120A1200	MN7234A2008	MN6134A1003
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	5 VA	5 VA	6 VA	6 VA	9 VA	9 VA
Actuator Torque	(lb.-in.)	88	88	175	175	300	300
Linkage Stem Force	(lbs.)	117	117	234	234	402	402
Control	(0)2-10 Vdc	•		•		•	
	4-20 mA (external 500 Ohm Resistor)	•		•		•	
	Floating	•	•	•	•		•
	Two-Position SPDT	•	•	•	•		•
	Two-Position SPST	•	•	•	•	•	•
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(inches)	95°	95°	95°	95°	95°	95°
Timing	(seconds at 0.75" stroke)	95	95	95	95	95	95
Aux Switch	2 x SPDT Built In	0 / 2	0 / 2	0 / 2	0 / 2		
	1 x SPDT Add-On						
	2 x SPDT Add-On	SSW2	SSW2	SW2-US	SW2-US	SW2-US	SW2-US
Feedback	(0)2-10 Vdc Built In	•		•		•	
	500 Ohm Add-On						
	2 kOhm Add-On						

Valve Size (inches)	Cv	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid					
2-Way Water Valves Straight Through	1/2"	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1008	230	230	230	230	230	230
						V5011N1016	230	230	230	230	230	230
						V5011N1024	230	230	230	230	230	230
						V5011N1032	230	230	230	230	230	230
						V5011N3004	230	230	230	230	230	230
						V5011N1040	230	230	230	230	230	230
	V5011N3012					230	230	230	230	230	230	
	V5011N1057					192	192	230	230	230	230	
	V5011N3020					192	192	230	230	230	230	
	V5011N1065					135	135	230	230	230	230	
	V5011N3038					135	135	230	230	230	230	
	V5011N1073					85	85	168	168	230	230	
	V5011N3046					85	85	168	168	230	230	
	V5011N1081					55	55	113	113	180	180	
V5011N1099	30	30	63	63	103	103						
2-Way Steam Valves Straight Through	1/2"	217 psi @ 248 F	100 psig / 337 F	Linear	Stem down to close	V5011N2006	100	100	100	100	100	100
						V5011N2014	100	100	100	100	100	100
						V5011N2022	100	100	100	100	100	100
						V5011N2030	100	100	100	100	100	100
						V5011N2048	100	100	100	100	100	100
						V5011N2055	100	100	100	100	100	100
	V5011N2063					100	100	100	100	100	100	
	V5011N2071					85	85	100	100	100	100	
	V5011N2089					55	55	100	100	100	100	
	V5011N2097					30	30	58	58	100	100	
3-Way Water Valves Mixing	1/2"	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1030	230	230	230	230	230	230
						V5013N1048	230	230	230	230	230	230
						V5013N1055	192	192	230	230	230	230
						V5013N1063	135	135	230	230	230	230
						V5013N1071	85	85	168	168	230	230
						V5013N1089	55	55	105	105	180	180
						V5013N1097	30	30	103	103	103	103
						V5011F1113	11	11	26	26	45	45

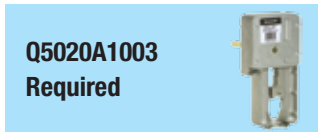
VALVES

Product Selection - Valves

NPT Globe Valves 1/2" - 3", With DCA and Valve Linkage

Common Features

- ANSI body class 150
- Close-Off pressure = maximum differential pressure
- Maximum static water pressure (250°F): 240 psi
- Maximum steam pressure
2-way steam valves, 337°F: 100 psi
2-way water valves: 15 psi
- Stem travel: 0.75"
- Rangeability: 50:1
- Leakage < 0.05% of Cv
- Body material: Red brass, stainless steel stem (steam valve has stainless steel trim.)



Actuator Features		Fail Safe				
Actuator O.S. Number		MS7505A2030 MS7505A2130	MS8105A1030 MS8105A1130	MS4105A1030 MS4105A1130	MS7510A2008 MS7510A2206 MS7510H2209	MS8110A1008 MS8110A1206
	Power Supply	Voltage	24 Vac	24 Vac	100-250 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	7.5VA	8 VA	11VA	14 VA	30 VA
Actuator Torque	(lb.-in.)	44	44	44	88	88
Linkage Stem Force	(lbs.)	58	58	58	117	117
Control	(0)2-10 Vdc	•			•	
	4-20 mA (external 500 Ohm Resistor)	•			•	
	Floating	•			•	
	Two-Position SPDT	•			•	
	Two-Position SPST	•	•	•	•	•
Fail Safe Action		Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(inches)	95°	95°	95°	95°	95°
Timing	(seconds at 0.75" stroke)	90	90	90	90	90
Aux Switch	SPDT Built In	0 / 1	0 / 1	0 / 1	0 / 2 / 2	0 / 2
	2 x SPDT Add-On				SW2-US	SW2-US
Feedback	2-10 Vdc Built In	•			•	

2-Way Water Valves

Straight Through

Valve Size (inches)	Cv	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid				
1/2"	0.73	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1008	230	230	230	230	230
	1.16					V5011N1016	230	230	230	230	230
	1.85					V5011N1024	230	230	230	230	230
	2.9					V5011N1032	230	230	230	230	230
	4.7					V5011N3004	230	230	230	230	230
	4.7					V5011N1040	184	184	184	230	230
	4.7					V5011N3012	184	184	184	230	230
	7.3					V5011N1057	79	79	79	150	150
	7.3					V5011N3020	79	79	79	150	150
	11.7					V5011N1065	66	66	66	136	136
11.7	V5011N3038	66	66	66	136	136					
18.7	V5011N1073	40	40	40	84	84					
18.7	V5011N3046	40	40	40	84	84					
29.3	V5011N1081	26	26	26	55	55					
46.8	V5011N1099	13	13	13	30	30					
63	V5011F1105	9	9	9	21	21					
100	V5011F1113	6	6	6	13	13					
1/2"	0.73	217 psi @ 248 F	100 psig / 337 F	Linear	Stem down to close	V5011N2006	100	100	100	100	100
	1.16					V5011N2014	100	100	100	100	100
	1.85					V5011N2022	100	100	100	100	100
	2.9					V5011N2030	100	100	100	100	100
	4.7					V5011N2048	100	100	100	100	100
	7.3					V5011N2055	79	79	79	100	100
	11.7					V5011N2063	66	66	66	100	100
	18.7					V5011N2071	40	40	40	84	84
	29.3					V5011N2089	26	26	26	55	55
	46.8					V5011N2097	13	13	13	30	30
63	V5011G1111	9	9	9	21	21					
100	V5011G1129	6	6	6	13	13					
1/2"	2.9	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1030	230	230	230	230	230
	4.7					V5013N1048	184	184	184	230	230
	7.3					V5013N1055	79	79	79	150	150
	11.7					V5013N1063	66	66	66	136	136
	18.7					V5013N1071	40	40	40	84	84
	29.3					V5013N1089	26	26	26	55	55
	46.8					V5013N1097	13	13	13	30	30

2-Way Steam Valves

Straight Through

3-Way Water Valves

Mixing

Product Selection - Valves

NPT Globe Valves 1/2"- 3", With DCA and Valve Linkage

**Q5020A1003
Required**



Actuator Features		Fail Safe			
Actuator O.S. Number		MS4110A1002 MS4110A1200	MS7520A2007 MS7520A2205 MS7520H2208	MS8120A1007 MS8120A1205	MS4120A1001 MS4120A1209
Power Supply	Voltage	100-250 Vac	24 Vac	24 Vac	100-250 Vac
	Frequency	60 Hz	50 / 60 Hz	50 / 60 Hz	60 Hz
	Power	45 VA	16 VA	40 VA	60 VA
Actuator Torque	(lb.-in.)	88	175	175	175
Linkage Stem Force	(lbs.)	117	234	234	234
Control	(0)2-10 Vdc		•		
	4-20 mA (external 500 Ohm Resistor)		•		
	Floating		•		
	Two-Position SPDT		•		
	Two-Position SPST		•		
Fail Safe Action		Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(inches)	95°	95°	95°	95°
Timing	(seconds at 0.75" stroke)	90	90	90	90
Aux Switch	SPDT Built In	0 / 2	0 / 2 / 2	0 / 2	0 / 2
	2 x SPDT Add-On	SW2-US	SW2-US	SW2-US	SW2-US
Feedback	2-10 Vdc Built In		•		

	Valve Size (inches)	Cv	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid			
2-Way Water Valves Straight Through	1/2"	0.73	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1008	230	230	230	230
		1.16					V5011N1016	230	230	230	230
		1.85					V5011N1024	230	230	230	230
		2.9					V5011N1032	230	230	230	230
		2.9					V5011N3004	230	230	230	230
		4.7					V5011N1040	230	230	230	230
	3/4"	7.3	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem up to close	V5011N3012	230	230	230	230
		7.3					V5011N1057	150	230	230	230
		11.7					V5011N3020	150	230	230	230
		11.7					V5011N1065	136	230	230	230
		18.7					V5011N3038	136	230	230	230
		18.7					V5011N1073	84	171	171	171
	1"	11.7	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem up to close	V5011N3046	84	171	171	171
		11.7					V5011N1081	55	113	113	113
		18.7					V5011N1099	30	63	63	63
		18.7					V5011F1105	21	45	45	45
29.3		V5011F1113					13	27	27	27	
29.3		V5011N2006					100	100	100	100	
2-Way Steam Valves Straight Through	1/2"	0.73	217 psi @ 248 F	100 psig / 337 F	Linear	Stem down to close	V5011N2014	100	100	100	100
		1.16					V5011N2022	100	100	100	100
		1.85					V5011N2030	100	100	100	100
		2.9					V5011N2048	100	100	100	100
		4.7					V5011N2055	100	100	100	100
		4.7					V5011N2063	100	100	100	100
	3/4"	7.3	217 psi @ 248 F	100 psig / 337 F	Linear	Stem down to close	V5011N2071	84	100	100	100
		7.3					V5011N2089	55	100	100	100
		11.7					V5011N2097	30	63	63	63
		11.7					V5011G1111	21	45	45	45
1"	11.7	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5011G1129	13	27	27	27	
	11.7					V5013N1030	230	230	230	230	
	18.7					V5013N1048	230	230	230	230	
	18.7					V5013N1055	150	230	230	230	
	29.3					V5013N1063	136	230	230	230	
	29.3					V5013N1071	84	171	171	171	
1-1/2"	29.3	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1089	55	113	113	113	
	46.8					V5013N1097	30	63	63	63	
	46.8										
	46.8										

VALVES

Product Selection - Valves

NPT Globe Valves 1/2" - 3", With Pneumatic Actuator

Common Features

- Rolling diaphragm for long life and low hysteresis
- Easily installation and attachment to the valve
- Direct or reverse acting
- No positive positioner

Valve and Actuator Assemblies available.

Full part numbers are **valve part number+actuator part number**



Example of complete orderable part number: **V5011N3004+MP953C1000**



Actuator Features		Without Positive Positioner											
Actuator O.S. Number		MP953C1000	MP953C1018	MP953C1026	MP953C1067	MP953C1075	MP953C1083	MP953C1554	MP953C1562	MP953D1107	MP953D1131	MP953D1172	
Direct Acting / Reverse Acting		Direct Acting						Reverse Acting					
Diaphragm Size		5"			8"			13"			7-1/8"		
Fail Safe Action		Stem Up						Stem Down					
Actuator Force		Low			Medium			High			Medium		
Spring Range	2-7 psi	•			•			•					
	3-7 psi											•	
	8-12 psi		•			•							
	8-13 psi									•			
	4-11 psi			•			•		•		•		

Valve Size (inches)	Cv	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure - See Charts On Page 110-111												
					A-NC	A-NC	A-NC	B-NC	B-NC	B-NC	N/A	C-NO	C-NO	C-NO	D*-NC	D*-NC	D*-NC
2-Way Water Valves Straight Through	1/2"	2.9	Equal %	Stem up to close	V5011N3004	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC	N/A	C-NO	C-NO	C-NO		
	1/2"	4.7			V5011N3012	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC	N/A	C-NO	C-NO	C-NO		
	3/4"	7.3			V5011N3020	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC	N/A	C-NO	C-NO	C-NO		
	1"	11.7			V5011N3038	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC	N/A	C-NO	C-NO	C-NO		
	1-1/4"	18.7			V5011N3046	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC	N/A	C-NO	C-NO	C-NO		
	1/2"	0.73			V5011N1008	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC		
	1/2"	1.16		V5011N1016	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	1/2"	1.85		V5011N1024	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	1/2"	2.9		V5011N1032	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	1/2"	4.7		V5011N1040	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	3/4"	7.3		V5011N1057	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	1"	11.7		V5011N1065	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	1-1/4"	18.7		V5011N1073	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	1-1/2"	29.3		V5011N1081	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
	2"	46.8		V5011N1099	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	N/A	D-NC	D-NC	D-NC			
2-1/2"	63	V5011F1105	L-NO	L-NO	L-NO	L-NO	L-NO	L-NO	N/A	G-NC	G-NC	G-NC					
3"	100	V5011F1113	L-NO	L-NO	L-NO	L-NO	L-NO	L-NO	N/A	G-NC	G-NC	G-NC					
2-Way Steam Valves Straight Through	1/2"	0.73	Linear	Stem down to close	V5011N2006	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC		
	1/2"	1.16			V5011N2014	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC		
	1/2"	1.85			V5011N2022	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC		
	1/2"	2.9			V5011N2030	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC		
	1/2"	4.7			V5011N2048	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC		
	3/4"	7.3			V5011N2055	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC		
	1"	11.7		V5011N2063	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC			
	1-1/4"	18.7		V5011N2071	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC			
	1-1/2"	29.3		V5011N2089	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC			
	2"	46.8		V5011N2097	F*-NO	F*-NO	F*-NO	E*-NO	E*-NO	E*-NO	N/A	D*-NC	D*-NC	D*-NC			
	2-1/2"	63		V5011G1111	L*-NO	L*-NO	L*-NO	L*-NO	L*-NO	L*-NO	N/A	G*-NC	G*-NC	G*-NC			
	3"	100		V5011G1129	L*-NO	L*-NO	L*-NO	L*-NO	L*-NO	L*-NO	N/A	G*-NC	G*-NC	G*-NC			
	3-Way Water Valves Mixing	1/2"		2.9	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1030	H-NC	H-NC	H-NC	J-NC	J-NC	J-NC	N/A	K-NC	K-NC	K-NC
		1/2"		4.7			V5013N1048	H-NC	H-NC	H-NC	J-NC	J-NC	J-NC	N/A	K-NC	K-NC	K-NC
		3/4"		7.3			V5013N1055	H-NC	H-NC	H-NC	J-NC	J-NC	J-NC	N/A	K-NC	K-NC	K-NC
1"		11.7	V5013N1063	H-NC			H-NC	H-NC	J-NC	J-NC	J-NC	N/A	K-NC	K-NC	K-NC		
1-1/4"		18.7	V5013N1071	H-NC			H-NC	H-NC	J-NC	J-NC	J-NC	N/A	K-NC	K-NC	K-NC		
1-1/2"		29.3	V5013N1089	H-NC			H-NC	H-NC	J-NC	J-NC	J-NC	N/A	K-NC	K-NC	K-NC		
2"		46.8	V5013N1097	H-NC			H-NC	H-NC	J-NC	J-NC	J-NC	N/A	K-NC	K-NC	K-NC		

*The close-off pressure not to exceed rated pressure of steam valve
 NC = Normally Closed
 NO = Normally Open

Product Selection - Valves

NPT Globe Valves 1/2" - 3", With Pneumatic Actuator

Common Features

- Rolling diaphragm for long life and low hysteresis
- Easily installation and attachment to the valve
- Direct or reverse acting
- Integrated positive positioner

Valve and Actuator Assemblies available.

Full part numbers are **valve part number+actuator part number**



Example of complete orderable part number: **V5011N3004+MP953E1301**



2-Way Water Valves
Straight Through

2-Way Steam Valves
Straight Through

3-Way Water Valves
Mixing

Valve Size (inches)	Cv	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure - See Charts On Page 110-111												
1/2"	2.9	Equal %	Stem up to close	V5011N3004	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC	N/A	C-NO	C-NO	C-NO			
1/2"	4.7			V5011N3012	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC		C-NO	C-NO	C-NO			
3/4"	7.3			V5011N3020	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC		C-NO	C-NO	C-NO			
1"	11.7			V5011N3038	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC		C-NO	C-NO	C-NO			
1-1/4"	18.7			V5011N3046	A-NC	A-NC	A-NC	B-NC	B-NC	B-NC		C-NO	C-NO	C-NO			
1/2"	0.73			V5011N1008	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO		D-NC	D-NC	D-NC			
1/2"	1.16			V5011N1016	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO		D-NC	D-NC	D-NC			
1/2"	1.85			V5011N1024	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO		D-NC	D-NC	D-NC			
1/2"	2.9			V5011N1032	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO		D-NC	D-NC	D-NC			
1/2"	4.7		V5011N1040	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	D-NC	D-NC	D-NC					
3/4"	7.3		V5011N1057	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	D-NC	D-NC	D-NC					
1"	11.7		V5011N1065	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	D-NC	D-NC	D-NC					
1-1/4"	18.7		V5011N1073	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	D-NC	D-NC	D-NC					
1-1/2"	29.3		V5011N1081	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	D-NC	D-NC	D-NC					
2"	46.8		V5011N1099	F-NO	F-NO	F-NO	E-NO	E-NO	E-NO	D-NC	D-NC	D-NC					
2-1/2"	63		V5011F1105							G-NC	G-NC	G-NC					
3"	100		V5011F1113							G-NC	G-NC	G-NC					
1/2"	0.73		Linear	Stem down to close	V5011N2006	F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO	N/A	D*-NC	D*-NC	D*-NC		
1/2"	1.16				V5011N2014	F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO		D*-NC	D*-NC	D*-NC		
1/2"	1.85				V5011N2022	F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO		D*-NC	D*-NC	D*-NC		
1/2"	2.9				V5011N2030	F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO		D*-NC	D*-NC	D*-NC		
1/2"	4.7				V5011N2048	F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO		D*-NC	D*-NC	D*-NC		
3/4"	7.3				V5011N2055	F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO		D*-NC	D*-NC	D*-NC		
1"	11.7	V5011N2063			F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO	D*-NC		D*-NC	D*-NC			
1-1/4"	18.7	V5011N2071			F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO	D*-NC		D*-NC	D*-NC			
1-1/2"	29.3	V5011N2089			F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO	D*-NC		D*-NC	D*-NC			
2"	46.8	V5011N2097			F**-NO	F**-NO	F**-NO	E**-NO	E**-NO	E**-NO	D*-NC		D*-NC	D*-NC			
2-1/2"	63	V5011G1111									G*-NC		G*-NC	G*-NC			
3"	100	V5011G1129									G*-NC		G*-NC	G*-NC			
1/2"	2.9	Linear B-AB / Equal % A-AB			Stem up closes A-AB	V5013N1030	H-NC	H-NC	H-NC	J-NC	J-NC		J-NC	N/A	K-NC	K-NC	K-NC
1/2"	4.7					V5013N1048	H-NC	H-NC	H-NC	J-NC	J-NC		J-NC		K-NC	K-NC	K-NC
3/4"	7.3		V5013N1055	H-NC		H-NC	H-NC	J-NC	J-NC	J-NC	K-NC	K-NC	K-NC				
1"	11.7		V5013N1063	H-NC		H-NC	H-NC	J-NC	J-NC	J-NC	K-NC	K-NC	K-NC				
1-1/4"	18.7		V5013N1071	H-NC		H-NC	H-NC	J-NC	J-NC	J-NC	K-NC	K-NC	K-NC				
1-1/2"	29.3		V5013N1089	H-NC		H-NC	H-NC	J-NC	J-NC	J-NC	K-NC	K-NC	K-NC				
2"	46.8		V5013N1097	H-NC		H-NC	H-NC	J-NC	J-NC	J-NC	K-NC	K-NC	K-NC				

*The close-off pressure not to exceed rated pressure of steam valve.
 **The close-off pressure not to exceed rated pressure of steam valve. Use 4-11 spring range for positive positioner models.
 NC = Normally Closed
 NO = Normally Open

VALVES

Close-off Pressure Charts - Valves

NPT Globe Valves 1/2" - 3"

Chart A

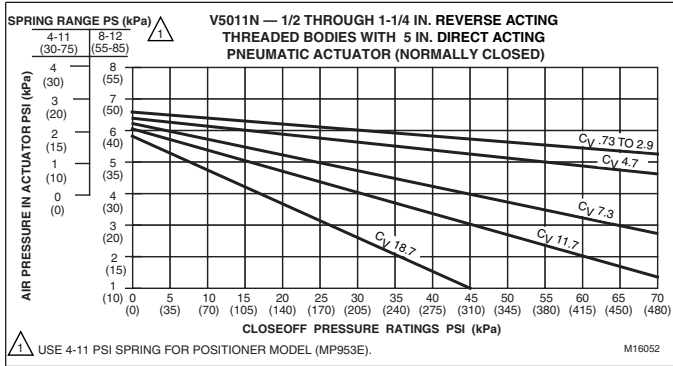


Chart B

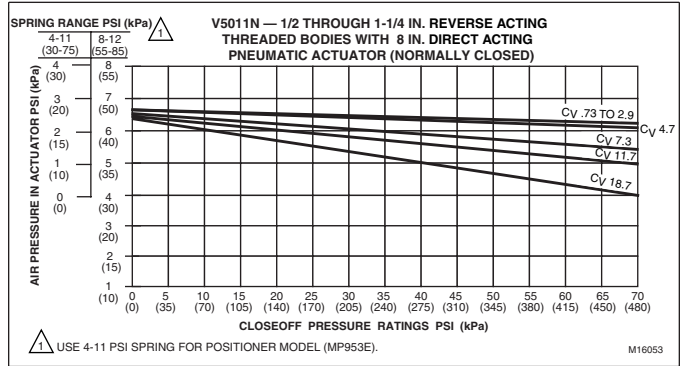


Chart E

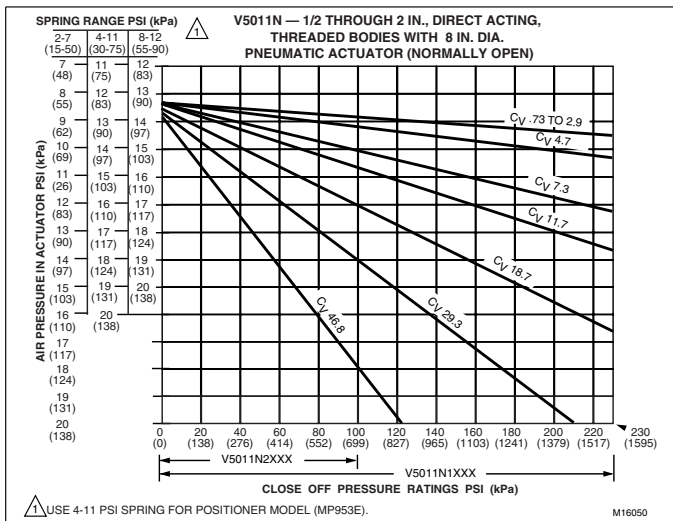


Chart F

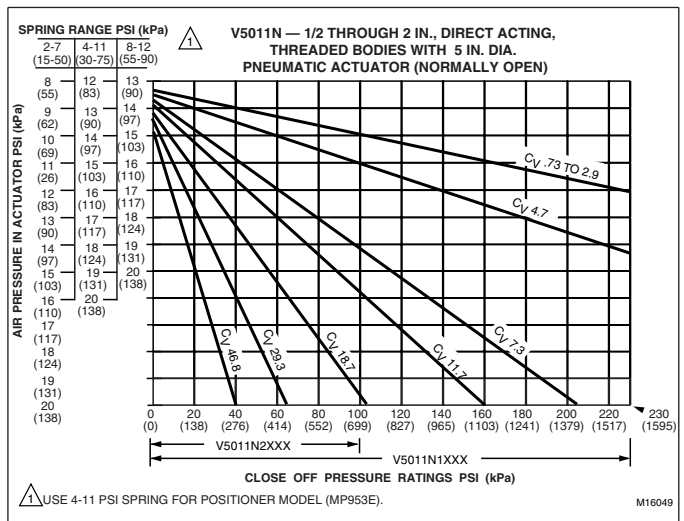


Chart J

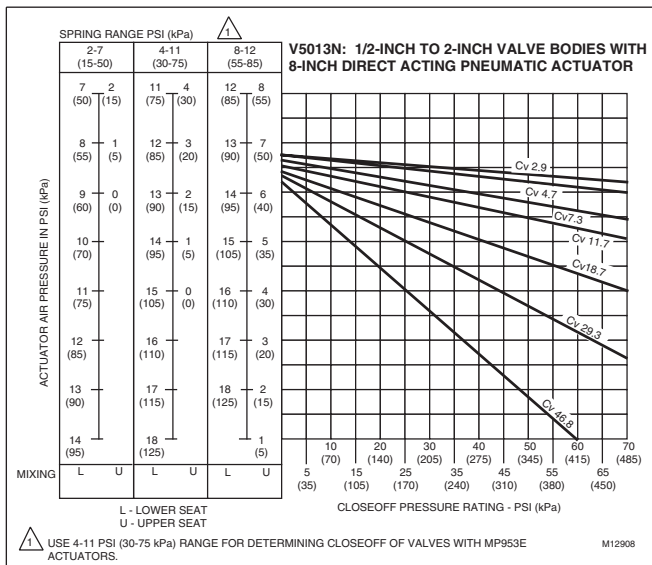
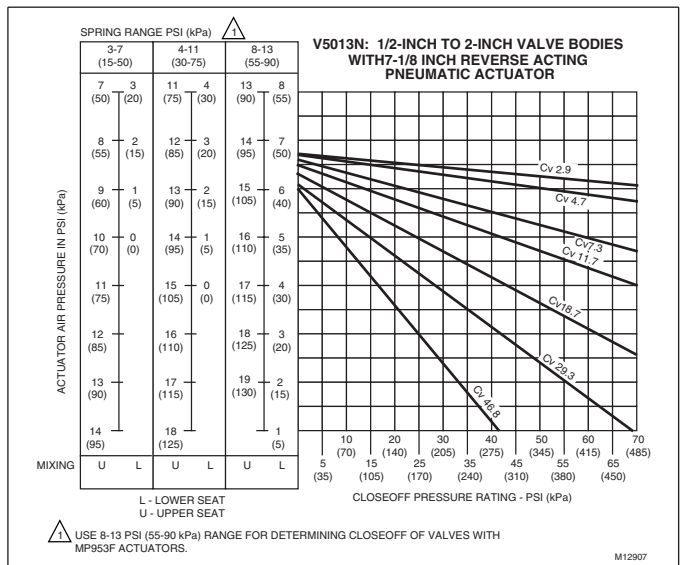


Chart K



Close-off Pressure Charts - Valves

NPT Globe Valves 1/2" - 3"

Chart C

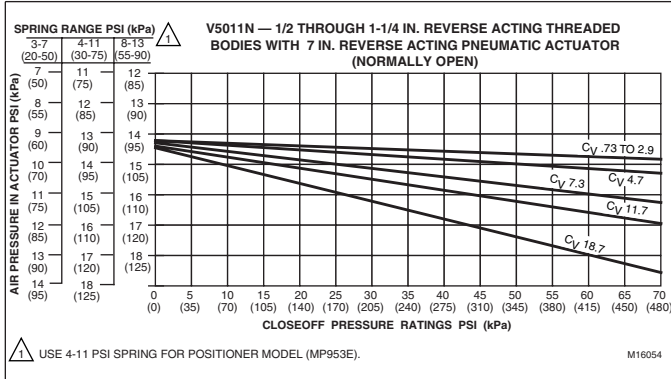


Chart D

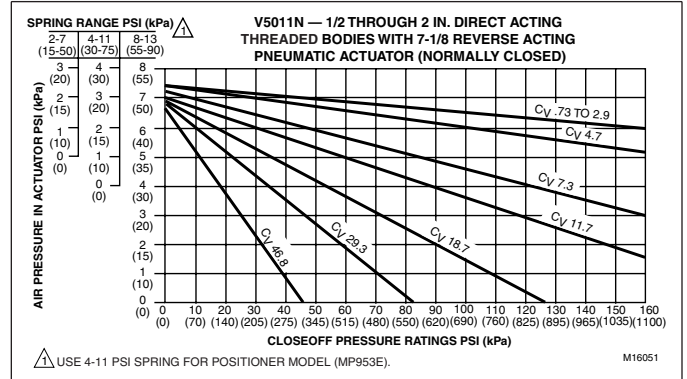


Chart G

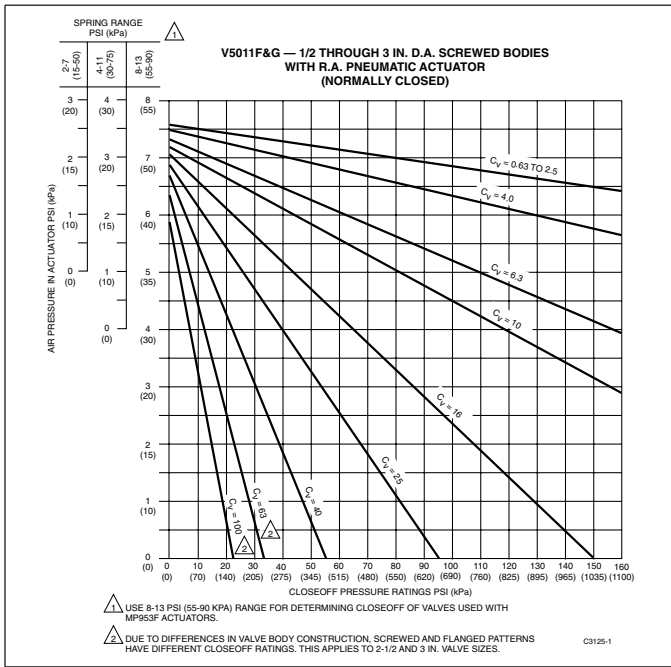


Chart H

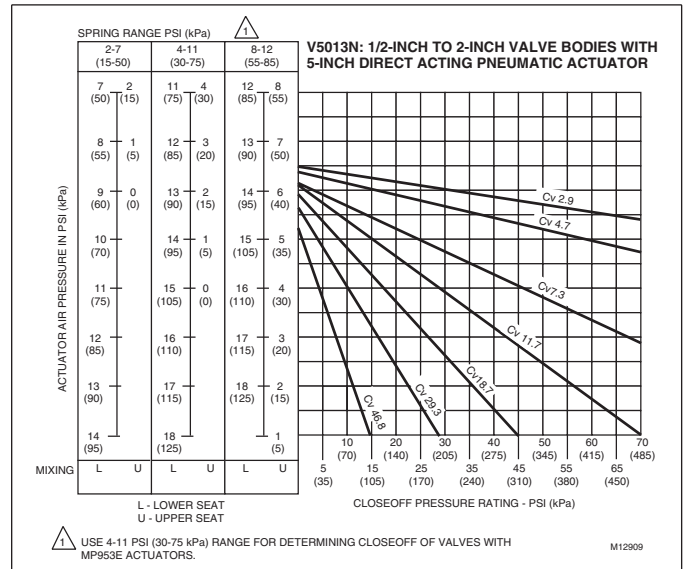
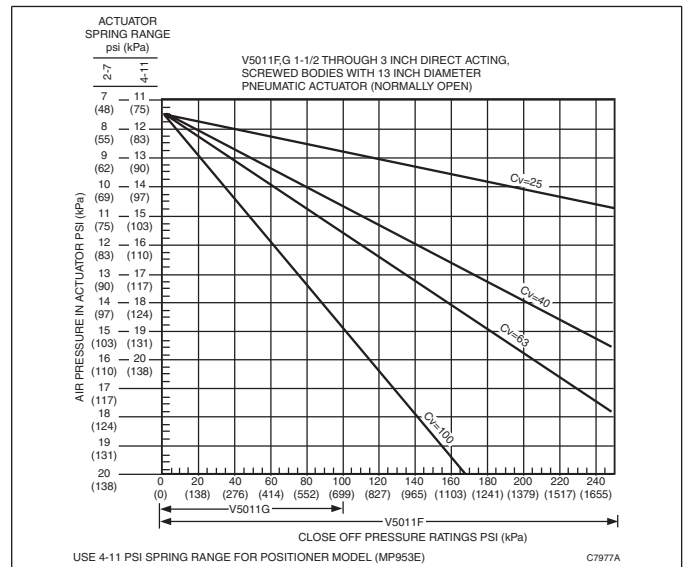


Chart L



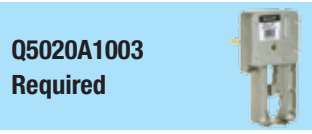
VALVES

Product Selection - Valves

Flanged Globe Valves 2½"- 3", With DCA and Valve Linkage

Common Features

- ANSI body class 125 or 250
- Close-off pressure = Maximum differential pressure
- Maximum static water pressure: Up to 400 psi
- Maximum steam pressure (VGF, 2-pos or modulating): 100 psi
- Maximum steam pressure (V5011, 2-pos): 15 psi
- Stem travel: 0.75"
- Rangeability: 50:1
- Body material: Cast iron
- Body trim: Stainless steel stem, brass seat (V5011/13), stainless steel (VGF)



Actuator Features		Non-fail Safe			
Actuator O.S. Number		MN7220A2007	MN6120A1002	MN7234A2008	MN6134A1003
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Actuator Torque	Power	6 VA	6 VA	9 VA	9 VA
	(lb.-in.)	175	175	300	300
Linkage Stem Force	(lbs.)	234	234	402	402
Control	(0)2-10 Vdc	•		•	
	4-20 mA (external 500 Ohm Resistor)	•		•	
	Floating	•	•		•
	Two-Position SPDT	•	•		•
	Two-Position SPST	•	•	•	•
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(degrees)	95°	95°	95°	95°
Timing	(seconds)	95	95	95	95
High Temperature Kit	Steam Application	43196000-001	43196000-001	43196000-001	43196000-001
Aux Switch	SPDT Built In	0 / 2	0 / 2		
	1 x SPDT Add-On				
	2 x SPDT Add-On	SW2-US	SW2-US	SW2-US	SW2-US
Feedback	(0)2-10 Vdc Built In	•		•	
	500 Ohm Add-On				
	2 kOhm Add-On				

2-Way Water & Steam Valves ANSI Class III (< 0.05% Cv) Seat Leakage

Valve Size (Inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid				
ANSI Class III seat leakage													
2-1/2"	63	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1734	52	52	88	88	
								VGF21ES25	52	52			
	70			175 psi @ 130 F	125 psig / 353 F	Equal %		VGF21LS25	52	52			
						Linear		VGF22ES25	52	52			
3"	100	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1767	24	24	42	42	
								VGF21ES30	26	26			
	115			175 psi @ 130 F	125 psig / 353 F	Equal %		VGF21LS30	26	26			
						Linear		VGF22ES30	26	26			
120	400 psi @ 130 F	250	400 psi @ 130 F			Equal %	Stem down to close	VGF21EP25	175	175	175	175	
								VGF21ES25			77	77	
70	175 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	125	175 psi @ 130 F		Stem down to close	VGF21LP25	175	175	175	175
									VGF21LS25			77	77
115	Pressure Balanced	Standard	250	400 psi @ 130 F	125	175 psi @ 130 F	Stem down to close		VGF22ES25			77	77
									VGF21EP30	175	175	175	175
120	Pressure Balanced	Standard	250	400 psi @ 130 F	125	175 psi @ 130 F		Stem down to close	VGF21ES30			38	38
									VGF21LP30	175	175	175	175
125	Standard	250	400 psi @ 130 F			Equal %	Stem down to close		VGF21LS30			38	38
									VGF22ES30			38	38

2-Way Water & Steam Valves ANSI Class IV (< 0.01% Cv) Seat Leakage

Valve Size (Inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid							
ANSI Class IV seat leakage																
2-1/2"	63	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	VGF21EP25	175	175	175	175				
								VGF21ES25			77	77				
	70			175 psi @ 130 F	125	175 psi @ 130 F		125 psig / 353 F	125	175 psi @ 130 F	Stem down to close	VGF21LP25	175	175	175	175
												VGF21LS25			77	77
115	Pressure Balanced	Standard	250	400 psi @ 130 F	125	175 psi @ 130 F	Stem down to close	VGF22ES25				77	77			
								VGF21EP30	175	175		175	175			
120	Pressure Balanced	Standard	250	400 psi @ 130 F	125	175 psi @ 130 F		Stem down to close	VGF21ES30			38	38			
									VGF21LP30	175	175	175	175			
125	Standard	250	400 psi @ 130 F			Equal %	Stem down to close		VGF21LS30			38	38			
									VGF22ES30			38	38			

3-Way Water Valves

Valve Size (Inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid			
ANSI Class III seat leakage												
2-1/2"	63	Mixing	125	150 psi @ 240 F	15 psi (2-position)	Constant Total	Stem up closes A-AB	V5013B1003	52	52	88	88
								V5013C1001	52	52	88	88
	70	Diverting	250	400 psi @ 130 F	125 psig / 353 F	Linear, Constant Total	Stem up closes B-AB	VGF31EM25	66	66	97	97
									VGF31LD25	52	52	97
	100	Mixing	125	150 psi @ 240 F	15 psi (2-position)	Equal % A-AB	Stem up closes A-AB	VGF32EM25	66	66	97	97
									VGF32LD25	52	52	97
	120	Diverting	250	400 psi @ 130 F	125 psig / 353 F	Linear, Constant Total	Stem up closes B-AB	V5013B1011	24	24	42	42
									V5013C1019	24	24	42
	115	Mixing	125	175 psi @ 130 F	125 psig / 353 F	Equal % A-AB	Stem up closes A-AB	VGF31EM30	44	44	65	65
									VGF31LD30	26	26	65
120	Diverting	250	400 psi @ 130 F	125 psig / 353 F	Linear, Constant Total	Stem up closes B-AB	VGF32EM30	44	44	65	65	
								VGF32LD30	26	26	65	65

Product Selection - Valves

Flanged Globe Valves 2½"- 3", With DCA and Valve Linkage

Common Features

- ANSI body class 125 or 250
- Close-off pressure = Maximum differential pressure
- Maximum static water pressure: Up to 400 psi
- Maximum steam pressure (VGF, 2-pos or modulating): 100 psi
- Maximum steam pressure (V5011, 2-pos): 15 psi
- Stem travel: 0.75"
- Rangeability: 50:1
- Body material: Cast iron
- Body trim: Stainless steel stem, brass seat (V5011/13), stainless steel (VGF)



**Q5020A1003
Required**



Actuator Features		Fail Safe		
Actuator O.S. Number		MS7520A2007 MS7520A2205 MS7520HZ208	MS8120A1007	MS4120A1001
Power Supply	Voltage	24 Vac	24 Vac	100-250 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	60 Hz
	Power	16 VA	40 VA	60 VA
Actuator Torque	(lb.-in.)	175	175	175
Linkage Stem Force	(lbs.)	234	234	234
Control	(0)2-10 Vdc	•		
	4-20 mA (external 500 Ohm Resistor)	•		
	Floating	•		
	Two-Position SPDT	•		
	Two-Position SPST	•	•	•
Fail Safe Action		Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(degrees)	95°	95°	95°
Timing	(seconds)	90	90	90
High Temperature Kit	Steam Application	43196000-001	43196000-001	43196000-001
Aux Switch	SPDT Built In	0 / 2 / 2	0 / 2	0 / 2
	1 x SPDT Add-On			
	2 x SPDT Add-On	SW2-US	SW2-US	SW2-US
Feedback	(0)2-10 Vdc Built In	•		
	500 Ohm Add-On			
	2 kOhm Add-On			

Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid			
ANSI Class III seat leakage												
2-1/2"	63	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1734	56	56	56	
				175 psi @ 130 F		Equal %		VGF21ES25	71	71	71	
				175 psi @ 130 F		Linear		VGF21LS25	71	71	71	
	3"		100	125	150 psi @ 240 F	15 psi (2-position)		Equal %	VGF22ES25	71	71	71
					175 psi @ 130 F			Equal %	V5011A1767	25	25	25
					175 psi @ 130 F			Linear	VGF21ES30	35	35	35
	125	175 psi @ 130 F	125 psig / 353 F	Linear	VGF21LS30	35	35	35				
	120	400 psi @ 130 F	250	400 psi @ 130 F	Equal %	VGF22ES30	35	35	35			
ANSI Class IV seat leakage												
2-1/2"	70	Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP25	175	175	175	
		Standard				Equal %		VGF21ES25				
		Pressure Balanced				Linear		VGF21LP25	175	175	175	
		Standard				Linear		VGF21LS25				
	3"	115	Pressure Balanced	125		175 psi @ 130 F		Equal %	VGF22ES25			
			Standard					Equal %	VGF21EP30	175	175	175
3"	120	Pressure Balanced	250	400 psi @ 130 F	Equal %	VGF21ES30						
		Standard			Linear	VGF21LP30	175	175	175			
	125	Pressure Balanced			Linear	VGF21LS30						
		Standard			Equal %	VGF22ES30						
ANSI Class III seat leakage												
2-1/2"	63	Mixing	125	150 psi @ 240 F	N / A	Constant Total	Stem up closes A-AB	V5013B1003	56	56	56	
		Diverting				Constant Total		V5013C1001	56	56	56	
		Mixing				Equal % A-AB		VGF31EM25	89	89	89	
		Diverting				Linear, Constant Total		VGF31LD25	71	71	71	
		70				Mixing		Equal % A-AB	VGF32EM25	89	89	89
						Diverting		Linear, Constant Total	VGF32LD25	71	71	71
	3"	100	Mixing	125		150 psi @ 240 F	Constant Total	Stem up closes A-AB	V5013B1011	25	25	25
			Diverting				Constant Total		V5013C1019	25	25	25
		120	Mixing				Equal % A-AB		VGF31EM30	59	59	59
			Diverting				Linear, Constant Total		VGF31LD30	35	35	35
		115	Mixing				Equal % A-AB		VGF32EM30	59	59	59
			Diverting				Linear, Constant Total		VGF32LD30	35	35	35

2-Way Water & Steam Valves ANSI Class III (< 0.05% Cv) Seat Leakage

2-Way Water & Steam Valves ANSI Class IV (< 0.01% Cv) Seat Leakage

3-Way Water Valves

VALVES

Product Selection - Valves

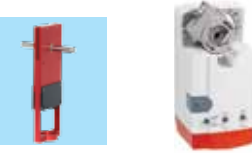
Threaded/Flanged Globe Valves 2"- 3", With Tandem DCA and Valve Linkage

Common Features

- Stem travel: 0.75"
- Rangeability: 50:1
- Body material: Bronze (V5011/13N), Cast iron
- Seat Material: Bronze (V5011/13), Stainless Steel (VGF2), Cast Iron (VGF3)
- Stem Material: Stainless Steel



**Q5022A1001
Required**



Actuator Features		Non-fail Safe			
		MN7220A2007	MN6120A1002	MN72342008	MN6134A1003
Actuator O.S. Number (Two required per linkage/valve)	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
	6 VA	6 VA	9 VA	9 VA	9 VA
Actuator Torque	(lb.-in.)	175	175	300	300
Linkage Stem Force, Two Actuators	(lbs.)	655	655	1115	1115
Control	(0)2-10 Vdc	•	•	•	•
	4-20 mA (external 500 Ohm Resistor)	•	•	•	•
	Floating	•	•	•	•
Fail Safe Action	Two-Position SPDT	•	•	•	•
	Two-Position SPST	•	•	•	•
	Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position (no signal)	(field configurable)	Stem Up/ Down	Stem Up/ Down	Stem Up/ Down	Stem Up/ Down
Actuator Stroke	(inches)	0.75	0.75	0.75	0.75
Timing	(seconds)	95	95	95	95
Aux Switch	2 x SPDT Add-On	SW2-US	SW2-US	SW2-US	SW2-US
	2 x SPDT Built In				
Feedback	(0)2-10 Vdc Built In	•	•	•	•

Valve Size (inches)	Pipe Fitting	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid								
ANSI Class III seat leakage																		
2"	f NPT	47	Standard	150	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1099	162	162	240	240					
2"	f NPT	47		150	217 psi @ 248 F	100 psig / 337 F	Equal %		V5011N2097	100	100	100	100					
2-1/2"	Flanged	63		125	150 psi @ 240 F	15 psi (2-position)	Equal %		V5011A1734	130	130	225	225					
				150	250 psi @ 100F	15 psi (2-position)	Equal %		V5011F1105	130	130	225	225					
	f NPT	70		150	250 psi @ 100F	100 psig / 337 F	Linear		V5011G1111	100	100	100	100					
				125	175 psi @ 130 F	Equal %	VGF21ES25		110	110	190	190						
3"	Flanged	100		125	175 psi @ 130 F	125 psig / 353 F	Linear		VGF21LS25	110	110	190	190					
				250	400 psi @ 130 F	Equal %	VGF22ES25		110	110	190	190						
				125	150 psi @ 250 F	15 psi (2-position)	Equal %		V5011A1767	66	66	115	115					
				150	250 psi @ 100F	15 psi (2-position)	Equal %		V5011F1113	65	65	115	115					
	f NPT	120		150	250 psi @ 100F	100 psig / 337 F	Linear		V5011G1129	65	65	100	100					
				125	175 psi @ 130 F	Equal %	VGF21ES30		55	55	94	94						
			125	175 psi @ 130 F	Linear	VGF21LS30	55	55	94	94								
			250	400 psi @ 130 F	Equal %	VGF22ES30	55	55	94	94								
ANSI Class IV seat leakage																		
2-1/2"	Flanged	70	Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP25	175*	175*	175*	175*					
							Equal %		VGF21ES25	74	74	152	152					
			Standard	Linear	VGF21LP25		175*		175*	175*	175*							
				Linear	VGF21LS25		74		74	152	152							
		115	Pressure Balanced	125	175 psi @ 130 F		Equal %		VGF22ES25	74	74	152	152					
							Equal %		VGF21EP30	175*	175*	175*	175*					
			Standard	Equal %	VGF21ES30		36		36	75	75							
				Linear	VGF21LP30		175*		175*	175*	175*							
3"	Flanged	120	Standard	250	400 psi @ 130 F	Equal %	VGF21LS30	36	36	75	75							
						Equal %	VGF22ES30	36	36	75	75							
						ANSI Class III seat leakage												
						2-1/2"	f NPT	47	Mixing	150	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1097	162	162	240
Mixing	150 psi @ 240 F	Constant Total	Stem up closes A-AB	V5013B1003	130				130				225	225				
Diverting	125	150 psi @ 240 F	Constant Total	Stem up closes B-AB	V5013C1001				130				130	225	225			
		175 psi @ 130 F	Linear B-AB / Equal % A-AB	Stem up closes A-AB	VGF31EM25				141				141	240	240			
70	Diverting	250	175 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB			VGF31LD25	110	110	190		190					
			400 psi @ 130 F	Linear B-AB / Equal % A-AB	Stem up closes A-AB			VGF32EM25	141	141	240		240					
	f NPT	100	400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB			VGF32LD25	110	110	190		190					
			150 psi @ 240 F	Constant Total	Stem up closes A-AB			V5013B1011	65	65	115		115					
3"	Flanged	100	Diverting	125	175 psi @ 130 F		Constant Total	Stem up closes B-AB	V5013C1019	65	65		115	115				
							175 psi @ 130 F	Linear B-AB / Equal % A-AB	Stem up closes A-AB	VGF31EM30	94		94	160	160			
			Diverting				250	175 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF31LD30		110	110	190	190		
								400 psi @ 130 F	Linear B-AB / Equal % A-AB	Stem up closes A-AB	VGF32EM30		94	94	160	160		
	120	Diverting	250	400 psi @ 130 F	Linear, Constant Total		Stem up closes B-AB	VGF32LD30	110	110	190		190					

*Only requires single actuator

** For high pressure steam-rated valves, close-off is the lesser of Maximum Steam Pressure or water close-off rating

Threaded/Flanged Globe Valves 2"- 3", With Tandem DCA and Valve Linkage

Common Features

- Stem travel: 0.75"
- Rangeability: 50:1
- Body material: Bronze (V5011/13N), Cast iron
- Seat Material: Bronze (V5011/13), Stainless Steel (VGF2), Cast Iron (VGF3)
- Stem Material: Stainless Steel



**Q5022A1001
Required******



Actuator Features		Fail Safe		
Actuator O.S. Number (Two required per linkage/valve)		MS7520A2007 MS7520A2205	MS8120A1007	MS4120A1001
Power Supply	Voltage	24 Vac	24 Vac	100-250 Vac
	Frequency	60 Hz	60 Hz	60 Hz
	Power	16 VA	40 VA	60 VA
Actuator Torque	(lb.-in.)	175	175	175
Linkage Stem Force, Two Actuators	(lbs.)	655	655	655
Control	(0)2-10 Vdc	•		
	4-20 mA (external 500 Ohm Resistor)	•		
	Floating	•		
	Two-Position SPDT	•		
	Two-Position SPST	•	•	•
Fail Safe Action		Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed
Normal Position (no signal)	(field configurable)	Stem Up/ Down	Stem Up/ Down	Stem Up/ Down
Actuator Stroke	(inches)	0.75	0.75	0.75
Timing	(seconds)	90	90	90
Aux Switch	2 x SPDT Add-On	SW2-US	SW2-US	SW2-US
	2 x SPDT Built In	0 / 2		
Feedback	(0)2-10 Vdc Built In	•		

Valve Size (inches)	Pipe Fitting	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid				
ANSI Class III seat leakage														
2"	f NPT	47	Standard	150	217 psi @ 248 F	15 psi (2-position)	Equal %	Stem down to close	V5011N1099	162	162	162		
2"	f NPT	47		150	217 psi @ 248 F	100 psig / 337 F	Equal %		V5011N2097	100	100	20		
2-1/2"	Flanged	63		125	150 psi @ 240 F	15 psi (2-position)	Equal %		V5011A1734	130	130	130		
				150	250 psi @ 100F	15 psi (2-position)	Equal %		V5011F1105	130	130	130		
	Flanged	70		150	250 psi @ 100F	100 psig / 337 F	Linear		V5011G1111	100	100	100		
				125	175 psi @ 130 F		Equal %		VGF21ES25	110	110	110		
				125	175 psi @ 130 F	125 psig / 353 F	Linear		VGF21LS25	110	110	110		
				250	400 psi @ 130 F		Equal %		VGF22ES25	110	110	110		
3"	Flanged	100		125	150 psi @ 250 F	15 psi (2-position)	Equal %		V5011A1767	66	66	66		
				150	250 psi @ 100F	15 psi (2-position)	Equal %		V5011F1113	65	65	65		
	Flanged	120		150	250 psi @ 100F	100 psig / 337 F	Linear		V5011G1129	65	65	65		
				125	175 psi @ 130 F		Equal %		VGF21ES30	55	55	55		
			125	175 psi @ 130 F	125 psig / 353 F	Linear	VGF21LS30	55	55	55				
			250	400 psi @ 130 F		Equal %	VGF22ES30	55	55	55				
ANSI Class IV seat leakage														
2-1/2"	Flanged	70	Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP25	175*	175*	175*		
							Equal %		VGF21ES25	74	74	74		
			Standard	Linear	VGF21LP25		175*		175*	175*				
				Linear	VGF21LS25		74		74	74				
			115	Pressure Balanced	Equal %		VGF22ES25		74	74	74			
					Equal %		VGF21EP30		175*	175*	175*			
		Standard		Equal %	VGF21ES30	36	36	36						
				Linear	VGF21LP30	175*	175*	175*						
		3"	120	Pressure Balanced	125	175 psi @ 130 F	250	400 psi @ 130 F	Linear	VGF21LS30	36	36	36	
								Equal %	VGF22ES30	36	36	36		
			Standard	Linear	VGF21LP30	175*		175*	175*					
				Linear	VGF21LS30	36		36	36					
ANSI Class III seat leakage														
2-1/2"	Flanged	63	Mixing	150	217 psi @ 248 F	N / A	Linear B-AB / Equal % A-AB	Stem up closes A-AB	V5013N1097	162	162	162		
							Constant Total		V5013B1003	130	130	130		
			Diverting	Constant Total	V5013C1001		130		130	130				
				Linear B-AB / Equal % A-AB	VGF31EM25		141		141	141				
			70	Mixing	Linear, Constant Total		VGF31LD25		110	110	110			
					Linear B-AB / Equal % A-AB		VGF32EM25		141	141	141			
		Diverting		Linear, Constant Total	VGF32LD25		110		110	110				
				Constant Total	V5013B1011		65		65	65				
		100	Mixing	125	150 psi @ 240 F		Constant Total		V5013C1019	65	65	65		
							Linear B-AB / Equal % A-AB		VGF31EM30	94	94	94		
			Diverting	Linear, Constant Total	VGF31LD30		110		110	110				
				Linear B-AB / Equal % A-AB	VGF32EM30		94		94	94				
				115	Mixing		250		400 psi @ 130 F	Linear, Constant Total	VGF32LD30	110	110	110
										Linear, Constant Total	VGF32LD30	110	110	110
		3"	Flanged	100	Mixing		125		150 psi @ 240 F	Linear, Constant Total	VGF32LD30	110	110	110
										Linear, Constant Total	VGF32LD30	110	110	110
				120	Diverting		250		400 psi @ 130 F	Linear, Constant Total	VGF32LD30	110	110	110
										Linear, Constant Total	VGF32LD30	110	110	110
115	Mixing				250	400 psi @ 130 F	Linear, Constant Total	VGF32LD30	110	110	110			
							Linear, Constant Total	VGF32LD30	110	110	110			
120	Diverting	250	400 psi @ 130 F	Linear, Constant Total	VGF32LD30	110	110	110						
				Linear, Constant Total	VGF32LD30	110	110	110						

*Only requires single actuator

** For high pressure steam-rated valves, close-off is the lesser of Maximum Steam Pressure or water close-off rating.

***Q5022A linkage compatible with VGF valves with 1/4-28UNF stem thread (Manufactured after June, 2005)

Product Selection - Valves

Flanged Globe Valves 2½"- 3", With Dedicated Valve Actuators



Common Features

- ANSI body class 125 or 250
- Close-off pressure = Maximum differential pressure
- Maximum static water pressure: Up to 400 psi
- Maximum steam pressure (VGF, 2-pos or modulating): 100 psi
- Maximum steam pressure (V5011, 2-pos): 15 psi
- Stem travel: 0.75"
- Rangeability: 50:1
- Body material: Cast iron
- Body trim: Stainless steel stem, brass seat (V5011/13), stainless steel (VGF)



Actuator Features		Non-fail Safe			
Actuator O.S. Number		ML7984A4009*	ML6984A4000**	ML7420A3065	ML7420A3063
	Power Supply	Voltage 24 Vac / 28 Vdc	24 Vac / 28 Vdc	24 Vac	24 Vac
	Frequency	0 / 50 / 60 Hz	0 / 50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	12 VA	12 VA	7 VA	7 VA
Stem Force	(lbs.)	160	160	135	135
Control	(0)2-10 Vdc	•		•	•
	4-20 mA (external 500 Ohm Resistor)	Built-in		•	•
	Floating		•		
	Two-Position SPDT		•		
	Two-Position SPST				
	135 Ohm	•			
Fail Safe Action		Stay in place	Stay in place	Stay in place	Stay in place
Normal Position (no signal)	(field configurable)	Stem Up	Stem Up	Stem Up	Stem Up
Actuator Stroke	(inches)	0.5 - 1 self adj	0.5 - 1 self adj	0.75	0.75
Timing	(seconds at 0.75" stroke)	63	63	60	30
High Temperature Kit	Steam Application			43196000-001	43196000-001
Aux Switch	1 x SPDT Add-On	272630D	272630D		
	2 x SPDT Add-On			43191680-105	43191680-105
Feedback	2-10 Vdc Built In			•	•
	2-10 Vdc Add-On	272630D	272630D		
	220 Ohm Add-On				
	10 kOhm Add-On				

Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid					
ANSI Class III seat leakage														
2-1/2"	63	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1734	33	33	28	28		
								VGF21ES25	27*	27*	23	23		
								VGF21LS25	27*	27*	23	23		
	100			125	150 psi @ 240 F	15 psi (2-position)		Equal %	Stem down to close	V5011A1767	19	19	16	16
										VGF21ES30	13*	13*	11	11
										VGF21LS30	13*	13*	11	11
120	250	400 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF22ES30	13*	13*	11	11		

ANSI Class IV seat leakage																			
2-1/2"	70	Pressure Balanced Standard	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP25	175	175	175	175							
								VGF21ES25											
		Pressure Balanced Standard						250	400 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21LP25	175	175	175	
															VGF21LS25				
		Pressure Balanced Standard						115	175 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF22ES25				
															VGF21EP30	175	175	175	175
120	125	400 psi @ 130 F	250	400 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21ES30									
										VGF21LP30	175	175	175	175					
VGF21LS30																			
VGF22ES30																			

ANSI Class III seat leakage																		
2-1/2"	63	Mixing	125	150 psi @ 240 F	N/A	Constant Total	Stem up closes A-AB	V5013B1003	27	27	23	23						
								V5013C1001	25	25	21	21						
		Diverting						175 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF31EM25	34	34	29	29			
											VGF31LD25	27	27	23	23			
		70						Mixing	250	400 psi @ 130 F	N/A	Equal % A-AB	Stem up closes A-AB	VGF32EM25	34	34	29	29
														VGF32LD25	27	27	23	23
	Diverting	250	400 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	Linear, Constant Total	Stem up closes B-AB	V5013B1011	13	13	11	11					
									V5013C1019	17	17	14	14					
	3"	100	Mixing	125	150 psi @ 240 F	N/A	Constant Total	Stem up closes A-AB	V5013B1011	13	13	11	11					
									V5013C1019	17	17	14	14					
		Diverting	175 psi @ 130 F						Equal % A-AB	Stem up closes A-AB	VGF31EM30	22	22	19	19			
											VGF31LD30	13	13	11	11			
120		Mixing	250						400 psi @ 130 F	N/A	Equal % A-AB	Stem up closes A-AB	VGF32EM30	22	22	19	19	
													VGF32LD30	13	13	11	11	
Diverting	250	400 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	Linear, Constant Total	Stem up closes B-AB	V5013B1011	13	13	11	11						
								V5013C1019	17	17	14	14						

*Requires 272629A adapter kit to provide upper stop for actuator torque switch

Product Selection - Valves

Flanged Globe Valves 2½"- 3", With Dedicated Valve Actuators



Actuator Features		Non-fail Safe			
Actuator O.S. Number		ML6420A3049	ML6420A3056	ML7421A1032	ML6421A1017
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	6 VA	6 VA	12 VA	11 VA
Stem Force	(lbs.)	135	135	404	404
Control	(0)2-10 Vdc			•	
	4-20 mA (external 500 Ohm Resistor)			•	
	Floating	•	•		•
	Two-Position SPDT	•	•		•
	Two-Position SPST				
	135 Ohm				
Fail Safe Action		Stay in place	Stay in place	Stay in place	Stay in place
Normal Position (no signal)	(field configurable)	Stem Up	Stem Up	Stem Up	Stem Up
Actuator Stroke	(inches)	0.75	0.75	0.75	0.75
Timing	(seconds at 0.75" stroke)	60	30	90	90
High Temperature Kit	Steam Application	43196000-001	43196000-001	43196000-001	43196000-001
Aux Switch	1 x SPDT Add-On				
	2 x SPDT Add-On	43191680-105	43191680-105	43191680-102	43191680-102
Feedback	2-10 Vdc Built In			•	
	2-10 Vdc Add-On				
	220 Ohm Add-On	43191679-112	43191679-112		43191679-101
	10 kOhm Add-On	43191679-111	43191679-111		

Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid					
ANSI Class III seat leakage														
2-1/2"	63	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1734	28	28	77	77		
				175 psi @ 130 F				VG21ES25	23	23				
	175 psi @ 130 F			125 psig / 353 F	Linear	VG21LS25		23	23					
	400 psi @ 130 F			Equal %	VG22ES25	23		23						
3"	100	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1767	16	16	53	53		
				175 psi @ 130 F				Equal %	VG21ES30	11	11			
	125			175 psi @ 130 F	125 psig / 353 F	Linear		VG21LS30	11	11				
	250			400 psi @ 130 F	Equal %	VG22ES30		11	11					
ANSI Class IV seat leakage														
2-1/2"	70	Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VG21EP25	175	175	175	175		
		Standard						VG21ES25			69	69		
		Pressure Balanced						Linear	VG21LP25	175	175	175	175	
		Standard						Linear	VG21LS25			69	69	
3"	115	Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VG22ES25			69	69		
		Standard						VG21EP30	175	175	175	175		
	115	Standard						Equal %	VG21ES30			34	34	
	120	Pressure Balanced						Linear	VG21LP30	175	175	175	175	
120	Standard	Linear	VG21LS30			34	34							
	250	Standard	250	400 psi @ 130 F		Equal %	VG22ES30			34	34			
ANSI Class III seat leakage														
2-1/2"	63	Mixing	125	150 psi @ 240 F	N / A	Constant Total	Stem up closes A-AB	V5013B1003	23	23	77	77		
		Diverting						V5013C1001	21	21	77	77		
	Mixing	Equal % A-AB						VG21EM25	29	29	87	87		
	Diverting	Linear, Constant Total						VG21LD25	23	23	69	69		
	70	Mixing						Equal % A-AB	VG23EM25	29	29	87	87	
		Diverting						Linear, Constant Total	VG23LD25	23	23	69	69	
3"	100	Mixing	125	150 psi @ 240 F	N / A	Constant Total	Stem up closes A-AB	V5013B1011	11	11	53	53		
		Diverting						Constant Total	V5013C1019	14	14	53	53	
	100	Diverting						Equal % A-AB	VG21EM30	19	19	58	58	
	120	Mixing						175 psi @ 130 F	Linear, Constant Total	VG21LD30	11	11	34	34
	120	Diverting						175 psi @ 130 F	Equal % A-AB	VG23EM30	19	19	58	58
	115	Mixing						250	400 psi @ 130 F	Linear, Constant Total	VG23LD30	11	11	34
120	Diverting	250	400 psi @ 130 F											

2-Way Water & Steam Valves ANSI Class III (< 0.05% Cv) Seat Leakage
 2-Way Water & Steam Valves ANSI Class IV (< 0.01% Cv) Seat Leakage

3-Way Water Valves

VALVES

Product Selection - Valves

Flanged Globe Valves 2½"- 3", With Dedicated Valve Actuators



Common Features

- ANSI body class 125 or 250
- Close-off pressure = Maximum differential pressure
- Maximum static water pressure: Up to 400 psi
- Maximum steam pressure (VGF, 2-pos or modulating): 100 psi
- Maximum steam pressure (V5011, 2-pos): 15 psi
- Stem travel: 0.75"
- Rangeability: 50:1
- Body material: Cast iron
- Body trim: Stainless steel stem, brass seat (V5011/13), stainless steel (VGF)



Actuator Features	Fail Safe			
	ML7425A3013	ML7425B3012	ML6425A3022	ML6425B3013
Actuator O.S. Number				
Power Supply Voltage	24 Vac	24 Vac	24 Vac	24 Vac
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Power	12 VA	12 VA	11 VA	11 VA
Stem Force (lbs.)	135	135	135	135
Control	(0)2-10 Vdc	•	•	
4-20 mA (external 500 Ohm Resistor)	•	•		
Floating			•	•
Two-Position SPDT			•	•
Two-Position SPST			•	•
135 Ohm				
Fail Safe Action	Stem Down (2-way N.C.)	Stem Up (2-way N.O.)	Stem Down (2-way N.C.)	Stem Up (2-way N.O.)
Normal Position (no signal) (field configurable)	Stem Up	Stem Up	Stem Up	Stem Up
Actuator Stroke (inches)	0.75	0.75	0.75	0.75
Timing (seconds at 0.75" stroke)	90	90	90	90
High Temperature Kit Steam Application	43196000-001	43196000-001	43196000-001	43196000-001
Aux Switch 1 x SPDT Add-On				
2 x SPDT Add-On	43191680-105	43191680-105	43191680-105	43191680-105
Feedback 2-10 Vdc Built In	•	•		
2-10 Vdc Add-On				
220 Ohm Add-On	43191679-112	43191679-112	43191679-112	43191679-112
10 kOhm Add-On	43191679-111	43191679-111	43191679-111	43191679-111

Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid					
ANSI Class III seat leakage														
2-1/2"	63	Standard	125	150 psi @ 240 F	15 psig (2-position)	Equal %	Stem down to close	V5011A1734	28	28	28	28		
				175 psi @ 130 F	125 psig / 353 F	Equal %		VGF21ES25	23	23	23	23		
				175 psi @ 130 F		Linear		VGF21LS25	23	23	23	23		
	100			400 psi @ 130 F		Equal %		VGF22ES25	23	23	23	23		
				115	125	150 psi @ 240 F		15 psig (2-position)	Equal %	V5011A1767	16	16	16	16
					125	175 psi @ 130 F			Equal %	VGF21ES30	11	11	11	11
120	125	175 psi @ 130 F		Linear	VGF21LS30	11	11	11	11	11				
	250	400 psi @ 130 F		Equal %	VGF22ES30	11	11	11	11	11				
	ANSI Class IV seat leakage													
2-1/2"	70	Standard	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP25	175	175	175	175		
						Equal %		VGF21ES25						
						Linear		VGF21LP25	175	175	175	175		
						Linear		VGF21LS25						
						Equal %		VGF22ES25						
						Equal %		VGF21EP30	175	175	175	175		
3"	115	Standard	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21ES30						
						Equal %		VGF21EP30	175	175	175	175		
						Linear		VGF21LP30	175	175	175	175		
						Linear		VGF21LS30						
						Equal %		VGF22ES30						
						Equal %		VGF22ES30						
ANSI Class III seat leakage														
2-1/2"	63	Mixing	125	150 psi @ 240 F	N / A	Constant Total	Stem up closes A-AB	V5013B1003	21	21	21	21		
						Constant Total	Stem up closes B-AB	V5013C1001	21	21	21	21		
						Equal % A-AB	Stem up closes A-AB	VGF31EM25	29	29	29	29		
						Linear, Constant Total	Stem up closes B-AB	VGF31LD25	23	23	23	23		
						Equal % A-AB	Stem up closes A-AB	VGF32EM25	29	29	29	29		
						Linear, Constant Total	Stem up closes B-AB	VGF32LD25	23	23	23	23		
	70	Mixing	250	400 psi @ 130 F	N / A	Constant Total	Stem up closes A-AB	V5013B1011	14	14	14	14		
						Constant Total	Stem up closes B-AB	V5013C1019	14	14	14	14		
						Equal % A-AB	Stem up closes A-AB	VGF31EM30	19	19	19	19		
						Linear, Constant Total	Stem up closes B-AB	VGF31LD30	11	11	11	11		
						Equal % A-AB	Stem up closes A-AB	VGF32EM30	19	19	19	19		
						Linear, Constant Total	Stem up closes B-AB	VGF32LD30	11	11	11	11		
3"	100	Mixing	125	150 psi @ 240 F	N / A	Constant Total	Stem up closes A-AB	V5013B1011	14	14	14	14		
						Constant Total	Stem up closes B-AB	V5013C1019	14	14	14	14		
						Equal % A-AB	Stem up closes A-AB	VGF31EM30	19	19	19	19		
						Linear, Constant Total	Stem up closes B-AB	VGF31LD30	11	11	11	11		
						Equal % A-AB	Stem up closes A-AB	VGF32EM30	19	19	19	19		
						Linear, Constant Total	Stem up closes B-AB	VGF32LD30	11	11	11	11		
120	Mixing	250	400 psi @ 130 F	N / A	Constant Total	Stem up closes A-AB	V5013B1011	14	14	14	14			
					Constant Total	Stem up closes B-AB	V5013C1019	14	14	14	14			
					Equal % A-AB	Stem up closes A-AB	VGF31EM30	19	19	19	19			
					Linear, Constant Total	Stem up closes B-AB	VGF31LD30	11	11	11	11			
					Equal % A-AB	Stem up closes A-AB	VGF32EM30	19	19	19	19			
					Linear, Constant Total	Stem up closes B-AB	VGF32LD30	11	11	11	11			

2-Way Water & Steam Valves ANSI Class III (< 0.05% Cv) Seat Leakage

2-Way Water & Steam Valves ANSI Class IV (< 0.01% Cv) Seat Leakage

3-Way Water Valves

Product Selection - Valves

Flanged Globe Valves 4"- 6", With Tandem DCA and Valve Linkage

Common Features

- Stem travel: 1.5"
- Rangeability: 50:1
- Body material: Cast iron
- Seat Material: Bronze (V5011/13), Stainless Steel (VGF)
- Stem Material: Stainless Steel
- Normal position field configurable to stem up or stem down



**Q5022B1009
Required*****



Actuator Features		Non-fail Safe			
Actuator O.S. Number (Two Actuators per valve/linkage)		MN7220A2007	MN6120A1002	MN72342008	MN6134A1003
Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	60 Hz	60 Hz	60 Hz	60 Hz
	Power	6 VA	6 VA	9 VA	9 VA
Actuator Torque	(lb.-in.)	175	175	300	300
Linkage Stem Force, Two Actuators	(lbs.)	325	325	555	555
Control	(0)-10 Vdc	•	•	•	•
	4-20 mA (external 500 Ohm Resistor)	•	•	•	•
	Floating	•	•	•	•
	Two-Position SPDT	•	•	•	•
	Two-Position SPST	•	•	•	•
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(inches)	1.5	1.5	1.5	1.5
Timing	(seconds)	95	95	95	95
Aux Switch	2 x SPDT Add-On	SW2-US	SW2-US	SW2-US	SW2-US
	2 x SPDT Built In				
Feedback	(0)-10 Vdc Built In	•	•	•	•

Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid				
ANSI Class III seat leakage													
4"	160	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1858	20	20	34	34	
	160			150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1013	20	20	34	34	
	150			175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21ES40	27	27	47	47	
	155			175 psi @ 130 F		Linear		VGF21LS40	27	27	47	47	
	150			400 psi @ 130 F		Equal %		VGF22ES40	27	27	47	47	
	250			150 psi @ 240 F		15 psi (2-position)		Equal %	V5011A1882	16	16	28	28
	250		150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1047	16	16	28	28		
	285		175 psi @ 130 F	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21ES50	11	11	18	18
	320		175 psi @ 130 F		Linear	VGF21LS50	11		11	18	18		
	320		400 psi @ 130 F		Equal %	VGF22ES50	11		11	18	18		
	360		150 psi @ 240 F		15 psi (2-position)	Equal %	V5011A1916		11	11	19	19	
	360		150 psi @ 240 F		15 psi (2-position)	Equal %	Stem up to close		V5011B1070	11	11	19	19
365	175 psi @ 130 F	175 psi @ 130 F	Equal %		Stem down to close	VGF21ES60	11		11	18	18		
370	175 psi @ 130 F	125 psig / 353 F	Linear	VGF21LS60		11	11	18	18				
370	400 psi @ 130 F	Equal %	VGF22ES60	11		11	18	18					
ANSI Class IV seat leakage													
4"	150	Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP40	175	175	175**	175**	
	150					Linear		VGF21LP40	175	175	175**	175**	
	5"					285		Equal %	VGF21EP50	175	175	175**	175**
						320		Linear	VGF21LP50	175	175	175**	175**
	6"					365		Equal %	VGF21EP60	175	175	175**	175**
						370		Linear	VGF21LP60	175	175	175**	175**
ANSI Class III seat leakage													
4"	160	Mixing	125	150 psi @ 240 F	N / A	Constant Total	Stem up closes A-AB	V5013B1029	20	20	34	34	
	160	Diverting		150 psi @ 240 F		Constant Total	Stem up closes B-AB	V5013C1027	20	20	34	34	
	150	Mixing		175 psi @ 130 F		Equal % A-AB	Stem up closes A-AB	VGF31EM40	27	27	47	47	
	160	Diverting		175 psi @ 130 F		Linear, Constant Total	Stem up closes B-AB	VGF31LD40	27	27	47	47	
	170	Mixing		250		400 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF32EM40	27	27	47	47
	160	Diverting		250		400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD40	27	27	47	47
	5"	250	Mixing	125		150 psi @ 240 F	Constant Total	Stem up closes A-AB	V5013B1037	16	16	28	28
		250	Diverting	150 psi @ 240 F		Constant Total	Stem up closes B-AB	V5013C1035	16	16	28	28	
		320	Mixing	175 psi @ 130 F		Equal % A-AB	Stem up closes A-AB	VGF31EM50	11	11	18	18	
		285	Diverting	175 psi @ 130 F		Linear, Constant Total	Stem up closes B-AB	VGF31LD50	11	11	18	18	
		320	Mixing	250		400 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF32EM50	11	11	18	18
		285	Diverting	250		400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD50	11	11	18	18
	6"	360	Mixing	125		150 psi @ 240 F	Constant Total	Stem up closes A-AB	V5013B1045	11	11	19	19
		360	Diverting	150 psi @ 240 F		Constant Total	Stem up closes B-AB	V5013C1043	11	11	19	19	
		370	Mixing	175 psi @ 130 F		Equal % A-AB	Stem up closes A-AB	VGF31EM60	11	11	18	18	
		380	Diverting	175 psi @ 130 F		Linear, Constant Total	Stem up closes B-AB	VGF31LD60	11	11	18	18	
		370	Mixing	250		400 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF32EM60	11	11	18	18
		380	Diverting	250		400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD60	11	11	18	18

**Only requires single actuator

120 ***Q5022B linkage compatible with VGF valves with 7/16-20UNF stem thread (Manufactured after June, 2005)

Product Selection - Valves

Flanged Globe Valves 4"- 6", With Tandem DCA and Valve Linkage

**Q5022B1009
Required*****



Actuator Features		Fail Safe		
Actuator O.S. Number (Two Actuators per valve/linkage)		MS7520A2007 MS7520A2205	MS8120A1007	MS4120A1001
Power Supply	Voltage	24 Vac	24 Vac	100-250 Vac
	Frequency	60 Hz	60 Hz	60 Hz
	Power	16 VA	40 VA	60 VA
Actuator Torque	(lb.-in.)	175	175	175
Linkage Stem Force, Two Actuators	(lbs.)	325	325	325
Control	(0)2-10 Vdc	•		
	4-20 mA (external 500 Ohm Resistor)	•		
	Floating	•		
	Two-Position SPDT	•		
	Two-Position SPST	•	•	•
Fail Safe Action		Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed
Normal Position (no signal)	(field configurable)	Stem Up/Down	Stem Up/Down	Stem Up/Down
Actuator Stroke	(inches)	1.5	1.5	1.5
Timing	(seconds)	90	90	90
Aux Switch	2 x SPDT Add-On	SW2-US	SW2-US	SW2-US
	2 x SPDT Built In	0 / 2		
Feedback	(0)2-10 Vdc Built In	•		

Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid					
ANSI Class III seat leakage														
4"	160	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1858	20	20	20			
	160			150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1013	20	20	20			
	150			175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21ES40	27	27	27			
	155			175 psi @ 130 F		Linear		VGF21LS40	27	27	27			
	150			400 psi @ 130 F		Equal %		VGF22ES40	27	27	27			
	250			150 psi @ 240 F	250	15 psi (2-position)	Equal %	Stem up to close	V5011A1882	16	16	16		
250	150 psi @ 240 F		15 psi (2-position)	Equal %		V5011B1047	16		16	16				
285	175 psi @ 130 F		Equal %	VGF21ES50		11	11		11					
320	175 psi @ 130 F		125 psig / 353 F	Linear		VGF21LS50	11		11	11				
320	400 psi @ 130 F			Equal %		VGF22ES50	11		11	11				
360	150 psi @ 240 F			Equal %		V5011A1916	11		11	11				
6"	360		125	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1070	11	11	11		
	365	175 psi @ 130 F			Equal %	VGF21ES60	11	11	11					
	370	175 psi @ 130 F			125 psig / 353 F	Linear	VGF21LS60	11	11	11				
	370	400 psi @ 130 F				Equal %	VGF22ES60	11	11	11				
	ANSI Class IV seat leakage													
	4"	150			Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP40	175	175	175
150		Linear	VGF21LP40	175					175		175			
5"	285	Equal %	VGF21EP50	175					175		175			
	320	Linear	VGF21LP50	175					175		175			
6"	365	Equal %	VGF21EP60	175					175		175			
	370	Linear	VGF21LP60	175					175		175			
ANSI Class III seat leakage														
4"	160	Mixing	125	150 psi @ 240 F	N / A	Constant Total	Stem up closes A-AB	V5013B1029	20	20	20			
	160	Diverting		150 psi @ 240 F		Constant Total	Stem up closes B-AB	V5013C1027	20	20	20			
	150	Mixing		175 psi @ 130 F		Equal % A-AB	Stem up closes A-AB	VGF31EM40	27	27	27			
	160	Diverting		175 psi @ 130 F		Linear, Constant Total	Stem up closes B-AB	VGF31LD40	27	27	27			
	170	Mixing		250		400 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF32EM40	27	27	27		
	160	Diverting		250		400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD40	27	27	27		
5"	250	Mixing	125	150 psi @ 240 F		N / A	Constant Total	Stem up closes A-AB	V5013B1037	16	16	16		
	250	Diverting		150 psi @ 240 F			Constant Total	Stem up closes B-AB	V5013C1035	16	16	16		
	320	Mixing		175 psi @ 130 F			Equal % A-AB	Stem up closes A-AB	VGF31EM50	11	11	11		
	320	Diverting		175 psi @ 130 F			Linear, Constant Total	Stem up closes B-AB	VGF31LD50	11	11	11		
	320	Mixing		250			400 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF32EM50	11	11	11	
	285	Diverting		250			400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD50	11	11	11	
6"	360	Mixing	125	150 psi @ 240 F	N / A		Constant Total	Stem up closes A-AB	V5013B1045	11	11	11		
	360	Diverting		150 psi @ 240 F			Constant Total	Stem up closes B-AB	V5013C1043	11	11	11		
	370	Mixing		175 psi @ 130 F			Equal % A-AB	Stem up closes A-AB	VGF31EM60	11	11	11		
	380	Diverting		175 psi @ 130 F			Linear, Constant Total	Stem up closes B-AB	VGF31LD60	11	11	11		
	370	Mixing		250			400 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF32EM60	11	11	11	
	380	Diverting		250			400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD60	11	11	11	

***Q5022B linkage compatible with VGF valves with 7/16-20UNF stem thread (Manufactured after June, 2005)

Product Selection - Valves

Flanged Globe Valves 4"- 6", With Dedicated Valve Actuators

Common Features

- ANSI body class 125 or 250
- Close-off pressure = Maximum differential pressure
- Maximum static water pressure: Up to 400 psi
- Maximum steam pressure (VGF, 2-pos or modulating): 100 psi
- Maximum steam pressure (V5011, 2-pos): 15 psi
- Stem travel: 1.5"
- Rangeability: 50:1
- Leakage < 0.05% of Cv
- Body material: Cast iron
- Body trim: Stainless steel stem, brass seat (V5011/13), stainless steel seat (VGF)



Actuator Features		Non-fail Safe	
Actuator O.S. Number		ML7421B1023	ML6421B1040
Power Supply	Voltage	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz
	Power	12 VA	11 VA
Stem Force	(lbs.)	404	404
Control	(0)2-10 Vdc	•	
	4-20 mA (external 500 Ohm Resistor)	•	
	Floating		•
	Two-Position SPDT		•
Fail Safe Action		Stay in Place	Stay in Place
Normal Position (no signal) (field configurable)		Stem Up	Stay in Place
Actuator Stroke	(inches)	1.5	1.5
Stroke Timing	(seconds)	175	175
High Temperature Kit	Steam Application	43196000-038	43196000-038
Aux Switch	2 x SPDT (24 Vac) (add-on)	43191680-102	43191680-102
Feedback	1 x 220 Ohm Potentiometer (add-on)	43191679-102	
	2-10 Vdc (built in)	•	

Valve Size (inches)	Cv	Valve Type	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid				
ANSI Class III seat leakage													
4"	160	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem down to close	V5011A1858	29	29			
	160			150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1013	29	29			
	150			175 psi @ 130 F	125 psig / 353 F	Linear	Stem down to close	VGF21ES40	34	34			
	155			175 psi @ 130 F		Linear		VGF21LS40	34	34			
	150			400 psi @ 130 F		Equal %		VGF22ES40	34	34			
	5"		250	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011A1882	18	18	
			250			150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1047	18	18	
			285			175 psi @ 130 F	Equal %	VGF21ES50	13	13			
			320		250	125	175 psi @ 130 F	125 psig / 353 F	Linear	Stem down to close	VGF21LS50	13	13
							320	400 psi @ 130 F	Equal %		VGF22ES50	13	13
360		150 psi @ 240 F					15 psi (2-position)	Equal %	V5011A1916		12	12	
6"	360	Standard	125	150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1070	12	12			
	360			150 psi @ 240 F	15 psi (2-position)	Equal %	Stem up to close	V5011B1070	12	12			
	365		175 psi @ 130 F	Equal %	VGF21ES60	13	13						
	370		175 psi @ 130 F	Linear	VGF21LS60	13	13						
	370		400 psi @ 130 F	Equal %	VGF22ES60	13	13						
ANSI Class IV seat leakage													
4"	150	Pressure Balanced	125	175 psi @ 130 F	125 psig / 353 F	Equal %	Stem down to close	VGF21EP40	175	175			
	150					Linear		VGF21LP40	175	175			
5"	285					Equal %		VGF21EP50	175	175			
	320					Linear		VGF21LP50	175	175			
6"	365					Equal %		VGF21EP60	175	175			
	370					Linear		VGF21LP60	175	175			
ANSI Class III seat leakage													
4"	160	Mixing	125	150 psi @ 240 F	N/A	Constant Total	Stem up closes A-AB	V5013B1029	29	29			
	160	Diverting		150 psi @ 240 F		Constant Total	Stem up closes B-AB	V5013C1027	29	29			
	150	Mixing		175 psi @ 130 F		Equal % A-AB	Stem up closes A-AB	VGF31EM40	34	34			
	160	Diverting		175 psi @ 130 F		Linear, Constant Total	Stem up closes B-AB	VGF31LD40	34	34			
	170	Mixing		400 psi @ 130 F		Equal % A-AB	Stem up closes A-AB	VGF32EM40	34	34			
	5"	160	Diverting	250		400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD40	34	34		
		250	Mixing	125		150 psi @ 240 F	Constant Total	Stem up closes A-AB	V5013B1037	18	18		
		250	Diverting			150 psi @ 240 F	Constant Total	Stem up closes B-AB	V5013C1035	18	18		
		320	Mixing			175 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF31EM50	13	13		
		285	Diverting			175 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF31LD50	13	13		
320	Mixing	250	400 psi @ 130 F		Equal % A-AB	Stem up closes A-AB	VGF32EM50	13	13				
6"	285	Diverting	250	400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD50	13	13				
	360	Mixing	125	150 psi @ 240 F	Constant Total	Stem up closes A-AB	V5013B1045	12	12				
	360	Diverting		150 psi @ 240 F	Constant Total	Stem up closes B-AB	V5013C1043	12	12				
	370	Mixing		175 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF31EM60	13	13				
	380	Diverting		175 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF31LD60	13	13				
	370	Mixing		250	400 psi @ 130 F	Equal % A-AB	Stem up closes A-AB	VGF32EM60	13	13			
	380	Diverting		250	400 psi @ 130 F	Linear, Constant Total	Stem up closes B-AB	VGF32LD60	13	13			

2-Way Water & Steam Valves ANSI Class III (< 0.05% Cv) Seat Leakage

2-Way Water & Steam Valves ANSI Class IV (< 0.01% Cv) Seat Leakage

3-Way Water Valves

Flanged Cage Valves 2½" - 6" With Tandem DCA and Valve Linkage

The V5051 Series advantage lies in its ability to perform like a globe valve while achieving high close-off pressures with a single spring return actuator. This premium valve delivers a high close-off using a single spring return actuator on all valves up to 6". It is highly suitable for medium-pressure steam applications.

Common Features

- Pressure balanced design for high close-off
- Close-off pressure = Maximum differential pressure
- ANSI body class 125
- Stem travel 1.5"
- Body material: Cast iron
- Body valve trim: Stainless steel
- Leakage: 0.01% Cv 2.5"-4" and 0.03% Cv 5"-6"
- Max static water pressure: 150 psi
- Max static steam pressure: 55 psi
- Flow characteristic: Modified linear



Q5020C1009 Required



Actuator Features		Non-fail Safe			Fail Safe	
Actuator O.S. Number		MM6120A1002 MM6120A1200	MM7220A2007 MM7220A2205	MS7520A2007 MS7520A2205 MS7520H2208	MS8120A1007 MS8120A1205	MM4120A1001 MS4120A1209
	Power Supply	Voltage	24 Vac	24 Vac	24 Vac	24 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	60 Hz
	Power	6 VA	6 VA	16 VA	40 VA	60 VA
Actuator Torque	(lbs.)	175	175	175	175	175
Control	(0)2-10 Vdc		•	•		
	4-20 mA (external 500 Ohm Resistor)		•	•		
	Floating	•	•	•		
	Two-Position SPDT	•	•	•		
	Two-Position SPST		•	•	•	•
Fail Safe Action		Stay in Place	Stay in Place	Configurable Open/Closed	Configurable Open/Closed	Configurable Open/Closed
Normal Position (no signal) (field configurable)		Stem Up	Stem Up	Stem Up	Stem Up	Stem Up
Linkage Stroke	(inches)	1.5	1.5	1.5	1.5	1.5
Stroke Timing	(seconds)	95	95	90	90	90
High Temperature Kit	Steam Application					
Aux Switch	2 x SPDT (built in)	0 / 2	0 / 2	0 / 2 / 2	0 / 2	0 / 2
	2 x SPDT (add-on)	SW2-US	SW2-US	SW2-US	SW2-US	SW2-US
Feedback	2-10 Vdc (built in)		•	•		

2-Way Water & Steam Valves	Valve Size (inches)	Cv	ANSI Class	Max Static Water Pressure	Max Steam Pressure / Temperature	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure, psid				
	2 1/2"	75	125	150 psi @ 100 F	55 psig / 300 F	Modified Linear	Stem down to close	V5051A3004	150	150	150	150	150
	3"	116						V5051A3012	150	150	150	150	150
	4"	178						V5051A3020	150	150	150	150	150
	5"	318						V5051A3038	150	150	150	150	150
	6"	390						V5051A3046	150	150	150	150	150

Product Selection - Valves

Flanged Globe Valves 2½"- 3", With Pneumatic Actuators

Common Features

- Rolling diaphragm for long life and low hysteresis
- Easily installation and attachment to the valve
- Direct or reverse acting
- No positive positioner



Actuator Features	Without Positive Positioner							
Actuator O.S. Number	MP953C1067	MP953C1075	MP953C1083	MP953C1554	MP953C1562	MP953D1107	MP953D1131	MP953D1172
Direct Acting/ Reverse Acting	Direct Acting				Reverse Acting			
Diaphragm Size	8"			13"		7-1/8"		
Fail Safe Action	Stem Up				Stem Down			
Actuator Force	Medium			High		Medium		
Spring Range	2-7 psi	•			•			
	3-7 psi							•
	8-12 psi		•					
	8-13 psi					•		
	4-11 psi			•	•		•	

2-Way Water & Steam Valves

Valve Size (Inches)	Cv	Valve Type	Max Static Water Pressure	ANSI Class	Max Steam Pressure	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure - See Charts On Page 126											
2-1/2"	63	Standard	250 psi	125	15 psi (2-position) 125 psig / 353 F	Equal %	Stem down to close	V5011A1734	M*-NO	M*-NO	M*-NO	P*-NO	P*-NO	N*-NC	N*-NC	N*-NC				
	70	Pressure Balanced	175 psi					VGF21EP25	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	70	Standard						VGF21ES25	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	72	Pressure Balanced						VGF21LP25	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	70	Standard						VGF21LS25	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	70	Standard						400 psi	250	VGF22ES25	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC		
3"	100	Standard	250 psi	125	15 psi (2-position) 125 psig / 353 F	Equal %	Stem down to close	V5011A1767	M*-NO	M*-NO	M*-NO	P*-NO	P*-NO	N*-NC	N*-NC	N*-NC				
	115	Pressure Balanced	175 psi					VGF21EP30	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	115	Standard						VGF21ES30	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	120	Pressure Balanced						VGF21LP30	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	125	Standard						VGF21LS30	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC				
	120	Standard						400 psi	250	VGF22ES30	L*-NO	L*-NO	L*-NO	O*-NO	O*-NO	R*-NC	R*-NC	R*-NC		
2-1/2"	63	Mixing	250 psi	125	N/A	Constant Total	Stem up closes A-AB	V5013B1003	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO				
	63	Diverting	250 psi					V5013C1001	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO				
	70	Mixing	175 psi					VGF31EM25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO				
	70	Diverting	175 psi					VGF31LD25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO				
	70	Mixing	400 psi					250	VGF32EM25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO			
	70	Diverting	400 psi					250	VGF32LD25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO			
3"	100	Mixing	250 psi	125	N/A	Constant Total	Stem up closes A-AB	V5013B1011	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO				
	100	Diverting	250 psi					V5013C1019	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO				
	120	Mixing	175 psi					VGF31EM30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO				
	120	Diverting	175 psi					VGF31LD30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO				
	115	Mixing	400 psi					250	VGF32EM30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO			
	120	Diverting	400 psi					250	VGF32LD30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO			

*The close-off pressure not to exceed rated pressure of steam valve
 NC = Normally Closed
 NO = Normally Open

Product Selection - Valves

Flanged Globe Valves 2½" - 3", With Pneumatic Actuators

Common Features

- Rolling diaphragm for long life and low hysteresis
- Easily installation and attachment to the valve
- Direct or reverse acting
- Integrated positive positioner



Actuator Features		With Positive Positioner							
Actuator O.S. Number		MP953E1368	MP953E1376	MP953E1384	MP953E1435	MP953E1443	MP953F1093	MP953F1101	MP953F1119
Direct Acting/ Reverse Acting		Direct Acting				Reverse Acting			
Diaphragm Size		8"		13"		7-1/8"			
Fail Safe Action		Stem Up				Stem Down			
Actuator Force		Medium			High		Medium		
Positioner Span	10 psi		•			•			•
	5 psi		•		•			•	
	3 psi	•					•		

Valve Size (inches)	Cv	Valve Type	Max Static Water Pressure	ANSI Class	Max Steam Pressure	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure - See Charts On Page 126									
									M**-NO	M**-NO	M**-NO	P**-NO	P**-NO	N**-NC	N**-NC	N**-NC	N**-NC	N**-NC
2-1/2"	63	Standard	250 psi	125	15 psi (2-position)	125 psig / 353 F	Stem down to close	V5011A1734	M**-NO	M**-NO	M**-NO	P**-NO	P**-NO	N**-NC	N**-NC	N**-NC		
	70	Pressure Balanced	175 psi					VG21EP25	L**-NO	L**-NO	L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC		
	70	Standard						VG21ES25	L**-NO	L**-NO	L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC		
	72	Pressure Balanced						VG21LP25	L**-NO	L**-NO	L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC		
	70	Standard						VG21LS25	L**-NO	L**-NO	L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC		
	70	Standard	400 psi					250	125 psig / 353 F	VG22ES25	L**-NO	L**-NO	L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC
	100	Standard	250 psi	125	V5011A1767	M**-NO		M**-NO		M**-NO	P**-NO	P**-NO	N**-NC	N**-NC	N**-NC			
	3"	115	Pressure Balanced	175 psi	VG21EP30	L**-NO		L**-NO		L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC			
		115	Standard		VG21ES30	L**-NO		L**-NO		L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC			
		120	Pressure Balanced		VG21LP30	L**-NO		L**-NO		L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC			
125		Standard	400 psi		250	VG21LS30	L**-NO	L**-NO		L**-NO	O**-NO	O**-NO	R**-NC	R**-NC				
120	Standard	400 psi	250	VG22ES30	L**-NO	L**-NO	L**-NO	O**-NO	O**-NO	R**-NC	R**-NC	R**-NC						
2-1/2"	63	Mixing	250 psi	125	N/A	Constant Total	Stem up closes A-AB	V5013B1003	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO		
	63	Diverting	250 psi			Constant Total	Stem up closes B-AB	V5013C1001	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO		
	70	Mixing	175 psi			Equal % A-AB	Stem up closes A-AB	VG31EM25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO		
	70	Diverting	175 psi			Linear, Constant Total	Stem up closes B-AB	VG31LD25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO		
	70	Mixing	400 psi			250	Equal % A-AB	Stem up closes A-AB	VG32EM25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO	
	70	Diverting	400 psi			250	Linear, Constant Total	Stem up closes B-AB	VG32LD25	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO	
	3"	100	Mixing	250 psi	125	N/A	Constant Total	Stem up closes A-AB	V5013B1011	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO	
		100	Diverting	250 psi			Constant Total	Stem up closes B-AB	V5013C1019	S-NC	S-NC	S-NC	T-NC	T-NC	U-NO	U-NO	U-NO	
		120	Mixing	175 psi			Equal % A-AB	Stem up closes A-AB	VG31EM30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO	
		120	Diverting	175 psi			Linear, Constant Total	Stem up closes B-AB	VG31LD30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO	
		115	Mixing	400 psi			250	Equal % A-AB	Stem up closes A-AB	VG32EM30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO
		120	Diverting	400 psi			250	Linear, Constant Total	Stem up closes B-AB	VG32LD30	L-NC	L-NC	L-NC	O-NC	O-NC	R-NO	R-NO	R-NO

*The close-off pressure not to exceed rated pressure of steam valve
 **The close-off pressure not to exceed rated pressure of steam valve. Use 4-11 spring range for positive positioner models.
 NC = Normally Closed
 NO = Normally Open

VALVES

Close-off Pressure Charts - Valves

Flanged Globe Valves 2½" - 3"

Chart L

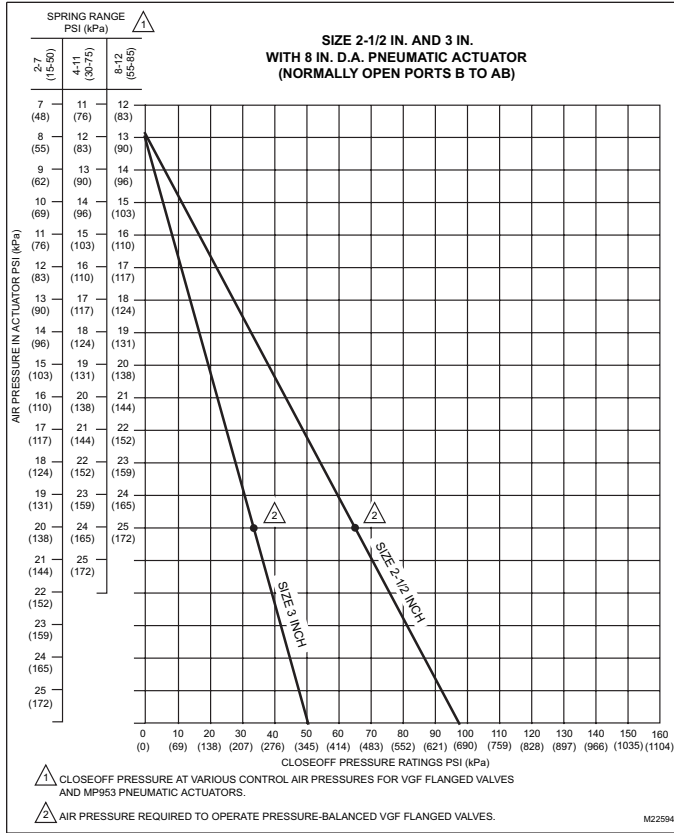


Chart P

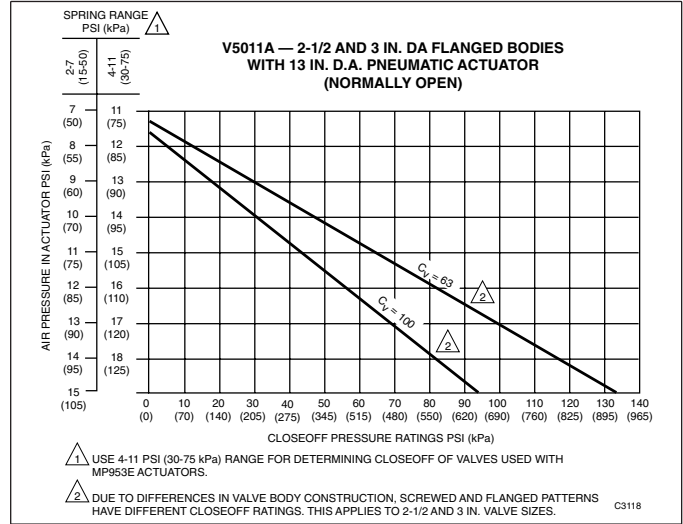


Chart S

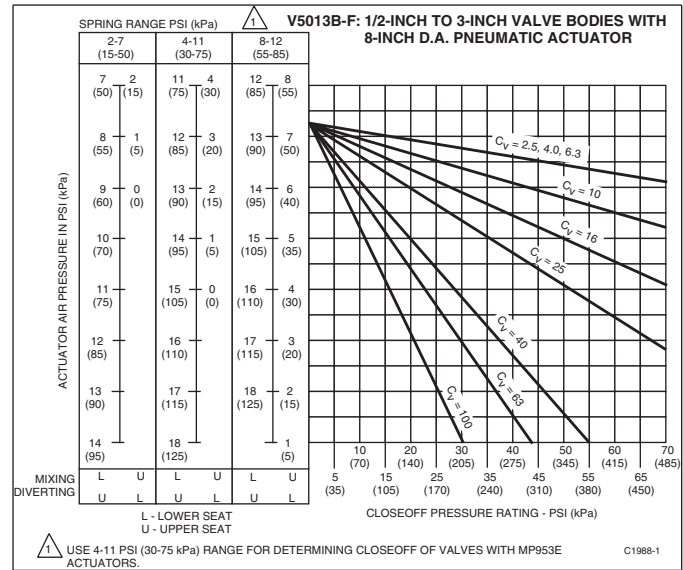
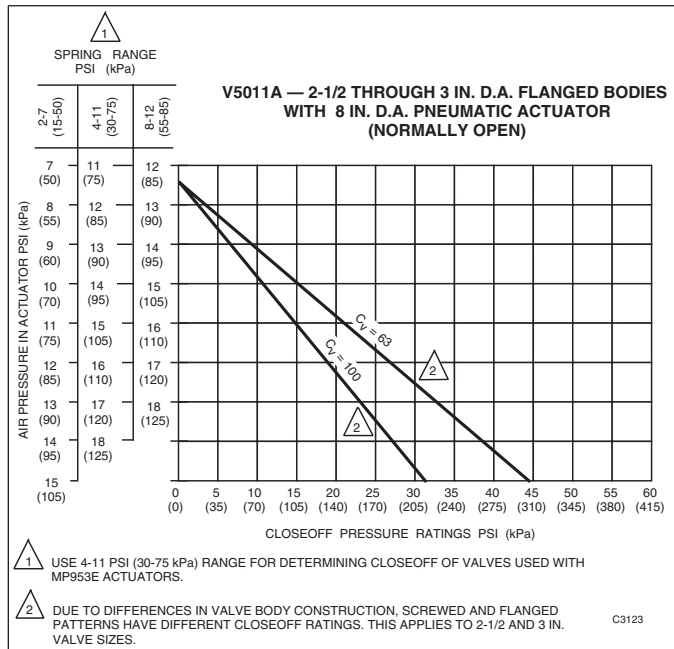
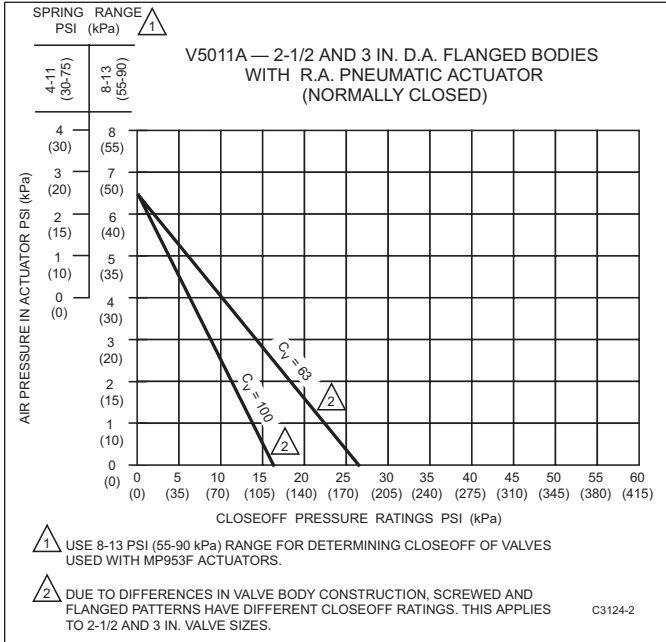


Chart M



Close-off Pressure Charts - Valves

Chart N



Flanged Globe Valves 2 1/2" - 3"

Chart O

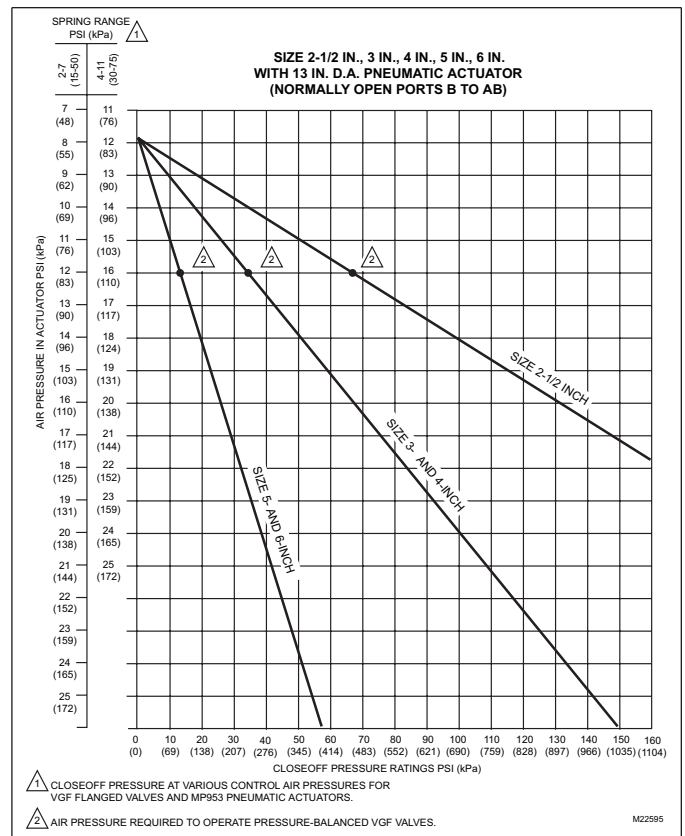


Chart R

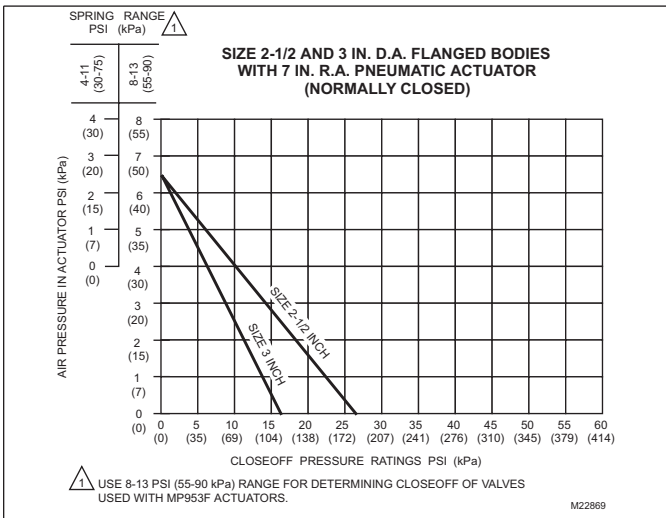


Chart T

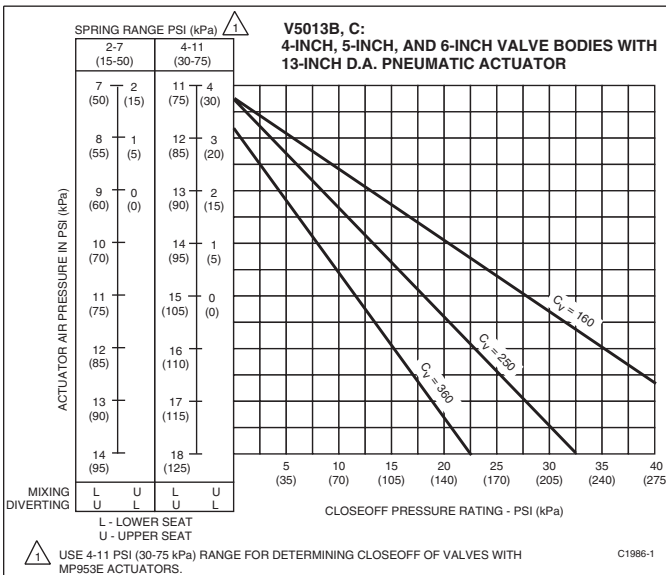
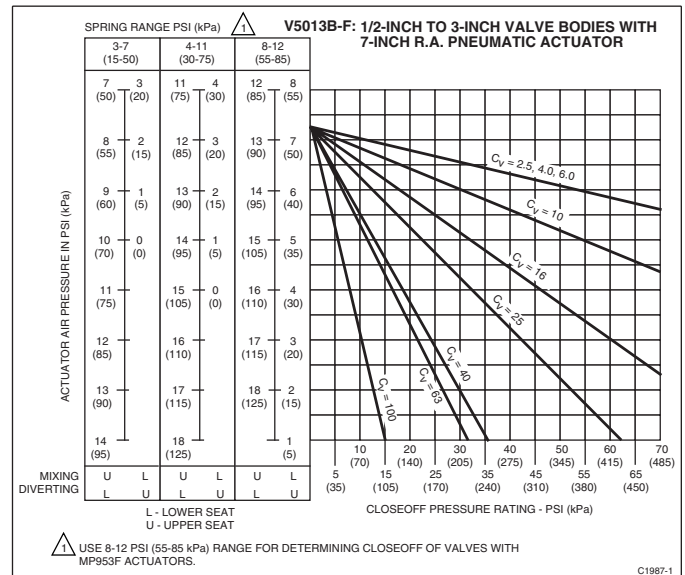


Chart U



VALVES

Product Selection - Valves

Flanged Globe Valves 4"- 6", With Pneumatic Actuators

Common Features

- Rolling diaphragm for long life and low hysteresis
- Easily installation and attachment to the valve
- Direct or reverse acting



Actuator Features	Without Positive Positioner			With Positive Positioner		
Actuator O.S. Number	MP953C1471	MP953C1489	MP953C1547	MP953E1285	MP953E1400	MP953E1418
Direct Acting / Reverse Acting	Direct Acting					
Diaphragm Size	13"		8"		13"	
Fail Safe Action	Stem Up					
Actuator Force	High		Medium		High	
Stroke	1-1/2"					
Spring Range	2-7 psi	•				
	4-11 psi		•	•	•	•
	3-15 psi		•			
Positioner Span	10 psi	N/A				•
	5 psi			•	•	

2-Way Water & Steam Valves

Valve Size (inches)	Cv	Valve Type	Max Static Water Pressure	ANSI Class	Max Steam Pressure	Flow Characteristic	Valve Action	Valve OS Number	Close-off Pressure - See Charts On Page 129								
4"	160	Standard	250 psi	125	15 psi (2-position)	Equal %	Stem down to close	V5011A1858	V*-NO	V*-NO	V*-NO	V*-NO	V**-NO	V**-NO	V**-NO		
	160	Standard	250 psi		15 psi (2-position)		Stem up to close	V5011B1013	W*-NO	W*-NO	W*-NO	W*-NO	W**-NO	W**-NO	W**-NO		
	150	Pressure Balanced	175 psi		125 psig / 353 F		Linear	Stem down to close	VGf21EP40	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO	
	150	Standard	175 psi						VGf21ES40	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO	
	150	Pressure Balanced	175 psi						VGf21LP40	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO	
	155	Standard	175 psi						VGf21LS40	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO	
	150		400 psi	VGf22ES40	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO						
	250	Standard	250 psi	125	15 psi (2-position)	Equal %	Stem up to close	V5011A1882	V*-NO	V*-NO	V*-NO	V*-NO	V**-NO	V**-NO	V**-NO		
	250		250 psi		V5011B1047			W*-NO	W*-NO	W*-NO	W*-NO	W**-NO	W**-NO	W**-NO			
	285	Pressure Balanced	175 psi	125 psig / 353 F	Linear	Stem down to close	VGf21EP50	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO			
285	Standard	175 psi	VGf21ES50				O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
320	Pressure Balanced	175 psi	VGf21LP50				O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
320	Standard	175 psi	VGf21LS50				O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
320		400 psi	VGf22ES50	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO							
360	Standard	250 psi	125	15 psi (2-position)	Equal %	Stem up to close	V5011A1916	V*-NO	V*-NO	V*-NO	V*-NO	V**-NO	V**-NO	V**-NO			
360		250 psi		V5011B1070			W*-NO	W*-NO	W*-NO	W*-NO	W**-NO	W**-NO	W**-NO				
365	Pressure Balanced	175 psi	125 psig / 353 F	Linear	Stem down to close	VGf21EP60	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
365	Standard	175 psi				VGf21ES60	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
370	Pressure Balanced	175 psi				VGf21LP60	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
370	Standard	175 psi				VGf21LS60	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
370	Standard	400 psi	250	Equal %		VGf22ES60	O*-NO	O*-NO	O*-NO	O*-NO	O**-NO	O**-NO	O**-NO				
3-Way Water Valves	4"	160	Mixing	250 psi	125	N/A	Constant Total	Stem up closes A-AB	V5013B1029	T-NC	T-NC	T-NC	T-NC	T-NC	T-NC		
		160	Diverting	250 psi			Constant Total	Stem up closes B-AB	V5013C1027	T-NC	T-NC	T-NC	T-NC	T-NC	T-NC		
		150	Mixing	175 psi			Equal % A-AB	Stem up closes A-AB	VGf31EM40	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC		
		160	Diverting	175 psi			Linear, Constant Total	Stem up closes B-AB	VGf31LD40	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC		
		170	Mixing	400 psi			250	Equal % A-AB	Stem up closes A-AB	VGf32EM40	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC	
		160	Diverting	400 psi			250	Linear, Constant Total	Stem up closes B-AB	VGf32LD40	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC	
	5"	250	Mixing	250 psi	125	N/A	N/A	Constant Total	Stem up closes B-AB	V5013B1037	T-NC	T-NC	T-NC	T-NC	T-NC	T-NC	
		250	Diverting	250 psi				Constant Total	Stem up closes B-AB	V5013C1035	T-NC	T-NC	T-NC	T-NC	T-NC	T-NC	
		320	Mixing	175 psi				Equal % A-AB	Stem up closes A-AB	VGf31EM50	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC	
		285	Diverting	175 psi				Linear, Constant Total	Stem up closes B-AB	VGf31LD50	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC	
		320	Mixing	400 psi				250	Linear, Constant Total	Stem up closes B-AB	VGf32EM50	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC
		285	Diverting	400 psi				250	Linear, Constant Total	Stem up closes B-AB	VGf32LD50	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC
	6"	360	Mixing	250 psi	125	N/A	N/A	Constant Total	Stem up closes A-AB	V5013B1045	T-NC	T-NC	T-NC	T-NC	T-NC	T-NC	
		360	Diverting	250 psi				Constant Total	Stem up closes B-AB	V5013C1043	T-NC	T-NC	T-NC	T-NC	T-NC	T-NC	
		370	Mixing	175 psi				Equal % A-AB	Stem up closes A-AB	VGf31EM60	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC	
		380	Diverting	175 psi				Linear, Constant Total	Stem up closes B-AB	VGf31LD60	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC	
		370	Mixing	400 psi				250	Equal % A-AB	Stem up closes A-AB	VGf32EM60	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC
		380	Diverting	400 psi				250	Linear, Constant Total	Stem up closes B-AB	VGf32LD60	O-NC	O-NC	O-NC	O-NC	O-NC	O-NC

*The close-off pressure not to exceed rated pressure of steam valve
 **The close-off pressure not to exceed rated pressure of steam valve. Use 4-11 spring range for positive positioner models.
 NC = Normally Closed
 NO = Normally Open

Close-off Pressure Charts - Valves

Flanged Globe Valves 4" - 6", With Pneumatic Actuators

Chart V

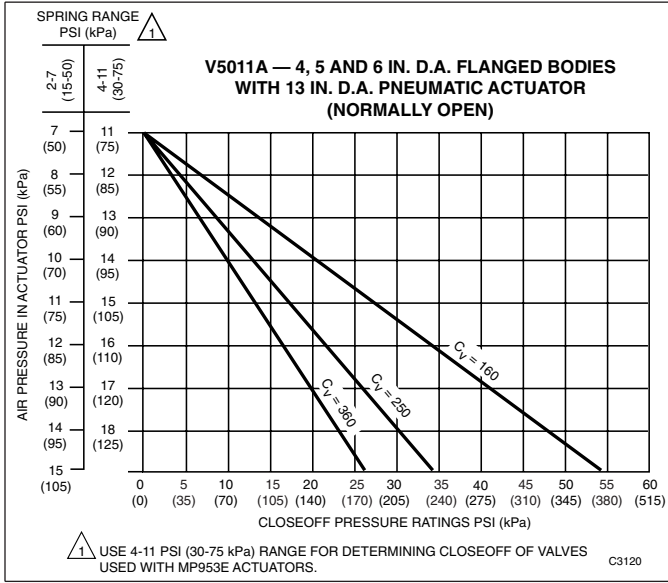


Chart W

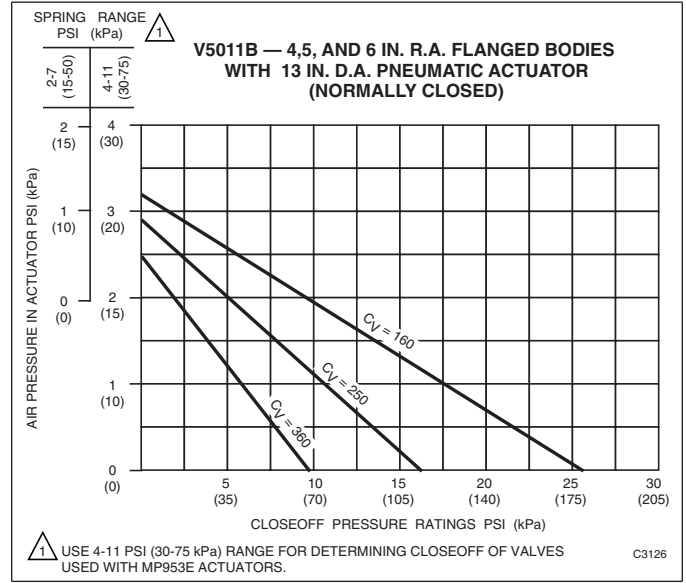


Chart O

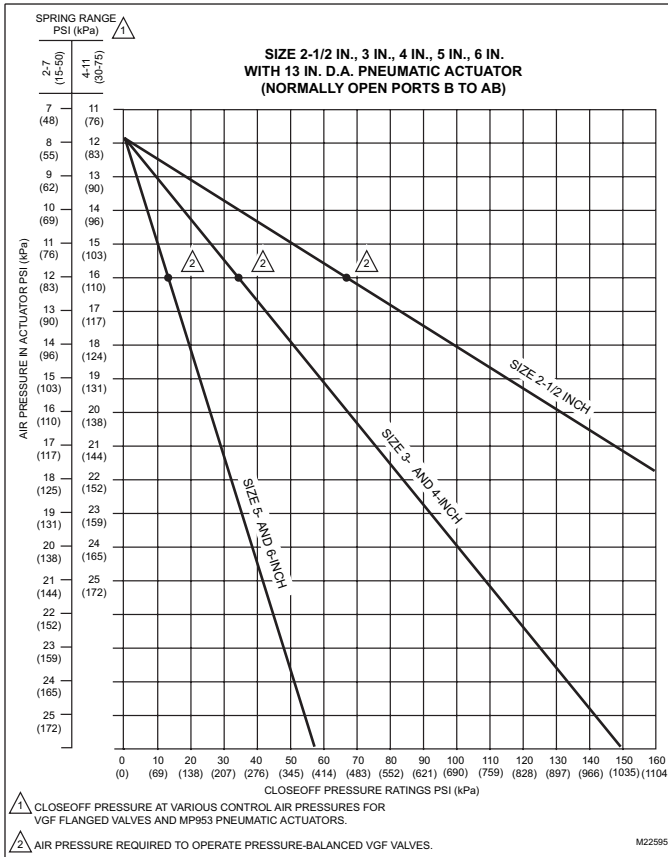
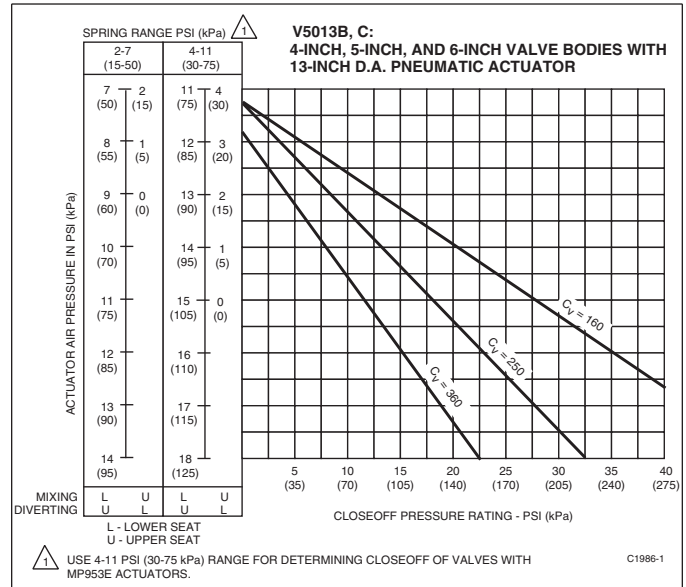


Chart T



VALVES

Product Selection - Valves

Resilient Seat Butterfly Valves, 2-Way Electric Actuation

Honeywell Resilient Seat Butterfly Valves family (VFF) offers options in sizes 2" to 20", highlighted with an industry unique tandem mount using Honeywell direct coupled actuators on valves up to 8" size.

Common Features

- Honeywell direct coupled actuators up to 8" size
- Maximum static pressure 175 psi at 250°F
- Body style: lugged butterfly valve, full-cut (150-175 psid close-off) or under-cut disc (50 psid close-off)
- ANSI 125/150 flanged connections
- Bubble-tight ANSI class VI seat leakage at rated close-off
- Heaters built into NEMA 4X and NEMA 4 actuators
- Controlled media: Water or glycol solutions up to 50% concentration
- Flow characteristics: Equal percentage from 20°-60° stem rotation, modified linear over full stroke
- Normally closed configuration (field configurable)
- Resilient Seat Butterfly Valves come with factory-fitted actuators



2-Way Normally Closed (Field-Configurable Normally Open)


Actuator Features		Non-fail Safe					
		Floating			Modulating		
Actuator O.S. Number	MN6134A1003	Industrial Actuators			Industrial Actuators		
	NEMA 2	NEMA 4X	NEMA 4	NEMA 2	NEMA 4X	NEMA 4	
Power Supply	Voltage	24 Vac	120 Vac	120 Vac	24 Vac	120 Vac	120 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	9 / 18 [†] VA	1.4 - 3.0 ALR	3.2 - 4.0 ALR	9 / 18 [†] VA	1.4 - 3.0 ALR	3.2 - 4.0 ALR
Actuator Torque	lb.-in.	300 / 600 [†]	300 - 6,500	8,850 - 31,000	300 / 600 [†]	300 - 6,500	8,850 - 31,000
Control	(0)2-10 Vdc				•	•	•
	4-20 mA (external 500 ohm resistor)				•	In-built	In-built
	Floating	24 Vac	120 Vac	120 Vac	24 Vac		
	2-Position	•	•	•	•		
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position		Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed
Aux Switch	Built in		2 x SPDT	2 x SPDT		2 x SPDT	2 x SPDT
	Add-On	SW2-US			SW2-US		
Feedback	Built in				2-10 Vdc	4-20mA / 2-10Vdc	4-20mA / 2-10Vdc
Manual Override			•	•		•	•
Conduit Connection		•	•	•	•	•	•
Waterproof			•	•		•	•
Corrosion-resistant			•	•		•	•
Anti-condensate heater			•	•		•	•

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number					
2"	61	144	175	VFF2FW1Y2A	VFF2FW1YXA		VFF2FW1Y2B	VFF2FW1YXB	
			250						
2-1/2"	107	282	175	VFF2GW1Y2A	VFF2GW1YXA		VFF2GW1Y2B	VFF2GW1YXB	
			250						
3"	154	461	175	VFF2HW1Y2A	VFF2HW1YXA		VFF2HW1Y2B	VFF2HW1YXB	
			250						
4"	274	841	50	VFF2JV1Y2A	VFF2JV1YXA		VFF2JV1Y2B	VFF2JV1YXB	
			175	VFF2JW1Y2A [†]	VFF2JW1YXA		VFF2JW1Y2B [†]	VFF2JW1YXB	
			250						
5"	428	1376	50	VFF2KV1Y2A*	VFF2KV1YXA		VFF2KV1Y2B*	VFF2KV1YXB	
			175	VFF2KW1Y2A [†]	VFF2KW1YXA		VFF2KW1Y2B [†]	VFF2KW1YXB	
			250						
6"	567	1850	50		VFF2LV1YXA			VFF2LV1YXB	
			175	VFF2LW1Y2A [†]	VFF2LW1YXA		VFF2LW1Y2B [†]	VFF2LW1YXB	
			250						
8"	1081	3316	50	VFF2MV1Y2A [†]	VFF2MV1YXA		VFF2MV1Y2B [†]	VFF2MV1YXB	
			175		VFF2MW1YXA			VFF2MW1YXB	
			250						
10"	1710	5430	50		VFF2NV1YXA			VFF2NV1YXB	
			175		VFF2NW1YXA			VFF2NW1YXB	
			250						
12"	2563	8077	50		VFF2PV1YXA			VFF2PV1YXB	
			175		VFF2PW1YXA			VFF2PW1YXB	
			250						
14"	3384	10538	50		VFF2RV1YXA			VFF2RV1YXB	
			150		VFF2RW1YXA			VFF2RW1YXB	
			250						
16"	4483	13966	50		VFF2SV1YXA			VFF2SV1YXB	
			150			VFF2SW1Y4A			VFF2SW1Y4B
			250						
18"	5736	17214	50		VFF2TV1YXA			VFF2TV1YXB	
			150			VFF2TW1Y4A			VFF2TW1Y4B
			250						
20"	7144	22339	50			VFF2UV1Y4A			VFF2UV1Y4B
			150			VFF2UW1Y4A			VFF2UW1Y4B
			250						

[†] Tandem mount
*Chilled water service only

Product Selection - Valves

Resilient Seat Butterfly Valves, 2-Way Electric Actuation

Actuator Features		Fail Safe			Valve Only Manual operation for end-of-line service	
		2-Position	Modulating			
Actuator O.S. Number		MS8120A1007	MS4120A1001	MS7520A2007		
		NEMA 2	NEMA 2	NEMA 2		
Power Supply	Voltage	24 Vac	100-250 Vac	24 Vac		
	Frequency	60 Hz	60 Hz	50 / 60 Hz		
	Power	40 / 80 [†] VA	60 / 120 [†] VA	16 / 32 [†] VA		
Actuator Torque		175 / 350 [†]	175 / 350 [†]	175 / 350 [†]		
Control	(0)2-10 Vdc			•		
	4-20 mA (external 500 ohm resistor)			•		
	Floating			24 Vac		
	2-Position	•	•	•		
Fail Safe Action		Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed		
Normal Position		Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed		
Aux Switch	Built in					
	Add-On	SW2-US	SW2-US	SW2-US		
Feedback		Built in		2-10 Vdc		
Manual Override						
Conduit Connection		•	•	•		
Waterproof						
Corrosion-resistant						
Anti-condensate heater						

2-Way Normally Closed (Field-Configurable Normally Open)

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number				
2"	61	144	175	VFF2FW1Y2C	VFF2FW1Y2E	VFF2FW1Y2D		
			250				VFF2FW2YLX	VFF2FW2YGX
2-1/2"	107	282	175	VFF2GW1Y2C	VFF2GW1Y2E	VFF2GW1Y2D		
			250				VFF2GW2YLX	VFF2GW2YGX
3"	154	461	175	VFF2HW1Y2C [†]	VFF2HW1Y2E [†]	VFF2HW1Y2D [†]		
			250				VFF2HW2YLX	VFF2HW2YGX
4"	274	841	50	VFF2JV1Y2C	VFF2JV1Y2E	VFF2JV1Y2D		
			175					
			250				VFF2JW2YLX	VFF2JW2YGX
5"	428	1376	50	VFF2KV1Y2C ^{†*}	VFF2KV1Y2E ^{†*}	VFF2KV1Y2D ^{†*}		
			175					
			250				VFF2KW2YLX	VFF2KW2YGX
6"	567	1850	50					
			175					
			250				VFF2LW2YLX	VFF2LW2YGX
8"	1081	3316	50					
			175					
			250				VFF2MW2YLX	VFF2MW2YGX
10"	1710	5430	50					
			175					
			250				VFF2NW2YLX	VFF2NW2YGX
12"	2563	8077	50					
			175					
			250				VFF2PW2YLX	VFF2PW2YGX
14"	3384	10538	50					
			150					
			250					VFF2RW2YGX
16"	4483	13966	50					
			150					
			250					VFF2SW2YGX
18"	5736	17214	50					
			150					
			250					VFF2TW2YGX
20"	7144	22339	50					
			150					
			250					VFF2UW2YGX

[†]Tandem mount
*Chilled water service only

Product Selection - Valves

Resilient Seat Butterfly Valves, 3-Way Electric Actuation

Common Features

- VFF3 – A-B-AB porting, full-cut (150-175 psid close-off) or under-cut disc (50 psid close-off)
- VFF6 – A-AB-B porting, full-cut (150-175 psid close-off) or under-cut disc (50 psid close-off)
- Honeywell direct coupled actuators up to 6" size
- Mixing or diverting control
- Standard right-angle cast-iron T-pipe
- A-port configured to closed position at factory
- Porting pattern field-configurable with valve linkage adjustment
- Resilient Seat Butterfly Valves come with factory-fitted actuators



3-Way Mixing / Diverting Valve Porting

3-Way Mixing / Diverting Center Common Port

Actuator Features	Non-fail Safe						
	Floating			Modulating			
Actuator O.S. Number	MN6134A1003	Industrial Actuators			MN7234A2008	Industrial Actuators	
	NEMA 2	NEMA 4X	NEMA 4	NEMA 2	NEMA 4X	NEMA 4	
Power Supply	Voltage	24 Vac	120 Vac	120 Vac	24 Vac	120 Vac	120 Vac
	Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	Power	9 / 18 [†] VA	1.4 - 3.0 ALR	3.2 - 4.0 ALR	9 / 18 [†] VA	1.4 - 3.0 ALR	3.2 - 4.0 ALR
Actuator Torque	lb.-in.	300 / 600 [†]	300 - 6,500	8,850 - 31,000	300 / 600 [†]	300 - 6,500	8,850 - 31,000
Control	(0)2-10 Vdc				•	•	•
	4-20 mA (external 500 ohm resistor)				•	In-built	In-built
	Floating	24 Vac	120 Vac	120 Vac	24 Vac		
	2-Position	•	•	•	•		
Fail Safe Action		Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place	Stay in Place
Normal Position		Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed
Aux Switch	Built in		2 x SPDT	2 x SPDT		2 x SPDT	2 x SPDT
	Add-On	SW2-US			SW2-US		
Feedback	Built in				2-10 Vdc	4-20mA / 2-10Vdc	4-20mA / 2-10Vdc
Manual Override			•	•		•	•
Conduit Connection		•	•	•	•	•	•
Waterproof			•	•		•	•
Corrosion-resistant			•	•		•	•
Anti-condensate heater			•	•		•	•

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number			
2"	61	144	175	VFF3FW1Y2A	VFF3FW1YXA	VFF3FW1Y2B	VFF3FW1YXB
2-1/2"	107	282	175	VFF3GW1Y2A	VFF3GW1YXA	VFF3GW1Y2B	VFF3GW1YXB
3"	154	461	175	VFF3HW1Y2A	VFF3HW1YXA	VFF3HW1Y2B	VFF3HW1YXB
4"	274	841	50	VFF3JV1Y2A	VFF3JV1YXA	VFF3JV1Y2B	VFF3JV1YXB
			175	VFF3JW1Y2A [†]	VFF3JW1YXA	VFF3JW1Y2B [†]	VFF3JW1YXB
5"	428	1376	50	VFF3KW1Y2A [†]	VFF3KV1YXA	VFF3KW1Y2B [†]	VFF3KV1YXB
			175	VFF3KW1Y2A [†]	VFF3KW1YXA	VFF3KW1Y2B [†]	VFF3KW1YXB
6"	567	1850	50	VFF3LV1Y2A [†]	VFF3LV1YXA	VFF3LV1Y2B [†]	VFF3LV1YXB
			175	VFF3LW1Y2A [†]	VFF3LW1YXA	VFF3LW1Y2B [†]	VFF3LW1YXB
8"	1081	3316	50	VFF3MV1Y2A [†]	VFF3MV1YXA	VFF3MV1Y2B [†]	VFF3MV1YXB
			175	VFF3MW1Y2A [†]	VFF3MW1YXA	VFF3MW1Y2B [†]	VFF3MW1YXB
10"	1710	5430	50	VFF3NV1Y2A [†]	VFF3NV1YXA	VFF3NV1Y2B [†]	VFF3NV1YXB
			175	VFF3NW1Y2A [†]	VFF3NW1YXA	VFF3NW1Y2B [†]	VFF3NW1YXB
12"	2563	8077	50	VFF3PV1Y2A [†]	VFF3PV1YXA	VFF3PV1Y2B [†]	VFF3PV1YXB
			175	VFF3PW1Y2A [†]	VFF3PW1YXA	VFF3PW1Y2B [†]	VFF3PW1YXB
14"	3384	10538	50	VFF3RV1Y2A [†]	VFF3RV1YXA	VFF3RV1Y2B [†]	VFF3RV1YXB
			150	VFF3RW1Y2A [†]	VFF3RW1YXA	VFF3RW1Y2B [†]	VFF3RW1YXB
16"	4483	13966	50	VFF3SV1Y2A [†]	VFF3SV1YXA	VFF3SV1Y2B [†]	VFF3SV1YXB
			150	VFF3SW1Y2A [†]	VFF3SW1YXA	VFF3SW1Y2B [†]	VFF3SW1YXB
18"	5736	17214	50	VFF3TV1Y2A [†]	VFF3TV1YXA	VFF3TV1Y2B [†]	VFF3TV1YXB
			150	VFF3TW1Y2A [†]	VFF3TW1YXA	VFF3TW1Y2B [†]	VFF3TW1YXB
20"	7144	22339	50	VFF3UV1Y2A [†]	VFF3UV1YXA	VFF3UV1Y2B [†]	VFF3UV1YXB
			150	VFF3UW1Y2A [†]	VFF3UW1YXA	VFF3UW1Y2B [†]	VFF3UW1YXB

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number			
2"	61	144	175	VFF6FW1Y2A	VFF6FW1YXA	VFF6FW1Y2B	VFF6FW1YXB
2-1/2"	107	282	175	VFF6GW1Y2A	VFF6GW1YXA	VFF6GW1Y2B	VFF6GW1YXB
3"	154	461	175	VFF6HW1Y2A	VFF6HW1YXA	VFF6HW1Y2B	VFF6HW1YXB
4"	274	841	50	VFF6JV1Y2A	VFF6JV1YXA	VFF6JV1Y2B	VFF6JV1YXB
			175	VFF6JW1Y2A [†]	VFF6JW1YXA	VFF6JW1Y2B [†]	VFF6JW1YXB
5"	428	1376	50	VFF6KW1Y2A [†]	VFF6KV1YXA	VFF6KW1Y2B [†]	VFF6KV1YXB
			175	VFF6KW1Y2A [†]	VFF6KW1YXA	VFF6KW1Y2B [†]	VFF6KW1YXB
6"	567	1850	50	VFF6LV1Y2A [†]	VFF6LV1YXA	VFF6LV1Y2B [†]	VFF6LV1YXB
			175	VFF6LW1Y2A [†]	VFF6LW1YXA	VFF6LW1Y2B [†]	VFF6LW1YXB
8"	1081	3316	50	VFF6MV1Y2A [†]	VFF6MV1YXA	VFF6MV1Y2B [†]	VFF6MV1YXB
			175	VFF6MW1Y2A [†]	VFF6MW1YXA	VFF6MW1Y2B [†]	VFF6MW1YXB
10"	1710	5430	50	VFF6NV1Y2A [†]	VFF6NV1YXA	VFF6NV1Y2B [†]	VFF6NV1YXB
			175	VFF6NW1Y2A [†]	VFF6NW1YXA	VFF6NW1Y2B [†]	VFF6NW1YXB
12"	2563	8077	50	VFF6PV1Y2A [†]	VFF6PV1YXA	VFF6PV1Y2B [†]	VFF6PV1YXB
			175	VFF6PW1Y2A [†]	VFF6PW1YXA	VFF6PW1Y2B [†]	VFF6PW1YXB
14"	3384	10538	50	VFF6RV1Y2A [†]	VFF6RV1YXA	VFF6RV1Y2B [†]	VFF6RV1YXB
			150	VFF6RW1Y2A [†]	VFF6RW1YXA	VFF6RW1Y2B [†]	VFF6RW1YXB
16"	4483	13966	50	VFF6SV1Y2A [†]	VFF6SV1YXA	VFF6SV1Y2B [†]	VFF6SV1YXB
			150	VFF6SW1Y2A [†]	VFF6SW1YXA	VFF6SW1Y2B [†]	VFF6SW1YXB
18"	5736	17214	50	VFF6TV1Y2A [†]	VFF6TV1YXA	VFF6TV1Y2B [†]	VFF6TV1YXB
			150	VFF6TW1Y2A [†]	VFF6TW1YXA	VFF6TW1Y2B [†]	VFF6TW1YXB
20"	7144	22339	50	VFF6UV1Y2A [†]	VFF6UV1YXA	VFF6UV1Y2B [†]	VFF6UV1YXB
			150	VFF6UW1Y2A [†]	VFF6UW1YXA	VFF6UW1Y2B [†]	VFF6UW1YXB

[†] Tandem mount
*Chilled water service only

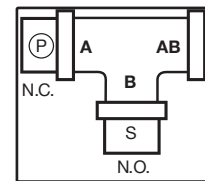
Resilient Seat Butterfly Valves, 3-Way Electric Actuation

Actuator Features		Fail Safe			Valve Only End-of-line Service
		2-Position		Modulating	
Actuator O.S. Number		MS8120A1007	MS4120A1001	MS7520A2007	
		NEMA 2	NEMA 2	NEMA 2	
Power Supply	Voltage	24 Vac	100-250 Vac	24 Vac	
	Frequency	60 Hz	60 Hz	50 / 60 Hz	
	Power	40 / 80 [†] VA	60 / 120 [†] VA	16 / 32 [†] VA	
Actuator Torque		175 / 350 [†]	175 / 350 [†]	175 / 350 [†]	
Control				•	
4-20 mA (external 500 ohm resistor)				•	
Floating				24 Vac	
2-Position		•	•	•	
Fail Safe Action		Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	
Normal Position		Configurable Open / Closed	Configurable Open / Closed	Configurable Open / Closed	
Aux Switch		Built in			
Add-On		SW2-US	SW2-US	SW2-US	
Feedback		Built in		2-10 Vdc	
Manual Override					
Conduit Connection		•	•	•	
Waterproof					
Corrosion-resistant					
Anti-condensate heater					

3-Way Mixing / Diverting Valve Porting

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number		
2"	61	144	175	VFF3FW1Y2C	VFF3FW1Y2E	VFF3FW1Y2D
2-1/2"	107	282	175	VFF3GW1Y2C	VFF3GW1Y2E	VFF3GW1Y2D
3"	154	461	175	VFF3HW1Y2C [†]	VFF3HW1Y2E [†]	VFF3HW1Y2D [†]
			50	VFF3JV1Y2C	VFF3JV1Y2E	VFF3JV1Y2D
4"	274	841	175			
			50	VFF3KV1Y2C ^{*†}	VFF3KV1Y2E ^{*†}	VFF3KV1Y2D ^{*†}
5"	428	1376	175			
			50			
6"	567	1850	175			
			50			
8"	1081	3316	175			
			50			
10"	1710	5430	175			
			50			
12"	2563	8077	175			
			50			
14"	3384	10538	150			
			50			
16"	4483	13966	150			
			50			
18"	5736	17214	150			
			50			
20"	7144	22339	150			
			150			

Use a pair of 2-way valves with standard flanged Tee



VFF3 Default Configuration

Notes:

Viewed from above

P = Actuator and Primary Valve

S = Slave Valve

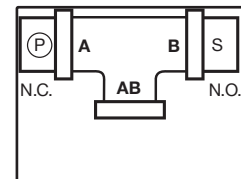
VFF3 valve action is mixing for fluid flow from left to right.

VFF3 valve action is diverting for fluid flow from right to left

3-Way Mixing / Diverting Center Common Port

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number		
2"	61	144	175	VFF6FW1Y2C	VFF6FW1Y2E	VFF6FW1Y2D
2-1/2"	107	282	175	VFF6GW1Y2C	VFF6GW1Y2E	VFF6GW1Y2D
3"	154	461	175	VFF6HW1Y2C [†]	VFF6HW1Y2E [†]	VFF6HW1Y2D [†]
			50	VFF6JV1Y2C	VFF6JV1Y2E	VFF6JV1Y2D
4"	274	841	175			
			50	VFF6KV1Y2C ^{*†}	VFF6KV1Y2E ^{*†}	VFF6KV1Y2D ^{*†}
5"	428	1376	175			
			50			
6"	567	1850	175			
			50			
8"	1081	3316	175			
			50			
10"	1710	5430	175			
			50			
12"	2563	8077	175			
			50			
14"	3384	10538	150			
			50			
16"	4483	13966	150			
			50			
18"	5736	17214	150			
			50			
20"	7144	22339	150			
			150			

Use a pair of 2-way valves with standard flanged Tee



VFF6 Default Configuration

Notes:

Viewed from above

P = Actuator and Primary Valve

S = Slave Valve

VFF6 may be piped for mixing control with water exiting port AB, or for diverting control with water entering port AB

[†] Tandem mount
*Chilled water service only

Product Selection - Valves

Resilient Seat Butterfly Valves, 2-Way Pneumatic Actuation

Common Features

Honeywell offers a wide selection of pneumatic actuators:

- 20 psi spring return (up to 10" size)
- 80 psi spring return
- 80 psi double acting bi-directional

Configurable with accessories:

- Positioner
- Electro-pneumatic positioner (80 psi only)
- Electro-pneumatic solenoid (80 psi only)
- VFF1 configured normally open and VFF2 normally closed at factory for spring return actuators
- Body style: lugged butterfly valve with full-cut (150-175 psid close-off) or under-cut disc (50 psid close-off)
- Bi-directional actuator 175 psid close-off on all sizes with full cut disc (2-way only)
- Normally-open configuration (VFF1 spring return)
- Normally-closed configuration (VFF2 spring return)



Actuator Features		Non-fail Safe (Bidirectional)				
Actuator		80 psi Actuator				
		Standard	E-P Solenoid	E-P Solenoid	Positioner	E-P Positioner
Power Supply	Voltage		24 Vac	120 VAc		24 Vac
	Frequency		50 / 60 Hz	50 / 60 Hz		50 / 60 Hz
	Power		6 W	6 W		
Control	Modulating Pneumatic	•			•	
	2-Position		•	•		
	4-20 mA					•
Auxiliary Switch	Add-On	VFF50-0400	VFF50-0400	VFF50-0400		
Manual Override		•				
Conduit Connection			•	•		•
Waterproof						•
Fail Safe						

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number				
				Use VFF2 models for Bi-directional pneumatic operation				
2"	61	144	175					
2-1/2"	107	282	175					
3"	154	461	175					
4"	274	841	50					
			175					
5"	428	1376	50					
			175					
6"	567	1850	50					
			175					
8"	1081	3316	50					
			175					
10"	1710	5430	50					
			175					
12"	2563	8077	50					
			175					
14"	3384	10538	50					
			150*					
16"	4483	13966	50					
			150*					
18"	5736	17214	50					
			150*					
20"	7144	22339	50					
			150*					
Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number				
2"	61	144	175	VFF2FW1YXR	VFF2FW1YCR	VFF2FW1YER	VFF2FW1YPR	VFF2FW1YDR
2-1/2"	107	282	175	VFF2GW1YXR	VFF2GW1YCR	VFF2GW1YER	VFF2GW1YPR	VFF2GW1YDR
3"	154	461	175	VFF2HW1YXR	VFF2HW1YCR	VFF2HW1YER	VFF2HW1YPR	VFF2HW1YDR
			50	VFF2JV1YXR	VFF2JV1YCR	VFF2JV1YER	VFF2JV1YPR	VFF2JV1YDR
4"	274	841	50	VFF2JW1YXR	VFF2JW1YCR	VFF2JW1YER	VFF2JW1YPR	VFF2JW1YDR
			175	VFF2KV1YXR	VFF2KV1YCR	VFF2KV1YER	VFF2KV1YPR	VFF2KV1YDR
5"	428	1376	50	VFF2KW1YXR	VFF2KW1YCR	VFF2KW1YER	VFF2KW1YPR	VFF2KW1YDR
			175	VFF2LV1YXR	VFF2LV1YCR	VFF2LV1YER	VFF2LV1YPR	VFF2LV1YDR
6"	567	1850	50	VFF2LW1YXR	VFF2LW1YCR	VFF2LW1YER	VFF2LW1YPR	VFF2LW1YDR
			175	VFF2MV1YXR	VFF2MV1YCR	VFF2MV1YER	VFF2MV1YPR	VFF2MV1YDR
8"	1081	3316	50	VFF2MW1YXR	VFF2MW1YCR	VFF2MW1YER	VFF2MW1YPR	VFF2MW1YDR
			175	VFF2NV1YXR	VFF2NV1YCR	VFF2NV1YER	VFF2NV1YPR	VFF2NV1YDR
10"	1710	5430	50	VFF2NW1YXR	VFF2NW1YCR	VFF2NW1YER	VFF2NW1YPR	VFF2NW1YDR
			175	VFF2PV1YXR	VFF2PV1YCR	VFF2PV1YER	VFF2PV1YPR	VFF2PV1YDR
12"	2563	8077	50	VFF2PW1YXR	VFF2PW1YCR	VFF2PW1YER	VFF2PW1YPR	VFF2PW1YDR
			175	VFF2RV1YXR	VFF2RV1YCR	VFF2RV1YER	VFF2RV1YPR	VFF2RV1YDR
14"	3384	10538	50	VFF2RW1YXR	VFF2RW1YCR	VFF2RW1YER	VFF2RW1YPR	VFF2RW1YDR
			175*	VFF2SV1YXR	VFF2SV1YCR	VFF2SV1YER	VFF2SV1YPR	VFF2SV1YDR
16"	4483	13966	50	VFF2SW1YXR	VFF2SW1YCR	VFF2SW1YER	VFF2SW1YPR	VFF2SW1YDR
			175*	VFF2TV1YXR	VFF2TV1YCR	VFF2TV1YER	VFF2TV1YPR	VFF2TV1YDR
18"	5736	17214	50	VFF2TW1YXR	VFF2TW1YCR	VFF2TW1YER	VFF2TW1YPR	VFF2TW1YDR
			175*	VFF2UV1YXR	VFF2UV1YCR	VFF2UV1YER	VFF2UV1YPR	VFF2UV1YDR
20"	7144	22339	50	VFF2UW1YXR	VFF2UW1YCR	VFF2UW1YER	VFF2UW1YPR	VFF2UW1YDR
			175*	VFF2UW1YXR	VFF2UW1YCR	VFF2UW1YER	VFF2UW1YPR	VFF2UW1YDR

* Full cut valves with bi-directional pneumatic actuators feature 175 psi close-off in all body sizes

Product Selection - Valves

Resilient Seat Butterfly Valves, 2-Way Pneumatic Actuation

Actuator Features				Fail Safe							
Actuator		20 psi Actuator		80 psi Actuator							
		8-13 spring	Positioner	Standard	E-P Solenoid	E-P Solenoid	Positioner	E-P Positioner			
Power Supply	Voltage				24 Vac	120 Vac		24 Vac			
	Frequency				50 / 60 Hz	50 / 60 Hz		50 / 60 Hz			
	Power				6 W	6 W					
Control	Modulating Pneumatic	•	•	•				•			
	2-Position				•	•					
	4-20 mA								•		
Auxiliary Switch	Add-On			VFF50-0400	VFF50-0400	VFF50-0400					
Manual Override				•							
Conduit Connection					•	•					
Waterproof											
Fail Safe		•	•	•	•	•	•	•	•	•	•

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number							
				2"	61	144	175	VFF1FW1Y8P	VFF1FW1YPP	VFF1FW1YXS	VFF1FW1YCS
2-1/2"	107	282	175	VFF1GW1Y8P	VFF1GW1YPP	VFF1GW1YXS	VFF1GW1YCS	VFF1GW1YES	VFF1GW1YPS	VFF1GW1YDS	
3"	154	461	175	VFF1HW1Y8P	VFF1HW1YPP	VFF1HW1YXS	VFF1HW1YCS	VFF1HW1YES	VFF1HW1YPS	VFF1HW1YDS	
4"	274	841	50	VFF1JV1Y8P	VFF1JV1YPP	VFF1JV1YXS	VFF1JV1YCS	VFF1JV1YES	VFF1JV1YPS	VFF1JV1YDS	
			175	VFF1JW1Y8P	VFF1JW1YPP	VFF1JW1YXS	VFF1JW1YCS	VFF1JW1YES	VFF1JW1YPS	VFF1JW1YDS	
5"	428	1376	50	VFF1KV1Y8P	VFF1KV1YPP	VFF1KV1YXS	VFF1KV1YCS	VFF1KV1YES	VFF1KV1YPS	VFF1KV1YDS	
			175	VFF1KW1Y8P	VFF1KW1YPP	VFF1KW1YXS	VFF1KW1YCS	VFF1KW1YES	VFF1KW1YPS	VFF1KW1YDS	
6"	567	1850	50	VFF1LW1Y8P*	VFF1LW1YPP*	VFF1LW1YXS	VFF1LW1YCS	VFF1LW1YES	VFF1LW1YPS	VFF1LW1YDS	
			175	VFF1LW1Y8P	VFF1LW1YPP	VFF1LW1YXS	VFF1LW1YCS	VFF1LW1YES	VFF1LW1YPS	VFF1LW1YDS	
8"	1081	3316	50	VFF1MV1Y8P	VFF1MV1YPP	VFF1MV1YXS	VFF1MV1YCS	VFF1MV1YES	VFF1MV1YPS	VFF1MV1YDS	
			175	VFF1MW1Y8P [†]	VFF1MW1YPP [†]	VFF1MW1YXS	VFF1MW1YCS	VFF1MW1YES	VFF1MW1YPS	VFF1MW1YDS	
10"	1710	5430	50	VFF1NV1Y8P [†]	VFF1NV1YPP [†]	VFF1NV1YXS	VFF1NV1YCS	VFF1NV1YES	VFF1NV1YPS	VFF1NV1YDS	
			175			VFF1NW1YXS	VFF1NW1YCS	VFF1NW1YES	VFF1NW1YPS	VFF1NW1YDS	
12"	2563	8077	50			VFF1PV1YXS	VFF1PV1YCS	VFF1PV1YES	VFF1PV1YPS	VFF1PV1YDS	
			175			VFF1PW1YXS	VFF1PW1YCS	VFF1PW1YES	VFF1PW1YPS	VFF1PW1YDS	
14"	3384	10538	50			VFF1RV1YXS	VFF1RV1YCS	VFF1RV1YES	VFF1RV1YPS	VFF1RV1YDS	
			150			VFF1RW1YXS	VFF1RW1YCS	VFF1RW1YES	VFF1RW1YPS	VFF1RW1YDS	
16"	4483	13966	50			VFF1SV1YXS	VFF1SV1YCS	VFF1SV1YES	VFF1SV1YPS	VFF1SV1YDS	
			150			VFF1SW1YXS	VFF1SW1YCS	VFF1SW1YES	VFF1SW1YPS	VFF1SW1YDS	
18"	5736	17214	50			VFF1TV1YXS	VFF1TV1YCS	VFF1TV1YES	VFF1TV1YPS	VFF1TV1YDS	
			150			VFF1TW1YXS	VFF1TW1YCS	VFF1TW1YES	VFF1TW1YPS	VFF1TW1YDS	
20"	7144	22339	50			VFF1UV1YXS	VFF1UV1YCS	VFF1UV1YES	VFF1UV1YPS	VFF1UV1YDS	
			150			VFF1UW1YXS	VFF1UW1YCS	VFF1UW1YES	VFF1UW1YPS	VFF1UW1YDS	

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number							
				2"	61	144	175	VFF2FW1Y8P	VFF2FW1YPP	VFF2FW1YXS	VFF2FW1YCS
2-1/2"	107	282	175	VFF2GW1Y8P	VFF2GW1YPP	VFF2GW1YXS	VFF2GW1YCS	VFF2GW1YES	VFF2GW1YPS	VFF2GW1YDS	
3"	154	461	175	VFF2HW1Y8P	VFF2HW1YPP	VFF2HW1YXS	VFF2HW1YCS	VFF2HW1YES	VFF2HW1YPS	VFF2HW1YDS	
4"	274	841	50	VFF2JV1Y8P	VFF2JV1YPP	VFF2JV1YXS	VFF2JV1YCS	VFF2JV1YES	VFF2JV1YPS	VFF2JV1YDS	
			175	VFF2JW1Y8P	VFF2JW1YPP	VFF2JW1YXS	VFF2JW1YCS	VFF2JW1YES	VFF2JW1YPS	VFF2JW1YDS	
5"	428	1376	50	VFF2KV1Y8P	VFF2KV1YPP	VFF2KV1YXS	VFF2KV1YCS	VFF2KV1YES	VFF2KV1YPS	VFF2KV1YDS	
			175	VFF2KW1Y8P	VFF2KW1YPP	VFF2KW1YXS	VFF2KW1YCS	VFF2KW1YES	VFF2KW1YPS	VFF2KW1YDS	
6"	567	1850	50	VFF2LW1Y8P*	VFF2LW1YPP*	VFF2LW1YXS	VFF2LW1YCS	VFF2LW1YES	VFF2LW1YPS	VFF2LW1YDS	
			175	VFF2LW1Y8P	VFF2LW1YPP	VFF2LW1YXS	VFF2LW1YCS	VFF2LW1YES	VFF2LW1YPS	VFF2LW1YDS	
8"	1081	3316	50	VFF2MV1Y8P	VFF2MV1YPP	VFF2MV1YXS	VFF2MV1YCS	VFF2MV1YES	VFF2MV1YPS	VFF2MV1YDS	
			175	VFF2MW1Y8P [†]	VFF2MW1YPP [†]	VFF2MW1YXS	VFF2MW1YCS	VFF2MW1YES	VFF2MW1YPS	VFF2MW1YDS	
10"	1710	5430	50	VFF2NV1Y8P [†]	VFF2NV1YPP [†]	VFF2NV1YXS	VFF2NV1YCS	VFF2NV1YES	VFF2NV1YPS	VFF2NV1YDS	
			175			VFF2NW1YXS	VFF2NW1YCS	VFF2NW1YES	VFF2NW1YPS	VFF2NW1YDS	
12"	2563	8077	50			VFF2PV1YXS	VFF2PV1YCS	VFF2PV1YES	VFF2PV1YPS	VFF2PV1YDS	
			175			VFF2PW1YXS	VFF2PW1YCS	VFF2PW1YES	VFF2PW1YPS	VFF2PW1YDS	
14"	3384	10538	50			VFF2RV1YXS	VFF2RV1YCS	VFF2RV1YES	VFF2RV1YPS	VFF2RV1YDS	
			150			VFF2RW1YXS	VFF2RW1YCS	VFF2RW1YES	VFF2RW1YPS	VFF2RW1YDS	
16"	4483	13966	50			VFF2SV1YXS	VFF2SV1YCS	VFF2SV1YES	VFF2SV1YPS	VFF2SV1YDS	
			150			VFF2SW1YXS	VFF2SW1YCS	VFF2SW1YES	VFF2SW1YPS	VFF2SW1YDS	
18"	5736	17214	50			VFF2TV1YXS	VFF2TV1YCS	VFF2TV1YES	VFF2TV1YPS	VFF2TV1YDS	
			150			VFF2TW1YXS	VFF2TW1YCS	VFF2TW1YES	VFF2TW1YPS	VFF2TW1YDS	
20"	7144	22339	50			VFF2UV1YXS	VFF2UV1YCS	VFF2UV1YES	VFF2UV1YPS	VFF2UV1YDS	
			150			VFF2UW1YXS	VFF2UW1YCS	VFF2UW1YES	VFF2UW1YPS	VFF2UW1YDS	

[†]Tandem mount
*Use full cut, 175psid close-off valves - No under-cut, 50psid close-off valve available

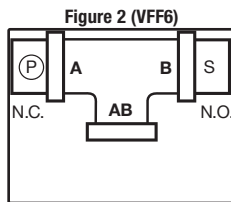
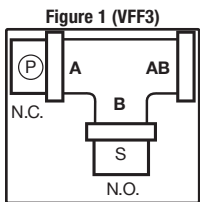
Product Selection - Valves

Resilient Seat Butterfly Valves, 3-Way Pneumatic Actuation

Common Features

Honeywell offers a wide selection of pneumatic actuators:

- FF3 – A-B-AB porting, full-cut (150-175 psid close-off) or under-cut disc (50 psid close-off) (Figure 1 - from 63-2661-03 fig. 12)
- VFF6 – A-AB-B porting, full-cut (150-175 psid close-off) or under-cut disc (50 psid close-off) (Figure 2 - from 63-2661-03 fig. 12)
- 20 psi spring return (up to 8" size)
- 80 psi spring return
- 80 psi double acting bi-directional
- Mixing or diverting control
- Standard right-angle cast-iron T-pipe
- A-port configured to closed position at factory
- Porting pattern field-configurable with valve linkage adjustment



Notes:

Viewed from above

P = Actuator and Primary Valve

S = Slave Valve

VFF3 valve action is mixing for fluid flow from left to right.

VFF3 valve action is diverting for fluid flow from right to left

VFF6 may be piped for mixing control with water exiting port AB, or for diverting control with water entering port AB

Actuator Features		Non-fail Safe (Bidirectional)				
Actuator		80 psi Actuator				
Power Supply		Standard	E-P Solenoid	E-P Solenoid	Positioner	E-P Positioner
Voltage			24 Vac	120 Vac		24 Vac
Frequency			50 / 60 Hz	50 / 60 Hz		50 / 60 Hz
Power			6 W	6 W		
Control						
Modulating Pneumatic		•			•	
2-Position			•	•		
4-20 mA						•
Auxiliary Switch		Add-On	VFF50-0400	VFF50-0400	VFF50-0400	
Manual Override		•				
Conduit Connection			•	•		•
Waterproof						•
Fail Safe						

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number				
				VFF3FW1YXR	VFF3FW1YCR	VFF3FW1YER	VFF3FW1YPR	VFF3FW1YDR
2"	61	144	175	VFF3FW1YXR	VFF3FW1YCR	VFF3FW1YER	VFF3FW1YPR	VFF3FW1YDR
2-1/2"	107	282		VFF3GW1YXR	VFF3GW1YCR	VFF3GW1YER	VFF3GW1YPR	VFF3GW1YDR
3"	154	461		VFF3HW1YXR	VFF3HW1YCR	VFF3HW1YER	VFF3HW1YPR	VFF3HW1YDR
4"	274	841	50	VFF3JV1YXR	VFF3JV1YCR	VFF3JV1YER	VFF3JV1YPR	VFF3JV1YDR
			175	VFF3JW1YXR	VFF3JW1YCR	VFF3JW1YER	VFF3JW1YPR	VFF3JW1YDR
5"	428	1376	50	VFF3KV1YXR	VFF3KV1YCR	VFF3KV1YER	VFF3KV1YPR	VFF3KV1YDR
			175	VFF3KW1YXR	VFF3KW1YCR	VFF3KW1YER	VFF3KW1YPR	VFF3KW1YDR
6"	567	1850	50	VFF3LV1YXR	VFF3LV1YCR	VFF3LV1YER	VFF3LV1YPR	VFF3LV1YDR
			175	VFF3LW1YXR	VFF3LW1YCR	VFF3LW1YER	VFF3LW1YPR	VFF3LW1YDR
8"	1081	3316	50	VFF3MV1YXR	VFF3MV1YCR	VFF3MV1YER	VFF3MV1YPR	VFF3MV1YDR
			175	VFF3MW1YXR	VFF3MW1YCR	VFF3MW1YER	VFF3MW1YPR	VFF3MW1YDR
10"	1710	5430	50	VFF3NV1YXR	VFF3NV1YCR	VFF3NV1YER	VFF3NV1YPR	VFF3NV1YDR
			175	VFF3NW1YXR	VFF3NW1YCR	VFF3NW1YER	VFF3NW1YPR	VFF3NW1YDR
12"	2563	8077	50	VFF3PV1YXR	VFF3PV1YCR	VFF3PV1YER	VFF3PV1YPR	VFF3PV1YDR
			175	VFF3PW1YXR	VFF3PW1YCR	VFF3PW1YER	VFF3PW1YPR	VFF3PW1YDR
14"	3384	10538	50	VFF3RV1YXR	VFF3RV1YCR	VFF3RV1YER	VFF3RV1YPR	VFF3RV1YDR
			150	VFF3RW1YXR	VFF3RW1YCR	VFF3RW1YER	VFF3RW1YPR	VFF3RW1YDR
16"	4483	13966	50	VFF3SV1YXR	VFF3SV1YCR	VFF3SV1YER	VFF3SV1YPR	VFF3SV1YDR
			150	VFF3SW1YXR	VFF3SW1YCR	VFF3SW1YER	VFF3SW1YPR	VFF3SW1YDR
18"	5736	17214	50	VFF3TV1YXR	VFF3TV1YCR	VFF3TV1YER	VFF3TV1YPR	VFF3TV1YDR
			150	VFF3TW1YXR	VFF3TW1YCR	VFF3TW1YER	VFF3TW1YPR	VFF3TW1YDR
20"	7144	22339	50	VFF3UV1YXR	VFF3UV1YCR	VFF3UV1YER	VFF3UV1YPR	VFF3UV1YDR
			150	VFF3UW1YXR	VFF3UW1YCR	VFF3UW1YER	VFF3UW1YPR	VFF3UW1YDR

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number				
				VFF6FW1YXR	VFF6FW1YCR	VFF6FW1YER	VFF6FW1YPR	VFF6FW1YDR
2"	61	144	175	VFF6FW1YXR	VFF6FW1YCR	VFF6FW1YER	VFF6FW1YPR	VFF6FW1YDR
2-1/2"	107	282		VFF6GW1YXR	VFF6GW1YCR	VFF6GW1YER	VFF6GW1YPR	VFF6GW1YDR
3"	154	461		VFF6HW1YXR	VFF6HW1YCR	VFF6HW1YER	VFF6HW1YPR	VFF6HW1YDR
4"	274	841	50	VFF6JV1YXR	VFF6JV1YCR	VFF6JV1YER	VFF6JV1YPR	VFF6JV1YDR
			175	VFF6JW1YXR	VFF6JW1YCR	VFF6JW1YER	VFF6JW1YPR	VFF6JW1YDR
5"	428	1376	50	VFF6KV1YXR	VFF6KV1YCR	VFF6KV1YER	VFF6KV1YPR	VFF6KV1YDR
			175	VFF6KW1YXR	VFF6KW1YCR	VFF6KW1YER	VFF6KW1YPR	VFF6KW1YDR
6"	567	1850	50	VFF6LV1YXR	VFF6LV1YCR	VFF6LV1YER	VFF6LV1YPR	VFF6LV1YDR
			175	VFF6LW1YXR	VFF6LW1YCR	VFF6LW1YER	VFF6LW1YPR	VFF6LW1YDR
8"	1081	3316	50	VFF6MV1YXR	VFF6MV1YCR	VFF6MV1YER	VFF6MV1YPR	VFF6MV1YDR
			175	VFF6MW1YXR	VFF6MW1YCR	VFF6MW1YER	VFF6MW1YPR	VFF6MW1YDR
10"	1710	5430	50	VFF6NV1YXR	VFF6NV1YCR	VFF6NV1YER	VFF6NV1YPR	VFF6NV1YDR
			175	VFF6NW1YXR	VFF6NW1YCR	VFF6NW1YER	VFF6NW1YPR	VFF6NW1YDR
12"	2563	8077	50	VFF6PV1YXR	VFF6PV1YCR	VFF6PV1YER	VFF6PV1YPR	VFF6PV1YDR
			175	VFF6PW1YXR	VFF6PW1YCR	VFF6PW1YER	VFF6PW1YPR	VFF6PW1YDR
14"	3384	10538	50	VFF6RV1YXR	VFF6RV1YCR	VFF6RV1YER	VFF6RV1YPR	VFF6RV1YDR
			175*	VFF6RW1YXR	VFF6RW1YCR	VFF6RW1YER	VFF6RW1YPR	VFF6RW1YDR
16"	4483	13966	50	VFF6SV1YXR	VFF6SV1YCR	VFF6SV1YER	VFF6SV1YPR	VFF6SV1YDR
			175*	VFF6SW1YXR	VFF6SW1YCR	VFF6SW1YER	VFF6SW1YPR	VFF6SW1YDR
18"	5736	17214	50	VFF6TV1YXR	VFF6TV1YCR	VFF6TV1YER	VFF6TV1YPR	VFF6TV1YDR
			175*	VFF6TW1YXR	VFF6TW1YCR	VFF6TW1YER	VFF6TW1YPR	VFF6TW1YDR
20"	7144	22339	50	VFF6UV1YXR	VFF6UV1YCR	VFF6UV1YER	VFF6UV1YPR	VFF6UV1YDR
			175*	VFF6UW1YXR	VFF6UW1YCR	VFF6UW1YER	VFF6UW1YPR	VFF6UW1YDR

3-Way Mixing / Diverting Valve Porting

3-Way Mixing / Diverting Center Common Port

* Full cut valves with bi-directional pneumatic actuators feature 175 psi close-off in all body sizes

Product Selection - Valves

Resilient Seat Butterfly Valves, 3-Way Pneumatic Actuation

Actuator Features				Fail Safe							
Actuator		20 psi Actuator		80 psi Actuator							
		8-13 spring	Positioner	Standard	E-P Solenoid	E-P Solenoid	Positioner	E-P Positioner			
Power Supply	Voltage				24 Vac	120 Vac			24 Vac		
	Frequency				50 / 60 Hz	50 / 60 Hz			50 / 60 Hz		
Control	Power				6 W	6 W					
	Modulating Pneumatic	•	•	•				•			
	2-Position				•	•					
	4-20 mA								•		
Auxiliary Switch	Add-On			VFF50-0400	VFF50-0400	VFF50-0400					
Manual Override				•							
Conduit Connection					•	•			•		
Waterproof									•		
Fail Safe		•	•	•	•	•	•	•	•		

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number							
				2"	61	144	175	VFF3FW1Y8P	VFF3FW1YPP	VFF3FW1YXS	VFF3FW1YCS
2-1/2"	107	282	175	VFF3GW1Y8P	VFF3GW1YPP	VFF3GW1YXS	VFF3GW1YCS	VFF3GW1YES	VFF3GW1YPS	VFF3GW1YDS	
3"	154	461	175	VFF3HW1Y8P	VFF3HW1YPP	VFF3HW1YXS	VFF3HW1YCS	VFF3HW1YES	VFF3HW1YPS	VFF3HW1YDS	
			50	VFF3JV1Y8P	VFF3JV1YPP	VFF3JV1YXS	VFF3JV1YCS	VFF3JV1YES	VFF3JV1YPS	VFF3JV1YDS	
4"	274	841	175	VFF3JW1Y8P	VFF3JW1YPP	VFF3JW1YXS	VFF3JW1YCS	VFF3JW1YES	VFF3JW1YPS	VFF3JW1YDS	
			50	VFF3KW1Y8P*	VFF3KW1YPP*	VFF3KW1YXS	VFF3KW1YCS	VFF3KW1YES	VFF3KW1YPS	VFF3KW1YDS	
5"	428	1376	175	VFF3KW1Y8P	VFF3KW1YPP	VFF3KW1YXS	VFF3KW1YCS	VFF3KW1YES	VFF3KW1YPS	VFF3KW1YDS	
			50	VFF3LV1Y8P	VFF3LV1YPP	VFF3LV1YXS	VFF3LV1YCS	VFF3LV1YES	VFF3LV1YPS	VFF3LV1YDS	
6"	567	1850	175	VFF3LW1Y8P†	VFF3LW1YPP†	VFF3LW1YXS	VFF3LW1YCS	VFF3LW1YES	VFF3LW1YPS	VFF3LW1YDS	
			50	VFF3MV1Y8P†	VFF3MV1YPP†	VFF3MV1YXS	VFF3MV1YCS	VFF3MV1YES	VFF3MV1YPS	VFF3MV1YDS	
8"	1081	3316	175			VFF3MW1YXS	VFF3MW1YCS	VFF3MW1YES	VFF3MW1YPS	VFF3MW1YDS	
			50			VFF3NV1YXS	VFF3NV1YCS	VFF3NV1YES	VFF3NV1YPS	VFF3NV1YDS	
10"	1710	5430	175			VFF3NW1YXS	VFF3NW1YCS	VFF3NW1YES	VFF3NW1YPS	VFF3NW1YDS	
			50			VFF3PV1YXS	VFF3PV1YCS	VFF3PV1YES	VFF3PV1YPS	VFF3PV1YDS	
12"	2563	8077	175			VFF3PW1YXS	VFF3PW1YCS	VFF3PW1YES	VFF3PW1YPS	VFF3PW1YDS	
			50			VFF3RV1YXS	VFF3RV1YCS	VFF3RV1YES	VFF3RV1YPS	VFF3RV1YDS	
14"	3384	10538	150			VFF3RW1YXS	VFF3RW1YCS	VFF3RW1YES	VFF3RW1YPS	VFF3RW1YDS	
			50			VFF3SV1YXS	VFF3SV1YCS	VFF3SV1YES	VFF3SV1YPS	VFF3SV1YDS	
16"	4483	13966	150								
			50			VFF3TV1YXS	VFF3TV1YCS	VFF3TV1YES	VFF3TV1YPS	VFF3TV1YDS	
18"	5736	17214	150								
			50			VFF3UV1YXS	VFF3UV1YCS	VFF3UV1YES	VFF3UV1YPS	VFF3UV1YDS	
20"	7144	22339	150								

Valve Size (inches)	Cv @ 60°	Cv @ 90°	Close-off (psid)	Valve O.S. Number						
				2"	61	144	175			VFF6FW1YXS
2-1/2"	107	282	175			VFF6GW1YXS	VFF6GW1YCS	VFF6GW1YES	VFF6GW1YPS	VFF6GW1YDS
3"	154	461	175			VFF6HW1YXS	VFF6HW1YCS	VFF6HW1YES	VFF6HW1YPS	VFF6HW1YDS
			50			VFF6JV1YXS	VFF6JV1YCS	VFF6JV1YES	VFF6JV1YPS	VFF6JV1YDS
4"	274	841	175			VFF6JW1YXS	VFF6JW1YCS	VFF6JW1YES	VFF6JW1YPS	VFF6JW1YDS
			50			VFF6KV1YXS	VFF6KV1YCS	VFF6KV1YES	VFF6KV1YPS	VFF6KV1YDS
5"	428	1376	175			VFF6KW1YXS	VFF6KW1YCS	VFF6KW1YES	VFF6KW1YPS	VFF6KW1YDS
			50			VFF6LV1YXS	VFF6LV1YCS	VFF6LV1YES	VFF6LV1YPS	VFF6LV1YDS
6"	567	1850	175			VFF6LW1YXS	VFF6LW1YCS	VFF6LW1YES	VFF6LW1YPS	VFF6LW1YDS
			50			VFF6MV1YXS	VFF6MV1YCS	VFF6MV1YES	VFF6MV1YPS	VFF6MV1YDS
8"	1081	3316	175			VFF6MW1YXS	VFF6MW1YCS	VFF6MW1YES	VFF6MW1YPS	VFF6MW1YDS
			50			VFF6NV1YXS	VFF6NV1YCS	VFF6NV1YES	VFF6NV1YPS	VFF6NV1YDS
10"	1710	5430	175			VFF6NW1YXS	VFF6NW1YCS	VFF6NW1YES	VFF6NW1YPS	VFF6NW1YDS
			50			VFF6PV1YXS	VFF6PV1YCS	VFF6PV1YES	VFF6PV1YPS	VFF6PV1YDS
12"	2563	8077	175			VFF6PW1YXS	VFF6PW1YCS	VFF6PW1YES	VFF6PW1YPS	VFF6PW1YDS
			50			VFF6RV1YXS	VFF6RV1YCS	VFF6RV1YES	VFF6RV1YPS	VFF6RV1YDS
14"	3384	10538	150			VFF6RW1YXS	VFF6RW1YCS	VFF6RW1YES	VFF6RW1YPS	VFF6RW1YDS
			50			VFF6SV1YXS	VFF6SV1YCS	VFF6SV1YES	VFF6SV1YPS	VFF6SV1YDS
16"	4483	13966	150							
			50			VFF6TV1YXS	VFF6TV1YCS	VFF6TV1YES	VFF6TV1YPS	VFF6TV1YDS
18"	5736	17214	150							
			50			VFF6UV1YXS	VFF6UV1YCS	VFF6UV1YES	VFF6UV1YPS	VFF6UV1YDS
20"	7144	22339	150							

3-Way Mixing / Diverting Valve Porting

3-Way Mixing / Diverting Center Common Port

VALVES

*Tandem mount
 †Use full cut, 175psid close-off valves - No under-cut, 50psid close-off valve available

Submittal Data - Valves

Pneumatic Valve Actuators



Pneumatic actuators provide proportional control of steam or hot or cold liquids in HVAC systems by operating V5011, V5013 and VGF valve assemblies. Replacement devices are available for older Honeywell actuators.

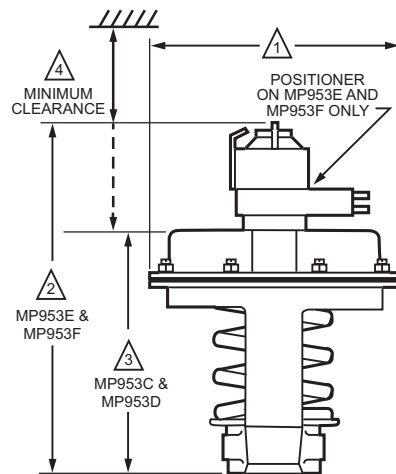
FEATURES

- Rolling diaphragm for long life and low hysteresis.
- Easily attached to valve.
- Can be installed after piping valve.
- Slide lock feature permits simple engagement to valve stem.
- Direct- or reverse-action control.
- Does not include positive positioner.

SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Spring Return
Air Connections	Dual barbed fitting for 5/32 in. O.D. and 1/4 in. O.D. plastic tubing
Temperature Range	0 F to 140 F (-18 C to +60 C)
Maximum Operating Pressure	(172 kPa) 25 psi
Humidity Range	5 to 95% RH

DIMENSIONS DIAGRAM



OPERATION SIZE NOMINAL DIA.	1	2	3	4
5 INCH	5-1/8 (130)	9-1/4 (235)	4-5/8 (117)	4-3/8 (111)
7-1/8 INCH	7-1/8 (181)	10-1/2 (267)	5-5/8 (143)	4-3/8 (111)
8 INCH	8-1/4 (210)	11-1/8 (283)	6-1/2 (165)	5-3/8 (137)
13 INCH	13-1/2 (343)	18-1/8 (460)	10 (254)	7-11/16 (195)

M13903

Pneumatic Valve Actuators



Pneumatic actuators provide proportional control of steam or hot or cold liquids in HVAC systems by operating V5011, V5013 and VGF valve assemblies. Replacement devices are available for older Honeywell actuators.

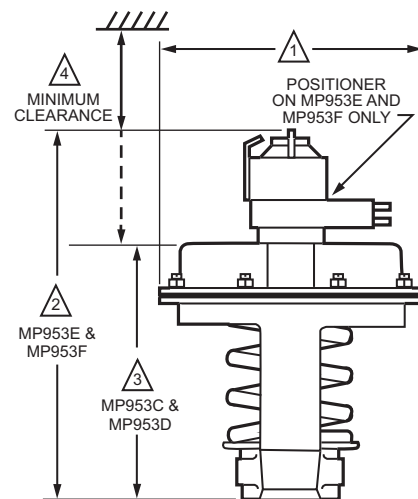
FEATURES

- Rolling diaphragm for long life and low hysteresis.
- Easily attached to valve.
- Can be installed after piping valve.
- Slide lock feature permits simple engagement to valve stem.
- Direct- or reverse-action control.
- Integral positive positioner relay provides positive positioning under varying load conditions.

SPECIFICATIONS

Actuator Type	Valve
Action	Direct Acting
Fail Safe Mode	Spring Return
Air Connections	Pilot: Barbed fitting for 5/32 in. O.D. plastic tubing Main: Barbed fitting for 1/4 in. O.D. plastic tubing
Temperature Range	0 F to 140 F (-18 C to +60 C)
Maximum Operating Pressure	(172 kPa) 25 psi
Humidity Range5 to 95% RH

DIMENSIONS DIAGRAM



OPERATION SIZE NOMINAL DIA.	1	2	3	4
5 INCH	5-1/8 (130)	9-1/4 (235)	4-5/8 (117)	4-3/8 (111)
7-1/8 INCH	7-1/8 (181)	10-1/2 (267)	5-5/8 (143)	4-3/8 (111)
8 INCH	8-1/4 (210)	11-1/8 (283)	6-1/2 (165)	5-3/8 (137)
13 INCH	13-1/2 (343)	18-1/8 (460)	10 (254)	7-11/16 (195)

M13903

Submittal Data - Valves

Pneumatic Valve Actuators

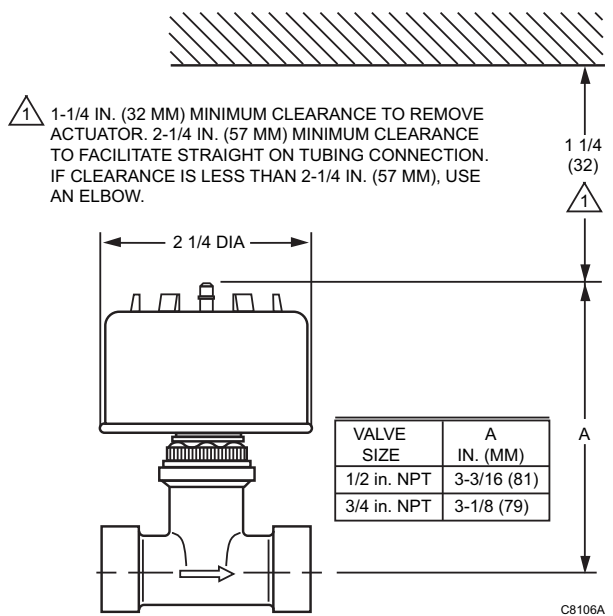


The MP958 Pneumatic Valve Actuator is direct acting and used only with Honeywell V5852A2xx, V5862A2xx, V5853A2xx, and V5863A2xx Terminal Unit Valves to control hot and/or chilled water.

SPECIFICATIONS

Actuator Type	Valve
Action	Direct Acting
Fail Safe Mode	Spring Return
Air Connections	Barbed fitting for 1/4 in. O.D. plastic tubing
Maximum Operating Pressure	30 psi

DIMENSIONS DIAGRAM





The VU844 Fan Coil Valve Actuators are used in conjunction with the VU52, VU53 and VU54 valves for controlling the flow of hot or chilled water in commercial HVAC equipment such as fan coil units, terminal reheat coils and convectors. These valves are humidity resistant and are suitable for use in condensing, non-corrosive environments.

FEATURES

- Compact construction for easy installation.
- Fits under the cover of most baseboard convectors with actuator fitted to valve body.
- One-button, quick release. Secure 3-point, metal latch to valve body.
- Spring return operation.
- Stainless steel case and aluminum cover. Rust-proof nickel-plated motors available.
- Line or low voltage, rust-resistant motors.
- Manual opener for installation and valve operation on power failure.
- Valve returns to automatic position when power is restored.
- Actuator may be reinstalled or serviced without draining the system or disassembling the valve.
- Slotted conduit hole for faster wiring.

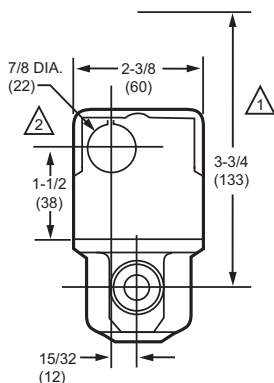
SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Spring Return
Electrical Connections	Leads
Frequency	60 Hz
Manual operation	Lever
Materials	Stainless Case, Aluminum Cover
Medium Temperature	200 F (94 C)
Ambient Temperature Range	34 F to 125 F ambient at 200 F Fluid (1 C to 52 C ambient at 93 C Fluid)
Maximum Differential Pressure Ratings (Close-off)	Depends on Cv rating of valve
Comments	For controlling the flow of hot or chilled water in commercial HVAC equipment such as fan coil units, terminal reheat coils and convectors

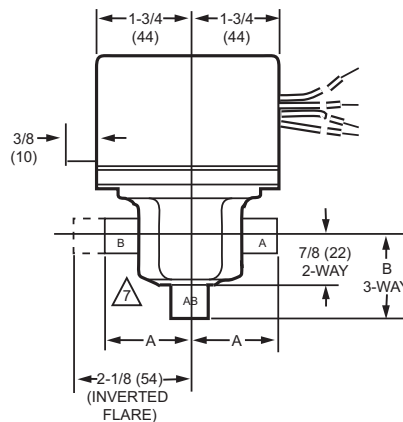
APPROVALS

Canadian Standards Association..... Certified C/US File No. LR1322

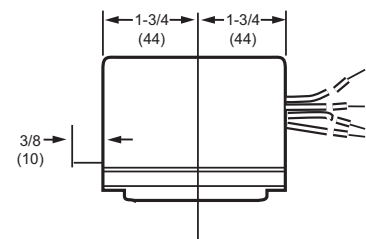
DIMENSIONS DIAGRAM



VU53 VALVE WITH VU448 ACTUATOR



VU53 AND VU54 VALVE WITH ACTUATOR



VU5 ACTUATOR

- 1 HEIGHT NEEDED TO REMOVE ACTUATOR OR COVER
- 2 OPENING FOR 1/2 IN. CONDUIT ON OPPOSITE SITE OF MANUAL LEVER FOR ALL MODELS.

VALVE BODY SIZE	A	B
1/2 IN. SWEAT	1-5/6 (33)	1-5/6 (33)
3/4 IN. SWEAT	1-3/8 (35)	1-11/16 (43)
1 IN. SWEAT	1-11/16 (43)	1-11/16 (43)
1/2 IN. NPT	1-3/8 (35)	1-5/16 (33)
3/4 IN. NPT	1-11/16 (43)	1-7/16 (37)
1 IN. NPT	1-11/16 (43)	1-7/16 (37)

Submittal Data - Valves

Unitary Valve Actuators, Two-Position



Control central heating and/or cooling systems, fan coil systems, radiators and convectors. Depending on the model selected, it can be controlled by either a low or line voltage SPST or SPDT controller such as a room thermostat.

FEATURES

- Use with two-way or three-way valves.
- Minimal actuator power consumption.
- Quick-connect or one meter cable electrical connections available.
- Quick and easy replacement of moving parts.
- Actuator head installation does not require draining the system.
- On/Off models with six second nominal timing
- Use two-position actuators with 1000 Series 2 way and 6000 Series 3-way VC valve bodies only.
- All VC Series actuator-valve combinations provide 60 psi close-off.

SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Stays in place
Maximum Differential Pressure Ratings	
(Close-off) (psi)	60 psid
Dimensions, Approximate	2.8 in. high x 3.7 in. wide x 2.7 in. deep (70 mm high x 94 mm wide x 68 mm deep)
Electrical Protection	Double Insulated
Electrical Connections	Plenum-rated cable
Ingress Protection Rating	IP40
Frequency	60 Hz
Manual operation	Lever
Mounting	Direct Coupled
Shaft Adapter Type	Self-alignment
Stroke	0.4 in. (10 mm)
Timing; Nominal Driving @ 60 Hz (sec)	6 sec
Materials	Plastic housing
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Medium Temperature	203 F (95 C)
Ambient Temperature Range	32 F to 150 F (0 C to 65 C)
Temperature Ratings (Shipping)	-40 F to +150 F (-40 C to +65 C)
Storage Temperature Range	-40 F to +150 F (-40 C to +65 C)
Weight	0.57 lb (0.26 kg)

APPROVALS

Canadian Standards Association	CSA Certified: LR1322-367
CE	89/336/ECC, 73/23/EEC
Underwriters Laboratories, Inc.	UL Recognized, File# MH11826

Unitary Valve Actuators, Proportional



Control central heating and/or cooling systems, fan coil systems, radiators and convectors. Depending on the model selected, it can be controlled by a low voltage SPST or SPDT switch, pulse-width modulated 24 Vac signal, or floating input, modulating controller such as a room thermostat, Aquastat control, flow switch or a 0/2 to 10 Vdc controller.

FEATURES

- Use with two-way or three-way valves.
- Double insulated actuator.
- Five foot plenum-rated cable.
- Quick and easy replacement of moving parts.
- Actuator head installation does not require draining the system.
- Selectable/switchable electronic fail safe normally open or normally closed.
- Available with valve bodies with 1000-series 2-way and 6000-series 3-way cartridges for new construction.
- All VC Series actuator-valve combinations provide 60 psi close-off.

SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Stays in place
Cable Entry	Molded strain relief, conduit clamp
Dimensions, Approximate	2.8 in. high x 3.7 in. wide x 2.7 in. deep (70 mm high x 94 mm wide x 68 mm deep)
Electrical Protection	Double Insulated
Electrical Connections	Plenum-rated cable
Electrical Connection Length	5 ft. (1.5 m)
Ingress Protection Rating	IP40
Frequency	50 Hz; 60 Hz
Manual operation	Lever
Mounting	Direct Coupled
Shaft Adapter Type	Self-alignment
Stroke	0.4 in. (10 mm)
Timing; Nominal Driving @ 60 Hz (sec)	120 sec
Supply Voltage	24 Vac
Power Consumption (Driving)	6 VA
Materials	Plastic housing
Operating Humidity Range (% RH).....	5 to 95% RH, non-condensing
Medium Temperature	203 F (95 C)
Ambient Temperature Range	32 F to 150 F (0 C to 65 C)
Temperature Ratings (Shipping)	-40 F to +150 F (-40 C to +65 C)
Storage Temperature Range	-40 F to +150 F (-40 C to +65 C)
Weight	0.84 lb (0.38 kg)

APPROVALS

Canadian Standards Association.....	CSA Certified: LR1322-367
Underwriters Laboratories, Inc.....	Listed 94-5V

Submittal Data - Valves

Unitary Valve Actuators, Fail Safe Proportional



Control central heating and/or cooling systems, fan coil systems, radiators and convectors. Depending on the model selected, it can be controlled by either a low or line voltage SPST or SPDT or floating or modulating controller such as a room thermostat, Aquastat control, flow switch or a 0/2 to 10 Vdc controller.

FEATURES

- Use with two-way or three-way valves.
- Minimal actuator power consumption.
- Double insulated actuator.
- Five foot plenum-rated cable electrical connections available.
- Quick and easy replacement of moving parts.
- Actuator head installation does not require draining the system.
- Selectable/switchable electronic fail safe normally open or normally closed.
- Includes valve bodies with 1000-series 2-way and 3000-series 3-way cartridges.
- All VC Series actuator-valve combinations provide 60 psi close-off.

SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode.....	N.O. or N.C., switchable electronic
Cable Entry.....	Molded strain relief, conduit clamp
Dimensions, Approximate	2.8 in. high x 3.7 in. wide x 2.7 in. deep (70 mm high x 94 mm wide x 68 mm deep)
Electrical Protection.....	Double Insulated
Electrical Connections.....	Plenum-rated cable
Electrical Connection Length	5 ft. (1.5 m)
Ingress Protection Rating	IP40
Frequency	50 Hz; 60 Hz
Manual operation.....	Lever
Mounting.....	Direct Coupled
Shaft Adapter Type.....	Self-alignment
Number of Internal Auxiliary Switch	0
Stroke	0.4 in. (10 mm)
Supply Voltage	24 Vac
Materials.....	Plastic housing
Operating Humidity Range (% RH)	5 to 95% RH, non-condensing
Medium Temperature	203 F (95 C)
Ambient Temperature Range	32 F to 150 F (0 C to 65 C)
Temperature Ratings (Shipping).....	-40 F to +150 F (-40 C to +65 C)
Storage Temperature Range	-40 F to +150 F (-40 C to +65 C)
Weight	0.84 lb (0.38 kg)
Includes.....	Flexible conduit adapter

APPROVALS

Canadian Standards Association.....	CSA Certified: LR1322-367
CE	89/336/ECC, 73/23/EEC
Underwriters Laboratories, Inc.....	Listed 94-5V

Unitary Valve Actuators M6410; M7410



Cartridge Globe Valve Actuators are small electric actuators for individual room control that provide floating or modulating control of V5852, V5862 two-way or V5853, V5863 three-way valves.

FEATURES

- Suitable for Excel/IRC system or other controllers providing specified signals.
- Magnetic coupling for torque limitation independent of voltage supply and self-adjustment of the close-off port.
- No mounting tools required.
- Small size allows installation in limited space of fan coil units, induction units, and small reheaters or recoolers.
- Visual position indication (red pin).

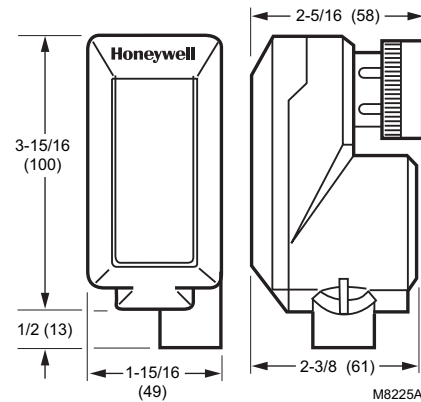
SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Stays in place
Cable Entry	Threaded conduit connector
Electrical Protection	Class I Insulation (24 Vac)
Electrical Connections	Plenum-rated cable
Ingress Protection Rating	IP42
Feedback	No
Frequency	50 Hz; 60 Hz
Manual operation	None (use valve dust cap)
Mounting	Threads onto V58XX valve bonnet
Number of Internal Auxiliary Switch	0
Stroke	1/4 in. (6 mm)
Supply Voltage	24 Vac +10/-30%
Timing; Nominal Driving @ 60 Hz (sec)	125 sec
Materials	Low Maintenance Plastic Housing
Operating Humidity Range (% RH)	5 to 95% RH
Medium Temperature	266 F Maximum (130 C Maximum)
Ambient Temperature Range	32 F to 122 F (0 C to 50 C)
Storage Temperature Range	-40 F to +158 F (-40 C to +70 C)
Weight	0.3125 lb (0.15 kg)
Includes	1/2 in. conduit hub

APPROVALS

Underwriters Laboratories, Inc..... UL94-5V

DIMENSIONS DIAGRAM



Submittal Data - Valves

Unitary Valve Actuators M6435; M7435



Cartridge Globe Valve Spring Return Actuators are small electric actuators for individual room control that provide floating or modulating control of V5852, V5862 two-way or V5853, V5863 three-way valves.

FEATURES

- Stem actuator retracts up on power failure. Fail safe mode depends on valve seat rest position.
- Suitable for Excel/IRC system or other controllers providing specified signals.
- Magnetic coupling for torque limitation independent of voltage supply and self-adjustment of the close-off port.
- No mounting tools required.
- Compact size allows installation in limited space of fan coil units, induction units, and small reheaters or recoolers.
- Visual position indication (red disk).

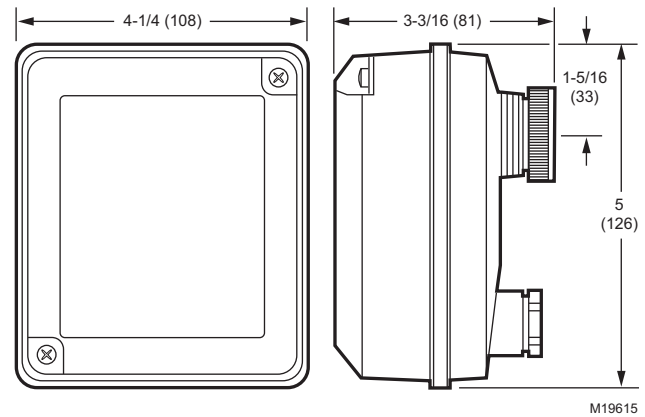
SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Spring Return, operator retracts up (Normally open for 1/2 in. and 3/4 in. V5852 and V5862. Normally closed for all other V58XX valves.)
Spring Return Direction	Stem up
Cable Entry	Threaded conduit connector
Electrical Protection	Class I Insulation (24 Vac)
Electrical Connections	Screw terminals
Ingress Protection Rating	IP54
Feedback	No
Frequency	50 Hz; 60 Hz
Manual operation	None (use valve dust cap)
Mounting	Threads onto V58XX valve bonnet
Number of Internal Auxiliary Switch	0
Stroke	1/4 in. (6 mm)
Supply Voltage	24 Vac +20%, -15%
Timing; Nominal Driving @ 60 Hz (sec)	50 sec
Spring Return Timing (Nominal (sec))	10 sec
Materials	Low Maintenance Plastic Housing
Operating Humidity Range (% RH)	5 to 95% RH
Medium Temperature	266 F Maximum (130 C Maximum)
Ambient Temperature Range	32 F to 122 F (0 C to 50 C)
Storage Temperature Range	-40 F to +158 F (-40 C to +70 C)
Weight	1.1 lb (0.5 kg)
Includes	1/2 in. conduit hub

APPROVALS

Underwriters Laboratories, Inc.UL94-5V

DIMENSIONS DIAGRAM



Direct Coupled Valve Actuators, MVN



MVN 3Nm (27 lb-in.) Control Valve Actuator is used with the VBN2 2-way and the VBN3 3-way Control Ball Valves to control hot and chilled water with glycol solutions up to 50% in heating, ventilating and air conditioning (HVAC) systems to provide two position or modulating functions.

FEATURES

- Non-spring Return
- Floating and modulating
- Space saving, click-on installation – no tool required
- Extendable position indicator for easy commissioning
- Available with or without cable
- Compatible with control ball valves from 1/2 to 1-1/4 inches.
- Actuator can be mounted on the valve in any of four positions.

SPECIFICATIONS

Actuator Type	Valve
Rotational Stroke	90° ±3°
Fail Safe Mode	Non-spring return, Fail in place
Torque	27 lb-in. (3 Nm)
External Auxiliary Switches Available	No
Supply Voltage	24 Vac +20%, -15%, 24 Vdc
Power Consumption	5 VA- Modulating; 1.5 VA - Floating; 6 VA - Fast Acting SPDT
Environmental Rating	NEMA2
Frequency	50 Hz; 60 Hz
Mounting	Click-on installation – no tool required
Noise Rating at 1m (Maximum)	35 dB(A) max at 1 m [50 dB (A) for MVN643]
Materials	Plenum rated plastic housing
Operating Humidity Range (% RH)	5 to 95% RH, noncondensing
Ambient Temperature Range	-4 °F to 131 °F (-20 °C to 55 °C)
Storage Temperature Range	-40 °F to 176 °F (-40 °C to 80 °C)
Dimensions	See page 161
Timing	90 sec. for MVN613 and MVN713; 30 sec. for MVN643
Electrical Connections	Field wiring 18 to 20 AWG to screw terminals, located under the removable access cover.
Humidity Ratings	5% to 95% RH noncondensing
Design Life (at Rated Voltage)	60,000 cycles; 1 cycle = 0°...90°...0°
Cable Specification	18 AWG, Plenum Rated, 300 V, 10 A, 3 ft. length from end of access cover.
Environmental Protection Ratings	IP40
Approvals	UL/cUL; UL60730

DIMENSIONS DIAGRAM

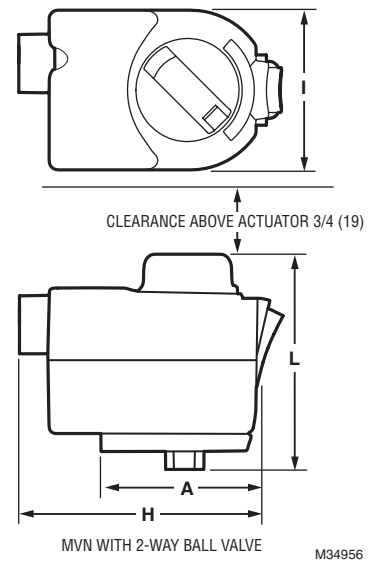


Table 1. Actuators and Accessories

Actuator	Description	Accessory
MVN613A0000	Floating control ball valve actuator	C1- 1 meter cable
MVN613L0000	Floating control ball valve actuator	
MVN643A0000	Fast acting SPDT control ball valve actuator	
MVN643L0000	Fast acting SPDT control ball valve actuator	
MVN713A0000	Modulating control ball valve actuator	
MVN713L0000	Modulating control ball valve actuator	

To order actuator with accessories order actuator part number + accessory. For example: MVN613A0000 + C1

Submittal Data - Valves

Direct Coupled Valve Actuators, ML6420; ML7420



Direct Coupled Globe Valve Actuators provide floating or modulating control of chilled water, hot water or steam, and mount directly on VGF series, V5011 and V5013 globe valves from 1/2 to 3 inches.

FEATURES

- Easy and quick installation on valves with 1 3/8 in. bonnet and 3/4 in. stroke.
- No separate linkage required.
- Conduit connector standard.
- No adjustments required on linkage.
- Accurate valve positioning.
- Low power consumption.
- High close-off ratings.
- Force limiting end switches.
- Manual operator.
- Synchronous motor.
- Maintenance free.
- ML7420 has an internal selector plug that can be used to reverse the direction of action.

SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Stays in place
Cable Entry	Conduit connector and one knockout on actuator case
Electrical Protection	Class I Insulation (24 Vac)
Electrical Connections	Screw terminals
Ingress Protection Rating	IP54
Frequency	50 Hz; 60 Hz
Manual operation	Knob
Mounting	Directly on V5011/V5013 Globe Valves and VGF Flanged Globe Valves (3/4 in. or 20mm stroke)
Number of Internal Auxiliary Switch	0
Stroke	3/4 in. (20 mm)
Supply Voltage	24 Vac \pm 15%
Materials	ABS-FR Plastic, aluminum yoke
Operating Humidity Range (% RH)	5 to 95% RH
Medium Temperature	300 F Maximum (150 C Maximum)
Ambient Temperature Range	14 F to 122 F (-10 C to +50 C)
Storage Temperature Range	-40 F to +158 F (-40 C to +70 C)
Weight	2.9 lb (1.3 kg)
Includes	1/2 in. conduit hub; 1/2 in. flexible conduit adapter

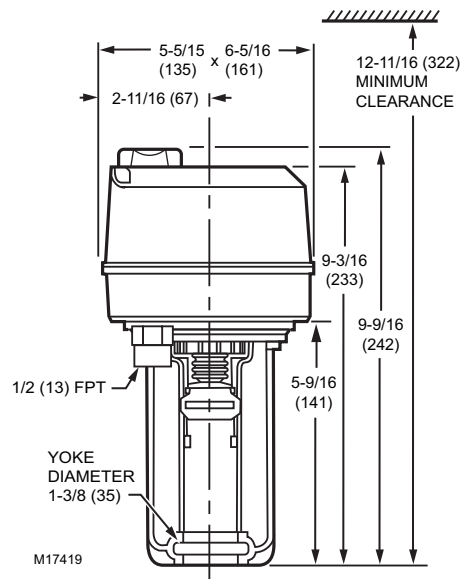
APPROVALS

Canadian Standards Association	Certified
CE	Listed
Underwriters Laboratories, Inc.	UL94-5V

ACCESSORIES

- 312495—Large stem button provides anti-spin for globe valves up to 3 in. (1/4-28UNF stem) with ML6420, ML7420, ML6421A, ML7421A, ML6425, and ML7425 actuators. Not required with ML6984/7984 actuators or Q5022A linkage; not compatible with Q5020 linkage.
- 43196000-001—High Temperature Kit for actuators with 3/4 inch (20 mm) stroke, stem button attachment
- 43191679-111—Potentiometer, 10k ohm, for ML6425, ML7425
- 43191679-112—Potentiometer, 220 ohm for ML6425, ML7425
- 43191680-105—Dual Auxiliary Switch for CREVAL actuators

DIMENSIONS DIAGRAM



Direct Coupled Valve Actuators, ML6421; ML7421



Direct Coupled Globe Valve Actuators provide floating or modulating control of chilled water, hot water or steam, and mount directly on VGF series, V5011 and V5013 valves. These Non-Spring Return High Force Actuators will operate 1-1/2 to 6 inch valves.

FEATURES

- Easy and quick installation on valves with 1 3/8 in. bonnet and 3/4 in. stroke, or with 1 7/8 in. bonnet and 1 1/2 in. stroke.
- High force for VGF Pressure-balanced valves.
- No separate linkage required.
- Conduit connector standard.
- No adjustments required on linkage.
- Accurate valve positioning.
- Low power consumption.
- High close-off ratings.
- Force limiting end switches.
- Manual operator.
- Synchronous motor.
- Maintenance free.

SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode.....	Stays in place
Cable Entry.....	Two knockout holes for 1/2 in. conduit standard on actuator case
Electrical Protection.....	Class I Insulation (24 Vac)
Electrical Connections.....	Screw terminals
Ingress Protection Rating	IP54
Frequency	50 Hz; 60 Hz
Manual operation.....	Knob
Mounting.....	Directly on V5011/V5013 Globe Valves and VGF Flanged Globe Valves
Number of Internal Auxiliary Switch	0
Materials.....	ABS Plastic
Operating Humidity Range (% RH)	5 to 95% RH
Medium Temperature	300 F Maximum (150 C Maximum)
Ambient Temperature Range	14 F to 122 F (-10 C to +50 C)
Storage Temperature Range	-40 F to +158 F (-40 C to +70 C)
Weight	5.1 lb (2.3 kg)
Includes.....	1/2 in. conduit hub; 1/2 in. flexible conduit adapter

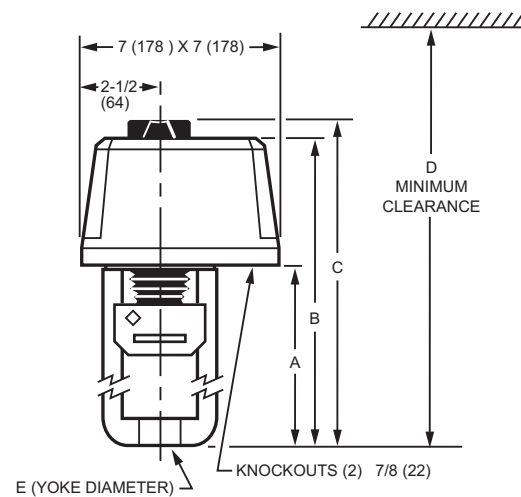
APPROVALS

Canadian Standards Association.....	Certified
CE.....	Recognized
Underwriters Laboratories, Inc.....	UL94-5V

ACCESSORIES

312495—Large stem button provides anti-spin for globe valves up to 3 in. (1/4-28UNF stem) with ML6420, ML7420, ML6421A, ML7421A, ML6425, and ML7425 actuators. Not required with ML6984/7984 actuators or Q5022A linkage; not compatible with Q5020 linkage.
 43191679-101—Auxiliary Potentiometer for ML6421A
 43191679-102—220 ohm Auxiliary Potentiometer for ML6421B
 43191680-102—Dual Auxiliary Switch for CREVAL actuators
 43196000-001—High Temperature Kit for actuators with 3/4 inch (20 mm) stroke, stem button attachment
 43196000-038—High Temperature Kit for actuators with 1-1/2 inch (38 mm) stroke, stem button attachment

DIMENSIONS DIAGRAM



	ML6421A, ML7421A	ML6421B, ML7421B
A	5-5/8 (142)	8 (204)
B	9-3/8 (239)	11-7/8 (301)
C	10-3/8 (264)	12-3/4 (326)
D	14-1/4 (360)	16-7/8 (430)
E	1-3/8 (35)	1-7/8 (48)

M16827

Submittal Data - Valves

Direct Coupled Valve Actuators, ML6425; ML7425



Direct Coupled Globe Valve Actuators provide floating and modulating control of chilled water, hot water and steam, and mount directly on VGF series, V5011 and V5013 globe valves. These Spring Return Actuators will operate 1/2 to 3 inch valves.

FEATURES

- Easy and quick installation on valves with 1 3/8 in. bonnet and 3/4 in. stroke.
- No separate linkage required.
- Conduit connector standard.
- No adjustments required on linkage.
- Accurate valve positioning.
- Low power consumption.
- High close-off ratings.
- Force limiting end switches.
- Internal manual operator.
- Synchronous motor.
- Maintenance free.

SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Stem down on power failure
Cable Entry	Conduit connector and one knockout on actuator case
Electrical Protection	Class I Insulation (24 Vac)
Electrical Connections	Screw terminals
Ingress Protection Rating	IP54
Frequency	50 Hz; 60 Hz
Manual operation	Manual override winding
Mounting	Directly on V5011/V5013 Globe Valves and VGF Flanged Globe Valves (3/4 in. or 20mm stroke)
Number of Internal Auxiliary Switch	0
Stroke	3/4 in. (20 mm)
Materials	ABS-FR Plastic, aluminum yoke
Operating Humidity Range (% RH)	5 to 95% RH
Medium Temperature	300 F Maximum (150 C Maximum)
Ambient Temperature Range	14 F to 122 F (-10 C to +50 C)
Storage Temperature Range	-40 F to +158 F (-40 C to +70 C)
Weight	5.1 lb (2.3 kg)
Includes	1/2 in. conduit hub; 1/2 in. flexible conduit adapter

APPROVALS

CE	Recognized
Underwriters Laboratories, Inc.	UL94-5V

ACCESSORIES

312495—Large stem button provides anti-spin for globe valves up to 3 in. (1/4-28UNF stem) with ML6420, ML7420, ML6421A, ML7421A, ML6425, and ML7425 actuators. Not required with ML6984/7984 actuators or Q5022A linkage; not compatible with Q5020 linkage.

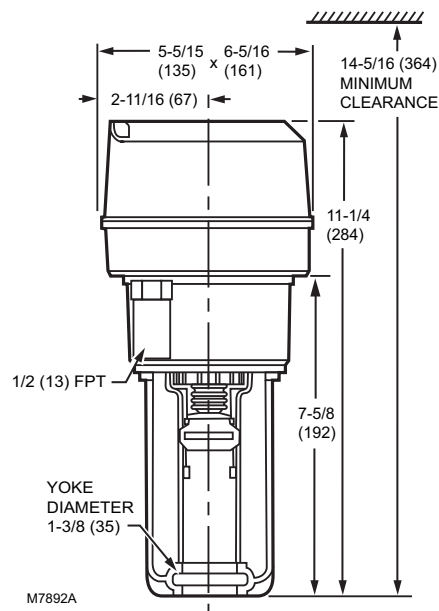
43191679-111—Potentiometer, 10k ohm, for ML6425, ML7425

43191679-112—Potentiometer, 220 ohm for ML6425, ML7425

43191680-105—Dual Auxiliary Switch for CREVAL actuators

43196000-001—High Temperature Kit for actuators with 3/4 inch (20 mm) stroke, stem button attachment

DIMENSIONS DIAGRAM



Direct Coupled Valve Actuators, ML6984



The ML6984 is a self-contained, self-adjusting, motorized linkage that mounts directly onto V5011 two-way or V5013 three-way valves and provides up to 25 mm (1") of linear travel (stem lift). For use with low voltage 3-wire SPDT Series 20 (on-off); Series 60 (floating) electromechanical (dry) contacts; or electronic (triac output) controllers (3-wire installation).

FEATURES

- Allows the use of one common transformer power supply for multiple actuators and controllers.
- Self-contained, motorized valve linkage.
- Linkage self-adjusts to valve stroke of 12 to 25 mm (1/2 to 1 in.).
- Multi-pose mounting.
- Strong valve seat closing force 160 lbf (710 N).
- Compact size for easy installation in confined area.
- One device for either 24 Vac or 28 Vdc power supply application.
- Electronic current sensing provides internal protection and positive full closing force.
- Field-addable position feedback/auxiliary switch module available (5-wire control wiring only).
- Compatible with 3-wire control systems.

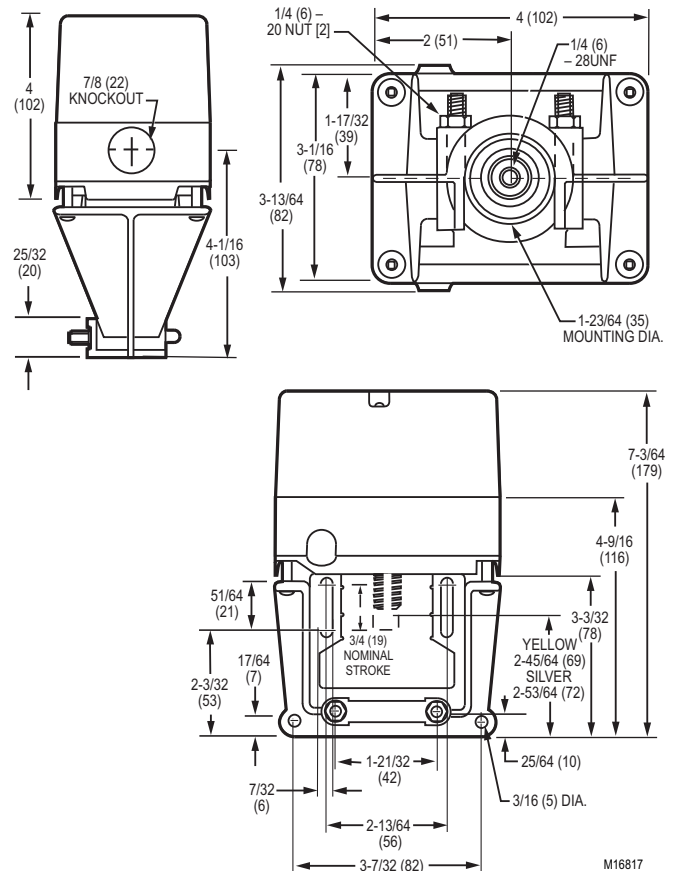
SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Stays in place
(Rated) Stem Force	160 lbf (710 N)
Cable Entry	7/8 in. hole for 1/2 in. conduit
External Auxiliary Switches Available	272630D
Electrical Protection	NEMA 3R
Electrical Connections	Screw terminals
Ingress Protection Rating	NEMA 3R, IP54 (mounted in vertical position)
Feedback	Position feedback available w/ 272630D; 2-10 Vdc
Frequency	50 Hz; 60 Hz
Manual operation	None
Mounting	Screws onto 1/4-28 UNF threaded valve stem
Number of Internal Auxiliary Switch	0
Stroke	1/2 to 1 in. (13 to 25 mm)
Supply Voltage	24 Vac; 28 Vdc
Materials	UV-stabilized plastic cover, aluminum base & yoke
Operating Humidity Range (% RH)	15 to 95% RH at 104 F (40 C)
Medium Temperature	300 F Maximum (150 C Maximum)
Ambient Temperature Range	32 F to 130 F (0 C to 50 C)
Temperature Ratings (Shipping)	-40 F to +150 F (-40 C to +65 C)
Storage Temperature Range	-40 F to +150 F (-40 C to +65 C)
Weight	2.2 lb (1 kg)
Includes	Screw terminals
Comments	3 or 5-wire operation. (3-wire required for XL10 controllers)

ACCESSORIES

272629A—Adapter Kit for mounting ML6984/ML7984 to V5045 and VGF non-pressure balanced 2-way valves
 272630D—Position feedback and SPDT pilot duty auxiliary switch

DIMENSIONS DIAGRAM



VALVES

Submittal Data - Valves

Direct Coupled Valve Actuators, ML7984



The ML7984 is a self-contained, self-adjusting, motorized linkage that mounts directly onto V5011 two-way or V5013 three-way valves and provides up to 25 mm (1") of linear stem travel. For use with Series 70 2-10Vdc, 4-20mA; Series 90 135 ohm; and Electronic (Super Mod) modulating signals controllers.

FEATURES

- Allows the use of one common transformer power supply for multiple actuators and controllers.
- Self-contained, motorized valve linkage.
- Linkage self-adjusts to valve stroke from 12 to 25 mm (1/2 - 1 in.).
- Multi-pose mounting.
- Strong valve seat closing force 160 lbf (710 N).
- Compact size for easy installation in confined area.
- One device for either Vac or Vdc power supply application.
- Electronic current sensing provides internal protection and positive full closing force.
- Field-addable position feedback/auxiliary switch module available.

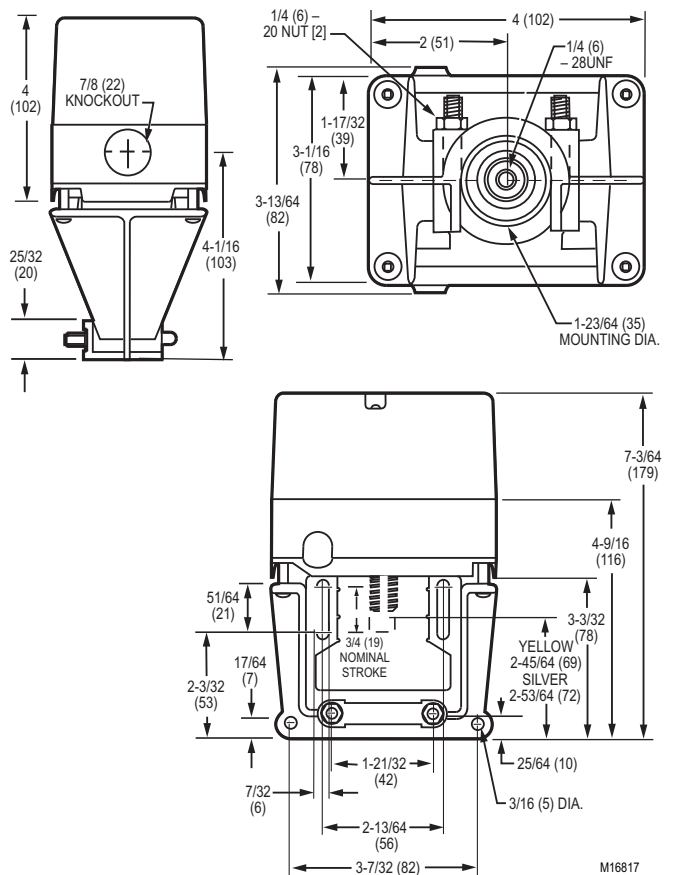
SPECIFICATIONS

Actuator Type	Valve
Fail Safe Mode	Stays in place
Cable Entry	7/8 in. hole for 1/2 in. conduit
External Auxiliary Switches Available	272630D
Electrical Protection	NEMA 3R
Electrical Connections	Screw terminals
Ingress Protection Rating	NEMA 3R, IP54 (mounted in vertical position)
Feedback	Position feedback available w/ 272630D; 2-10 Vdc
Frequency	50 Hz; 60 Hz
Manual operation	None
Mounting	Screws onto 1/4-28 UNF threaded valve stem
Number of Internal Auxiliary Switch	0
Stroke	1/2 to 1 in. (13 to 25 mm)
Supply Voltage	24 Vac; 28 Vdc
Materials	UV-stabilized plastic cover, aluminum base & yoke
Operating Humidity Range (% RH)	15 to 95% RH at 104 F (40 C)
Ambient Temperature Range	32 F to 130 F (0 C to 55 C)
Temperature Ratings (Shipping)	-40 F to +150 F (-40 C to +65 C)
Storage Temperature Range	-40 F to +150 F (-40 C to +65 C)
Weight	2.2 lb (1 kg)
Includes	Screw terminals
Comments	Direct/Reverse Acting Switch

ACCESSORIES:

- 272629A—Adapter Kit for mounting ML6984/ML7984 to V5045 and VGF non-pressure balanced 2-way valves
- 272630D—Position feedback and SPDT pilot duty auxiliary switch

DIMENSIONS DIAGRAM



M16817



Two-way Fan Coil Valves, the VU53 high pressure zone valves are used to control the flow of hot or chilled water in commercial HVAC equipment such as fan coil units, terminal reheat coils and convectors. **IMPORTANT** These valves are not for use in systems containing dissolved oxygen.

FEATURES

- Compact construction for easy installation.
- Fits under the cover of most baseboard convectors with actuator fitted to valve body.
- VU52 and VU53 provide 2-way, straight-through control of water.
- Available in normally closed (VU53) or normally open (VU52) configurations.
- 300 psi (2,000 kPa, PN20) operating pressure rating.
- Patented ball seal provides long service life, soft close off.
- Triple O-ring seal provides three lines of defense against corrosion and water leakage around drive shaft.
- Quick opening flow curve.
- Available with NPT end connections for iron or steel piping.

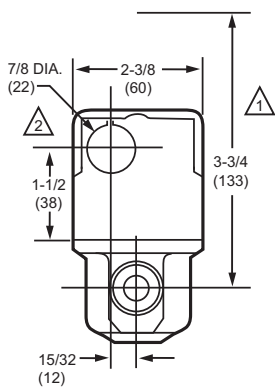
SPECIFICATIONS

Valve Type	Fan Coil Valve
Actuation:	Must be purchased separately
Flow Characteristic:	Quick opening
Body Pattern	Two-way, Straight-through
Controlled Fluid	Chilled or hot water with up to 60% Glycol
Maximum Safe Operating Pressure.....	300 psig (2068 kPa)
Ambient Temperature Range	34 F to 125 F at 200 F Fluid (1 to 52 C @ 94 C Fluid)
Materials	
(Body)	Brass
(Stem)	Brass
(Seat)	Brass
(Plug/Ball/Disc)	Buna-N rubber
(Packing)	EPDM rubber

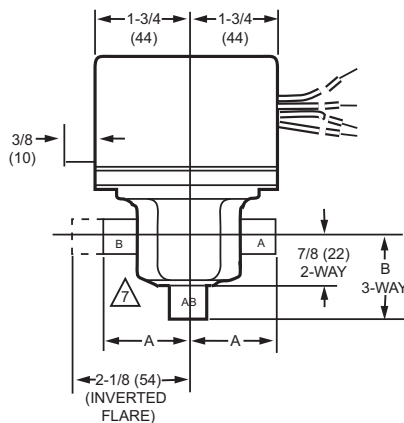
APPROVALS

Canadian Standards Association.....CSA C/US

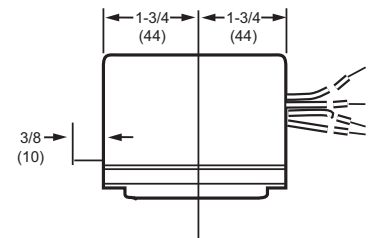
DIMENSIONS DIAGRAM



VU53 VALVE WITH VU448 ACTUATOR



VU53 AND VU54 VALVE WITH ACTUATOR



VU5 ACTUATOR

- 1 HEIGHT NEEDED TO REMOVE ACTUATOR OR COVER
 2 OPENING FOR 1/2 IN. CONDUIT ON OPPOSITE SITE OF MANUAL LEVER FOR ALL MODELS.

VALVE BODY SIZE	A	B
1/2 IN. SWEAT	1-5/6 (33)	1-5/6 (33)
3/4 IN. SWEAT	1-3/8 (35)	1-11/16 (43)
1 IN. SWEAT	1-11/16 (43)	1-11/16 (43)
1/2 IN. NPT	1-3/8 (35)	1-5/16 (33)
3/4 IN. NPT	1-11/16 (43)	1-7/16 (37)
1 IN. NPT	1-11/16 (43)	1-7/16 (37)

M18261A

Submittal Data - Valves

Unitary Valve, VU54



Three-way Fan Coil Valve, the VU54 high pressure zone valves are used to control the flow of hot or chilled water in commercial HVAC equipment such as fan coil units, terminal reheat coils and convectors.

IMPORTANT These valves are not for use in systems containing dissolved oxygen.

FEATURES

- Compact construction for easy installation.
- Fits under the cover of most baseboard convectors with actuator fitted to valve body.
- VU54 provides three-way diverting control of water.
- 300 psi (2,000 kPa, PN20) operating pressure rating.
- Patented ball seal provides long service life, soft close off.
- Triple O-ring seal provides three lines of defense against corrosion and water leakage around drive shaft.
- Quick opening flow curve.
- Choice of NPT end connections for iron or steel piping.

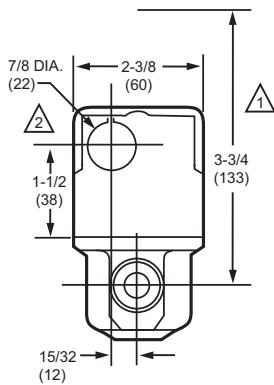
SPECIFICATIONS

Valve Type	Fan Coil Valve
Valve Action:.....	Mixing
Body Pattern	Three-way A-AB-B
Flow Characteristic:.....	quick opening
Controlled Fluid	Chilled or hot water with up to 60% Glycol
Maximum Safe Operating Pressure	300 psig (2068 kPa)
Ambient Temperature Range	34 F to 125 F at 200 F Fluid (1 to 52 C @ 94 C Fluid)
Actuation:	Must be purchased separately
Materials	
(Body).....	Brass
(Stem).....	Brass
(Seat).....	Brass
(Plug/Ball/Disc).....	Buna-N rubber
(Packing).....	EPDM rubber

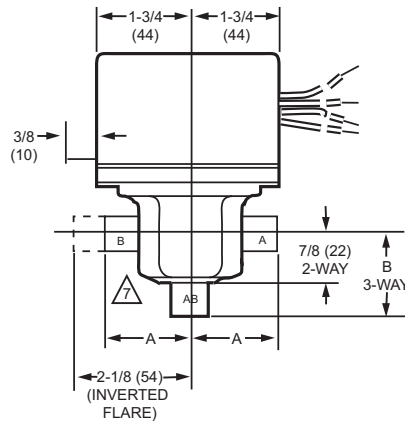
APPROVALS

Canadian Standards Association..... CSA C/US

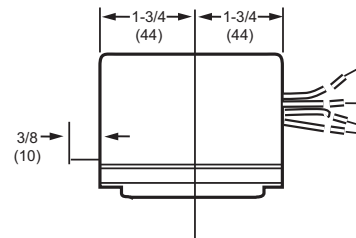
DIMENSIONS DIAGRAM



VU53 VALVE WITH VU448 ACTUATOR



VU53 AND VU54 VALVE WITH ACTUATOR



VU5 ACTUATOR

- ① HEIGHT NEEDED TO REMOVE ACTUATOR OR COVER
- ② OPENING FOR 1/2 IN. CONDUIT ON OPPOSITE SITE OF MANUAL LEVER FOR ALL MODELS.

VALVE BODY SIZE	A	B
1/2 IN. SWEAT	1-5/6 (33)	1-5/6 (33)
3/4 IN. SWEAT	1-3/8 (35)	1-11/16 (43)
1 IN. SWEAT	1-11/16 (43)	1-11/16 (43)
1/2 IN. NPT	1-3/8 (35)	1-5/16 (33)
3/4 IN. NPT	1-11/16 (43)	1-7/16 (37)
1 IN. NPT	1-11/16 (43)	1-7/16 (37)

M18261A



Two-way Cartridge Cage Valves are intended for hydronic applications in a normal indoor environment to control the flow of hot water or chilled water glycol solution to 60% concentration. These valves are designed for zone control of heating/cooling systems, or to control individual fan coil, baseboard radiator or convector applications. Depending on the model selected they can be controlled by SPST or SPDT two position controller, tristate (floating), or modulating proportional

controller. For best control, outdoor temperature compensation of supply water temperature is recommended. For trouble-free operation of the product, good installation practice must include initial system flushing, chemical water treatment, and the use of a 50 micron (or finer) system side stream filter(s). Remove all filters before flushing.

SPECIFICATIONS

Valve Type	Cartridge Cage Valve
Valve Action:	Stem up to close A port
Body Pattern	Two-way, Straight-through
Connection Type	Sweat
Controlled Fluid	Chilled or hot water with up to 60% Glycol
Maximum Safe Operating Pressure	300 psi (2068 kPa (20 Bar))
Maximum Differential Pressure Ratings (Close-off)	(414 kPa (4 bar)); 60 psi
Fluid Temperature Range	34 F to 203 F (1 C to 95 C)
Ambient Temperature Range	32 F to 150 F (0 C to 65 C)
Stem Travel	0.4 in. (10 mm)
Materials	
(Body)	Bronze
(Stem)	Stainless Steel
(Seat)	EPDM O-ring seals on Noryl piston
(Cartridge)	Ryton®, Noryl® engineering plastic
(Packing)	EPDM rubber
Includes:	Cartridge installation wrench

APPROVALS

Canadian Standards Association CSA Certified

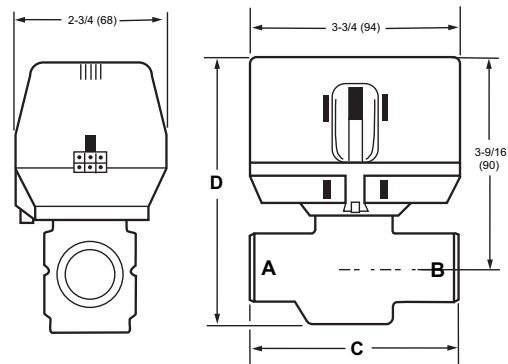
ACCESSORIES

40007029-002—Wrench for cartridge (included with sweat valves and all replacement cartridges)

FEATURES

- Quick open, linear, and equal percentage flow characteristics available
- Bi-directional installation
- 3000-series valves for floating and modulating non-fail safe applications
- 1000-series valves for two-position control
- High close-off rating independent of Cv
- Available with a variety of North American and international pipe fittings
- No tools required for actuator installation or removal
- Actuator removal does not require draining system
- Service is by replacement of cartridge, not valve body
- Cartridge replacement rebuilds valve to factory-new condition.

DIMENSIONS DIAGRAM



Pipe Fitting Sizes North American Standard	C		D		Pipe Fitting Sizes	C		D	
	in.	mm	in.	mm		in.	mm	in.	mm
3/8" FLARE	3-7/8	98	4-3/8	111	1/2" BSPP (int.)	3-7/8	98	4-3/8	111
1/2" SWEAT	3-1/2	89			1/2" BSPT (int.)				
1/2" FLARE	3-7/8	98			3/4" BSPP (int.)	3-11/16	94	4-7/16	113
1/2" INVERTED FLARE					3/4" BSPT (int.)				
1/2" NPT (int.)					3/4" BSPP (ext.)				
3/4" NPT (int.)	3-11/16	94	4-7/16	113	22 mm Compression	4-7/16	112		
3/4" SWEAT					1" BSPP (int.)	3-11/16	94		
1" NPT (int.)					1" BSPP (ext.)	3-11/17	95	4-7/17	114
1" SWEAT					1" BSPT (int.)	3-11/16	94	4-7/16	113
1-1/4" SWEAT	4-5/16	110	4-5/8	118	28 mm Compression	4-9/16	116		
1-1/4" NPT (int.)									

△ NO ADAPTERS

△ SUITABLE FOR USE AS 15 MM COMPRESSION FITTING

△ DIMENSIONS SHOWN WITH NUTS AND OLIVES INSTALLED

△ SOME MODELS NOT AVAILABLE IN ALL COUNTRIES

M18942

Submittal Data - Valves

Unitary Valve, VCZM; VCZN



Three-way Cartridge Cage Valves are intended for hydronic applications in a normal indoor environment to control the flow of hot water or chilled water glycol solution to 60% concentration. These valves are designed for zone control of heating/cooling systems, or to control individual fan coil, baseboard radiator or convactor applications. Depending on the model selected they can be controlled by SPST or SPDT two position controller, tristate (floating), or modulating proportional controller. For best control, outdoor

temperature compensation of supply water temperature is recommended. For trouble-free operation of the product, good installation practice must include initial system flushing, chemical water treatment, and the use of a 50 micron (or finer) system side stream filter(s). Remove all filters before flushing.

FEATURES

- Quick open and linear flow characteristics available
- Mixing or diverting application
- A-AB-B body pattern
- 7000-series valves for floating and modulating non-fail safe applications
- 6000-series valves for two-position control
- High close-off rating independent of Cv
- Available with a variety of North American and international pipe fittings
- No tools required for actuator installation or removal
- Actuator removal does not require draining system
- Service is by replacement of cartridge, not valve body
- Cartridge replacement rebuilds valve to factory-new condition

SPECIFICATIONS

Valve Type	Cartridge Cage Valve
Valve Action:.....	Stem up to close A port
Body Pattern	Three-way A-AB-B
Controlled Fluid	Chilled or hot water with up to 60% Glycol
Maximum Safe Operating Pressure	300 psi (2068 kPa (20 Bar))
Maximum Differential Pressure Ratings (Close-off).....	(414 kPa (4 bar)); 60 psi
Fluid Temperature Range.....	34 F to 203 F (1 C to 95 C)
Ambient Temperature Range	32 F to 150 F (0 C to 65 C)
Stem Travel.....	0.4 in. (10 mm)
Includes:.....	Cartridge changing tool
Materials	
(Body).....	Bronze
(Stem).....	Stainless Steel
(Seat).....	EPDM O-ring seals on Noryl piston
(Cartridge).....	Ryton®, Noryl® engineering plastic
(Packing).....	EPDM rubber

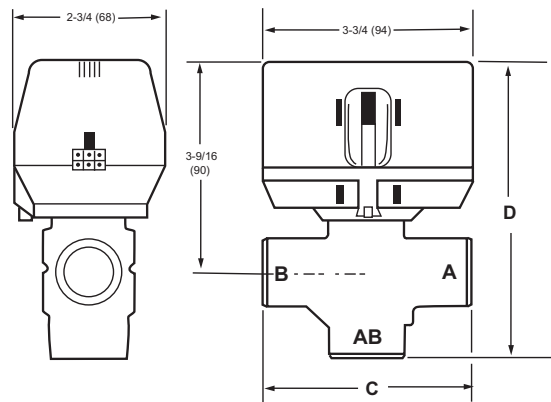
APPROVALS

Canadian Standards Association..... CSA Certified

ACCESSORIES

40007029-002—Wrench for cartridge (included with sweat valves and all replacement cartridges)

DIMENSIONS DIAGRAM



Pipe Fitting Sizes North American Standard	C		D		Pipe Fitting Sizes	C		D	
	in.	mm	in.	mm		in.	mm	in.	mm
3/8" FLARE	3-7/8	98	5-11/32	136	1/2" BSPP (int.)	3-7/8	98	5-11/32	136
1/2" SWEAT	3-1/2	89	5-1/8	130	1/2" BSPT (int.)				
1/2" FLARE	3-7/8	98	5-11/32	136	3/4" BSPP (int.)	3-11/16	94	5-1/8	130
1/2" INVERTED FLARE					3/4" BSPT (int.)				
1/2" NPT (int.)					3/4" BSPP (ext.)				
3/4" NPT (int.)	3-11/16	94	5-1/8	130	22 mm Compression	4-7/16	112	5-1/2	140
3/4" SWEAT			5-3/16	132	1" BSPP (int.)	3-11/16	94	5-11/32	136
1" NPT (int.)				136	1" BSPP (ext.)	3-11/17	95	5-11/33	137
1" SWEAT			5-11/32	136	1" BSPT (int.)	3-11/16	94	5-11/32	136
1-1/4" SWEAT	4-5/16	110	5-5/8	142	28 mm Compression	4-9/16	116	5-13/16	147
1-1/4" NPT (int.)									

△ NO ADAPTERS

△ SUITABLE FOR USE AS 15 MM COMPRESSION FITTING

△ DIMENSIONS SHOWN WITH NUTS AND OLIVES INSTALLED

M18943

Unitary Valve, V5852; V5862



Two-way Cartridge Globe Valves control hot and/or chilled water for VAV terminal units, fan coil units, small reheaters and recoolers in electric/electronic temperature control systems. Used with the M6410 3-position floating Non-Spring Return Valve Actuator and the M7410 selectable 0 to 10 Vdc or 2 to 10 Vdc Non-Spring Return Actuator. The 1/2 in. and 3/4 in. valves are compatible with the

M6435 floating Spring Return Actuator, the M7435 selectable 0 to 10 Vdc or 2 to 10 Vdc Spring Return Actuator, and the MP958 Pneumatic Actuator. Larger valves (1 in. through 1-1/2 in.) are pressure balanced, which results in higher close-off pressures.

SPECIFICATIONS

Valve Type	Cartridge Globe Valve
Body Pattern	Two-way
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	1/2 in. and 3/4 in. valves: ANSI Class IV (0.01% of Cv maximum) 1 in., 1-1/4 in., 1-1/2 in. valves: ANSI Class III (less than 0.02% of Cv)
Maximum Safe Operating Pressure	235 psi (1620 kPa)
Fluid Temperature Range	36 F to 230 F (2 C to 110 C)
Stem Travel	1/4 in. (6.4 mm)
Actuation:	Must be purchased separately
Materials	
(Body)	Brass
(Stem)	Stainless Steel
(Seat)	Brass
(Cartridge)	Brass
(Plug/Ball/Disc)	Brass

ACCESSORIES

- 0902807—Replacement Insert for 1/2 in. V5852/V5862, 1.9 Cv
Interchangeable with 0902808
- 0902808—Replacement Insert for 1/2 in. V5852/V5862, 1.2 Cv
Interchangeable with 0902807
- 0902809—Replacement Insert for 1/2 in. V5852/V5862, 0.74 Cv
Interchangeable with 0902810 or 090212
- 0902810—Replacement Insert for 1/2 in. V5852/V5862, 0.47 Cv
Interchangeable with 0902809 or 090212

REPLACEMENT PARTS

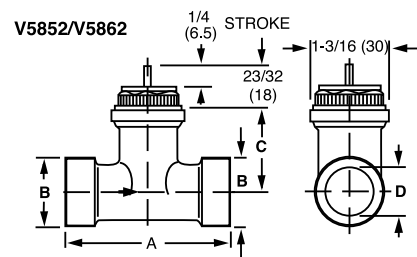
- 0902812—Replacement Insert for 1/2 in. V5852/V5862, 0.19 Cv
Interchangeable with 0902809 or 090210
- 0902814—Replacement Insert for 3/4 in. V5852/V5862, 2.9 Cv
Interchangeable with 0902815
- 0902815—Replacement Insert for 3/4 in. V5852/V5862, 4.9 Cv
Interchangeable with 0902814
- 0903827—Replacement Packing for 1 in. V5862/63
- 0903828—Replacement Packing for 1-1/4 in. V5862/63
- 0903829—Replacement Packing for 1-1/2 in. V5862/63

FEATURES

Long stroke allows wider range of control.

- Soft valve seat provides low leakage rate.
- Inserts for 1/2 in. and 3/4 in. valves are changeable without draining valve when used with an insert replacement tool.
- Brass body and Stainless Steel stem.
- Threaded plastic cover/manual handle allows manual operation.
- Easily installed in areas where space is limited.

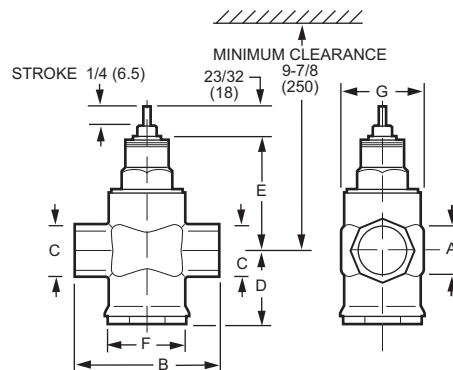
DIMENSIONS DIAGRAM



VALVE SIZE	A	B	C	D (NPT)	D (SWEAT)
1/2 (13)	3 (77)	3/4 (19)	1-5/16 (34)	1/2 (13)	5/8 (16)
3/4 (19)	3-1/2 (88)	1 (25)	1-1/4 (32)	3/4 (19)	7/8 (22)

NOTE: SOLDER ENDS CONFORM TO ANSI B16-18.

M18917



VALVE SIZE A (NPT)	B	C	D	E	F	G
1 (25)	4-1/8 (105)	1-5/8 (41)	2-1/16 (53)	3-5/8 (92)	2 (50)	1-3/4 (44)
1-1/4 (32)	4-15/16 (125)	2 (50)	2-7/16 (62)	3-5/8 (92)	2-3/16 (55)	2-1/4 (57)
1-1/2 (38)	5-1/8 (130)	2-3/16 (55)	2-9/16 (65)	3-7/8 (98)	2-3/8 (60)	2-5/8 (67)

Submittal Data - Valves

Unitary Valve, V5853; V5863



Three-way Cartridge Globe Valves control hot and/or chilled water for VAV terminal units, fan coil units, small reheaters and recoolers in electric/ electronic temperature control systems. Used with the M6410 3-position floating Non-Spring Return Valve Actuator and the M7410 selectable 0 to 10 Vdc or 2 to 10 Vdc Non-Spring Return Actuator. The 1/2 in. and 3/4 in. valves are also compatible with the M6435 floating Spring Return

Actuator, the M7435 selectable 0 to 10 Vdc or 2 to 10 Vdc Spring Return Actuator, and the MP958 Pneumatic Actuator.

FEATURES

- Long stroke allows wider range of control.
- Soft valve seat provides low leakage rate.
- Inserts for 1/2 in. and 3/4 in. valves are changeable without draining valve when used with an insert replacement tool.
- Brass body and stainless steel stem.
- Threaded plastic cover/manual handle allows manual operation.
- Easily installed in areas where space is limited.

SPECIFICATIONS

Valve Type	Cartridge Globe Valve
Body Pattern	Three-way
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	1/2 in. and 3/4 in. valves: ANSI Class IV (0.01% of Cv maximum) 1 in., 1-1/4 in., 1-1/2 in. valves: ANSI Class III (less than 0.02% of Cv)
Maximum Safe Operating Pressure	235 psi (1620 kPa)
Maximum Differential Pressure Ratings (Close-off)	34 psi (234 kPa)
Fluid Temperature Range	36 F to 230 F (2 C to 110 C)
Stem Travel	1/4 in. (6.4 mm)
Actuation:	Must be purchased separately

Materials

(Body)	Brass
(Stem)	Stainless Steel
(Seat)	Brass
(Cartridge)	Brass
(Plug/Ball/Disc)	Brass

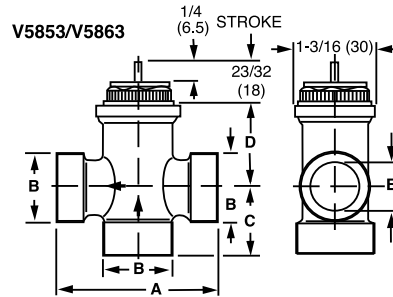
ACCESSORIES

0903827—Replacement Packing for 1 in. V5862/63

REPLACEMENT PARTS

- 0902821—Replacement Insert for 1/2 in. V5853/V5863, 0.29 Cv
Interchangeable with 0902822 or 0902823 or 0902824
- 0902822—Replacement Insert for 1/2 in. V5853/V5863, 0.47 Cv
Interchangeable with 0902821 or 0902823 or 0902824
- 0902823—Replacement Insert for 1/2 in. V5853/V5863, 0.74 Cv
Interchangeable with 0902821 or 0902822 or 0902824
- 0902824—Replacement Insert for 1/2 in. V5853/V5863, 1.2 Cv
Interchangeable with 0902821 or 0902822 or 0902823
- 0902825—Replacement Insert for 1/2 in. V5853/V5863, 1.9 Cv
Interchangeable with 0902827
- 0902827—Replacement Insert for 3/4 in. V5853/V5863, 4.9 Cv
Interchangeable with 0902825
- 0903827—Replacement Packing for 1 in. V5862/63
- 0903828—Replacement Packing for 1-1/4 in. V5862/63
- 0903829—Replacement Packing for 1-1/2 in. V5862/63

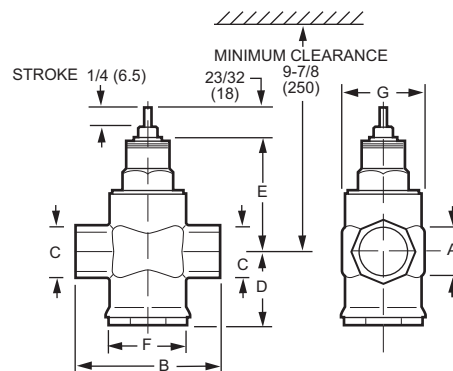
DIMENSIONS DIAGRAM



VALVE SIZE	A	B	C	D	E (NPT)	E (SWEAT)
1/2 (13)	3 (77)	3/4 (19)	1-5/16 (34)	1-5/16 (34)	1/2 (13)	5/8 (16)
3/4 (19)	3-1/2 (88)	1 (25)	1-1/2 (38)	1-1/4 (32)	3/4 (19)	7/8 (22)

NOTE: SOLDER ENDS CONFORM TO ANSI B16-18.

M18919



VALVE SIZE A (NPT)	B	C	D	E	F	G
1 (25)	4-1/8 (105)	1-5/8 (41)	2-1/16 (53)	3-5/8 (92)	2 (50)	1-3/4 (44)
1-1/4 (32)	4-15/16 (125)	2 (50)	2-7/16 (62)	3-5/8 (92)	2-3/16 (55)	2-1/4 (57)
1-1/2 (38)	5-1/8 (130)	2-3/16 (55)	2-9/16 (65)	3-7/8 (98)	2-3/8 (60)	2-5/8 (67)



The Fail Safe VC6936 Floating and VC7936 Modulating Control valves provides proportional control of hot or chilled water in commercial heating and cooling applications, such as unit ventilators. On a power failure, this patented actuator design drives the valve to the fail safe position, either fully open or closed according to the installer's wiring connections.

These actuators use a microprocessor-controlled, low voltage stepper motor with a super capacitor-based power supply capable of storing enough power to drive the valve to its when 24V power is removed from the actuator.

A VC hydronic valve consists of a valve body, a replaceable characterized cartridge assembly and a Honeywell VC6900 or VC7900-series actuator, providing proportional flow control. Three-way bodies may be used in either diverting or mixing applications. VC valves use cam-operated cartridge travel to resist water hammer. Limit switches prevent motor overrun. For best control, outdoor temperature compensation of supply water temperature is recommended.

SPECIFICATIONS

Valve Type	Cartridge Cage Valve
Valve Action:	Stem up to close A port
Controlled Fluid	Chilled or hot water with up to 60% Glycol
Maximum Safe Operating Pressure.....	300 psi (2068 kPa (20 Bar))
Maximum Differential Pressure	
Ratings (Close-off).....	60 psi (414 kPa (4 bar))
Fluid Temperature Range	34 F to 203 F (1 C to 95 C)
Ambient Temperature Range	32 F to 150 F (0 C to 65 C)
Stem Travel	0.4 in. (10 mm)
Timing (sec, min.):.....	For VC6936: 2 minutes; For VC7936: installer-selectable 60 or 120 seconds.
Materials	
(Body).....	Bronze
(Stem)	Stainless Steel
(Seat).....	EPDM O-ring seals on Noryl piston
(Cartridge).....	Ryton®, Noryl® engineering plastic
(Packing)	EPDM rubber

APPROVALS

Canadian Standards Association.....CSA Certified

Submittal Data - Valves

NPT Control Ball Valve, VBN2



The VBN2 Two-Way Control Ball Valves control hot and chilled water with glycol solutions up to 50% in heating, ventilating and air conditioning (HVAC) systems to provide two-position or modulating functions. These valve assemblies can be ordered with or without factory-mounted non-spring return or spring return actuators.

SPECIFICATIONS

Valve Type	Control Ball Valve
Body Pattern	Two-way
Connection Type	Female NPT
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	ANSI Class IV (0.01% of Cv maximum)
Maximum Safe Operating Pressure	360 psi (2482 kPa)
Fluid Temperature Range	-22 F to +250 F (-30 C to +121 F)
Materials	
(Body)	Brass
(Seat)	Teflon® seals with EPDM O-rings
(Flow Control Insert)	Noryl®

FEATURES

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Equal percentage flow characteristic.
- Reduced B port CV for constant loop flow.
- Choice of factory-installed actuation: floating, modulating (2-10 V), spring return or non-spring return
- 2-Position, Spring Return Modulating/Floating.
- Field configurable for normally open or normally closed fail-safe position.
- Removable manual operating handle to control valve during installation or in an event of power failure.
- Actuator can be mounted on the valve in any of four orientations.
- Field-serviceable stem assembly.
- Wide range of CV choices from 0.33 to 266.
- Nickel-chrome plated brass or 316 stainless steel ball and stem.
- Valve installs in a globe valve “T” pattern, no extra elbows or piping required.
- Mixing or Diverting control for 3-way valves.
- ANSI Class IV seat leakage specification (0.01% of CV) for 3-way A port and ANSI Class III seat leakage specification (0.1% of CV) for 3-way B port.

Dimensional Diagrams - Valves

NPT Control Ball Valve, VBN2

DIMENSIONS DIAGRAM

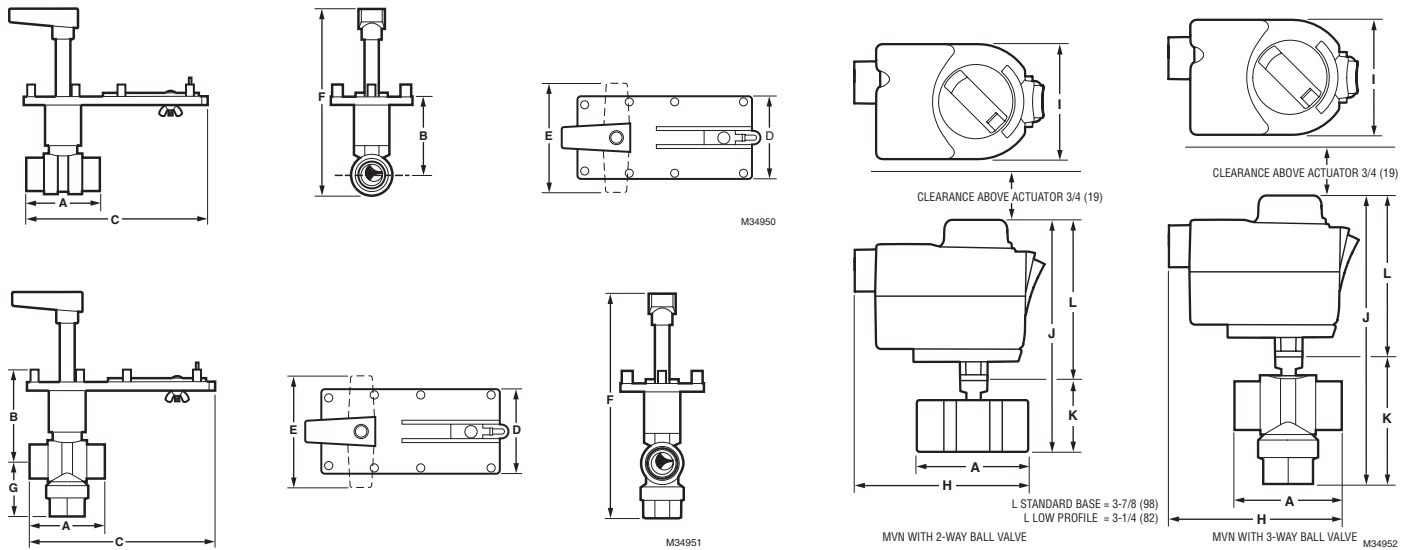


Table 7. VBN2 dimensions in inches (millimeters).

Pipe Size			C _y Designators	MVN, MN, AND MS ACTUATORS WITH 2-WAY BALL VALVE Dimensions in in. (mm)										Weight (valve only) lbs.	Replacement Stem Assembly**		
In.	(DN)	Code		A	B	C	D	E	Fms ^a	Fmn ^b	H	I	J (w/std)			J (w/low)	K
1/2	15	VBN2A	0.38, 0.68, 1.30, 2.00, 2.60, 4.70, 8.00, 11.70*	2-3/8 (60)	3-7/16 (87)	6-5/8 (168)	3 (76)	4 (102)	8-1/8 (206)	6-7/8 (175)			5-7/16 (139)	4-13/16 (123)	1-5/8 (41)	1	5112-19 5112-22(SS)
3/4	20	VBN2B	0.31, 0.63, 1.20, 2.50, 4.30, 7.40, 14.70*	2-3/8 (60)	3-7/16 (87)	6-7/16 (164)	3 (76)	4 (102)	8-1/8 (206)	6-7/8 (175)			5-7/16 (139)	4-13/16 (123)	1-5/8 (41)	1	
			10.10, 29.00*	2-5/8 (67)	3-11/16 (94)	6-1/2 (165)	3 (76)	4 (102)	8-5/16 (211)	7-1/16 (180)			5-5/8 (143)	5 (127)	1-13/16 (45)	1	
1	25	VBN2C	9.00	3-3/4 (95)	3-11/16 (94)	7-1/16 (179)	3 (76)	4 (102)	8-5/16 (211)	7-1/16 (180)	4-9/16 (116)	2-3/16 (71)	5-5/8 (143)	5 (127)	1-13/16 (45)	1	5112-20 5112-23(SS)
			4.40, 15.30, 26.00, 44.00, 54.00*	3-1/16 (77)	3-15/16 (100)	6-3/4 (171)	3 (76)	4 (102)	8-11/16 (221)	7-7/16 (189)			6 (152)	5-3/8 (137)	2-3/16 (55)	1.4	
1-1/4	32	VBN2D	4.40, 8.30, 14.90, 25.00, 41.00*	3(76)	3-15/16 (100)	6-11/16 (170)	3 (76)	4 (102)	8-11/16 (221)	7-7/16 (189)			6 (152)	5-3/8 (137)	2-1/8 (54)	1.4	5112-20 5112-23(SS)
			37.00, 102.00*	3-5/8 (92)	4-7/16 (113)	7 (178)	3 (76)	4 (102)	9-1/16 (231)	7-13/16 (198)			6-3/8 (162)	5-3/4 (146)	2-9/16 (64)	2.4	
1-1/2	40	VBN2E	23.00, 30.00, 74.00*	3-7/16 (87)	3-15/16 (100)	6-15/16 (176)	3 (76)	4 (102)	9-1/16 (231)	7-13/16 (198)						2.4	5112-21 5112-24(SS)
			41.00, 172.00*	4-1/16 (103)	5-3/16 (132)	7-1/16 (179)	3 (76)	4 (102)	8-7/8 (225)	7-5/8 (194)						3.2	
2	50	VBN2F	42.00, 108.00*	4(101)	3-3/4 (95)	7-3/16 (183)	3 (76)	4 (102)	8-7/8 (225)	7-5/8 (194)						3.2	5112-21 5112-24(SS)
			57.00, 71.00, 100.00, 210.00, 266.00*	4-15/16 (125)	4-1/16 (103)	7-7/16 (188)	3 (76)	4 (102)	10-1/2 (267)	9-1/4 (235)						5	
2-1/2	65	VBN2G	45.00, 55.00, 72.00, 101.00, 162.00, 202.00*	5-5/16 (135)	4-1/16 (103)	7-9/16 (192)	3 (76)	4 (102)	10-1/2 (267)	9-1/4 (235)						5.5	5112-21 5112-24(SS)
3	80	VBN2H	49.00, 63.00, 82.00, 124.00, 145.00*	5(127)	5-7/8 (149)	7-11/16 (196)	3 (76)	4 (102)	10-11/16 (271)	9-7/16 (240)						5.9	

^a For models using the MS direct coupled actuator.

^b For models using the MN direct coupled actuator.

* Indicates full port valve: no flow characterizing insert.

** Replacement stems available in brass or stainless steel--use accordingly to valve part number.

Submittal Data - Valves

NPT Control Ball Valve, VBN3



The VBN3 Three-Way Control Ball Valves control hot and chilled water with glycol solutions up to 50% in heating, ventilating and air conditioning (HVAC) systems to provide two-position or modulating functions. These valve assemblies can be ordered with or without factory-mounted non-spring return or spring return actuators.

SPECIFICATIONS

Valve Type	Control Ball Valve
Body Pattern	Three-way
Flow Characteristic:	Linear (B-AB); Equal Percentage (A-AB)
Connection Type	Female NPT
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	ANSI Class IV (0.01% of Cv maximum)
Maximum Safe Operating Pressure	360 psi (2482 kPa)
Fluid Temperature Range	-22 F to +250 F (-30 C to +121 F)
Materials	
(Body)	Brass
(Stem):	Brass
(Seat)	Teflon® seals with EPDM O- rings
(Plug/Ball/Disc):	Nickel-plated brass ball
(Flow Control Insert)	Noryl®

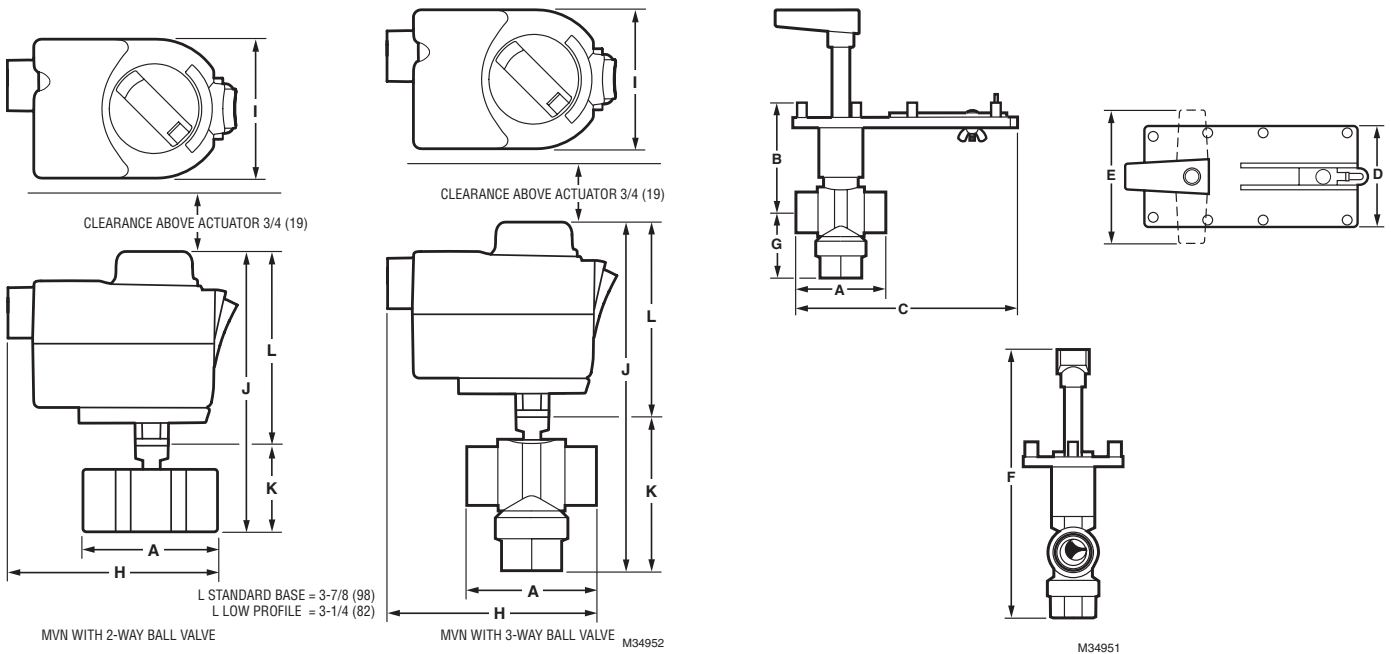
FEATURES

- Sizes from 1/2 to 2-1/2 inches with internal (female) NPT connections.
- Equal percentage or linear flow characteristics.
- Reduced B-port Cv for constant loop flow.
- Choice of four, factory-installed actuation control schemes: Floating, Modulating (2-10 V), Spring Return 2-Position, Spring Return Modulating/Floating.
- Field configurable for normally open or normally closed fail safe position.
- Removable manual operating handle to control valve during installation or in an event of power failure.
- ANSI Class IV seat leakage specification (0.01% of Cv).
- Optional NEMA 3R (IP54) rated enclosure for outdoor applications.
- Actuator can be mounted on the valve in any of four orientations.
- Wide Cv choices from 0.33 to 109.
- Valve installs in a globe valve "T" pattern, no extra elbows or piping required.
- Field-serviceable stem assembly.
- Nickel-chrome plated brass ball and stem.
- Mixing or Diverting control.

Dimensional Diagrams - Valves

NPT Control Ball Valve, VBN3

DIMENSIONS DIAGRAM



Pipe Size			C _v Designators	MVN WITH 3-WAY BALL VALVE											Weight (valve only) lbs.	Replacement Stem Assembly	
In.	(DN)	Code		Dimensions in in. (mm)													
				A	B	C	D	E	F	G	H	I	J (w/ std)	J (w/ low)	K		
1/2	15	VBN3A	0.33, 0.59, 1.00, 2.40, 4.30, 8.00	3-1/2 (89)	3-5/16 (84)	7 (178)	3 (76)	4 (102)	9-3/8 (238)	2-3/8 (60)			6-11/16 (170)	6-1/16 (154)	2-7/8 (72)	2.4	
3/4	20	VBN3B	0.40, 0.66, 1.30, 2.40, 3.80, 11.00*	2-13/16 (71)	3-5/16 (84)	6-1/2 (165)	3 (76)	4 (102)	8-13/16 (224)	2 (51)			6-1/8 (156)	5-1/2 (140)	2-5/16 (58)	2	5112-19
1	25	VBN3C	0.40, 0.65, 1.30, 2.30, 3.50	3-13/16 (97)	3-5/16 (84)	7-5/16 (185)	3 (76)	4 (102)	9-1/2 (241)	2-3/4 (70)			6-13/16 (173)	6-3/16 (157)	3 (75)	2.8	
			8.60, 22.00	3 (76)	3-13/16 (97)	6-13/16 (173)	3 (76)	4 (102)	9-13/16 (249)	2-5/8 (67)	4-9/16 (116)	2-13/16 (71)	7-1/8 (181)	6-1/2 (165)	3-5/16 (83)	2.6	
1-1/4	32	VBN3D	4.10, 8.70, 19.00*	3 (76)	3-13/16 (97)	6-13/16 (173)	3 (76)	4 (102)	9-13/16 (249)	2-1/2 (64)			7-1/8 (181)	6-1/2 (165)	3-5/16 (83)	2.5	5112-20
			12.70, 27.00, 34.00*	3-5/8 (91)	4 (102)	7-5/16 (185)	3 (76)	4 (102)	10-5/16 (262)	2-3/4 (70)			7-5/8 (194)	7 (178)	3-13/16 (96)	2.8	
1-1/2	40	VBN3E	4.00, 8.30, 13.40, 32.00*	4-5/16 (114)	4 (102)	7-13/16 (198)	3 (76)	4 (102)	10-13/16 (275)	3-1/4 (83)						3.3	
			24.00, 61.00	4 (102)	4-1/2 (114)	7-5/16 (185)	3 (76)	4 (102)	11 (279)	3-1/4 (83)						3.3	
2	50	VBN3F	24.00, 38.00, 57.00	4 (102)	4-1/2 (114)	7-5/16 (185)	3 (76)	4 (102)	11 (279)	3-1/4 (83)						3.3	
			83.00, 109.00	5 (127)	5-13/16 (147)	7-13/16 (198)	3 (76)	4 (102)	12-5/16 (313)	3-3/4 (95)						3.8	5112-21
2-1/2	65	VBN3G	38.00, 74.00, 100.00	5 (127)	5-13/16 (147)	7-13/16 (198)	3 (76)	4 (102)	12-5/16 (313)	3-3/4 (95)						3.8	

*Indicates full A-port: no flow characterizing insert.

Submittal Data - Valves

Flanged Control Ball Valve, VBF2



The VBF2 Two-Way Ball Valve Assemblies, with and without actuators, control hot and chilled water with glycol solutions up to 50% in closed loop heating, ventilating and air conditioning (HVAC) systems to provide two-position or modulating functions. These valve assemblies can be ordered with or without factory-mounted non-spring return or spring return direct-coupled actuators (DCA).

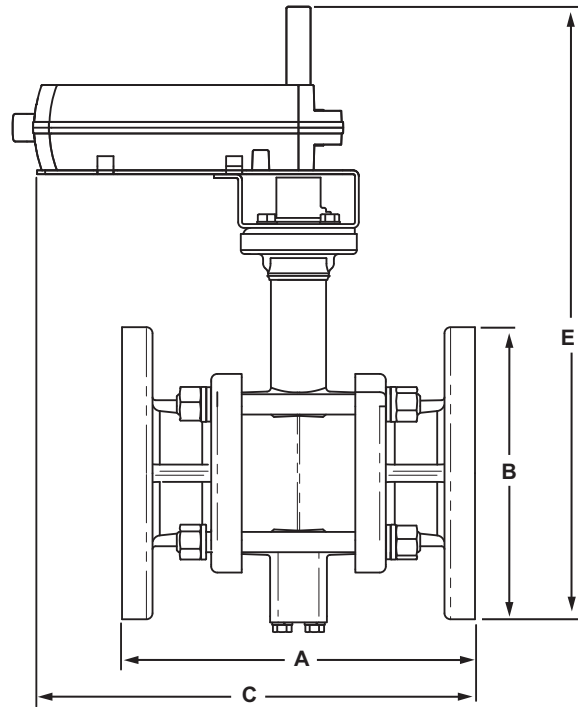
FEATURES

- Sizes from 4 to 6 inch with ANSI Class 125 flanged connections.
- Equal percentage or linear flow characteristics.
- Choice of four, factory-installed actuation control schemes: Floating, Modulating (2-10 V), Spring Return 24V 2-Position, Spring Return Modulating/Floating.
- Field configurable for normally open or normally closed fail safe position.
- Removable manual operating handle to control valve during installation or in an event of power failure.
- ANSI Class IV leakage specification (0.01% of Cv).
- Optional NEMA 3R (IP54) rated enclosure for outdoor applications.
- Option of four actuator mounting positions on the valve.
- Wide range of Cv choices from 91 to 650.
- Valve ball and stem 316 stainless steel.

SPECIFICATIONS

Valve Type	Control Ball Valve
Body Pattern	Two-way
Connection Type	Flanged
Flow Characteristic:.....	Equal Percentage
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	ANSI Class IV (0.01% of Cv maximum)
Maximum Safe Operating Pressure	240 psi (1655 kPa)
Maximum Differential Pressure	
Ratings (Close-off)	70 psi (483 kPa)
Fluid Temperature Range	-22 F to +250 F (-30 C to +121 F)
Materials	
(Body).....	Cast Iron
(Stem).....	316 Stainless Steel
(Seat).....	Teflon®
(Plug/Ball/Disc).....	316 stainless steel

DIMENSIONS DIAGRAM



Size (in.)	Model Number	A in. (mm)	B in. (mm)	C in. (mm)	D (depth) (not shown) in. (mm)	E in. (mm)	Wt. lb (kg)
4	VBF2J	11 (278)	9 (229)	13-1/4 (337)	9 (229)	18-3/4 (476)	65 (31)
5	VBF2K	12-3/8 (352)	10 (254)	14-1/4 (362)	10 (254)	19 (483)	75 (34)
6	VBF2L	13-7/8 (352)	11 (278)	15-1/8 (384)	11 (278)	19-7/8 (505)	90 (41)

M13732

Flanged Control Ball Valve, VBF3



The VBF3 Three-Way Ball Valve Assemblies, with and without actuators, control hot and chilled water with glycol solutions up to 50% in closed loop heating, ventilating and air conditioning (HVAC) systems to provide two-position or modulating functions. These valve assemblies can be ordered with or without factory-mounted non-spring return or spring return direct-coupled actuators (DCA).

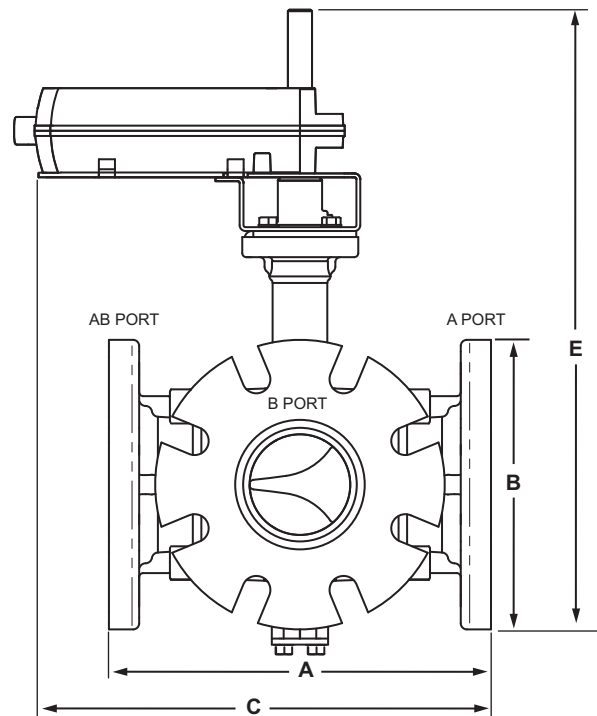
FEATURES

- Sizes from 4 to 6 inch with ANSI Class 125 flanged connections.
- Equal percentage or linear flow characteristics.
- Choice of four, factory-installed actuation control schemes: Floating, Modulating (2-10 V), Spring Return 24V 2-Position, Spring Return Modulating/Floating.
- Field configurable for normally open or normally closed fail safe position.
- Removable manual operating handle to control valve during installation or in an event of power failure.
- ANSI Class IV A-port seat leakage (0.01% of Cv).
- Optional NEMA 3R (IP54) rated enclosure for outdoor applications.
- Option of four actuator mounting positions on the valve.
- Wide range of Cv choices from 91 to 650.
- Valve ball and stem 316 stainless steel.
- Non-isolating mixing or diverting control.

SPECIFICATIONS

Valve Type	Control Ball Valve
Body Pattern	Three-way
Connection Type.....	Flanged
Flow Characteristic:.....	Linear (B-AB); Equal Percentage (A-AB)
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	ANSI Class IV (A port only) B port ~2% leakage
Maximum Safe Operating Pressure.....	240 psi (1655 kPa)
Maximum Differential Pressure	
Ratings (Close-off).....	70 psi (483 kPa)
Fluid Temperature Range	-22 F to +250 F (-30 C to +121 F)
Materials	
(Body).....	Cast Iron
(Stem)	316 Stainless Steel
(Seat).....	Teflon®
(Plug/Ball/Disc).....	316 stainless steel

DIMENSIONS DIAGRAM



Size (in.)	Model Number	A in. (mm)	B in. (mm)	C in. (mm)	D (depth) (not shown) in. (mm)	E in. (mm)	Wt. lb (kg)
4	VBF3J	11-7/8 (278)	9 (229)	14-1/8 (337)	10-3/8 (229)	18-1/2 (470)	75 (34)
5	VBF3K	13-7/8 (352)	10 (254)	15-1/8 (362)	12 (254)	19-3/8 (483)	90 (41)
6	VBF3L	15-7/8 (403)	11 (278)	16-1/8 (410)	13-3/8 (521)	20-1/2 (521)	105 (48)

M13733A

Submittal Data - Valves

NPT Globe Valve, V5011F; V5011G



Used for two-position or modulating control of steam and water and glycol solutions (to 50 percent concentration) in heating or cooling systems.

FEATURES

- Sizes range from 2-1/2 to 3 inches.
- Direct acting
- High pressure steam models with stainless steel trim.
- Spring-loaded, self-adjusting packing.
- Stainless steel stem prevents corrosion.
- Valve designs provide equal percentage characteristics of flow for close control of water, and linear characteristic of flow for close control of steam or chilled water.
- Valves utilize direct mounting, electric or pneumatic linear valve actuators; Q5001 linkage with Modutrol Motor; or Q5020/Q5022A linkages with Direct Coupled Actuators to operate the valve.

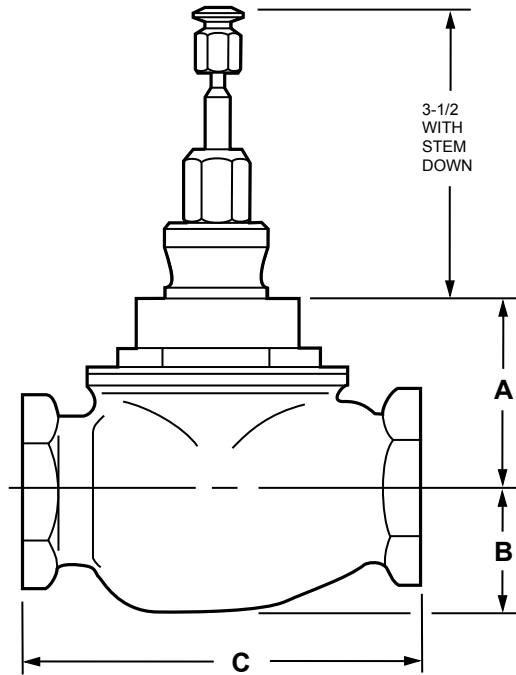
SPECIFICATIONS

Valve Type	Globe Valve
Body Pattern	Two-way, Straight-through
Connection Type	Female NPT
Leakage Rating	0.5% of Cv
Maximum Differential for Quiet Water Service	20 psid (138 kPa)
Fluid Temperature Range	40 F to 337 F (4 C to 169 C)
Stem Travel	3/4 in. (20 mm)
Bonnet Size:	1-3/8 in. (35 mm)
Valve Action:	Stem down to close
ANSI/ASME Rating:	150
Actuation:	Must be purchased separately
Materials	
(Body)	Red Brass
(Stem)	Stainless Steel
(Seat):	V5011F: Brass; V5011G: Stainless Steel
(Plug/Ball/Disc):	V5011F: Teflon disc; V5011G: Stainless steel plug with carbon-loaded Teflon disc
(Packing):	V5011F: Teflon and Nitrile; V5011G: Teflon Cone

APPROVALS

CRN Number 0C0861.9087YTN

DIMENSIONS DIAGRAM



V5011F,G

BODY STYLE	PIPE SIZE (in.)	DIMENSIONS					
		A		B		C	
		in	mm	in	mm	in	mm
V5011F,G THREADED DIRECT BODY	1/2	2	51	1-3/4	45	3-3/8	86
	3/4	1-3/4	45	1-3/4	45	3-3/8	86
	1	1-7/8	48	1-3/4	45	4-1/4	108
	1-1/4	2	51	1-5/8	42	4-7/8	124
	1-1/2	2-7/8	73	1-5/8	42	5-5/8	143
	2	3-1/8	80	2	51	5-5/8	143
	2-1/2	2-3/4	70	2-3/8	61	7-1/2	191
	3	3-1/8	80	2-5/8	67	8-7/8	226

M2804A

NPT Globe Valve, V5011N



Used for two-position or modulating control of steam and water and glycol solutions (to 50 percent concentration) in heating or cooling systems.

FEATURES

- Sizes range from 1/2 to 2 inches.
- Direct and reverse acting
- High pressure steam models with stainless steel trim
- Spring-loaded, self-adjusting packing.
- Stainless steel stem prevents corrosion.
- Valve designs provide equal percentage characteristics of flow for close control of water, and linear characteristic of flow for close control of steam or chilled water.
- Valves utilize direct mounting, electric or pneumatic linear valve actuators; Q5001 linkage with Modutrol Motor; or Q5020/Q5022A linkages with direct coupled rotary actuators to operate the valve.
- Not suitable for combustible gases.

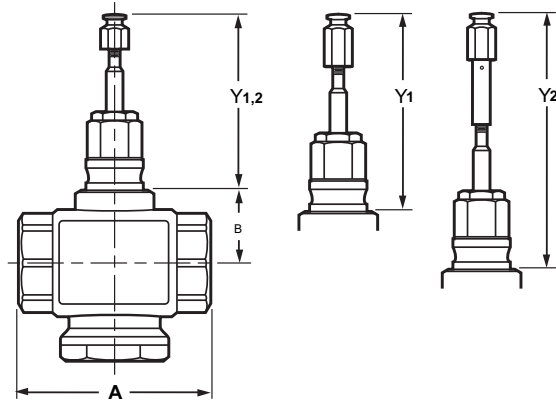
SPECIFICATIONS

Valve Type	Globe Valve
Body Pattern.....	Two-way
Connection Type.....	Female NPT
Leakage Rating	Seat: 0.05% of Cv
Maximum Differential f or Quiet Water Service.....	20 psid (138 kPa)
Maximum Differential Pressure	
Ratings (Close-off).....	240 psi (1655 kPa)
Ambient Temperature Range	36 F to 248 F water (2 C to 120 C water)
Stem Travel	3/4 in. (20 mm)
Bonnet Size:	1-3/8 in. (35 mm)
ANSI/ASME Rating:	150
Actuation:	Must be purchased separately
Materials	
(Body)	Red Brass
(Stem)	Stainless Steel
(Packing)	Teflon

APPROVALS

CRN Number0C0861.9087YTN/0C0861.99

DIMENSIONS DIAGRAM



VALVE SIZE (IN)	A in. (mm)	B in. (mm)
1/2	3-1/4 (83)	1-9/16 (40)
3/4		
1	4-1/16 (103)	
1-1/4	4-3/16 (106)	
1-1/2	4-3/4 (120)	1-13/16 (47)
2	5-1/4 (134)	

VALVE	Y1 in. (mm)	Y2 ^a in. (mm)
V5011N1XXX OR V5011N2XXX	3-1/2 (89)	5-1/4 (133)
V5011N3XXX	4-3/16 (107)	5-15/16 (151)
	STEM FULLY UP	
	STEM FULLY DOWN	

^aY2 WITH STEM EXTENSION FOR MP953C,E (8 IN. ONLY)

M17378A

Submittal Data - Valves

NPT Globe Valve, V5013N



The V5013N is a three-way threaded globe valve that controls hot water, cold water and glycol solutions (up to 50 percent concentration) in heating or cooling HVAC applications. The valves are used for mixing service to direct flow from one or two inlets to a common outlet in two-position or modulating control systems.

FEATURES

- Red brass body with NPT-threaded connections.
- Stainless steel stem and brass plug.
- Low seat leakage rating, < 0.05%.
- Spring-loaded, self adjusting packing.
- 50:1 rangeability per VDI/VDE 2173.
- Constant total flow throughout full stem travel.
- Accurate positioning to ensure state-of-the-art temperature control.
- Sizes range from 1/2 inch to 2 inches.
- Valves utilize direct mounting, electric or pneumatic valve actuators; Q5001 linkage with Modutrol Motor; or Q5020/Q5022 linkages with Direct Coupled Actuators to operate the valve.
- Repack and rebuild kits available for field servicing.
- Not suitable for combustible gases.

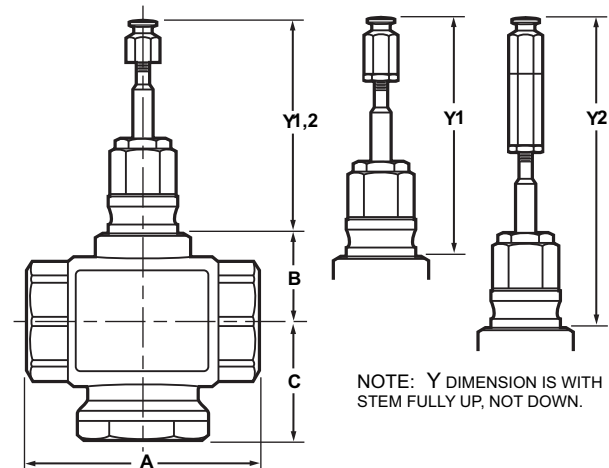
SPECIFICATIONS

Valve Type	Globe Valve
Body Pattern	Three-way mixing, A-B-AB porting
Flow Characteristic:.....	Linear (B-AB), Equal Percentage (A-AB)
Connection Type	Female NPT
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	0.05% of Cv
Maximum Safe Operating Pressure	217 psi at 248 F (1500 kPa at 120 C)
Maximum Differential for Quiet Water Service	20 psid (138 kPa)
Maximum Differential Pressure	
Ratings (Close-off)	240 psi (1655 kPa)
Ambient Temperature Range	36 F to 248 F water (2 C to 120 C water)
Stem Travel.....	3/4 in. (20 mm)
Bonnet Size:	1-3/8 in. (35 mm)
Valve Action:.....	Mixing
ANSI/ASME Rating:.....	150
Actuation:	Must be purchased separately
Materials	
(Body).....	Red Brass
(Stem)	Stainless Steel
(Plug/Ball/Disc).....	Brass
(Packing).....	Teflon/EPDM

APPROVALS

CRN Number.....0C0861.9087YTN/0C0861.123

DIMENSIONS DIAGRAM



VALVE SIZE	A	B	C	STEM UP	
				Y ₁	Y ₂ ^a
1/2 (15)	3-1/4 (83)	1-9/16 (39.7)	2-9/16 (65)	4-3/16 (106)	5-15/16 (151)
3/4 (20)	3-1/4 (83)	1-9/16 (39.7)	2-9/16 (65)		
1 (25)	4-1/16 (103)	1-9/16 (39.7)	2-5/8 (66.5)		
1-1/4 (32)	4-3/16 (106)	1-9/16 (39.7)	2-7/8 (72.5)		
1-1/2 (40)	4-3/4 (120)	1-13/16 (46.5)	3 (77)		
2 (50)	5-1/4 (134)	1-13/16 (46.5)	3-5/16 (83.5)		

^a Y₂ WITH STEM EXTENSION FOR MP953C,E (8 IN. ONLY)

M12901A

Flanged Cage Valve, V5051A



Single-Seated Cage Valves control steam, air, liquids or non-combustible gases in two-position, proportional or floating control systems where line isolation is not required.

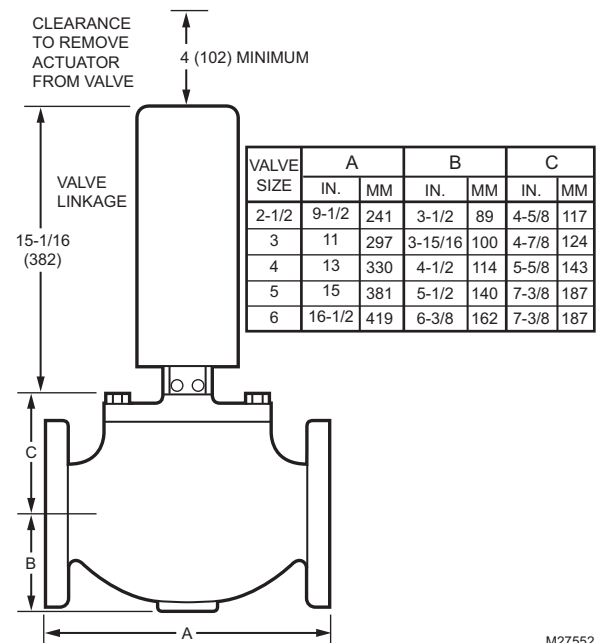
FEATURES

- Pressure balanced cage type construction.
- Low operating force allows fail safe operation with spring return actuator.
- Combines 1 3/8 in. bonnet with 1 1/2 in. stroke.
- Sizes range from 2-1/2 to 6 in. (DN65 to DN150).
- Spring-loaded Teflon V-ring packing.
- Requires Q5020C valve linkage with one rotary, direct coupled actuator, or Q5001D with Modutrol Motor.

SPECIFICATIONS

Valve Type	Cage Valves
Body Pattern	Two-way, Straight-through
Connection Type	Flanged
Flow Characteristic	Modified Linear
Controlled Fluid	Steam; Chilled or hot water with up to 50% Glycol. Not for use with fuels
Leakage Rating	0.01% of Cv, 0.03% of Cv @ 5 & 6 in.
Maximum Safe Operating Pressure	55 psi steam (379 kPa steam); 150 psi water at 100F (1034 kPa water at 38 C)
Maximum Differential Pressure	
Ratings (Close-off)	150 psi (1034 kPa)
Ambient Temperature Range	35 F to 300 F (2 C to 150 C)
Stem Travel	1 1/2 in. (38 mm)
Bonnet Size:	1-3/8 in. (35 mm)
Valve Action:	Stem down to close
ANSI/ASME Rating:	125
Actuation:	Must be purchased separately
Comments:	Q5001D1000 requires 1/2 in. 220867A Cam.
Materials	
(Body)	Cast Iron
(Stem)	Stainless Steel
(Seat)	Resilient
(Plug/Ball/Disc)	Stainless Steel
(Packing)	Teflon

DIMENSIONS DIAGRAM



M27552

Submittal Data - Valves

Flanged Globe Valve, V5011A; V5011B



Used for proportional control of hot or chilled water and glycol solutions (to 50 percent concentration) and for two-position control of low pressure steam in closed loop HVAC systems.

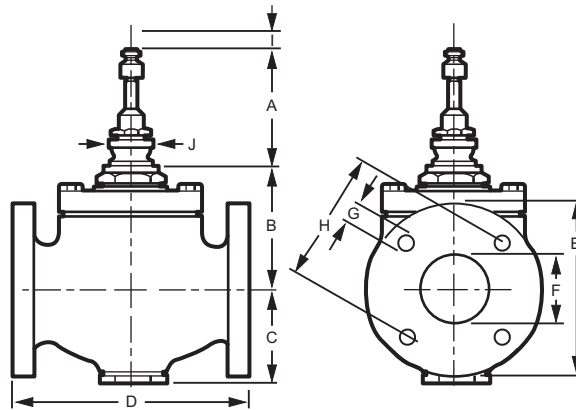
FEATURES

- Sizes range from 2-1/2 to 6 inches.
- Stainless steel stem with serviceable Teflon packing.
- Valves utilize direct mounting valve actuators, Q5020/ Q5022 linkages with Direct Coupled Actuators, or Pneumatic Valve Actuators to operate the valve.
- Equal Percentage flow characteristic.

SPECIFICATIONS

Valve TypeGlobe Valve
 Body PatternTwo-way
 Connection TypeFlanged
 Flow Characteristic:.....Equal percentage
 Controlled FluidChilled or hot water with up to 50% Glycol. Not for use with fuels; Low pressure steam
 Maximum Safe Operating Pressure 15 psi steam (100 kPa steam); 150 psi at 240 F water (1034 kPa at 115 C water)
 Maximum Differential for Quiet Water Service20 psid (138 kPa)
 Ambient Temperature Range40 F to 250 F (4 C to 121 C)
 ANSI/ASME Rating:.....125
 Actuation:Must be purchased separately
Materials
 (Body).....Cast Iron
 (Stem).....316 Stainless Steel
 (Seat).....Bronze
 (Packing).....Teflon Cone

DIMENSIONS DIAGRAM



MODEL	VALVE SIZE	A*	B	C	D	E	F	G	H	I (TRAVEL)	J (DIAMETER)
V5011A	2-1/2 (64)	3-1/2 (89)	4-13/16 (122)	4 (102)	9-1/2 (241)	7 (178)	2-1/2 (64)	3/4 (19)	5-1/2 (140)	3/4 (19)	1-3/8 (35)
	3 (76)	3-1/2 (89)	3-1/2 (89)	4-5/8 (117)	11 (279)	7-1/2 (191)	3 (76)	3/4 (19)	6 (152)	3/4 (19)	1-3/8 (35)
	4 (102)	5-1/4 (133)	5-1/4 (133)	5-3/16 (132)	13 (330)	9 (229)	4 (102)	3/4 (19)	7-1/2 (191)	1-1/2 (38)	1-7/8 (48)
V5011B	4 (102)	6-3/4 (171)	6-3/4 (171)	8-1/16 (205)	13 (330)	9 (229)	4 (102)	3/4 (19)	7-1/2 (191)	1-1/2 (38)	1-7/8 (48)

M27256

Submittal Data - Valves

Flanged Globe Valve, V5013B; V5012C



The V5013B are three-way mixing valves. The V5013C are three-way diverting valves. These valves provide proportional or two-position control of hot or chilled water in closed loop heating or cooling systems. These valves are offered in sizes 2 1/2 in. through 6 in.

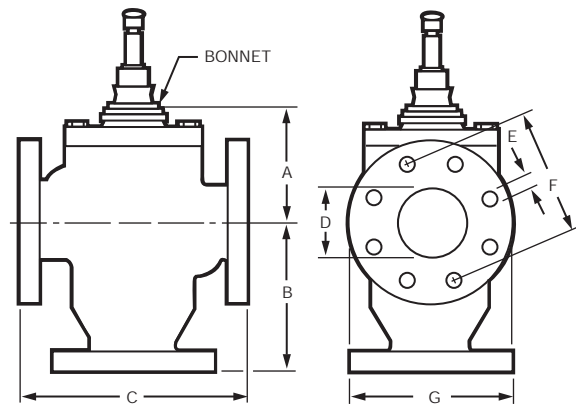
FEATURES

- Not suitable for combustible gases.
- Valves utilize direct mounting valve actuators, Q5020/ Q5022 linkages with Direct Coupled Actuators, or Pneumatic Valve Actuators to operate the valve.
- Constant total flow through full plug travel.
- Stainless steel stem prevents corrosion.
- Class IV (0.01% of Cv) Leakage Rating.

SPECIFICATIONS

Valve Type	Globe Valve
Body Pattern	Three-way
Flow Characteristic:	Linear (constant total)
Connection Type	Flanged
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Maximum Safe Operating Pressure.....	150 psi at 240 F water (1034 kPa at 115 C water)
Maximum Differential f or Quiet Water Service.....	20 psid (138 kPa)
Ambient Temperature Range	40 F to 250 F (4 C to 121 C)
ANSI/ASME Rating	125
Actuation:	Must be purchased separately
Materials	
(Body)	Cast Iron
(Stem)	Stainless Steel
(Seat)	Bronze
(Packing)	Teflon Cone

DIMENSIONS DIAGRAM



V5013B,C DIMENSIONS

VALVE SIZE IN INCHES (MM)					
	2-1/2 (64)	3 (76)	4 (102)	5 (125)	6 (152)
A	4-1/2 (114)	5-1/4 (133)	5-7/8 (149)	6-1/4 (159)	7-1/4 (184)
B	6-7/17 (164)	6-5/8 (168)	8-11/16 (221)	9-5/8 (244)	10-11/16 (271)
C	9-1/2 (241)	11 (279)	13 (330)	15 (381)	16-1/2 (419)
D	2-1/2 (64)	3 (76)	4 (102)	5 (127)	6 (152)
E	3/4 (19)	3/4 (19)	3/4 (19)	7/8 (22)	7/8 (22)
F	5-1/2 (140)	6 (152)	7-1/2 (191)	8-1/2 (216)	9-1/2 (241)
G	7 (178)	7-1/2 (191)	9 (229)	10 (254)	11 (279)

VALVE SIZE	BONNET SIZE	NUMBER OF BOLT HOLES
2-1/2 (64)	1-3/8 (35)	4
3 (76)		
4 (102)		
5 (125)	1-7/8 (48)	8
6 (152)		

C7959B

VALVES

Submittal Data - Valves

Flanged Globe Valve, VGF2



VGF Flanged Globe Valves are used for 2-position or modulating control of steam, hot water or chilled water-glycol solutions up to 50 percent concentration in closed loop heating, ventilation and air conditioning (HVAC) systems. They can be operated by ML6984/7984, ML6420/6425, ML6421/7421 Electric Linear Actuators, MP953 Pneumatic Actuators, Modutrol™ Motors with Q5001 valve linkage or MN/MS Series

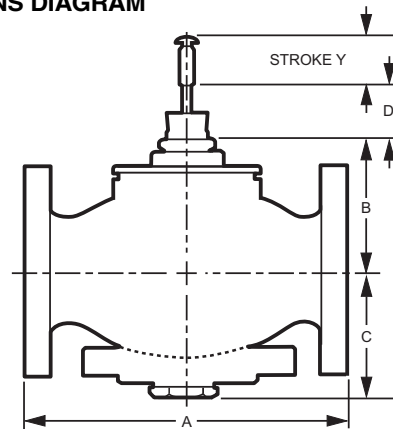
FEATURES

- ANSI Class 125 and Class 250 cast iron bodies with flanged end connections
- Equal percentage and linear flow characteristics
- Face-to-face flange dimensions per ANSI/ISA S75.03 standard
- Sizes from 2-1/2 to 6 in.
- Stainless steel trim standard for long life span
- ANSI Class III or IV seat leakage
- Steam inlet pressure up to 125 psig and 353 F maximum temperature
- Self-adjusting packing
- Accurate positioning with equal percentage and linear flow characteristics to ensure precise temperature control
- Universal bonnet for direct-coupled electric and pneumatic actuators for easy mounting, or linkage coupled Modutrol™ Motors and MN/MS Series direct coupled actuators.
- Not suitable for combustible gasses.
- Valves utilize direct mounting valve actuators, Q5020/ Q5022 linkages with Direct Coupled Actuators or Pneumatic Valve Actuators to operate the valve.

SPECIFICATIONS

Valve Type.....	Globe Valve
Valve Action.....	Stem down to close
Body Pattern.....	Two-way
Connection Type.....	Flanged
Controlled Fluid.....	Steam; Chilled or hot water with up to 50% Glycol. Not for use with fuels
Fluid Temperature Range.....	20 F to 250 F, steam 353 F (-7 C to +120 C, steam 180 C)
Actuation:.....	Must be purchased separately
Stem Travel	
2-1/2 and 3 inch valves.....	3/4 in. (20 mm)
4 to 6 inch valves:.....	1-1/2 in. (39 mm)
Bonnet Size	
2-1/2 and 3 inch valves.....	1-3/8 in. (35 mm)
4 to 6 inch valves:.....	1-7/8 in. (47.6 mm)
Materials	
(Body).....	Cast Iron ASTM A126 Class B
(Stem).....	Stainless Steel
(Seat).....	Stainless Steel
(Cartridge).....	Stainless Steel
(Plug/Ball/Disc):.....	Stainless Steel
(Packing).....	Spring-loaded PTFE cone rings

DIMENSIONS DIAGRAM



1 DOTTED LINE REPRESENTS ANSI 125 VALVE BONNET.

MODEL NUMBER	DIMENSIONS, IN. (MM)				
	A	B	C	E	Y
2-WAY VALVES, ANSI CLASS 125. STEM DOWN TO CLOSE. EQUAL PERCENTAGE OR LINEAR FLOW CHARACTERISTIC					
VGF21_S25	10-7/8 (276)	4-3/8 (112)	7 (178)	3-1/2 (89)	13/16 (20)
VGF21_S30	11-3/4 (298)	6-3/8 (161)	7-1/2 (191)		
VGF21_S40	13-7/8 (352)	5-7/8 (150)	9 (229)	5-1/4 (133)	1-1/2 (38)
VGF21_S50	15-3/4 (400)	6-3/16 (157)	10 (254)		
VGF21_S60	17-3/4 (451)	6-3/16 (157)	11 (279)		
2-WAY VALVES, ANSI CLASS 250. STEM DOWN TO CLOSE. EQUAL PERCENTAGE FLOW CHARACTERISTIC					
VGF22ES25	11-1/2 (292)	4-3/8 (112)	7-1/2 (191)	3-1/2 (89)	13/16 (20)
VGF22ES30	12-1/2 (318)	6-3/8 (161)	8-1/4 (210)		
VGF22ES40	14-1/2 (368)	5-7/8 (150)	10 (254)	5-1/4 (133)	1-1/2 (38)
VGF22ES50	16-5/8 (422)	6-3/16 (157)	11 (279)		
VGF22ES60	18-5/8 (473)	6-3/16 (157)	12-1/2 (318)		
2-WAY VALVES, PRESSURE-BALANCED, ANSI CLASS 125. STEM DOWN TO CLOSE. EQUAL PERCENTAGE OR LINEAR FLOW CHARACTERISTIC					
VGF21_P25	10-7/8 (276)	4-3/16 (107)	7 (178)	3-1/2 (89)	13/16 (20)
VGF21_P30	11-3/4 (298)	5-7/8 (150)	7-1/2 (191)		
VGF21_P40	13-7/8 (352)	5-7/8 (150)	9 (229)	5-1/4 (133)	1-1/2 (38)
VGF21_P50	15-3/4 (400)	6-1/8 (156)	10 (254)		
VGF21_P60	17-3/4 (451)	6-1/8 (156)	11 (279)		

Flanged Globe Valve, VGF3



VGF Flanged Globe Valves are used for 2-position or modulating control of hot water or chilled water-glycol solutions up to 50% concentration in closed loop heating, ventilation and air conditioning (HVAC) systems. They can be operated by ML6984/7984, ML6420/6425, ML6421/7421 Electric Linear Actuators, MP953 Pneumatic Actuators, Modutrol™ Motors with Q5001 valve linkage or MN/MS Series Direct Coupled Actuators with Q5020 or Q5022 valve linkages. Three-way bodies are available in mixing or diverting style with equal percentage and

linear flow characteristics, respectively. For boiler/chiller bypass applications requiring tight close-off, use VGF31/32LD diverting valves. For outdoor temperature compensation of building supply water or modulating control of heat exchangers, use VGF31/32EM mixing valves.

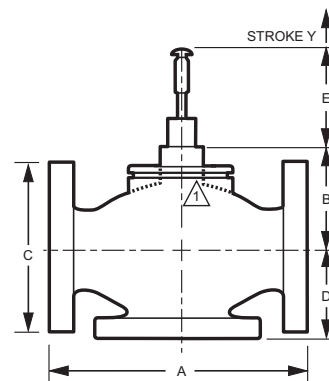
SPECIFICATIONS

Valve Type	Globe Valve
Body Pattern	Three-way
Connection Type	Flanged
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Leakage Rating	Port A seat leakage: 0.5%; Port B seat leakage 1.0%.
Maximum Safe Operating Pressure	175 psig at 130 F (66 C) (1206 kPa at 66 C (130 F))
Maximum Differential Pressure Ratings (Close-off)87 psi (599 kPa)
Fluid Temperature Range20 F to 250 F (-7 C to +120 C)
Actuation:	Must be purchased separately
Stem Travel	
2-1/2 and 3 inch valves	3/4 in. (20 mm)
4 to 6 inch valves:	1-1/2 in. (39 mm)
Bonnet Size	
2-1/2 and 3 inch valves	1-3/8 in. (35 mm)
4 to 6 inch valves:	1-7/8 in. (47.6 mm)
Materials	
(Body)	Cast Iron ASTM A126 Class B
(Stem)	Stainless Steel
(Seat)	Stainless Steel
(Cartridge)	Stainless Steel
(Plug/Ball/Disc)	Stainless Steel
(Packing)	Spring-loaded PTFE cone rings

FEATURES

- ANSI Class 125 and Class 250 cast iron bodies with flanged end connections.
- Face-to-face flange dimensions per ANSI/ISA S75.03 standard.
- Sizes from 2-1/2 to 6 inches.
- Stainless steel trim standard for long life span.
- Self-adjusting packing.
- Accurate positioning with equal percentage and linear flow characteristics to ensure precise temperature control.
- Universal bonnet for direct-coupled electric and pneumatic actuators for easy mounting, or linkage coupled Modutrol™ Motors and MN/MS Series direct coupled actuators.
- Constant total flow throughout full plug travel (3-way diverting models).
- Not suitable for combustible gasses.
- Valves utilize direct mounting valve actuators, Q5020/ Q5022 linkages with Direct Coupled Actuators or Pneumatic Valve Actuators.

DIMENSIONS DIAGRAM



▲ DOTTED LINE REPRESENTS ANSI 125 VALVE BONNET.

MODEL NUMBER	DIMENSIONS, IN. (MM)					
	A	B	C	D	E	Y
3-WAY MIXING VALVES, ANSI CLASS 125. STEM UP TO CLOSE A-AB						
VGF31EM25	10-7/8 (276)	3 (76)	7 (178)	3-3/4 (95)	4-3/16 (107)	13/16 (20)
VGF31EM30	11-3/4 (298)	4-3/16 (107)	7-1/2 (191)	4-3/8 (111)		
VGF31EM40	13-7/8 (352)	5-8/16 (140)	9 (229)	5-1/8 (130)	6-11/16 (170)	1-1/2 (38)
VGF31EM50	15-3/4 (400)	5-3/8 (137)	10 (254)	5-3/4 (146)		
VGF31EM60	17-3/4 (451)	5-11/16 (145)	11 (279)	6-5/8 (168)		
3-WAY MIXING VALVES, ANSI CLASS 250. STEM UP TO CLOSE A-AB						
VGF32EM25	11-1/2 (292)	4-3/8 (112)	7-1/2 (191)	3-3/4 (95)	4-3/16 (107)	13/16 (20)
VGF32EM30	12-1/2 (318)	6-3/8 (161)	8-1/4 (210)	4-3/8 (111)		
VGF32EM40	14-1/2 (368)	5-7/8 (150)	10 (254)	5-1/8 (130)	6-11/16 (170)	1-1/2 (38)
VGF32EM50	16-5/8 (422)	6-3/16 (157)	11 (279)	5-3/4 (146)		
VGF32EM60	18-5/8 (473)	6-3/16 (157)	12-1/2 (318)	6-5/8 (168)		
3-WAY DIVERTING VALVES, ANSI CLASS 125. STEM DOWN TO CLOSE AB-A						
VGF31LD25	10-7/8 (276)	3 (76)	7 (178)	3-3/4 (95)	4-3/16 (107)	13/16 (20)
VGF31LD30	11-3/4 (298)	4-3/16 (107)	7-1/2 (191)	4-3/8 (111)		
VGF31LD40	13-7/8 (352)	5-8/16 (140)	9 (229)	5-1/8 (130)	6-11/16 (170)	1-1/2 (38)
VGF31LD50	15-3/4 (400)	5-3/8 (137)	10 (254)	5-3/4 (146)		
VGF31LD60	17-3/4 (451)	5-11/16 (145)	11 (279)	6-5/8 (168)		
3-WAY DIVERTING VALVES, ANSI CLASS 250. STEM DOWN TO CLOSE AB-A						
VGF32LD25	11-1/2 (292)	4-3/8 (112)	7-1/2 (191)	3-3/4 (95)	4-3/16 (107)	13/16 (20)
VGF32LD30	12-1/2 (318)	6-3/8 (161)	8-1/4 (210)	4-3/8 (111)		
VGF32LD40	14-1/2 (368)	5-7/8 (150)	10 (254)	5-1/8 (130)	6-11/16 (170)	1-1/2 (38)
VGF32LD50	16-5/8 (422)	6-3/16 (157)	11 (279)	5-3/4 (146)		
VGF32LD60	18-5/8 (473)	6-3/16 (157)	12-1/2 (318)	6-5/8 (168)		

M27604

Submittal Data - Valves

Pressure Independent Control Valves, VRN



The VRN2 two-way pressure independent control ball valves maintain constant flow of hot or chilled water in closed loop heating, ventilating and air conditioning (HVAC) systems regardless of head pressure fluctuations above the minimum specified pressure drop. These valve assemblies can be used with Honeywell non-spring return or spring return direct coupled actuators (DCA) with minimum torque of 35 lb-in (4 Nm) on valve sizes up to 3 inches (DN80). The built-in differential pressure regulator makes fluid flow through the valve independent of changes in supply pressure, eliminating "hunting" by the control system, even at low coil flow. The pressure regulator virtually eliminates cavitation in the valve, and decouples the control valve from the effects of piping components such as reducers and elbows.

Pressure independent control valves are sized to match design coil flow regardless of coil size. VRN2 valves eliminate the need to balance the system for proper flow, and allow chillers to be operated at design temperature differential for maximum efficiency at every load condition. When used in a system with variable speed pump drives, 3-way valves and coil bypass lines are not required. In new construction, VRN2 valves perform better than reverse return piping designs without the extra materials these systems need.

Systems that utilize the capabilities of properly installed and monitored pressure independent control valves may qualify for LEED points. Pressure independent control requires less flow, enabling use of smaller piping, pumps and chillers.

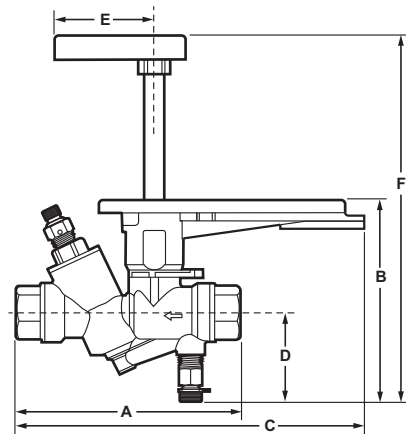
SPECIFICATIONS

Valve Type	Dynamic pressure independent control valve
Body Pattern	2-way, straight-through
Pipe Connection Type	Female-NPT
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Valve Action.....	Quarter-turn rotary
Maximum Safe Operating Pressure	360 psi (2500 kPa)
Maximum Safe Operating Temperature.....	248 F (120 C)
Maximum Close-off Pressure	100 psid (690 kPa)
Fluid Temperature Range.....	-22 F to 250 F (-30 C to 121 C)
Ambient Temperature Range	14 F to 131 F (-10 C to 55 C)
Accuracy	±5% over specified pressure range
Stem Travel.....	90 deg. rotation
Materials	
(Body).....	Forged Brass ASTM B584
(Seat).....	Teflon seals/EPDM O-rings
(Regulator)	Stainless Steel
(Packing).....	Teflon seals/EPDM O-rings
(Diaphragm).....	Hydrogenated Acrylonitrile Butadiene Rubber
Comments	No feedback signal Full port ball; No feedback

FEATURES

- Sizes from 1/2 to 3 in. with internal (female) NPT connections.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 1 to 95 gpm.
- Differential pressure regulator for constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design for long service life for flow control accuracy of ±5% over specified control range.
- Equal percentage flow characteristic using patented flow control ball insert.
- Multiple regulated flow rates available per valve size.
- Patented ball seals require low operating torque.
- Nickel-chrome plated brass or stainless steel trim.
- Choice of factory-installed actuation using Honeywell N05/S05-series direct-coupled actuators: Floating, Modulating (2-10 V), Spring Return Modulating/Floating.
- Spring return actuators field-configurable for normally open or normally closed fail safe position.
- Actuators available with optional auxiliary switches.
- Removable, manual operating handle to control valve during installation or in an event of power failure.
- Upstream Test Port for venting or pressure gauge attachment.
- Three actuator orientations on the valve for cramped spaces.

DIMENSIONS DIAGRAM



VALVE SIZE (IN.)	DIMENSIONS IN INCHES (MM)						
	A	B	C	D	E	F _z ^a	F _s ^a
1/2	5-11/16 (145)	4-5/16 (109)	8-19/32 (218)	1 (26)	2-1/2 (64)	8-13/32 (213)	7-3/16 (182)
3/4			8-45/64 (221)				
1	5-29/32 (150)	4-19/32 (117)	10-57/64 (277)	1-5/8 (41)		9-13/32 (239)	8-3/16 (207)
	9 (229)		10-19/32 (269)				
1-1/4	8-3/32 (213)	5-3/16 (132)	10-1/2 (267)	2-3/32 (53)		10-13/32 (264)	9-3/16 (232)
1-1/2	8-3/16 (208)		12-3/32 (307)				
2	9-29/32 (251)	10-9/32 (263)	12 (305)				
			12-3/16 (310)				
2-1/2			12-13/32 (314)				
3	10-13/16 (274)						

^a LONG SHAFT SUPPLIED WITH "ZELIX" (Z) DIRECT COUPLED ACTUATORS; SHORT SHAFT SUPPLIED WITH "SALT" (S) NON-SPRING RETURN DCAS.

Pressure Independent Control Valves, VRW



The VRW2 two-way pressure independent control valves maintain constant flow of hot and chilled water in closed-loop heating, ventilating and air conditioning (HVAC) systems regardless of head pressure fluctuations above minimum specified pressure drop. These valves come complete with proportional, stay-in-place or electronic fail safe actuators.

The built-in differential pressure regulator makes fluid flow through the valve independent of changes

in supply pressure, eliminating “hunting” by the control system, even at low coil flow. The pressure regulator virtually eliminates cavitation in the valve, and decouples the control valve from the effects of piping components such as reducers and elbows.

Pressure independent control valves are sized to match design coil flow regardless of coil size. VRW2 valves eliminate the need to balance the system for proper flow, and allow chillers to be operated at design temperature differential for maximum efficiency at every load condition. When used in a system with variable speed pump drives, 3-way valves and coil bypass lines are not required.

Systems that utilize the capabilities of properly installed, adjusted, and monitored pressure independent control valves may qualify for LEED points.

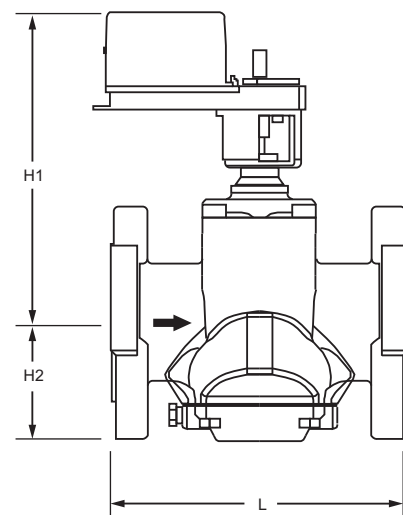
FEATURES

- Multi-sized bodies from 2-1/2 to 6 inch pipes with wafer flanged connections.
- Combination ANSI/ASME Class 150/300 pressure rating.
- Controls hot or chilled water with up to 50% glycol.
- Regulated flow rates available from 39 to 469 gpm.
- Stainless steel pressure regulator maintains constant pressure drop across valve seat.
- Positive pressure, rolling diaphragm regulator design provides flow control accuracy of $\pm 5\%$ over specified pressure range.
- Equal percentage flow characteristic using multi turn, non-rising, characterized plug.
- High close-off rating.
- 50 discrete, selectable flow rates available per valve size.
- Stainless steel trim.
- Six-turn actuator with floating or modulating inputs available with stay-in-place or electronic fail safe action.
- Fail safe actuators field-configurable for normally open or normally closed power failure return position.
- Two Test Ports for venting or pressure gauge attachment.

SPECIFICATIONS

Valve Type	Wafer flanged dynamic pressure independent control valve
Body Pattern	2-way, straight-through
Flow Characteristic	Equal Percentage
Pipe Connection Type	Wafer flange
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Valve Action	Multi-turn linear
Leakage Rating	0.2% max.
Maximum Safe Operating Pressure.....	580 psig (4000 kPa)
Maximum Safe Operating Temperature.....	248 F (120 C)
Maximum Close-off Pressure.....	101 psid (700 kPa)
Fluid Temperature Range	-4 F to 248 F (-20 C to 120 C)
Ambient Temperature Range	14 F to 131 F (-10 C to 55 C)
Accuracy	$\pm 5\%$ over specified pressure range
Stem Travel	1 to 6 Rotations in 51 equal, field-selectable increments
ANSI/ ASME Class	150/300
Comments	2 - 10V position feedback signal
Materials	
(Body)	Ductile Iron, ASTM A536 ∇ 65T, Class 60-45-18
(Stem)	Stainless Steel
(Seat)	316 Stainless steel
(Regulator).....	316 Stainless steel
(Plug/Ball/Disc).....	316 stainless steel
(Packing)	EPDM and Nitrile O-rings
(Diaphragm)	EPDM

DIMENSIONS DIAGRAM



L		H ₁		H ₂	
in.	mm	in.	mm	in.	mm
8 3/4	224	9 3/4	246	3 3/4	95
12 5/8	320	11 3/8	290	5 1/4	135
16 5/8	422	13 1/4	338	7 1/8	180

M31311

Submittal Data - Valves

Resilient Seat Butterfly Valves, VFF1

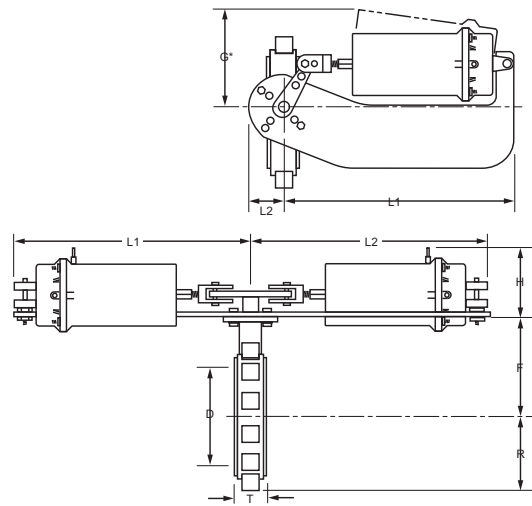


Resilient seat in two-way valves, provide control for HVAC system applications including chilled water, hot water, cooling tower water and thermal storage systems.

SPECIFICATIONS

Body Pattern	2 way (S/R NO)
Valve Action.....	Normally Open
Connection Type	Lugged
Controlled Fluid.....	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Actuator Control Type.....	Pneumatic
Type of Enclosure.....	Pneumatic
Flow Characteristic.....	Modified Equal Percent
Mounting	ANSI Flanged
Static Pressure Rating (max).....	250 psi (1724 kPa)
Actuator Temperature Ratings	-20 F to 150 F (-29 C to 66 C)
Fluid Temperature Range.....	-40 F to 250 F (-40 C to 121 C)
Number of Flange Bolts	
For 2 in., 2-1/2 in., 3 in. valves:	4
For 4 in., 5 in., 6 in., 8 in., valves:	8
For 10 in., 12 in., 14 in. valves:.....	12
For 16 in., 18 in. valves:	16
For 20 in. valves:	20
Flange Bolt Thread	
For 2 in., 2-1/2 in., 3 in. valves:	5/8 in.-11 pitch
For 4 in., 5 in., 6 in., 8 in., valves:.....	3/4 in.-10 pitch
For 10 in., 12 in., 14 in. valves:.....	7/8 in.-9 pitch
For 16 in., 18 in., 20 in. valves:.....	1-1/8 in.-7 pitch
Materials	
(Body).....	Polyester-coated cast iron ASTM A126 Class B
(Stem).....	416 Stainless Steel
(Seat).....	Peroxide-cured EPDM resilient seat
(Plug/Ball/Disc).....	Nylon 11-coated ductile iron

DIMENSIONS DIAGRAM



PIPE SIZE IN. [mm]	FULL CUT DISK, 175 PSI CLOSE-OFF (VFF1/2_V1Y8P/PP)					THICKNESS T	UNDER CUT DISK, 50 PSI CLOSE-OFF** (VFF1/2_V1Y8P/PP)				
	G	H	HP	L1	L2		G	H	HP	L1	L2*
2 [DN50]						1-5/8 [41]					
2-1/2 [DN65]	5-5/8 [144]	3-1/8 [79]	6-1/4 [160]	16 [406]	3 [76]	1-3/4 [44]					
3 [DN80]						2 [51]	5-5/8 [144]	3-1/8 [79]	6-1/4 [160]	16 [406]	
4 [DN100]	7-1/4 [186]		10 [254]	20 [506]		2-1/8 [54]	7-1/4 [186]		10 [254]	20 [506]	3 [76]
5 [DN125]											
6 [DN150]	9 [227]	6-7/8 [175]	10-1/8 [257]	22-3/4 [578]	22-3/4 [578]	2-1/2 [64]	9 [227]	6-7/8 [175]	10-1/8 [257]	22-3/4 [578]	
8 [DN200]											
10 [DN250]											22-3/4 [578]
12 [DN300]	LOW PRESSURE ACTUATORS NOT AVAILABLE IN THESE, AND LARGER BODY SIZES.										

**NOTE: VALVE SIZES 2 TO 3 INCHES ARE AVAILABLE ONLY WITH FULL CUT DISKS. VALVE STROKE IS LIMITED TO 70 DEGREES.

M16908

Resilient Seat Butterfly Valves, VFF2



Resilient seat two-way valves provide control for HVAC system applications including chilled water, hot water, cooling tower water and thermal storage systems.

SPECIFICATIONS

Body Pattern.....	2 way (NC, NC/NO; NSR)
Valve Action.....	Normally Closed, convertible to Normally Open with Spring Return DCA
Connection Type.....	Lugged
Controlled Fluid.....	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Flow Characteristic.....	Modified Equal Percent
Mounting.....	ANSI Flanged
Static Pressure Rating (max).....	250 psi (1724 kPa)
Actuator Temperature Ratings.....	-5 F to 140 F (-20 C to 60 C)
Fluid Temperature Range.....	-40 F to 250 F (-40 C to 121 C)
Number of Flange Bolts	
For 2 in., 2-1/2 in., 3 in. valves:.....	4
For 4 in., 5 in., 6 in., 8 in., valves:.....	8
For 10 in., 12 in., 14 in. valves:.....	12
For 16 in., 18 in. valves:.....	16
For 20 in. valves:.....	20
Flange Bolt Thread	
For 2 in., 2-1/2 in., 3 in. valves:.....	5/8 in.-11 pitch
For 4 in., 5 in., 6 in., 8 in., valves:.....	3/4 in.-10 pitch
For 10 in., 12 in., 14 in. valves:.....	7/8 in.-9 pitch
For 16 in., 18 in., 20 in. valves:.....	1-1/8 in.-7 pitch
Materials	
(Body).....	Polyester-coated cast iron ASTM A126 Class B
(Stem).....	416 Stainless Steel
(Seat).....	Peroxide-cured EPDM resilient seat
(Plug/Ball/Disc).....	Nylon 11-coated ductile iron

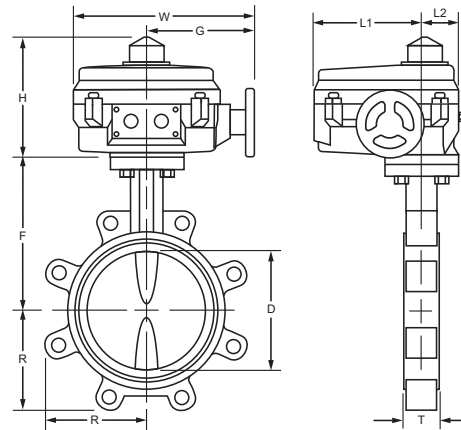
APPROVALS

CE.....	Compliant
Underwriters Laboratories, Inc.	C/US UL873, Plenum Rated

ACCESSORIES

VFF50-0400—Position status monitor for VFF butterfly valves with high pressure pneumatic actuators

DIMENSIONS DIAGRAM



PIPE SIZE IN. [mm]	FULL CUT DISK, HIGH CLOSE-OFF* NEMA 4X (VFF2_W1YXA/B)					THICK- NESS T	UNDER CUT DISK, 50 PSI CLOSE-OFF** NEMA 4X (VFF2_V1YXA/B)				
	W	H1	L1	L2	G		W	H1	L1	L2	G
2 [DN50]						1-5/8 [41]					
2-1/2 [DN65]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [51]	5-3/4 [147]	1-3/4 [44]					
3 [DN80]						2 [51]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [51]	5-3/4 [147]
4 [DN100]						2-1/8 [54]					
5 [DN125]	10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]	2-1/2 [64]	10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]
6 [DN150]						3 [76]					
8 [DN200]						4 [102]	12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]
10 [DN250]	12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]	4-1/4 [108]					
12 [DN300]						5 [127]					
14 [DN350]											
16 [DN400]											
18 [DN450]	8-1/2 [217]	16 [406]	8-3/4 [221]	4-1/2 [115]	12-1/2 [320]						
20 [DN500]											

* 175 PSI [1206 KPA] CLOSE-OFF UP TO 12 INCHES [DN 300], 150 PSI [1034 KPA] OTHERWISE
 **NOTE: VALVE SIZES 2 TO 3 INCHES HAVE 175 PSI [1206 KPA] CLOSE-OFF AND ARE AVAILABLE ONLY WITH FULL CUT DISKS.

▲ NEMA 4X ACTUATORS ARE WATERPROOF AND CORROSION-RESISTANT.

M16907

VALVES

Submittal Data - Valves

Resilient Seat Butterfly Valves, VFF3



Resilient seat three-way valves provide control for HVAC system applications including chilled water, hot water, cooling tower water and thermal storage systems.

SPECIFICATIONS

Body Pattern 3 way (A-B-AB porting)
 Valve Action..... Normally Closed
 Connection Type Lugged
 Controlled Fluid..... Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
 Actuator Control Type..... Electric floating
 Flow Characteristic..... Modified Equal Percent
 Mounting ANSI Flanged
 Static Pressure Rating (max)..... 250 psi (1724 kPa)
 Actuator Temperature Ratings -5 F to 140 F (-20 C to 60 C)
 Fluid Temperature Range..... -40 F to 250 F (-40 C to 121 C)
 Number of Flange Bolts
 For 2 in., 2-1/2 in., 3 in. valves: 4
 For 4 in., 5 in., 6 in., 8 in., valves:..... 8
 For 10 in., 12 in., 14 in. valves:..... 12
 For 16 in., 18 in. valves: 16
 For 20 in. valves: 20
 Flange Bolt Thread
 For 2 in., 2-1/2 in., 3 in. valves: 5/8 in.-11 pitch
 For 4 in., 5 in., 6 in., 8 in., valves:..... 3/4 in.-10 pitch
 For 10 in., 12 in., 14 in. valves:..... 7/8 in.-9 pitch
 For 16 in., 18 in., 20 in. valves:..... 1-1/8 in.-7 pitch
 Materials
 (Body)..... Polyester-coated cast iron
 ASTM A126 Class B
 (Stem)..... 416 Stainless Steel
 (Seat)..... Peroxide-cured EPDM resilient seat
 (Plug/Ball/Disc)..... Nylon 11-coated ductile iron

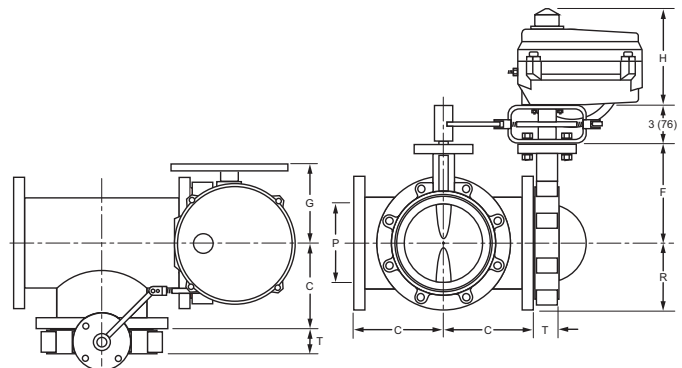
APPROVALS

CE..... Compliant
 Underwriters Laboratories, Inc..... C/US UL873, Plenum Rated

ACCESSORIES

VFF50-0400—Position status monitor for VFF butterfly valves with high pressure pneumatic actuators

DIMENSIONS DIAGRAM



PIPE SIZE IN. [mm]	FULL CUT DISK, 175 PSI CLOSE-OFF NEMA 4X (VFF3/6, W1YXA/B)					THICKNESS T	UNDER CUT DISK, 50 PSI CLOSE-OFF** NEMA 4X (VFF3/6, V1YXA/B)				
	W	H	L1	L2	G		W	H	L1	L2	G
2 [DN50]						1-5/8 [41]					
2-1/2 [DN65]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [49]	5-3/4 [147]	1-3/4 [44]					
3 [DN80]											
4 [DN100]						2 [51]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [49]	5-3/4 [147]
5 [DN125]						2-1/8 [54]					
6 [DN150]	10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]						
8 [DN200]						2-1/2 [64]	10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]
10 [DN250]	12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]						
12 [DN300]						3 [76]	12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]
14 [DN350]	NEMA 4 (VFF3/6, W1Y4A/4B)										
16 [DN400]						4 [102]					
18 [DN450]	8-1/2 [217]	16 [406]	8-3/4 [221]	4-1/2 [115]	12-1/2 [320]	4-1/4 [108]	NEMA 4 (VFF3/6, V1Y4A/4B)				
20 [DN500]						5 [127]	8-1/2 [217]	16 [406]	8-3/4 [221]	4-1/2 [115]	12-1/2 [320]

* 175 PSI [1206 KPA] CLOSE-OFF UP TO 12 INCHES [DN 300], 150 PSI [1034 KPA] OTHERWISE
 **NOTE: VALVE SIZES 2 TO 3 INCHES HAVE 175 PSI [1206 KPA] CLOSE-OFF AND ARE
 AVAILABLE ONLY WITH FULL CUT DISKS.

M16906

Resilient Seat Butterfly Valves, VFF6



Resilient seat three-way valves provide control for HVAC system applications including chilled water, hot water, cooling tower water and thermal storage systems.

SPECIFICATIONS

Body Pattern.....	3 way (A-AB-B porting)
Valve Action.....	Normally Closed
Connection Type.....	Lugged
Controlled Fluid	Chilled or hot water with up to 50% Glycol. Not for use with steam or fuels.
Actuator Control Type.....	Electric floating
Type of Enclosure.....	NEMA 2 housing
Flow Characteristic.....	Modified Equal Percent
Mounting.....	ANSI Flanged
Static Pressure Rating (max).....	250 psi (1724 kPa)
Actuator Temperature Ratings.....	-5 F to 140 F (-20 C to 60 C)
Fluid Temperature Range	-40 F to 250 F (-40 C to 121 C)
Number of Flange Bolts	
For 2 in., 2-1/2 in., 3 in. valves:.....	4
For 4 in., 5 in., 6 in., 8 in., valves:.....	8
For 10 in., 12 in., 14 in. valves:.....	12
For 16 in., 18 in. valves:.....	16
For 20 in. valves:.....	20
Flange Bolt Thread	
For 2 in., 2-1/2 in., 3 in. valves:.....	5/8 in.-11 pitch
For 4 in., 5 in., 6 in., 8 in., valves:.....	3/4 in.-10 pitch
For 10 in., 12 in., 14 in. valves:.....	7/8 in.-9 pitch
For 16 in., 18 in., 20 in. valves:.....	1-1/8 in.-7 pitch
Materials	
(Body).....	Polyester-coated cast iron ASTM A126 Class B
(Stem).....	416 Stainless Steel
(Seat).....	Peroxide-cured EPDM resilient seat
(Plug/Ball/Disc).....	Nylon 11-coated ductile iron

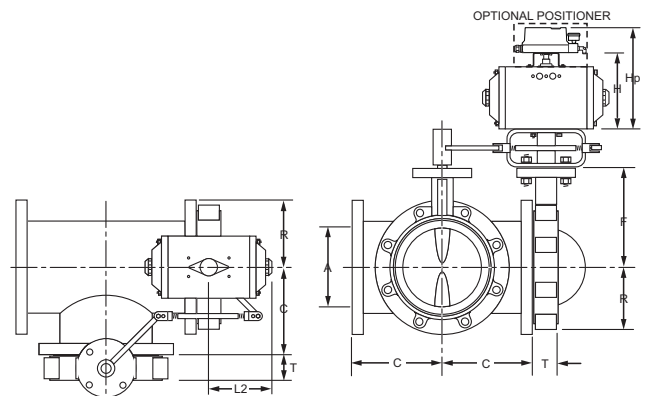
APPROVALS

CE.....	Compliant
Underwriters Laboratories, Inc.....	C/US UL873, Plenum Rated

ACCESSORIES

VFF50-0400—Position status monitor for VFF butterfly valves with high pressure pneumatic actuators

DIMENSIONS DIAGRAM



PIPE SIZE IN. [mm]	FULL CUT DISK, HIGH CLOSE-OFF* (VFF3/6_W1YCS/DS/ES/PS/XS)						THICK- NESS T	UNDER CUT DISK, 50 PSI CLOSE-OFF** (VFF3/6_V1YCS/DS/ES/PS/XS)				
	W	H	HP	L1	L2	W		H	HP	L1	L2	
2 [DN50]	2-3/4 [70]	4-1/4 [109]	10-1/4 [262]	3 [76]	3 [76]	1-5/8 [41]						
2-1/2 [DN65]	3-5/8 [91]	5-2/8 [132]	11-2/8 [284]	4 [100]	4 [100]	1-3/4 [44]						
3 [DN80]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]							
4 [DN100]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]	2 [51]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]	
5 [DN125]	5-3/8 [137]	7-3/4 [196]	13-3/4 [349]	6-1/8 [157]	6-1/8 [157]	2-1/8 [54]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]	
6 [DN150]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]		6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]	
8 [DN200]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]	2-1/2 [64]						
10 [DN250]												
12 [DN300]	10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]	3 [76]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]	
14 [DN350]												
16 [DN400]						4 [102]						
18 [DN450]						4-1/4 [108]	10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]	
20 [DN500]						5 [127]						

* 175 PSI [1206 KPA] CLOSE-OFF UP TO 12 INCHES [DN 300], 150 PSI [1034 KPA] AT 14 INCHES AND NO PRODUCT AVAILABLE GREATER THAN 14 INCHES.

**NOTE: VALVE SIZES 2 TO 3 INCHES ARE AVAILABLE ONLY WITH FULL CUT DISKS.

M16905

VALVES

Submittal Data - Valves

Valve Linkage, Q5001



The Q5001 Valve Linkage connects a Modutrol® Motor to a 2- or 3-way valve. It is used primarily on V5011 or V5013 steam and water valves.

SPECIFICATIONS

Linkage Type Valve
 Mounting Linkage mounts directly to the valve bonnet; motor mounts on linkage bracket.
 Used with Actuator Modutrol Motor
 Stem Force Rating 80 or 160 lbf (356 N or 712 N)
 Ambient Temperature Range -40 F to +150 F (-40 C to +66 C)

ACCESSORIES

220829BCQ1—Barber-Colman Valve Adapter Kit
 220829LGQ3—Landis and Gyr Powers Valve Adapter Kit

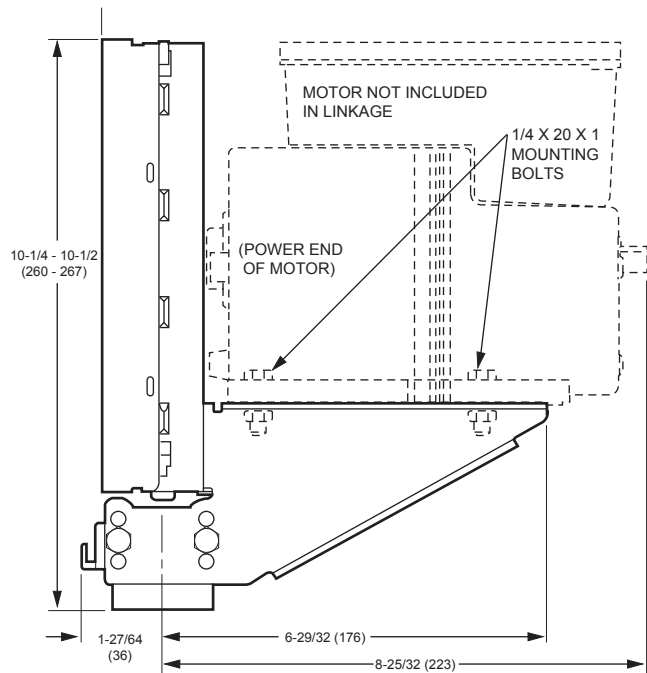
REPLACEMENT PARTS

220845/0767—Retainer button for Q5001

FEATURES

- Q5001 Valve Linkage is applicable to 2-Way or 3-Way valves in modulating or two-position service.
- Linkage requires no adjustment when used with Honeywell valves and Modutrol IV™ Motors.
- Q5001 Valve Linkage replaces Q601 and Q618 Valve Linkages.
- Linkage mounts directly to the valve bonnet; motor mounts to linkage bracket.
- Easy-to-read position indicator.
- Valve stem lift height cam selectable.
- Overtravel permits tight close-off without excessive motor strain.
- Available brackets make linkages adaptable to many valve bodies.
- Models available with 80 lb, 160 lb, and 320 lb stem force.
- Reversible cams on the Q5001 allow field selection of normally open or normally closed valve operation.
- All models have anti-spin clips.

DIMENSIONS DIAGRAM



M13993

Globe Valve Linkage, Q5020



The Q5020 Globe Valve Linkages connect a Honeywell direct coupled actuator (DCA) to a steam or water globe valve. The Q5020 Linkages are compatible with two-way and three-way globe valves up to 3 inch (DN80).

FEATURES

- Used with two-way and three-way globe valves in modulating or two-position service.
- Used with 25, 50, and 142 lb-in. spring return and 35, 70, 150, and 300 lb-in. non-spring return DCA.
- Quick and simple installation with no disassembly required.
- Heavy-duty steel rack and pinion construction and aluminum die-cast housing.
- Maintenance-free construction.
- Precision roller-bearing rack construction prevents premature valve packing wear and leakage.
- Flexible actuator mounting orientation.
- Adjustable manual override lever and valve position indicator.
- Can be mounted on specific non-Honeywell valves using a 32004629 Bonnet Adapter Kit.

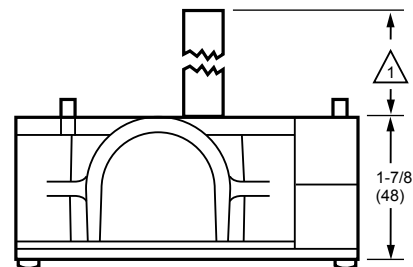
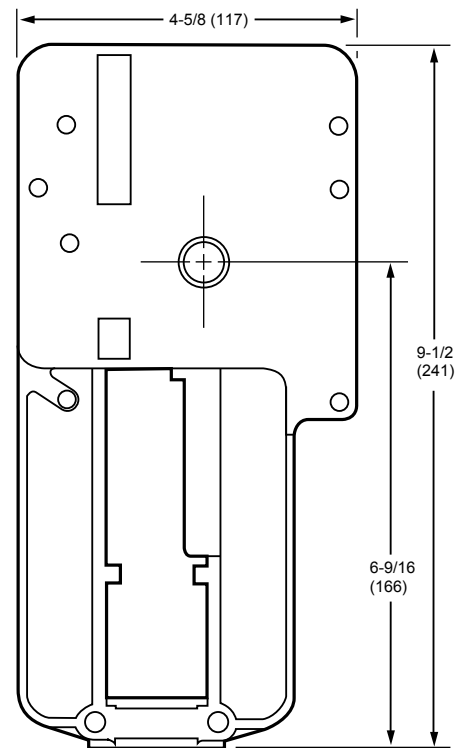
SPECIFICATIONS

Linkage Type..... Valve
 Mounting Linkage mounts directly to the valve bonnet; actuator mounts on linkage
 Used with Actuator Direct Coupled Actuator

ACCESSORIES

- 32004629-001—Bonnet adapter kit to adapt Siemens (Landis/Power) Flowrite 599 1/2 inch to 3 inch globe valves with Q5020A or Q5009B
- 32004629-002—Bonnet adapter kit to adapt Johnson VG7000 1/2 inch to 3/4 inch globe valves with Q5020D
- 32004629-003—Bonnet adapter kit to adapt Johnson VG7000 1 inch to 2 inch globe valves with Q5020A, Q5020B or Q5020D
- 32004629-004—Bonnet adapter kit to adapt Siebe VB7000 1/2 inch to 2 inch globe valves with Q5020D

DIMENSIONS DIAGRAM



1 Q5020A,B,D: 4-7/16 (112)
 Q5020C: 3-7/8 (98)

M16346A

Submittal Data - Valves

Globe Valve Linkage, Q5022



The Q5022A,B Globe Valve Linkages connect one or two Honeywell direct coupled rotary actuators (DCA) to a globe valve for control of chilled water, hot water, or steam. The Q5022A,B Linkages are compatible with 2 and 3-way globe valves up to 6 in. (DN150) pipe size.

Q5022A is used to provide enhanced close-off ratings with Honeywell globe valves up to 3 in. with 1-3/8 in. diameter bonnet and 3/4 in. stem stroke.

Q5022B is used with Honeywell globe valves 4 to 6 in. with 1-7/8 in. diameter bonnet and 1-1/2 in. stem stroke.

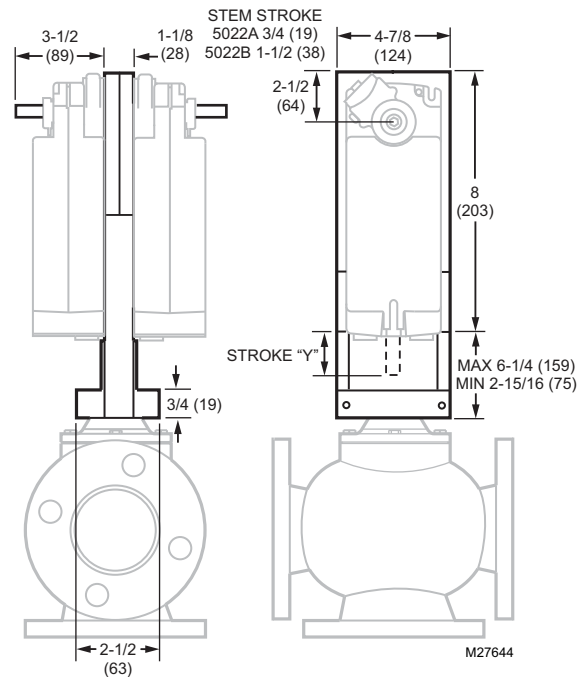
FEATURES

- For use with 2-way and 3-way globe valves in modulating or two-position service.
- For use with 175 lb.-in. (S20) spring return or 175 and 300 lb.-in. (N20, N34) non-spring return DCAs.
- Accepts single or dual matching actuators for higher close-off pressures.
- Fail safe operation with spring return DCAs, field selectable normally open or normally closed for direct or reverse-acting valves.
- Linkage threads onto valve stem.
- Oilite™ self-lubricated actuator shaft bearing.
- Anodized extruded aluminum housing.
- Maintenance-free construction.
- Precision roller-bearing rack construction to prevent premature valve packing wear and leakage.
- Flexible actuator mounting orientation.

SPECIFICATIONS

Linkage Type	Valve
Mounting	Linkage mounts directly to the valve bonnet; actuator(s) mount on linkage
Used with Actuator	Direct Coupled Actuator
Stem Force Rating	1117 max. (4969 max.)
Includes	Anti-spin brackets
Comments	This linkage is not compatible with the 43196000 high temperature kits

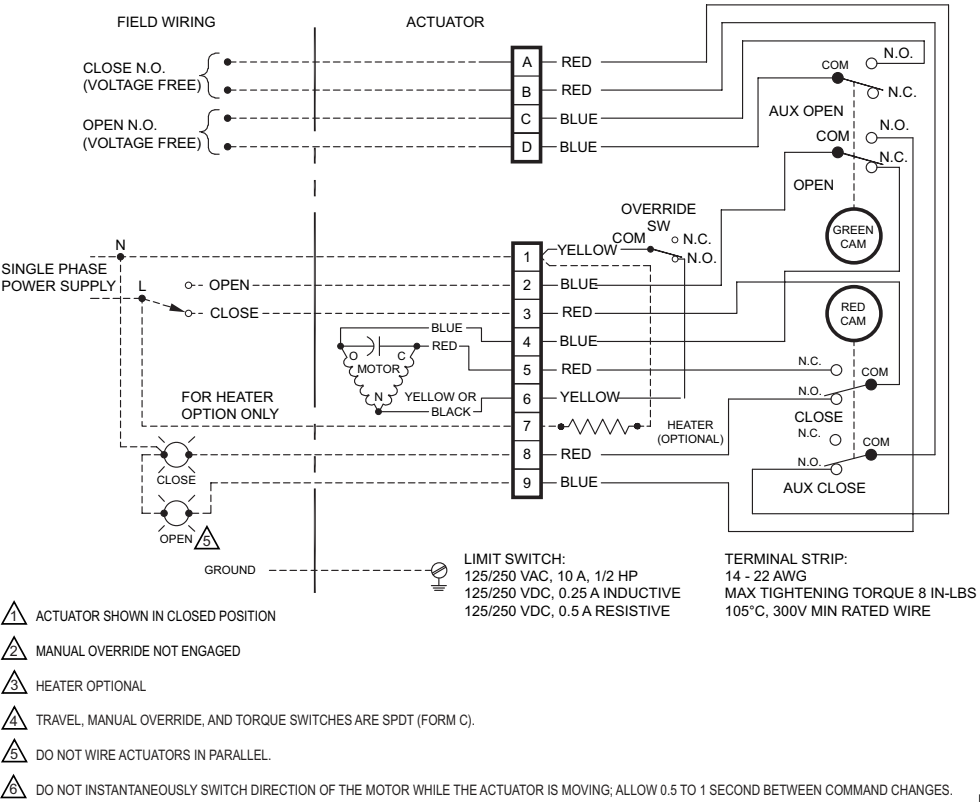
DIMENSIONS DIAGRAM



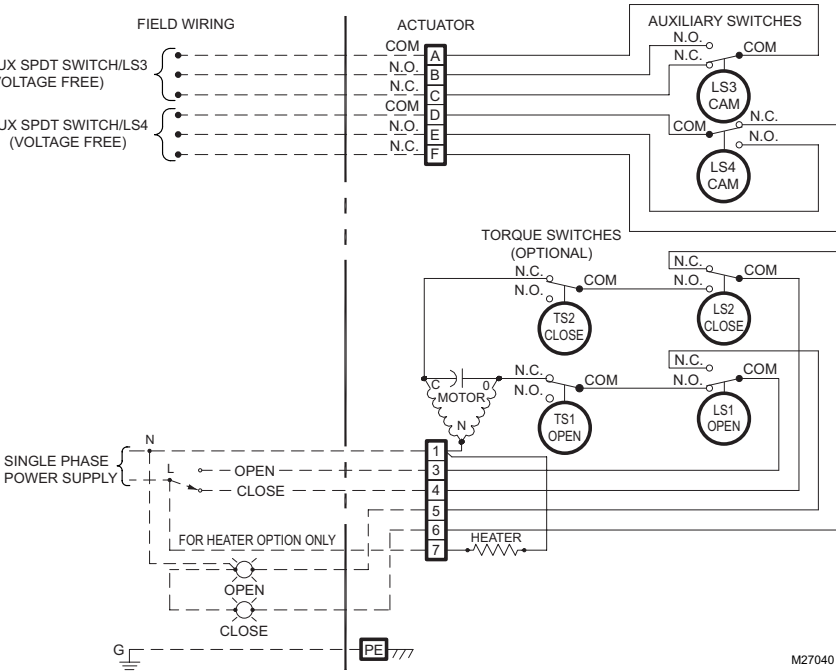
Wiring Diagrams - Valves

Butterfly Valve Actuators, VFF1; VFF2; VFF3; VFF6

NEMA 4X floating/2-position industrial-grade actuator for valves up to 18"



NEMA 4 floating/2-position industrial-grade actuator for valves 14" to 20"

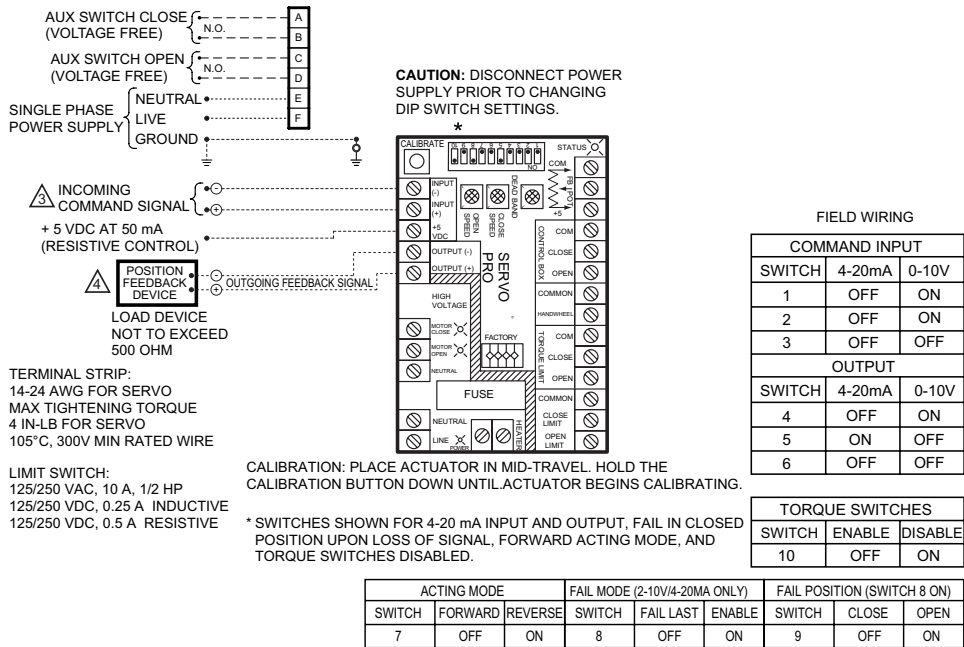


VALVES

Wiring Diagrams - Valves

Butterfly Valve Actuators, VFF1; VFF2; VFF3; VFF6

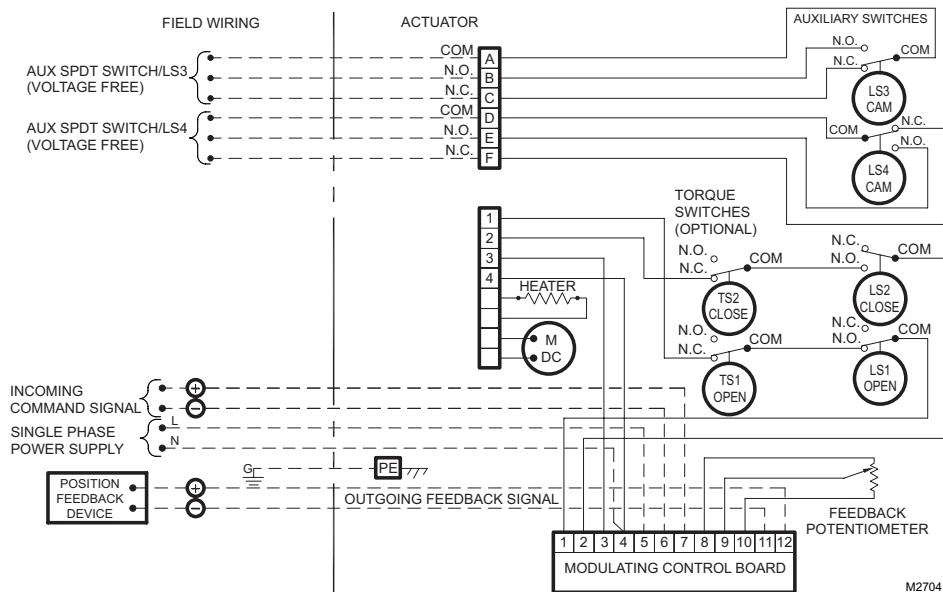
NEMA 4X floating/2-position industrial-grade actuator for valves up to 18"



- ⚠ ACTUATOR SHOWN IN CLOSED POSITION.
- ⚠ MANUAL OVERRIDE NOT ENGAGED.
- ⚠ COMMAND SIGNAL AND FEEDBACK SIGNAL MUST BE ISOLATED FROM EACH OTHER AND ANY OTHER CIRCUIT.
- ⚠ FEEDBACK LOOP IS POWERED BY THE SERVO, DO NOT SUPPLY EXTERNAL POWER.
- ⚠ SEE MANUAL FOR DETAILS.
- ⚠ HEATER OPTIONAL.
- ⚠ TRAVEL LIMIT AND MANUAL OVERRIDE SWITCHES ARE SPDT (FORM C).
- ⚠ SEE NAME TAG FOR POWER RATING.

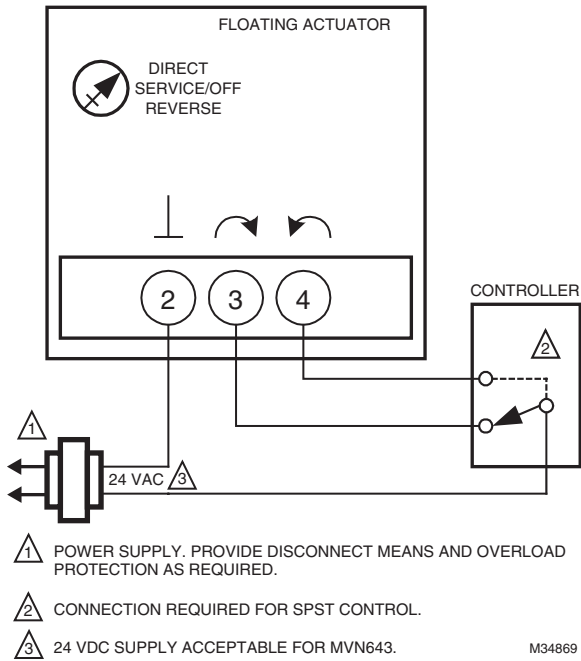
M27039

NEMA 4 modulating industrial-grade actuator for valves 14" to 20"

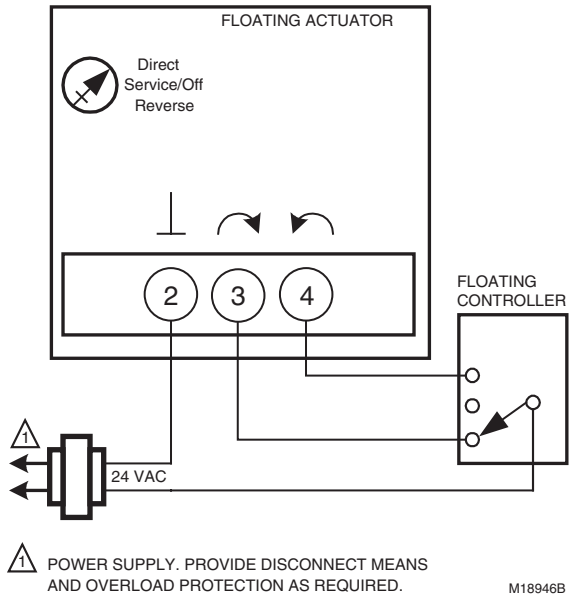


M27041

MN6105 with On/Off Control.



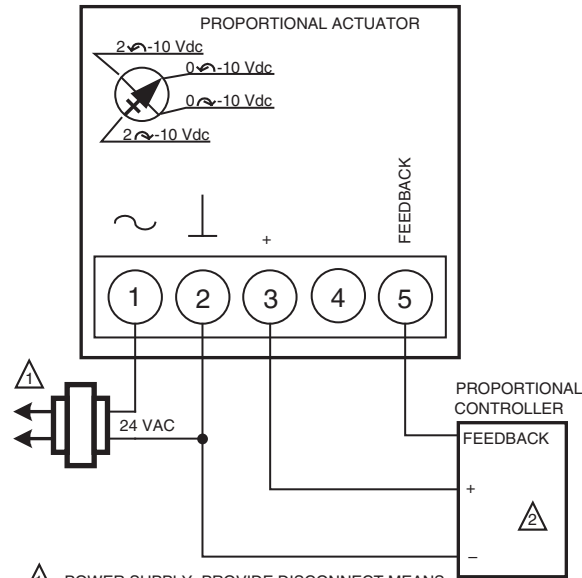
MN6105 with Floating Control.



Wiring Diagrams - Valves

Ball Valve Actuators

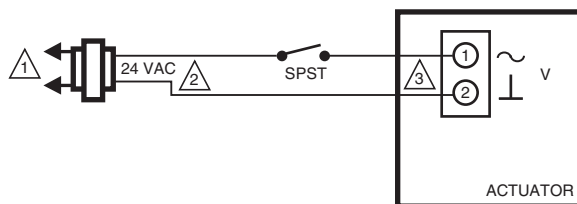
MN7505 with Modulating Control.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 0(2)-10 VDC OF 0(4)-20 mA CONTROL SIGNAL ACCEPTABLE. SET CONTROL SIGNAL DIP SWITCH TO "OFF" FOR VOLTAGE. SET TO "ON" FOR CURRENT.

M18947B

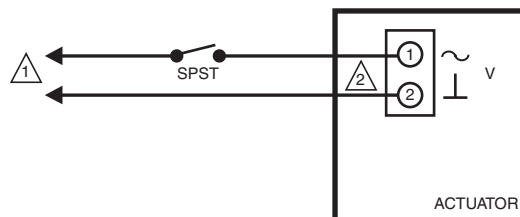
MS8105 with On/Off Control.



- 1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

- 2 24 VDC SUPPLY ACCEPTABLE.

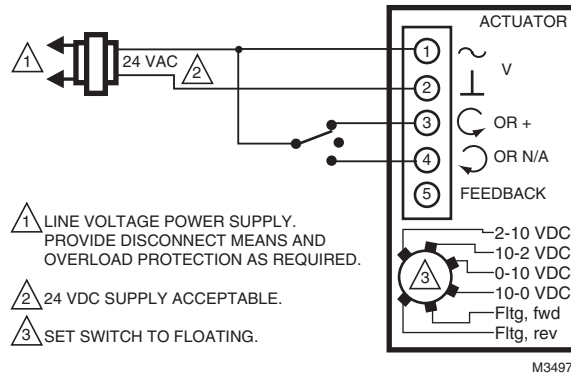
M34973



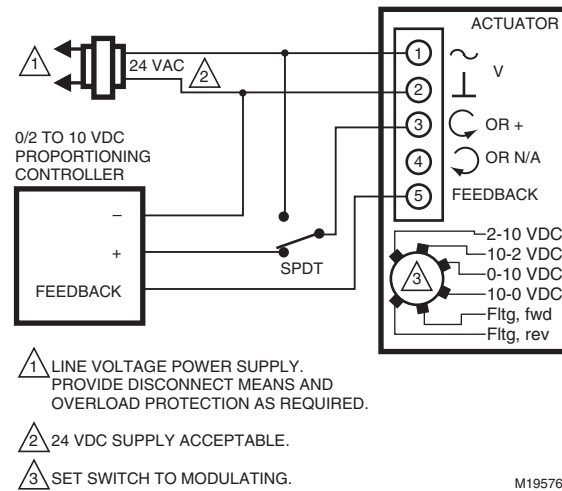
- 1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

M34974

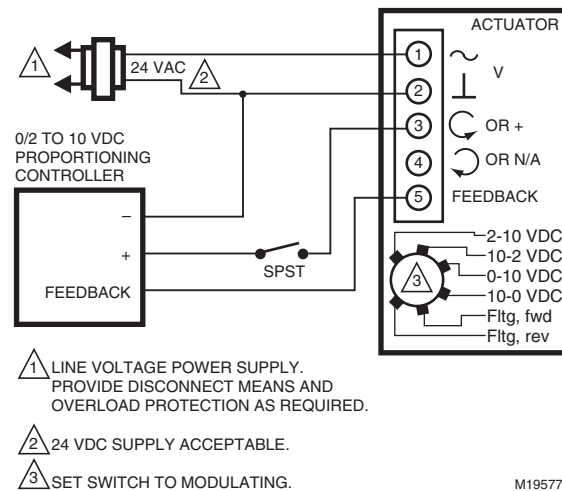
MS7505 with Floating Control (Floating mode setting).



MS7505 with override to full open (Modulating mode setting).



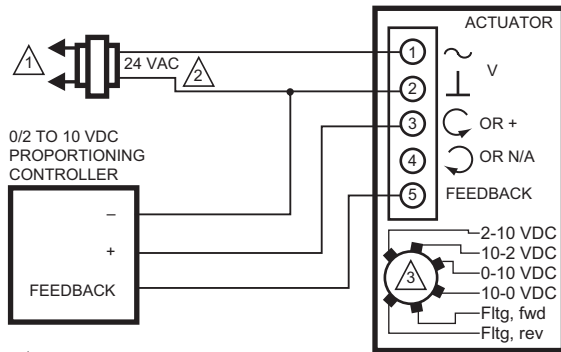
MS7505 with override to full closed (Modulating mode setting).



Wiring Diagrams - Valves

Ball Valve Actuators

MS7505 with Proportioning Controllers (Modulating mode setting).

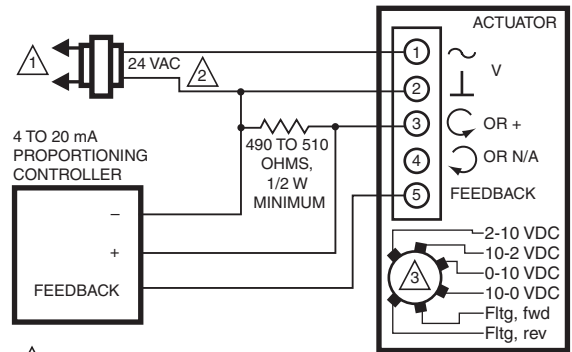


1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 24 VDC SUPPLY ACCEPTABLE.

3 SET SWITCH TO MODULATING.

M34976



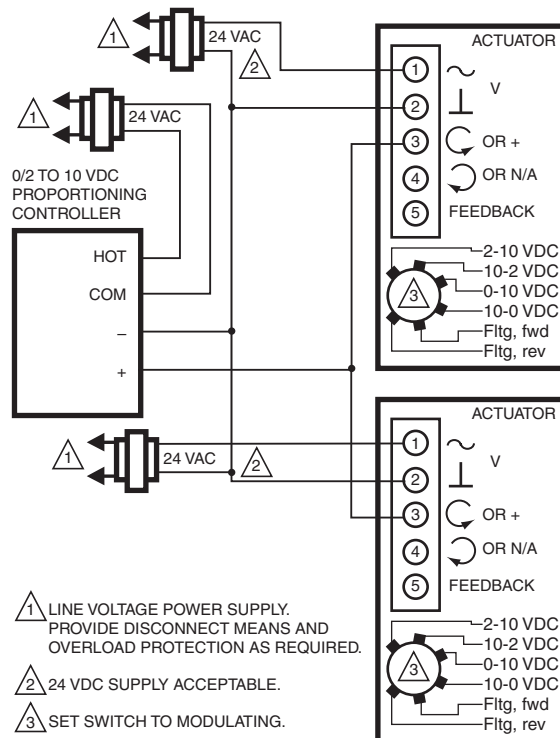
1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 24 VDC SUPPLY ACCEPTABLE.

3 SET SWITCH TO MODULATING.

M34977

MS7505 with Proportioning controllers operating multiple actuators (Modulating mode setting).



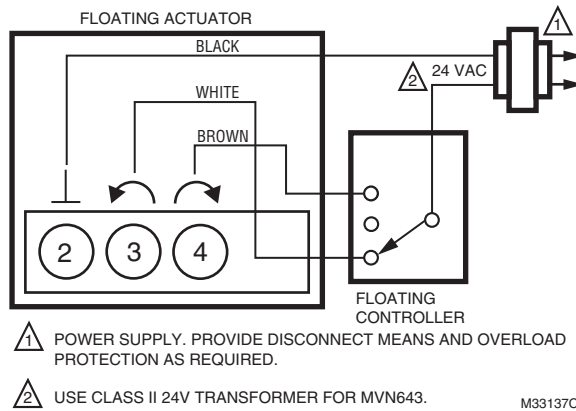
1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 24 VDC SUPPLY ACCEPTABLE.

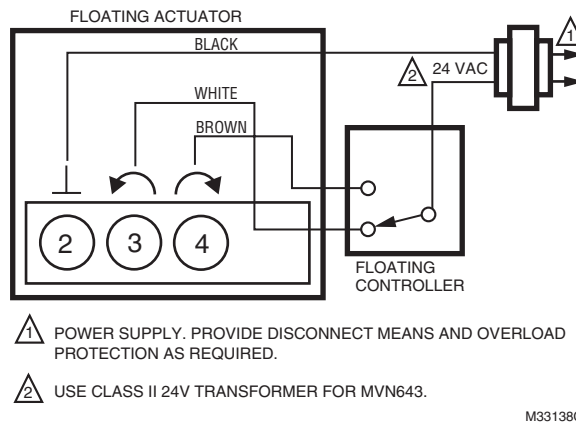
3 SET SWITCH TO MODULATING.

M34978

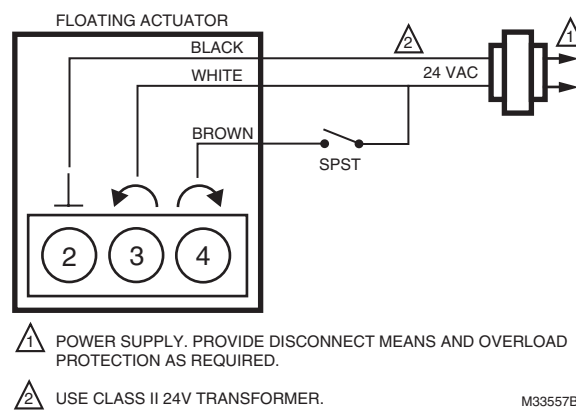
MVN613 or MVN643 with Floating Control.



MVN613 or MVN643 with 2 position or Floating Control.



MVN643 with Two Position SPST Control.

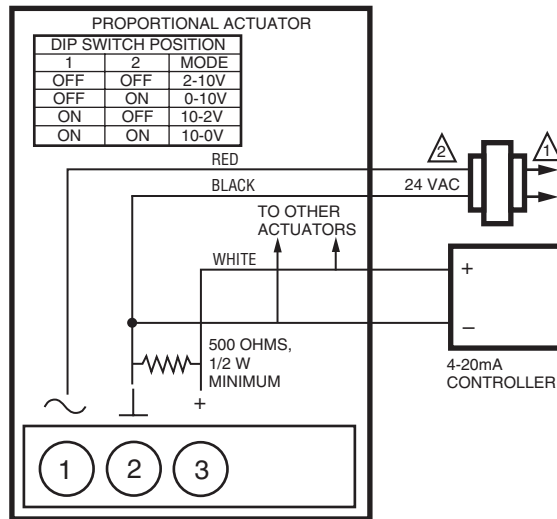


Wiring Diagrams - Valves

MVN Actuator

MVN713 with 4-20mA Control.

PROPORTIONAL/MODULATING: 4-20mA CONTROLLER OUTPUT WITH 500Ω SERIES RESISTOR



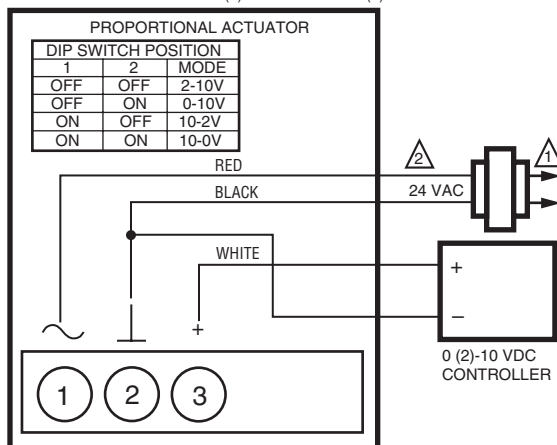
⚠️ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

⚠️ USE CLASS II 24V TRANSFORMER.

M33141B

MVN713 with 0 (2)-10 VDC Control.

PROPORTIONAL/MODULATING: 0(2)...10 VDC OR 10...0(2) VDC CONTROLLER OUTPUT



⚠️ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

⚠️ 24 VDC SUPPLY ACCEPTABLE.

M33140A

Accessories - Valves

Valve Actuator Accessories

Product Number	Description	Used With
114191A	Auxiliary Switch Assembly	—
127834A	Switch (made)	—
272629A	Adapter Kit for mounting ML6984/ML7984 to V5045 and VGF non-pressure balanced 2-way valves	ML6984 or ML7984, V5045; VGF21ES; VGF21LS, VGF22ES; VGF22LS
272630D	Position feedback and SPDT pilot duty auxiliary switch	ML6984/ML7984 Series 4000 and higher (ML6984 in 5-wire mode only)
312495	Large stem button provides anti-spin for CREVAL actuators with globe valves up to 3 in.	ML6420, ML6421, ML6425, ML7420, ML7421, or ML7425; Not required with ML6984/M7984 Actuators or Q5022A linkage; Not compatible with Q5020 linkage
40003793-005	U-bolt bag assembly for ML6984 & ML7984.	ML6984 or ML7984
43191679-101	Auxiliary Potentiometer for ML6421A	ML6421A
43191679-102	220 ohm Auxiliary Potentiometer for ML6421B	ML6421B
43191679-111	Potentiometer, 10k ohm, for ML6425, ML7425	ML6425 or ML7425
43191679-112	Potentiometer, 220 ohm for ML6425, ML7425	ML6425 or ML7425
43191680-102	Dual Auxiliary Switch for CREVAL actuators	ML6421, ML7421
43191680-105	Dual Auxiliary Switch for CREVAL actuators	ML6420, ML6425
43196000-001	High Temperature Kit for actuators with 3/4 inch (20 mm) stroke, stem button attachment	ML6420, ML6421, ML6425, ML7420, ML7421, or ML7425; Not compatible with Q5022A
43196000-038	High Temperature Kit for actuators with 1-1/2 inch (38 mm) stroke, stem button attachment	ML6421, ML7421; Not compatible with Q5022B;

Accessories - Valves

Valve Actuator Accessories

Product Number	Description	Used With
5112-3R	Weather Enclosure Assembly	MN6105A1011, MN7505A2001, MS7505A2030, MS8105A1030
5112-24/U	Replacement SS Stem Kit	For VBN & VRN Valves. Refer to Table 7 on page 161 for specific models
5112-23/U	Replacement SS Stem Kit	For VBN & VRN Valves. Refer to Table 7 on page 161 for specific models
5112-22/U	Replacement Stem Kit	For VBN & VRN Valves. Refer to Table 7 on page 161 for specific models
5112-21/U	Replacement Stem Kit	For VBN & VRN Valves. Refer to Table 7 on page 161 for specific models
5112-20/U	Replacement Stem Kit	For VBN & VRN Valves. Refer to Table 7 on page 161 for specific models
5112-19/U	Replacement Stem Kit	For VBN & VRN Valves. Refer to Table 7 on page 161 for specific models
MVNAAA	Replacement Valve Adaptor	MVN613A0000, MVN643A0000, MVN713A0000
MVNAAL	Replacement Valve Adaptor, Low Profile	MVN613L0000, MVN643L0000, MVN713L0000
MVNAC7131	Replacement Cable with Terminal 1m, Modulation (RED, BLACK, WHITE)	MVN713A0000, MVN713L0000
MVNAC6131	Replacement Cable with Terminal 1m, Floating (RED, BLACK, WHITE)	MVN613A0000, MVN613L0000, MVN643A0000, MVN643L0000
MVNAT3	Replacement Screw type Terminal Block, Pluggable	MVN613A0000, MVN613L0000, MVN643A0000, MVN643L0000, MVN713A0000, MVN713L0000
5112-11	Replacement actuator bracket	MN6105A1011, MN7505A2001, MS7505A2030, MS8105A1030
205860	Minimum position Potentiometer	MN6105A1011, MN7505A2001, MS7505A2030, MS8105A1030
32006306-001	Resistor Kit (500 ohm); converts 4-20 mA signal to 2-10 Vdc	MS7505A2030, MS8105A1030
Q7002B1009	Universal Interface Module	MN6105A1011, MN7505A2001, MS7505A2030, MS8105A1030
STRN-SCSA	Self-centering Shaft Adapter	MS7505A2030, MS8105A1030
32000085-001	Strain Relief Fitting (10 pack)	MN6105A1011, MN7505A2001, MS7505A2030, MS8105A1030
AT120A1004	120 to 24 Vac Transformer (20 VA)	MVN613A0000, MVN613L0000, MVN643A0000, MVN643L0000, MVN713A0000, MN6105A1011, MN7505A2001, MS7505A2030, MS8105A1030
AT140A1000	120 to 24 Vac Transformer (40 VA)	MVN613A0000, MVN613L0000, MVN643A0000, MVN643L0000, MVN713A0000, MN6105A1011, MN7505A2001, MS7505A2030, MS8105A1030
STRN-STRNRLF	Strain Relief Fitting (10 pack)	MS7505A2030, MS8105A1030

Accessories - Valves

Valve Linkage Accessories

Product Number	Description	Used With
220845/0767	Retainer button for Q5001	Q5001
220848A	Q5001 Cam	Q5001
220852A	Stroke Indicator, Q5001	Q5001
220861A	3/4 inch lift Q5001 linkage cam assembly	Q5001
220863A	1 inch lift Q5001 linkage cam assembly	Q5001
220864A	1 1/8 inch lift Q5001 linkage cam assembly	Q5001
220865A	1 1/4 inch lift Q5001 linkage cam assembly	Q5001
220867A	1 1/2 inch lift Q5001 linkage cam assembly	Q5001
32004629-001	Bonnet adapter kit to adapt Seimens (Landis/Power) Flowrite 599 1/2 inch to 3 inch globe valves with Q5020A or Q5009B	Siemens valves
32004629-002	Bonnet Adapter Kit, Johnson Controls 1/2 to 3/4 in., Q5020	Johnson valves; Q5020
32004629-003	Bonnet Adapter Kit, Johnson Controls 1 to 2 in., Q5020	Johnson valves; Q5020
32004629-004	Bonnet Adapter Kit, Siebe 1/2 to 2 in., Q5020	Siebe valves; Q5020
4074ETB	Antispin Kit, Q5001	Q5001

VU Series Fan Coil Actuator Accessories

Product Number	Description	Used With
272885C	Nickel-plated replacement motor for 24V VU-series valve actuators	VU843A, VU844A
272885D	Nickel-plated replacement motor for 120 VU-series valve actuators	VU443A1008/A1180/E1009; VU444A1007/A1155

Accessories - Valves

Pneumatic Valve Actuator Accessories

Product Number	Description	Used With
14002039-001	MP953D Diaphragm Sleeve	MP953B,D,F
14002040-002	MP953D Diaphragm	MP953B,D,F
14003124-002	MP953B,D,F Diaphragm Repair Kit (includes 14002039-001 and 14002040-002)	MP953B,D,F
14004138-001	MP953B,F (Reverse Acting) Positive Positioner Retrofit Kit	MP953B,F
14004139-001	MP953A,E (Direct Acting, 8 in. and 13 in. diameter, 3/4 in. stroke) Positive Positioner Retrofit Kit	MP953A,E
14004140-001	MP953A,E (Direct Acting, 8 in. and 13 in. diameter, 1-1/2 in. stroke) Positive Positioner Retrofit Kit	MP953A,E
14004211-001	MP953E (8 in. and 13 in. diameter, 3/4 in. stroke) Feedback Spring Kit	MP953E
14004212-001	MP953E (8 in. and 13 in. diameter, 1-1/2 in. stroke) Feedback Spring Kit	MP953E
14004213-001	MP953F (Reverse Acting) Feedback Spring Kit	MP953F
14004214-001	MP953A,E (5 in. diameter) 3/4 inch stroke Positive Positioner Retrofit Kit	MP953A,E
14004298-001	Thread forming Screw, Size 4-40	MP953D,F
14004298-003	MP953C,E (5 in. dia.) and MP953B,D,F (7-1/8 in. dia.) Actuator Base Screw, size 1/4-20	MP953B,D,F; MP953C,E (5 in.)
14004577-001/U	MP953 A, C, and E (Direct Acting, 5 in. diameter) Yoke/Base Assembly	MP953A,C,E
14004578-001	MP953 B, D, and F (Reverse Acting, 7-1/8 in. diameter) Yoke/Base Assembly	MP953B,D,F
14004660-001	Cup, aluminum die cast alloy 7 1/64 inch	MP953D
14004667-001	Offset Crank arm assembly with 2 screws (304725-062), nuts (14004102-001), crank arm (14004655-001) for 1/2 in. Drive Axle	Pneumatic Actuators
14004697-001	Stem extension for 13 in. MP953C,E with 3/4 in. Stroke	MP953C,E
310664	MP953A, C and E (5 in. and 8 in. models only) Tension Spring	MP953A,C,E
310665/0062	Spring Support for MP 953	MP953A,C,E (5 in.)
310668	MP953A, C and E (5 in. diameter) High Temperature Silicone Diaphragm - Old Style	MP953A,C,E
311393	White Spring, 4- 11 psi	MP953C,E
311616	MP953A, C and E (5 in. diameter) Main Spring (2-7 psi sp ring range - Brown)	MP953A,C,E (5 in.)
311618	MP953A, C and E (5 in. diameter) Main Spring (8-12 psi sp ring range - Gray)	MP953A,C,E (5 in.)
311749/0605	Cup diaphragm, 8 in. for MP95 3A, C, E	MP953A,C,E (8 in.)
311750	MP953A, C and E (8 in. diameter) Regular Temperature Neoprene Diaphragm - New Style	MP953A,C,E
311851/0062	Stem extension for 8 in. dia. 3/4 in. stroke MP953A,C,E	MP953A,C,E (8 in.)

Accessories - Valves

Pneumatic Valve Actuator Accessories

Product Number	Description	Used With
311852	Brown Spring for MP953A,C 3/4 inch stroke (8 inch diameter), 2-7 psi range	MP953A,C (8 in., 2-7 psi)
311855	Gray spring for MP953C (8 inch diameter), 8-12 psi range	MP953C
311863	Stem Retainer for the MP953C,E (8 in. diameter)	MP953C,E
312099	1-1/2 in. stroke Spider for 13 in. MP953C and E	MP953C,E
312203	Black Spring for MP953D,F for 8-13 psi range	MP953D,F
312466/0605	Stem Extension for MP953C1489, MP953C1471, MP953E1392, MP953E1400, and MP953E1418	MP953C,E
312471	White Spring for MP953C,E (13 in. dia. 1/2 in. stroke)	MP953C,E (13 in.)
312505	MP953A,C,E (13 in. diameter) regular temperature Neoprene diaphragm - New style	MP953A,C,E
312760	MP953A,C,E (5 in. diameter) regular temperature Neoprene diaphragm - New style	MP953A,C,E
312817/U	MP953 (5 in. diameter) Cover	MP953A,C,E
313745	MP953 (5 in. diameter) Cover	MP953C (5 in.)
314153	MP953A, C and E (8 in. diameter) High Temperature Silicone Diaphragm - New Style	MP953A,C,E
314646A/0062	Plate, Spring for 13 in. diameter MP953A,C,E	MP953A,C,E
314650A	MP953B, D and F (Reverse Acting) Support Assembly (for Series-2 actuators only, use this Support Assembly and 316059A Yoke Assembly to Convert Series-1 MO/MP953)	MP953B,D,F
314651A	MP953B,D,F (Reverse Acting) yoke assembly for support assembly- with nylon insert for use with old style actuators not made with a Helicoil insert in yoke	MP953B,D,F
314652	Spring for MP953D, F (used in yoke assembly)	MP953D,F
314683/0062	Stem Retainer for 13 in. diameter MP953A,C,E (Latches on Stem Button)	MP953A,C,E (13 in.)
315020	Cup for MP953C,E (13 inch diameter)	MP953C,E (13 in.)
316059A	MP953B, D and F (Reverse Acting) Yoke Assembly for Support Assembly- with helicoil insert	MP953B,D,F

Economizer Selection

The JADE™ economizer doesn't heat or cool anything. It simply brings in outdoor air to naturally lower a building's interior temperature. You don't need a certified programmer or installer to set up and operate the JADE economizer. JADE is designed to work seamlessly with existing and future roof top systems. The LCD screen delivers continuous messages, important diagnostics and system status.

Section 4: Economizers

JADE™ Economizer Controller W7220	
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Product Selection - JADE™ Economizer

W7220



JADE economizers make energy saving easier for your customers. For buildings with less than 100,000 sq ft and stand-alone rooftop unit applications JADE delivers fresh air ventilation and energy savings. It is packed with features you'd expect in more expensive units, but it can be installed and configured by technicians without significant training.

- LCD screen delivers continuous messages, diagnostics and system status
- Color-coded wiring terminals make wiring easy
- Built-in freeze protection closes outdoor dampers to protect coils when outdoor temperatures drop
- Two-wire Sylk® bus communications enable simple wiring and enhanced diagnostics
- Demand control ventilation (DCV) saves energy with clean outside air without over ventilating and conditioning excess air
- UL Listed

Y-Pack

Control Type	Kit Part Number	Kit Includes			
		Actuator	OA Sensor	MAT Sensor	CO2 Sensor
Dry Bulb with Black Motor	Y7220A7215	M7215A1008	C7250A1001	C7250A1001	
Dry Bulb with Non Communicating DCA	YL7220A7503	MS7503A2030	C7250A1001	C7250A1001	
Dry Bulb with Communicating 27 lb-in DCA	YL7220AJ3103	MS3103J1030	C7250A1001	C7250A1001	
Dry Bulb with Communicating 44 lb-in DCA	YL7220AJ3105	MS3105J3030	C7250A1001	C7250A1001	
Dry Bulb with Communicating 27 lb-in DCA and CO2 Wall Sensor without Display	YL7220ACW3103	MS3103J1030	C7250A1001	C7250A1001	C7632A1004
Enthalpy with Black Motor	Y7220S7215	M7215A1008	C7400S1000	C7250A1001	
Enthalpy with Black Motor and CO2 Wall Sensor with a Display	Y7220SCW7215	M7215A1008	C7400S1000	C7250A1001	C7232A1016
Enthalpy with Black Motor and CO2 Duct Sensor with a Display	Y7220SCD7215	M7215A1008	C7400S1000	C7250A1001	C7232B1014
Enthalpy with Non-Communicating DCA	YL7220S7503	MS7503A2030	C7400S1000	C7250A1001	
Enthalpy with Communicating 27 lb-in DCA	YL7220SJ3103	MS3103J1030	C7400S1000	C7250A1001	
Enthalpy with Communicating 44 lb-in DCA	YL7220SJ3105	MS3105J3030	C7400S1000	C7250A1001	
Enthalpy with Communicating 27 lb-in DCA and CO2 Wall Sensor with a Display	YL7220SCW3103	MS3103J1030	C7400S1000	C7250A1001	C7232A1016
Enthalpy with Communicating 27 lb-in DCA and CO2 Duct Sensor with a Display	YL7220SCD3103	MS3103J1030	C7400S1000	C7250A1001	C7232B1014

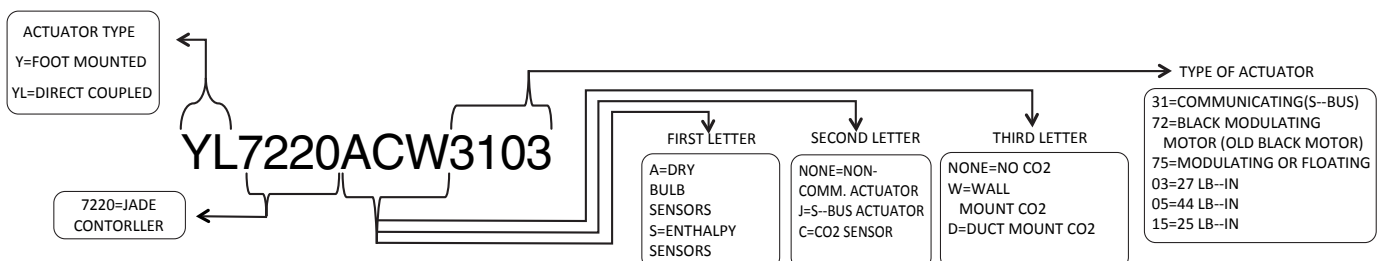
Sensors

	Function	OS Number
Mixed Air Temperature or Outdoor Air Temperature Sensor	MAT or OAT	C7250A1001
Outdoor Air or Return Air Enthalpy Sensor	OAE	C7400S1000
Wall Mount CO2 Sensor with Fixed Settings	CO2	C7632A1004
Wall Mount CO2 Sensor with Selectable Settings	CO2	C7232A1016
Duct Mount CO2 Sensor with Selectable Settings	CO2	C7232B1014

NOTE:
See pages 318-322 for sensor submittal data.

Accessories

Used With	Function	OS Number
C7400S1000, C7250A1001	2-pin edge connector	50048926-001
W7220A1000	6-pin edge connector	50048926-002
C7250A and C7400S Sensors	Duct mount kit	50053060-001
W7220A1000	PCMOD - Connects with PC to communicate with JADE	W7220-PCMOD



The JADE™ Economizer System is an expandable economizer control system, which includes a W7220 Economizer controller with an LCD and keypad. The W7220 can be configured with optional sensors. The W7220 controller is used as a standalone economizer wired directly to a commercial set back thermostat and sensors to provide Outdoor Air dry-bulb economizer control. Optional Sylk bus sensors can be connected to the controller for single or differential enthalpy control. An additional Return Air Sylk bus sensor can be added for differential dry bulb control.

SPECIFICATIONS

Electrical

Rated Voltage.....	20 to 30 Vac; 50/60 Hz Transformer: 100 VA maximum
Nominal Power Consumption (at 24 Vac, 60 Hz).....	11.5 VA without sensors or actuators
Relay Digital Output Rating at 30 Vac (maximum power from Class 2 input only).....	1.5A run; 3.5A inrush @ 0.45PF (200,000 cycles) or 7.5A inrush @ 0.45PF (100,000 cycles)
External Sensors Power Output.....	21 Vdc +/- 5% @ 48mA

IMPORTANT

All inputs and outputs must be Class 2 wiring.

Inputs: sensors

Dry Bulb Temperature (optional) and Mixed Air (required), C7250A.....	2-wire (18 to 22 AWG); Temperature range -40 to 150 °F (-40 to 65 °C). Temperature accuracy -0°F/+2°F
Temperature and Humidity, C7400S1000 (optional).....	Temperature: range -40 to 150 °F (-40 to 65 °C) Temperature accuracy -0°F/+2°F Humidity: range 0 to 100% RH with 5% accuracy.

NOTE: Up to three (3) SYLK Bus sensors may be connected to the JADE™ Economizer controller: outdoor air (OA), return air (RA) and discharge (supply) air (DA).

DCV (CO ₂) Sensor (C7232 or C7632).....	2-10 Vdc control signal;
4 Binary inputs	1-wire 24 Vac + common GND 24 Vac power supply: 50/60Hz;

Outputs

Actuator signal	2-10 Vdc; Sylkbus output for Honeywell Sylkbus communicating actuators.
Exhaust fan, Y1, Y2 and AUX1 O	All Relay Outputs (at 30 Vac): Running: 1.5A maximum Inrush: 7.5A maximum

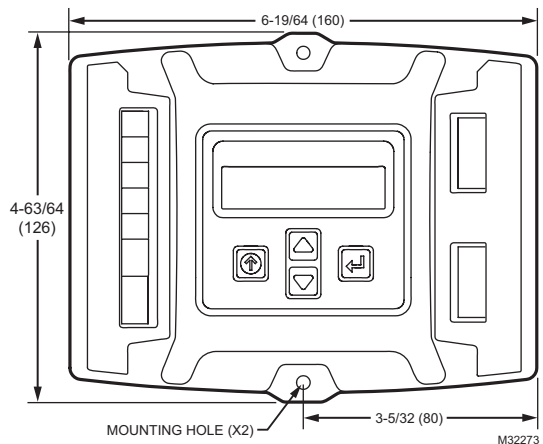
Environmental

Operating Temperature.....	-40 to 150 °F (-40 to 65 °C).
Storage Temperature.....	-40 to 150 °F (-40 to 65 °C)
Shipping Temperature.....	-40 to 150 °F (-40 to 65 °C)
Relative Humidity.....	5% to 95% RH non-condensing
Dimensions.....	Height: 4.98 inches (126.4 mm) Width: 6.3 inches (160 mm) Depth: 1.34 inches (34 mm)
Weight.....	0.58 lb. (0.265 kg)
Approvals	UL listed (XAPX) for USA and Canada.

FEATURES

- LCD Screen delivers continuous messages, important diagnostics feedback and system status.
- Color-coded wiring terminals help with easy installation.
- Built-in freeze protection closes the outdoor dampers to protect coils when temperatures drop.
- Two-wire Sylk™ bus communications enable simple integration and future expansion.
- On-board fault detection and diagnostics quickly identify sensor failures or loss of communication, saving time on service and commissioning.

DIMENSIONS DIAGRAM



Wiring Diagrams - JADE Economizer

W7220

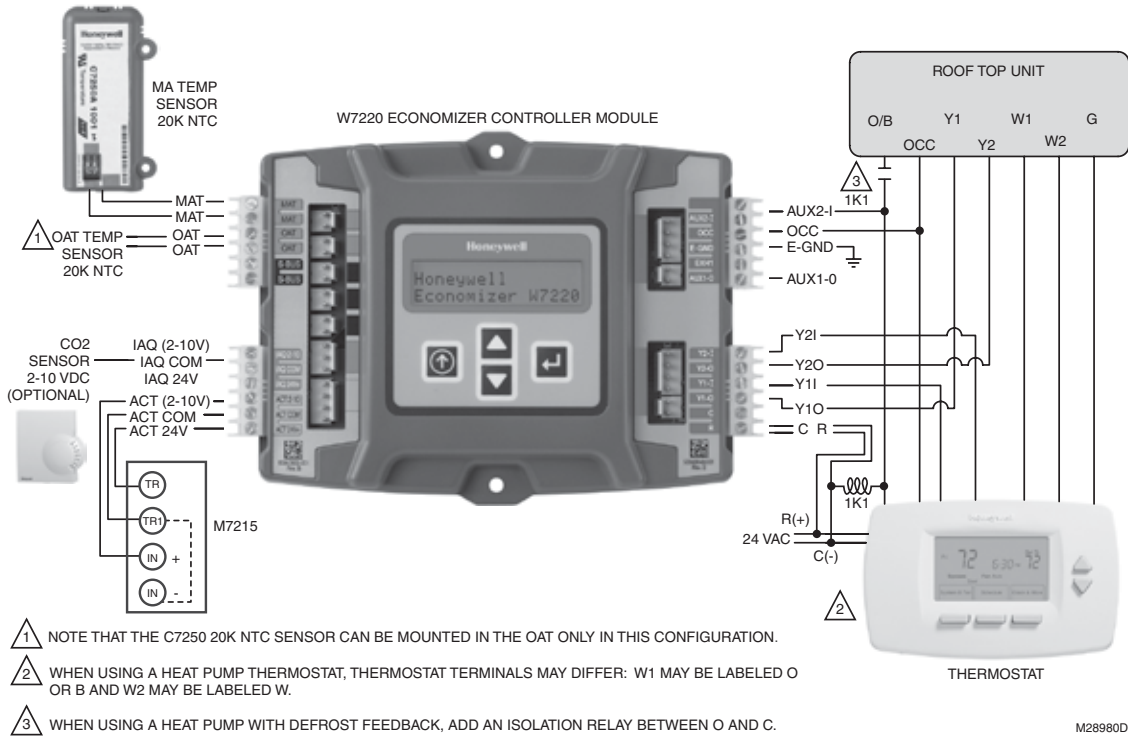


Fig 1. Standalone dry bulb Economizer configuration with black motor M7215.

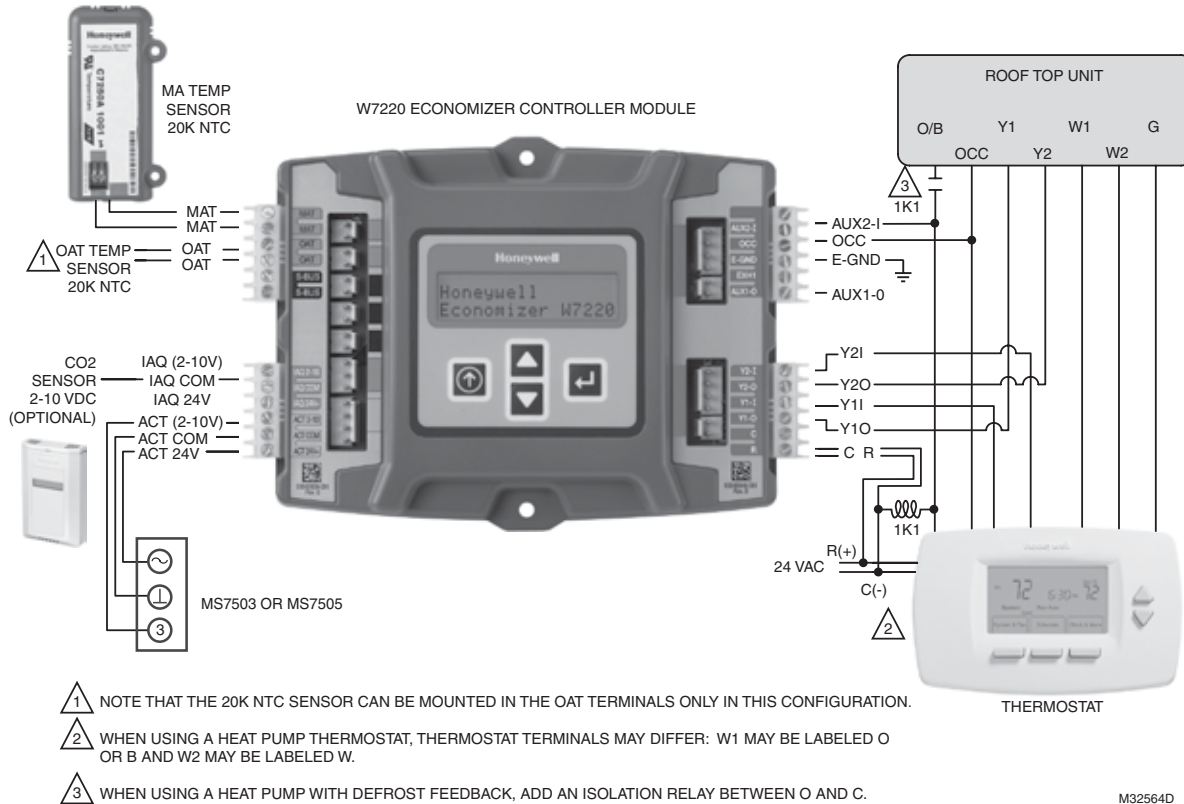


Fig 2. Standalone dry bulb Economizer configuration with Honeywell MS7503 or MS7505 Direct Coupled Actuator.

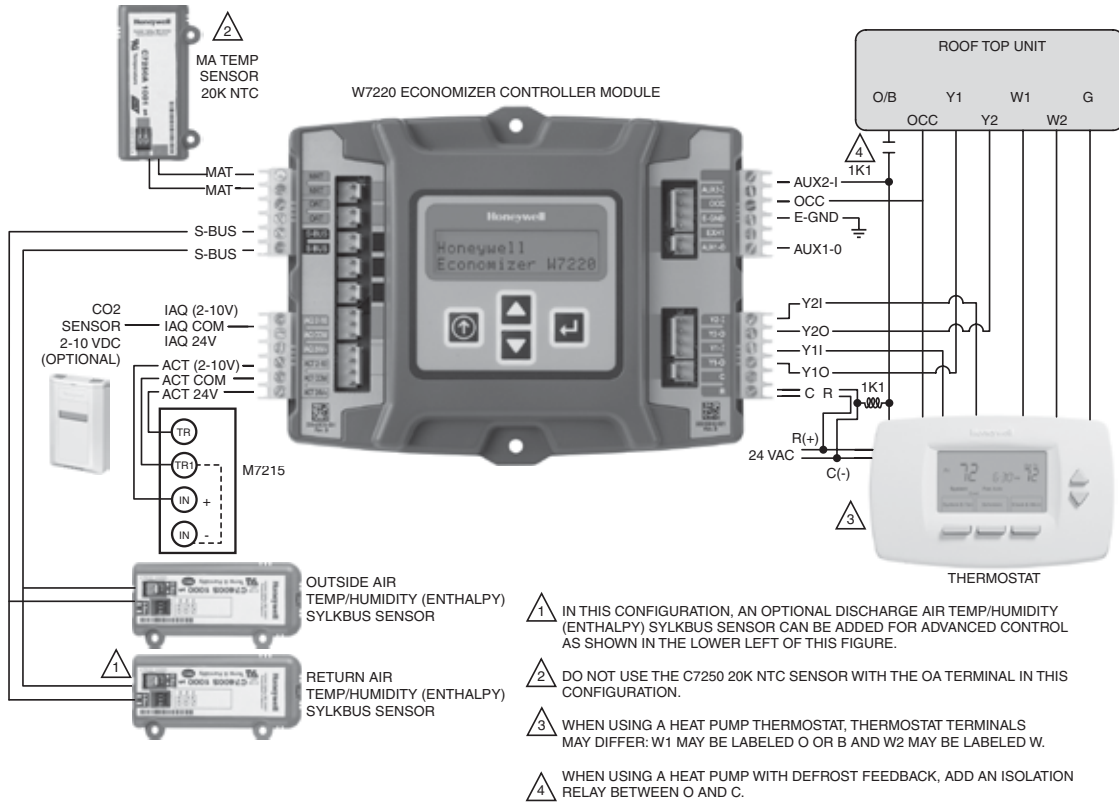


Fig 3. Economizer with Sylk Bus sensors for enthalpy configuration with Honeywell M7215 black motor.

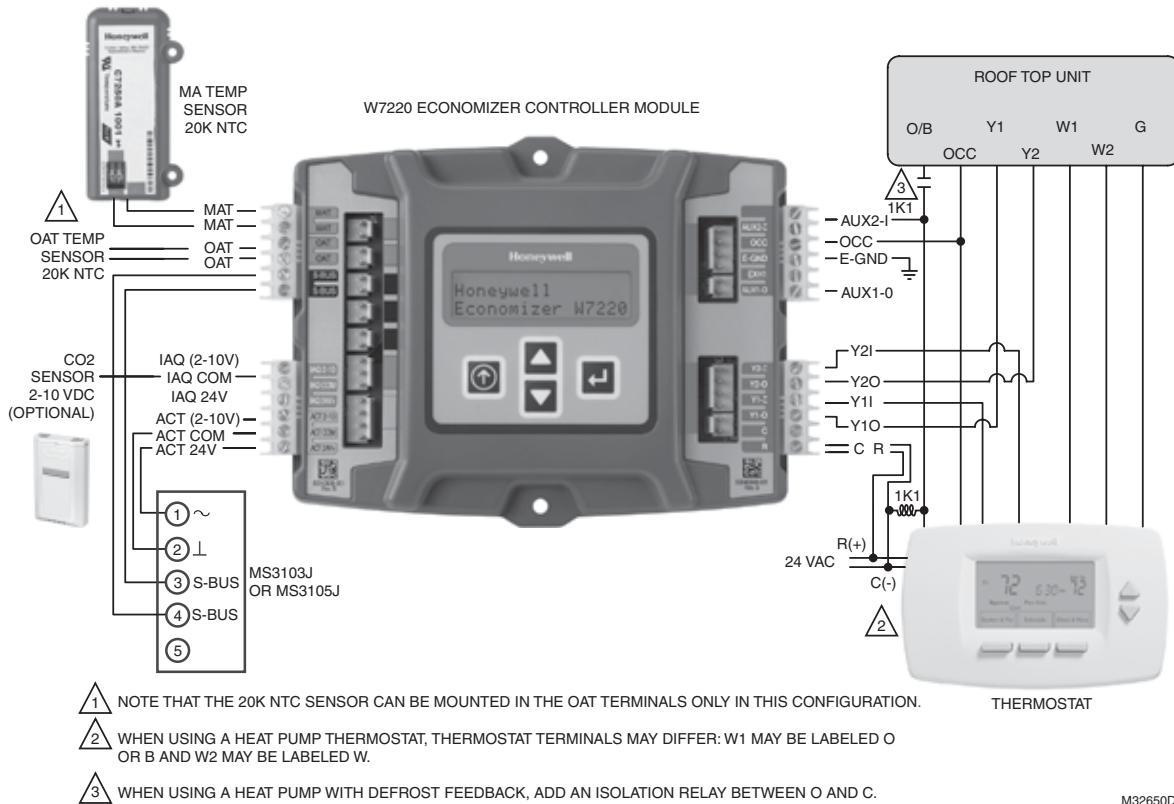


Fig 4. Standalone dry bulb Economizer configuration with Honeywell MS3103J or MS3105J communicating actuators.

Wiring Diagrams - JADE Economizer

W7220

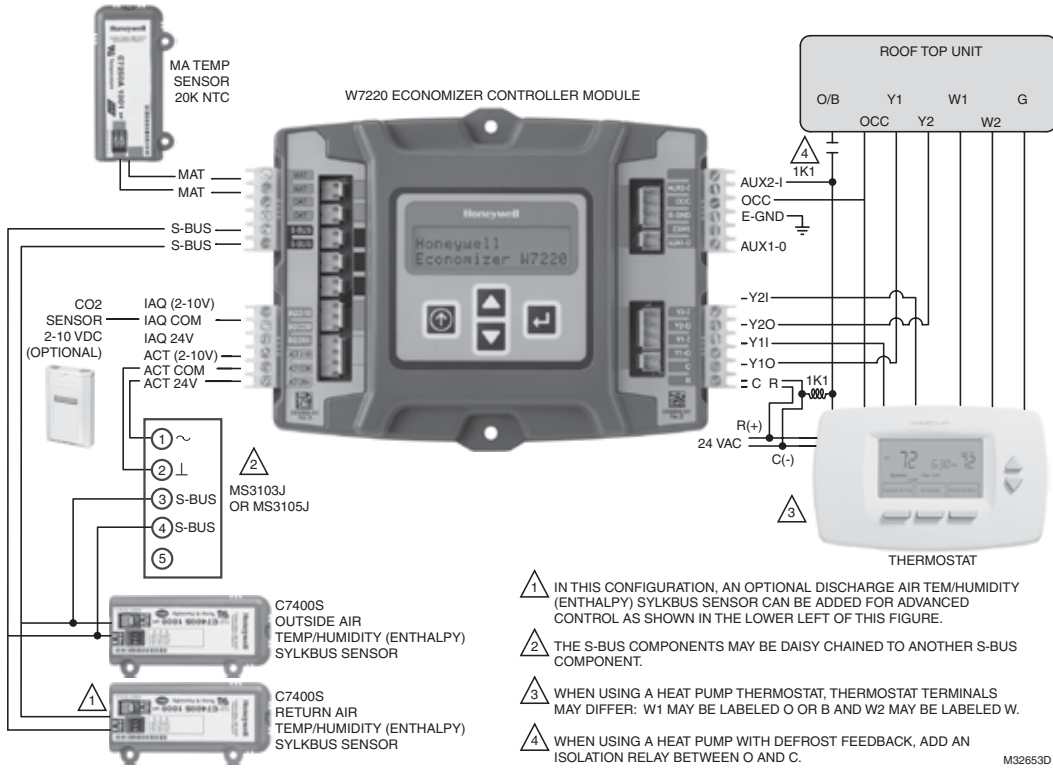


Fig 6. Economizer with Sylk bus sensor for enthalpy configuration with Honeywell MS3103 or MS3105 communicating actuators.

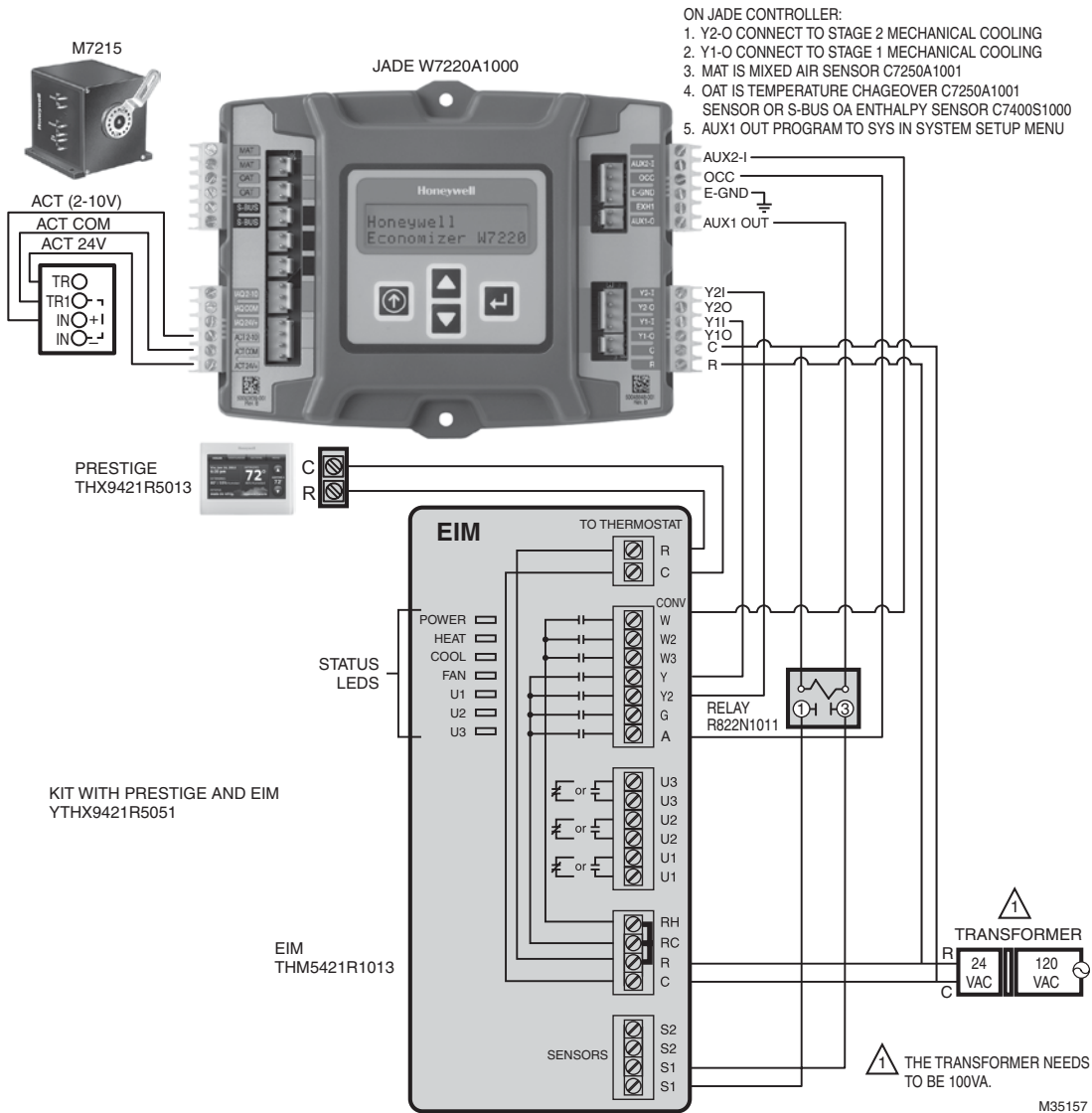


Fig 7. Prestige with EIM connected to JADE™ Economizer and M7215 Black Motor.

Wiring Diagrams - JADE Economizer

W7220

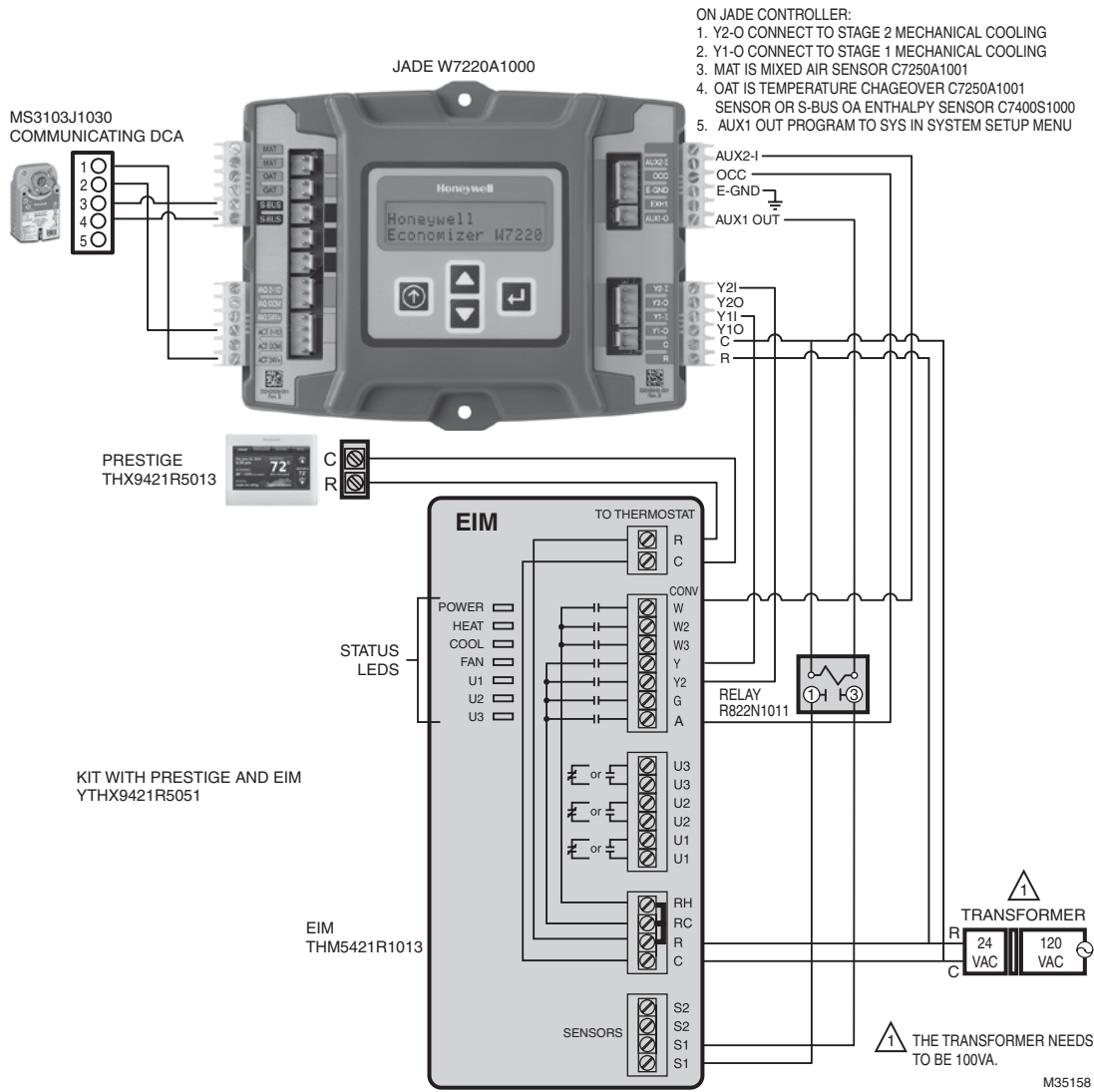
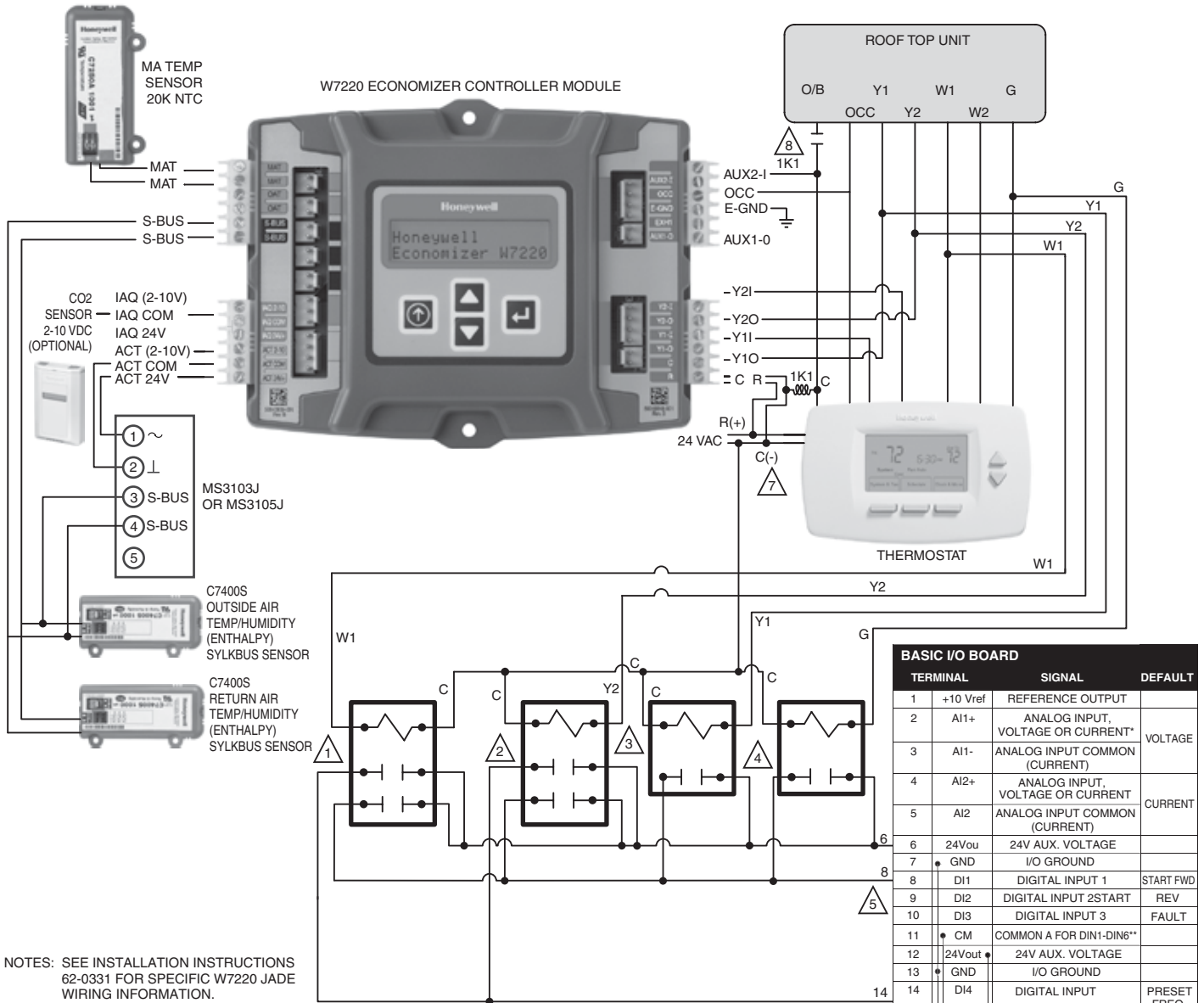


Fig 8. W7220 JADE™ Wired to a Prestige with EIM and MS3103 Communicating DCA.



NOTES: SEE INSTALLATION INSTRUCTIONS 62-0331 FOR SPECIFIC W7220 JADE WIRING INFORMATION.

- 1 RELAY 1, DPDT RELAY, NO CONTACTS ENERGIZE DIGITAL INPUT 4 FOR HIGH SPEED FAN WITH W1 CALL.
- 2 RELAY 2, DPST RELAY, NO CONTACTS ENERGIZE DIGITAL INPUT 4 FOR HIGH SPEED FAN WITH Y2 CALL.
- 3 RELAY 3, SPST RELAY, NO CONTACTS ENERGIZE DIGITAL INPUT 1 FOR LOW SPEED FAN WITH Y1 CALL.
- 4 RELAY 4, SPST RELAY, NO CONTACTS ENERGIZE DIGITAL INPUT 1 FOR LOW SPEED FAN WITH G CALL.
- 5 LOW SPEED FAN IS CONFIGURED BY SETTING "MINIMUM FREQUENCY" WITH PARAMETER M1.8 OF THE STARTUP WIZARD OF THE SMARTVFD HVAC.
- 6 HIGH SPEED FAN IS CONFIGURED BY SETTING "PRESET FREQUENCY 1" WITH PARAMETER M3.3.12 OF THE SMARTVFD HVAC.
- 7 WHEN USING A HEAT PUMP THERMOSTAT, THERMOSTAT TERMINALS MAY DIFFER: W1 MAY BE LABELED O OR B AND W2 MAY BE LABELED W.
- 8 WHEN USING A HEAT PUMP WITH DEFROST FEEDBACK, ADD AN ISOLATION RELAY BETWEEN O AND C.

I/O BOARD ON SMARTVFD HVAC DRIVE HVFDS

M35159

Fig 9. W7220 JADE with the SmartVFD HVAC for Two Speed Fan Operation.

Variable Frequency Drives Selection

To pick the right drive for your motor application, first make sure that the motor is capable of handling the additional heat that is created when varying the speed of the drive with a frequency drive. Check the motor nameplate to make sure that the insulation class is F, H or higher. Older motors with class A or B insulation should not be used with a VFD.

From the motor nameplate you will need the following information: Hertz (50 or 60), Volts, Full Load Amps, Phases of power (single or 3-phase), and RPM.

Pick the Right VFD for the Application

- Drives are typically sized to match the horsepower rating of the motor, which will be accurate 95 percent of the time. But for greatest accuracy, drives should be sized based on the Full Load Amps or current draw of the motor. The VFD must have a slightly larger output current rating.
- The environment the drive will operate in is critical for selection. Honeywell offers NEMA 1, NEMA 12 (for dusty, dirtier environments) and NEMA 3R enclosures (for falling water or rain situations).
- Because of the complexity of VFDs, a clean, conditioned space with temperatures between 14° F and 104° F provides an environment for ideal operation. Some drives are rated as standard for a slightly larger temperature range as noted herein.
 - o VFDs can be de-rated for operation at higher temperatures and/or high altitudes within limits. See specific drive family for de-rating calculations. De-rating for altitude and ambient temperature is cumulative.
 - o Heaters are an option in order to keep your VFD at its recommended temperature when mounted outdoors or in an unconditioned space. Quoted as special.

Determine specific building requirements in regards to harmonics, RFI filtration, etc. Local codes and or jobsite requirements will vary driven by building electrical requirements and requirements by the utility for the condition of power at the point of common coupling to the building.

Section 5: Variable Frequency Drives

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Product Selection - VFDs

SmartVFD COMPACT Standalone Drives



The SmartVFD COMPACT is a micro drive that lets you make the most of the available space in your control cabinet or it can be converted to a NEMA 1 enclosure. In addition, you choose only the features you require.

- 1 x 115 Vac input, 3 x 208/230 Vac output: 0.25 to 1.5 Nominal HP
- 1 x 208/230 Vac input, 3 x 208/230 Vac output: 0.25 to 3 Nominal HP
- 3 x 208/230 Vac: 0.25 to 3 Nominal HP
- 3 x 460 Vac: 0.5 to 7.5 Nominal HP
- 3 x 600 Vac: 1 to 7.5 Nominal HP
- NEMA 1 enclosure option

SmartVFD COMPACT drives are designed to operate between 14 V to 122 °F and 0-95% relative humidity, non-condensing.

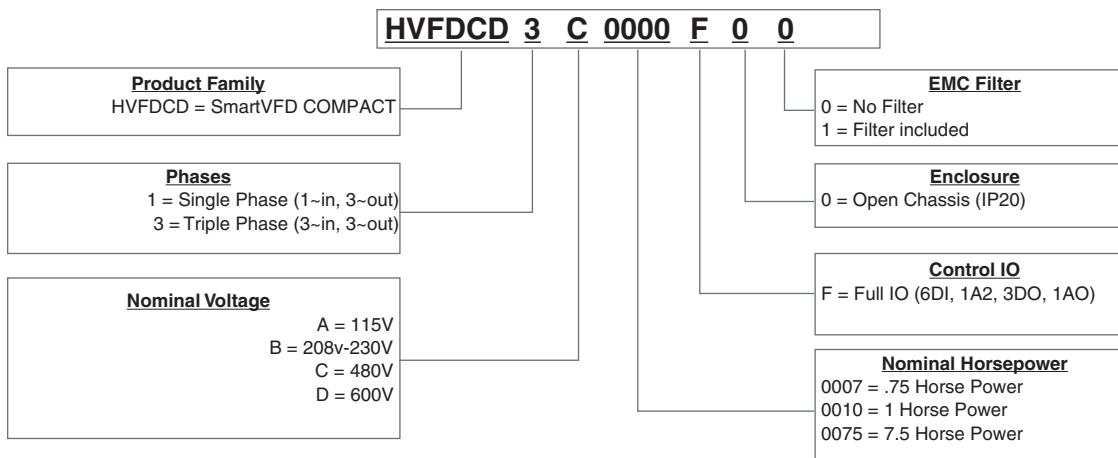
CONTROL INPUT/OUTPUT OPTIONS

Choose full or limited control configuration.

API		TERMINAL	SIGNAL, DEFAULT SETTINGS
Full	Limited	+10Vref	Reference voltage
Full	Limited	AI1	Analog input 0/4-20 mA
Full	Limited	GND	I/O ground
Full	Limited	+24Volt	24 V auxiliary voltage
Full	Limited	GND	I/O ground
Full	Limited	DIN1	Start forward
Full	Limited	DIN2	Start reverse
Full	Limited	DIN3	Fault reset
Full	Limited	A	Serial bus (Modbus RTU)
Full	Limited	B	Serial bus
Full	Limited	R011	Relay output 1, FAULT, Change over
Full	Limited	R012	Relay output 1, FAULT, NC
Full		A12	Analog input 0-10V
Full		GND	I/O ground
Full		GND	I/O ground
Full		DIN4	Preset speed 1
Full		DIN5	Preset speed 2
Full		DIN6	Preset speed 3
Full		AO	Analog output, output frequency
Full		DO	Ready
Full		R021	Relay output 2, RUN, NO
Full		R022	Relay output 2, RUN, NO
Full		R013	Relay output 1, FAULT, NO

Model Nomenclature

Select the voltage, amps, control input/output, and filters you require.



Product Selection - VFDs

SmartVFD COMPACT Standalone Drives

Product Number	Voltage	Horsepower	Frame Type	Current Ratings*	Software	Dimensions, Approximate		Weight		Description
						(inch)	(mm)	(lb)	(kg)	
HVFDCD1A0003F00/U	115V/230V 1/3	.25 HP	2	1.7A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 1 Phase 115Vac in/3 phase 230Vac out, 0.25 HP, Full IO, Open Chassis, No EMC
HVFDCD1A0005F00/U	115V/230V 1/3	.5 HP	2	2.4A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 1 Phase 115Vac in/3 phase 230Vac out, 0.5 HP, Full IO, Open Chassis, No EMC
HVFDCD1A0010F00/U	115V/230V 1/3	1 HP	2	3.7A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 1 Phase 115Vac in/3 phase 230Vac out, 1 HP, Full IO, Open Chassis, No EMC
HVFDCD1A0015F00/U	115V/230V 1/3	1.5 HP	3	4.8A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 1 Phase 115Vac in/3 phase 230Vac out, 1.5 HP, Full IO, Open Chassis, No EMC
HVFDCD1B0003F00/U	230V 1/3	.25 HP	1	1.7 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 0.25 HP, Full IO, Open Chassis, No EMC
HVFDCD1B0003F01/U	230V 1/3	.25 HP	1	1.7 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 0.25 HP, Full IO, Open Chassis, EMC
HVFDCD1B0005F00/U	230V 1/3	0.5 HP	1	2.4 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 0.5HP, Full IO, Open Chassis, No EMC
HVFDCD1B0005F01/U	230V 1/3	0.5 HP	1	2.4 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac 0.5HP, Full IO, Open Chassis, EMC
HVFDCD1B0007F00/U	230V 1/3	0.75 HP	1	2.8 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 0.75HP, Full IO, Open Chassis, No EMC
HVFDCD1B0007F01/U	230V 1/3	0.75 HP	1	2.8 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 0.75HP, Full IO, Open Chassis, EMC
HVFDCD1B0010F00/U	230V 1/3	1 HP	1	3.7 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 1HP, Full IO, Open Chassis, No EMC
HVFDCD1B0010F01/U	230V 1/3	1 HP	1	3.7 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 1HP, Full IO, Open Chassis, EMC
HVFDCD1B0015F00/U	230V 1/3	1.5 HP	2	4.8 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 1.5HP, Full IO, Open Chassis, No EMC
HVFDCD1B0015F01/U	230V 1/3	1.5 HP	2	4.8 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 1.5HP, Full IO, Open Chassis, EMC
HVFDCD1B0020F00/U	230V 1/3	2 HP	2	7.0 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 2HP, Full IO, Open Chassis, No EMC
HVFDCD1B0020F01/U	230V 1/3	2 HP	2	7.0 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 2HP, Full IO, Open Chassis, EMC
HVFDCD1B0030F00/U	230V 1/3	3 HP	3	11.0 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 3HP, Full IO, Open Chassis, No EMC
HVFDCD1B0030F01/U	230V 1/3	3 HP	3	11.0 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 1-Phase 208/230Vac in/3-Phase 208/230Vac out, 3HP, Full IO, Open Chassis, EMC
HVFDCD3B0003F00/U	230V 3/3	.25 HP	1	1.7A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out, 230Vac, 0.25 HP, Full IO, Open Chassis, No EMC
HVFDCD3B0005F00/U	230V 3/3	.5 HP	1	2.4A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out, 230Vac, 0.5 HP, Full IO, Open Chassis, No EMC
HVFDCD3B0010F00/U	230V 3/3	1 HP	2	3.7A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 3 Phase in/out, 230Vac, 1 HP, Full IO, Open Chassis, NO, Open Chassis, No EMC
HVFDCD3B0020F00/U	230V 3/3	2 HP	2	7A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 3 Phase in/out, 230Vac, 2 HP, Full IO, Open Chassis, No EMC
HVFDCD3B0030F00/U	230V 3/3	3 HP	3	11A	Full	9.9 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out, 230Vac, 3 HP, Full IO, Open Chassis, No EMC
HVFDCD3C0005F00/U	460V 3/3	0.5 HP	1	1.3 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 0.5HP, Full IO, Open Chassis, No EMC
HVFDCD3C0005F01/U	460V 3/3	0.5 HP	1	1.3 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 0.5HP, Full IO, Open Chassis, EMC
HVFDCD3C0007F00/U	460V 3/3	0.75 HP	1	1.9 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 0.75HP, Full IO, Open Chassis, No EMC
HVFDCD3C0007F01/U	460V 3/3	0.75 HP	1	1.9 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 0.75HP, Full IO, Open Chassis, EMC


*Current Ratings shown are for variable torque applications. For constant torque (150% overload current), refer to on-line installation manual.

Product Selection - VFDs

SmartVFD COMPACT Standalone Drives

Product Number	Voltage	Horsepower	Frame Type	Current Ratings*	Software	Dimensions, Approximate		Weight		Description
						(inch)	(mm)	(lb)	(kg)	
HVFDCD3C0010F00/U	460V 3/3	1 HP	1	2.4 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 1HP, Full IO, Open Chassis, No EMC
HVFDCD3C0010F01/U	460V 3/3	1 HP	1	2.4 A	Full	6.2 x 2.6 x 3.9	157 x 66 x 99	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 1HP, Full IO, Open Chassis, EMC
HVFDCD3C0015F00/U	460V 3/3	1.5 HP	2	3.3 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 1.5HP, Full IO, Open Chassis, No EMC
HVFDCD3C0015F01/U	460V 3/3	1.5 HP	2	3.3 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.2 lb	0.54 kg	COMPACT VFD, 3 Phase in/out 460Vac, 1.5HP, Full IO, Open Chassis, EMC
HVFDCD3C0020F00/U	460V 3/3	2 HP	2	4.3 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 3 Phase in/out 460Vac, 2HP, Full IO, Open Chassis, No EMC
HVFDCD3C0020F01/U	460V 3/3	2 HP	2	4.3 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 3 Phase in/out 460Vac, 2HP, Full IO, Open Chassis, EMC
HVFDCD3C0030F00/U	460V 3/3	3 HP	2	5.6 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 3 Phase in/out 460Vac, 3HP, Full IO, Open Chassis, No EMC
HVFDCD3C0030F01/U	460V 3/3	3 HP	2	5.6 A	Full	7.7 x 3.5 x 4	196 x 90 x 102	1.5 lb	0.68 kg	COMPACT VFD, 3 Phase in/out 460Vac, 3HP, Full IO, Open Chassis, EMC
HVFDCD3C0040F00/U	460V 3/3	4 HP	3	7.6 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 460Vac, 4HP, Full IO, Open Chassis, No EMC
HVFDCD3C0040F01/U	460V 3/3	4 HP	3	7.6 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 460Vac, 4HP, Full IO, Open Chassis, EMC
HVFDCD3C0050F00/U	460V 3/3	5 HP	3	9.0 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 460Vac, 5HP, Full IO, Open Chassis, No EMC
HVFDCD3C0050F01/U	460V 3/3	5 HP	3	9.0 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 460Vac, 5HP, Full IO, Open Chassis, EMC
HVFDCD3C0075F00/U	460V 3/3	7.5 HP	3	12.0 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 460Vac, 7.5HP, Full-IO, Open Chassis, No EMC
HVFDCD3C0075F01/U	460V 3/3	7.5 HP	3	12.0 A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 460Vac, 7.5HP, Full IO, Open Chassis, EMC
HVFDCD3D0010F00/U	600V 3/3	1 HP	3	2A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 600Vac, 1 HP, Full IO, Open Chassis, No EMC
HVFDCD3D0020F00/U	600V 3/3	2 HP	3	3.6A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 600Vac, 2 HP, Full IO, Open Chassis, No EMC
HVFDCD3D0030F00/U	600V 3/3	3 HP	3	5A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 600Vac, 3 HP, Full IO, Open Chassis, No EMC
HVFDCD3D0050F00/U	600V 3/3	5 HP	3	7.6A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 600Vac, 5 HP, Full IO, Open Chassis, No EMC
HVFDCD3D0075F00/U	600V 3/3	7.5 HP	3	10.4A	Full	10.2 x 3.9 x 4.3	251 x 100 x 109	2.2 lb	1 kg	COMPACT VFD, 3 Phase in/out 600Vac, 7.5 HP, Full IO, Open Chassis, No EMC

*Current Ratings shown are for variable torque applications. For constant torque (150% overload current), refer to on-line installation manual.

Product Number	Description	Used With	
HVFDCABLE/U	SmartVFD HVAC and COMPACT USB Commissioning Cable	SmartVFD HVAC and SmartVFD COMPACT	
HVFDCDMCA/U	COMPACT VFD Commissioning device	SmartVFD COMPACT	
HVFDCDMCAKIT/U	COMPACT VFD Commissioning kit	SmartVFD COMPACT	
HVFDCDNEMA1FR1/U	COMPACT VFD NEMA 1 kit - Frame size 1	SmartVFD COMPACT	
HVFDCDNEMA1FR2/U	COMPACT VFD NEMA 1 kit - Frame Size 2	SmartVFD COMPACT	
HVFDCDNEMA1FR3/U	COMPACT VFD NEMA 1 kit - Frame size 3	SmartVFD COMPACT	
HVFDCDTRAINER/U	COMPACT VFD Training Demonstration kit	SmartVFD COMPACT	

Submittal Data - VFDs

SmartVFD COMPACT Standalone Drives



The SmartVFD COMPACT drive is a micro drive designed to fit in your enclosure or become a NEMA 1 enclosure whichever is required for your smaller frequency drive applications.

FEATURES

Modular Design

- Full or limited input / output options
- NEMA 1 kit
- Optional EMC filter
- Accessory PC interface

Easy to Install

- DIN-rail or screw mounting
- Zero clearance side-by-side mounting

Easy Communication

- Intuitive user interface
- Accessory PC interface
- Free PC Tool with optional adaptor turn your computer into a programming window to setup, control, monitor and diagnose in real time or for off-line editing and backup
- PI control
- Program without main power supply. See page 208 for format
- Modbus RTU

Rugged, High Performance

- Plenum rated
- Optional EMC Filter on most models

Warranty

- 3 years

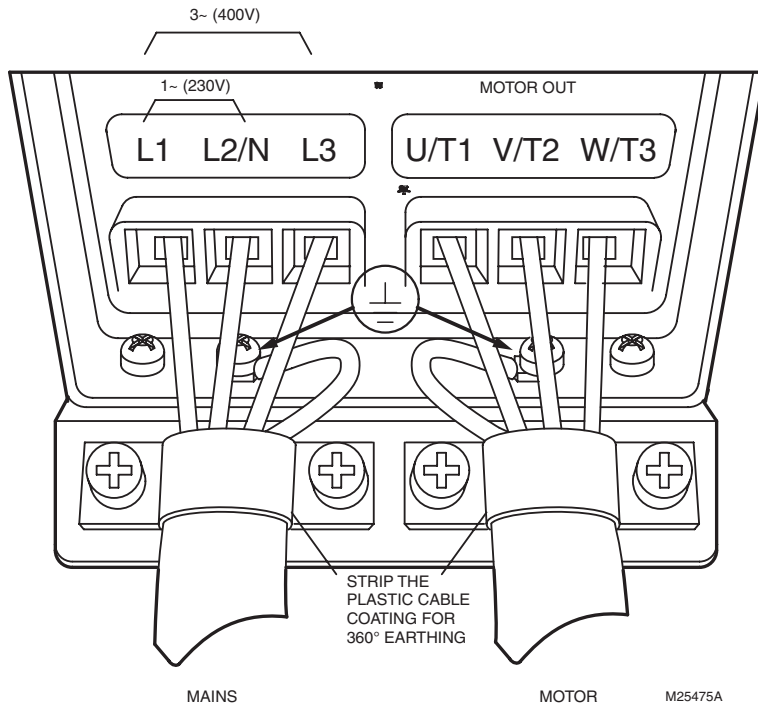
SmartVFD COMPACT Technical Data

Mains connection	Input voltage U_m	115V, -15%...+10% 1~	
		208...240V, -15%...+10% 1~	
		208...240V, -15%...+10% 3~	
		380 - 480V, -15%...+10% 3~	
Supply network	Input frequency	45...66 Hz	
		Line current THD	> 120%
		Connection to mains	Once per minute or less (normal case)
		Networks	SmartVFD COMPACT (400V) cannot be used with corner grounded networks
Motor connection	Output current	Maximum short circuit current has to be < 50kA	
		Output voltage	0 - U_m
		Starting current/torque	Continuous rated I_n at ambient temperature max. +122 °F (50 °C) for 115 Vac, 460 Vac and 600 Vac and +104 °F (40 °C), for 208 Vac/230 Vac, overload 1.5 x I_n max. 1 min/10 min
		Output frequency	Current 2 x I_n for 2 secs in every 20 sec period. Torque depends on motor
Control characteristics	Frequency resolution	0...320 Hz	
		0,01 Hz	
		Control method	Frequency Control U/f Open Loop Sensorless Vector Control
		Switching frequency	1,5...16 kHz; Factory default 6 kHz
		Frequency reference	Resolution 0.01 Hz
		Field weakening point	30...320 Hz
		Acceleration time	0.1...3000 sec
		Deceleration time	0.1...3000 sec
Ambient conditions	Braking torque	100%* T_n with brake option (only in 3~ drives sizes MI2 and MI3) 30%* T_n without brake option	
		Ambient operating temperature	+14 °F (-10 °C) (no frost)...+104/122 °F (40/50 °C) for 115 Vac, 460 Vac and 600 Vac and +104 °F (40 °C), for 208 Vac/230 Vac, rated loadability I_n
		Storage temperature	-40 °F (-40 °C)...+158 °F (+70 °C)
		Relative humidity	0...95% RH, non-condensing, non-corrosive, no dripping water
		Air quality: chemical vapors mech. Particles	IEC 721-3-3, unit in operation, class 3C2 IEC 721-3-3, unit in operation, class 3S2
		Altitude	100% load capacity (no derating) up to 3280 ft. (1000m). 1% derating for each 328 ft. (100m) above 3280 ft. max. 6560 ft. (2000m)
		Vibration: EN60068-2-6"	3...150 Hz Displacement amplitude .04 (peak) inches, 1 (peak) mm, at 3...15.8 Hz. Max acceleration amplitude 1 G at 15.8...150 Hz
		Shock IEC 68-2-27	UPS Drop Test (for applicable UPS weights) Storage and shipping: max 15 G, 11 ms (in package)
EMC	Enclosure class	IP20	
		Pollution degree	PD2
		Immunity	Complies with EN50082-1, -2, EN61800-3
Standards	Emissions	115V: Complies with EMC category C4 230V: Complies with EMC category C2; with an internal RFI filter 400V: Complies with EMC category C2; with an internal RFI filter 600V: Complies with EMC category C4 All: No EMC emission protection (Honeywell level N): Without RFI filter	
		For EMC: EN61800-3 For safety: UL508C, EN61800-5-1	
Certificates and manufacturer's declarations of conformity	Emissions	For safety: CB, CE, UL, cUL For EMC: CE, CB, c-tick (see unit nameplate for more detailed approvals)	

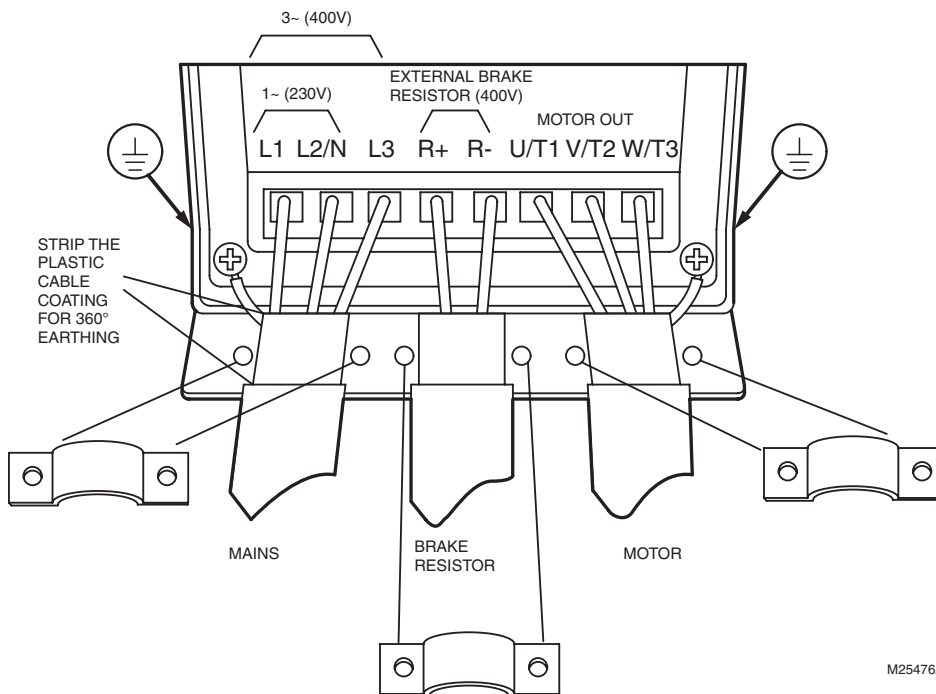
SmartVFD COMPACT drives can be mounted side by side. Each drive requires 3.0 inches above and 2.0 inches below of free space, for cooling airflow circulation.

Power Wiring

Power Connections, Frame Size MI1



Power Connections, Frame Size MI2 - MI3



Wiring Diagrams - VFDs

SmartVFD COMPACT Standalone Drives

Control Inputs and Outputs

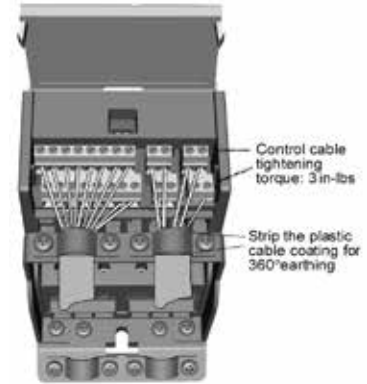
API FULL

Terminal	Signal	Factory preset	Description
1	+10Vre	Ref. voltage out	Maximum load 10 mA
2	AI1	Analog signal in 1	Freq. reference ^{P)} 0 - +10 V Ri = 200 kΩ (min)
3	GND	I/O signal ground	
6	24Vout	24V output for DI's	±20 %, max. load 50 mA
7	GND	I/O signal ground	
8	DI1	Digital input 1	Start forward ^{P)} 0 - +30 V Ri = 12 kΩ min
9	DI2	Digital input 2	Start reverse ^{P)}
10	DI3	Digital input 3	Preset speed B0 ^{P)}
A	A	RS485 signal A	FB Communication
B	B	RS485 signal B	FB Communication
4	AI2	Analog signal in 2	PI actual value ^{P)} 0(4) - 20 mA, Ri = 200Ω
5	GND	I/O signal ground	
13	GND	I/O signal ground	
14	DI4	Digital input 4	Preset speed B1 ^{P)} 0 - +30 V Ri = 12 kΩ (min)
15	DI5	Digital input 5	Fault reset ^{P)}
16	DI6	Digital input 6	Disable PI contr. ^{P)}
18	AO	Output frequency ^{P)}	0(4) - 20 mA, RL = 500Ω
20	DO	Digital signal out	Active = READY ^{P)} Open collector, max. load 48V/50mA
22	RO 11	Relay out 1	Active = RUN ^{P)} Max. switching load: 250Vac/2A or 250Vdc/ 0.4A
23	RO 12		
24	RO 21	Relay out 2	Active = FAULT ^{P)} Max. switching load: 250Vac/2A or 250Vdc/ 0.4A
25	RO 22		
26	RO 23		

Table 1: SmartVFD COMPACT General purpose application default I/O configuration and connections for API FULL version.

P) = Programmable function, parameter lists and descriptions.

Control Wiring



API LIMITED

Terminal	Signal	Factory preset	Description
1	+10Vre	Ref. voltage out	Maximum load 10 mA
2	AI1	Analog signal in 1	Freq. reference ^{P)} 0 - +10 V Ri = 200 kΩ
3	GND	I/O signal ground	
6	24Vout	24V output for DI's	±20 %, max. load 50 mA
7	GND	I/O signal ground	
8	DI1	Digital input 1	Start forward ^{P)} 0 - +30 V Ri = 12 kΩ min
9	DI2	Digital input 2	Start reverse ^{P)}
10	DI3	Digital input 3	Preset speed B0 ^{P)}
A	A	RS485 signal A	FB Communication
B	B	RS485 signal B	FB Communication
24	RO 21	Relay out 2	ACTIVE (Relay opened) = FAULT ^{P)} Max. switching load: 250Vac/2A or 250Vdc/ 0.4A
25	RO 22		

Table 2: SmartVFD COMPACT General purpose application default I/O configuration and connections for API LIMITED version.

P) = Programmable function, parameter lists and descriptions.

the speed you need



Fast Installation. Fast Startup. Fast Savings.

Think of the time you'll save per job if you have a variable frequency drive (VFD) that covers nearly all of your commercial heating, ventilation and air conditioning (HVAC) applications, is a breeze to install, takes minutes to program, and is backed by Honeywell dependability. You'd increase your profitability, and your customers would enjoy a lower installed cost and years of energy savings.

Honeywell

For more information on VFD CORE, call **1-800-466-3993**
or visit **customer.honeywell.com**

Product Selection - VFDs

SmartVFD HVAC Standalone Drives



SmartVFD HVAC drives are designed to meet all your specification and communication requirements for variable torque HVAC applications.

- 3 x 208/230 Vac: 0.75 to 125 Nominal HP
- 3 x 480 Vac: 1.5 to 250 Nominal HP
- NEMA 1, NEMA 12, and NEMA 3R enclosure options
- Disconnect option
- Bypass options: 2 contactor, 3 contactor, or 3 contactor auto-bypass

Smart VFD drives may operate above 104+ °F or above 1000 meters above sea level if the current draw is de-rated. De-rating for temperature and altitude is cumulative.

De-rating for Temperature

For installations where the ambient temperature will be above 104 °F, (40 °C):

- De-rate the drive output current rating by 1.5% for every 1.8 °F, (1 °C)
- The maximum operating temperature is 122 °F, (50 °C)

Example:

Desire 9.0 Amps at 122 °F. De-rate = 15%

Calculate Amps needed: $X - (X \times .15) = 9$

10.6 Amps are required to provide 9 Amps at 122 °F.

De-rating for Altitude

For installations where ambient temperature will be above 1000 meters (3281 feet) above sea level:

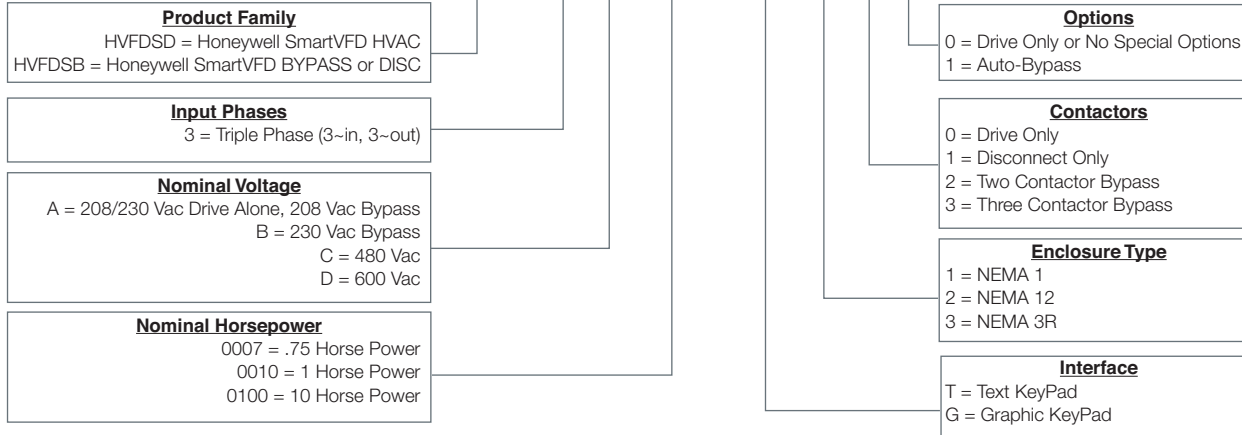
- De-rate the drive output current rating by 1% for every 100 m (328 feet) over 1000 m (3281 feet)
- Maximum altitude is 4500 m (14764 feet) above sea level

If the drive will be mounted where both temperature and altitude de-rating apply, perform one calculation and use the result as the starting Amps for the second.

Note: I/O signals over 2000 meters must be 120 V or 24 V signals

Model Nomenclature

HVFSD 3 C 0100 G 0 0 0



Product Number	Voltage	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
HVFSD3A0007G100/U	208 Vac/230 Vac	0.75 HP	4	NEMA 1	3.7A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0007G200/U	208 Vac/230 Vac	0.75 HP	4	NEMA 12	3.7A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0007G300/U	208 Vac/230 Vac	0.75 HP	4	NEMA 3R	3.7A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3A0010G100/U	208 Vac/230 Vac	1 HP	4	NEMA 1	4.8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0010G200/U	208 Vac/230 Vac	1 HP	4	NEMA 12	4.8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0010G300/U	208 Vac/230 Vac	1 HP	4	NEMA 3R	4.8A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3A0015G100/U	208 Vac/230 Vac	1.5 HP	4	NEMA 1	6.6A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0015G200/U	208 Vac/230 Vac	1.5 HP	4	NEMA 12	6.6A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0015G300/U	208 Vac/230 Vac	1.5 HP	4	NEMA 3R	6.6A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3A0020G100/U	208 Vac/230 Vac	2 HP	4	NEMA 1	8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0020G200/U	208 Vac/230 Vac	2 HP	4	NEMA 12	8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0020G300/U	208 Vac/230 Vac	2 HP	4	NEMA 3R	8A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3A0030G100/U	208 Vac/230 Vac	3 HP	4	NEMA 1	11A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0030G200/U	208 Vac/230 Vac	3 HP	4	NEMA 12	11A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3A0030G300/U	208 Vac/230 Vac	3 HP	4	NEMA 3R	11A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3A0050G100/U	208 Vac/230 Vac	5 HP	5	NEMA 1	18A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3A0050G200/U	208 Vac/230 Vac	5 HP	5	NEMA 12	18A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3A0050G300/U	208 Vac/230 Vac	5 HP	5	NEMA 3R	18A	20.5 x 24 x 10	520.7 x 609.6 x 254	58 lb	26.3 kg
HVFSD3A0075G100/U	208 Vac/230 Vac	7.5 HP	5	NEMA 1	24A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3A0075G200/U	208 Vac/230 Vac	7.5 HP	5	NEMA 12	24A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3A0075G300/U	208 Vac/230 Vac	7.5 HP	5	NEMA 3R	24A	20.5 x 24 x 10	520.7 x 609.6 x 254	58 lb	26.3 KG
HVFSD3A0100G100/U	208 Vac/230 Vac	10 HP	5	NEMA 1	31A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3A0100G200/U	208 Vac/230 Vac	10 HP	5	NEMA 12	31A	5.7 x 16.5 x 8.4	144.78 x 419.1 x 213.36	22 lb	9.97 kg
HVFSD3A0100G300/U	208 Vac/230 Vac	10 HP	5	NEMA 3R	31A	20.5 x 24 x 10	520.7 x 609.6 x 254	58 lb	26.3 kg
HVFSD3A0150G100/U	208 Vac/230 Vac	15 HP	6	NEMA 1	48A	7.7 x 21.9 x 9	196 x 556 x 229	44.1 lb	20 kg
HVFSD3A0150G200/U	208 Vac/230 Vac	15 HP	6	NEMA 12	48A	7.7 x 21.9 x 9	196 x 556 x 229	44.1 lb	20 kg
HVFSD3A0150G300/U	208 Vac/230 Vac	15 HP	6	NEMA 3R	48A	28.5 x 36 x 10	723.9 x 914.4 x 254	80 lb	36.3 kg
HVFSD3A0200G100/U	208 Vac/230 Vac	20 HP	6	NEMA 1	62A	7.7 x 21.9 x 9	196 x 556 x 229	44.1 lb	20 kg
HVFSD3A0200G200/U	208 Vac/230 Vac	20 HP	6	NEMA 12	62A	7.7 x 21.9 x 9	196 x 556 x 229	44.1 lb	20 kg
HVFSD3A0200G300/U	208 Vac/230 Vac	20 HP	6	NEMA 3R	62A	28.5 x 36 x 10	723.9 x 914.4 x 254	80 lb	36.3 kg
HVFSD3A0250G100/U	208 Vac/230 Vac	25 HP	7	NEMA 1	75A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3A0250G200/U	208 Vac/230 Vac	25 HP	7	NEMA 12	75A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3A0250G300/U	208 Vac/230 Vac	25 HP	7	NEMA 3R	75A	28.5 x 48 x 12	723.9 x 1219.2x 304.8	130 lb	59 kg
HVFSD3A0300G100/U	208 Vac/230 Vac	30 HP	7	NEMA 1	88A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3A0300G200/U	208 Vac/230 Vac	30 HP	7	NEMA 12	88A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3A0300G300/U	208 Vac/230 Vac	30 HP	7	NEMA 3R	88A	28.5 x 48 x 12	723.9 x 1219.2x 304.8	130 lb	59 kg
HVFSD3A0400G100/U	208 Vac/230 Vac	40 HP	7	NEMA 1	105A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3A0400G200/U	208 Vac/230 Vac	40 HP	7	NEMA 12	105A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3A0400G300/U	208 Vac/230 Vac	40 HP	7	NEMA 3R	105A	28.5 x 48 x 12	723.9 x 1219.2x 304.8	130 lb	59 kg
HVFSD3A0500G100/U	208 Vac/230 Vac	50 HP	8	NEMA 1	140A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A0500G200/U	208 Vac/230 Vac	50 HP	8	NEMA 12	140A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A0500G300/U	208 Vac/230 Vac	50 HP	8	NEMA 3R	140A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A0600G100/U	208 Vac/230 Vac	60 HP	8	NEMA 1	170A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg

Product Selection - VFDs

SmartVFD HVAC Standalone Drives

Product Number	Voltage	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
HVFSD3A0600G200/U	208 Vac/230 Vac	60 HP	8	NEMA 12	170A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A0600G300/U	208 Vac/230 Vac	60 HP	8	NEMA 3R	170A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A0750G100/U	208 Vac/230 Vac	75 HP	8	NEMA 1	205A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A0750G200/U	208 Vac/230 Vac	75 HP	8	NEMA 12	205A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A0750G300/U	208 Vac/230 Vac	75 HP	8	NEMA 3R	205A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3A1000G100/U	208 Vac/230 Vac	100 HP	9	NEMA 1	261A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 kg
HVFSD3A1000G200/U	208 Vac/230 Vac	100 HP	9	NEMA 12	261A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 Kg
HVFSD3A1250G100/U	208 Vac/230 Vac	125 HP	9	NEMA 1	310A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 kg
HVFSD3A1250G200/U	208 Vac/230 Vac	125 HP	9	NEMA 12	310A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 Kg
HVFSD3C0015G100/U	460 Vac	1.5 HP	4	NEMA 1	3.4A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0015G200/U	460 Vac	1.5 HP	4	NEMA 12	3.4A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0015G300/U	460 Vac	1.5 HP	4	NEMA 3R	3.4A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3C0020G100/U	460 Vac	2 HP	4	NEMA 1	4.8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0020G200/U	460 Vac	2 HP	4	NEMA 12	4.8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0020G300/U	460 Vac	2 HP	4	NEMA 3R	4.8A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3C0030G100/U	460 Vac	3 HP	4	NEMA 1	5.6A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0030G200/U	460 Vac	3 HP	4	NEMA 12	5.6A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0030G300/U	460 Vac	3 HP	4	NEMA 3R	5.6A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3C0040G100/U	460 Vac	4 HP	4	NEMA 1	8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0040G200/U	460 Vac	4 HP	4	NEMA 12	8A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0040G300/U	460 Vac	4 HP	4	NEMA 3R	8A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3C0050G100/U	460 Vac	5 HP	4	NEMA 1	9.6A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0050G200/U	460 Vac	5 HP	4	NEMA 12	9.6A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0050G300/U	460 Vac	5 HP	4	NEMA 3R	9.6A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3C0075G100/U	460 Vac	7.5 HP	4	NEMA 1	12A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0075G200/U	460 Vac	7.5 HP	4	NEMA 12	12A	5 x 12.9 x 7.5	127 x 327.66 x190.5	13.2 lb	5.98 kg
HVFSD3C0075G300/U	460 Vac	7.5 HP	4	NEMA 3R	12A	20.5 x 20 x 10	520.7 x 508 x 254	39 lb	17.7 kg
HVFSD3C0100G100/U	460 Vac	10 HP	5	NEMA 1	16A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3C0100G200/U	460 Vac	10 HP	5	NEMA 12	16A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3C0100G300/U	460 Vac	10 HP	5	NEMA 3R	16A	20.5 x 24 x 10	520.7 x 609.6 x 254	58 lb	26.3 kg
HVFSD3C0150G100/U	460 Vac	15 HP	5	NEMA 1	23A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3C0150G200/U	460 Vac	15 HP	5	NEMA 12	23A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3C0150G300/U	460 Vac	15 HP	5	NEMA 3R	23A	20.5 x 24 x 10	520.7 x 609.6 x 254	58 lb	26.3 kg
HVFSD3C0200G100/U	460 Vac	20 HP	5	NEMA 1	31A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3C0200G200/U	460 Vac	20 HP	5	NEMA 12	31A	5.7 x 16.5 x 8.4	144.78 x 419.1 x213.36	22 lb	9.97 kg
HVFSD3C0200G300/U	460 Vac	20 HP	5	NEMA 3R	31A	20.5 x 24 x 10.5	520.7 x 609.6 x 254	58 lb	26.3 kg
HVFSD3C0250G100/U	460 Vac	25 HP	6	NEMA 1	38A	7.7 x 21.9 x 9	196 x 556 x229	44.1 lb	20 kg
HVFSD3C0250G200/U	460 Vac	25 HP	6	NEMA 12	38A	7.7 x 21.9 x 9	196 x 556 x229	44.1 lb	20 kg
HVFSD3C0250G300/U	460 Vac	25 HP	6	NEMA 3R	38A	28.5 x 36 x 10.5	723.9 x 914.4 x 254	80 lb	36.3 kg
HVFSD3C0300G100/U	460 Vac	30 HP	6	NEMA 1	46A	7.7 x 21.9 x 9	196 x 556 x229	44.1 lb	20 kg
HVFSD3C0300G200/U	460 Vac	30 HP	6	NEMA 12	46A	7.7 x 21.9 x 9	196 x 556 x229	44 lb	20 kg
HVFSD3C0300G300/U	460 Vac	30 HP	6	NEMA 3R	46A	28.5 x 36 x 10.5	723.9 x 914.4 x 254	80 lb	36.3 kg
HVFSD3C0400G100/U	460 Vac	40 HP	6	NEMA 1	61A	7.7 x 21.9 x 9	196 x 556 x229	44.1 lb	20 kg
HVFSD3C0400G200/U	460 Vac	40 HP	6	NEMA 12	61A	7.7 x 21.9 x 9	196 x 556 x229	44.1 lb	20 kg
HVFSD3C0400G300/U	460 Vac	40 HP	6	NEMA 3R	61A	28.5 x 36 x 10.5	723.9 x 914.4 x 254	80 lb	36.3 kg
HVFSD3C0500G100/U	460 Vac	50 HP	7	NEMA 1	72A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3C0500G200/U	460 Vac	50 HP	7	NEMA 12	72A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3C0500G300/U	460 Vac	50 HP	7	NEMA 3R	72A	28.5 x 48 x 12.5	723.9 x 1219.2x 304.8	130 lb	59 kg
HVFSD3C0600G100/U	460 Vac	60 HP	7	NEMA 1	87A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3C0600G200/U	460 Vac	60 HP	7	NEMA 12	87A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3C0600G300/U	460 Vac	60 HP	7	NEMA 3R	87A	28.5 x 48 x 12.5	723.9 x 1219.2x 304.8	130 lb	59 kg
HVFSD3C0750G100/U	460 Vac	75 HP	7	NEMA 1	105A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3C0750G200/U	460 Vac	75 HP	7	NEMA 12	105A	9.3 x 26 x 10.2	236 x 660 x259	82.7 lb	37.5 kg
HVFSD3C0750G300/U	460 Vac	75 HP	7	NEMA 3R	105A	28.5 x 48 x 12.5	723.9 x 1219.2x 304.8	130 lb	59 kg
HVFSD3C1000G100/U	460 Vac	100 HP	8	NEMA 1	140A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3C1000G200/U	460 Vac	100 HP	8	NEMA 12	140A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3C1250G100/U	460 Vac	125 HP	8	NEMA 1	170A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3C1250G200/U	460 Vac	125 HP	8	NEMA 12	170A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3C1500G100/U	460 Vac	150 HP	8	NEMA 1	205A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3C1500G200/U	460 Vac	150 HP	8	NEMA 12	205A	11.4 x 38 x 13.5	290 x 965 x 343	154.3 lb	70 kg
HVFSD3C2000G100/U	460 Vac	200 HP	9	NEMA 1	261A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 Kg
HVFSD3C2000G200/U	460 Vac	200 HP	9	NEMA 12	261A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 Kg
HVFSD3C2500G100/U	460 Vac	250 HP	9	NEMA 1	310A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 kg
HVFSD3C2500G200/U	460 Vac	250 HP	9	NEMA 12	310A	18.9 x 45.3 x 14.4	480 x 1150 x 366	238.1 lb	108 Kg

Accessories & Parts - VFDs

SmartVFD HVAC Standalone Drives

VFDs



Product Number	Description	Used With	
32006630-001/U	Lon Communication Card (NXOPTC4)	SmartVFD HVAC & NXS	
HFVDSDMOUNTKIT/U	SmartVFD HVAC panel mount kit for NEMA 12 Install, 3-meter cable	SmartVFD HVAC	
HFVDSDBATTERY/U	Battery Package, 5 pcs, for Real Time Clock	SmartVFD HVAC	
HFVSDSFANFR4/U	SmartVFD HVAC Frame 4 Replacement Fan	SmartVFD HVAC	
HFVSDSFANFR5/U	SmartVFD HVAC Frame 5 Replacement Fan	SmartVFD HVAC	
HFVSDSFANFR6/U	SmartVFD HVAC Frame 6 Replacement Fan	SmartVFD HVAC	
HFVSDSFANFR7/U	SmartVFD HVAC Frame 7 Replacement Fan	SmartVFD HVAC	
HFVSDSFLANGEFR4/U	SmartVFD HVAC Flange Mounting Kit for Frame 4	SmartVFD HVAC	
HFVSDSFLANGEFR5/U	SmartVFD HVAC Flange Mounting Kit for Frame 5	SmartVFD HVAC	
HFVSDSFLANGEFR6/U	SmartVFD HVAC Flange Mounting Kit for Frame 6	SmartVFD HVAC	
HFVSDSFLANGEFR7/U	SmartVFD HVAC Flange Mounting Kit for Frame 7	SmartVFD HVAC	
HFVSDSGRAPHICKP/U	SmartVFD HVAC Replacement Graphical Keypad	SmartVFD HVAC	
HFVSDSINSTALLFR4/U	SmartVFD HVAC Replacement Installation Accessories Frame 4	SmartVFD HVAC	
HFVSDSINSTALLFR5/U	SmartVFD HVAC Replacement Installation Accessories Frame 5	SmartVFD HVAC	
HFVSDSINSTALLFR6/U	SmartVFD HVAC Replacement Installation Accessories Frame 6	SmartVFD HVAC	
HFVSDMOUNTKIT/U	SmartVFD HVAC Panel Mount Kit for NEMA 12 Install; 3-meter cable	SmartVFD HVAC	
HFVSDSNEMA12FR4/U	SmartVFD HVAC NEMA 12 Kit Frame 4	SmartVFD HVAC	
HFVSDSNEMA12FR5/U	SmartVFD HVAC NEMA 12 Kit Frame 5	SmartVFD HVAC	
HFVSDSNEMA12FR6/U	SmartVFD HVAC NEMA 12 Kit Frame 6	SmartVFD HVAC	
HFVSDSOPT1AI2AO/U	1 x AI, 2 x AO (isolated, D- and E-slot compatible)	SmartVFD HVAC	
HFVSDSOPT1RO5DI/U	1 x RO, 5 x DI (42-240VAC, D- and E-slot compatible)	SmartVFD HVAC	
HFVSDSOPT2RO1T/U	2 x RO + Thermistor (D- and E-slot compatible)	SmartVFD HVAC	
HFVSDSOPT3RO/U	3 x RO (D- and E-slot compatible)	SmartVFD HVAC	
HFVSDSOPT6DI/U	6 x DI / DO Programmable (D- and E-slot compatible)	SmartVFD HVAC	
HFVSDSDREP2RO1T/U	2 x RO + Thermistor (B-slot compatible)	SmartVFD HVAC	
HFVSDSDREP3RO/U	3 x RO (B-slot compatible)	SmartVFD HVAC	
HFVSDSTRAINER/U	SmartVFD HVAC Training Demonstration Kit with 115V Transformer to 230V	SmartVFD HVAC	
HFVDCABLE/U	SmartVFD HVAC and COMPACT USB Commissioning Cable	SmartVFD HVAC and SmartVFD COMPACT	

Submittal Data - VFDs

SmartVFD HVAC Standalone Drives



The SmartVFD HVAC is a variable frequency drive designed for use in HVAC applications to control the speed of HVAC pumps and fans in order to maximize energy efficiency. Smart VFD is also designed to run 3 phase standard and high efficiency induction motors by varying the output voltage and frequency.

The SmartVFD is easy to install, communicates effectively with building control systems to minimize energy consumption. The SmartVFD BYPASS is easy to specify, select, install and commission. It is the perfect complement to the advanced capabilities of the SmartVFD HVAC.

The SmartVFD BYPASS configurations make it easy for you to select the right bypass to complete your drive package. All configurations are available in NEMA 1, NEMA 12 and ventilated NEMA 3R.

FEATURES

Easy Communication

- Start-up Wizards—All you have to do is tell the VFD whether you have a pump or a fan, enter nominal motor information, and you are up and running
- Graphic Interface—The easy-to-use keypad and interface deliver menu-driven programming and monitoring for fast, uniform commissioning. It's also easy for the building owner or manager to learn and use, helping to reduce service calls. Plus, a manual is built into the keypad for easy access when needed.
- Built-In Communications—With BACnet®, N2 and Modbus built in, your customers will enjoy a lower total installed cost and reliable communications with the building management system.
- PC Software Wizards—Commissioning, programming and troubleshooting are all a snap thanks to these guided Startup and PID wizards.
- Built-In configurable inputs and outputs enable the flexibility to adapt to your application without additional external logic.

Built-in Protection

- 5% DC Choke for harmonic protection.
- Standard RFI Filter—Ensures that EMC/RFI requirements are met.
- Fire Mode for safe operation.
- Enclosure classes NEMA 1, NEMA 12 or NEMA 3R
- Bypass Options—Meet specifications and system critical applications with a comprehensive bypass offering.
- Motor Switch Ride-Through—Easy, fault-free maintenance.
- Overvoltage trip and undervoltage trip protection
- Ground fault protection
- Mains and motor phase supervisions
- Overcurrent and unit overtemperature protection
- Motor overload, motor stall and motor underload protection
- Short-circuit protection of +24V and +10V reference voltage

Smart Technology

- 6-pulse IGBT, PWM technology
- Intelligent cooling arrangement. Control and power airflow separated.
- Real-Time Clock—Battery included
- 98% Displacement Power Factor Rating
- 98.5% Efficiency at full load
- 0-320Hz output frequency capabilities

Compliance

- 100KA SCCR (Short Circuit Current Requirement) compliant
- EMC harmonics: EN 61000-3-12 compliant.
- EMC radio frequencies: EN 61800-3 Category C2 built in. Complies with radiated and conducted emissions.
- RoHS compliant, no electrolytic capacitors, no lead in the circuit boards.
- American Recovery and Reinvestment Act (ARRA)

Warranty

- 3 years
- Repair available

Table 1. General.

Communication	RS485	Standard: Modbus™ RTU, BACnet, N2
	Ethernet	Standard: Modbus/TCP, BACnet/IP
Software features	Energy-saving functions	<ul style="list-style-type: none"> Real-time clock for timed functions Energy monitor for kWh monitoring Sleep function to minimize downtime energy
	Protections	<ul style="list-style-type: none"> Overload and underload protections (e.g. broken fan and dry pump) Motor thermal protection Missing phase detection Automatic reset to avoid interruption of the process
Process control	2 * PID	For process control
	Multipump	For replacing the pump controller
	Flying start	For tripless catching of spinning fan
Human interfaces	Keypad	Graphical display with built-in manual and wizards.
	PC Tools	<ul style="list-style-type: none"> PC Commissioning Tool for easy commissioning, monitoring, and troubleshooting. Energy Savings calculator to estimate cost avoidance. Product selection tool for selecting VFD and bypass, and creating submittal documents.

Table 2. I/O Connections. (Continued)

Table 2. I/O Connections.

Basic I/O Board		
Terminal		Signal
1	+10	Reference output
2	AI1+	Analogue input, voltage or current
3	AI1-	Analogue input common (current)
4	AI2+	Analogue input, voltage or current
5	AI2-	Analogue input common (current)
6	24	24 V aux. voltage
7	GND	I/O ground
8	DI1	Digital input 1
9	DI2	Digital input 2
10	DI3	Digital input 3
11	CM	Common A for DI1-DI6
12	24	24 V aux. voltage
13	GND	I/O ground
14	DI4	Digital input 4
15	DI5	Digital input 5
16	DI6	Digital input 6
17	CM	Common A for DI1-DI6

Basic I/O Board		
Terminal		Signal
18	AO1+	Analogue signal (+output)
19	AO-/GND	Analogue output common
30	+24	24 V auxiliary input voltage
A	RS485	Differential receiver/transmitter
B	RS485	Differential receiver/transmitter

Table 3. I/O Connections, Relay Board 2.

Relay Board 2		
Terminal		Signal
21	Relay output 1*	Switching capacity 24VDC/8A
22		250VAC/8A
23		125VDC/0.4A Min. switching load 5V/10mA
24	Relay output 2*	Switching capacity 24VDC/8A
25		250VAC/8A
26		125VDC/0.4A Min. switching load 5V/10mA
28	Thermistor input	Rtrip = 4.7 kΩ (PTC); Measuring
29		voltage 3.5V

Submittal Data - VFDs

SmartVFD HVAC Standalone Drives

Table 4. SmartVFD HVAC Technical Specifications.

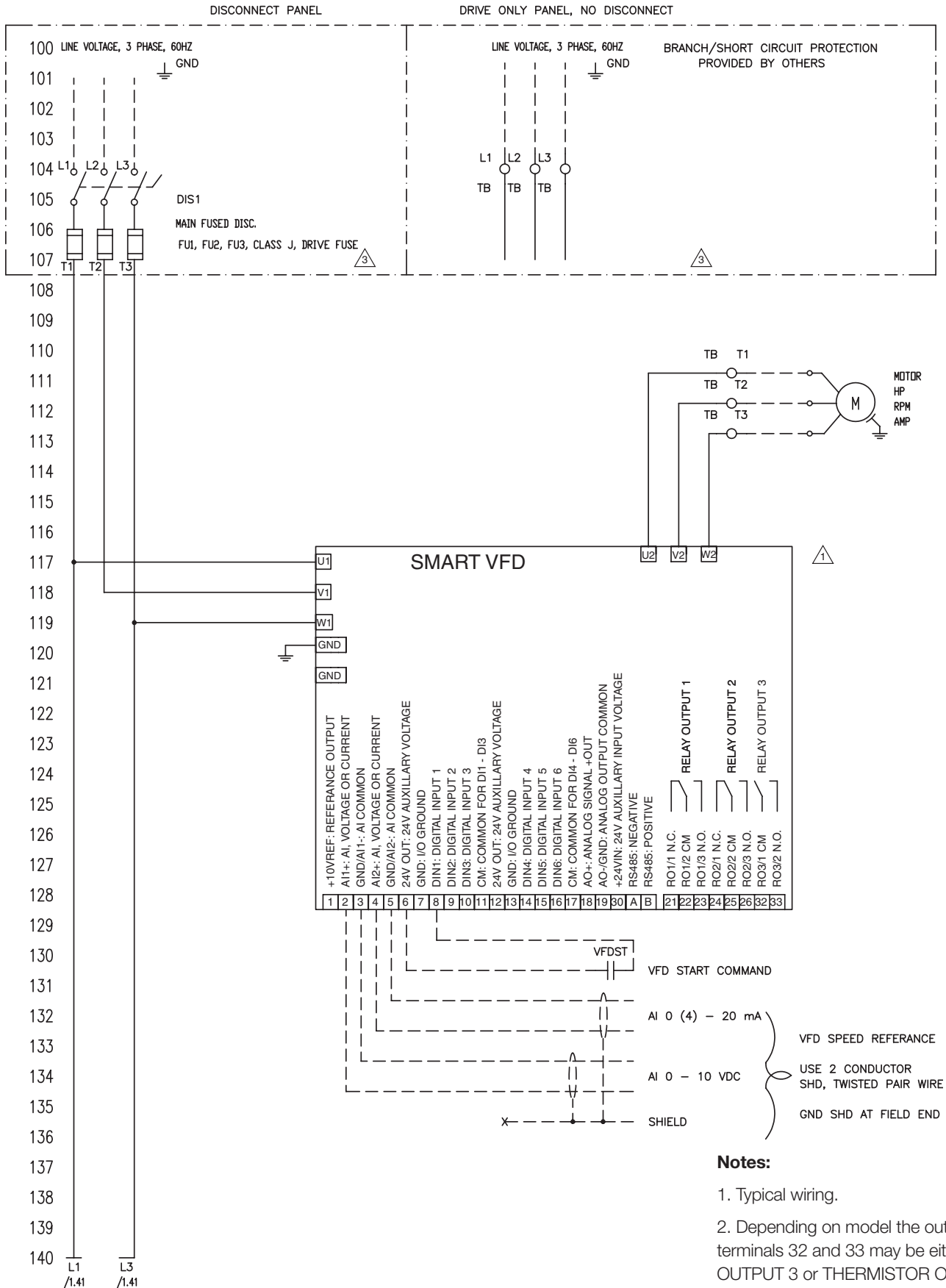
Mains connection	Input voltage U_{in}	208...240V; 380...480V; -10%...+10%
	Input frequency	47...66 Hz
	Connection to mains	Once per minute or less
	Starting delay	4 s (Frame4 to Frame6); 6 s (Frame7 to Frame9)
Motor connection	Output voltage	0- U_{in}
	Continuous output current	I_L : Ambient temperature max. +104°F, overload 1.1 x I_L (1 min./10 min.)
	Starting current	I_S for 2 s every 20 s
	Output frequency	0...320 Hz (standard)
	Frequency resolution	0.01 Hz
Control characteristics	Switching frequency (see parameter M3.1.2.1)	1.5...10 kHz; Defaults: 6 kHz (Frame4-6), 4 kHz (Frame7), 3 kHz (Frame8-9) Automatic switching frequency derating in case of overheating.
	<u>Frequency reference</u>	
	Analogue input	Resolution 0.1% (10-bit), accuracy $\pm 1\%$
	Panel reference	Resolution 0.01 Hz
	Field weakening point	8...320 Hz
	Acceleration time	0.1...3000 sec
Ambient conditions	Deceleration time	0.1...3000 sec
	Ambient operating temperature	Frame4-Frame9: I_L : 14°F (no frost)...+104°F
	Storage temperature	-40°F...+158°F
	Relative humidity	0 to 95% R_H , non-condensing, non-corrosive
	Air quality: chemical vapors mechanical particles	IEC 60721-3-3, unit in operation, class 3C2 IEC 60721-3-3, unit in operation, class 3S2
	Altitude	100% load capacity (no derating) up to 3,280 ft. (1,000 m) 1-% derating for each 328 ft. (100 m) above 3,280 ft. (1,000 m) Max. altitudes: 208...240V : 14,764 ft. (4,500 m) (TN and IT systems) 380...480V : 9,842 ft. (TN and IT systems)
	Vibration EN61800-5-1/ EN60068-2-6	5...150 Hz Displacement amplitude 1 mm (peak) at 5...15.8 Hz (Frame4...Frame9) Max acceleration amplitude 1 G at 15.8...150 Hz (Frame4...Frame9)
	Shock EN61800-5-1 EN60068-2-27	UPS Drop Test (for applicable UPS weights) Storage and shipping: max 15 G, 11 ms (in package)
EMC (at default settings)	Enclosure class	IP21/NEMA 1 standard in entire kW/HP range IP54/NEMA 12 option Note: Keypad required for IP54/NEMA 12
	Immunity	Fulfils EN61800-3 (2004), first and second environment
Emissions	Emissions	Depend on EMC level. +EMC2: EN61800-3 (2004), Category C2 Honeywell Smart VFD HVAC will be delivered with class C2 EMC filtering, if not otherwise specified. Honeywell Smart VFD HVAC can be modified for IT-networks.
	Average noise level (cooling fan) sound power level in dB(A)	Frame4: 65 Frame7: 77 Frame5: 70 Frame8: 86 Frame6: 77 Frame9: 87
Safety		EN 61800-5-1 (2007), CE, cUL; (see unit nameplate for more detailed approvals)

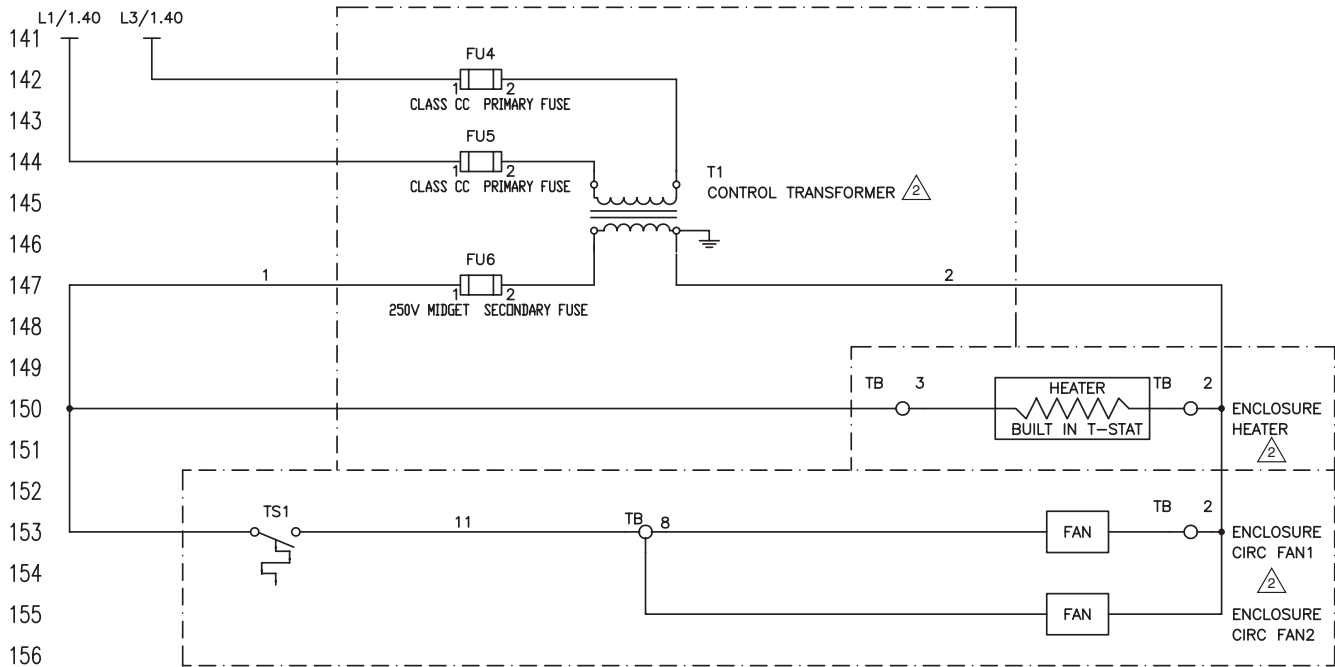
Table 4. SmartVFD HVAC Technical Specifications. (Continued)

Protections	Overvoltage trip limit	Yes
	Undervoltage trip limit	Yes
	Ground fault protection	In case of ground fault in motor or motor cable, only the drive is protected.
	Mains supervision	Yes
	Motor phase supervision	Trips if any of the output phases is missing.
	Overcurrent protection	Yes
	Unit overtemperature protection	Yes
	Motor overload protection	Yes
	Motor stall protection	Yes
	Motor underload protection	Yes
	Short-circuit protection of +24V and +10V reference voltages	Yes

Wiring Diagrams - VFDs

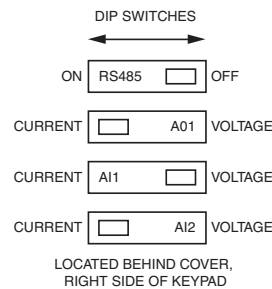
SmartVFD HVAC Standalone Drives





NOTES:

- 1. ALL PANELS SHIPPED WITH VFD DEFAULT PROGRAMMING PARAMETERS. SET DIP SWITCHES AS NEEDED.
- 2. TS1, ENCLOSURE FAN1 STANDARD ON ALL NEMA 3R PANELS. ENCLOSURE FAN2 ON 30HP, 40HP, AND 100HP AT 480V. HEATER IS OPTIONAL ON ALL NEMA 3R PANELS. TRANSFORMER ONLY REQUIRED ON 3R MODELS.
- 3. DISCONNECT PANEL HAS FUSED MAIN DISCONNECT. DRIVE ONLY PANEL HAS WIRE TERMINALS. ON DRIVE ONLY PANEL, CUSTOMER IS RESPONSIBLE FOR BRANCH CIRCUIT AND SHORT CIRCUIT PROTECTION.



ALL WIRING: USE COPPER WIRE ONLY SUITABLE FOR MIN. 75 DEG. C, FIELD WIRING, NEC CLASS 1.
 MOTOR AND FEEDER WIRE SIZE MUST BE IN ACCORDANCE WITH NEC.

----- FIELD WIRE
 _____ WIRE INSIDE C/PNL
 - - - - - OPTION

TYPICAL WIRING.
 DEPENDING ON MODEL, THE OUTPUT ACROSS TERMINALS 32 AND 33 MAY BE EITHER RELAY OUTPUT 3 OR THERMISTOR INPUT.

Notes (continued from previous page):

1. Typical wiring.
2. NEMA 3R enclosures include a circulation fan(s). Integral enclosure heaters and/or cooling are available as special options.

Product Selection - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect



The SmartVFD BYPASS is easy to specify, select, install and commission and is the perfect complement to the advanced capabilities of the SmartVFD family. For the drive features, model number nomenclature and model accessories refer to the SmartVFD HVAC drive section immediately preceding this section.

Disconnect and/or Bypass Features

Our five configurations make it easy to select the right bypass to complete your drive package. All bundles are available in NEMA 1, NEMA 12 and ventilated NEMA 3R.

SmartVFD Disconnect Option

- Adds a fused disconnect to the VFD.

SmartVFD 2-Contactor Bypass Option

Provides an economical means of bypassing the VFD.

- No Main Disconnect
- Freeze/Fire/Smoke Interlock

SmartVFD 3-Contactor Bypass Option

During commissioning, the TEST position enables power-up of the VFD without sending power to the motor.

- In Bypass mode, the VFD is isolated from the power supply
- Fused Disconnect
- Freeze/Fire/Smoke Interlock

SmartVFD 3-Contactor Auto-Bypass Option

All the features of the 3-Contactor bypass plus:

- Any VFD fault will automatically send the bypass to bypass mode
- A contact closure sends the bypass to bypass mode
- Dry contacts indicate when the bypass is in bypass mode, alerting the building management system

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with Fused Disconnect; **Auto Bypass:** No; **Disconnect Type:** Fused; **Pilot Lights:** None

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Drive Input Disconnect	Drive Input Fuses	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
HVFDSB3A0007G110/U	0.75 HP	4	NEMA 1	3.7A	Yes	Yes	8.6 x 31.9 x 9.6	227 x 811 x 245	33 lb	15 kg
HVFDSB3A0007G210/U	0.75 HP	4	NEMA 12	3.7A	No	—	12 x 36 x 8.8	305 x 914 x 224	40 lb	18.1 kg
HVFDSB3A0007G310/U	0.75 HP	4	NEMA 3R	3.7A	No	—	20.5 x 20 x 10	520.7 x 508 x 254	43 lb	19.5 kg
HVFDSB3A0010G110/U	1 HP	4	NEMA 1	4.8A	Yes	Yes	8.6 x 31.9 x 9.6	227 x 811 x 245	33 lb	15 kg
HVFDSB3A0010G210/U	1 HP	4	NEMA 12	4.8A	No	—	12 x 36 x 8.8	305 x 914 x 224	40 lb	18.1 kg
HVFDSB3A0010G310/U	1 HP	4	NEMA 3R	4.8A	No	—	20.5 x 20 x 10	520.7 x 508 x 254	43 lb	19.5 kg
HVFDSB3A0015G110/U	1.5 HP	4	NEMA 1	6.6A	Yes	Yes	8.6 x 31.9 x 9.6	227 x 811 x 245	33 lb	15 kg
HVFDSB3A0015G210/U	1.5 HP	4	NEMA 12	6.6A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.1 kg
HVFDSB3A0015G310/U	1.5 HP	4	NEMA 3R	6.6A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFDSB3A0020G110/U	2 HP	4	NEMA 1	8A	Yes	Yes	8.6 x 31.9 x 9.6	227 x 811 x 245	33 lb	15 kg
HVFDSB3A0020G210/U	2 HP	4	NEMA 12	8A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.1 kg
HVFDSB3A0020G310/U	2 HP	4	NEMA 3R	8A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFDSB3A0030G110/U	3 HP	4	NEMA 1	11A	Yes	Yes	8.6 x 31.9 x 9.6	227 x 811 x 245	33 lb	15 kg
HVFDSB3A0030G210/U	3 HP	4	NEMA 12	11A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.1 kg
HVFDSB3A0030G310/U	3 HP	4	NEMA 3R	11A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFDSB3A0050G110/U	5 HP	5	NEMA 1	18A	Yes	Yes	8.9 x 34.7 x 19.6	226.06 x 881.38 x 261.62	43 lb	19.5 kg
HVFDSB3A0050G210/U	5 HP	5	NEMA 12	18A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.7 kg
HVFDSB3A0050G310/U	5 HP	5	NEMA 3R	18A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.7 kg
HVFDSB3A0075G110/U	7.5 HP	5	NEMA 1	24A	Yes	Yes	8.9 x 34.7 x 9.6	226.06 x 881.38 x 261.62	43 lb	19.5 kg
HVFDSB3A0075G210/U	7.5 HP	5	NEMA 12	24A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.7 kg
HVFDSB3A0075G310/U	7.5 HP	5	NEMA 3R	24A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.7 kg
HVFDSB3A0100G110/U	10 HP	5	NEMA 1	31A	Yes	Yes	8.9 x 34.7 x 10.3	226.06 x 881.38 x 261.62	43 lb	19.5 kg
HVFDSB3A0100G210/U	10 HP	5	NEMA 12	31A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.7 kg
HVFDSB3A0100G310/U	10 HP	5	NEMA 3R	31A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.7 kg
HVFDSB3A0150G110/U	15 HP	6	NEMA 1	48A	Yes	Yes	12.4 x 45 x 10.1	315 x 1143 x 257	60 lb	27.68 kg
HVFDSB3A0150G210/U	15 HP	6	NEMA 12	48A	No	—	12 x 46.5 x 13	04.8 x 1181.1 x 330.2	120 lb	54.43 kg
HVFDSB3A0150G310/U	15 HP	6	NEMA 3R	48A	No	—	28.5 x 36 x 12	723.9 x 914.4 x 304.8	188 lb	39.92 kg
HVFDSB3A0200G110/U	20 HP	6	NEMA 1	62A	Yes	Yes	12.4 x 45 x 10.1	315 x 1143 x 257	60 lb	27.68 kg
HVFDSB3A0200G210/U	20 HP	6	NEMA 12	62A	No	—	12 x 46.5 x 13	304.8 x 1181.1 x 330.2	120 lb	54.43 kg
HVFDSB3A0200G310/U	20 HP	6	NEMA 3R	62A	No	—	28.5 x 36 x 12	723.9 x 914.4 x 304.8	88 lb	39.92 kg
HVFDSB3A0250G110/U	25 HP	7	NEMA 1	75A	Yes	Yes	20.8 x 51.7 x 13.3	529 x 1313 x 292	140 lb	63.5 kg
HVFDSB3A0250G210/U	25 HP	7	NEMA 12	75A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	149 lb	67.59 kg
HVFDSB3A0250G310/U	25 HP	7	NEMA 3R	75A	No	—	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	242 lb	109.8 kg
HVFDSB3A0300G110/U	30 HP	7	NEMA 1	88A	Yes	Yes	20.8 x 51.7 x 13.3	529 x 1313 x 292	140 lb	63.5 kg
HVFDSB3A0300G210/U	30 HP	7	NEMA 12	88A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	160 lb	72.57 kg
HVFDSB3A0300G310/U	30 HP	7	NEMA 3R	88A	No	—	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	149 lb	67.59 kg
HVFDSB3A0400G110/U	40 HP	7	NEMA 1	105A	Yes	Yes	20.8 x 51.7 x 13.3	529 x 1313 x 292	140 lb	63.5 kg
HVFDSB3A0400G210/U	40 HP	7	NEMA 12	105A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	175 lb	79.38 kg
HVFDSB3A0400G310/U	40 HP	7	NEMA 3R	105A	No	—	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	149 lb	67.59 kg
HVFDSB3A0500G110/U	50 HP	8	NEMA 1	140A	Yes	Yes	25 x 60 x 15.3	635 x 1524 x 388	250 lb	113.4 kg
HVFDSB3A0500G210/U	50 HP	8	NEMA 12	140A	Yes	Yes	40.5 x 60 x 14	1028.7 x 1524 x 355.6	280 lb	127.01 kg
HVFDSB3A0500G310/U	50 HP	8	NEMA 3R	140A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	149 lb	67.59 Kg
HVFDSB3A0600G110/U	60 HP	8	NEMA 1	170A	Yes	Yes	25 x 60 x 15.3	635 x 1524 x 388	250 lb	113.4 kg
HVFDSB3A0600G210/U	60 HP	8	NEMA 12	170A	Yes	Yes	40.5 x 60 x 14	1028.7 x 1524 x 355.6	280 lb	127.01 kg
HVFDSB3A0600G310/U	60 HP	8	NEMA 3R	170A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	149 lb	67.59 Kg
HVFDSB3A0750G110/U	75 HP	8	NEMA 1	205A	Yes	Yes	25 x 60 x 15.3	635 x 1524 x 388	250 lb	113.4 kg
HVFDSB3A0750G210/U	75 HP	8	NEMA 12	205A	Yes	Yes	40.5 x 60 x 14	1028.7 x 1524 x 355.6	280 lb	127.01 kg
HVFDSB3A0750G310/U	75 HP	8	NEMA 3R	205A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	149 lb	67.59 Kg

Product Selection - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Auto Bypass:** No; **Disconnect Type:** None; **Pilot Lights:** None

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Drive Input Disconnect	Drive Input Fuses	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
HVFD3A0007G120/U	0.75 HP	4	NEMA 1	3.7A	No	—	8.9 x 31.9 x 10.4	226 x 811 x 263	38 lb	17.2 kg
HVFD3A0007G220/U	0.75 HP	4	NEMA 12	3.7A	Yes	Yes	16 x 36 x 8.8	406.4 x 914.4 x 223.52	64 lb	29 kg
HVFD3A0007G320/U	0.75 HP	4	NEMA 3R	3.7A	Yes	Yes	24.5 x 24 x 10	623 x 610 x 254	83 lb	37.7 kg
HVFD3A0010G120/U	1 HP	4	NEMA 1	4.8A	No	—	8.9 x 31.9 x 10.4	226 x 811 x 263	38 lb	17.2 kg
HVFD3A0010G220/U	1 HP	4	NEMA 12	4.8A	Yes	Yes	16 x 36 x 8.8	406.4 x 914.4 x 223.52	64 lb	29 kg
HVFD3A0010G320/U	1 HP	4	NEMA 3R	4.8A	Yes	Yes	24.5 x 24 x 10	623 x 610 x 254	83 lb	37.7 kg
HVFD3A0015G120/U	1.5 HP	4	NEMA 1	6.6A	No	—	8.9 x 31.7 x 10.7	226 x 805 x 272	38 lb	17.2 kg
HVFD3A0015G220/U	1.5 HP	4	NEMA 12	6.6A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFD3A0015G320/U	1.5 HP	4	NEMA 3R	6.6A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.2 kg
HVFD3A0020G120/U	2 HP	4	NEMA 1	8A	No	—	8.9 x 31.7 x 10.7	226.06 x 810.26 x 243.84	38 lb	17.2 kg
HVFD3A0020G220/U	2 HP	4	NEMA 12	8A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFD3A0020G320/U	2 HP	4	NEMA 3R	8A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.2 kg
HVFD3A0030G120/U	3 HP	4	NEMA 1	11A	No	—	8.9 x 31.9 x 9.6	226.06 x 810.26 x 243.84	38 lb	17.2 kg
HVFD3A0030G220/U	3 HP	4	NEMA 12	11A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFD3A0030G320/U	3 HP	4	NEMA 3R	11A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.2 kg
HVFD3A0050G120/U	5 HP	5	NEMA 1	18A	No	—	8.9 x 34.7 x 10.4	226 x 881 x 263	50 lb	21.8 kg
HVFD3A0050G220/U	5 HP	5	NEMA 12	18A	Yes	Yes	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.6 kg
HVFD3A0050G320/U	5 HP	5	NEMA 3R	18A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.7 kg
HVFD3A0075G120/U	7.5 HP	5	NEMA 1	24A	No	—	8.9 x 34.7 x 10.4	226 x 881 x 263	50 lb	22.7 kg
HVFD3A0075G220/U	7.5 HP	5	NEMA 12	24A	Yes	Yes	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.8 kg
HVFD3A0075G320/U	7.5 HP	5	NEMA 3R	24A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.7 kg
HVFD3A0100G120/U	10 HP	5	NEMA 1	31A	No	—	8.9 x 34.7 x 10.5	226.06 x 881.38 x 266.7	50 lb	22.7 kg
HVFD3A0100G220/U	10 HP	5	NEMA 12	31A	Yes	Yes	16 x 45 x 11	406 x 1143 x 279.4	84 lb	38.1 kg
HVFD3A0100G320/U	10 HP	5	NEMA 3R	31A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.7 kg
HVFD3A0150G120/U	15 HP	6	NEMA 1	48A	No	—	12.4 x 45 x 11.3	314 x 1143 x 287	59 lb	27 kg
HVFD3A0150G220/U	15 HP	6	NEMA 12	48A	Yes	Yes	16 x 50.5 x 13	406.4 x 1282.7 x 256.54	125 lb	56.7 kg
HVFD3A0150G320/U	15 HP	6	NEMA 3R	48A	Yes	Yes	28.5 x 36 x 10.5	723.9 x 914.4 x 266.7	118 lb	53.52 kg
HVFD3A0200G120/U	20 HP	6	NEMA 1	62A	No	—	12.4 x 45 x 11.3	314 x 1143 x 287	59 lb	27 kg
HVFD3A0200G220/U	20 HP	6	NEMA 12	62A	Yes	Yes	20 x 54.5 x 13	508 x 1384.3 x 330.2	140 lb	63.5 kg
HVFD3A0200G320/U	20 HP	6	NEMA 3R	62A	Yes	Yes	28.5 x 36 x 10.5	723.9 x 914.4 x 266.7	118 lb	53.52 kg
HVFD3A0250G120/U	25 HP	7	NEMA 1	75A	No	—	20.9 x 51.7 x 13.3	530.86 x 1313.18 x 337	149 lb	68 kg
HVFD3A0250G220/U	25 HP	7	NEMA 12	75A	Yes	Yes	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	160 lb	72.57 kg
HVFD3A0250G320/U	25 HP	7	NEMA 3R	75A	Yes	Yes	28.5 x 48 x 12.5	711.2 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3A0300G120/U	30 HP	7	NEMA 1	88A	No	—	20.9 x 51.7 x 13.3	530.86 x 1313.18 x 337	149 lb	68 kg
HVFD3A0300G220/U	30 HP	7	NEMA 12	88A	Yes	Yes	24 x 65.5 x 13.5	609 x 1663.7 x 342.9	175 lb	79.38 kg
HVFD3A0300G320/U	30 HP	7	NEMA 3R	88A	Yes	Yes	28.5 x 48 x 12.5	711.2 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3A0400G120/U	40 HP	7	NEMA 1	105A	No	—	20.9 x 51.7 x 13.3	530.86 x 1313.18 x 337	149 lb	68 kg
HVFD3A0400G220/U	40 HP	7	NEMA 12	105A	Yes	Yes	30 x 70.5 x 13.5	762 x 1790.7 x 342.9	200 lb	90.72 kg
HVFD3A0400G320/U	40 HP	7	NEMA 3R	105A	Yes	Yes	28.5 x 48 x 12.5	711.2 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3A0500G120/U	50 HP	8	NEMA 1	140A	No	—	25 x 60 x 15.2	635 x 1524 x 386.08	250 lb	113.4 kg
HVFD3A0500G220/U	50 HP	8	NEMA 12	140A	No	—	40.5 x 60 x 12.5	1028.7 x 1524 x 317.5	350 lb	158.75 kg
HVFD3A0500G320/U	50 HP	8	NEMA 3R	140A	No	—	60 x 41 x 14	1524 x 1041 x 356	185 lb	83.91 kg
HVFD3A0600G120/U	60 HP	8	NEMA 1	170A	No	—	25 x 60 x 16.2	635 x 1524 x 386.08	265 lb	120.2 kg
HVFD3A0600G220/U	60 HP	8	NEMA 12	170A	No	—	40.5 x 60 x 12.5	1028.7 x 1524 x 317.5	350 lb	158.75 kg
HVFD3A0600G320/U	60 HP	8	NEMA 3R	170A	No	—	60 x 41 x 14	1524 x 1041 x 356	185 lb	83.91 kg
HVFD3A0750G120/U	75 HP	8	NEMA 1	205A	No	—	25 x 60 x 15.2	635 x 1524 x 386.08	280 lb	127.01 kg
HVFD3A0750G220/U	75 HP	8	NEMA 12	205A	No	—	40.5 x 60 x 12.5	1028.7 x 1524 x 317.5	350 lb	158.75 kg
HVFD3A0750G320/U	75 HP	8	NEMA 3R	205A	No	—	60 x 41 x 14	1524 x 1041 x 356	185 lb	83.91 kg

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Auto Bypass:** No; **Disconnect Type:** Fused; **Drive Input Fuses:** Yes; **Pilot Lights:** None

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
HVFDSB3A0007G130/U	0.75 HP	4	NEMA 1	3.7A	8.9 x 38.7 x 10.4	226 x 988 x 264	46 lb	21 kg
HVFDSB3A0007G230/U	0.75 HP	4	NEMA 12	3.7A	16 x 36 x 8.8	406.4 x 914.4 x 223.52	66 lb	29.9 kg
HVFDSB3A0007G330/U	0.75 HP	4	NEMA 3R	3.7A	24.5 x 24 x 10	623 x 610 x 254	85 lb	38.6 kg
HVFDSB3A0010G130/U	1 HP	4	NEMA 1	4.8A	8.9 x 38.7 x 10.7	226 x 983 x 272	44 lb	20 kg
HVFDSB3A0010G230/U	1 HP	4	NEMA 12	4.8A	16 x 36 x 8.8	406.4 x 914.4 x 223.52	66 lb	29.9 kg
HVFDSB3A0010G330/U	1 HP	4	NEMA 3R	4.8A	24.5 x 24 x 10	623 x 610 x 254	85 lb	38.6 kg
HVFDSB3A0015G130/U	1.5 HP	4	NEMA 1	6.6A	8.9 x 38.7 x 10.4	226 x 988 x 264	46 lb	21 kg
HVFDSB3A0015G230/U	1.5 HP	4	NEMA 12	6.6A	16 x 37.5 x 11in.	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFDSB3A0015G330/U	1.5 HP	4	NEMA 3R	6.6A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.5 kg
HVFDSB3A0020G130/U	2 HP	4	NEMA 1	8A	8.9 x 38.7 x 10.4	226 x 988 x 264	46 lb	21 kg
HVFDSB3A0020G230/U	2 HP	4	NEMA 12	8A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFDSB3A0020G330/U	2 HP	4	NEMA 3R	8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.5 kg
HVFDSB3A0030G130/U	3 HP	4	NEMA 1	11A	8.9 x 38.7 x 10.4	226 x 988 x 264	46 lb	21 kg
HVFDSB3A0030G230/U	3 HP	4	NEMA 12	11A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFDSB3A0030G330/U	3 HP	4	NEMA 3R	11A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.5 kg
HVFDSB3A0050G130/U	5 HP	5	NEMA 1	18A	8.9 x 41.7 x 10.4	226 x 1059 x 264	56 lb	25 kg
HVFDSB3A0050G230/U	5 HP	5	NEMA 12	18A	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.8 kg
HVFDSB3A0050G330/U	5 HP	5	NEMA 3R	18A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.4 kg
HVFDSB3A0075G130/U	7.5 HP	5	NEMA 1	24A	8.9 x 41.7 x 10.4	226 x 1059 x 264	57 lb	26 kg
HVFDSB3A0075G230/U	7.5 HP	5	NEMA 12	24A	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.8 kg
HVFDSB3A0075G330/U	7.5 HP	5	NEMA 3R	24A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.4 kg
HVFDSB3A0100G130/U	10 HP	5	NEMA 1	31A	8.9 x 41.7 x 10.4	226 x 1059 x 264	60 lb	27 kg
HVFDSB3A0100G230/U	10 HP	5	NEMA 12	31A	16 x 45 x 11	406 x 1143 x 279.4	84 lb	38.1 kg
HVFDSB3A0100G330/U	10 HP	5	NEMA 3R	31A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.4 kg
HVFDSB3A0150G130/U	15 HP	6	NEMA 1	48A	12.4 x 55 x 11.3	315 x 1397 x 287	95 lb	43 kg
HVFDSB3A0150G230/U	15 HP	6	NEMA 12	48A	20 x 54 x 10.8	406.4 x 1282.7 x 256.54	125 lb	56.7 kg
HVFDSB3A0150G330/U	15 HP	6	NEMA 3R	48A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFDSB3A0200G130/U	20 HP	6	NEMA 1	62A	12.4 x 55 x 11.3	315 x 1397 x 287	99 lb	45 kg
HVFDSB3A0200G230/U	20 HP	6	NEMA 12	62A	20 x 54.5 x 13	508 x 1384.3 x 330.2	140 lb	63.5 kg
HVFDSB3A0200G330/U	20 HP	6	NEMA 3R	62A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFDSB3A0250G130/U	25 HP	7	NEMA 1	75A	20.8 x 59.2 x 13.3	530 x 1499 x 337	135 lb	61.3 kg
HVFDSB3A0250G230/U	25 HP	7	NEMA 12	75A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	160 lb	72.57 kg
HVFDSB3A0250G330/U	25 HP	7	NEMA 3R	75A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3A0300G130/U	30 HP	7	NEMA 1	88A	20.8 x 59.2 x 13.3	530 x 1499 x 337	150 lb	68.2 kg
HVFDSB3A0300G230/U	30 HP	7	NEMA 12	88A	24 x 65.5 x 13.5	609 x 1663.7 x 342.9	175 lb	79.38 kg
HVFDSB3A0300G330/U	30 HP	7	NEMA 3R	88A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3A0400G130/U	40 HP	7	NEMA 1	105A	20.8 x 59.2 x 13.3	530 x 1499 x 337	170 lb	77.1 kg
HVFDSB3A0400G230/U	40 HP	7	NEMA 12	105A	30 x 70.5 x 13.5	762 x 1790.7 x 342.9	200 lb	90.72 kg
HVFDSB3A0400G330/U	40 HP	7	NEMA 3R	105A	40.4 x 48 x 12	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3A0500G130/U	50 HP	8	NEMA 1	140A	25 x 70.01 x 16.2	635 x 1780 x 411	286 lb	130 kg
HVFDSB3A0500G230/U	50 HP	8	NEMA 12	140A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3A0500G330/U	50 HP	8	NEMA 3R	140A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg
HVFDSB3A0600G130/U	60 HP	8	NEMA 1	170A	25 x 70.01 x 16.2	635 x 1780 x 411	295 lb	134 kg
HVFDSB3A0600G230/U	60 HP	8	NEMA 12	170A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3A0600G330/U	60 HP	8	NEMA 3R	170A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg
HVFDSB3A0750G130/U	75 HP	8	NEMA 1	205A	25 x 70.01 x 16.2	635 x 1780 x 411	331 lb	150 kg
HVFDSB3A0750G230/U	75 HP	8	NEMA 12	205A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3A0750G330/U	75 HP	8	NEMA 3R	205A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg

Product Selection - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with 3 Contactor Bypass and Auto Bypass; **Auto Bypass:** Yes; **Disconnect Type:** Fused;
Drive Input Fuses: Yes; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
HVFD3A0007G131/U	0.75 HP	4	NEMA 1	3.7A	8.9 x 38.9 x 10.4	226 x 988 x 264	46 lb	20.9 kg
HVFD3A0007G231/U	0.75 HP	4	NEMA 12	3.7A	16 x 36 x 8.8	406.4 x 914.4 x 223.52	66 lb	29.9 kg
HVFD3A0007G331/U	0.75 HP	4	NEMA 3R	3.7A	24.5 x 24 x 10	623 x 610 x 254	85 lb	38.6 kg
HVFD3A0010G131/U	1 HP	4	NEMA 1	4.8A	8.9 x 38.9 x 10.4	226 x 988 x 254	46 lb	20.9 kg
HVFD3A0010G231/U	1 HP	4	NEMA 12	4.8A	16 x 36 x 8.8	406.4 x 914.4 x 223.52	66 lb	29.9 kg
HVFD3A0010G331/U	1 HP	4	NEMA 3R	4.8A	24.5 x 24 x 10	623 x 610 x 254	85 lb	38.6 kg
HVFD3A0015G131/U	1.5 HP	4	NEMA 1	6.6A	8.9 x 38.9 x 10.4	226 x 988 x 264	46 lb	20.9 kg
HVFD3A0015G231/U	1.5 HP	4	NEMA 12	6.6A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFD3A0015G331/U	1.5 HP	4	NEMA 3R	6.6A	24.5 x 24 x 12i	622.3 x 609.6 x 304.8	54 lb	24.5 kg
HVFD3A0020G131/U	2 HP	4	NEMA 1	8A	8.9 x 38.9 x 10.4	226 x 988 x 264	46 lb	20.9 kg
HVFD3A0020G231/U	2 HP	4	NEMA 12	8A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFD3A0020G331/U	2 HP	4	NEMA 3R	8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.5 kg
HVFD3A0030G131/U	3 HP	4	NEMA 1	11A	8.9 x 38.9 x 10.4	226 x 988 x 264	46 lb	20.9 kg
HVFD3A0030G231/U	3 HP	4	NEMA 12	11A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	25 kg
HVFD3A0030G331/U	3 HP	4	NEMA 3R	11A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.5 kg
HVFD3A0050G131/U	5 HP	5	NEMA 1	18A	8.9 x 41.7 x 10.4	226 x 1059 x 264	56 lb	25.4 kg
HVFD3A0050G231/U	5 HP	5	NEMA 12	18A	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.8 kg
HVFD3A0050G331/U	5 HP	5	NEMA 3R	18A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.4 kg
HVFD3A0075G131/U	7.5 HP	5	NEMA 1	24A	8.9 x 38.9 x 10.4	226 x 988 x 264	58 lb	26 kg
HVFD3A0075G231/U	7.5 HP	5	NEMA 12	24A	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.8 kg
HVFD3A0075G331/U	7.5 HP	5	NEMA 3R	24A	28.5 x 24 x 10	724 x 610 x 254	125 lb	56.7 kg
HVFD3A0100G131/U	10 HP	5	NEMA 1	31A	8.9 x 38.9 x 10.4	226 x 988 x 264	60 lb	27.2 kg
HVFD3A0100G231/U	10 HP	5	NEMA 12	31A	16 x 45 x 11	406 x 1143 x 279.4	84 lb	38.1 kg
HVFD3A0100G331/U	10 HP	5	NEMA 3R	31A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.4kg
HVFD3A0150G131/U	15 HP	6	NEMA 1	48A	12.4 x 55 x 11.3	315 x 1397 x 287	95 lb	43 kg
HVFD3A0150G231/U	15 HP	6	NEMA 12	48A	16 x 50.5 x 13	406.4 x 1282.7 x 256.54	125 lb	56.7 kg
HVFD3A0150G331/U	15 HP	6	NEMA 3R	48A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3A0200G131/U	20 HP	6	NEMA 1	62A	12.4 x 55 x 11.3	315 x 1397 x 287	99 lb	45 kg
HVFD3A0200G231/U	20 HP	6	NEMA 12	62A	20 x 54.5 x 13	508 x 1384.3 x 330.2	140 lb	63.5 kg
HVFD3A0200G331/U	20 HP	6	NEMA 3R	62A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3A0250G131/U	25 HP	7	NEMA 1	75A	20.8 x 59 x 13.3	529 x 1499 x 337	135 lb	61 kg
HVFD3A0250G231/U	25 HP	7	NEMA 12	75A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	160 lb	72.57 kg
HVFD3A0250G331/U	25 HP	7	NEMA 3R	75A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3A0300G131/U	30 HP	7	NEMA 1	88A	20.8 x 59 x 13.3	529 x 1499 x 337	150 lb	68.2 kg
HVFD3A0300G231/U	30 HP	7	NEMA 12	88A	24 x 65.5 x 13.5	609 x 1663.7 x 342.9	175 lb	79.38 kg
HVFD3A0300G331/U	30 HP	7	NEMA 3R	88A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3A0400G131/U	40 HP	7	NEMA 1	105A	20.8 x 59 x 13.3	529 x 1499 x 337	170 lb	77.1 kg
HVFD3A0400G231/U	40 HP	7	NEMA 12	105A	30 x 70.5 x 13.5	762 x 1790.7 x 342.9	200 lb	90.72 kg
HVFD3A0400G331/U	40 HP	7	NEMA 3R	105A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	326 lb	87.54 kg
HVFD3A0500G131/U	50 HP	8	NEMA 1	140A	25 x 70 x 16.2	635 x 1778 x 411	286 lb	130 kg
HVFD3A0500G231/U	50 HP	8	NEMA 12	140A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFD3A0500G331/U	50 HP	8	NEMA 3R	140A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg
HVFD3A0600G131/U	60 HP	8	NEMA 1	170A	25 x 70 x 16.2	635 x 1778 x 411	295 lb	134 kg
HVFD3A0600G231/U	60 HP	8	NEMA 12	170A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFD3A0600G331/U	60 HP	8	NEMA 3R	170A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg
HVFD3A0750G131/U	75 HP	8	NEMA 1	205A	25 x 70 x 16.2	635 x 1778 x 411	331 lb	150 kg
HVFD3A0750G231/U	75 HP	8	NEMA 12	205A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFD3A0750G331/U	75 HP	8	NEMA 3R	205A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with Fused Disconnect; **Auto Bypass:** No; **Disconnect Type:** Fused; **Pilot Lights:** None

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Drive Input Disconnect	Drive Input Fuses	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
HVFD3B0007G110/U	0.75 HP	4	NEMA 1	3.7A	Yes	Yes	8.9 x 31.9 x 9.6	226 x 811 x 245	33 lb	15 kg
HVFD3B0007G210/U	0.75 HP	4	NEMA 12	3.7A	No	—	12 x 37.5 x 11	305 x 914 x 224	51 lb	23.1 kg
HVFD3B0007G310/U	0.75 HP	4	NEMA 3R	3.7A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFD3B0010G110/U	1 HP	4	NEMA 1	4.8A	Yes	Yes	8.9 x 31.9 x 9.6	226 x 811 x 245	33 lb	15 kg
HVFD3B0010G210/U	1 HP	4	NEMA 12	4.8A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3B0010G310/U	1 HP	4	NEMA 3R	4.8A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFD3B0015G110/U	1.5 HP	4	NEMA 1	6.6A	Yes	Yes	8.9 x 31.9 x 9.6	226 x 811 x 245	33 lb	15 kg
HVFD3B0015G210/U	1.5 HP	4	NEMA 12	6.6A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3B0015G310/U	1.5 HP	4	NEMA 3R	6.6A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFD3B0020G110/U	2 HP	4	NEMA 1	8A	Yes	Yes	8.9 x 31.9 x 9.6	226 x 811 x 245	33 lb	15 kg
HVFD3B0020G210/U	2 HP	4	NEMA 12	8A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3B0020G310/U	2 HP	4	NEMA 3R	8A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFD3B0030G110/U	3 HP	4	NEMA 1	11A	Yes	Yes	8.9 x 31.9 x 9.6	226 x 811 x 245	33 lb	15 kg
HVFD3B0030G210/U	3 HP	4	NEMA 12	11A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3B0030G310/U	3 HP	4	NEMA 3R	11A	No	—	20.5 x 20 x 12	520.7 x 508 x 304.8	43 lb	19.5 kg
HVFD3B0050G110/U	5 HP	5	NEMA 1	18A	Yes	Yes	8.9 x 34.5 x 9.6	226 x 876 x 245	43 lb	19.5 kg
HVFD3B0050G210/U	5 HP	5	NEMA 12	18A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.66 kg
HVFD3B0050G310/U	5 HP	5	NEMA 3R	18A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.67 kg
HVFD3B0075G110/U	7.5 HP	5	NEMA 1	24A	Yes	Yes	8.9 x 34.5 x 9.6	226 x 876 x 245	50 lb	23 kg
HVFD3B0075G210/U	7.5 HP	5	NEMA 12	24A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.66 kg
HVFD3B0075G310/U	7.5 HP	5	NEMA 3R	24A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.67 kg
HVFD3B0100G110/U	10 HP	5	NEMA 1	31A	Yes	Yes	8.9 x 34.5 x 9.6	226 x 876 x 245	50 lb	23 kg
HVFD3B0100G210/U	10 HP	5	NEMA 12	31A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.66 kg
HVFD3B0100G310/U	10 HP	5	NEMA 3R	31A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.67 kg
HVFD3B0150G110/U	15 HP	6	NEMA 1	48A	Yes	Yes	12.4 x 45 x 10.1	315 x 1143 x 257	55 lb	25 kg
HVFD3B0150G210/U	15 HP	6	NEMA 12	48A	No	—	12 x 46.5 x 13	304.8 x 1181.1 x 330.2	120 lb	54.43 kg
HVFD3B0150G310/U	15 HP	6	NEMA 3R	48A	No	—	28.5 x 36 x 12	723.9 x 914.4 x 304.8	88 lb	39.92 kg
HVFD3B0200G110/U	20 HP	6	NEMA 1	62A	Yes	Yes	12.4 x 45 x 10.1	315 x 1143 x 257	59 lb	27 kg
HVFD3B0200G210/U	20 HP	6	NEMA 12	62A	No	—	12 x 46.5 x 13	304.8 x 1181.1 x 330.2	120 lb	54.43 kg
HVFD3B0200G310/U	20 HP	6	NEMA 3R	62A	No	—	28.5 x 36 x 12	723.9 x 914.4 x 304.8	88 lb	39.92 kg
HVFD3B0250G110/U	25 HP	6	NEMA 1	75A	Yes	Yes	20.8 x 51.7 x 13.3	530 x 1313 x 326	140 lb	63.5 kg
HVFD3B0250G210/U	25 HP	6	NEMA 12	75A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	145 lb	65.77 kg
HVFD3B0250G310/U	25 HP	6	NEMA 3R	75A	No	—	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	149 lb	67.59 kg
HVFD3B0300G110/U	30 HP	7	NEMA 1	88A	Yes	Yes	20.8 x 51.7 x 13.3	530 x 1313 x 326	140 lb	63.5 kg
HVFD3B0300G210/U	30 HP	7	NEMA 12	88A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	160 lb	72.57 kg
HVFD3B0300G310/U	30 HP	7	NEMA 3R	88A	No	—	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	149 lb	67.59 kg
HVFD3B0400G110/U	40 HP	7	NEMA 1	105A	Yes	Yes	20.8 x 51.7 x 13.3	530 x 1313 x 326	140 lb	63.5 kg
HVFD3B0400G210/U	40 HP	7	NEMA 12	105A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	175 lb	79.38 kg
HVFD3B0400G310/U	40 HP	7	NEMA 3R	105A	No	—	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	149 lb	67.59 kg
HVFD3B0500G110/U	50 HP	8	NEMA 1	140A	Yes	Yes	25 x 60 x 15.3	635 x 1524 x 388	250 lb	113.4 kg
HVFD3B0500G210/U	50 HP	8	NEMA 12	140A	Yes	Yes	40.5 x 60 x 14	1028.7 x 1524 x 355.6	280 lb	127.00 kg
HVFD3B0500G310/U	50 HP	8	NEMA 3R	140A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	149 lb	67.59 kg
HVFD3B0600G110/U	60 HP	8	NEMA 1	170A	Yes	Yes	25 x 60 x 15.3	635 x 1524 x 388	265 lb	120 kg
HVFD3B0600G210/U	60 HP	8	NEMA 12	170A	Yes	Yes	40.5 x 60 x 14	1028.7 x 1524 x 355.6	280 lb	127.00 kg
HVFD3B0600G310/U	60 HP	8	NEMA 3R	170A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	149 lb	67.59 kg
HVFD3B0750G110/U	75 HP	8	NEMA 1	205A	Yes	Yes	25 x 60 x 15.3	635 x 1524 x 388	280 lb	127 kg
HVFD3B0750G210/U	75 HP	8	NEMA 12	205A	Yes	Yes	40.5 x 60 x 14	1028.7 x 1524 x 355.6	280 lb	127.00 kg
HVFD3B0750G310/U	75 HP	8	NEMA 3R	205A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	149 lb	67.59 kg

Product Selection - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Auto Bypass:** No; **Disconnect Type:** None; **Pilot Lights:** None

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Drive Input Disconnect	Drive Input Fuses	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
HVFD3B3B0007G120/U	0.75 HP	4	NEMA 1	3.7A	No	—	8.9 x 31.9 x 10.4	226 x 811 x 264	38 lb	17.2 kg
HVFD3B3B0007G220/U	0.75 HP	4	NEMA 12	3.7A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFD3B3B0007G320/U	0.75 HP	4	NEMA 3R	3.7A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3B0010G120/U	1 HP	4	NEMA 1	4.8A	No	—	8.9 x 31.9 x 10.4	226 x 811 x 264	38 lb	17.24 kg
HVFD3B3B0010G220/U	1 HP	4	NEMA 12	4.8A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFD3B3B0010G320/U	1 HP	4	NEMA 3R	4.8A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3B0015G120/U	1.5 HP	4	NEMA 1	6.6A	No	—	8.9 x 31.9 x 10.4	226 x 811 x 264	38 lb	17.2 kg
HVFD3B3B0015G220/U	1.5 HP	4	NEMA 12	6.6A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFD3B3B0015G320/U	1.5 HP	4	NEMA 3R	6.6A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3B0020G120/U	2 HP	4	NEMA 1	8A	No	—	8.9 x 31.9 x 10.4	226 x 811 x 264	38 lb	17.2 kg
HVFD3B3B0020G220/U	2 HP	4	NEMA 12	8A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFD3B3B0020G320/U	2 HP	4	NEMA 3R	8A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3B0030G120/U	3 HP	4	NEMA 1	11A	No	—	8.9 x 31.9 x 10.4	226 x 811 x 264	38 lb	17.2 kg
HVFD3B3B0030G220/U	3 HP	4	NEMA 12	11A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFD3B3B0030G320/U	3 HP	4	NEMA 3R	11A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3B0050G120/U	5 HP	5	NEMA 1	18A	No	—	8.9 x 34.5 x 10.4	226 x 876 x 264	48 lb	21.7 kg
HVFD3B3B0050G220/U	5 HP	5	NEMA 12	18A	Yes	Yes	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.75 kg
HVFD3B3B0050G320/U	5 HP	5	NEMA 3R	18A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.66 kg
HVFD3B3B0075G120/U	7.5 HP	5	NEMA 1	24A	No	—	8.9 x 34.5 x 10.4	226 x 876 x 264	50 lb	23 kg
HVFD3B3B0075G220/U	7.5 HP	5	NEMA 12	24A	Yes	Yes	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.75 kg
HVFD3B3B0075G320/U	7.5 HP	5	NEMA 3R	24A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.66 kg
HVFD3B3B0100G120/U	10 HP	5	NEMA 1	31A	No	—	8.9 x 34.5 x 10.4	226 x 876 x 264	50 lb	23 kg
HVFD3B3B0100G220/U	10 HP	5	NEMA 12	31A	Yes	Yes	16 x 45 x 11	406 x 1143 x 279.4	84 lb	38.1 kg
HVFD3B3B0100G320/U	10 HP	5	NEMA 3R	31A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.66 kg
HVFD3B3B0150G120/U	15 HP	6	NEMA 1	48A	No	—	12.4 x 45 x 11.3	315 x 1143 x 287	60 lb	27.2 kg
HVFD3B3B0150G220/U	15 HP	6	NEMA 12	48A	Yes	Yes	16 x 50.5 x 13	406.4 x 1282.7 x 256.54	125 lb	56.7 kg
HVFD3B3B0150G320/U	15 HP	6	NEMA 3R	48A	Yes	Yes	28.5 x 36 x 10.5	723.9 x 914.4 x 266.7	118 lb	53.52 kg
HVFD3B3B0200G120/U	20 HP	6	NEMA 1	62A	No	—	12.4 x 45 x 11.3	315 x 1143 x 287	60 lb	27.2 kg
HVFD3B3B0200G220/U	20 HP	6	NEMA 12	62A	Yes	Yes	20 x 54.5 x 13	508 x 1384.3 x 330.2	140 lb	63.5 kg
HVFD3B3B0200G320/U	20 HP	6	NEMA 3R	62A	Yes	Yes	28.5 x 36 x 10.5	723.9 x 914.4 x 266.7	118 lb	53.52 kg
HVFD3B3B0250G120/U	25 HP	7	NEMA 1	75A	No	—	20.9 x 51.7 x 13.3	530.86 x 1313 x 338	149 lb	68 kg
HVFD3B3B0250G220/U	25 HP	7	NEMA 12	75A	Yes	Yes	24 x 64 x 13.3	508 x 1485.9 x 342.9	160 lb	73 kg
HVFD3B3B0250G320/U	25 HP	7	NEMA 3R	75A	Yes	Yes	28.5 x 48 x 12.5	711.2 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3B3B0300G120/U	30 HP	7	NEMA 1	88A	No	—	20.9 x 51.7 x 13.3	530.86 x 1313 x 338	149 lb	68 kg
HVFD3B3B0300G220/U	30 HP	7	NEMA 12	88A	Yes	Yes	24 x 65.5 x 13.5	609 x 1663.7 x 342.9	175 lb	79.38 kg
HVFD3B3B0300G320/U	30 HP	7	NEMA 3R	88A	Yes	Yes	28.5 x 48 x 12.5	711.2 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3B3B0400G120/U	40 HP	7	NEMA 1	105A	No	—	20.9 x 51.7 x 13.3	530.86 x 1313 x 338	149 lb	68 kg
HVFD3B3B0400G220/U	40 HP	7	NEMA 12	105A	Yes	Yes	30 x 70.5 x 13.5	762 x 1790.7 x 342.9	200 lb	90.72 kg
HVFD3B3B0400G320/U	40 HP	7	NEMA 3R	105A	Yes	Yes	28.5 x 48 x 12.5	711.2 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3B3B0500G120/U	50 HP	8	NEMA 1	140A	No	—	25 x 60 x 15.2	635 x 1524 x 386.08	250 lb	113.4 kg
HVFD3B3B0500G220/U	50 HP	8	NEMA 12	140A	No	—	40.5 x 60 x 12.5	1028.7 x 1524 x 317.5	350 lb	158.76 kg
HVFD3B3B0500G320/U	50 HP	8	NEMA 3R	140A	No	—	60 x 41 x 14	1524 x 1041 x 356	185 lb	83.91 kg
HVFD3B3B0600G120/U	60 HP	8	NEMA 1	170A	No	—	25 x 60 x 15.2	635 x 1524 x 386.08	265 lb	120.2 kg
HVFD3B3B0600G220/U	60 HP	8	NEMA 12	170A	No	—	40.5 x 60 x 12.5	1028.7 x 1524 x 317.5	350 lb	158.76 kg
HVFD3B3B0600G320/U	60 HP	8	NEMA 3R	170A	No	—	60 x 41 x 14	1524 x 1041 x 356	185 lb	83.91 kg
HVFD3B3B0750G120/U	75 HP	8	NEMA 1	205A	No	—	25 x 60 x 15.2	635 x 1524 x 386.08	280 lb	127.01 kg
HVFD3B3B0750G220/U	75 HP	8	NEMA 12	205A	No	—	40.5 x 60 x 12.5	1028.7 x 1524 x 317.5	350 lb	158.76 kg
HVFD3B3B0750G320/U	75 HP	8	NEMA 3R	205A	No	—	60 x 41 x 14	1524 x 1041 x 356	185 lb	83.91 kg

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Auto Bypass:** No; **Disconnect Type:** Fused; **Drive Input Fuses:** Yes; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
HVFDSB3B0007G130/U	0.75 HP	4	NEMA 1	3.7A	8.9 x 38.9 x 10.3	226.06 x 988.06 x 261.62	44 lb	19.96 kg
HVFDSB3B0007G230/U	0.75 HP	4	NEMA 12	3.7A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0007G330/U	0.75 HP	4	NEMA 3R	3.7A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0010G130/U	1 HP	4	NEMA 1	4.8A	8.9 x 38.9 x 10.3	226.06 x 988.06 x 261.62	44 lb	19.96 kg
HVFDSB3B0010G230/U	1 HP	4	NEMA 12	4.8A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0010G330/U	1 HP	4	NEMA 3R	4.8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0015G130/U	1.5 HP	4	NEMA 1	6.6A	8.9 x 38.9 x 10.3	226.06 x 988.06 x 261.62	44 lb	19.96 kg
HVFDSB3B0015G230/U	1.5 HP	4	NEMA 12	6.6A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0015G330/U	1.5 HP	4	NEMA 3R	6.6A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0020G130/U	2 HP	4	NEMA 1	8A	8.9 x 38.9 x 10.3	226.06 x 988.06 x 261.62	44 lb	19.96 kg
HVFDSB3B0020G230/U	2 HP	4	NEMA 12	8A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0020G330/U	2 HP	4	NEMA 3R	8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0030G130/U	3 HP	4	NEMA 1	11A	8.9 x 38.9 x 10.3	226.06 x 988.06 x 261.62	44 lb	19.96 kg
HVFDSB3B0030G230/U	3 HP	4	NEMA 12	11A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0030G330/U	3 HP	4	NEMA 3R	11A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0050G130/U	5 HP	5	NEMA 1	18A	8.9 x 41.7 x 10.3	226.06 x 1059.1 x 261.62	55 lb	24.95 kg
HVFDSB3B0050G230/U	5 HP	5	NEMA 12	18A	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.75 kg
HVFDSB3B0050G330/U	5 HP	5	NEMA 3R	18A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFDSB3B0075G130/U	7.5 HP	5	NEMA 1	24A	8.9 x 41.7 x 10.3	226.06 x 1059.1 x 261.62	57 lb	25.85 kg
HVFDSB3B0075G230/U	7.5 HP	5	NEMA 12	24A	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.75 kg
HVFDSB3B0075G330/U	7.5 HP	5	NEMA 3R	24A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFDSB3B0100G130/U	10 HP	5	NEMA 1	31A	8.9 x 41.7 x 10.8	226.06 x 1059.1 x 274.32	59.5 lb	26.99 kg
HVFDSB3B0100G230/U	10 HP	5	NEMA 12	31A	16 x 45 x 11	406 x 1143 x 279.4	84 lb	38.1 kg
HVFDSB3B0100G330/U	10 HP	5	NEMA 3R	31A	28.5 x 24 x 10	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFDSB3B0150G130/U	15 HP	6	NEMA 1	48A	12.4 x 55 x 11.3	315 x 1397 x 287	98 lb	44.5 kg
HVFDSB3B0150G230/U	15 HP	6	NEMA 12	48A	16 x 50.5 x 13	406.4 x 1282.7 x 256.54	125 lb	56.7 kg
HVFDSB3B0150G330/U	15 HP	6	NEMA 3R	48A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFDSB3B0200G130/U	20 HP	6	NEMA 1	62A	12.4 x 55 x 11.3	315 x 1397 x 287	98 lb	44.5 kg
HVFDSB3B0200G230/U	20 HP	6	NEMA 12	62A	20 x 54.5 x 13	508 x 1384.3 x 330.2	140 lb	63.5 kg
HVFDSB3B0200G330/U	20 HP	6	NEMA 3R	62A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFDSB3B0250G130/U	25 HP	7	NEMA 1	75A	20.9 x 59.2 x 13.3	530 x 1503 x 338	135 lb	61.3 kg
HVFDSB3B0250G230/U	25 HP	7	NEMA 12	75A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	160 lb	72.57 kg
HVFDSB3B0250G330/U	25 HP	7	NEMA 3R	75A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3B0300G130/U	30 HP	7	NEMA 1	88A	20.9 x 59.2 x 13.3	530 x 1503 x 338	150 lb	68.2 kg
HVFDSB3B0300G230/U	30 HP	7	NEMA 12	88A	24 x 65.5 x 13.5	609 x 1663.7 x 342.9	175 lb	79.38 kg
HVFDSB3B0300G330/U	30 HP	7	NEMA 3R	88A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3B0400G130/U	40 HP	7	NEMA 1	105A	20.9 x 59.2 x 13.3	530.86 x 1503 x 338	170 lb	77.1 kg
HVFDSB3B0400G230/U	40 HP	7	NEMA 12	105A	30 x 70.5 x 13.5	762 x 1790.7 x 342.9	200 lb	90.72 kg
HVFDSB3B0400G330/U	40 HP	7	NEMA 3R	105A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3B0500G130/U	50 HP	8	NEMA 1	140A	25 x 70 x 16.2	635 x 1778 x 411	286 lb	130 kg
HVFDSB3B0500G230/U	50 HP	8	NEMA 12	140A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3B0500G330/U	50 HP	8	NEMA 3R	140A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg
HVFDSB3B0600G130/U	60 HP	8	NEMA 1	170A	25 x 70 x 16.2	635 x 1778 x 411	295 lb	134 kg
HVFDSB3B0600G230/U	60 HP	8	NEMA 12	170A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3B0600G330/U	60 HP	8	NEMA 3R	170A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg
HVFDSB3B0750G130/U	75 HP	8	NEMA 1	205A	25 x 70 x 16.2	635 x 1778 x 411	331 lb	150 kg
HVFDSB3B0750G230/U	75 HP	8	NEMA 12	205A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3B0750G330/U	75 HP	8	NEMA 3R	205A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg

Product Selection - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with 3 Contactor Bypass and Auto Bypass; **Auto Bypass:** Yes; **Disconnect Type:** Fused; **Drive Input Fuses:** Yes; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
HVFDSB3B0007G131/U	0.75 HP	4	NEMA 1	3.7A	8.9 x 38.7 x 10.4	226 x 983 x 264	44 lb	20 kg
HVFDSB3B0007G231/U	0.75 HP	4	NEMA 12	3.7A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0007G331/U	0.75 HP	4	NEMA 3R	3.7A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0010G131/U	1 HP	4	NEMA 1	4.8A	8.9 x 38.7 x 10.4	226 x 983 x 264	44 lb	20kg
HVFDSB3B0010G231/U	1 HP	4	NEMA 12	4.8A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0010G331/U	1 HP	4	NEMA 3R	4.8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0015G131/U	1.5 HP	4	NEMA 1	6.6A	8.9 x 38.7 x 10.4	226 x 983 x 264	46 lb	20 kg
HVFDSB3B0015G231/U	1.5 HP	4	NEMA 12	6.6A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0015G331/U	1.5 HP	4	NEMA 3R	6.6A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0020G131/U	2 HP	4	NEMA 1	8A	8.9 x 38.7 x 10.4	226 x 983 x 264	44 lb	20 kg
HVFDSB3B0020G231/U	2 HP	4	NEMA 12	8A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0020G331/U	2 HP	4	NEMA 3R	8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0030G131/U	3 HP	4	NEMA 1	11A	8.9 x 38.7 x 10.4	226 x 983 x 264	44 lb	20 kg
HVFDSB3B0030G231/U	3 HP	4	NEMA 12	11A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	55 lb	24.95 kg
HVFDSB3B0030G331/U	3 HP	4	NEMA 3R	11A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFDSB3B0050G131/U	5 HP	5	NEMA 1	18A	8.9 x 41.5 x 10.4	226 x 1054 x 264	55 lb	24.9 kg
HVFDSB3B0050G231/U	5 HP	5	NEMA 12	18A	16 x 44 x 8.8	406 x 1041.4 x 279.4	70 lb	31.75 kg
HVFDSB3B0050G331/U	5 HP	5	NEMA 3R	18A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFDSB3B0075G131/U	7.5 HP	5	NEMA 1	24A	8.9 x 41.5 x 10.4	226 x 1054 x 264	58 lb	26 kg
HVFDSB3B0075G231/U	7.5 HP	5	NEMA 12	24A	16 x 41 x 11	406 x 1041.4 x 279.4	70 lb	31.75 kg
HVFDSB3B0075G331/U	7.5 HP	5	NEMA 3R	24A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFDSB3B0100G131/U	10 HP	5	NEMA 1	31A	8.9 x 41.5 x 10.4	226 x 1054 x 264	60 lb	27.2 kg
HVFDSB3B0100G231/U	10 HP	5	NEMA 12	31A	16 x 45 x 11	406 x 1143 x 279.4	84 lb	38.1 kg
HVFDSB3B0100G331/U	10 HP	5	NEMA 3R	31A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFDSB3B0150G131/U	15 HP	6	NEMA 1	48A	12.4 x 55 x 11.3	315 x 1397 x 287	98 lb	44.5 kg
HVFDSB3B0150G231/U	15 HP	6	NEMA 12	48A	16 x 50.5 x 13	406.4 x 1282.7 x 256.54	125 lb	56.7 kg
HVFDSB3B0150G331/U	15 HP	6	NEMA 3R	48A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFDSB3B0200G131/U	20 HP	6	NEMA 1	62A	12.4 x 55 x 11.3	315 x 1397 x 287	105 lb	47.6 kg
HVFDSB3B0200G231/U	20 HP	6	NEMA 12	62A	20 x 54.5 x 13	508 x 1384.3 x 330.2	140 lb	63.5 kg
HVFDSB3B0200G331/U	20 HP	6	NEMA 3R	62A	34.5 x 36 x 12	867.3 x 914.4 x 304.8	124 lb	56.25 kg
HVFDSB3B0250G131/U	25 HP	7	NEMA 1	75A	20.9 x 59.2 x 13.3	530 x 1503 x 338	135 lb	61.3 kg
HVFDSB3B0250G231/U	25 HP	7	NEMA 12	75A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	160 lb	72.57 kg
HVFDSB3B0250G331/U	25 HP	7	NEMA 3R	75A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3B0300G131/U	30 HP	7	NEMA 1	88A	20.9 x 59.2 x 13.3	530 x 1503 x 338	150 lb	68.2 kg
HVFDSB3B0300G231/U	30 HP	7	NEMA 12	88A	24 x 65.5 x 13.5	609 x 1663.7 x 342.9	175 lb	79.38 kg
HVFDSB3B0300G331/U	30 HP	7	NEMA 3R	88A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3B0400G131/U	40 HP	7	NEMA 1	105A	20.9 x 59.2 x 13.3	530.86 x 14503 x 338	170 lb	77.1 kg
HVFDSB3B0400G231/U	40 HP	7	NEMA 12	105A	30 x 70.5 x 13.5	762 x 1790.7 x 342.9	200 lb	90.72 kg
HVFDSB3B0400G331/U	40 HP	7	NEMA 3R	105A	28.5 x 48 x 14	711.2 x 1219.2 x 355.6	193 lb	87.54 kg
HVFDSB3B0500G131/U	50 HP	8	NEMA 1	140A	25 x 70 x 16.2	635 x 1778 x 411	286 lb	130 kg
HVFDSB3B0500G231/U	50 HP	8	NEMA 12	140A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3B0500G331/U	50 HP	8	NEMA 3R	140A	60 x 41 x 14.	1524 x 1041 x 356	193 lb	87.54 kg
HVFDSB3B0600G131/U	60 HP	8	NEMA 1	170A	25 x 70 x 16.2	635 x 1778 x 411	295 lb	134 kg
HVFDSB3B0600G231/U	60 HP	8	NEMA 12	170A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3B0600G331/U	60 HP	8	NEMA 3R	170A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg
HVFDSB3B0750G131/U	75 HP	8	NEMA 1	205A	25 x 70 x 16.2	635 x 1778 x 411	331 lb	150 kg
HVFDSB3B0750G231/U	75 HP	8	NEMA 12	205A	40.5 x 60 x 14	1028.7 x 1524 x 355.6	369 lb	167.38 kg
HVFDSB3B0750G331/U	75 HP	8	NEMA 3R	205A	60 x 41 x 14	1524 x 1041 x 356	193 lb	87.54 kg

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with Fused Disconnect; **Auto Bypass:** No; **Disconnect Type:** Fused; **Pilot Lights:** None

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Drive Input Disconnect	Drive Input Fuses	Dimensions, Approximate		Weight	
							(Inch)	(mm)	(lb)	(kg)
HVFD3C0015G110/U	1.5 HP	4	NEMA 1	3.4A	Yes	Yes	8.9 x 31.7 x 9.6	226 x 805 x 244	33 lb	15 kg
HVFD3C0015G210/U	1.5 HP	4	NEMA 12	3.4A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3C0015G310/U	1.5 HP	4	NEMA 3R	3.4A	No	—	20.5 x 20 x 12	520.7 x 208 x 304.8	43 lb	19.5 kg
HVFD3C0020G110/U	2 HP	4	NEMA 1	4.8A	Yes	Yes	8.9 x 31.9 x 10.3	226.06 x 810.26 x 261.62	33 lb	14.97 kg
HVFD3C0020G210/U	2 HP	4	NEMA 12	4.8A	No	—	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	40 lb	18.14 kg
HVFD3C0020G310/U	2 HP	4	NEMA 3R	4.8A	No	—	16 x 37.5 x 11	304.8 x 952.5 x 279.4	43 lb	19.5 kg
HVFD3C0030G110/U	3 HP	4	NEMA 1	5.6A	Yes	Yes	8.9 x 31.9 x 10.3	226.06 x 810.26 x 261.62	33 lb	14.97 kg
HVFD3C0030G210/U	3 HP	4	NEMA 12	5.6A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3C0030G310/U	3 HP	4	NEMA 3R	5.6A	No	—	20.5 x 20 x 12	520.7 x 208 x 304.8	43 lb	19.5 kg
HVFD3C0040G110/U	4 HP	4	NEMA 1	8A	Yes	Yes	8.9 x 31.9 x 10.3	226.06 x 810.26 x 261.62	33 lb	14.97 kg
HVFD3C0040G210/U	4 HP	4	NEMA 12	8A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3C0040G310/U	4 HP	4	NEMA 3R	8A	No	—	20.5 x 20 x 12	520.7 x 208 x 304.8	43 lb	19.5 kg
HVFD3C0050G110/U	5 HP	4	NEMA 1	9.6A	Yes	Yes	8.9 x 31.9 x 10.3	226.06 x 810.26 x 261.62	33 lb	14.97 kg
HVFD3C0050G210/U	5 HP	4	NEMA 12	9.6A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3C0050G310/U	5 HP	4	NEMA 3R	9.6A	No	—	20.5 x 20 x 12	520.7 x 208 x 304.8	43 lb	19.5 kg
HVFD3C0075G110/U	7.5 HP	4	NEMA 1	12A	Yes	Yes	8.9 x 31.9 x 10.3	226.06 x 810.26 x 261.62	33 lb	14.97 kg
HVFD3C0075G210/U	7.5 HP	4	NEMA 12	12A	No	—	12 x 37.5 x 11	304.8 x 952.5 x 279.4	40 lb	18.14 kg
HVFD3C0075G310/U	7.5 HP	4	NEMA 3R	12A	No	—	20.5 x 20 x 12	520.7 x 208 x 304.8	43 lb	19.5 kg
HVFD3C0100G110/U	10 HP	5	NEMA 1	16A	Yes	Yes	8.9 x 34.7 x 10.3	226.06 x 881.38 x 261.62	43 lb	19.5 kg
HVFD3C0100G210/U	10 HP	5	NEMA 12	16A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.66 kg
HVFD3C0100G310/U	10 HP	5	NEMA 3R	16A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.67 kg
HVFD3C0150G110/U	15 HP	5	NEMA 1	23A	Yes	Yes	8.9 x 34.7 x 10.3	6.06 x 881.38 x 261.62	43 lb	19.5 kg
HVFD3C0150G210/U	15 HP	5	NEMA 12	23A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.66 kg
HVFD3C0150G310/U	15 HP	5	NEMA 3R	23A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.67 kg
HVFD3C0200G110/U	20 HP	5	NEMA 1	31A	Yes	Yes	8.9 x 34.7 x 10.3	226.06 x 881.38 x 261.62	43 lb	19.5 kg
HVFD3C0200G210/U	20 HP	5	NEMA 12	31A	No	—	12 x 41 x 11	304.8 x 1041.4 x 279.4	72 lb	32.66 kg
HVFD3C0200G310/U	20 HP	5	NEMA 3R	31A	No	—	20.5 x 24 x 12	520.7 x 609.6 x 304.8	61 lb	27.67 kg
HVFD3C0250G110/U	25 HP	6	NEMA 1	38A	Yes	Yes	12.4 x 45.1 x 11.3	314.96 x 1145.5 x 287.02	50 lb	22.68 kg
HVFD3C0250G210/U	25 HP	6	NEMA 12	38A	No	—	12 x 46.5 x 13	304.8 x 1181.1 x 330.2	120 lb	54.43 kg
HVFD3C0250G310/U	25 HP	6	NEMA 3R	38A	No	—	28.5 x 36 x 10.5	723.9 x 914.4 x 266.7	118 lb	53.52 kg
HVFD3C0300G110/U	30 HP	6	NEMA 1	46A	Yes	Yes	12.4 x 45.1 x 11.3	314.96 x 1145.5 x 287.02	50 lb	22.68 kg
HVFD3C0300G210/U	30 HP	6	NEMA 12	46A	No	—	12 x 46.5 x 13	304.8 x 1181.1 x 330.2	120 lb	54.43 kg
HVFD3C0300G310/U	30 HP	6	NEMA 3R	46A	No	—	28.5 x 36 x 12	723.9 x 914.4 x 304.8	88 lb	39.92 kg
HVFD3C0400G110/U	40 HP	6	NEMA 1	61A	Yes	Yes	12.4 x 45.1 x 11.3	314.96 x 1145.5 x 287.02	50 lb	22.68 kg
HVFD3C0400G210/U	40 HP	6	NEMA 12	61A	No	—	12 x 46.5 x 13	304.8 x 1181.1 x 330.2	136 lb	61.69 kg
HVFD3C0400G310/U	40 HP	6	NEMA 3R	61A	No	—	28.5 x 36 x 12	723.9 x 914.4 x 304.8	88 lb	39.92 kg
HVFD3C0500G110/U	50 HP	7	NEMA 1	72A	Yes	Yes	20.8 x 51.5 x 13.2	528.32 x 1308.1 x 335.28	100 lb	45.36 kg
HVFD3C0500G210/U	50 HP	7	NEMA 12	72A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	145 lb	65.77 kg
HVFD3C0500G310/U	50 HP	7	NEMA 3R	72A	No	—	28.5 x 48 x 14	723.9 x 1219.2 x 355.6	149 lb	67.59 kg
HVFD3C0600G110/U	60 HP	7	NEMA 1	87A	Yes	Yes	20.8 x 51.5 x 13.2	528.32 x 1308.1 x 335.28	100 lb	45.36 kg
HVFD3C0600G210/U	60 HP	7	NEMA 12	87A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	160 lb	72.57 kg
HVFD3C0600G310/U	60 HP	7	NEMA 3R	87A	No	—	28.5 x 48 x 14	723.9 x 1219.2 x 355.6	149 lb	67.59 kg
HVFD3C0750G110/U	75 HP	7	NEMA 1	105A	Yes	Yes	20.8 x 51.5 x 13.2	528.32 x 1308.1 x 335.28	100 lb	45.36 kg
HVFD3C0750G210/U	75 HP	7	NEMA 12	105A	No	—	16 x 50.5 x 13.5	406.4 x 1282.7 x 342.9	193 lb	87.54 kg
HVFD3C0750G310/U	75 HP	7	NEMA 3R	105A	No	—	28.5 x 48 x 14	723.9 x 1219.2 x 355.6	149 lb	67.59 kg
HVFD3C1000G110/U	100 HP	8	NEMA 1	140A	Yes	Yes	25 x 60 x 16.2	635 x 1524 x 411.48	200 lb	90.72 kg
HVFD3C1000G210/U	100 HP	8	NEMA 12	140A	Yes	Yes	20 x 64 x 15.1	508 x 1625.6 x 383.5	280 lb	127.00 kg
HVFD3C1000G310/U	100 HP	8	NEMA 3R	140A	Yes	Yes	40.5 x 60 x 14	1028.7 x 1524 x 355.6	340 lb	154.22 kg
HVFD3C1250G110/U	120 HP	8	NEMA 1	170A	Yes	Yes	25 x 60 x 16.2	635 x 1524 x 411.5	265 lb	120.2 kg
HVFD3C1250G210/U	120 HP	8	NEMA 12	170A	Yes	Yes	20 x 64 x 15.1	508 x 1625.6 x 383.5	280 lb	127.00 kg
HVFD3C1250G310/U	120 HP	8	NEMA 3R	170A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	375 lb	170.1 kg
HVFD3C1500G110/U	150 HP	8	NEMA 1	205A	Yes	Yes	25 x 60 x 16.2	635 x 1524 x 411.5	280 lb	127 kg
HVFD3C1500G210/U	150 HP	8	NEMA 12	205A	Yes	Yes	20 x 64 x 15.1	508 x 1625.6 x 383.5	280 lb	127.00 kg
HVFD3C1500G310/U	150 HP	8	NEMA 3R	205A	Yes	Yes	48 x 36 x 16	1219 x 914 x 406	375 lb	170.1 kg

Product Selection - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Auto Bypass:** No; **Disconnect Type:** Fused; **Pilot Lights:** None

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Drive Input Disconnect	Drive Input Fuses	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
HVFD3B3C0015G120/U	1.5 HP	4	NEMA 1	3.4A	No	—	8.9 x 319. x 9.6	226.06 x 805.18 x 243.84	38 lb	17.24 kg
HVFD3B3C0015G220/U	1.5 HP	4	NEMA 12	3.4A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0015G320/U	1.5 HP	4	NEMA 3R	3.4A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3C0020G120/U	2 HP	4	NEMA 1	4.8A	No	—	8.9 x 319. x 9.6	226.06 x 805.18 x 243.84	38 lb	17.24 kg
HVFD3B3C0020G220/U	2 HP	4	NEMA 12	4.8A	Yes	Yes	12 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0020G320/U	2 HP	4	NEMA 3R	4.8A	Yes	Yes	20.5 x 20 x 12	520.7 x 208 x 304.8	49 lb	22.23 kg
HVFD3B3C0030G120/U	3 HP	4	NEMA 1	5.6A	No	—	8.9 x 319. x 9.6	226.06 x 805.18 x 243.84	38 lb	17.24 kg
HVFD3B3C0030G220/U	3 HP	4	NEMA 12	5.6A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0030G320/U	3 HP	4	NEMA 3R	5.6A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3C0040G120/U	4 HP	4	NEMA 1	8A	No	—	8.9 x 319. x 9.6	226.06 x 805.18 x 243.84	38 lb	17.24 kg
HVFD3B3C0040G220/U	4 HP	4	NEMA 12	8A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0040G320/U	4 HP	4	NEMA 3R	8A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3C0050G120/U	5 HP	4	NEMA 1	9.6A	No	—	8.9 x 319. x 9.6	226.06 x 805.18 x 243.84	38 lb	17.24 kg
HVFD3B3C0050G220/U	5 HP	4	NEMA 12	9.6A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0050G320/U	5 HP	4	NEMA 3R	9.6A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3C0075G120/U	7.5 HP	4	NEMA 1	12A	No	—	8.9 x 319. x 9.6	226.06 x 805.18 x 243.84	38 lb	17.24 kg
HVFD3B3C0075G220/U	7.5 HP	4	NEMA 12	12A	Yes	Yes	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0075G320/U	7.5 HP	4	NEMA 3R	12A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	49 lb	22.23 kg
HVFD3B3C0100G120/U	10 HP	4	NEMA 1	16A	No	—	8.9 x 34.7 x 9.6	226.06 x 876.3 x 243.84	48 lb	21.77 kg
HVFD3B3C0100G220/U	10 HP	5	NEMA 12	16A	Yes	Yes	16 x 44 x 8.8	406.4 x 1041.4 x 279.4	64 lb	29.03 kg
HVFD3B3C0100G320/U	10 HP	5	NEMA 3R	16A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.66 kg
HVFD3B3C0150G120/U	15 HP	5	NEMA 1	23A	No	—	8.9 x 34.7 x 9.6	226.06 x 876.3 x 243.84	50 lb	22.68 kg
HVFD3B3C0150G220/U	15 HP	5	NEMA 12	23A	Yes	Yes	16 x 41 x 11	406.4 x 1041.4 x 279.4	64 lb	29.03 kg
HVFD3B3C0150G320/U	15 HP	5	NEMA 3R	23A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.66 kg
HVFD3B3C0200G120/U	20 HP	5	NEMA 1	31A	No	—	8.9 x 34.7 x 9.6	226.06 x 876.3 x 243.84	50 lb	22.68 kg
HVFD3B3C0200G220/U	20 HP	5	NEMA 12	31A	Yes	Yes	16 x 45 x 11	406.4 x 1143 x 279.4	76 lb	34.47 kg
HVFD3B3C0200G320/U	20 HP	5	NEMA 3R	31A	Yes	Yes	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	72 lb	32.66 kg
HVFD3B3C0250G120/U	25 HP	6	NEMA 1	38A	No	—	12.4 x 45.1 x 10.1	314.96 x 1143 x 256.54	55 lb	24.95 kg
HVFD3B3C0250G220/U	25 HP	6	NEMA 12	38A	Yes	Yes	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	120 lb	54.43 kg
HVFD3B3C0250G320/U	25 HP	6	NEMA 3R	38A	Yes	Yes	34.5 x 36 x 10	876.3 x 914.4 x 254	194 lb	88.2 kg
HVFD3B3C0300G120/U	30 HP	6	NEMA 1	46A	No	—	12.4 x 45.1 x 10.1	314.96 x 1143 x 256.54	59 lb	26.76 kg
HVFD3B3C0300G220/U	30 HP	6	NEMA 12	46A	Yes	Yes	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	120 lb	54.43 kg
HVFD3B3C0300G320/U	30 HP	6	NEMA 3R	46A	Yes	Yes	28.5 x 36 x 10.5	723.9 x 914.4 x 266.7	118 lb	53.52 kg
HVFD3B3C0400G120/U	40 HP	6	NEMA 1	61A	No	—	12.4 x 45.1 x 10.1	314.96 x 1143 x 256.54	59 lb	26.76 kg
HVFD3B3C0400G220/U	40 HP	6	NEMA 12	61A	Yes	Yes	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	136 lb	61.69 kg
HVFD3B3C0400G320/U	40 HP	6	NEMA 3R	61A	Yes	Yes	28.5 x 36 x 10.5	723.9 x 914.4 x 266.7	118 lb	53.52 kg
HVFD3B3C0500G120/U	50 HP	7	NEMA 1	72A	No	—	20.8 x 51.5 x 12.2	530.86 x 1313.18 x 309.88	169 lb	76.66 kg
HVFD3B3C0500G220/U	50 HP	7	NEMA 12	72A	Yes	Yes	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	150 lb	68.04 kg
HVFD3B3C0500G320/U	50 HP	7	NEMA 3R	72A	Yes	Yes	28.5 x 48 x 12.5	723.9 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3B3C0600G120/U	60 HP	7	NEMA 1	87A	No	—	20.8 x 51.5 x 12.2	530.86 x 1313.18 x 309.88	179 lb	81.19 kg
HVFD3B3C0600G220/U	60 HP	7	NEMA 12	87A	Yes	Yes	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	165 lb	74.84 kg
HVFD3B3C0600G320/U	60 HP	7	NEMA 3R	87A	Yes	Yes	28.5 x 48 x 12.5	723.9 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3B3C0750G120/U	75 HP	7	NEMA 1	105A	No	—	20.8 x 51.5 x 12.2	530.86 x 1313.18 x 309.88	189 lb	85.73 kg
HVFD3B3C0750G220/U	75 HP	7	NEMA 12	105A	Yes	Yes	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	193 lb	87.54 kg
HVFD3B3C0750G320/U	75 HP	7	NEMA 3R	105A	Yes	Yes	28.5 x 48 x 12.5	723.9 x 1219.2 x 317.5	185 lb	83.91 kg
HVFD3B3C1000G120/U	100 HP	8	NEMA 1	140A	No	—	25 x 60 x 15.2	635 x 1524 x 386.08	250 lb	113.4 kg
HVFD3B3C1000G220/U	100 HP	8	NEMA 12	140A	No	—	56 x 48 x 15.1	1422 x 1219 x 384	350 lb	158.76 kg
HVFD3B3C1000G320/U	100 HP	8	NEMA 3R	140A	No	—	40.5 x 60 x 12.5	1028.7 x 1524 x 317.5	430 lb	195.04 kg
HVFD3B3C1250G120/U	120 HP	8	NEMA 1	170A	No	—	25 x 60 x 16.2	635 x 1524 x 411.5	265 lb	120.2 kg
HVFD3B3C1250G220/U	120 HP	8	NEMA 12	170A	No	—	56 x 48 x 15.1	1422 x 1219 x 384	350 lb	158.76 kg
HVFD3B3C1250G320/U	120 HP	8	NEMA 3R	170A	No	—	60 x 41 x 14	1524 x 1041 x 356	451 lb	204.6 kg
HVFD3B3C1500G120/U	150 HP	8	NEMA 1	205A	No	—	25 x 60 x 16.2	635 x 1524 x 411.5	280 lb	127 kg
HVFD3B3C1500G220/U	150 HP	8	NEMA 12	205A	No	—	56 x 48 x 15.1	1422 x 1219 x 384	350 lb	158.76 kg
HVFD3B3C1500G320/U	150 HP	8	NEMA 3R	205A	No	—	60 x 41 x 14	1524 x 1041 x 356	451 lb	204.6 kg

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Auto Bypass:** No; **Disconnect Type:** Fused; **Drive Input Fuses:** Yes; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
HVFD3B3C0015G130/U	1.5 HP	4	NEMA 1	3.4A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	44 lb	19.96 kg
HVFD3B3C0015G230/U	1.5 HP	4	NEMA 12	3.4A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0015G330/U	1.5 HP	4	NEMA 3R	3.4A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0020G130/U	2 HP	4	NEMA 1	4.8A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	44 lb	19.96 kg
HVFD3B3C0020G230/U	2 HP	4	NEMA 12	4.8A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0020G330/U	2 HP	4	NEMA 3R	4.8A	24.5 x 24 x 10.5	622.3 x 609.6 x 266.7	54 lb	24.49 kg
HVFD3B3C0030G130/U	3 HP	4	NEMA 1	5.6A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	44 lb	19.96 kg
HVFD3B3C0030G230/U	3 HP	4	NEMA 12	5.6A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0030G330/U	3 HP	4	NEMA 3R	5.6A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0040G130/U	4 HP	4	NEMA 1	8A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	44 lb	19.96 kg
HVFD3B3C0040G230/U	4 HP	4	NEMA 12	8A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0040G330/U	4 HP	4	NEMA 3R	8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0050G130/U	5 HP	4	NEMA 1	9.6A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	44 lb	19.96 kg
HVFD3B3C0050G230/U	5 HP	4	NEMA 12	9.6A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0050G330/U	5 HP	4	NEMA 3R	9.6A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0075G130/U	7.5 HP	4	NEMA 1	12A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	44 lb	19.96 kg
HVFD3B3C0075G230/U	7.5 HP	4	NEMA 12	12A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0075G330/U	7.5 HP	4	NEMA 3R	12A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0100G130/U	10 HP	5	NEMA 1	16A	8.9 x 41.7 x 10.3	226.06 x 881.38 x 261.62	55 lb	24.95 kg
HVFD3B3C0100G230/U	10 HP	5	NEMA 12	16A	16 x 41 x 11	406.4 x 1041.4 x 279.4	64 lb	29.03 kg
HVFD3B3C0100G330/U	10 HP	5	NEMA 3R	16A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFD3B3C0150G130/U	15 HP	5	NEMA 1	23A	8.9 x 41.7 x 10.3	226.06 x 881.38 x 261.62	57 lb	25.85 kg
HVFD3B3C0150G230/U	15 HP	5	NEMA 12	23A	16 x 41 x 11	406.4 x 1041.4 x 279.4	64 lb	29.03 kg
HVFD3B3C0150G330/U	15 HP	5	NEMA 3R	23A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFD3B3C0200G130/U	20 HP	5	NEMA 1	31A	8.9 x 41.7 x 10.8	226.06 x 881.38 x 274.32	59 lb	26.76 kg
HVFD3B3C0200G230/U	20 HP	5	NEMA 12	31A	16 x 45 x 11	406.4 x 1143 x 279.4	76 lb	34.47 kg
HVFD3B3C0200G330/U	20 HP	5	NEMA 3R	31A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFD3B3C0250G130/U	25 HP	6	NEMA 1	38A	12.4 x 55.2 x 11.3	314.96 x 1145.5 x 287.02	94.5 lb	42.86 kg
HVFD3B3C0250G230/U	25 HP	6	NEMA 12	38A	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	120 lb	54.43 kg
HVFD3B3C0250G330/U	25 HP	6	NEMA 3R	38A	34.5 x 36 x 12	723.9 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3B3C0300G130/U	30 HP	6	NEMA 1	46A	12.4 x 55.2 x 11.3	314.96 x 1145.5 x 287.02	98.5 lb	44.68 kg
HVFD3B3C0300G230/U	30 HP	6	NEMA 12	46A	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	120 lb	54.43 kg
HVFD3B3C0300G330/U	30 HP	6	NEMA 3R	46A	34.5 x 36 x 12	723.9 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3B3C0400G130/U	40 HP	6	NEMA 1	61A	12.4 x 55.2 x 11.3	314.96 x 1145.5 x 287.02	105.5 lb	47.85 kg
HVFD3B3C0400G230/U	40 HP	6	NEMA 12	61A	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	136 lb	61.69 kg
HVFD3B3C0400G330/U	40 HP	6	NEMA 3R	61A	34.5 x 36 x 12	723.9 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3B3C0500G130/U	50 HP	7	NEMA 1	72A	20.8 x 59 x 13.2	528.32 x 1308.1 x 335.28	175 lb	79.38 kg
HVFD3B3C0500G230/U	50 HP	7	NEMA 12	72A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	150 lb	68.04 kg
HVFD3B3C0500G330/U	50 HP	7	NEMA 3R	72A	40.5 x 48 x 14	1028.7 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3B3C0600G130/U	60 HP	7	NEMA 1	87A	20.8 x 59 x 13.2	528.32 x 1308.1 x 335.28	184 lb	83.46 kg
HVFD3B3C0600G230/U	60 HP	7	NEMA 12	87A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	165 lb	74.84 kg
HVFD3B3C0600G330/U	60 HP	7	NEMA 3R	87A	40.5 x 48 x 14	1028.7 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3B3C0750G130/U	75 HP	7	NEMA 1	105A	20.8 x 59 x 13.2	528.32 x 1308.1 x 335.28	195 lb	88.45 kg
HVFD3B3C0750G230/U	75 HP	7	NEMA 12	105A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	193 lb	87.54 kg
HVFD3B3C0750G330/U	75 HP	7	NEMA 3R	105A	40.5 x 48 x 14	1028.7 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3B3C1000G130/U	100 HP	8	NEMA 1	140A	25 x 70 x 16.2	635 x 1524 x 411.48	285 lb	129.27 kg
HVFD3B3C1000G230/U	100 HP	8	NEMA 12	140A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	158.76 kg
HVFD3B3C1000G330/U	100 HP	8	NEMA 3R	140A	40.4 x 60 x 12	1026 x 1524 x 304.8	470 lb	213.2 kg
HVFD3B3C1250G130/U	120 HP	8	NEMA 1	170A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	167.4 kg
HVFD3B3C1250G230/U	120 HP	8	NEMA 12	170A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	158.76 kg
HVFD3B3C1250G330/U	120 HP	8	NEMA 3R	170A	40.4 x 60 x 12	1026 x 1524 x 304.8	470 lb	213.2 kg
HVFD3B3C1500G130/U	150 HP	8	NEMA 1	205A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	167.4 kg
HVFD3B3C1500G230/U	150 HP	8	NEMA 12	205A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	158.76 kg
HVFD3B3C1500G330/U	150 HP	8	NEMA 3R	205A	40.4 x 60 x 12	1026 x 1524 x 304.8	470 lb	213.2 kg

Product Selection - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with 3 Contactor Bypass and Auto Bypass; **Auto Bypass:** Yes; **Disconnect Type:** Fused; **Drive Input Fuses:** Yes; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
HVFD3B3C0015G131/U	1.5 HP	4	NEMA 1	3.4A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	46 lb	20.87 kg
HVFD3B3C0015G231/U	1.5 HP	4	NEMA 12	3.4A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0015G331/U	1.5 HP	4	NEMA 3R	3.4A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0020G131/U	2 HP	4	NEMA 1	8A	8.9 x 38.7 x 10.7	226.06 x 982.98 x 271.78	Call Customer Care	
HVFD3B3C0020G231/U	2 HP	4	NEMA 12	4.8A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0020G331/U	2 HP	4	NEMA 3R	4.8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0030G131/U	3 HP	4	NEMA 1	5.6A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	46 lb	20.87 kg
HVFD3B3C0030G231/U	3 HP	4	NEMA 12	5.6A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0030G331/U	3 HP	4	NEMA 3R	5.6A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0040G131/U	4 HP	4	NEMA 1	8A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	46 lb	20.87 kg
HVFD3B3C0040G231/U	4 HP	4	NEMA 12	8A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0040G331/U	4 HP	4	NEMA 3R	8A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0050G131/U	5 HP	4	NEMA 1	9.6A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	46 lb	20.87 kg
HVFD3B3C0050G231/U	5 HP	4	NEMA 12	9.6A	16 x 37.5 x 11	304.8 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0050G331/U	5 HP	4	NEMA 3R	9.6A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49 kg
HVFD3B3C0075G131/U	7.5 HP	4	NEMA 1	12A	8.9 x 38.9 x 10.3	226.06 x 810.26 x 261.62	46 lb	20.87 kg
HVFD3B3C0075G231/U	7.5 HP	4	NEMA 12	12A	16 x 37.5 x 11	406.4 x 952.5 x 279.4	53 lb	24.04 kg
HVFD3B3C0075G331/U	7.5 HP	4	NEMA 3R	12A	24.5 x 24 x 12	622.3 x 609.6 x 304.8	54 lb	24.49kg
HVFD3B3C0100G131/U	10 HP	5	NEMA 1	16A	8.9 x 41.7 x 10.3	226.06 x 881.38 x 261.62	55 lb	25.4 kg
HVFD3B3C0100G231/U	10 HP	5	NEMA 12	16A	16 x 41 x 11	406.4 x 1041.4 x 279.4	64 lb	29.03 kg
HVFD3B3C0100G331/U	10 HP	5	NEMA 3R	16A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFD3B3C0150G131/U	15 HP	5	NEMA 1	23A	8.9 x 41.7 x 10.3	226.06 x 881.38 x 261.62	56 lb	25.4 kg
HVFD3B3C0150G231/U	15 HP	5	NEMA 12	23A	16 x 41 x 11	406.4 x 1041.4 x 279.4	64 lb	29.03 kg
HVFD3B3C0150G331/U	15 HP	5	NEMA 3R	23A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFD3B3C0200G131/U	20 HP	5	NEMA 1	31A	8.9 x 41.7 x 10.8	226.06 x 881.38 x 274.32	60 lb	27.22 kg
HVFD3B3C0200G231/U	20 HP	5	NEMA 12	31A	16 x 45 x 11	406.4 x 1143 x 279.4	76 lb	34.47 kg
HVFD3B3C0200G331/U	20 HP	5	NEMA 3R	31A	28.5 x 30 x 12	723.9 x 762 x 304.8	78 lb	35.38 kg
HVFD3B3C0250G131/U	25 HP	6	NEMA 1	38A	12.4 x 55.2 x 11.3	314.96 x 1145.5 x 287.02	96.5 lb	43.77 kg
HVFD3B3C0250G231/U	25 HP	6	NEMA 12	38A	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	120 lb	54.43 kg
HVFD3B3C0250G331/U	25 HP	6	NEMA 3R	38A	34.5 x 36 x 12	723.9 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3B3C0300G131/U	30 HP	6	NEMA 1	46A	12.4 x 55.2 x 11.3	314.96 x 1145.5 x 287.02	100.5 lb	45.59 kg
HVFD3B3C0300G231/U	30 HP	6	NEMA 12	46A	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	120 lb	54.43 kg
HVFD3B3C0300G331/U	30 HP	6	NEMA 3R	46A	34.5 x 36 x 12	723.9 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3B3C0400G131/U	40 HP	6	NEMA 1	61A	12.4 x 55.2 x 11.3	314.96 x 1145.5 x 287.02	107.5 lb	48.76 kg
HVFD3B3C0400G231/U	40 HP	6	NEMA 12	61A	16 x 50.5 x 13	406.4 x 1282.7 x 330.2	136 lb	61.69 kg
HVFD3B3C0400G331/U	40 HP	6	NEMA 3R	61A	34.5 x 36 x 12	723.9 x 914.4 x 304.8	124 lb	56.25 kg
HVFD3B3C0500G131/U	50 HP	7	NEMA 1	72A	20.8 x 59 x 13.2	528.32 x 1308.1 x 335.28	177 lb	80.29 kg
HVFD3B3C0500G231/U	50 HP	7	NEMA 12	72A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	150 lb	68.04 kg
HVFD3B3C0500G331/U	50 HP	7	NEMA 3R	72A	40.5 x 48 x 14	1028.7 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3B3C0600G131/U	60 HP	7	NEMA 1	87A	20.8 x 59 x 13.2	528.32 x 1308.1 x 335.28	186 lb	84.37 kg
HVFD3B3C0600G231/U	60 HP	7	NEMA 12	87A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	165 lb	74.84 kg
HVFD3B3C0600G331/U	60 HP	7	NEMA 3R	87A	40.5 x 48 x 14	1028.7 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3B3C0750G131/U	75 HP	7	NEMA 1	105A	20.8 x 59 x 13.2	528.32 x 1308.1 x 335.28	197 lb	89.36 kg
HVFD3B3C0750G231/U	75 HP	7	NEMA 12	105A	20 x 58.5 x 13.5	508 x 1485.9 x 342.9	193 lb	87.54 kg
HVFD3B3C0750G331/U	75 HP	7	NEMA 3R	105A	40.5 x 48 x 14	1028.7 x 1219.2 x 355.6	193 lb	87.54 kg
HVFD3B3C1000G131/U	100 HP	8	NEMA 1	140A	25 x 70 x 16.2	635 x 1524 x 411.48	287 lb	130.18 kg
HVFD3B3C1000G231/U	100 HP	8	NEMA 12	140A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	158.76 kg
HVFD3B3C1000G331/U	100 HP	8	NEMA 3R	140A	40.4 x 60 x 12	1026 x 1524 x 304.8	470 lb	213.2 kg
HVFD3B3C1250G131/U	120 HP	8	NEMA 1	170A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	167.4 kg
HVFD3B3C1250G231/U	120 HP	8	NEMA 12	170A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	158.76 kg
HVFD3B3C1250G331/U	120 HP	8	NEMA 3R	170A	40.4 x 60 x 12	1026 x 1524 x 304.8	470 lb	213.2 kg
HVFD3B3C1500G131/U	150 HP	8	NEMA 1	205A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	167.4 kg
HVFD3B3C1500G231/U	150 HP	8	NEMA 12	205A	56 x 48 x 15.1	1422 x 1219 x 384	369 lb	158.76 kg
HVFD3B3C1500G331/U	150 HP	8	NEMA 3R	205A	40.4 x 60 x 12	1026 x 1524 x 304.8	470 lb	213.2 kg

replacement opportunity



Universal Actuator for Fire & Smoke Dampers.

Honeywell is the leading supplier of fire and smoke actuators designed for UL555 and UL555S. Our current product line is the universal replacement for existing fire and smoke damper actuators.

Smart Solutions for Intelligent buildings.

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Submittal Data - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect



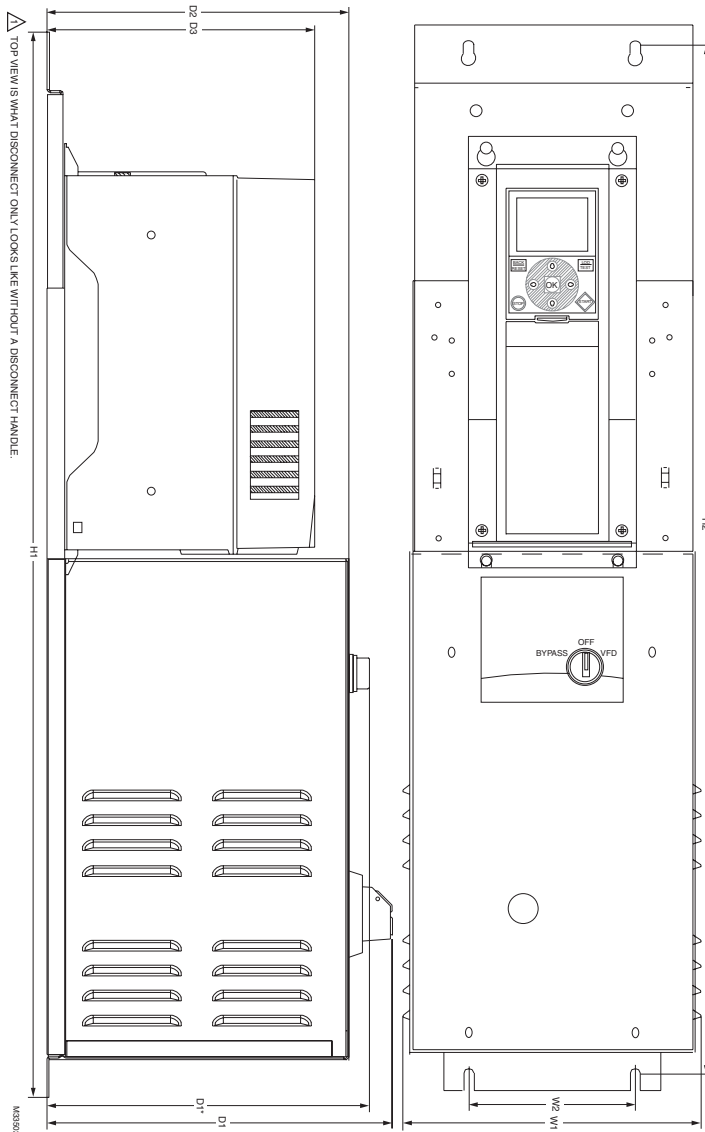
SmartVFD Drives are available in four configurations with bypass and/or disconnect as explained below. All configurations are available in NEMA 1, NEMA 12 and ventilated NEMA 3R.

Dimensional Drawings for SmartVFD HVAC Drives with Bypass and/or Disconnect

The following are the dimensional drawings and data for NEMA 1 drives with bypass and/or disconnect.

Refer to www.customer.honeywell.com for dimensional drawings for NEMA 12 or NEMA 3R models.

NEMA 1, SmartVFD HVAC Drive with 2-Contactor Bypass, No Disconnect



FEATURES

SmartVFD with Disconnect

- Fused Disconnect with no bypass

SmartVFD with 2-Contactor Bypass

Provides an economical means of bypassing the VFD.

- No Main Disconnect
- Freeze/Fire/Smoke Interlock

SmartVFD with 3-Contactor Bypass

Commission and test the VFD without affecting the operation of the motor. Provide additional bypass control capabilities with Auto bypass.

- Fused Disconnect
- Freeze/Fire/Smoke Interlock
- TEST position powers the VFD without sending power to the motor

SmartVFD with 3-Contactor Auto Bypass

SmartVFD with 3-Contactor Bypass plus VFD will automatically send the bypass into BYPASS mode:

- A contact closure sends the bypass into BYPASS mode
- Dry contacts indicate when the bypass is in BYPASS mode and can be used to alert the building management system.

Warranty

- 3 Years
- Repair Available

Refer to SmartVFD HVAC Standalone Drive Submittal Data herein for data regarding the included SmartVFD HVAC drive.

SmartVFD HVAC Drives with Bypass and/or Disconnect

NEMA 1, SmartVFD HVAC Drive with 2-Contactor Bypass, No Disconnect

Frame Size 4

Frame Size	HP and Voltage			Configuration	Dimensions						Weight Lb.	
	208/230 VAC	460 VAC	600 VAC		W1	W2	H1	H2	D1	D2		D3
4	0.75-4HP	1.5-7.5HP		Disconnect	8.92	4.98	31.91	30.8	10.36	9.04	8.01	33
*depth of 2 CONT only				2-Contractor	8.92	4.98	31.91	30.8	*9.64	9.04	8.01	38

Frame Size 5

Frame Size	HP and Voltage			Configuration	Dimensions						Weight Lb.	
	5HP	10HP			W1	W2	H1	H2	D1	D2		D3
5				Disconnect	8.92	4.98	34.72	33.61	10.36	9.04	8.96	43
* depth of 2 CONT only				2-Contractor	8.92	4.98	34.72	33.61	*9.64	9.04	8.96	48
5	7.5HP	15HP		Disconnect	8.92	4.98	34.72	33.61	10.36	9.04	8.96	43
				2-Contractor	8.92	4.98	34.72	33.61	*9.64	9.04	8.96	50
5	10HP	20HP		Disconnect	8.92	4.98	34.72	33.61	10.36	9.04	8.96	43
				2-Contractor	8.92	4.98	34.72	33.61	*9.64	9.04	8.96	50

Frame Size 6

Frame Size	HP and Voltage			Configuration	Dimensions						Weight Lb.	
		25HP			W1	W2	H1	H2	D1	D2		D3
6				Disconnect	12.42	4.98	45.17	43.9	11.31	9.57		50
* depth of 2 CONT only				2-Contractor	12.42	4.98	45.17	43.9	*10.1	9.57		55
6	15HP	30HP		Disconnect	12.42	4.98	45.17	43.9	11.31	9.57		50
				2-Contractor	12.42	4.98	45.17	43.9	*10.1	9.57		59
6	20HP	40HP		Disconnect	12.42	4.98	45.17	43.9	11.31	9.57		50
				2-Contractor	12.42	4.98	45.17	43.9	*10.1	9.57		59

Frame Size 7

Frame Size	HP and Voltage			Configuration	Dimensions						Weight Lb.	
	208/230 Vac	460Vac			W1	W2	H1	H2	D1	D2		
7	25HP	50HP		Disconnect	20.84	20.09	51.57	47.5	13.28	11.44		130
* depth of 2 CONT only				2-Contractor	20.84	20.09	51.57	47.5	*12.28	11.44		130
7	30HP	60HP		Disconnect	20.84	20.09	51.57	47.5	13.28	11.44		141
				2-Contractor	20.84	20.09	51.57	47.5	*12.28	11.44		141
7	40HP	75HP		Disconnect	20.84	20.09	51.57	47.5	13.28	11.44		149
				2-Contractor	20.84	20.09	51.57	47.5	*12.28	11.44		149

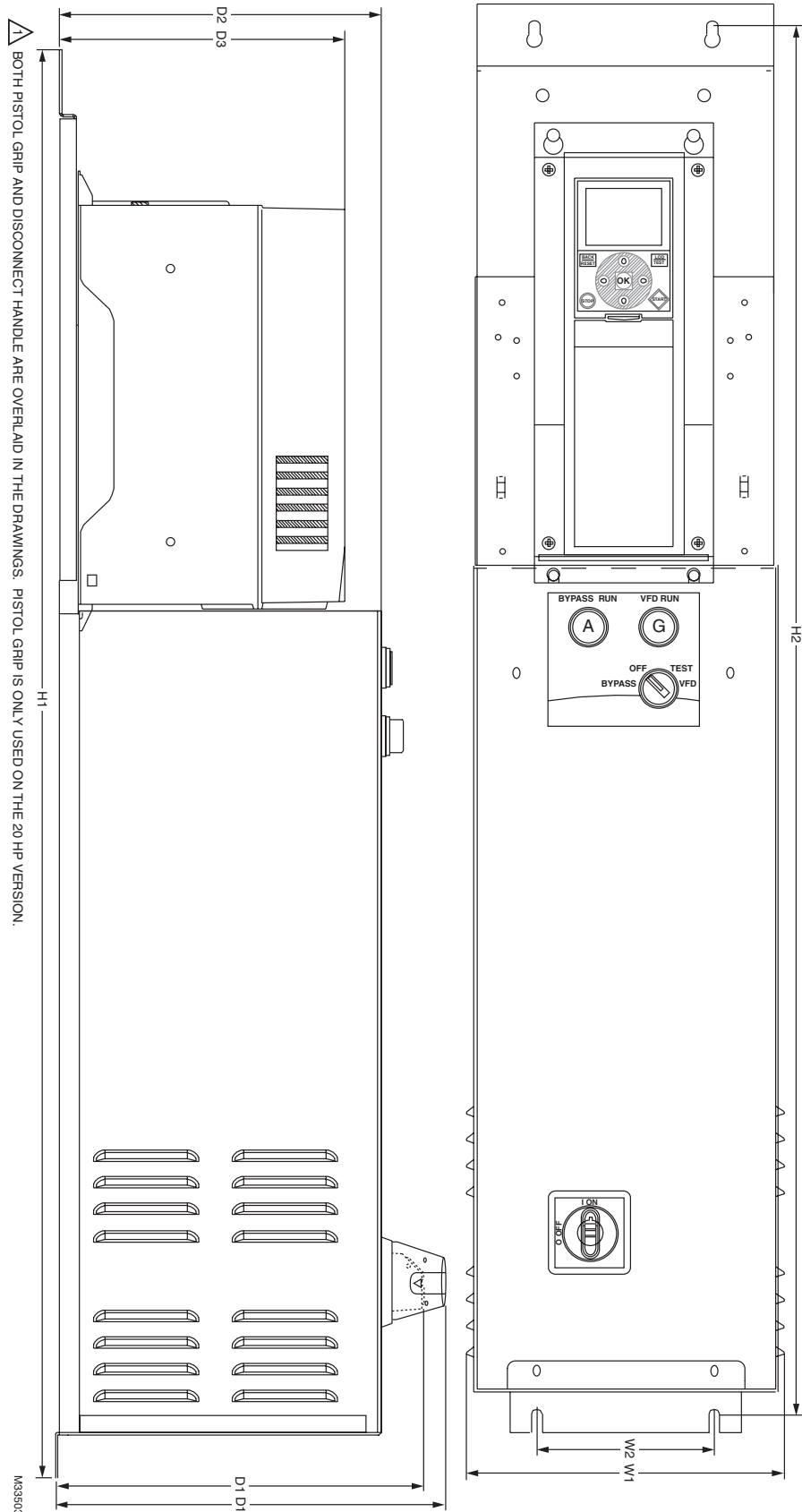
Frame Size 8

Frame Size	HP and Voltage			Configuration	Dimensions						Weight (approx.) Lb.	
	208/230	460Vac			W1	W2	H1	H2	D1	D2		
8	50HP	100HP		Disconnect	25	23.41	60	55	16.27	14.55		200
* depth of 2 CONT only				2-Contractor	25	23.41	60	55	*15.28	14.55		250
8	60HP	125HP		Disconnect	25	23.41	60	55	16.27	14.55		200
				2-Contractor	25	23.41	60	55	*15.28	14.55		265
8	75HP	150HP		Disconnect	25	23.41	60	55	16.27	14.55		200
				2-Contractor	25	23.41	60	55	*15.28	14.55		280

Submittal Data - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

NEMA 1, SmartVFD HVAC Drive with 3-Contactor and 3-Contactor with Auto-Bypass, Fused Disconnect.



SmartVFD HVAC Drives with Bypass and/or Disconnect

NEMA 1, SmartVFD HVAC Drive with 3-Contactor and 3-Contactor with Auto-Bypass, Fused Disconnect.

Frame Size 4

Frame Size	HP and Voltage			Configuration	Dimensions						Weight Lb.	
	208/230 VAC	460 VAC	600 VAC		W1	W2	H1	H2	D1	D2		D3
4	0.75-4HP	1.5-7.5HP		3-Contractor	8.92	4.98	38.91	37.8	10.36	9.04	8.01	44
				3-Contractor with Auto Bypass	8.92	4.98	38.91	37.8	10.36	9.04	8.01	38

Frame Size 5

Frame Size	HP and Voltage			Configuration	Dimensions						Weight Lb.	
	208/230 Vac	460 Vac	600 Vac		W1	W2	H1	H2	D1	D2		D3
5	5HP	10HP		3-Contractor	8.92	4.98	41.72	40.61	10.36	9.04	8.96	55.5
				3-Contractor with Auto-Bypass	8.92	4.98	41.72	40.61	10.36	9.04	8.96	56
5	7.5HP	15HP		3-Contractor	8.92	4.98	41.72	40.61	10.36	9.04	8.96	57
				3-Contractor with Auto-Bypass	8.92	4.98	41.72	40.61	10.36	9.04	8.96	57.5
5	10HP	20HP		3-Contractor	8.92	4.98	41.72	40.61	10.36	9.04	8.96	59.5
				3-Contractor with Auto-Bypass	8.92	4.98	41.72	40.61	10.36	9.04	8.96	60

Frame Size 6

Frame Size	HP and Voltage			Configuration	Dimensions						Weight Lb.	
	208/230 Vac	460 Vac	600 Vac		W1	W2	H1	H2	D1	D2		D3
6		25HP		3-Contractor	12.42	4.98	55.21	53.99	11.31	9.55		94.5
				3-Contractor with Auto-Bypass	12.42	4.98	55.21	53.99	11.31	9.55		96.5
6	15HP	30HP		3-Contractor	12.42	4.98	55.21	53.99	11.31	9.55		98.5
				3-Contractor with Auto-Bypass	12.42	4.98	55.21	53.99	11.31	9.55		100.5
6	20HP	40HP		3-Contractor	12.42	4.98	55.21	53.99	11.31	9.55		105.5
				3-Contractor with Auto-Bypass	12.42	4.98	55.21	53.99	11.31	9.55		107.5

Frame Size 7

Frame Size	HP and Voltage		Configuration	Dimensions						Weight Lb.	
	208/230	460Vac		W1	W2	H1	H2	D1	D2		D3
7	25HP	50HP	3-Contractor	20.84	20.09	59	55	13.28	11.44	11.08	135
			3-Contractor with Auto-Bypass	20.84	20.09	59	55	13.28	11.44	11.08	135
7	30HP	60HP	3-Contractor	20.84	20.09	59	55	13.28	11.44	11.08	150
			3-Contractor with Auto-Bypass	20.84	20.09	59	55	13.28	11.44	11.08	150
7	40HP	75HP	3-Contractor	20.84	20.09	59	55	13.28	11.44	11.08	170
			3-Contractor with Auto-Bypass	20.84	20.09	59	55	13.28	11.44	11.08	170

Frame Size 8

Frame Size	HP and Voltage		Configuration	Dimensions						Weight (approx.) Lb.
	208/230 Vac	460Vac		W1	W2	H1	H2	D1	D2	
8	50HP	100HP	3-Contactor	25	24	70.06	55	16.2	14.6	285.8
			3-Contactor with Auto-Bypass	25	24	70.06	55	16.2	14.6	287
8	60HP	125HP	3-Contactor	25	24	70.06	55	16.2	14.6	295.3
			3-Contactor with Auto-Bypass	25	24	70.06	55	16.2	14.6	297
8	75HP	150HP	3-Contactor	25	24	70.06	55	16.2	14.6	331.3
			3-Contactor with Auto-Bypass	25	24	70.06	55	16.2	14.6	333

Submittal Data - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

NEMA 12, SmartVFD HVAC – All Configurations

Frame Size	HP and Voltage		Configuration	208/230 Vac Dimensions (in) & Weight (lb)				460 Vac Dimensions (in) & Weight (lb)			
	208/230 Vac	460 Vac		W	H	D	lb	W	H	D	lb
4	0.75-3 HP	1.5-7.5 HP	Drive alone	5	12.9	7.5	13.2	5	12.9	7.5	13.2
			Disconnect	12	37.5	11	40	12	37.5	11	40
			2-Contactor	16	37.5	11	55	16	37.5	11	53
			3-Contactor	16	37.5	11	55	16	37.5	11	53
			3-Contactor with Auto-Bypass	16	37.5	11	55	16	37.5	11	53
5	5-10 HP	10 HP 15 HP 20 HP	Drive alone	5.7	16.5	8.4	22	5.7	16.5	8.4	22
			Disconnect	12	41	11	72	12	41	11	72
			2-Contactor	16	41/41/45	11	70/70/84	16	41/41/45	11	64/64/76
			3-Contactor	16	41/41/45	11	70/70/84	16	41/41/45	11	64/64/76
			3-Contactor with Auto-Bypass	16	41/41/45	11	70/70/84	16	41/41/45	11	64/64/76
6	15-20 HP	25 HP 30 HP 40 HP	Drive alone	7.7	21.9	9	44.1	7.7	21.9	9	44.1
			Disconnect	12	46.5	13	120	12/12/16	46.5	13	120/120/136
			2-Contactor	16/20	50.5/54.5	13	125/140	16/16/20	50.5/50.5/54.5	13	120/120/136
			3-Contactor	16/20	50.5/54.5	13	125/140	16/16/20	50.5/50.5/54.5	13	120/120/136
			3-Contactor with Auto-Bypass	16/20	50.5/54.5	13	125/140	16/16/20	50.5/50.5/54.5	13	120/120/136
7	25-40 HP	50 HP 60 HP 75 HP	Drive alone	9.3	25.4	10.2	82.7	9.3	25.4	10.2	82.7
			Disconnect	16	50.5	13.5	145/160/175	16	50.5	13.5	145/160/175
			2-Contactor	20/24/30	58.5/65.5/70.5	13.5	160/175/200	20/24/30	58.5/65.5/70.5	13.5	150/165/193
			3-Contactor	20/24/30	58.5/65.5/70.5	13.5	160/175/200	20/24/30	58.5/65.5/70.5	13.5	150/165/193
			3-Contactor with Auto-Bypass	20/24/30	58.5/65.5/70.5	13.5	160/175/200	20/24/30	58.5/65.5/70.5	13.5	150/165/193
8	50-75 HP	100 HP 125 HP 150 HP	Drive alone	11.4	38	13.5	154.3	11.42	38.03	13.5	154.3
			Disconnect	Contact Customer Care				Contact Customer Care			
			2-Contactor								
			3-Contactor								
			3-Contactor with Auto-Bypass								
9	100-125 HP	180-220 HP	Drive alone	18.9	45.3	14.4	238.1	18.9	45.27	14.4	238.1

SmartVFD HVAC Drives with Bypass and/or Disconnect

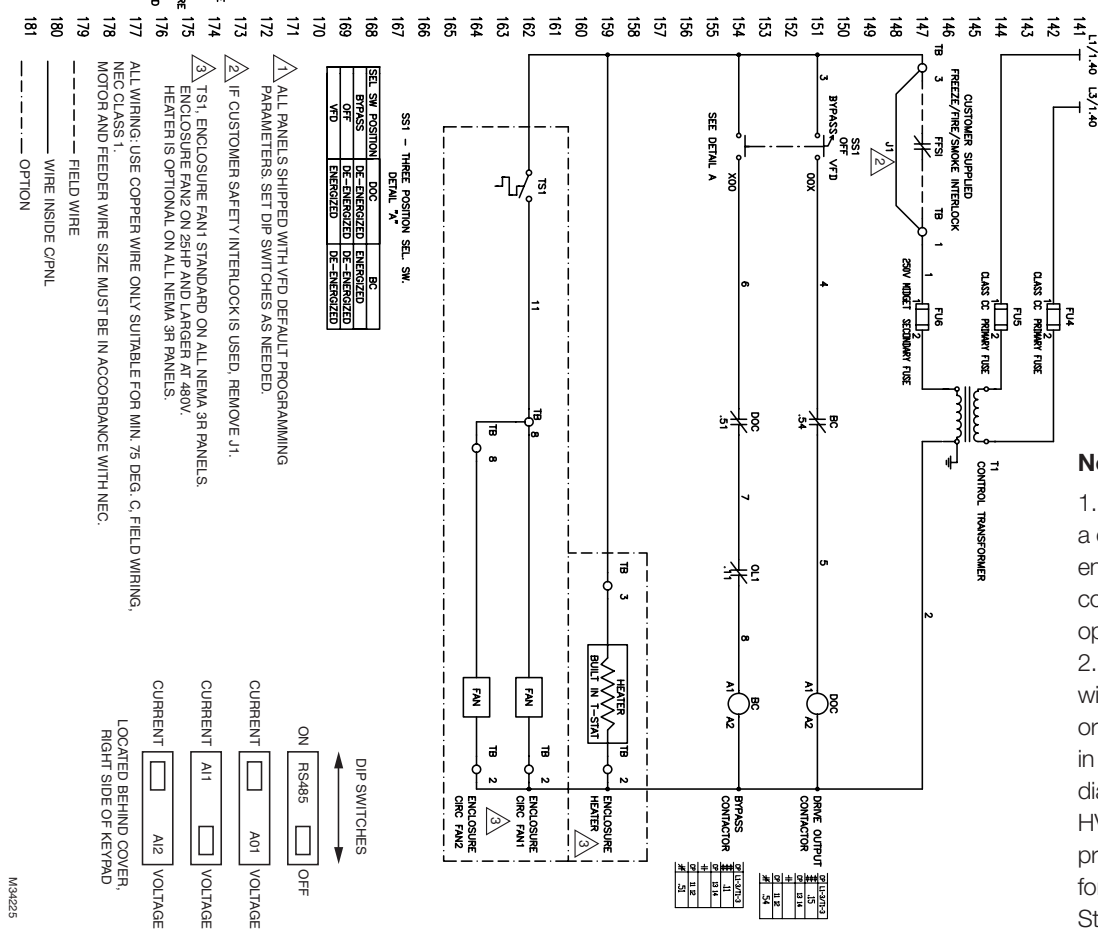
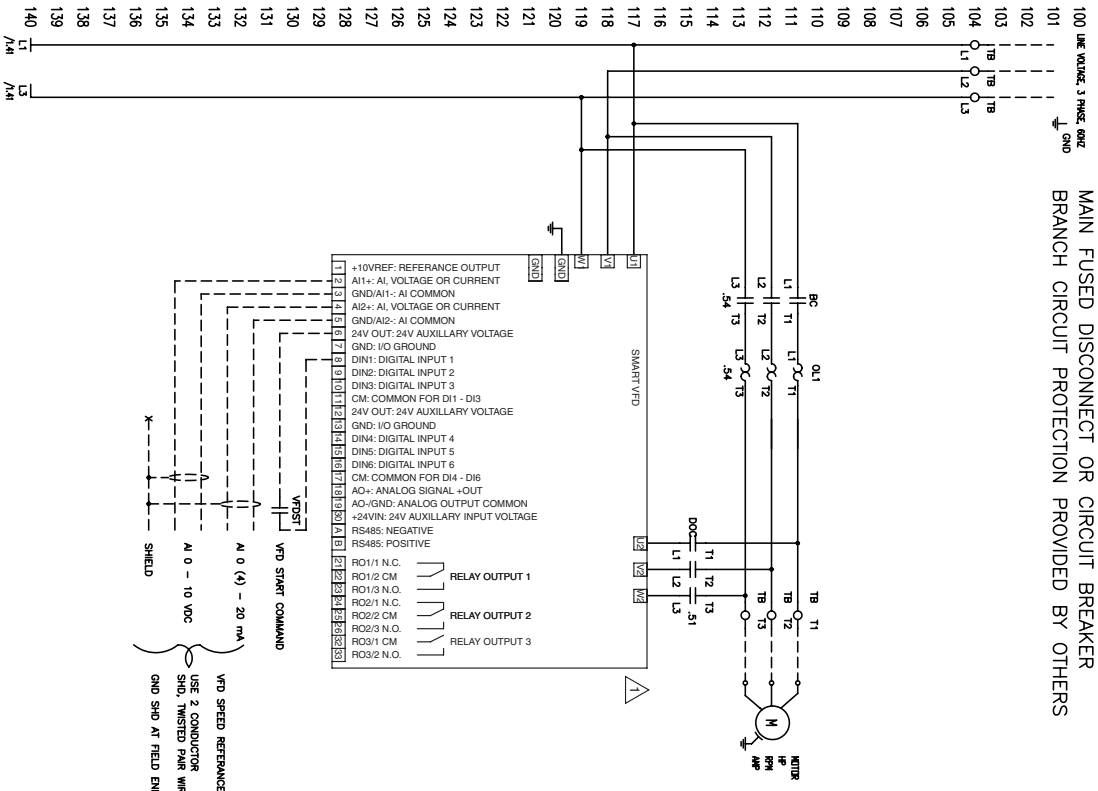
NEMA 3R, SmartVFD HVAC – All Configurations

Frame Size	HP and Voltage		Configuration	Dimensions (in)			Weight lb
	208/230 Vac	460 Vac		W	H	D	
4	0.75-3 HP	1.5-7.5 HP	Drive alone	20.5	20	10.5	39
			Disconnect	20.5	20	12	43
			2-Contactor	24.5	24	10.5	49
			3-Contactor	24.5	24	12	54
			3-Contactor with Auto-Bypass	24.5	24	12	54
5	5-10 HP	10 HP-20 HP	Drive alone	20.5	24	10.5	58
			Disconnect	24.5	24	12	61
			2-Contactor	28.5	24	10.5	72
			3-Contactor	28.5	30	12	78
			3-Contactor with Auto-Bypass	28.5	30	12	78
6	15-20 HP	25 HP-40 HP	Drive alone	28.5	36	10.5	80
			Disconnect	28.5	36	12	88
			2-Contactor	28.5	36	10.5	118
			3-Contactor	34.5	36	12	124
			3-Contactor with Auto-Bypass	34.5	36	12	124
7	25-40 HP	50 HP-75 HP	Drive alone	28.5	48	12.5	130
			Disconnect	28.5	48	14	149
			2-Contactor	28.5	48	12.5	185
			3-Contactor	40.5	48	14	193
			3-Contactor with Auto-Bypass	40.5	48	14	193
8	50-75 HP	100 HP-150 HP	Drive alone	40.5	60	12.5	299
			Disconnect	40.5	60	14	340
			2-Contactor	40.5	60	12.5	430
			3-Contactor	40.5	60	14	440
			3-Contactor with Auto-Bypass	40.5	60	14	440

Wiring Diagrams - VFDs

SmartVFD HVAC Drives with Bypass and/or Disconnect

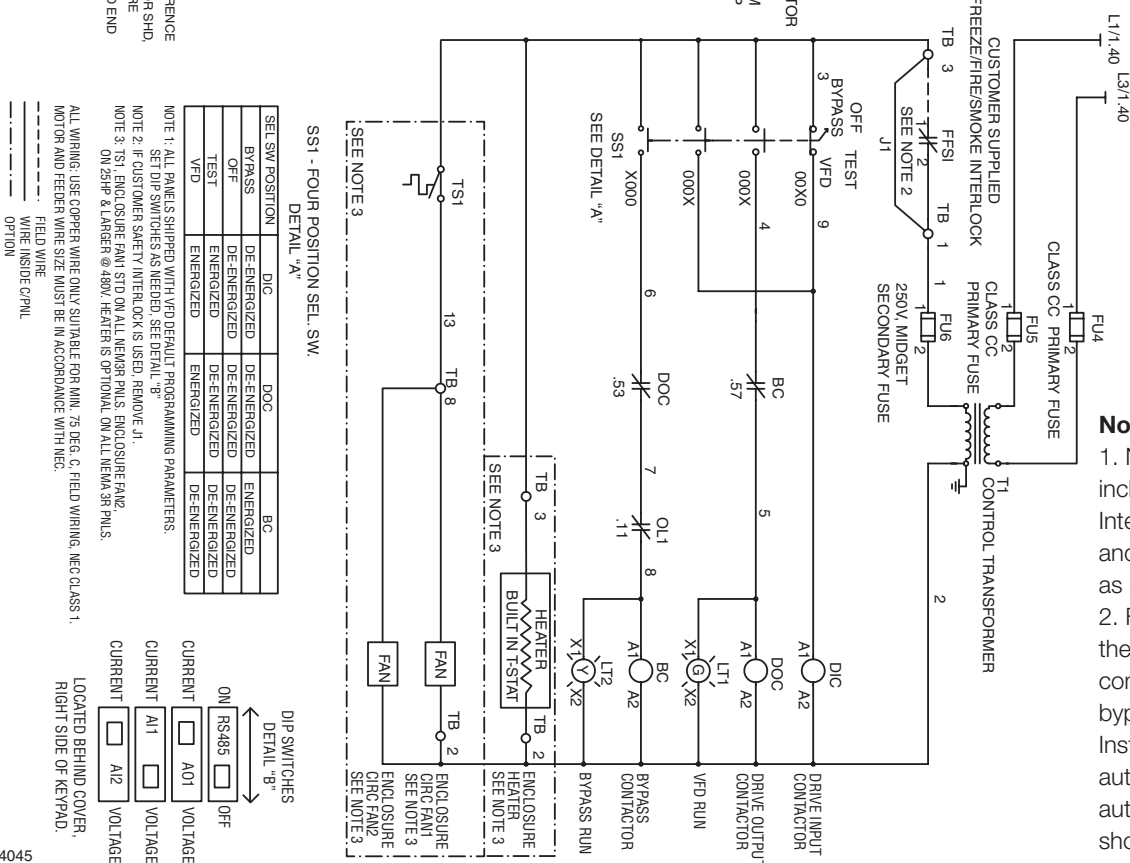
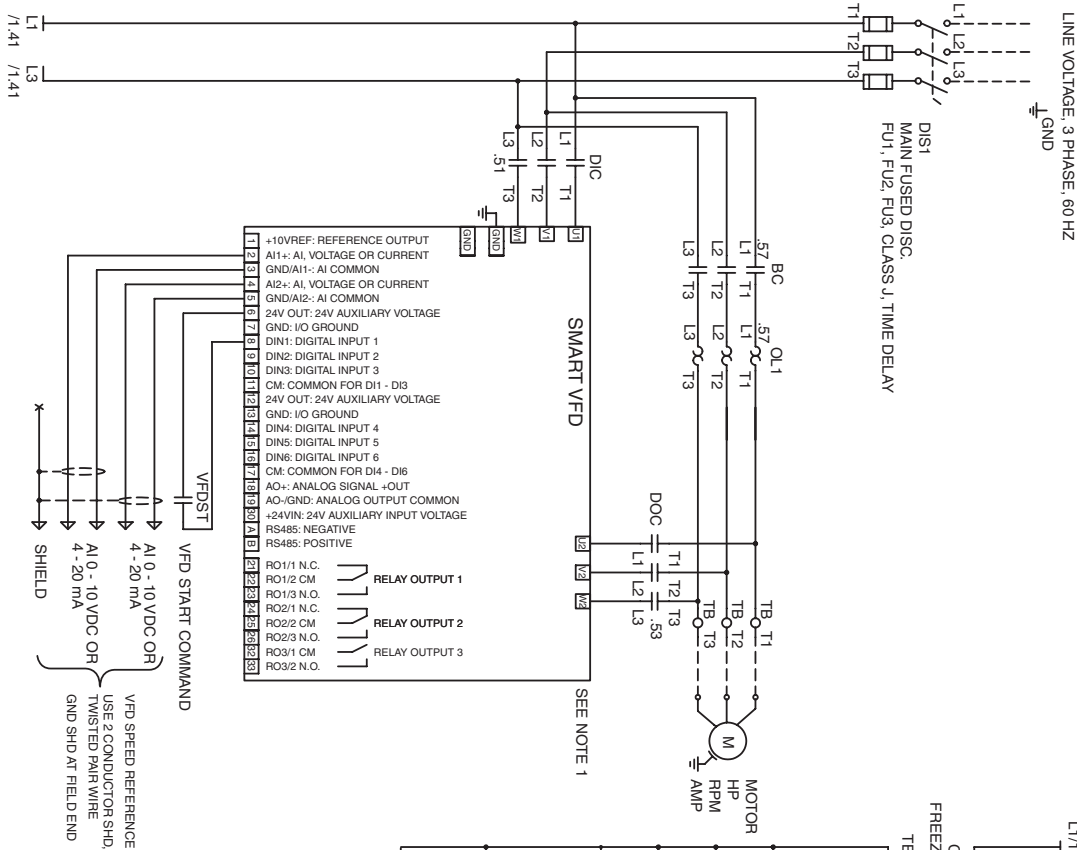
SmartVFD HVAC Drive with 2-Contactor Bypass (No Disconnect)



- Notes:**
1. NEMA 3R enclosures include a circulation fan(s). Integral enclosure heaters and/or cooling are available as special options.
 2. For SmartVFD HVAC drive with disconnect wiring diagram or SmartVFD HVAC drive alone in a NEMA 3R enclosure wiring diagram, refer to the SmartVFD HVAC Wiring Diagram in the previous section: Submittal Data for SmartVFD HVAC Series Standalone Drives.

SmartVFD HVAC Drives with Bypass and/or Disconnect

SmartVFD HVAC Drive with 3-Contactor Bypass and Fused Disconnect



Notes:

1. NEMA 3R enclosures include a circulation fan(s). Integral enclosure heaters and/or cooling are available as special options.
2. For auto-bypass units the drive parameters come configured for auto-bypass. Refer to Installation Instructions to disable the auto-bypass or to reset the auto-bypass parameters should factory defaults be reset on the drive.

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Product Selection - VFDs

NX Series Standalone Drives



NXS/NXP Series

The NXS/NXP Series drives are flexible, general purpose, dual rated drives designed to meet your toughest HVAC and constant torque applications. Built-in input and output EMI/FRI filters and AC chokes provide compact, reliable drive protection and reduced interference to the surrounding environment.

- 3 phase, 208/230 Vac: 1.5 to 125 Nominal HP
- 3 phase, 480 Vac: 1.5 to 450 Nominal HP
- 3 phase, 600 Vac: 3 to 200 Nominal HP
- NEMA 1 and NEMA 12 enclosure options
- Disconnect option
- Bypass options: 2 contactor, 3 contactor, and 3 contactor auto-bypass

NXS drives may operate above 104 °F or above 1000 meters (3281 feet) above sea level if the current draw is de-rated. De-rating for temperature and altitude is cumulative.

De-rating for Temperature

For installations where the ambient temperature will be above 104 °F, (40 °C):

- De-rate the drive output current rating by 1.5% for every 1.8 °F, (1 °C).
- The maximum operating temperature is 122 °F, (50 °C).

Example:

Desire 9.0 Amps at 122 F. De-rate = 15%.

Calculate Amps needed: $X - (X \times .15) = 9$

10.6 Amps are required to provide 9 Amps at 122 °F.

De-rating for Altitude

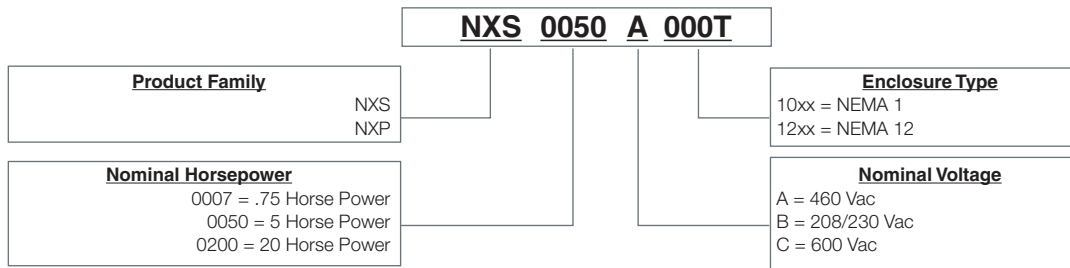
For installations where ambient temperature will be above 1000 meters, (3281 feet), above sea level:

- De-rate the drive output current rating by 1% for every 100 m (328 feet) over 1000 m (3281 feet) Maximum altitude is 3000 m (9843 feet) above sea level

If the drive will be mounted where both temperature and altitude de-rating apply, perform one calculation and use the result as the starting Amps for the second.

Note: I/O signals over 2000 meters (6562 feet) must be 120 V or 24 V signals

NX Series Model Number Nomenclature



Voltage: 208 Vac; 230 Vac

Product Number	Horsepower	Frame Type	Layout	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
						(Inch)	(mm)	(lb)	(kg)
NXS0010B1000/U	1 HP	FR4	Standalone drive	NEMA 1	4.8A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0010B1208/U	1 HP	FR4	Standalone drive	NEMA 12	4.8A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0015B1005/U	1.5 HP	FR4	Standalone drive	NEMA 1	6.6A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0015B1203/U	1.5 HP	FR4	Standalone drive	NEMA 12	6.6A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0020B1008/U	2 HP	FR4	Standalone drive	NEMA 1	7.8A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0020B1206/U	2 HP	FR4	Standalone drive	NEMA 12	7.8A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0030B1006/U	3 HP	FR4	Standalone drive	NEMA 1	11A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0030B1204/U	3 HP	FR4	Standalone drive	NEMA 12	11A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0040B1004/U	4 HP	FR4	Standalone drive	NEMA 1	12.5A	5.4 x 11.5 x 7.5	137 x 292 x 191	17.9 lb	8.1 kg
NXS0040B1202/U	4 HP	FR4	Standalone drive	NEMA 12	12.5A	5.4 x 11.5 x 7.5	137 x 292 x 191	17.9 lb	8.1 kg
NXS0050B1001/U	5 HP	FR5	Standalone drive	NEMA 1	17.5A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0050B1209/U	5 HP	FR5	Standalone drive	NEMA 12	17.5A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0075B1002/U	7.5 HP	FR5	Standalone drive	NEMA 1	25A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0075B1200/U	7.5 HP	FR5	Standalone drive	NEMA 12	25A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0100B1001/U	10 HP	FR5	Standalone drive	NEMA 1	31A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	40.8 lb	18.5 kg
NXS0100B1209/U	10 HP	FR5	Standalone drive	NEMA 12	31A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	40.8 lb	18.5 kg
NXS0150B1000/U	15 HP	FR6	Standalone drive	NEMA 1	48A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0150B1208/U	15 HP	FR6	Standalone drive	NEMA 12	48A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0200B1000/U	20 HP	FR6	Standalone drive	NEMA 1	61A	7.7 x 20.4 x 9.3	196 x 518 x 236	77.2 lb	35 kg
NXS0200B1208/U	20 HP	FR6	Standalone drive	NEMA 12	61A	7.7 x 20.4 x 9.3	196 x 518 x 236	77.2 lb	35 kg
NXS0250B1009/U	25 HP	FR7	Standalone drive	NEMA 1	75A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0250B1207/U	25 HP	FR7	Standalone drive	NEMA 12	75A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0300B1009/U	30 HP	FR7	Standalone drive	NEMA 1	88A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0300B1207/U	30 HP	FR7	Standalone drive	NEMA 12	88A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0400B1008/U	40 HP	FR8	Standalone drive	NEMA 1	114A	9.3 x 23.3 x 10.1	236 x 520 x 257	127.9 lb	58.0 kg
NXS0400B1206/U	40 HP	FR8	Standalone drive	NEMA 12	114A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0500B1007/U	50 HP	FR8	Standalone drive	NEMA 1	140A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0500B1205/U	50 HP	FR8	Standalone drive	NEMA 12	140A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0600B1006/U	60 HP	FR8	Standalone drive	NEMA 1	169A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0600B1204/U	60 HP	FR8	Standalone drive	NEMA 12	169A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0750B1004/U	75 HP	FR8	Standalone drive	NEMA 1	205A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0750B1202/U	75 HP	FR8	Standalone drive	NEMA 12	205A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg

Product Selection - VFDs

NX Series Standalone Drives

Voltage: 460 Vac

Product Number	Horsepower	Frame Type	Layout	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
NXS0015A1007/U	1.5 HP	FR4	Standalone drive	NEMA 1	3.3A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0015A1205/U	1.5 HP	FR4	Standalone drive	NEMA 12	3.3A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0020A1000/U	2 HP	FR4	Standalone drive	NEMA 1	4.3A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0020A1208/U	2 HP	FR4	Standalone drive	NEMA 12	4.3A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0030A1008/U	3 HP	FR4	Standalone drive	NEMA 1	5.6A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0030A1206/U	3 HP	FR4	Standalone drive	NEMA 12	5.6A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0040A1006/U	4 HP	FR4	Standalone drive	NEMA 1	7.6A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0040A1204/U	4 HP	FR4	Standalone drive	NEMA 12	7.6A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0050A1003/U	5 HP	FR4	Standalone drive	NEMA 1	9A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0050A1201/U	5 HP	FR4	Standalone drive	NEMA 12	9A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0075A1004/U	7.5 HP	FR4	Standalone drive	NEMA 1	12A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0075A1202/U	7.5 HP	FR4	Standalone drive	NEMA 12	12A	5.4 x 11.5 x 7.5	137 x 292 x 191	11 lb	5.0 kg
NXS0100A1003/U	10 HP	FR5	Standalone drive	NEMA 1	16A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0100A1201/U	10 HP	FR5	Standalone drive	NEMA 12	16A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0150A1002/U	15 HP	FR5	Standalone drive	NEMA 1	23A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0150A1200/U	15 HP	FR5	Standalone drive	NEMA 12	23A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0200A1002/U	20 HP	FR5	Standalone drive	NEMA 1	31A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0200A1200/U	20 HP	FR5	Standalone drive	NEMA 12	31A	5.7 x 15.4 x 8.4	144.8 x 391.2 x 213.4	17.9 lb	8.1 kg
NXS0250A1001/U	25 HP	FR6	Standalone drive	NEMA 1	38A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0250A1209/U	25 HP	FR6	Standalone drive	NEMA 12	38A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0300A1001/U	30 HP	FR6	Standalone drive	NEMA 1	46A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0300A1209/U	30 HP	FR6	Standalone drive	NEMA 12	46A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0400A1000/U	40 HP	FR6	Standalone drive	NEMA 1	61A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0400A1208/U	40 HP	FR6	Standalone drive	NEMA 12	61A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0500A1009/U	50 HP	FR7	Standalone drive	NEMA 1	72A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0500A1207/U	50 HP	FR7	Standalone drive	NEMA 12	72A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0600A1008/U	60 HP	FR7	Standalone drive	NEMA 1	87A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0600A1206/U	60 HP	FR7	Standalone drive	NEMA 12	87A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0750A1006/U	75 HP	FR7	Standalone drive	NEMA 1	105A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0750A1204/U	75 HP	FR7	Standalone drive	NEMA 12	105A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS1000A1002/U	100 HP	FR8	Standalone drive	NEMA 1	140A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS1000A1200/U	100 HP	FR8	Standalone drive	NEMA 12	140A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS1250A1009/U	125 HP	FR8	Standalone drive	NEMA 1	170A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS1250A1207/U	125 HP	FR8	Standalone drive	NEMA 12	170A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS1500A1007/U	150 HP	FR9	Standalone drive	NEMA 1	205A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS1500A1205/U	150 HP	FR9	Standalone drive	NEMA 12	205A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS2000A1000/U	200 HP	FR9	Standalone drive	NEMA 1	261A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS2500A1005/U	250 HP	FR9	Standalone drive	NEMA 1			Call Customer Care		

Product Selection - VFDs

NX Series Standalone Drives

Voltage: 600 Vac

Product Number	Horsepower	Frame Type	Layout	Type of Enclosure	Current Ratings	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
NXS0030C1004/U	3 HP	FR6	Standalone drive	NEMA 1	4.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0030C1202/U	3 HP	FR6	Standalone drive	NEMA 12	4.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0040C1002/U	4 HP	FR6	Standalone drive	NEMA 1	5.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0040C1200/U	4 HP	FR6	Standalone drive	NEMA 12	5.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0050C1009/U	5 HP	FR6	Standalone drive	NEMA 1	7.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0050C1207/U	5 HP	FR6	Standalone drive	NEMA 12	7.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0075C1000/U	7.5 HP	FR6	Standalone drive	NEMA 1	10A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0075C1208/U	7.5 HP	FR6	Standalone drive	NEMA 12	10A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0100C1009/U	10 HP	FR6	Standalone drive	NEMA 1	13.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0100C1207/U	10 HP	FR6	Standalone drive	NEMA 12	13.5A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0150C1008/U	15 HP	FR6	Standalone drive	NEMA 1	18A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0150C1206/U	15 HP	FR6	Standalone drive	NEMA 12	18A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0200C1008/U	20 HP	FR6	Standalone drive	NEMA 1	22A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0200C1206/U	20 HP	FR6	Standalone drive	NEMA 12	22A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0250C1007/U	25 HP	FR6	Standalone drive	NEMA 1	27A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0250C1205/U	25 HP	FR6	Standalone drive	NEMA 12	27A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0300C1007/U	30 HP	FR6	Standalone drive	NEMA 1	34A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0300C1205/U	30 HP	FR6	Standalone drive	NEMA 12	34A	7.7 x 20.4 x 9.3	196 x 518 x 236	40.8 lb	18.5 kg
NXS0400C1006/U	40 HP	FR7	Standalone drive	NEMA 1	41A	16 x 62 x 12	406 x 1575 x 330	77.2 lb	35 kg
NXS0400C1204/U	40 HP	FR7	Standalone drive	NEMA 12	41A	9.3 x 23.3 x 10.1	236 x 520 x 257	77.2 lb	35 kg
NXS0500C1005/U	50 HP	FR7	Standalone drive	NEMA 1	52A	16 x 62 x 12	406 x 1575 x 330	77.2 lb	35 kg
NXS0500C1203/U	50 HP	FR7	Standalone drive	NEMA 12	52A	16 x 62 x 12	406 x 1575 x 330	77.2 lb	35 kg
NXS0600C1004/U	60 HP	FR8	Standalone drive	NEMA 1	62A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0600C1202/U	60 HP	FR8	Standalone drive	NEMA 12	62A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0750C1002/U	75 HP	FR8	Standalone drive	NEMA 1	80A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS0750C1200/U	75 HP	FR8	Standalone drive	NEMA 12	80A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS1000C1008/U	100 HP	FR8	Standalone drive	NEMA 1	100A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS1000C1206/U	100 HP	FR8	Standalone drive	NEMA 12	100A	11.2 x 28.4 x 12.3	285 x 721 x 312	127.9 lb	58.0 kg
NXS1250C1005/U	125 HP	FR9	Standalone drive	NEMA 1	125A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS1250C1203/U	125 HP	FR9	Standalone drive	NEMA 12	125A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS1500C1003/U	150 HP	FR9	Standalone drive	NEMA 1	144A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS1500C1201/U	150 HP	FR9	Standalone drive	NEMA 12	144A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS2000C1006/U	200 HP	FR9	Standalone drive	NEMA 1	208A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg
NXS2000C1204/U	200 HP	FR9	Standalone drive	NEMA 12	208A	18.9 x 45.3 x 14.3	480 x 1150 x 362	321.9 lb	146 kg

Accessories - VFDs

NX Series

Product Number	Description	Used With
32006628-001/U	Panel mount kit, NEMA 12, 6 ft	NXS
32006629-001/U	Blank display	NXS
32006629-002/U	Alphanumeric Display	NXS
32006629-003/U	7 segment display for NXL	NXL
32006629-004/U	Variable Frequency Drive RS232 Adapter	—
32006629-010/U	2m RS232 Serial Link Cable	NXS/NXL
32006629-011/U	1,5M RS232 PC-Cable for NXS/NXL Model	NXS/NXL
32006630-001/U	Lonbus Card	NXS/NXL
32006630-002/U	Modbus Card	NXS/NXL
32006630-003/U	2 RO (NO/NC)	NXS/NXL
32006630-004/U	6DI/DO Programmable	NXS/NXL
32006630-005/U	6DI, 1DO, 2AI, 1AO	NXS/NXL
32006630-006/U	1RO (NO/NC), 1RO (NO)	NXS/NXL
32006630-007/U	3RO (NO)	NXS/NXL
32006630-008/U	1AI (mA), 2AO (mA)	NXS/NXL
32006630-013/U	BACnet card	NXS/NXL
32006662-002/U	NXS demo	NXS
HVFDSDMOUNTKIT/U	SmartVFD HVAC Panel mount kit, NEMA 12, 6 ft	SmartVFD HVAC and NXS
32006803-001/U	Control Module NXS	NXS
32006803-002/U	NXS replacement Fan Assembly for Frame size 4	NXS
32006803-003/U	NXS replacement Fan Assembly for Frame size 5	NXS
32006803-004/U	NXS replacement Fan Assembly for Frame size 6	NXS
32006803-005/U	NXS replacement Fan Assembly for Frame size 7	NXS
32006803-006/U*	NXS replacement Fan Assembly for Frame size 8	NXS
32006803-050/U*	NXS replacement Fan Assembly for Frame size 9	NXS

*For NXS replacement fan components for drives larger than Frame 7, contact Honeywell Tech Support at 888-516-9347, Option 4.

FEATURES

Easy Communications

- Easy commissioning through software or control keypad
- Versatile PC tools for loading, adjusting and comparing parameters
- Multilingual control display
- Configurations and applications can be transferred between drives
- Flexibility in communication with optional: LONWORKS®, Modbus®, or BACnet®

Powerful logic

- Built in PLC - Seven configurable applications built in for control of whatever process you require.
- Capable of accepting a control input and then providing output control signal(s) tailored to operate as many as six devices.

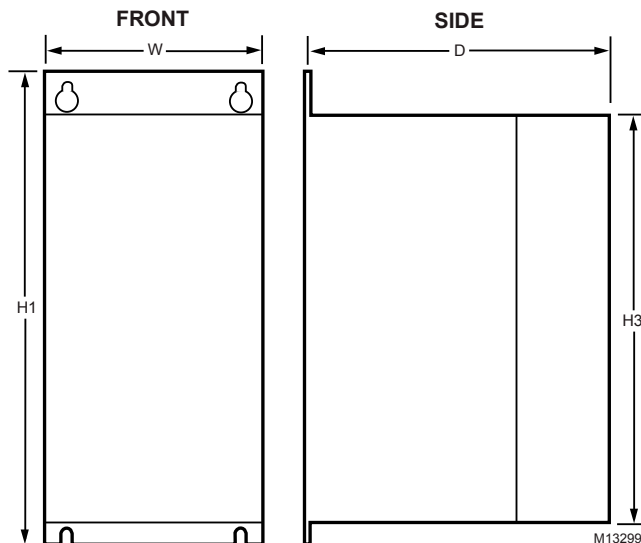
Built-in Protection

- Integrated AC choke for maximum protection and minimum harmonics
- Integral RFI filter for residential, light commercial as well as industrial applications
- Factory tested at maximum temperature and load
- Continuous logic can be powered from an external auxiliary supply, maintaining power to the control panel, internal drive functions, and field buses while the power module is down
- Eleven protective functions

Highly Configurable

- Flexible I/O configuration – standard configuration for most applications, various I/O modules for more complex applications
- Drives can be wall or panel mounted
- Slim, space-saving “bookshelf” design for side-by-side installation.

Dimensional Diagram for NXS Variable Frequency Drives



The NX Series drive family is a dual-microprocessor based Pulse Width Modulated (PWM) adjustable frequency AC Drive. The NX Series drives offer a suite of general HVAC and advanced water application solutions. Built-in input and output EMI/RFI filters and AC chokes provide compact, reliable drive protection and reduced interference to the surrounding environment.



Application

The NX Series variable frequency drives are the single best solution for a wide variety of HVAC and industrial applications from simple fans, pumps and compressors to elevators, cranes or winders. Easy to install and commission and modular input/output capability allow you to configure the drive to meet your needs. The NXS Series can be configured to operate with different field bus options making it easy to communicate with a variety of control systems.

Dimensional Data for NX Series Standalone Drives

Frame Size	Model Number	HP	Weight (lbs)	Dimensions WxHxD (inches)	Volts AC
Frame 4	NXS0015A	1.5	11	5.0x11.5x7.5	480
Frame 4	NXS0020A	2	11	5.0x11.5x7.5	480
Frame 4	NXS0030A	3	11	5.0x11.5x7.5	480
Frame 4	NXS0040A	4	11	5.0x11.5x7.5	480
Frame 4	NXS0050A	5	11	5.0x11.5x7.5	480
Frame 4	NXS0075A	7.5	11	5.0x11.5x7.5	480
Frame 5	NXS0100A	10	18	5.7x15.4x8.4	480
Frame 5	NXS0150A	15	18	5.7x15.4x8.4	480
Frame 5	NXS0200A	20	18	5.7x15.4x8.4	480
Frame 6	NXS0250A	25	41	7.7x20.4x9.3	480
Frame 6	NXS0300A	30	41	7.7x20.4x9.3	480
Frame 6	NXS0400A	40	41	7.7x20.4x9.3	480
Frame 7	NXS0500A	50	77	9.3x23.3x10.1	480
Frame 7	NXS0600A	60	77	9.3x23.3x10.1	480
Frame 7	NXS0750A	75	77	9.3x23.3x10.1	480
Frame 8	NXS1000A	100	128	11.2x28.4x11.3	480
Frame 8	NXS1250A	125	128	11.2x28.4x11.3	480
Frame 8	NXS1500A	150	128	11.2x28.4x11.3	480
Frame 9	NXS2000A	200	322	18.9x45.3x14.3	480
Frame 9	NXS2500A	250	322	18.9x45.3x14.3	480
Frame 4	NXS0010B	1	4.2	3.3x7.3x6.9	208/230
Frame 4	NXS0015B	1.5	11	5.0x11x7.5	208/230
Frame 4	NXS0020B	2	11	5.0x11x7.5	208/230
Frame 4	NXS0030B	3	11	5.0x11x7.5	208/230
Frame 4	NXS0040B	4	11	5.0x11x7.5	208/230
Frame 5	NXS0050B	5	18	5.7x15.4x8.4	208/230
Frame 5	NXS0075B	7.5	18	5.7x15.4x8.4	208/230
Frame 5	NXS0100B	10	18	5.7x15.4x8.4	208/230
Frame 6	NXS0150B	15	41	7.8x20.4x9.3	208/230
Frame 6	NXS0200B	20	41	7.8x20.4x9.3	208/230
Frame 7	NXS0250B	25	77	9.3x23.3x10.1	208/230
Frame 7	NXS0300B	30	77	9.3x23.3x10.1	208/230
Frame 7	NXS0400B	40	77	9.3x23.3x10.1	208/230
Frame 8	NXS0500B	50	128	11.4x29.9x13.5	208/230
Frame 8	NXS0600B	60	128	11.4x29.9x13.5	208/230
Frame 8	NXS0750B	75	128	11.4x29.9x13.5	208/230
Frame 9	NXS1000B	100	322	18.9x45.3x14.3	208/230
Frame 9	NXS1250B	125	322	18.9x45.3x14.3	208/230

Submittal Data - VFDs

NX Series Standalone Drives

General		
Communication	RS485	Optional: Modbus RTU and N2, LonWorks, BACnet RS-485
Software Features	Applications	Start-up Wizard
		Basic Application
		Standard Application (Pump and Fan)
		Multi-step Speed Control
		PID Control
		Multi-purpose Control
		Pump and Fan Control (Up to 4 Auxiliary Drives)
		Password
Human Interfaces	Keypad	Text display with built-in start-up wizard
	PC Tools	PC Commissioning Tool for easy commissioning, monitoring, and troubleshooting
		Energy Savings calculator to estimate cost avoidance
		Product selection tool for selecting VFD and bypass

Table 1: General.

Basic I/O Board		
Terminal		Signal
1	10	Reference output
2	AI1+	Analog input, voltage or current
3	GND/AI1-	Analog input common (current)
4	AI2+	Analog input, voltage or current
5	GND/AI2-	Analog input common (current)
6	24V	Ground for reference and controls
7	GND	I/O ground
8	DI1	Digital input 1
9	DI2	Digital input 2
10	DI3	Digital input 3
11	CMA	Common for DI1 - DI3
12	24V	Ground for reference and controls
13	GND	I/O ground
14	DI4	Digital input 4
15	DI5	Digital input 5
16	DI6	Digital input 6
17	CMB	Common for DI4 - DI6
18	A01+	Analog signal (+output)
19	A01-	Analog output common
20	D01	Open collector output

Table 2. I/O Connections—I/O Board.

OPT-A3 Board (Standard)		
Terminal		Signal
21	Relay output 1	Switching capacity 24 VDC/8A,
22		250 VAC/8A, 125 VDC/0.4A
23		Min switching load 5 V/10 mA
25	Relay output 2	Switching capacity 24 VDC/8A,
26		250 VAC/8A, 125 VDC/0.4A
		Min switching load 5 V/10 mA
28	Thermister input+	Galvanically isolated, $R_{tip} = 4.7 \Omega$
29	Thermister input-	

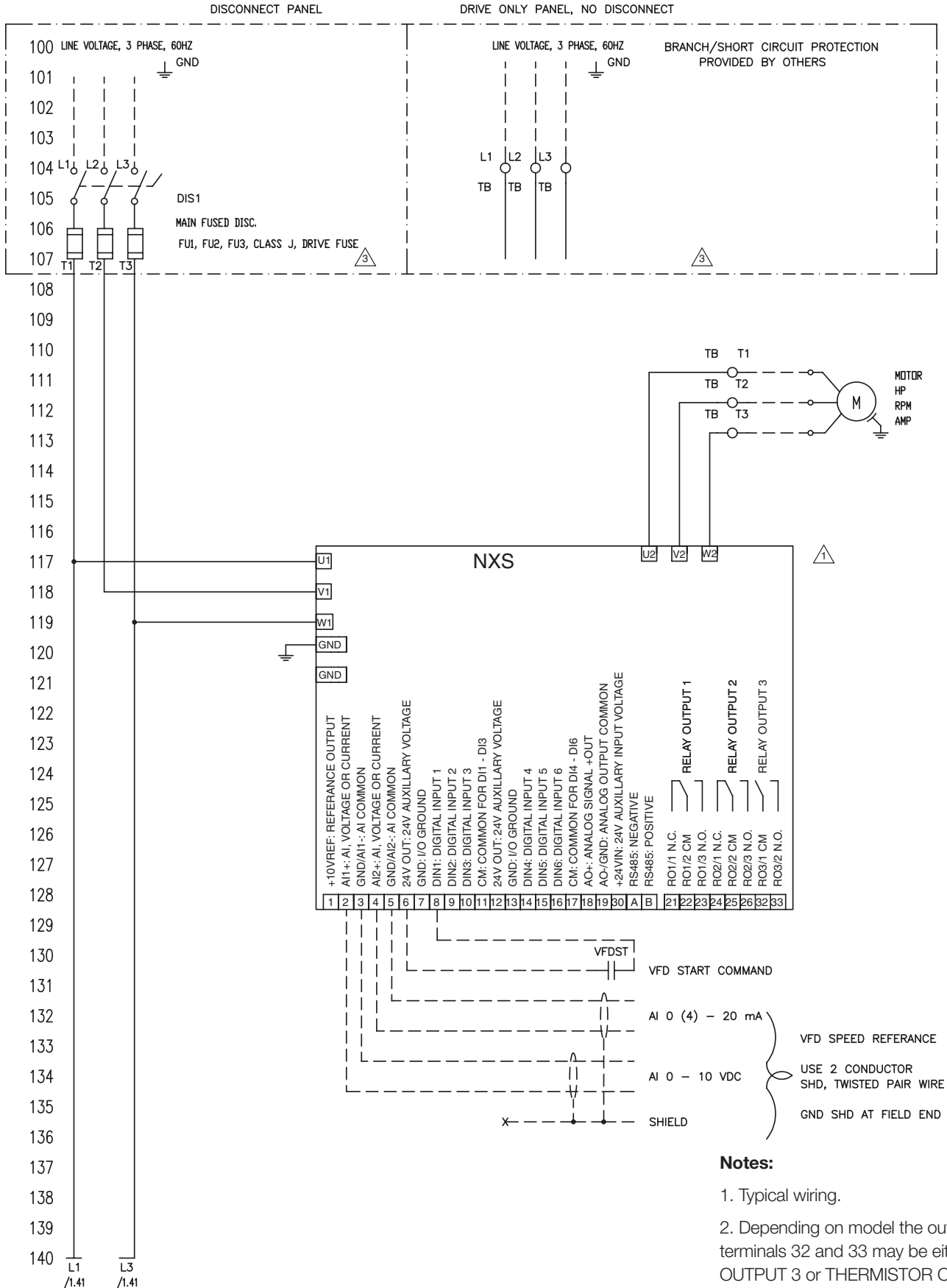
Table 3. I/O Connections—OPT-A3 Board.

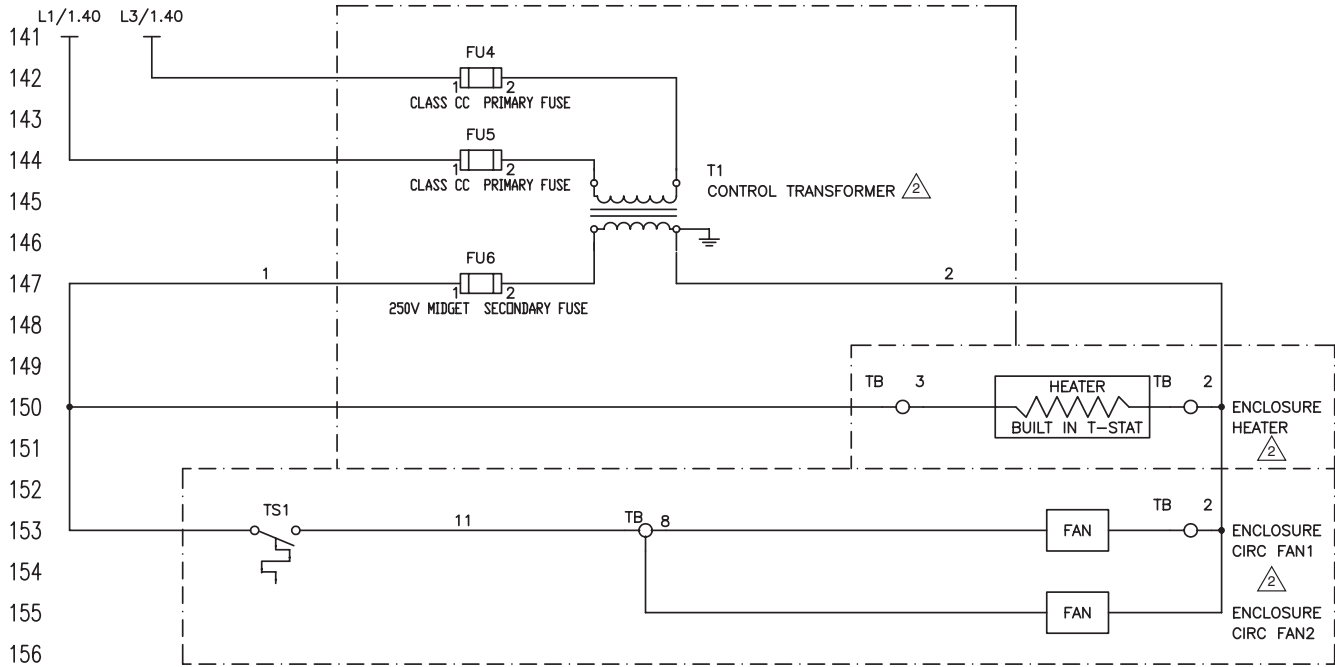
NX Series Technical Specifications		
Mains connection	Input voltage U_{in}	208...240 V; 380...500 V; 500...690 V; (-10%...+10%)
	Input frequency	50...60 Hz (+/- 10%)
	Connection to mains	Once per minute or less (normal case)
Motor connection	Output voltage	$0-U_{in}$
	Continuous output current	High overloadability Amps
		Low overloadability Amps
	Overload capacity	High: 150% Nominal Amps; 1 min, Low: 110% Nominal Amps; 1 min
	Output frequency	0...320 Hz
Frequency resolution	0.01 Hz	
Control characteristics	Control method	Frequency control V/f; Open Loop Vector Control (speed, torque)
		Closed Loop Control, Permanent Magnet Synchronous Motor Control (NXP Only)
	Switching frequency	208...240 V/380...500 V:
		FR 4-6: 1...16 kHz; Factory default: 10 kHz
		FR 7-9: 1...10 kHz; Factory default: 3.6 kHz
		500...690 V:
	Fr 4-9: 1...6 kHz, Factory default: 1.5 kHz	
Field weakening point	8...320 Hz	
Acceleration time	0...3000 sec	
Deceleration time	0...3000 sec	
Braking	DC brake: $30\% \cdot T_n$ (without brake resistor), flux braking	
Ambient conditions	Ambient operating temperature	14 F (no frost)...122 F: High OL
		14 F (no frost)...104 F: High OL (600 V, 30 and 40 HP max 95 F)
	Storage temperature	-40 F...158 F
	Relative humidity	0 to 95% RH, non-condensing, non-corrosive, no dripping water
	Air quality: - chemical vapors - mechanical particles	IEC 60721-3-3, unit in operation, class 3C2
		IEC 60721-3-3, unit in operation, class 3S2
	Altitude	100% load capacity (no derating) up to 3280 feet
		-1% derating for each 328 feet above 3280 feet; max 9840 feet
Vibration EN50178/EN60068-2-6	5...150 Hz: Displacement amplitude 1 mm (peak) at 5...15.8 Hz	
	Max acceleration amplitude 1 G at 15.8...150 Hz	
Shock EN50178, EN60068-2-27	UPS Drop Test (for applicable UPS weights)	
	Storage and shipping: max 15 G, 11 ms (in package)	
Enclosure class	UL Type 1/IP21 and UL Type 12/IP54	
EMC	Immunity	Fulfill all EMC immunity requirements
	Emissions	EMC level C1: IEC/EN61800-3 (2004), category C1
		EMC level C2: IEC/EN61800-3 (2004), category C2
		EMC level C3: IEC/EN61800-3 (2004), category C3
EMC level C4: Low earth-current solution suitable for IT networks, IEC/EN61800-3 (2004), category C4		
Safety	EN 50178 (1997), EN 60204-1 (2006), IEC 61800-5, CE, UL, CUL; (See unit nameplate for more detailed approvals.)	
Control connections (OPT-A1, -A2, or OPT-A1, -A3)	Analog input voltage	0...+10 V(-10 V...+10 V joystick control), $R_i = 200 \text{ k}\Omega$, resolution 0.1%, accuracy +/- 1%
	Analog input current	0(4)...20 mA, $R_i = 250 \text{ }\Omega$ differential, resolution 0.1%, accuracy +/- 1%
	Digital inputs	6, positive or negative logic; 18...30 VDC
	Auxiliary voltage	+24 V, +/- 15%, max 250 mA
	Output reference voltage	+10 V, +3%, max load 10 mA
	Analog output	0(4)...20 mA, R_i max 500 Ω , resolution 10 bit, accuracy +/- 2%
	Digital output	Open collector output, 50 mA/48 V
	Relay outputs	2 programmable change-over relay outputs (NO/NC +NO)
		Switching capacity: 24 VDC/8 A, 250 VAC/8 A, 125 VDC/0.4 A Min switching load: 5 V/10 mA
Thermistor input	Galvanically isolated, $R_{tp} = 4.7 \text{ k}\Omega$	
Protections	Overvoltage, undervoltage, earth fault, mains supervision, motor phase supervision, over current, unit overtemperature, motor overload, motor stall, motor underload, short-circuit of +24 V and +10 V reference voltages	

Table 4. NX Series Technical Specifications.

Wiring Diagrams - VFDs

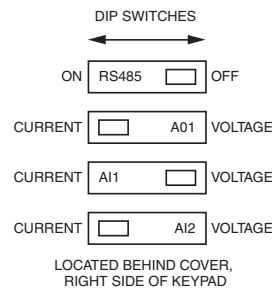
NX Series Standalone Drives





NOTES:

- 1. ALL PANELS SHIPPED WITH VFD DEFAULT PROGRAMMING PARAMETERS. SET DIP SWITCHES AS NEEDED.
- 2. TS1, ENCLOSURE FAN1 STANDARD ON ALL NEMA 3R PANELS. ENCLOSURE FAN2 ON 30HP, 40HP, AND 100HP AT 480V. HEATER IS OPTIONAL ON ALL NEMA 3R PANELS. TRANSFORMER ONLY REQUIRED ON 3R MODELS.
- 3. DISCONNECT PANEL HAS FUSED MAIN DISCONNECT. DRIVE ONLY PANEL HAS WIRE TERMINALS. ON DRIVE ONLY PANEL, CUSTOMER IS RESPONSIBLE FOR BRANCH CIRCUIT AND SHORT CIRCUIT PROTECTION.



ALL WIRING: USE COPPER WIRE ONLY SUITABLE FOR MIN. 75 DEG. C, FIELD WIRING, NEC CLASS 1.

MOTOR AND FEEDER WIRE SIZE MUST BE IN ACCORDANCE WITH NEC.

----- FIELD WIRE

————— WIRE INSIDE C/PNL

- · - · - · - · - OPTION

TYPICAL WIRING.

DEPENDING ON MODEL, THE OUTPUT ACROSS TERMINALS 32 AND 33 MAY BE EITHER RELAY OUTPUT 3 OR THERMISTOR INPUT.

Notes (continued from previous page):

1. Typical wiring.
2. NEMA 3R enclosures include a circulation fan(s). Integral enclosure heaters and/or cooling are available as special options.

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect



Variable Frequency Drives (VFD) accept a control input and then output tailored PWM control signal to operate (motors, fans, pumps, etc.) with maximum efficiency. The VFD can be field programmed without any extra devices or computer connections.

NXS/NXP Bypass

The NXS/NXP series of drives are available with a diverse offering of bypass options to complement the NXS/NXP family.

FEATURES

Our five configurations make it easy to select the right bypass to complete your drive package. All bundles are available in NEMA 1, NEMA 12 and ventilated NEMA 3R.

NXS/NXP Disconnect Option

- Adds a fused disconnect to the VFD

NXS/NXP 2-Contactor Bypass Option

Provides an economical means of bypassing the VFD.

- No Main Disconnect
- Freeze/Fire/Smoke Interlock

NXS/NXP 3-Contactor Bypass Option

During commissioning, the TEST position enables power-up of the VFD without sending power to the motor.

- In Bypass mode, the VFD is isolated from the power supply
- Fused Disconnect
- Freeze/Fire/Smoke Interlock

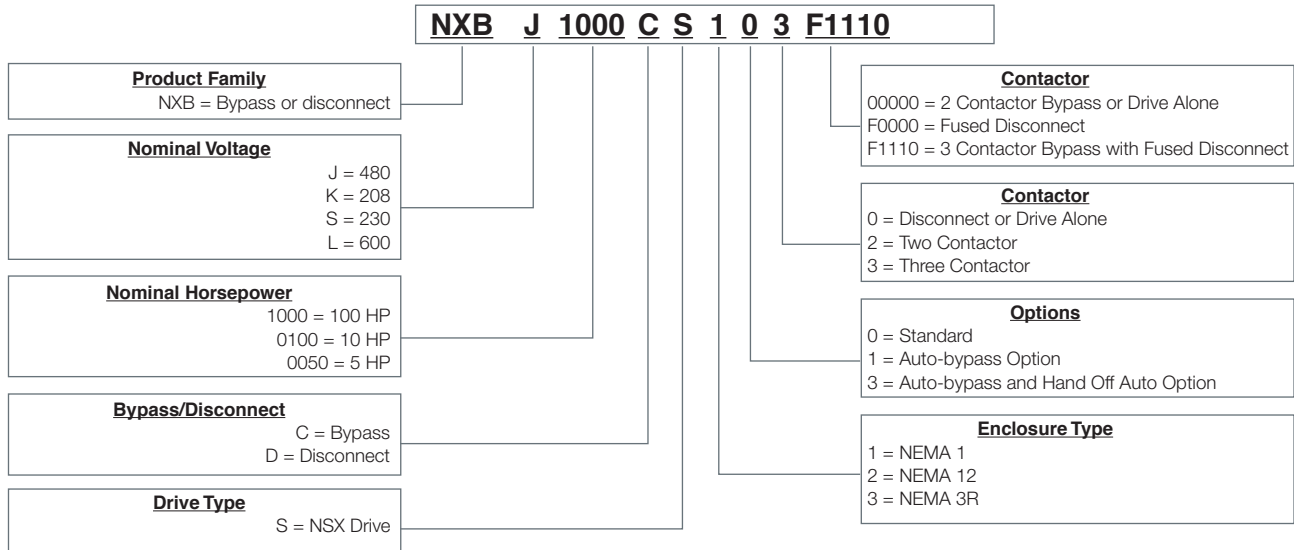
NXS/NXP 3-Contactor Auto-Bypass Option

All the features of the 3-Contactor bypass plus:

- Any VFD fault will automatically send the bypass to bypass mode
- A contact closure sends the bypass to bypass mode
- Dry contacts indicate when the bypass is in bypass mode, alerting the building management system mode, alerting the building management system

NX Series Drives with Bypass and/or Disconnect

NX Series Bypass and Disconnect Model Number Nomenclature



Voltage: 208 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBK0010CS10200000	1 HP	FR4	Vertical	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBK0015CS10200000	1.5 HP	FR4	Vertical	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0020CS10200000	2 HP	FR4	Vertical	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0030CS10200000	3 HP	FR4	Vertical	0.46A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0040CS10200000	4 HP	FR4	Vertical	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0050CS10200000	5 HP	FR5	Vertical	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0075CS10200000	7.5 HP	FR5	Vertical	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0100CS10200000	10 HP	FR5	Vertical	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0150CS10200000	15 HP	FR6	Vertical	48A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBK0200CS10200000	20 HP	FR6	Vertical	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBK0250CS10200000	25 HP	FR7	Vertical	75A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBK0300CS10200000	30 HP	FR7	Vertical	88A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBK0400CS10200000	40 HP	FR8	Side by Side	114A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0500CS10200000	50 HP	FR8	Side by Side	140A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0600CS10200000	60 HP	FR8	Side by Side	170A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0750CS10200000	75 HP	FR8	Side by Side	205A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBK0010CS103F1110	1 HP	FR4	Vertical	No	—	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBK0010CS113F1110	1 HP	FR4	Vertical	Yes	—	4.8A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0010CS133F1110	1 HP	FR4	Vertical	Yes	Hand Off Auto	4.8A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0015CS103F1110	1.5 HP	FR4	Vertical	No	—	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0015CS113F1110	1.5 HP	FR4	Vertical	Yes	—	6.6A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0015CS133F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	6.6A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0020CS103F1110	2 HP	FR4	Vertical	No	—	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0020CS113F1110	2 HP	FR4	Vertical	Yes	—	7.8A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0020CS133F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	7.8A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0030CS103F1110	3 HP	FR4	Vertical	No	—	0.46A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0030CS113F1110	3 HP	FR4	Vertical	Yes	—	11A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0030CS133F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	11A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0040CS103F1110	4 HP	FR4	Vertical	No	—	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0040CS113F1110	4 HP	FR4	Vertical	Yes	—	12.5A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0040CS133F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	12.5A	40 x 9.5 x 9.5	1016 x 241 x 231	43 lb	19.5 kg
NXBK0050CS103F1110	5 HP	FR5	Vertical	No	—	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0050CS113F1110	5 HP	FR5	Vertical	Yes	—	17.5A	46 x 10.5 x 11	1168 x 257 x 279	62 lb	28.1 kg
NXBK0050CS133F1110	5 HP	FR5	Vertical	Yes	Hand Off Auto	17.5A	46 x 10.5 x 11	1168 x 257 x 279	62 lb	28.1 kg
NXBK0075CS103F1110	7.5 HP	FR5	Vertical	No	—	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0075CS113F1110	7.5 HP	FR5	Vertical	Yes	—	25A	46 x 10.5 x 11	1168 x 257 x 279	62 lb	28.1 kg
NXBK0075CS133F1110	7.5 HP	FR5	Vertical	Yes	Hand Off Auto	25A	46 x 10.5 x 11	1168 x 257 x 279	62 lb	28.1 kg
NXBK0100CS103F1110	10 HP	FR5	Vertical	No	—	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0100CS113F1110	10 HP	FR5	Vertical	Yes	—	31A	46 x 10.5 x 11	1168 x 257 x 279	62 lb	28.1 kg
NXBK0100CS133F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	31A	46 x 10.5 x 11	1168 x 257 x 279	62 lb	28.1 kg
NXBK0150CS103F1110	15 HP	FR6	Vertical	No	—	48A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBK0150CS113F1110	15 HP	FR6	Vertical	Yes	—	48A	53 x 12 x 14	1298 x 294 x 343	99 lb	44.9 kg
NXBK0150CS133F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	48A	53 x 12 x 14	1298 x 294 x 343	99 lb	44.9 kg
NXBK0200CS103F1110	20 HP	FR6	Vertical	No	—	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBK0200CS113F1110	20 HP	FR6	Vertical	Yes	—	61A	53 x 12 x 14	1298 x 294 x 343	99 lb	44.9 kg
NXBK0200CS133F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	61A	53 x 12 x 14	1298 x 294 x 343	99 lb	44.9 kg
NXBK0250CS103F1110	25 HP	FR7	Vertical	No	—	75A	16 x 62 x 12	400 x 1550 x 300	154 lb	69.8 kg
NXBK0250CS113F1110	25 HP	FR7	Vertical	Yes	—	75A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBK0250CS133F1110	25 HP	FR7	Vertical	Yes	Hand Off Auto	75A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBK0300CS103F1110	30 HP	FR7	Vertical	No	—	88A	16 x 62 x 12	400 x 1550 x 300	154 lb	69.8 kg
NXBK0300CS113F1110	30 HP	FR7	Vertical	Yes	—	88A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBK0300CS133F1110	30 HP	FR7	Vertical	Yes	Hand Off Auto	88A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBK0400CS103F1110	40 HP	FR8	Side by Side	No	—	114A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0400CS113F1110	40 HP	FR7	Vertical	Yes	—	114A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBK0400CS133F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	114A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBK0500CS103F1110	50 HP	FR8	Side by Side	No	—	140A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0500CS113F1110	50 HP	FR8	Side by Side	Yes	—	140A	54 x 16 x 36	1350 x 400 x 900	360 lb	163.3 kg
NXBK0500CS133F1110	50 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	54 x 16 x 36	1350 x 400 x 900	360 lb	163.3 kg
NXBK0600CS103F1110	60 HP	FR8	Side by Side	No	—	170A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0600CS113F1110	60 HP	FR8	Side by Side	Yes	—	170A	54 x 16 x 36	1350 x 400 x 900	360 lb	163.3 kg
NXBK0600CS133F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	170A	54 x 16 x 36	1350 x 400 x 900	360 lb	163.3 kg
NXBK0750CS103F1110	75 HP	FR8	Side by Side	No	—	205A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0750CS113F1110	75 HP	FR8	Side by Side	Yes	—	205A	54 x 16 x 36	1350 x 400 x 900	360 lb	163.3 kg
NXBK0750CS133F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	54 x 16 x 36	1350 x 400 x 900	360 lb	163.3 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 1; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBK0010DS100F0000	1 HP	FR4	Vertical	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBK0015DS100F0000	1.5 HP	Call Customer Care	Vertical	6.6A	Call Customer Care			
NXBK0020DS100F0000	2 HP	Call Customer Care	Vertical	7.8A	Call Customer Care			
NXBK0030DS100F0000	3 HP	Call Customer Care	Vertical	0.46A	Call Customer Care			
NXBK0040DS100F0000	4 HP	Call Customer Care	Vertical	12.5A	Call Customer Care			
NXBK0050DS100F0000	5 HP	Call Customer Care	Vertical	17.5A	Call Customer Care			
NXBK0075DS100F0000	7.5 HP	FR5	Vertical	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0100DS100F0000	10 HP	Call Customer Care	Vertical	31A	Call Customer Care			
NXBK0150DS100F0000	15 HP	Call Customer Care	Vertical	48A	Call Customer Care			
NXBK0200DS100F0000	20 HP	Call Customer Care	Vertical	61A	Call Customer Care			
NXBK0250DS100F0000	25 HP	Call Customer Care	Vertical	75A	Call Customer Care			
NXBK0300DS100F0000	30 HP	Call Customer Care	Vertical	88A	Call Customer Care			
NXBK0400DS100F0000	40 HP	Call Customer Care	Side by Side	114A	Call Customer Care			
NXBK0500DS100F0000	50 HP	Call Customer Care	Side by Side	140A	Call Customer Care			
NXBK0600DS100F0000	60 HP	Call Customer Care	Side by Side	170A	Call Customer Care			
NXBK0750DS100F0000	75 HP	Call Customer Care	Side by Side	205A	Call Customer Care			

Voltage: 208 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Control Transformer:** No;
Disconnect Type: No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Current Ratings	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
NXBK0010CS20200000	1 HP	FR4	Vertical	No	4.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBK0015CS20200000	1.5 HP	FR4	Vertical	No	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0020CS20200000	2 HP	FR4	Vertical	No	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0030CS20200000	3 HP	FR4	Vertical	No	0.46A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0040CS20200000	4 HP	FR4	Vertical	No	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBK0050CS20200000	5 HP	FR5	Vertical	No	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0075CS20200000	7.5 HP	FR5	Vertical	No	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0100CS20200000	10 HP	FR5	Vertical	No	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBK0150CS20200000	15 HP	FR6	Vertical	No	48A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBK0200CS20200000	20 HP	FR6	Vertical	No	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBK0250CS20200000	25 HP	FR7	Vertical	No	75A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBK0300CS20200000	30 HP	FR7	Vertical	No	88A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBK0400CS20200000	40 HP	FR8	Side by Side	No	114A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0500CS20200000	50 HP	FR8	Side by Side	No	140A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0600CS20200000	60 HP	FR8	Side by Side	No	170A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0750CS20200000	75 HP	FR8	Side by Side	No	205A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBK0750CS21200000	75 HP	FR8	Side by Side	Yes	205A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBK0010CS203F1110	1 HP	FR4	Vertical	No	—	4.8A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0010CS213F1110	1 HP	FR4	Vertical	Yes	—	4.8A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0010CS233F1110	1 HP	FR4	Vertical	Yes	Hand Off Auto	4.8A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0015CS203F1110	1.5 HP	FR4	Vertical	No	—	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43lb	19.5 kg
NXBK0015CS213F1110	1.5 HP	FR4	Vertical	Yes	—	6.6A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0015CS233F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	6.6A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0020CS203F1110	2 HP	FR4	Vertical	No	—	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43lb	19.5 kg
NXBK0020CS213F1110	2 HP	FR4	Vertical	Yes	—	7.8A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0020CS233F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	7.8A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0030CS203F1110	3 HP	FR4	Vertical	No	—	0.46A	9.5 x 40 x 9.5	241 x 1016 x 241	43lb	19.5 kg
NXBK0030CS213F1110	3 HP	FR4	Vertical	Yes	—	11A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0030CS233F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	11A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0040CS203F1110	4 HP	FR4	Vertical	No	—	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43lb	19.5 kg
NXBK0040CS213F1110	4 HP	FR4	Vertical	Yes	—	12.5A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0040CS233F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	12.5A	36H x 10D x 16W	882H x 245D x 392W	53lb	116.6 kg
NXBK0050CS203F1110	5 HP	FR5	Vertical	No	—	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62lb	28.1 kg
NXBK0050CS213F1110	5 HP	FR5	Vertical	Yes	—	17.5A	36H x 10D x 16W	882H x 245D x 392W	64lb	140.8 kg
NXBK0050CS233F1110	5 HP	FR5	Vertical	Yes	Hand Off Auto	17.5A	36H x 10D x 16W	882H x 245D x 392W	64lb	140.8 kg
NXBK0075CS203F1110	7.5 HP	FR5	Vertical	No	—	25A	11 x 46 x 10.5	275 x 1150 x 262	62lb	28.1 kg
NXBK0075CS213F1110	7.5 HP	FR5	Vertical	Yes	—	25A	36H x 10D x 16W	882H x 245D x 392W	64lb	140.8 kg
NXBK0075CS233F1110	7.5 HP	FR5	Vertical	Yes	Hand Off Auto	25A	36H x 10D x 16W	882H x 245D x 392W	64lb	140.8 kg
NXBK0100CS203F1110	10 HP	FR5	Vertical	No	—	31A	11 x 46 x 10.5	275 x 1150 x 262	62lb	28.1 kg
NXBK0100CS213F1110	10 HP	FR5	Vertical	Yes	—	31A	44H x 10D x 16W	1078H x 245D x 392W	70lb	31.7 kg
NXBK0100CS233F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	31A	44H x 10D x 16W	1078H x 245D x 392W	70lb	31.7 kg
NXBK0150CS203F1110	15 HP	FR6	Vertical	No	—	48A	14 x 53 x 12	350 x 1325 x 300	99lb	44.9 kg
NXBK0150CS213F1110	15 HP	FR6	Vertical	Yes	—	48A	50H x 10D x 16W	1225H x 245D x 392W	120lb	54.5 kg
NXBK0150CS233F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	48A	50H x 10D x 16W	1225H x 245D x 392W	120lb	54.5 kg
NXBK0200CS203F1110	20 HP	FR6	Vertical	No	—	61A	14 x 53 x 12	350 x 1325 x 300	99lb	44.9 kg
NXBK0200CS213F1110	20 HP	FR6	Vertical	Yes	—	61A	54H x 10D x 20W	1323H x 245D x 490W	136lb	61.7 kg
NXBK0200CS233F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	61A	54H x 10D x 20W	1323H x 245D x 490W	136lb	61.7 kg
NXBK0250CS213F1110	25 HP	FR7	Vertical	Yes	—	75A	58 x 10 x 20	1421 x 245 x 490	150lb	68.2 kg
NXBK0250CS233F1110	25 HP	FR7	Vertical	Yes	Hand Off Auto	75A	58 x 10 x 20	1421 x 245 x 490	150lb	68.2 kg
NXBK0300CS213F1110	30 HP	FR7	Vertical	Yes	—	88A	58 x 10 x 20	1421 x 245 x 490	150lb	68.2 kg
NXBK0300CS233F1110	30 HP	FR7	Vertical	Yes	Hand Off Auto	88A	58 x 10 x 20	1421 x 245 x 490	150lb	68.2 kg
NXBK0400CS213F1110	40 HP	FR7	Vertical	Yes	—	114A	64 x 12 x 24	1568 x 294 x 588mm	200lb	90.7 kg
NXBK0400CS233F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	114A	64 x 12 x 24	1568 x 294 x 588mm	200lb	90.7 kg
NXBK0500CS213F1110	50 HP	FR8	Side by Side	Yes	—	140A	48H x 14D x 36W	1176H x 343D x 882W	350lb	158.8 kg
NXBK0500CS233F1110	50 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	48H x 14D x 36W	1176H x 343D x 882W	350lb	158.8 kg
NXBK0600CS213F1110	60 HP	FR8	Side by Side	Yes	—	170A	48H x 14D x 36W	1176H x 343D x 882W	350lb	158.8 kg
NXBK0600CS233F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	170A	48H x 14D x 36W	1176H x 343D x 882W	350lb	158.8 kg
NXBK0750CS213F1110	75 HP	FR8	Side by Side	Yes	—	205A	48H x 14D x 36W	1176H x 343D x 882W	350lb	158.8 kg
NXBK0750CS233F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	48H x 14D x 36W	1176H x 343D x 882W	350lb	158.8 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 12; **Auto Bypass:** No; **Control Transformer:** No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Contactor	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
NXBK0010DS200F0000	1 HP	FR4	Vertical	4.8A	—	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBK0015DS200F0000	1.5 HP	Call Customer Care	Vertical	6.6A	—	Call Customer Care			
NXBK0020DS200F0000	2 HP	Call Customer Care	Vertical	7.8A	—	Call Customer Care			
NXBK0030DS200F0000	3 HP	Call Customer Care	Vertical	0.46A	—	Call Customer Care			
NXBK0040DS200F0000	4 HP	Call Customer Care	Vertical	12.5A	—	Call Customer Care			
NXBK0050DS200F0000	5 HP	Call Customer Care	Vertical	17.5A	—	Call Customer Care			
NXBK0075DS200F0000	7.5 HP	Call Customer Care	Vertical	25A	—	Call Customer Care			
NXBK0100DS200F0000	10 HP	Call Customer Care	Vertical	31A	—	Call Customer Care			
NXBK0150DS200F0000	15 HP	Call Customer Care	Vertical	48A	—	Call Customer Care			
NXBK0200DS200F0000	20 HP	Call Customer Care	Vertical	61A	—	Call Customer Care			
NXBK0250DS200F0000	25 HP	Call Customer Care	Vertical	75A	—	Call Customer Care			
NXBK0300DS200F0000	30 HP	Call Customer Care	Vertical	88A	—	Call Customer Care			
NXBK0400DS200F0000	40 HP	Call Customer Care	Side by Side	114A	—	Call Customer Care			
NXBK0500DS200F0000	50 HP	Call Customer Care	Side by Side	140A	—	Call Customer Care			
NXBK0600DS200F0000	60 HP	Call Customer Care	Side by Side	170A	—	Call Customer Care			
NXBK0750DS200F0000	75 HP	Call Customer Care	Side by Side	205A	—	Call Customer Care			

Voltage: 208 Vac; **Configuration:** Drive Alone; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No; **Control Transformer:** No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBK0010CS30000000	1 HP	FR4	Vertical	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBK0015CS30000000	1.5 HP	FR4	Vertical	6.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBK0020CS30000000	2 HP	FR4	Vertical	7.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBK0030CS30000000	3 HP	FR4	Vertical	11A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBK0040CS30000000	4 HP	FR4	Vertical	12.5A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBK0050CS30000000	5 HP	FR5	Vertical	17.5A	30H x 10D x 24W	735H x 245D x 588W	78 lb	171.6 kg
NXBK0075CS30000000	7.5 HP	FR5	Vertical	25A	30H x 10D x 24W	735H x 245D x 588W	78 lb	171.6 kg
NXBK0100CS30000000	10 HP	FR5	Vertical	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	171.6 kg
NXBK0150CS30000000	15 HP	FR6	Vertical	48A	36H x 12D x 30W	882H x 294D x 735W	124 lb	272.8 kg
NXBK0200CS30000000	20 HP	FR6	Vertical	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	272.8 kg
NXBK0250CS30000000	25 HP	FR7	Vertical	75A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	424.6 kg
NXBK0300CS30000000	30 HP	FR7	Vertical	88A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	424.6 kg
NXBK0400CS30000000	40 HP	FR7	Vertical	114A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	424.6 kg

Voltage: 208 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No; **Control Transformer:** No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBK0010CS30200000	1 HP	FR4	Vertical	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBK0020CS30200000	2 HP	FR4	Vertical	7.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBK0075CS30200000	7.5 HP	FR5	Vertical	25A	30H x 10D x 24W	735H x 245D x 588W	78 lb	171.6 kg
NXBK0250CS30200000	25 HP	FR7	Vertical	75A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	424.6 kg
NXBK0600CS30200000	60 HP	FR8	Side by Side	170A	60H x 14D x 36W	1470H x 343D x 882W	440 lb	968 kg

Note: Other sizes may be available as a special.

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 3R; **Disconnect Type:** Fused Disconnect

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Control Transformer	Drive Input Disconnect	Pilot Lights	Dimensions, Approximate		Weight	
										(inch)	(mm)	(lb)	(kg)
NXBK0010CS303F1110	1 HP	FR4	Vertical	No	—	4.8A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0010CS313F1110	1 HP	FR4	Vertical	Yes	—	4.8A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0010CS333F1110	1 HP	FR4	Vertical	Yes	Hand Off Auto	4.8A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0015CS303F1110	1.5 HP	FR4	Vertical	No	—	6.6A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0015CS313F1110	1.5 HP	FR4	Vertical	Yes	—	6.6A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0015CS333F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	6.6A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0020CS303F1110	2 HP	FR4	Vertical	No	—	7.8A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0020CS313F1110	2 HP	FR4	Vertical	Yes	—	7.8A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0020CS333F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	7.8A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0030CS303F1110	3 HP	FR4	Vertical	No	—	11A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0030CS313F1110	3 HP	FR4	Vertical	Yes	—	11A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0030CS333F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	11A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0040CS303F1110	4 HP	FR4	Vertical	No	—	12.5A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0040CS313F1110	4 HP	FR4	Vertical	Yes	—	12.5A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0040CS333F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	12.5A	Yes	Yes	Yes	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg
NXBK0050CS303F1110	5 HP	FR5	Vertical	No	—	17.5A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0050CS313F1110	5 HP	FR5	Vertical	Yes	—	17.5A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0050CS333F1110	5 HP	FR5	Vertical	Yes	Hand Off Auto	17.5A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0075CS303F1110	7.5 HP	FR5	Vertical	No	—	25A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0075CS313F1110	7.5 HP	FR5	Vertical	Yes	—	25A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0075CS333F1110	7.5 HP	FR5	Vertical	Yes	Hand Off Auto	25A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0100CS303F1110	10 HP	FR5	Vertical	No	—	31A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0100CS313F1110	10 HP	FR5	Vertical	Yes	—	31A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0100CS333F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	31A	Yes	Yes	Yes	30 x 10 x 24	735 x 245 x 588	78 lb	171.6 kg
NXBK0150CS313F1110	15 HP	FR6	Vertical	Yes	—	48A	Yes	Yes	Yes	36 x 12 x 30	882 x 294 x 735	124 lb	272.8 kg
NXBK0150CS333F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	48A	Yes	Yes	Yes	36 x 12 x 30	882 x 294 x 735	124 lb	272.8 kg
NXBK0200CS303F1110	20 HP	FR6	Vertical	No	—	61A	Yes	Yes	Yes	36 x 12 x 30	882 x 294 x 735	124 lb	272.8 kg
NXBK0200CS313F1110	20 HP	FR6	Vertical	Yes	—	61A	Yes	Yes	Yes	36 x 12 x 30	882 x 294 x 735	124 lb	272.8 kg
NXBK0200CS333F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	61A	Yes	Yes	Yes	36 x 12 x 30	882 x 294 x 735	124 lb	272.8 kg
NXBK0250CS303F1110	25 HP	FR7	Vertical	No	—	75A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0250CS313F1110	25 HP	FR7	Vertical	Yes	—	75A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0250CS333F1110	25 HP	FR7	Vertical	Yes	Hand Off Auto	75A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0300CS303F1110	30 HP	FR7	Vertical	No	—	88A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0300CS313F1110	30 HP	FR7	Vertical	Yes	—	88A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0300CS333F1110	30 HP	FR7	Vertical	Yes	Hand Off Auto	88A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0400CS303F1110	40 HP	FR7	Vertical	No	—	114A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0400CS313F1110	40 HP	FR7	Vertical	Yes	—	114A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0400CS333F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	114A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0400CS603F1110	40 HP	FR7	Vertical	No	—	114A	Yes	Yes	Yes	48 x 12 x 36	1176 x 294 x 882	193 lb	424.6 kg
NXBK0500CS303F1110	50 HP	FR8	Side by Side	No	—	140A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0500CS313F1110	50 HP	FR8	Side by Side	Yes	—	140A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0500CS333F1110	50 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0600CS303F1110	60 HP	FR8	Side by Side	No	—	170A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0600CS313F1110	60 HP	FR8	Side by Side	Yes	—	170A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0600CS333F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	170A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0750CS303F1110	75 HP	FR8	Side by Side	No	—	205A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0750CS313F1110	75 HP	FR8	Side by Side	Yes	—	205A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0750CS333F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	Yes	Yes	Yes	60 x 14 x 36	1470 x 343 x 882	440 lb	968 kg
NXBK0010DS300F0000	1 HP	FR4	Vertical	No	—	4.8A	No	No	No	24 x 10 x 20	588 x 245 x 490	54 lb	118.8 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 208 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBK0010DS300F0000	1 HP	FR4	Vertical	4.8A	24 x 10 x 20	588 x 245 x 490	54 lb	118.8kg
NXBK0015DS300F0000	1.5 HP	Call Customer Care	Vertical	6.6A	Call Customer Care			
NXBK0020DS300F0000	2 HP	Call Customer Care	Vertical	7.8A	Call Customer Care			
NXBK0030DS300F0000	3 HP	Call Customer Care	Vertical	0.46A	Call Customer Care			
NXBK0040DS300F0000	4 HP	Call Customer Care	Vertical	12.5A	Call Customer Care			
NXBK0050DS300F0000	5 HP	Call Customer Care	Vertical	17.5A	Call Customer Care			
NXBK0075DS300F0000	7.5 HP	Call Customer Care	Vertical	25A	Call Customer Care			
NXBK0100DS300F0000	10 HP	Call Customer Care	Vertical	31A	Call Customer Care			
NXBK0150DS300F0000	15 HP	Call Customer Care	Vertical	48A	Call Customer Care			
NXBK0200DS300F0000	20 HP	Call Customer Care	Vertical	61A	Call Customer Care			
NXBK0250DS300F0000	25 HP	Call Customer Care	Vertical	75A	Call Customer Care			
NXBK0300DS300F0000	30 HP	Call Customer Care	Vertical	88A	Call Customer Care			
NXBK0400DS300F0000	40 HP	Call Customer Care	Side by Side	114A	Call Customer Care			
NXBK0500DS300F0000	50 HP	Call Customer Care	Side by Side	140A	Call Customer Care			
NXBK0600DS300F0000	60 HP	Call Customer Care	Side by Side	170A	Call Customer Care			
NXBK0750DS300F0000	75 HP	Call Customer Care	Side by Side	205A	Call Customer Care			

Voltage: 230 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBS0010CS10200000	1 HP	FR4	Vertical	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0015CS10200000	1.5 HP	FR4	Vertical	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0020CS10200000	2 HP	FR4	Vertical	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0030CS10200000	3 HP	FR4	Vertical	11A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0040CS10200000	4 HP	FR4	Vertical	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0050CS10200000	5 HP	FR5	Vertical	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0075CS10200000	7.5 HP	FR5	Vertical	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0100CS10200000	10 HP	FR5	Vertical	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0150CS10200000	15 HP	FR6	Vertical	48A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0200CS10200000	20 HP	FR6	Vertical	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0250CS10200000	25 HP	FR7	Vertical	75A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBS0300CS10200000	30 HP	FR7	Vertical	88A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBS0400CS10200000	40 HP	FR8	Side by Side	114A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0500CS10200000	50 HP	FR8	Side by Side	140A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0600CS10200000	60 HP	FR8	Side by Side	170A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0750CS10200000	75 HP	FR8	Side by Side	205A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBS0010CS103F1110	1 HP	FR4	Vertical	No	—	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0010CS113F1110	1 HP	FR4	Vertical	Yes	—	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0010CS133F1110	1 HP	FR4	Vertical	Yes	Hand Off Auto	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0015CS103F1110	1.5 HP	FR4	Vertical	No	—	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0015CS113F1110	1.5 HP	FR4	Vertical	Yes	—	6.6A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0015CS133F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	6.6A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0020CS103F1110	2 HP	FR4	Vertical	No	—	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0020CS113F1110	2 HP	FR4	Vertical	Yes	—	7.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0020CS133F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	7.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0030CS103F1110	3 HP	FR4	Vertical	No	—	11A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0030CS113F1110	3 HP	FR4	Vertical	Yes	—	11A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0030CS133F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	11A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0040CS103F1110	4 HP	FR4	Vertical	No	—	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0040CS113F1110	4 HP	FR4	Vertical	Yes	—	12.5A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0040CS133F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	12.5A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0050CS103F1110	5 HP	FR5	Vertical	No	—	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0050CS113F1110	5 HP	FR5	Vertical	Yes	—	17.5A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBS0050CS133F1110	5 HP	FR5	Vertical	Yes	Hand Off Auto	17.5A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBS0075CS103F1110	7.5 HP	FR5	Vertical	No	—	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0075CS113F1110	7.5 HP	FR5	Vertical	Yes	—	25A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBS0075CS133F1110	7.5 HP	FR5	Vertical	Yes	Hand Off Auto	25A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBS0100CS103F1110	10 HP	FR5	Vertical	No	—	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0100CS113F1110	10 HP	FR5	Vertical	Yes	—	31A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBS0100CS133F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	31A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBS0150CS103F1110	15 HP	FR6	Vertical	No	—	48A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0150CS113F1110	15 HP	FR6	Vertical	Yes	—	48A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBS0150CS133F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	48A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBS0200CS103F1110	20 HP	FR6	Vertical	No	—	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0200CS113F1110	20 HP	FR6	Vertical	Yes	—	61A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBS0200CS133F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	61A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBS0250CS103F1110	25 HP	FR7	Vertical	No	—	75A	16 x 62 x 12	400 x 1550 x 300	154 lb	69.8 kg
NXBS0250CS113F1110	25 HP	FR7	Vertical	Yes	—	75A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBS0250CS133F1110	25 HP	FR7	Vertical	Yes	Hand Off Auto	75A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBS0300CS103F1110	30 HP	FR7	Vertical	No	—	88A	16 x 62 x 12	400 x 1550 x 300	154 lb	69.8 kg
NXBS0300CS113F1110	30 HP	FR7	Vertical	Yes	—	88A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBS0300CS133F1110	30 HP	FR7	Vertical	Yes	Hand Off Auto	88A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBS0400CS103F1110	40 HP	FR8	Side by Side	No	—	114A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0400CS113F1110	40 HP	FR7	Vertical	Yes	—	114A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBS0400CS133F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	114A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBS0500CS103F1110	50 HP	FR8	Side by Side	No	—	140A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0500CS113F1110	50 HP	FR8	Side by Side	Yes	—	140A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBS0500CS133F1110	50 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBS0600CS103F1110	60 HP	FR8	Side by Side	No	—	170A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0600CS113F1110	60 HP	FR8	Side by Side	Yes	—	170A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBS0600CS133F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	170A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBS0750CS103F1110	75 HP	FR8	Side by Side	No	—	205A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0750CS113F1110	75 HP	FR8	Side by Side	Yes	—	205A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBS0750CS133F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 1; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBS0010DS100F0000	1 HP	FR4	Vertical	4.8A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBS0015DS100F0000	1.5 HP	Call Customer Care	Vertical	6.6A	Call Customer Care			
NXBS0020DS100F0000	2 HP		Vertical	7.8A	Call Customer Care			
NXBS0030DS100F0000	3 HP	FR4	Vertical	11A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0040DS100F0000	4 HP	Call Customer Care	Vertical	12.5A	Call Customer Care			
NXBS0050DS100F0000	5 HP		Vertical	17.5A	Call Customer Care			
NXBS0075DS100F0000	7.5 HP		Vertical	25A	Call Customer Care			
NXBS0100DS100F0000	10 HP		Vertical	31A	Call Customer Care			
NXBS0150DS100F0000	15 HP		Vertical	48A	Call Customer Care			
NXBS0200DS100F0000	20 HP	FR5	Vertical	61A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0250DS100F0000	25 HP	Call Customer Care	Vertical	75A	Call Customer Care			
NXBS0300DS100F0000	30 HP		Vertical	88A	Call Customer Care			
NXBS0400DS100F0000	40 HP		Vertical	114A	Call Customer Care			
NXBS0500DS100F0000	50 HP		Side by Side	140A	Call Customer Care			
NXBS0600DS100F0000	60 HP		Side by Side	170A	Call Customer Care			
NXBS0750DS100F0000	75 HP		Side by Side	205A	Call Customer Care			

Voltage: 230 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBS0010CS20200000	1 HP	FR4	Vertical	4.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0015CS20200000	1.5 HP	FR4	Vertical	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0020CS20200000	2 HP	FR4	Vertical	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0030CS20200000	3 HP	FR4	Vertical	11A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0040CS20200000	4 HP	FR4	Vertical	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0050CS20200000	5 HP	FR5	Vertical	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0075CS20200000	7.5 HP	FR5	Vertical	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0100CS20200000	10 HP	FR5	Vertical	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0150CS20200000	15 HP	FR6	Vertical	48A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0200CS20200000	20 HP	FR6	Vertical	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0250CS20200000	25 HP	FR7	Vertical	75A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBS0300CS20200000	30 HP	FR7	Vertical	88A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBS0400CS20200000	40 HP	FR8	Side by Side	114A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0500CS20200000	50 HP	FR8	Side by Side	140A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0600CS20200000	60 HP	FR8	Side by Side	170A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg
NXBS0750CS20200000	75 HP	FR8	Side by Side	205A	36 x 54 x 16	914.4 x 1371.6 x 406.4	360 lb	163.3 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Control Transformer:** Yes; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBS0010CS203F1110	1 HP	FR4	Vertical	No	—	4.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0010CS213F1110	1 HP	FR4	Vertical	Yes	—	4.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0010CS233F1110	1 HP	FR4	Vertical	Yes	Hand Off Auto	4.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0015CS203F1110	1.5 HP	FR4	Vertical	No	—	6.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0015CS213F1110	1.5 HP	FR4	Vertical	Yes	—	6.6A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0015CS233F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	6.6A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0020CS203F1110	2 HP	FR4	Vertical	No	—	7.8A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0020CS213F1110	2 HP	FR4	Vertical	Yes	—	7.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0020CS233F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	7.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0030CS203F1110	3 HP	FR4	Vertical	No	—	11A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0030CS213F1110	3 HP	FR4	Vertical	Yes	—	11A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0030CS233F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	11A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0040CS203F1110	4 HP	FR4	Vertical	No	—	12.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0040CS213F1110	4 HP	FR4	Vertical	Yes	—	12.5A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0040CS233F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	12.5A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0050CS203F1110	5 HP	FR5	Vertical	No	—	17.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0050CS213F1110	5 HP	FR5	Vertical	Yes	—	17.5A	36H x 10D x 16W	882H x 245D x 392W	64 lb	29 kg
NXBS0050CS233F1110	5 HP	FR5	Vertical	Yes	Hand Off Auto	17.5A	36H x 10D x 16W	882H x 245D x 392W	64 lb	29 kg
NXBS0075CS203F1110	7.5 HP	FR5	Vertical	No	—	25A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0075CS213F1110	7.5 HP	FR5	Vertical	Yes	—	25A	36H x 10D x 16W	882H x 245D x 392W	64 lb	29 kg
NXBS0075CS233F1110	7.5 HP	FR5	Vertical	Yes	Hand Off Auto	25A	36H x 10D x 16W	882H x 245D x 392W	64 lb	29 kg
NXBS0100CS203F1110	10 HP	FR5	Vertical	No	—	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBS0100CS213F1110	10 HP	FR5	Vertical	Yes	—	31A	44H x 10D x 16W	1078H x 245D x 392W	70 lb	31.7 kg
NXBS0100CS233F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	31A	44H x 10D x 16W	1078H x 245D x 392W	70 lb	31.7 kg
NXBS0150CS203F1110	15 HP	FR6	Vertical	No	—	48A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0150CS213F1110	15 HP	FR6	Vertical	Yes	—	48A	50H x 10D x 16W	1225H x 245D x 392W	120 lb	54.5 kg
NXBS0150CS233F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	48A	50H x 10D x 16W	1225H x 245D x 392W	120 lb	54.5 kg
NXBS0200CS203F1110	20 HP	FR6	Vertical	No	—	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBS0200CS213F1110	20 HP	FR6	Vertical	Yes	—	61A	54H x 10D x 20W	1323H x 245D x 490W	136 lb	61.7 kg
NXBS0200CS233F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	61A	54H x 10D x 20W	1323H x 245D x 490W	136 lb	61.7 kg
NXBS0250CS213F1110	25 HP	FR7	Vertical	Yes	—	75A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBS0250CS233F1110	25 HP	FR7	Vertical	Yes	Hand Off Auto	75A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBS0300CS213F1110	30 HP	FR7	Vertical	Yes	—	88A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBS0300CS233F1110	30 HP	FR7	Vertical	Yes	Hand Off Auto	88A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBS0400CS213F1110	40 HP	FR7	Vertical	Yes	—	114A	64 x 12 x 24	1568 x 294 x 588mm	200 lb	90.7 kg
NXBS0400CS233F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	114A	64 x 12 x 24	1568 x 294 x 588mm	200 lb	90.7 kg
NXBS0500CS213F1110	50 HP	FR8	Side by Side	Yes	—	140A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBS0500CS233F1110	50 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBS0600CS213F1110	60 HP	FR8	Side by Side	Yes	—	170A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBS0600CS233F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	170A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBS0750CS213F1110	75 HP	FR8	Side by Side	Yes	—	205A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBS0750CS233F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 12; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBS0010DS200F0000	1 HP	FR4	Vertical	4.8A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBS0015DS200F0000	1.5 HP	Call Customer Care	Vertical	6.6A	Call Customer Care			
NXBS0020DS200F0000	2 HP	Call Customer Care	Vertical	7.8A	Call Customer Care			
NXBS0030DS200F0000	3 HP	Call Customer Care	Vertical	11A	Call Customer Care			
NXBS0040DS200F0000	4 HP	Call Customer Care	Vertical	12.5A	Call Customer Care			
NXBS0050DS200F0000	5 HP	Call Customer Care	Vertical	17.5A	Call Customer Care			
NXBS0075DS200F0000	7.5 HP	Call Customer Care	Vertical	25A	Call Customer Care			
NXBS0100DS200F0000	10 HP	Call Customer Care	Vertical	31A	Call Customer Care			
NXBS0150DS200F0000	15 HP	Call Customer Care	Vertical	48A	Call Customer Care			
NXBS0200DS200F0000	20 HP	Call Customer Care	Vertical	61A	Call Customer Care			
NXBS0250DS200F0000	25 HP	Call Customer Care	Vertical	75A	Call Customer Care			
NXBS0300DS200F0000	30 HP	Call Customer Care	Vertical	88A	Call Customer Care			
NXBS0400DS200F0000	40 HP	Call Customer Care	Vertical	114A	Call Customer Care			
NXBS0500DS200F0000	50 HP	Call Customer Care	Side by Side	140A	Call Customer Care			
NXBS0600DS200F0000	60 HP	Call Customer Care	Side by Side	170A	Call Customer Care			
NXBS0750DS200F0000	75 HP	Call Customer Care	Side by Side	205A	Call Customer Care			

Voltage: 230 Vac; **Configuration:** Drive Alone; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBS0010CS30000000	1 HP	FR4	Vertical	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0015CS30000000	1.5 HP	FR4	Vertical	6.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0020CS30000000	2 HP	FR4	Vertical	7.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0030CS30000000	3 HP	FR4	Vertical	11A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0040CS30000000	4 HP	FR4	Vertical	12.5A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0050CS30000000	5 HP	FR5	Vertical	17.5A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0075CS30000000	7.5 HP	FR5	Vertical	25A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0100CS30000000	10 HP	FR5	Vertical	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0200CS30000000	20 HP	FR6	Vertical	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBS0250CS30000000	25 HP	FR7	Vertical	75A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0300CS30000000	30 HP	FR7	Vertical	88A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0400CS30000000	40 HP	FR7	Vertical	114A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg

Voltage: 230 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBS0010CS30200000	1 HP	FR4	Vertical	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0015CS30200000	1.5 HP	FR4	Vertical	6.6A	20 x 24 x 10	500 x 600 x 250	54 lb	24.5 kg
NXBS0020CS30200000	2 HP	FR4	Vertical	7.8A	20 x 24 x 10	500 x 600 x 250	54 lb	24.5 kg
NXBS0030CS30200000	3 HP	FR4	Vertical	11A	20 x 24 x 10	500 x 600 x 250	54 lb	24.5 kg
NXBS0100CS30200000	10 HP	FR5	Vertical	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0300CS30200000	30 HP	FR7	Vertical	88A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0750CS30200000	75 HP	FR8	Side by Side	205A	60 x 12 x 34	1524 x 305 x 864	440 lb	199.6 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 3R; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBS0010CS303F1110	1 HP	FR4	Vertical	No	—	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0010CS313F1110	1 HP	FR4	Vertical	Yes	—	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0010CS333F1110	1 HP	FR4	Vertical	Yes	Hand Off Auto	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0015CS303F1110	1.5 HP	FR4	Vertical	No	—	6.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0015CS313F1110	1.5 HP	FR4	Vertical	Yes	—	6.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0015CS333F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	6.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0020CS303F1110	2 HP	FR4	Vertical	No	—	7.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0020CS313F1110	2 HP	FR4	Vertical	Yes	—	7.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0020CS333F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	7.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0030CS203F1110	3 HP	FR4	Vertical	No	—	11A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBS0030CS303F1110	3 HP	FR4	Vertical	No	—	11A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0030CS313F1110	3 HP	FR4	Vertical	Yes	—	11A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0030CS333F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	11A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0040CS303F1110	4 HP	FR4	Vertical	No	—	12.5A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0040CS313F1110	4 HP	FR4	Vertical	Yes	—	12.5A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0040CS333F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	12.5A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0050CS303F1110	5 HP	FR5	Vertical	No	—	17.5A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0050CS313F1110	5 HP	FR5	Vertical	Yes	—	17.5A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0050CS333F1110	5 HP	FR5	Vertical	Yes	Hand Off Auto	17.5A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0075CS303F1110	7.5 HP	FR5	Vertical	No	—	25A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0075CS313F1110	7.5 HP	FR5	Vertical	Yes	—	25A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0075CS333F1110	7.5 HP	FR5	Vertical	Yes	Hand Off Auto	25A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0100CS303F1110	10 HP	FR5	Vertical	No	—	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0100CS313F1110	10 HP	FR5	Vertical	Yes	—	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0100CS333F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBS0150CS303F1110	15 HP	FR6	Vertical	No	—	48A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBS0150CS313F1110	15 HP	FR6	Vertical	Yes	—	48A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBS0150CS333F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	48A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBS0200CS303F1110	20 HP	FR6	Vertical	No	—	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBS0200CS313F1110	20 HP	FR6	Vertical	Yes	—	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBS0200CS333F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBS0250CS303F1110	25 HP	FR7	Vertical	No	—	75A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0250CS313F1110	25 HP	FR7	Vertical	Yes	—	75A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0250CS333F1110	25 HP	FR7	Vertical	Yes	Hand Off Auto	75A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0300CS303F1110	30 HP	FR7	Vertical	No	—	88A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0300CS313F1110	30 HP	FR7	Vertical	Yes	—	88A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0300CS333F1110	30 HP	FR7	Vertical	Yes	Hand Off Auto	88A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0400CS303F1110	40 HP	FR7	Vertical	No	—	114A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0400CS313F1110	40 HP	FR7	Vertical	Yes	—	114A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0400CS333F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	114A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBS0500CS303F1110	50 HP	FR8	Side by Side	No	—	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0500CS313F1110	50 HP	FR8	Side by Side	Yes	—	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0500CS333F1110	50 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0600CS303F1110	60 HP	FR8	Side by Side	No	—	170A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0600CS313F1110	60 HP	FR8	Side by Side	Yes	—	170A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0600CS333F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	170A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0750CS303F1110	75 HP	FR8	Side by Side	No	—	205A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0750CS313F1110	75 HP	FR8	Side by Side	Yes	—	205A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBS0750CS333F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 230 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBS0010DS300F0000	1 HP	FR4	Vertical	4.8A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBS0015DS300F0000	1.5 HP	Call Customer Care	Vertical	6.6A	Call Customer Care			
NXBS0020DS300F0000	2 HP	Call Customer Care	Vertical	7.8A	Call Customer Care			
NXBS0030DS300F0000	3 HP	Call Customer Care	Vertical	11A	Call Customer Care			
NXBS0040DS300F0000	4 HP	Call Customer Care	Vertical	12.5A	Call Customer Care			
NXBS0050DS300F0000	5 HP	Call Customer Care	Vertical	17.5A	Call Customer Care			
NXBS0075DS300F0000	7.5 HP	Call Customer Care	Vertical	25A	Call Customer Care			
NXBS0100DS300F0000	10 HP	Call Customer Care	Vertical	31A	Call Customer Care			
NXBS0150DS300F0000	15 HP	Call Customer Care	Vertical	48A	Call Customer Care			
NXBS0200DS300F0000	20 HP	Call Customer Care	Vertical	61A	Call Customer Care			
NXBS0250DS300F0000	25 HP	Call Customer Care	Vertical	75A	Call Customer Care			
NXBS0300DS300F0000	30 HP	Call Customer Care	Vertical	88A	Call Customer Care			
NXBS0400DS300F0000	40 HP	Call Customer Care	Vertical	114A	Call Customer Care			
NXBS0500DS300F0000	50 HP	Call Customer Care	Side by Side	140A	Call Customer Care			
NXBS0600DS300F0000	60 HP	Call Customer Care	Side by Side	170A	Call Customer Care			
NXBS0750DS300F0000	75 HP	Call Customer Care	Side by Side	205A	Call Customer Care			

Voltage: 460 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBJ0015CS10200000	1.5 HP	FR4	Vertical	3.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0020CS10200000	2 HP	FR4	Vertical	4.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0030CS10200000	3 HP	FR4	Vertical	5.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0040CS10200000	4 HP	FR4	Vertical	7.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0050CS10200000	5 HP	FR4	Vertical	0.37A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0075CS10200000	7.5 HP	FR4	Vertical	—	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0100CS10200000	10 HP	FR5	Vertical	16A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0150CS10200000	15 HP	FR5	Vertical	23A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0150CS12200000	15 HP	FR5	Vertical	23A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBJ0200CS10200000	20 HP	FR5	Vertical	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0200CS12200000	20 HP	FR5	Vertical	31A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBJ0250CS10200000	25 HP	FR6	Vertical	38A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0250CS12200000	25 HP	FR6	Vertical	38A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0300CS10200000	30 HP	FR6	Vertical	46A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0400CS10200000	40 HP	FR6	Vertical	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0500CS10200000	50 HP	FR7	Vertical	72A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0600CS10200000	60 HP	FR7	Vertical	87A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0750CS10200000	75 HP	FR7	Vertical	105A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ1000CS10200000	100 HP	FR8	Side by Side	140A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1250CS10200000	125 HP	FR8	Side by Side	170A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1500CS10200000	150 HP	FR8	Side by Side	205A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
NXBJ0015CS103F1110	1.5 HP	FR4	Vertical	—	3.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0015CS113F1110	1.5 HP	FR4	Vertical	—	3.3A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0015CS133F1110	1.5 HP	FR4	Vertical	Hand Off Auto	3.3A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0020CS103F1110	2 HP	FR4	Vertical	—	4.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0020CS113F1110	2 HP	FR4	Vertical	—	4.3A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0020CS133F1110	2 HP	FR4	Vertical	Hand Off Auto	4.3A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0030CS103F1110	3 HP	FR4	Vertical	—	5.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0030CS113F1110	3 HP	FR4	Vertical	—	5.6A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0030CS133F1110	3 HP	FR4	Vertical	Hand Off Auto	5.6A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0040CS103F1110	4 HP	FR4	Vertical	—	7.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0040CS113F1110	4 HP	FR4	Vertical	—	7.6A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0040CS133F1110	4 HP	FR4	Vertical	Hand Off Auto	7.6A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0050CS103F1110	5 HP	FR4	Vertical	—	0.37A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0050CS113F1110	5 HP	FR4	Vertical	—	9A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0050CS133F1110	5 HP	FR4	Vertical	Hand Off Auto	9A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0075CS103F1110	7.5 HP	FR4	Vertical	—	—	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0075CS113F1110	7.5 HP	FR4	Vertical	Auto-Bypass	—	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0075CS133F1110	7.5 HP	FR4	Vertical	Hand Off Auto	12A	40H x 9.5D x 9.5W	1016H x 241D x 231W	43 lb	19.5 kg
NXBJ0100CS103F1110	10 HP	FR5	Vertical	—	16A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0100CS113F1110	10 HP	FR5	Vertical	Auto-Bypass	16A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0100CS133F1110	10 HP	FR5	Vertical	Hand Off Auto	16A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBJ0150CS103F1110	15 HP	FR5	Vertical	—	23A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0150CS113F1110	15 HP	FR5	Vertical	Auto-Bypass	23A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0150CS133F1110	15 HP	FR5	Vertical	Hand Off Auto	23A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBJ0200CS103F1110	20 HP	FR5	Vertical	—	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0200CS113F1110	20 HP	FR5	Vertical	—	31A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBJ0200CS133F1110	20 HP	FR5	Vertical	Hand Off Auto	31A	46H x 10.5D x 11W	1168H x 257D x 279W	62 lb	28.1 kg
NXBJ0250CS103F1110	25 HP	FR6	Vertical	—	38A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0250CS113F1110	25 HP	FR6	Vertical	—	38A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0250CS133F1110	25 HP	FR6	Vertical	Hand Off Auto	38A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0300CS103F1110	30 HP	FR6	Vertical	—	46A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0300CS113F1110	30 HP	FR6	Vertical	—	46A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0300CS133F1110	30 HP	FR6	Vertical	Hand Off Auto	46A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0400CS103F1110	40 HP	FR6	Vertical	—	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0400CS113F1110	40 HP	FR6	Vertical	—	61A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0400CS123F1110	40 HP	FR6	Vertical	—	61A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0400CS133F1110	40 HP	FR6	Vertical	Hand Off Auto	61A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBJ0500CS103F1110	50 HP	FR7	Vertical	—	72A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0500CS113F1110	50 HP	FR7	Vertical	—	72A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBJ0500CS133F1110	50 HP	FR7	Vertical	Hand Off Auto	72A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBJ0600CS103F1110	60 HP	FR7	Vertical	—	87A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0600CS113F1110	60 HP	FR7	Vertical	—	87A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBJ0600CS133F1110	60 HP	FR7	Vertical	Hand Off Auto	87A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBJ0750CS103F1110	75 HP	FR7	Vertical	—	105A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0750CS113F1110	75 HP	FR7	Vertical	—	105A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBJ0750CS123F1110	75 HP	FR7	Vertical	—	105A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBJ0750CS133F1110	75 HP	FR7	Vertical	Hand Off Auto	105A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBJ1000CS103F1110	100 HP	FR8	Side by Side	—	140A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1000CS113F1110	100 HP	FR8	Side by Side	—	140A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ1000CS133F1110	100 HP	FR8	Side by Side	Hand Off Auto	140A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ1250CS103F1110	125 HP	FR8	Side by Side	—	170A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1250CS113F1110	125 HP	FR8	Side by Side	—	170A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ1250CS133F1110	125 HP	FR8	Side by Side	Hand Off Auto	170A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ1500CS103F1110	150 HP	FR8	Side by Side	—	205A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1500CS113F1110	150 HP	FR8	Side by Side	—	205A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ1500CS133F1110	150 HP	FR8	Side by Side	Hand Off Auto	205A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ2000CS103F1110	200 HP	Call Customer Care	Side by Side	—	261A	Call Customer Care			
NXBJ2000CS113F1110	200 HP	FR9	Freestanding Drive	—	261A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ2000CS133F1110	200 HP	FR9	Freestanding Drive	Hand Off Auto	261A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ2500CS103F1110	250 HP	Call Customer Care	Side by Side	—	300A	Call Customer Care			
NXBJ2500CS113F1110	250 HP	FR9	Freestanding Drive	—	300A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBJ2500CS133F1110	250 HP	FR9	Freestanding Drive	Hand Off Auto	300A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 1; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight		
					(inch)	(mm)	(lb)	(kg)	
NXB.J0015DS100F0000	1.5 HP	Call Customer Care	Vertical	3.3A	Call Customer Care				
NXB.J0020DS100F0000	2 HP		Vertical	4.3A	Call Customer Care				
NXB.J0030DS100F0000	3 HP		Vertical	5.6A	Call Customer Care				
NXB.J0040DS100F0000	4 HP	Call Customer Care	Vertical	7.6A	Call Customer Care				
NXB.J0050DS100F0000	5 HP		Vertical	0.37A	Call Customer Care				
NXB.J0075DS100F0000	7.5 HP		Vertical	—	Call Customer Care				
NXB.J0100DS100F0000	10 HP		Vertical	16A	Call Customer Care				
NXB.J0150DS100F0000	15 HP		Vertical	23A	Call Customer Care				
NXB.J0200DS100F0000	20 HP		Vertical	31A	Call Customer Care				
NXB.J0250DS100F0000	25 HP		Vertical	38A	Call Customer Care				
NXB.J0300DS100F0000	30 HP		Vertical	46A	Call Customer Care				
NXB.J0400DS100F0000	40 HP		FR4	Vertical	61A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXB.J0500DS100F0000	50 HP		Call Customer Care	Vertical	72A	Call Customer Care			
NXB.J0600DS100F0000	60 HP	FR7	Vertical	87A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg	
NXB.J0750DS100F0000	75 HP	FR7	Vertical	105A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg	
NXB.J1000DS100F0000	100 HP	Call Customer Care	Side by Side	140A	Call Customer Care				
NXB.J1250DS100F0000	125 HP		Side by Side	170A	Call Customer Care				
NXB.J1500DS100F0000	150 HP		Side by Side	205A	Call Customer Care				

Voltage: 460 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXB.J0015CS20200000	1.5 HP	FR4	Vertical	3.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXB.J0020CS20200000	2 HP	FR4	Vertical	4.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXB.J0030CS20200000	3 HP	FR4	Vertical	5.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXB.J0040CS20200000	4 HP	FR4	Vertical	7.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXB.J0050CS20200000	5 HP	FR4	Vertical	0.37A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXB.J0075CS20200000	7.5 HP	FR4	Vertical	—	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXB.J0100CS20200000	10 HP	FR5	Vertical	16A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXB.J0150CS20200000	15 HP	FR5	Vertical	23A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXB.J0200CS20200000	20 HP	FR5	Vertical	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXB.J0250CS20200000	25 HP	FR6	Vertical	38A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXB.J0300CS20200000	30 HP	FR6	Vertical	46A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXB.J0400CS20200000	40 HP	FR6	Vertical	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXB.J0500CS20200000	50 HP	FR7	Vertical	72A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXB.J0600CS20200000	60 HP	FR7	Vertical	87A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXB.J0750CS20200000	75 HP	FR7	Vertical	105A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXB.J1000CS20200000	100 HP	FR8	Side by Side	140A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXB.J1250CS20200000	125 HP	FR8	Side by Side	170A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXB.J1500CS20200000	150 HP	FR8	Side by Side	205A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBJ0015CS203F1110	1.5 HP	FR4	Vertical	No	—	3.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0015CS213F1110	1.5 HP	FR4	Vertical	Yes	—	3.3A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0015CS233F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	3.3A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0020CS203F1110	2 HP	FR4	Vertical	No	—	4.3A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0020CS213F1110	2 HP	FR4	Vertical	Yes	—	4.3A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0020CS233F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	4.3A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0030CS203F1110	3 HP	FR4	Vertical	No	—	5.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0030CS213F1110	3 HP	FR4	Vertical	Yes	—	5.6A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0030CS233F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	5.6A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0040CS203F1110	4 HP	FR4	Vertical	No	—	7.6A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0040CS213F1110	4 HP	FR4	Vertical	Yes	—	7.6A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0040CS233F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	7.6A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0050CS203F1110	5 HP	FR4	Vertical	No	—	0.37A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0050CS213F1110	5 HP	FR4	Vertical	Yes	—	9A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0050CS233F1110	5 HP	FR4	Vertical	Yes	Hand Off Auto	9A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0075CS203F1110	7.5 HP	FR4	Vertical	No	—	—	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBJ0075CS213F1110	7.5 HP	FR4	Vertical	Yes	—	12A	36H x 10D x 16W	882H x 245D x 392W	53 lb	116.6 kg
NXBJ0075CS233F1110	7.5 HP	FR5	Vertical	Yes	Hand Off Auto	12A	36H x 10D x 16W	882H x 245D x 392W	64 lb	140.8 kg
NXBJ0100CS203F1110	10 HP	FR5	Vertical	No	—	16A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0100CS213F1110	10 HP	FR5	Vertical	Yes	—	16A	36H x 10D x 16W	882H x 245D x 392W	64 lb	140.8 kg
NXBJ0100CS233F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	16A	36H x 10D x 16W	882H x 245D x 392W	64 lb	140.8 kg
NXBJ0150CS203F1110	15 HP	FR5	Vertical	No	—	23A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0150CS213F1110	15 HP	FR5	Vertical	Yes	—	23A	36H x 10D x 16W	882H x 245D x 392W	64 lb	140.8 kg
NXBJ0150CS233F1110	15 HP	FR5	Vertical	Yes	Hand Off Auto	23A	36H x 10D x 16W	882H x 245D x 392W	64 lb	140.8 kg
NXBJ0200CS203F1110	20 HP	FR5	Vertical	No	—	31A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBJ0200CS213F1110	20 HP	FR5	Vertical	Yes	—	31A	44H x 10D x 16W	1078H x 245D x 392W	70 lb	31.7 kg
NXBJ0200CS233F1110	20 HP	FR5	Vertical	Yes	Hand Off Auto	31A	44H x 10D x 16W	1078H x 245D x 392W	70 lb	31.7 kg
NXBJ0250CS203F1110	25 HP	FR6	Vertical	No	—	38A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0250CS213F1110	25 HP	FR6	Vertical	Yes	—	38A	50H x 10D x 16W	1225H x 245D x 392W	120 lb	54.5 kg
NXBJ0250CS233F1110	25 HP	FR6	Vertical	Yes	Hand Off Auto	38A	50H x 10D x 16W	1225H x 245D x 392W	120 lb	54.5 kg
NXBJ0300CS203F1110	30 HP	FR6	Vertical	No	—	46A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0300CS213F1110	30 HP	FR6	Vertical	Yes	—	46A	50H x 10D x 16W	1225H x 245D x 392W	120 lb	54.5 kg
NXBJ0300CS233F1110	30 HP	FR6	Vertical	Yes	Hand Off Auto	46A	50H x 10D x 16W	1225H x 245D x 392W	120 lb	54.5 kg
NXBJ0400CS203F1110	40 HP	FR6	Vertical	No	—	61A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBJ0400CS213F1110	40 HP	FR6	Vertical	Yes	—	61A	54H x 10D x 20W	1323H x 245D x 490W	136 lb	61.7 kg
NXBJ0400CS233F1110	40 HP	FR6	Vertical	Yes	Hand Off Auto	61A	54H x 10D x 20W	1323H x 245D x 490W	136 lb	61.7 kg
NXBJ0500CS203F1110	50 HP	FR7	Vertical	No	—	72A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0500CS213F1110	50 HP	FR7	Vertical	Yes	—	72A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBJ0500CS233F1110	50 HP	FR7	Vertical	Yes	Hand Off Auto	72A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBJ0600CS203F1110	60 HP	FR7	Vertical	No	—	87A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0600CS213F1110	60 HP	FR7	Vertical	Yes	—	87A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBJ0600CS233F1110	60 HP	FR7	Vertical	Yes	Hand Off Auto	87A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBJ0750CS203F1110	75 HP	FR7	Vertical	No	—	105A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBJ0750CS213F1110	75 HP	FR7	Vertical	Yes	—	105A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBJ0750CS233F1110	75 HP	FR7	Vertical	Yes	Hand Off Auto	105A	58 x 10 x 20	1421 x 245 x 490	150 lb	68.2 kg
NXBJ1000CS203F1110	100 HP	FR8	Side by Side	No	—	140A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1000CS213F1110	100 HP	FR8	Side by Side	Yes	—	140A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBJ1000CS233F1110	100 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBJ1250CS203F1110	125 HP	FR8	Side by Side	No	—	170A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1250CS213F1110	125 HP	FR8	Side by Side	Yes	—	170A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBJ1250CS233F1110	125 HP	FR8	Side by Side	Yes	Hand Off Auto	170A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBJ1500CS203F1110	150 HP	FR8	Side by Side	No	—	205A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBJ1500CS213F1110	150 HP	FR8	Side by Side	Yes	—	205A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg
NXBJ1500CS233F1110	150 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	48H x 14D x 36W	1176H x 343D x 882W	350 lb	158.8 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with Fused Disconnect; **Type of Enclosure:** NEMA 12; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXB.J0015DS200F0000	1.5 HP	Call Customer Care	Vertical	3.3A		Call Customer Care		
NXB.J0020DS200F0000	2 HP		Vertical	4.3A		Call Customer Care		
NXB.J0030DS200F0000	3 HP		Vertical	5.6A		Call Customer Care		
NXB.J0040DS200F0000	4 HP		Vertical	7.6A		Call Customer Care		
NXB.J0050DS200F0000	5 HP		Vertical	0.37A		Call Customer Care		
NXB.J0075DS200F0000	7.5 HP		Vertical	—		Call Customer Care		
NXB.J0100DS200F0000	10 HP		Vertical	16A		Call Customer Care		
NXB.J0150DS200F0000	15 HP		Vertical	23A		Call Customer Care		
NXB.J0200DS200F0000	20 HP		Vertical	31A		Call Customer Care		
NXB.J0250DS200F0000	25 HP		Vertical	38A		Call Customer Care		
NXB.J0300DS200F0000	30 HP		Vertical	46A		Call Customer Care		
NXB.J0400DS200F0000	40 HP		Vertical	61A		Call Customer Care		
NXB.J0500DS200F0000	50 HP		Vertical	72A		Call Customer Care		
NXB.J0600DS200F0000	60 HP		Vertical	87A		Call Customer Care		
NXB.J0750DS200F0000	75 HP	FR7	Vertical	105A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXB.J1000DS200F0000	100 HP	Call Customer Care	Side by Side	140A		Call Customer Care		
NXB.J1250DS200F0000	125 HP		Side by Side	170A		Call Customer Care		
NXB.J1500DS200F0000	150 HP		Side by Side	205A		Call Customer Care		

Voltage: 460 Vac; **Configuration:** Drive Alone; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXB.J0015CS30000000	1.5 HP	FR4	Vertical	—	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXB.J0015CS60000000	1.5 HP	FR4	Vertical	3.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXB.J0020CS30000000	2 HP	FR4	Vertical	4.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXB.J0030CS30000000	3 HP	FR4	Vertical	5.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXB.J0040CS30000000	4 HP	FR4	Vertical	7.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXB.J0050CS30000000	5 HP	FR4	Vertical	9A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXB.J0075CS30000000	7.5 HP	FR4	Vertical	12A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXB.J0100CS30000000	10 HP	FR5	Vertical	16A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXB.J0150CS30000000	15 HP	FR5	Vertical	23A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXB.J0200CS30000000	20 HP	FR5	Vertical	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXB.J0250CS30000000	25 HP	FR6	Vertical	38A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXB.J0300CS30000000	30 HP	FR6	Vertical	46A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXB.J0400CS30000000	40 HP	FR6	Vertical	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXB.J0500CS30000000	50 HP	FR7	Vertical	72A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXB.J0600CS30000000	60 HP	FR7	Vertical	87A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXB.J0750CS30000000	75 HP	FR7	Vertical	105A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg

Voltage: 460 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
						(inch)	(mm)	(lb)	(kg)
NXB.J0050CS30200000	5 HP	FR4	Vertical	—	0.37A	20 x 24 x 10	500 x 600 x 250	54 lb	24.5 kg
NXB.J0150CS30200000	15 HP	FR5	Vertical	—	23A	24 x 30 x 10	610 x 762 x 254	78 lb	35.4 kg
NXB.J0200CS60200000	20 HP	FR5	Vertical	with Cooling Fan and Heat Strip	31A	24 x 30 x 10	610 x 762 x 254	78 lb	35.4 kg
NXB.J0300CS30200000	30 HP	FR6	Vertical	—	46A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXB.J0600CS30200000	60 HP	FR7	Vertical	—	87A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXB.J0750CS602F0000	75 HP	FR7	Vertical	—	105A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXB.J1500CS30200000	150 HP	FR8	Side by Side	—	205A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 3R; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBJ0015CS303F1110	1.5 HP	FR4	Vertical	No	—	3.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0015CS313F1110	1.5 HP	FR4	Vertical	Yes	—	3.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0015CS333F1110	1.5 HP	FR4	Vertical	Yes	Hand Off Auto	3.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0020CS303F1110	2 HP	FR4	Vertical	No	—	4.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0020CS313F1110	2 HP	FR4	Vertical	Yes	—	4.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0020CS333F1110	2 HP	FR4	Vertical	Yes	Hand Off Auto	4.3A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0030CS303F1110	3 HP	FR4	Vertical	No	—	5.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0030CS313F1110	3 HP	FR4	Vertical	Yes	—	5.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0030CS333F1110	3 HP	FR4	Vertical	Yes	Hand Off Auto	5.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0040CS303F1110	4 HP	FR4	Vertical	No	—	7.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0040CS313F1110	4 HP	FR4	Vertical	Yes	—	7.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0040CS333F1110	4 HP	FR4	Vertical	Yes	Hand Off Auto	7.6A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0050CS303F1110	5 HP	FR4	Vertical	No	—	9A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0050CS313F1110	5 HP	FR4	Vertical	Yes	—	9A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0050CS333F1110	5 HP	FR4	Vertical	Yes	Hand Off Auto	9A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0075CS303F1110	7.5 HP	FR4	Vertical	No	—	12A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0075CS313F1110	7.5 HP	FR4	Vertical	Yes	—	12A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0075CS333F1110	7.5 HP	FR4	Vertical	Yes	Hand Off Auto	12A	24H x 10D x 20W	588H x 245D x 490W	54 lb	118.8 kg
NXBJ0100CS303F1110	10 HP	FR5	Vertical	No	—	16A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0100CS313F1110	10 HP	FR5	Vertical	Yes	—	16A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0100CS333F1110	10 HP	FR5	Vertical	Yes	Hand Off Auto	16A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0100CS603F1110	10 HP	FR5	Vertical	No	—	16A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0150CS313F1110	15 HP	FR5	Vertical	Yes	—	23A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0150CS333F1110	15 HP	FR5	Vertical	Yes	Hand Off Auto	23A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0150CS603F1110	15 HP	FR5	Vertical	No	—	23A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0200CS303F1110	20 HP	FR5	Vertical	No	—	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0200CS313F1110	20 HP	FR5	Vertical	Yes	—	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0200CS333F1110	20 HP	FR5	Vertical	Yes	Hand Off Auto	31A	30H x 10D x 24W	735H x 245D x 588W	78 lb	35.4 kg
NXBJ0250CS303F1110	25 HP	FR6	Vertical	No	—	38A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0250CS313F1110	25 HP	FR6	Vertical	Yes	—	38A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0250CS333F1110	25 HP	FR6	Vertical	Yes	Hand Off Auto	38A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0300CS303F1110	30 HP	FR6	Vertical	No	—	46A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0300CS313F1110	30 HP	FR6	Vertical	Yes	—	46A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0300CS333F1110	30 HP	FR6	Vertical	Yes	Hand Off Auto	46A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0400CS303F1110	40 HP	FR6	Vertical	No	—	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0400CS313F1110	40 HP	FR6	Vertical	Yes	—	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0400CS333F1110	40 HP	FR6	Vertical	Yes	Hand Off Auto	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0400CS623F1100	40 HP	FR6	Vertical	No	—	61A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBJ0500CS303F1110	50 HP	FR7	Vertical	No	—	72A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0500CS313F1110	50 HP	FR7	Vertical	Yes	—	72A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0500CS333F1110	50 HP	FR7	Vertical	Yes	Hand Off Auto	72A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0600CS303F1110	60 HP	FR7	Vertical	No	—	87A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0600CS313F1110	60 HP	FR7	Vertical	Yes	—	87A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0600CS333F1110	60 HP	FR7	Vertical	Yes	Hand Off Auto	87A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0750CS303F1110	75 HP	FR7	Vertical	No	—	105A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0750CS313F1110	75 HP	FR7	Vertical	Yes	—	105A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ0750CS333F1110	75 HP	FR7	Vertical	Yes	Hand Off Auto	105A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBJ1000CS303F1110	100 HP	FR8	Side by Side	No	—	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1000CS313F1110	100 HP	FR8	Side by Side	Yes	—	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1000CS333F1110	100 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1250CS303F1110	125 HP	FR8	Side by Side	No	—	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1250CS313F1110	125 HP	FR8	Side by Side	Yes	—	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1250CS333F1110	125 HP	FR8	Side by Side	Yes	Hand Off Auto	140A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1500CS303F1110	150 HP	FR8	Side by Side	No	—	205A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1500CS313F1110	150 HP	FR8	Side by Side	Yes	—	205A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBJ1500CS333F1110	150 HP	FR8	Side by Side	Yes	Hand Off Auto	205A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 460 Vac; **Configuration:** Drive Fused Disconnect; **Type of Enclosure:** NEMA 3R; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** Fused Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXB.J0015DS300F0000	1.5 HP	Call Customer Care	Vertical	3.3A	Call Customer Care			
NXB.J0020DS300F0000	2 HP		Vertical	4.3A	Call Customer Care			
NXB.J0030DS300F0000	3 HP		Vertical	5.6A	Call Customer Care			
NXB.J0040DS300F0000	4 HP		Vertical	7.6A	Call Customer Care			
NXB.J0050DS300F0000	5 HP		Vertical	0.37A	Call Customer Care			
NXB.J0075DS300F0000	7.5 HP		Vertical	—	Call Customer Care			
NXB.J0100DS300F0000	10 HP		Vertical	16A	Call Customer Care			
NXB.J0150DS300F0000	15 HP		Vertical	23A	Call Customer Care			
NXB.J0200DS300F0000	20 HP		Vertical	31A	Call Customer Care			
NXB.J0250DS300F0000	25 HP		Vertical	38A	Call Customer Care			
NXB.J0250DS400F0000	25 HP	FR6	Vertical	38A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXB.J0300DS300F0000	30 HP	Call Customer Care	Vertical	46A	Call Customer Care			
NXB.J0400DS300F0000	40 HP		Vertical	61A	Call Customer Care			
NXB.J0500DS300F0000	50 HP		Vertical	72A	Call Customer Care			
NXB.J0600DS300F0000	60 HP		Vertical	87A	Call Customer Care			
NXB.J0750DS300F0000	75 HP	FR7	Vertical	105A	36 x 48 x 12	900 x 1250 x 300	193 lb	87.5 kg
NXB.J1000DS300F0000	100 HP	Call Customer Care	Side by Side	140A	Call Customer Care			
NXB.J1250DS300F0000	125 HP		Side by Side	170A	Call Customer Care			
NXB.J1500DS300F0000	150 HP		Side by Side	205A	Call Customer Care			

Voltage: 600 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBL0030CS10200000	3 HP	FR4	Vertical	4.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0040CS10200000	4 HP	FR4	Vertical	5.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0050CS10200000	5 HP	FR4	Vertical	7.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0075CS10200000	7.5 HP	FR4	Vertical	0.42A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0100CS10200000	10 HP	FR5	Vertical	13.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0150CS10200000	15 HP	FR5	Vertical	18A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0200CS10200000	20 HP	FR5	Vertical	22A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0250CS10200000	25 HP	FR6	Vertical	27A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0300CS10200000	30 HP	FR6	Vertical	34A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0400CS10200000	40 HP	FR6	Vertical	41A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0500CS10200000	50 HP	FR7	Vertical	52A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0600CS10200000	60 HP	FR7	Vertical	62A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0750CS10200000	75 HP	FR7	Vertical	80A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL1000CS10200000	100 HP	FR8	Side by Side	100A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1250CS10200000	125 HP	FR8	Side by Side	125A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1500CS10200000	150 HP	FR8	Side by Side	144A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 600 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 1; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBL0030CS103F1110	3 HP	FR4	Vertical	No	—	4.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0030CS113F1110	3 HP	FR6	Vertical	Yes	—	4.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0030CS133F1110	3 HP	FR6	Vertical	Yes	Hand Off Auto	4.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0040CS103F1110	4 HP	FR4	Vertical	No	—	5.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0040CS113F1110	4 HP	FR6	Vertical	Yes	—	5.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0040CS133F1110	4 HP	FR6	Vertical	Yes	Hand Off Auto	5.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0050CS103F1110	5 HP	FR4	Vertical	No	—	7.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0050CS113F1110	5 HP	FR6	Vertical	Yes	—	7.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0050CS133F1110	5 HP	FR6	Vertical	Yes	Hand Off Auto	7.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0075CS103F1110	7.5 HP	FR4	Vertical	No	—	0.42A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0075CS113F1110	7.5 HP	FR6	Vertical	Yes	—	10A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0075CS133F1110	7.5 HP	FR6	Vertical	Yes	Hand Off Auto	10A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0100CS103F1110	10 HP	FR5	Vertical	No	—	13.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0100CS113F1110	10 HP	FR6	Vertical	Yes	—	13.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0100CS133F1110	10 HP	FR6	Vertical	Yes	Hand Off Auto	13.5A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0150CS103F1110	15 HP	FR5	Vertical	No	—	18A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0150CS113F1110	15 HP	FR6	Vertical	Yes	—	18A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0150CS133F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	18A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0200CS103F1110	20 HP	FR5	Vertical	No	—	22A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0200CS113F1110	20 HP	FR6	Vertical	Yes	—	22A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0200CS133F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	22A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0250CS103F1110	25 HP	FR6	Vertical	No	—	27A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0250CS113F1110	25 HP	FR6	Vertical	Yes	—	27A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0250CS133F1110	25 HP	FR6	Vertical	Yes	Hand Off Auto	27A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0300CS103F1110	30 HP	FR6	Vertical	No	—	34A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0300CS113F1110	30 HP	FR6	Vertical	Yes	—	34A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0300CS133F1110	30 HP	FR6	Vertical	Yes	Hand Off Auto	34A	53H x 12D x 14W	1298H x 294D x 343W	99 lb	44.9 kg
NXBL0400CS103F1110	40 HP	FR6	Vertical	No	—	41A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0400CS113F1110	40 HP	FR7	Vertical	Yes	—	41A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBL0400CS133F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	41A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBL0500CS103F1110	50 HP	FR7	Vertical	No	—	52A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0500CS113F1110	50 HP	FR7	Vertical	Yes	—	52A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBL0500CS133F1110	50 HP	FR7	Vertical	Yes	Hand Off Auto	52A	62 x 13 x 16	1574 x 339 x 406	154 lb	69.8 kg
NXBL0600CS103F1110	60 HP	FR7	Vertical	No	—	62A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0600CS113F1110	60 HP	FR8	Side by Side	Yes	—	62A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBL0600CS133F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	62A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBL0750CS103F1110	75 HP	FR7	Vertical	No	—	80A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0750CS113F1110	75 HP	FR8	Side by Side	Yes	—	80A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBL0750CS133F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	80A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBL1000CS103F1110	100 HP	FR8	Side by Side	No	—	100A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1000CS113F1110	100 HP	FR8	Side by Side	Yes	—	100A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBL1000CS133F1110	100 HP	FR8	Side by Side	Yes	Hand Off Auto	100A	54H x 16D x 36W	1350H x 400D x 900W	360 lb	163.3 kg
NXBL1250CS103F1110	125 HP	FR8	Side by Side	No	—	125A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1500CS103F1110	150 HP	FR8	Side by Side	No	—	144A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg

NX Series Drives with Bypass and/or Disconnect

Voltage: 600 Vac; **Configuration:** Drive with 2 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Auto Bypass:** No;
Control Transformer: No; **Disconnect Type:** No Disconnect; **Pilot Lights:** No

Product Number	Horsepower	Frame Type	Layout	Current Ratings	Dimensions, Approximate		Weight	
					(inch)	(mm)	(lb)	(kg)
NXBL0030CS20200000	3 HP	FR4	Vertical	4.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0040CS20200000	4 HP	FR4	Vertical	5.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0050CS20200000	5 HP	FR4	Vertical	7.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0075CS20200000	7.5 HP	FR4	Vertical	0.42A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0100CS20200000	10 HP	FR5	Vertical	13.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0150CS20200000	15 HP	FR5	Vertical	18A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0200CS20200000	20 HP	FR5	Vertical	22A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0250CS20200000	25 HP	FR6	Vertical	27A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0300CS20200000	30 HP	FR6	Vertical	34A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0400CS20200000	40 HP	FR6	Vertical	41A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0500CS20200000	50 HP	FR7	Vertical	52A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0600CS20200000	60 HP	FR7	Vertical	62A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0750CS20200000	75 HP	FR7	Vertical	80A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL1000CS20200000	100 HP	FR8	Side by Side	100A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1250CS20200000	125 HP	FR8	Side by Side	125A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1500CS20200000	150 HP	FR8	Side by Side	144A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg

Voltage: 600 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 12; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBL0030CS203F1110	3 HP	FR4	Vertical	No	—	4.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0030CS213F1110	3 HP	FR6	Vertical	Yes	—	4.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0030CS233F1110	3 HP	FR6	Vertical	Yes	Hand Off Auto	4.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0040CS203F1110	4 HP	FR4	Vertical	No	—	5.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0040CS213F1110	4 HP	FR6	Vertical	Yes	—	5.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0040CS233F1110	4 HP	FR6	Vertical	Yes	Hand Off Auto	5.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0050CS203F1110	5 HP	FR4	Vertical	No	—	7.5A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0050CS213F1110	5 HP	FR6	Vertical	Yes	—	7.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0050CS233F1110	5 HP	FR6	Vertical	Yes	Hand Off Auto	7.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0075CS203F1110	7.5 HP	FR4	Vertical	No	—	0.42A	9.5 x 40 x 9.5	241 x 1016 x 241	43 lb	19.5 kg
NXBL0075CS213F1110	7.5 HP	FR6	Vertical	Yes	—	10A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0075CS233F1110	7.5 HP	FR6	Vertical	Yes	Hand Off Auto	10A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0100CS203F1110	10 HP	FR5	Vertical	No	—	13.5A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0100CS213F1110	10 HP	FR6	Vertical	Yes	—	13.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0100CS233F1110	10 HP	FR6	Vertical	Yes	Hand Off Auto	13.5A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0150CS203F1110	15 HP	FR5	Vertical	No	—	18A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0150CS213F1110	15 HP	FR6	Vertical	Yes	—	18A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0150CS233F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	18A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0200CS203F1110	20 HP	FR5	Vertical	No	—	22A	11 x 46 x 10.5	275 x 1150 x 262	62 lb	28.1 kg
NXBL0200CS213F1110	20 HP	FR6	Vertical	Yes	—	22A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0200CS233F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	22A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0250CS203F1110	25 HP	FR6	Vertical	No	—	27A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0250CS213F1110	25 HP	FR6	Vertical	Yes	—	27A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0250CS233F1110	25 HP	FR6	Vertical	Yes	Hand Off Auto	27A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0300CS203F1110	30 HP	FR6	Vertical	No	—	34A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0300CS213F1110	30 HP	FR6	Vertical	Yes	—	34A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0300CS233F1110	30 HP	FR6	Vertical	Yes	Hand Off Auto	34A	48H x 14D x 36W	1176H x 343D x 882W	99 lb	44.9 kg
NXBL0400CS203F1110	40 HP	FR6	Vertical	No	—	41A	14 x 53 x 12	350 x 1325 x 300	99 lb	44.9 kg
NXBL0400CS213F1110	40 HP	FR7	Vertical	Yes	—	41A	48H x 14D x 36W	1176H x 343D x 882W	154 lb	69.8 kg
NXBL0400CS233F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	41A	48H x 14D x 36W	1176H x 343D x 882W	154 lb	69.8 kg
NXBL0500CS203F1110	50 HP	FR7	Vertical	No	—	52A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0500CS213F1110	50 HP	FR7	Vertical	Yes	—	52A	48H x 14D x 36W	1176H x 343D x 882W	154 lb	69.8 kg
NXBL0500CS233F1110	50 HP	FR7	Vertical	Yes	Hand Off Auto	52A	48H x 14D x 36W	1176H x 343D x 882W	154 lb	69.8 kg
NXBL0600CS203F1110	60 HP	FR7	Vertical	No	—	62A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0600CS213F1110	60 HP	FR8	Side by Side	Yes	—	62A	48H x 14D x 36W	1176H x 343D x 882W	360 lb	163.3 kg
NXBL0600CS233F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	62A	48H x 14D x 36W	1176H x 343D x 882W	360 lb	163.3 kg
NXBL0750CS203F1110	75 HP	FR7	Vertical	No	—	80A	16 x 62 x 13	400 x 1550 x 325	154 lb	69.8 kg
NXBL0750CS213F1110	75 HP	FR8	Side by Side	Yes	—	80A	48H x 14D x 36W	1176H x 343D x 882W	360 lb	163.3 kg
NXBL0750CS233F1110	75 HP	FR8	Side by Side	Yes	Hand Off Auto	80A	48H x 14D x 36W	1176H x 343D x 882W	360 lb	163.3 kg
NXBL1000CS203F1110	100 HP	FR8	Side by Side	No	—	100A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1000CS213F1110	100 HP	FR8	Side by Side	Yes	—	100A	48H x 14D x 36W	1176H x 343D x 882W	360 lb	163.3 kg
NXBL1000CS233F1110	100 HP	FR8	Side by Side	Yes	Hand Off Auto	100A	48H x 14D x 36W	1176H x 343D x 882W	360 lb	163.3 kg
NXBL1250CS203F1110	125 HP	FR8	Side by Side	No	—	125A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg
NXBL1500CS203F1110	150 HP	FR8	Side by Side	No	—	144A	36 x 54 x 16	900 x 1350 x 400	360 lb	163.3 kg

Product Selection - VFDs

NX Series Drives with Bypass and/or Disconnect

Voltage: 600 Vac; **Configuration:** Drive with 3 Contactor Bypass; **Type of Enclosure:** NEMA 3R; **Control Transformer:** Yes;
Disconnect Type: Fused Disconnect; **Pilot Lights:** Yes

Product Number	Horsepower	Frame Type	Layout	Auto Bypass	Additional Features	Current Ratings	Dimensions, Approximate		Weight	
							(inch)	(mm)	(lb)	(kg)
NXBL0030CS303F1110	3 HP	FR6	Vertical	No	—	4.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0030CS313F1110	3 HP	FR6	Vertical	Yes	—	4.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0030CS333F1110	3 HP	FR6	Vertical	Yes	Hand Off Auto	4.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0040CS303F1110	4 HP	FR6	Vertical	No	—	5.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0040CS313F1110	4 HP	FR6	Vertical	Yes	—	5.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0040CS333F1110	4 HP	FR6	Vertical	Yes	Hand Off Auto	5.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0050CS303F1110	5 HP	FR6	Vertical	No	—	7.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0050CS313F1110	5 HP	FR6	Vertical	Yes	—	7.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0050CS333F1110	5 HP	FR6	Vertical	Yes	Hand Off Auto	7.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0075CS303F1110	7.5 HP	FR6	Vertical	No	—	10A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0075CS313F1110	7.5 HP	FR6	Vertical	Yes	—	10A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0075CS333F1110	7.5 HP	FR6	Vertical	Yes	Hand Off Auto	10A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0100CS303F1110	10 HP	FR6	Vertical	No	—	13.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0100CS313F1110	10 HP	FR6	Vertical	Yes	—	13.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0100CS333F1110	10 HP	FR6	Vertical	Yes	Hand Off Auto	13.5A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0150CS303F1110	15 HP	FR6	Vertical	No	—	18A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0150CS313F1110	15 HP	FR6	Vertical	Yes	—	18A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0150CS333F1110	15 HP	FR6	Vertical	Yes	Hand Off Auto	18A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0200CS303F1110	20 HP	FR6	Vertical	No	—	22A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0200CS313F1110	20 HP	FR6	Vertical	Yes	—	22A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0200CS333F1110	20 HP	FR6	Vertical	Yes	Hand Off Auto	22A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0250CS303F1110	25 HP	FR6	Vertical	No	—	27A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0250CS313F1110	25 HP	FR6	Vertical	Yes	—	27A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0250CS333F1110	25 HP	FR6	Vertical	Yes	Hand Off Auto	27A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0300CS303F1110	30 HP	FR6	Vertical	No	—	34A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0300CS313F1110	30 HP	FR6	Vertical	Yes	—	34A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0300CS333F1110	30 HP	FR6	Vertical	Yes	Hand Off Auto	34A	36H x 12D x 30W	882H x 294D x 735W	124 lb	56.2 kg
NXBL0400CS303F1110	40 HP	FR7	Vertical	No	—	41A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBL0400CS313F1110	40 HP	FR7	Vertical	Yes	—	41A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBL0400CS333F1110	40 HP	FR7	Vertical	Yes	Hand Off Auto	41A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBL0500CS303F1110	50 HP	FR7	Vertical	No	—	52A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBL0500CS313F1110	50 HP	FR7	Vertical	Yes	—	52A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBL0500CS333F1110	50 HP	FR7	Vertical	Yes	Hand Off Auto	52A	48H x 12D x 36W	1176H x 294D x 882W	193 lb	87.5 kg
NXBL0600CS303F1110	60 HP	FR8	Side by Side	No	—	62A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBL0600CS313F1110	60 HP	FR8	Side by Side	Yes	—	62A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg
NXBL0600CS333F1110	60 HP	FR8	Side by Side	Yes	Hand Off Auto	62A	60 x 14 x 36	1470 x 343 x 882	440 lb	199.6 kg

NX Series Drives with Bypass and/or Disconnect

Features

NX Series with Disconnect:

Fused Disconnect with no bypass

NX Series with 2-Contactor Bypass:

Provides an economical means of bypassing the VFD.

- No Main Disconnect
- Freeze/Fire/Smoke Interlock

NX Series with 3-Contactor Bypass:

Commission and test the VFD without affecting the operation of the motor.

Provide additional bypass control capabilities with Auto bypass.

- Fused Disconnect
- Freeze/Fire/Smoke Interlock
- TEST position powers the VFD without sending power to the motor

NX Series with 3-Contactor Auto-bypass:

NX Series with 3-Contactor Bypass plus VFD will automatically send the bypass into BYPASS mode:

- A contact closure sends the bypass into BYPASS mode
- Dry contacts indicate when the bypass is in BYPASS mode and can be used to alert the building management system.

NX Series Drives are available in four configurations with bypass and/or disconnect as explained below. All configurations are available in NEMA 1, NEMA 12, and ventilated NEMA 3R.

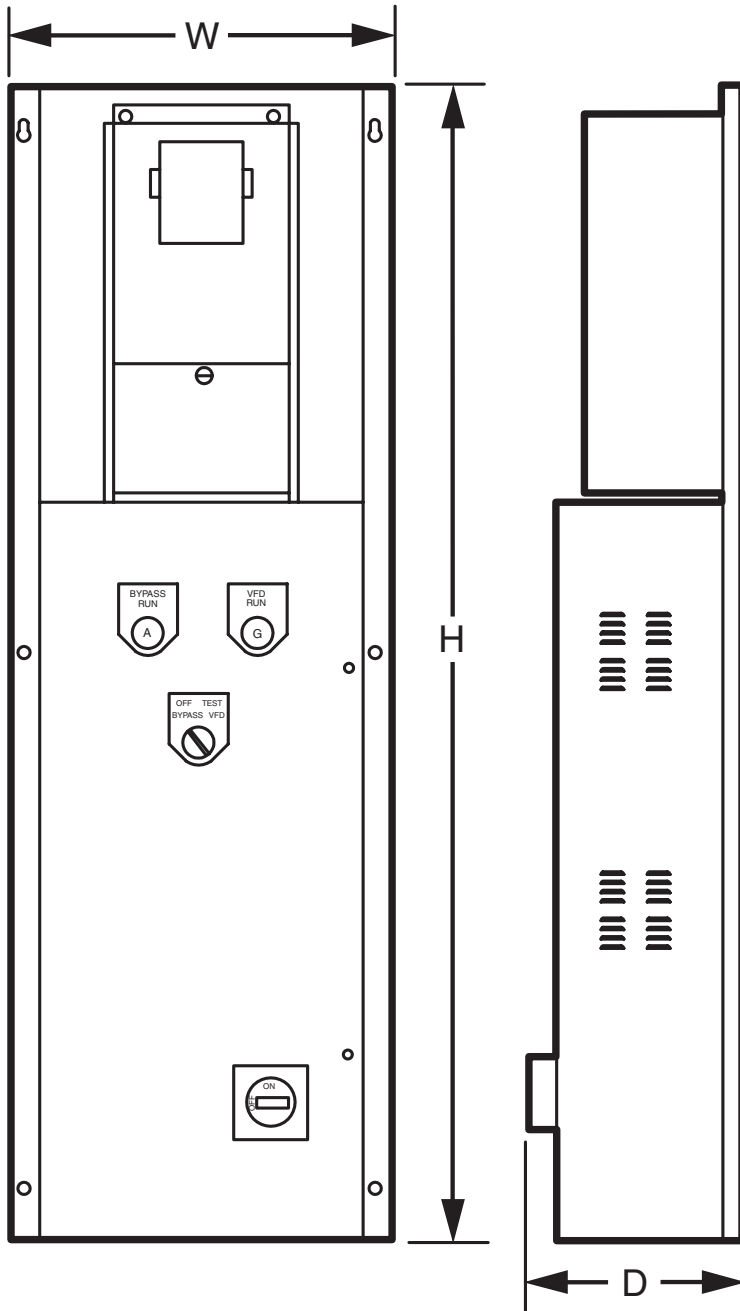


Refer to NX Series Standalone Drive Submittal Data herein for data regarding the included NX Series drive.

Dimensional Diagrams - VFDs

NX Series Drives with Bypass and/or Disconnect

NXS with Bypass and/or disconnect, NEMA 1 Enclosure^a



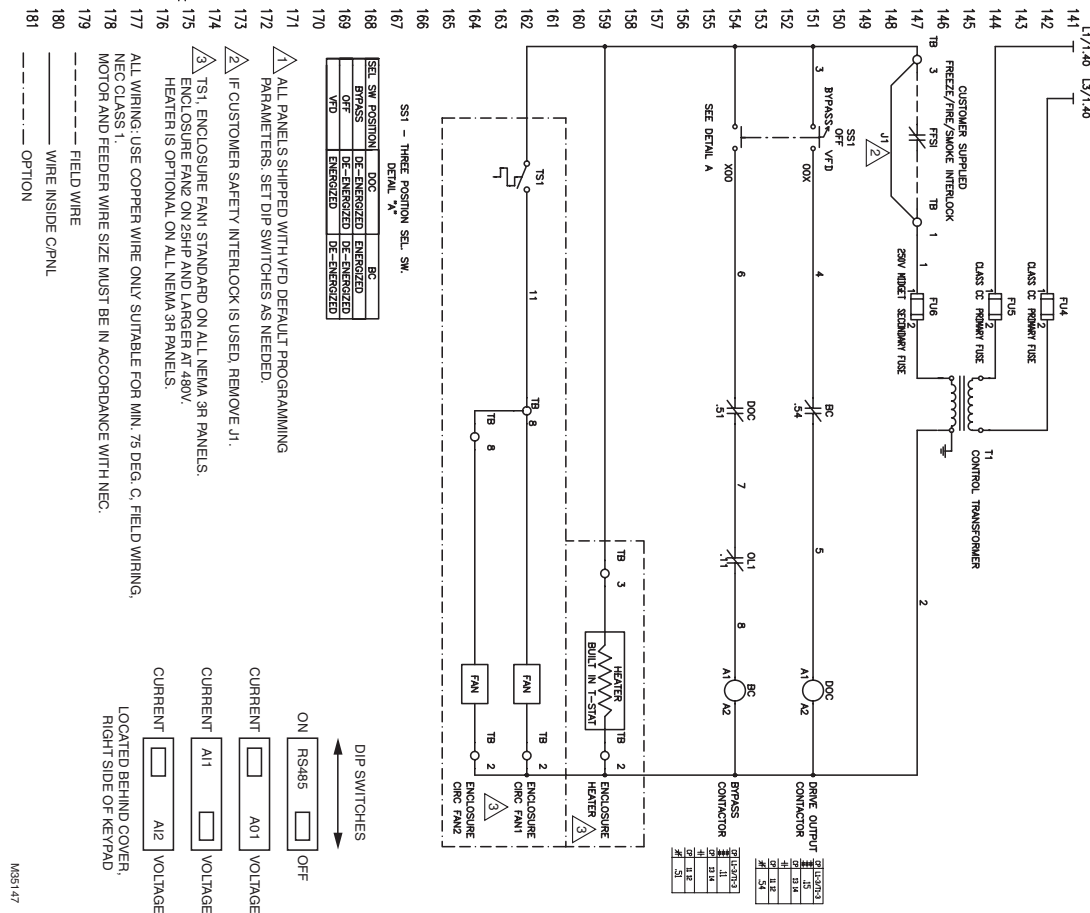
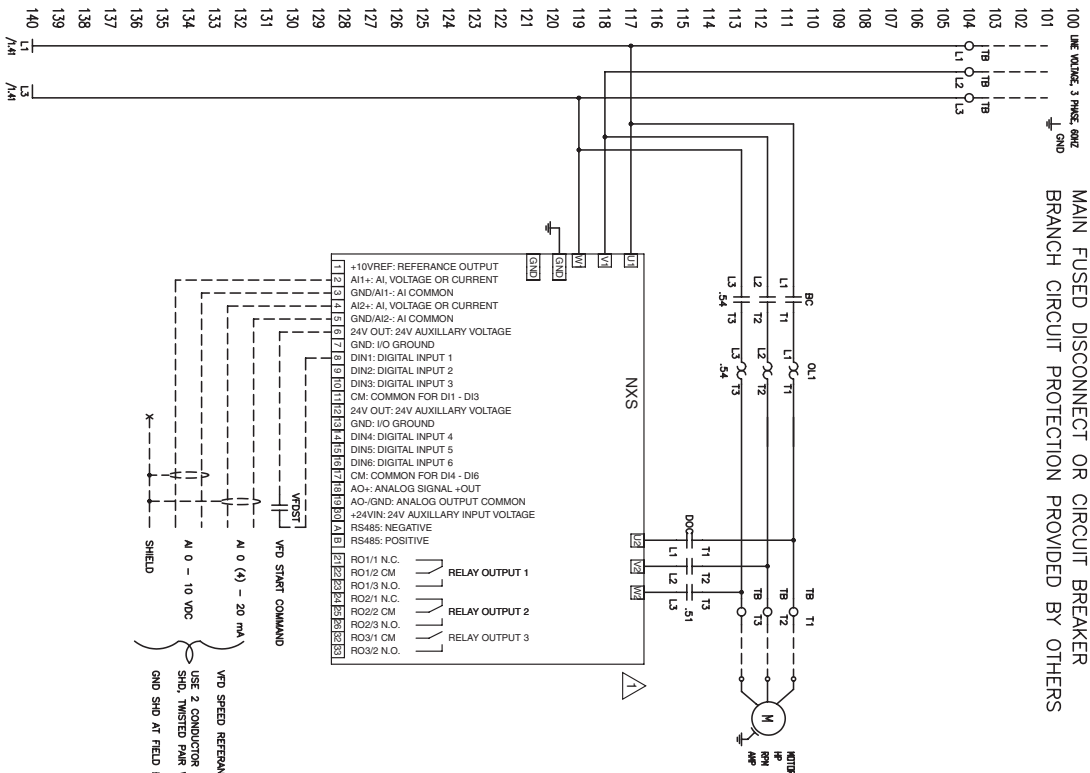
Frame Size	H (in.)	H1 (in.)	D (in.)	W (in.)	W1 (in.)	Weight (Lb.)
FR4	40	N/A	9.5	9.5	7.5	43
FR5	46	N/A	10.5	11	9	62
FR6	53	N/A	12	14	12	99
FR7	62	N/A	13	16	14	154
FR8	54	52	16	36	N/A	360

^a Note: All bypass and disconnect models are also available in NEMA 12 and NEMA 3R configurations. Model numbers can be derived from Product Nomenclature table below.

Wiring Diagrams - VFDs

NX Series Drives with Bypass and/or Disconnect

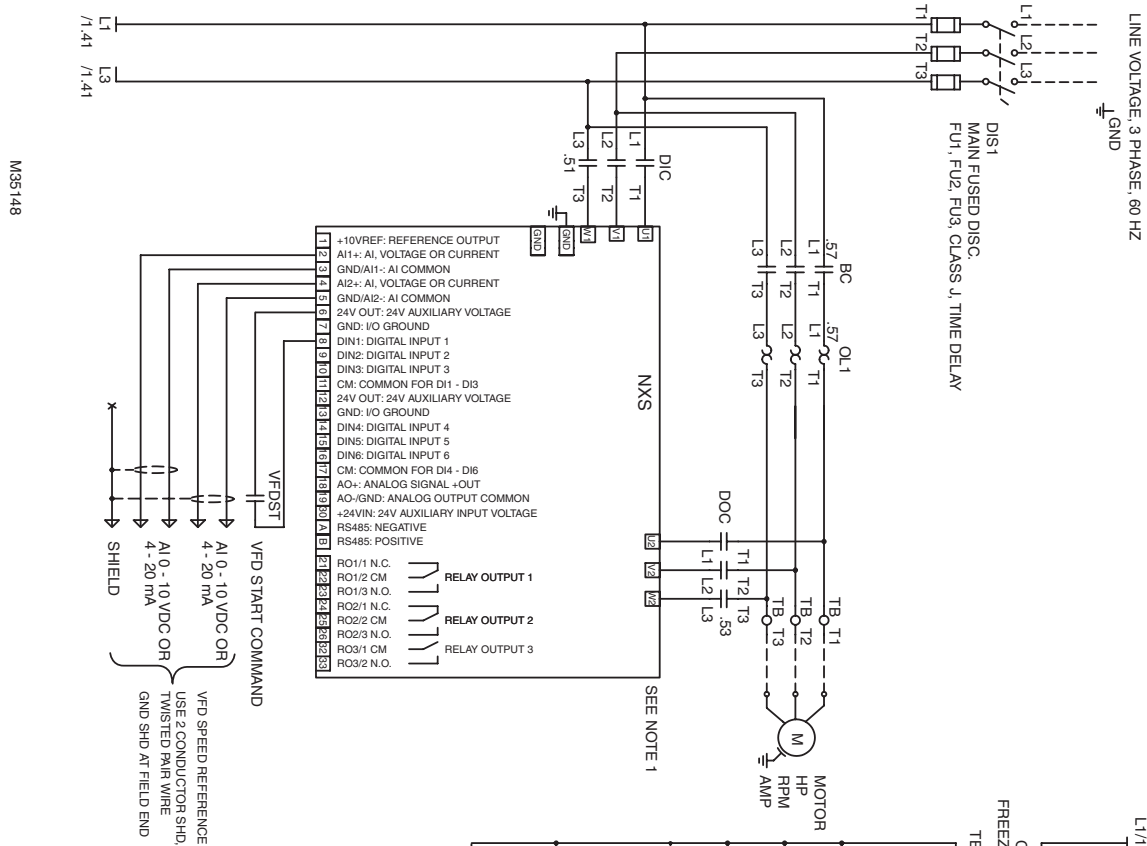
NX Series with 2-Contactor Bypass (No Disconnect)



Wiring Diagrams - VFDs

NX Series Drives with Bypass and/or Disconnect

NX Series with 3-Contactor Bypass and Fused Disconnect



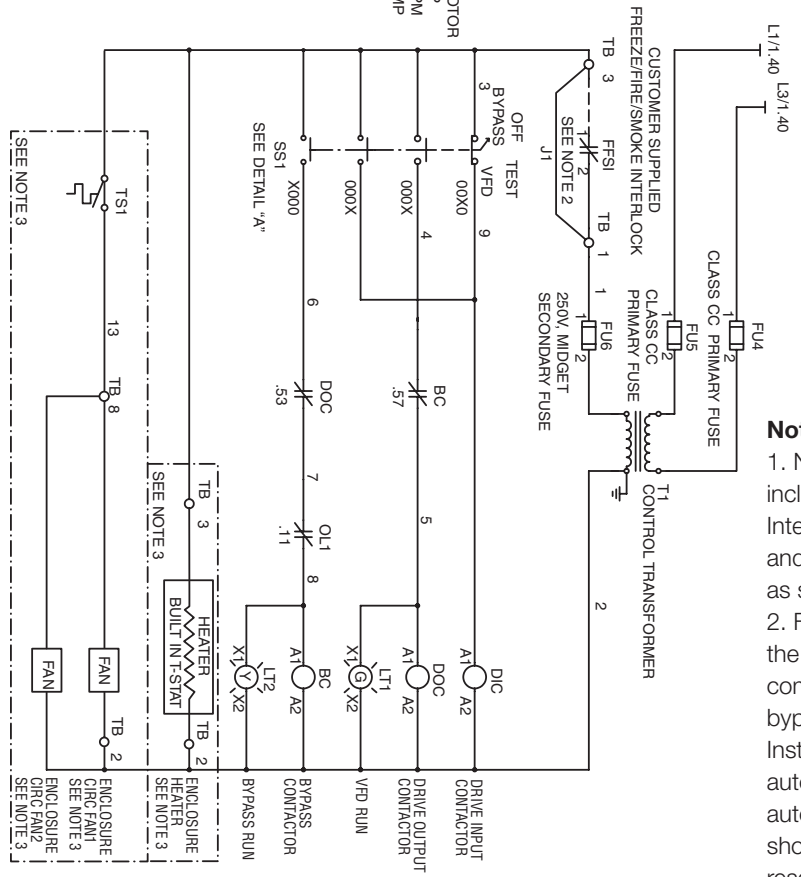
M35148

Terminal Block Legend:

- 1: +10VREF: REFERENCE OUTPUT
- 2: AI1+: AI VOLTAGE OR CURRENT
- 3: GND/AI1-: AI COMMON
- 4: AI2+: AI VOLTAGE OR CURRENT
- 5: GND/AI2-: AI COMMON
- 6: 24V OUT: 24V AUXILIARY VOLTAGE
- 7: GND: I/O GROUND
- 8: DIN1: DIGITAL INPUT 1
- 9: DIN2: DIGITAL INPUT 2
- 10: DIN3: DIGITAL INPUT 3
- 11: CM: COMMON FOR DI1 - DI6
- 12: 24V OUT: 24V AUXILIARY VOLTAGE
- 13: GND: I/O GROUND
- 14: DIN4: DIGITAL INPUT 4
- 15: DIN5: DIGITAL INPUT 5
- 16: DIN6: DIGITAL INPUT 6
- 17: CM: COMMON FOR DI4 - DI6
- 18: AO+: ANALOG SIGNAL +OUT
- 19: AO-/GND: ANALOG OUTPUT COMMON
- 20: +24VIN: 24V AUXILIARY INPUT VOLTAGE
- 21: RS485: NEGATIVE
- 22: RS485: POSITIVE
- 23: RO1/1: N.C.
- 24: RO1/2: CM
- 25: RO1/3: N.C.
- 26: RO2/1: N.C.
- 27: RO2/2: CM
- 28: RO2/3: N.C.
- 29: RO3/1: CM
- 30: RO3/2: N.C.
- 31: RO3/3: N.C.

Other Components:

- VFD START COMMAND (Terminal 10)
- VFD SPEED REFERENCE (Terminal 11)
- USE 2 CONDUCTOR SHD. TWISTED PAIR WIRE (Terminal 12)
- AI 0 - 10 VDC OR 4 - 20 MA (Terminal 13)
- SHIELD (Terminal 14)
- SEE NOTE 1



- Notes:**
1. NEMA 3R enclosures include a circulation fan(s). Integral enclosure heaters and/or cooling are available as special options.
 2. For auto-bypass units the drive parameters come configured for auto-bypass. Refer to Installation Instructions to disable the auto-bypass or to reset the auto-bypass parameters should factory defaults be reset on the drive.

SEL SW POSITION DETAIL "A"

SEL SW POSITION	DIC	DOC	BC
BYPASS	DE-ENERGIZED	DE-ENERGIZED	DE-ENERGIZED
OFF	DE-ENERGIZED	DE-ENERGIZED	DE-ENERGIZED
TEST	ENERGIZED	DE-ENERGIZED	DE-ENERGIZED
VFD	ENERGIZED	ENERGIZED	DE-ENERGIZED

DIP SWITCHES DETAIL "B"

- ON: RS485 VOLTAGE
- OFF: RS485 VOLTAGE
- CURRENT A1: VOLTAGE
- CURRENT A2: VOLTAGE

LOCATED BEHIND COVER, RIGHT SIDE OF KEYPAD.

Legend:

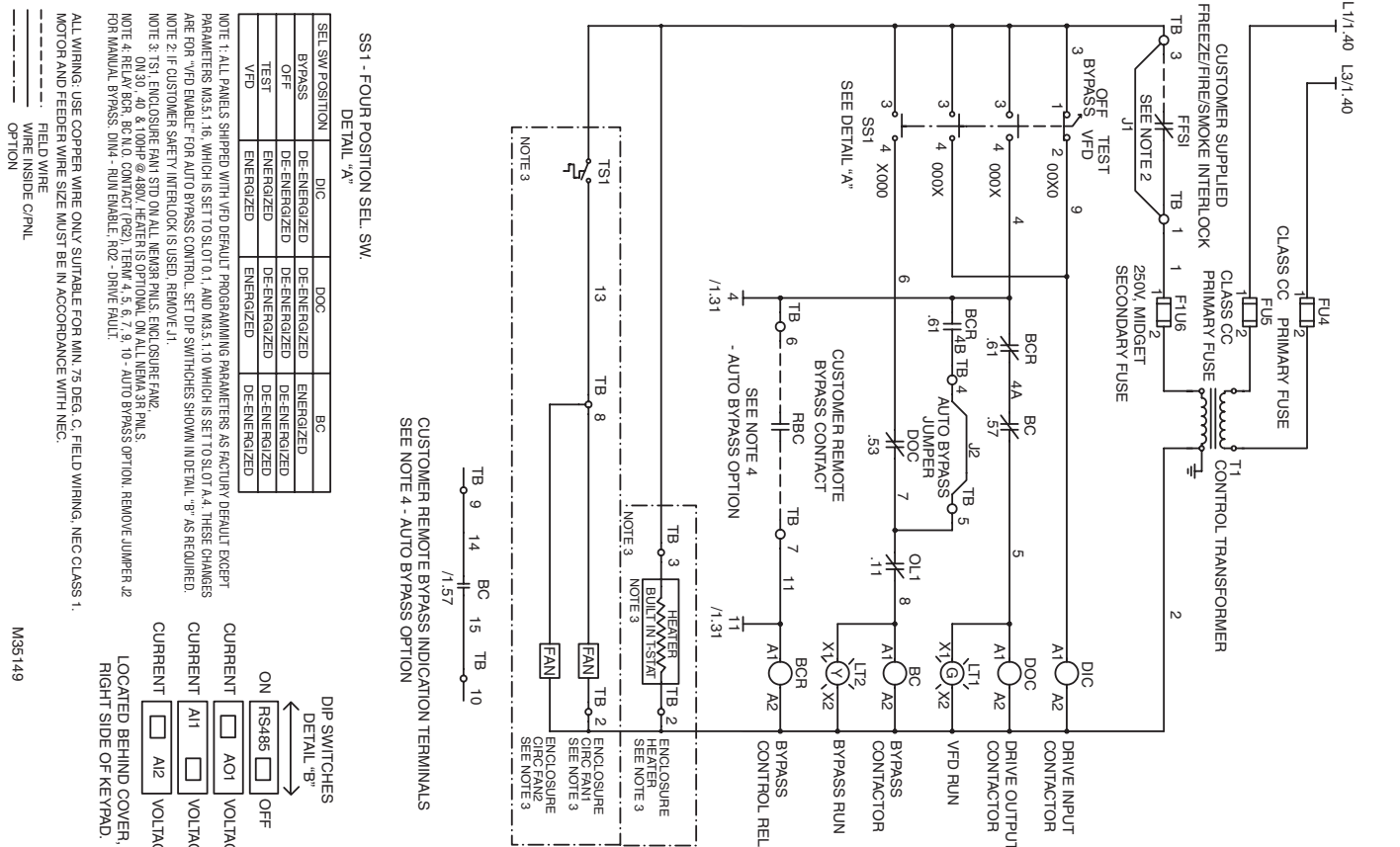
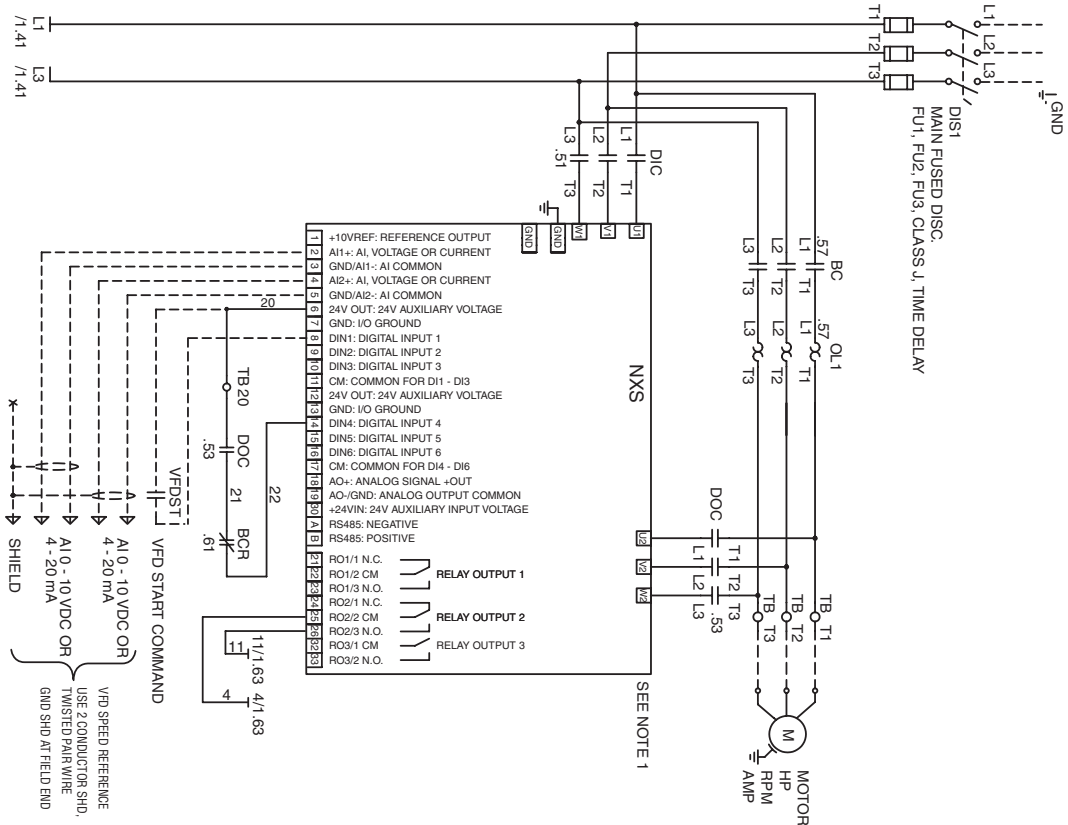
- Solid line: FIELD WIRE
- Dashed line: WIRE INSIDE CP/NL
- : OPTION

Notes:

- NOTE 1: ALL PANELS SHIPPED WITH VFD DEFAULT PROGRAMMING PARAMETERS.
- NOTE 2: SET DIP SWITCHES AS NEEDED. SEE DETAIL "B".
- NOTE 3: TS1 ENCLOSURE FAN. STD ON ALL. NEMER PLUS ENCLOSURE FAN2 ON /25HP & LARGER @ 480V. HEATER IS OPTIONAL. ON ALL NEMA-3R PLUS.

NX Series Drives with Bypass and/or Disconnect

NX Series with 3-Contactor Auto-Bypass and Fused Disconnect



Sensor Selection

Honeywell's complete line of sensors covers all necessary control applications and mounting options, making Honeywell your best sensor source. From temperature and current sensors to CO₂ and enthalpy sensors and more, Honeywell sensors are the smart, cost-effective choice.

Section 6: Sensors

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Product Selection - Sensors

TR70 and TR40 Series, Wireless Sensors and Receivers

Spyder Sylk Sensors



	Display	Temperature	Humidity	CO2	Customizable Parameters	Schedule Access
TR70-US	•	•			•	
TR70-H-US	•	•	•		•	
TR71	•	•			•	
TR71-H	•	•	•		•	
TR75	•	•			•	•
TR75-H	•	•	•		•	•
TR-42	•	•				
TR42-H	•	•	•			
TR42-CO2	•	•		•		
TR42-H-CO2	•	•	•	•		
TR-40		•				
TR40-H		•	•			
TR40-CO2		•		•		
TR40-H-CO2		•	•	•		

Wireless Sensors and Receivers



Model Number	Temp	Humidity	Selectable Setpoint	Occupied Override	Comments	Compatible Controllers	Compatible Thermostats
TR21-WK	•				Includes one prebound sensor and receiver	Honeywell controllers including Spyder, Excel 10, W7750, W7751, W7752, W7753 and non-Honeywell controllers with remote setpoint	T7350, T7351 and TB8575 Honeywell Thermostats and Non Honeywell thermostats with remote setpoint
TR21-WKU	•				Includes one prebound sensor and receiver, No Honeywell logo		
TR23-WK	•		•	•	Includes one prebound sensor and receiver		
TR23-WKU	•		•	•	Includes one prebound sensor and receiver, No Honeywell logo		
TR21-WS	•				Sensor only. For replacement. Requires a wireless receiver		
TR23-WS	•		•	•	Sensor only. For replacement. Requires a wireless receiver		
WRECVR					Wireless receiver only. For replacement. Requires a wireless sensor.		

Product Selection - Sensors

TR20, C7772A and T7560 Series Sensors

For use in XL10, Excel 10, 15, 50, 100, 500, Spyder, and T7350 applications



Application	Honeywell Wall Module Model	Replaces Honeywell Model	Sensor Element Type	Sensor Type	Sensor Type	Selectable Setpoint	Occupied Override	LON Jack	Fan	Comments
				Temp	Humidity					
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR21	T7770A1006	20K ohms non-linear	•						
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR21-A	T7770A3002	10K ohms non-linear for averaging only	•						
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR21-H	N/A	20K ohms non-linear	•	•			•		
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR21-J	T7770A2004	20K ohms non-linear	•				•		
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR22	T7770B1004 T7770B1020 T7770B1046	20K ohms non-linear	•		•		•		
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR23	TR7770C1002 TR7770C1028 TR7770C1044	20K ohms non-linear	•		•	•	•		
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR23-H	N/A	20K ohms non-linear	•	•	•	•	•		
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR23-KL	N/A	20K ohms non-linear	•		•	•	•		Knobs not included
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR23-H-KL	N/A	20K ohms non-linear	•	•	•	•	•		Knobs not included
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR23-N	T7770C1051	20K ohms non-linear	•		•	•	•		No Honeywell logo
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR24	T7770D1000	20K ohms non-linear	•			•	•		
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR22-F5	N/A	20K ohms non-linear	•		•		•	5 position	Not for use with T7350
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR23-F3	T7770E1023	20K ohms non-linear	•		•	•	•	3 position	Not for use with T7350
Excel 10, 15, 50, 100, 500, Spyder, T7350	TR23-F5	T7770F1005	20K ohms non-linear	•		•	•	•	5 position	Not for use with T7350
Excel 10, 15, 50, 100, 500, Spyder, T7350	C7772A1004	N/A	20K ohms non-linear	•						No Honeywell logo
Excel 10, 15, 50, 100, 500, Spyder, T7350	C7772A1012	N/A	20K ohms non-linear	•						With Honeywell logo
Excel 10, 20, 50, 80, 10, 500, 600	T7560A1018	N/A	20K ohms non-linear	•		•	•	Optional	Yes	LCD Display/white and blue
Excel 10, 20, 50, 80, 10, 500, 600	T7560A1042	N/A	20K ohms non-linear	•		•	•	Optional	Yes	LCD Display/all white
Excel 10, 20, 50, 80, 10, 500, 600	T7560B1016	N/A	20K ohms non-linear	•	•	•	•	Optional	Yes	LCD Display/white and blue
Excel 10, 20, 50, 80, 10, 500, 600	T7560B1032	N/A	20K ohms non-linear	•	•	•	•	Optional	Yes	LCD Display/all white
TR20 Series Sensors	KNOB-C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Replacement Knob (C [°])
TR20 Series Sensors	KNOB-F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Replacement Knob (F [°])
TR20 Series Sensors	KNOB-O	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Replacement Knob +/-

Note: For use in XL10, Excel 10, 15, 50, 100, 500, Spyder and T7350 applications.

Product Selection - Sensors

T7047, T7147 Temperature Sensors and Economizer Sensors

Sensors for use in T7300 applications

Part Number	Sensing Element/Sensor Type	Color/Mounting	Features
T7047C2007	1420 ohms	Taupe, new styling	
T7047C2015	1420 ohms	Premier white, new styling	
T7047G2008	710 ohms	Taupe, new styling	Averaging only
T7047G2016	710 ohms	Premier white, new styling	Averaging only
T7147A2000	1420 ohms	Taupe, new styling	Override
T7147A2018	1420 ohms	Taupe, new styling	Override, warmer, cooler
T7147G2023	710 ohms	Taupe, new styling	Override, warmer, cooler, averaging only
T7022A1010	1420 ohms	Duct mount	
C7031G2014	PT3000	Outdoor mount	For use with T7350
C7031G2006	1715 ohms	Outdoor mount	For use with W7100

T775 Sensors



Part Number	Sensing Element	Description	Temperature Range
50021579-001	1097 ohms at 77° F	Standard temperature probe	-40° to 350° F (-40° to 177° C)
T775-SENS-WR	1097 ohms at 77° F	Water-resistant probe with 5-ft. leads	-40° to 270° F (-40° to 132° C)
T775-SENS-WT	1097 ohms at 77° F	Water-tight probe with 6-ft. leads	-40° to 270° F (-40° to 132° C)
T775-SENS-OAT	1097 ohms at 77° F	Outdoor air temperature sensor	-40° to 158° F (-40° to 70° C)
T775-SENS-STRAP	1097 ohms at 77° F	Strap-on	-40° to 250° F (-40° to 121° C)
C7031D2003	1097 ohms at 77° F	5-in. immersion sensor with wiring box (well included, 50001774-001)	-40° to 350° F (4° to 177° C)
C7031B2005	1097 ohms at 77° F	6-in duct with wiring box	-40° to 250° F (-40° to 121° C)
C7031J2009	1097 ohms at 77° F	12-in. duct averaging sensor with four elements with wiring box	40° to 180° F (4° to 82° C)
C7046D1008	1097 ohms at 77° F	8-in. duct probe with mounting flange	40° to 150° F (4° to 66° C)
C7100D1001	1097 ohms at 77° F	12-in. flat response, duct averaging sensor with flange	40° to 220° F (4° to 104° C)
C7130B1009	1097 ohms at 77° F	Room mount sensor	-40° to 100° F (-40° to 38° C)
C7170B1000	1097 ohms at 77° F	3/8-in. diameter temperature probe	-40° to 250° F (-40° to 121° C)

Analog and Communicating Economizer Sensors

	Part Number	Sensing Element	Temperature Range	Insertion Length	Type	Mounting & Application
Analog Economizer and Spyder	C7150B1004	3K ohms NTC at 77° F	-40° to 110° F (-40° to 43° C)	N/A	Duct - Temp Sensor	Mixed or discharge air sensor
	C7660A1000	4 - 20 mA	-40° to 149° F (-40° to 65° C)	N/A	Duct - Temp Sensor	Dry-bulb temperature sensor
	C7046A1004	3K ohms NTC at 77° F	40° to 150° F (4° to 66° C)	8 in.	Duct - Temp Sensor	Mixed or discharge air sensor
	C7046A1038	3K ohms NTC at 77° F	40° to 150° F (4° to 66° C)	12 in.	Duct - Temp Sensor	Mixed or discharge air sensor
	C7400A2001	4 - 20 mA	-40° to 150° F (-40° to 66° C)	NA	Duct - Enthalpy Sensor	Outdoor or return air sensor, may be used with duct mounting kit 50053060-001
JADE Economizer	C7400S1000	S-bus Temperature & Humidity	-40° to 150° F (-40° to 66° C)	N/A	Duct - Temp Sensor	Outdoor, return, discharge air sensor, may be used with duct mounting kit 50053060-001
Spyder	C7400S1010	S-bus Temperature & Humidity	-40° to 150° F (-40° to 66° C)	N/A	Duct - Temp Sensor	Outdoor, return, discharge air sensor, may be used with duct mounting kit 50053060-001
JADE Economizer and Spyder	C7250A1001	20K NTC	-40° to 150° F (-40° to 66° C)	N/A	Duct - Temp Sensor	Outdoor, mixed dry bulb sensor, may be used with duct mounting kit 50053060-001

General Temperature Sensors



General Temperature Sensors



	Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
Wall Mount	C7130A1001	PT3000	3,484 ohms PTC at 77°F	-40° to 250° F	Wall mount
Wall Mount	C7130B1009	PT1000	1,097 Ohms PTC at 77°F	-40° to 100° F	Wall mount
Water	C7021D2001	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	5" w/ wiring enclosure, use well 50001774-001
Water	C7023D2001	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	5" w/ wiring enclosure, use well 50001774-001
Water	C7031D2003	PT1000	1097 ohms PTC at 77F	-40° to 350° F	5" w/ wiring enclosure, includes well 50001774-001
Water	C7041D2001	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	5" w/ wiring enclosure, use well 50001774-001
Outdoor	C7021F2009	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 158° F	Outdoor weatherproof, connects to 1/2" conduit
Outdoor	C7023F2009	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 158° F	Outdoor weatherproof, connects to 1/2" conduit
Outdoor	C7031G2014	PT3000	3484 ohms at 77F	-40° to 120° F	Outdoor weatherproof, connects to 1/2" conduit
Outdoor	C7041F2006	20K ohms NTC	20K ohms NTC at 77°F	-40° to 158° F	Outdoor weatherproof, connects to 1/2" conduit
Duct Mount	C7021J2007	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	12' duct averaging w/ wiring enclosure
Duct Mount	C7021R2000	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	12' duct averaging flexible copper
Duct Mount	C7021R2018	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	24' duct averaging flexible copper
Duct Mount	C7031J2009	PT1000	1097 ohms PTC at 77F	40° to 180° F	12' duct averaging flexible copper
Duct Mount	C7041J2007	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	12 ft. Duct (Averaging) w/ wiring enclosure
Duct Mount	C7041R2000	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	12 ft. Duct flexible copper (Averaging)
Duct Mount	C7041R2018	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	24 ft. Duct flexible copper (Averaging)
Duct Mount	C7021B2005	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	6" duct w/ wiring enclosure
Duct Mount	C7021B2013	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	12" duct w/ wiring enclosure
Duct Mount	C7021C2003	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	18" duct w/wiring enclosure
Duct Mount	C7023B2005	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	6" duct w/ wiring enclosure
Duct Mount	C7023B2013	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	12" duct w/ wiring enclosure
Duct Mount	C7023C2003	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	18" duct w/ wiring enclosure
Duct Mount	C7031B2005	PT1000	1097K ohms NTC at 77F	-40° to 250° F	6" duct w/wiring enclosure
Duct Mount	C7041B2005	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	6" duct w/ wiring enclosure
Duct Mount	C7041B2013	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	12" duct w/ wiring enclosure
Duct Mount	C7041C2003	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	18" duct w/ wiring enclosure
Water	C7021K2005	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	Strap-on pipe sensor with wiring enclosure
Water	C7023K2005	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	Strap-on pipe sensor with wiring enclosure
Water	C7041K2005	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	Strap-on with wiring enclosure
Water/Air	C7021N2001	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	Probe Sensor with 6' Lead
Water/Air	C7023N2001	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	Probe Sensor with 6' Lead
Water/Air	C7041N2020	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	Probe Sensor with 6' Lead
Wall Mount	C7021P2004	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	Small metal button sensor
Wall Mount	C7023P2004	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	Small metal button sensor
Wall Mount	C7041P2004	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	Small metal button sensor

Product Selection - Sensors

Current Sensors, Transmitters, Switches and Relays

Current Switches



Part Number	Description	Core Type	Normally Open or Normally Closed	Trip Point	Operating Range	Output Switch Rating	LEDs
CSS-O-F5-001	"Go/No Go" current switch	Solid	N/O	0.5 A	0-250 A	0.3 A at 200 Vac/Vdc	Red
CSS-O-F1-001	"Go/No Go" current switch	Solid	N/O	0.2 A	0-250 A	0.3 A at 200 Vac/Vdc	Red
CSS-C-F5-001	"Go/No Go" current switch	Solid	N/C	1.0 A	0-250 A	0.15 A at 300 Vac/Vdc	Red
CSS-C-F1-001	"Go/No Go" current switch	Solid	N/C	0.5 A	0-250 A	0.15 A at 300 Vac/Vdc	Red
CSS-O-A300-001	Adjustable current switch	Solid	N/O	1.0 A to 250 A	0-250 A	0.3 A at 200 Vac/Vdc	Red and green
CSS-O-A200-001	Adjustable current switch	Solid	N/O	0.5 A to 250 A	0-250 A	0.3 A at 200 Vac/Vdc	Red and green
CSP-O-F15-001	"Go/No Go" current switch	Split	N/O	2.5 A	0-200 A	0.3 A at 200 Vac/Vdc	Red
CSP-O-F10-001	"Go/No Go" current switch	Split	N/O	1.5 A	0-200 A	0.3 A at 200 Vac/Vdc	Red
CSP-O-A300-001	Adjustable current switch	Split	N/O	3.0 A to 200 A	0-200 A	0.3 A at 200 Vac/Vdc	Red and green
CSP-O-A200-001	Adjustable current switch	Split	N/O	2.0 A to 200 A	0-200 A	0.3 A at 200 Vac/Vdc	Red and green
CSP-C-A200-001	Adjustable current switch	Split	N/C	2.5 A to 250 A	0-250 A	0.15 A at 300 Vac/Vdc	Red and green

Current Transmitters



Part Number	Description	Core Type	Output	Current Range	Type	Loop Powered	True RMS or average
CTS-20-250-AVG-001	Loop powered current sensor	Solid	4-20 mA	0-100, 0-200, 0-250 A	Adjustable	Yes	Average
CTS-20-250-VFD-001	Loop powered current sensor	Solid	4-20 mA	0-100, 0-200, 0-250 A	Adjustable	Yes	True RMS
CTP-20-200-AVG-001	Loop powered current sensor	Split	4-20 mA	0-100, 0-150, 0-200 A	Adjustable	Yes	Average
CTP-20-050-VFD-001	Loop powered current sensor	Split	4-20 mA	0-10, 0-20, 0-50 A	Adjustable	Yes	True RMS
CTS-05-050-VDC-001	Current sensor	Solid	0-5 Vdc	0-10, 0-20, 0-50 A	Adjustable	No	Average
CTS-10-250-VDC-001	Current sensor	Solid	0-10 Vdc	0-100, 0-200, 0-250 A	Adjustable	No	Average

Mini Current Switches



Part Number	Description	Core Type	Normally Open or Normally Closed	Trip Point	Amperage Rating	Output Rating	LEDs
MCSS-F	"Go/No Go" Fixed Mini Current Switch	Solid	N/O	0.20 A	0.20 to 150 Amps	"0.5A Continuous, 36 Vac/Vdc"	Red LED - Above Trip Point, Blue LED - Under Trip Point
MCSP-F	"Go/No Go" Fixed Mini Current Switch	Split	N/O	0.55 A	0.55 to 150 Amps	"0.5A Continuous, 36 Vac/Vdc"	Red LED - Above Trip Point, Blue LED - Under Trip Point
MCSS-A	Adjustable Mini Current Switch	Solid	N/O	0.32-150 Amps	0.32 to 150 Amps continuous	"1A Continuous 36 Vac/Vdc"	N/A
MCSP-A	Adjustable Mini Current Switch	Split	N/O	0.70-150 Amps	0.70 to 150 Amps continuous	"1A Continuous 36 Vac/Vdc"	N/A

Command Relays



Part Number	Description	Coil Voltage	Contact Ratings (All SPDT)	Status LED
CR-DC-5A	5 Amp SPDT Relay	23-31.2Vdc, 15mA@24Vdc	5A (NO)/2A(NC) @ 250Vac, 5A(NO)/3A(NC) @ 125Vac	Yes
CR-DC-12A	12 Amp SPDT Relay	20-31.2Vdc, 16mA@24Vdc	12A @ 250Vac, 12A @ 30Vdc	Yes
CR-12DC-12A	12 Amp SPDT Relay	10-15.6Vdc, 30mA@12Vdc	12A @ 250Vac, 12A @ 30Vdc	Yes
CR-24AC-10A	10 Amp SPDT Relay	16-26.4Vac, 28mA@24Vac	10A @ 250Vac, 10A @ 24Vdc	Yes
CR-115AC-8A	8 Amp SPDT Relay	80-132Vac, 10mA@115Vac	8A @ 250Vac, 8A @ 30Vdc	Yes
CR-230AC-8A	8 Amp SPDT Relay	165-264Vac, 5mA@230Vac	8A @ 250Vac, 8A @ 30Vdc	Yes

Product Selection - Sensors

Humidity and Dew Point Sensors



Electronic Humidity Sensors

Part Number	Output Signal	RH Accuracy	Mounting & Application	Voltage Supply	Temp Sensor	Use With	Insertion Length
H7625A2010	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 2% from 20-95% RH	Wall	18-40 VDC / 18-28 VAC	20K ohm at 77° F	T7350, H775, XL50, XFC, W750B/C, W7753, W7760A/C, W7761	N/A
H7625B2006	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 2% from 20-95% RH	Duct	18-40 VDC / 18-28 VAC	20K ohm at 77° F	T7350, H775, XL50, XFC, W750B/C, W7753, W7760A/C, W7761	7.5" - "B" model only
H7626A2020	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 2% from 20-95% RH	Wall	18-40 VDC / 18-28 VAC	1097 ohm at 77°F	Excel 15, Excel 10, T7350, T775 Series 2000	N/A
H7626B2024	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 2% from 20-95% RH	Duct	18-40 VDC / 18-28 VAC	1097 ohm at 77°F	Excel 15, Excel 10, T7350, T775 Series 2000	7.5" - "B" model only
H7635A2012	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 3% from 20-95% RH	Wall	18-40 VDC / 18-28 VAC	20K ohm at 77° F	T7350, H775, XL50, XFC, W750B/C, W7753, W7760A/C, W7761	N/A
H7635B2018	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 3% from 20-95% RH	Duct	18-40 VDC / 18-28 VAC	20K ohm at 77° F	T7350, H775, XL50, XFC, W750B/C, W7753, W7760A/C, W7761	7.5" - "B" model only
H7635C2015	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 3% from 20-95% RH	Outdoor	18-40 VDC / 18-28 VAC	20K ohm at 77° F	T7350, H775, XL50, XFC, W750B/C, W7753, W7760A/C, W7761	
H7636A2022	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 3% from 20-95% RH	Wall	18-40 VDC / 18-28 VAC	1097 ohm at 77°F	Excel 15, Excel 10, T7350, T775 Series 2000	N/A
H7636B2026	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 3% from 20-95% RH	Duct	18-40 VDC / 18-28 VAC	1097 ohm at 77°F	Excel 15, Excel 10, T7350, T775 Series 2000	7.5" - "B" model only
H7656B2029	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	± 5% from 25-95% RH	Duct	18-40 VDC / 18-28 VAC	1097 ohm at 77°F	Excel 15, Excel 10, T7350, T775 Series 2000	N/A
H7655A1001	0-10 Vdc	5%	Wall	16-40 VDC / 16-30 VAC	None	Any controller that accepts 0-10 Vdc input	N/A
H7655B2014	Selectable 4-20mA, 0-10Vdc, or 0-5 Vdc	5%	Duct	18-40 VDC/18-28 VAC	20K ohm at 77° F	T7350, H775, XL50, XFC, W750B/C, W7753, W7760A/C, W7761	N/A
C7600A2008	4-20 mA	5% between 30-70% RH	Anywhere where it is exposed to freely circulating air	N/A	None	W7600 or controller requiring 4-20 mA reverse acting input	N/A
C7600B2008	2-10 Vdc	± 5 between 30-70% RH ± 7 between 10-90% RH	Wall	16-40 VDC / 16-30 VAC	None	H775 that accepts 2-10 Vdc output	N/A
C7600C2001	4-20 mA	5% between 30-70% RH	Anywhere where it is exposed to freely circulating air	N/A	None	W7600 or controller requiring 4-20 mA reverse acting input	N/A



Dew Point Sensors

Part Number	Output	Switch	Hysteresis
HSS-DPS	Potential-free relay with changeover contact	RH>90% ± 3% contact open; RH < 90% ± 3% closed	5% RH

Product Selection - Sensors

CO2 Sensors, Pressure Sensors and Transducers

Carbon Dioxide Sensors



Part Number	Output Signal	20K ohms Temp sensor	Display Screen	Honeywell Logo	Mounting	CO2 Range (accuracy)
C7232A1008	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	Yes	Yes	Wall	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7232A1016	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	No	Yes	Wall	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7232A1024	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	Yes	No	Wall	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7232A1032	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	No	No	Wall	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7232B1006	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	Yes	Yes	Duct (8" insertion length)	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7232B1014	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	No	Yes	Duct (8" insertion length)	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7232B1022	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	Yes	No	Duct (8" insertion length)	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7232B1030	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	No	No	No	Duct (8" insertion length)	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 2% of reading at normal temperature and pressure
C7262A1008	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	Yes	Yes	Yes	TR20 Series Style Wall	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 3% of reading from 59°F - 85°F (15°C - 30°C)
C7262A1016	0/2 to 10 Vdc or 0/4 to 20 mA w/ one adjustable SPST relay output	Yes	No	Yes	TR20 Series Style Wall	0 to 2,000 ppm adjustable, +/- 30 ppm +/- 3% of reading from 59°F - 85°F (15°C - 30°C)
C7632A1004	0-10 Vdc (fixed)	No	No	Yes	Wall	0 to 2,000 ppm fixed
C7632B1002	0-10 Vdc (fixed)	No	No	Yes	Duct	0 to 2,000 ppm fixed

P7640 Differential Pressure Transducers



Model	Mounting	Selectable W.C. Range	Display	Output	Supply Voltage
P7640A1000	Panel	0-.1", 0-.25", 0-.5", 0-1"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640A1018	Panel	0-.1", 0-.25", 0-.5", 0-1"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640A1026	Panel	0-1", 0-2.5", 0-5", 0-10"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640A1034	Panel	0-1", 0-2.5", 0-5", 0-10"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640B1008	Duct	0-.1", 0-.25", 0-.5", 0-1"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640B1016	Duct	0-.1", 0-.25", 0-.5", 0-1"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640B1024	Duct	0-1", 0-2.5", 0-5", 0-10"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640B1032	Duct	0-1", 0-2.5", 0-5", 0-10"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640U1040	Universal	0-.1", 0-.25", 0-.5", 0-1" 0-2.5", 0-5", 0-10"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac
P7640U1052	Universal	0-.1", 0-.25", 0-.5", 0-1" 0-2.5", 0-5", 0-10"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac

PWT Series Wet Differential Pressure Transducers



Model	Selectable Pressure Range	Output	Supply Voltage
PWT50	0-5, 0-10, 0-25, 0-50 psid	0-10Vdc, 0-5Vdc, and 4-20mA selectable	12-30Vdc or 24Vac
PWT100	0-10, 0-20, 0-50, 0-100 psid	0-10Vdc, 0-5Vdc, and 4-20mA selectable	12-30Vdc or 24Vac
PWT250	0-25, 0-50, 0-125, 0-250 psid	0-10Vdc, 0-5Vdc, and 4-20mA selectable	12-30Vdc or 24Vac

MLH Gauge Pressure Sensors



Model	Pressure Range	Pressure Connection	Output	Excitation
MLH050PSCDJ1235	0-50 psig	1/4" -18 NPT	4-20mA	9.5 Vdc to 30 Vdc
MLH150PSCDJ1236	0-150 psig	1/4" -18 NPT	4-20mA	9.5 Vdc to 30 Vdc
MLH300PSCDJ1237	0-300 psig	1/4" -18 NPT	4-20mA	9.5 Vdc to 30 Vdc
MLH500PSCDJ1240	0-500 psig	1/4" SAE Female Schrader	4-20mA	9.5 Vdc to 30 Vdc
MLH01KPSCDJ1241	0-1000 psig	1/4" SAE Female Schrader	4-20mA	9.5 Vdc to 30 Vdc

Submittal Data - Sensors

Spyder Sylk Sensors, TR70 Series



The TR71 and TR75 are two-wire, polarity insensitive, Sylk bus communicating wall modules, which communicate with Spyder® and some ComfortPoint™ programmable controllers.

All models have a space-temperature sensor, network bus jack and an LCD panel with three softkeys and two Up/Down adjustment keys. The TR71-H and TR75-H models include an onboard humidity sensor.

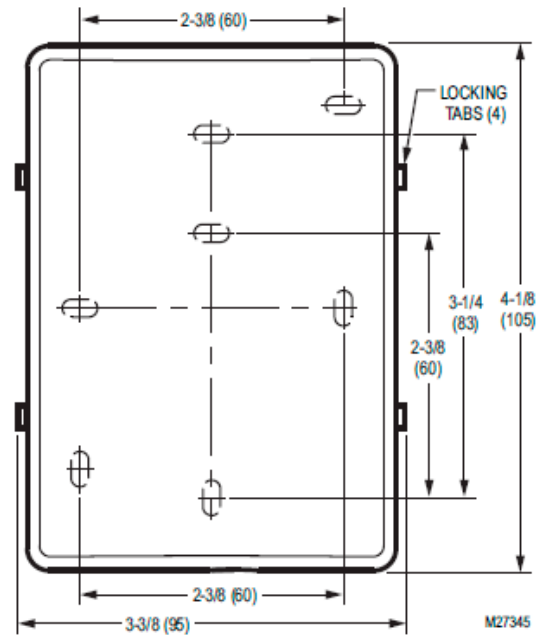
SPECIFICATIONS

Compatibility.....	Full feature set, including scheduling and password protection requires the latest Spyder firmware (field upgradeable with Spyder Flash Tool), Spyder Tool version greater than 5.18, and WEBs-AX Workbench version 3.4.57 or greater.
Construction.....	Two-piece construction, cover and internally wired subbase. Field wiring, 18 to 24 AWG (0.82 to 0.20 sq. mm), connects to a terminal block in the subbase.
Mounting Options.....	The LCD wall modules can be mounted on a standard two by four inch junction box or on a 60 mm diameter junction box. The modules may be mounted up to 200 ft. (61 m) from the programmable controller. Twisted pair wiring is recommended for distances longer than 100 ft. (30.5 m).
Environmental Ratings.....	Operating Temperature: 30 °F to 110 °F (-1 °C to 43 °C) Shipping Temperature: -40 °F to 150 °F (-40 °C to 65.5 °C) Relative Humidity: 5% to 95% non-condensing
Temperature Setpoint Range.....	Default range is 55 °F to 85 °F (10 °C to 35 °C); configurable for other ranges.
Temperature Sensor Accuracy.....	±0.36 °F at 77 °F (±0.2 °C at 25 °C)
Humidity Sensor Accuracy.....	±5% RH from 20% to 80% RH (TR71-H/TR75-H only)
Power.....	18 Vdc power is supplied to the wall module from the two-wire S-BUS connection to the programmable controller.
Accessories.....	50007298-001 (pack of 12) medium, cover plate; 6-7/8 x 5 in. (175 x 127 mm).
Approvals.....	CE; UL94-HB plastic enclosure; FCC Part 15, Class B

FEATURES

- Ability to control tenant access to controller parameters via password protection
- Ability to assign labels for enumerated values
- Customized parameter access, by using the Honeywell WEBs-AX Workbench tool
- Ability to link setpoint limits to a network variable
- Programmable for: Home screen options, tenant access, contractor access, optional password protection to contractor mode, access to controller parameters, setpoint, override, fan and other parameters
- Ability to access and adjust most parameters in the programmable controller.
- TR75 can access and adjust the controller schedule
- Ability to balance the VAV system from the wall module
- Home screen can display one to three of any of the following parameters: Temperature Setpoint, Room Temperature, Room Humidity, Outdoor Humidity, Outdoor Temperature and Time, or one of virtually any parameter in the controller
- The TR75 has more than twice the memory capacity for parameters as the TR71
- Network bus jack
- Simple two-wire terminal connection to the programmable controller (includes power) and an optional two-wire terminal connection for the network. All connections are polarity insensitive
- Permanent retention of user configuration, including setpoints after a power outage

DIMENSIONS DIAGRAM



Spyder Sylk Sensors, TR40 Series



The TR40 and TR42 are two-wire, non-polarity sensitive, Sylk communicating wall modules, which communicate with Spyder® programmable controllers.

The TR40 and TR42 are simple temperature wall modules with basic setpoint, override and fan options; designed for a broad range of applications.

SPECIFICATIONS

Environmental Ratings	Operating Temperature: 32 °F to 122 °F (0 °C to 50 °C) Shipping Temperature: -40 °F to 150 °F (-40 °C to 65.5 °C) Relative Humidity: 5% to 95% non-condensing
Accessories	50007298-001 (pack of 12) medium, cover plate; 6-7/8 x 5 in. (175 x 127 mm).
Approvals	CE; UL94-V0 plastic enclosure; FCC Part 15, Class B
Accuracy	Temperature: ± 0.2 °C at 25 °C (± 0.36°F at 77°F) Humidity: +/-3% RH from 20-80%RH CO2: +/- (30ppm +3% of measured value). Calibrated at the factory. Uses automatic background calibration. No calibration required for the life of the product. Meets CEC Title 24 requirement of +/-75ppm accuracy at 600ppm and 1000ppm ambient levels. For proper CO2 operation, install only in spaces that see at least 4 hours of continuous unoccupied time per week.

FEATURES

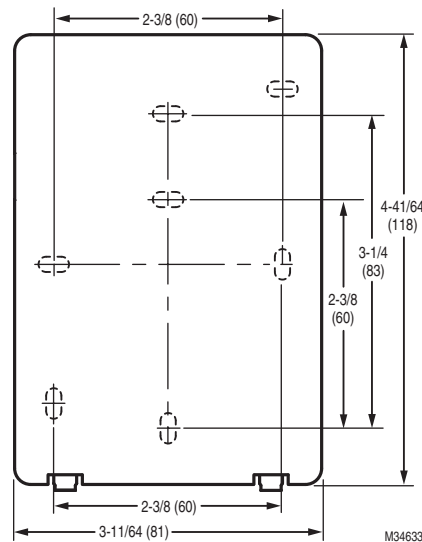
The TR40 and TR42 wall modules include:

- Two-wire, polarity insensitive Sylk provides both power and communication to the device.
- Models available with display (TR42) or without display (TR40).
- Models available with or without built-in humidity or CO2 sensors.

All TR42 display wall modules include:

- Fan speed options: Auto-On, Auto-Off-On, Auto-Off-Low-Med-High (configurable in the Niagara tool)
- Override option (configurable in the Niagara tool)
- Ability for tenant to change between °F and °C
- Ability to provide tenant either a relative "warmer cooler" setpoint adjustment or absolute temperature setpoint adjustment
- An installer mode with optional password protection that allows:
 - Switching between °F and °C
 - Temperature calibration
 - Humidity calibration
 - Numerical or Graphical setpoint adjustment
 - Adjustment of the Setpoint Range Limits
 - Adjustment of override time (Choose Network Time or 1-24 hours)
- Choosing the sensor or setpoint value to be shown in the Home Screen, or choose to scroll through sensor and setpoint values.
- Choosing between English and International icon display.

DIMENSIONS DIAGRAM



Submittal Data - Sensors

Wireless Sensors and Receivers



The WRECVR receiver and TR21-WS, TR23-WS, TR21-WK, and TR23-WK are a family of wireless wall modules and receiver for use with:

- Spyder Unitary Controllers: PUL, PVL, etc.
 - Excel 10 W7750, W7751, W7752 and W7753 controllers
 - T7350, T7351 and TB8575 low-voltage SuitePRO™ thermostats
 - Will not work with TB7220, TB8220 or TB line voltage thermostats, XL15s, W7762, W7763 or certain other XL controllers
- Will work with WEBs-AX™ I/O Module products if using a separate transformer
 - Compatibility with various other non-Honeywell controllers that accept 10K type2 NTC temperature inputs

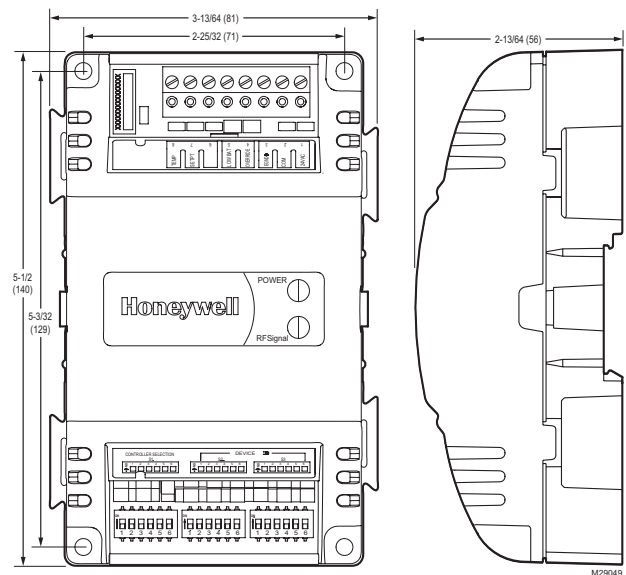
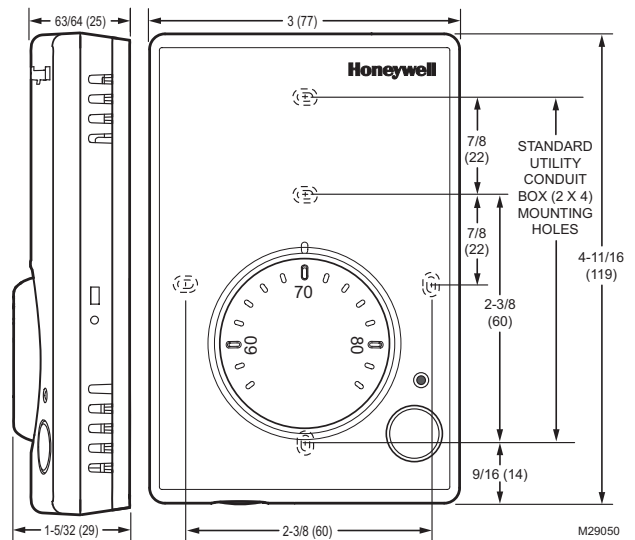
SPECIFICATIONS

Models	For specific model information, see Specification Data, form 63-1332.
Environmental Ratings	Wall Module Operating Temperature: 45° to 99 °F (7° to 37 °C). Receiver Operating Temperature: -40° to 150 °F (-40° to 65.5 °C). Storage Temperature: -40° to 150 °F (-40° to 65.5 °C). Operating Humidity: 5% to 95% RH (non-condensing)
Accuracy	+/- 1°F (+/- 0.5°C) across 12 °C to 30°C
Setpoint Range for TR23	56° to 84 °F (13° to 29 °C)
Accessories	50007298-001 (pack of 12) medium, cover plate; 6-7/8 x 5 in. (175 x 127 mm).
Power	Receiver Voltage: 20 – 30VAC/DC, 50/60Hz; 24VAC typical
Housing	Wall Module: UL94-HB Receiver: UL94-5VA
Radio Frequency	2.4 GHz (IEEE Std 802.15.4-2003 compliant) Open Range: 3000 feet Typical Range: 100 feet Output power: 16dBm Receiver power consumption: <1.5 VA@24VAC

FEATURES

- Wall module to Receiver (point to point) wireless kits can replace any standard wired sensor
- Wireless Kits (wall module and receiver) are pre-bound at the factory for quick installation
- Signal Strength LED built into the wall module
- Low battery indication
- Optional dip switches available to bind any wall module to any receiver
- Approximate 5-year battery life with AA Alkaline (included), 7.5 years with Lithium
- Locking screw discourages tampering and battery theft

DIMENSIONS DIAGRAM





The TR21, TR22, TR23 and TR24 are a family of direct-wired wall modules for use with:

- Spyder Unitary Controllers: PUL, PVL
- Excel 10 W7750, W7751a, W7752, and W7753 controllers
- Honeywell Excel 800, 600, 500, 100, and 80 (all fully programmable) controllers
- W7761 Controller
- ComfortPoint LON Controllers: CP-UL, CP-VL
- All models have a space temperature

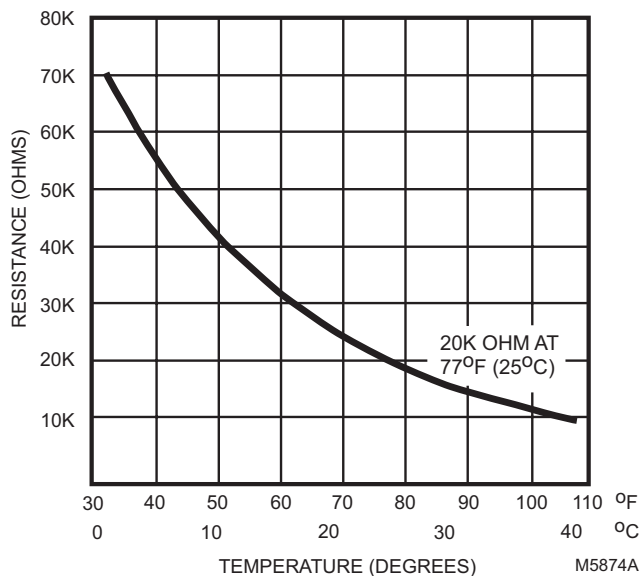
sensor. Some models have a temperature dial, setpoint adjustment, LONWORKS bus jack, override (bypass) with LED, and fan switch.

SPECIFICATIONS

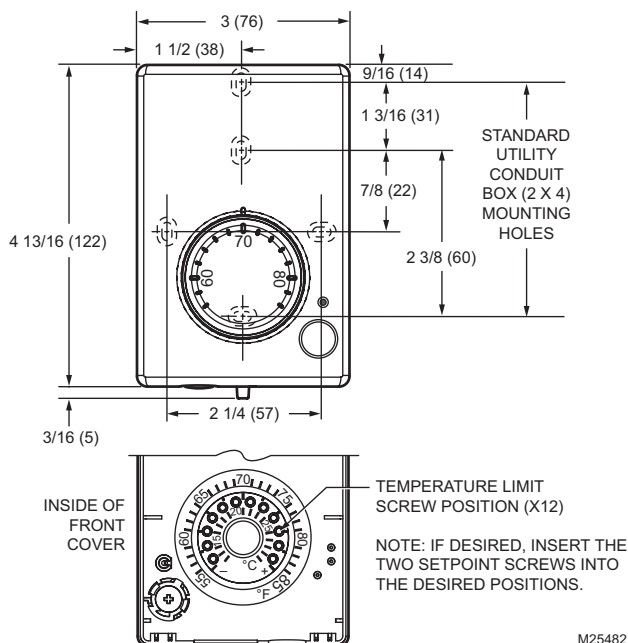
Models	For specific model information, see TR21, TR22, TR23, and TR24 Wall Modules – Specification Data, form 63-1321.
Environmental Ratings	Operating Temperature: 45° to 99° F (7° to 37° C). Shipping Temperature: -40° to 150° F (-40° to 65.5° C).
Accessories	50007298-001 (pack of 12) medium, cover plate; 6-7/8 x 5 in. (175 x 127 mm).
Approvals	CE; UL94 plastic enclosure; FCC Part 15, Class B
Sensor	All models are furnished with a 20K Ohm nonlinear NTC temperature sensor that follows a specific temperature resistance curve. NOTE: The TR21-A wall module model has two (2) 20K Ohm nonlinear NTC temperature sensors in parallel, which provide 10K NTC temperature sensing necessary for averaging.

FEATURES

- Models with setpoint adjustment.
- Models with humidity output.
- Models with occupied/unoccupied override (bypass) with LED.
- Models with three-position (auto/0/1) or 5-position (auto/0/1/2/3 speed) fan switch.
- LONWORKS® bus jack on all models except the TR21 and TR21-A models.
- Locking cover on all models.
- Operating range 45° to 99° F (7° to 37° C).
- Models (TR22 and TR23) with user-selectable temperature setpoint dials in Fahrenheit, Celsius and Relative (- to +).



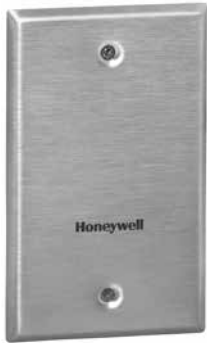
DIMENSIONS DIAGRAM



M25482

Submittal Data - Sensors

C7772A Series Wallplate Sensors



The C7772A series of Wallplate Temperature Sensors are designed to be used with the Excel 5000 family and other Honeywell controllers. The C7772F Series is designed to be used with the TB7600, TB7300 and TB7200 Series communicating thermostats and other controllers that require a 10K ohm NTC Type II sensor. The C7772G is designed to be used with WEBs-AX I/O modules and other controllers that require a 10K ohm NTC Type III sensor. The C7772 sensors provide a resistive output signal proportional to sensed room or space temperature. The C7772 is well

suited for low-profile wall-mounted applications where durability and tamper-proof construction is desired, such as schools, prisons and institutions.

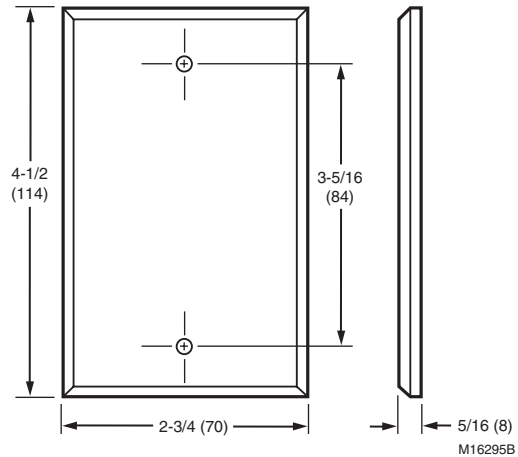
SPECIFICATIONS

Temperature Ratings.....	Operating: 45 °F to 99 °F (7 °C to 37 °C). Shipping: -40 °F to 150 °F (-40 °C to 65 °C).
Long-term temperature sensor drift (for 20K ohm sensors only)	Maximum sensor drift is nominally +/-0.13 °F after 5 years of operation, no appreciable drift thereafter. No calibration of the device is possible. Long term drift calibration/ maintenance through controller software is typically not necessary.
Humidity Ratings	5 to 95% rh, non-condensing.
Sensor.....	C7772A furnished with a 20K non-linear NTC thermister, C7772F with a 10K non-linear NTC type II thermister, and C7772G with a 10K non-linear NTC type III thermister.
Approvals	National Electrical Code (NEC) Class II

FEATURES

- Low profile when mounted on industry standard utility conduit box.
- Rugged, brushed stainless steel wallplate.
- Integral foam pad isolates wallplate sensor from conduit box.
- Insulated screw terminals ensure reliable field wiring connection.
- Models available with a variety of resistive temperature sensor elements.

DIMENSIONS DIAGRAM



C7772 SENSOR RESISTANCE

	Typical Resistance (in ohms)	Typical Resistance (in ohms)	Typical Resistance (in ohms)
	C7772A	C7772F	C7772G
At 41°F (5°C)	54,200	25,392	23,467
At 50°F (10°C)	41,758	19,901	18,789
At 59°F (15°C)	32,427	15,712	15,137
At 68°F (20°C)	25,370	12,493	12,268
At 77°F (25°C)	20,000	10,000	10,000
At 86°F (30°C)	15,856	8,057	8,196
At 95°F (35°C)	12,654	6,531	6,754



The T7047C and T7047G Digital Wall Module (DWM) display and provide space temperature, setpoint, Occupied/Unoccupied override and fan mode/speed selection for the Honeywell Excel 10 W7750, W7751, W7752, W7753, W7761, W7762, W7763 and Excel 600, 500, 100, 80, 50, 20 Controllers, as applicable (a software module is available to adapt the wall module to the respective Excel 20, 50, 80, 100,

500, 600 controller, see T7560 Installation Instructions, form 95-7620 for details).

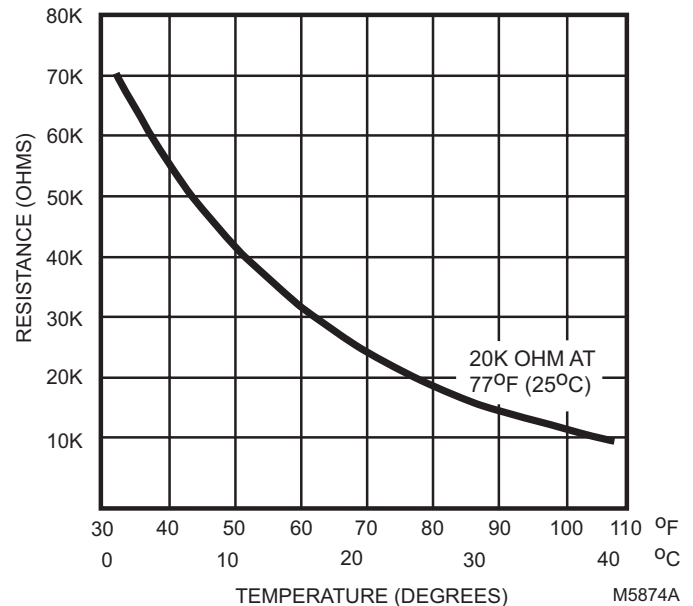
Using the three buttons, the user can change room temperature setpoint, fan mode/speed, initiate/cancel bypass and change configuration information such as the DWM's engineering units. These wall modules are not compatible with Honeywell W7751A,C,E,G (VAV1) and W7752D1 (FCU1) Controllers.

FEATURES

- Fully compatible with all current Excel 10 and Excel 20 to 600 controllers.
- Low power consumption.
- LCD display continuously shows current space temperature, occupied/unoccupied/standby mode, fan status/mode, humidity, as configured.
- Push-button interface for full navigation and change control of wall module functions.
- Single touch occupied/unoccupied override.
- Setpoint wheel for setpoint adjustment.
- Integral 20k ohm NTC sensor.
- Fan Speed/Mode commandable from buttons.
- Selectable °F/°C temperature display.
- Selectable setpoint type, absolute or relative.
- Separate mounting base for easy installation.

SPECIFICATIONS

Temperature Sensor Accuracy.....	The DWM is furnished with a 20k ohm NTC temperature sensor that follows a specific temperature-resistance curve. Honeywell controllers used with the DWM employ an algorithm that provides readings close to the actual temperature. Across the range of 43 to 104 °F (6 to 40 °C) the accuracy is better than ±0.75 °F (±0.42 °C).
Power Supply.....	24 Vac/dc with a valid range of 18 to 30 V 5 Vdc via LED input with a valid range of 5 to 12 V (see T7560 Installation Instructions, form 95-7620 for details)
Power Consumption.....	<2 VA at 24 Vac, 50/60 Hz
Field Wiring.....	16 to 22 AWG (1.5 to 0.34 mm ²) depending on application 18 AWG (1.0 mm ²) minimum for 24 Vac power wiring Maximum length of wire from a device to a wall module is 164 ft (50 m) Twisted pair wire recommended for wire runs longer than 100 ft (30.5 m)
Setpoint Adjustment Range.....	Setpoint can be configured for Fahrenheit absolute (55 to 85°F) Fahrenheit relative (+/-10) Centigrade absolute (12 to 30°C) Centigrade relative (+/-5)
Temperature Value Display Resolution....	Degree Centigrade ◊ 0.1 °C Degree Fahrenheit ◊ 0.1 °F
Setpoint Value Display Resolution	Degree Centigrade ◊ 0.5 °C Degree Fahrenheit ◊ 1.0 °F
Mounting Options.....	Wall mounting
Dimensions(H/W/D).....	4-1/8 x 3-15/16 x 1-3/16 in. (104 x 99 x 30 mm)
Environmental Ratings.....	Shipping Temperature: -40 to 140 °F (-40 to 60 °C) Operating Temperature: 32 to 104 °F (0 to 40°C) Relative Humidity: 5% to 90% non-condensing
Approvals.....	UL 916, NEC Class 2; CE



Submittal Data - Sensors

T7300 Sensors



The T7047C and T7047G Electronic Thermostats and Remote Space Sensors are used in Series 70 Control Systems to provide modulating space temperature control.

SPECIFICATIONS

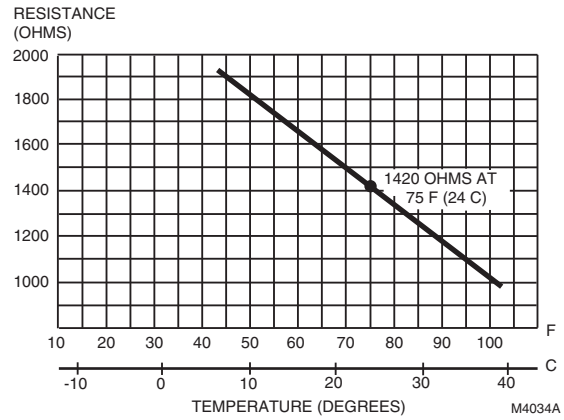
Models T7047C: 2-wire remote sensor for use with control systems such as the T7100, T7300, W927, W960 and W973.
 T7047G: 2-wire remote sensor without internal adjustment means, requires remote setpoint device such as T7100, T7300, S963B, 7067B or T7080B.

Temperature Sensor Thermistor-resistor element.

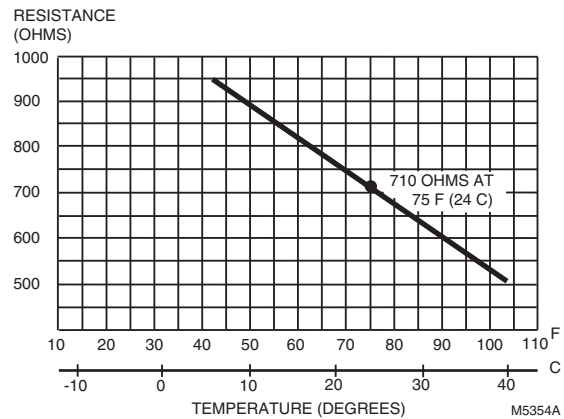
Sensor Resistance..... For the following negative temperature coefficient (NTC) devices, resistance decreases as temperature increases
 T7047C: 1420 ohms nominal at 75°F (24°C); resistance changes 15 ohms for each 1°F (0.6°C) temperature change.
 T7047G: 710 ohms nominal at 75°F (24°C); resistance changes 7.5 ohms for each 1°F (0.6°C) temperature change.

Mounting Mounts on wall or 2 x 4 in. vertical outlet box with screws provided.

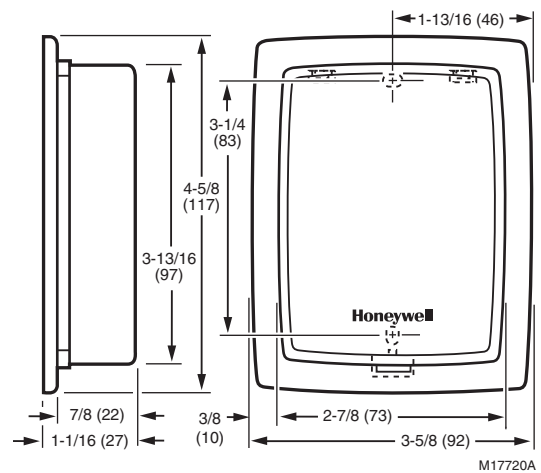
T7047C



T7047G



DIMENSIONS DIAGRAM

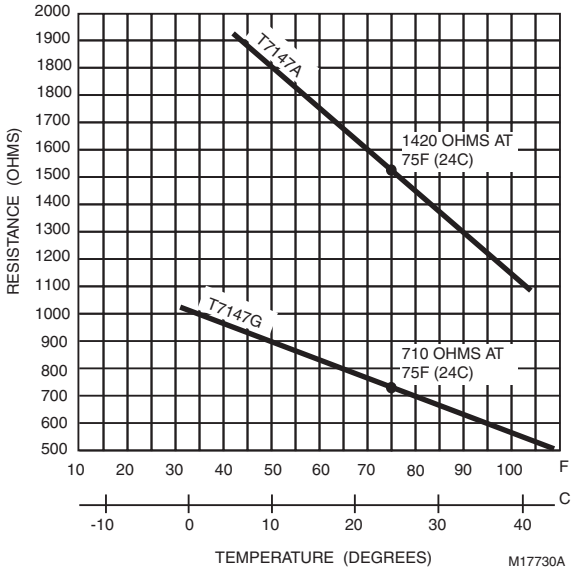




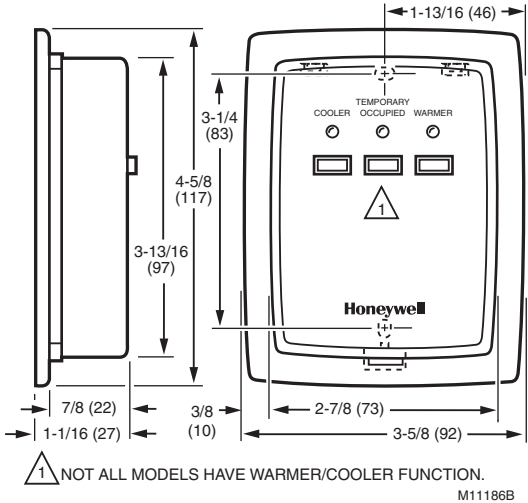
The T7147A and T7147G Remote Space Sensors and Override Modules are used with T7300/Q7300 Thermostat/ Subbase to provide space temperature control, switch initiation and override indication from a remote location.

SPECIFICATIONS

Temperature Sensor Thermistor-resistor (NTC) element.
 Sensor Resistance..... Resistance decreases as temperature increases
 T7147A: 1420 ohms nominal at 75 °F (24 °C); resistance changes 15 ohms for each 1 °F (0.6 °C) temperature change.
 T7147G: 710 ohms nominal at 75 °F (24 °C); resistance changes 7.5 ohms for each 1 °F (0.6 °C) temperature change.
 Mounting Mounts on wall or 2 x 4 in. vertical outlet box with screws provided.



DIMENSIONS DIAGRAM



SENSORS

Submittal Data - Sensors

T775 Sensors



- Used with T775 Series 2000 Electronic Controllers
- Some typical applications for the 50021579-001 and T775-SENS-WT/-WR sensors include:
 - Monitoring return air temperatures
 - Monitoring discharge air temperatures
 - Monitoring mixed air temperatures

Use the T775-SENS-OAT to measure outside air temperature.

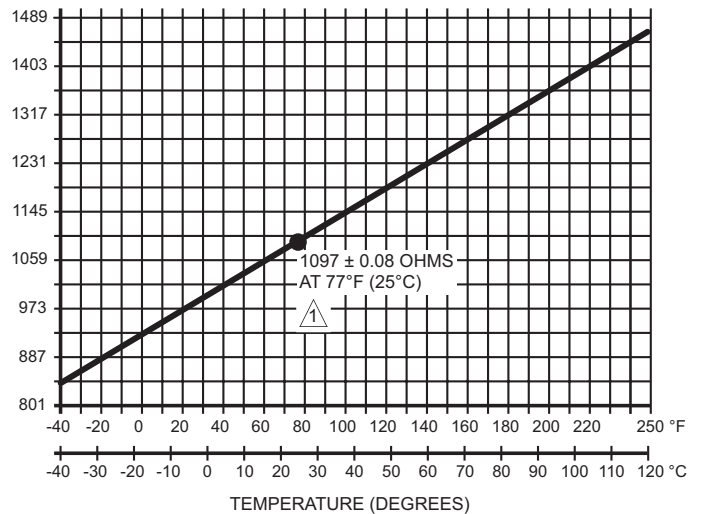
FEATURES

- Fast response time and highly accurate
- 1/2 in. (6.35 mm) stainless steel probe with a thermally conductive epoxy
- All sensors are 1,097 Ohms PTC at 77°F (25°C)
- The 50021579-001 is a standard temperature sensor for indoor applications
- The T775-SENS-WR is a water resistant sensor with 5 ft leads
- The T775-SENS-WT is a water tight sensor with 6 ft leads
- The T775-SENS-OAT is for sensing outdoor air temperature and is housed in a weatherproof case for outdoor use (knockouts allow for 1/2 in. conduit connection)
- Two-year warranty

SPECIFICATIONS

Operating temperature range.....	50021571-001: -40 F to 350 F (-40C to 177C) Short term spikes to 392F (200C) okay. T775-SENS-WR and T775-SENS-WT: -40F to 270F (-40C to 132C) T775-SENS-OAT: -40F to 158F (-40C to 70C)
Accuracy	Meets DIN-IEC-751 Class A standards for overall accuracy of +/- 0.06% at 32°F (0°C)
Self Heating Coefficient.....	4 mW/C (Measured in air with velocity of 1m/sec.)
Response Time	Air (Velocity = 1 m/s) = 15 sec. max.
Temperature Coefficient	3,850 ppm/C
Environmental Compliance	RoHS-Directive 2002/95/EC
Applied Current	1.0 mA Max.
Sensor Output.....	1 K Ohms at 32 F (0 C)
Approvals.....	RoHS: Compliant

RESISTANCE (OHMS)



△ POSITIVE TEMPERATURE COEFFICIENT (PTC) OF 2.1 OHMS PER °F
M24304

DIMENSIONS DIAGRAM

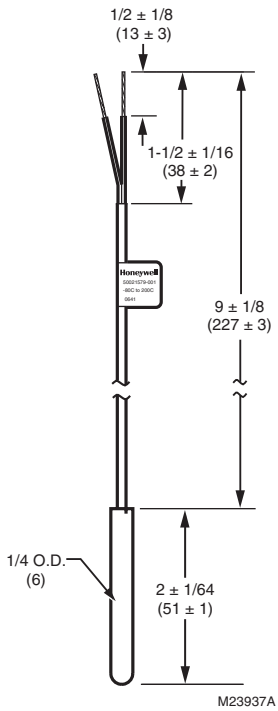


Fig. 1. 50021579-001 Dimensions in Inches (mm).

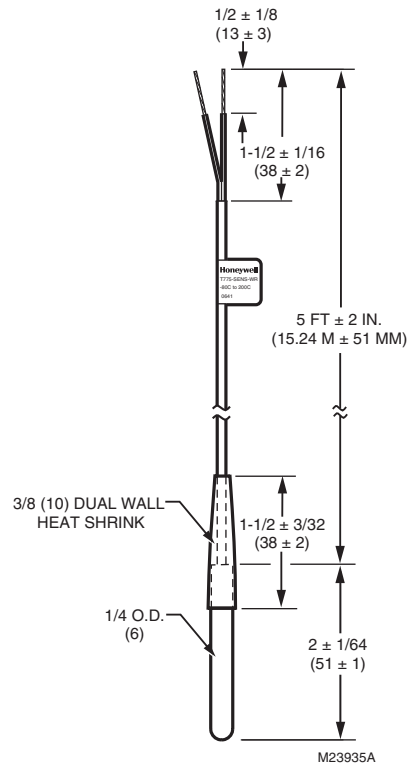


Fig. 2. T775-SENS-WR Dimensions in Inches (mm).

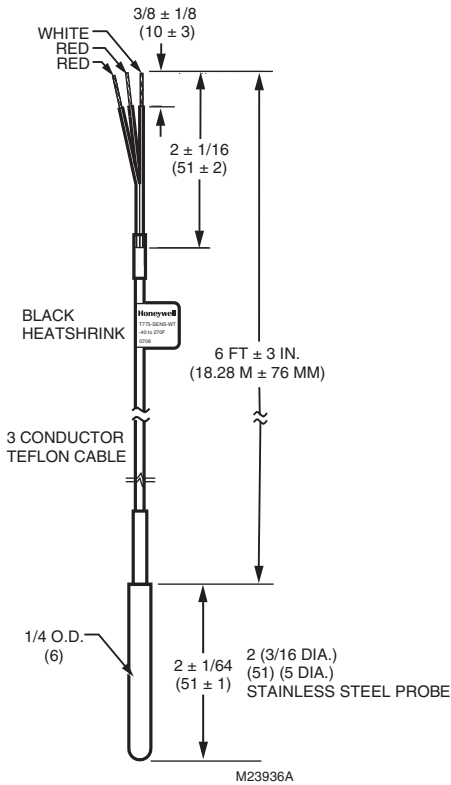


Fig. 3. T775-SENS-WT Dimensions in Inches (mm).

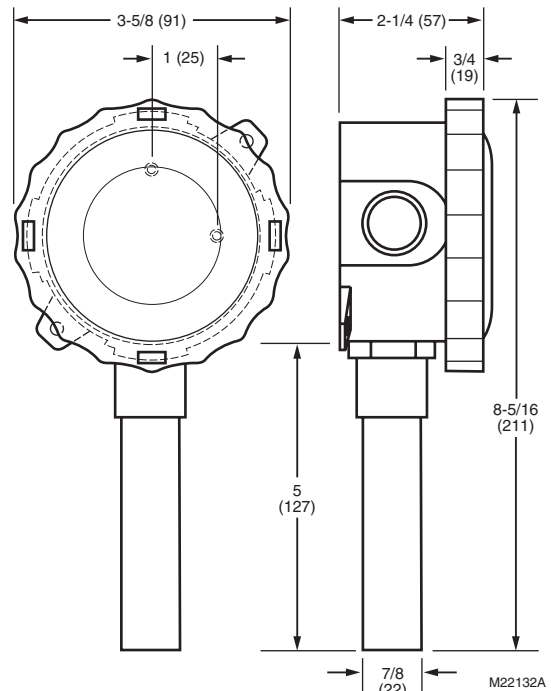


Fig. 4. T775-SENS-OAT Dimensions in Inches (mm).

Submittal Data - Sensors

Analog Economizer Sensors



The C7660 Selectable Outdoor Air Temperature Sensor is used with the W7459, W7215, W7212, W7213 and W7214 Economizer Controls. The economizer controls are mounted on an M7415/M7215 Actuator. They permit the use of outdoor air as the first stage of cooling in heating, ventilating and air conditioning (HVAC) systems.

The C7660 Selectable Temperature Sensor is only to be used with single temperature change over with the sensor located in the outdoor air.

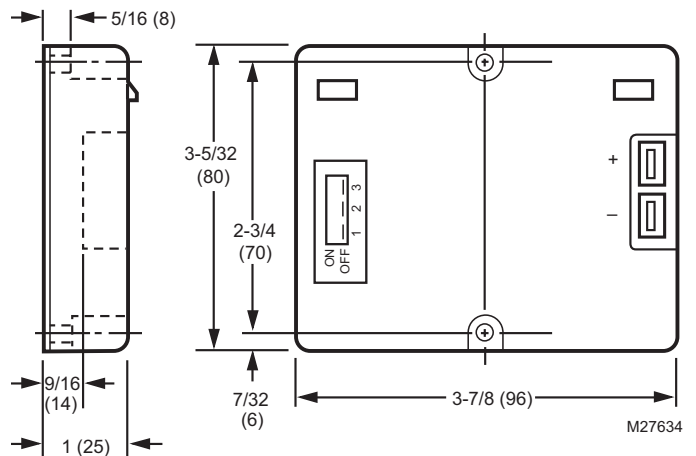
SPECIFICATIONS

Model	C7660 Selectable Temperature Sensor Case: Duct mount Temperature Sensing Element: Thermistor
Output Signal	4mA not OK to economize, 20 mA OK to economize
Operating Ambient Temperature Range	-40° to 149 °F (-40° to 65 °C).
Shipping Temperature Range.....	-40° to 149 °F (-40° to 65 °C).
Supply Voltage	Power to sensor is supplied through economizer or if not used with an economizer, logic power input is 21.6 vdc ± 1.5 vdc.
Electrical Connections	Two 1/4 in. (6.4 mm) quick connect terminals.
Hysteresis.....	Hysteresis +/- 1F; Economizer Cut-in 1F below setpoint, Cut-out 1F above setpoint
Accuracy	+/- 1° F
Approvals	Underwriters Laboratories Inc. Flammability Rating UL94-5V

FEATURES

- Senses temperature of outdoor air and provides a signal to economizer control with OK or not OK to economize.
- Selectable dip switch provides 8 change over temperature options.
- When temperature of outdoor air is below change over temperature, the outdoor air damper is opened to reduce the cooling load in the building.
- Provides 4 OR 20 mA output signal to economizer control; At 4 mA not OK to economize, 20 mA OK to economize.
- Highly accurate microprocessor control.
- Sensor is enclosed in a rugged, corrosion-resistant plastic case.
- Replaces C7650 temperature sensors and the control function of temperature change over in the economizer control.
- Easy to set change real time temperature settings. The installer can change the temperature set point without cutting power to the system.

DIMENSIONS DIAGRAM





The C7046 series of Duct Air Temperature Sensors for analog economizer applications and primary and/or secondary sensors in electronic control systems.

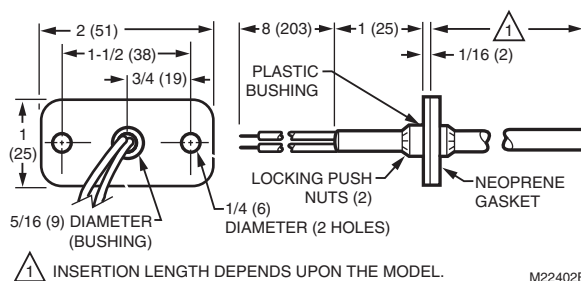
FEATURES

- C7046 Sensors have probe lengths of 6 in. (152 mm), 8 in. (203 mm) and 12 in. (305 mm).
- Carbon type, negative temperature coefficient (NTC) thermistor sensing element in the C7046A,B,C and platinum thin film, positive temperature coefficient (PTC) element in C7046D precisely measures temperature changes.
- No settings or calibration required.
- Solid state components not affected by dust or dirt.
- Fast reacting.
- Rugged stainless steel insertion probe.
- Mounts on duct or plenum surface with mounting flange or in a 2 in. by 4 in. (51 by 102 mm) junction box

SPECIFICATIONS

C7046 Air Temperature Sensor.....	C7046A used with W973, W7210, W7460 and other controllers; C7046B used with W7080; C7046C used with W973; and C7046D used with Excel controllers and T775 series 2000.
Mounting	Integral mounting flange requiring two No. 8 screws.
Sensing Element.....	C7046A,B,C: Carbon type, thermistor-resistor element, C7046D platinum thin film element, 1/4" (6 mm) diameter
Maximum Ambient Temperature	250 °F (121 °C).
Operating Temperature Range	40 to 150 °F (4 to 66 °C).
Wiring Connections	6 in. (152 mm) leadwires.
Performance Characteristics.....	Reaction Time Constant with Air Approach Velocity of 500 ft/min (2 m/sec): C7046A: 100 seconds. C7046A,C: Nominal Resistance: 3000 ohms at 77 °F (25 °C) Nominal Sensitivity: 70 ohms per degree F (124 ohms per degree C) at midrange. C7046B: 22.8K ohms NTC at 77F C7046D: 1097 ohms PTC at 77F
Resistance/Temperature (NTC)	

DIMENSIONS DIAGRAM



M22402B

Submittal Data - Sensors

Analog Economizer Sensors



The C7400A Enthalpy Sensor is used with the economizer logic modules with the A,B,C and D performance curves. The sensors combined with the economizer logic modules permit the use of outdoor air as the first stage of cooling in heating, ventilating and air conditioning (HVAC) systems.

SPECIFICATIONS

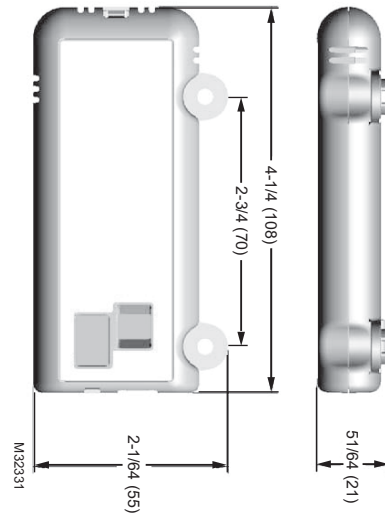
C7400A enthalpy sensor for use with economizer logic modules with A,B,C, and D performance curves.

Output Signal	4 to 20 mA current signal increases from 4 mA to 20 mA as enthalpy decreases.
Ambient Temperature Ranges.....	Shipping: -40 °F to 150 °F (-40 °C to 66 °C) Operating: 32 °F to 125 °F (0 °C to 52 °C)
Maximum Power Consumption.....	0.8VA maximum at 40Vdc 20mA
Supply Voltage	12 to 40 Vdc
Electrical Connections	Two 1/4 in. (6 mm) quick connect terminals.
Approvals	Underwriters Laboratories Inc. Flammability Rating UL94-5V

FEATURES

- Senses and combines temperature and humidity of outdoor air.
- Long lasting thermistor sensing element is accurate and stable over time.
- As enthalpy of outdoor air increases, the outdoor air damper closes to a preset minimum position.
- As enthalpy of outdoor air becomes low, the outdoor air damper opens to reduce the mechanical cooling load in the building.
- Maximum economizer savings is achieved when two C7400 Enthalpy Sensors are used for differential enthalpy changeover control.
- Compact size and lightweight construction allow easy mounting in HVAC rooftop unit.
- Sensor is enclosed in a rugged, corrosion-resistant glass fiber reinforced plastic duct-mount case.
- Provides a 4 to 20 mA output signal to Economizer Logic Module; setpoint is located on the logic module.

DIMENSIONS DIAGRAM



Communicating Economizer Sensors



The sensors are part of the JADE™ Economizer System (Model W7220) that permit the use of outdoor air as the first stage of cooling in heating, ventilating and air conditioning (HVAC) systems. With Spyder system, the C7400S1010 communicates temperature and humidity via Sylk to the controller.

The C7400S Sylk Bus sensor is a combination temperature and humidity sensor, which is intended to be used in commercial rooftop units for sensing air. The sensor is powered by and communicates on the Sylk Bus. The C7400S communicates temperature and humidity separately digitally on the Sylk Bus Communication Protocol. The JADE Economizer controller provides power and communications on the Sylk Bus for the C7400S Sylk Bus sensor.

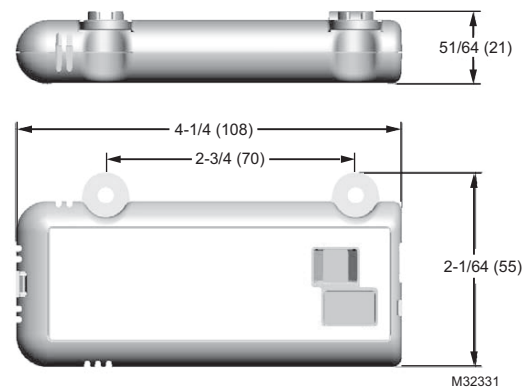
FEATURES

- This unit mounted C7400S enthalpy sensor includes solid state temperature and humidity sensors.
- Outputs a digital communicating signal on a two-wire Sylkbus communications link, reporting the temperature and humidity separately to the controller.
- The controller then determines the enthalpy (total heat), enabling economizer modes of operation when outside air enthalpy is suitable for free cooling.
- Enthalpy sensors are compatible with Honeywell economizer systems.
- The enthalpy boundary curve is programmed via the controller. When the temperature and humidity are determined to be suitable based on the relationship to the boundary, the controller allows outside air for economizing
- Ambient temperature operating range from -40° to 150° F.
- Dual enthalpy sensors in outside air and return switches the controllers to economizer mode of operation anytime the outside enthalpy is less than the return air enthalpy. UL recognized component (Guide info XAPX).
- Select the C7400S1010 for use with the Spyder Controller to communicate temperature and humidity to your building automation system via Sylk.

SPECIFICATIONS

Supply Voltage	7 to 21 Vdc
Power Consumption.....	5 mA
Output Rating.....	75 ohm load switched at 9600 Baud
Wiring: Sylk Bus	2-wire (18 to 22 AWG)
Operating Temperature range	-40 to 150 °F (-40 to 65 °C)
Storage Temperature range	-40 to 150 °F (-40 to 65 °C)
Shipping Temperature range	-40 to 150 °F (-40 to 65 °C)
Operating Relative Humidity range.....	5% to 95% RH noncondensing
Temperature and Humidity, C7400S:	Temperature sensing range: -40 to 150 °F (-40 to 65 °C)
	Humidity sensing range: 0 to 100% RH with 5% accuracy.
Height	0.8 inches (20.5 mm)
Width	2.17 inches (55 mm)
Length	4.25 inches (108 mm)
Weight	0.58 lb. (0.265 kg)
Approvals	EN61000-6-3;EN61000-3-2;EN61000-3-3;EN61000-6-1; EN60730-1; Annex H.23 (emissions); Annex H.26 (immunity); CE Mark

DIMENSIONS DIAGRAM



Submittal Data - Sensors

Communicating Economizer Sensors

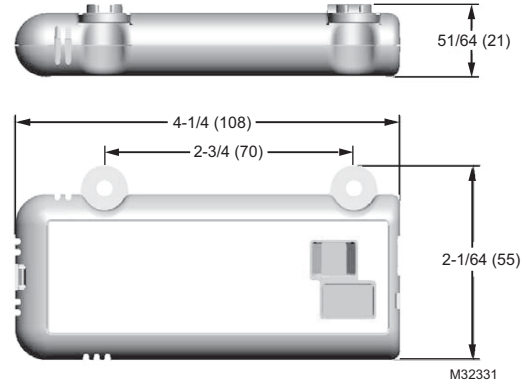


The C7250 Temperature sensor is designed for use as a 20k input to a controller for mixed air or discharge air temperature in rooftop packaged air conditioning equipment. Compatible with the JADE™ Economizer System (Model W7220) which provides power and communications for the C7250 temperature sensor.

FEATURES

- This unit mounted C7250A temperature sensor utilizes a 20K NTC sensor.
- Compatible with Honeywell W7220 JADE economizer controller

DIMENSIONS DIAGRAM



SPECIFICATIONS

Output Rating	20K ohms at 77 °F (25 °C), NTC
Wiring	2-wire (18 to 22 AWG)
Operating Temperature range	-40 to 150 °F (-40 to 65 °C)
Storage Temperature range	-40 to 150 °F (-40 to 65 °C)
Shipping Temperature range	-40 to 150 °F (-40 to 65 °C)
Temperature, C7250	Temperature sensing range: 0 to 150 °F (18 to 65 °C)
Height	0.8 inches (20.5 mm)
Width	2.17 inches (55 mm)
Length	4.25 inches (108 mm)
Weight	0.58 lb. (0.265 kg)
Approvals	EN61000-6-3, EN61000-3-2; EN61000-3-3; EN61000-6-1; EN60730-1 Annex H.23 (emissions); Annex H.26 (immunity); CE Mark FOR EU



The C7130A Wall-Mount Air Temperature Sensors provide indoor air temperature input required by the R7380J,L Indicating Controller, W7100 Discharge Controller, W7600 Direct Digital Controller and the W7620 Direct Digital Controller.

C7130B Wall-Mount Temperature Sensor provides indoor air input to the Excel 500 Controller.

SPECIFICATIONS

Dimensions (in.)	2 13/16 in. high x 4 5/8 in. wide
Dimensions (mm)	71.4mm high x 118 mm wide
Mounting	Wall mount
Sensor PT3000	3484 ohms @ 77 F PTC
Operating Temperature Range (F)	-40 F to +100 F
Operating Temperature Range (C)	-40 C to +38 C
Shipping and Storage Temperature Range (F)	-40 F to +150 F
Shipping and Storage Temperature Range (C)	-40 C to +65 C
Ambient Temperature Range (F)	150 F
Maximum Ambient Temperature Range (C)	66 C Maximum
Approvals	EN61000-6-3; EN61000-3-2; EN61000-3-3; EN61000-6-1; EN60730-1 Annex H.23 (emissions); Annex H.26 (immunity); CE Mark FOR EU

Submittal Data - Sensors

Immersion Temperature Sensors



FEATURES

- C7021D, C7023D, C7031D, C7041D for immersion mounted water temperature sensing
- Solid state components not affected by dust or dirt

SPECIFICATIONS

See Table 1 and 2 for additional specifications.

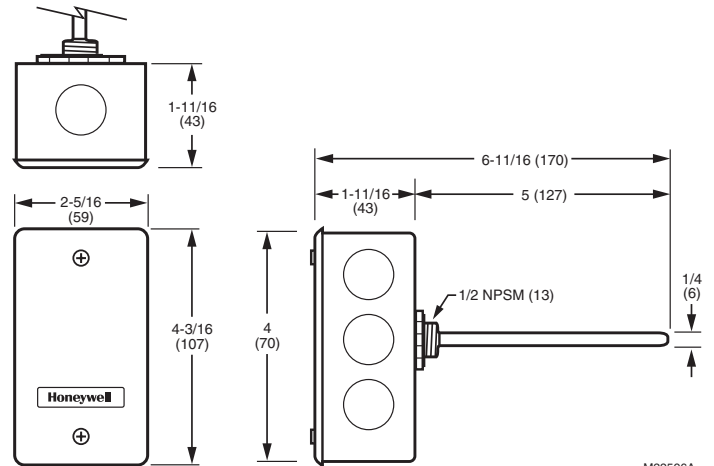
Compatibility.....Use Series 2000 C7031, C7041 Temperature Sensors with Excel 10, 15, 80, 100, and 500 controllers. Series 2000 C7031D sensors are compatible with various Honeywell controllers. Series 2000 C7021 temperature sensors are compatible with TB7600, TB7300 and TB7200 communicating thermostats. Series 2000 C7023 temperature sensors are compatible with WEBS-AX I/O modules

Sensor Accuracy ± 0.36 °F at 77 °F (± 0.2 °C at 25 °C) for 20K ohm NTC sensors and 10K ohm NTC Type II and Type III sensors.

APPLICATION

The Series 2000 Electronic Temperature Sensors are designed for use with electronic controllers in domestic or commercial heating and cooling systems.

DIMENSIONS DIAGRAM



M22596A

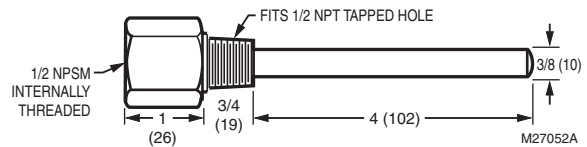


Fig. 1. 5-inch Stainless-Steel Immersion Well.

Submittal Data - Sensors

Immersion Temperature Sensors

Table 1: Specifications

Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
C7021D2001	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	5" w/wiring enclosure, use well 50001774-001
C7023D2001	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	5" w/wiring enclosure, use well 50001774-001
C7031D2003	PT1000	1097K	40° to 350° F	5" w/wiring enclosure, use well 50001775-001
C7041D2001	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	5" w/wiring enclosure, use well 50001774-001

Table 2: Sensor Resistance

	Typical Resistance (in ohms)			
	C7021 Sensors (10K Ohm NTC Type II)	C7023 Sensors (10K Ohm NTC Type III)	C7031 Sensors (1097 Ohms PTC)	C7041 Sensors (20K ohm NTC)
At 41°F (5°C)	25,392	23,467	1,020	54,200
At 50°F (10°C)	19,901	18,789	1,039	41,758
At 59°F (15°C)	15,712	15,137	1,059	32,427
At 68°F (20°C)	12,493	12,268	1,078	25,370
At 77°F (25°C)	10,000	10,000	1,097	20,000
At 86°F (30°C)	8,057	8,196	1,117	15,856
At 95°F (35°C)	6,531	6,754	1,136	12,654

Submittal Data - Sensors

Outdoor Air Temperature Sensors



FEATURES

- C7021F, C7023F, C7031G, C7041F sense outdoor air temperature and are weatherproof for outdoor use (knockouts allow for 1/2 in. conduit connection).
- Solid state components not affected by dust or dirt

SPECIFICATIONS

See Table 1 and 2 for additional specifications.

Compatibility.....	Use Series 2000 C7031, C7041 Temperature Sensors with Excel 10, 15, 80, 100 and 500 controllers. Series 2000 C7031G sensors are compatible with various Honeywell controllers. The C7031F2014 is compatible with the T7350 Commercial Thermostat Series 2000 C7021 temperature sensors are compatible with TB7600, TB7300 and TB7200 communicating thermostats. Series 2000 C7023 temperature sensors are compatible with WEBS-AX I/O module
Sensor Accuracy	± 0.36 °F at 77 °F (± 0.2 °C at 25 °C) for 20K ohm NTC sensors and 10K ohm NTC Type II and Type III sensors.

APPLICATION

The Series 2000 Electronic Temperature Sensors are designed for use with electronic controllers in domestic or commercial heating and cooling systems.

DIMENSIONS DIAGRAM

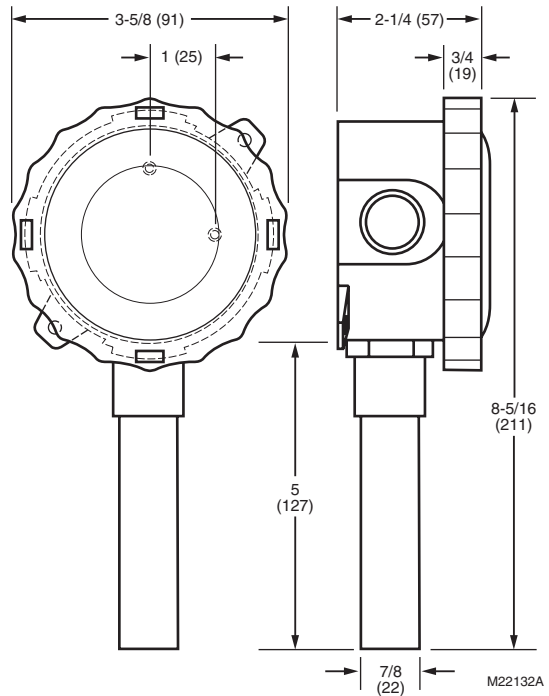


Fig. 1. C7031G, C7021F, C7023F, C7041F Dimensions in Inches (mm).

Submittal Data - Sensors

Outdoor Air Temperature Sensors

Table 1: Specifications

Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
C7021F2009	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 158° F	Outdoor weatherproof, connects to 1/2" conduit
C7023F2009	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 158° F	Outdoor weatherproof, connects to 1/2" conduit
C7031G2014	PT3000	3484 ohms at 77F	-40° to 120° F	Outdoor weatherproof, connects to 1/2" conduit
C7041F2006	20K ohms NTC	20K ohms NTC at 77°F	-40° to 158° F	Outdoor weatherproof, connects to 1/2" conduit

Table 2: Sensor Resistance

	Typical Resistance (in ohms)			
	C7021 Sensors (10K Ohm NTC Type II)	C7023 Sensors (10K Ohm NTC Type III)	C7031 Sensors (1097 Ohms PTC)	C7041 Sensors (20K ohm NTC)
At 41°F (5°C)	25,392	23,467	1,020	54,200
At 50°F (10°C)	19,901	18,789	1,039	41,758
At 59°F (15°C)	15,712	15,137	1,059	32,427
At 68°F (20°C)	12,493	12,268	1,078	25,370
At 77°F (25°C)	10,000	10,000	1,097	20,000
At 86°F (30°C)	8,057	8,196	1,117	15,856
At 95°F (35°C)	6,531	6,754	1,136	12,654

Submittal Data - Sensors

Duct Air Temperature Sensors



FEATURES

- C7021J/R, C7023J/R, C7031J, C7041J/R sense average duct air temperature.
- Solid state components not affected by dust or dirt

SPECIFICATIONS

See Table 1 and 2 for additional specifications.

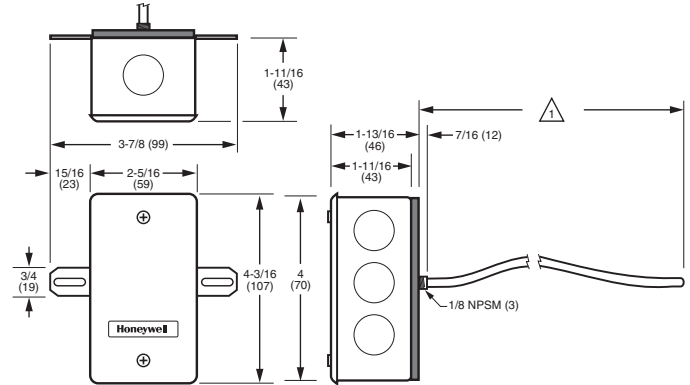
Compatibility.....Use Series 2000 C7031, C7041 Temperature Sensors with Excel 10, 15, 80, 100 and 500 controllers. Series 2000 C7031B,D,G,J sensors are compatible with various Honeywell controllers. The C7031G2014 is compatible with the T7350 Commercial Thermostat. Series 2000 C7021 temperature sensors are compatible with TB7600, TB7300 and TB7200 communicating thermostats. Series 2000 C7023 temperature sensors are compatible with WEBS-AX I/O modules

Sensor Accuracy $\pm 0.36^{\circ}\text{F}$ at 77°F ($\pm 0.2^{\circ}\text{C}$ at 25°C) for 20K ohm NTC sensors and 10K ohm NTC Type II and Type III sensors.

APPLICATION

The Series 2000 Electronic Temperature Sensors are designed for use with electronic controllers in domestic or commercial heating and cooling systems.

DIMENSIONS DIAGRAM



Δ DEPENDING ON THE MODEL, THE ELEMENT LENGTH IS EITHER 12 FT (366 CM) OR 24 FT (732 CM). M22818A

Fig. 1. C7021R, C7023R, C7041R Dimensions in Inches (mm).

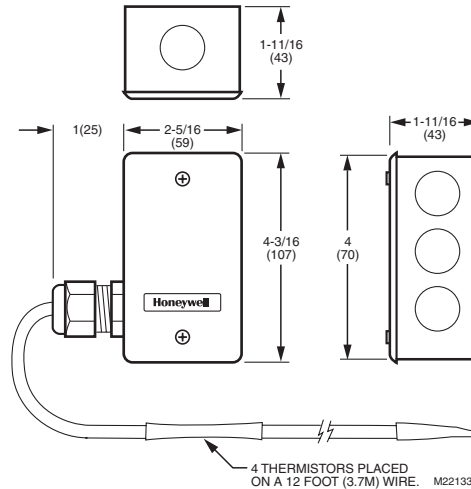


Fig. 2. C7021J, C7023J, C7031J, C7041J Dimensions in Inches (mm).

Submittal Data - Sensors

Duct Air Temperature Sensors

Table 1: Specifications

Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
C7021J2007	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	12' duct averaging w/wiring enclosure
C7021R2000	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	12' duct averaging flexible copper
C7021R2018	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	24' duct averaging flexible copper
C7023J2007	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	12' duct averaging w/wiring enclosure
C7023R2000	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	12' duct averaging flexible copper
C7023R2018	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	24' duct averaging flexible copper
C7031J2009	PT1000	1097 ohms PTC at 77F	40° to 180° F	12' duct averaging flexible copper
C7041J2007	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	12 ft. Duct (Averaging) w/wiring enclosure
C7041R2000	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	12 ft. Duct flexible copper (Averaging)
C7041R2018	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	24 ft. Duct flexible copper (Averaging)

Table 2: Sensor Resistance

	Typical Resistance (in ohms)			
	C7021 Sensors (10K Ohm NTC Type II)	C7023 Sensors (10K Ohm NTC Type III)	C7031 Sensors (1097 Ohms PTC)	C7041 Sensors (20K ohm NTC)
At 41°F (5°C)	25,392	23,467	1,020	54,200
At 50°F (10°C)	19,901	18,789	1,039	41,758
At 59°F (15°C)	15,712	15,137	1,059	32,427
At 68°F (20°C)	12,493	12,268	1,078	25,370
At 77°F (25°C)	10,000	10,000	1,097	20,000
At 86°F (30°C)	8,057	8,196	1,117	15,856
At 95°F (35°C)	6,531	6,754	1,136	12,654

Submittal Data - Sensors

Duct Air Temperature Sensors



FEATURES

- C7021B/C, C7023B/C, C7031B, C7041B/C sense duct air temperature.
- Solid state components not affected by dust or dirt

SPECIFICATIONS

See Table 1 and 2 for additional specifications.

Compatibility.....	Use Series 2000 C7031, C7041 Temperature Sensors with Excel 10, 15, 80, 100 and 500 controllers. Series 2000 C7031B sensors are compatible with various Honeywell controllers. Series 2000 C7021 temperature sensors are compatible with TB7600, TB7300 and TB7200 communicating thermostats. Series 2000 C7023 temperature sensors are compatible with WEBS-AX I/O modules
Sensor Accuracy	$\pm 0.36^{\circ}\text{F}$ at 77°F ($\pm 0.2^{\circ}\text{C}$ at 25°C) for 20K ohm NTC sensors and 10K ohm NTC Type II and Type III sensors.

APPLICATION

The Series 2000 Electronic Temperature Sensors are designed for use with electronic controllers in domestic or commercial heating and cooling systems.

DIMENSIONS DIAGRAM

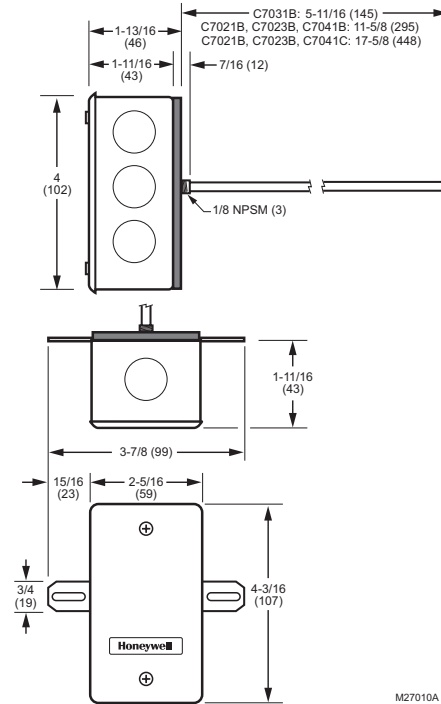


Fig. 1. C7021B/C, C7023B/C Dimensions in Inches (mm).

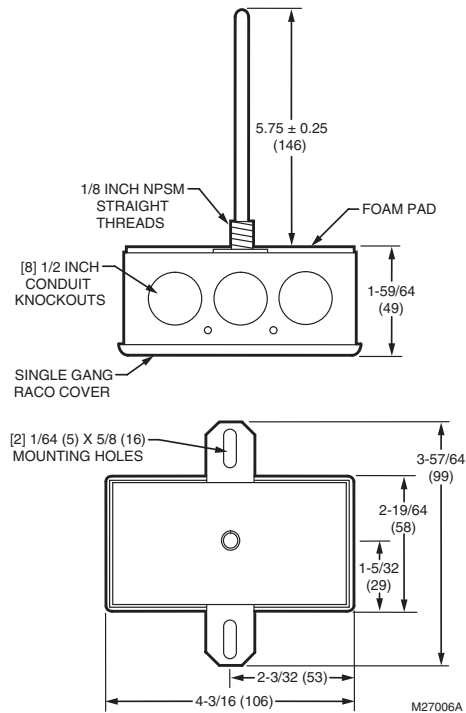


Fig. 2. C7031B Dimensions in Inches (mm).

Submittal Data - Sensors

Duct Air Temperature Sensors

Table 1: Specifications

Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
C7021B2005	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	6" duct w/wiring enclosure
C7021B2013	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	12" duct w/wiring enclosure
C7021C2003	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	18" duct w/wiring enclosure
C7023B2005	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	6" duct w/wiring enclosure
C7023B2013	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	12" duct w/wiring enclosure
C7023C2003	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	18" duct w/wiring enclosure
C7031B2005	PT1000	1097K ohms NTC at 77F	-40° to 250° F	6" duct w/wiring enclosure
C7041B2005	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	6" duct w/wiring enclosure
C7041B2013	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	12" duct w/wiring enclosure
C7041C2003	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	18" duct w/wiring enclosure

Table 2: Sensor Resistance

	Typical Resistance (in ohms)			
	C7021 Sensors (10K Ohm NTC Type II)	C7023 Sensors (10K Ohm NTC Type III)	C7031 Sensors (1097 Ohms PTC)	C7041 Sensors (20K ohm NTC)
At 41°F (5°C)	25,392	23,467	1,020	54,200
At 50°F (10°C)	19,901	18,789	1,039	41,758
At 59°F (15°C)	15,712	15,137	1,059	32,427
At 68°F (20°C)	12,493	12,268	1,078	25,370
At 77°F (25°C)	10,000	10,000	1,097	20,000
At 86°F (30°C)	8,057	8,196	1,117	15,856
At 95°F (35°C)	6,531	6,754	1,136	12,654

Submittal Data - Sensors

Strap-On Water Temperature Sensors



FEATURES

- C7021K, C7023K, C7041K with strap-on mounting senses water temperature.
- Solid state components not affected by dust or dirt

SPECIFICATIONS

See Table 1 and 2 for additional specifications.

Compatibility.....Use Series 2000 C7041 Temperature Sensors with Excel 10, 15, 80, 100, and 500 controllers. Series 2000 C7021 temperature sensors are compatible with TB7600, TB7300 and TB7200 communicating thermostats.

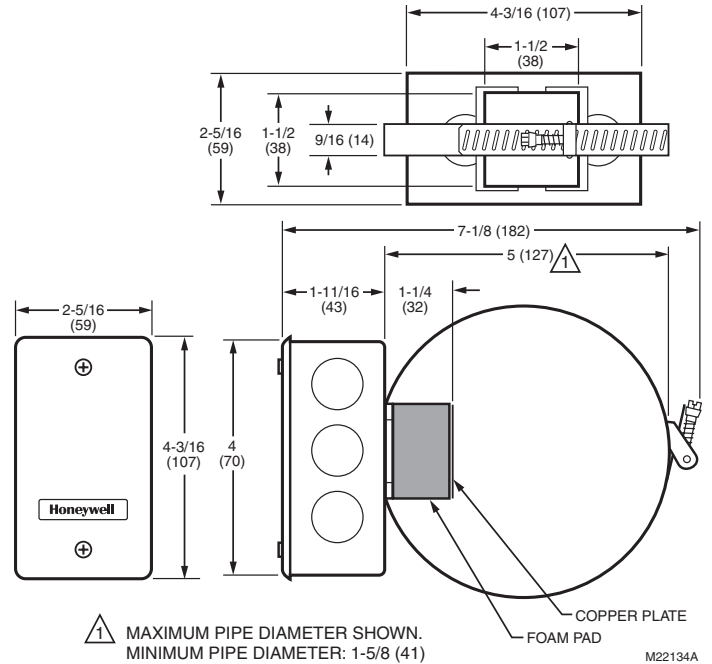
Series 2000 C7023 temperature sensors are compatible with WEBS-AX I/O modules

Sensor Accuracy $\pm 0.36^{\circ}\text{F}$ at 77°F ($\pm 0.2^{\circ}\text{C}$ at 25°C) for 20K ohm NTC sensors and 10K ohm NTC Type II and Type III sensors.

APPLICATION

The Series 2000 Electronic Temperature Sensors are designed for use with electronic controllers in domestic or commercial heating and cooling systems.

DIMENSIONS DIAGRAM



Submittal Data - Sensors

Strap-On Water Temperature Sensors

Table 1: Specifications

Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
C7021K2005	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	Strap-on pipe sensor with wiring enclosure
C7023K2005	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	Strap-on pipe sensor with wiring enclosure
C7041K2005	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	Strap-on with wiring enclosure

Table 2: Sensor Resistance

	Typical Resistance (in ohms)		
	C7021 Sensors (10K Ohm NTC Type II)	C7023 Sensors (10K Ohm NTC Type III)	C7041 Sensors (20K ohm NTC)
At 41°F (5°C)	25,392	23,467	54,200
At 50°F (10°C)	19,901	18,789	41,758
At 59°F (15°C)	15,712	15,137	32,427
At 68°F (20°C)	12,493	12,268	25,370
At 77°F (25°C)	10,000	10,000	20,000
At 86°F (30°C)	8,057	8,196	15,856
At 95°F (35°C)	6,531	6,754	12,654

Submittal Data - Sensors

Air or Water Temperature Sensor Probe



APPLICATION

The Series 2000 Electronic Temperature Sensors are designed for use with electronic controllers in residential or commercial heating and cooling systems.

FEATURES

- C7021N, C7023N, C7041N probe senses water or air temperature.
- Solid state components not affected by dust or dirt

SPECIFICATIONS

See Table 1 and 2 for additional specifications.

Compatibility.....	Use Series 2000 C7041 Temperature Sensors with Excel 10, 15, 80, 100 and 500 controllers. Series 2000 C7021 temperature sensors are compatible with TB7600, TB7300 and TB7200 communicating thermostats. Series 2000 C7023 temperature sensors are compatible with WEBS-AX I/O modules
Sensor Accuracy	$\pm 0.36^{\circ}\text{F}$ at 77°F ($\pm 0.2^{\circ}\text{C}$ at 25°C) for 20K ohm NTC sensors and 10K ohm NTC Type II and Type III sensors.

Table 1: Specifications

Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
C7021N2001	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	Probe Sensor with 6' Lead
C7023N2001	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	Probe Sensor with 6' Lead
C7041N2020	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	Probe Sensor with 6' Lead

Table 2: Sensor Resistance

	Typical Resistance (in ohms)		
	C7021 Sensors (10K Ohm NTC Type II)	C7023 Sensors (10K Ohm NTC Type III)	C7041 Sensors (20K ohm NTC)
At 41°F (5°C)	25,392	23,467	54,200
At 50°F (10°C)	19,901	18,789	41,758
At 59°F (15°C)	15,712	15,137	32,427
At 68°F (20°C)	12,493	12,268	25,370
At 77°F (25°C)	10,000	10,000	20,000
At 86°F (30°C)	8,057	8,196	15,856
At 95°F (35°C)	6,531	6,754	12,654

DIMENSIONS DIAGRAM

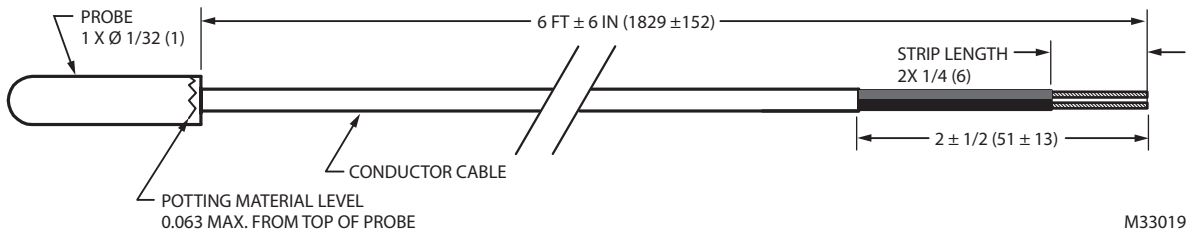


Fig. 1. C7021N, C7023N, C7041N Dimensions in Inches (mm).

Submittal Data - Sensors

Air Temperature Sensor



APPLICATION

The Series 2000 Electronic Temperature Sensors are designed for use with electronic controllers in domestic or commercial heating and cooling systems.

FEATURES

- C7021P, C7023P, C7041P senses air temperature.
- Solid state components not affected by dust or dirt

SPECIFICATIONS

See Table 1 and 2 for additional specifications.

Compatibility.....	Use Series 2000 C7041 Temperature Sensors with Excel 10, 15, 80, 100 and 500 controllers. Series 2000 C7021 temperature sensors are compatible with TB7600, TB7300 and TB7200 communicating thermostats. Series 2000 C7023 temperature sensors are compatible with WEBS-AX I/O modules
Sensor Accuracy	$\pm 0.36^{\circ}\text{F}$ at 77°F ($\pm 0.2^{\circ}\text{C}$ at 25°C) for 20K ohm NTC sensors and 10K ohm NTC Type II and Type III sensors.

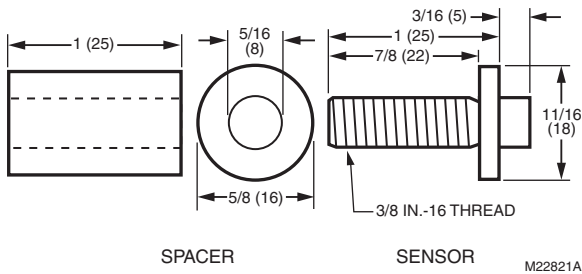
Table 1: Specifications

Part Number	Sensing Element	Resistance	Operating Range	Mounting and Application
C7021P2004	10K ohms NTC Type II	10K ohms NTC at 77°F	-40° to 250° F	Small metal button sensor
C7023P2004	10K ohms NTC Type III	10K ohms NTC at 77°F	-40° to 250° F	Small metal button sensor
C7041P2004	20K ohms NTC	20K ohms NTC at 77°F	-40° to 250° F	Small metal button sensor

Table 2: Sensor Resistance

	Typical Resistance (in ohms)		
	C7021 Sensors (10K Ohm NTC Type II)	C7023 Sensors (10K Ohm NTC Type III)	C7041 Sensors (20K ohm NTC)
At 41°F (5°C)	25,392	23,467	54,200
At 50°F (10°C)	19,901	18,789	41,758
At 59°F (15°C)	15,712	15,137	32,427
At 68°F (20°C)	12,493	12,268	25,370
At 77°F (25°C)	10,000	10,000	20,000
At 86°F (30°C)	8,057	8,196	15,856
At 95°F (35°C)	6,531	6,754	12,654

DIMENSIONS DIAGRAM



Submittal Data - Sensors

Current Switches, CSS & CSP



FEATURES

- Very low operating trip points
- LED status indication
- Integral DIN-rail mounting flange
- Easy wiring, polarity insensitive
- Accepts up to a 350 MCM (17.3 mm) cable
- Operates up to 200 or 250 continuous amps
- RoHS and WEEE compliant
- Limited five-year warranty

SPECIFICATIONS

Sensor Power.....	Induced from monitored conductor
Amperage Rating.....	0 to 200 Amps and 0 to 250 Amps (See Table 1)
Operating Frequency Range.....	40 Hz to 1 kHz
Isolation Voltage.....	2220 Vac
Max Sensing Current Voltage.....	600 Vac
Output Switch Rating.....	CSS-O; CSP-O: 0.3 Amps @ 200 Vac/Vdc CSS-C; CSP-C: 0.15 Amps @ 300 Vac/Vdc
Adjustable Trip Point (Setpoint).....	See Table 1
Hysteresis (Dead Band).....	10% Setpoint, typical
Status Indication.....	Red LED - Above Trip Point Green LED - Below Trip Point
Aperture (Hole) Size.....	3/4 in. (19 mm), Accepts up to 350 MCM (17.3 mm) cables
DIN Rail Size.....	1-3/8 in. (35 mm)
Unit Weight.....	CSS: 0.21 lb (0.1 kg) CSP: 0.23 lb (0.1 kg)
Enclosure Rating/Color.....	UL94-5VB/Burgundy
Operating Temperature Range.....	5° to 104 °F (-15° to 40 °C)
Operating RH Range.....	0 to 95% RH, non-condensing
Approvals.....	Underwriters Laboratories, Inc.: Flammability Rating UL94-5V; CE
Environmental Compliance.....	RoHS-Directive 2002/95/EC WEEE-Directive 2002/96/EC

APPLICATION

The CSS solid-core and the CSP split-core current switches have either Normally-Open (N.O.) or Normally-Closed (N.C.) output configurations. All of these sensors will have a solidstate output with an adjustable trip point (setpoint). These current switches are ideal for providing status information on any type of AC current using equipment. The CSS series current switches are an excellent choice for new installations. The CSP series current switches are ideal for retrofit or existing installations since it is not necessary to power down the unit and disconnect any wires during the installation process. The CSS and CSP current switches are accurate, reliable, easy to install and require less servicing than differential pressure switches, flow switches and paddle wheels.

These current switches should be used in applications in which a current switch with adjustable trip point is required. A current switch can be used to monitor fan and pump status, motors, compressors and electrical equipment for proper operation. A change in the operating current may indicate motor failure, belt loss/slippage or mechanical failure. Any time one of these events occur the current can significantly increase or decrease, thus tripping the sensor and notifying building management of an alarm condition.

The CSS and CSP series current switches can be used to monitor devices with a maximum continuous operating current of up to 200 or 250 Amps depending on the model. These switches will not need to be externally powered since the power for the switch is induced from the conductor being monitored. Another great feature of the CSS and CSP series current switches is that they include both a red and green LED that will indicate the "Status" of the switch contacts. All of these units come with a unique 1-3/8 in. (35 mm) DIN-rail mounting flange and a limited five-year warranty.

Table 1. Operating Specifications

Product Number	Core Type	Normal Position	Trip Point	Output Switch Rating	Max. Current Cont.	Max. Current for 1 sec.
CSS-O-F5-001	Solid	N/O	0.5 A	0.3 A at 200 Vac/Vdc	250 A	1000 A
CSS-O-F1-001	Solid	N/O	0.2 A	0.3 A at 200 Vac/Vdc	250 A	1000 A
CSS-C-F5-001	Solid	N/C	1.0 A	0.15 A at 300 Vac/Vdc	250 A	1000 A
CSS-C-F1-001	Solid	N/C	0.5 A	0.15 A at 300 Vac/Vdc	250 A	1000 A
CSS-O-A300-001	Solid	N/O	1.0 A to 250 A	0.3 A at 200 Vac/Vdc	250 A	1000 A
CSS-O-A200-001	Solid	N/O	0.5 A to 250 A	0.3 A at 200 Vac/Vdc	250 A	1000 A
CSP-O-F15-001	Split	N/O	2.5 A	0.3 A at 200 Vac/Vdc	200 A	800 A
CSP-O-F10-001	Split	N/O	1.5 A	0.3 A at 200 Vac/Vdc	200 A	800 A
CSP-O-A300-001	Split	N/O	3.0 A to 200 A	0.3 A at 200 Vac/Vdc	200 A	800 A
CSP-O-A200-001	Split	N/O	2.0 A to 200 A	0.3 A at 200 Vac/Vdc	200 A	800 A
CSP-C-A200-001	Split	N/C	2.5 A to 250 A	0.15 A at 300 Vac/Vdc	250 A	800 A

DIMENSIONS DIAGRAM

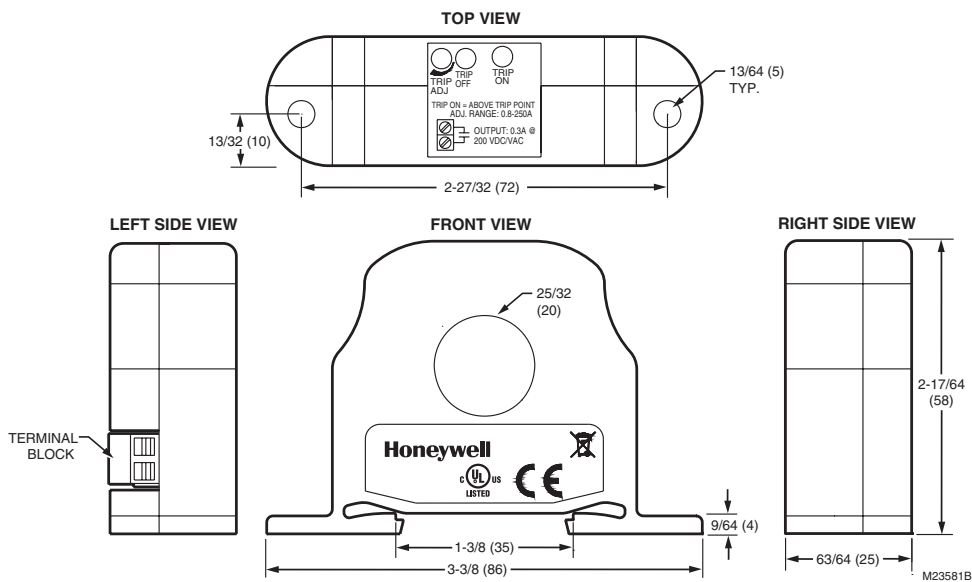


Fig. 1. CSS Current Sensor Dimensions in Inches (mm).

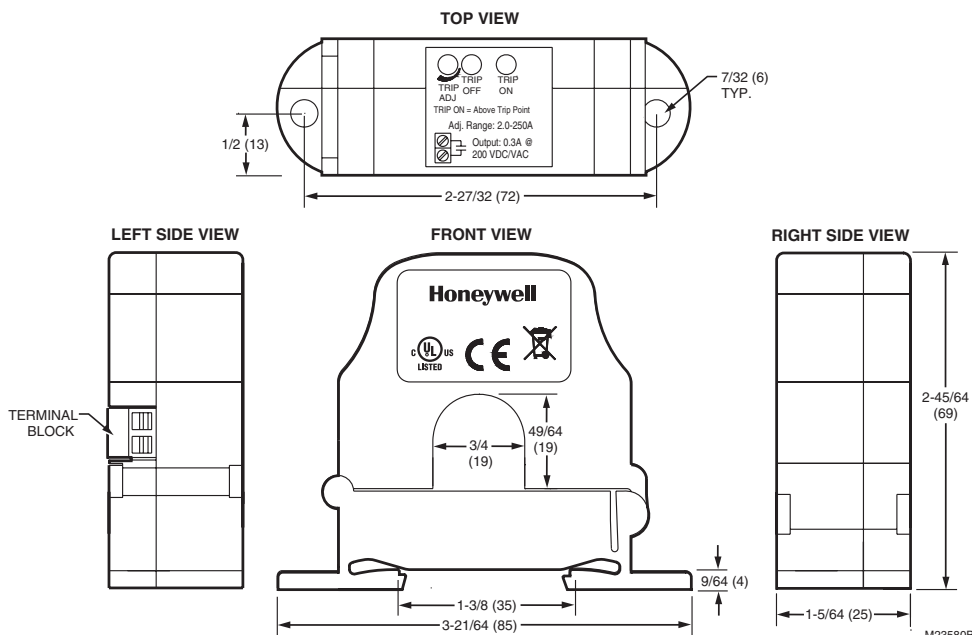


Fig. 2. CSP Current Sensor Dimensions in Inches (mm).

SENSORS

Submittal Data - Sensors

Current Transmitters, CTS & CTP



FEATURES

- Solid and split-core Vdc output current transmitters
- Fast response time
- Integral DIN-rail mounting flange
- Easy wiring, polarity sensitive output
- Accepts up to a 350 MCM (17.3 mm) cable
- Operates up to 250 continuous amps
- Highly accurate
- Five-year limited warranty
- RoHS and WEEE compliant

SPECIFICATIONS

Supply Voltage	Induced from monitored conductor
Output Voltage	CTS-05; CTP-05: 0 to 5 Vdc CTS-10; CTP-10: 0 to 10 Vdc
Amperage Ranges.....	0 to 250 amps
Accuracy	CTS-05: $\pm 1.0\%$ (2 to 100% FSO) CTP-05, CTP-10; CTS-10: $\pm 1.0\%$ (5 to 100% FSO)
Response Time	<100 mS
Load.....	Calibrated into a 1 mohm load
Operating Frequency Range	50 to 600 Hz
Isolation Voltage	2220 Vac
Max Sensing Current Voltage.....	600 Vac
Aperture (Hole) Size	3/4 in. (19 mm), Accepts up to 350 MCM (17.3 mm) cables
DIN Rail Size.....	1-3/8 in. (35 mm)
Unit Weight.....	CTS: 0.22 lbs (0.1 kg) CTP: 0.24 lbs (0.1 kg)
Enclosure Rating/Color	UL94-5VB/Burgundy
Operating Temperature Range	5° to 104°F (-15° to 40°C)
Operating RH Range	0 to 95% RH, non-condensing
Approvals	CE, UL
Environmental Compliance	RoHS-Directive 2002/95/EC WEEE-Directive 2002/96/EC

APPLICATION

The CTS-05,-10 and CTP-05,-10 current sensors monitor the current flowing to electrical equipment or buildings. The magnitude of this current is then converted into a linear and proportional 0 to 5 or 0 to 10 Vdc output signal, which can be monitored by your Building Management, DDC, or PLC controller. The current sensors have jumper selectable input ranges. These current sensors should be used in load trending (current monitoring) type applications. The CTS current sensors are an excellent choice for new installations. The CTP current switches are ideal for retrofit or existing installations since it is not necessary to power down the unit and disconnect any wires during the installation process.

These current sensors are fast acting, reliable, and extremely easy to install. No DIN-rail mounting clips are necessary. All current sensors have an integral DIN-rail mounting flange. The CTS-05,-10 and CTP-05,-10 current sensors are extremely accurate. All of the current sensors are factory calibrated using a NIST Traceable standard and shipped with the jumper placed in the largest jumper selectable range. A span adjustment potentiometer is included for minor field calibration or adjustments. The power for the current transmitter is induced from the conductor being monitored. This means that no external power supply is necessary for the installation of these sensors. The CTS-05,-10 and CTP-05,-10 current sensors come with a limited five-year factory warranty.

Table 1. Operating Specifications

Product Number	Core Type	Normal Position	Trip Point	Output Switch Rating	Max. Current Cont.	Max. Current for 1 sec.	Max. Current for 1 sec.
CTS-20-250-AVG-001	Loop powered current sensor	Solid	4-20 mA	0-100, 0-200, 0-250 A	Adjustable	Yes	Average
CTS-20-250-VFD-001	Loop powered current sensor	Solid	4-20 mA	0-100, 0-200, 0-250 A	Adjustable	Yes	True RmS
CTP-20-200-AVG-001	Loop powered current sensor	Split	4-20 mA	0-100, 0-150, 0-200 A	Adjustable	Yes	Average
CTP-20-050-VFD-001	Loop powered current sensor	Split	4-20 mA	0-10, 0-20, 0-50 A	Adjustable	Yes	True RmS

DIMENSIONS DIAGRAM

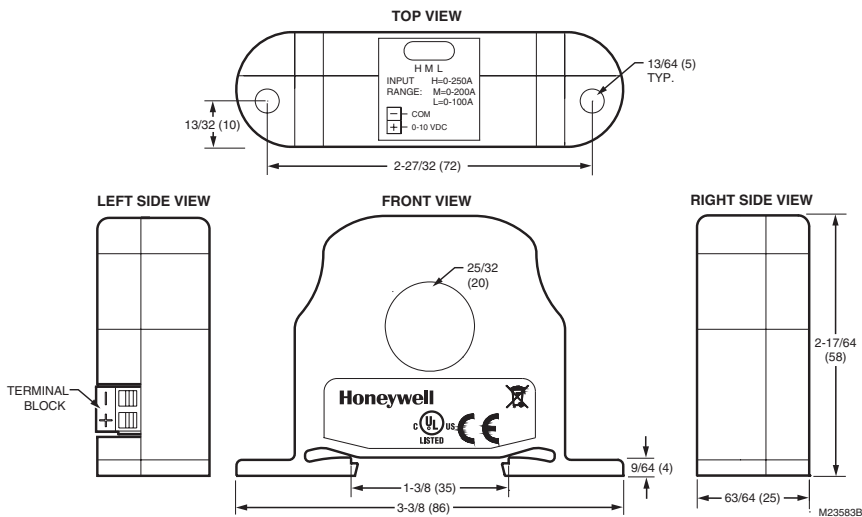


Fig. 1. CTS Current Sensor Dimensions in Inches (mm).

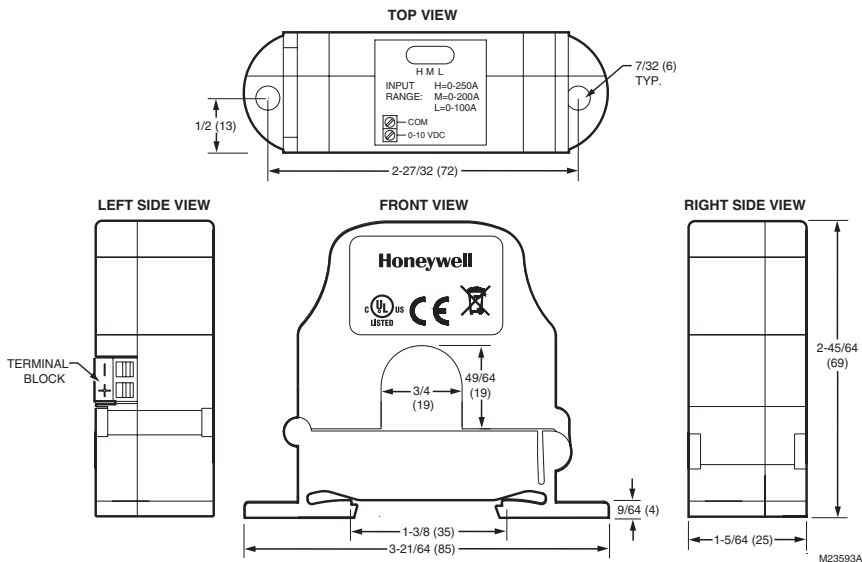


Fig. 2. CTP Current Sensor Dimensions in Inches (mm).

Submittal Data - Sensors

Current Transmitters, CTS & CTP



FEATURES

- Solid or split core loop-powered current transmitters
- Fast response time
- Integral DIN-rail mounting flange
- Easy wiring, polarity sensitive output
- Accepts up to a 350 MCM (17.3 mm) cable
- Operates up to 250 continuous amps
- True RMS versions are available
- Limited five-year warranty
- RoHS and WEEE compliant

SPECIFICATIONS

Sensor Supply Voltage (Vs)	+12 to 30 Vdc
Supply Current	36 mA max
Amperage Ranges	See Table 1
Output	4 to 20 mA, 2-Wire loop powered
Accuracy (from 1-100% of FSO)	CTS-20-AVG, CTP-20-AVG: $\pm 0.5\%$ CTS-20-VFD, CTP-20-VFD: $\pm 0.5\%$
Maximum Load Resistance	CTS-20-AVG, CTP-20-AVG: 700 ohms @ 24 Vdc (Vs-9)/ 0.02-40.2 CTS-20-VFD, CTP-20-VFD: 650 ohms @ 24 Vdc (Vs-10)/ 0.02-40.2
Response Time	CTS-20-AVG, CTP-20-AVG: <75 mS CTS-20-VFD, CTP-20-VFD: <200 m
Operating Frequency Range	30 Hz to 1 kHz
Isolation Voltage	2220 Vac
Max Sensing Current Voltage	600 Vac
Aperture (Hole) Size	3/4 in. (19 mm), Accepts up to 350 MCM (17.3 mm) cables
Dimensions	See Figures 1 and 2
DIN Rail Size	1-3/8 in. (35 mm)
Unit Weight	CTS: 0.22 lbs (0.1 kg) CTP: 0.24 lbs (0.1 kg)
Enclosure Rating/Color	UL94-5VB/Burgundy
Operating Temperature Range	CTS-20-AVG, CTP-20-AVG: 5° to 104° F (-15° to 40° C) CTS-20-VFD, CTP-20-VFD: 32° to 104° F (0° to 40° C)
Operating RH Range	0 to 95% RH, non-condensing
Approvals	CE, UL
Environmental Compliance	02/95/EC WEEE-Directive 2002/96/EC

APPLICATION

The CTS-20 and CTP-20 series current sensors monitor the current flowing to electrical equipment or buildings. The magnitude of this current is then converted into a linear and proportional 4 to 20 mA output signal, which can be monitored by your Building Management, DDC or PLC controller. The current sensors are available in either an average or true RMS output version. All of these sensors have jumper selectable input ranges except for the 0 to 5 Amp input range. These current sensors should be used in load trending (current monitoring) type applications. The CTS-20 series current sensors are an excellent choice for new installations. The CTP-20 series current sensors are ideal for retrofit or existing installations, since it is not necessary to power down the unit and disconnect any wires during the installation process. All of the current sensors are fast acting, reliable and extremely easy to install. No additional DIN-rail mounting clips are necessary, due to the unique design of the integral DIN-rail mounting flange.

The CTS-20 and CTP-20 series current sensors are extremely accurate from 1 to 100% of the FSO (Full Scale Output). All of the current sensors are factory calibrated using a NIST Traceable standard and shipped with the jumper placed in the largest jumper selectable range. In applications where the maximum current is larger than 250 Amps, Honeywell recommends the use of a traditional ratio:5 (5A) current transformer and the CTS-20-005 or CTP-20-005 for best results. The CTS-20 and CTP-20 must be externally powered using a +12 to 30 Vdc power supply. All of the CTS-20 and CTP-20 series current sensors come with a limited five-year factory warranty.

Table 1. Operating Specifications

Product Number	Core Type	Output	Range	Jumper ^a	Max. Current Continuous	Max. Current for 6 secs.
CTS-20-005-AVG-001	Solid	4-20 mA Average	0-5 Amps Fixed	None	100 Amps	125 Amps
CTS-20-050-AVG-001	Solid	4-20 mA Average	0-10 Amps 0-20 Amps 0-50 Amps	Low Middle High	100 Amps 150 Amps 200 Amps	125 Amps 225 Amps 300 Amps
CTS-20-250-AVG-001	Solid	4-20 mA Average	0-100 Amps 0-200 Amps 0-250 Amps	Low Middle High	200 Amps 360 Amps 400 Amps	250 Amps 450 Amps 500 Amps
CTS-20-005-VFD-001 ^b	Solid	4-20 mA True RMS	0-5 Amps Fixed	None	60 Amps	100 Amps
CTS-20-050-VFD-001 ^b	Solid	4-20 mA True RMS	0-10 Amps 0-20 Amps 0-50 Amps	Low Middle High	60 Amps 100 Amps 160 Amps	80 Amps 200 Amps 300 Amps
CTS-20-250-VFD-001	Solid	4-20 mA True RMS	0-100 Amps 0-200 Amps 0-250 Amps	Low Middle High	160 Amps 320 Amps 400 Amps	200 Amps 400 Amps 500 Amps
CTP-20-005-AVG-001	Split	4-20 mA Average	0-5 Amps Fixed	None	100 Amps	125 Amps
CTP-20-050-AVG-001	Split	4-20 mA Average	0-10 Amps 0-20 Amps 0-50 Amps	Low Middle High	100 Amps 150 Amps 200 Amps	125 Amps 225 Amps 300 Amps
CTP-20-200-AVG-001	Split	4-20 mA Average	0-100 Amps 0-150 Amps 0-200 Amps	Low Middle High	135 Amps 180 Amps 250 Amps	200 Amps 300 Amps 400 Amps
CTP-20-005-VFD-001 ^b	Split	4-20 mA True RMS	0-5 Amps Fixed	None	60 Amps	100 Amps
CTP-20-050-VFD-001 ^b	Split	4-20 mA True RMS	0-10 Amps 0-20 Amps 0-50 Amps	Low Middle High	60 Amps 100 Amps 160 Amps	80 Amps 200 Amps 300 Amps
CTP-20-200-VFD-001 ^b	Split	4-20 mA True RMS	0-100 Amps 0-150 Amps 0-200 Amps	Low Middle High	135 Amps 180 Amps 250 Amps	200 Amps 300 Amps 400 Amps

^aAll current sensors are shipped from the factory with the jumper set in the high range.

^bAll VFD models have True RMS outputs and should be used with Variable Frequency Drives.

DIMENSIONS DIAGRAM

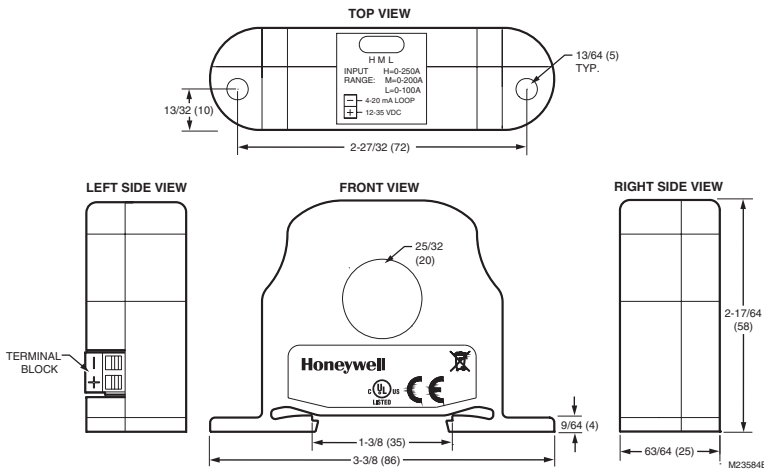


Fig. 1. CTS-20 Current Sensor Dimensions in Inches (mm).

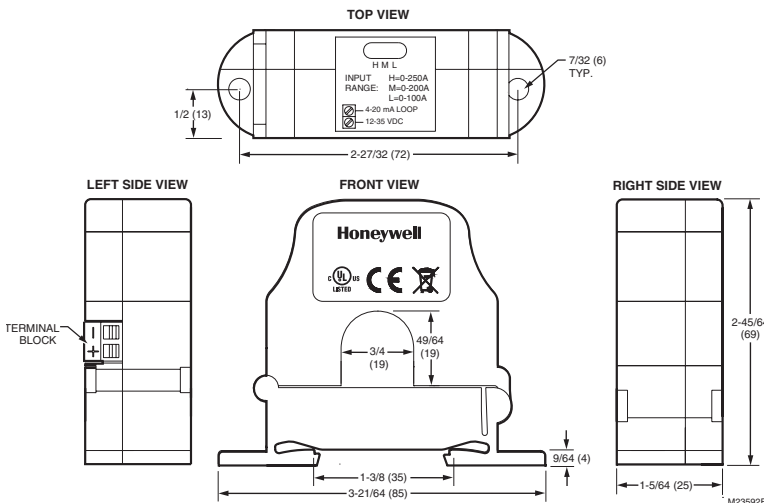


Fig. 2. CTP-20 Current Sensor Dimensions in Inches (mm).

Submittal Data - Sensors

Mini Current Switches, MCSS & MCSP



SPECIFICATIONS

Sensor Power	Induced from monitored conductor
Amperage Rating.....	MCSS-F: 0.20 to 150 Amps MCSP-F: 0.55 to 150 Amps MCSS-A: 0.32 to 150 Amps continuous MCSP-A: 0.70 to 150 Amps continuous
Max. Sensing Current Voltage.....	600 VAC Isolation Voltage: 2,200 VAC
Output Rating	MCSS-F: 0.5 A Continuous, 36 VAC/VDC MCSP-F: 0.5 A Continuous, 36 VAC/VDC MCSS-A: 1.0 A Continuous, 36 VAC/VDC MCSP-A: 1.0 A Continuous, 36 VAC/VDC
Status LED Indication (MCSS-A/MCSP-A models only).....	Red LED: Above Trip Point Blue LED: Under Trip Point NOTE: Do NOT use the LEDs to indicate whether the sensors have power applied to them.
Operating Frequency	50 Hz, 60 Hz
Isolation Voltage	2,200 VAC
Aperture (Hole) Size	MCSS: 0.55" dia., up to 1 AWG cables MCSP: 0.53" dia., up to 1 AWG cables
Trip Point	MCSS-F: Fixed @ below 0.20 A MCSP-F: Fixed @ below 0.55 A
Dimensions (L x W x H).....	MCSS: 2.50" x 1.96" x 0.95" MCSP: 2.65" x 2.35" x 0.95"
Operating Temperature Range.....	-30 to 60 °C (-22 to 140 °F)
Operating Humidity Range.....	0 to 95% RH, non-condensing

APPLICATION

The Honeywell MCSS and MCSP series current switches are miniature "Go/No Go" current status switches designed to provide status information on AC current supplied equipment. The output of these switches uses a N/O solid-state switch (more reliable than a relay) and is non-polarity sensitive.

The MCSS series is an excellent option for new installations where the conductors can be run through the solid-core housing before connecting the wires. The MCSP series are ideal for retrofit applications, since their split-core design allows them to be opened and clamped around the existing wires without disconnecting the current being monitored. Both of these units do not need power supplied to them as they induce the current from the conductors being monitored. The MCSS series has a fixed trip point of below 0.20 A while the MCSP series has a fixed trip point of below 0.55 A. When the current in the conductor exceeds this threshold, the sensor will be "Closed." The sensor will indicate "Open" when the current is interrupted or falls to 0 A. The adjustable switches, MCSS-A and MCSP-A, include two Status LED indicators that will indicate three states: tripped on, current present but below trip point, and current off or below the low end of the adjustable trip point range. Also these adjustable current switches can be used to monitor any change in AC current. A change in current may indicate motor failure, belt loss/slippage, or mechanical failure. Any time one of these events occurs, the current can significantly decrease, thus tripping the current switch and immediately notifying the Building Management System of the failure or problem.

Table 1. Operating Specifications

Model	Core Type	Switch Type	Trip Point	Output Switch Rating	Max. Sensing Current Voltage	Max. Continuous Current	Max. Current for 6 seconds	Max. Current for 1 second
MCSS-F	Solid	Fixed	< 0.20 Amps	0.50 Amp @ 36 VAC/ VDC	600 VAC	158 Amps	240 Amps	600 Amps
MCSP-F	Split	Fixed	< 0.55 Amps					
MCSS-A	Solid	Adjustable	0.32 - 150 Amps	1.00 Amp @ 36 VAC/ VDC	600 VAC	158 Amps	240 Amps	600 Amps
MCSP-A	Split	Adjustable	0.70 - 150 Amps					

DIMENSIONS DIAGRAM

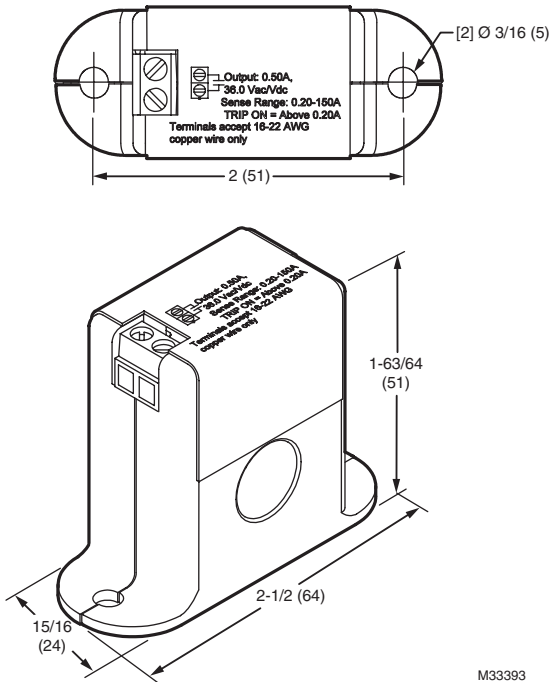


Fig. 1. Dimensions in Inches (mm) of the Solid Core Models MCSS-F and MCSS-A.

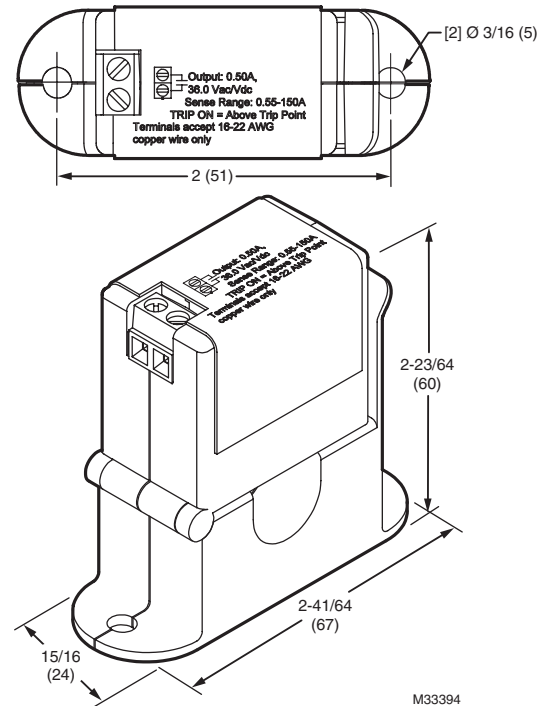


Fig. 2. Dimensions in Inches (mm) of the Split Core Models MCSS-F and MCSS-A.

Submittal Data - Sensors

Command Relays



FEATURES

- 35mm DIN-rail mounting flange
- SPDT Form 1C Relay contacts
- Pilot duty rated
- LED status indication
- Stackable for streamlined installation
- Can be used with any Honeywell analog current sensor or switch

APPLICATION

The CR (Command Relay) Series brings control (start/stop) functionality to your load trending and fan/pump/motor status monitoring applications. Each unit has a Form 1C-SPDT relay which means you have both a N/O and a N/C contact in the same unit. (See Table 1 for output ratings). The 35mm DIN-rail Mounting Flange will allow you to use the CR Series with any Honeywell analog current sensor or switch. The stacking feature will also allow you to reduce the required panel space, since up to two CR Series Command Relays may be stacked together during installation.

The command relays are for use with:

- Motor control
- Lighting applications
- Interposing relay
- Control pumps/compressors
- Appliances/industrial equipment

Table 1. Operating Specifications

Part #	Description	Contact Ratings (All SPDT)	Coils
CR-DC-5A	5 Amp SPDT Relay, 23-31.2 VDC Coil Voltage	5A (NO)/2A(NC) @ 250VAC, 5A(NO)/3A(NC) @ 125VAC	23-31.2VDC, 15mA@24VDC
CR-DC-12A	12 Amp SPDT Relay, 20-31.2 VDC Coil Voltage	12A @ 250VAC, 12A @ 30VDC	20-31.2VDC, 16mA@24VDC
CR-12DC-12A	12 Amp SPDT Relay, 10-15.6 VDC Coil Voltage	12A @ 250VAC, 12A @ 30VDC	10-15.6VDC, 30mA@12VDC
CR-24AC-10A	10 Amp SPDT Relay, 16-26.4 VAC Coil Voltage	10A @ 250VAC, 10A @ 24VDC	16-26.4VAC, 28mA@24VAC
CR-115AC-8A	8 Amp SPDT Relay, 80-132 VAC Coil Voltage	8A @ 250VAC, 8A @ 30VDC	80-132VAC, 10mA@115VAC
CR-230AC-8A	8 Amp SPDT Relay, 165-264 VAC Coil Voltage	8A @ 250VAC, 8A @ 30VDC	165-264VAC, 5mA@230VAC

DIMENSIONS DIAGRAM

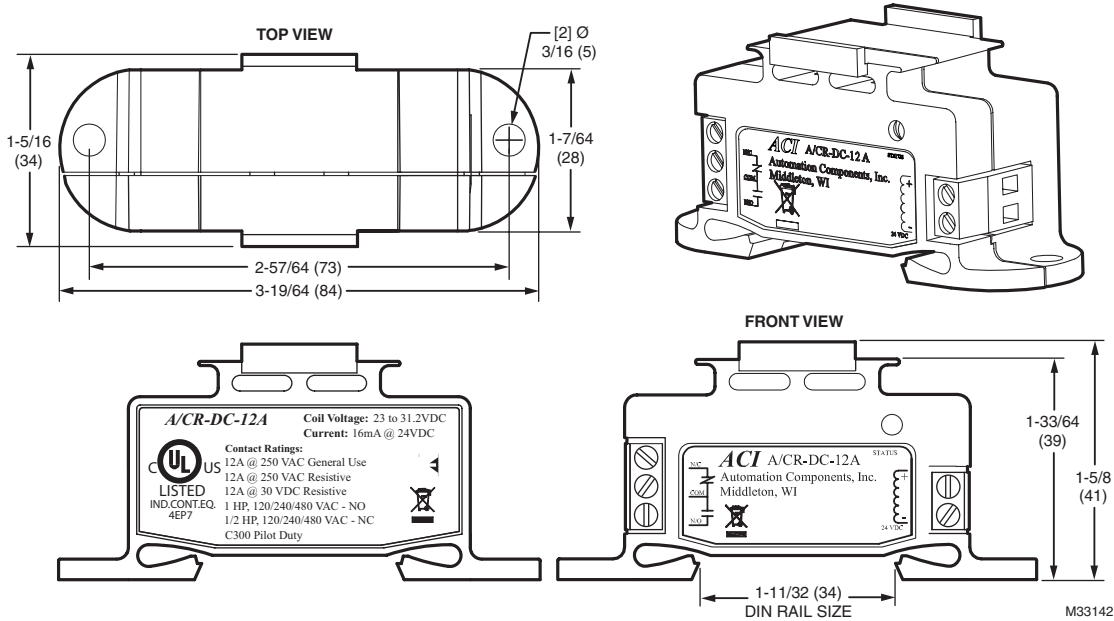


Fig. 1. Dimensions in Inches (mm).

SENSORS

Submittal Data - Sensors

Humidity/Temperature Sensors



FEATURES

- Thermoset polymer capacitive sensing element for high accuracy and fast response
- Multi-layer construction sensing element provides excellent resistance to wetting, dust and common environment
- Highly accurate, repeatable, stable output with negligible hysteresis
- Temperature compensated output
- Zero and span trimmers and increment/decrement recalibration feature.
- All units have selectable 4-20mA, 0-10Vdc, or 0-5Vdc output.

APPLICATION

The H7625, H7635 and H7655 are highly accurate, stable humidity transducers designed for use with HVAC controllers such as the T7350 Thermostat, H775 Remote Humidity Controller, and W7760 Direct Digital Controllers. The multi-layer thermoset polymer capacitive sensing element has stable low-drift performance and fast response time.

SPECIFICATIONS

Operating RH Range	0 to 100% RH.
Humidity Accuracy	±2%, ±3% or ±5% from 20 to 95% RH.
1K Ohm Temperature Accuracy	± (0.15 + 0.002t) C t = actual temperature in C
20K Ohm Temperature Accuracy	±0.4 °F at 77 °F (±0.2 °C at 25 °C)
1K Ohm Temperature	Room: 32 to 122 °F (0 to 50 °C).
Output Range	Duct: -58 to 572 °F (-50 to 300 °C).
20K Ohm Temperature	Room: 40° to 110 °F (4° to 43 °C).
Output Range	Duct/Outdoor: -40° to 240 °F (-40° to 116 °C).
Hysteresis	Less than ±0.5% RH.
Supply Voltage	4-20mA Output: 250 Ohm Load 15 – 40 VDC / 18 - 28 VAC 4-20mA Output: 500 Ohm Load 18 – 40 VDC / 18 - 28 VAC (500 Ohm Load Max) 0-5 VDC Output: 12 - 40 VDC / 18 - 28 VAC (10K Load Minimum) 0-10 VDC Output: 18 - 40 VDC / 18 – 28 VAC (10K Load Minimum)
Maximum Supply Current	Current Mode: 24 mA. Voltage Mode: 8 mA.
Finish	Room Enclosure: ABS Plastic (UL94-VO rated). Duct Enclosure: ABS Plastic (UL94-5VA rated). Outdoor Enclosure: ASA Plastic (UL-94V0 rated).
Compensated Temperature Range	Room: 32 to 122 °F (-0 to 50 °C). (Full RH Range) Duct/Outdoor: -10 to 140 °F (-23 to 60 °C)
Humidity Response Time	200 seconds.
Saturation Response Time	10 minutes.
Sensitivity	0.1%RH.
Interchangeability	Less than ±3% RH nominal.
Repeatability	0.5% RH.
Long term drift	Less than 2% RH drift/5 years.

Table 1. Operating Specifications

Model Number	Replaces	RH Accuracy	Mounting	Temperature Sensor	Output Signal	Used With
H7625A2010	H7625A1008	2%	Room	20K ohm at 77F, reference 206598	Selectable 4-20mA, 0-10Vdc, or 0-5Vdc	T7350, H775, XL50, XL500, XFC, W7750B/C, W7753, W7760A/C, W7761
H7635A2012	H7635A1006	3%				
H7625B2006	H7625B1006	2%	Duct			
H7635B2018	H7635B1004	3%				
H7655B2014	H7655B1009	5%	Outdoor			
H7635C2015	H7635C1002	3%				
H7626A2020		2%	Room	1097 ohm at 77F		T775
H7636A2022		3%	Duct			
H7626B2024		2%				
H7636B2026		3%				
H7656B2029		5%				

DIMENSIONS DIAGRAM

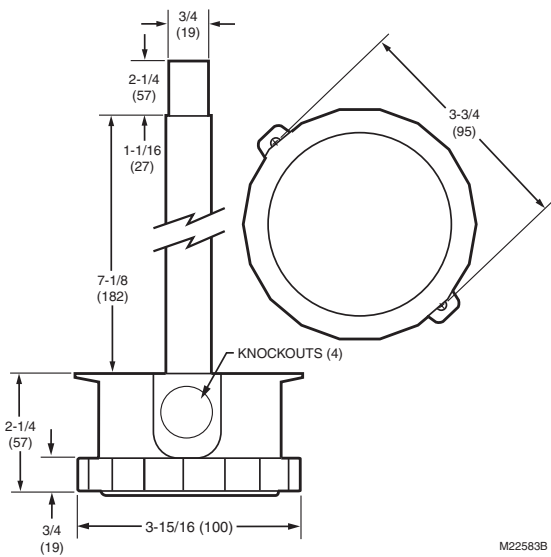


Fig. 1. Duct-mount Sensor Dimensions in In (mm).

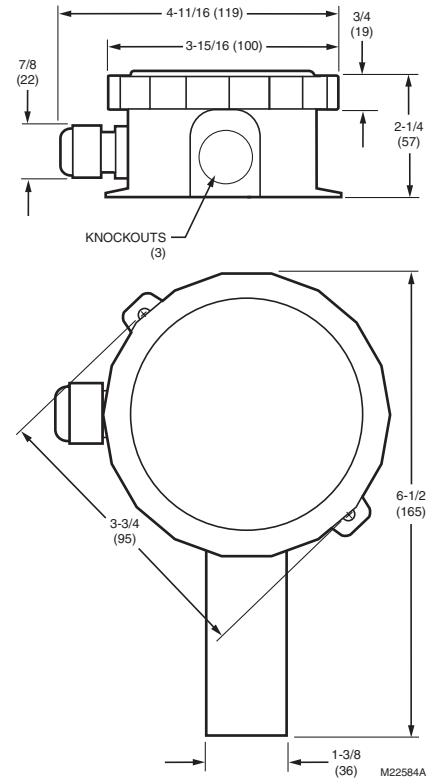


Fig. 2. Outdoor-mount Sensor Dimensions in Inches (mm).

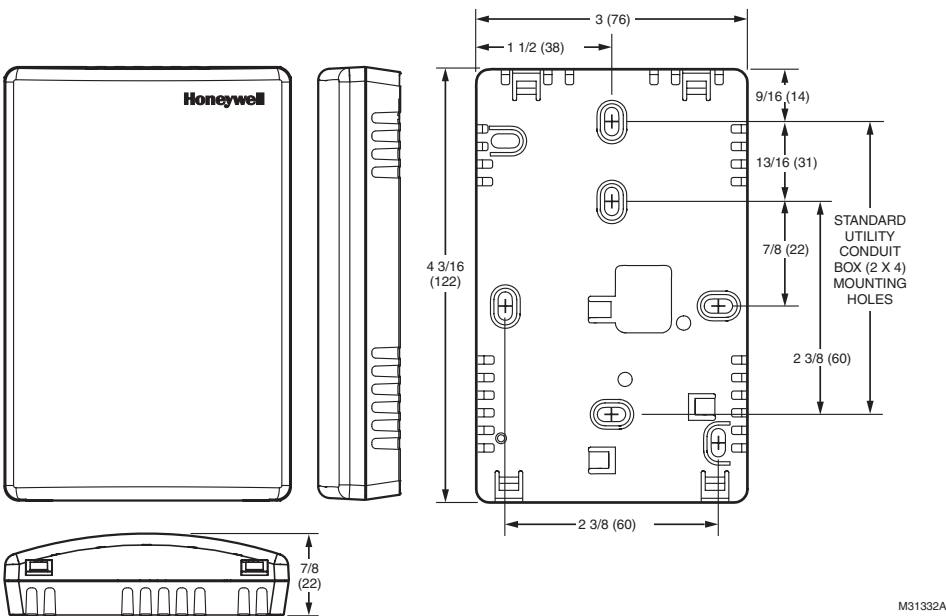


Fig. 3. Wall-mount Sensor Dimensions in In (mm).

Submittal Data - Sensors

Electronic Humidity Sensors



APPLICATION

H7655 and C7600 Solid State Humidity Sensors sense the relative humidity level of an area and is used with any controller capable of processing a 0-10 Vdc or 2-10 Vdc signal.

FEATURES

- Long-lasting solid state sensing element is accurate and stable over time.
- Enclosed in rugged, wall-mounted plastic case.
- Vents on top and sides of cover allow air flow to humidity sensing element.
- Compact size and lightweight construction provide easy mounting.
- C7600B provides 2-10 Vdc output directly proportional to relative humidity and can be used with the H775 Humidity Controller.
- H7655A provides 0-10 Vdc output directly proportional to relative humidity and can be used with the T7350 Temperature/Humidity Controller.

SPECIFICATIONS

Dimensions	See Fig. 1.
Case	Rugged, lightweight, compact plastic, easy to install.
Electrical Ratings	Input: 16-40 Vdc or 16-30 Vac.
Output	C7600B: 2-10 Vdc voltage signal; increases from 2 to 10Vdc as humidity increases. Output voltage is directly proportional to relative humidity increase. See Fig. 2. H7665A: 0-10 Vdc voltage signal; increases from 0 to 10Vdc as humidity increases. Output voltage is directly proportional to relative humidity increase. See Fig. 3.
Maximum Power Consumption.....	0.3 VA.
Mounting	Wall mount (directly to wall or standard outlet box).
Ambient Temperature Ranges.....	Operating: 32 °F to 125 °F (0 °C to 52 °C). Shipping: -40 °F to +150 °F (-40 °C to +66 °C).
Humidity Range	10 to 90 percent RH, noncondensing.
Humidity Accuracy	From 30 to 70% RH: ±5 percent RH. From 10 to 90% RH: ±7 percent RH.

DIMENSIONS DIAGRAM

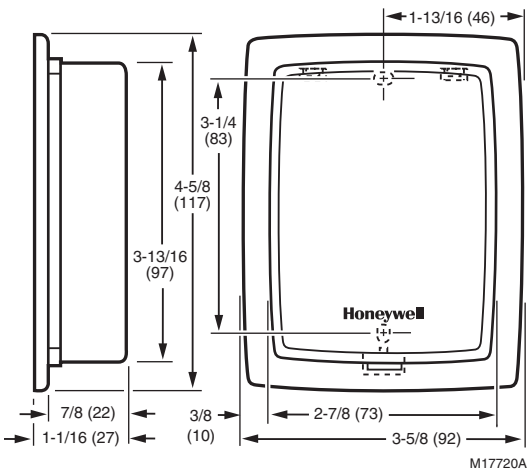


Fig. 1. C7600B, H7665A Dimensions in In (mm).

OUTPUT VOLTAGE CHARTS

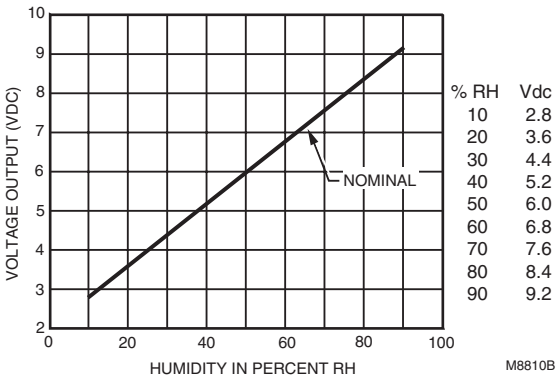


Fig. 2. C7600B Nominal Output Voltage Vs. Relative Humidity.

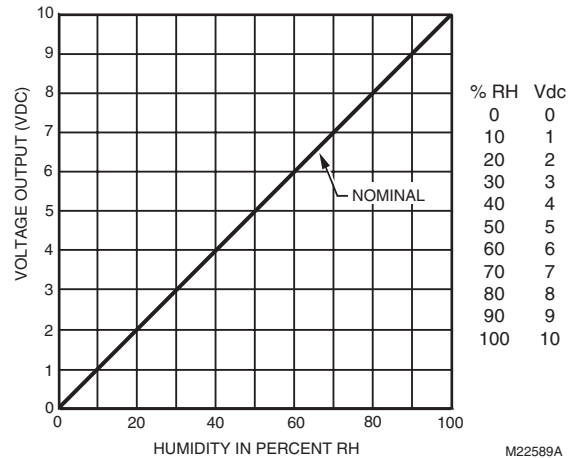


Fig. 3. H7665A Nominal Output Voltage Vs. Relative Humidity.

Submittal Data - Sensors

Dew Point Sensors



FEATURES

- Does not wait to detect when the dew point has already been reached, but rather provides an early warning of the approaching dew point
- Compact design
- Fast response
- Module is coated, thus protected against contamination
- Simple and easy mounting
- Status indication

APPLICATION

The HSS-DPS early-warning dew point switch is used to monitor the formation of condensation on chilled ceilings or to prevent condensation at critical spots of HVAC systems. It is also used as a dew point monitor for systems operating near the dewpoint. The dew point switch measures the relative humidity near the dew point using its high-quality capacitive sensor. At reaching the switching point the output will provide an early warning signal for the initiation of control steps (increasing the initial water temperature, reducing the cooling capacity, switching on the heating, etc...). An additional status light indicates the condensation danger. Thanks to the special protection coating, sensor and electronics are highly insensitive to dust and dirt. HSS-DPS dew point switch can be mounted on walls, ducts and pipes up to 50mm (2").

SPECIFICATIONS

Supply Voltage	24 Vac/Vdc $\pm 20\%$
Power Consumption.....	< 10 mA (ac) / < 3 mA (dc)
Switch-points	RH > 90% $\pm 3\%$ contact "open" RH < 90% $\pm 3\%$ contact "closed"
Switching hysteresis	5% RH
Output.....	Potential-free relay with changeover contact
Switching voltage max.....	24 Vac/dc
Switching current max.....	1 A
Response time at change of pipe/wall temperature...	< 3 min
Response time at change of relative humidity	< 25 s
Weight approx.	60 g
Operation temperature	0...50 °C (32...122 °F)
Storage temperature.....	20...70 °C (-4...158 °F)
Humidity	10...100% RH
Status indication	LED, red
Dust protection.....	Special coating (permeable for water vapor)
Housing protection	class IP40
Housing material.....	PC, fire resistant according toUL94-V0

DIMENSIONS DIAGRAM

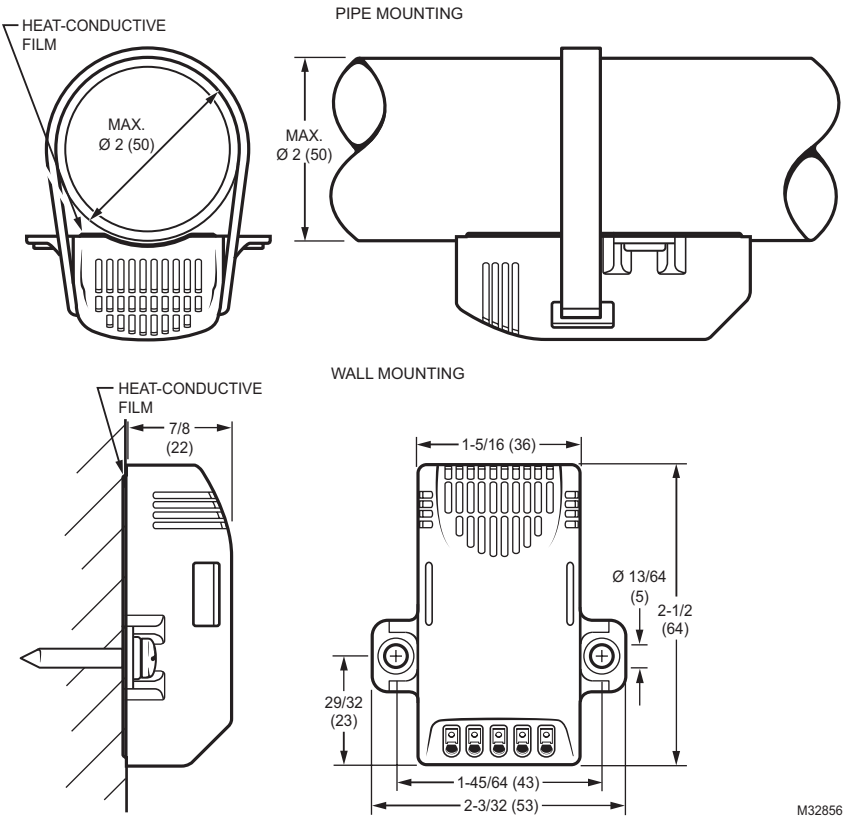


Fig. 1. Mounting (Dimensions in mm).

M32856

SENSORS

Submittal Data - Sensors

Carbon Dioxide Sensors

SPECIFICATIONS

Models	C7232 Sensor and Controller. A standalone carbon dioxide (CO ₂) sensor with two jumper-adjustable outputs (one analog and one SPST relay).
	C7232A: Wall mount model.
	C7232B: Duct mount model.
	NOTE: Models are available with or without a 4-digit LCD that indicates the current CO ₂ concentration.
Dimensions.....	C7232A: See Fig. 1.
	C7232B: See Fig. 2.
Sensor Response Time	1 min.
CO ₂ Sensor Operation	Non-dispersive infrared (NDIR).
CO ₂ Sensor Sampling.....	Diffusion
CO ₂ Sensor Range	0 to 2000 ppm
CO ₂ Sensor Accuracy.....	± (30 ppm +2% of reading)*
	* This product complies with Title 24 Part 6, CEC Standard for Residential and Non-Residential Buildings—2005, when installed according to instructions.
Power Supply	24 Vac/dc ±20%, 50/60 Hz (Class 2).
Maximum Power Consumption.....	3W.
Peak Current (at 20 ms).....	600 mA.
Relay Configuration	Shipped N.O.
Contact Rating	1A at 50 Vac/24 Vdc.
Minimum Permissible Load.....	1 mA at 5 Vdc.
Linear Analog Output.....	Voltage: 0/2-10 Vdc (resistive load greater than 5000 ohms).
	Current: 0/4-20 mA (resistive load less than 500 ohms).
Outputs	Analog: 0-10 Vdc (Default: 2-10 Vdc, 500 to 1500 ppm).
	Relay: Normally Open SPST (Default: Close at 800 ppm).
Ambient Ratings	Temperature:
	Operating:
	+32°F to +122°F (0°C to +50°C).
	Storage:
	-4°F to +158°F (-20°C to +70°C).
	Relative Humidity (non-condensing):
	0 to 95 percent.
CO ₂ Pressure Dependence	1.4% change in reading per 1 kPa deviation from 100 kPa.
Wiring Connections	C7232A: 20-gauge cable with six 8 in. leadwires.
	C7232B: 20-gauge cable with six 6 in. leadwires.
Mounting	C7232A: Vertical surface with standard single-gang junction box.
	C7232B: Sheet metal duct with a sampling tube.
	Automatic Background Calibration (ABC) default: On.
Calibration	This product is factory calibrated. No field calibration is necessary for the life of this product.
Approvals	CE
	Underwriters Laboratories Inc. Listed, File No. E4436
	cUL
	C7232B: Flammability Rating, UL94-5V.
	C7232A: NEMA 1.
	C7232B: NEMA 3.



FEATURES

- Used for CO₂ based ventilation control.
- Models available with LCD that provides sensor readings and status information.
- Non-Dispersion-Infrared (NDIR) technology used to measure carbon dioxide gas.
- Device provides voltage or current output based on CO₂ levels.
- Models available with SPST relay output.
- Automatic Background Calibration (ABC) algorithm based on long-term evaluation reduces required typical zero-drift check maintenance.

APPLICATION

The C7232 Sensor and Controller is a standalone carbon dioxide (CO₂) sensor for use in determining ventilation necessity with HVAC controllers. The C7232 measures the CO₂ concentration in the ventilated space or duct. The C7232 is used in ventilation and air conditioning systems to control the amount of fresh outdoor air supplied to maintain acceptable levels of CO₂ in the space.

DIMENSIONS DIAGRAM

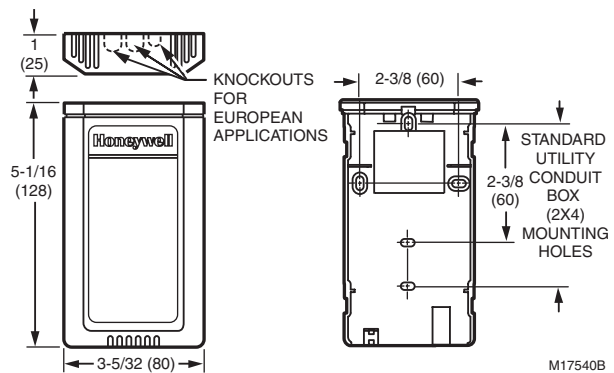


Fig. 1. C7232A Dimensions in In (mm).

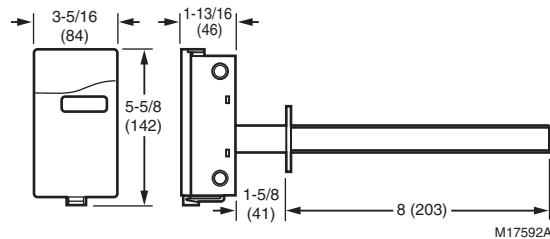


Fig. 2. C7232B Dimensions in In (mm).



SPECIFICATIONS

Models	C7632 Sensor and Controller. A stand-alone carbon dioxide (CO ₂) sensor with one 0-10 Vdc analog output. C7632A: Wall mount model. C7632B: Duct mount model.
Dimensions.....	C7632A: See Fig. 1. C7632B: See Fig. 2.
Operating Temperature.....	+32°F to +122°F (0°C to +50°C).
Storage Temperature.....	-4°F to +158°F (-20°C to +70°C).
Relative Humidity (non-condensing).....	0 to 95 percent.
Automatic Background Calibration (ABC) default	On.
Electrical Ratings.....	Power Supply: 24 Vac ±20%, 50/60 Hz (Class 2).
Maximum Power Consumption.....	Average: 1W. Peak: 2W.
Peak Current (at 20 ms).....	300 mA.
Linear Analog Output.....	0-10 Vdc.
Mounting	C7632A: Vertical surface with standard single-gang junction box. C7632B: Sheet metal duct with a sampling tube.
CO ₂ Pressure Dependence.....	1.6% change in reading per 1 kPa deviation from 100 kPa.
Output.....	Analog: 0-10 Vdc, 0-2000 ppm (fixed).
Sensor Performance Ratings	Response Time: 1 min.
Carbon Dioxide Sensor.....	Operation: Non-dispersive infrared (NDIR).
Sampling	Diffusion.
Range	0 to 2000 ppm (fixed).
Annual Drift.....	±10 ppm (nominal).
Accuracy	±(30 ppm+2%) at normal temperature/pressure.
Wiring Connections	C7632A: Terminal block. C7632B: 20-gauge cable with three 6 in. leadwires.
Approvals	CE. C7632B: Flammability Rating, UL94-5V. C7632A: NEMA 1. C7632B: NEMA 3.

FEATURES

- Non-Dispersion-Infrared (NDIR) technology used to measure carbon dioxide gas.
- Gold-plated sensor provides long-term calibration stability.
- Device provides voltage output based on CO₂ levels.
- Used for CO₂ based ventilation control.
- Automatic Background Calibration (ABC) algorithm based on long-term evaluation reduces required typical zero-drift check maintenance.
- Fixed 0 to 10 Vdc from 0 to 2000 ppm. No adjustments are necessary.
- Compatible with Honeywell Excel 10, 15, 5000 and any controller requiring 0-10 Vdc input.

APPLICATION

The C7632 Sensor and Controller is a standalone carbon dioxide (CO₂) sensor for use in determining ventilation necessity with heating ventilation and air conditioning (HVAC) controllers. The C7632 measures the CO₂ concentration in the ventilated space or duct. The C7632 is used in HVAC systems to control the amount of fresh outdoor air supplied to maintain acceptable levels of CO₂ in the space.

DIMENSIONS DIAGRAM

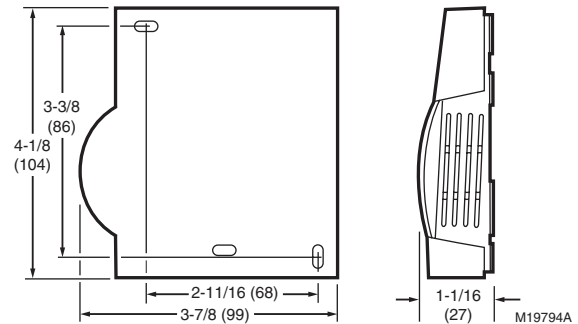


Fig. 1. C7632A Dimensions in Inches (mm).

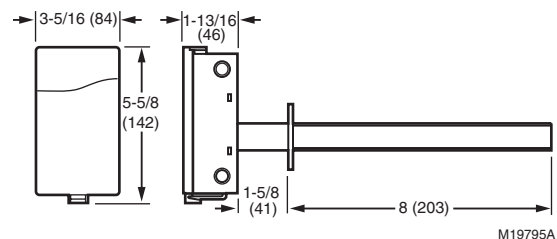


Fig. 2. C7632B Dimensions in Inches (mm).

Submittal Data - Sensors

Pressure Transducers



APPLICATION

The P7640A Panel Mount, P7640B Duct Mount and P7640U Universal Differential Pressure Sensors provide reliable, accurate measurement and control. Proper applications include measurement of extremely low pressure applications such as: building/room pressure, air flow, variable air volume, filter status and duct pressure. They are ideal for clean rooms, hospitals, fume hoods and computer rooms

FEATURES

- Temperature-compensated transmitter with advanced ceramic capacitive sensing element designed for very low pressure differentials provides a stable, reliable, maintenance-free operation.
- The P7640 Pressure Sensors are designed with field selectable 4-20 mA, 0-5 Vdc, or 0-10 Vdc output.
- All models offer jumper selectable inches w.c. or pascal scale.
- All models offer uni- or bi-directional output.
- All models offer jumper selectable fast or standard response time.
- The P7640A,B offer four configurable pressure ranges, selectable between 0-1" w.c./0-250 Pa or 0-10" w.c./0-2500 Pa with an easy to set rotary switch. No jumpers, no guessing.
- The P7640U offers configurable pressure ranges between 0-10 in. w.c./0-2500 Pa with an easy to set rotary switch.
- Duct model comes with factory installed duct probe. The Universal model comes with attachable duct probe and can be used in either panel or duct mounting application.
- All models offer both pushbutton and digital input to zero the output. A microprocessor algorithm prevents accidental zero adjustment during normal operation.

SPECIFICATIONS

Dimensions.....	Refer to Fig. 1.
Fittings	Brass barb; 0.24 in. (6.1 mm) O.D.
Electrical Ratings	Supply Voltage: 12-30 Vdc or 24 Vac (±15%) nominal. Maximum Supply Current (Vac): 60 mA. Maximum Supply Current (Vdc): 25 mA. Maximum Output Current: 25 mA.
Operating Environment	32° to 140° F (0° to 60° C). 0 to 90% RH. Dry air or inert gas only.
Zero Adjust.....	Pushbutton auto-zero and digital input on terminal block.
Mode.....	Unidirectional (default) or bidirectional, jumper selectable.
Proof Pressure.....	3 psid.
Burst Pressure.....	5 psid.
Accuracy	+/- 1% full scale (combined linearity and hysteresis).
Temperature Effect	1 in. models: 0.05% per ° C. 10 in. models: 0.01% per ° C (relative to 25° C) 0-50° C.

Table 1. Operating Specifications

Model	Mounting	Selectable W.C. Range	Display	Output	Supply Voltage	Comment
P7640A1000	Panel	0-.1", 0-.25", 0-.5", 0-1"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640A1018	Panel	0-.1", 0-.25", 0-.5", 0-1"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640A1026	Panel	0-1", 0-2.5", 0-5", 0-10"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640A1034	Panel	0-1", 0-2.5", 0-5", 0-10"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640B1008	Duct	0-.1", 0-.25", 0-.5", 0-1"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640B1016	Duct	0-.1", 0-.25", 0-.5", 0-1"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640B1024	Duct	0-1", 0-2.5", 0-5", 0-10"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640B1032	Duct	0-1", 0-2.5", 0-5", 0-10"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640U1040	Universal	0-.1", 0-.25", 0-.5", 0-1" 0-2.5", 0-5", 0-10"	No	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately
P7640U1052	Universal	0-.1", 0-.25", 0-.5", 0-1" 0-2.5", 0-5", 0-10"	Yes	0-10 Vdc, 0-5 Vdc, and 4-20 mA selectable	12-30 Vdc or 24 Vac	PWT-BV Bypass valve sold separately

DIMENSIONS DIAGRAM

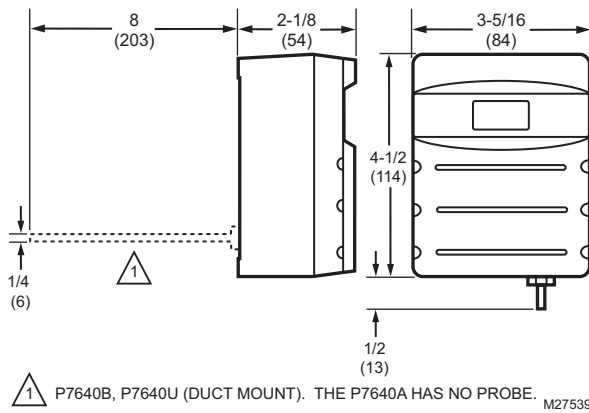


Fig. 1. Dimensions in Inches (mm).

Submittal Data - Sensors

Differential Pressure Transducers



APPLICATION

The PWT Series wet/wet differential pressure sensors provide reliable, accurate measurement and control of proper applications, including the monitor and control of pump differential pressure, chiller/boiler differential pressure drop and CW/HW system differential pressure. The PWT Series is ideal for measuring pressure across pumps, filters, heat exchangers, compressors and other non-corrosive wet media applications.

FEATURES

- The PWT Pressure Sensors incorporate microprocessor profiled sensors for exceptional accuracy and reliability.
- Field-selectable 4-20 mA, 0-5 Vdc, or 0-10 Vdc output.
- Jumper-selectable slow or fast response time.
- Switch-selectable pressure ranges (See Table 2).
- The jumper-selectable output switch for normal (4-20 mA) or reverse (20-4mA) operation provides application flexibility.
- Rugged, die-cast enclosure provides NEMA 4 sealing.
- Jumper-selectable port swap feature.
- All models offer both push button and digital input to zero the output. A microprocessor algorithm prevents accidental zero adjustment during normal operation.
- Used with the PWT-BV bypass valve manifold.

SPECIFICATIONS

Models	See Table 1.
Dimensions.....	See Fig. 1.
Media Compatibility	17-4 PH stainless steel
Supply Voltage	12 to 30 VDC, 24 VAC nom.
Maximum Current Draw DC.....	125 mA; AC: 280 mA
Proof Pressure.....	2x max. F.S. range
Burst Pressure.....	5x max. F.S. range
Accuracy at 25°C*	Ranges A, B, C: ±1% F.S.** Range D: ±2% F.S.**
Temperature Compensated Range	0° to 50 °C (32° to 122 °F); TC Zero <1.5% of product F.S. per sensor; TC Span <1.5% of product F.S. per sensor
Sensor Operating Range	-20° to 85 °C (-4° to 185 °F)
Long Term Stability	±0.25%
Zero Adjust	Push button auto-zero and digital input (2-position terminal block)
Operating Environment	-10° to 55 °C (14° to 131 °F); 10- 90% RH noncondensing
Fittings	1/8 in. NPT female, stainless steel 17-4 PH

* Accuracy combines linearity, hysteresis, and repeatability.

** F.S. is defined as full span of selected range in bidirectional mode.

Table 1. PWT Series Wet Differential Pressure Transducers

Model	Selectable Pressure Range	Output	Supply Voltage
PWT50	0-5, 0-10, 0-25, 0-50 psid	0-10Vdc, 0-5Vdc, and 4-20mA selectable	12-30Vdc or 24Vac
PWT100	0-10, 0-20, 0-50, 0-100 psid	0-10Vdc, 0-5Vdc, and 4-20mA selectable	12-30Vdc or 24Vac
PWT250	0-25, 0-50, 0-125, 0-250 psid	0-10Vdc, 0-5Vdc, and 4-20mA selectable	12-30Vdc or 24Vac

DIMENSIONS DIAGRAM

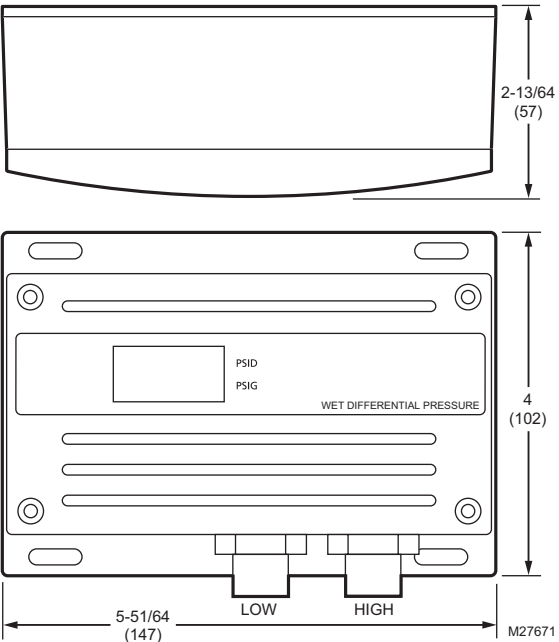


Fig. 1. Dimensional in in. (mm).

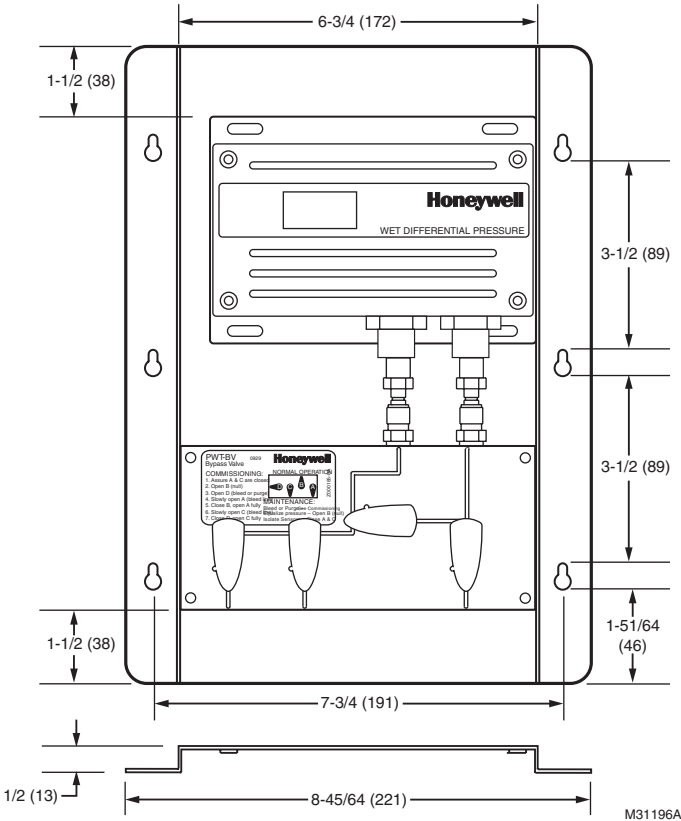


Fig. 2. Dimensional Drawing of PWT-BV Bypass Valve Manifold showing PWT (not included) for Reference Only.

SENSORS

Submittal Data - Sensors

Gauge Pressure Sensors



APPLICATION

The MLH Series is a two-wire 4-20mA gauge pressure sensor. This digitally compensated sensor offers an unparalleled value and performance combination, making it the ideal pressure sensing solution for demanding applications. The MLH series is available in pressure ranges up to 1000 psi.

FEATURES

- Available in 50, 150, 300, 500 and 1000 psi.
- All metal wetted parts for use in a wide variety of fluid applications.
- Suitable for use with refrigerants.
- No internal elastomeric seals mean no o-ring compatibility issues.
- 3 meter cable standard.
- Reverse polarity and overvoltage protection—protects against reversed excitation.
- Less than 2 ms response time provides accurate, high speed measurement.
- Select models available with 1/4-in. SAE female Schrader connection with valve depressor.
- Exceeds CE heavy industrial EMC for use in areas of high RFI/EMI.

SPECIFICATIONS

(All specifications are measured at 25°C (77°F) and at rated excitation unless otherwise specified.)

Operating temperature range.....	-40° C to 125° C (-40° F to 257° F)
Storage temperature range.....	-40° C to 125° C (-40° F to 257° F)
Compensated temperature range.....	-40° C to 125° C (-40° F to 257° F)
Proof Pressure.....	3X Working Pressure Range (50-500 psi) 2X Working Pressure Range (1000 psi)
Burst Pressure.....	10X Working Pressure Range
Dimensions.....	See Fig. 1 and 2.
Housing Material.....	Black plastic — Amodel AS-4133 HS - PPA
Material in contact with media	Stainless steel 304L and Haynes 214 alloy
Excitation.....	9.5Vdc to 30Vdc
Signal Output	4mA to 20mA
Zero Output.....	4.0mA
Full Scale Span (FSS)	16mA (4 to 20mA)
Supply rejection ratio	90db
Termination.....	Cable (3 meter) Red Lead (Excitation) White Lead (Output Signal)
Shock.....	50 g peak [5 ms], 100 g peak [11 ms]
Vibration	MI - STD- 810C. Figure 514.2-5, Curve AK, Table 514.2-V, Random Vibration Test [overall g rms = 20.7 min.]

TABLE 1. MLH Specifications

Parameter	Specification
Response Time	<2 ms
Accuracy ¹	
<100 psi	±0.50% FSS
≥100 psi	±0.25% FSS
Total error band ²	
<300 psig (-40°C to 125°C [-40°F to 257°F])	±3% FSS
≥300 psig (>65°C to 125°C [>149°F to 257°F])	±2% FSS

¹ Includes pressure non-linearity (BFSL), pressure hysteresis, and non-repeatability. Thermal errors are not included.

² Includes zero error, span error, thermal effect on zero, thermal effect on span, thermal hysteresis, pressure-non-linear-ity, pressure hysteresis, and non-repeatability.

TABLE 2. MLH Models

Old Part Number	New Part Number	Pressure Range	Pressure Connection
50035430-050/U	MLH050PSCDJ1235	0-50 psig	1/4"-18 NPT
50035430-150/U	MLH150PSCDJ1236	0-150 psig	1/4"-18 NPT
50035430-300/U	MLH300PSCDJ1237	0-300 psig	1/4"-18 NPT
50035430-500/U	MLH500PSCDJ1240	0-500 psig	1/4" SAE female Schrader
50035430-01K/U	MLH01KPSCDJ1241	0-1000 psig	1/4" SAE female Schrader

DIMENSIONS DIAGRAM

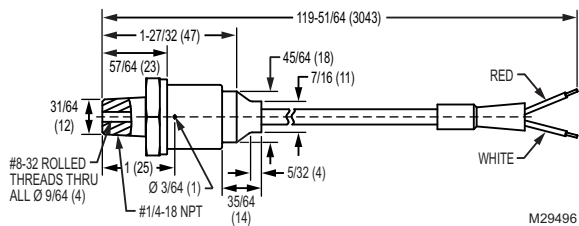


Fig. 1. MLH050PSCDJ1235/MLH150SCDJ1236/MLH300PSCDJ1237 Dimensions in Inches (mm).

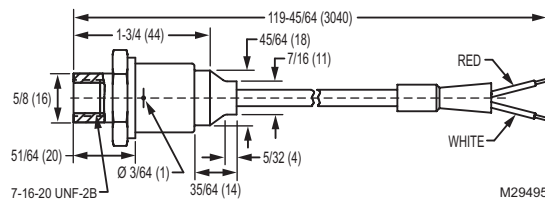


Fig. 2. MLH01KPSCDJ1241/MLH500PSCDJ1240 Dimensions in Inches (mm).

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Appendix A: Valve Selection and Sizing

Introduction

This section provides information on valve selection and sizing. Valves must be selected for ability to meet temperature, pressure, flow control characteristic, and piping connection requirements of the hydronic system. Valve sizing is critical to ensure support for heating and cooling loads with adequate valve capacity, yet able to control system flow to provide stable building conditions efficiently.

Definitions

Valve Components

Actuator: The part of an automatic control valve that moves the stem based on an electric, electronic, or pneumatic signal from a controller. The actuator and valve can be two separate devices or together they can be one device.

Body: The valve casting through which the controlled fluid flows (Fig. 1).

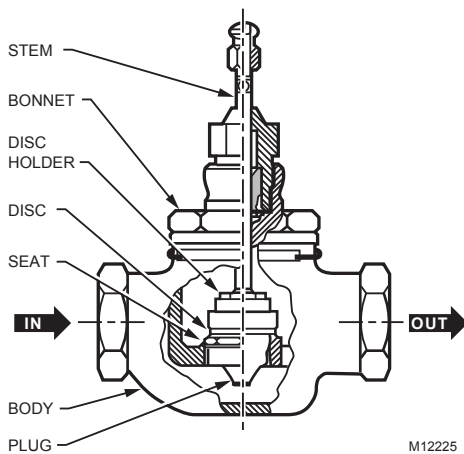


Fig. 1. Globe Valve Components.

Bonnet: The part that screws to the top of the valve body and contains the packing that seals and guides the valve stem.

Disc: The part of the valve assembly that contacts the valve seat to close off flow of the controlled fluid. Some valve assemblies are built so the disc is replaceable. Replaceable discs are usually made of a composition material softer than metal. "Metal trim" valves use precisely-machined metal plugs and seats operated by high force actuators instead of a disk.

Plug: The part that varies the opening for the fluid to flow through the valve body. The following describes the three most common types of plugs:

- A contoured plug has a shaped end that is usually end-guided at the top or bottom (or both) of the

valve body. The shaped end controls fluid flow through the valve with respect to stem travel.

- A V-port plug has a cylinder, called a skirt, that rides up and down in the valve seat ring. The skirt guides the plug and varies the flow area with respect to stem travel via its shaped openings.
- A quick-opening plug is flat and is either end-guided or guided by wings riding in the valve seat ring. The flat plug provides maximum flow soon after it lifts from the valve seat.

Port: The opening in the valve seat.

Seat: The stationary part of the valve body that has a raised lip to contact the valve disc when closing off flow of the controlled fluid.

Stem: The shaft that runs through the valve bonnet and connects an actuator to the valve plug.

Trim: All parts of the valve that contact the controlled fluid. Trim includes the stem, packing, plug, disc, and seat; it does not include the valve body.

Valve Flow Characteristics

Direction of Flow: The correct flow of the controlled fluid through the valve is usually indicated on the valve body. If the fluid flow through the valve is incorrect, the disc can slam into the seat as it approaches the closed position. The result is poor control, excessive valve wear, and noisy operation. In addition, the actuator must work harder to reopen the closed valve since it must overcome the pressure exerted by the fluid on top of the disc rather than have the fluid assist in opening the valve by exerting pressure under the disc. Gate and butterfly valves may offer bi-directional flow.

Equal percentage: A valve which changes flow by an equal percentage (regardless of flow rate) for similar movements in stem travel (at any point in the flow range).

Linear: A valve which provides a flow-to-lift relationship that is directly proportional. It provides equal flow changes for equal lift changes, regardless of percentage of valve opening.

Quick-opening: A valve which provides maximum possible flow as soon as the stem lifts the disc from the valve seat.

Valve flow characteristic: The relationship between the stem travel of a valve, expressed in percent of travel, and the fluid flow through the valve, expressed in percent of full flow.

Appendix A: Valve Selection and Sizing

Valve Flow Terms

Rangeability: The ratio of maximum flow to minimum controllable flow. Approximate rangeability ratios are 50 to 1 for V-port globe valves and 30 to 1 for contoured plug valves.

EXAMPLE:

A valve with a total flow capacity of 100 gpm full open and a rangeability of 30 to 1, can accurately controls flow accurately as low as 3 gpm.

Tight shut-off/close-off: A valve condition in which virtually no leakage of the controlled fluid occurs in the closed position. Generally, only single-seated valves provide tight shut-off. Double-seated valves typically have a one to three percent leakage in the closed position.

Turndown: The ratio of maximum flow to minimum controllable flow of a valve installed in a system. Turndown is equal to or less than rangeability.

EXAMPLE:

For the valve in the rangeability example, if the system requires a 66 gpm maximum flow through the valve and since the minimum accurately controllable flow is 3 gpm, the turndown is 22.

Valve Ratings

Flow coefficient (capacity index): Used to state the flow capacity of a control valve for specified conditions. In the control valve industry currently one of three flow coefficients is used depending upon the location and system of units; British A_v , European k_{vs} , or United States C_v . The flow coefficients have the following relationships:

$$\begin{aligned}A_v &= 0.0000278 k_{vs} \\A_v &= 0.0000240 C_v \\k_{vs} &= 0.865 C_v\end{aligned}$$

The flow coefficient A_v is in cubic meters per second and can be determined from the formula:

$$A_v = Q \sqrt{\frac{\rho}{\Delta p}}$$

Where:

- Q = volumetric flow in cubic meters per second.
- ρ = fluid density in kilograms per cubic meter.
- Δp = static pressure loss across the valve in pascals.

The flow coefficient k_{vs} is water flow in cubic meters per hour with a static pressure loss across the valve of

10^5 pascals (1 bar) within the temperature range of 5 to 40°C and can be determined from the formula:

$$k_{vs} = Q \sqrt{\frac{\Delta p k_{vs}}{\Delta p} \cdot \frac{\rho}{\rho_w}}$$

Where:

- Q = volumetric flow in cubic meters per hour.
- ρ = fluid density in kilograms per cubic meter.
- ρ_w = density of water in kilograms per cubic meter.
- $\Delta p k_{vs}$ = static pressure loss of 10^5 pascals.
- Δp = static pressure loss across the valve in pascals.

The flow coefficient C_v is water flow in gallons per minute with a pressure loss across the valve of one pound per square inch within the temperature range of 40 to 100F and can be determined for other conditions from the formula:

$$C_v = Q \sqrt{\frac{1}{\Delta p} \cdot \frac{\rho}{\rho_w}}$$

Where:

- Q = volumetric flow in US gallons per minute.
- ρ = fluid density in pounds per cubic foot.
- ρ_w = density of water in pounds per cubic foot within the temperature range of 40 to 100F
- Δp = static pressure loss across the valve in pounds per square inch.

Close-off rating: The maximum pressure drop that a valve can withstand without leakage while in the full closed position. The close-off rating is a function of actuator power to hold the valve closed against pressure drop, by structural parts such as the stem can be the limiting factor. The construction of gate-style valves, such as ball valves, often allows them to hold back high head pressures in the closed position, although the actuator may not be powerful enough to operate the valve against such forces.

EXAMPLE:

A valve with a close-off rating of 10 psi could have 40 psi upstream pressure and 30 psi downstream pressure. Note that in applications where failure of the valve to close is hazardous, the maximum upstream pressure must not exceed the valve close-off rating, regardless of the downstream pressure.

The valve close-off rating is independent of the actual valve body rating. See definition of BODY RATING (ACTUAL).

Appendix A: Valve Selection and Sizing

Close-off rating of three-way valves: The maximum pressure difference between either of the two inlet ports and the outlet port for mixing valves, or the pressure difference between the inlet port and either of the two outlet ports for diverting valves.

Pressure drop: The difference in upstream and downstream pressures of the fluid flowing through the valve.

Pressure drop (critical): The flow of a gaseous controlled fluid through the valve increases as the pressures drop increases until reaching a critical point. This is the critical pressure drop.

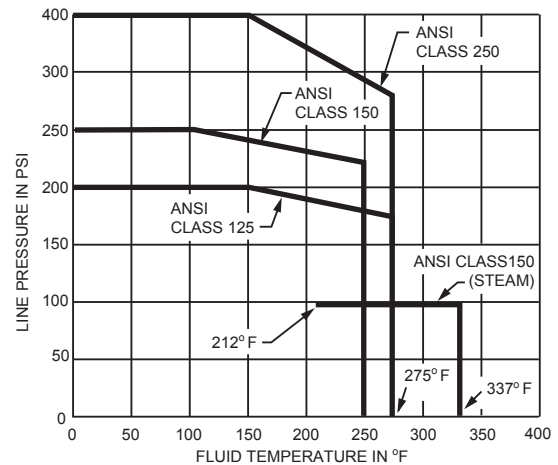
Any increase in pressure drop beyond the critical pressure drop is dissipated as noise and cavitation rather than increasing flow. The noise and cavitation can destroy the valve and adjacent piping components.

Body rating (nominal): The theoretical pressure rating, expressed in psi, of the valve body exclusive of packing, disc, etc. The nominal rating is often cast on the valve body and provides a way to classify the valve by pressure. A valve of specified body material and nominal body rating often has characteristics such as pressure-temperature ratings, wall thickness, and end connections which are determined by a society such as ANSI (American National Standards Institute). Figure 2 shows ANSI pressure-temperature ratings for valves. Note that the nominal body rating is not the same as the actual body rating.

Body rating (actual): The correlation between safe, permissible flowing fluid pressure and flowing fluid temperature of the valve body (exclusive of the packing, disc, etc.). The nominal valve body rating is the permissible pressure at a specific temperature.

EXAMPLE:

From Figure 2, a valve with an ANSI rating of 150 psi (ANSI Class 150) has an actual rating of 225 psi at 250F.



NOTES:

1. FOR HIGH FLUID TEMPERATURES, THE VALVE AND/OR PIPING SHOULD BE INSULATED TO PREVENT AMBIENT TEMPERATURES FROM EXCEEDING ACTUATOR RATINGS.

M12224

Fig. 2. Sample ANSI Pressure-Temperature Ratings for Valves.

Maximum pressure and temperature: The maximum pressure and temperature limitations of fluid flow that a valve can withstand. These ratings may be due to valve packing, body, or disc material or actuator limitations. The actual valve body ratings are exclusively for the valve body and the maximum pressure and temperature ratings are for the complete valve (body and trim). Note that the maximum pressure and temperature ratings may be less than the actual valve body ratings.

EXAMPLE:

The body of a valve, exclusive of packing, disc, etc., has a pressure and temperature rating of 125 psi at 335F. If the valve contains a composition disc that can withstand a temperature of only 240F, then the temperature limit of the disc becomes the maximum temperature rating for the valve.

Valve Types

Ball valve: A ball valve has a precision ball between two seats with a body (Fig. 3). Ball valves have several port sizes for a given body size and go from closed to open with a 90 degree turn of the stem. They are available in both two-way and three-way configurations. For HVAC applications, ball valve construction includes brass and cast iron bodies; stainless steel, chrome plated brass, and cast iron balls; resilient seats with various temperature ratings. Ball valves provide tight shut-off, while full port models have low flow resistance, and models with flow characterizing inserts can be selected for modulating applications.

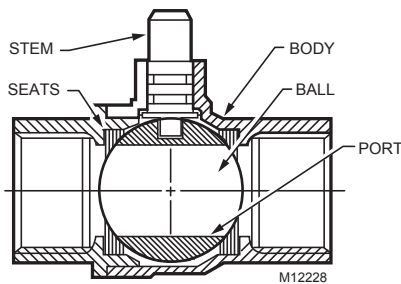


Fig. 3. Ball Valve.

Butterfly valve: A valve with cylindrical body, a shaft, and a rotating disc (Fig. 4). The disc rotates 90 degrees from open to closed. The disc seats against a resilient body liner or spring-loaded metal seat and may be manufactured for tight shut-off or made smaller for reduced operating torque at lower close-off. Butterfly valves have limited rangeability for modulating applications so are used mainly for two-way operation. For three-way applications, two butterfly valves are assembled to a pipe tee with linkage for simultaneous operation.

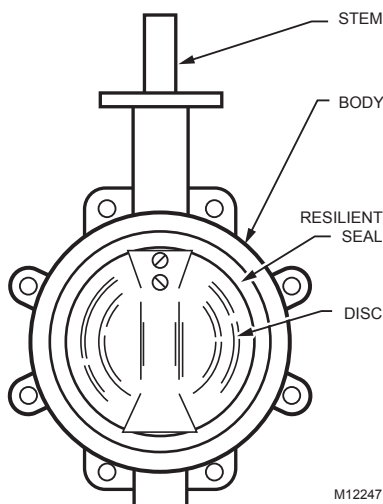


Fig. 4. Butterfly Valve.

Double-seated valve: A valve with two seats, plugs, and discs.

Double-seated valves are suitable for applications where fluid pressure is too high to permit a single seated valve to close. The discs in a double-seated valve are arranged so that in the closed position there is minimal fluid pressure forcing the stem toward the open or closed position; the pressure on the discs is essentially balanced. For a valve of given size and port area, the double-seated valve requires less force to operate than the single-seated valve so the double seated valve can use a smaller actuator than a single seated.

Also, double-seated valves often have a larger port area for a given pipe size. A limitation of double-seated valves is that they do not provide tight shut-off. Since both discs rigidly connect together and changes in fluid temperature can cause either the disc or the valve body to expand or contract, one disc may seat before the other and prevent the other disc from seating tightly.

Flanged-end connections: A valve that connects to a pipe by bolting a flange on the valve to a flange screwed onto the pipe. Flanged connections are typically used on large valves only.

Gate valve: A valve that controls flow using a gating mechanism, usually a plate, that moves across the valve seat instead of pushing against the flow. The actuator works against the friction of the seals rather than directly against the force of the water. Gate valves are inherently self-sealing and are often capable of high close-off pressures without an actuator. Ball valves are a type of gate valve.

Globe valve: A valve which controls flow by moving a circular disk against or away from a seat. When used in throttling control a contoured plug (throttling plug) extends from the center of circular disk through the center of the seat for precise control (Fig. 1).

Pressure-balanced valve: A globe valve with a sealed pressure chamber built into the plug, which equalizes head pressure across the seat and allows most of the actuator force to be used to close off the flow, resulting in very high close-off ratings with very low seat leakage.

Reduced-port valve: A valve with a capacity less than the maximum for the valve body. Ball, butterfly, and smaller globe valves are available with reduced ports to allow correct sizing for good control.

Appendix A: Valve Selection and Sizing

Single-seated valve: A valve with one seat, plug, and disc. Single-seated valves are suitable for applications requiring tight shut-off. Since a single-seated valve has nothing to balance the force of the fluid pressure exerted on the plug, it requires more closing force than a double-seated valve of the same size and therefore requires more actuator force than a double-seated valve.

Threaded-end connection: A valve with threaded pipe connections. Valve threads are usually tapered female, to National Pipe Thread standards, but male connections are available for special applications. Some valves have an integral union for easier installation.

Three-way valve: A valve with three ports. The internal design of a three-way valve classifies it as a mixing or diverting valve. Three-way valves control liquid in modulating or two-position applications and do not provide tight shut-off.

Two-way valve: A valve with one inlet port and one outlet port. Two-way valves control water or steam in two-position or modulating applications and provide tight shut-off in both straight through and angle patterns.

Valve Material and Media

Valves with bronze or cast iron bodies having brass or stainless steel trim perform satisfactorily in HVAC hydronic systems when the water is treated properly. Failure of valves in these systems may be an indication of inadequate water treatment. The untreated water may contain dissolved minerals (e.g., calcium, magnesium, or iron compounds) or gases (e.g., carbon dioxide, oxygen, or ammonia). Inadequate treatment results in corrosion of the system. Depending on the material of the valve, the color of the corrosion may indicate the substance causing the failure (Table 1).

Table 1. Corrosive Elements in Hydronic Systems.

Brass or Bronze Component	
Corrosive Substance	Corrosion Color
Chloride	Light Blue-Green
Ammonia	Blue or Dark Blue
Carbonates	Dark Blue-Green
Magnesium or Calcium	White
Oxides	Black (water)
Sulphide (Hydrogen)	Black (Gas)
Iron	Rust
Iron or Steel Component	
Corrosive Substance	Corrosion Color
Magnesium or Calcium	White
Iron	Rust

Petroleum products from sources such as cutting oils, solder flux, etc. can cause some rubber compounds to swell and interfere with moving parts.

Chloramines, chemical compounds of ammonia and chlorine used to treat municipal drinking water, are reported to attack some rubber compounds commonly used in closed loop hydronic systems.

Particulate present in the system can interfere with, and sometimes damage moving parts. Examples include: rust (Fe_2O_3), magnetite (Fe_3O_4), sand (quartz granules), silt from municipal water, iron filings from pipe threads, and scale precipitated from hard water. Rust, in particular, is highly abrasive and can rapidly wear out stem seals, causing leaks.

To prevent damage to valves and pumps, a complete flushing of the system during commissioning, including the existing structure when building an addition, may be required to remove physical particulate. Additional components may also be needed, such as in-line Y-strainers for large objects such as stones or solder blobs and mechanical filtration, such as a 50 micron 10% side-stream filter piped in parallel with the system pumps.

Glycol solutions may be used to prevent hydronic systems freezing. Glycol solutions should be formulated for HVAC systems. Some available glycol solutions formulated for other uses contain additives that are injurious to some system seals. In addition, hydronic seals react differently to water and glycol such that when a new system is started up with water or glycol the seals are effective. The hydronic seals are likely to leak if the system is later restarted with media changed from water to glycol or glycol to water. To prevent leakage part of the process of media changeover should include replacing seals such as, pump and valve packing. Glycol mixtures are usually limited to 50% concentration. At 60% concentration, glycol mixtures have their minimum freezing temperature, but can have unstable phase changes which may severely damage a system.

Valve Selection

Proper valve selection matches a valve to the control and hydronic system physical requirements. First consider the application requirements and then consider the valve characteristics necessary to meet those requirements. The following questions provide a guide to correct valve selection.

- What is the piping arrangement and size?

The piping arrangement indicates whether a two-way or three-way mixing or diverting valve is needed. The piping size gives some indication of whether the valve requires a screwed end or a flanged end connection.

- Does the application require two-position control or proportional control? Does the application require a normally open or normally closed valve? Should the actuator be direct acting or reverse acting?

In its state of rest, the valve is normally open or closed depending on the load being controlled, the fluid being controlled, and the system configuration.

For chilled water coils, it is usually preferable to close the valve on fan shutdown to prevent excessive condensation around the duct and coil, and to save pumping energy. This may be accomplished with either normally closed valves or a variety of other control schemes. Lower cost and more powerful normally open valve assemblies may be used with the close-on-shutdown feature and allow, in the case of pneumatic systems, the capability to provide heating or cooling in the event of air compressor failure.

Converter control valves should be normally closed and outdoor air preheat valves should be normally open.

- Is tight shut-off necessary? What differential pressure does the valve have to close against? How much actuator close-off force is required?

Valves should never be allowed to "dead head" a pump unless the pumps are controlled by variable speed drive systems capable of detecting such conditions and shutting down the pumps.

Single-seated valves provide tight shut-off, while double-seated valves do not. Double seated valves are acceptable for use in pressure bypass or in-line throttling applications.

The design and flow capacity of a valve determine how much actuator force is required for a given close-off. Therefore, the valve must first be sized, then, the valve and actuator selected to provide the required close-off.

- What type of medium is being controlled? What are the temperature and pressure ranges of the medium?

Valves must be compatible with system media composition, maximum and minimum temperature, and maximum pressure. The temperature and pressure of the medium being controlled should not exceed the maximum temperature and pressure ratings of the valve.

For applications such as chlorinated water or brine, select valve materials to avoid corrosion.

- What is the pressure drop across the valve? Is the pressure drop high enough?

The full open pressure drop across the valve must be high enough to allow the valve to exercise control over its portion of the hydronic system. However, the full open pressure drop must not exceed the valve's rating for quiet service and normal life. Closed pressure drop must not exceed valve and actuator close-off rating.

Globe Valve

Globe valves are popular for HVAC applications. They are available in pipe sizes from 1/2 in. to 12 in. and in a large variety of capacities, flow characteristics, and temperature and pressure capabilities. They provide wide rangeability and tight shutoff for excellent control over a broad range of conditions. Globe valves are made in two-way, straight or angle configurations and three-way mixing and diverting designs. Globe valves close against the flow and have arrows on the body indicating correct flow direction. Incorrect piping can result in stem oscillations, noise, and high wear.

A two-way globe valve has one inlet port and one outlet port (Fig. 5) in either a straight through or angle pattern. The valve can be either push-down-to-close or push-down-to-open.

Pneumatic and electric actuators with linear motion to operate globe valves are available for operation with many control signals.

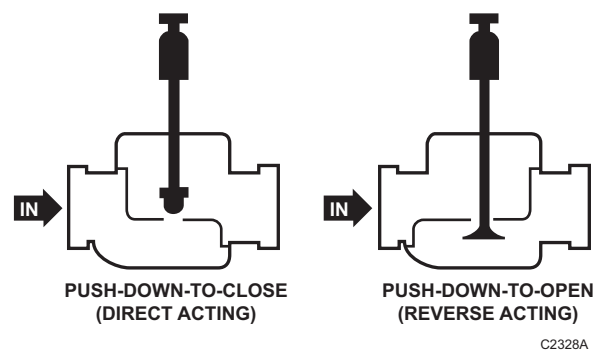


Fig. 5. Two-Way Globe Valves.

Appendix A: Valve Selection and Sizing

Ball Valve

Ball valves are available for two-position applications either manual (hand) or power operated or for modulating applications with direct coupled electric actuators. Ball valves are relatively low cost, provide tight close off, and are available in two-way and three-way configurations. As with all other valves, ball valves must be properly sized to provide good flow control.

When used in modulating service, ball valves must be specifically designed for modulating service as compared to two-position service. Packing must provide leak-free sealing through thousands of cycles to ensure trouble-free HVAC service. The ball, stem and seals should be made of materials that minimizes sticking and breakaway torque to achieve smooth operation.

Two-way ball valves have equal percentage flow control characteristics and flow in full-port models can be in either direction.

Three-way ball valves can be used in either mixing or diverting service. Full port models have linear flow control characteristics for constant total flow. A popular option with 3-way valves is a 20% flow capacity reduction in the B port to equalize pressure losses in a coil-bypass application.

Butterfly Valve

Butterfly valves (Fig. 6) control the flow of hot, chilled, or condenser water in two-position or proportional applications. Butterfly valves are available in two-way or three-way configurations. Tight shutoff may be achieved by proper selection of actuator force and body lining. The three-way valve can be used in mixing or diverting applications with the flow in any direction. The three-way valve consists of two butterfly valves that mount on a flanged cast iron tee and are linked to an actuator which opens one valve as it closes the other. Minimum combined capacity of both valves occurs at the half-open position.

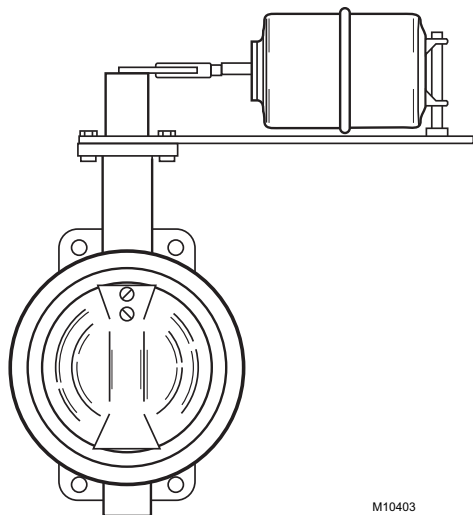


Fig. 6. Butterfly Valve.

When butterfly valves are used for proportional control, they must be applied using conservative pressure drop criteria. If the pressure drop approaches the critical pressure drop, unbalanced forces on the disc can cause oscillations, poor control, and/or damage to the linkage and actuator, even though the critical flow point is not reached. Modulating control is usually limited to a range of 15 to 65 degrees of disk rotation.

Butterfly valves are usually found in larger pipe sizes. For example, two butterfly valves could be piped in a mixing application to control the temperature of the water going back to the condenser. The valves proportion the amount of tower water and condenser water return that is flowing in the condenser water supply line.

Two-way Valve

Two-way valves are available as globe, ball, or butterfly valves. The combination of valve body and actuator (called valve assembly) determines the valve stem position. Two-way valves control steam or water in two-position or proportional applications (Fig. 7). They provide tight shutoff and are available with quick-opening, linear, or equal percentage flow characteristics. Control valves are typically installed on the supply side of convectors and radiators, and the return side of small-bore water coils used in fan-forced equipment.

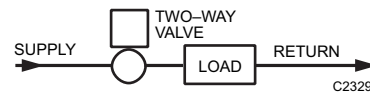


Fig. 7. Two-Way Valve Application.

Ideally, a control system has a linear response over its entire operating range. The sensitivity of the control to a change in temperature is then constant throughout the entire control range. For example, a small increase in temperature provides a small increase in cooling. A nonlinear system has varying sensitivity. For example, a small increase in temperature can provide a large increase in cooling in one part of the operating range and a small increase in another part of the operating range. To achieve linear control, the combined system performance of the actuator, control valve, and load must be linear. If the system is linear, a linear control valve is appropriate (Fig. 8). If the system is not linear, a nonlinear control valve, such as an equal percentage valve, is appropriate to balance the system so that resultant performance is linear.

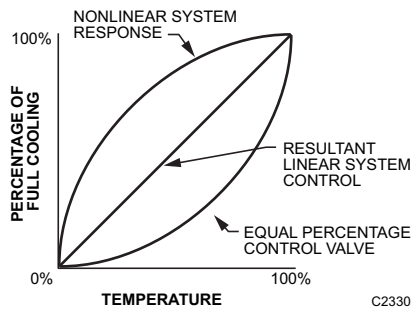


Fig. 8. Linear vs. Nonlinear System Control.

QUICK-OPENING VALVE

A quick-opening two-way valve includes only a disc guide and a flat or quick-opening plug. This type of valve is used for two position control of steam. The pressure drop for a quick opening two-way valve should be 10 to 20 percent of the piping system pressure differential, leaving the other 80 to 90 percent for the load and piping connections. Figure 9 shows the relationship of flow versus stem travel for a quick-opening valve. To achieve 90 percent flow, the stem must open only 20 percent. Linear or equal percentage valves can be used in lieu of quick-opening valves in two-position control applications as the only significant positions are full open and full closed.

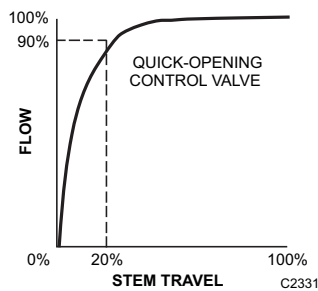


Fig. 9. Flow vs. Stem Travel Characteristic of a Quick-Opening Valve.

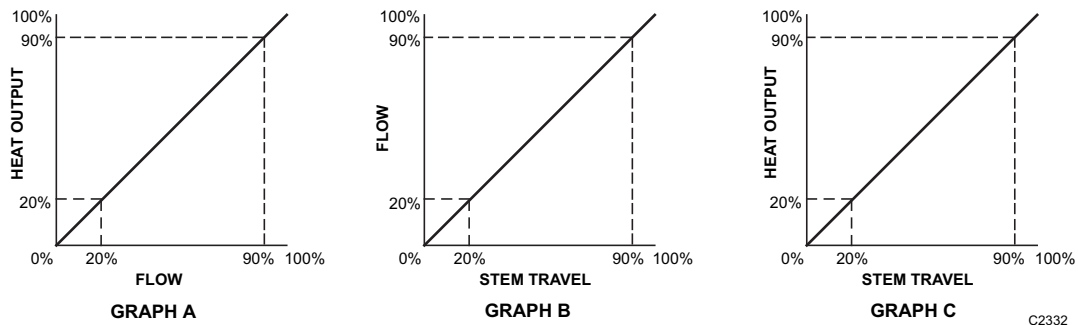


Fig. 10. Heat Output, Flow, and Stem Travel Characteristics of a Linear Valve.

EQUAL PERCENTAGE VALVE

An equal percentage valve includes a contoured plug or contoured V-port shaped so that similar movements in stem travel at any point in the flow range change the existing flow an

Linear Valve

A linear valve may include a V-port plug or a contoured plug. This type of valve is used for proportional control of steam or chilled water, or in applications that do not have wide load variations. Typically in steam or chilled water applications, changes in flow through the load (e.g., heat exchanger, coil) cause proportional changes in heat output. For example, Figure 10 shows the relationships between heat output, flow, and stem travel given a steam heat exchanger and a linear valve as follows:

- Graph A shows the linear relationship between heat output and flow for the steam heat exchanger. Changes in heat output vary directly with changes in the fluid flow.
- Graph B shows the linear relationship between flow and stem travel for the linear control valve. Changes in stem travel vary directly with changes in the fluid flow.

NOTE: As a linear valve just starts to open, a minimum flow occurs due to clearances required to prevent sticking of the valve. Some valves have a modified linear characteristic to reduce this minimum controllable flow. This modified characteristic is similar to an equal percentage valve characteristic for the first 5 to 10 percent of stem lift and then follows a linear valve characteristic for the remainder of the stem travel.

- Graph C shows the linear relationship between heat output and stem travel for the combined heat exchanger and linear valve. Changes in heat output are directly proportional to changes in the stem travel.

Thus a linear valve is used in linear applications to provide linear control.

Appendix A: Valve Selection and Sizing

EXAMPLE:

When a valve with the stem at 30 percent of its total lift and existing flow of 3.9 gpm (Table 2) opens an additional 10 percent of its full travel, the flow measures 6.2 gpm or increases 60 percent. If the valve opens an additional 10 percent so the stem is at 50 percent of its full travel, the flow increases another 60 percent and is 9.9 gpm.

Table 2. Stem Position vs. Flow for Equal Percentage Valve.

Stem		Flow	
Change	Position	Rate	Change
—	30% open	3.9 gpm	—
10% increase	40% open	6.2 gpm	60% increase
10% increase	50% open	9.9 gpm	60% increase

An equal percentage valve is used for proportional control in hot water applications and is useful in control applications where wide load variations can occur. Typically in hot water applications, large reductions in flow through the load (e.g., coil) cause small reductions in heat output. An equal percentage valve is used in these applications to achieve linear control. For example, Figure 11 shows the heat output, flow, and stem travel relationships for a hot water coil, with 200F, entering water and 50F entering air and an equal percentage valve, as follows:

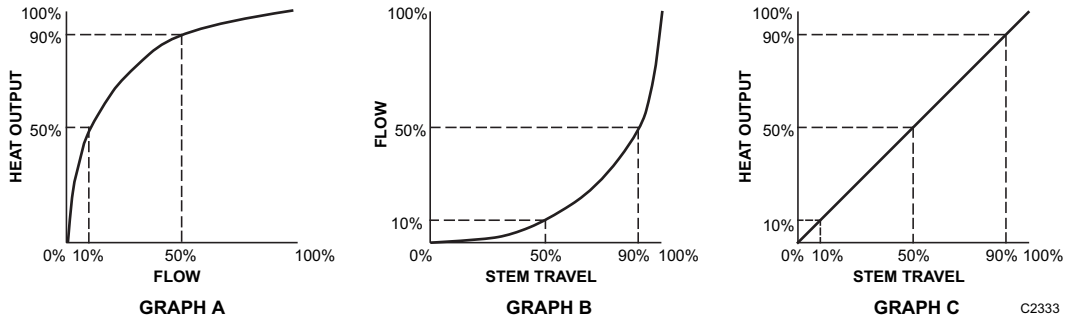


Fig. 11. Heat Output, Flow, and Stem Travel Characteristics of an Equal Percentage Valve.

Three-way Valves

Three-way valves (Fig. 12) control the flow of liquids in mixing or diverting valve applications (Fig. 13). The internal design of a three-way globe valve enables it to seat against the flow of liquid in the different applications. An arrow cast on the valve body indicates the proper direction of liquid flow. It is important to connect three-way valve piping correctly or oscillations, noise, and excessive valve wear can result. Three-way valves are typically have linear flow characteristics, although, some are equal percentage for flow through the coil with linear flow characteristics for flow through the coil bypass. Ball valves are also available in a three-way configuration, while two butterfly valves can be made to act as a three-way valve.

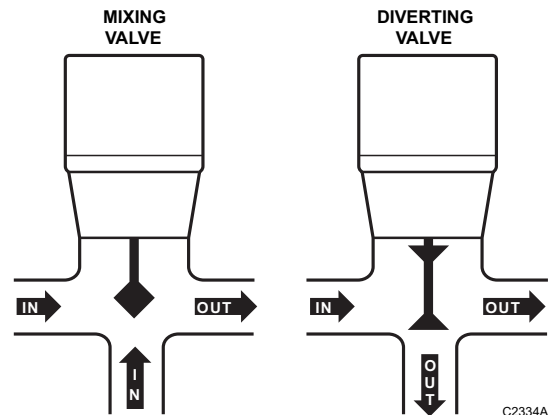


Fig. 12. Three-Way Valves.

- Graph A shows the nonlinear relationship between heat output and flow for the hot water coil. A 50 percent reduction in flow causes a 10 percent reduction in heat output. To reduce the heat output by 50 percent, the flow must decrease 90 percent.
- Graph B shows the nonlinear relationship between flow and stem travel for the equal percentage control valve. To reduce the flow 50 percent, the stem must close 10 percent. If the stem closes 50 percent, the flow reduces 90 percent.
- Graph C shows the relationship between heat output and stem travel for the combined coil and equal percentage valve. The combined relationship is close to linear. A 10 percent reduction in heat output requires the stem to close 10 percent, a 50 percent reduction in heat output requires the stem to close 50 percent, and a 90 percent reduction in heat output requires the stem to close 90 percent.

The equal percentage valve compensates for the characteristics of a hot water application to provide a control that is close to linear.

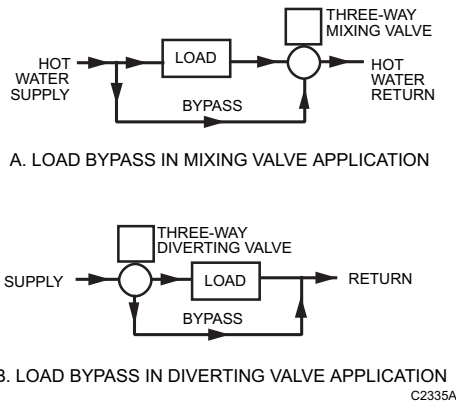


Fig. 13. Three-Way Valve Applications.

MIXING VALVE

A mixing valve provides two inlet ports and one common outlet port. The valve receives liquids to be mixed from the inlet ports and discharges the liquid through the outlet port (Fig. 12). The position of the valve disc determines the mixing proportions of the liquids from the inlet ports.

The close-off pressure in a mixing valve equals the maximum value of the greater inlet pressure minus the minimum value of the downstream pressure.

EXAMPLE:

A mixing valve application has a maximum pressure of 25 psi on one inlet port, maximum pressure of 20 psi on the other inlet port, and minimum downstream pressure of 10 psi on the outlet port. The close-off pressure is $25 \text{ psi} - 10 \text{ psi} = 15 \text{ psi}$. The application requires a mixing valve with at least a 15 psi close-off rating. The actuator selected must have a high enough force to operate satisfactorily.

In globe mixing valve applications, the force exerted on the valve disc due to unbalanced pressure at the inlets usually remains in the same direction. In cases where there is a reversal of force, the force changes direction and holds the valve disc off the seat, cushioning it as it closes. If the pressure difference for the system is greater than the pressure ratings of available globe mixing valves, use a ball mixing valve or two butterfly valves in a tee configuration.

Globe mixing valves are not suitable for modulating diverting valve applications. If a mixing valve is piped for modulating diverting service, the inlet pressure slams the disc against the seat when it nears the closed position. This results in loss of control, oscillations, and excessive valve wear and noise. Mixing valves are acceptable using about 80 percent of the close-off rating, but not recommended, in two-position diverting valve applications.

DIVERTING VALVE

A globe diverting valve provides one common inlet port and two outlet ports. The diverting valve uses two V-port plugs which seat in opposite directions and against the common inlet flow. The valve receives a liquid from one inlet port and discharges the liquids through the outlet ports (Fig. 12) depending on the position of the valve disc. If the valve disc is against the bottom seat (stem up), all the liquid discharges through the side outlet port. If the valve disc is against the top seat (stem down), all the liquid discharges through the bottom outlet port.

The close-off pressure in a diverting valve equals the maximum value of the inlet pressure minus the minimum value of the downstream pressure.

Globe diverting valves must not be used for mixing service. As with mixing valves used for diverting service, media pressure drop across the valve can cause it to slam shut with resulting loss of control.

EXAMPLE:

A diverting valve application has 20 psi maximum on the inlet port, one outlet port discharging to the atmosphere, and the other outlet port connecting to a tank under 10 psi constant pressure. The pressure difference between the inlet and the first outlet port is 20 psi and between the inlet and second outlet port is 10 psi. The application requires a diverting valve with at least 20 psi close-off rating.

Valve Sizing

Every valve has a capacity index or flow coefficient (C_v). Typically determined for the globe and ball valves at full open and about 60 degrees open for butterfly valves. C_v is the quantity of water in gpm at 60F that flows through a valve with a pressure differential of 1 psi. Sizing a valve requires knowing the medium (liquid or gas) and the required pressure differential to calculate the required C_v . When the required C_v is not available in a standard valve, select the next closest and calculate the resulting valve pressure differential at the required flow to verify acceptable performance.

After determination of the valve C_v , calculation of the flow of any medium through that valve can be found if the characteristics of the medium and the pressure drop across the valve are known.

Appendix A: Valve Selection and Sizing

Water Valves

Determine the capacity index (C_v) for a valve used in a water application, using the formula:

$$C_v = \frac{Q\sqrt{G}}{\sqrt{h}}$$

Where:

- Q = Flow of fluid in gallons per minute required to pass through the valve.
- G = Specific gravity of the fluid (water = 1).
- h = Pressure drop in psi. See Figures 14 and 15 for glycol solution correction values.

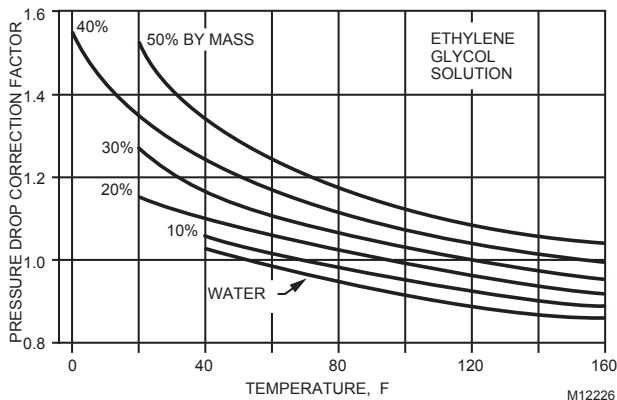
NOTE: The calculated C_v will rarely match the C_v of an available valve. For most accurate proportional control, select the valve with the next lower C_v value, and increase the pressure drop across the control valve to achieve the required flow through the coil by reducing the setting of the balancing valve. Otherwise, turn-down ratio will be reduced, proportionally.

For example, if the calculated C_v is 87, and the two closest C_v values are 63 and 100, the best choice for control precision would be the valve with a C_v of 63, and increase pressure drop across the valve by 90%.

If increased pressure drop is not possible, use the valve with C_v of 100, and accept a 13% reduction in valve rangeability.

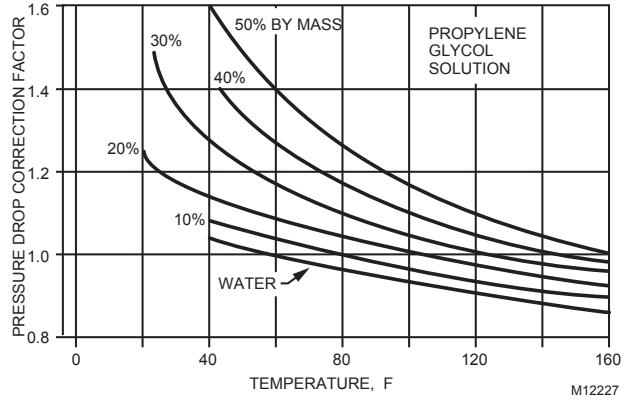
For two-position control, always chose the largest C_v greater than the coil with acceptable close-off pressure rating.

Determining the C_v of a water valve requires knowing the quantity of water (gpm) through the valve and the pressure drop (h) across the valve. If the fluid is a glycol solution, use the pressure drop multipliers from either Figure 14 or 15. See the sections on QUANTITY OF WATER and WATER VALVE PRESSURE DROP. Then select the appropriate valve based on C_v , temperature range, action, body ratings, etc., per VALVE SELECTION guidelines.



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Fig. 14. Pressure Drop Correction for Ethylene Glycol Solutions



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Fig. 15. Pressure Drop Correction for Propylene Glycol Solutions.

Quantity of Water

To find the quantity of water (Q) in gallons per minute use one of the following formulas:

1. When Btu/hr is known:

$$Q = \frac{Btu/hr}{K \times TD_w}$$

Where:

- Btu/hr = Heat output.
- K = Value from Table 3; based on temperature of water entering the coil. The value is in pounds per gallon x 60 minutes per hour.
- TD_w = Temperature difference of water entering and leaving the coil.

Table 3. Water Flow Formula Table

Water		Water	
Temp F	K	Temp F	K
40	502	200	484
60	500	225	483
80	498	250	479
100	496	275	478
120	495	300	473
150	490	350	470
180	487	400	465

2. For hot water coil valves:

$$Q = \frac{cfm \times 1.08 \times TD_a}{K \times TD_w}$$

Where:

- cfm = Airflow through the coil.
- 1.08 = A scaling constant. See Note.
- TD_a = Temperature difference of air entering and leaving the coil.
- K = Value from Table 3; based on temperature of water entering the coil (pounds per gallon x 60 minutes per hour).
- TD_w = Temperature difference of water entering and leaving the coil.

NOTE: The scaling constant 1.08 is derived as follows:

$$1.08 = \frac{0.24 BTU}{lbairF} \times \frac{60 min}{1 hr} \times \frac{1 lbair}{13.35 ft^3}$$

Where:

$$\frac{1 lbair}{13.35 ft^3} = \text{the specific volume of air at standard conditions of temperature and atmospheric pressure.}$$

Simplifying the equation:

$$1.08 = \frac{14.40 Btu min}{Fhr 13.35 ft^3}$$

To find the scaling constant for air conditions other than standard, divide 14.40 Btu by specific volume of air at those conditions.

3. For fan system chilled water coil valves:

$$Q = \frac{cfm \times Btu/lb}{113 \times TD_w}$$

Where:

- cfm = Airflow through the coil.
- Btu/lb = Heat per pound of dry air removed. Includes both sensible and latent heat.
- 113 = A scaling constant.
- TD_w = Temperature difference of water entering and leaving the coil.

WATER VALVE PRESSURE DROP

To determine valve pressure drop:

1. For two-way valves consider the following guidelines for valve pressure drop:
 - a. Include the pressure drop in the design of the water circulating system.
 - In systems with two-way valves only, it is often necessary to provide a pump relief bypass or some other means of differential pressure control to limit valve pressure drops to the valve capabilities. For control stability at light loads, pressure drop across the fully closed valve should not exceed triple the pressure drop used for sizing the valve.
 - To avoid high pressure drops near the pump, reverse returns are recommended in large systems.
 - b. The pressure drop across an open valve should be about half of the pressure difference between system supply and return, enough so that the valve, not the friction through the coil or radiator, controls the volume of water flow or the valve pressure drop should be equal to or greater than the pressure drop through the coil or radiator, plus the pipe and fittings connecting them to the supply and return mains.
 - c. Verify allowable full open and full closed pressure drops for all proportional and two-position water valves with appropriate manufacturer literature.
 - d. Make an analysis of the system at maximum and minimum rates of flow to determine whether or not the pressure difference between the supply and return mains stays within the limits that are acceptable from the stand point of control stability and close-off rating.
2. For two- and three-way valves consider the following guidelines for valve pressure drop:
 - a. In load bypass applications (Fig. 13) such as radiators, coils, and air conditioning units, the pressure drop should be 50 to 70 percent of the minimum difference between the supply and return main pressure at design operating conditions.
 - b. A manual balancing valve may be installed in the bypass to equalize the load drop and the bypass drop.
3. When selecting pressure drops for three-way mixing valves in boiler bypass applications (Fig. 13), consider the following:
 - a. Determine the design pressure drop through the boiler including all of the piping, valves, and fittings from the bypass connection through the boiler and up to the three-way valve input.
 - b. The valve pressure drop should be equal to or greater than the drop through the boiler and the fittings. If the valve drop is much smaller than the boiler pressure drop at design, effective control is obtained only when the disc is near one of the two seats. The mid-portion of the valve lift will be relatively ineffective.

Appendix A: Valve Selection and Sizing

- c. A manual balancing valve may be installed in the boiler bypass to equalize the boiler drop and the bypass drop.

WATER VALVE SIZING EXAMPLES

EXAMPLE 1:

A two-way linear valve is needed to control flow of 45F chilled water to a cooling coil. The coil manufacturer has specified an eight-row coil having a water flow pressure drop of 3.16 psi. Further, specifications say that the coil will produce 55F leaving air with a water flow of 14.6 gpm. Supply main is maintained at 40 psig, return is at 30 psig. Select required capacity index (C_V) of the valve.

Use the water valve C_V formula to determine capacity index for Valve V1 as follows:

$$C_V = \frac{Q\sqrt{G}}{\sqrt{h}}$$

Where:

- Q = Flow of fluid in gallons per minute required is 14.6 gpm.
G = Specific gravity of water is 1.
h = Pressure drop across the valve. The difference between the supply and return is 10 psi. 50% to 70% x 10 psi = 5 to 7 psi. Use 6 psi for the correct valve pressure drop. Note that 6 psi is also greater than the coil pressure drop of 3.16 psi.

Substituting:

$$C_V = \frac{14.6\sqrt{1}}{\sqrt{6}} = 6$$

Select a linear valve providing close control with a capacity index of 6 and meeting the required pressure and temperature ratings.

EXAMPLE 2:

A bypass valve is required to prevent flow through the chiller from dropping below 90 percent of design flow. When sizing valves for pump or chiller bypass applications (Fig. 16), system conditions that cause the valve to open or close completely must be considered before a pressure drop can be selected.

Assume the following:

- System flow at design, 1000 gpm
- Pump head at design, 48 ft
- Pump head at 90 percent flow, 50 ft
- Pressure across mains at AHU 1 at design flow, 28 ft
- Chiller pressure drop, 12 ft
- Chiller piping loop design pressure drop, 8 ft

With full system flow, Valve V5 is closed. Pressure drop across V5 equals the pump head minus the friction drops to V5. Pressure drop across Valve V5 is then 48 ft – 12 ft (chiller drop) – 4 ft (supply drop) – 4 ft (return drop) or 28 ft.

With system flow at 90 percent, the pump head rises to 50 ft, while the friction drops fall to the lower values shown in Figure 16. For additional information on chiller bypass operation see Chiller, Boiler, and Distribution System Applications section. Pressure drop across V5 equals the pump head minus the friction drops to V5. Pressure drop across Valve V5 is then 50 ft – 9.6 ft (chiller drop) – 3.2 ft (supply drop) – 3.2 ft (return drop) or 34 ft. Converting ft to psi, 34 ft x 0.4335 psi/ft = 14.7 psi.

Substituting the flow of water, specific gravity of water, and pressure drop in the C_V formula shows that the Valve V5 should have a C_V of 235.

$$C_V = \frac{900\sqrt{1}}{\sqrt{14.7}} = 235$$

Appendix A: Valve Selection and Sizing

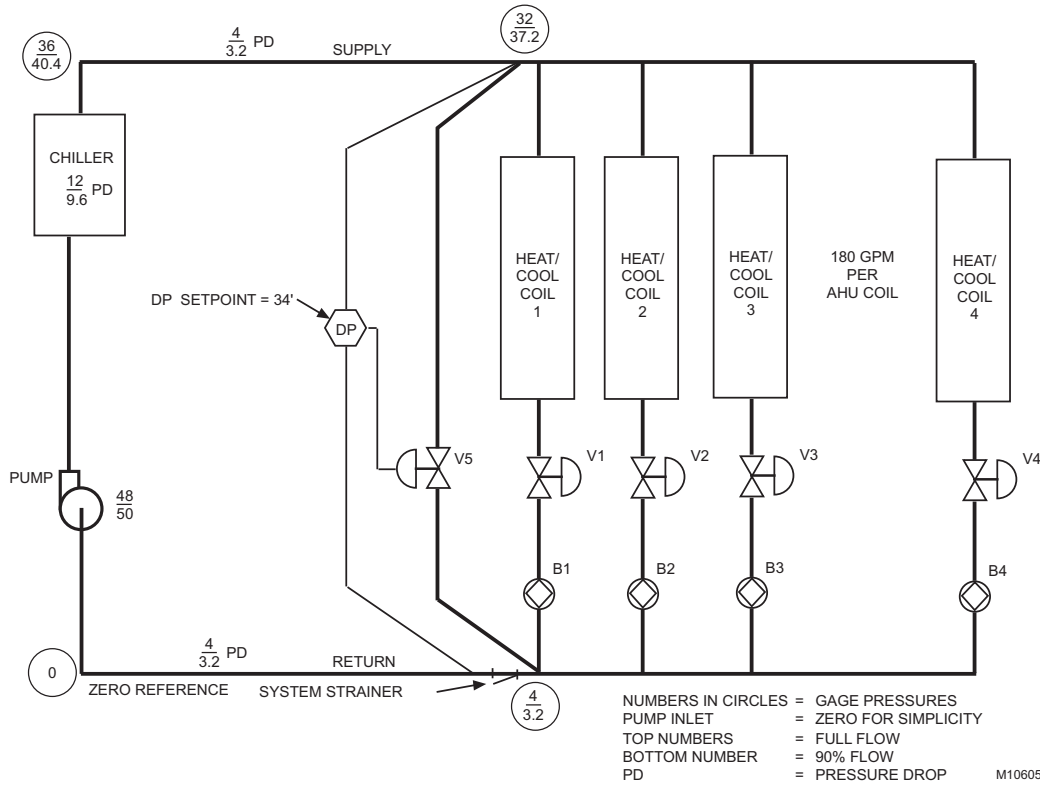


Fig. 16. Chiller Bypass Application.

EXAMPLE 3:

Sizing water valves for heating coils is especially critical. In Figure 17, a valve with a C_v of 12 will have 30 percent of the available pressure drop when full open, while a valve with a C_v of 5 will have 70 percent of the available pressure drop. As shown in Figure 18, the valve with 70 percent of the available pressure drop essentially provides the equal percentage water flow control, resulting in linear coil heat transfer and stable temperature control. The valve with only 30 percent of the available pressure drop has a more linear flow control which results in nonlinear coil heat transfer. See EQUAL PERCENTAGE VALVE section for further information.

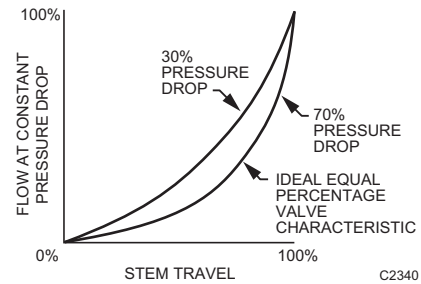


Fig 18. Effect of Pressure Drop in Hot Water Valve Sizing.

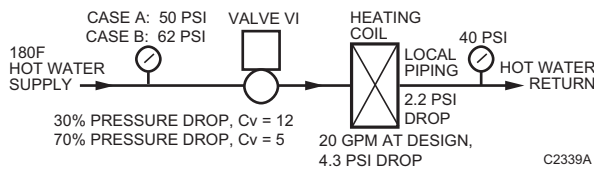


Fig. 17. Equal Percentage Valve Hot Water Application.

EXAMPLE 4:

A three-way mixing valve is needed for a heat exchanger application with a bypass line. Water flow is specified at the rate of 70 gpm. Manufacturer data for the exchanger indicates a pressure drop of 1.41 ft of water through the exchanger coils.

Appendix A: Valve Selection and Sizing

Use the water valve C_v formula to determine capacity index for Valve V1 as follows:

$$C_v = \frac{Q\sqrt{G}}{\sqrt{h}}$$

Where:

- Q = Flow of fluid in gallons per minute required to pass through the valve is 70 gpm.
- G = Specific gravity of water is 1.
- h = Pressure drop across the valve. Plans of the heating system indicate three-inch supply and return mains. From an elbow equivalent table and pipe friction chart found in the ASHRAE Handbook or other reference manuals, the calculated pressure drop through a three-inch tee and the piping from the valve and the tee to the exchanger is 0.09 psi. Heat exchanger pressure drop is 1.41 ft of water or 1.41 ft x 0.433 psi/ft = 0.61 psi. Total pressure drop from bypass connection through the heat exchanger and to the hot-water input of the three-way valve is 0.61 + 0.09 or 0.70 psi.

Since the valve pressure drop (h) should be equal to or greater than the drop through the heat exchanger and fittings, 0.70 psi is used as the valve pressure drop.

For optimum control, a manual balancing valve is installed in the bypass line to equalize the pressure drops in the exchanger and bypass circuits.

$$C_v = \frac{70\sqrt{1}}{\sqrt{0.70}} = 83.6 \text{ or } 84$$

Substituting the flow of water, specific gravity of water, and pressure drop in the C_v formula shows that the valve should have a C_v of 83.6 or 84.

Select a linear valve providing close control with a capacity index of 84 and meeting the required pressure and temperature ratings.

Steam Valves

Calculate the required capacity index (C_v) for a valve used in a steam application, using the formula:

$$C_v = \frac{(1 + 0.00075s)Q\sqrt{V}}{63.5\sqrt{h}}$$

Where:

- Q = Quantity of steam in pounds per hour required to pass through the valve.
- V = Specific volume of steam, in cubic feet per pound, at the average pressure in the valve. For convenience Table 5 at the end of the STEAM VALVES section lists the square root of the specific volume of steam for various steam pressures. Therefore, use the value in this column of the table as is; do not take its square root.
- 63.5 = A scaling constant.
- h = Pressure drop in psi.
- s = Superheat in degrees F.

Determining the C_v for a steam valve requires knowing, the quantity of steam (Q) through the valve, the pressure drop (h) across the valve, and the degrees of superheat. See QUANTITY OF STEAM and STEAM VALVE PRESSURE DROP. Then select the appropriate valve based on C_v , temperature range, action, body ratings, etc., per VALVE SELECTION guidelines.

NOTE: When the superheat is 0F, then $(1 + 0.00075s)$ equals 1 and may be ignored.

QUANTITY OF STEAM

To find the quantity of steam (Q) in pounds per hour use one of the following formulas:

- When Btu/hr (heat output) is known:

$$Q = \frac{\text{Btu/hr}}{1000\text{Btu/lbsteam}}$$

Where:

- Btu/hr = Heat output.
- 1000 Btu/lb= A scaling constant representing the approximate heat of vaporization of steam.

- For sizing steam coil valves:

$$Q = \frac{\text{CFM} \times \text{TD}_a \times 1.08}{1000\text{Btu/lbsteam}}$$

Where:

- cfm = Cubic feet per minute (ft³/min) of air from the fan.
- TD_a = Temperature difference of air entering and leaving the coil.
- 1.08 = A scaling constant. See NOTE.
- 1000 Btu/lb= A scaling constant representing the approximate heat of vaporization of steam.

Appendix A: Valve Selection and Sizing

NOTE: The scaling constant 1.08 is derived as follows:

$$1.08 = \frac{0.24 BTU}{lbairF} \times \frac{60min}{1hr} \times \frac{1lbair}{13.35ft^3}$$

Where:

$$\frac{1lbair}{13.35ft^3} = \text{the specific volume of air at standard conditions of temperature and atmospheric pressure.}$$

Simplifying the equation:

$$1.08 = \frac{14.40 Btumin}{Fhr13.35ft^3}$$

To find the scaling constant for air conditions other than standard, divide 14.40 Btu by specific volume of air at those conditions.

3. For sizing steam to hot water converter valves:

$$Q = gpm \times TD_w \times 0.49$$

Where:

gpm = Gallons per minute of water flow through converter.

TD_w = Temperature difference of water entering and leaving the converter.

0.49 = A scaling constant. This value is derived as follows:

$$0.49 = \frac{8.33lbwater}{1gal} \times \frac{60min}{1hr} \times \frac{1lbsteam}{1000Btu} \times \frac{1Btu}{lbwaterF}$$

Simplifying the equation:

$$0.49 = \frac{0.49minlbsteam}{galhrF}$$

4. When sizing steam jet humidifier valves:

$$Q = \frac{(W_1 - W_2)lbmoisture}{lbair} \times \frac{1}{13.35ft^3} \times \frac{ft^3}{min} \times \frac{60min}{hr}$$

Where:

W1 = Humidity ratio entering humidifier, pounds of moisture per pound of dry air.

W2 = Humidity ratio leaving humidifier, pounds of moisture per pound of dry air.

$\frac{13.35ft^3}{lbair}$ = The specific volume of air at standard conditions of temperature and atmospheric pressure.

$\frac{ft^3}{min}$ = Cubic feet per minute (cfm) of air from the fan.

$\frac{60min}{hr}$ = A conversion factor.

Simplifying:

$$Q = 4.49 \frac{(W_1 - W_2)lbmoisture}{hr}$$

5. When Equivalent Direct Radiation (EDR) is known:

$$Q = EDR(Total) \times 0.24$$

Where:

EDR (Total)=Radiators are sized according to Equivalent Direct Radiation (EDR). If controlling several pieces of radiation equipment with one valve, add the EDR values for all pieces to obtain the total EDR for the formula.

0.24 = A scaling constant, lb steam/unit EDR. See Table 4.

Table 4. Output of Radiators and Convectors.

Average Radiator of Convector Temperature, Deg F	Cast Iron Radiator Btu/Hr/EDR ^a	Convector, Btu/Hr/EDR ^b
215	240	240
200	209	205
190	187	183
180	167	162
170	148	140
160	129	120
150	111	102
140	93	85
130	76	69
120	60	53
110	45	39
100	31	27
90	18	16

a At Room Temperature

b At 65 F Inlet Air Temperature

STEAM VALVE PRESSURE DROP

Proportional Applications

When specified, use that pressure drop (h) across the valve.

When not specified:

1. Calculate the pressure drop (h) across the valve for good modulating control:

$$h = 80\% \times (P_m - P_r)$$

NOTE: For a zone valve in a system using radiator orifices use:

$$h = (50 - 75)\% \times (P_m - P_r)$$

Where

P_m = Pressure in supply main in psig or psia (gage or absolute pressure).

P_r = Pressure in return in psig or psia. A negative value if a vacuum return.

Appendix A: Valve Selection and Sizing

2. Determine the critical pressure drop:

$$h_{\text{critical}} = 50\% \times P_{\text{ma}}$$

Where:

P_{ma} = Pressure in supply main in psia (absolute pressure)

psia = psig + 14.7

Use the smaller value h or h_{critical} when calculating C_v .

Two-Position Applications

Use line sized valves whenever possible. If the valve size must be reduced, use:

$$h = 20\% \times (P_{\text{m}} - P_{\text{r}})$$

Where

P_{m} = Pressure in supply main in psig or psia (gage or absolute pressure).

P_{r} = Pressure in return in psig or psia. A negative value if a vacuum return.

STEAM VALVE SIZING EXAMPLES

EXAMPLE 1:

A two-way linear valve (V1) is needed to control high-pressure steam flow to a steam-to-water heat exchanger. An industrial-type valve is specified. Steam pressure in the supply main is 80 psig with no superheat, pressure in return is equal to atmospheric pressure, water flow is 82.5 gpm, and the water temperature difference is 20F.

Use the steam valve C_v formula to determine capacity index for Valve V1 as follows:

$$C_v = \frac{(1 + 0.00075s)Q\sqrt{V}}{63.5\sqrt{h}}$$

Where:

Q = The quantity of steam required to pass through the valve is found using the converter valve formula:

$$Q = \text{gpm} \times TD_w \times 0.49$$

Where:

gpm = 82.5 gpm water flow through exchanger

TD_w = 20F temperature difference

0.49 = A scaling constant

Substituting this data in the formula:

Q = 808.5 pounds per hour

h = The pressure drop across a valve in a modulating application is:

$$h = 85\% \times (P_{\text{m}} - P_{\text{r}})$$

Where:

P_{m} = Upstream pressure in supply main is 80 psig.

P_{r} = Pressure in return is atmospheric pressure or 0 psig.

Substituting this data in the pressure drop formula:

$$h = 0.85 \times (80 - 0)$$

$$= 0.85 \times 80$$

$$= 68 \text{ psi}$$

The critical pressure drop is found using the following formula:

$$h_{\text{critical}} = 50\% \times (\text{psig} + 14.7 \text{ psi})$$

$$h_{\text{critical}} = 0.50 \times (80 \text{ psig upstream} + 14.7 \text{ psi})$$

$$= 0.50 \times 94.7 \text{ psi}$$

$$= 47.4 \text{ psi}$$

The critical pressure drop (h_{critical}) of 47.4 psi is used in calculating C_v , since it is less than the pressure drop (h) of 68 psi. Always, use the smaller of the two calculated values.

V = Specific volume (V) of steam, in cubic feet per pound at average pressure in valve (P_{avg}):

$$P_{\text{avg}} = P_{\text{m}} - \frac{h}{2}$$

$$= 80 - \frac{47.4}{2} = 80 - 23.6 = 56.4 \text{ psig}$$

The specific volume of steam at 56.4 psig is 6.14 and the square root is 2.48.

63.5 = A scaling constant.

Substituting the quantity of steam, specific volume of steam, and pressure drop in the C_v formula shows that the valve should have a C_v of 4.6.

$$C_v = \frac{(1 + 0.00075 \times 0) \times 808.5 \times 2.48}{63.5 \sqrt{47.4}}$$

$$= \frac{1745.6}{63.5 \times 6.88} = 4.6$$

NOTE: If P_{avg} is rounded off to the nearest value in Table 5 (60 psi), the calculated C_v is 4.5 a negligible difference.

Appendix A: Valve Selection and Sizing

Select a linear valve providing close control with a capacity index of 4 and meeting the required pressure and temperature ratings.

NOTE: For steam valves downstream from pressure reducing stations, the steam will be superheated in most cases and must be considered.

EXAMPLE 2:

In Figure 19, a linear valve (V1) is needed for accurate flow control of a steam coil that requires 750 pounds per hour of steam. Upstream pressure in the supply main is 5 psig and pressure in the return is 4 in. Hg vacuum minimum.

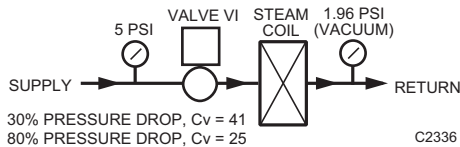


Fig. 19. Linear Valve Steam Application.

Use the steam valve C_V formula to determine capacity index for Valve V1 as follows:

$$C_V = \frac{(1 + 0.00075s)Q\sqrt{V}}{63.5\sqrt{h}}$$

Where:

- Q = Quantity of steam required to pass through the valve is 750 pounds per hour.
- h = The pressure drop across a valve in a modulating application is found using:
h = 80% x (Pm – Pr)
- and:
- Pm = Upstream pressure in supply main is 5 psig.
- Pr = Pressure in return is 4 in. Hg vacuum.

NOTE: 1 in. Hg = 0.49 psi and 1 psi = 2.04 in. Hg.

Therefore,
4 in. Hg vacuum = -1.96 psig.

$$\begin{aligned} h &= 0.80 \times [5 - (-1.96)] \\ &= 0.80 \times 6.96 \\ &= 5.6 \text{ psi} \end{aligned}$$

The critical pressure drop is found using the following formula:

$$\begin{aligned} h_{\text{critical}} &= 50\% \times (\text{psig} + 14.7 \text{ psi}) \\ h_{\text{critical}} &= 0.50 \times (5 \text{ psig upstream} + 14.7 \text{ psi}) \\ &= 0.50 \times 19.7 \text{ psia} \\ &= 9.9 \text{ psi} \end{aligned}$$

The pressure drop (h) of 5.6 psi is used in calculating the C_V , since it is less than the critical pressure drop (h_{critical}) of 9.9 psi.

V = Specific volume (V) of steam, in cubic feet per pound at average pressure in valve (P_{avg}):

$$\begin{aligned} P_{\text{avg}} &= P_m - \frac{h}{2} \\ &= 5 - \frac{5.6}{2} = 5 - 2.8 = 2.2 \text{ psig} \end{aligned}$$

The specific volume of steam at 2.2 psig is 23.54 and the square root is 4.85.

63.5 = A scaling constant.
s = 0

Substituting the quantity of steam, specific volume of steam, and pressure drop in the C_V formula shows that Valve V1 should have a C_V of 24.17 or the next higher available value (e.g., 25).

$$\begin{aligned} C_V &= \frac{(1 + 0.00075 \times 0) \times 750 \times 4.85}{63.5\sqrt{5.6}} \\ &= \frac{3637.5}{63.5 \times 2.37} = 24.17 \end{aligned}$$

NOTE: If P_{avg} is rounded off to the nearest value in Table 5 (2 psi), the calculated C_V is 24.30.

Select a linear valve providing close control with a capacity index of 25 and meeting the required pressure and temperature ratings.

EXAMPLE 3:

Figure 20 shows the importance of selecting an 80 percent pressure drop for sizing the steam valve in Example 2. This pressure drop (5.6 psi) approximates the linear valve characteristic. If only 30 percent of the available pressure drop is used ($0.30 \times 6.96 \text{ psi} = 2.10 \text{ psi}$ or 2 psi), the valve C_V becomes:

$$\begin{aligned} C_V &= \frac{(1 + 0.00075s)Q\sqrt{V}}{63.5\sqrt{h}} \\ C_V &= \frac{750 \times 4.85}{63.5\sqrt{2}} = 40.5 \end{aligned}$$

Appendix A: Valve Selection and Sizing

This larger valve (2 psi drop) has a steeper curve that is further away from the desired linear valve characteristic. See LINEAR VALVE under VALVE SELECTION for more information.

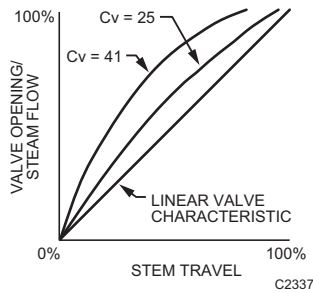


Fig. 20. Effect of Pressure Drop in Steam Valve Sizing.

Table 5. Properties of Saturated Steam.

Vacuum, Inches of Mercury	Boiling Point or Steam Temperature (Deg F)	Specific Volume (V), cu. ft/lb	\sqrt{V} (For valve sizing)	Maximum Allowable Pressure Drop, psi.
29	76.6	706.00	26.57	0.23
25	133.2	145.00	12.04	1.2
20	161.2	75.20	8.672	2.4
15	178.9	51.30	7.162	3.7
14	181.8	48.30	6.950	3.9
12	187.2	43.27	6.576	4.4
10	192.2	39.16	6.257	4.9
8	196.7	35.81	5.984	5.4
6	201.0	32.99	5.744	5.9
4	204.8	30.62	5.533	6.4
2	208.5	28.58	5.345	6.9

Gage Pressure, psig	Boiling Point or Steam Temperature (Deg F)	Specific Volume (V), cu. ft/lb	\sqrt{V} (For valve sizing)	Maximum Allowable Pressure Drop, psi.
0	212.0	26.79	5.175	7.4
1	215.3	25.20	5.020	7.8
2	218.5	23.78	4.876	8.4
3	221.5	22.57	4.751	8.8
4	224.4	21.40	4.626	9.4
5	227.1	20.41	4.518	9.8
6	229.8	19.45	4.410	10.4
7	232.3	18.64	4.317	10.8
8	234.8	17.85	4.225	11.4
9	237.1	17.16	4.142	11.8

Gage Pressure, psig	Boiling Point or Steam Temperature (Deg F)	Specific Volume (V), cu. ft/lb	\sqrt{V} (For valve sizing)	Maximum Allowable Pressure Drop, psi.
10	239.4	16.49	4.061	12.4
11	241.6	15.90	3.987	12.8
12	243.7	15.35	3.918	13.4
15	249.8	13.87	3.724	14.8
20	258.8	12.00	3.464	17.4
25	266.8	10.57	3.251	19.8
30	274.0	9.463	3.076	22.4
35	280.6	8.56	2.93	24.8
40	286.7	7.826	2.797	27.4
45	292.4	7.209	2.685	29.8
50	297.7	6.682	2.585	32.4
55	302.6	6.232	2.496	34.8
60	307.3	5.836	2.416	37.4
65	311.8	5.491	2.343	39.8
70	316.0	5.182	2.276	42.4
75	320.0	4.912	2.216	44.8
80	323.9	4.662	2.159	47.4
85	327.6	4.445	2.108	49.8
90	331.2	4.239	2.059	52.4
95	334.6	4.060	2.015	54.8
100	337.9	3.888	1.972	57.4
110	344.1	3.595	1.896	62.3
120	350.0	3.337	1.827	67.4
130	355.2	3.12	1.766	72.3
140	360.9	2.923	1.710	77.4
150	366.2	2.746	1.657	82.3
160	370.6	2.602	1.613	87.4
170	375.5	2.462	1.569	92.3
180	379.6	2.345	1.531	97.4
190	383.9	2.234	1.495	102.3
200	387.8	2.134	1.461	107.4
225	397.4	1.918	1.385	119.8
250	406.0	1.742	1.320	132.4
275	414.2	1.595	1.263	145.0
300	421.8	1.472	1.213	157.4
350	435.6	1.272	1.128	182.4
400	448.1	1.120	1.058	207.4
450	459.5	0.998	0.999	232.4
500	470.0	0.900	0.949	257.4
550	479.7	0.818	0.904	282.4
600	488.8	0.749	0.865	307.4
650	497.3	0.690	0.831	332.4
700	505.4	0.639	0.799	357.4
800	520.3	0.554	0.744	407.4
900	533.9	0.488	0.699	457.4
1000	546.3	0.435	0.659	507.4

Technology Comparison of Control Ball and Globe Valves

Attribute	Control Ball Valve	Globe Valve	Advantage	Reason
Flow Characteristics	Quadratic (with characterization)	Equal percent to design temp.	Globe	BAS controller expects flow from valve at low signal
	Linear (full port)	Linear		
	Delayed opening / early close-off	Continuous from start		
Rangeability (turn-down ratio)	Fixed minimum flow results in 1. Low TDR at low Cv 2. High TDR at high Cv	50:1 = 2% steps (HON)	Globe	Small sizes are the most common applications and need high TDR
		100:1 (Siemens claim)		
		Maximum 25:1 (JCI)		
Operating Differential Pressure	20 – 25 psid for characterized ports (plate distortion)	20 – 25 psid for quiet operation (cavitation at low flow)	— —	20+ psid is not typical of control valve applications
Close-Off Differential Pressure	High with low Torque actuators (water pressure aids sealing)	Inversely proportional to Cv, and proportional to actuator force	Control Ball	Globe is comparable in small sizes
	Capable of dead-heading pumps*	Pressure balanced is high		PB more expensive
Seat Leakage	ANSI Class IV (< 0.01% Cv) @ A port (Does not apply to B port without seals)	ANSI Class III w/ small metal seats ANSI Class IV with resilient seat and larger metal seated valves	Control Ball	Less leakage reduces energy use with chilled water
Trim (internal construction)	Plated brass ball and stem	Resilient material on metal seat	— —	Long term performance of ball valve in automatic control unknown
		Stainless steel ball and stem Brass plug on brass seat		
	Rubber and Teflon stem O-rings	Stainless steel plug on SS seat		
Steam Ratings	Low pressure (full port only)	Low pressure	Globe	Greater versatility. Equal % flow available with globe
	— —	High pressure		
Cv Ratings	Multiple Cv's per valve size	Multiple Cvs @ 1/2" size	Ball	Lower installed cost with no loss of control capability
Line Size Piping	Line size piping with lower Cv	Reducers often needed > 1/2"	Ball	Lower installed cost with no loss of control capability
Pipe Sizes	1/2" – 3" Threaded	1/2" – 3" Threaded ANSI 150	Globe	Wider applications
	4" – 6" ANSI 125 Flanged	2-1/2" – 6" ANSI 125 and 250 Flanged		
3-Way Body Styles	Combo mixing/diverting	Mixing models	Control Ball	Easier to select. Piping different mixing & diverting
	B port seal required for tight close-off	Diverting models		
Physical Size	Low profile at large sizes	Large profile at large sizes	Control Ball	Depends on application
	Relatively large in 1/2" pipe	Small size in 1/2" pipe	Globe	
Control Inputs	Floating/2-position, modulating	Floating/2-position, modulating	— —	Depends on application
	Some pneumatic actuators available	Large linear pneumatic installed base	Globe	
Fail Safe Operation	N/O or N/C by actuator position	N/O or N/C up to 3"	Control Ball	Globe needs higher power actuators
	Stay-in-place	Stay-in-place		
Valve Serviceability	Requires unions for valve access VBN stems replaceable	In-line serviceable	Globe	B.V. must be removed from piping
CE Preference	Growing with time	Well established	Globe	Familiar technology (habit)
Contractor Preference	Valve comes with actuator	Actuator selection separate	Control Ball	Easier to select
Actuator Selection	Match valve and damper DCAs	Requires linkage for DCAs	Control Ball	Added cost for globe valve

*Pumps require pressure cut-offs or supply-return differential pressure regulators to avoid pump seal damage and potential leakage that can result without flow-through. Unless used in end-of-line-service, control valves do not need to close off against full pump head.

Appendix B: NEMA Standard Classification Code for Enclosures

NEMA 1—General purpose. for indoor protection, where conditions are not unusually severe.

NEMA 2—Drip tight. Designed to exclude falling moisture or dirt. Particularly applicable to cooling rooms, laundries, etc., where condensation is prevalent. For indoor use.

NEMA 3—Weather Resistant (weatherproof). For outdoor use; designed to withstand all normal exposure to natural elements. Controls mounted on pullout racks for easy access. With rain hood and weather seals.

NEMA 4—Watertight. Withstands water pressure from 1 in. hose nozzle, 65 gallons per minute, from distance of not less than 10 ft for five minutes. Suitable for maritime applications, breweries, etc.

NEMA 5—Dust-tight. Equipped with dust-tight gaskets. Suitable for mills and other high-dust atmospheres.

NEMA 6—Submersible. For submerged operation under specified pressures and time.

NEMA 7—Hazardous Locations, National Electrical Code Class 1 (circuit breaks in air).

NEMA 8—Hazardous Locations, National Electrical Code Class 1 (circuit breaks immersed in oil).

NEMA 9—Hazardous Locations, National Electrical Code Class 2.

NEMA 10—Explosion-proof. Meets U.S. Bureau of Mines requirements for explosive atmospheres.

NEMA 11—Acid or Fume Resistant. Provides for immersion of enclosed equipment in oil.

NEMA 12—Industrial Use. Excludes oils, dust, moisture, to satisfy individual requirements.

Appendix C: Best Practices for Low Power Control Signal Wiring

Low power analog signals are commonly used for proportional control signal wiring in HVAC applications. Following are a series of best practices for the prevention of corruption of these signals due to electro-magnetic interference (“EMI”).

EMI is typically caused by coupling of the electro-magnetic field that surrounds all wires carrying current. It may also be caused by radio frequency sources such as “walkie talkies” using amplitude modulated signals. A strong EM field can induce electrical noise in wires up to 2 V in amplitude. The strongest coupling comes between closely spaced, parallel wires. Inductive and high power motor loads are some of the strongest sources of EMI, along with electronics lighting ballasts, dimmers, and variable frequency motor drives. More potential EMI sources in a building mean that greater attention needs to be paid to effective wiring practices.

All control wiring should consist of twisted pairs of wires, which resist interference better than straight, non-twisted conductors. Stranded conductors offer less resistance to current flow than solid wires, and are more flexible making them easier to install; however, care must be taken to ensure that all the conductors in the wire are properly installed and that “whiskers” do not short out any wiring connections.

Shielded Wiring

Control signals can be protected from EMI using shielded wire. The more continuous the shield, the more effective it is. Braided shield is commonly used for microphone cables because of its superior flexibility. HVAC wiring is fixed, does not require high flexibility during use, and is better served with lower cost cables using continuous foil shielding and a “drain wire”.

1. All signal wiring in hospitals should be shielded to prevent the potential for interference with medical equipment such as high power MRI and CT scanners.
2. All 0~10 Vdc control signals should be run in shielded cable. EMI noise can be interpreted as control signaling, depending on the noise suppression circuitry in the controlled equipment.
3. Long runs of wiring from 24 V power supply transformers should be shielded in heavy electrical noise environments to prevent EMI from coupling through the actuator’s power supply.
4. In typical commercial buildings, 2~10 Vdc signals do not require shielded wiring.
5. Current flow is much more difficult to induce in wiring than voltage, and current-based control signals usually do not require shielded cable except in heavy industrial applications.
 - a. If the terminal equipment only accepts voltage input, install a 500 ohm, ¼ Watt (or larger), 1% resistor across the control input terminals to convert a 4~20 mA(dc) signal to 2~10 Vdc.
 - b. If multiple actuators are connected in parallel, install this resistor at the first actuator in the group.

- c. Any standard resistor (“EIA”) value between 490 and 510 ohms is acceptable, and can be purchased at retail outlets that sell electronic components.
6. Floating, pulse-width modulated, and two-position actuators use switched 24 Vac control or power signals and so rarely require shielded wiring.

Wiring Techniques

1. No wiring should ever be assumed to be interference-proof. Never strap signal cables to other conductors or conduit, especially line voltage.
2. Never run signal wires in raceways or wiring troughs with other conductors. Keep signal wires at least a yard away from line voltage wiring. Higher voltage wiring requires greater separation.
3. When necessary, cross line voltage conductors with signal wiring at 90° (right angles), to minimize signal coupling.
4. Electromagnetic shielding is a static phenomenon; any current running through the shield will negate any protection the shield may have provided. Only ground (or “earth”) a shield drain wire at one point, preferably where the signal will be the weakest, for example: at the actuator.
 - a. Do not ground the secondary of the 24 V power supply in the control system. This will create a secondary current path and negate the protection of any shielding.
 - b. If there is a burner ignition system, power it with its own transformer and use an interface relay for isolation, if necessary.
 - c. Use relays with built-in coil arc suppression, such as a Honeywell R8229.
5. Insulate all exposed shielding and drain wire joins and splices so that they cannot contact electrical ground, especially junction boxes and conduit. Do not use the ground screw of a junction box as a tie point. Use a separate electrical ground wire if required for safety extra-low voltage wiring by local code.
6. Both rigid and flexible conduit are continuously grounded (“bonded”) for electrical safety, and cannot function as a signal shield. Where local codes require mechanical protection for all wiring, shielded signal cable may be run inside conduit, following the practices listed above.

Additional References

Most of these wiring techniques were developed to protect the very low-strength signals in audio recording. The 20 mA current loop signal was originally used with teletype (“TWX”) equipment communicating over telephone lines and adapted for proportional analog control signaling in industrial process control. Further information and background theory can be found in:

1. Audio Engineering Handbook, edited by Blair K. Benson, McGraw-Hill
2. Handbook for Sound Engineers, by Glen Ballou
3. Standard Handbook of Audio Engineering, by Jerry Whittaker and Blair K. Benson, McGraw-Hill.

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| <p>Sixty (60) months from date of installation</p> <ul style="list-style-type: none"> • Prestige®, Prestige® IAQ, VisionPRO®, Commercial VisionPRO®, FocusPRO®, Wireless FocusPRO®, PRO 4000, PRO 3000, LineVoltPRO™, Digital Round™, and Modern Round™ (T87K, N) Series Thermostats with a date code of 0501 or later • Air Cleaners, Humidifiers, Ventilators, Ultraviolet Treatment and Zoning products with a date code of 0501 or later, excluding replacement maintenance parts • Indoor air quality products F50, F52, F300, F200, F150, UV100E, HE225, HE265, HE365, with date codes of 0452 or earlier, excluding replacement maintenance parts • MS, MN and fast acting 2-position Direct Coupled Actuators • JADE economizer when used with Honeywell sensors and actuators • AquaPUMP circulating pump • C7189 wireless indoor sensor | <p>Sixty (60) months from date of manufacture</p> <ul style="list-style-type: none"> • Access and Video Systems power supplies <p>Thirty-six (36) months from date of shipment</p> <ul style="list-style-type: none"> • Variable frequency drive devices (VFD) and accessories <p>Thirty-six (36) months from date of installation</p> <ul style="list-style-type: none"> • AUBE branded thermostats, timers, and switches <p>Twenty-four (24) months from date of installation</p> <ul style="list-style-type: none"> • CommercialPRO, PRO 2000 and PRO 1000 thermostats • Other Honeywell indoor air quality and zoning products with a date code of 0452 or earlier, unless otherwise specified • AQ2000 Aquatrol panels and AQ1000 thermostats <p>Twenty-four (24) months from date of manufacture</p> <ul style="list-style-type: none"> • Pan-Tilt-Zoom Domes for Access and Video Systems | <p>Eighteen (18) months from date of shipment,</p> <ul style="list-style-type: none"> • All WEBs building automation and security parts, unless specified otherwise <p>Twelve (12) months from date of installation</p> <ul style="list-style-type: none"> • Water Solutions products • Other Honeywell thermostats and thermostats with a date code of 0452 or earlier, unless specified otherwise <p>Twelve (12) months from date of shipment</p> <ul style="list-style-type: none"> • Building automation security accessories <p>Twelve (12) months from date of manufacture</p> <ul style="list-style-type: none"> • Keyboards, Controllers and other Access and Video System accessories. <p>Ninety (90) days from date of manufacture</p> <ul style="list-style-type: none"> • IR Halogen bulbs for Access and Video Systems <p>The warranty period for all other products is twelve (12) months from date of installation.</p> |
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If a product is defective due to workmanship or materials, is removed within the applicable warranty period, and is returned to Honeywell in accordance with the procedure described below, Honeywell will, at its option, either repair, replace or credit the customer for the purchase price of the product, in accordance with the procedure described below. This warranty extends only to persons or organizations who purchase products in this catalog for resale.

The expressed warranty above constitutes the entire warranty of Honeywell with respect to the products in this catalog and IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL HONEYWELL BE RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER.

INSTRUCTIONS—INSTALLING OR SERVICING CONTRACTOR OR DEALER

When replacing a Honeywell product under warranty, including those products furnished on original heating and/or cooling equipment, you should rely on your local Honeywell Wholesaler or Distributor for prompt and efficient product replacement service.

No warranty claim for product replacement or credit will be honored by Honeywell without a completed return authorization form or a manual return authorization form issued by Honeywell Customer Care.

INSTRUCTIONS—WHOLESALE OR DISTRIBUTOR

The following will apply to the return of any product to Honeywell under this warranty, except any products which are not variable frequency drives or WEBs and are:

- (i) identified with a Honeywell Return Authorization Form (obtained from the B2B website at Customer.Honeywell.com)
- (ii) display the Return Authorization Form number and return address label on the outside of the return carton. Make sure a copy of the form is enclosed in the return carton
- (iii) packed separately from other returns and protected from shipping damage;

- (iv) have certification by the installer or servicing dealer that the product was removed, due to failure, within the applicable warranty period;
- (v) are received transportation pre-paid at the facility listed on the shipping and/or packing slip.
- (vi) and are found by Honeywell's inspection to be defective in workmanship or materials under normal use and service

will be handled in accordance with one of the two following procedures, as specified by the customer making the return.

1. **CREDIT PROCEDURE.** Honeywell will issue credit, at Honeywell's lowest wholesaler net price in effect at the time of the return (as set forth on Honeywell's then current price sheet) or at the actual invoice amount if a copy of that invoice is attached to the packing list. (TRADELINE Replacement Exchange Products will be at Honeywell's lowest replacement exchange net price in effect at the time of such return, as shown on Honeywell's then current price sheet.) Honeywell reserves the right to disallow this credit option in cases of warranty abuse.
2. **REPLACEMENT PROCEDURE.** Warranty replacement procedure must be used for in-warranty emergency replacement orders. Customer will not be credited for items not meeting warranty criteria as outlined by policy. Please return the defective item to the address listed on the return authorization form.

List Water Solutions products on a separate Return Goods Order form, marked "Water Solutions".

All new and unused VBN control ball valves MUST be approved by your Honeywell sales representative before returned.

WEBs return products must be processed through WEBs Customer Care. Defective hardware products under warranty have to be returned to Tridium in Richmond, VA. Security Access and Video products must have prior authorization.

All VFD warranty return products must be coordinated through the Commercial Components Hotline (1-888-516-9347 option 4) staff and VFD Warranty and Repair Program Coordinator (ECC-VFD Coordinator). All VFD warranty returns must have prior authorization and must be returned to the specified Honeywell VFD Service Center.

The warranty will not be honored if:

- (i) product is damaged or missing parts or accessory items including batteries.
- (ii) product exhibits evidence of field misapplications.

Final disposition of any warranty claim will be determined solely by Honeywell. If inspection by Honeywell does not disclose any defect covered by the warranty, the product will be returned or scrapped as instructed by the customer and Honeywell's regular service charges will apply. Products returned to the customer may be sent shipping charges collect.

If you have any questions relative to product returns to Honeywell, contact your Customer Care Representative:

Honeywell International Inc.
Customer Care MN10-131A
1985 Douglas Drive
Golden Valley, MN 55422
1-888-793-8193

SPECIAL MESSAGE TO INDUSTRIAL USERS AND BUILDING OWNERS

Thank you for using Honeywell products.

As a user, when you purchase a Honeywell product from this catalog you should expect performance from the product and, if it fails, replacement of the product by the installing dealer.

Typically, you will have purchased a Honeywell product under the following circumstances:

1. To modernize or refurbish your existing commercial and/or process control system.

2. You have purchased new commercial and/or process heating, cooling, air cleaning or humidification equipment that is furnished with Honeywell controls or components (refer to your owner's manual furnished with the equipment).
3. A control has failed on your existing commercial and/or process heating and/or cooling equipment and is replaced by a Honeywell TRADELINE product.

With few exceptions, you utilize the services of a competent plumbing, heating and/or cooling dealer/contractor for new or replacement work performed.

Although our warranty does not extend to you, Honeywell does extend a warranty to your supplier.

Your supplier can rely on its local Honeywell Wholesaler/Distributor or Honeywell for prompt replacement.

If you have any questions, need additional information or would like to comment on Honeywell's products or services, please write or phone:

Honeywell International Inc.
Customer Care MN10-131A
1985 Douglas Drive North
Golden Valley, MN 55422-4386
1-888-793-8193

or check your telephone directory (white pages) for one of many Honeywell field sales offices.

Learn More

www.buildingcontrols.honeywell.com

Home and Building Technologies

In the US:

Honeywell

1985 Douglas Drive North

Golden Valley, MN 55422-3992

customer.honeywell.com

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