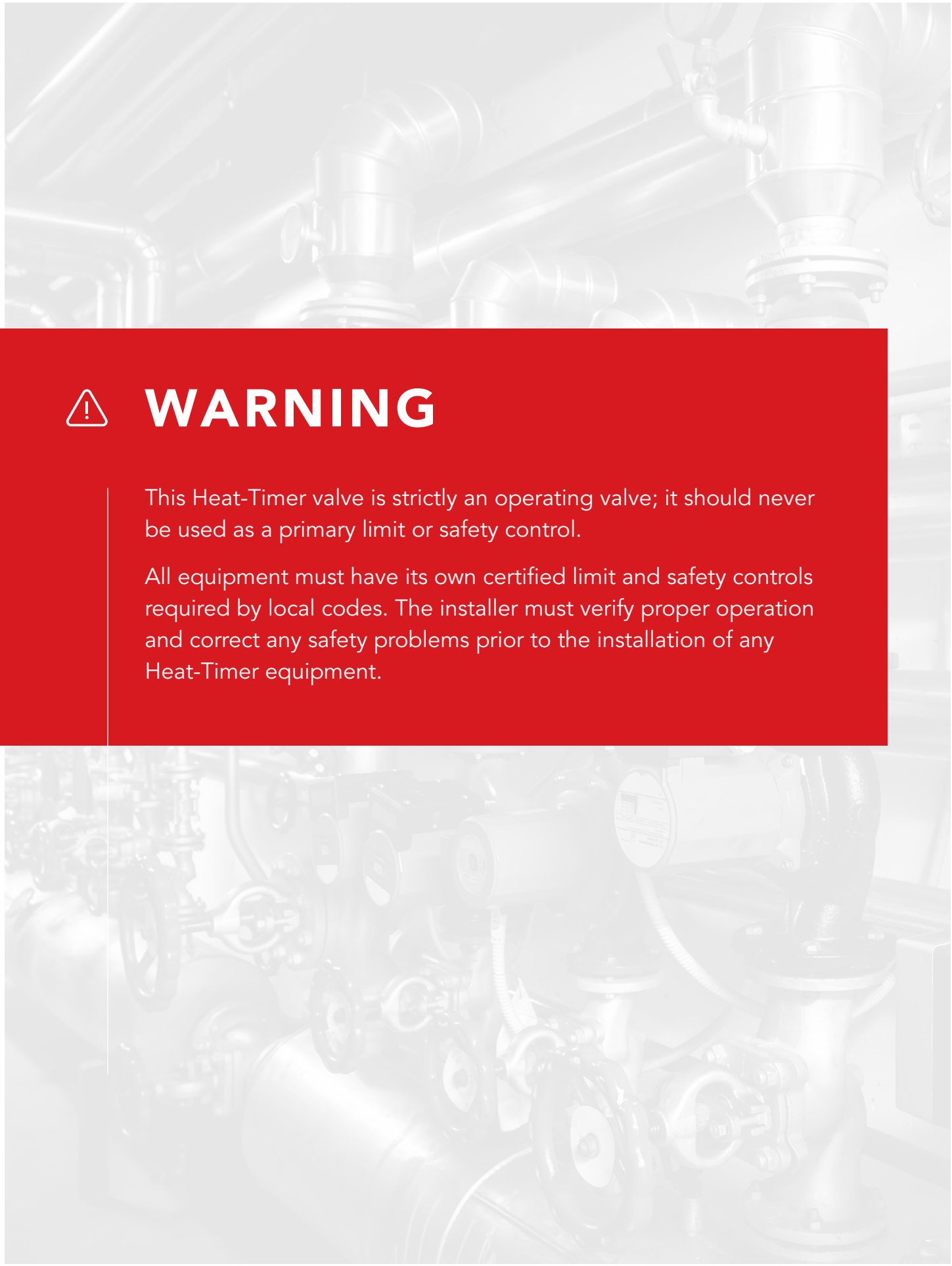
INSTALLATION AND
OPERATION MANUAL

HEAT-TIMER® CORPORATION

2-WAY AND 3-WAY MOTORIZED VALVES

FOR STEAM, VACUUM, AND HOT WATER

059700-00 REV. C



⚠ WARNING

This Heat-Timer valve is strictly an operating valve; it should never be used as a primary limit or safety control.

All equipment must have its own certified limit and safety controls required by local codes. The installer must verify proper operation and correct any safety problems prior to the installation of any Heat-Timer equipment.

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FLOATING ACTUATOR

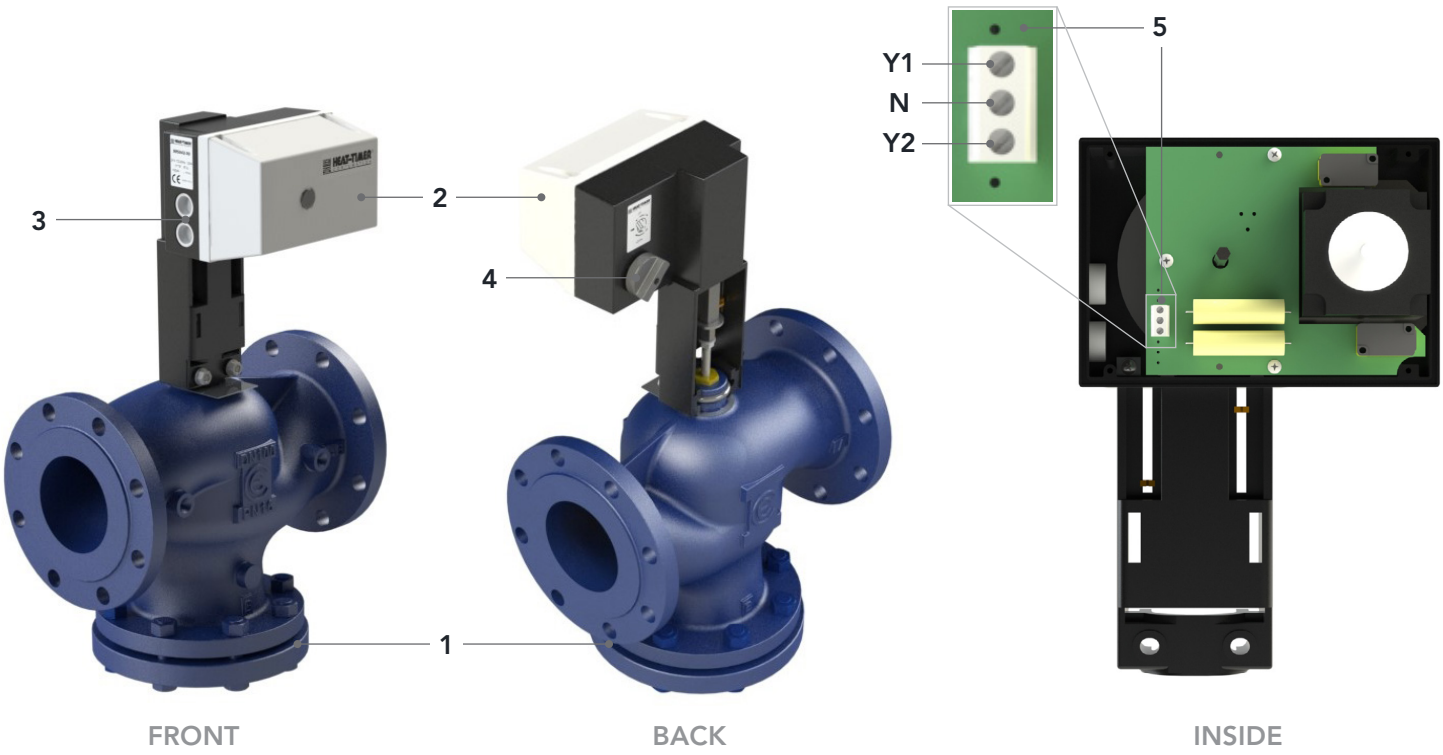


FIGURE 1

2-WAY AND 3-WAY MOTORIZED VALVES CONTROLS, INDICATORS, AND CONNECTIONS

ITEM	DESCRIPTION
1	Valve Body
2	Valve Actuator
3	Wiring Entry Fittings
4	Actuator Manual Adjustment Knob
5	Wiring Connections • Terminal Y1—Drives Valve Stem Up • Terminal N—24Vac Common • Terminal Y2—Drives Valve Stem Down

FLOATING ACTUATOR WITH FEEDBACK

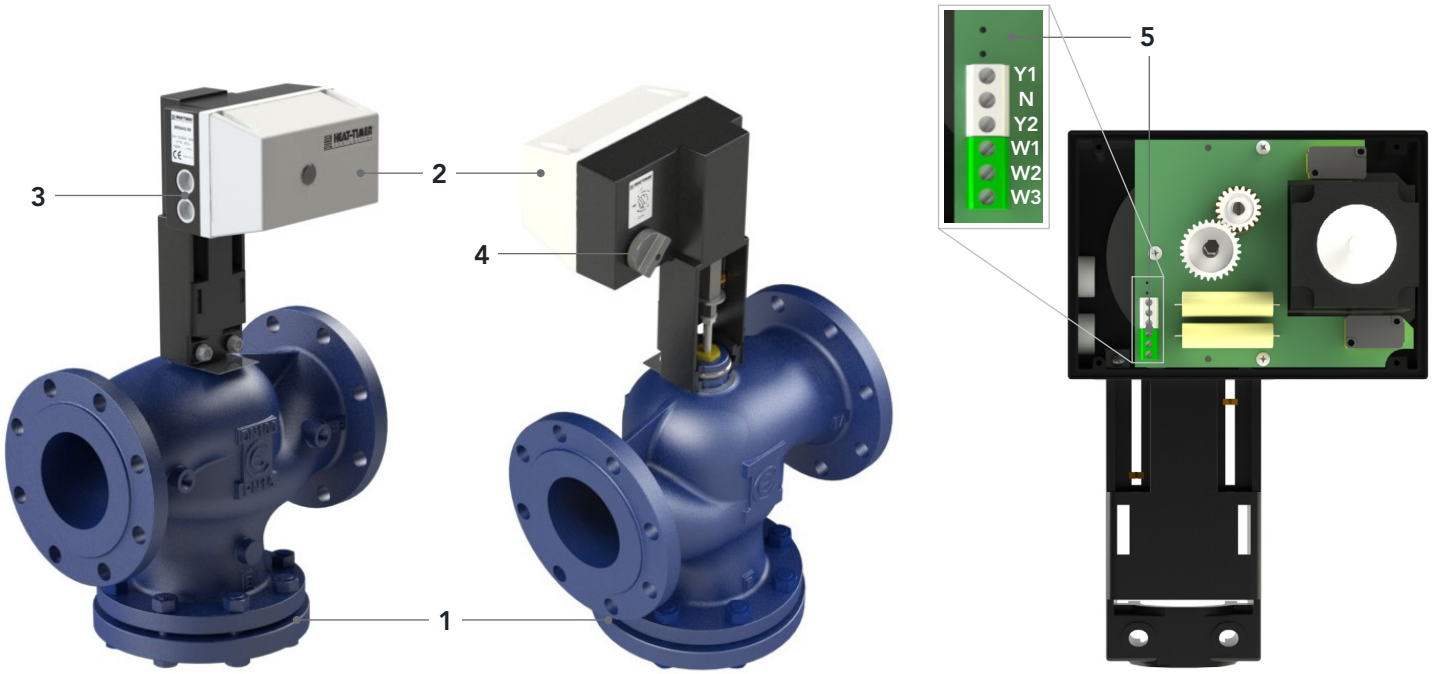


FIGURE 1A

2-WAY AND 3-WAY MOTORIZED VALVES CONTROLS, INDICATORS, AND CONNECTIONS

ITEM	DESCRIPTION
1	Valve Body
2	Valve Actuator
3	Wiring Entry Fittings
4	Actuator Manual Adjustment Knob
5	Wiring Connections • Terminal Y1—Drives Valve Stem Up • Terminal N—24Vac Common • Terminal Y2—Drives Valve Stem Down • Terminal W1—Valve OPEN Signal • Terminal W2—Common • Terminal W3—Valve CLOSE Signal

PROPORTIONAL ACTUATOR

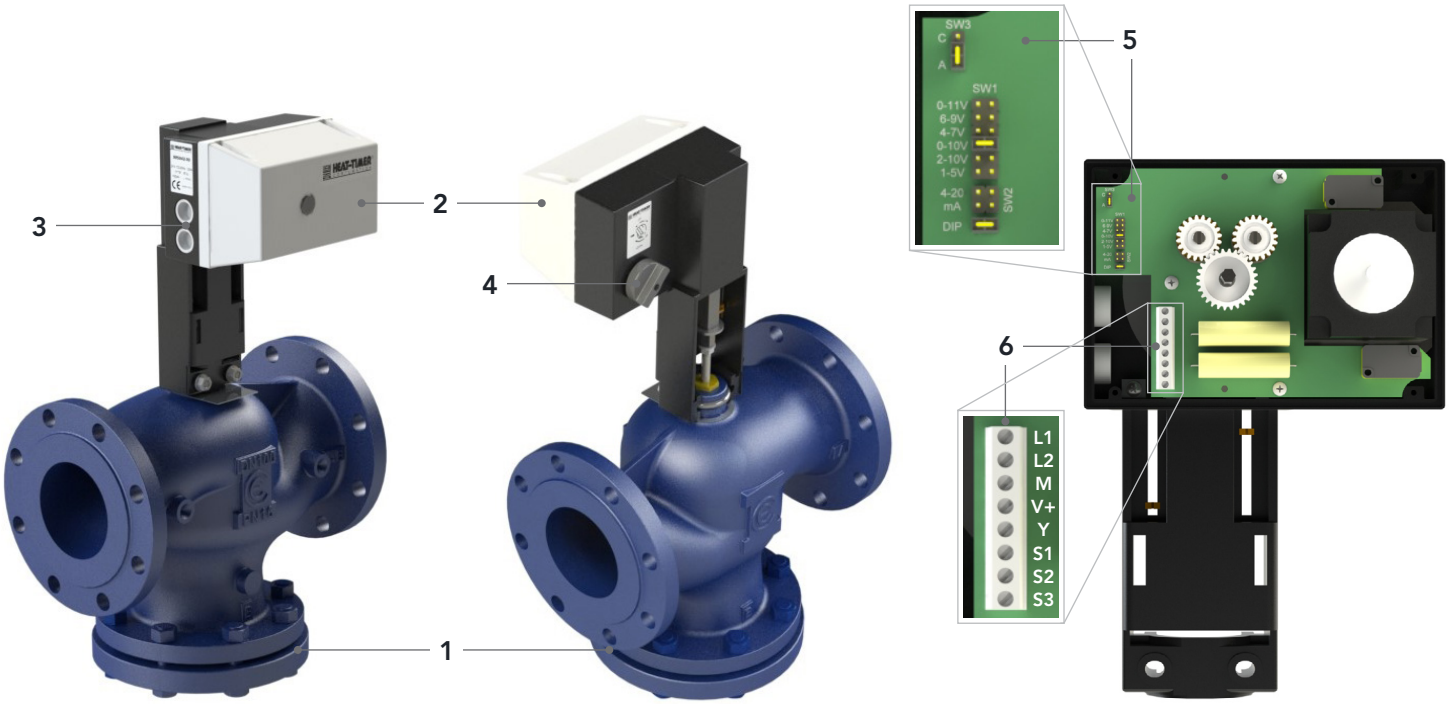


FIGURE 1B

2-WAY AND 3-WAY MOTORIZED VALVES CONTROLS, INDICATORS, AND CONNECTIONS

ITEM	DESCRIPTION
1	Valve Body
2	Valve Actuator
3	Wiring Entry Fittings
4	Input Signal Selection and Valve Direction • 8–11V • 6–9V • 4–7V • 0–10V (Factory Default) • 2–10V • 1–5V • 4–20mA • C–10V Drives Valve Stem Down • A–10V Drives Valve Stem Up

ITEM	DESCRIPTION
5	Actuator Manual Adjustment Knob
6	Wiring Connections • Terminal L1—24Vac Connection • Terminal L2—24Vac Connection • Terminal M—Common • Terminal V+—15V Output • Terminal Y—0-10V Control Signal Input • Terminal S1—Feedback Common • Terminal S2—0-10V/0-200µA Output Signal • Terminal S3—10-0V/0-200µA Output Signal

OVERVIEW

The 2-Way and 3-Way Motorized Valves work with any of the following steam, vacuum, or hot water system applications:

- Single-Seated Valves
  - 2-Way Low-Pressure Steam Valve Application
  - 2-Way Vacuum Steam Valve Application
  - 3-Way Converted Hot Water Heating Application
- Double-Seated and Balanced Plug Valves
  - 2-Way High-Pressure Steam Valve Application

NOTE

Prior to installation, the contractor should ensure the proper valve for the application has been selected.

SINGLE-SEATED VALVES

2-WAY LOW-PRESSURE STEAM VALVE APPLICATION

This type of application is generally a low pressure (< 15 PSIG) system in which the valve can turn on or off the flow of steam from the boiler (or other source) in a steam distribution system. A typical application would be where steam is used for heating radiators in a one or two-pipe steam heated building using the MPC Platinum controller.

Another typical application in which a 2-way steam valve is used is in a steam-to-hot water heat exchanger. The 2-way steam valve is used to regulate the amount of steam entering a heat exchanger to maintain the hot water using the HWR Platinum controller. As the hot water load changes, the steam valve is signaled to change the amount of steam entering the heat exchanger.

2-WAY VACUUM STEAM VALVE APPLICATION

2-way valves can modulate the flow of sub-atmospheric steam from the boiler (or other source) into a steam distribution system. Actuators are equipped with a position feedback signal. A typical example of this type of application would be using vacuum steam to heat radiators in a building. When the control, such as the SRC Platinum, calls to put heat into the system, the 2-way valve partially modulates open and steam flows into the radiators based on the outdoor air temperature. When the control determines that sufficient heat has entered the radiators, the control either marginally closes the 2-way valve, reducing the flow of steam, or closes the valve.

3-WAY CONVERTED HOT WATER HEATING APPLICATION

The standard 2-way single-seated valves can be converted and used as a 3-way valve simply by removing the lower ANSI flange plate. In a 3-way valve configuration, valves are used to mix heating water to a desired temperature. The hot water from the boiler is blended with the correct proportion of cooler water returning from the system to maintain the target temperature as the HWR Platinum control resets the hot water temperature based on outside temperature. The operation of the actuator allows the hot supply and the cold supply to be interchangeable, allowing additional flexibility in the installation of the valve.

DOUBLE-SEATED AND BALANCED PLUG VALVES

2-WAY HIGH-PRESSURE STEAM VALVE APPLICATION

Two-way double-seated or Balanced Plug valves can turn on or off the flow of steam from the boiler (or other sources) into a steam distribution system where the close-off pressure is high and the allowable leakage is low.

Double-seated and Balanced Plug style valves are more suitable than a single-seated valve in applications where the system pressure and the differential pressure are both high. Typical application include: high-pressure steam in district heating, and steam heating.

ACTUATOR MANUAL OPERATION

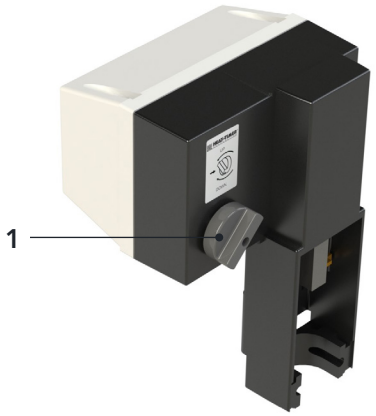
Motorized valves can be manually operated during power outages or when servicing the equipment.

⚠ CAUTION ⚠

DO NOT manually operate the valve when power is supplied to the actuator. Manually operating the valve while the controller is also positioning the valve may result in damage to the equipment. Only manually operate the valve when power has been removed from the actuator.

DO NOT attempt to force the manual control beyond the end of the actuator stroke.

1. Ensure power has been removed from the valve actuator.
2. Push in and hold the actuator manual control knob (1).
3. While continuing to press in the actuator manual control knob, turn the knob until the valve is in the desired position.
   - Turning the knob clockwise moves the valve stem downwards.
     - 2-way valves: the valve opens
     - 3-way valves: the valve A port opens, B port closes
   - Turning the knob counterclockwise moves the valve stem upwards.
     - 2-way valves: the valve closes
     - 3-way valves: the valve A port closes, B port opens
4. When the valve is in the desired position, release pressure on the manual control knob.



MAINTENANCE

TYPE	NOTES
Lubrication	The valve and actuator do not require any formal maintenance to operate. The internal lubrication of the actuator is sufficient for the life of the actuator.
Cleaning	Any cleaning of the actuator external enclosure should be done with a light detergent with a low level of chemical aggressiveness.

ACTUATOR SPECIFICATIONS

FLOATING ACTUATOR

Input Signal	24Vac Floating
Power Consumption	12VA
Operating Temperature	Ambient 5°F to 122°F (–15°C to 50°C)
Locations	NEMA Type 2 / IP54 Indoor Only
User Interface	Manual Override Handle Status

FLOATING ACTUATOR WITH FEEDBACK

Input Signal	24Vac Floating
Power Consumption	12VA
Operating Temperature	Ambient 5°F to 122°F (–15°C to 50°C)
Locations	NEMA Type 2 / IP54 Indoor Only
User Interface	Manual Override Handle Status
Valve Position Feedback Signal	0-1000 ohms

PROPORTIONAL

Input Signal	0–10V (default), 8–11V, 6–9V, 4–7V, 2–10, 1–5V, 4–20mA
Power Consumption	12VA
Operating Temperature	Ambient 5°F to 122°F (–15°C to 50°C)
Locations	NEMA Type 2 / IP54 Indoor Only
User Interface	Manual Override Handle Status
Output Signal—Valve Position	0–10V or 0–200µA

VALVE SPECIFICATIONS

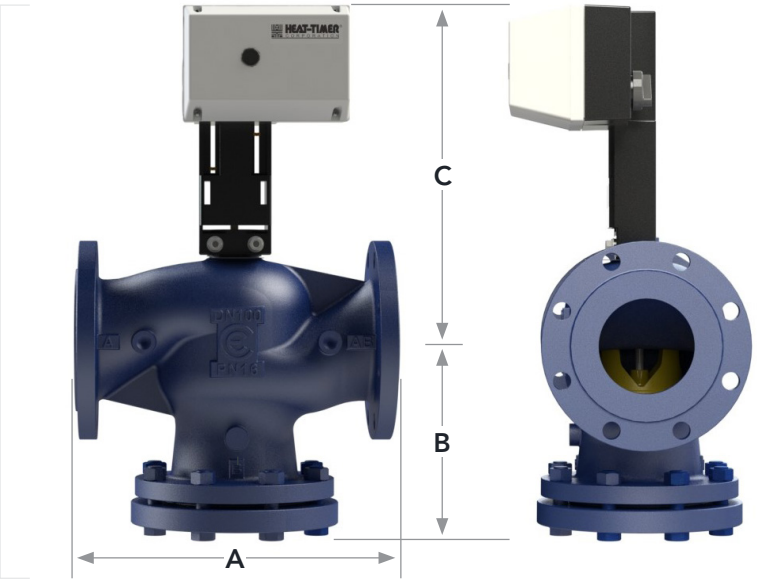
2-WAY BALANCED PLUG/DOUBLE-SEATED VALVES—STEAM (WITH OR WITHOUT VACUUM)

VALVE SIZE	HEAT-TIMER P/N	PORT	FLOW CV RATING	DIMENSIONS (INCHES)			SHIPPING WEIGHT (LBS)	MOTOR SPEED (MINUTES)
				A	B	C		
2 ½″	928072-XX	Balanced	73	11.4″	6.9″	13.5″	66	2
3″	928073-XX	Balanced	115	12.2″	7.3″	13.9″	83	2
4″	928074-XX	Balanced	150	13.8″	8.1″	14.4″	128	2
5″	928075-XX	Balanced	231	15.7″	10.0″	15.3″	162	2
6″	928076-XX	Balanced	347	18.9″	10.8″	16″	205	2
8″	928078-XX	Balanced	578	23.6″	10.8″	23.4″	400	2

NOTE: Replace **XX** as follows: **00** for 24V Floating Actuator, **CV** for 0–10V Proportional Actuator, **VAC** for 24V Floating Actuator with Valve Position Feedback.

FIGURE 2

2-WAY BALANCED PLUG/DOUBLE- SEATED VALVE BODY AND ACTUATOR DIMENSIONS



VALVE SPECIFICATIONS

Valve Body Material	ANSI B16.1 Iron
Valve Connection	125 lb ANSI Flange
Temperature Rating	14°F to 302°F (–10°C to 150°C)
Stem/Plug Material	Stainless/Brass
Seat Closure	Double or Balanced Port ANSI — Class IV Shutoff
Packing Material	Long-Life EPDM Rubber
Packing Temperature Rating	302°F (150°C)
Maximum Operating Pressure at 302°F	55 psi

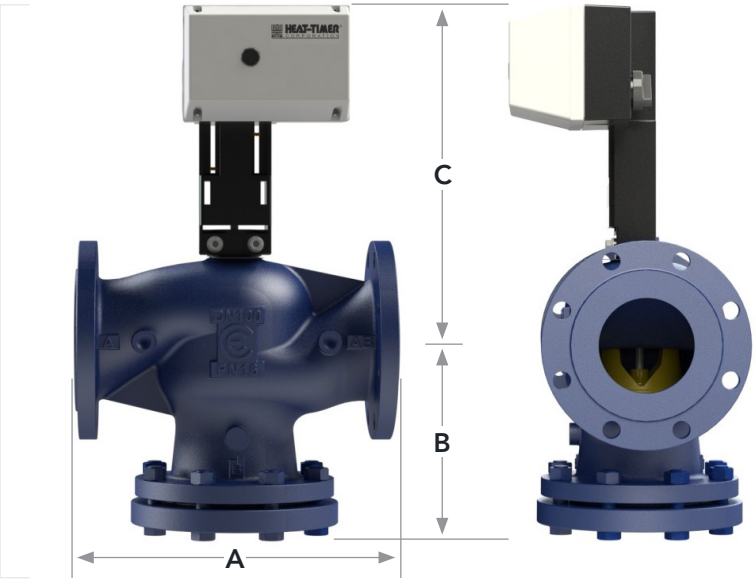
2-WAY SINGLE-SEATED VALVES (STEAM >15 PSI)

VALVE SIZE	HEAT-TIMER P/N	FLOW CV RATING	CLOSE-OFF PRESSURE RATING	DIMENSIONS (INCHES)			SHIPPING WEIGHT (LBS)	MOTOR SPEED (MINUTES)
				A	B	C		
2 ½″	928272-XX	73	62	11.4″	6.9″	13.5″	67	2
3″	928273-XX	116	41	12.2″	7.4″	13.9″	84	2
4″	928274-XX	151	25	13.8″	8.1″	14.4″	129	2
5″	928275-XX	232	15	15.7″	9.2″	15.3″	163	2
6″	928276-XX	348	10	18.9″	10.9″	16″	206	2

NOTE: Replace **XX** as follows: **00** for 24V Floating Actuator, **CV** for 0–10V Proportional Actuator, **VAC** for 24V Floating Actuator with Valve Position Feedback.

FIGURE 2A

2-WAY SINGLE-SEATED VALVE BODY AND ACTUATOR DIMENSIONS



VALVE SPECIFICATIONS

Valve Body Material	ANSI B16.1 Iron
Valve Connection	125 lb ANSI Flange
Temperature Rating	14°F to 302°F (–10°C to 150°C)
Stem/Plug Material	Stainless/Brass
Seat Closure	Single-Seated ANSI — Class IV Shutoff
Packing Material	Long-Life EPDM Rubber
Packing Temperature Rating	302°F (150°C)
Maximum Operating Pressure at 302°F	55 psi

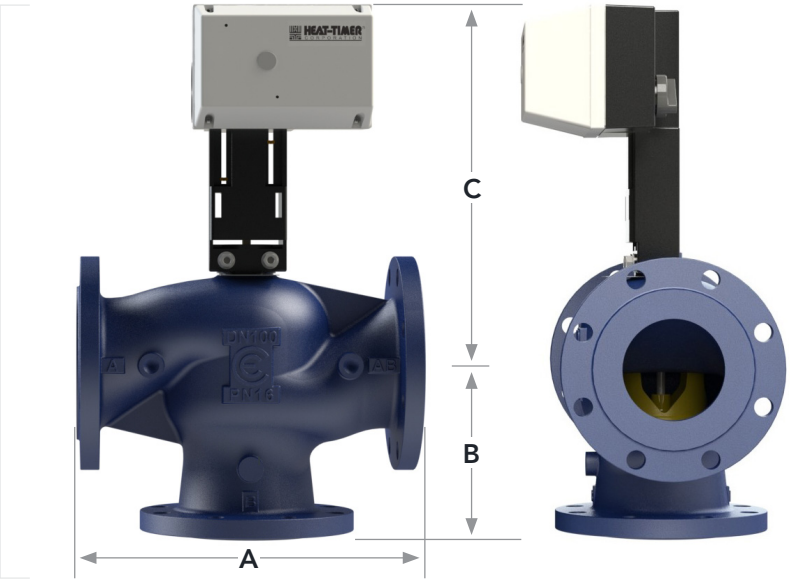
3-WAY SINGLE-SEATED VALVES

VALVE SIZE	HEAT-TIMER P/N	FLOW CV RATING	CLOSE-OFF PRESSURE RATING	DIMENSIONS (INCHES)			SHIPPING WEIGHT (LBS)	MOTOR SPEED (MINUTES)
				A	B	C		
2 ½″	928272-XX	73	62	11.4″	5.7″	13.5″	67	2
3″	928273-XX	116	41	12.2″	6.1″	13.9″	84	2
4″	928274-XX	151	25	13.8″	6.9″	14.4″	129	2
5″	928275-XX	232	15	15.7″	7.9″	15.3″	163	2
6″	928276-XX	348	10	18.9″	9.5″	16″	206	2

NOTE: Replace **XX** as follows: **00** for 24V Floating Actuator, **CV** for 0–10V Proportional Actuator, **VAC** for 24V Floating Actuator with Valve Position Feedback.

FIGURE 2B

3-WAY SINGLE-SEATED VALVE BODY AND ACTUATOR DIMENSIONS



VALVE SPECIFICATIONS

Valve Body Material	ANSI B16.1 Iron
Valve Connection	125 lb ANSI Flange
Temperature Rating	14°F to 302°F (–10°C to 150°C)
Stem/Plug Material	Stainless/Brass
Seat Closure	Single-Seated ANSI — Class IV Shutoff
Packing Material	Long-Life EPDM Rubber
Packing Temperature Rating	302°F (150°C)
Maximum Operating Pressure	200 psi @ 200°F — 165 psi @ 302°F

The installation process for 2-Way and 3-Way Motorized Valves consists of the following basic steps:

1. Initial installation *(see "Design Considerations" on page 14)*.
2. Installing the valve body *(see page 16)*.
3. Wiring the actuator *(see page 20)*.

SUPPLIED MATERIALS

The following materials are supplied with the control module:

- 24Vac (40VA) Transformer (P/N 210006–00)
- Installation and Operation Manual (P/N 059700–00)
- Warranty Card (P/N 059115–00)

REQUIRED MATERIALS (NOT SUPPLIED)

The following materials/tools are required for installation, but are not supplied:

- General tool kit (screwdrivers, wire strippers, power drill, pipe wrenches, etc.)
- ½", 14mm, and adjustable wrenches
- 18 AWG cable (Heat-Timer P/N 703001–01 or equivalent #18/2 cable) for actuator wiring
- Electrical conduit as required by local or state requirements

DESIGN CONSIDERATIONS

When installing the system, certain design considerations must be taken into account. These include:

- Calculating the correct valve sizing *(see "Calculating Valve Sizing" on page 15)*.
- Location of the valve and actuator
  - The valve actuator is not intended for outdoor installation.
  - The valve location should be where leakage from the piping field connections will not cause damage to the surrounding area.
  - Consider the location of any new or existing piping and electrical components.
- General piping guidelines:
  - All piping, including the piping of the valve body, must meet or exceed all applicable local, state, and/or federal guidelines, codes, regulations, and laws.
  - Support all piping using hangers. **DO NOT** support piping by the unit or its components.
  - Use isolation valves to isolate system components.
  - Use unions to allow for servicing and, if required, removal of the valve and other components.
  - Include drain valves to assist in servicing the valve.

CALCULATING VALVE SIZING

HOT WATER VALVE SIZING

The selection of a hot water valve should be based on a C_V rating approximately 10% greater than the calculated requirement to maintain control at the maximum flow rate.

Use the following formula to calculate the C_V rating:

$$C_V = \frac{G.P.M}{\sqrt{\Delta P}}$$

NOTE: These calculations must use absolute pressures.

The objective is to minimize the pressure drop across the valve. The example below will calculate the C_V in a system that will pass 200 GPM of water while limiting the pressure drop to 3 PSIG.

$$C_V = \frac{200\ G.P.M}{\sqrt{3 + 14.7}} = 48 \qquad C_V = 48 \times 1.1 = 53$$

Refer to *"Valve Specifications" on page 10* and select the valve size where the C_V matches or exceeds the 53. In this example, a 2 ½" three-way valve.

STEAM VALVE SIZING—10 PSIG OR LESS

The selection of a steam valve in a zoning situation should be based on minimizing the drop across a 2-way valve. In the case of heat exchangers, the objective is to allow maximum capacity flow as specified by the heat exchanger and/or pump capacity.

Use the following formula to calculate the C_V rating:

$$C_V = \frac{Lb/hr.}{2.1\sqrt{(P_1 - P_2) \times (P_1 + P_2)}}$$

NOTE: These calculations must use absolute pressures.

The following example shows the C_V calculation in a system that will pass 5000 lb/hr of saturated steam when the inlet pressure is 7 PSIG and a 2 PSIG pressure drop is desired. Remember to use absolute pressures.

P_1 = 14.7 PSI + 7.0 PSIG = 21.7 PSI

P_2 = 14.7 PSI + (7.0 PSIG - 2.0 PSIG) = 19.7 PSI

$$C_V = \frac{5{,}000}{2.1\sqrt{(21.7 - 19.7) \times (21.7 - 19.7)}} = 262$$

Refer to *"Valve Specifications" on page 10* and select the valve size where the C_V matches or exceeds the 262. In this example, a 6" two-way single or double-seated valve.

INSTALLING THE VALVE BODY

1 Ensure all debris (dirt, metal shavings, etc.) is flushed from the system before installing the valve body.

2 Ensure all service clearances are met. The installation should account for a minimum 12" (30.5cm) clearance to the valve and actuator. This space is needed to allow for servicing and the manual operation of the actuator. Refer to *"Valve Specifications" on page 10 through page 12* for dimension information.

3 If installing a single-seat valve, determine whether the installation requires a 2-way or 3-way configuration.

- **To use the valve in a 3-way configuration:** Remove the cover (1) from valve port B by removing all eight bolts (2) that hold the cover in place.
- **To use the valve in a 2-way configuration:** Ensure the cover (1) is in place on valve port B and is secured with the eight cover bolts (2).

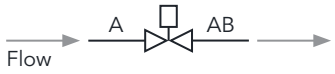
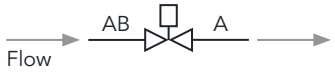
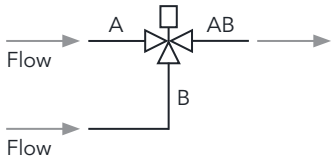
FIGURE 3

SINGLE-SEAT VALVE - 2-WAY OR 3-WAY COVER AND BOLTS

4 Install the valve body while observing the following precautions:

- Reference the labeling and casting marks on the valve body to ensure proper direction of flow through the valve body.

TABLE 1: FLOW DIRECTION

APPLICATION	NOTES
NOTE: For 2-way valves, the actuator shaft moving DOWN opens the valve, moving UP closes the valve. All valve ports are marked with the letters "A" and "AB".	
NOTE: For steam applications, the valve must be installed on the horizontal pipe.	
2-Way Single-Seat Valve—Low-Pressure Steam	Install the valve so the direction of flow is from A to AB. 
2-Way Double-Seat and Balanced Plug Valve—High-Pressure Steam	Install the valve so the direction of flow is from AB to A. 
NOTE: For 3-way valves, the actuator shaft moving DOWN opens valve port A and closes valve port B, moving UP closes valve port A and opens valve port B. All valve ports are marked with the letters "A", "B", and "AB". **CAUTION: For hot water applications, ensure the pump is installed after the valve discharge port. Installing the pump before the valve input ports may result in pump failure or damage to the valve when the valve is either fully open or closed.**	
Converted 3-way Single-Seat Valve—Hot Water	The default valve position is: • Port B—HOT supply • Port A—COLD supply • Port AB—MIXED outlet 3-way valves may also be installed in the alternate configuration with the A and B supplies reversed: • Port B—COLD supply • Port A—HOT supply • Port AB—MIXED outlet  **NOTE: If the 3-way valve is installed in the alternate configuration, reverse the actuator Open and Close connections** *(see "Wiring the Actuator" on page 20)*.

- The preferred orientation of the valve stem and actuator is upright (vertically). However, where space restrictions dictate, the valve actuator assembly can be mounted in any position as long as the valve is not upside down or the actuator manual control knob is not facing up or down (see Figure 4).
- **DO NOT** install motorized valves upside down. Doing so can stress the valve stem.

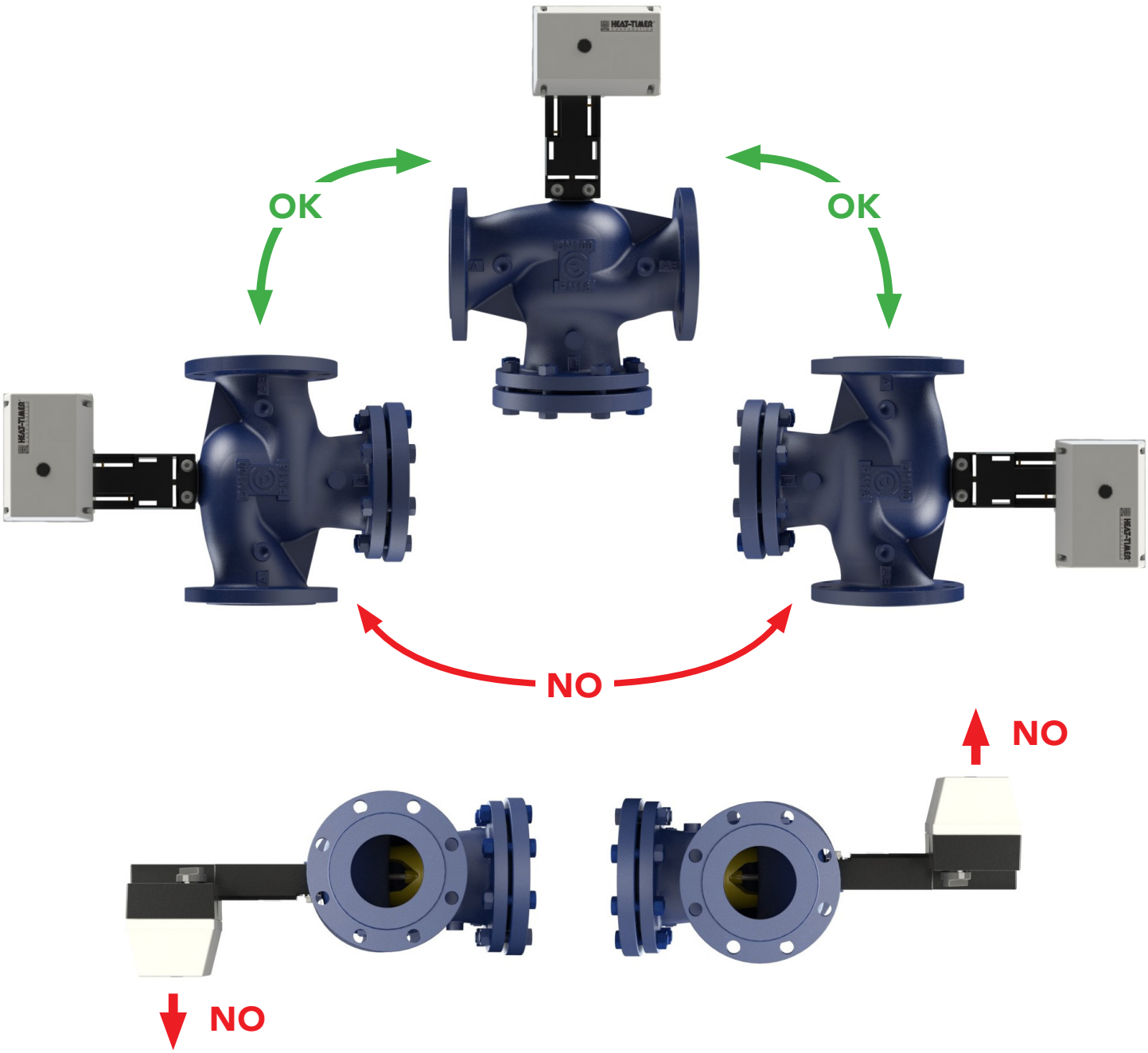


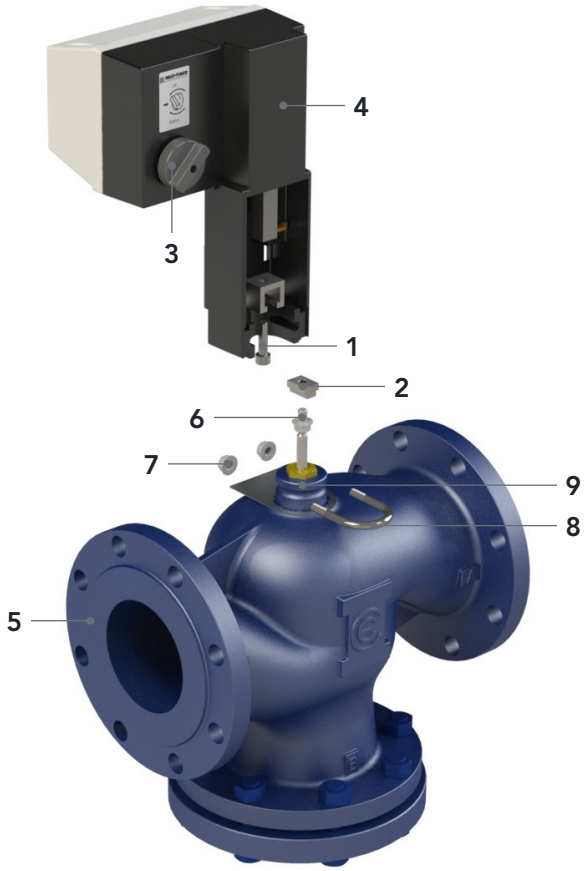
FIGURE 4

ACCEPTABLE VALVE BODY AND ACTUATOR ORIENTATION

MOUNTING THE VALVE ACTUATOR

FIGURE 5

MOUNTING THE ACTUATOR TO THE VALVE STEM



1 Manually lower the "C" Bracket (1) down using the Manual Adjustment Knob (3). Rotate the knob counterclockwise to the lower actuator to the full CLOSE position. The "C" Bracket (1) is installed by the factory.

2 Push the valve stem (6) down. The "T" Stem Nut (2) is installed by the factory.

3 Mount the actuator to the valve by sliding the "T" Stem Nut (2) into the "C" Bracket (1) on the Actuator. If necessary, use the actuator Manual Adjustment Knob (3) to adjust the position of the U-Bolt (8) until it is aligned with the valve groove (9).

NOTE: The U-bolt must also be aligned with the valve groove, as shown in Figure 8.

4 Insert the U-bolt (8) around the valve groove (9) and into the actuator assembly.

5 Secure the U-bolt (8) in place with two locking nuts (7), ensuring the locking nuts are tightened evenly.

NOTE: If the locking nuts are not tight the actuator could potentially make a grinding noise and potentially damage the actuator.

WIRING THE ACTUATOR

⚠ WARNING ⚠

ELECTRICAL SHOCK HAZARD! For your safety, to avoid the risk of electric shock, disconnect electrical power to the device before servicing or making any electrical connections. DO NOT re-connect electrical power until ALL wiring to the actuator is completed. Failure to do so may result in severe personal injury or death.

All wiring must meet or exceed all applicable local, state, and/or federal guidelines, codes, regulations, and laws.

MOUNTING THE ACTUATOR POWER TRANSFORMER

NOTE

Actuators must be powered using the provided 24Vac transformer(s). For configurations where a control device is operating two actuators in series, a single transformer can be used to power both actuators. If a control device is operating two actuators in parallel, external double-throw relays and two transformers (one for each actuator) must be installed.

1. Select an appropriate location to mount the provided 24Vac power transformer(s). The location must meet the following minimum requirements:
   - The location should be within close proximity of the actuator to reduce wiring length.
   - The mounting surface should be flat and strong enough to hold the weight of the transformer.
   - **DO NOT** mount the device in a location where it will be exposed to extreme heat, cold, humidity, or moisture.
2. Secure the transformer(s) to the mounting surface using two screws (not supplied).

CONNECTING THE ACTUATOR WIRING— FLOATING ACTUATOR

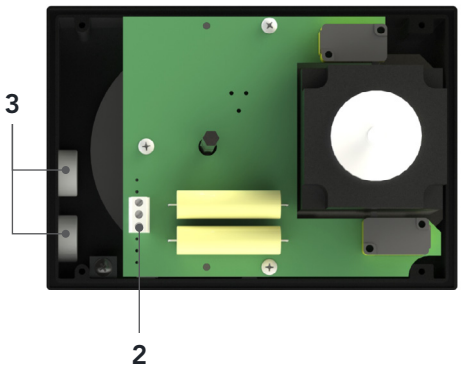
1 De-energize the circuit that will provide power to the actuator transformer by turning off the appropriate circuit breaker.

2 Using a Phillips screwdriver, remove the four actuator faceplate screws (1) and then remove the actuator faceplate to expose the circuit board and wiring terminal (2).

3 Run the wiring from the Control through one of the actuator wiring entry fittings (3).

4 Connect the wiring from the Control OPEN and CLOSE terminals to the actuator wiring terminal using one of the options below:

- **If connecting to a 2-way valve, or to a 3-way valve in the standard configuration (port A cold, port B hot),** *see Figure 8 (Page 25)*:
  - a Connect the Control OPEN terminal to actuator terminal Y1.
  - b Connect the Control CLOSE terminal to actuator terminal Y2.
- **If connecting to a 3-way valve in the alternate configuration (port A hot, port B cold),** *see Figure 9 (Page 25)*:
  - a Connect the Control OPEN terminal to actuator terminal Y2.
  - b Connect the Control CLOSE terminal to actuator terminal Y1.



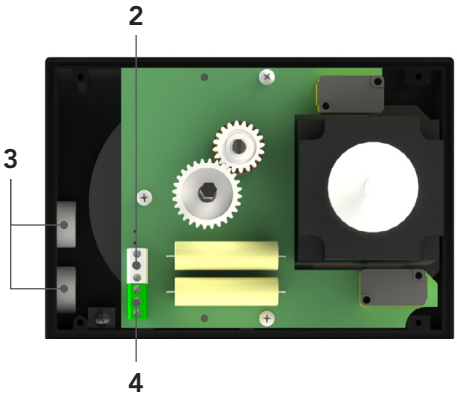
5 Connect the Control COMMON terminal to one of the transformer wires.

6 Run the other transformer wire through one of the actuator wiring entry fittings (3) and connect it to actuator terminal N.

7 Place the actuator faceplate on the actuator and secure it with four screws (1).

8 Restore power to the circuit powering the actuator transformer.

CONNECTING THE ACTUATOR WIRING—
FLOATING ACTUATOR WITH FEEDBACK



1 De-energize the circuit that will provide power to the actuator transformer by turning off the appropriate circuit breaker.

2 Using a Phillips screwdriver, remove the four actuator faceplate screws (1) and then remove the actuator faceplate to expose the circuit board and wiring terminal (2).

3 Run the wiring from the Control through one of the actuator wiring entry fittings (3).

4 Connect the wiring from the Control OPEN and CLOSE terminals to the actuator wiring terminal using one of the options below:

- **If connecting to a 2-way valve, or to a 3-way valve in the standard configuration (port A cold, port B hot),** *see Figure 8 (Page 25)*:
  - a Connect the Control OPEN terminal to actuator terminal Y1.
  - b Connect the Control CLOSE terminal to actuator terminal Y2.
- **If connecting to a 3-way valve in the alternate configuration (port A hot, port B cold),** *see Figure 9 (Page 25)*:
  - a Connect the Control OPEN terminal to actuator terminal Y2.
  - b Connect the Control CLOSE terminal to actuator terminal Y1.

5 Connect the Control COMMON terminal to one of the transformer wires.

6 Run the other transformer wire through one of the actuator wiring entry fittings (3) and connect it to actuator terminal N.

7 Connect the Feedback signal wiring from the SRC Platinum Valve Position terminals to the actuator wiring terminal (4) as shown in *Figure 10 (Page 26)*.

SRC Platinum A4 terminal to Actuator W1 terminal—Valve OPEN

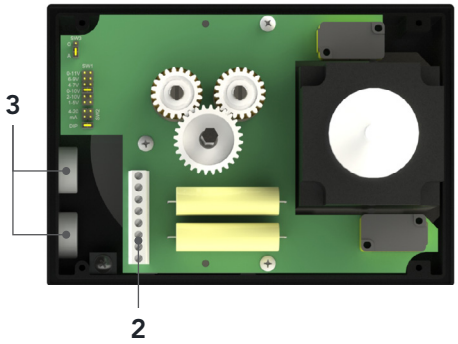
SRC Platinum A5 terminal to Actuator W2 terminal—Common

SRC Platinum A6 terminal to Actuator W3 terminal—Valve CLOSED

8 Place the actuator faceplate on the actuator and secure it with four screws (1).

9 Restore power to the circuit powering the actuator transformer.

CONNECTING THE ACTUATOR WIRING— PROPORTIONAL ACTUATOR



1 De-energize the circuit that will provide power to the actuator transformer by turning off the appropriate circuit breaker.

2 Using a Phillips screwdriver, remove the four actuator faceplate screws (1) and then remove the actuator faceplate to expose the circuit board and wiring terminal (2).

3 Run the wiring from the Control through one of the actuator wiring entry fittings (3).

4 Connect the 0–10V signal wiring from the Heat Timer Control voltage signal terminals to the actuator wiring terminal Y as shown in *Figure 11 (Page 26)*. Ensure the Heat Timer Control voltage ground is wired to actuator terminal M as shown in *Figure 11 (Page 26)*.

5 Connect the 24Vac power wiring from the Heat Timer Control terminals to the actuator terminals L1 and L2.

6 If the control input signal to the actuator is not 0–10V, the wiring remains the same as described in Step 4 and the selection of the input signal to the actuator must be revised as described in the section *on page 24*. Otherwise skip to Step 7.

7 If the valve was installed as a 3-way valve in an alternate position as described *on page 18*, then the actuator direction setting must be revised. For detail instructions on actuator direction selection see section *on page 24*. Otherwise skip to Step 8.

8 For valve position output signal, either 0–10V or 0–200 µA, the following terminals apply:

- S1 is Common
- S2 equals 10V or 200 µA when the valve stem is down
- S3 equals 10V or 200 µA when the valve stem is up.

9 Place the actuator faceplate on the actuator and secure it with four screws (1).

10 Restore power to the circuit powering the actuator transformer.

SELECTION OF INPUT SIGNAL— PROPORTIONAL ACTUATOR

Reference the SW1 terminals in Figure 6.

The input signal for the actuator is factory default at 0–10V, however the actuator will accept other input signals. To set the actuator to other input signal settings, simply remove the jumper on 0–10V and move it to the appropriate selection.

For an input signal of 4–20mA, (2) jumpers are required. Move the jumper from the 0–10V setting and use the jumper currently at DIP.

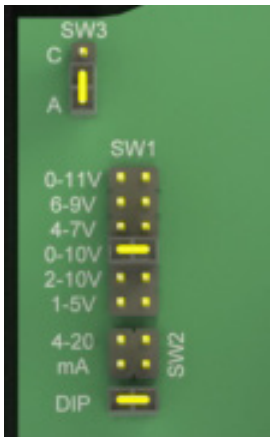


FIGURE 6
SW1 TERMINALS

SELECTION OF VALVE DIRECTION— PROPORTIONAL ACTUATOR

Reference the SW3 terminals in Figure 7.

The actuator is currently defaulted to pull the valve stem up with a 10V signal or high input signal if other input signals are used. The actuator will push the valve stem down with a 0V signal or low input signal if other input signal is used.

If the valve is in stalled in an alternate 3-way configuration as describe in **Table 1** *on page 17* then the jumper placed on A terminal must be move to the C terminals. The terminal between A and C is a common terminal and must be included in either setting.

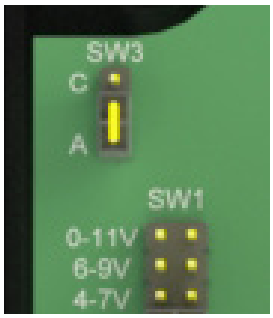


FIGURE 7
SW3 TERMINALS

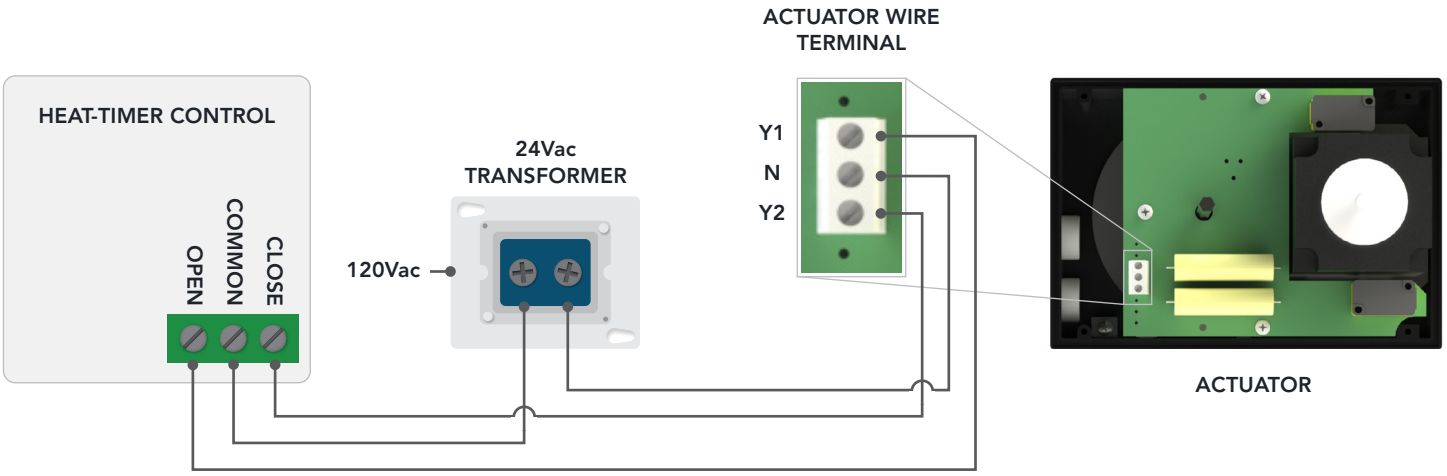


FIGURE 8

ACTUATOR WIRING DIAGRAM—2-WAY VALVE OR 3-WAY VALVE STANDARD CONFIGURATION

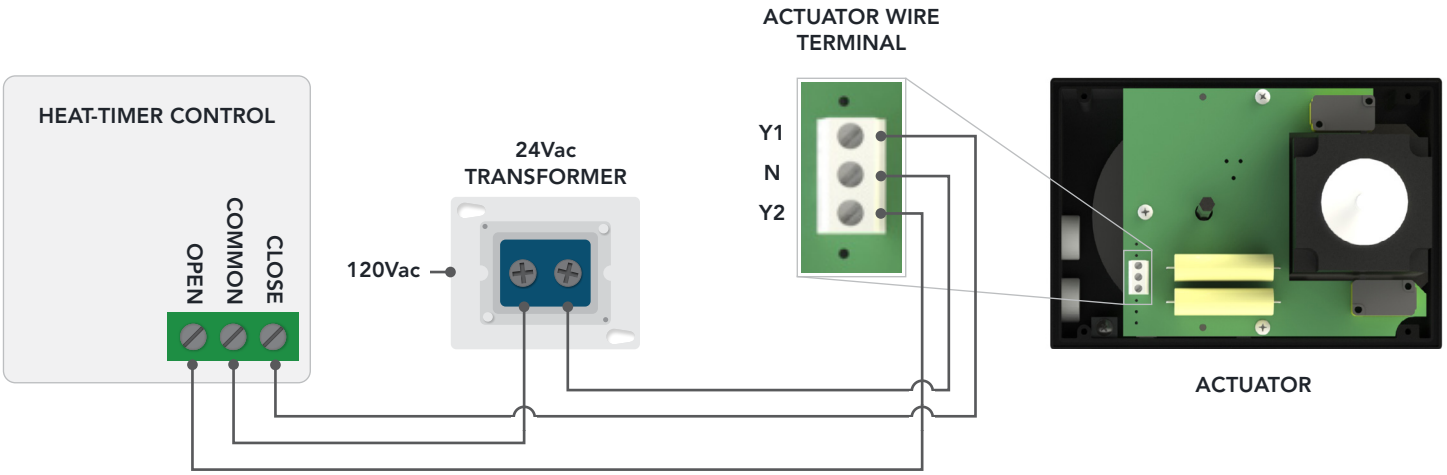


FIGURE 9

ACTUATOR WIRING DIAGRAM—3-WAY VALVE ALTERNATE CONFIGURATION

FIGURE 10

ACTUATOR WIRING DIAGRAM—FLOATING ACTUATOR WITH FEEDBACK AND SRC PLATINUM

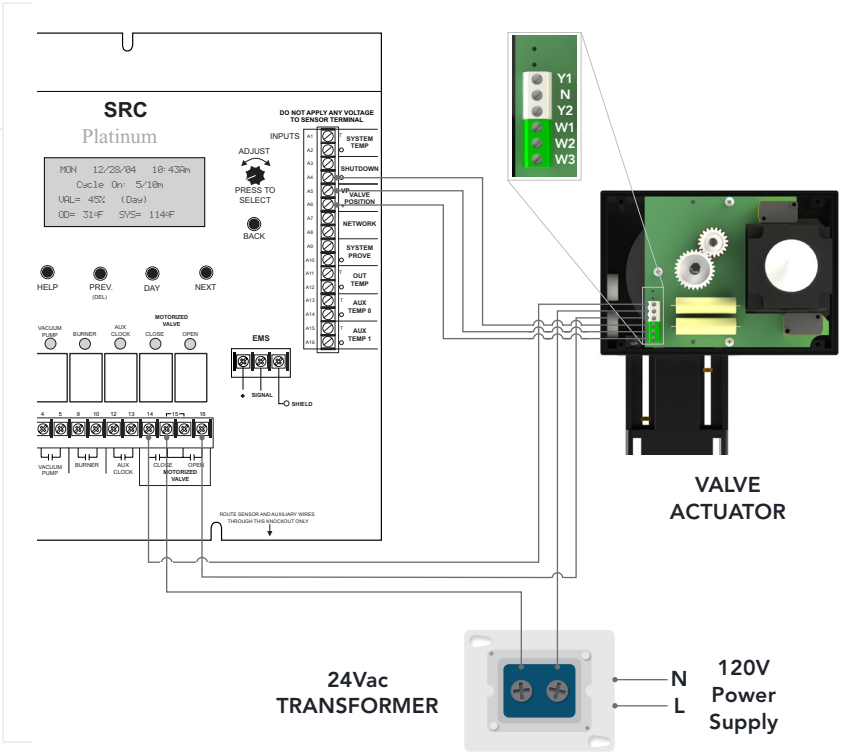
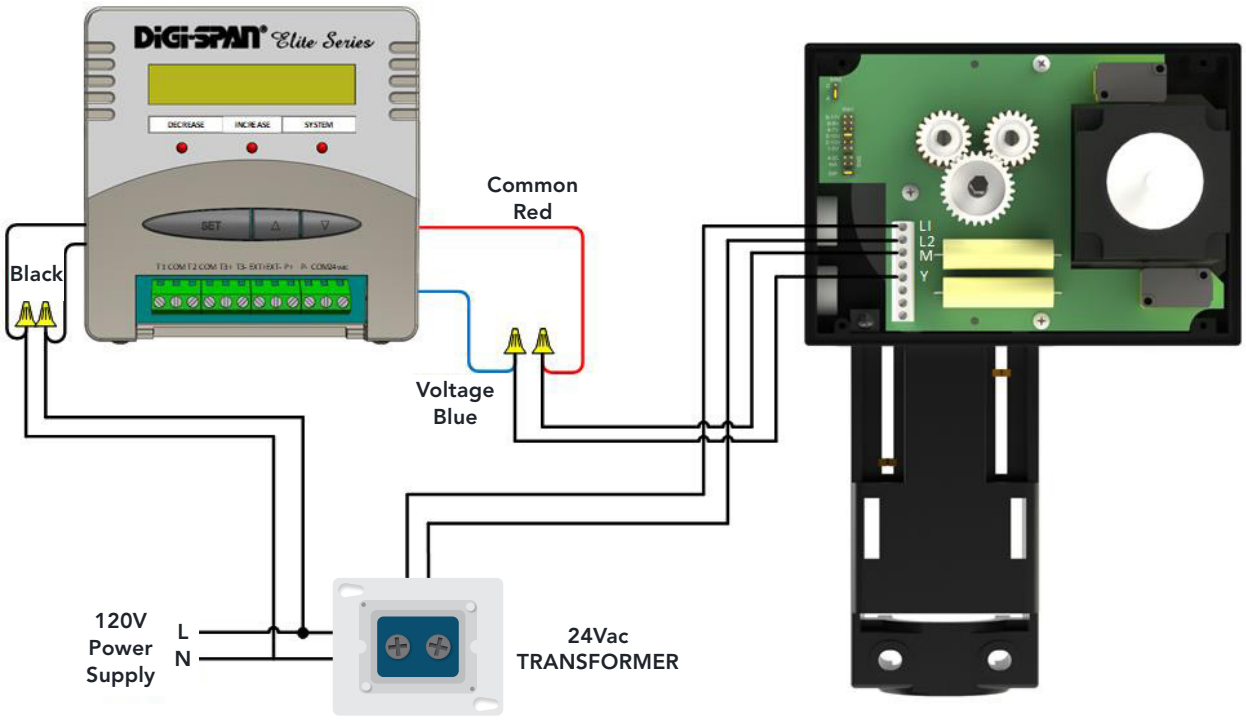


FIGURE 11

ACTUATOR WIRING DIAGRAM—PROPORTIONAL ACTUATOR AND DIGI-SPAN MCA 0–10V



2-WAY ACTUATOR VALVE INSTALLATIONS

SYMPTOM	POSSIBLE CAUSE	RECOMMENDED ACTION(S)
Loud banging noise.	Valve not installed on a horizontal pipe.	Verify the valve is installed on a horizontal pipe. Refer to the precautions listed *on page 17*.
	Condensate draining back against the valve when closed, causing steam to flash the condensate when the valve opens.	Ensure no condensate will drain back against the valve when closed.

3-WAY ACTUATOR VALVE INSTALLATIONS

SYMPTOM	POSSIBLE CAUSE	RECOMMENDED ACTION(S)
Water getting hotter when the valve closes.	Incorrect valve port used.	Ensure the valve was installed using the correct valve ports. Refer to Table 1 *on page 17*.
Difficult to control water temperature.	Pump installed before any hot or cold water input ports.	Ensure the pump is installed after the valve discharge port. **CAUTION!** **Installing the pump before the input ports may result in pump failure or damage to the valve when the valve is either fully open or closed.** Refer to the precautions listed *on page 17*.
Valve does not close.	Pump installed before the hot water input port. Valve actuator does not have the force to close the valve against pump flow.	Ensure the pump is installed after the valve discharge port. Refer to the precautions listed *on page 17*.

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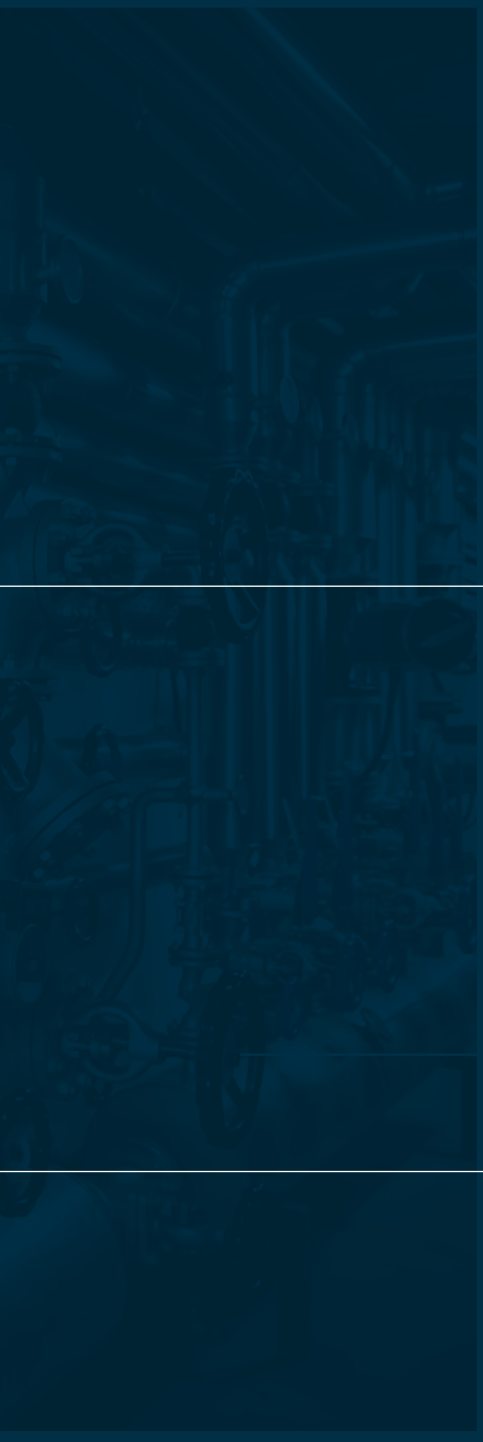

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