

INSTALLATION & OPERATION INSTRUCTIONS

GENERAL INFORMATION



1. Clean the lines upstream of valve particles larger than 1/16" diameter (welding slag, pipe scale and other contaminants). Griswold Controls recommends the use of a strainer upstream to prevent damage or blockage.
2. Air should be eliminated from the system so valves remain full of fluid during operation. All PI valves trap air in the regulator section of the valve. If the air is not removed, one of the effects is a valve that may pulsate with a mild or violent shaking force. The normal process of bleeding air from a system will not remove this air because the air is trapped within a chamber. A convenient way to bleed the air is to cycle the valve closed, wait 10-15 seconds, then open it. This exhausts air out of the diaphragm chamber and into the pipe where it can later rise to a high point for extraction. In a building with several valves, it is most convenient to perform this from a central building automation control. We recommend

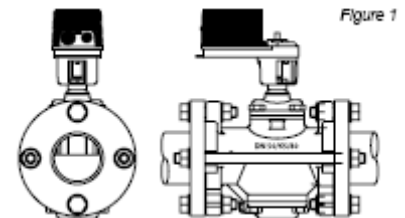
sequentially closing one valve at a time to minimize the disruption to occupants. If the building is not occupied it is acceptable to cycle all the valves at once as long as there is a method in place to keep the system pressure differential to within the valve differential pressure range. In the event that vibration persists, the MVP products have a pressure response valve (PRV) for additional control over the regulator response time. It's a small needle valve located on the bottom of the valve at the center of a hex nut designed to control the response time of the valve as it corrects for pressure fluctuations. Screw the small needle valve clockwise to close. **DO NOT over tighten as it is a small brass screw and can easily be damaged.** Then open it about a 1/4 turn. This will slow down the response and should further suppress vibration.

3. All styles of Griswold 2-way flow control valves are marked to show the direction of flow. THE FLOW ARROW MUST POINT IN THE DIRECTION OF FLOW FOR PROPER OPERATION.
4. Do not use boiler additives, chemicals which are petroleum based or contain mineral oil, hydrocarbons, azole compounds or ethylene glycol acetate. Compounds which can be used, with minimum 50% water dilution, are diethylene glycol, ethylene glycol, and propylene glycol. If installing these valves in an addition or retrofitting an existing building, do not assume that the fluid in the existing piping meets these criteria.
5. Do not install valves at pump discharge. Minimum of 8 pipe diameters (or 8 feet) is required before the valve.

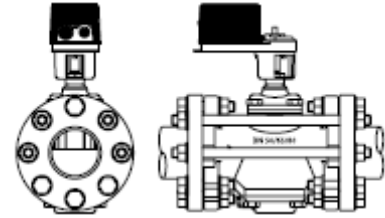
MECHANICAL INSTALLATION

FLANGE CONNECTIONS

1. O-rings are supplied with the valve and are used to seal the connections. Cleanliness is important for proper seal action and long O-ring life. Foreign particles like dirt, metal chips, etc. in the O-ring groove may cause O-ring leakage and can damage the O-ring thus reducing its life. Place the o-ring in the grooves in the inlet and outlet of the valve body.
2. Using silicon oil or grease lubricant at assembly helps protect the O-ring.
3. 2-1/2"-3": 4 holes flanges require (4) 5/8" X 2-3/4" bolts and (2) 5/8" X 12-1/2" studs. Valves are not compatible with slip on flanges in all sizes. See Dimension chart.



4. All other sizes: 8 holes flanges require (8) 5/8" X 2-3/4" bolts and (4) 5/8" X 12-1/2" studs. 2-1/2" to 4" valves are compatible with both Class 150 and Class 300 flanges. 5" valve is compatible with Class 150 flanges and/or Class 300, 5" flanges



DIMENSIONS & WEIGHTS (NOMINAL) (measured in inches and lbs unless noted)

All dimensions are for planning purposes only and may change without notice.

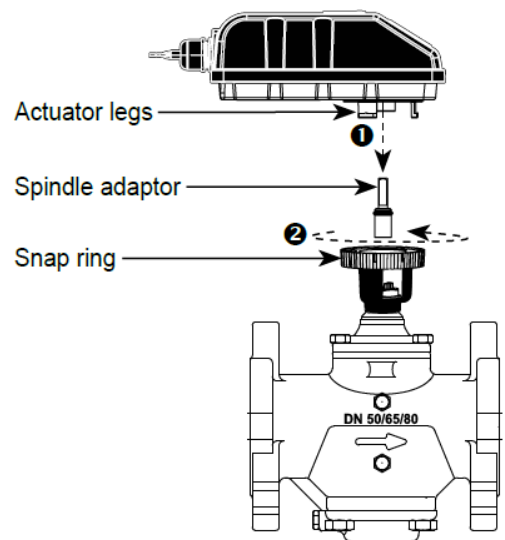
MODEL NO.	SIZE	L	H1	H2	ASME B16.5 WELD NECK		ASME B16.5 SLIP ON		WEIGHT
					CLASS 150	CLASS 300	CLASS 150	CLASS 300	
MVP3__	2-1/2"	8.8"	9.9"	3.74"	•	•	•	•	27.8
	3"				•	•			
MVP4__	3"	12.6"	11.5"	5.3"	•	•	•	•	75
	4"				•	•			
MVP5__	5"	16.6"	13.3"	7.1"	•	•	•	•	148
	6"				•				
MVP6__	8"	28.5"	18.6"	11.5"		•		•	547
	10"				•		•		

ELECTRICAL INSTALLATION

FITTING AND ORIENTATION OF THE ACTUATOR

To fit the actuator on the valve body, please grease the o-ring on the spindle adaptor and place the spindle adaptor on the valve spindle. ① Place the actuator on the spindle adaptor and place the three actuator "legs" into the three holes in the mounting bracket. Make sure that the snap ring is clicked onto the mounting bracket, so that the snap ring is locked at the top of the mounting bracket, but is able to rotate. ② Then turn the snap ring counter clockwise (upside view) approximately 1/6 of a turn until its stop points touch the actuator "legs" and the mounting is locked with a (small) click.

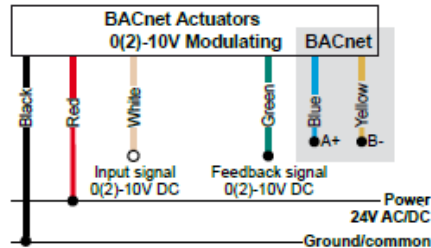
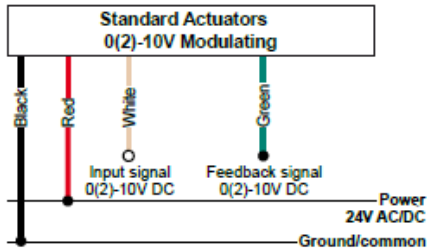
To remove the actuator, first send signal to fully open the valve. Then reverse the install procedure, i.e. turn the snap ring clockwise until the actuator is loosened and lift the actuator up.



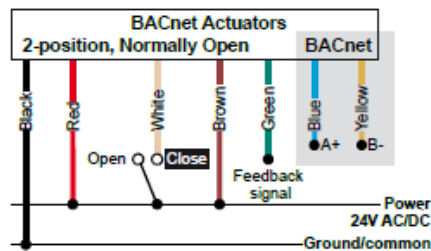
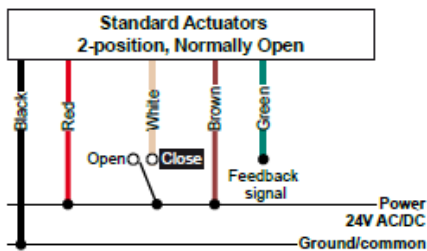
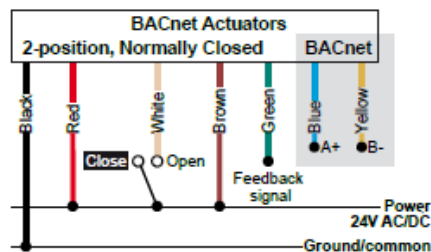
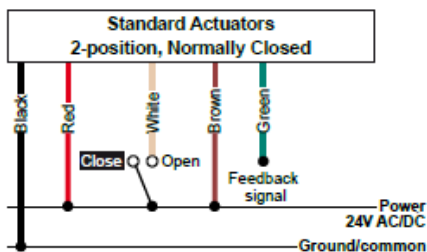
WIRING DIAGRAMS

If feedback signal is not required, leave green wire detached.
For modulating setup, brown wire is not used and may be cut.

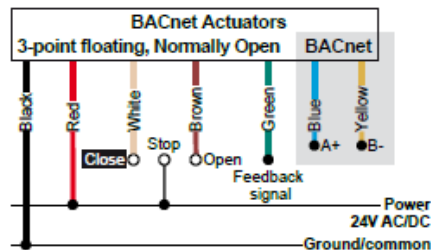
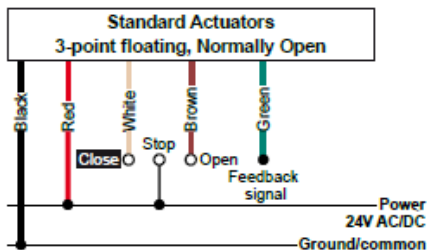
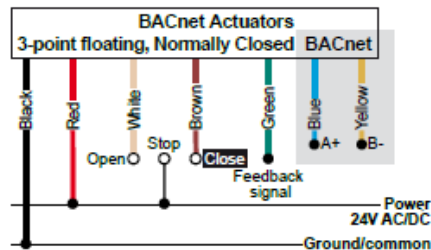
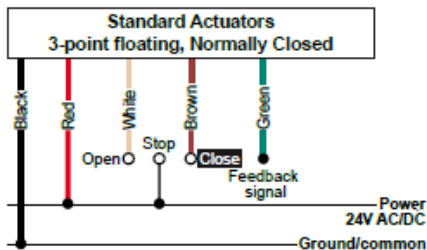
ELECTRICAL MODULATING



ELECTRICAL 2-POSITION



ELECTRICAL 3-POINT FLOATING



FITTING AND ORIENTATION OF THE ACTUATOR

When power to the actuator is turned on, the actuator will automatically calibrate:

- Valve is calibrating to determine closing point. This calibration can take up to 10 minutes depending on the valve's position at start-up. During calibration actuator display will show "CALIB" and scroll menu will show model number, firmware number, and serial number.
- If no control signal is detected, flush is started if enabled in programming menu 4 (enabled by default), opening valve to 5/6 of fully open. Actuator display will show "FLUSH" until control signal is detected.
- When control signal is present, actuator will adjust to current control signal and proceed with normal operation.
- All actuator settings must be set at start up for the actuator to work correctly. For Standard Actuators the setting is done directly on the actuator buttons. For BACnet Actuators the setting is done via the BMS system or directly on the actuator buttons.

PROGRAMMING PORT

The Actuator features a dedicated programming port, primarily designed to enable firmware updates. This ensures the actuator can be kept up to date with the latest software improvements.

To upload new firmware, lift the silicone cap on the top of the actuator to get access to the programming port. Connect the cable and programming dongle (both supplied by Griswold Controls) to the port. Connect the other end of the cable to your PC and upload the new firmware (file and guide supplied to Griswold Controls).

ACTUATOR WIRING AND PROGRAMMING

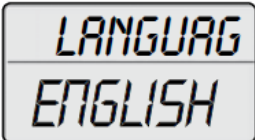
At first start-up please enter programming menu to adjust actuator settings.

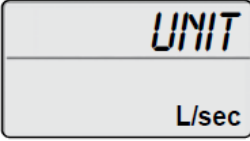
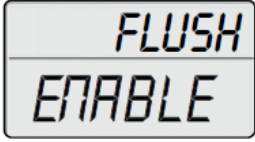
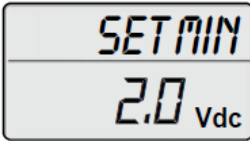
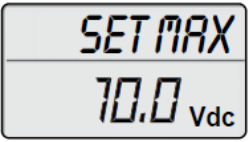
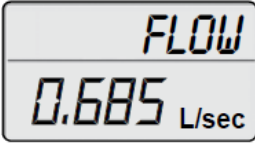
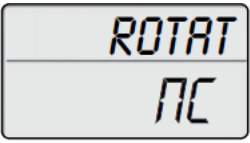
The programming menu is always accessible. To enter the programming menu, please simultaneously press the two arrow buttons (► and ◄) for 6 seconds, until bottom line blinks.

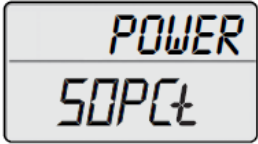
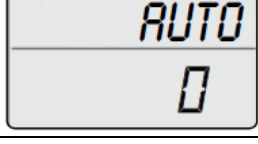
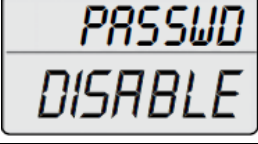
Generally, press ► **button** to accept value and go to next step and press ◄ button to go to previous step. To change the value, pls. press ▲ or ▼ keys, for quick scroll through values hold down the button.

Press and simultaneously for 6 sec. to exit programming menu. Actuator will automatically return to operation mode if no action is detected on arrow keys during 1 minute.

All values selected in the programming menu are stored in non-volatile memory.

Step	Display	Description	Values
0		Password. *scrolling top: ENTER PASS WORD	Disabled by default Password: 3569266. Only if Enabled (in step 15). Press ▲ and ▼ to change digits. Press ► and ◄ to move between digits. At last digit, press ► to go to next step.
1		Select language. *scrolling top: SELECT LANGUAG	Default: English.

2		Select valve model onto which the actuator is installed. <i>*scrolling top:</i> SELECT VALVE MODEL	Default: SM.0.0 Select from the available valve models using this cross reference. MVP31_ =SM.3.1; MVP32_ =SM.3.2; MVP41_ =SM.4.1; MVP42_ =SM.4.2; MVP51_ =SM.5.1; MVP52_ =SM.5.2 MVP61_ =SM.6.1; MVP62_ =SM.6.2
3		Choose unit scale for flow rate. <i>*scrolling top:</i> SELECT UNIT SCALE	Default: l/sec. Options: l/sec or l/hr or GPM.
4		Activate Flush mode at start-up. <i>*scrolling top:</i> SELECT FLUSH MODE	Default: Enable. Options: Enable or Disable. When no control signal (analog) is detected at start up, flush mode is started (5/6 of fully opened). It will be dismissed when control signal is detected.
5		Select type of control signal. <i>*scrolling top:</i> SELECT CONTROL SIGNAL	Default: 2-10VDC. Options: 2-10VDC for VDC 4-20mA for mA Digital for 2 position or 3 point floating BACnet (Only valid for BACnet actuators)
6		Select minimum control value. <i>*scrolling top:</i> SET MIN LIMIT	<u>Volt default: 2.</u> Options: from 0-7. Increment: 0.1. <u>mA default: 4.</u> Options: from 0-14. Increment: 0.2. <u>NA if Digital (in step 5).</u>
7		Select maximum control value. <i>*scrolling top:</i> SET MAX LIMIT	<u>Volt default: 10.</u> Options: from 3-10 and at least 3 VDC greater than the selected minimum limit. Increment: 0.1. <u>mA default: 20.</u> Options: from 6-20 and at least 6 mA greater than the selected minimum limit. Increment: 0.2. <u>NA if Digital (in step 5).</u>
8		Select feedback signal. <i>*scrolling top:</i> SELECT FEEDBAC SIGNAL	<u>Default: AU; Automatic match of control signal if analog.</u> Options: 0-10 VDC, 2-10 VDC or 4-20 mA or AU. <u>If Digital (in step 5) AU is not an option.</u>
9		Set the designed maximum flow. <i>*scrolling top:</i> SELECT MAXIMUM FLOW	Default: Max flow. Values depend on valve model and unit scale chosen in step 2 and 3. Stepping increments as per tech note.
10		Select direction of rotation. <i>*scrolling top:</i> SELECT ROTAT DIRECT	Default: Normally Closed (NC). Options: Normally Open (NO) or Normally Closed (NC).

11		Select actuator mode. *scrolling top: SELECT ACTUAT MODE	Default: Linear flow. Options: Linear flow, Equal percentage. Or Linear rotation.
12		Supply voltage failsafe action. *scrolling top: SELECT POWER FAILSAFE	Default: 0% Open. Options: From 0-100. Increment: 1. Fail in Place: -1. <i>Only valid for Failsafe models. Failsafe 100% means opening to max flow chosen in step 9.</i>
13		Control signal failsafe action. *scrolling top: SELECT CONTROL FAILSAFE	Default: 0% Open. Options: From 0-100. Increment: 1. Fail in Place: -1. <i>Only valid for Failsafe models. Failsafe 100% means opening to max flow chosen in step 9.</i>
14		Auto stroke. *scrolling top: SELECT AUTO STROKE	Default: 7 Days. Options: 0-365. Increment: 1. Disabled: 0.
15		Activation of password. *scrolling top: ACTIVAT PASSWO	Default: Disable. Options: Enable or Disable. If Enabled, password is required to access programming menu.

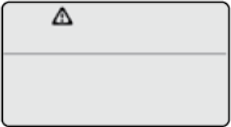
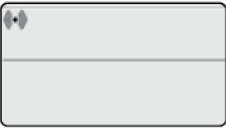
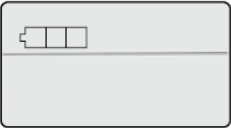
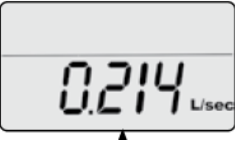
Notes about Failsafe mode (Only available for Failsafe models)

When control signal is lost, the actuator will move to the control signal failsafe position chosen in programming menu step 13 and during control signal failsafe mode warning code 06 will show in the actuator display. Upon control signal return, the actuator returns to normal operation mode and the Δ will be reset.

When power is lost, the actuator will go into failsafe mode with approximately 60 sec. delay. Failsafe position is chosen in programming menu step 12 and during failsafe mode warning code 05 will show in the actuator display until the actuator shuts off.

Upon power return and before actuator shut-off, the actuator returns to normal operation mode and Δ will be reset. If power returns after actuator shut-off, the actuator re-calibrates, returns to normal operation and resets Δ .

IN OPERATION

Display	Description	Values
	Indicates unit scale system.	l/sec or l/min or GPM. mA or VDC.
	Alarm indicator.	Blinking if actuator is still functional (warning). Fully on if actuator is not working (critical).
	BACnet indicator	BACnet communication
	Battery Level	 Basic versions with no battery (SM.0.0.1.3/5).  Failsafe versions with battery (SM.0.0.1.4/6).  Low battery level, charging needed.  Medium battery level.  High battery level, fully charged. Initial charging: 24 hr. Recharge: 4-8 hr.
	Information Current Flowrate	The flowrate shown on the actuator display is a calculated value. Flow rates below 1.0 valve rotation is shown with higher tolerances and illustrated with an apostrophe in front of the flow rate. If display shows "NA" the valve model has not been chosen in programming menu step 2.

ALARM MENU

To enter the alarm menu, simultaneously press ► and ◀ for 6 seconds. Press ► to go to the next alarm display, press ◀ to return to previous step. Press ▲ and ▼ simultaneously for 6 seconds to exit alarm menu. Actuator will automatically return to operation mode if no action is detected on arrow keys during 1 minute.

If the actuator is **still functioning**, the △ icon will blink indicate a warning. If the actuator is **NOT functioning**, the △ icon is fully on indicating a critical error. Active alarm codes will be shown in the information part of the actuator display and alarm menu will display a digit larger than 0.

Code	Icon	Description	Details
01	 FULL ON	Valve/actuator is over torqued.	Operation is stopped. Actuator will retry operation every 4 minutes. If over torque condition disappears, error will convert to error code 02.

02	 BLINKING	Actuator has reached its torque limit in the past.	Actuator is functioning.
03	 FULL ON	Critical - over temperature.	Critical: Temperature in actuator is at least 70°C, motor operation is stopped. If temperature is decreasing, operation will resume and error will convert to code 04.
04	 BLINKING	High temperature.	Actuator is still functioning. Temperature in actuator is at least 50°C/122 °F. If temperature is decreasing, operation will resume.
05	 FULL ON	Power Failure Warning. Failsafe models only	No power signal is detected, and actuator will go into Supply Voltage Failsafe mode (according to programming menu step 12). Alarm will automatically reset when power is restored
06	 BLINKING	Control signal error.	No control signal is detected, and actuator will go into Control Signal Failsafe mode (according to programming menu step 13). Alarm will automatically reset when control signal is restored
07	 FULL ON	Lack of Valve error.	No valve is detected at first actuator power-up and proper calibration cannot be performed. A re-calibration is tried every 24 hours. Alarm will automatically reset when calibration is successful
08	 BLINKING	Battery error.	Actuator is functional, but failsafe function is not. Battery needs replacement. Contact Griswold Controls for service. <i>Only valid for failsafe model</i>
09	 FULL ON	BACnet fallback mode	Actuator is NOT functional. BACnet control value has not been updated and BACnet fallback timeout has been reached. Alarm will reset when BACnet control signal is refreshed <i>Only valid for BACnet actuators</i>

AUTO STROKE RECALIBRATION

In case the valve does not operate as expected, start the auto-stroke sequence to re-calibrate the closing point of the valve and to make sure that the actuator is able to open the valve fully. Press buttons ► and ▲ simultaneously for 6 seconds to start the autostroke. Change of value in programming menu 14 will also active an auto-stroke sequence.

An auto-stroke sequence cannot be cancelled and during the sequence, actuator display will show "AUTO-STROKE". After auto-cycle, the valve will proceed to normal operation mode (according to control signal)

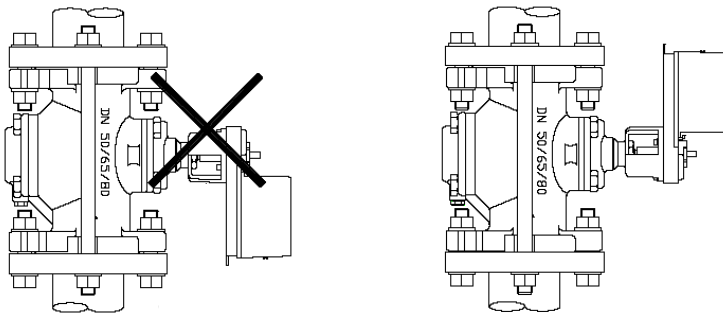
MANUAL OVERRIDE

Manual override is used to temporarily set the position of the valve regardless of the settings and control signal for the actuator.

1. Turn off power to the actuator.
2. Remove actuator from valve as described.
3. Turn spindle to the relevant position (Clockwise to close valve, counter clockwise to open valve). Be sure not to use more than 7 Nm torque or warranty will be voided. Please protect actuator from water while not on valve.
4. Re-mount actuator on valve as described.
5. Turn on power to the actuator when normal operation is needed.

OPERATION

1. Ensure that the valve is not in the fully closed position when filling the system with water.
2. Do not exceed maximum pressure differential control range for valve.
3. Install valve indoors. If valve is installed outdoors, water tight protection is required for the actuator.
4. If the valve is to be installed in vertical pipe on a chilled water system, ensure that the covered electronics are upwards above the valve spindle, to prevent condensation from entering the electronics. If necessary use a socket and ratchet to remove the brass nut attaching the mounting bracket to the valve body, re-position the Actuator and replace the brass nut.

**MAINTENANCE**

1. If the system experiences large amounts of pipe scale due to poor water conditions, as sometimes found in older or retrofit pipe systems, provisions should be made to keep the system clean. Proper water treatment is also recommended by the use of a Separator.