

Victaulic® Series UBP Unibody PICV Balancing Valve

WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
 - Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
 - Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
 - Wear safety glasses, gloves, hardhat, and foot protection.
- Failure to follow these instructions could result in death or serious personal injury and property damage.

RECEIVING THE SHIPMENT

Victaulic® Series UBP Unibody PICV Balancing Valves are a pre-packaged and labeled system designed to improve efficiency of connecting HVAC coils. Upon receipt of the shipment, verify that the kit is the correct one for the coil being installed. If any components are damaged or missing, contact Victaulic.

Series UBP Valve Weights

Size			Weight
Nominal inches DN	IPS Actual Outside Diameter inches mm	CTS Actual Outside Diameter inches mm	Approx. (Each) Series UBP lbs kg
½ D15	0.840 21.3	0.625 15.9	5.1 2.3
¾ DN20	1.050 26.9	0.875 22.2	6.0 2.7
1 DN25	1.315 33.7	1.125 28.6	6.4 2.9

LUBRICANT COMPATIBILITY FOR GASKETS

The following recommendations are for the gasket material listed. Commercial lubricants may contain multiple ingredients. Always refer to the lubricant manufacturer's recommendations for material compatibility.

	Victaulic Lubricant	Soap- Based Solutions	Glycerin	Silicone Grease	Silicone Spray	Corn Oil	Soybean Oil	Hydrocarbon- Based Oils	Petroleum- Based Greases
Compatible with EPDM Gaskets?	Yes	Yes	Yes	Yes	No	No	No	No	No

PICV CARTRIDGES

Choose the Victaulic PICV (Pressure Independent Control Valve Cartridge) that coincides with the required constant flow rate and range of differential pressure needed for the application. Refer to the PICV Selection Guide and Adjustment Diagram on the following page.

STORAGE

- **DO** protect the valve from direct sunlight and mechanical damage. Valves shall be stored in a dry area that is protected from dirt and debris accumulation.
- **DO** store valves in temperatures from -4°F up to 140°F/-20°C up to +60°C, maximum relative air humidity of 95%.
- **DO NOT** expose valves to aggressive fluids or heat sources.

SWEAT CONNECTIONS

CAUTION

- **DO NOT** exceed the temperature rating of the valve (250°F/121°C).
- Separate tailpieces and union nuts from valve before soldering to pipe.

Soldering tailpieces with valve attached may cause damage to internal components, resulting in valve leakage and property damage.

Verify that the valve is installed in the correct direction of flow (refer to applicable flow direction arrow on the valve body). Separate tailpieces and union nuts from valve to solder to the pipe. Connections shall be soft soldered with 95/5 (95% tin, 5% antimony) type solder. Tailpieces, union nuts, and pipe shall be allowed to cool to room temperature before attaching to valve. **DO NOT** exceed the temperature rating of the valve (250°F/121°C) at seats and seals.

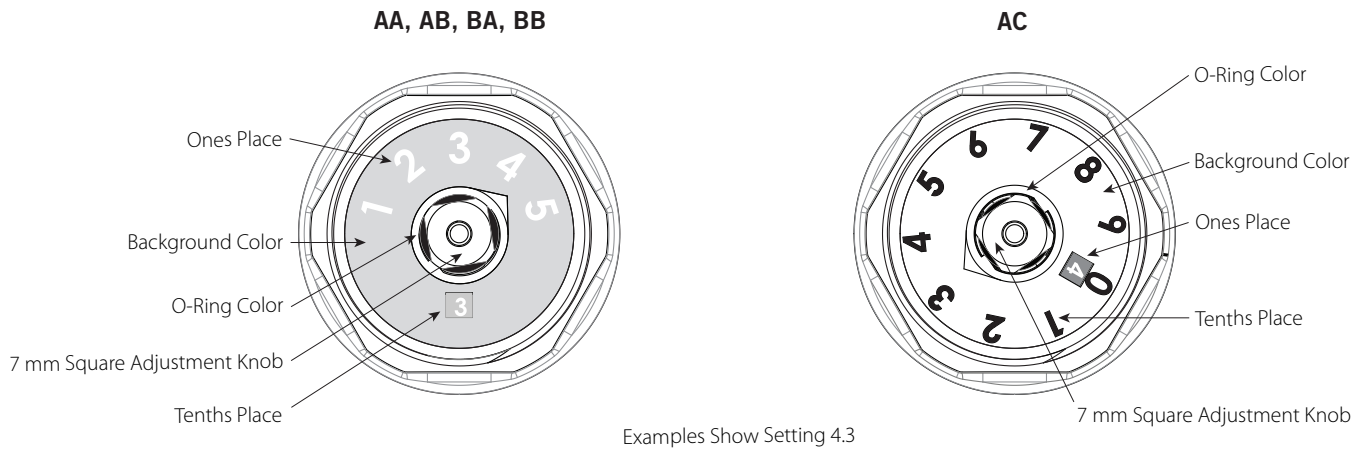
THREADED PIPE CONNECTIONS

Verify that all threaded connections are clean and free of any burrs. Apply PTFE thread sealant tape or pipe dope to the external threads of all threaded pipe connections. **DO NOT** get any tape, dope, or other foreign material into the flow path. For threaded connections to Series UH1, refer to the "Series UH1 Stainless Steel Annular Corrugated Flexible Pipe" section in this document.

UNION-TYPE ADAPTERS/CONNECTIONS

The o-rings in union-type adapters/connections shall be lubricated with a compatible lubricant to help prevent the o-ring from pinching or tearing during installation. Refer to the "Lubricant Compatibility for Gaskets" table below. Tighten union-type adapters/connections hand-tight, then apply an additional quarter turn. **DO NOT** over-tighten the connection. **DO NOT** apply pipe tape or dope to union threads.

PICV SELECTION GUIDE AND ADJUSTMENT DIAGRAM



PICV CARTRIDGE SELECTION GUIDE

1. Select the Victaulic® Series UBP Unibody Balance Style Type: Linear or Equal Percentage.
2. Select the Pressure Differential Range.
3. Select the Flow Range.

Control Characteristic	PICV Code	Visual Identification	Flow Range	Flow Range	Pressure Differential Range	Pressure Differential Range	Part Code
			GPM	LPM	PSID	kPaD	
Linear	AA	Gray O-Ring, Green Background	0.163 to 2.53	0.62 to 9.57	2.3 to 87	16 to 600	P000UBPPAA
	AB	Black O-Ring, Green Background	0.282 to 4.89	1.07 to 18.51	4.4 to 116	30 to 800	P000UBPPAB
	AC	Black O-Ring, White Background	2.73 to 11.70	10.34 to 44.28	5.1 to 116	35 to 800	P000UBPPAC
Equal Percentage	BA	Gray O-Ring, Gray Background	0.0763 to 2	0.29 to 7.57	2.3 to 87	16 to 600	P000UBPPBA
	BB	Black O-Ring, Gray Background	0.121 to 3.54	0.46 to 13.40	4.4 to 116	30 to 800	P000UBPPBB

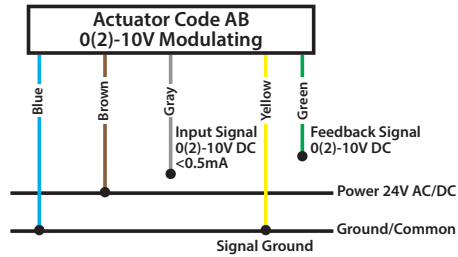
4. Select the Actuator.

PICV Actuator Options

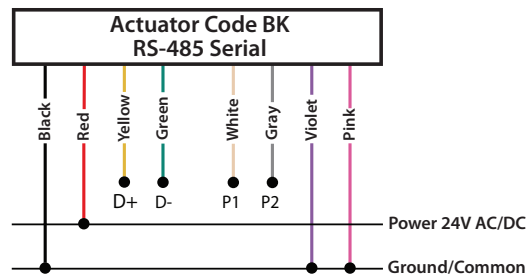
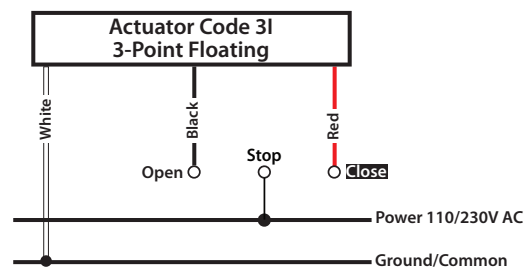
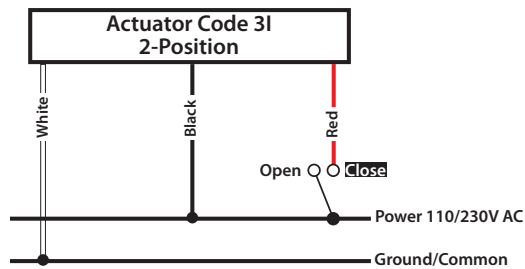
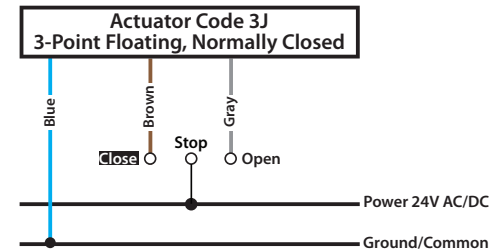
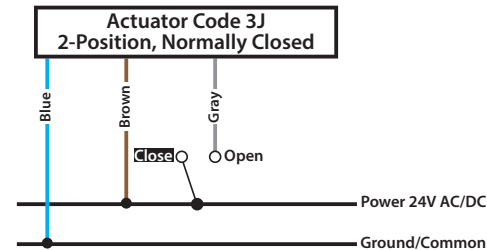
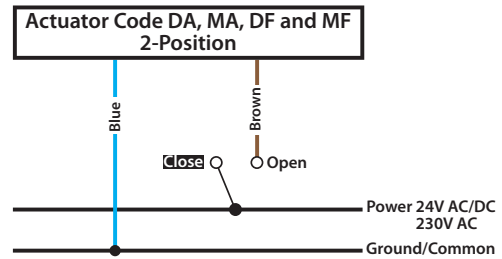
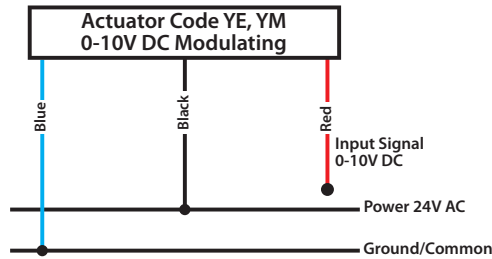
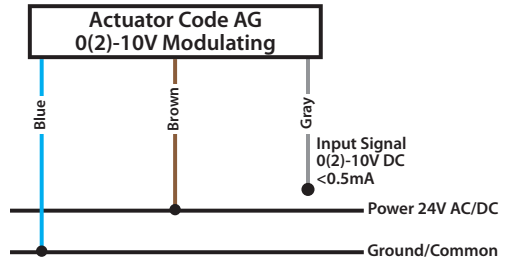
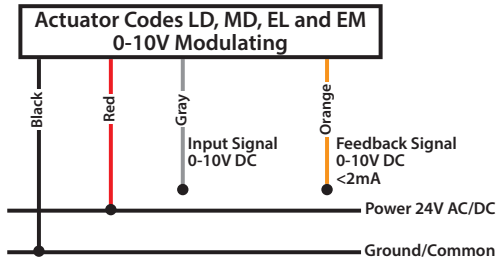
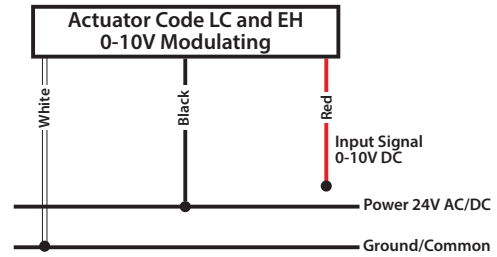
Actuator Code	Supply Voltage	Type	Control Signal	Feedback Signal	Fail-Safe*	Auto-Stroke	Actuator Travel Speed	Override Option	Part Code
AB	24VAC/DC	Motorized	Analog 0(2)-10V DC, Linear, Equal Percentage and Normally Open Options (DIP Switch)	Analog 0(2)-10V DC	Fail in Place	Yes	75 sec/cycle	Electrical	P000UBPMAB
LC	24VAC/DC	Motorized	Analog 0-10V DC, Linear	None	Fail in Place	No	19 sec/cycle	Manual	P000UBPMLC
LD	24VAC/DC	Motorized	Analog 0-10V DC, Linear	Analog 0-10V DC	Closed	No	28 sec/cycle	None	P000UBPMLD
MD	24VAC/DC	Motorized	Analog 0-10V DC, Linear	Analog 0-10V DC	Open	No	28 sec/cycle	None	P000UBPMMD
EL	24VAC/DC	Motorized	Analog 0-10V DC, Equal Percentage	Analog 0-10V DC	Closed	No	28 sec/cycle	None	P000UBPMEL
EM	24VAC/DC	Motorized	Analog 0-10V DC, Equal Percentage	Analog 0-10V DC	Open	No	28 sec/cycle	None	P000UBPMEM
3J	24VAC/DC	Motorized	Digital 2-Position/3-Point Floating, Normally Open Option (DIP Switch)	None	Fail in Place	Yes	75 sec/cycle	Electrical	P000UBPM3J
DA	24VAC/DC	Thermal	ON/OFF	None	Closed	No	4.5 min/cycle	None	P000UBP0DA
MA	24VAC/DC	Thermal	ON/OFF	None	Open	No	4.5 min/cycle	None	P000UBP0MA
YE	24VAC/DC	Thermal	Analog 0-10V DC, Linear	None	Closed	No	4.5 min/cycle	None	P000UBP0YE
YM	24VAC/DC	Thermal	Analog 0-10V DC, Linear	None	Open	No	4.5 min/cycle	None	P000UBP0YM
DF	230VAC	Thermal	ON/OFF	None	Closed	No	4.5 min/cycle	None	P000UBP0DF
MF	230VAC	Thermal	ON/OFF	None	Open	No	4.5 min/cycle	None	P000UBP0MF
AG	24VAC/DC	Motorized	Analog 0(2)-10V DC, Linear, Equal Percentage and Normally Open Options (DIP Switch)	None	Fail in Place	Yes	75 sec /cycle	Electrical	P000UBP0AG
EH	24VAC/DC	Motorized	Analog 0-10V DC, Equal Percentage	None	Fail in Place	No	19 sec/cycle	Manual	P000UBP0EH
3I	110/230VAC	Motorized	Digital 2-Point Position / 3-Point Floating	None	Fail in Place	No	93 sec/cycle	Manual	P000UBP03I
BK	24VAC/DC	Motorized	0-100% (BACnet or Modbus)	0-100% (BACnet or Modbus)	Fail in Place	Yes	75 sec/cycle	Manual (with Magnet)	P000UBP0BK

NOTE: All cartridges have an M30 x 1.5 actuator connection.

ACTUATOR WIRING



NOTE: AB Actuator requires common ground between power and signal.



Actuator Power Consumption

Actuator Code	Power Consumption	
	24V AC	24V DC
AB, 3J, AG, BK	0.9VA Standby/2.5VA Operating/4.7VA Max.	0.75W Standby/1.2W Operating/2.2W Max.
LC, EH	1VA Standby/6VA Operating/6VA Max.	0.5W Standby/4W Operating/4W Max.
LD, MD, EL, EM	2.5VA Standby/2.5VA Operating/5VA Max.	1.5W Standby/1.5W Operating/3W Max.

Actuator Code	Power Consumption
DA, MA, YE, YM, DF, MF	1.2W
3I	1VA Standby/6VA Operating/6VA Max.

PICV Cartridge Flow Performance and Settings

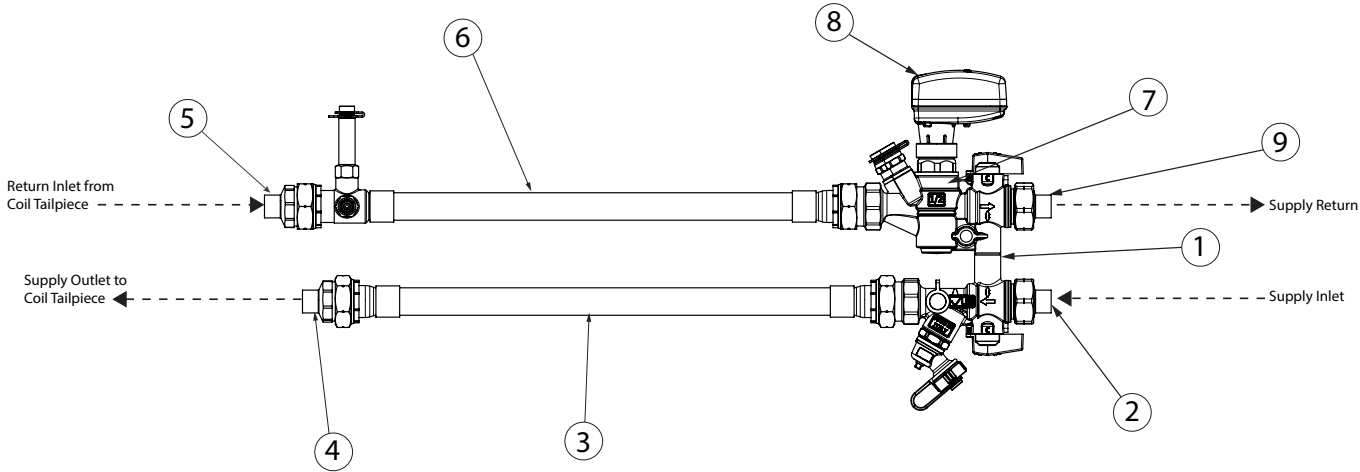
Control Characteristic	Linear						Equal Percentage			
Cartridge Model	AA ¹		AB ²		AC ²		BA ³		BB ³	
Visual Indication	Gray O-Ring, Green Background		Black O-Ring, Green Background		Black O-Ring, White Background		Gray O-Ring, Gray Background		Black O-Ring, Gray Background	
Pressure Differential Range psid kPaD	2.3 to 87 16 to 600		4.4 to 116 30 to 899		5.1 to 116 35 to 800		2.3 to 87 16 to 600		4.4 to 116 30 to 800	
Flow Setting	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM
1.0	–	–	0.282	1.07	–	–	0.0763	0.29	0.121	0.46
1.1	0.163	0.62	0.624	2.36	–	–	0.087	0.33	0.139	0.53
1.2	0.37	1.40	0.92	3.48	–	–	0.10	0.38	0.162	0.61
1.3	0.51	1.93	1.18	4.47	–	–	0.115	0.44	0.188	0.71
1.4	0.664	2.51	1.41	5.34	–	–	0.132	0.50	0.219	0.83
1.5	0.792	3.00	1.61	6.09	2.73	10.34	0.153	0.58	0.255	0.97
1.6	0.902	3.41	1.80	6.81	3.17	12	0.176	0.67	0.296	1.12
1.7	1.03	3.90	1.96	7.42	3.61	13.67	0.202	0.76	0.342	1.29
1.8	1.14	4.32	2.12	8.03	4.10	15.52	0.231	0.87	0.392	1.48
1.9	1.24	4.69	2.27	8.59	4.67	17.68	0.263	1.00	0.448	1.70
2.0	1.33	5.03	2.42	9.16	5.15	19.49	0.298	1.13	0.509	1.93
2.1	1.41	5.34	2.56	9.69	5.55	21.01	0.336	1.27	0.576	2.18
2.2	1.49	5.64	2.69	10.18	5.95	22.52	0.377	1.43	0.647	2.45
2.3	1.55	5.87	2.82	10.67	6.28	23.77	0.421	1.59	0.723	2.74
2.4	1.63	6.17	2.95	11.17	6.61	25.02	0.467	1.77	0.805	3.05
2.5	1.68	6.36	3.08	11.66	6.96	26.35	0.517	1.96	0.891	3.37
2.6	1.73	6.55	3.21	12.15	7.27	27.52	0.569	2.15	0.982	3.72
2.7	1.79	6.78	3.33	12.61	7.62	28.84	0.624	2.36	1.08	4.09
2.8	1.82	6.89	3.45	13.06	7.93	30.02	0.681	2.58	1.18	4.47
2.9	1.88	7.12	3.56	13.48	8.28	31.34	0.741	2.80	1.28	4.85
3.0	1.93	7.31	3.68	13.93	8.59	32.52	0.803	3.04	1.39	5.26
3.1	1.98	7.50	3.79	14.35	8.72	33.01	0.866	3.28	1.50	5.68
3.2	2.02	7.65	3.89	14.73	8.85	33.5	0.931	3.52	1.61	6.09
3.3	2.06	7.80	3.99	15.10	8.99	34.03	0.998	3.78	1.73	6.55
3.4	2.10	7.95	4.08	15.44	9.12	34.52	1.07	4.05	1.84	6.97
3.5	2.14	8.10	4.17	15.79	9.25	35.02	1.13	4.28	1.96	7.42
3.6	2.17	8.21	4.25	16.09	9.47	35.85	1.20	4.54	2.08	7.87
3.7	2.21	8.37	4.32	16.35	9.69	36.68	1.27	4.81	2.21	8.37
3.8	2.25	8.52	4.39	16.62	9.91	37.51	1.34	5.07	2.33	8.82
3.9	2.28	8.63	4.46	16.88	10.10	38.23	1.41	5.34	2.45	9.27
4.0	2.31	8.74	4.51	17.07	10.40	39.37	1.48	5.60	2.57	9.73
4.1	2.34	8.86	4.57	17.30	10.50	39.75	1.54	5.83	2.69	10.18
4.2	2.37	8.97	4.61	17.45	10.60	40.13	1.61	6.09	2.80	10.60
4.3	2.39	9.05	4.66	17.64	10.70	40.50	1.67	6.32	2.91	11.02
4.4	2.42	9.16	4.70	17.79	10.90	41.26	1.73	6.55	3.02	11.43
4.5	2.43	9.20	4.73	17.90	11.00	41.64	1.78	6.74	3.13	11.85
4.6	2.46	9.31	4.77	18.06	11.10	42.02	1.84	6.97	3.22	12.19
4.7	2.48	9.39	4.80	18.17	11.30	42.78	1.88	7.12	3.32	12.57
4.8	2.50	9.46	4.83	18.28	11.40	43.15	1.93	7.31	3.40	12.87
4.9	2.51	9.50	4.86	18.40	11.50	43.53	1.97	7.46	3.48	13.17
5.0	2.52	9.57	4.89	18.51	11.70	44.28	2.00	7.57	3.54	13.40

¹ Accuracy of -20%/+0% applies in 29 to 87 psid/200 to 600 kPaD range; otherwise, greatest of either +/- 10% of controlled flow rate or +/- 5% of maximum flow rate

² Accuracy of -20%/+0% applies in 58 to 116 psid/400 to 800 kPaD range; otherwise, greatest of either +/- 10% of controlled flow rate or +/- 5% of maximum flow rate

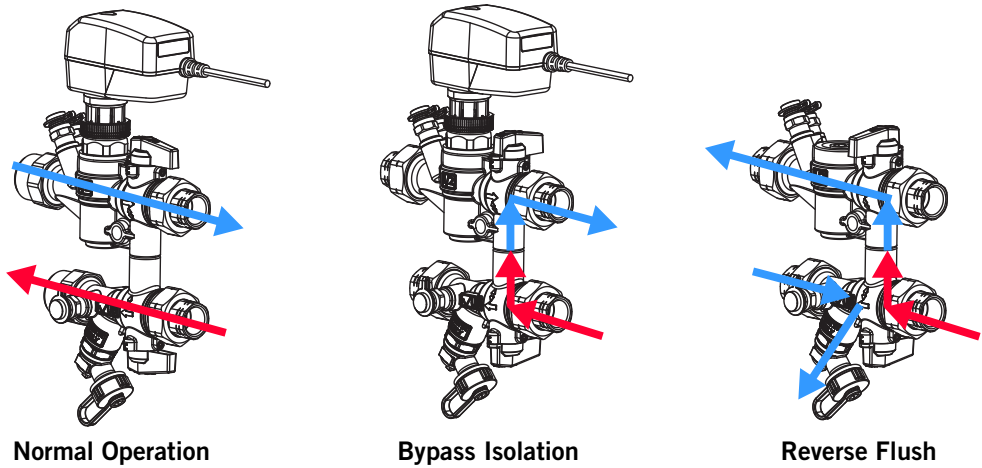
³ Accuracy of +/- 10% controlled flow rate

SERIES UBP VALVE TRIM COMPONENTS



Item	Description
1	Series UBP Valve
2	Supply Inlet Tailpiece
3	Inlet Series UH1
4	Supply Outlet to Coil Tailpiece
5	Return Inlet from Coil Tailpiece
6	Return Series UH1 (PT Port option shown)
7	PICV Insert
8	PICV Actuator
9	Supply Return Tailpiece

SERIES UBP VALVE HANDLE OPERATION POSITIONS



Valve	Normal Operation	Bypass Isolation	Reverse Flush
Upstream (Red)	B	C	C
Downstream (Blue)	B	C	A

SERIES UBP VALVE INSTALLATION

1. Mount the Series UBP Valve according to available space and type of location. (Consider using a $\frac{3}{8}$ " threaded rod directly to mounting hole.)
2. Connect applicable tailpieces to coil (not shown in drawing) and Supply Pipe and Return Pipe (not shown in drawing) via standard connection practices, described previously in Sweat, Threaded, Union-Type, or Copper Press sections in this document.
3. Connect the Supply Inlet Tailpieces to the Valve, verifying that the flow arrow is in the correct direction. Move the handles to Position C (Bypass Isolation) for tightening and return to Position A (normal operation).
4. If using a Series UH1, verify that the seals are in place and undamaged. Series UH1 in $\frac{1}{2}$ - 1" sizes contains seals in the swivel union ends. Refer to the "Series UH1 Stainless Steel Annular Corrugated Flexible Pipe" section for more information.
5. Connect Inlet and Return Series UH1 and Supply Outlet to Coil Tailpiece and Return Inlet from Coil Tailpiece and appropriate valve ends.
NOTE: Verify that the return side of the coil is connected to the return side of the valve, and the supply side of the coil is connected to the supply side of the valve. Refer to the "Series UH1 Stainless Steel Annular Corrugated Flexible Pipe" section for details on minimum static bend radius specifications and additional installation requirements.
6. Verify joints are properly tightened including air bleed on Series UH1 Body (Items 3 and 6) and UB Drain Valve (located in Item 1).
NOTE: Use cap of Drain Valve as a handle.
7. Remove actuator and use Cartridge Key (7-mm square) to adjust flow setting based on balancing insert instructions shown on page 2.
8. Install and wire actuator per "Actuator Wiring" section on page 4 and "Installation of Actuators" section on page 15.
9. Move valve handles into Bypass Isolation (Position C) Operation to flush the system without exposing the coil to fluid, then return to Normal Operation Position (Position B).
10. Remove PICV insert and replace with the optional Balancing Insert Plug before Reverse Flush.

CAUTION

- If back flushing through the coils, do not flush through the balancing cartridge. A cap is available to replace the cartridge during this process if desired.

Failure to follow this instruction could cause damage to the balancing cartridge.

SERIES UH1 STAINLESS STEEL ANNULAR CORRUGATED FLEXIBLE PIPE

WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

- The installer shall understand the use of this product and why it was specified for the particular application.
 - The installer shall understand common industry safety standards and potential consequences of improper product installation.
 - It is the responsibility of the system designer to verify suitability of stainless steel annular corrugated flexible pipe for use with the intended fluid media within the piping system and external environments.
 - The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on stainless steel annular corrugated flexible pipe shall be evaluated by the material specifier to confirm system life will be acceptable for the intended service.
- Failure to follow these instructions could cause product failure, resulting in death or serious personal injury and property damage.

Guidelines for the Installation and Use of Series UH1 Stainless Steel Annular Corrugated Flexible Pipe:

NOTICE

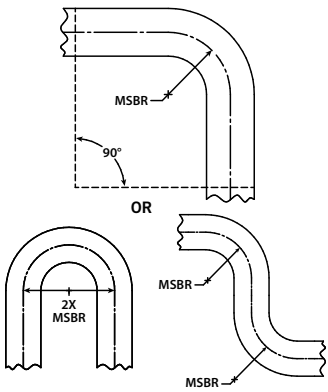
- Certain applications may require special testing and analysis prior to Series UH1 selection. Actual service life can only be determined through testing under all extreme conditions.
- The installation and routing requirements in this document are consistent with the following standards and guidelines: SAE J1273, ISO 17165-2, and Hose Safety Institute Handbook – Design and Specification of Hose Assemblies v1.3.

- Pressure spikes shall not exceed the maximum pressure rating of the Series UH1. Pressure pulsations outside the intended working pressure can cause fatigue and lead to premature failure.
- Exposure to chemicals, UV radiation, salt water, and mechanical wear can degrade the Series UH1.
- Incorrect Series UH1 selection for the fluid being conveyed can lead to chemical degradation. The system designer shall verify suitability of the Series UH1 for use with the intended fluid media within the piping system and external environments.
- Store the Series UH1 in their original packaging in a clean, dry, and well-ventilated area.
- Care shall be taken to protect Series UH1 from wear, snagging, cuts, and other damage.
- External mechanical loads can significantly reduce Series UH1 service life. Mechanical loads include: tensile, compressive, torsional, and bending loads such that the Series UH1 is forced outside the installation guidance given below.
- Avoid installing the Series UH1 in dynamic systems. A dynamic system is defined as having one fixed end connection with the other end connection independently moving in a single plane.
- The system designer shall verify that the correct Series UH1 length has been specified to:
 - Avoid excessive stretching or compression during service
 - Reduce strain on components
 - Compensate for tolerance stack-up in assemblies
 - Allow for length changes during pressurization, thermal expansion or contraction, and system component tolerances and movement
- Avoid installing the Series UH1 in applications involving steam services.
- Avoid installing the Series UH1 in untreated systems and systems where media is exposed to atmosphere.

Installation:

- The OD of the seal is marked with a ✓. Inspect the seal to confirm that it has been installed properly.
- Connect applicable adapters to coil and valve locations before installing the Series UH1 to adapters.
- Use the Series UH1 only for hydronic applications that are suitable for the Series UH1 seal material. Reference 05.01 and GSG-100, which can be downloaded at victaulic.com.
- Avoid installing the Series UH1 where it can come in contact with vibrating equipment, abrasive surfaces, or sharp surfaces such as sheet metal corners. Series UH1 should not contact each other during service.
- Use angled fittings if the minimum static bend radius cannot be achieved.
- Check the Series UH1 for frayed braiding and any other damaged components just prior to installation.
- DO NOT use the Series UH1 in gas/air applications.
- DO NOT apply thread tape or dope to parallel Series UH1 union connections of adapter.
- DO NOT allow torque to exceed hand-tight plus a quarter turn during assembly. Wrench must engage only with wrench flats of Series UH1 connection nuts.
- DO NOT twist the Series UH1 during installation or tightening. Minimize torsional twisting.
- DO NOT expose the Series UH1 to solder flux or other chemicals known to deteriorate stainless steel.

Minimum Static Bend Radius:

Installation at less than the minimum static bend radius listed may significantly reduce service life of the Series UH1. Any bends that are less than the minimum static bend radius shall be avoided. To the right is a listing of the minimum static bend radius requirement per Series UH1 diameter.	Size	Minimum Static Bend Radius (MSBR)		
	inches		inches	
	DN		mm	
	1/2		1 1/2	
	DN15		38	
	3/4		2	
	DN20		51	
	1		2 1/2	
	DN25		64	
	1 1/4		3	
	DN32		76	
	1 1/2		3 1/2	
	DN40		89	
	2		4 1/2	
	DN50		114	

Post-Installation Inspection and Testing:

Perform a visual inspection of Series UH1 assemblies prior to any leak and pressure testing. If any of the following conditions are noted, the Series UH1 assembly shall be removed from the system, discarded, and replaced:

- Series UH1 that have been bent to a radius smaller than the minimum static bend radius
- Series UH1 that have been cut, cracked, or otherwise damaged
- Series UH1 that have frayed braid wire
- Fittings that contain damage such as scratches on sealing surfaces and deformation

After visual inspection has occurred, pressurize the system gradually to verify proper assembly and check for leaks. Depressurize and drain the system before attempting to replace or adjust any system components.

Using the Manual Air Vent of the Series UH1:

1. Attach a 7/16" wrench to the hexed needle of the manual air vent along with 1/4" tubing, as shown, to direct the flow of air and water spray.
2. Loosen the hexed needle of the manual air vent counterclockwise to vent air from the system.
3. When air has been sufficiently vented, re-tighten the hexed needle of the manual air vent clockwise and remove the tubing.



MAINTENANCE

⚠ WARNING



- Always place any operating coils in non-operational mode prior to isolation and allow isolated section to reach 120°F or below in the case of heating before attempting to depressurize or drain fluid. Always follow coil manufacturer instructions for any maintenance performed.
- Always verify that the piping system has been completely depressurized and drained before installation and removal. Adjustment, or maintenance may require similar precautions if not outlined in this document.

- Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.

Failure to follow this instruction could result in death or serious personal injury and property damage.

DRAIN MAINTENANCE

Refer to "Series UBP Valve Handle Operation Positions" section in this document.

1. Deactivate coils.
2. Place the valve into bypass isolation to isolate the coils and the drain valve, and allow fluid to cool to a safe working temperature, if needed.
3. Prepare a container to capture fluid from the isolated section and position appropriately underneath the UB Drain Valve.
4. Remove the Drain valve cap and use its square key feature or a wrench to open the drain valve and allow to drain.
5. Use a wrench to unthread UB drain valve counterclockwise.
6. Remove the UB strainer screen. Replace after cleaning or with a new component.
7. Inspect the UB Drain Valve and verify it is clear of debris and close the valve. If clear of debris it may be reinstalled.
8. Inspect the UB Strainer Plug O-ring. If undamaged, it may be reinstalled.
9. If all components are clear and undamaged, reinstall the UB Drain Valve, or replace with a new component.
10. Place the valve into normal operation and verify the UB Drain valve is leak tight through the drain valve and at the joint.
11. Reactivate coils.

NOTE: The maximum particulate size the strainer drain valve will pass is 500 micron (0.02"). To clean larger particles or replace components, follow the "Drain Maintenance" section above.

Replacement Strainer Baskets

Description	Part Code
UB Strainer (20 Mesh, 800 µm)	P004UBPSTN

Replacement O-Rings

Description	Part Code
UB Strainer Plug O-Ring	P004UBPORG

SERIES UBP REPLACEMENT PART INFORMATION

⚠ WARNING



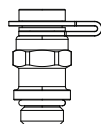
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.

- Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.

Failure to follow this instruction could result in death or serious personal injury and property damage.

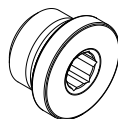
The following parts are sold separately through Victaulic for UB Components. Contact Victaulic with any order requests or questions regarding these parts.

SERIES UBP ACCESSORIES



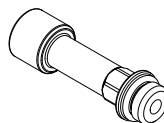
UB PT Ports are field-replaceable. Remove the existing PT port(s), and thread the new port(s) into the valve body. DO NOT use PTFE thread sealant tape or pipe dope on the o-ring sealed PT Port threads.

Nominal Size	Part Code	Description
1/4"	P002UBPPTB	UB PT Port w/O-Ring Standard Length BSPP Blue
1/4"	P002UBPPTR	UB PT Port w/O-Ring Standard Length BSPP Red



PT Port Plugs are field replaceable with PT Ports. Thread the new plug into the valve body. DO NOT use PTFE thread sealant tape or pipe dope on the o-ring sealed plug threads.

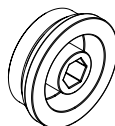
Nominal Size	Part Code	Description
1/4"	P002UBPPLG	UB PT Port Plug with O-Ring BSPP



Port Extenders are available for applications where Series UBP components will be insulated, to extend the PT ports to provide clearance for 2 inches/51 mm or 4 inches/102 mm of insulation. Thread the port extenders into the existing PT ports. Use PTFE thread sealant or pipe dope on the tapered PT port thread but DO NOT use thread sealant or pipe dope on the o-ring sealed extender thread.

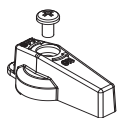
NOTE: Depending on the configuration ordered, some Series UBP kits may be supplied with this option factory installed.

Nominal Size	Part Code	Description
2"	P002UBP2XT	UB PT Port Extender 2-inch
4"	P002UBP4XT	UB PT Port Extender 4-inch



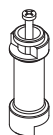
Replace the PICV or ABV Cartridge with this **Balancing Insert Plug** for the reverse flush operation, as outlined in the instructions. DO NOT use thread sealant or pipe dope on the o-ring sealed threads.

Part Code	Description
P004UBPPLG	Balancing Insert Plug



UB Standard Handles with retaining screws are available for replacement. Place valve in Normal Operation position for replacement or install, and verify handle and valve are in the correct position.

Part Code	Description
P004UBPRHL	UB Standard Handle (with Red screw kit)
P004UBPBHL	UB Standard Handle (with Blue screw kit)



UB Handle Extension parts are used in applications where Series UBP components will be insulated. These handle extension parts provide clearance for 2 inches/51 mm or 4 inches/102 mm of insulation. Remove the retaining screw and handle. Re-install the handle assembly onto the handle extension by using the provided extension body in between the handle and valve along with the provided long screw. The handle is not provided in the handle extension part code and must be ordered separately or use existing part.

NOTE: Depending on the configuration ordered, some Series UBP kits may come with this option factory installed.

Nominal Size	Part Code	Description
2"	P004UBP2HL	UB Handle Extension 2" Length
4"	P004UBP4HL	UB Handle Extension 4" Length



UB Drain Valves are field-replaceable. Remove the existing drain valve from the valve body, retain or replace the stainer in the valve body, and thread the new assembly into the adapter. DO NOT use thread seal tape or pipe dope on the male o-ring sealed threads.

Part Code	Description
P000UBPDRN	UB Drain Valve



The **ABV Cartridge Cap** can cover the Series UBP Cartridge stem and adjustment interface when there is no actuator installed. Thread the Cartridge Cap onto the M30 x 1.5 thread of the Series UBP Cartridge. DO NOT use thread sealant or pipe dope: Hand tighten.

Part Code	Description
P0044UB006	ABV Cartridge Cap

Part Code	Description
P000UBPSOC	½ - 1 Series UBP Shut Off Cap
P000UBA0KY	Cartridge Keys

Replacement Tailpieces for Supply Side



Nominal Size Inches	Female Tailpiece Part Code	Sweat Tailpiece Part Code	Male Tailpiece Part Code	Copper Press Part Code
½ x ½	P00478Y304	P00478Y504	P00478U404	P0047990PM
¾ x ½	P00678Y304	P00678Y504	P00678U404	P0047990PM
	¾	P00678Y306	P00678Y506	P0067990PM
1 x ½	P00678Y304	P00678Y504	P00678U404	P0047990PM
	¾	P00678Y306	P00678Y506	P0067990PM
	1	P00678Y310	P00678Y510	P0107990PM

NOTE: The copper press adapter requires a female NPT tailpiece to thread into to complete the connection.

SERIES UH1 REPLACEMENT PART INFORMATION

Replacement Adapters/Tailpieces for ½ – 1" Sizes of Series UH1

Size	Part Code
M33 Male x ½" NPT Male	P004UH1404
M33 Male x ½" NPT Female	P004UH1304
M33 Male x ½" Sweat US	P004UH1504
M33 Male x ¾" Sweat US	P004UH1503
M33 Male x ½" Press	P004UH1604
M33 Male x ¾" NPT Male	P004UH1406
M33 Male x ¾" NPT Female	P004UH1306
M33 Male x ¾" Sweat US	P004UH1506
M33 Male x ¾" Press	P004UH1606
M33 Male x 1" NPT Male	P004UH1410
M33 Male x 1" NPT Female	P004UH1310
M33 Male x 1" Sweat US	P004UH1510
M33 Male x 1" Press	P004UH1610

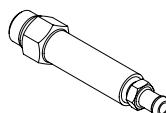
Optional Tailpiece – Series UH1 Only



Nominal Size	Series UH1 M33 Part Code
½" x M33	P00478Y033
¾" x M33	P00678Y033
1" x M33	P00678Y033

Replacement Ports for Series UH1

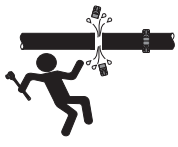
Part Description	Part Number
Replacement PT Port for Series UH1	P000UH1006
Series UH1 PT Port (Blue)	P000UH106B
Series UH1 PT Port (Red)	P000UH106R



Extended Body Air Bleed Valve for Series UH1
(Part Number P000UH1008)

Replacement Gasket for Series UH1

Part Description	Part Number
½ - 1" Gasket Seal for Series UH1	P000UH1002

PRESS-END TAILPIECE/ADAPTER INSTALLATION INSTRUCTIONS**⚠ WARNING**

- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.

Failure to follow this instruction could result in death or serious personal injury and property damage.

Copper tubing in accordance with ASTM B88 or B75 shall be used. When using ASTM B88 copper tubing, types K, L, or M are acceptable.

Soft anneal O60 and light anneal O50 are limited to ½ - 1 ¼" nominal tubing sizes. Hard temper H58 is acceptable for ½ - 2" nominal tubing sizes.

When using ASTM B75 Soft Anneal O60 and Light Anneal O50 copper tubing, the dimensions shall be in accordance with the following table.

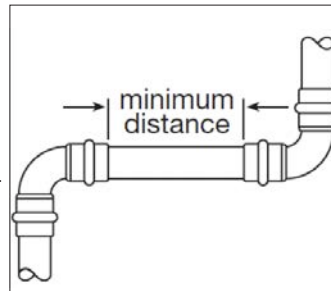
Nominal Tube Diameter inches	Outside Diameter inches/mm	Tolerance on Outside Diameter inches/mm	Wall Thickness Maximum inches/mm	Wall Thickness Minimum inches/mm
½	0.625 15.9	0.0025 0.06	0.054 1.37	0.025 0.64
¾	0.875 22.2	0.0030 0.08	0.071 1.80	0.029 0.74
1	1.125 28.6	0.0035 0.09	0.071 1.80	0.031 0.79

When using ASTM B75 hard temper H58 copper tubing, the dimensions shall be in accordance with the following table.

Nominal Tube Diameter inches	Outside Diameter inches/mm	Tolerance on Outside Diameter inches/mm	Wall Thickness Maximum inches/mm	Wall Thickness Minimum inches/mm
½	0.625 15.9	0.0010 0.025	0.054 1.37	0.025 0.64
¾	0.875 22.2	0.0010 0.025	0.071 1.80	0.029 0.74
1	1.125 28.6	0.0015 0.038	0.071 1.80	0.031 0.79

Minimum Distance Between Fittings

To ensure a correct press, a minimum distance between press-end tailpieces/adapters shall be maintained. Failure to provide this distance may result in an improper seal or incomplete press. Refer to the table to the right.



Tube Diameter inches	Minimum Distance inches/mm
½	0.4 10
¾	
1	

⚠ CAUTION

- Press-end tailpieces/adapters can form improper connections as the result of damaged tube and/or sealing elements.
- DO NOT use flame cutters when cutting the tube.
- DO NOT use grease or oils when cutting the tube.

Failure to follow these instructions could cause product damage, resulting in joint leakage and property damage.

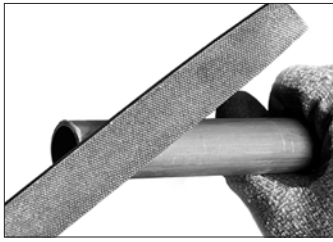


1. Cut the tube square using a displacement-type cutter or fine-tooth saw.

NOTE: If using a vise, cut tubing a minimum of 4 inches/102 mm away from the contact area of the vise to prevent possible damage to the tubing in the press area.

⚠ CAUTION

- Damage as the result of using an improper deburring tool can occur.
 - Connections may leak if they are damaged by improper deburring.
- Failure to deburr tubing may cause system leaks, resulting in property damage.



2a. Deburr the ID and OD of the tubing end.

2b. Clean the tube using a wire brush, scouring pad, or sandpaper to remove loose dirt and rust particles from the pressing and sealing area. Cleaning marks shall be in the circumferential direction and not run longitudinally along the pipe.

NOTE: The tube ends shall be thoroughly deburred after cutting. Deburring prevents damage or twisting of the seal during installation.

⚠ WARNING



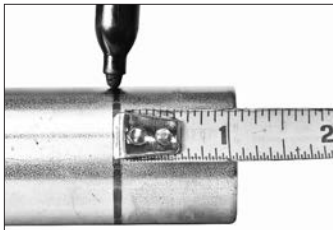
- Prior to pressing tailpieces/adapters read and understand all information and safety requirements in the press tool manufacturer's installation instructions.
- Keep extremities and foreign objects away from press tool during pressing operation to prevent injury or incomplete press.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.



3. Check the following before proceeding.

- The tube end shall not be bent or damaged.
- The tube shall be deburred.
- The seal shall be undamaged.
- The complete seal shall be engaged within the bead of the tailpiece/adapter.



4a. Measure tube insertion depth. Refer to the table below.

4b. Mark the proper insertion depth on the outside of the tube. Verify that the depth marking is visible on the completed assembly. **NOTE:** Victaulic tailpieces/adapters may have a mechanical stop for insertion depth.

Insertion Depths for 1/2" to 1" Press-End Tailpiece/Adapter

Tube Diameter inches	Insertion Depth inches/mm
1/2	1 1/16 24
3/4	1 1/8 29
1	1 1/4 27

⚠ CAUTION

- Improper insertion depth may result in an improper seal.
- Mark the correct insertion depth on the tube before pressing the tailpiece/adapter.

Failure to properly mark the insertion depth could cause an improper seal, resulting in joint leakage and property damage.



5. Insert the prepared end of the tube into the press-end tailpiece/adapter. Turn the tube slightly during insertion until it contacts the mechanical stop of the tailpiece/adapter. Verify that the mark on the tube indicates full insertion into the press-end tailpiece/adapter.

6. Perform the pressing operation with a press tool equipped with the proper size jaws. Always reference the press tool manufacturer's instructions for complete assembly and maintenance requirements.

⚠ CAUTION

- Avoid pressing over grooves, manufacturer's markings, or engravings on the tube surface.
- Failure to follow this instruction could cause an improper seal, resulting in property damage.

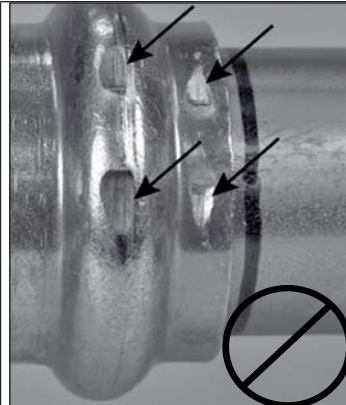
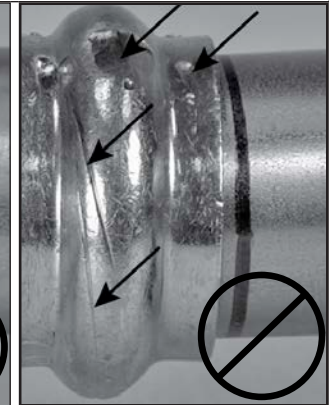
⚠️ **WARNING**



- Always inspect each joint to ensure proper product installation.
- Undersized or oversized tube and improperly pressed tailpieces/adapters are unacceptable. Any of these conditions shall be corrected before attempting to pressurize the system.

Failure to follow these instructions could result in death or serious personal injury and property damage.

7. Inspect all press-end tailpieces/adapters and compare to the photos below. If the press does not look like the “Proper Press” photo, the tailpiece/ adapter and tube shall be removed and replaced.
8. Re-inspect all press-end tailpieces immediately before and after any system testing.

PROPER PRESS	IMPROPER PRESSES (NOT ACCEPTABLE)		
			
Tube Inserted Fully and Tailpiece/ Adapter Pressed Properly	Tube Not Inserted Fully	Tailpiece/Adapter Not Fully Pressed	Tailpiece/Adapter Not Pressed Correctly Due to Incorrect Press Jaw Placement

INSTALLATION OF ACTUATORS

⚠️ **CAUTION**

- DO NOT connect power to the actuator unless the actuator is already fitted on the valve.
- NEVER install the actuator in closed position as it may damage the valve. The actuator is supplied in open position to facilitate commissioning of the system.

Failure to follow these instructions could result in product damage.

1. Mount the Actuator on the UB Valve so that the actuator union is concentric with the PICV Cartridge Stem and M30 x 1.5 Thread.
2. After mounting, finger tighten the connection union. Do not use additional tools. For wiring diagrams, reference the “Actuator Wiring” section in this document.
- Orientation:** AB, LC, 3J, DA, MA, YE, YM, DR, MF, AG, EH, 3I, and BK actuators can be installed horizontally, vertically, or upside-down. LD, MD, EL, and EM actuators cannot be installed upside-down.

Continued on the following page.

LC/EH/3I ACTUATORS

START-UP SEQUENCE

When power to the actuator is turned on, the actuator will automatically calibrate to determine closing point and stroke length of the insert. From that point forward, it will proceed to normal operation mode (according to control signal).

MANUAL OVERRIDE

Before performing override, turn off the power supply. Lift the silicone cap on top of the actuator to get access to manual override. Manual override is performed with a 4 mm (START-UP/RE-POWER SEQUENCE).

When powering the actuator turn the (~5/32") hex key. Counter-Clockwise turning will open the valve and clockwise turning will close the valve.

LD/EL/MD/EM ACTUATORS

START-UP/RE-POWER SEQUENCE

When power to the actuator is turned on, capacitor charging will be prioritized (maximum 150 seconds depending on capacitor energy level) during startup and re-powering. After completion of charging mode, the actuator will automatically calibrate to determine closing point. Hereafter, it will proceed to normal operation mode (according to control signal).

CLOSING POINT VALIDATION

The built-in "Closing Point Validation" re-confirms the valve's closing point when the valve is left in fully closed position for a longer period of time. It will perform a short stroke lift and back to closed position every 2 hours if no stroke movement has occurred.

FAIL SAFE MODE

When power is lost, the actuator will go into fail-safe mode. It is mandatory that capacitor charging is completed. The LD/EL actuator will perform fail-safe action (close) and fully turn off the actuator. The MD/EM Actuator will perform fail-safe action (open) and fully turn off the actuator. Upon powering up, the actuator remains in the final fail-safe position until charging made (maximum 150 seconds) and calibration mode are completed. Hereafter, the actuator will return to normal operation mode.

UNINSTALL LD ACTUATORS

In the event the actuator must be removed, it is recommended to electrically open the actuator for easier removal, then disconnect power and finger loosen the connection union. Do not use additional tools. Verify that the actuator is electrically fully opened, before refitting on the valve.

ACTUATOR LED STATUS

The LED indicator is visible through the dark colored transparent connection cover. The LED indication will give the following statuses.

LD/EL/MD/EM ACTUATORS LED STATUS	
Status	LED Indicator
Not configured	Blinking red, green and blue
Normal Operation mode (moving)	Blinking green
Normal operation mode (reached)	Full on green
Charging mode (maximum 150 seconds)	Full on blue
Calibration mode (closing point adjustment)	Blinking red
Fail-safe mode	Blinking blue
Perpetual Failure mode	Rapid blinking red
Super capacitor near end-of-life (recommend actuator replacement)	Rapid blinking blue

AB/3J/AG/BK ACTUATORS

PLEASE NOTE: The 3J Actuator has a reaction time of 0.8 seconds. This refers to the time from giving a 24V power signal until the actuator starts to move. This is particularly important if using a pulse power signal.

START-UP SEQUENCE

AB/3J/AG: When power to the actuator is turned on, the actuator will automatically calibrate to determine closing point. From that point forward, it will proceed to normal operation mode (according to control signal).

BK: Bus address configuration is required and shall be done immediately after first start up. Calibration mode and then normal operation mode will follow thereafter.

DIPSWITCH SETTINGS FOR AB/3J/AG/BK ACTUATORS

The valve functions are set on DIP switches found under the connection cover. PCB mounted electrical components will not be directly exposed when DIP switches are to be set. Factory settings apply when all switches are OFF.

AB/AG DIP SWITCH GUIDE

AB/AG DIP Switch	ON	OFF
6	Electrical Override ON	Electrical Override OFF
5	No Function	No Function
4	Equal Percentage	Linear
3	Normally Open	Normally Closed
2	Control Signal 2-10V	Control Signal 0-10V
1	Auto Cycle ON	Auto Cycle OFF

3J DIP SWITCH GUIDE

3J DIP Switch	ON	OFF
6	Electrical Override ON	Electrical Override OFF
5	No Function	No Function
4	No Function	No Function
3	Normally Open	Normally Closed
2	No Function	No Function
1	No Function	No Function

BK DIP SWITCH GUIDE

BK DIP Switch	ON	OFF
8	Terminal Resistor Active	Terminal Resistor Inactive
7	Modbus	BACnet
6	BIT 5 = 1	BIT 5 = 0
5	BIT 4 = 1	BIT 4 = 0
4	BIT 3 = 1	BIT 3 = 0
3	BIT 2 = 1	BIT 2 = 0
2	BIT 1 = 1	BIT 1 = 0
1	BIT 0 = 0	BIT 0 = 0

AB/3J/AG AUTO CYCLE SEQUENCE

Auto Cycle can be activated during commissioning. It prevents the valve from jamming when the valve is not moved for a longer period of inactivity. The AB/3J/AG Actuator Auto Cycle is activated by moving DIP switch #1 from OFF to ON. The actuator will then perform 50% stroke cycle every 3 weeks if no stroke movement has occurred.

BK AUTO CYCLE SEQUENCE

BK Auto Cycle is activated and cycle time is configured via the bus (Modbus register 136 and BACnet AV 10; 0 = not activated).

AB/3J/AG OVERRIDE

For AB and 3J Actuators electrical override is activated by moving DIP switch #6 from OFF to ON. The valve will open fully. During override mode the LED indicator will blink red and green. When DIP switch #6 is moved back to OFF, the actuator will re-calibrate and thereafter go into normal operation mode. Electrical override is performed with power supply on.

BK OVERRIDE:

When performing the manual override procedure, set DIP switches **1 to 6** to **OFF** and the spindle will fully retract, and the LED will rapidly blink green. In this state, the valve can be manually closed or opened using a magnet.

AB/3J LED STATUS

The LED Indicator is visible through the dark colored transparent connection cover. The LED indication will give the following statuses.

Status	LED Indication	
	AB/3J/AG Actuator	BK Actuator
Normal operation mode	Full on green	Full on green
Charge mode (60 sec)	N/A	N/A
Calibration mode (closing point adjustment)	Blinking green	Blinking green
Bus communication mode	N/A	Flickering green
Mounting position mode	N/A	Rapid blinking green
Electrical override mode	Blinking red/green	N/A
Manual Spindle Adjustment	N/A	Blinking yellow
Perpetual failure mode	Full on red	Full on red

RECALIBRATION OF AB/3J/AG/BK ACTUATORS

AB/AG ACTUATOR RE-CALIBRATION

Re-calibration can be achieved in one of two ways:

- Forced individual actuator re-calibration can also be performed by flipping DIP switch #6 from OFF to ON and back to OFF on the relevant actuator.
- Forced concurrent re-calibration for all modulating actuators is electrically possible. Within 60 seconds, provide the following electrical control signal sequence to the grey wire: 10V-2V-10V-2V-10V-2V to achieve re-calibration.

After re-calibration the actuator will go into normal operation mode.

3J ACTUATOR RE-CALIBRATION

Forced individual actuator re-calibration can also be performed by flipping DIP switch #6 from OFF to ON and back to OFF on the relevant actuator. After re-calibration the actuator will go into normal operation mode.

BK ACTUATOR RE-CALIBRATION

Change MSV 1 to 2 (BACnet) or register 138 to 1 (Modbus). After re-calibration the actuator will go into normal operation mode.

UNINSTALL AB/AG/3J/BK ACTUATORS

In the event the actuator shall be uninstalled, do not use any additional tools. Use only fingers to loosen the connection union and remove the actuator from the valve. To reinstall, verify that the actuator is manually opened before refitting it on the valve.

Victaulic® Series UBP Unibody PICV Balancing Valve

DA/MA/YE/YM/DF/MF THERMAL ACTUATORS

DA/MA/YE/YM/DF/MF FITTING/INSTALLATION

Thermal actuators are as standard supplied with a separate black adapter ring. YE/YM Thermal Actuators come with a plug-in cable. The DA/MA/DF/MF Thermal Actuators have fixed cables.

1. Mount the adapter ring on top of the valve and finger-tighten. Do not use additional tools. **NOTE:** For the cable plug-in version (YE/YM Actuators), verify that the cable is properly installed.
2. Place the actuator on the adapter ring. **NOTE:** A click noise will indicate that the actuator is correctly fitted.

UNINSTALL DA/MA/YE/YM/DF/MF ACTUATORS

1. Activate the release mechanism.
2. Push the front button and remove the actuator from the adapter ring.

REFITTING DA/MA/YE/YM/DF/MF ACTUATORS

Verify that the actuator is electrically opened prior to re-fitting it on the valve. **NOTE:** A special feature on the YE/YM allows the actuator to become tamper proof by removing the push button.

DA/MA/YE/YM/DF/MF START UP SEQUENCE

During first time powering up, operating voltage shall be applied for at least 6 minutes. **NOTE:** YE/YM Thermal Actuators shall be mounted on the valve when powering up for it has automatic stroke detection.

WIRING

24V versions shall be powered by a safety isolating transformer (for AC variant) according to EN 61558-2-6 or class II FCC-quality proofed or a switching power supply (for DC variant) according to EN 61558-2-16. For YE/YM, the power supply shall have a maximum power output of 100VA.