

Features

- Assembled in USA
- Fits most lever/tee type ball valves up to 2"
- Fits most backflow preventers up to 2"
- Operates on open or closed valves
- Includes mounting hardware to supervise coils on most solenoids
- Accommodates up to 12 AWG wire
- Optional field installed cover tamper switch kit (0090224)
- RoHS compliant

NOTICE

Before any work is done on the fire sprinkler or fire alarm system, the building owner or their authorized representative shall be notified. Before opening any closed valve, ensure that opening the valve will not cause any damage from water flow due to open or missing sprinklers, piping, etc.



Important: This document contains important information on the installation and operation of the RBVS Universal Ball Valve/Solenoid Coil Supervisory Switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

Description

The Model RBVS is designed to monitor the fully open or closed position of a ball valve installed in a sprinkler system as well as monitor the position of a coil on a solenoid for a preaction/deluge system. The unit will fit on most ball valves installed on back-flow-preventers and alarm trim lines of dry, alarm, and deluge sprinkler valves. The switch operates if the ball valve handle is moved from the normal position. However, the switch does not track the position of the handle or ball. When the ball valve handle is under the RBVS plunger, a spring-loaded actuator will contact the valve handle. When the handle is moved from the position, this actuator extends to the tripped position, and the RBVS contacts change state, thereby opening or closing a circuit.

The unit also includes a small "L" bracket and "V" clamp to allow the RBVS to mount directly to the nipple on the coil of a solenoid valve. The plunger of the RBVS is actuated by the stud protruding through the center of the coil, see Fig. 6. If a technician removes the coil from the solenoid for testing, the RBVS will activate.

A cover tamper switch is available and is activated by the removal of the RBVS housing cover. If an attempt is made to remove the RBVS by the removal of the mounting brackets, the unit will be set into the tripped mode by this action.

The RBVS can be mounted to the hex portion of the ball valve or back-flow-preventer or to the adjoining pipe via two clamps. The RBVS is shipped with three sets of mounting kits to accommodate various pipe and valve sizes, refer to Table 1. An "L" shaped and offset bracket for mounting the switch enclosure and an extension bracket add to the mounting flexibility of the RBVS. See "Typical Mounting Diagrams" and "Installations and Operation" on following pages.

Technical Specifications

Dimensions	With Large Clamps: 6" L x 5" W x 5.3" H (15,2 cm L x 12,7 cm W x 13,2 cm H)
	With Small Clamps: 6" L x 4" W x 5.3" H (15,2 cm L x 10,2 cm W x 13,2 cm H)
	With Solenoid Clamp Assembly: 5.1" L x 3.3" W x 6" H (13 cm L x 8,38 cm W x 15,24 cm H)
Shipping Weight	1.65 lbs.
Enclosure	Non-Corrosive Composite Material
Temperature Range	-40°F to 150°F (-40°C to 65°C)
Optional Housing Cover Tamper	Cover incorporates tamper resistant fasteners that requires a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090224. See bulletin #5401598
Contact Ratings	SPDT Contact: (Form C) 10.1A at 125 VAC 2A at 30 VDC Resistive 10 mAmps minimum at 24 VDC
	SPDT Cover Tamper: 5A at 125 VAC 1mA at 5 VDC min
Environmental Limitations	NEMA 4 (IP66) Not for use in hazardous locations Use suitably rated conduit and connections
Conduit Entrance	One Knockout for 1/2" conduit connection provided (See Notice on Page 6)

*Specifications subject to change without notice.

Mounting kits

Bag Color	Item No.	Description	Qty	Illustration
White Mounting Kit	1	CLAMP-VEE (SMALL)	2	
	2	GRIPPER-RUBBER (SMALL)	2	
	3	SCREW-MACHINE #10-32 X 2-1/2"	2	
	4	NUT-HEX #10-32 STEEL/ ZINC PLATED	2	
Blue Mounting Kit	5	CLAMP-VEE (LARGE)	2	
	6	GRIPPER-RUBBER (LARGE)	2	
	7	SCREW-1/4-20 X 4" HEX WASHER HD ZINC	2	
	8	WASHER-SAE 1/4"	2	
	9	NUT-HEX 1/4-20	2	
Clear Solenoid Mounting Kit	10	CLAMP-VEE SOLENOID (SMALL)	1	

Clear Solenoid Mounting Kit	11	NUT-HEX #10-32 STEEL/ ZINC PLATED	2	
	12	SCREW-MACHINE #10-32 X 1-3/4"	2	
Red Bracket-Hardware Kit	13	"L" BRACKET-MOUNTING	1	
	14	BRACKET-EXTENSION	1	
	15	BRACKET-OFFSET	1	
	16	KEY-HEX TAMPERPROOF HOLE ONE END	1	
	17	SCREW-TAMPER RESISTANT #8-32 X 1/2"	4	
	18	BOLT 1/4-20 X 3/4 HEX HD CAP SCREW	2	
	19	WASHER-SAE 1/4"	2	
	20	NUT-KEYS #8-32 HEX STEEL / ZINC PLATED	2	
	21	BRACKET-SOLENOID MOUNTING	1	

Table 1: Mounting Configurations

Pipe Size/Valve	Supervise Open/ Closed Valves	Valve Handle Type	Use Bag Color	Use Item Number: Item # (xQty)		
				Clamps/Grippers Item # (xQty)	Brackets Item #	Hardware: Item # (xQty)
1/2" to 3/4" (12,5 to 19mm)	Open	Lever (Fig 1&2)	White/Red Mounting Kit	1(x2), 2(x2)	13	3(x2), 4(x2), 16, 17(x2), 18, 19
				1(x2), 2(x2)	13, 14	3(x2), 4(x2), 16, 17(x2), 18(x2), 19(x2)
		Tee (Fig 4)		1(x2), 2(x2)	13, 15	3(x2), 4(x2), 16, 17(x4), 18, 19, 20(x2)
1/2" to 3/4" (12,5 to 19mm)	Closed	Lever (Fig 5)	White/Red Mounting Kit	1(x2), 2(x2)	13, 14	3(x2), 4(x2), 16, 17(x2), 18(x2), 19(x2)
		Tee		1(x2), 2(x2)	13, 14, 15	3(x2), 4(x2), 16, 17(x4), 18(x2), 19(x2), 20(x2)
1" to 2" (25 to 50mm)	Open	Lever (Fig 1&2)	Blue/Red Mounting Kit	5(x2), 6(x2)	13	7(x2), 8(x2), 9(x2), 16, 17(x2), 18, 19
				5(x2), 6(x2)	13, 14	7(x2), 8(x2), 9(x2), 16, 17(x2), 18(x2), 19(x2)
		Tee (Fig 4)		5(x2), 6(x2)	13, 15	7(x2), 8(x2), 9(x2), 16, 17(x4), 18, 19, 20(x2)
1" to 2" (25 to 50mm)	Closed	Lever (Fig 5)	Blue/Red Mounting Kit	5(x2), 6(x2)	13, 14	7(x2), 8(x2), 9(x2), 16, 17(x2), 18(x2), 19(x2)
		Tee		5(x2), 6(x2)	13, 14, 15	7(x2), 8(x2), 9(x2), 16, 17(x4), 18(x2), 19(x2), 20(x2)
1/2" Solenoid Conduit "Nipple"	-	1/2 Solenoid Valve (Fig 6)	White/Clear/ Red Solenoid Mounting Kit	1, 2(x2), 10	13, 21	11(x2), 12(x2), 16, 17(x4), 18, 19, 20(x2)

Installation on Lever Handle Valves

1. Select Clamp Mounting Kit (clamps and screws) based upon pipe/valve size, see Mounting Configuration Table 1 (see page 2).

Note: See Fig. 1 & 2 for utilization of extension bracket.

2. Insert rubber clamp grippers into clamps, see Fig. 1 & 2.
3. Insert screws into mounting clamp-vee, then place over pipe.

Note: If using Blue Mounting Kit, place washer on screw before inserting into clamp-vee.

4. Place second clamp-vee over the screws from step 3. Then thread hex nuts onto the screws, but do not fully tighten, (be sure hex nuts seat properly in clamp-vee hex recesses).

Note: Some installations may require one of the mounting screws to be inserted from the bottom of the brackets and then trimmed to allow the extension bracket to clear. See Fig. 3.

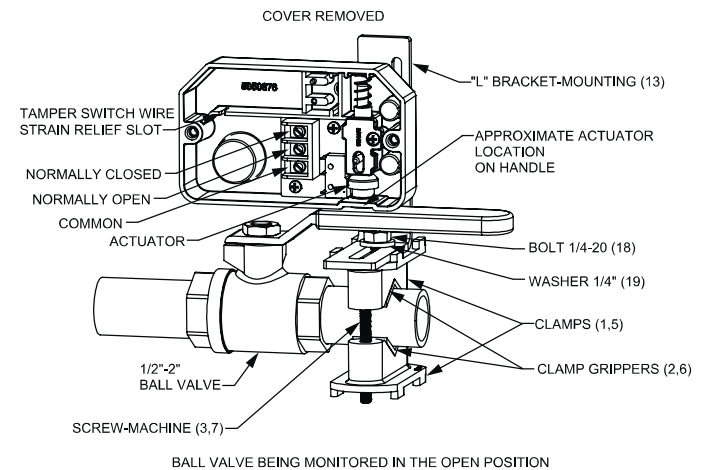
5. Position clamp-vee assembly so that the RBVS actuator will contact the valve handle approximately 1" from its inside end. See Fig 1 for approximate location. Make sure the top face of the clamp-vee assembly is parallel with the ball valve handle when tightening screws.
6. Tighten screws alternately to 30 in-lbs. (minimum) of torque.
7. If necessary, for positioning, attach bracket-extension from the Red bag to the top clamp-vee using 1/4-20 X 3/4 Hex bolt and washer, but do not fully tighten. See Fig 2. If bracket-extension is not necessary, skip to number 9.
8. Attach "L" bracket-mounting to bracket-extension using 1/4-20 X 3/4" Hex bolt and washer, but do not fully tighten. See Fig 2. Skip to number 10 if bracket-extension is necessary.
9. Attach "L" bracket-mounting from the Red bag directly to the top clamp-vee, See Fig 1, using 1/4-20 X 3/4" Hex bolt and washer, but do not fully tighten.
10. Attach RBVS switch enclosure to "L" bracket-mounting slot with two tamper resistant screw from the Red bag, but do not tighten fully.
11. Place ball valve in the desired position to monitor.
12. Position "L" bracket-mounting so that it contacts the back edge of the valve handle and secure its hex bolt. It may be necessary to close/open valve to access this bolt.
13. Slide loosely assembled RBVS switch enclosure to a position that permits the actuator to contact the valve handle. Cut and remove the plastic coating from the ball valve handle to allow the RBVS actuator to contact and be activated by the metal of the handle.
14. If bracket-extension is used, secure its hex bolt.
15. Remove the RBVS switch enclosure cover.
16. Slide RBVS enclosure down "L" bracket-mounting until the housing contacts valve handle. Securely tighten the two tamper resistant screws. This will ensure the actuator is fully depressed.
17. Close and open the valve to verify operation. The valve handle may "trim" some material off the actuator during the first few operations.
18. Place valve in supervised position.
19. Wire main switch and optional tamper switch (if required). If

required, carefully route tamper switch wires through strain relief slot in switch enclosure. Fully seat the wires into the bottom of the channel. See Fig. 1.

20. Replace RBVS switch enclosure cover and securely tighten cover screws to 10 in-lbs minimum. See notice on page 6.

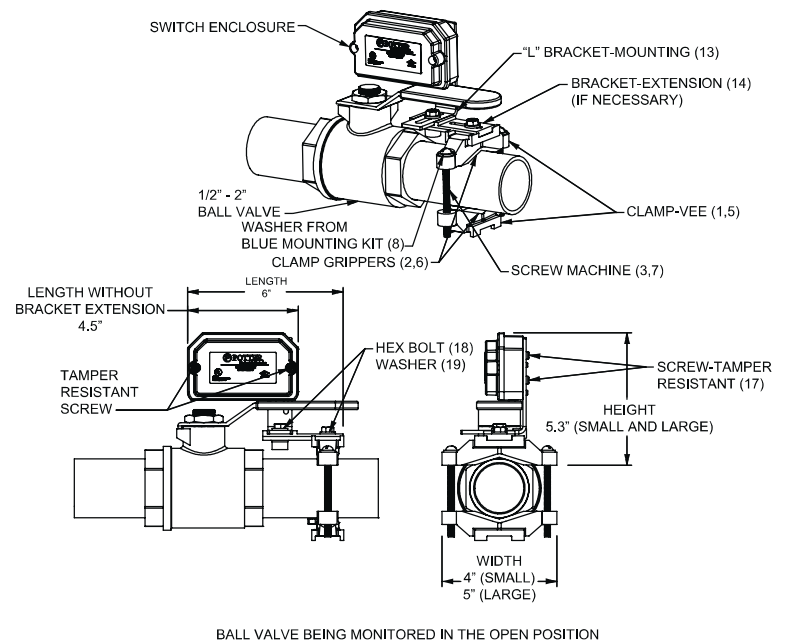
Internal Components/Typical Lever Handle Valve Mounting

Fig 1



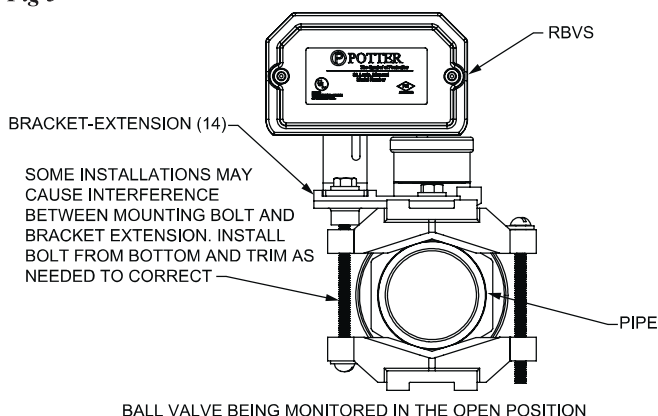
Typical Lever Handle Valve Mounting

Fig 2



Alternate Lever Handle Valve Mounting

Fig 3



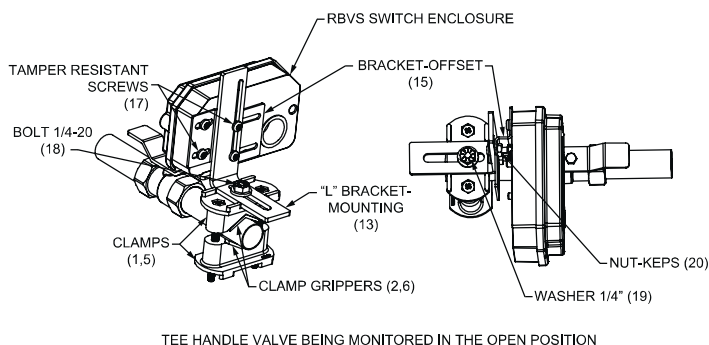
Installation on Tee Handle Valves

1. Select Clamp Mounting Kit (clamps and screws) based upon pipe/valve size, see Mounting Configuration Table 1.
2. Insert rubber clamp grippers into clamps, See Fig. 4.
3. Insert screws into mounting clamp-vee, then place over pipe.
Note: If using Blue Mounting Kit, place washer on screw before inserting into clamp-vee.
4. Place second clamp-vee over the screws from step 3. Then thread hex nuts onto the screws, but do not fully tighten, (be sure hex nuts seat properly in clamp hex recesses).
5. Position clamp-vee assembly so that the RBVS actuator will contact the tee-valve handle approximately $\frac{1}{2}$ " from the end of the tee-handle. See Fig 4 for approximate location. Make sure the top face of the clamp-vee assembly is parallel with the tee handle when tightening screws.
6. Tighten screws alternately to 30 in-lbs. (Minimum) of torque.
7. Loosely attach "L" bracket-mounting parallel to the pipe with the vertical edge facing the tee handle by using the 1/4-20 x 3/4" bolt and washer out of the Red bag. Then loosely attach the bracket-offset to the "L" bracket-mounting
8. Attach RBVS switch enclosure to the bracket-offset with two tamper resistant screws from the Red bag, but do not tighten fully. See Fig. 4.
9. Place Tee handle valve in the desired position to monitor.
10. Slide loosely assembled RBVS switch enclosure to a position that permits the actuator to contact the tee handle. Cut and remove the plastic coating from the ball valve handle to allow the RBVS actuator to contact and be activated by the metal of the handle.
11. Tighten "L" bracket-mounting hex bolt to 30 in-lbs. (Minimum) of torque.
12. Remove the RBVS switch enclosure cover.
13. Slide RBVS enclosure down "L" bracket-mounting until the housing contacts the tee-valve handle. Securely tighten the two tamper resistant screws. This will ensure the actuator is fully depressed.

14. Close and open the valve to verify operation. The valve handle may "trim" some material off the actuator during the first few operations.
15. Place tee-handle valve in supervised position.
16. Wire main switch and tamper switch (if required). If required, carefully route tamper switch wires through strain relief slot in switch enclosure. Fully seat the wires into the bottom of the channel. See Fig. 1.
17. Replace RBVS switch enclosure cover and securely tighten cover screws to 10 in-lbs minimum. See notice on page 6.

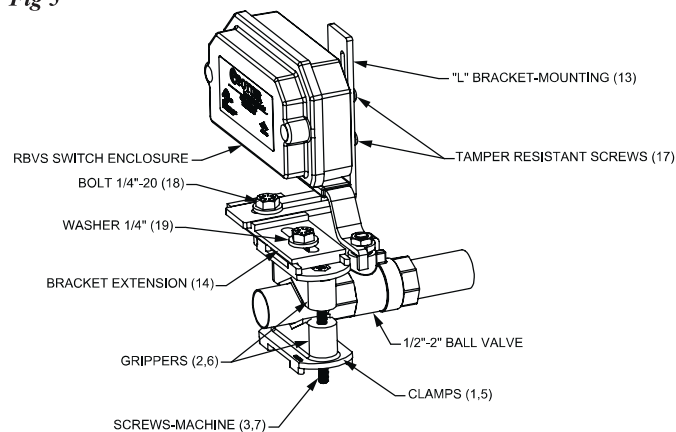
Typical Tee Handle Ball Valve Mounting

Fig 4



Typical Lever Handle Valve Mounted in the Closed Position

Fig 5

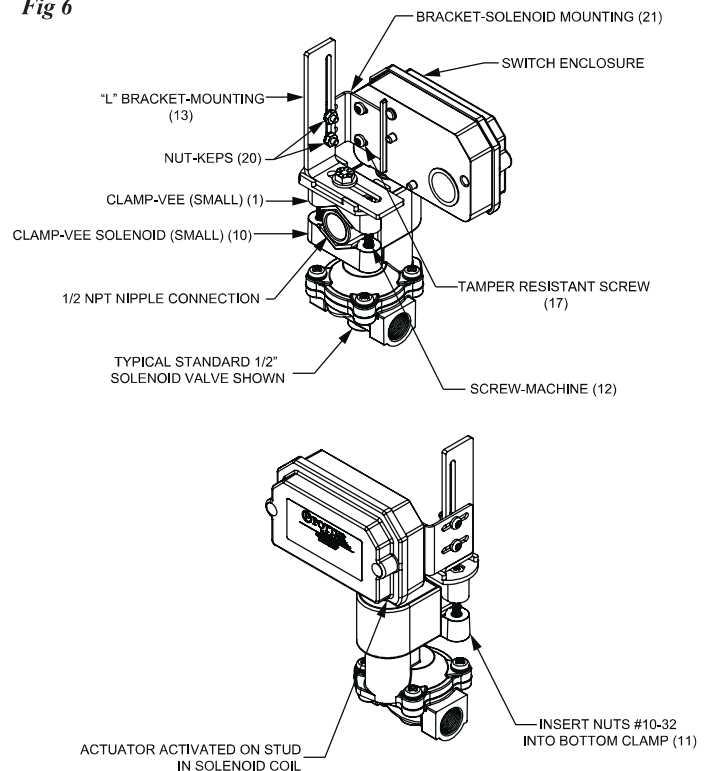


Installation on Solenoid Valve

1. For solenoid mounting use Bag colors, White, Clear and Red. See Mounting Configuration Table 1 (see page 2).
2. Use one clamp-vee (small) from the white bag as the top clamp and the (clamp-vee solenoid) as the bottom clamp from the clear bag. See Fig 6.
3. Insert both small rubber grippers from the white bag into both clamps.
4. Insert two, #10-32 hex nuts from the clear bag into the bottom press fit hex slots of the (clamp-vee solenoid). Make sure the hex nuts are fully seated in the hex slots. See Fig 7.
5. Insert screws into top mounting clamp-vee (small).
6. Place (clamp-vee solenoid) on bottom of the solenoid nipple.
7. Place top mounting clamp-vee (small) over solenoid nipple and insert the screws into (clamp-vee solenoid). Make sure the top of the clamp-vee (small) is parallel with the top of the solenoid coil. Tighten alternately to 30 in-lbs. (minimum) of torque.
8. Attach the "L" bracket-mounting to the top clamp-vee using the 1/4-20 X 3/4" hex bolt and washer out of the Red bag. Do not fully tighten hex bolt. Make sure vertical slot on the "L" mounting-bracket is closer to the center of the solenoid coil. See Fig 6.
9. Attach the (bracket-mounting solenoid) from the Red bag to the RBVS through the two smaller slots in the bracket with two tamper resistant screws.
10. Slide the bracket up against the stop on the back of the RBVS and tighten the tamper resistant screws.
11. Using two tamper resistant screws and keps nuts, loosely attach the (bracket-mounting solenoid) to the "L" bracket-mounting. See Fig 6.
12. Remove the RBVS switch enclosure cover.
13. Position the RBVS so the actuator is directly above the coil mounting stud in the center of the solenoid coil. Tighten the hex bolt on the "L" mounting-bracket.
14. Slide the RBVS down the "L" mounting-bracket so the actuator is activated by the stud in the solenoid coil.
15. While holding the RBVS enclosure down so that the actuator is depressed by the coil mounting stud, securely tighten the two tamper resistant screws and keps nuts.
16. Wire main switch and tamper switch (if required). If required, carefully route tamper switch wires through strain relief slot in switch enclosure. Fully seat the wires into the bottom of the channel. See Fig 1.
17. Replace RBVS switch enclosure cover and securely tighten cover screws to 10 in-lbs minimum. See notice on page 6.

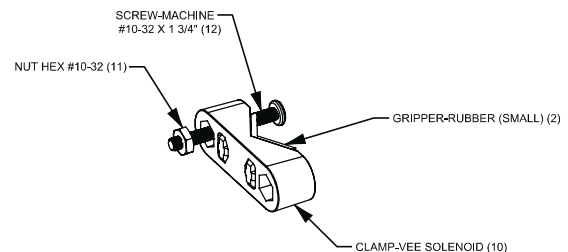
Typical Solenoid Valve Mounting

Fig 6

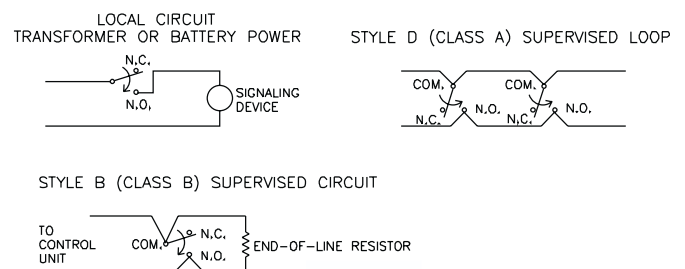


Press Fit Hex Slots

Fig 7

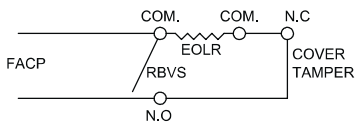


Typical Electrical Connections

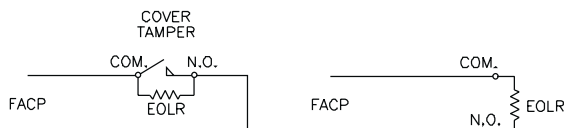


Tamper Switch Connections

COVER TAMPER & RBVS CONNECTED
TO THE SAME ZONE ON THE FACP



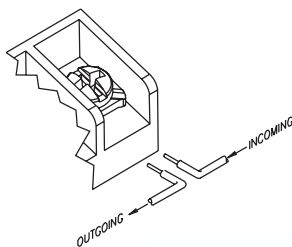
COVER TAMPER & RBVS WIRED
TO SEPERATE ZONES



NOTICE

All conduit and connectors selected for the installation of this product shall be suitable for the environment for which it is to be used and shall be installed to the manufacturer's installation instructions. For NEMA 4 installations, the cover screws are recommended to be tightened to 10 in-lbs minimum.

Switch Terminal Connections Clamping Plate Terminal



WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Testing

The RBVS and its associated protective monitoring system should be tested in accordance with applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

Engineering Specification

UL, cUL Listed and FM Approved supervisory switch specifically manufactured for monitoring ball valves shall be furnished and installed on 1/4 turn ball valves that can be used to shut off the flow of water to a portion of the sprinkler system including the trim piping on alarm check, dry pipe or preaction/deluge valves. Locations shall be as indicated on drawings and plans and as required by applicable local and national codes and standards. The supervisory switch shall monitor the position of the handle on the valve and be capable of monitoring a valve in the open or closed position. Movement of the valve handle from normal shall activate the supervisory switch. Restoration of the valve handle shall cause the supervisory switch to automatically restore to normal. There shall not be any tools or extra steps required to restore the supervisory switch to normal. The enclosure shall be corrosion resistant and rated NEMA 4. The cover of the device shall be secured by the use of tamper proof screws. All mounting hardware necessary for the installation on valves ranging in sizes from 1/2" - 2" including backflow preventers shall be included. Also included shall be hardware to allow the switch to be mounted to a solenoid valve to provide the ability to supervise the position of the coil on the solenoid. The switch shall mount to the wiring nipple of the coil and the switch plunger shall be depressed by the coil enclosure. Removal of the coil shall activate the switch. Each ball valve switch shall contain 1 SPDT contact rated 10.1A at 125 VAC and 2A at 30 VDC resistance. Ball valve supervisory switch shall be model RBVS as manufactured by Potter Electric Signal Company LLC.

NOTICE

Supervisory switches have a normal service life of 10-15 years. However, the service life may be significantly reduced by local environmental conditions.

Ordering Information

Model	Description	Stock No.
RBVS	Universal Ball Valve/Solenoid Coil Switch	1000065
	Cover Tamper Kit (Optional)	0090224