Reliable®

Model E & E3
2½" (65 mm), 3" (80 mm) & 76 mm Sizes
Alarm Check Valves
With Model E3 Trim

Bulletin 427

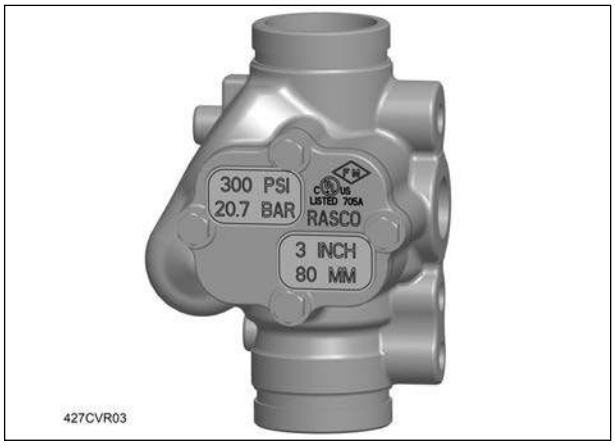
Features

1. Made expressly for wet-pipe sprinkler systems.
2. Valve's grooved seat design insures positive water flow alarm operation
3. Precision retard chamber limits false alarms under variable pressure conditions
4. External bypass aids in prevention of false alarms under all supply conditions.
5. Vertical and horizontal installation options.
6. Model E3 Valve: 300 psi rated
   Model E Valve: 175 psi rated
7. Model E3 Valve: Groove/Groove
   Model E Valve: Flange/Flange or Flange/Groove
8. Model E3 Trim is used with both Model E and Model E3 Valves.
9. Galvanized trim styles available:
   - Individual part trim
   - Pre-assembled trim
   - Factory trimmed valve

Approvals and Listings:

1. Listed by Underwriters Laboratories and certified by UL for Canada (cULus)
2. FM Approved (FM)

The Reliable Model E and Model E3 Alarm Check Valve acts as a Water Flow Alarm Device in wet pipe sprinkler systems. The design allows for installation under both variable and constant supply pressure conditions. When water flows into the sprinkler system due to the operation of one or more Automatic Fire Sprinklers the Alarm Valve opens, allowing continuous flow of water into the system and a transmission of an alarm, both electrically and mechanically.



Model E3 Alarm Valve - 300 psi (20.7 Bar) rated Groove/Groove

Model E Alarm Valve - 175 psi (12.1 Bar) rated Flange/Flange

Model E Alarm Valve - 175 psi (12.1 Bar) rated Flange/Groove

Operation

Variable Pressure

The Reliable Model E & E3 Alarm Check Valve in its closed and open positions is shown in Fig. 1 and Fig. 2. The closed position is maintained as long as the water pressure in the sprinkler system piping above the Alarm Valve is greater than, or equal to, the supply pressure. A flow of water into the system piping, resulting from the discharge through one or more fused Automatic Sprinkler(s), causes the Clapper to rise off its Grooved Seat and permits water from the supply to enter the system for distribution on the fire.

Virtually all sprinkler system piping contains confined air. If a water hammer or pressure surge occurs in the supply line, the increased pressure will compress the confined air and cause the Alarm Valve Clapper to lift intermittently which may result in false alarms. The Model E and Model E3 Alarm Check Valve prevents false alarms under these conditions using two features:

a. The By-Pass connection with Check Valve (Figure 3 & 4) allows pressure surges from the supply to by-pass the Alarm Valve Clapper. An excess system pressure is thus created which steadies the Clapper. Should a heavy surge unseat the Clapper and permit water to flow into the alarm line, the Retard Chamber then comes into action.

b. Drain Orifice Restriction from / to the Retard Chamber allows intermittent flows to be drained before the Chamber fills and activates the Alarms.

Constant Pressure

The operation of the Model E Alarm Check Valve in installations where the water pressure is constant is the same as described above, with this exception: The Retard Chamber is not required and water passing through the groove in the Alarm Check Valve Seat flows directly to and activates the Mechanical and Electrical Alarms.

Note: 1 bar = 100 kPa

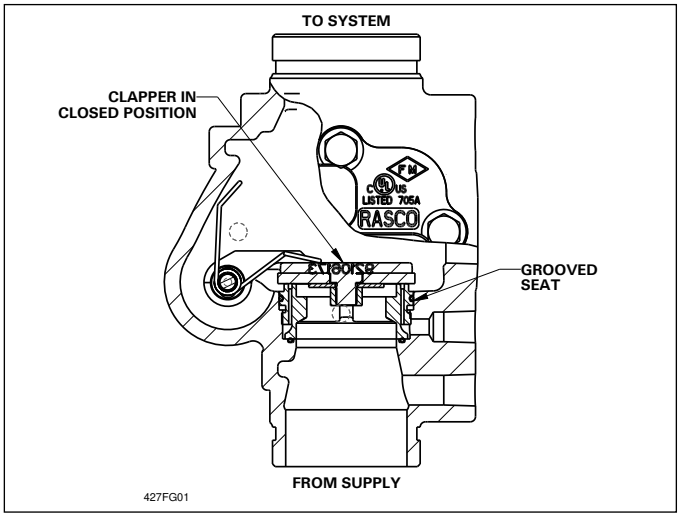


Fig. 1

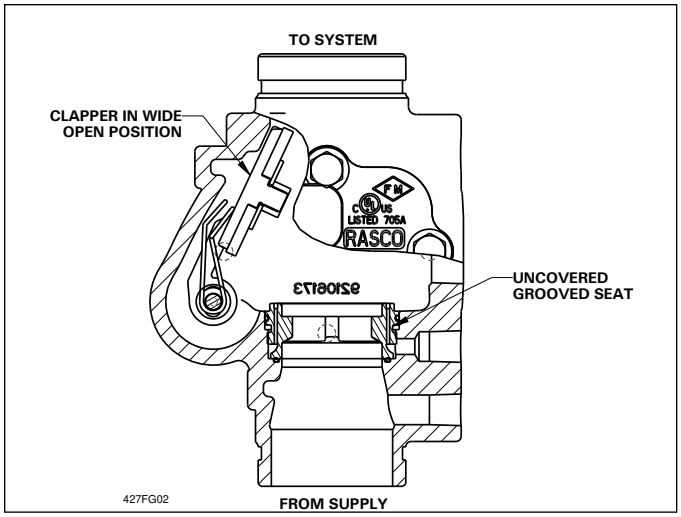


Fig. 2

Valve Description

1. Rated working pressure:
   - Model E valves are rated to 175 psi (12.1 bar)
   - Model E3 valves are rated to 300 psi (20.7 bar)
2. Factory hydrostatic test pressure:
   - Model E valves are tested to 350 psi (24.2 bar)
   - Model E3 valves are tested to 600 psi (41.4 bar)
3. End and Trim connections – Four valve connection styles are available
   a. Model E valve with US Standard Flanged Inlet and Outlet
      - Flanges mate with ANSI B 16.1 (Class 150) Flange

US Flange Table:					
Valve Size:	**Bolt Circle Diameter**	**Bolt Hole Diameter**	**Square Flange Dimension**	**Flange Thickness**	**No. Bolts**
2½" (65 mm)	5½" (140 mm)	¾" (19 mm)	6⅛" (156 mm)	¾" (19 mm)	4
3" (80 mm)	6" (152 mm)	¾" (19 mm)	6⅛" (156 mm)	¾" (19 mm)	4

      - Threaded openings per ANSI B 2.1
      - Reliable's standard trim sets are compatible with 2½" (65 mm) & 3" (80 mm) US Flanged Valves
      - Color - Black

   b. Model E valve with US Standard Flanged Inlet and Grooved Outlet (Fig. 1)
      - Inlet flange mates with ANSI B 16.1 (Class 150) Flange
      - Outlet groove dimensions per ANSI/AWWA C606

Groove Dimension Table				
Valve Size:	**Outlet Diameter**	**Groove Diameter**	**Groove Width**	**Outlet Face to Groove**
2½" (65 mm)	2.875" (73 mm)	2.720" (69 mm)	11/32" (9.0 mm)	5/8" (16 mm)
76 mm	3.000" (76 mm)	2.845" (72 mm)	11/32" (9.0 mm)	5/8" (16 mm)
3" (80 mm)	3.500" (89 mm)	3.344" (85 mm)	11/32" (9.0 mm)	5/8" (16 mm)

      - Threaded openings per ANSI B 2.1

- Reliable's standard trim sets are compatible with 2½" (65 mm) & 3" (80 mm) US Flanged Valves
- Color - Black

c. Model E valve with Metric flanged inlet and outlet Flanged Inlet and Outlet
   - 65 mm valve plain faced flanges mate with DIN 2500 8.66, NF-E-29-282 and BS 4504 NP16 Flanges

Metric Flange Table (mm):					
Valve Size:	**Bolt Circle Diameter**	**Bolt Hole Diameter**	**Square Flange Dimension**	**Flange Thickness**	**No. Bolts**
65 mm	145 mm	18 mm	156 mm	19 mm	4

   - Threaded openings per ANSI B 2.1
   - Reliable's standard trim sets may be used with metric valves provided trim is assembled carefully and extra thread sealant is applied to the connections between valves and trim.
   - Color – Red

d. Model E3 valve with Grooved End Connections
   - 2½" (65 mm), 3" (80 mm) & 76 mm inlet and outlet groove dimensions per ANSI/AWWA C606 (See table above)
   - Threaded openings per ANSI B 2.1
   - Reliable's standard trim sets are compatible with 2½" (65 mm) & 3" (80 mm) & 76 mm Grooved Valves
   - Color – Black (2½" & 3") or Red (65 mm, 80 mm and 76 mm)

4. Face to Face Dimensions:

Face to Face Dimension Table:		
Valve Size:	**End Connection:**	**End to End Dimension:**
2½" (65 mm), 76 mm & 3" (80 mm)	Flange/ Flange	9 3/16 (233)
	Flange/ Groove	9 3/16 (233)
	Groove/ Groove	10¼ (260)

5. Shipping Weight:

Valve Shipping Weight Table:		
Valve Size:	**End Connection:**	**Weight lb(kg):**
2½" (65 mm), 76 mm & 3" (80 mm)	Flange/ Flange	35.0 (15.9)
	Flange/ Groove	32.0 (14.5)
	Groove/ Groove	26.5 (12.0)

Trim Shipping Weight Table:	
Trim Type:	**Weight lb(kg):**
Horizontal Trim	17.0 (7.7)
Vertical Trim	16.0 (7.3)
Retard Chamber	4.0 (1.8)

6. Friction Loss – Expressed in Equivalent Length of Pipe, Based on Hazen & Williams Formula

Friction Loss Table		
Valve Size:	**Equivalent Length ft(m)**	
	C=100	**C=120**
2½" (65 mm) & 76 mm	5.5 (1.7)	7.7 (2.4)
3" (80 mm)	15.3 (4.7)	21.5 (6.6)

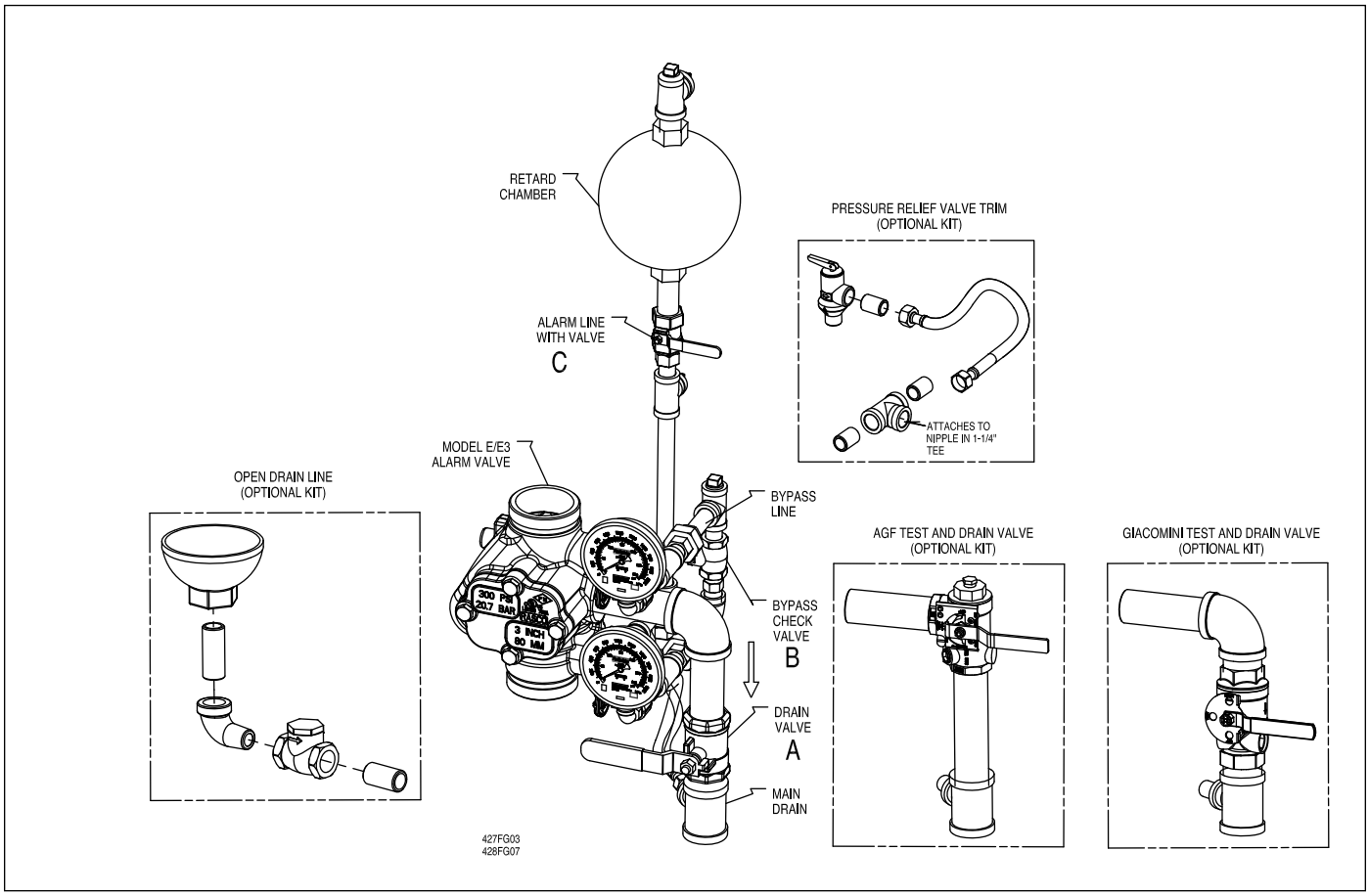


Fig. 3 - Vertical Trim

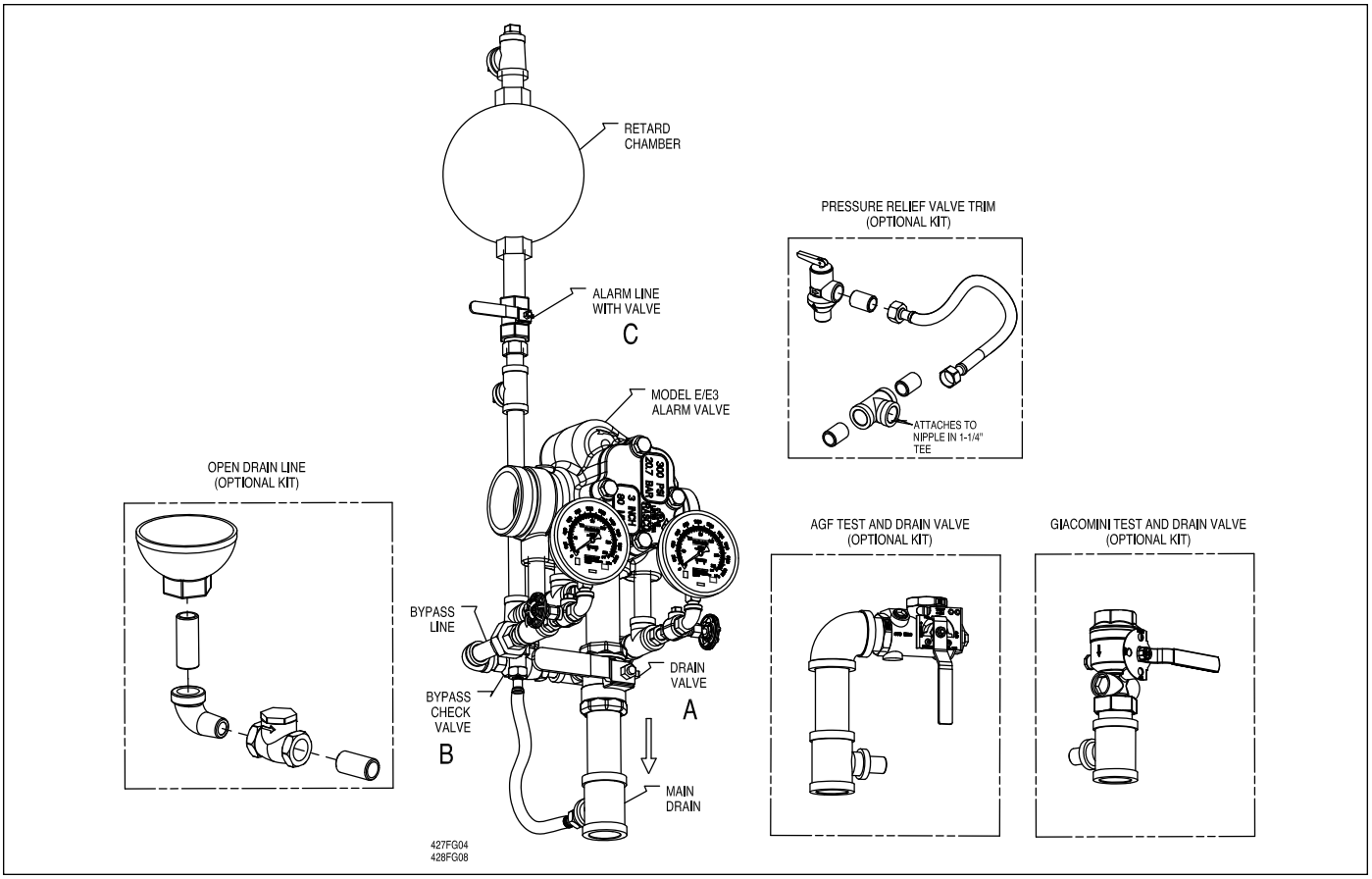


Fig. 4 - Horizontal Trim

Model E3 Trim Description

The E3 trim sets for the Reliable Model E and Model E3 Alarm Valve (Figs. 3 & 4) are arranged for rapid, easy and compact attachment, and serve as connection points to Reliable alarm and other devices. They also act as a means for testing system operation. The Model E and E3 Alarm Valves are available with separate trim configurations for either vertical or horizontal installation and the following options:

- Constant Pressure, Closed Drain - Retard Chamber is not required. The Model E3 trim is available as a constant pressure trim. This trim set is used where water supply pressure does not vary, such as a gravity tank. The mechanical sprinkler alarm line automatically drains to the 1¼"(32 mm) main drain line.
- Variable Pressure with Closed Retard Chamber Drain—Retard Chamber is required. This trim is used where water supply pressures vary. A closed drain is provided to drain the Retard Chamber and the Mechanical Sprinkler Alarm line. The mechanical sprinkler alarm line automatically drains to the 1¼" (32 mm) main drain line.
- Variable Pressure with Open Retard Chamber Drain—Retard chamber is required. Optional Drain Line Kit required (see Figs. 3 & 4). This trim set is used where water supply pressures vary. An open drip cup is provided to drain the retard chamber and the mechanical sprinkler alarm line. This drain connection is piped directly into the 1¼" (32 mm) main drain line.

  Note: A combination test and drain valve segment is optional, to be purchased separately, as a replacement to the Drain valve (see optional Kit in Figs. 3 & 4).

  All trim sets can be fitted with an optional Pressure Relief Trim Kit (see optional kit in Figs. 3 & 4) to relieve pressures above 175 psi in the sprinkler system, as required by NFPA 13, 3-1.2.

- Pressure Relief Trim Kit — Required with a wet pipe system when a rise in ambient temperature can cause system pressure to exceed 175 psi (12.1 bar) with Model E Alarm Valves, 300 psi (20.7 Bar) with Model E3 Alarm Valves, or with gridded systems.

  Note: Pressure relief trim is not intended for use in relieving water hammer or fire pump surges. It must be installed and maintained in compliance with NFPA 13, local codes and the authority having jurisdiction.

Trim Kits are available in three assembly options:

- Individual part trim
- Pre-assembled trim
- Factory trimmed valve

Alarm valves are cULus listed and FM Approved only when used with Reliable's trim sets.

Valve Part Number Table:	
Valve Description:	**Part Number:**
Model E3 Valve Assembly 2½" Groove/Groove (300 psi rated)	6102025519
Model E3 Valve Assembly 3" Groove/Groove (300 psi rated)	6102030519
Model E3 Valve Assembly 76 mm Groove/Groove (20.7 Bar rated)	6102030517
Model E Valve Assembly 2½" Class 150 Flange/Flange (175 psi rated)	6102025549
Model E Valve Assembly 3" Class 150 Flange/Flange (175 psi rated)	6102030549
Model E Valve Assembly 65 mm PN16 Flange/Flange (12.1 Bar rated)	6102025547
Model E Valve Assembly 65 mm BS-E Flange/Flange (12.1 Bar rated)	6102025548
Model E Valve Assembly 80 mm BS-E Flange/Flange (12.1 Bar rated)	6102030548
Model E Valve Assembly 2½" Class 150 Flange/Groove (175 psi rated)	6102025539
Model E Valve Assembly 3" Class 150 Flange/Groove (175 psi rated)	6102030539

Model E3 Trim Part Number Table (Compatible with Model E and Model E3 Alarm Valves):						
	Part Number:					
	Vertical Installation			Horizontal Installation		
Trim Description:	**w/ Drain Valve**	**w/ Giocomini Test and Drain Valve**	**w/ AGF Test and Drain Valve**	**w/ Drain Valve**	**w/ Giocomini Test and Drain Valve**	**w/ AGF Test and Drain Valve**
Vertical Loose Trim	6502054502	6502054504	6502D54504	6502054506	6502054508	6502D54508
Segmented Trim	6502054501	6502054503	6502D54503	6502054505	6502054507	6502D54507
Valve Assembly 2½" Groove/Groove	6504121010	6504121110	6504D21110	6504121210	6504121310	6504D21310
Valve Assembly 3" Groove/Groove	6504131010	6504131110	6504D31110	6504131210	6504131310	6504D31310
Valve Assembly 76 mm Groove/Groove	6504A31011	6504A31111	N/A	6504A31211	6504A31311	N/A
Valve Assembly 2½" Class 150 Flange/Flange	6504121040	6504121140	6504D21140	6504121240	6504121340	6504D21340
Valve Assembly 3" Class 150 Flange/Flange	6504131040	6504131140	6504D31140	6504131240	6504131340	6504D31340
Valve Assembly 65 mm PN16 Flange/Flange	6504A21041	6504A21141	N/A	6504A21241	6504A21341	N/A
Valve Assembly 65 mm BS-E Flange/Flange	6504A21043	6504A21143	N/A	6504A21243	6504A21343	N/A
Valve Assembly 80 mm BS-E Flange/Flange	6504A31041	6504A31141	N/A	6504A31241	6504A31341	N/A
Valve Assembly 2½" Class 150 Flange/Groove	6504121030	6504121130	6504D21130	6504121230	6504121330	6504D21330
Valve Assembly 3" Class 150 Flange/Groove	6504131030	6504131130	6504D31130	6504131230	6504131330	6504D31330

Ordering Information

Specify:

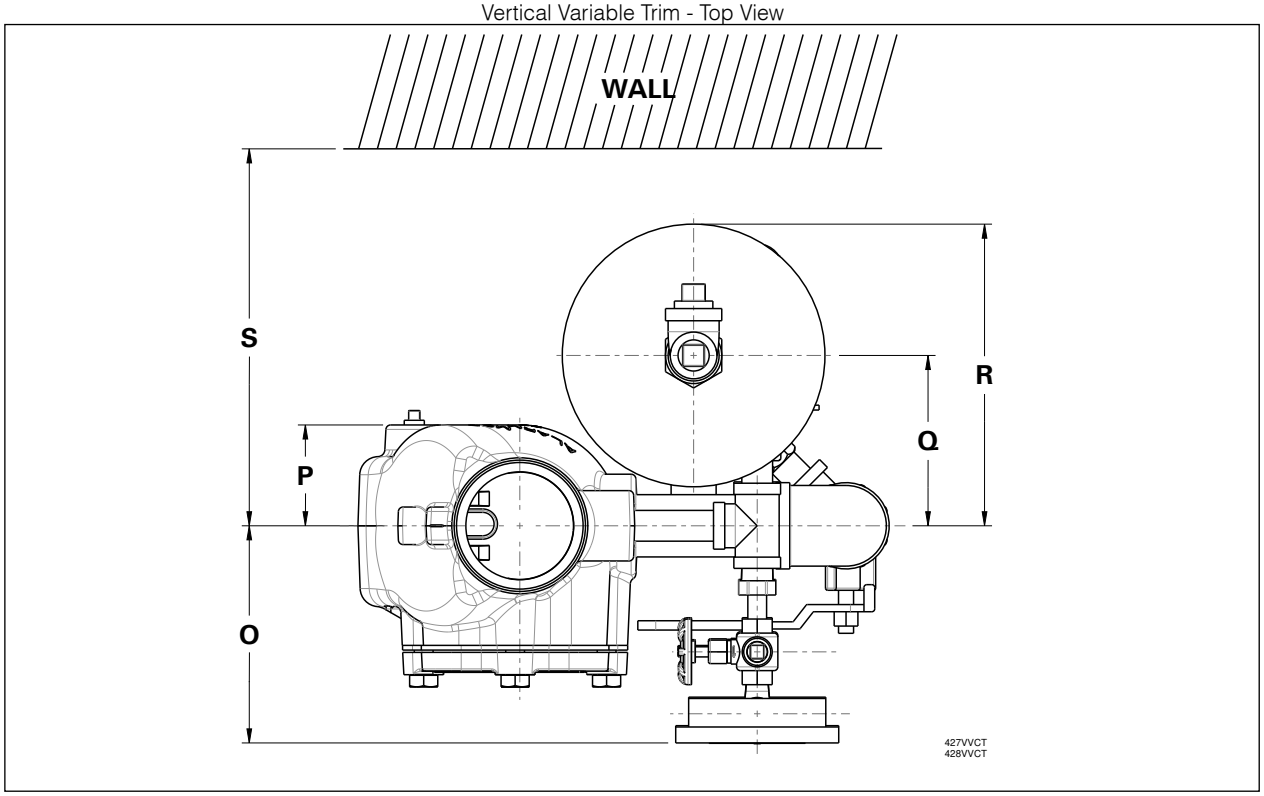
- Valve Size—[2-1/2"][3"][65 mm][76 mm][80 mm].
- Valve Type and Inlet/Outlet Connections: [Model E valve Flanged/Flanged 175 psi (12.1 bar) rated][Model E valve Flanged/Grooved 175 psi (12.1 bar) rated][Model E3 valve Grooved/Grooved 300 psi (20.7 bar) rated].
- Type of Trim—Constant Pressure or Variable Pressure/Closed Drain or Variable Pressure/Open Drain.
- Installation Orientation: [Vertical][Horizontal].
- Trim Style: [Individual Part Trim][Pre-assembled Trim][Factory Trimmed Valve].
- Additional Equipment—Retard Chamber, Mechanical Sprinkler Alarm, Pressure Relief Trim Kit, and Pressure Alarm Switch must be separately ordered.

Installation Dimensions in Inches (mm)																			
A	**B**	**C**	**D**	**E**	**F**	**G***	**G****	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**
4¼ (108)	9 (229)	10 (254)	4¾ (121)	12¾ (324)	21¼ (540)	10¼ (260)	9 3/16 (233)	17 (432)	16½ (419)	10¾ (273)	7¼ (184)	15 (381)	23½ (597)	4¾ (121)	6 (152)	4¾ (121)	3 (76)	8¼ (210)	9¼ (235)

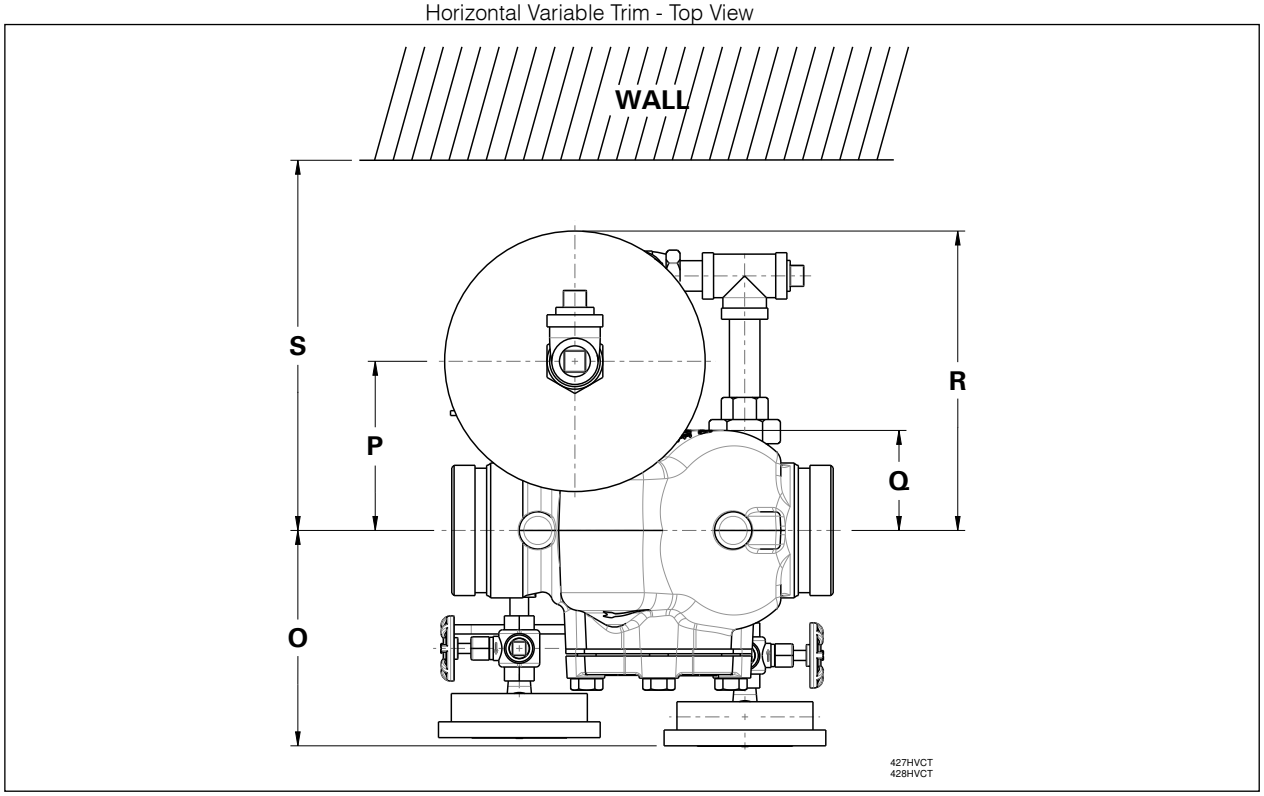
G* is total takeout for Grv/Grv Valve Configurations

G** is total takeout for Flg/Grv and Flg/Flg Valve Configurations

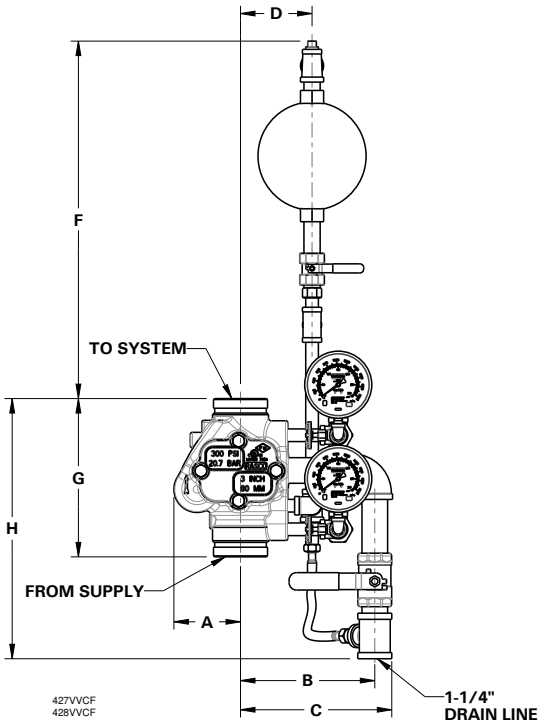
Vertical Variable Trim - Top View



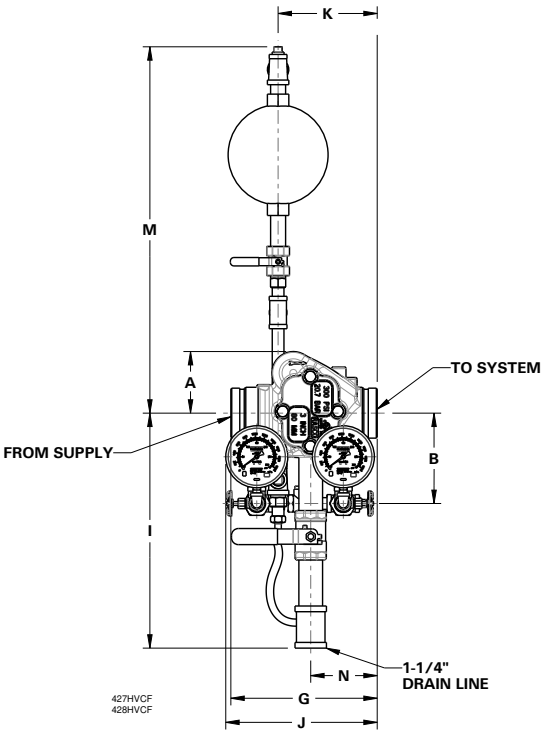
Horizontal Variable Trim - Top View



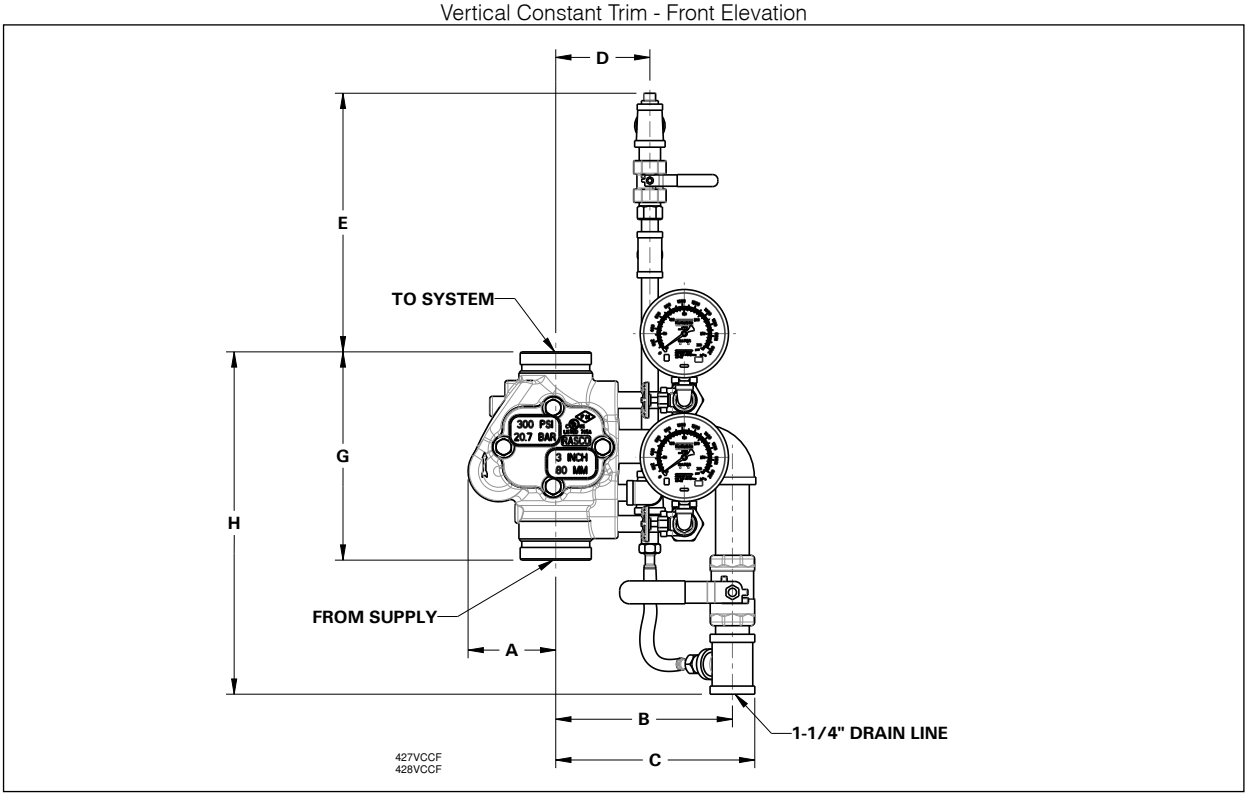
Vertical Variable Trim - Front Elevation



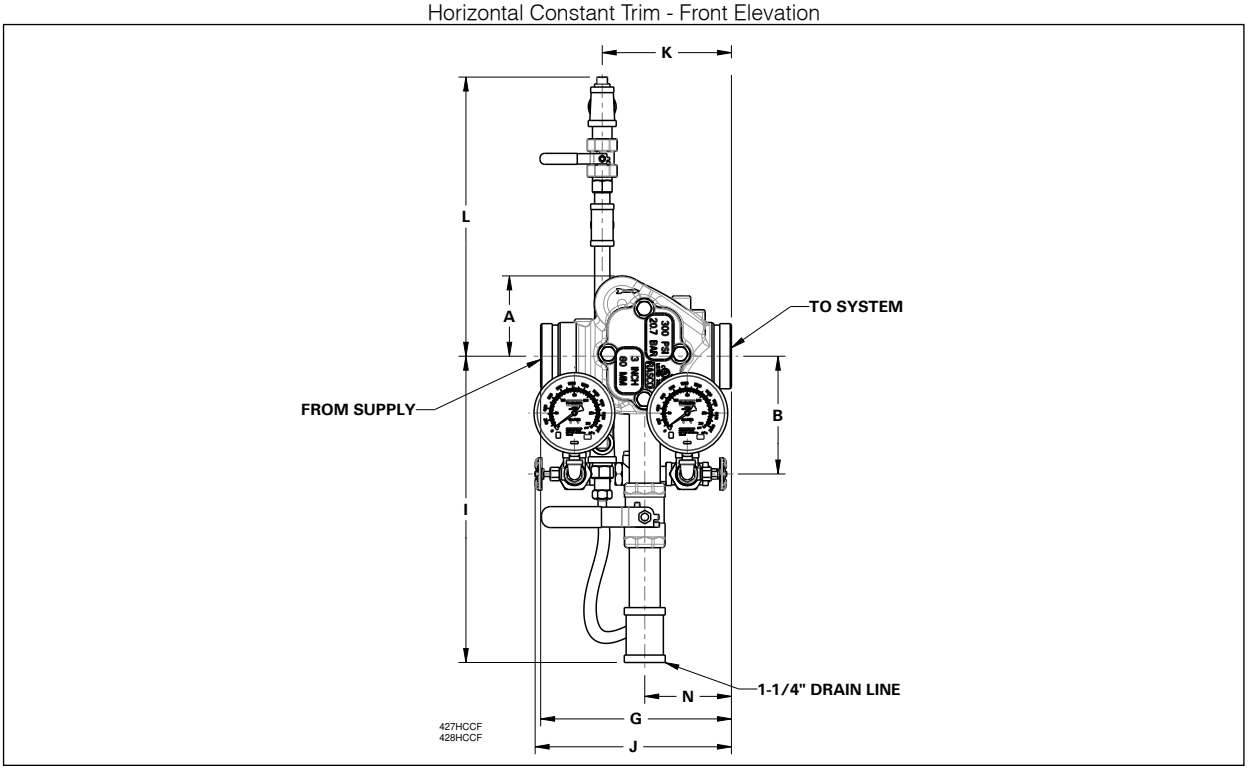
Horizontal Variable Trim - Front Elevation



Vertical Constant Trim - Front Elevation



Horizontal Constant Trim - Front Elevation



The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for over 90 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

Manufactured by

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