PATRIOT FIRE PROTECTION, INC.

Fire Sprinklers Save Lives!

2707 70TH Avenue East
Tacoma, WA 98424

TEL: (253) 926.2290
FAX: (253) 922.6150

Fire Protection Equipment Submittal

for

PSE Operational Training Facility
325 Todd Road NW
Puyallup, WA 98371

Job #11-2418

HANFORD, WA OFFICE
TEL (509) 373.8895
FAX (509) 373.8919

VANCOUVER, WA OFFICE
TEL (360) 699.4403
PORTLAND (503) 222.6001
FAX (360) 699.4485

SPOKANE, WA OFFICE
TEL (509) 926.3428
FAX (509) 926.3708

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PATRIOT FIRE PROTECTION, INC.

Equipment Submittal

DATE: November 2024

PROJECT NAME:	PSE - OTC			LOCATION:	Puyallup, WA
SPECIFICATION SECTION:				JOB #:	11-2418
NO.	**ITEM**	**MANUFACTURER**	**MODEL**	**SIZE**	**REMARKS**
		FIRE SPRINKLERS			
1	Standard Response Sprinklers	Reliable	F1-56	K=5.6	SSU - Bronze
2	Quick Response Sprinklers	Reliable	F1FR56	K=5.6	Recessed
3	Quick Response Sprinklers	Reliable	KFR56	K=5.6	SSU - Bronze
4	Quick Response Concealed Sprinklers	Reliable	G5-56	K=5.6	White/Chrome/165F
5	ESFR Sprinkler	Reliable	JL17	K=16.8	Warehouse
		Valves			
6	Backflow Preventer	Wilkins	350ASTDA-G	8"	Double Detector Check with Grv'd OS&Y Valves
7	Dry Pipe Valve	Reliable	FX	4"	Pump Room
8	Preaction Valve	Reliable	DDX	2"	Pump Room
9	OS&Y Valve	Kennedy	7093	8"	Grooved Ends
10	Check Valve	Tyco	CV-1	4" & 6"	Grooved Ends
11	Butterfly Control Valve	Reliable	REL363GT	4" - 6"	Grooved Ends - Integral Tamper
12	Reverse Tamper Butterfly Valve	Reliable	REL363GTC	4"	Reverse Tamper - Grv'd
13	Standard Hose Valve	Potter Roemer	4065-GRV	2 1/2"	Grooved Inlet
14	Test & Drain Valve w/pressure relief	AGF	2511A	2"	Wet Riser
15	Pressure Relief Valve	AGF	7000L	1/2"	200 PSI
		Electrical Equipment Installed By Patriot Wired by Others			
16	Pressure Switch	Potter Electric	PS10	-	On Dry Pipe Valve Trim
17	Hi/Low Air Switch	Potter Electric	PS40	-	On Dry Pipe Valve Trim
18	Waterflow Indicator	Potter Electric	VSR	6"	Wet Riser
19	Tamper Switch	Potter Electric	OSYSU-2	-	OS&Y Valve
20	Air compressor	Jenny	K1C17UMS	600 Gallon	1HP / 115V / 17 Gallon Tank
		Electrical Equipment Provided By Patriot Installed by Others			
21	Electric Bell	Potter Electric	MBA-6-24	6"	24V

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Reliable®

F1-56 Series
Standard-Response Sprinklers

K-factor 5.6 (80)

Features

- Standard coverage standard-response sprinklers
- Upright, pendent, horizontal sidewall, and vertical sidewall deflectors
- Low profile, compact design
- Available in a wide variety of finishes
- Available as Intermediate Level Sprinklers

Product Description

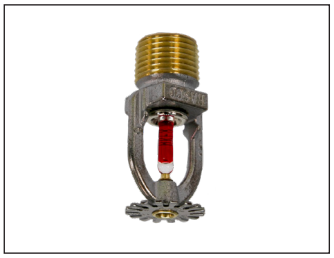
Reliable Model F1 series sprinklers are standard-response standard spray automatic fire sprinklers utilizing a 5.0 mm glass bulb thermal element.

Pendent and horizontal sidewall sprinklers may be installed exposed or surface mounted using escutcheons such as the Reliable Models B, C, or HB (reference Technical Bulletin 204). When installed recessed, the Model F1-56 series sprinklers are specifically listed with and may only be installed with listed Reliable escutcheons. Refer to the technical information on the following pages for specific listings for recessed installations and refer to Figures 7 and 8 for dimensional information.

When fitted with an approved water shield, these sprinklers may considered intermediate sprinklers for use in racks, below grated walkways, and other areas where intermediate level sprinklers are required.

Table A provides a summary of the approvals and availability of specific Model F1 series sprinkler configurations. Additional technical information for each sprinkler model is provided on the following pages.

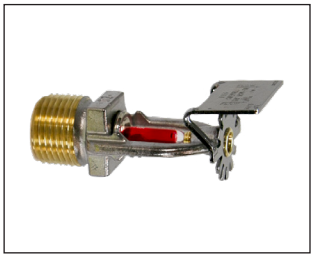
Important! Reliable fire sprinklers must be handled, stored, and installed in accordance with the guidelines in Caution Sheet 310 and this bulletin. Failure to follow these instructions may result in unintended operation or nonoperation of the fire protection system.



Model F1-56 Pendent

Model F1-56 Upright

Model F1-56 Vertical Sidewall



Model F1-56
Horizontal Sidewall

Note: Not all versions of the product are shown.

Note: This bulletin may contain information on New and Legacy sprinklers that reflects a dimensional change only.

Sprinkler Identification Number (SIN), application, performance, and listings/approval are not otherwise affected. Sprinklers with New frames will include the suffix “N” in the order.

F1-56 Series Sprinkler Summary — **Table A**

Sprinkler Model	K-Factor gpm/psi$^{1/2}$ (lpm/bar$^{1/2}$)	Orientation	Listings & Approvals	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
F1-56	5.6 (80)	Upright Intermediate Upright	cULus, FM, LPCB, VdS, EC, UKCA	175 (12) 250 (17) (cULus only)	RA1325
		Pendent	cULus, FM, LPCB, VdS, EC, UKCA	175 (12) 250 (17) (cULus only)	RA1314
		Horizontal Sidewall	cULus, FM	175 (12)	RA1335
		Vertical Sidewall	cULus, FM, LPCB, UKCA	175 (12)	RA1385

Model F1-56 Upright Sprinkler — SIN RA1325

Technical Specifications
Style: Upright, Intermediate Upright
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications
Thermal Sensor: 5.0mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Standard response

Temperature Ratings
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)
360°F (182°C)
500°F (260°C)

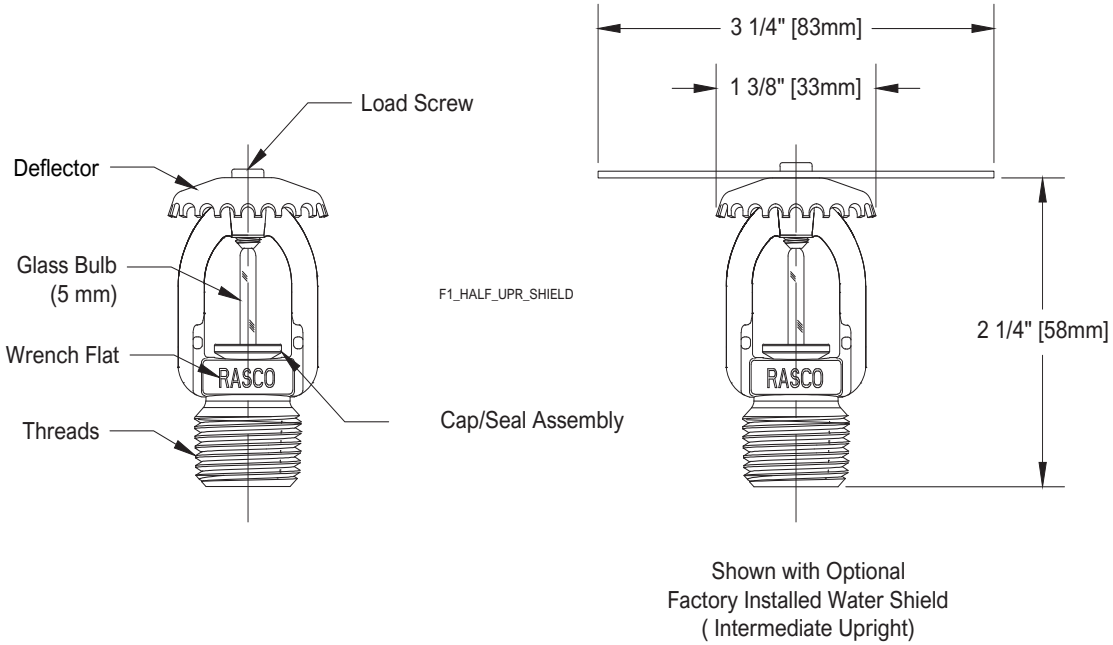
Guards & Shields (New Frames)
Factory Water Shield (cULus, FM)
F-1 Guard (cULus, FM)
F-3 Guard with Shield (cULus, FM)

Guards and Shields (Legacy Frames)
Factory Water Shield
C-1 Guard (FM)
C-3 Guard with Shield (cULus, FM)
D-1 Guard (cULus)
D-3 Guard with Shield (cULus)

Sprinkler Wrench
Model W2
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals
cULus Listed
FM Approved
LPCB
VdS
EC
UKCA: 0832-UKCA-CPR-S5045

Model F1-56 Upright Sprinkler Components and Dimensions — Figure 1



Shown with Optional
Factory Installed Water Shield
(Intermediate Upright)

Model F1-56 Pendent Sprinkler — SIN RA1314

Technical Specifications
Style:
Pendent
Recessed Pendent
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications
Thermal Sensor: 5.0mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Standard response

Temperature Ratings (1)
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)
360°F (182°C)
500°F (260°C)

Recessed Escutcheons
Model F1 (cULus, LPCB, VdS, CE)
Model F2 (cULus, FM, LPCB, VdS, CE)
Model FP (cULus, VdS, CE)

Guards & Shields(New Frames)(2)
F-1 Guard (FM)
F-5 Guard/Shield Kit (FM)
F-7 Guard (cULus)
F-8 Guard/Shield Kit (cULus)
S-1 Shield (cULus, FM)

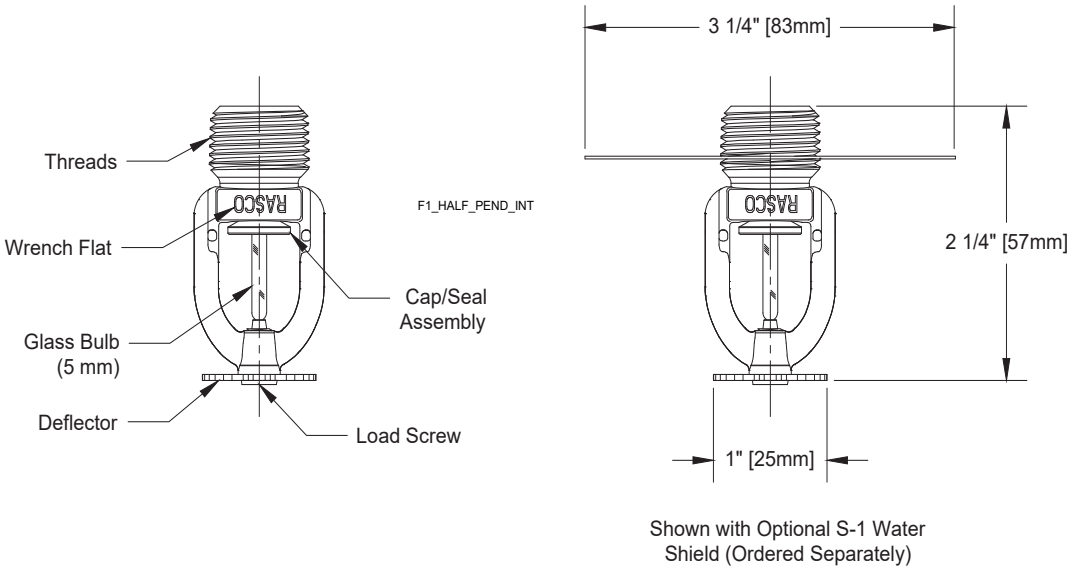
Guards & Shields (Legacy Frames)(2)
C1 Guard (FM)
C5 Guard/Shield Kit (FM)
D1 Guard (cULus, FM)
D4 Guard/Shield Kit (FM)
D5 Guard/Shield Kit (cULus, FM)
S-1 Shield (cULus, FM)

Sprinkler Wrenches
Model W2 (pendent)
Model W4 (recessed)
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals(3)
cULus Listed
FM Approved
LPCB
VdS
EC
UKCA: 0832-UKCA-CPR-S5045

Notes:
1. 286°F (141°C) and higher temperature rated sprinkler not listed for recessed use.
2. Not suitable for used with recessed pendent installations
3. When used surface mounted or exposed. See Recessed Escutcheon and Cover Plate section for specific approvals when installed recessed or concealed.

Model F1-56 Pendent Sprinkler Components and Dimensions — **Figure 2**



Note: Please refer to Figure 7 for recessed installation.

Model F1-56 Horizontal Sidewall Sprinkler — SIN RA1335

Technical Specifications
Style: Horizontal Sidewall
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)

Material Specifications
Thermal Sensor: 5.0mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Standard response

Temperature Ratings [1]
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)
360°F (182°C)

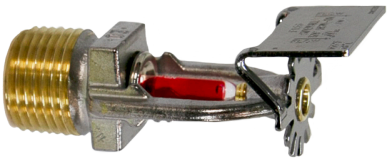
Recessed Escutcheons[2]
Model F1 (cULus, FM)
Model F2 (cULus, FM)
Model FP (cULus)

Guards & Shields (New Frames)[3]
F-4 Guard (FM)
F-7 Guard/Shield Kit (cULus)

Guards & Shields (Legacy Frames)[3]
F-4 Guard (FM)
F-7 Guard/Shield Kit (cULus)

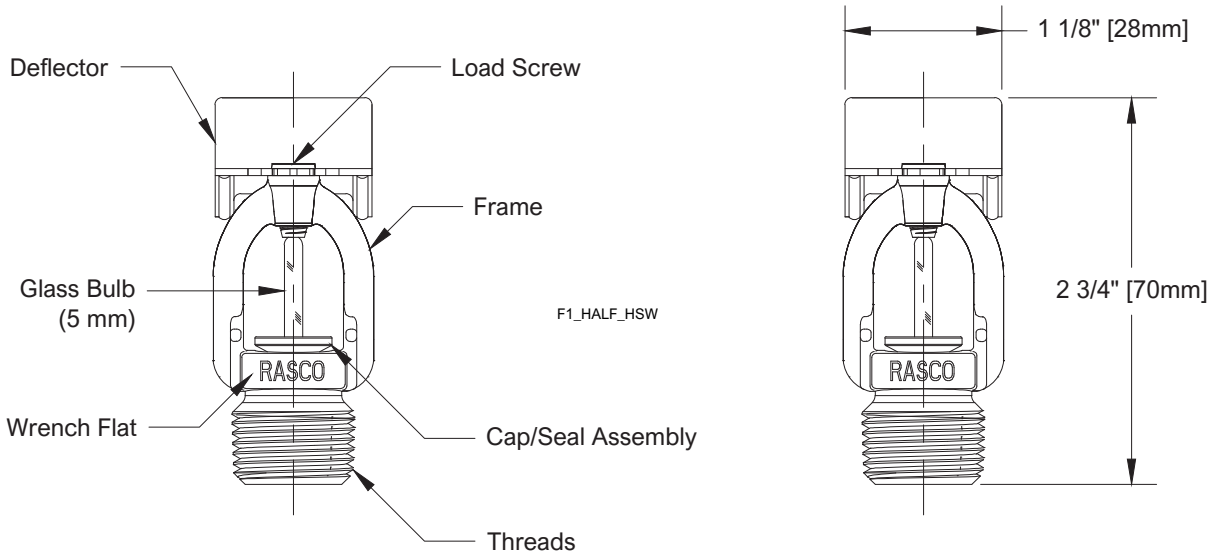
Sprinkler Wrenches
Model W2 (horizontal)
Model W4 (recessed)
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals
cULus Listed
FM Approved[4]



Notes:
1. 286°F (141°C) and higher temperature rated sprinkler not listed for recessed use.
2. cULus Listed for Light and Ordinary Hazard when installed exposed or surface mounted. Listed for Light Hazard ONLY when installed recessed.
3. Not suitable for recessed horizontal sidewall installations.
4. FM Approved for Light Hazard ONLY.

Model F1-56 Horizontal Sidewall Sprinkler Components and Dimensions — **Figure 3**



Note: Please refer to Figure 7 for recessed installation.

Model F1-56 Vertical Sidewall Sprinkler — SIN RA1385

Technical Specifications
Style:
Upright Vertical Sidewall
Pendent Vertical Sidewall
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: 5.0mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Standard response

Temperature Ratings
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)
360°F (182°C)

Guards & Shields (New Frames)
F-2 Guard (FM)

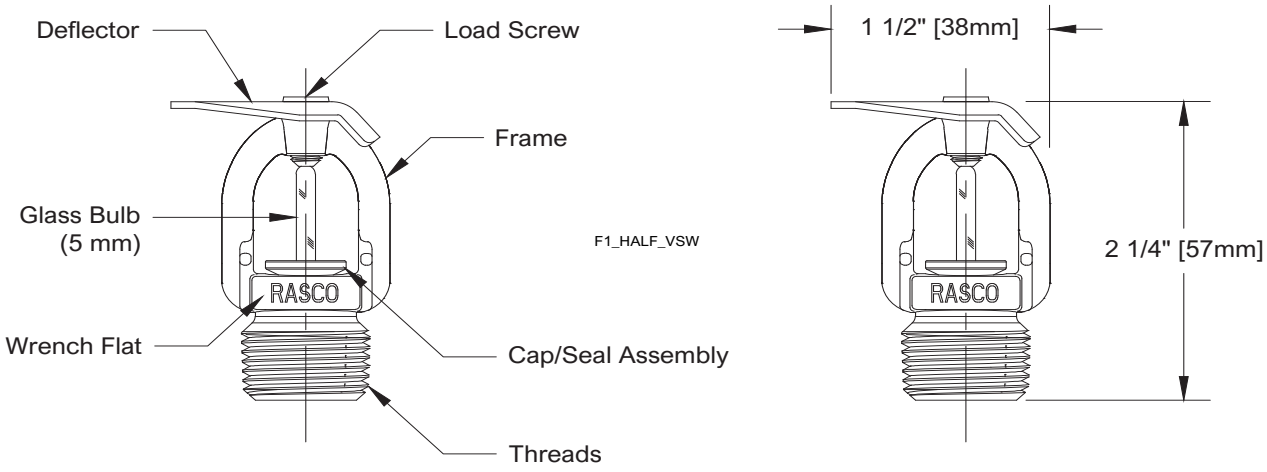
Guards & Shields (Legacy Frames)
F-2 Guard (FM)

Sprinkler Wrenches
Model W2
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals[1]
cULus Listed
FM Approved
LPCB[2]
UKCA: 0832-UKCA-CPR-S5045

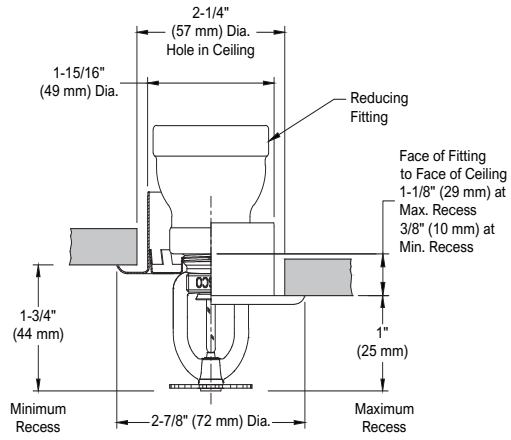
Notes:
1. Listed and approved for Light Hazard ONLY.
2. LPCB approved for use in pendent position ONLY.

Model F1-56 Vertical Sprinkler Components and Dimensions — **Figure 4**

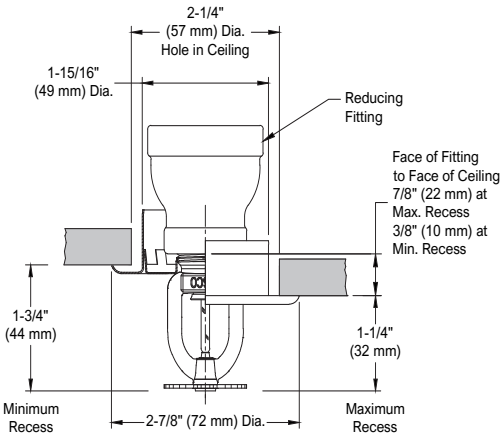


Recessed Installation: Pendent Sprinklers

Figure 5

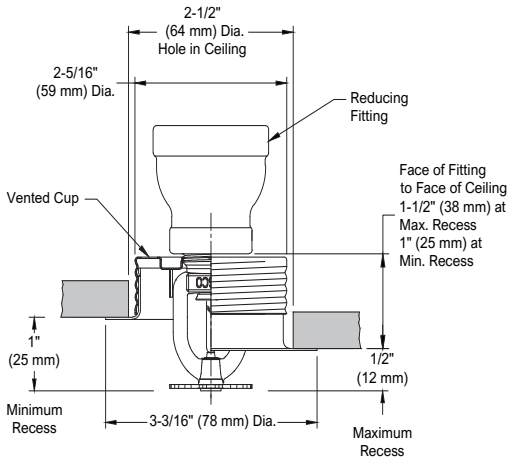


Models F1 & F1FR Pendent Sprinkler
with Model F1 Recessed Escutcheon
3/4" (19mm) Nominal Adjustment



Models F1 & F1FR Pendent Sprinkler
with Model F2 Recessed Escutcheon
1/2" (13mm) Nominal Adjustment

F1_REC_PEND

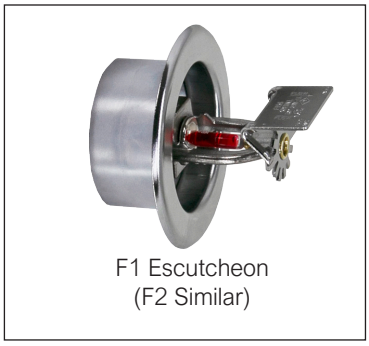


Models F1 & F1FR Pendent Sprinkler
with Model FP Recessed Escutcheon
1/2" (13mm) Nominal Adjustment

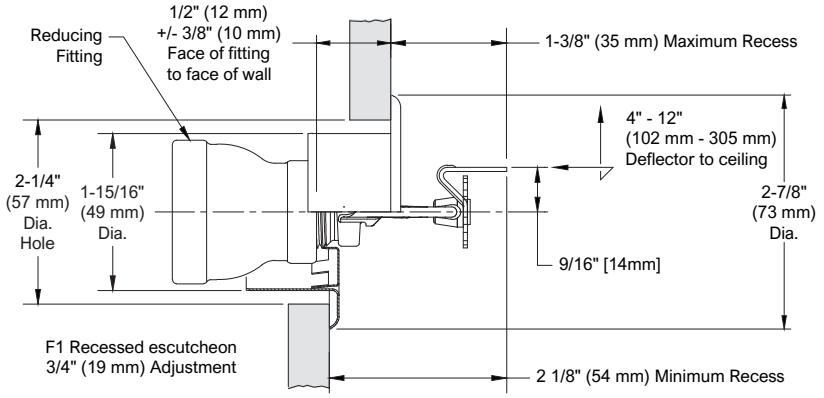
Note: Model FP recessed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.

FP Escutcheon

F1 Escutcheon
(F2 Similar)

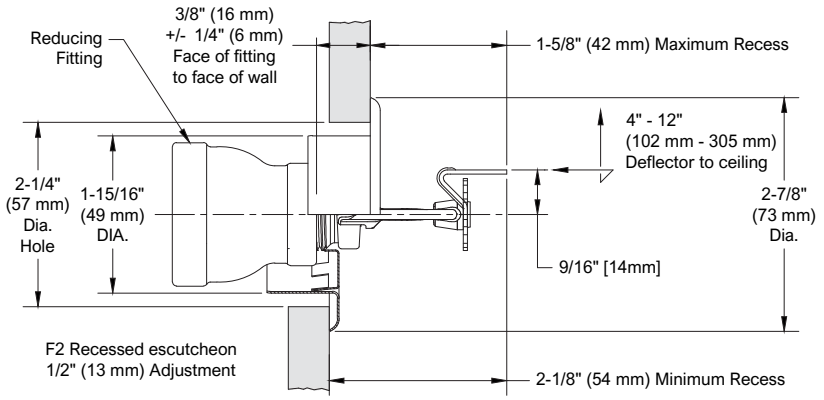


F1 Escutcheon
(F2 Similar)

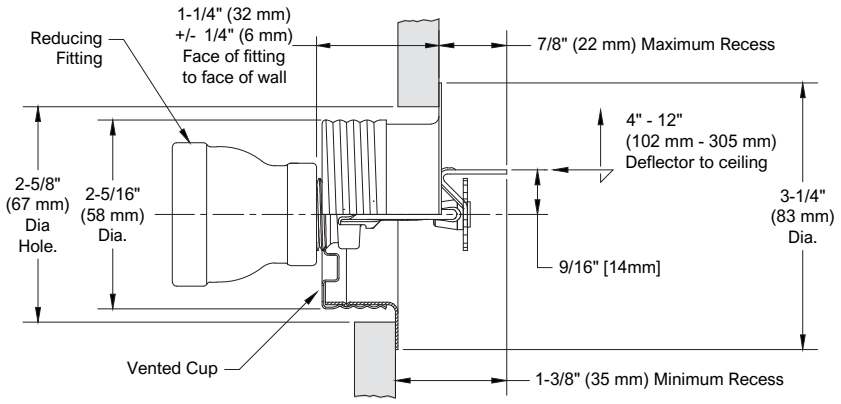


Model F1FR Horizontal Sidewall Sprinkler
with Model F1 Recessed Escutcheon
3/4" (19mm) Nominal Adjustment

F1FR_REC_HSW



Model F1FR Horizontal Sidewall Sprinkler
with Model F2 Recessed Escutcheon
1/2" (13mm) Nominal Adjustment



Model F1FR Horizontal Sidewall Sprinkler
with Model FP Recessed Escutcheon
1/2" (13mm) Nominal Adjustment

Note: Model FP recessed assemblies may not be used where the pressure in the space behind the sprinkler is positive with respect to the space in the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.

Wrenches

Model W2 (upright, pendent)

Model W13 (Legacy frame with guard installed)

Model W14 (New frame with guard installed)

Model W4
(recessed pendent)

Sprinkler and Escutcheon Finishes[1]

Table B

Standard Finishes		Special Application Finishes	
Sprinkler	**F1, F2 and FP[2] Escutcheons**	**Sprinkler**	**F1, F2 and FP[2] Escutcheons**
Bronze (Unfinished)	Brass	Electroless Nickel PTFE[3][4]	Bright Brass
Chrome	Chrome	Bright Brass[5]	Satin Chrome
White Polyester[3][8]	White Polyester	Satin Chrome	Custom Color Polyester
		Custom Color Polyester[3][6][8]	
		Lead Plated[3]	
		Wax Coated[3][7]	
		Wax Over Lead[3][7]	

Notes:

1. Paint or any other coating applied over the factory finish will void all approvals and warranties.
2. Model FP escutcheons utilize a galvanized steel cup with a finished trim ring.
3. cULus Listed as corrosion resistant.
4. FM Approved as corrosion resistant.
5. For 200°F (93°C) maximum temperature rated sprinklers only.
6. LPCB and VDS approved for SIN RA1314 and RA1325.
7. Clear wax used on ordinary temperature rated sprinklers; brown wax used on intermediate temperature rated sprinklers. Brown wax may be used on high temperature rated sprinklers where the ambient temperature does not exceed 150°F (66°C).
8. Not available for 500°F (260°C) temperature rated sprinklers.

Installation

Model F1 Series sprinklers must be installed in accordance with NFPA13 and the requirements of all applicable authorities having jurisdiction. Model F1 Series sprinklers must be installed with the Reliable sprinkler installation wrench identified in the Design and Installation Information table in this Bulletin. Any other wrench may damage the sprinkler. A leak tight sprinkler joint can be obtained with a torque of 8 to 18 lb-ft (11 to 24 N·m). Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

Glass bulb sprinklers have orange bulb protectors or protective caps to minimize bulb damage during shipping, handling and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

Maintenance

Reliable Model F1 series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Model
- F1-56

Deflector/Orientation
- Upright
- Intermediate Upright
- Pendent
- Horizontal Sidewall
- Vertical Sidewall

Temperature Rating
- See sprinkler technical specifications

Sprinkler Finish
- See Table B

Recessed Escutcheon[1][2]
- F1
- F2
- FP

Escutcheon Finish
- See Table B

Sprinkler Wrench
- Model W2 (upright and pendent)
- Model W4 (recessed)
- Model W14 (New frame with guard installed)
- Model W13 (Legacy frame with guard installed)

Notes:
1. 286°F (141°C) sprinklers are not listed to be used recessed.
2. For FM, recessed sprinklers must use the Model F2 escutcheon.

P/N 9999970620

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Reliable®

F1FR56 Series
Quick Response Sprinklers

K-factor 5.6 (80)

Features

- Standard coverage quick-response sprinklers
- Upright, pendent, horizontal sidewall, and vertical sidewall deflectors
- Low profile, compact design
- Available in a wide variety of finishes

Product Description

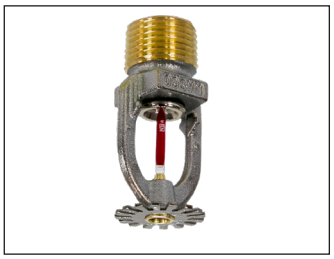
Reliable Model F1FR56 series sprinklers are quick-response standard spray automatic fire sprinklers utilizing a sensitive 3.0 mm glass bulb thermal element.

Pendent and horizontal sidewall sprinklers may be installed exposed or surface mounted using escutcheons such as the Reliable Models B, C, or HB (reference Technical Bulletin 204). When installed recessed or concealed, the Model F1FR56 series sprinklers are specifically listed with and may only be installed with listed Reliable escutcheons and cover plates. Refer to the technical information on the following pages for specific listings for recessed and concealed installations and refer to Figures 5 and 6 for dimensional information.

When fitted with an approved water shield, these sprinklers may considered intermediate sprinklers for use in racks, below grated walkways, and other areas where intermediate level sprinklers are required.

Table A provides a summary of the approvals and availability of specific Model F1FR series sprinkler configurations. Additional technical information for each sprinkler model is provided on the following pages.

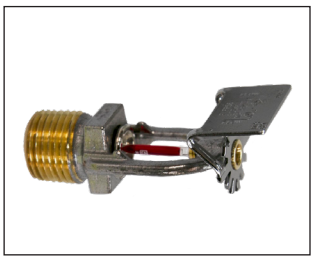
Important! Reliable fire sprinklers must be handled, stored, and installed in accordance with the guidelines in Caution Sheet 310 and this bulletin. Failure to follow these instructions may result in unintended operation or nonoperation of the fire protection system.



Model F1FR56 Pendent

Model F1FR56 Upright

Model F1FR56 Vertical Sidewall



Model F1FR56
Horizontal Sidewall

Note: Not all versions of the product are shown.

Note: This bulletin may contain information on New and Legacy sprinklers that reflects a dimensional change only. Sprinkler Identification Number (SIN), application, performance, and listings/approval are not otherwise affected. Sprinklers with New frames will include the suffix "N" in the order.

F1FR Series Sprinkler Summary — **Table A**

Sprinkler Model	K-Factor gpm/psi$^{1/2}$ (lpm/bar$^{1/2}$)	Orientation	Listings & Approvals	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
F1FR56	5.6 (80)	Upright Intermediate Upright	cULus, FM, LPCB, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1425
		Pendent	cULus, FM, LPCB, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1414
		Concealed Pendent	cULus, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1414
		Horizontal Sidewall	cULus, FM	175 (12)	RA1435
		Vertical Sidewall	cULus, FM, LPCB, UKCA	175 (12)	RA1485

Model F1FR56 Upright Sprinkler — SIN RA1425

Technical Specifications
Style: Upright, Intermediate Upright
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications
Thermal Sensor: 3 mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Quick response

Temperature Ratings
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)

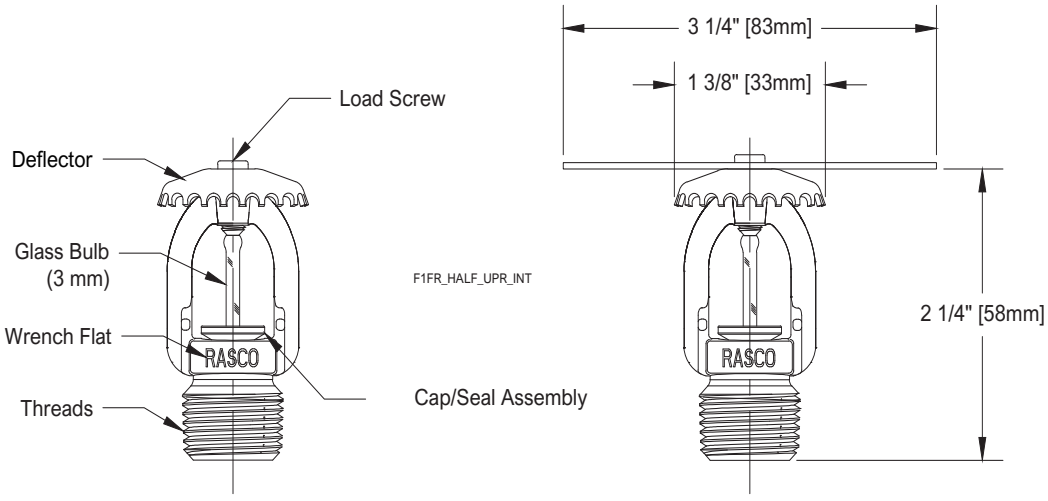
Guards & Shields (New Frames)
Factory Water Shield (cULus, FM)
F-1 Guard (cULus, FM)
F-3 Guard with Shield (cULus, FM)

Guards and Shields (Legacy Frames)
Factory Water Shield
C-1 Guard (FM)
C-3 Guard with Shield (cULus, FM)
D-1 Guard (cULus)
D-3 Guard with Shield (cULus)

Sprinkler Wrench
Model W2
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals
cULus Listed
FM Approved
LPCB
VdS
EC
WM
UKCA: 0832-UKCA-CPR-S5045

Model F1FR56 Upright Sprinkler Components and Dimensions — **Figure 1**



Shown with Optional
Factory Installed Water Shield
(Intermediate Upright)

Model F1FR56 Pendent Sprinkler — SIN RA1414

Technical Specifications
Style:
Pendent
Recessed Pendent
Concealed Pendent
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications
Thermal Sensor: 3 mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Quick response

Temperature Ratings[1]
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)

Recessed Escutcheons
Model F1 (cULus, LPCB, VdS, CE, WM)
Model F2 (cULus, FM, LPCB, VdS, CE, WM)
Model FP (cULus, VdS, CE, WM)

Cover Plate
Model CCP (cULus, VdS[2], CE[2])

Guards & Shields (New Frames)[3]
F-1 Guard (FM)
F-5 Guard/Shield Kit (FM)
F-7 Guard (cULus)
F-8 Guard/Shield Kit (cULus)
S-1 Shield (cULus, FM)

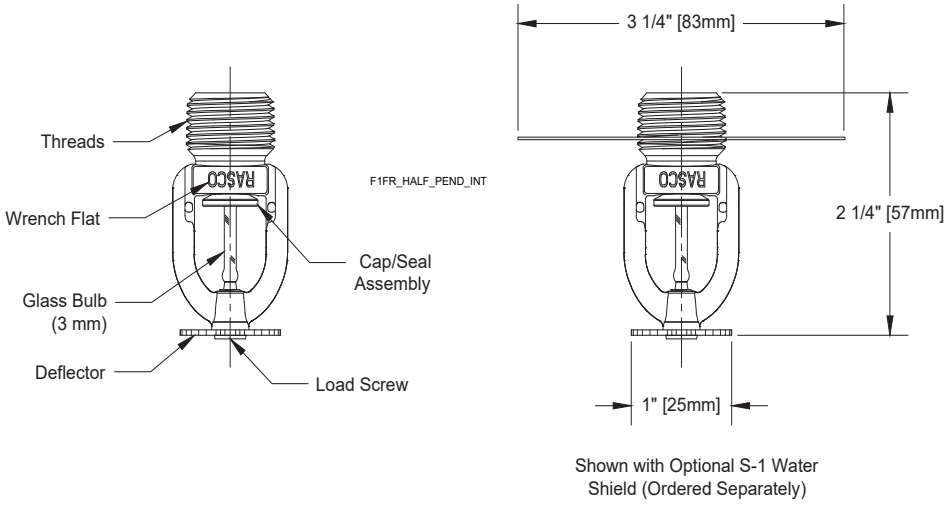
Guards & Shields (Legacy Frames)[3]
C-1 Guard (FM)
C-5 Guard/Shield Kit (FM)
D-1 Guard (cULus, FM)
D-4 Guard/Shield Kit (FM)
D-5 Guard/Shield Kit (cULus, FM)
S-1 Shield (cULus, FM)

Sprinkler Wrenches
Model W2 (pendent)
Model W4 (recessed or concealed)
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals[4]
cULus Listed
FM Approved
LPCB
VdS
EC
WM
UKCA: 0832-UKCA-CPR-S5045, 0831-UKCA-CPR-5072 (CCP)

Notes:
1. 286°F (141°C) temperature rated sprinkler not listed for recessed or concealed use.
2. VdS and CE approval for CCP concealed use is for 155°C (68°C) sprinkler ONLY.
3. Not suitable for recessed or concealed pendent installations.
4. When used surface mounted or exposed. See Recessed Escutcheon and Cover Plate section for specific approvals when installed recessed or concealed.

Model F1FR56 Pendent Sprinkler Components and Dimensions — Figure 2



Shown with Optional S-1 Water Shield (Ordered Separately)

Note: Please refer to Figure 8 for recessed and concealed installation.

Model F1FR56 Horizontal Sidewall Sprinkler — SIN RA1435

Technical Specifications
Style:
Horizontal Sidewall
Recessed Horizontal Sidewall
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)

Material Specifications
Thermal Sensor: 3 mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Quick response

Temperature Ratings (1)
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)

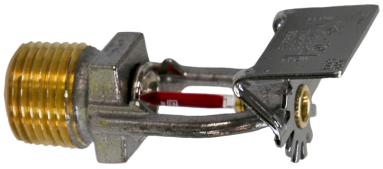
Recessed Escutcheons(2)
Model F1 (cULus)
Model F2 (cULus, FM)
Model FP (cULus)

Guards & Shields (New Frames)(3)
F-4 Guard (FM)
F-7 Guard (cULus)

Guards & Shields (Legacy Frames)(3)
C1 Guard (FM)
D1 Guard (cULus)

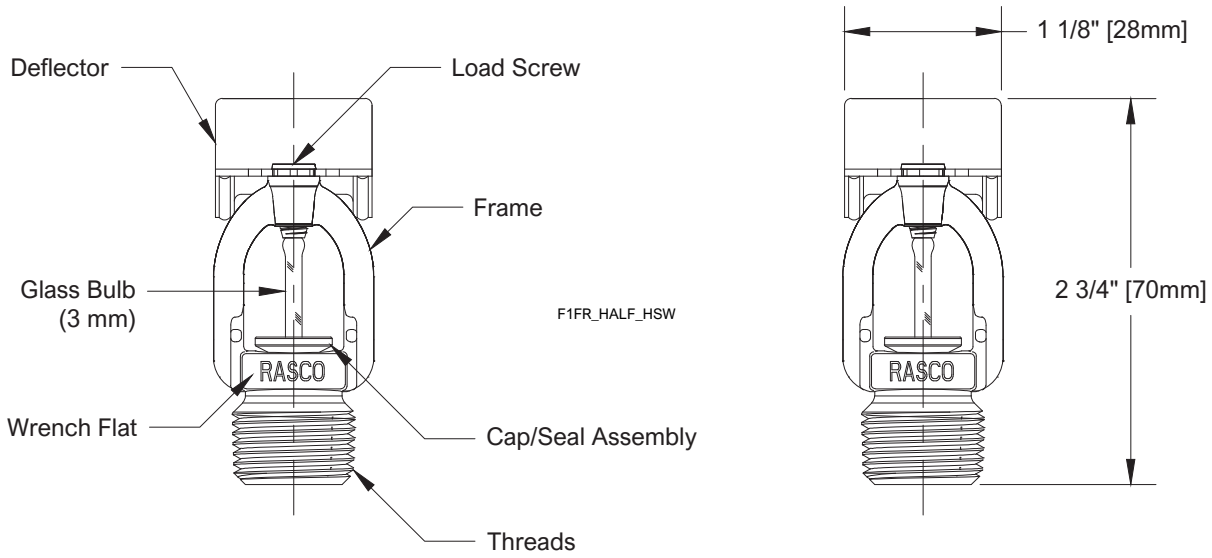
Sprinkler Wrenches
Model W2 (non-recessed)
Model W4 (recessed)
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals
cULus Listed(4)
FM Approved(5)



Notes:
1. 286°F (141°C) temperature rated sprinkler not listed for recessed use.
2. FM approved recessed installation when used with Model F2 escutcheon ONLY.
3. Not suitable for recessed horizontal sidewall installations.
4. cULus Listed for Light and Ordinary Hazard when installed exposed or surface mounted. Listed for Light Hazard ONLY when installed recessed.
5. FM Approved for Light Hazard ONLY.

Model F1FR56 Horizontal Sidewall Sprinkler Components and Dimensions — **Figure 3**



Note: Please refer to Figure 9 for recessed installation.

Model F1FR56 Vertical Sidewall Sprinkler — SIN RA1435

Technical Specifications
Style:
Upright Vertical Sidewall
Pendent Vertical Sidewall
Threads: 1/2" NPT or ISO 7-R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: 3 mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table B)

Sensitivity
Quick response

Temperature Ratings
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)

Guards & Shields (New Frames)
F-2 Guard (FM)

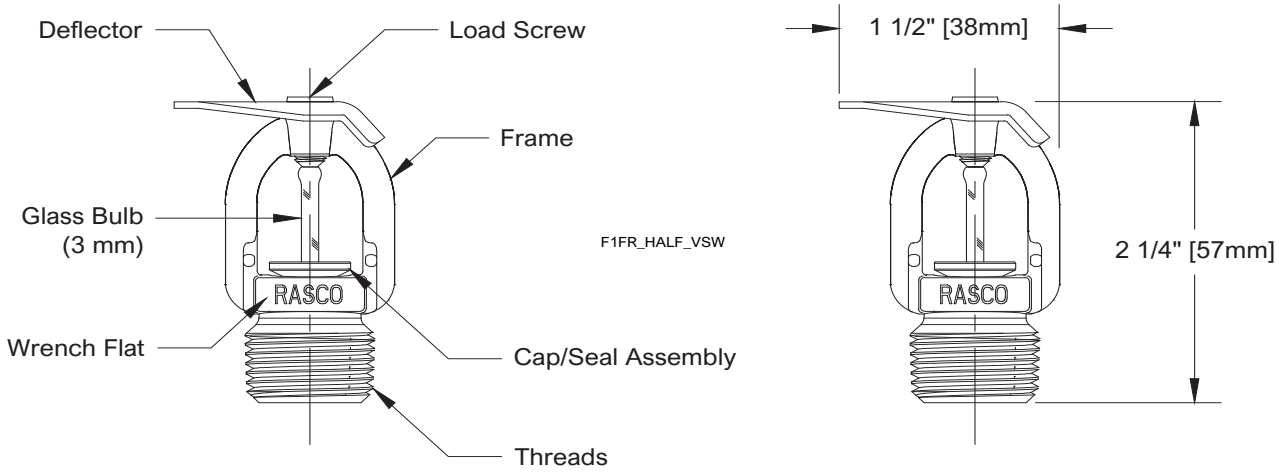
Guards & Shields (Legacy Frames)
C1 Guard (FM)

Sprinkler Wrenches
Model W2
Model W14 (New frame with guard installed)
Model W13 (Legacy frame with guard installed)

Listings and Approvals[1]
cULus Listed
FM Approved
LPCB[2]
UKCA: 0832-UKCA-CPR-S5045

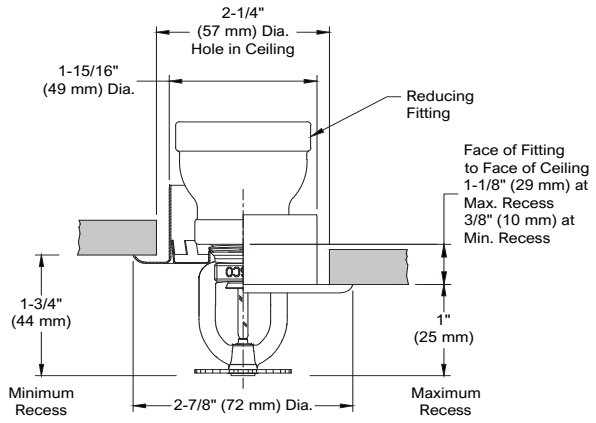
Notes:
1. Listed and approved for Light Hazard ONLY.
2. LPCB approved for use in pendent position ONLY.

Model F1FR56 Vertical Sprinkler Components and Dimensions — **Figure 4**

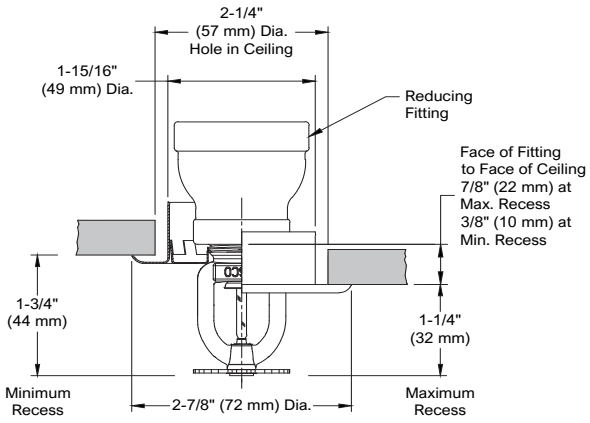


Recessed and Concealed Installation: Pendent Sprinklers

Figure 5

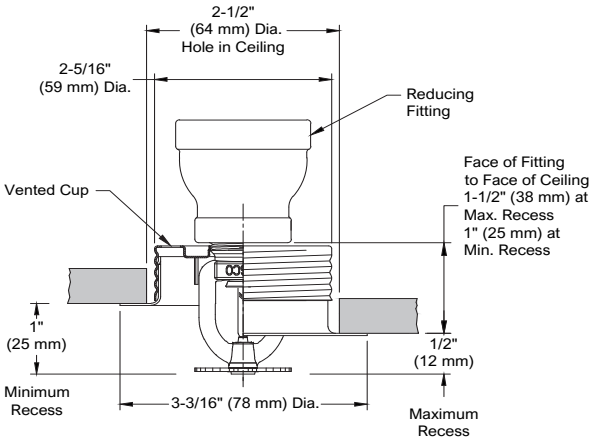


Models F1 & F1FR Pendent Sprinkler
with Model F1 Recessed Escutcheon
3/4" (19mm) Nominal Adjustment



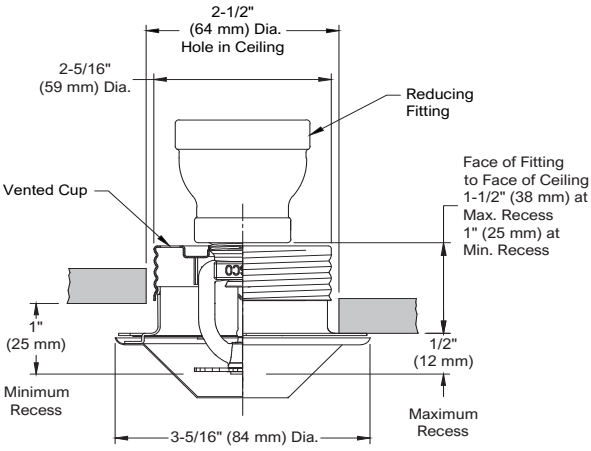
Models F1 & F1FR Pendent Sprinkler
with Model F2 Recessed Escutcheon
1/2" (13mm) Nominal Adjustment

F1_REC_PEND_CCP



Models F1 & F1FR Pendent Sprinkler
with Model FP Recessed Escutcheon
1/2" (13mm) Nominal Adjustment

Note: Model FP recessed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.



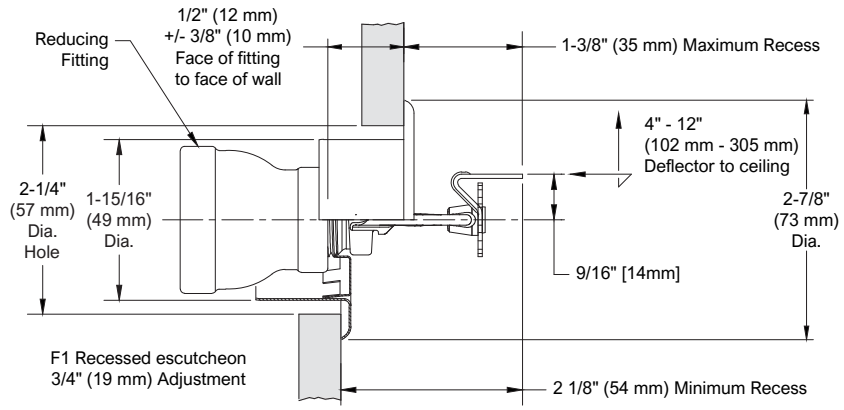
Model F1FR56 CCP Conical Concealed Sprinkler
1/2" (13mm) Nominal Adjustment
(Nominal Cover Plate Projection is 1" (25 mm))

Note: Model CCP concealed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model CCP cup are unobstructed following installation.

F1 Escutcheon
(F2 Similar)

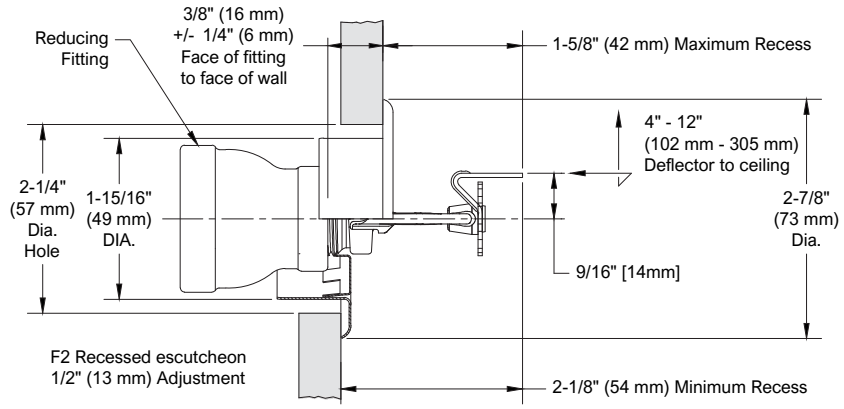
FP Escutcheon

CCP Cover Plate

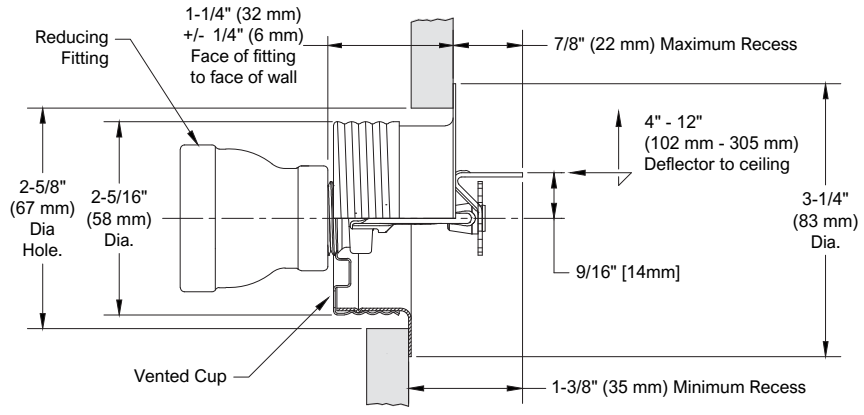


Model F1FR Horizontal Sidewall Sprinkler
with Model F1 Recessed Escutcheon
3/4" (19mm) Nominal Adjustment

F1FR_REC_HSW



Model F1FR Horizontal Sidewall Sprinkler
with Model F2 Recessed Escutcheon
1/2" (13mm) Nominal Adjustment



Model F1FR Horizontal Sidewall Sprinkler
with Model FP Recessed Escutcheon
1/2" (13mm) Nominal Adjustment

Note: Model FP recessed assemblies may not be used where the pressure in the space behind the sprinkler is positive with respect to the space in the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.

Wrenches

Model W2 (upright, pendent)

Model W13 (Legacy frame with guard installed)

Model W14 (New frame with guard installed)

Model W4
(recessed, concealed pendent)

Finishes[1]

Table B

Standard Finishes			Special Application Finishes		
Sprinkler	**F1, F2 and FP[2] Escutcheons**	**CCP Cover Plate[2]**	**Sprinkler**	**F1, F2 and FP[2] Escutcheons**	**CCP Cover Plate[2]**
Bronze	Brass	Chrome	Electroless Nickel PTFE[3][4]	Bright Brass	Bright Brass
Chrome	Chrome	White Paint	Bright Brass[5]	Satin Chrome	Satin Chrome
White Polyester[3]	White Polyester		Satin Chrome	Custom Color Polyester	Custom Color Paint
			Custom Color Polyester[3]		

Notes:
1. Paint or any other coating applied over the factory finish will void all approvals and warranties.
2. Model FP escutcheons and Model CCP sprinklers utilize a galvanized steel cup with a finished trim ring or cover plate.
3. cULus Listed as corrosion resistant.
4. FM Approved as corrosion resistant.
5. For 200°F (93°C) maximum temperature rated sprinklers only.

Installation

Model F1FR Series sprinklers must be installed in accordance with NFPA13 and the requirements of all applicable authorities having jurisdiction. Model F1FR Series sprinklers must be installed with the Reliable sprinkler installation wrench identified in this Bulletin. Any other wrench may damage the sprinkler. The Models W2 and W4 wrenches have two sets of jaws. Use the smallest set of jaws that fit on the wrench flats of the sprinkler. A leak tight sprinkler joint can be obtained with a torque of 8 to 18 lb-ft (11 to 24 N·m). Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

Glass bulb sprinklers have orange bulb protectors or protective caps to minimize bulb damage during shipping, handling and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

Maintenance

Reliable Model F1FR series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Model
- F1FR56

Deflector/Orientation
- Upright
- Intermediate Upright
- Pendent
- CCP Concealed Pendent
- Horizontal Sidewall
- Vertical Sidewall

Temperature Rating
- See sprinkler technical specifications

Sprinkler Finish
- See Table B

Recessed Escutcheon[1][2]
- F1
- F2
- FP

Escutcheon Finish
- See Table B

CCP Cover Plate Temperature Rating
- 135°F (57°C) [For use with 135°F (57°C) and 155°F (68°C) sprinklers.]
- 165°F (74°C) [For use with 175°F (79°C) and 200°F (93°C) sprinklers.]

CCP Cover Plate Finish
- See Table B

Sprinkler Wrench
- Model W2
- Model W4 (recessed, concealed)
- Model W14 (New frame with guard installed)
- Model W13 (Legacy frame with guard installed)

Notes:
1. 286°F (141°C) sprinklers are not listed to be used recessed or concealed.
2. For FM, recessed sprinklers must use the Model F2 escutcheon.

P/N 9999970623

Intentionally Blank

Reliable®

Model KFR56 Series Sprinklers

Quick-response, Standard Spray Fusible Link Sprinklers

K5.6 (80 metric)
cULus Listed, FM Approved, VdS Approved, CE Certified

Product Description

Model KFR56 series sprinklers are standard spray, quick-response sprinklers with a fusible link operating element. The sprinklers are cULus Listed, FM Approved, VdS Approved, and CE Certified. See Table C for available finishes. All KFR56 sprinklers have a nominal K-factor of 5.6 (80 metric).

Model KFR56 series sprinklers are available in Ordinary (165°F [74°C]) or Intermediate (212°F [100°C]) temperature classification. Model KFR56 Pendent sprinklers are available with Model F1, Model F2, or Model FP recessed escutcheons.

Application

Model KFR56 series sprinklers are listed and approved for installation in accordance with NFPA 13 and FM Loss Prevention Data Sheets. Follow requirements of NFPA 13 for Quick-response Standard Spray Sprinklers when installing Model KFR56 series sprinklers. FM Approvals classifies Model KFR56 sprinklers as K5.6 QR Non-storage and K5.6 QR In-rack Storage sprinklers.

Installation

Model KFR56 series sprinklers must be installed in accordance with the requirements of NFPA 13 or FM Property Loss Prevention Data Sheets. The Model F1, F2, and FP escutcheons are the only recessed escutcheons listed and approved for use with Model KFR56 Pendent sprinklers. The use of any other recessed escutcheon will void all approvals and warranties. Do not install Model FP escutcheons in ceilings that are positively pressurized with respect to the occupied space below.

Use only the Model W2 sprinkler wrench for installing Model KFR56 series pendent, upright, and horizontal sidewall sprinklers, and use the Model W1 or W4 wrench for installing Model KFR56 series recessed pendent, conical concealed pendent (CCP), and recessed horizontal sidewall sprinklers. The use of wrenches other than those specified may damage these sprinklers.

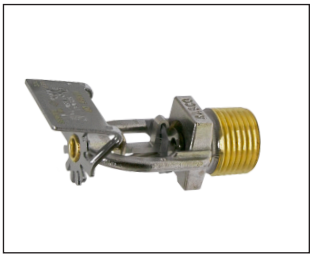
Recommended installation torque is 14-20 ft-lbs (19 – 27 N·m). Do not tighten sprinklers over the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

Important! Reliable fire sprinklers must be handled, stored, and installed in accordance with the guidelines in Caution Sheet 310 and this bulletin. Failure to follow these instructions may result in unintended operation or nonoperation of the fire protection system.

Model KFR56 Pendent

Model KFR56 Upright

Model CCP



Model KFR56 HSW

Listings & Approvals

Listed by Underwriters Laboratories, Inc. and UL Certified for Canada (cULus)
- Sprinklers, Automatic and Open (VNIV)

FM Approved (FM)
- K5.6 QR Non-storage
- K5.6 QR In-rack Storage

VdS Approved and CE Certified to EN12259
UKCA: 0832-UKCA-CPR-S5073, -5074, -5075

Model KFR Series Sprinkler Summary — **Table A**

Sprinkler Model	Orientation	Listing or Approval	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
KFR56 Pendent	Pendent	cULus	250 (17.2)	RA3614
		FM, VdS, CE, UKCA	175 (12)	
KFR56 Upright KFR56 Upright Intermediate	Upright	cULus	250 (17.2)	RA3624
		FM, VdS, CE, UKCA	175 (12)	
KFR56 HSW	HSW	cULus	250 (17.2)	RA3634
		FM, VdS, CE, UKCA	175 (12)	

Model KFR56 Pendent sprinkler — SIN RA3614

Technical Specifications
Style: Pendent, Recessed Pendent, or Conical Concealed Pendent
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
cULus: 250 psi (17.2 bar)
FM, VdS, CE: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrenches
Model W2 (non-recessed)
Model W1 or W4 (recessed & concealed)
Model W14 (with guard installed)

Listings and Approvals
cULus Listed
FM Approved
VdS Approved
CE Certificate of constancy of performance
0786-CPR40313
UKCA: 0832-UKCA-CPR-S5074

Sprinkler Finishes
(See Table C)

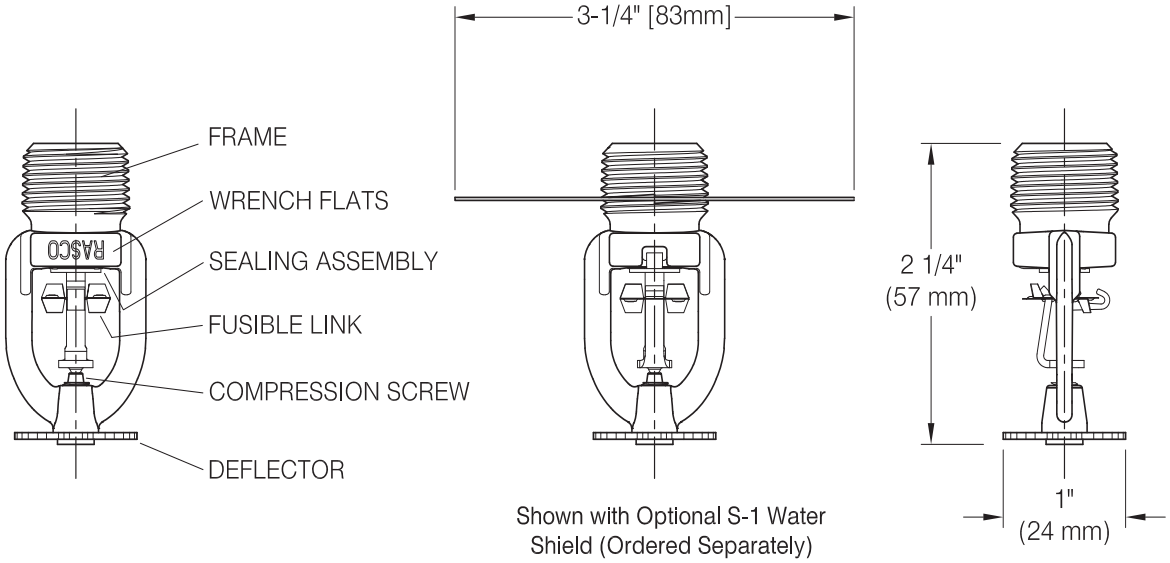
Sensitivity
Quick-response

Temperature Ratings
165°F (74°C), Gray Link
212°F (100°C), White Link

Recessed Escutcheons/Cover Plates
Model F1 escutcheon (cULus only)
Model F2 escutcheon (cULus, FM)
Model FP escutcheon (cULus only)
Model CCP cover plate (cULus only)

Guards/Water Shields
F-7 Guard (cULus)
F-1 Guard (FM)
F-8 Guard/Water Shield (cULus)
F-5 Guard/Water Shield (FM)
S-1 Water Shield (cULus, FM)

Model KFR56 Pendent Sprinkler Components and Dimensions — **Figure 1**



Model KFR56 Upright Sprinkler — SIN RA3624

Technical Specifications
Style: Upright
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
cULus: 250 psi (17.2 bar)
FM, VdS, CE: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrench
Model W2
Model W14 (with guard installed)

Listings and Approvals
cULus Listed
FM Approved
VdS Approved
CE Certificate of constancy of performance
0786-CPR40314
UKCA: 0832-UKCA-CPR-S5075

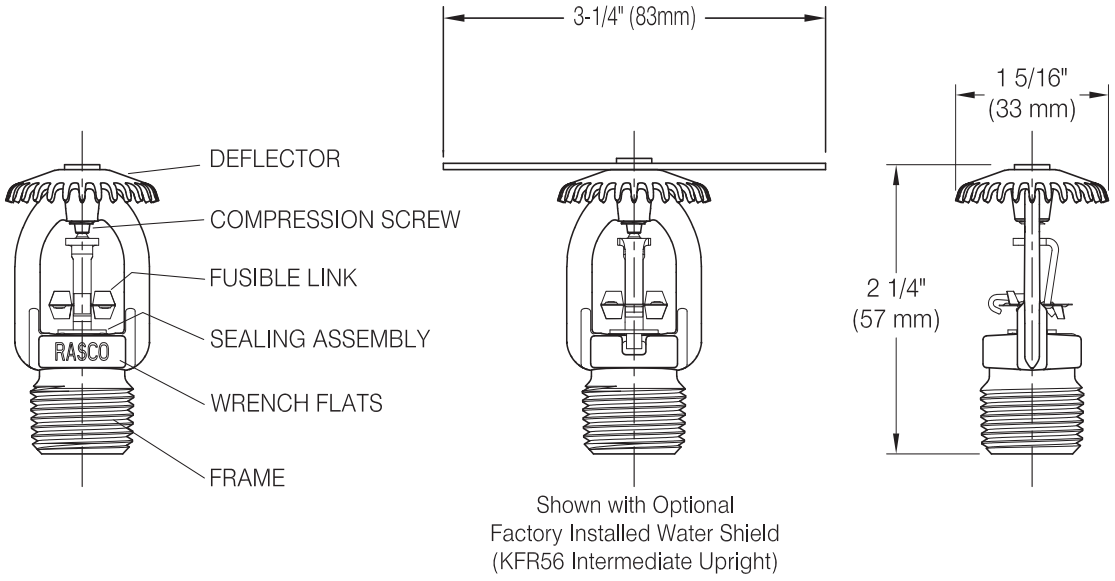
Sprinkler Finishes
(See Table C)

Sensitivity
Quick-response

Temperature Ratings
165°F (74°C), Gray Link
212°F (100°C), White Link

Guards/Water Shields
F-1 Guard (cULus, FM)
F-3 Guard/Water Shield (cULus, FM)
Factory Installed Shield (cULus, FM)

Model KFR56 Upright Sprinkler Components and Dimensions — **Figure 2**



Model KFR56 HSW Horizontal Sidewall Sprinkler — SIN RA3634

Technical Specifications
Style: HSW or Recessed HSW
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
cULus: 250 psi (17.2 bar)
FM, VdS, CE: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrenches
Model W2 (non-recessed)
Model W1 or W4 (recessed)
Model W14 (with guard installed)

Listings and Approvals
cULus Listed
FM Approved
VdS Approved
CE Certificate of constancy of performance
0786-CPR40312
UKCA: 0832-UKCA-CPR-S5073

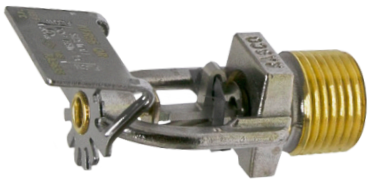
Sprinkler Finishes
(See Table C)

Sensitivity
Quick-response

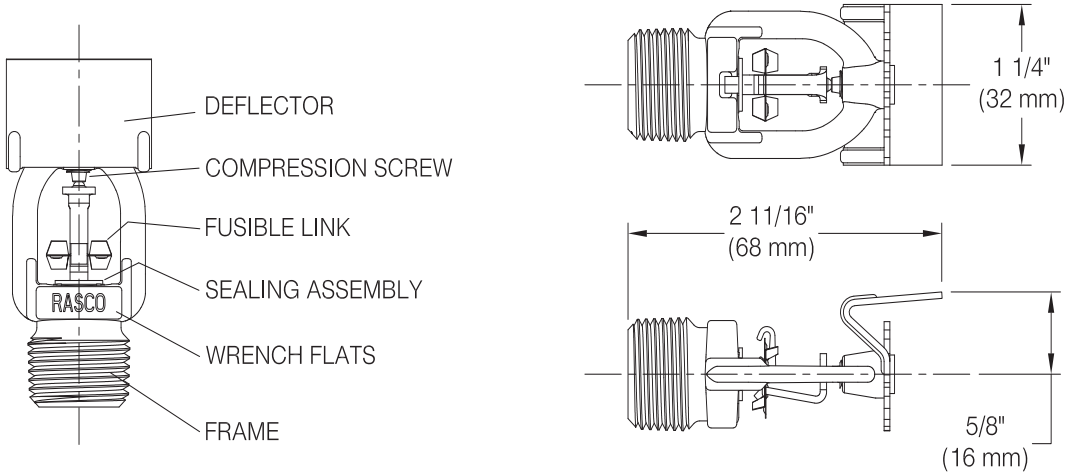
Temperature Ratings
165°F (74°C), Gray Link
212°F (100°C), White Link

Recessed Escutcheons
Model F1 escutcheon (cULus only)
Model F2 escutcheon (cULus, FM)
Model FP escutcheon (cULus only)

Guards
F-7 Guard (cULus)
F-4 Guard (FM)



Model KFR56 HSW Sprinkler Components and Dimensions — Figure 3

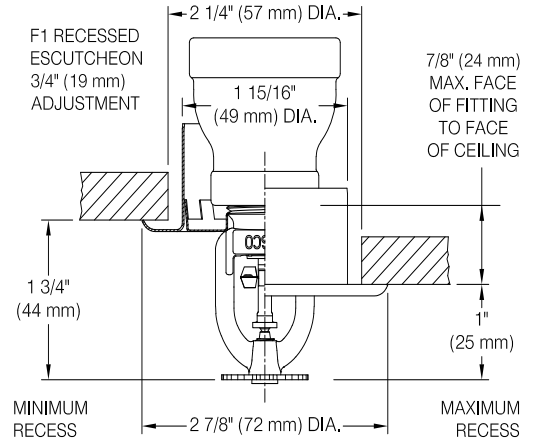


Recessed Escutcheon and Conical Concealed Cover Plate Dimensions **Table B**

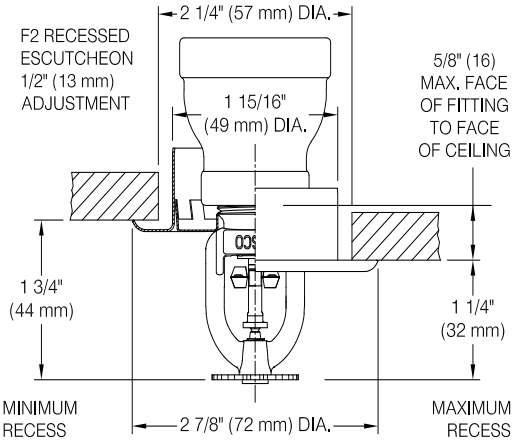
Type	Adjustment Inch (mm)	Maximum Face of Fitting to Ceiling* Inch (mm)	Minimum Face of Fitting to Ceiling* Inch (mm)	Maximum Deflector Distance Below Ceiling Inch (mm)	Minimum Deflector Distance Below Ceiling Inch (mm)
F1	3/4 (19)	7/8 (24)	1/8 (3)	1-3/4 (44)	1 (25)
F2	1/2 (12)	5/8 (16)	1/8 (3)	1-3/4 (44)	1-1/4 (32)
FP	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)
CCP	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)

***Note:** Face of fitting to ceiling dimensions are based on nominal thread make up. Verify dimensions based on fitting and thread sealing method prior to installation.

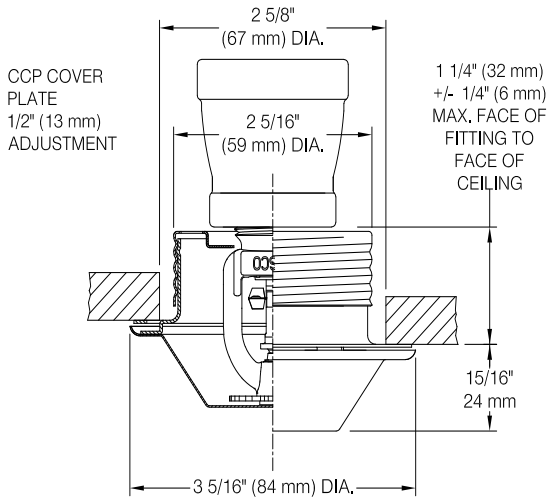
Recessed Escutcheon and Conical Concealed Cover Plate Diagrams **Figure 4**



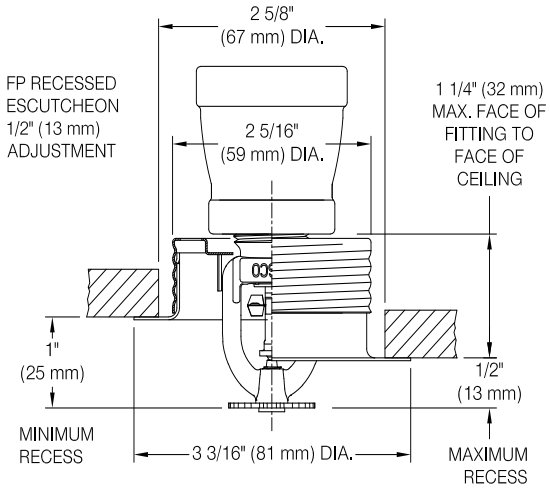
F1 RECESSED ESCUTCHEON INSTALLATION



F2 RECESSED ESCUTCHEON INSTALLATION



CCP COVER PLATE INSTALLATION

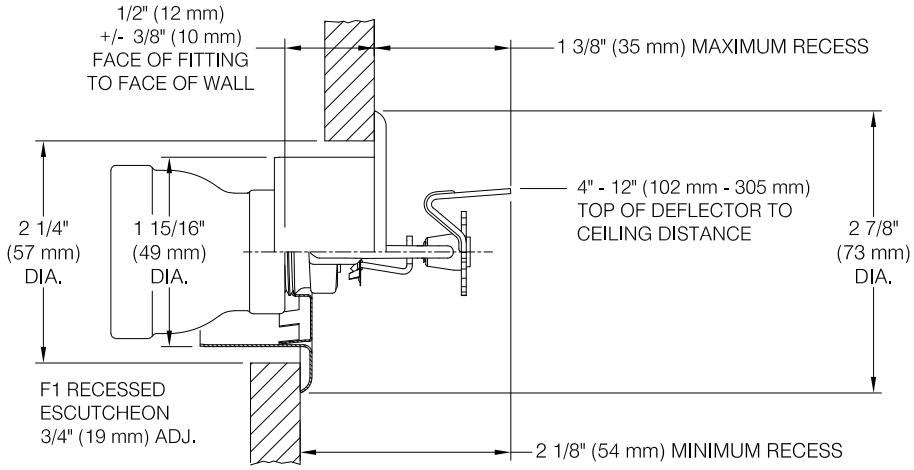


FP RECESSED ESCUTCHEON INSTALLATION

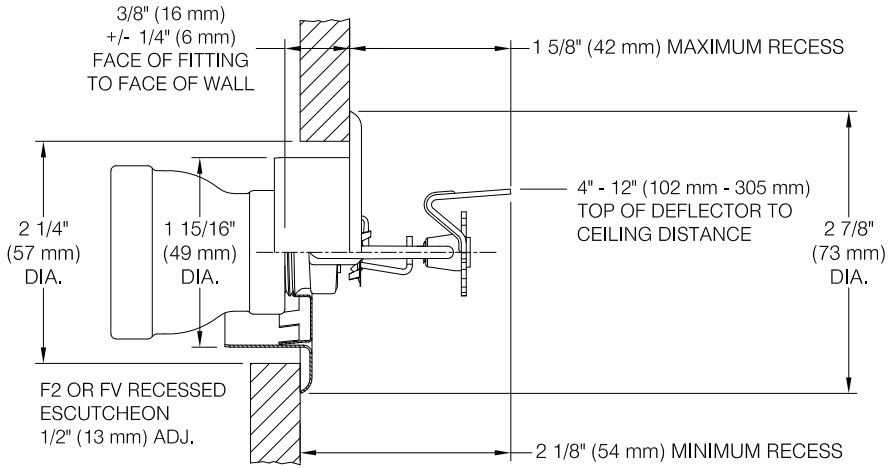
Note: Pendent sprinklers with CCP cover plates or FP recessed escutcheons shall not be installed in locations where the pressure in the ceiling is positive with respect to the pressure below the ceiling. Ensure that the openings in the cup are unobstructed following installation.

Model KFR56 HSW Recessed Escutcheon Diagrams

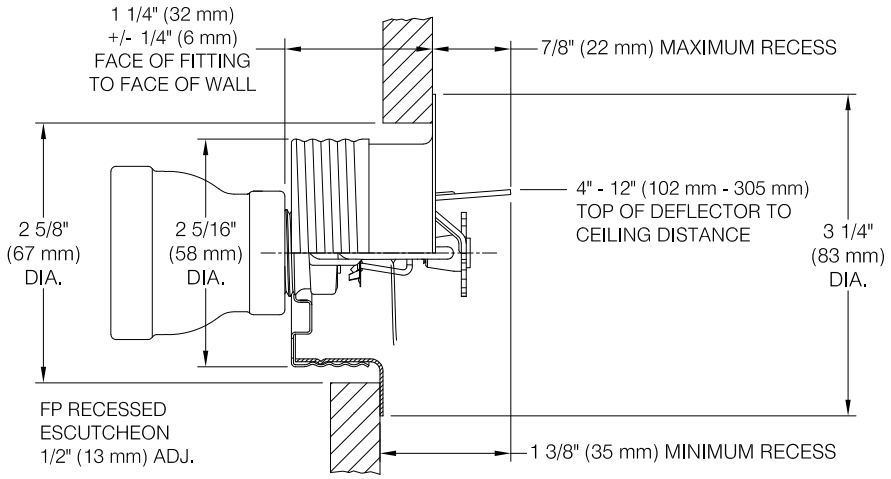
Figure 5



F1 RECESSED ESCUTCHEON INSTALLATION



F2 RECESSED ESCUTCHEON INSTALLATION



FP RECESSED ESCUTCHEON INSTALLATION

Note: Sidewall sprinklers with FP recessed escutcheons shall not be installed in locations where the pressure in or behind the wall is positive with respect to the pressure in the protected area. Ensure that the openings in the FP cup are unobstructed following installation.

Sprinkler, Escutcheon, and Cover Plate Finishes[1] **Table C**

Standard Finishes			Special Application Finishes		
Sprinkler	**F1, F2 , and FP[2] Escutcheons**	**CCP Cover Plate**	**Sprinkler**	**F1, F2 , and FP[2] Escutcheons**	**CCP Cover Plate**
Bronze	Brass	--	Bright Brass	Bright Brass	Bright Brass
Chrome Plated	Chrome Plated	Chrome Plated	Satin Chrome	Satin Chrome	Satin Chrome
White Polyester	White Polyester	White Paint	Black Polyester	Black Polyester	Black Paint
			Custom Color Polyester	Custom Color Polyester	Custom Color Paint

Notes:

[1] Paint or any other coating applied over the factory finish will void all approvals and warranties.

[2] The Model FP escutcheon assembly consists of an unfinished galvanized cup with a finished escutcheon ring.

Wrench

Model W2 (non-recessed)

Model W14 (with guard installed)

Model W1 (recessed & concealed)

Model W4 (alt. recessed & concealed)

Maintenance

Reliable Model KFR56 series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering.

Sprinkler

- Model (KFR56 Pendent, KFR56 Upright, KFR56 Upright Intermediate, or KFR56 HSW)
- Temperature Rating [165°F (74°C) or 212°F (100°C)]
- Threads ($1/2$" NPT or ISO 7-1 R$3/4$)
- Finish (See Table C)

Escutcheon or Coverplate

- Type (None, F1, F2, FP, or CCP)
- Finish (See Table C)

Guards/Water Shields

- See sprinkler information pages in this bulletin

Sprinkler Wrench

- W2 (Pendent, Upright, & HSW)
- W1 or W4 (Recessed Pendent & HSW, CCP)
- W14 (with guard installed)

P/N 9999970483

Intentionally Blank

Reliable®

Model G5 Series Sprinklers

Standard Spray, Flat Concealed Pendent

Available with Gasketed Cover Plate

Features

- Standard Coverage, Concealed Pendent (K2.8, 4.2, 5.6, & 8.0 [40, 60, 80, & 115 metric])
- Flat concealed cover plate available in a variety of finishes.
- Available with Stainless Steel Clad cover plate (see Table I).
- 3/4-inch (19 mm) cover plate adjustment.
- Cover plate available with optional gasket.

Product Description

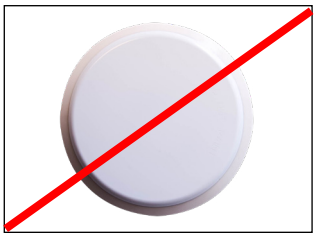
Model G5 series sprinklers are standard coverage, flat plate concealed sprinklers designed for installation in accordance with NFPA 13 and FM Global Property Loss Prevention Data Sheets. All Model G5 series sprinklers use a fusible-link operating element.

The sprinklers are offered with a standard Model G5 cover plate, a Model G5 cover plate with a quick-response (QR) gasket, or a Model G5 cover plate with a standard-response (SR) gasket. Model G5 sprinklers with a gasketed cover plate are intended for use in dust free environments such as clean rooms.

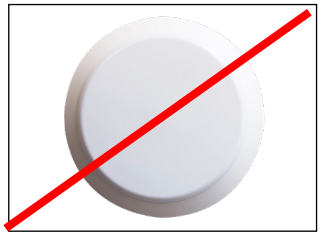
Model G5 sprinklers must only be used with the Model G5 cover plate listed or approved with the sprinkler. Table A provides a summary of available Model G5 series sprinklers, along with Listing and Approval information for each sprinkler and cover plate combination.

Important! Reliable fire sprinklers must be handled, stored, and installed in accordance with the guidelines in Caution Sheet 310 and this bulletin. Failure to follow these instructions may result in unintended operation or nonoperation of the fire protection system.

Model G5 Cover Plate



Model G5 Cover Plate with QR Gasket



Model G5 Cover Plate with SR Gasket

Note: Gasket material is silicone rubber, available in white only.

Model G5 Series Sprinkler Summary — **Table A**

Sprinkler Model	K-Factor gpm/psi$^{1/2}$ (L/min/bar$^{1/2}$)	Cover Plate Model	Listings and Approvals	Sensitivity	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
G5-28	2.8 (40)	G5	cULus	QR	175 (12)	RA3411
			FM	SR		
		G5 QR Gasket	cULus	QR		
		G5 SR Gasket	cULus, FM	SR		
G5-42	4.2 (60)	G5	cULus	QR	175 (12)	RA3413
		G5 QR Gasket				
		G5 SR Gasket	cULus	SR		
G5-56	5.6 (80)	G5	cULus	QR	250 (17)	RA3415
			FM, LPCB, VdS, CE, UKCA	SR	175 (12)	
		G5 QR Gasket	cULus	QR	250 (17)	
		G5 SR Gasket	cULus	SR	250 (17)	
			FM	SR	175 (12)	
G5-56 300	5.6 (80)	G5	cULus	QR	300 (21)	RA4014
		G5 QR Gasket				
		G5 SR Gasket	cULus	SR		
G5-80	8.0 (115)	G5	cULus	QR	175 (12)	RA3412
		G5 QR Gasket				
		G5 SR Gasket	cULus	SR		
G5-80F	8.0 (115)	G5	FM	SR	175 (12)	RA3417
		G5 SR Gasket				

Model G5-28 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3411

Technical Specifications
Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 2.8 (40 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Temperature Ratings
Ordinary
165°F (74°C) (Sprinkler)
[135°F (57°C) (Cover Plate)]
Intermediate
212°F (100°C) (Sprinkler)
[165°F (74°C) (Cover Plate)]

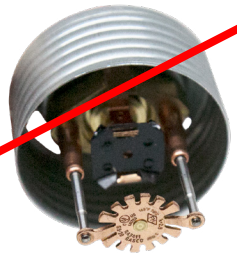
Sensitivity
(See Table B)

Cover Plates
Model G5
Model G5 QR Gasket (cULus only)
Model G5 SR Gasket

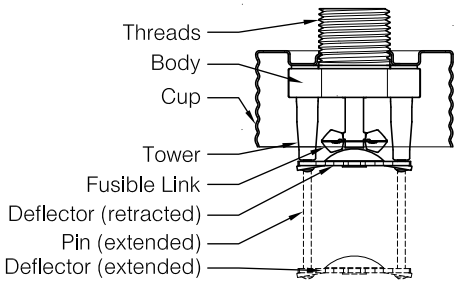
Cover Plate Finishes
(See Table I)

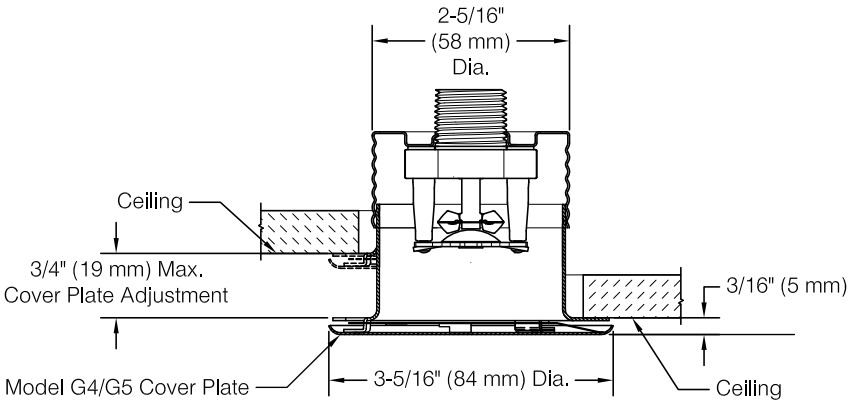
Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light Hazard only)
FM Approved



Model G5-28 Sprinkler Components and Dimensions — **Figure 1**





Model G5-28 Sprinkler Sensitivity — **Table B**

Cover Plate Model	Listing or Approval Agency	
	cULus	FM
G5	QR	SR
G5 QR Gasket	QR	--
G5 SR Gasket	SR	SR

QR: Quick-response
SR: Standard-response

Model G5-42 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3413

Technical Specifications
- **Style:** Flat Concealed Pendent
- **Threads:** 1/2" NPT or ISO 7-1 R1/2
- **Nominal K-Factor:** 4.2 (60 metric)
- **Max. Working Pressure:** 175 psi (12 bar)

Material Specifications
- **Fusible Link:** Beryllium Nickel
- **Sprinkler Body:** Brass Alloy
- **Levers:** Bronze Alloy
- **Yoke:** Brass Alloy
- **Sealing washer:** Nickel with PTFE
- **Load Screw:** Bronze Alloy
- **Towers:** Copper Alloy
- **Pins:** Stainless Steel
- **Deflector:** Bronze Alloy
- **Cup:** Steel

Temperature Ratings
Ordinary
165°F (74°C) (Sprinkler)
[135°F (57°C) (Cover Plate)]
Intermediate
212°F (100°C) (Sprinkler)
[165°F (74°C) (Cover Plate)]

Sensitivity
(See Table C)

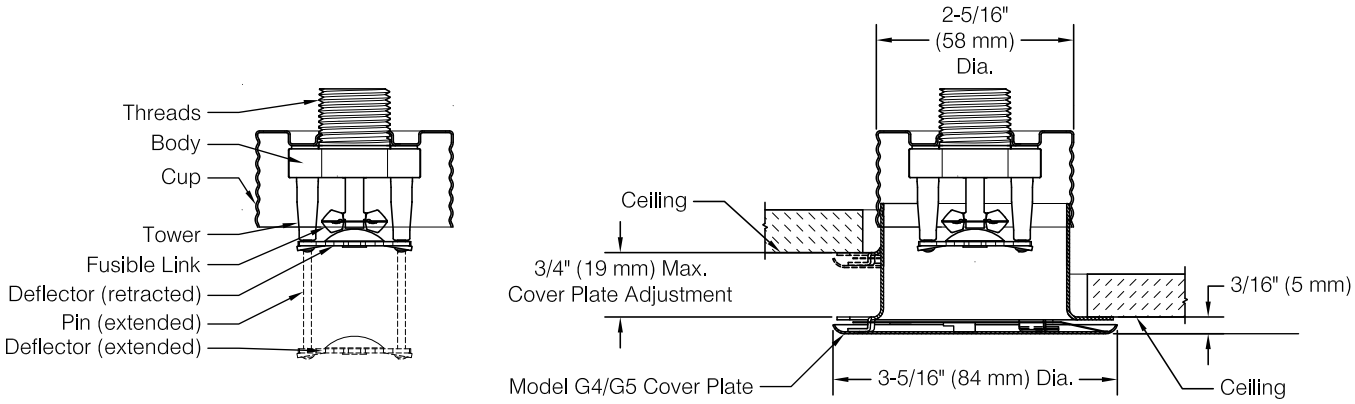
Cover Plates
Model G5
Model G5 QR Gasket
Model G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light Hazard only)

Model G5-42 Sprinkler Components and Dimensions — **Figure 2**



Model G5-42 Sensitivity — **Table C**

Cover Plate Model	Listing or Approval Agency
	cULus
G5	QR
G5 QR Gasket	QR
G5 SR Gasket	SR

QR: Quick-response
SR: Standard-response

Model G5-56 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3415

Technical Specifications
Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Temperature Ratings
Ordinary
165°F (74°C) (Sprinkler)
[135°F (57°C) (Cover Plate)]
Intermediate
212°F (100°C) (Sprinkler)
[165°F (74°C) (Cover Plate)]

Sensitivity
(See Table D)

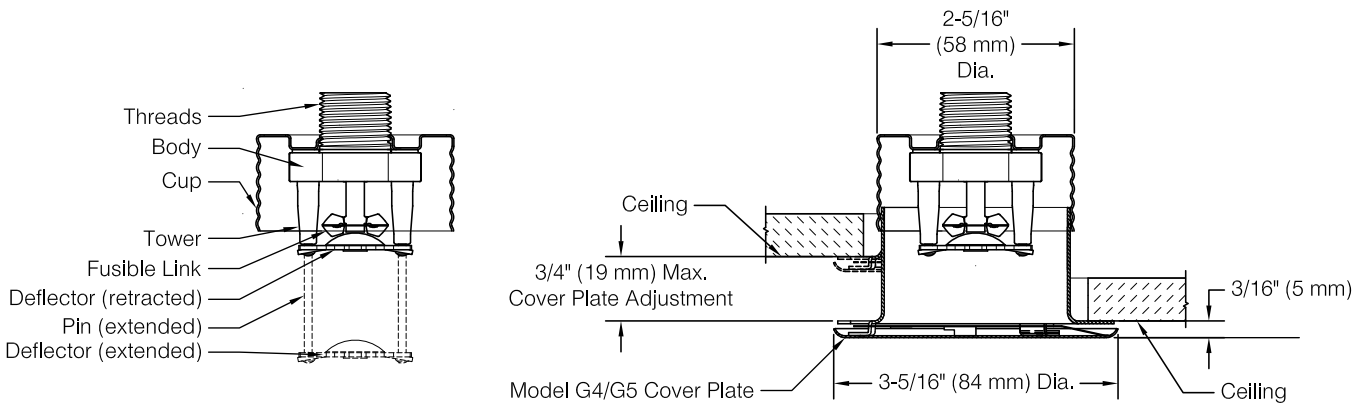
Cover Plates
Model G5
Model G5 QR Gasket (cULus only)
Model G5 SR Gasket (cULus and FM only)

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light & Ordinary Hazard only)
FM Approved
LPCB Approved
VdS Approved [165°F (74°C) only]
CE Listed (2831-CPR-S2062)
UKCA: 0832-UKCA-CPR-S5045

Model G5-56 Sprinkler Components and Dimensions — Figure 3



Model G5-56 Sensitivity — Table D

Cover Plate Model	Listing or Approval Agency		
	cULus	FM	LPCB, VdS, CE, UKCA
G5	QR	SR	SR
G5 QR Gasket	QR	--	--
G5 SR Gasket	SR	SR	--

QR: Quick-response
SR: Standard-response

Model G5-56 300 Standard Coverage, Concealed Pendent Sprinkler — SIN RA4014

Technical Specifications
- **Style:** Flat Concealed Pendent
- **Threads:** 1/2" NPT or ISO 7-1 R1/2
- **Nominal K-Factor:** 5.6 (80 metric)
- **Max. Working Pressure:** 300 psi (21 bar)

Material Specifications
- **Fusible Link:** Beryllium Nickel
- **Sprinkler Body:** Brass Alloy
- **Levers:** Bronze Alloy
- **Yoke:** Brass Alloy
- **Sealing washer:** Nickel with PTFE
- **Load Screw:** Bronze Alloy
- **Towers:** Copper Alloy
- **Pins:** Stainless Steel
- **Deflector:** Bronze Alloy
- **Cup:** Steel

Temperature Ratings
- Ordinary
  - 165°F (74°C) (Sprinkler)
  - [135°F (57°C) (Cover Plate)]
- Intermediate
  - 212°F (100°C) (Sprinkler)
  - [165°F (74°C) (Cover Plate)]

Sensitivity
- (See Table E)

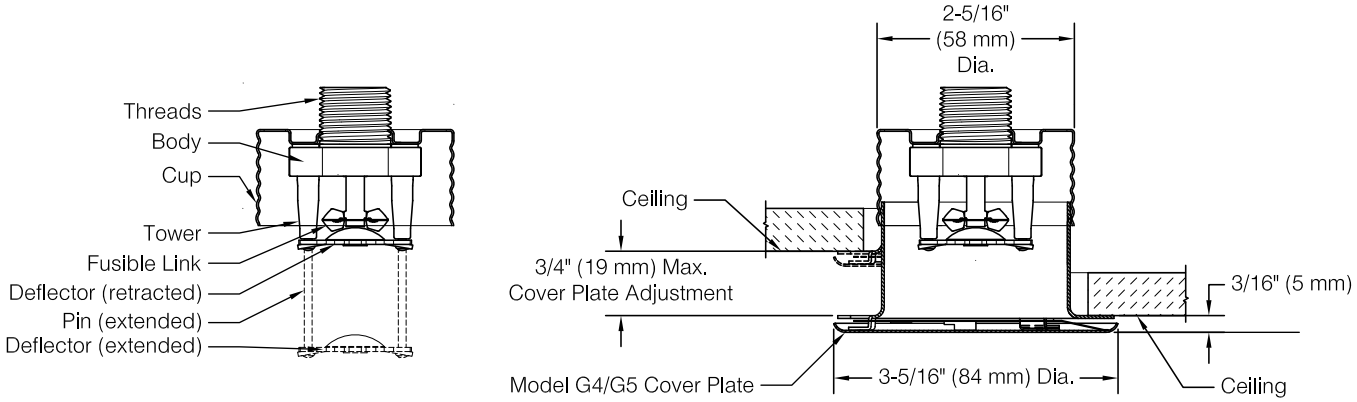
Cover Plates
- Model G5
- Model G5 QR Gasket
- Model G5 SR Gasket

Cover Plate Finishes
- (See Table I)

Sprinkler Wrench
- Model W3
- Model FC

Listings and Approvals
- cULus Listed (Light & Ordinary Hazard only)

Model G5-56 300 Sprinkler Components and Dimensions — Figure 4



Model G5-56 300 Sensitivity — Table E

Cover Plate Model	Listing or Approval Agency
	cULus
G5	QR
G5 QR Gasket	QR
G5 SR Gasket	SR

QR: Quick-response
SR: Standard-response

Model G5-80 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3412

Technical Specifications
Style: Flat Concealed Pendent
Threads: 3/4" NPT or ISO 7-1 R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Temperature Ratings
Ordinary
165°F (74°C) (Sprinkler)
[135°F (57°C) (Cover Plate)]
Intermediate
212°F (100°C) (Sprinkler)
[165°F (74°C) (Cover Plate)]

Sensitivity
(See Table F)

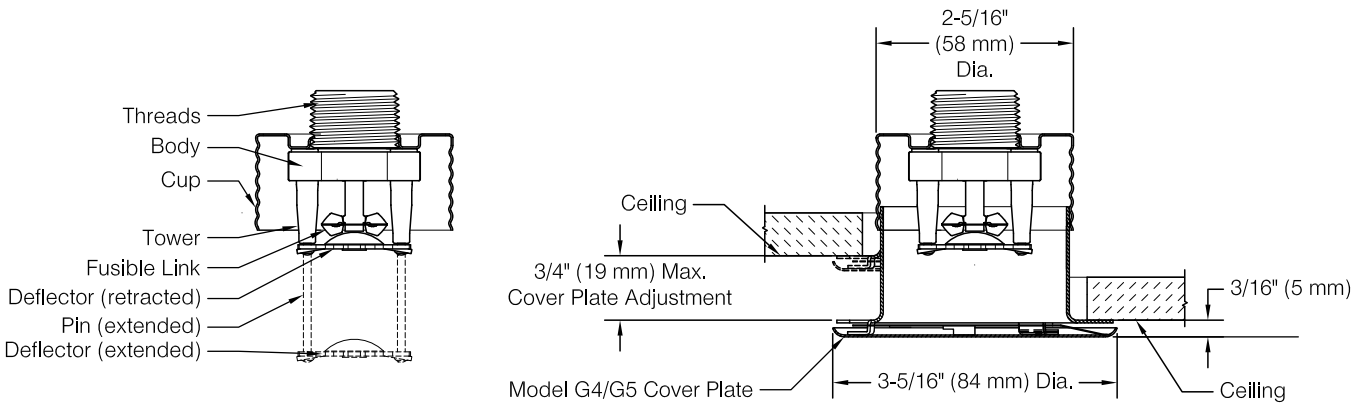
Cover Plates
Model G5
Model G5 QR Gasket
Model G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light & Ordinary Hazard only)

Model G5-80 Sprinkler Components and Dimensions — Figure 5



Model G5-80 Sensitivity — Table F

Cover Plate Model	Listing or Approval Agency
	cULus
G5	QR
G5 QR Gasket	QR
G5 SR Gasket	SR

QR: Quick-response
SR: Standard-response

Model G5-80F Standard Coverage, Concealed Pendent Sprinkler — SIN RA3417

Technical Specifications
Style: Flat Concealed Pendent
Threads: 3/4" NPT or ISO 7-1 R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Stainless Steel
Cup: Steel

Temperature Ratings
Ordinary
165°F (74°C) (Sprinkler)
[135°F (57°C) (Cover Plate)]
Intermediate
212°F (100°C) (Sprinkler)
[165°F (74°C) (Cover Plate)]

Sensitivity
Standard Response

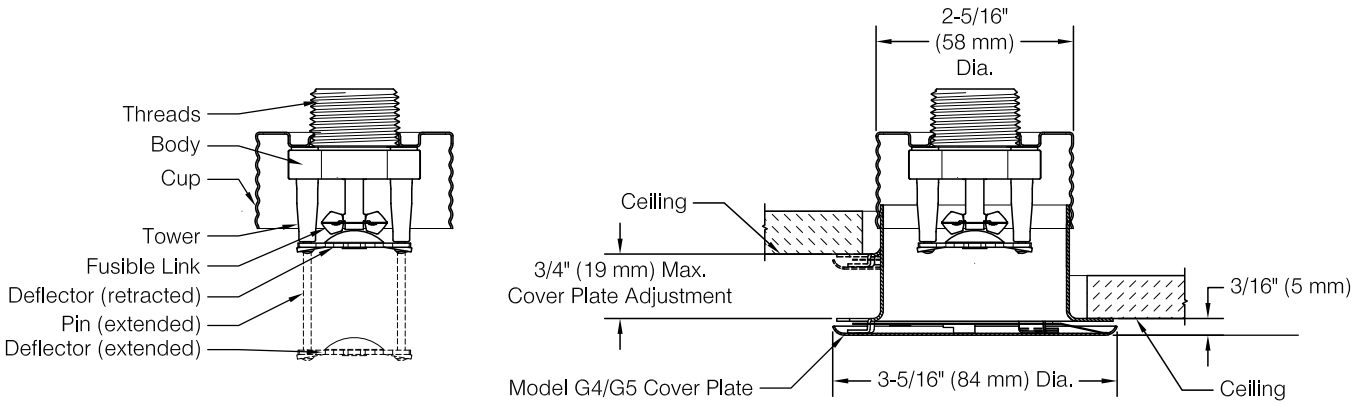
Cover Plates
Model G5
Model G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
FM Approved

Model G5-80F Sprinkler Components and Dimensions — **Figure 6**



Model G5-80F Sensitivity — **Table G**

Cover Plate Model	Listing or Approval Agency
	FM
G5	SR
G5SR Gasket	SR

SR: Standard-response

Installation Dimensions and Cover Plate Information — **Table H**

Cover Plate Model	Cover Plate Diameter Inch (mm)	Recommended Hole Diameter in Ceiling Inch (mm)	Cover Plate Adjustment Inch (mm)	Min. to Max. Face of Fitting to Ceiling[1] Inch (mm)	Min. to Max. Dropped Deflector Distance below Ceiling Inch (mm)	Cover Plate Temperature Rating °F (°C)
G5	3-5/16 (84)	2-5/8 (67)	3/4 (19)	1-1/2 to 2-1/4 (38 to 57)	1/4 to 1 (6 to 25)	135°F[3] (57°C) or 165°F[4] (74°C)
G5 QR Gasket[2]	3-11/16 (94)					
G5 SR Gasket[2]	4 (101 mm)					

Notes:

1. Face of fitting to ceiling dimensions are based on nominal thread make up. Verify dimensions based on fitting and thread sealing method prior to installation. A 1/2" x 1/2" brass nipple extension (Reliable P/N 6999991900) is available to assist with replacement of Reliable Model G4A sprinklers.
2. Model G5 QR Gasket and Model G5 SR Gasket cover plates are sold as assembled units including both the cover plate and gasket. Model G5 QR Gasket and Model G5 SR Gasket cover plates and gaskets are not interchangeable.
3. For use with 165°F (74°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 100°F (38°C).
4. For use with 212°F (100°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 150°F (66°C).

Cover Plate Finishes[1][2] — **Table I**

Standard Finishes	Special Application Finishes
White Paint Chrome	Off-White Paint Black Paint Custom Color Paint (Specify)[3] Raw Brass (Lacquered) Bright Brass Finished Bronze Satin Chrome Stainless Steel Clad[4] Custom Printed

Notes:

1. Paint or any other coating applied over the factory finish will void all approvals and warranties.
2. Cover plates do not carry corrosion resistant listings or approvals.
3. Custom color paint is semi-gloss unless specified otherwise.
4. Stainless steel clad cover plates are Type 316 Stainless Steel on the finished side and C102 Copper Alloy on the back side.

Application

Model G5 series sprinklers are standard coverage, flat plate concealed pendent sprinklers. The sprinklers are intended for use in accordance with NFPA 13 and FM Global Property Loss Prevention Data Sheets, as well as the requirements of the applicable approval agencies.

Model G5 series sprinklers are available as either Quick-response (QR) or Standard-response (SR) depending on the approval agency and cover plate selected.

Model G5 series sprinklers use Model G5 flat cover plates. Model G5 QR Gasket and G5 SR Gasket cover plates are available to limit air and dust movement through the ceiling.

Listing & Approval Agencies

Individual Model G5 series sprinkler may be listed or approved by the following agencies:

- Underwriters Laboratories, Inc. and UL Canada (cULus)
  Listing Category: Sprinklers, Automatic and Open
  Guide Number: VNIV
- FM Approvals (FM)
- Loss Prevention Certification Board (LPCB)
- VdS Schadenverhütung GmbH (VdS)
- EC-Certificate of Conformity 0832-CPD-2062 (CE)
- UKCA EN12259-1 : 1999 +A3:2006

See Table A and the individual sprinkler data sheets in this Bulletin for listings and approvals applicable to each sprinkler.

Installation

Model G5 series sprinklers are intended to be installed in accordance with NFPA 13, FM Global Property Loss Prevention Data Sheets, and the requirements of applicable authorities having jurisdiction. Model G5 series sprinklers must not be installed in ceilings with positive pressure in the space above. Ensure that the 4 slots in the cup are open and unobstructed following installation.

Model G5 series sprinklers are shipped with a wrench-able protective cap that should remain on the sprinkler until the sprinkler system is placed in service following construction.

Model G5 series sprinklers can be installed without removing the wrench-able protective cap using the Model W3 wrench. Alternatively, Model G5 series sprinklers can be installed using the Model FC wrench by temporarily removing the protective cap during installation of the sprinkler. The use of any other wrench to installed Model G5 series sprinklers is not permitted and may damage the sprinkler.

Wrench

Model FC
For use with Model G5 Series sprinklers without wrench-able cap installed

Model W3
For use with Model G5 Series sprinklers with wrench-able cap installed

Fully insert the Model W3 wrench over the cap until it reaches the bottom of the cup, or the Model FC wrench over the sprinkler until the wrench engages the body. Do not wrench any other part of the sprinkler/cup assembly. The Model W3 and FC wrenches are designed to be turned with a standard 1/2" square drive. Tighten the sprinkler into the fitting after applying a PTFE based thread sealant to the sprinkler's threads. Recommended installation torque is specified in Table J.

Installation Torque — **Table J**

Sprinkler Threads	Recommended Installation Torque (min. – max.)	
	ft.lb	N·m
½" NPT or ISO7-1R1/2	8-18	11-24
¾" NPT or ISO7-1R3/4	14-20	19-27

Do not exceed the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinkler. Use care when inserting or removing the wrench from the sprinkler to avoid damage to the sprinkler.

Install the cover plate by hand, pushing and then turning the cover in the clockwise direction until it is tight against the ceiling. For Model G5 QR Gasket and Model G5 SR Gasket cover plates, the gasket should be attached to the flange of the cover plate skirt only. Do not glue the gasket in place or allow the gasket to overlap both the cover plate and the flange of the skirt.

Maintenance

Reliable Model G5 series sprinkler should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler or cover plate which has been painted (other than factory applied). Properly installed Model G5 cover plates will have an air gap that is required for proper operation, do not seal the gap or paint the cover plates. Model G5 series sprinklers have holes in the cup that must remain unobstructed.

Replace any sprinkler which has been damaged. A stock of spare sprinklers should be maintained to allow quick re-placement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Patents

Model G5 series sprinklers may be covered by one or more of the following patents:

U.S. Patent 6,554,077, U.S. Patent 7,275,603, U.S. Patent 8,776,903, U.S. Patent 9,248,327

Ordering Information

Specify the following when ordering.

Sprinkler
- Model [G5-28] [G5-42] [G5-56] [G5-56 300] [G5-80] [G5-80F]
- Temperature Rating [165°F (74°C)] [212°F (100°C)]
- Threads [NPT or ISO 7-1]

Cover Plate
- Model [G5, G5 QR Gasket, G5 SR Gasket]
- Finish (See Table I)

Sprinkler Wrench
- Model W3
- Model FC

P/N 9999970421

Intentionally Blank

Reliable®

Model JL14 & JL17 ESFR Pendent Sprinklers

175 psi (12 bar) rated

Features

- cULus, VdS, and LPCB listed as an ESFR sprinkler
- FM Approved as a quick-response, storage and non-storage sprinkler
- Fusible link operating element
- Compact design

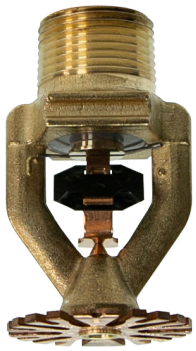
Product Description

The Reliable Models JL14 and JL17 are Early Suppression Fast Response (ESFR) Sprinklers with nominal K-factors of 14.0 (200 metric) and 16.8 (240 metric), respectively. The sprinklers use a levered fusible alloy solder link in either a 165°F (74°C) or a 212°F (100°C) temperature rating. These sprinklers are designed to respond quickly to growing fires and will deliver a heavy water discharge to “suppress” rather than “control” fires.

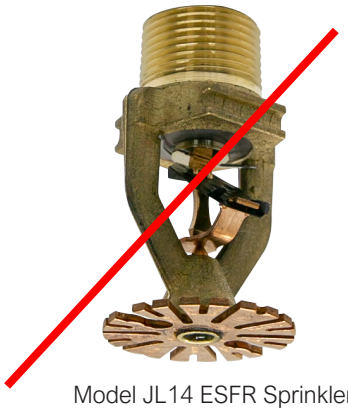
FM Approvals classifies the Model JL14 and JL17 as quick-response sprinklers, storage and non-storage, when used in accordance with FM Global Property Loss Prevention Data Sheets.

Model JL14 and JL17 ESFR sprinklers are designed to be shorter and more compact than other ESFR sprinklers, allowing greater flexibility with regard to distance from ceilings and obstructions. The JL14 and JL17 ESFR sprinklers are also less susceptible to damage due to smaller deflector and frame design. The lighter JL14 and JL17 ESFR sprinklers passed rough use and abuse listing tests without plastic protectors

Important! Reliable fire sprinklers must be handled, stored, and installed in accordance with the guidelines in Caution Sheet 310 and this bulletin. Failure to follow these instructions may result in unintended operation or nonoperation of the fire protection system.



Model JL17 ESFR Sprinkler



Model JL14 ESFR Sprinkler

Models JL14 & JL17 ESFR Pendent Sprinklers — **Table A**

Model	Nominal K-factor gpm/psi$^{1/2}$ (L/min/bar$^{1/2}$)	Approvals	Sprinkler Identification Number (SIN)
JL14	14.0 (200)	cULus, FM, VdS, LPCB, CNBOP-PIB, CE	RA1812
JL17	16.8 (240)	cULus, FM, VdS, LPCB, CNBOP-PIB, CE	RA1914

Model JL14 ESFR Sprinkler

SIN RA1812

Technical Specifications
- **Style:** Pendent
- **Connection:** 3/4” NPT or ISO7-1R3/4 (BSPT) threads
- **Nominal K-Factor:** 14.0 (200 metric)
- **Max. Working Pressure:** 175 psi (12 bar)

Material Specifications
- **Thermal Sensor:** Beryllium Nickel Solder Link
- **Sprinkler Frame:** Brass Alloy
- **Cap:** Bronze Alloy
- **Sealing Assembly:** Nickel Alloy with PTFE
- **Load Screw:** Bronze Alloy
- **Deflector:** Bronze Alloy
- **Kick Spring:** Stainless Steel Alloy

Sprinkler Finishes
- Bronze

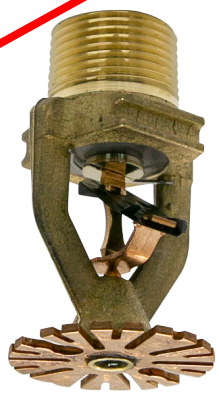
Sensitivity
- Fast-Response
- Quick-Response (FM)

Temperature Ratings
- Ordinary: 165°F (74°C)
- Intermediate: 212°F (100°C)

Sprinkler Wrench
- Model J1

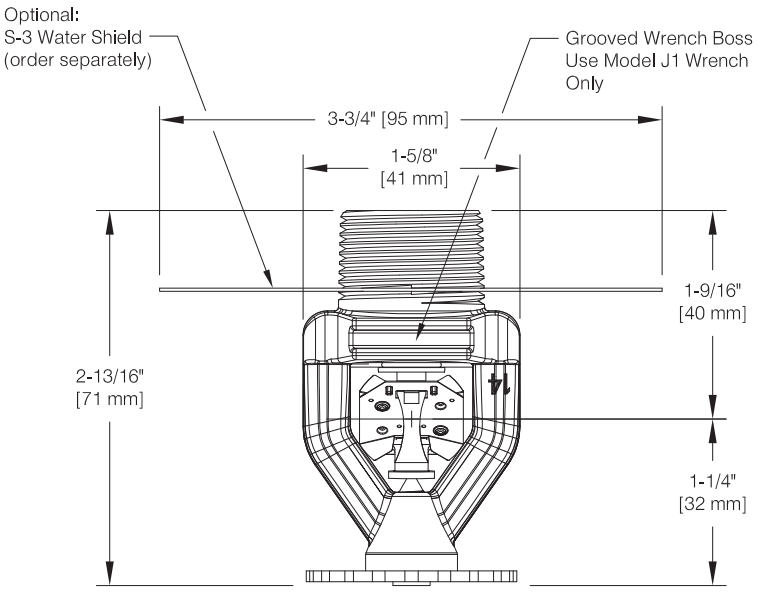
Guards & Shields
- Model S-3 Water Shield (FM)*

Listings and Approvals
- cULus
- FM Approved
- VdS
- LPCB
- CNBOP-PIB
- CE (2809-CPR-M0015)



***Note:** Model JL14 fire sprinkler is FM Approved with Model S-3 Water Shield for use as a pendent intermediate level sprinkler. Model S-3 Water Shield diameter is 3-3/4” (95mm).

Model JL14 Sprinkler Components and Dimensions — **Figure 1**



Model JL17 ESFR Sprinkler — SIN RA1914

Technical Specifications
- **Style:** Pendent
- **Connection:** 3/4” NPT or ISO7-1R3/4 (BSPT) threads
- **Nominal K-Factor:** 16.8 (240 metric)
- **Max. Working Pressure:** 175 psi (12 bar)

Material Specifications
- **Thermal Sensor:** Beryllium Nickel Solder Link
- **Sprinkler Frame:** Brass Alloy
- **Cap:** Bronze Alloy
- **Sealing Assembly:** Nickel Alloy with PTFE
- **Load Screw:** Bronze Alloy
- **Deflector:** Bronze Alloy
- **Kick Spring:** Stainless Steel Alloy

Sprinkler Finishes
- Bronze

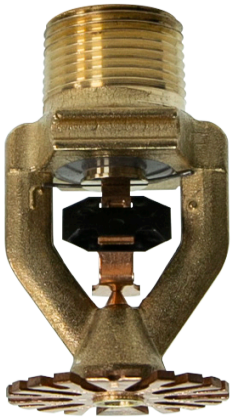
Sensitivity
- Fast-Response
- Quick-Response (FM)

Temperature Ratings
- Ordinary: 165°F (74°C)
- Intermediate: 212°F (100°C)

Sprinkler Wrench
- Model J1

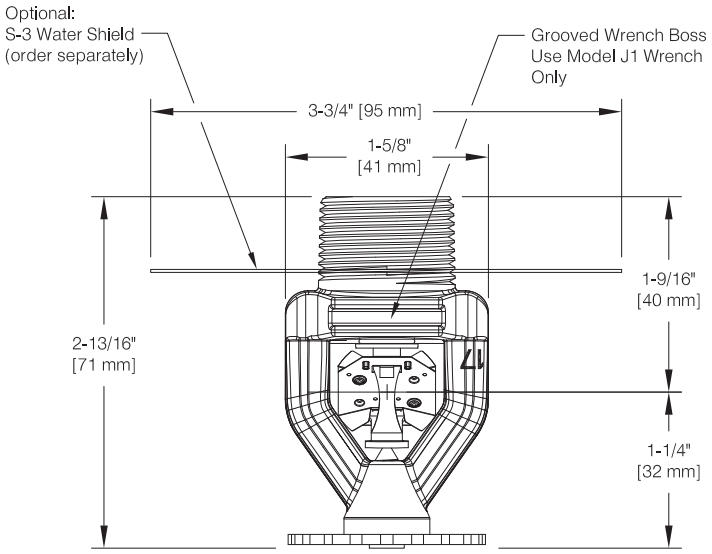
Guards & Shields
- Model S-3 Water Shield (FM)*

Listings and Approvals
- cULus
- FM Approved
- VdS
- LPCB
- CNBOP-PIB
- CE (2809-CPR-M0015)



***Note:** Model JL17 fire sprinkler is FM Approved with Model S-3 Water Shield for use as a pendent intermediate level sprinkler. Model S-3 Water Shield diameter is 3-3/4” (95mm).

Model JL17 Sprinkler Components and Dimensions — **Figure 2**



Model JL14 and JL17 Commodity Selection and Design Criteria Overview **Table B**

Storage Type	NFPA	FM GLOBAL
Sprinkler Type	ESFR	Storage
Response Type	ESFR	Quick Response
System Type	Wet	Wet
Temperature Rating °F (°C)	165 (74), 212 (100)	165 (74), 212 (100)
Roof Construction	See NFPA 13	See FM Global 2-0
Ceiling Slope	See NFPA 13	See FM Global 2-0
Maximum Coverage Area	See NFPA 13	See FM Global 2-0
Minimum Coverage Area	See NFPA 13	See FM Global 2-0
Maximum Spacing	See NFPA 13	See FM Global 2-0
Minimum Spacing	See NFPA 13	See FM Global 2-0
Minimum Clearance to Commodity	See NFPA 13	See FM Global 2-0
Sprinkler Distance to Ceiling	See NFPA 13	See FM Global 2-0
Open Frame, Single, Double, Multiple Row, or Portable Rack Storage of Class I-IV Commodities and Group A Plastics	See NFPA 13	See FM 2-0 & 8-9
Solid Pile or Palletized Storage of Class I-IV Commodities and Group A Plastics	See NFPA 13	See FM 2-0 & 8-9
Idle Pallet Storage	See NFPA 13	See FM 2-0, 8-9 & 8-24
Rubber Tire Storage	See NFPA 13	See FM 2-0 & 8-3
Rolled Paper Storage	See NFPA 13	See FM 8-21
Flammable Liquid Storage	See NFPA 30	See FM 7-29
Aerosol Storage	See NFPA 30B	See FM 7-31
Auto Components in Portable Racks	See NFPA 13	See FM 2-0 and 8-9

Installation

Model JL14 and JL17 sprinklers are intended for installation in accordance with NFPA 13 and FM Loss Prevention Data Sheets 2-0 and 8-9, as well as the requirements of any Authorities Having Jurisdiction. See Table B for information on NFPA and FM Global design criteria for the Model JL14 and JL17 sprinklers.

For threaded sprinklers only, use the Model J1 sprinkler wrench for removal and installation. Any other type of wrench may damage the sprinkler. A grooved wrench boss is provided on the sprinkler to limit the potential for the wrench to slip during installation.

When handling sprinklers, hold sprinklers only on frame arms and do not apply any force on the link assembly. Model JL14 and JL17 sprinklers should be tightened between 14 - 40 ft-lbs (19 - 54 N·m) torque. Sprinklers not tightened to recommended torque may cause leakage or impairment of the sprinkler. Damaged sprinklers must be replaced immediately.

Caution: When handling sprinklers, hold sprinklers only by the frame arms and do not apply any force on the link assembly.

Maintenance

Model JL14 and JL17 ESFR Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinkler with soap and water, ammonia or any other cleaning fluid. Replace any sprinkler that has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used, to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Once operated, automatic sprinklers cannot be reassembled and reused. New sprinklers of the same size, type and temperature rating must be installed. A cabinet of replacement sprinklers should be provided for this purpose.

Listings and Approvals

1. UL Listed and ULC Certified for Canada (cULus)
2. FM Approved (FM)
3. VdS Certified (VdS)
4. Loss Prevention Certification Board Approved (LPCB)
5. CNBOP-PIB Technical Approval (CNBOP-PIB)
6. CE (2809-CPR-M0015, 2809-CPR-M0016)

Model J1 Sprinkler Wrench **Figure 3**

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify

- Sprinkler: [JL14] [JL17]
- Temperature Rating: [165°F (64°C)] [212°F (100°C)]
- End Connection: [3/4" NPT] [ISO7-1R3/4 (BSPT)]

Optional

- S-3 Water Shield (threaded sprinklers only)

Intentionally Blank

Model 350ASTDA

Double Check Detector Assembly

Application

Designed for installation on water lines in fire protection systems to protect against both backsiphonage and back-pressure of polluted water into the potable water supply. Model 350ASTDA shall provide protection where a potential health hazard does not exist. Incorporates metered by-pass to detect leaks and unauthorized water use.

Standards Compliance (Horizontal & Vertical)

- ASSE® Listed 1048
- AWWA Compliant C510 (with gates only) and C550
- UL® Classified
- C-UL® Classified
- FM® Approved
- CSA® Certified B64.5
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California
- Meets the requirements of NSF/ANSI/CAN 61*

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

By-Pass Backflow Assembly 3/4" Model 950XLD

Materials

Main valve body	304L Stainless steel
Access covers	304L Stainless steel
Internals	Stainless steel, 300 Series NORYL™
Fasteners & springs	Stainless Steel, 300 Series
Elastomers	EPDM (FDA approved)
	Buna Nitrile (FDA approved)
Polymers	NORYL™

Features

Sizes: 2 1/2", 3", 4", 6", 8", 10"

Maximum working water pressure	175 PSI
Maximum working water temperature	140°F
Hydrostatic test pressure	350 PSI
End connections (Grooved for steel pipe)	AWWA C606
(Flanged)	ANSI B16.42 Class 150

Dimensions & Weights (do not include pkg.)

MODEL 350ASTDA SIZE		WEIGHT							
		WITH OS&Y GATES (GXF)		WITH OS&Y GATES (GXG)		WITH BUTTERFLY VALVES (GXG)		WITH BUTTERFLY VALVES (FXG)	
in.	mm	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
2 1/2	65	126	57	116	53	93	42	103	47
3	80	143	65	131	60	97	44	110	50
4	100	218	99	198	90	101	46	123	56
6	150	352	160	322	147	164	74	194	88
8	200	667	303	613	278	350	159	373	169
10	250	885	401	827	375	463	210	521	236

(SHOWN WITH OPTIONAL FLANGED END BUTTERFLY VALVES)

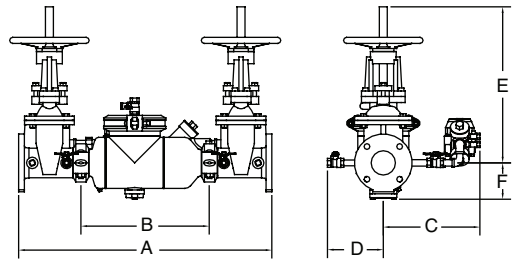
Options (Suffixes can be combined)

- ☐ - with flanged end OS & Y gate valves (standard)
- ☐ LM - less water meter
- ☐ - with gallon meter (standard)
- ☐ CFM - with cu ft meter
- ☐ CMM - with cu meter meter
- ☐ G - with grooved end OS&Y gate valves
- ☐ FG - with flanged inlet gate connection and grooved outlet gate connection
- ☐ PI - with Post Indicator Gate Valves
- ☐ BG - with grooved end butterfly valves with integral supervisory switches
- ☐ BF - with flanged end butterfly valves with integral supervisory switches
- ☐ RV - with By-pass on right hand side

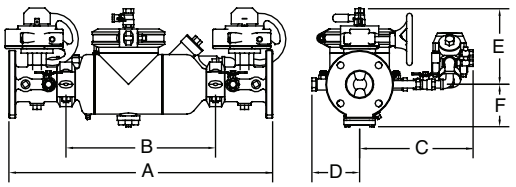
Accessories

- ☐ Repair kit (rubber only)
- ☐ Thermal expansion tank (Model XT)
- ☐ OS & Y Gate valve tamper switch (OSY-40)

MODEL 350ASTDA with OS&Y option



MODEL 350ASTDA with BF option



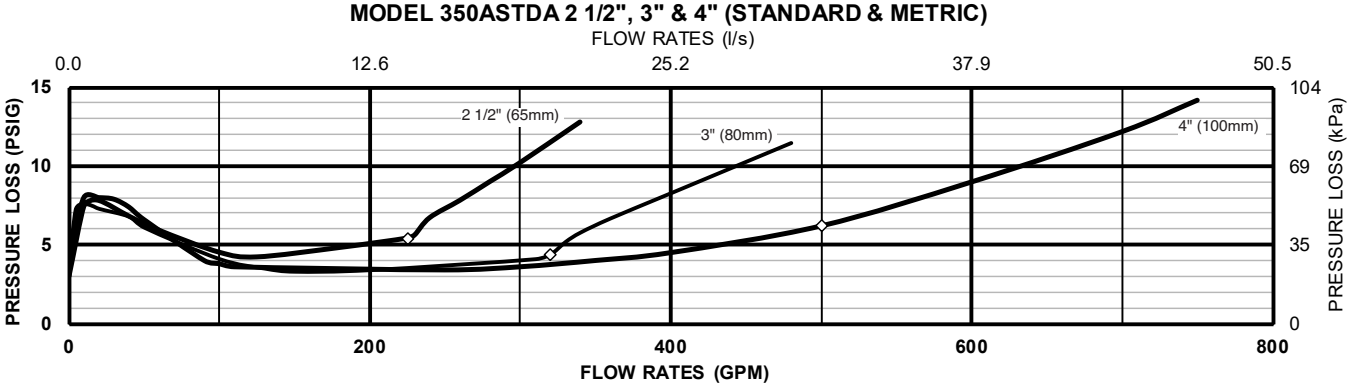
MODEL 350ASTDA SIZE		DIMENSION (approximate)																	
		A		A WITH BUTTERFLY VALVES		B LESS GATE VALVES		C		D		E OS&Y OPEN		E OS&Y CLOSED		E WITH BUTTERFLY VALVES		F	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2 1/2	65	31 7/8	810	28 3/4	730	n/a	n/a	12	305	7 1/4	184	17 3/4	451	15 3/8	391	8 1/4	210	5	127
3	80	32 7/8	835	29 3/8	746	n/a	n/a	12	305	7 1/4	184	20 1/4	514	17	432	8 1/4	210	5	127
4	100	34 7/8	886	30 1/4	768	n/a	n/a	12	305	8	203	22 1/2	572	18 1/4	464	9	229	5	127
6	150	43 1/2	1105	36 1/2	927	n/a	n/a	10 1/2	267	10	254	30 1/2	775	24 1/4	616	10 1/4	260	6	152
8	200	52 3/4	1340	45 3/4	1162	n/a	n/a	15 1/8	384	11	279	37	940	28 1/2	724	18 1/2	470	8 3/8	213
10	250	55 3/4	1416	49 3/4	1264	n/a	n/a	15 1/8	384	12	305	45 5/8	1159	34 3/4	883	18 1/2	470	8 3/8	213

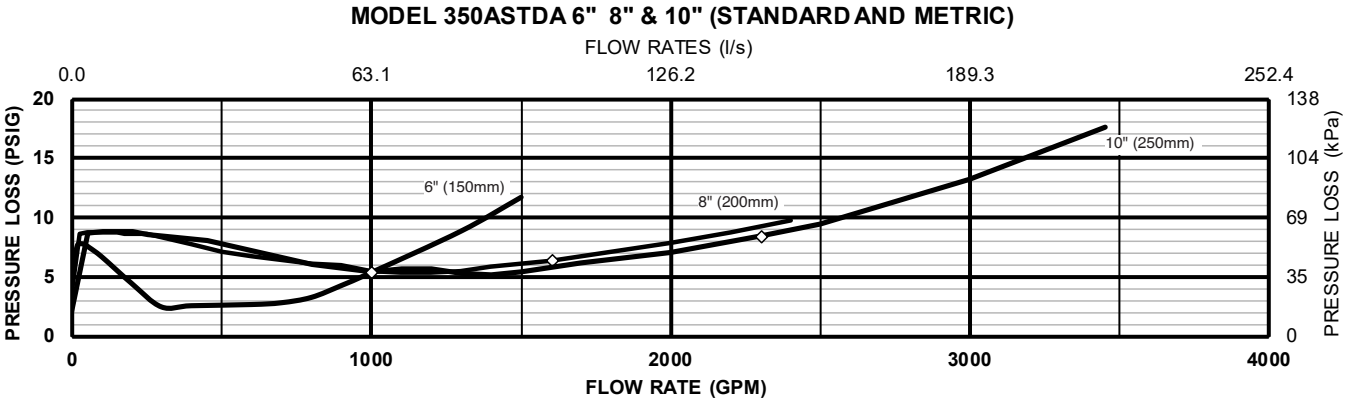
Zurn Industries, LLC | Wilkins
1747 Commerce Way, Paso Robles, CA U.S.A. 93446 Ph. 855-663-9876, Fax 805-238-5766
In Canada | **Zurn Industries Limited**
7900 Goreway Drive, Unit 10, Brampton, Ontario L6T 5W6, 877-892-5216
www.zurn.com

Rev. Q
Date: 08/20
Document No. BF-350ASTDA
Product No. Model 350ASTDA
Patent zurn.com/patents

Flow Characteristics

◇Rated Flow (established by approval agencies)

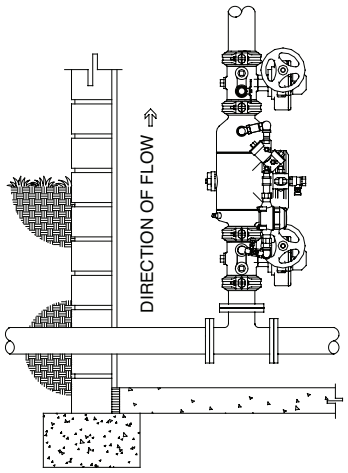




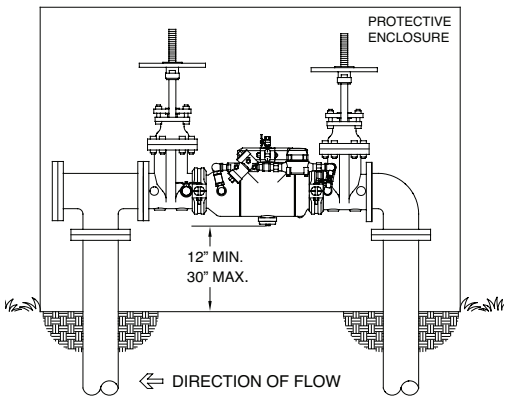
Typical Installation

Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted at a minimum of 12" (305mm) and a maximum of 30" (762mm) above adequate drains with sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe size	5 ft/sec	7.5 ft/sec	10ft/sec	15 ft/sec
2 1/2"	**75**	**112**	**149**	**224**
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1763	2644	3525	5288



ZURN WILKINS MODEL 350ASTDABG
INDOOR VERTICAL INSTALLATION



ZURN WILKINS MODEL 350ASTDA
OUTDOOR HORIZONTAL INSTALLATION

Specifications

The Double Check Detector Backflow Prevention Assembly shall be certified to NSF/ANSI/CAN 61, ASSE® Listed 1048, and supplied with full port gate valves. The main body and access cover shall be 304L Stainless Steel, the seat ring and check valve shall be Noryl™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The first and second check valves shall be accessible for maintenance without removing the device from the line. The Double Check Detector Backflow Prevention Assembly shall be a ZURN WILKINS Model 350ASTDA.

Zurn Industries, LLC | Wilkins
1747 Commerce Way, Paso Robles, CA U.S.A. 93446 Ph. 855-663-9876, Fax 805-238-5766
In Canada | **Zurn Industries Limited**
7900 Goreway Drive, Unit 10, Brampton, Ontario L6T 5W6, 877-892-5216
www.zurn.com

Reliable®

Model FX Dry Pipe Valve

2” (50mm), 2-1/2” (65mm), 76mm, 3” (80mm), 4” (100mm), 6” (150mm), 165mm

cULus Listed, FM Approved, LPCB Approved

Features

- Lightweight ductile iron body with compact trim
- External reset reduces setup and commissioning time
- Does not require priming water

Product Description

The Reliable Model FX Dry Pipe Valve is a differential-principle, externally resettable valve designed for use as a primary control valve in a dry pipe system. The valve clapper is held in the set position by pneumatic pressure acting on a larger surface area than that of the incoming water pressure. Release of pneumatic pressure from the system allows the dry pipe valve to open. The Model FX valve is available with grooved end, flanged end, or flange x grooved end connections (see Table A).

When required, all sizes of the Model FX valve may be equipped with the Reliable Model B1 Accelerator (PN 650120001A; ordered separately). The accelerator is a normally closed valve that opens upon a predetermined rate of air or nitrogen pressure loss. When the accelerator opens, air or nitrogen pressure is directed to the intermediate chamber of the Model FX valve, hastening the valve trip time. Please refer to Reliable Technical Bulletin 323 for further information.

Note: Pressure switches (low air and flow alarm) provided with fully assembled valves only. Order separately with loose and segmented trim.

Model FX Dry Pipe Valve Technical Data — **Table A**

Valve Size	End Connection	Fully Assembled Weight (w/o Control Valve) lbs (kg)	Approximate Shipping Weight for Valve Fully Assembled with Trim lbs (kg)	Rated Pressure psi (bar)	Listings and Approvals
2” (50mm)	Groove/Groove	42 (19)	82 (37)	250 (17.2)	cULus FM LPCB
2-1/2” (65mm)	Groove/Groove	55 (25)	115 (52)	300 (20.7)	
76mm	Groove/Groove	55 (25)	120 (54)		
3” (80mm)	Groove/Groove	56 (25)	120 (54)		
4” (100mm)	Groove/Groove	78 (35)	155 (70)		
	Flange/Groove	90 (41)	167 (76)		
	Flange/Flange	102 (46)	179 (81)		
6” (150mm)	Groove/Groove	127 (58)	234 (106)		
	Flange/Groove	136 (62)	252 (114)		
	Flange/Flange	163 (74)	270 (122)		
165mm	Groove/Groove	127 (58)	234 (106)		

Notes:

1. Grooved ends per ANSI/AWWA C606; flanged ends per ASME B16.5 Class 150, BS10 BS-E, or ISO 7005-2 PN16 (specify).
2. Valves are intended to be installed on systems where the pressure does not exceed the working capabilities of the end configurations.
3. Approximate shipping weight given for fully assembled valve and trim, including control valve and accelerator.

Model FX Dry Pipe Valve

Technical Specifications
Pressure Rating: See Table A

Material Specifications
Body & Cover: Ductile Iron, painted
Clapper: Stainless Steel
Seat: EPDM Rubber/Aluminum
Trim: Galvanized Steel

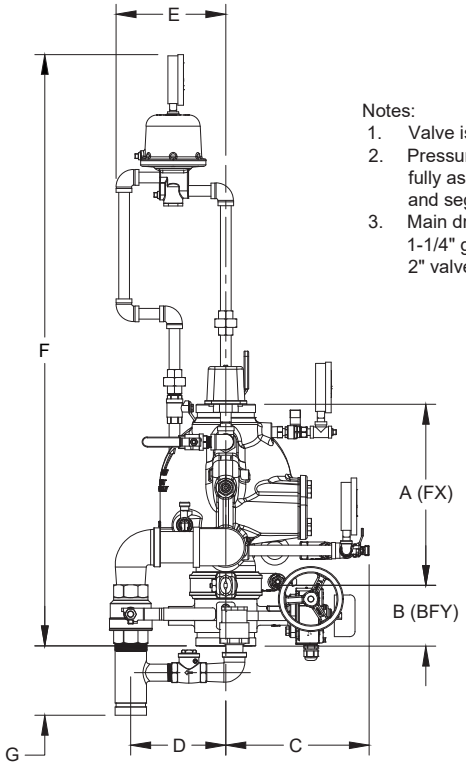
End Connections
See Table A

Installation Orientation
Vertical (Up Through Valve)

Approvals
cULus Listed
FM Approved
LPCB Approved
(EN 12259-3:2000)

Model FX Dry Pipe Valve Components and Dimensions

Figure 1



Notes:
1. Valve is shown with optional Model B1 Accelerator
2. Pressure switches (low air and flow alarm) provided with fully assembled valves only. Order separately with loose and segmented trim.
3. Main drain connection is 2" grooved for 4" and 6" valves, 1-1/4" grooved for 2-1/2" and 3" valves, and 1" FNPT for 2" valves.

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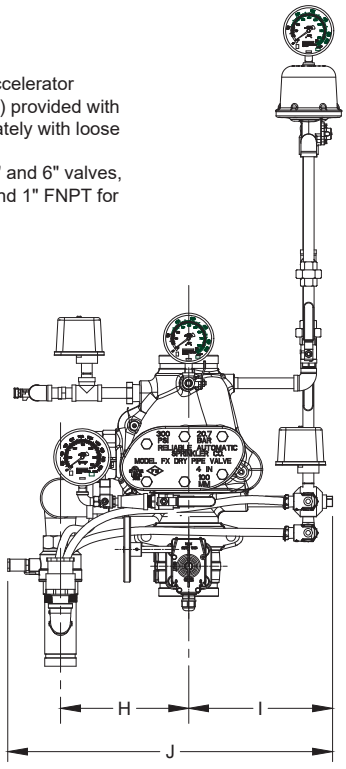


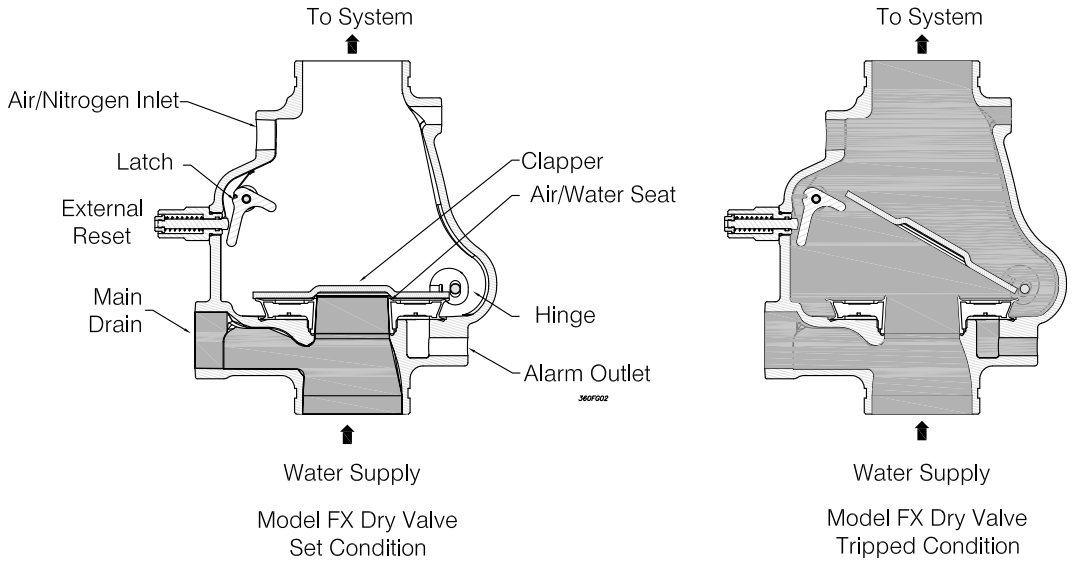
Model FX Dry Pipe Valve Dimensions - in. (mm)

Table B

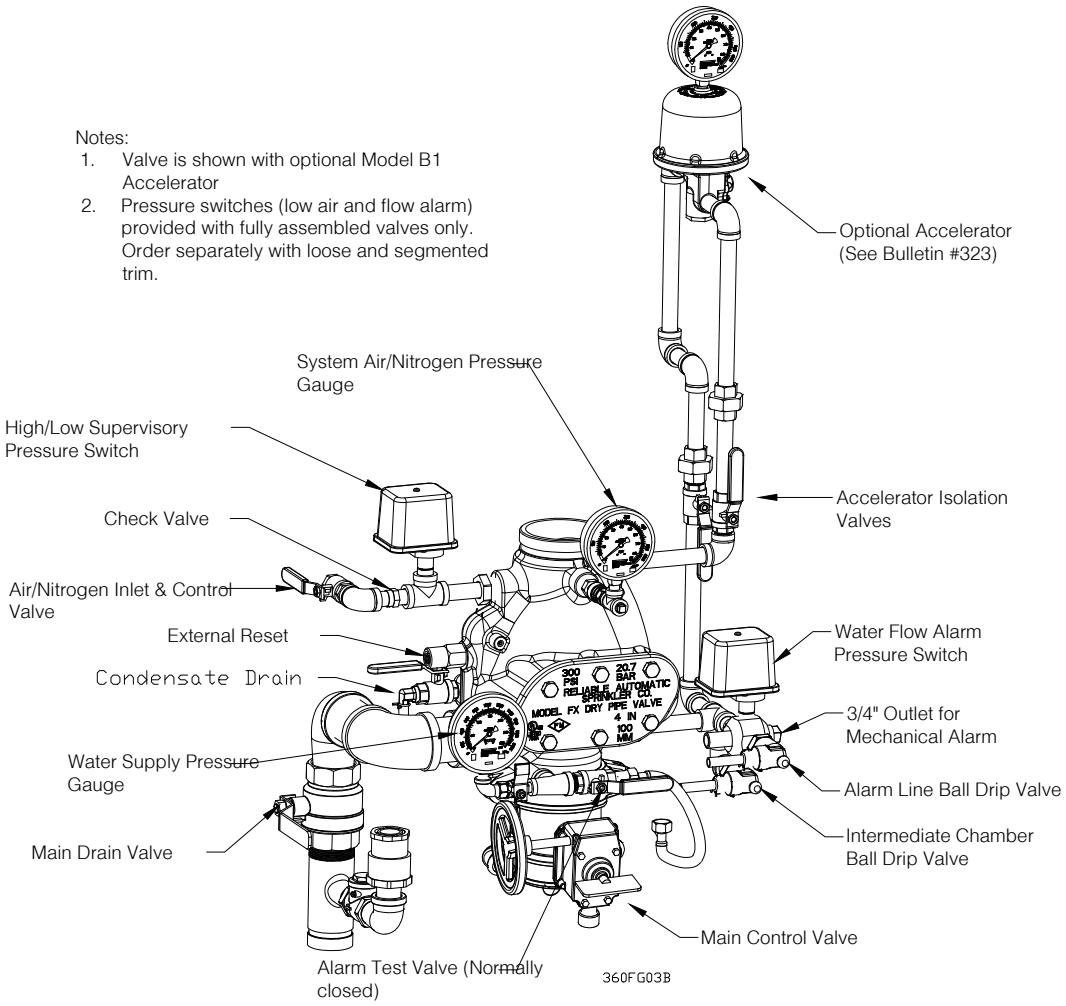
Valve Size	A	B	C	D	E	F	G	H	I	J
2" (50mm)	10 (254)	3-7/8 (98)	10 (254)	7 (178)	8-1/4 (210)	40 (1016)	3/4 (19)	7-1/4 (184)	9-5/8 (244)	21-3/8 (543)
2-1/2" (65mm), 3" (80mm), & 76mm	12-1/4 (311)	3-7/8 (98)	10-1/4 (260)	7-3/8 (187)	8-1/4 (210)	43-3/4 (1111)	5-7/8 (149)	8-1/4 (210)	10-1/8 (257)	22 (559)
4" (100mm)	13-3/4 (349)	4-9/16 (116)	10-7/8 (276)	7-1/2 (191)	8-1/4 (210)	45-5/8 (1159)	4-7/8 (124)	9-5/8 (244)	10-3/4 (273)	24-1/2 (622)
6" (150mm), 165mm	16 (406)	5-7/8 (149)	12-1/2 (318)	7-1/2 (191)	8-1/4 (210)	47-1/2 (1207)	4 (102)	11-1/2 (292)	12 (305)	30-1/2 (775)

Note: Dimension A (body take-out) is same for all end configurations. Dimension B (control valve) is not applicable to 76mm and 165mm valves as well as flanged valves.

Model FX Dry Pipe Valve Section View **Figure 2**



Model FX Dry Pipe Valve Components **Figure 3**



Operation

The Reliable Model FX Dry Pipe Valve is shown in both the closed and open position in Figure 2. The upper surface area of the clapper is approximately six times larger than the surface area of the bottom of the clapper that is exposed to the water supply in the set position. In the closed position, pneumatic pressure acts on the larger upper surface of the clapper while water pressure acts on the smaller lower surface area. Because of this surface area differential, one psi of pneumatic pressure can offset approximately six psi of water pressure. Table C provides the appropriate pneumatic pressure to water pressure ratio.

When a sprinkler operates, the upward force of the water pressure acting beneath the clapper overcomes the reduced pneumatic pressure and allows the clapper to open. Water then flows through the Model FX Dry Pipe Valve into the system piping and into the alarm outlet activating the alarm device(s). Once the clapper has opened, the lever acts as a latch preventing the clapper from returning to the closed position until manually reset.

Pneumatic Pressure Requirement **Table C**

Water Pressure psi (bar)	Pneumatic Pressure psi (bar)	
Maximum	Not Less Than	Not More Than
20 (1.37)	10 (0.68)	20 (1.37)
50 (3.45)	15 (1.03)	25 (1.72)
75 (5.17)	20 (1.37)	30 (2.06)
100 (6.89)	25 (1.72)	35 (2.41)
125 (8.62)	30 (2.06)	40 (2.75)
150 (10.34)	35 (2.41)	45 (3.10)
175 (12.07)	40 (2.75)	50 (3.45)
200 (13.79)	45 (3.10)	55 (3.79)
225 (15.51)	50 (3.45)	60 (4.14)
250 (17.24)	55 (3.79)	65 (4.48)
275 (18.96)	60 (4.14)	70 (4.83)
300 (20.68)	65 (4.48)	75 (5.17)

Installation

The Model FX Dry Pipe Valve shall be installed in accordance with NFPA 13, “Standard for the Installation of Sprinkler Systems,” as well as the requirements of any authorities having jurisdiction. The direction of flow shall be up through the assembly. Failure to follow installation instructions may void the warranty and/or listing of the valve. Verify compatibility of the Model FX Dry Pipe Valve materials with the water supply and the environment where the valve will be installed prior to installation.

The Model FX Dry Pipe Valve must be installed in a readily visible and accessible location where a minimum temperature of 40°F (4°C) or above must be maintained. Heat tracing of the Model FX Dry Pipe Valve and trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that can prevent proper operation of the dry pipe valve.

The valve and trim kit have been tested, approved and listed in accordance with UL and FM standards. Hydrostatically testing the valve and trim to pressures higher than their rating is limited to the hydrostatic test as referenced by NFPA 13.

Normal operation and hydrostatic testing do not address the possibility of a water hammer which may damage the valve. A water hammer can create pressure more than the rated pressure of the equipment and should be avoided by all necessary means. Water hammer can occur from (but is not limited to) improper fire pump settings, underground construction work, or improper venting of trapped air in piping.

Friction Loss (Equivalent Length of Schedule 40 Pipe) **Table D**

Size	C = 100 ft (m)	C = 120 ft (m)	Cv Value
2” (50mm)	7.2 (2.2)	10.0 (3.0)	99
2-1/2” (65mm), 76mm	8.1 (2.5)	11.4 (3.5)	170
3” (80mm)	9.5 (2.9)	13.2 (4.0)	262
4” (100mm)	16.7 (5.1)	23.5 (7.2)	396
6” (150mm), 165mm	26.4 (8.0)	37 (11.3)	861

Model FX Dry Pipe Valve Set Up Procedure (Reference Figure 2)

1. Close the Main Control Valve and close the Air/Nitrogen Control Valve.
2. Open the Main Drain Valve and drain the system.
3. Open all drain valves and vents at low points throughout the system, closing them when flow of water has stopped.
4. Inspect and replace any necessary portions of the sprinkler system subjected to fire conditions.
5. Push in the plunger of the Intermediate Chamber Ball Drip Valve and the Alarm Line Ball Drip Valve to force the ball from its seat to drain any water in the lines.
6. When standing in front of the valve, locate the External Reset on the left side of the dry valve body. Push in on the plunger in the center of the External Reset until you hear a distinct clicking noise indicating that the clapper has closed. A tool, such as a screwdriver, may be needed to press the External Reset plunger.
7. Open the Air/Nitrogen Control Valve and rapidly apply compressed air or nitrogen into the Model FX Dry Pipe Valve system until the pressure conforms to the level indicated in Table C, as indicated on the System Pressure Gauge. Set the air or nitrogen supply to automatic operation.
8. Partially open the Main Drain Valve.
9. Slightly open the Main Control Valve until water begins to flow through the Main Drain Valve.
10. Once water begins to flow through the Main Drain Valve, slowly close the Main Drain Valve.
11. If installed, reset the Model B1 Accelerator per Reliable Technical Bulletin 323 and open the Accelerator Isolation Valves.
12. Observe if water leaks through the Intermediate Chamber Ball Drip Valve into the closed drain. If no leak occurs, the dry pipe valve clapper is sealed.
13. Slowly open the Main Control Valve. Verify that the Main Control Valve is fully open and properly monitored.

Alarm Test

1. Notify the owner and monitoring company that testing is being performed on the system.
2. Open the Alarm Test Valve.
3. Verify that pressure alarm switch has activated, and signal has been reported to the fire alarm system.
4. Close the Alarm Test Valve.
5. Push in the plunger of the Alarm Line Ball Drip Valve to force the ball from its seat to relieve pressure and drain any water in the line.

When testing is complete, notify the owner and monitoring company that the system has been returned to service.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a system out of service may eliminate the fire protection that is provided by the fire protection system. Notify any required authorities having jurisdiction and implement appropriate precautions prior to proceeding.

The Reliable Model FX Dry Pipe Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Replace any components found to be corroded, damaged, worn or non-operable. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact materials and/or operation of the assembly.

Excess water may settle above the valve clapper following hydrostatic testing, system activation, or as a result of condensation. To remove excess water from the system:

1. Notify the owner and monitoring company that maintenance is being performed on the system.
2. Close the Main Control Valve and close the Air/Nitrogen Control Valve.
3. If an Accelerator is present, close the Accelerator Isolation Valves.
4. Open the Main Drain Valve.
5. Open the Condensate Drain Valve on the left rear of the dry pipe valve body until all water has drained. Close Condensate Drain Valve immediately when the flow of water has stopped.
6. Open the Air/Nitrogen Control Valve and allow pneumatic pressure to return to normal (refer to Table C). Set pneumatic supply to automatic operation.
7. If an Accelerator was isolated in step three, open the Accelerator Isolation Valves.
8. Open the Main Control Valve until water begins to flow through the Main Drain Valve.
9. Slowly close the Main Drain Valve.
10. Fully open the Main Control Valve. Verify that the Main Control Valve is fully open and properly monitored.
11. Notify the owner and monitoring company that the system has been returned to service.

Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

- Model FX Dry Pipe Valve
- Size
- End Connections
- Trim*
  - Fully assembled with control valve
  - Fully assembled without control valve
  - Segmented trim (control valve not included)
  - Loose trim (control valve not included)
- (Optional) Model B1 Accelerator (PN 650120001A)

***Note:** Low pressure switch (PN 6990006381) and alarm pressure switch (PN 6990006382) are included with fully assembled trims only. Order separately when selecting segmented or loose trim.

Service Kits

Service kits are available for routine servicing of the valve (reference assembly drawings on website). Service kits for the Model FX Dry Pipe Valve include the following components:

- Seal Assembly (item 4)
- Cover Gasket (item 5)
- Grease (item 17)

Note: Seat and seal is an integral unit. Replacement requires the appropriate Seat Installation Wrench.

- 2" Model FX Seat Wrench: PN 6881702000
- 2-1/2" and 3" Model FX Seat Wrench: PN 6881703000
- 4" Model FX Seat Wrench: PN 6881704000
- 6" Model FX Seat Wrench: PN 6881706000

Model FX Fully Assembled Part Number — **Figure 4**

65080 X Y Z 00

Valve Size X	End Connection Y	Trim Z
2 = 2" (50mm)*	7 = Groove/Groove	0 = W/O Control Valve, W/O Accelerator
1 = 2-1/2" (65mm)*	8 = Flange/Groove, Class 150	1 = W/ Control Valve, W/O Accelerator*
7 = 76mm*	9 = Flange/Groove, BS-E	2 = W/ 2 Control Valves, W/O Accelerator*
3 = 3" (80mm)*	A = Flange/Groove, PN16	3 = W/O Control Valve, W/ Accelerator
4 = 4" (100mm)	B = Flange/Flange, Class 150	4 = W/ Control Valve, W/ Accelerator*
6 = 6" (150mm)	C = Flange/Flange, BS-E	5 = W/ 2 Control Valves, W/ Accelerator*
5 = 165mm*	E = Flange/Flange, PN 16	

***Note:** Available only with Groove/Groove connections

Model FX Valve Only (No Trim) Part Number — **Figure 5**

61010 XX 60 Y

Valve Size XX	End Connection Y
20 = 2" (50mm)*	7 = Groove/Groove
25 = 2-1/2" (65mm)*	8 = Flange/Groove, Class 150
76 = 76mm*	9 = Flange/Groove, BS-E
30 = 3" (80mm)*	A = Flange/Groove, PN16
40 = 4" (100mm)	B = Flange/Flange, Class 150
60 = 6" (150mm)	C = Flange/Flange, BS-E
65 = 165mm*	E = Flange/Flange, PN 16

***Note:** Available only with Groove/Groove connections

Weight (Valve Only) — **Figure 6**

Size	End Connection lbs (kg)		
	GRV/GRV	FLG/GRV	FLG/FLG
2" (50mm)	22 (10)	N/A	N/A
2-1/2" (65mm) & 76 mm	34 (16)	N/A	N/A
3" (80mm)	35 (15)	N/A	N/A
4" (100mm)	52 (24)	64 (29)	76 (35)
6" (150mm)	101 (46)	119 (54)	137 (62)
165mm	101 (46)	N/A	N/A

Model FX Trim Only Part Number — **Figure 7**

Valve Size	Trim Part Numbers	
	Loose	Segmentally Assembled
2" (50mm)	6508000001	65080000011
2-1/2" (65mm), 76mm, & 3" (80mm)	6508000002	65080000012
4" (100mm), 6" (150mm), 165mm	6508000003	65080000013

Weight (Trim Only) — **Figure 8**

Size	Loose Trim lbs (kg)	Segementally Assembled Trim lbs (kg)
2" (50mm)	20 (9)	23 (10)
2-1/2" (65mm), 76mm, & 3" (80mm)	21 (10)	25 (11)
4" (100mm), 6" (150mm), & 165mm	26 (12)	30 (14)

P/N 9999970559

Bulletin 750 February 2024

Model DDX Double Interlock Preaction System – Type D
2” (50 mm), 2½” (65 mm), 3” (80 mm), 76 mm, 4” (100 mm), 6” (150 mm), 165 mm & 8” (200 mm)

Technical Specifications and Instructions for Installation, Operation, and Maintenance

- Available with 175 psi (12.1 bar) or 300 psi (20.7 bar) Rated Solenoid Valve
- Externally Resettable Clapper
- One Main Drain
- 7 psi (0.48 bar) Minimum Supervisory Pressure
- Electric/Electric Actuation

Image subject to change.

Reliable Automatic Sprinkler Co., Inc., 103 Fairview Park Drive, Elmsford, New York 10523

General

The Reliable Model DDX Type D Double Interlock Preaction system is designed for water sensitive areas that require protection from inadvertent water flow into the sprinkler system piping, but where a mechanical backup for the electric release is not required. Typical applications for this type of system are libraries and computer server rooms.

To release the valve and flow water into a Type D Double Interlock Preaction System, two events must take place: a fire detection device must operate, and the low pressure switch must be operated by the loss of system air or nitrogen pressure due to sprinkler operation (see note 1 below). These two signals must coexist at the releasing control panel, which only then will energize the normally closed solenoid valve (175 psi (12.1 bar) or 300 psi (20.7 bar) rated), causing the water flow into the system.

These systems utilize fire detection devices and system air pressure as separate zones (inputs) to a cross-zoned releasing control panel. The solenoid releasing valve remains closed until energized by the releasing control panel. This will occur only when both a fire detection device is operated and the low air pressure switch has detected sufficient loss of system air pressure generally resulting from the operation of a fire sprinkler.

In the event that the system piping is ruptured, or a sprinkler is accidentally opened, the low air pressure switch will operate and an alarm will sound. The Model DDX Deluge Valve, however, will not release water since the solenoid valve remains closed due since the detection system has not activated.

Conversely, in the event of a false alarm from the detection system, the Model DDX Deluge Valve will not release water provided air pressure in the system is maintained and the low pressue switch is not activated. The requirement for both detector operation and loss of system pressure before the Model DDX Type D Double Interlock Preaction system releases water assures maximum protection against inadvertent water flow.

At the heart of the Reliable Type D Double Interlock Preaction System is the Model DDX Deluge Valve. This deluge valve is a hydraulically operated, straight-through-design, differential latching clapper-type (see Fig. 1). System maintenance is simplified since the deluge valve can be reset extermally without removing the cover plate. This feature provides a significant system-restoration time advantage. The Model DDX Deluge Valve has an intermediate chamber and thereby does not require an in-line air check valve. Subsequently, the deluge valve only requires a single drain connection.

The Reliable Model DDX Type D Double Interlock Preaction System trim set provides all of the necessary equipment for connections to the Model DDX Deluge Valve pushrod chamber inlet and outlet ports, a 1¼" (30 mm) main drain on 2" (50 mm), 2½" (65 mm), 76 mm and 3" (80 mm) valve sizes or a 2" (50 mm) main drain on 4" (100 mm), 165 mm, 6" (150 mm) and 8" (200 mm) valve sizes, alarm devices, air supply, and required pressure gauges. This trim set is available in individual (loose) parts, in time-saving, segmented assembled kit forms or fully assembled to the Model DDX Deluge Valve (with or without a control valve).

Listings & Approvals:

(Only when used with Reliable Trim Sets.)

1. Reliable's Type D Double Interlock Preaction Systems 2" (50 mm), 2½" (65 mm), 76 mm and 3" (80 mm), 4" (100 mm), 165 mm, 6" (150 mm) and 8" (200 mm) are Factory Mutual Approved Refrigerated Area Sprinkler Systems for use in refrigerated rooms or buildings. Refrigerated area sprinkler systems are FM Approved as complete systems. Systems are FM Approved for use with thermal detectors and Class A detector wiring only.
2. Factory Mutual Approved for applications where FM Global Data Sheets allow the use of double-interlock preaction systems.
3. Reliable's Type D Double Interlock Preaction Systems 2" (50 mm), 2½" (65 mm), 76 mm, 3" (80 mm), 4" (100 mm), 165 mm, 6" (150 mm) and 8" (200 mm) are Underwriters Laboratories, Inc. Listed and UL certified for Canada (cULus) in the Special System Water Control Valve-Double Interlock Type (VLJH) category.

Note: Wherever the word "air" is used in this bulletin as a reference to the pneumatic pressure source it shall also mean "air or nitrogen."

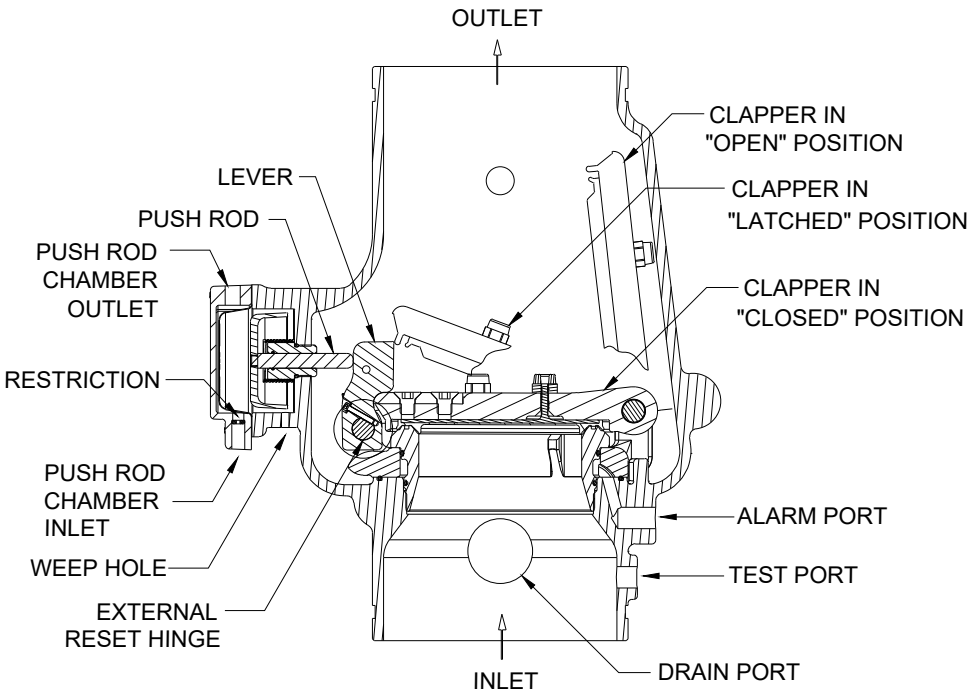
System Operation

When set correctly for service, the Model DDX Deluge Valve is hydraulically established to separate the supply water from the sprinkler system piping. The Reliable Model DDX Deluge Valve is shown in both closed and open positions in Fig. 1. In the closed position, the supply pressure acts on the underside of the clapper and also on the pushrod through the pushrod chamber inlet restriction. The resultant force due to the supply pressure acting on the pushrod is multiplied by the mechanical advantage of the lever and is more than sufficient to hold the clapper closed against normal supply pressure surges.

Whenever the detection system is activated and a low system air pressure condition coexist, the solenoid valve is energized open which vents the pushrod chamber to atmosphere through the chamber outlet. Since the pressure can not be replenished through the inlet restriction as rapidly as it is vented, the pushrod chamber pressure falls instantaneously. When the pushrod chamber pressure approaches approximately on-third of the supply pressure, the upward force of the supply pressure acting beneath the clapper overcomes the lever applied force thereby opening the clapper.

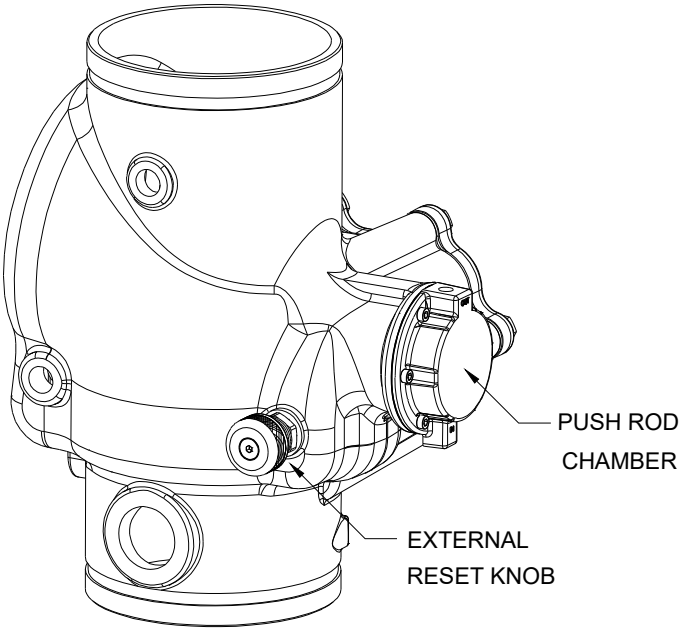
Once the clapper has opened, the lever acts as a latch, preventing the clapper from returning to the closed position. Water from the supply flows through the Deluge Valve into the sprinkler system piping. Water also flows through the alarm outlet to the alarm devices.

Resetting the clapper of the Model DDX Deluge Valve is accomplished using the convenient external reset knob on the rear of the valve. The external reset feature of the Model DDX Deluge Valve provides a means for simple, economical system testing, which is one essential facet of a good maintenance program. The external reset feature does not,



MODEL DDX VALVE: SECTION VIEW

1C_COMMDDX_1



MODEL DDX VALVE: REAR VIEW

TO RESET: PUSH INWARD AND ROTATE KNOB CLOCKWISE (AS VIEWED FROM REAR) TO RESET CLAPPER. NOTE: PUSH ROD CHAMBER MUST BE VENTED TO DRAIN.

Fig. 1

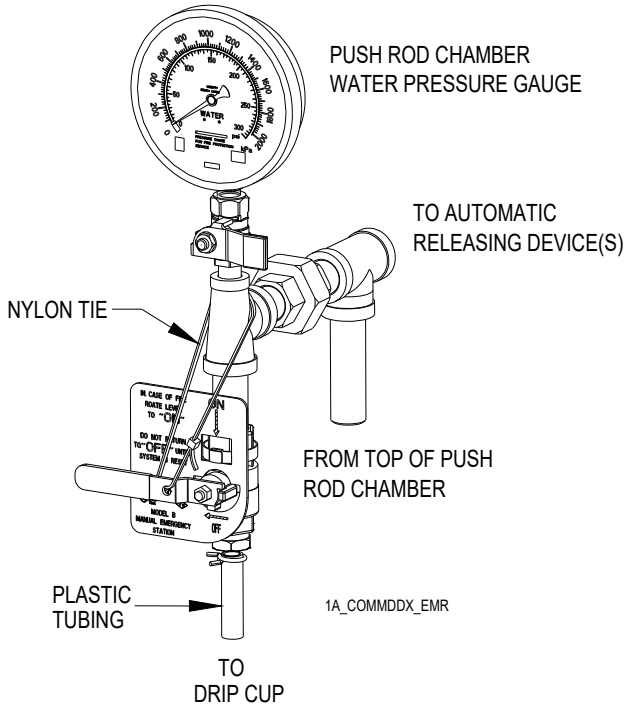
however, eliminate another important facet of good maintenance, namely, periodic cleaning and inspection of the internal valve parts.

A valve body drain is provided in the event that water builds up due to condensate from the air supply system or water left inside form system testing. After closing the main supply valve, the condensate drain can be opened slightly until the water inside the vale body and main pipe column has drained. See the section titled “Draining Excess/Condensate Water from the System” in this bulletin for the detailed procedure.

The Model B Manual Emergency Station is included in the Reliable Type D Double Interlock Preaction System trim sets. It consists of an aluminum nameplate mechanically attached to a ball valve. The valve handle in its OFF position is guarded against accidental turning to the ON position (and system discharge) by a nylon cable tie provided with each trim kit. The cable tie is inserted after the system has been restored for operation. The nylon cable tie is designed to allow, in case of an emergency, forceful turning of the valve handle to the ON position. As an alternative to the Model B Hydraulic Manual Emergency Station, the Model A Hydraulic Manual Emergency Pull Box (see Reliable Bulletin 506) is also available and can be provided as an option.

Whenever ambient temperature conditions are high, the water temperature in the Model DDX Deluge Valve pushrod chamber could possibly increase, thereby increasing the pressure in the chamber to values exceeding the rated pressure of the system. In an indoor installation where standard room temperatures are exceeded, a pressure relief kit may be needed. Pressure relief kit, P/N 6503050001, can be installed into the pushrod chamber’s releasing line to limit the pressure to 250 psi (17.2 bar).

Reliable Model DDX Deluge Valve with associated Type D Double Interlock Preaction Trims sizes 2” (50 mm), 2½” (65 mm), 76 mm, 3” (80 mm), 4” (100 mm), 165 mm, 6” (150 mm) and 8” (200 mm) are rated for use at a minimum water supply pressure of 20 psi (1.4 bar) and a maximum water supply pressure of 250 psi (17.2 bar) for 2” (50mm), 2½” (65mm), 3” (80mm), 76mm and 8” (200mm) valve sizes and 300 psi (20.7 bar) for 4” (100mm), 6” (150mm) and 165mm valve sizes. Water supplied to the inlet of the valve and to the pushrod chamber must be maintained between 40°F (4°C) and 140°F(60°C).



EMERGENCY MANUAL RELEASE STATION

NORMALLY CLOSED AND SECURED. ROTATE HANDLE DOWN
TO VENT PUSH ROD CHAMBER AND RELEASE SYSTEM.

Fig. 2

Pressurizing Line Connection

The water supply for the pushrod chamber must be provided a dedicated connection to the water supply piping. Pressurizing lines for multiple Model DDX Deluge Valve pushrod chambers must never be manifolded together. Each Model DDX Deluge Valve must have its own pushrod chamber pressurizing line connection.

This connection must be made on the supply side of the water supply control valve. This can be accomplished by:

- Using a tapped connection directly below or next to the main water supply control valve using a welded outlet or the appropriate mechanical fittings. A grooved-end outlet coupling is one way to achieve this; or
- Using a water supply control valve that has an available threaded (NPT) supply-side tap design to allow for a direct water supply connection to the Model DDX Deluge Valve's pushrod chamber.

Caution: Reliable's DDX valve is designed with an inlet restriction built into the pushrod chamber. It is important not to introduce additional restrictions into the direct water supply connection or the discharge from the pushrod chamber by installing additional valves or improperly installing the copper lines used in the trim of the valve.

Hydrostatic Testing of DDX Valves and DDX Systems

As required by NFPA 13, fire sprinkler systems with working pressures up to and including 150 psi are to be hydrostatically tested at a water pressure of 200 psi. Fire sprinkler systems with working pressures above 150 psi are required to be hydrostatically tested at 50 psi above the system working pressure. In addition to the hydrostatic tests described above, dry pipe and double interlock preaction systems require an additional low pressure air test.

In some cases, hydrostatic testing (in accordance with the NFPA 13 requirements noted above) will result in pressures that exceed the working pressure of the valve and trim kit for the two-hour test period. **The valve and applicable trim kit have been tested, approved and listed under these conditions and as such, hydrostatic testing in accordance with NFPA 13 is acceptable. In addition, the clapper can remain in the closed position and the trim kit need not be isolated, as each has been designed to withstand hydrostatic testing as required by NFPA 13.**

Hydrostatically testing the valve and trim to pressures higher than their rating is limited to the hydrostatic test as referenced by NFPA 13. It does not address the occurrence(s) of a "water hammer" effect, which can indeed damage the valve. A "water hammer" in the water supply piping of the valve can create pressures in excess of the rated pressure and should be avoided by all necessary means. This condition may be created from improper fire pump settings, underground construction work, or an improper venting of trapped air in the water supply piping.

System Design Considerations

The automatic sprinklers, releasing devices, electric releasing control equipment, fire detection devices, manual pull stations, and signaling devices which are utilized with the Type D Double Interlock Preaction System must be UL or ULC Listed or FM Approved, as applicable.

Factory Mutual requires that detection devices in refrigerated areas be of the fixed temperature type having a temperature rating lower than that of the sprinklers and preferably as low as possible for the given ambient conditions.

The Deluge Valve, and all interconnecting piping must be located in a readily visible and accessible location and in an area that can be maintained above 40ºF (4ºC). **Note:** Heat Tracing is not permitted.

Pendent sprinklers, other than dry pendents, used on preaction systems shall be installed on return bends per NFPA 13.

The solenoid valve must be operated and the system supervised by a listed releasing control panel.

System Air Pressure Requirements

In accordance with NFPA 13, Double Interlock Preaction Systems require a minimum of 7 psi (0.5 bar) pneumatic pressure to supervise the sprinkler system. The Reliable Model A Pressure Maintenance Device is used to maintain the system pneumatic pressure where a dry nitrogen gas supply or a clean, dependable and continuous (24 hours a day, 7 days a week) compressed air source is available. To adjust the system pneumatic pressure, refer to Reliable Bulletin 251.

The high/low pressure alarm switch should be set to operate between 5 and 6 psi (0.3 and 0.4 bar) on decreasing (low) and increasing (high) pneumatic pressure. Adjustment can be made to the pressure switch by following the manufacturer's installation and maintenance procedures.

Note: The dew point of the air supply must be maintained below the lowest ambient temperature to which the double interlock preaction system piping will be exposed. Introduction of moisture into the system piping that is exposed to freezing temperatures can create ice blockage, which could prevent proper operation of the sprinkler system. As a minimum, the air supply of air should be taken from the refrigerated area at the lowest temperature. The air supply system must be carefully designed to prevent plugging by frost deposits. Special requirements such as those in FME&R Installation Guidelines for Refrigerated Storage may need to be incorporated.

Each Type D Double Interlock Preaction system is provided with a Reliable Model A Pressure Maintenance Device for individual monitoring of pneumatic pressure and proper operation of the system. The Reliable Model A Pressure Maintenance Device requires a tank mounted air compressor.

System Electrical Requirements

All releasing and detection devices in Reliable's Model DDX Type D Double Interlock Preaction System may be operated and supervised by the PFC-4410G3 Releasing Control Panel. An emergency manual pull station should be provided near the sprinkler riser to facilitate setup of the system.

The power supply, the standby emergency power supply, battery charger, and the rectifier circuitry are all contained within the Potter PFC-4410G3 Releasing Control Panel. Batteries that provide ninety hours of standby power are required for Factory Mutual Approved systems.

The Potter PFC-4410G3 Releasing Control Panel can utilize either 120VAC or 220VAC.

Note: The high/low pressure alarm switch should be set to operate between 5 and 6 psi (0.3 and 0.4 bar) on decreasing (low) and increasing (high) pneumatic pressure. Adjustment can be made to the pressure switch by following the manufacturer's installation and maintenance procedures.

Standard Solenoid Valve Specifications:

Parker-Hannifin Model 73218BN4UNLVN0C111C2
Rated working pressure: 175 psi (12.1 bar)
Voltage: 24 VDC
Power: 10 Watts
Current: 0.41 Amps Holding
Enclosure Coil: NEMA 4X
Pipe Size: ½" NPT Female
Cv Factor: 4.0

Alternate Solenoid Valve Specifications:

Parker-Hannifin Model 73212BN4TNLVN0C322C2
Rated working pressure: 300 psi (20.7 bar)
Voltage: 24 VDC
Power: 22 Watts
Current: 0.83 Amps Holding
Enclosure Coil: NEMA 4X
Pipe Size: ½" NPT Female
Cv Factor: 2.8

Pneumatic Supervisory Pressure Supply Options

Note: See Reliable Bulletins 254 and 251 for complete information on air and nitrogen regulating equipment.

Owner's Air supply

Supervisory air supply shall be provided by an owner supplied air system in conjunction with a listed automatic pressure maintenance device, capable of maintaining a constant system pressure regardless of pressure fluctuations in the compressed air source.

Compressed Air Supply

Supervisory air supply shall be provided by an automatic tank-mounted air compressor sized for the capacity of the double interlock preaction system piping, and be capable of restoring normal air pressure in the system within the time limits specified by NFPA 13. Unit shall include a motor mounted, oil-less, piston compressor, pressure gauge, pressure switch, check valve, drain valve and safety relief valve. Single-phase motor shall have internal thermal protection.

Nitrogen

Nitrogen cylinders are an acceptable source of supervisory pnuematic pressure. The nitrogen cylinder pressure shall be regulated and supervised through the use of nitrogen regulating device and low-pressure trim kit. This device shall consist of a brass, single stage pressure regulator, equipped with high pressure inlet and low pressure outlet gauges, and ¼" copper connection tubing with galvanized ¾" x ¼" reducer bushing. This kit shall include a low-pressure switch with associated galvanized connection trim. Assembly shall be a Reliable Nitrogen Regulating Device. This device is to be used in conjunction with the Reliable Model A Pressure Maintenance Device.

Nitrogen generators meeting the requirements of NFPA 13 are also an acceptable source of supervisory pneumatic pressure. Note the the nitrogen generator system must incorporate a storage tank.

Technical Data

Reliable Double Interlock Type D Preaction Systems, with associated trim, size 2" (50 mm), 2½" (65 mm), 76 mm, 3" (80 mm), 4" (100 mm), 165 mm, 6" (150 mm), 8" (200 mm) are rated for use at minimum water supply pressure of 20 psi (1.4 bar) and maximum supply pressure of 250 psi (17.2 bar) for 2" (50mm), 21/2" (65mm), 3" (80mm), 76mm and 8" (200mm) valve sizes and 300 psi (20.7 bar) for 4" (100mm), 6" (150mm) and 165mm valve sizes. Water supplied to the inlet of the valve and to the pushrod chamber must be maintained between 40°F (4°C) and 140°F (60°C).

The following list of technical bulletins pertains to valves and devices that may be used in this preaction system:

Deluge Valve	Reliable 519
Hydraulic Emergency Station (Model A)	Reliable 506
Mechanical Sprinkler Alarm	Reliable 612/613
Pressure Maintenance Device	Reliable 251
Nitrogen Regulating Device	Reliable 254
Releasing/Control Panel	Potter #5401600
Low Air Pressure Supervisory Switch	Potter 5401524, 5401564
Waterflow Pressure Alarm Switch	Potter 5400928

Model DDX Deluge Valve Description

1. Rated working pressure:
   Valve & System - 250 psi (17.2 bar) for 2" (50mm), 2½" (65mm), 3" (80mm), 76mm and 8" (200mm) valve sizes and 300 psi (20.7 bar) for 4" (100mm), 6" (150mm) and 165mm valve sizes.
2. Factory tested to a hydrostatic pressure of 500 psi (34.5 bar) for 2" (50mm), 2½" (65mm), 3" (80mm), 76mm and 8" (200mm) valve sizes and 600 psi (41.7 bar) for 4" (100mm), 6" (150mm) and 165mm valve sizes. (Valve only)
3. End and trim connections:
   - ANSI/AWWA C606 grooved inlet and outlet

Nominal Pipe Size	Outlet Diameter	Groove Diameter	Groove Width	Outlet Face to Groove
2" (50 mm)	2.375" (60 mm)	2.250" (57 mm)	11/32" (9.0 mm)	5/8" (16 mm)
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)
4" (100 mm)	4.500" (114 mm)	4.334" (110 mm)	3/8" (9.5 mm)	5/8" (16 mm)
165 mm	6.500" (165 mm)	6.330" (161 mm)	3/8" (9.5 mm)	5/8" (16 mm)
6" (150 mm)	6.625" (168 mm)	6.455" (164 mm)	3/8" (9.5 mm)	5/8" (16 mm)
8" (200 mm)	8.625" (219 mm)	8.441" (214 mm)	7/16" (11 mm)	3/4" (19 mm)

   - Threaded openings Per ANSI B 2.1
   - Flange Dimensions

Flange Type:	Nominal Pipe Size	Bolt Circle Diameter	Bolt Hole Diameter	Flange Outside Diameter	Flange Thickness	Number of Bolts
ASME B16.5 Class 150	4" (100mm)	7½" (191mm)	¾" (19mm)	9" (229mm)	15/16" (24mm)	8
ISO 7005-2 PN16	4" (100mm)	7 3/32" (180mm)	¾" (19mm)	9" (229mm)	15/16" (24mm)	8
ASME B16.5 Class 150	6" (150mm)	9½" (241mm)	7/8" (22mm)	11" (279mm)	15/16" (24mm)	8
ISO 7005-2 PN16	6" (150mm)	9 7/16" (240mm)	29/32" (23mm)	11" (279mm)	15/16" (24mm)	8
ASME B16.5 Class 150	8" (200mm)	11¾" (298mm)	7/8" (22mm)	13½" (343mm)	1" (25.4mm)	8
ISO 7005-2 PN16	8" (200mm)	11 5/8" (295mm)	29/32" (23mm)	13½" (343mm)	1" (25.4mm)	12

4. Valve Color:

Valve Size	Color
2" (50 mm)	Black or Red
2½" (65 mm)	Black or Red
76 mm	Red
3" (80 mm)	Black or Red
4" (100 mm)	Black or Red
165 mm	Red
6" (150 mm)	Black or Red
8" (200 mm)	Black or Red

5. Face to face dimensions:

Valve Size:	End Connection:	End to End:
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	Groove/ Groove	12½" (318mm)
4" (100mm)	Groove/ Groove	14" (356mm)
	Flange/ Groove	16" (406mm)
	Flange/ Flange	16" (406mm)
6" (150mm) & 165mm	Groove/ Groove	16" (406mm)
	Flange/ Groove	19" (483mm)
	Flange/ Flange	19" (483mm)
8" (200mm)	Groove/ Groove	19 3/8" (492mm)
	Flange/ Flange	21¼" (540mm)

6. Valve shipping weight:

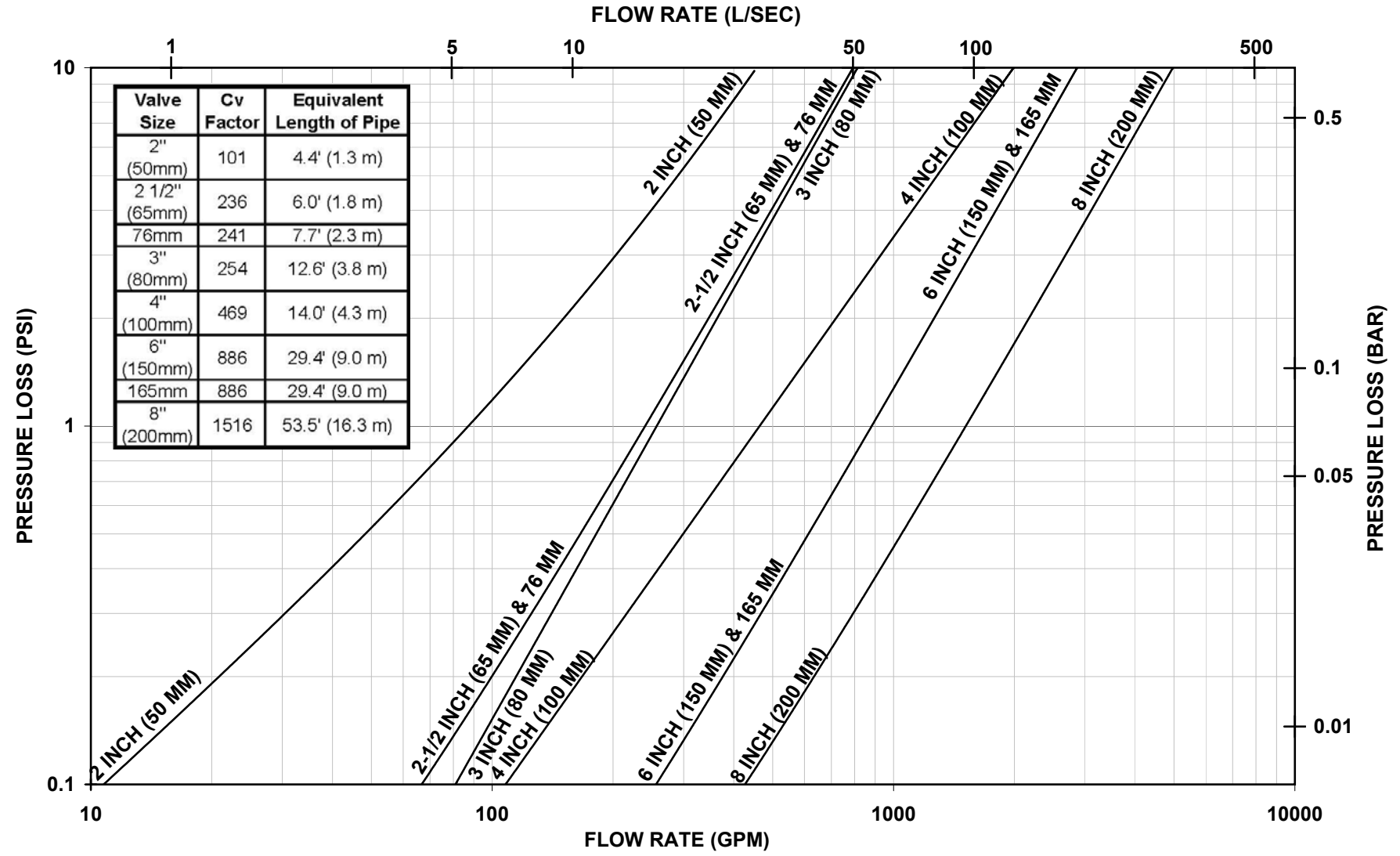
Valve Size:	End Connection:	Weight:
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	Groove/ Groove	34 lbs (15 kg)
4" (100mm)	Groove/ Groove	64 lbs (29 kg
	Flange/ Groove	79 lbs (36 kg)
	Flange/ Flange	92 lbs (42 kg)
6" (150mm) & 165mm	Groove/ Groove	95 lbs (43 kg)
	Flange/ Groove	122 lbs (56 kg)
	Flange/ Flange	138 lbs (69 kg)
8" (200mm)	Groove/ Groove	148 lbs (67 kg)
	Flange/ Flange	197 lbs (90 kg)

7. Trim shipping weight:

Trim Configuration	2" (50 mm), 2½" (65 mm), 3" (80 mm) & 76 mm	4" (100 mm), 6" (150 mm), 8" (200 mm) & 165 mm
Type D Double Interlock	47 lbs (21 kg)	52 lbs (24 kg)

8. Friction loss (Expressed in equivalent length of Schedule 40 pipe, based on Hazen & Williams formula: Reference Figure 3.
9. Installation position: Vertical

MODEL DDX HYDRAULIC FRICTION LOSS GRAPH



Valve Size	Cv Factor	Equivalent Length of Pipe
2" (50mm)	101	4.4' (1.3 m)
2 1/2" (65mm)	236	6.0' (1.8 m)
76mm	241	7.7' (2.3 m)
3" (80mm)	254	12.6' (3.8 m)
4" (100mm)	469	14.0' (4.3 m)
6" (150mm)	886	29.4' (9.0 m)
165mm	886	29.4' (9.0 m)
8" (200mm)	1516	53.5' (16.3 m)

Fig. 3

Trim Descriptions

The Type D Double Interlock Preaction Trims for the Reliable Model DDX Deluge Valve are arranged for rapid, easy, and compact attachment, and serve as connection points to Reliable Model C Mechanical Alarms and other devices.

The Double Interlock Type D Preaction System trim configurations can be ordered as individual parts, in time-saving segmentally assembled kit forms, or fully assembled to the Model DDX Deluge Valve (with or without a control valve).

The Model B Hydraulic Manual Emergency Station is a standard item of all Deluge Valve trim sets. It consists of an aluminum nameplate mechanically attached to a ball valve. The valve handle in its OFF position is guarded against accidental turning to the ON position (and system discharge) by a nylon cable tie provided with each trim kit. The cable tie is inserted, after the system has been restored for operation. The nylon cable tie is designed to allow, in case of an emergency, forceful turning of the valve handle to the ON position. As an alternative to the Model B Hydraulic Manual Emergency Station, the Model A Hydraulic Manual Emergency Pull Box (see Bulletin 506) is also available and can be provided as an option.

Resetting Model DDX Type D Double Interlock Preaction System

1. Close the valve controlling water supply to the Deluge Valve and close the air or nitrogen supply to the sprinkler system.
2. Close the pushrod chamber supply valve.
3. Open main drain valve and drain system.
4. Open all drain valves and vents at low points throughout the system, closing them when flow of water has stopped. Open the Model B Manual Emergency Station to relieve pressure in the pushrod chamber of the Deluge Valve.
5. With the alarm line valve open, push in the plunger of ball drip valve, forcing the ball from its seat, and drain the alarm line.
6. With the Model B Manual Emergency Station open, push in and rotate the Deluge Valve's external reset knob counterclockwise (when facing the valve), until you hear a distinct noise indicating that the clapper has reset. **Note:** The reset knob can be rotated only while pressure in the pushrod chamber is vented to atmospheric conditions (0 psig).
7. Inspect and replace any portion of the detection system and/or sprinkler system subjected to fire conditions.
8. Open the pushrod chamber supply valve and allow water to fill the pushrod chamber. Close the Model B Manual Emergency Station.
9. Bleed all air from the actuation piping: Open the solenoid valve by operating a detector or an electric manual emergency station. While water is flowing through the solenoid valve, cause it to close using the release control panel reset.
10. Close the alarm line valve. Open the air or nitrogen supply quick fill valve to restore 10 psi (0.7 bar) supervisory pressure in the sprinkler system, then set the pneumatic supply to automatic operation. Note: To build supervisory air pressure in the sprinkler system, it may be necessary to temporarily close the main drain valve until air pressure has built up to the recommended level.
11. Open the alarm line valve. Verify the main drain valve is open. Open slightly the main valve controlling water supply to the Model DDX Deluge Valve, closing the main drain valve when water flows. Observe if water leaks through the ball drip valve into the drip cup. If no leak occurs, the Deluge Valve clapper is sealed. Open slowly and verify the main valve controlling water supply is fully opened and properly monitored.
12. Verify that the pushrod chamber supply valve and alarm line valve are open. The pushrod chamber supply valve must remain open when the Deluge Valve has been reset, to maintain water pressure in the pushrod chamber.
13. Verify that the Model B Manual Emergency Station is secured in the OFF position with the appropriate nylon tie.

Inspection and Testing

1. Water supply — Confirm that valves controlling water supply to the Deluge Valve are opened fully and properly monitored.
2. Alarm line — Confirm that the alarm line valve is open and remains in this position.
3. Other trim valves — Confirm that the pushrod chamber supply valve is open, as well as all pressure gauge valves. The main drain valve, condensate drain valve, and alarm test valve should be closed.
4. Ball drip valve — Push in on the plunger to be sure ball check is off its seat. If no water appears, the Deluge Valve water seat is tight. Inspect the bleed hole on the underside of the pushrod chamber for leakage.
5. Dry pilot trim — Inspect air pressure for conformance to Table A.
6. Releasing device — Check outlet of the releasing device (i.e., solenoid valve and hydraulic manual emergency station) for leakage. Also verify that tubing drain lines from releasing devices are not pinched or crushed which could prevent proper releasing of the Deluge Valve.
7. Testing alarms — Open the alarm test valve permitting water from the supply to flow to the electric sprinkler alarm switch and to the mechanical sprinkler alarm (water motor). After testing, close this valve securely. Push in on the plunger of ball drip valve until all water has drained from the alarm line.
8. Operational test — Open the Model B Manual Emergency Station. Alternatively, operate the electrical detection system and deplete pneumatic pressure from the sprinkler system.

Note: AN OPERATIONAL TEST WILL CAUSE THE DELUGE VALVE TO OPEN AND FLOW WATER INTO THE SPRINKLER SYSTEM.

9. Secure the Model B Manual Emergency Station in the OFF position with nylon tie after Deluge Valve is reset.

Testing Detection System Without Operating Deluge Valve

1. Close the valve controlling water supply to the deluge valve and open the main drain valve.
2. Verify that valve supplying hydraulic pressure to the piston/pushrod chamber is open, allowing water to enter the pushrod chamber.
3. Operate the electrical detection system and deplete pneumatic pressure from the sprinkler system.
4. Operation of the detection combined with loss of pneumatic pressure must result in a sudden drop of water pressure in the pushrod chamber, as indicated by the pressure gauge on the hydraulic release trim.
5. Reset the valve per the reset instructions.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve or detection/control system out of service may eliminate the fire protection that is provided by the fire protection system.

The Reliable Model DDX valve and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing, and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. System components shall be tested, operated, cleaned, and inspected at least annually, and parts replaced as required. Replace any components found to be corroded, damaged, worn, or non-operable. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact materials or operation of the assembly.

If face plate is removed during maintenance, torque face plate bolts to the following values during re-installation:

- 35 ft-lbs. (47 N-m) for 2" through 4" valves
- 70 ft-lbs. (95 N-m) for 6"-8" valves

Troubleshooting

1. Mechanical sprinkler alarm not operating: This is most likely caused by a clogged screen in the strainer of the water motor. Proceed as follows: Remove plug from the strainer. Remove and clean the screen. Replace the screen and the plug, and then tighten securely (Ref. Bulletin 613).
2. Water leaking from Ball Drip. This can be caused by either a water column on top of the clapper or a supply water leakage.
    a. Leakage due to water column. This condition is caused by leakage past the clapper seal assembly. Be sure the clapper seal and seat are free of any type of de-bris or damage. If necessary, follow steps below to replace the seal assembly and/or seat.
    b. Supply water leakage. This condition is caused by leakage past the lower seat O-ring. Follow steps below for inspection and/or replacement of lower seat O-ring.

Repair Procedures - Model DDX Deluge Valve

The following section provides instructions to correct both conditions:

1. Disable detection system.
2. Shut down the valve controlling the water supply to the Deluge Valve and open the main drain valve. Open the condensate drain valve. Close the pushrod chamber supply valve and open the Model B Manual Emergency Station.
3. Remove the Deluge Valve front (handhold) cover and inspect the seat, clapper, and seal assembly for damage. If inspection indicates damage to the seal assembly, replace as follows:
4. Remove the bumpstop nuts and remove the seal assembly. Install a new seal assembly and thread the bumpstop nuts onto the threaded studs of the seal assembly. Tighten finger tight plus ¼ to ½ turn.
5. If inspection indicates damage to the clapper, proceed to step 6.
6. At the rear of the valve, disconnect the condensate drain trim section starting with the elbow connector. Then remove the ¼" globe valve, followed by the ¾"x¼" reducing bushing. Remove the retaining rings from the clapper hinge pin, push the hinge through the condensate drain opening and remove the clapper subassembly. Install a new clapper subassembly in the reverse order making sure the clapper spacers are in their proper position.
7. If the seat is damaged, or it is suspected that the leakage is through the seat O-rings, proceed to step 8.
8. Using Reliable P/N 6881603000 Seat Wrench for 2" (50mm), 2½" (65mm), 76mm and 3" (80mm) valve sizes, Reliable P/N 6881604000 for 4" (100mm) valve size, Reliable P/N 6881606000 for the 6" (150mm) and 165mm valve sizes or Reliable P/N 6881608000 Seat Wrench for 8" (200mm) valve size, remove the seat by unscrewing. This will loosen the seat-clapper-mounting ring subassembly. Reach into the valve and grasp the seat and remove it from the valve. Then remove the clapper-mounting ring subassembly from the valve. Visually examine all components of the seat-clapper-mounting ring subassembly and replace any component that appears damaged. New O-rings should always be used for reassembly.
9. Reassembly: clean the bore of the valve body. Lubricate the bore with O-ring grease. Lubricate and install the O-rings onto the seat. Lubricate and install the mounting ring O-ring into the body (8" (200mm) valve size only). Insert the clapper-mounting-ring subassembly into the handhold opening of the Deluge Valve using caution to not damage or dislodge the mounting ring O-ring (8" (200mm) valve size only). Align the mounting ring so that the Lever is near the pushrod and the mounting ring "ears" are between the tabs of the valve body. Insert the seat into the valve body and through the clapper-mounting ring subassembly. Start to tread the seat into the body by hand, then tighten the seat with the seat wrench until it bottoms out on the mounting ring. Verify that the seat-clapper-mounting ring subassembly is in the fully down position between the tabs of the body, and check to see that the lever lines up with the pushrod. Reassemble the handhold cover and set up the Model DDX Deluge Valve as per the section "Resetting Model DDX Type D Double Interlock Preaction System."

Pushrod Chamber Maintenance - Model DDX Deluge Valve

A small bleed hole is located on the underside of the pushrod chamber. Water leakage from the bleed hole can be caused by a ruptured pushrod diaphragm:

a) Disable detection system.

b) Shut down the valve controlling water supply to the Deluge Valve. Relieve the inlet pressure by opening the main drain valve. Close the pushrod chamber supply valve and open the Model B Manual Emergency Station.

c) Remove the trim at the unions nearest to the pushrod chamber cover.

d) Take the pushrod chamber cover off by removing the six retaining screws.

e) Visually inspect the pushrod chamber cover and piston to determine what could have damaged the diaphragm and then correct. Install a new diaphragm.

Note: The diaphragm has two different surfaces; it is not bi-directional and will fail if installed backwards. Roll the diaphragm so that the smooth surface (the pressure side) conforms to the inside of the pushrod chamber cover and the fabric side engages the pushrod.

f) Reassemble the six retaining screws with an installation torque of 15 foot-pounds in a star pattern.

g) Set up the Model DDX Deluge Valve as per the section "Resetting Model DDX Type D Double Interlock Preaction System."

Draining Excess/Condensate Water from the System

1. Notify the owner and monitoring company that maintenance is being performed on the system.
2. Close the main water control valve.
3. Open the Main Drain Valve.
4. Open the Condensate Drain Valve until all water has drained.
5. Close Condensate Drain Valve.
6. Partially open the Main Water Control Valve.
7. Slowly close the Main Drain Valve.
8. Fully open the Main Water Control Valve.
9. Notify the owner and monitoring company that the system has been returned to service.

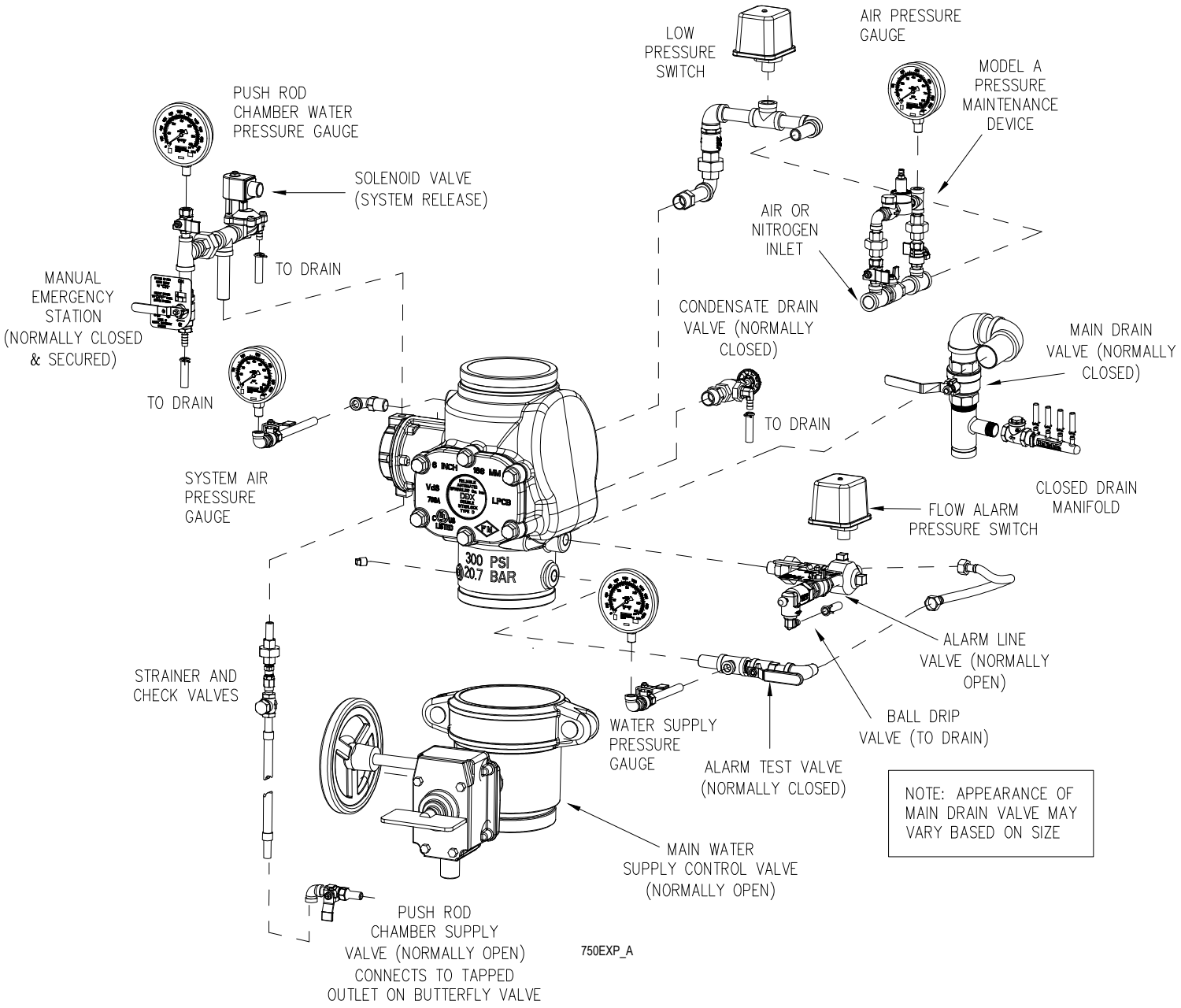
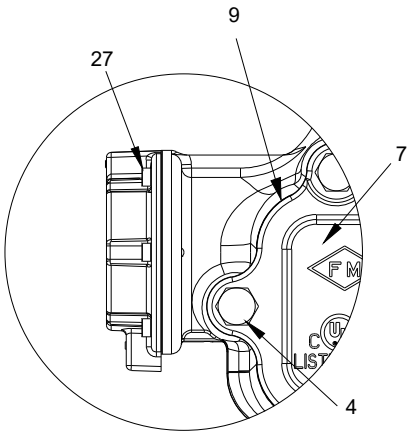
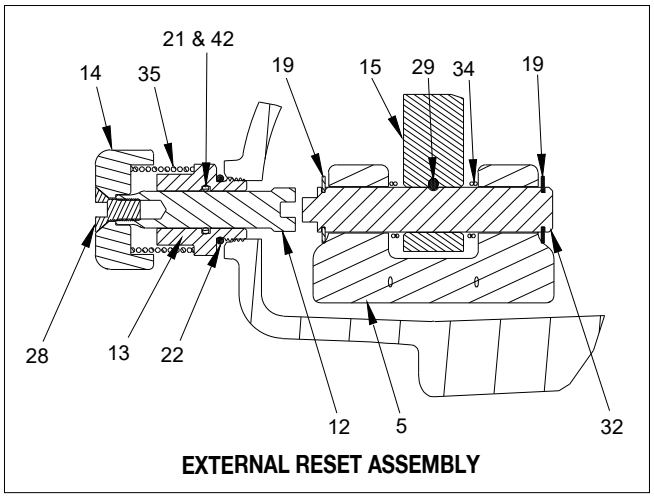

LOW PRESSURE SWITCH
AIR PRESSURE GAUGE
MODEL A PRESSURE MAINTENANCE DEVICE
PUSH ROD CHAMBER WATER PRESSURE GAUGE
SOLENOID VALVE (SYSTEM RELEASE)
TO DRAIN
AIR OR NITROGEN INLET
MANUAL EMERGENCY STATION (NORMALLY CLOSED & SECURED)
CONDENSATE DRAIN VALVE (NORMALLY CLOSED)
MAIN DRAIN VALVE (NORMALLY CLOSED)
TO DRAIN
TO DRAIN
SYSTEM AIR PRESSURE GAUGE
CLOSED DRAIN MANIFOLD
FLOW ALARM PRESSURE SWITCH
300 PSI 20.7 BAR
ALARM LINE VALVE (NORMALLY OPEN)
STRAINER AND CHECK VALVES
WATER SUPPLY PRESSURE GAUGE
BALL DRIP VALVE (TO DRAIN)
ALARM TEST VALVE (NORMALLY CLOSED)
NOTE: APPEARANCE OF MAIN DRAIN VALVE MAY VARY BASED ON SIZE
MAIN WATER SUPPLY CONTROL VALVE (NORMALLY OPEN)
PUSH ROD CHAMBER SUPPLY VALVE (NORMALLY OPEN) CONNECTS TO TAPPED OUTLET ON BUTTERFLY VALVE
750EXP_A

Fig. 4

MODEL DDX VALVE WITH STAINLESS STEEL SCREW-IN SEAT

IMPORTANT NOTE: Early generation 4" and 6" DDX valves may incorporate a brass drop-in seat. Prior to ordering replacement parts, confirm the presence of a stainless steel screw-in seat or brass drop-in seat. For replacement parts for valves with brass drop-in seat, please contact Reliable Sprinkler Company Technical Services (techserv@reliablesprinkler.com)





EXTERNAL RESET ASSEMBLY

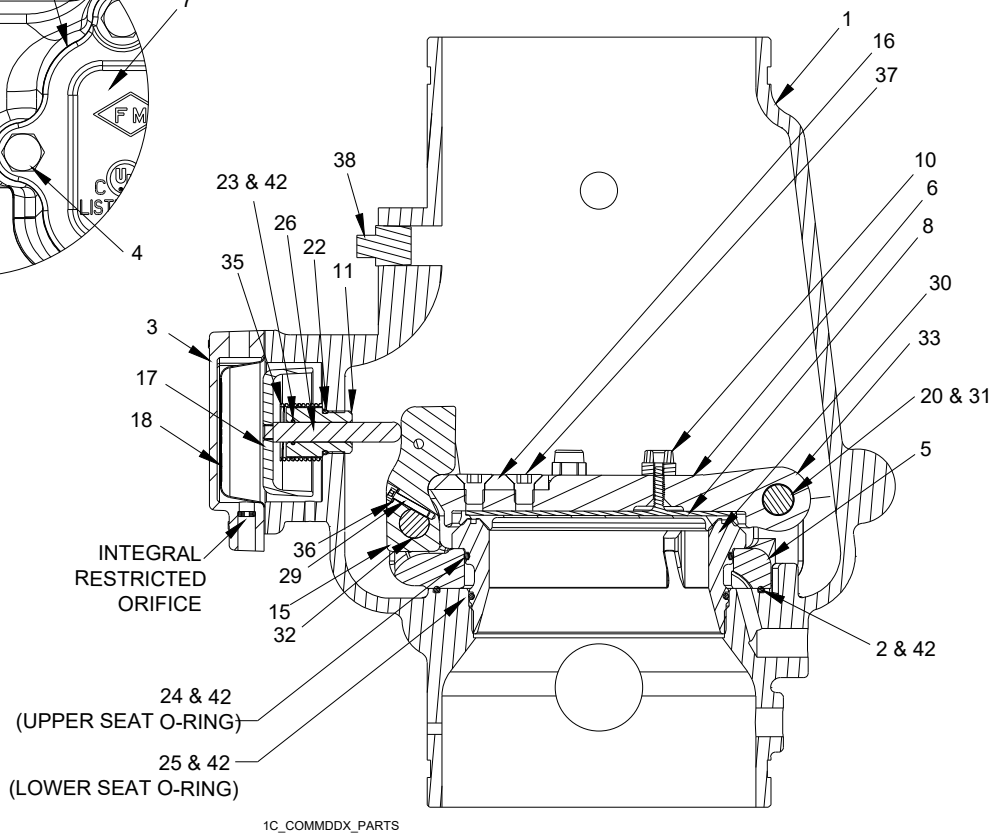


Fig.5

Model DDX (Screw-In Seat Configuration) Deluge Valves Parts List (Refer to Fig. 5)

Item No.	Part No.								Part Description	QTY.	Material
	2" (50mm)	2½" (65mm)	76mm	3" (80mm)	4" (100mm)	165mm	6" (150mm)	8" (200mm)			
1	91006011	91006012	91006023	91006013	91006005	91006027	91006007	91006028	Valve Body Groove/Groove	1	Ductile Iron 65-45-12
	N/A	N/A	N/A	N/A	91006045	N/A	91006067	N/A	Valve Body Flange/Groove		
	N/A	N/A	N/A	N/A	91006035	N/A	91006037	91006039	Valve Body Flange/Flange		
2	N/A	N/A	N/A	N/A	N/A	N/A		95406414	O-ring (Mounting Ring)	1	Buna-N
3	71040416								Pushrod Cover Assembly	1	Ductile Iron 65-45-12 & Brass C360000
4	91106123				N/A	N/A		N/A	Hex Bolt ½"-13 x 1¼"	6	Zinc Plated Steel
	N/A				95606107	N/A		N/A	Hex Bolt ½"-13 x 1½"	6	
	N/A				N/A	91106006		N/A	Hex Bolt ⅝"-11 x 1¾"	6	
	N/A				N/A	N/A		95606110	Hex Bolt ⅝"-11 x 2"	8	
5	91306013				91306014	91306016		91306018	Mounting Ring	1	Stainless Steel CF8 or CF8M
6	91916003				91916014	91916016		91916008	Clapper	1	Stainless Steel CF8 or CF8M
7	92116063				92116064	92116065	92116066	92116068	Access Cover	1	Ductile Iron 65-45-12
8	93416003				93416014	93416016		93416008	Seal Assembly	1	Stainless Steel 304 & EPDM
9	93706003				93706004	93706006		93706008	Access Cover Gasket	1	Buna-N or Neoprene
10	93722000				93722000	N/A		N/A	Bumpstop Assembly	1	Stainless Steel UNS S31600 & EPDM
	N/A				N/A	93722000		N/A		2	
	N/A				N/A	N/A		93722000		3	
11	93916006								Pushrod Guide	1	Acetal
12	93916066								Reset Shaft	1	Brass UNS C36000
13	94106066								Reset Housing	1	Brass UNS C36000
14	94356006								Reset Knob	1	Aluminum 6061
15	94506003				94506004	94506016		94506008	Lever	1	Stainless Steel UNS S17400
16	95006412				94006412	95006410		95006410	Striker	1	Aluminum Bronze C95400
17	95106006								Piston	1	Stainless Steel CF8M
18	95276006								Diaphragm	1	EPDM & Polyester
19	95306267				N/A	N/A		N/A	Retaining Ring, ⅜" Shaft, Lever Pin	2	Stainless Steel 15-7 or 17-7
	N/A				95306267	N/A		N/A	Retaining Ring, ½" Shaft, Lever Pin		
	N/A				N/A	95306269		N/A	Retaining Ring, ⅝" Shaft, Lever Pin		
	N/A				N/A	N/A		95316408	Retaining Ring, ¾" Shaft, Lever Pin		
20	95306268				N/A	N/A		N/A	Retaining Ring, ⅜" Shaft, Hinge Pin	2	Stainless Steel 15-7 or 17-7
	N/A				95306267	95306267		N/A	Retaining Ring, ½" Shaft, Hinge Pin		
	N/A				N/A	N/A		95316408	Retaining Ring, ¾" Shaft, Hinge Pin		
21	95406007								O-Ring, Reset Housing ID	1	Buna-N
22	95406024								O-Ring, Reset Housing & Pushrod Guide OD	2	Buna-N
23	95406407								O-Ring, Pushrod Guide ID	1	Buna-N
24	95406410				95406409	95436126		95406413	O-Ring, Upper Seat	1	Buna-N
25	95406411				95406420	95446226		95406412	O-Ring, Lower Seat	1	Buna-N
26	95506006								Pushrod	1	Stainless Steel UNS S30300
27	95606114								Socket Head Screw, ¼"-20 x ⅝"	6	Steel
28	95606127								Flat Head Socket Cap Screw ⅜"-16 x ¾"	1	Steel
29	95606133				N/A	N/A		N/A	Socket Head Screw #6-32 x ½"	1	Stainless Steel 18-8
	N/A				95606130	95606130		95606130	Socket Head Screw #10-32 x 1"		Stainless Steel UNS S31600
30	96016003				96016014	96016016		96016008	Seat	1	Stainless Steel CF8M
31	96206003				N/A	N/A		N/A	Hinge Pin	1	Stainless Steel UNS S30400
	N/A				96216086	96216086		96206008			Stainless Steel UNS S21800
32	96216003				N/A	N/A		N/A	Lever Pin	1	Stainless Steel UNS S17400
	N/A				96216044	96216047		96216008			Stainless Steel UNS S21800
33	96310003				96906904	96906904		96310008	Clapper Spacer	2	Teflon or Acetal
34	96406003				N/A	N/A		N/A	Lever Spring	1	Stainless Steel UNS S30400
	N/A				96406004	96406005		96406008			Stainless Steel UNS S31600
35	96406906								Piston/ Reset Spring	2	Stainless Steel UNS S31600

Model DDX (Screw-In Seat Configuration) Deluge Valves Parts List (Refer to Fig. 5) (Cont.)

Item No.	Part No.								Part Description	QTY.	Material
	2" (50mm)	2½" (65mm)	76mm	3" (80mm)	4" (100mm)	165mm	6" (150mm)	8" (200mm)			
36	96906112				N/A	N/A		N/A	Spring Lock Washer, #6	1	Stainless Steel 18-8
	N/A				96906111	96906111		96906111	Spring Lock Washer, #10		Stainless Steel UNS S31600
37	95606140				N/A	N/A		N/A	Flat Head Socket Cap Screw ¼"-20 x ½"	2	Stainless Steel 18-8
	N/A				95606139	N/A		N/A			Stainless Steel UNS S31600
	N/A				N/A	N/A		95606135	Flat Head Socket Cap Screw ½"-13 x ¾"		Stainless Steel UNS S31600
38	98604402								Plug, ½" NPT	1	Steel
39	94616921								Knob Caution Label (Not Shown)	1	Polystyrene
40	91556922								Ball Chain, 1/8" (Not Shown) (Length is in Inches)	6	Nickel Plated Brass
41	91556923								Clamping Link, Ball Chain (Not Shown)	1	
42	699993406								O-Ring Grease, Dupont™ Krytox® GPL-205	A/R	Krytox®

Ordering Information

Specify:

Model DDX Type D Double Interlock Preaction System

- **Size**
- **End Configuration**
- **Trim Assembly**
  - Loose Trim
  - Segmentally Assembled
  - Fully Assembled no Control Valve
  - Fully Assembled with Control Valve
- **Optional 300 psi (20,7 bar) solenoid valve**

Service Kits

Service kits are available for routine servicing of the valve (reference Figure 5). Service kits for the Model DDX Deluge Valve include the following components:

- Clapper Seal Assembly (item 8)
- Cover Gasket (item 9)
- Bumpstop(s) (item 10)
- Push rod chamber diaphragm (item 18)
- Grease (item 42)

2", 2-1/2", and 3" Model DDX Service Kit: PN 6501200R03
4" Model DDX Service Kit: PN 6501200R04
6" Model DDX Service Kit: PN 6501200R05
8" Model DDX Service Kit: PN 6501200R06

Note: Early generation 4" and 6" Model DDX valves utilize a drop-in brass clapper. Service kits for early Model DDX valves are as follows:

4" Early generation DDX Deluge Valve Service Kit: PN 6501200R07
6" Early generation DDX Deluge Valve Service Kit: PN 6501200R08

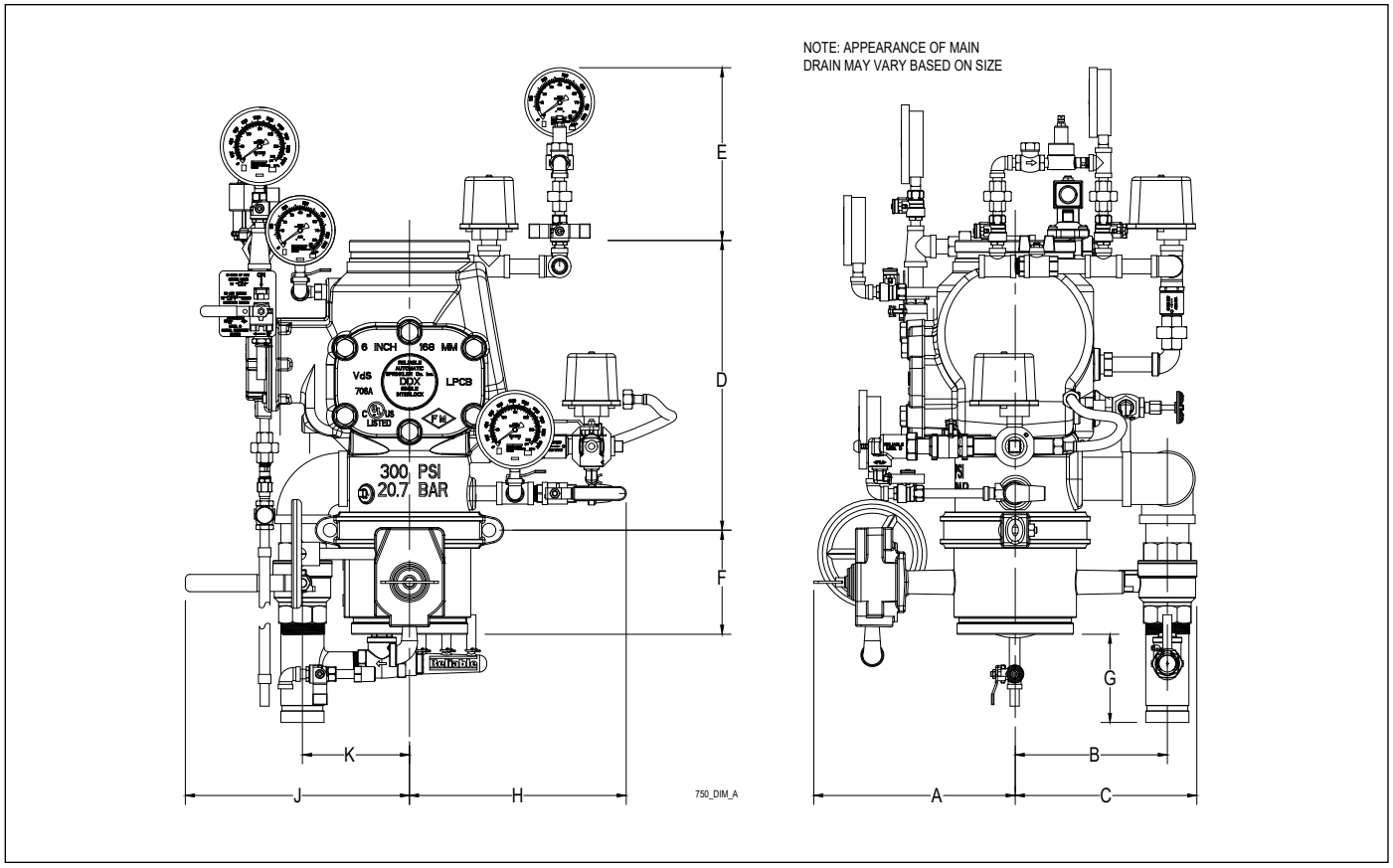


Fig. 7

Nominal Pipe Size	Installation Dimensions in Inches (mm)										
	A	B	C	D(1)	D(2)	E	F(3)	G	H	J	K
2" (50mm)	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	14 (356)	3-7/8 (98)	1-1/2 (38)	10 (254)	9-1/2 (241)	4 (102)
2-1/2" (65 mm), 76 mm, & 3" (80 mm)	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	14 (356)	3-7/8 (98)	1-3/8 (35)	9-7/8 (251)	9-1/2 (241)	3-7/8 (99)
4" (100 mm)	9-3/4 (248)	7-5/8 (194)	9-1/4 (235)	14 (356)	16 (406)	10-3/8 (264)	4-9/16 (116)	5-1/4 (133)	11 (279)	11-7/8 (301)	5-1/2 (140)
6" (150 mm) & 165 mm	11-1/8 (283)	8-1/8 (206)	9-3/4 (248)	16 (406)	19 (483)	10-1/8 (257)	5-7/8 (149)	3-3/4 (95)	11 (279)	12 (305)	5-1/2 (140)
8" (200 mm)	12-5/8 (321)	9 (229)	10-5/8 (270)	19-3/8 (492)	21-1/4 (540)	13-1/8 (333)	5-1/4 (134)	4-1/8 (105)	12-5/8 (306)	12 (305)	5-1/2 (140)

Notes:

1. End to end take out of Model DDX valve with grooved inlet.
2. End to end take out of Model DDX valve with flanged inlet where available (see page 8; also reference Bulletin 519).
3. Not applicable to 76mm or 165mm systems, or systems using a flanged inlet Model DDX valve.

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.

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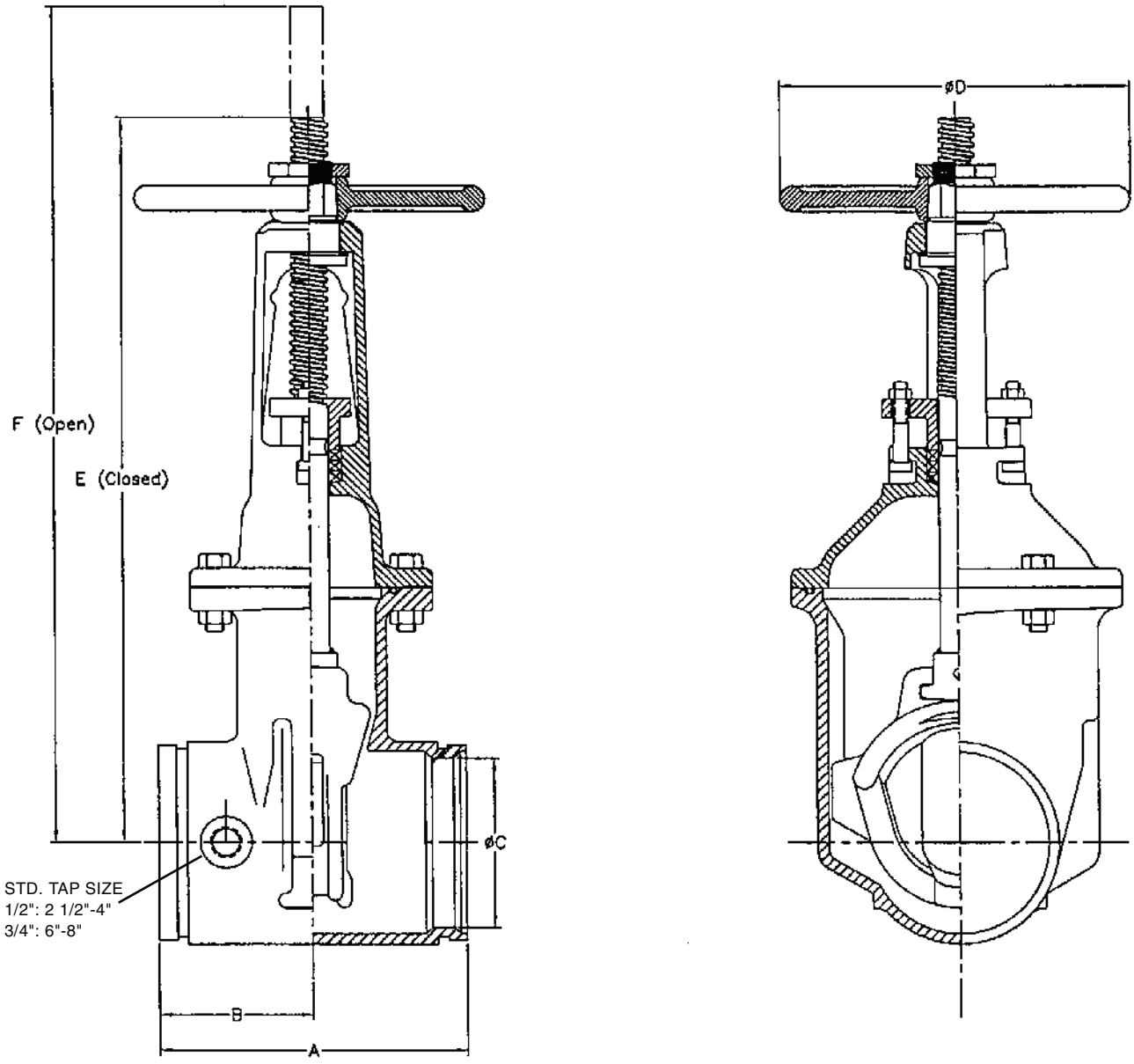
Complies with applicable requirements of AWWA C515

2 1/2" - 8" R/S VALVE GROOVE ENDS OS&Y GENERAL DIMENSIONS

KENNEDY VALVE MODEL KS-RW

7093A



GRV X GRV VALVES TAPPED & PLUGGED @ POSITION “A”, "B", "F"

VALVE SIZE	A	B	C	D	E	F
2 1/2	7 1/2	3 3/4	1.97	7 1/4	13 7/8	16 3/8
3	8	4	2.63	10	15 5/8	18 7/8
4	9	4 1/2	3.75	10	18 1/4	22 3/4
6	10 1/2	5 1/4	5.80	12	23 3/4	30 1/8
8	11 1/2	5 3/4	7.67	14	29 1/4	37 ¾
10	13	6 1/2	9.80	16	35 3/8	45 3/4

Intentionally Blank

Model REL363GT & REL363GTC
Butterfly Valve / Grooved Tapped Body

cULus Listed, FM Approved
363 psi (25 bar)

Product Description

The Reliable Model REL363GT and REL363GTC supervised butterfly valves are cULus Listed and FM Approved control valves for fire protection systems. The valves have AWWA C606 grooved end connections. They are available in 2” (50 mm), 2-1/2” (65 mm), 3” (80 mm), 4” (100 mm), 6” (150 mm), 8” (200 mm), and 10” (250 mm) nominal sizes. The valves are listed for 363 psi (25 bar) working pressure. The maximum working temperature for the valves is 212°F (100°C). The valve bodies come equipped with a plugged, tapped port on the supply and discharge side of the disc. These valves are available with two options for the wire harness; a standard 9” (0.23 m) set of wire leads, and a 39” (1 m) extended-length set of wire leads.

Verify compatibility of the Model 363GT/GTC materials with the water supply and the environment where the valve will be used prior to installation.

Partially close the valve during installation, so that the butterfly seal does not extend past the end of the housing.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

Reliable Butterfly valves and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, “Inspection, Testing and Maintenance of Water Based Fire Protection Systems,” provides minimum maintenance requirements.

2” (50mm) through 8” (200mm) valves require approximately 10 full turns to move the valve from fully open to closed (or vice versa), at which time a mechanical stop will be encountered. Any attempt to further open or close the valve beyond the mechanical stop may result in damage to the valve. (Note: 10” (250mm) valve will require approximately 15 full turns.)

See Technical Bulletin 840 for instructions on adjustment of mechanical stops if the butterfly seal does not fully seat with the valve handle in the closed position.

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Model REL363GT Butterfly Valve - Supervised Normally Open

Model REL363GTC Butterfly Valve - Supervised Normally Closed

Ordering Information

Specify the following when ordering:

Service
- Normally Open (Yellow Indicator, Red Actuator)
- Normally Closed (Red Indicator, Yellow Actuator)

Valve Size
- 2” (50 mm)
- 2-1/2” (65 mm)
- 76 mm
- 3” (80 mm)
- 4” (100 mm)
- 6” (150 mm)
- 165 mm
- 8” (200 mm)
- 10” (250 mm)

Wire Harness Length
- Standard: 9” (0.23 m)
- Optional: 39” (1 m)

Reliable Model REL363GT and REL363GTC Butterfly Valve

Technical Specifications
Pressure Rating:
363 psi (25 bar)

Material Specifications
Upper Stem: Stainless Steel ASTM A 276 Type 420
Upper Bearing: PTFE Bronze Sintered on Steel
Stem Seal O-Ring: EPDM
Body: Ductile Iron ASTM A 395, Epoxy Coated
Disc: Ductile Iron ASTM A 395 with EPDM Encapsulation
Lower Bearing: PTFE Bronze Sintered on Steel
Lower Stem: Stainless Steel ASTM A 276 Type 420
Dust Plug: PVC
Name Plate: Aluminum
Gear Operator: Cast Iron and Steel
Indicator Flag: Steel
Handwheel: Cast Iron
Cable Gland: Nickel plated brass
Plug: Carbon Steel (Zinc-plated)

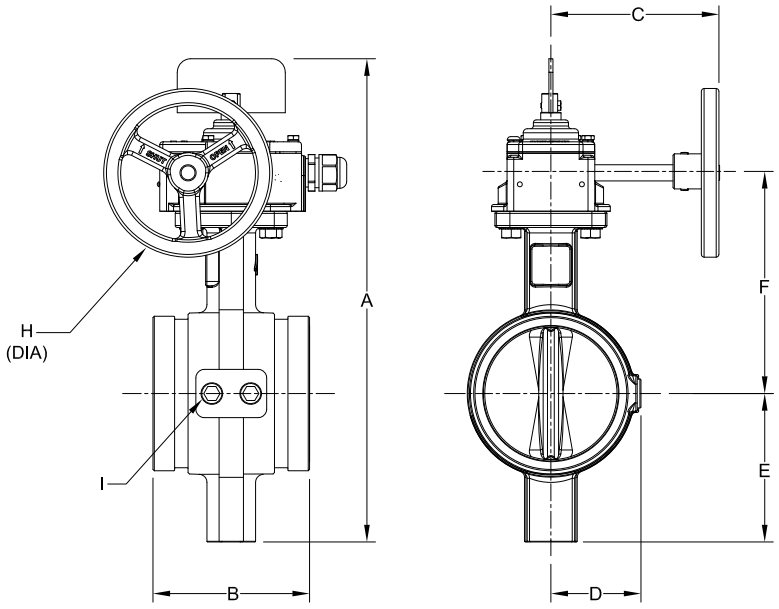
Specifications
Groove Inlet: AWWA C 606

Listings and Approvals
cULus Listed
FM Approved

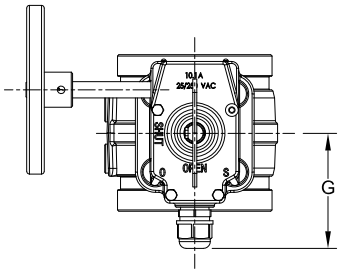
Applications
- Indoor and outdoor use
- For use with grooved-end IPS steel pipe of any schedule or wall thickness
- Not for use with cast ductile iron pipe
- Not for submersible service

Reliable Model REL363GT and REL363GTC Butterfly Valve Dimensions

Figure 1



NOTE: HAND WHEEL WILL BE ON OPPOSITE SIDE OF GEAR HOUSING ON THE NORMALLY CLOSED (REL363GTC) VALVE.



Grooved Dimensions - in. (mm)

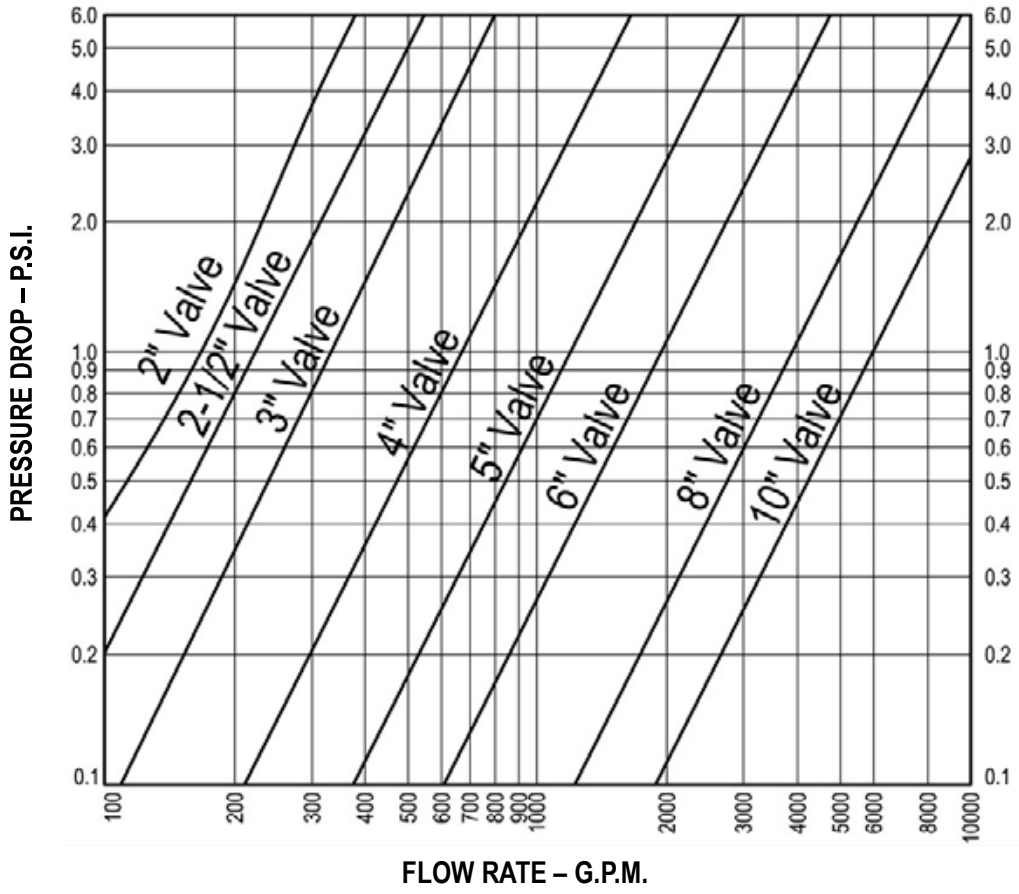
Table A

Nominal Size	A	B	C	D	E	F	G	H	I	Weight lb (kg)
2” (50)	9-13/16 (250)	3-7/8 (98)	4-15/16 (125)	1-9/16 (40)	2-1/4 (58)	4-1/4 (108)	3-3/8 (85)	4-1/4 (108)	1/4 NPT	9.9 (4.5)
2-1/2” (65)	10-7/8 (276)	3-7/8 (98)	4-15/16 (125)	1-3/4 (45)	2-5/8 (68)	4-15/16 (125)	3-3/8 (85)	4-1/4 (108)	1/4 NPT	10.1 (4.6)
76 mm	10-7/8 (276)	3-7/8 (98)	4-15/16 (125)	2 (50)	2-7/8 (74)	4-15/16 (125)	3-3/8 (85)	4-1/4 (108)	1/4 NPT	10.4 (4.7)
3” (80)	11-1/2 (291)	3-7/8 (98)	4-15/16 (125)	2 (52)	2-7/8 (74)	5-1/4 (134)	3-3/8 (85)	4-1/4 (108)	1/4 NPT	11.2 (5.1)
4” (100)	13-1/2 (342)	4-9/16 (116)	4-15/16 (125)	2-1/2 (63)	3-3/4 (95)	6-1/2 (164)	3-3/8 (85)	4-15/16 (125)	1/4 NPT	15 (6.8)
6” (150)	15-13/16 (402)	5-7/8 (149)	6-5/8 (168)	3-9/16 (91)	4-13/16 (122)	7-13/16 (199)	3-5/8 (92)	5-7/8 (150)	1/4 NPT	32.4 (18.8)
165 mm	15-13/16 (402)	5-7/8 (149)	6-5/8 (168)	3-9/16 (91)	4-13/16 (122)	7-13/16 (199)	3-3/8 (85)	5-7/8 (150)	1/4 NPT	31.5 (41.3)
8” (200)	18-3/8 (466)	5-1/4 (134)	6-5/8 (168)	4-5/8 (118)	5-3/4 (147)	9-3/8 (238)	3-5/8 (92)	5-7/8 (150)	1/4 NPT	41.4 (18.8)
10” (250)	21-5/8 (549)	6-5/16 (160)	9-7/16 (240)	5-11/16 (144)	7-1/8 (181)	11-3/16 (284)	3-15/16 (100)	9-13/16 (250)	1/4 NPT	78 (35.4)

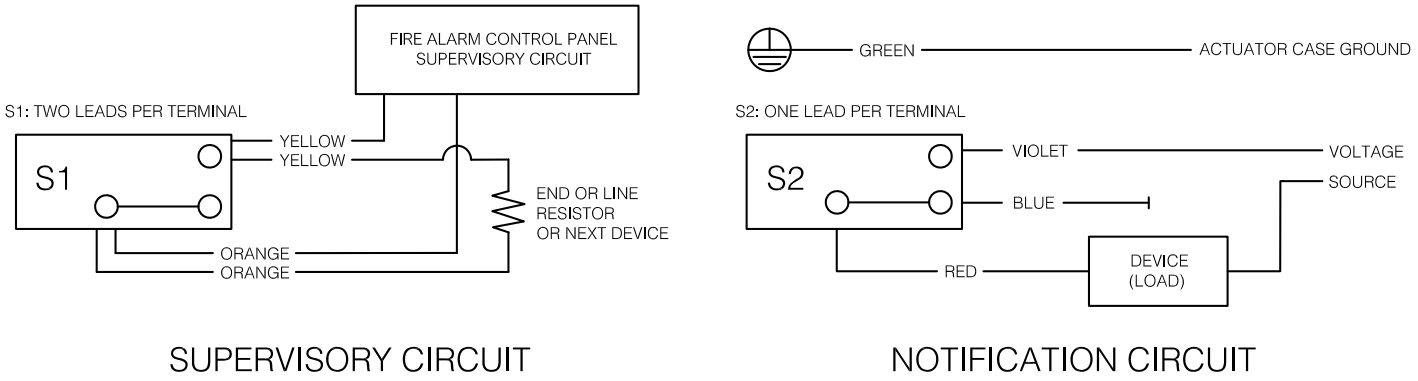
Flow Performance Data **Table B**

Pipe Size NPS (DN)	Full-Open Flow Coefficient (Cv) Calculated using GPM and PSI units	Equivalent Length of Pipe Friction Loss ft (m)
2 (50)	155	5.0 (1.4)
2-1/2 (65)	225	5.6 (1.7)
76 mm	225	6 (1.8)
3 (80)	374	6.3 (1.9)
4 (100)	710	7.3 (2.2)
6 (150)	1640	11.4 (3.5)
165 mm	1640	12.5 (3.8)
8 (200)	3874	8.8 (2.7)
10 (250)	5995	11.9 (3.6)

Reliable Model REL363GT and REL363GTC Performance Data **Figure 2**

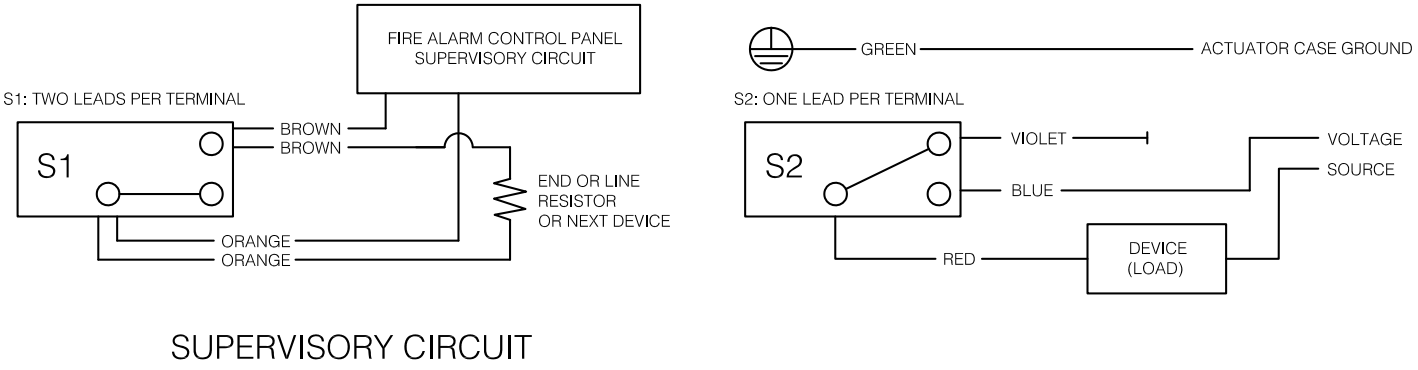


Reliable Model REL363GT Wiring Diagram - Supervised Normally Open **Figure 3**



NOTES:
1. WIRING SHOWN IS FOR NORMALLY OPEN CIRCUITS.
2. CAP ALL ENDS OF UNUSED WIRES.
3. SWITCH RATING: 10.1A, 125/250 VAC

Reliable Model REL363GTC Wiring Diagram - Supervised Normally Closed **Figure 4**



NOTES:
1. WIRING SHOWN IS FOR NORMALLY OPEN CIRCUITS.
2. CAP ALL ENDS OF UNUSED WIRES.
3. SWITCH RATING: 10.1A, 125/250 VAC

P/N 9999970668

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Member of Morris Group International™

VALVES
ANGLE HOSE VALVES

Model/Series No.
4060-4075 SERIES

SPECIFICATIONS

ANGLE VALVES

FEMALE X MALE
Cast brass valve with red hand wheel, Female N.P.T. inlet x male hose thread outlet. 300 psi

DOUBLE FEMALE
Cast brass valve with red hand wheel. Female N.P.T. inlet and outlet. 300 psi

MODEL 4065 (Shown)

MODEL SELECTION

VALVES

- ☐ **4060** 1-1/2” Female x Male Angle Valve ◄FM►
- ☑ **4065** 2-1/2” Female x Male Angle Valve ◄FM►
- ☐ **4065-500** 2-1/2” Female x Male Angle Valve 500 psi
- ☐ **4070** 1-1/2” Double Female Angle Valve ◄FM►
- ☐ **4075** 2-1/2” Double Female Angle Valve ◄FM►
- ☐ **4075-500** 2-1/2” Double Female Angle Valve 500 psi

OPTIONAL CAPS & FLANGES

- ☐ **4615** 1-1/2” Cap w/ Chain
- ☐ **4625** 2-1/2” Cap w/ Chain
- ☐ **4711** 1-1/2” Flange 3” O.D.
- ☐ **4712** 2-1/2” Flange 6-1/4” O.D.

PRODUCT OPTIONS

FINISHES:

- ☑ -B Polished Brass
- ☐ -C Rough Chrome Plated
- ☐ -D Polished Chrome Plated

THREADS:

- ☑ N.S.T.
- ☐ Other _____

VARIATIONS:

- ☐ Extended Stem Up to 24” Specify _____
- ☐ Rocker Lugs (Cap Models Only)
- ☑ -GRV Grooved Inlet (4065 Only)

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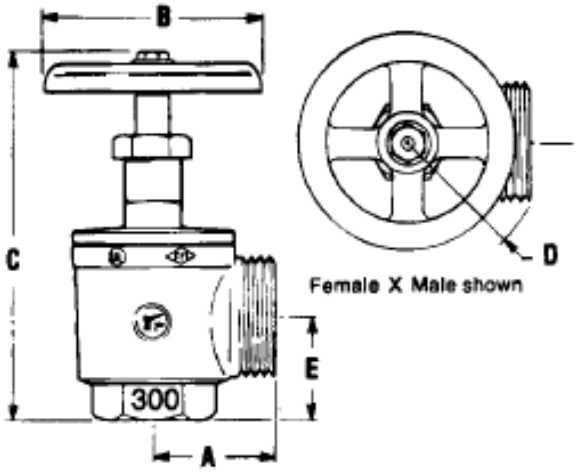
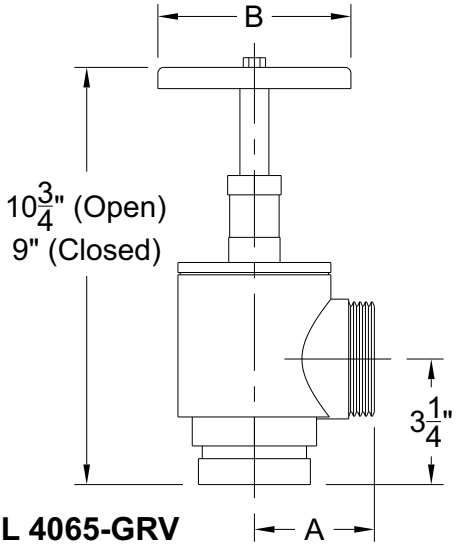
MODEL DIMENSIONS

Size	Closed			Open		
	A	B	C	C	D	E
1-1/2	2-1/4	3-1/2	6-1/2	7-1/2	2-1/2	2
2-1/2	3-1/2	5	9-1/2	11-1/2	3-1/2	2-3/4

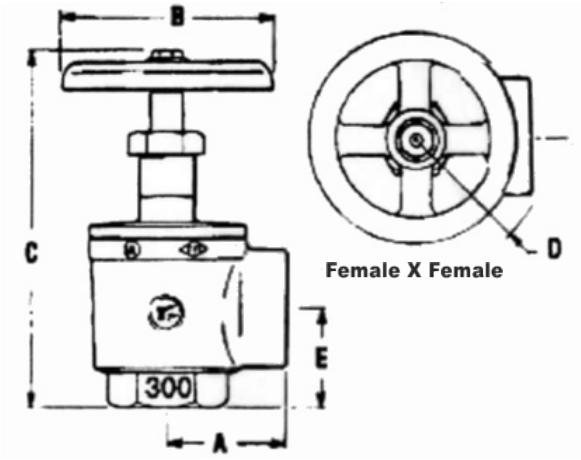
ALL DIMENSIONS IN INCHES



MODEL 4060-4065



MODEL 4065-GRV



MODEL 4070-4075

MEMBERSHIP

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Atlanta (800) 762-0542
Miami (866) 961-3473
Dallas (866) 644-3473

www.potterroemer.com

TESTANDRAIN®

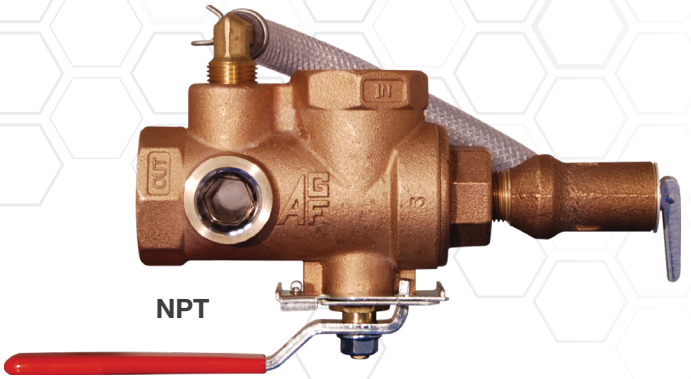
Model 2511A

QUALITY COMPONENTS FOR FIRE SPRINKLER SYSTEMS

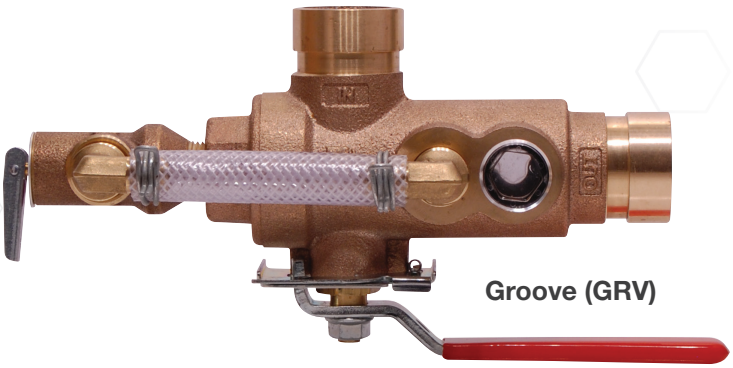
System Test and Express Drain Valve

The AGF TESTANDRAIN Model 2511A is a single-handle ball valve (with an alternative handle location for added installation flexibility) that provides the test and express drain functions for wet fire sprinkler systems. The single-handle ball valve configuration eliminates the multiple connections needed by traditional loop assemblies.

The Model 2511A is compliant with industry standards which require provisions for properly draining a system and the inclusion of a pressure relief valve on all wet systems (NFPA 13). All 2511A models feature a 175 PSI rated pressure relief valve (other ratings available) with drain trim, and tamper-resistant test orifice and sight glass. TESTANDRAIN valves are available in a full range of sizes (1"—2") with optional orifice sizes (2.8K—25.2K) and NPT or grooved (GRV) inlet/outlet ports. Valves are field-serviceable (repair kits sold separately) and offer locking kits for added security.



NPT



Groove (GRV)

Features

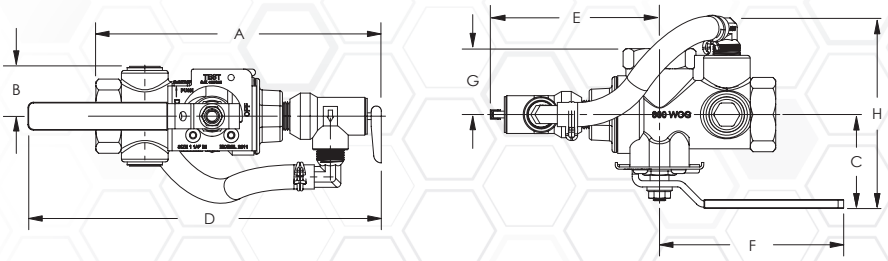
- NFPA Compliant (13, 13D, and 13R)
- 1", 1¼", and 2" Sizes
- Orifice Options (2.8K—25.2K)
- Alternative Handle Location
- Tamper-Resistant Test Orifice and Sight Glass
- 300 PSI Rated
- 175 PSI Rated Pressure Relief Valve Included (Other Rating Available)
- Horizontal or Vertical Installation
- Field Serviceable
- Locking Kits Available

Models

Model 2511A Part Numbers						
Orifice Size		1"		1¼"		2"
K-Factor	Fractional	NPT	GRV	NPT	GRV	GRV
2.8	3/8"	406A-0	406GA-0	407A-0	407GA-0	409GA-0
4.2	7/16"	406A-1	406GA-1	407A-1	407GA-1	409GA-1
5.6	1/2"	406A-2	406GA-2	407A-2	407GA-2	409GA-2
8.0	17/32"	406A-3	406GA-3	407A-3	407GA-3	409GA-3
11.2 (ELO)	5/8"	406A-4	406GA-4	407A-4	407GA-4	409GA-4
14.0 (ESFR)	3/4"	-	-	407A-5	407GA-5	409GA-5
25.2	-	-	-	-	-	409GA-6

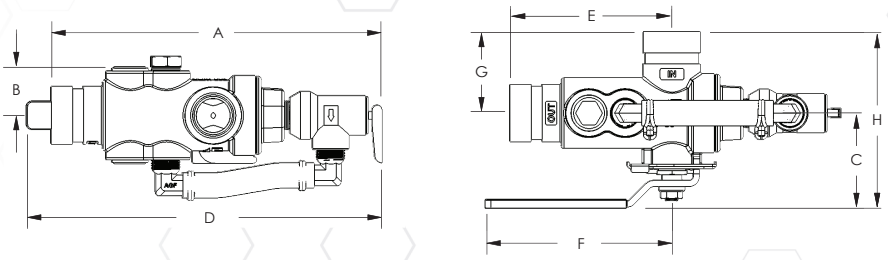
Most Popular Models

Dimensions



NPT								
Size	A	B	C	D	E	F	G	H
1"	8" (203 mm)	1¼" (33 mm)	2⅜" (60 mm)	9⅛" (233 mm)	4⅝" (117 mm)	4⅝" (116 mm)	1¾" (44 mm)	5" (129 mm)
1¼"	8½" (216 mm)	1½" (38 mm)	2¾" (71 mm)	10½" (267 mm)	5" (128 mm)	5½" (139 mm)	2" (50 mm)	5⅝" (144 mm)

Sizes have been rounded to the highest millimeter



GRV								
Size	A	B	C	D	E	F	G	H
1"	9⅛" (232 mm)	1¼" (32 mm)	2⅜" (60 mm)	9⅛" (232 mm)	4⅝" (117 mm)	4⅝" (116 mm)	2⅛" (54 mm)	4½" (113 mm)
1¼"	9¾" (247 mm)	1⅜" (35 mm)	2¾" (71 mm)	10½" (265 mm)	4¾" (121 mm)	5½" (139 mm)	2⅜" (60 mm)	5⅛" (130 mm)
2"	11" (279 mm)	1⅞" (47 mm)	3¾" (95 mm)	13⅝" (346 mm)	5½" (140 mm)	8⅛" (207 mm)	2¾" (70 mm)	6½" (164 mm)

Sizes have been rounded to the highest millimeter

NOTE: UL and FM standards for sprinkler system pressure relief valves require relief valves to operate within a range of their ratings. FM requires a relief valve to OPEN at a pressure no less than 85% of their rating and UL requires OPENING at a pressure no greater than 105% of their rating. Both standards require the relief valves to CLOSE within a percentage below OPEN. Choose the relief valve comparing static pressure to 90% of the relief valve's rating to determine the estimated minimum OPENING and 80% of the relief valve's rating for approximate maximum CLOSING. The relief valve should be installed where it is easily accessible for maintenance. Care should be taken that the relief valve CANNOT be isolated from the system when the system is operational. A relief valve should NEVER have a shutoff valve or a plug downstream of its outlet.

USA Patent #4741361 and Other Patents Pending

For use on wet fire sprinkler systems.

Valve Sizes

1", 1¼", and 2"

Orifice Options

2.8K, 4.2K, 5.6K, 8.0K, 11.2K (ELO), 14.0K (ESFR), and 25.2K

Connections

Inlet..... NPT or Groove (GRV)
Outlet..... NPT or Groove (GRV)
(BSPT Available)

Installation Orientation

Horizontal
Vertical

Electrical Requirements

None

Materials

Handle ..... Steel
Stem ..... Rod Brass
Ball..... C.P. Brass
Body ..... Bronze
Valve Seat..... Impregnated Teflon®
Indicator Plate ..... Steel
Relief Valve ..... Bronze
Bypass Fittings..... Brass
Bypass Tube..... Nylobraid

Rating

300 PSI

Compliance

NFPA 13
NYC-BSA No. 720-87-SM

Approvals

UL/ULC (EX4019 & EX4533)
FM

UL LISTED
FM APPROVED

AGF Manufacturing Inc.
100 Quaker Lane, Malvern, PA 19355
Phone: 610-240-4900
Fax: 610-240-4906
www.agfmfg.com

Job Name: _____
Architect: _____
Engineer: _____
Contractor: _____

Pressure Relief Valve
Model 7000L/7200L

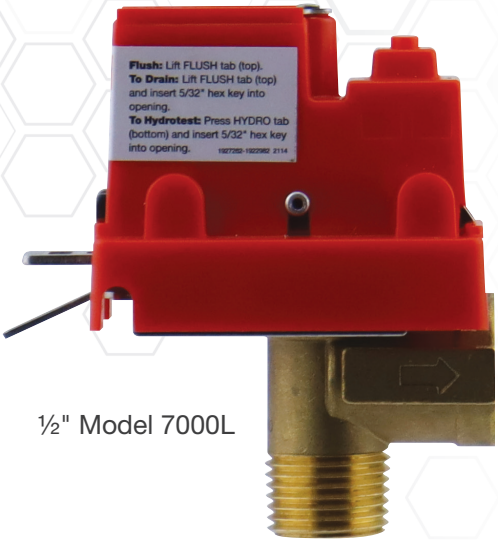
QUALITY COMPONENTS FOR FIRE SPRINKLER SYSTEMS

Pressure Relief Valves with Lock-Out for System Testing

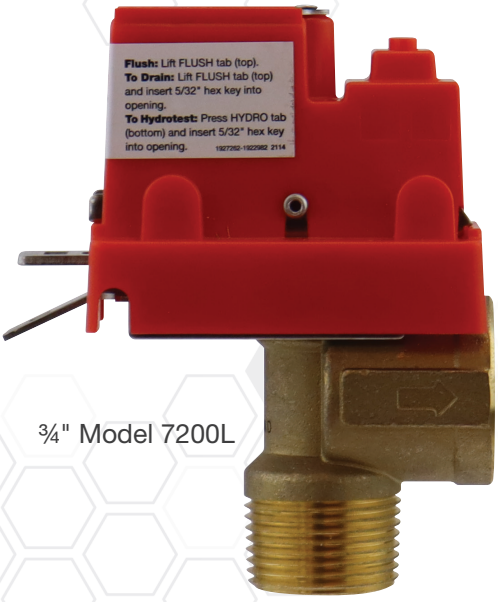
AGF Manufacturing Model 7000L and 7200L pressure relief valves comply with the requirements of NFPA 13 that stipulates a pressure relief valve must be installed on all wet fire sprinkler systems and downstream of any pressure reducing valve. Both models relieve excess system pressure caused by surges or temperature changes. They include a bronze body and stainless steel spring housed in a plastic casing that allows the user to temporarily lock it out to perform hydrostatic testing without removing the valve from the system.

The Model 7000L has a ½" MIPT inlet and FIPT outlet and is included with all TESTANDRAIN (1011, 2511), REMOTETEST (1211), INSPECTORSTEST (3011), and RISERPACK (8011, 8511, 8611) models that utilize a pressure relief valve. The Model 7000L is available with factory set ratings of 175, 200, 225, and 300 PSI. The Model 7200L has a ¾" MIPT inlet and FIPT outlet and is utilized on the 1" Residential RISERPACK Model 8011 13D. The Model 7200L is rated at 175 PSI.

Both models UL Listed and FM Approved and can be purchased separately.



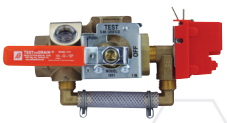
½" Model 7000L



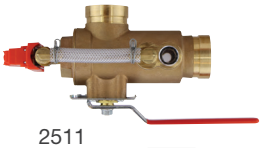
¾" Model 7200L

Features:

- Temporarily Lock Closed to Allow Hydrostatic Testing Without Removing the Pressure Relief Valve from the System
- UL Listed
- FM Approved
- Factory-Set PSI:
  - Tested for Accuracy in Desired Range
  - Resistant to Tampering
  - Quickly Open to Flush Leak-Causing Debris



1011



2511

3011

8011

Products shown with 7000L and drain trim (A-Kit).

NOTE: UL and FM standards for sprinkler system pressure relief valves require relief valves to operate within a range of their ratings. FM requires a relief valve to OPEN at a pressure no less than 85% of their rating and UL requires OPENING at a pressure no greater than 105% of their rating. Both standards require the relief valves to CLOSE within a percentage below OPEN. Choose the relief valve comparing static pressure to 90% of the relief valve's rating to determine the estimated minimum OPENING and 80% of the relief valve's rating for approximate maximum CLOSING. The relief valve should be installed where it is easily accessible for maintenance. Care should be taken that the relief valve CANNOT be isolated from the system when the system is operational. A relief valve should NEVER have a shutoff valve or a plug downstream of its outlet.

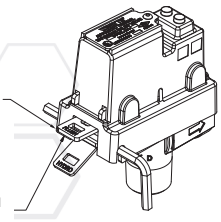
UL LISTED FM APPROVED

Operation

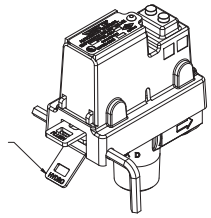
The Model 7000L (1/2") and 7200L (3/4") are pressure relief valves specifically designed to relieve excess pressure caused by pressure surges or temperature changes in wet fire sprinkler systems. They comply with NFPA 13 requirements stipulating that a pressure relief valve be installed on all wet systems and downstream of all pressure reducing valves. These valves can be opened to flush debris from the seat, drain a system, or they can be temporarily locked closed for system hydrostatic testing.

Installation

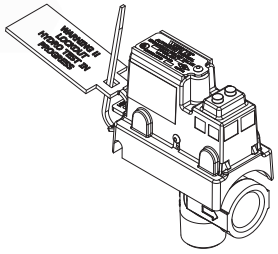
To prevent damage to the valve when installing the M7000L or M7200L in the system, do not torque the valve into place using the valve cover! The valve must be installed using only the wrench flats provided on the valve's brass body.



1. Lift Flush Tab to Flush
2. Lift Flush Tab and use 5/32" wrench to pin in place to drain



3. Press HYDRO Tab and use 5/32" wrench to pin in place for test



Operation

The valve can be (1) manually opened for flushing operations; (2) manually locked open for draining operations and (3) manually locked close for system hydrostatic testing;

1. **Flushing:** Lift FLUSH tab (top).
2. **Draining:** Lift FLUSH tab (top) and insert 5/32" hex wrench into opening.
3. **Hydrotest:** Press HYDRO tab (bottom) down and insert 5/32" hex wrench into opening

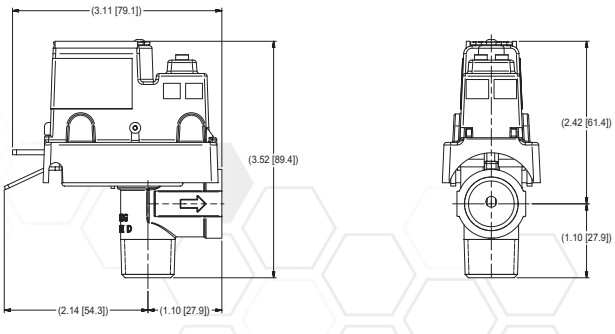
   OR

   Hydrotest Alternative: Using a lock-out tag (field supplied), lift the HYDRO tab and tie to the FLUSH tab.

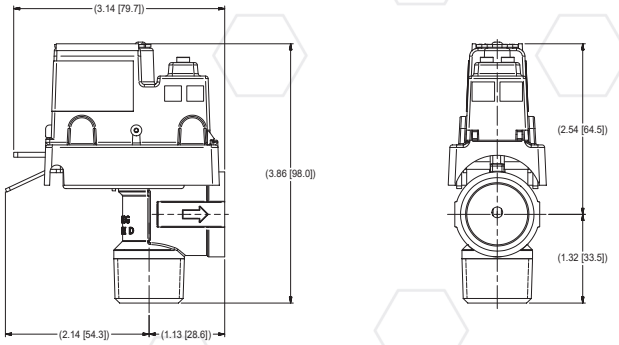
⚠ WARNING Remove hex wrench OR lock-out tag to restore valve to operating condition.

Dimensions

7000L



7200L



USA Patent and Other Patents Pending

AGF Manufacturing Inc.
100 Quaker Lane, Malvern, PA 19355
Phone: 610-240-4900
Fax: 610-240-4906
www.agfmfg.com

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PS10 SERIES
PRESSURE SWITCH

UL, cUL, and CSFM Listed, FM and LPC Approved, NYMEA Accepted, CE Marked

Dimensions: 3.78" (9,6cm)W x 3.20" (8,1cm)D x 4.22" (10,7cm)H

Conduit Entrance: Two knockouts provided for 1/2" conduit. Individual switch compartments and ground screws suitable for dissimilar voltages.

Enclosure: Cover - Die-cast with textured red powdercoat finish, single cover screw and rain lip.

Base - Die-cast

Pressure Connection: Nylon 1/2" NPT Male

Factory Adjustment: 4 - 8 PSI (0,27 - 0,55 BAR)
Differential: 2 PSI (0,13 BAR) typical

Maximum System Pressure: 300 PSI (20,68 BAR)

Switch Contacts: SPDT (Form C)
10.1 Amps at 125/250VAC, 2.0 Amps at 30VDC
One SPDT in PS10-1, Two SPDT in PS10-2

Environmental Specifications:
NEMA 4/IP66 Rated Enclosure - indoor or outdoor when used with NEMA 4 conduit fittings.
Temperature range: -40°F to 140°F (-40°C to 60°C)

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential Occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Ordering Information

Model	Description	Stock No.
PS10-1	Pressure switch with one set SPDT contacts	1340103
PS10-2	Pressure switch with two sets SPDT contacts	1340104
	Hex Key	5250062
	Cover Tamper Switch Kit	0090200

Tamper
Cover incorporates tamper resistant fastener that requires a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090200. See bulletin #5401200 PSCTSK.

Installation
The Potter PS10 Series Pressure Actuated Switches are designed for the detection of a waterflow condition in automatic fire sprinkler systems of particular designs such as wet pipe systems with alarm check valves, dry pipe, preaction, or deluge valves. The PS10 is also suitable to provide a low pressure supervisory signal; adjustable between 4 and 15 psi (0,27 and 1,03 BAR).

1. Apply Teflon tape to the threaded male connection on the device. (Do not use pipe dope)
2. Device should be mounted in the upright position (threaded connection down).
3. Tighten the device using a wrench on the flats on the device.

Wiring Instructions

1. Remove the tamper resistant screw with the special key provided.
2. Carefully place a screwdriver on the edge of the knockout and sharply apply a force sufficient to dislodge the knockout plug. See Fig 9
3. Run wires through an approved conduit connector and affix the connector to the device.
4. Connect the wires to the appropriate terminal connections for the service intended. See Figures 2,4,5, and 6. See Fig 7 for two switch, one conduit wiring.

Testing
The operation of the pressure alarm switch should be tested upon completion of installation and periodically thereafter in accordance with the applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

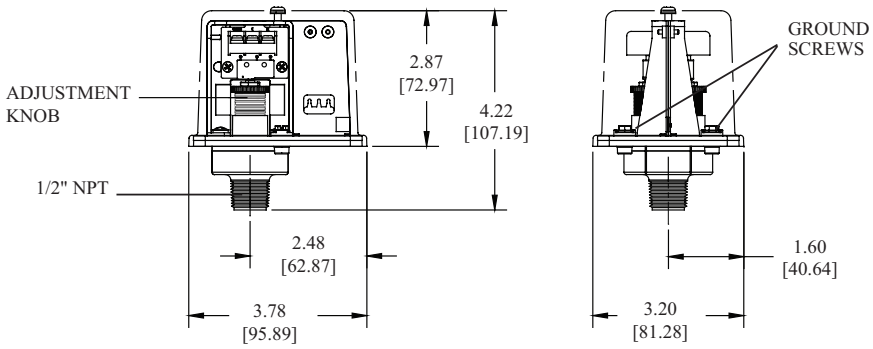
Wet System
Method 1: When using PS10 and control unit with retard - connect PS10 into alarm port piping on the input side of retard chamber and electrically connect PS10 to control unit that provides a retard to compensate for surges. Insure that no unsupervised shut-off valves are present between the alarm check valve and PS10.
Method 2: When using the PS10 for local bell application or with a control that does not provide a retard feature - the PS10 must be installed on the alarm outlet side of the retard chamber of the sprinkler system.
Testing: Accomplished by opening the inspector's end-of-line test valve. Allow time to compensate for system or control retard.
Note: Method 2 is not applicable for remote station service use, if there is an unsupervised shut-off valve between the alarm check valve and the PS10.

Wet System With Excess Pressure
Connect PS10 into alarm port piping extending from alarm check valve. Retard provisions are not required. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.
Testing: Accomplished by opening the water by-pass test valve or the inspector's end-of-line test valve. When using end-of-line test, allow time for excess pressure to bleed off.

Dry System
Connect PS10 into alarm port piping that extends from the intermediate chamber of the alarm check valve. Install on the outlet side of the in-line check valve of the alarm port piping. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.
Testing: Accomplished by opening the water by-pass test valve.
Note: The above tests may also activate any other circuit closer or water motor gongs that are present on the system.

Dimensions

Fig. 1

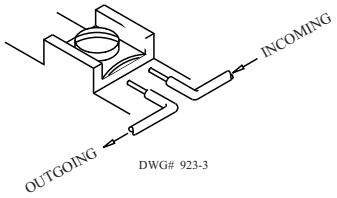


NOTE: To prevent leakage, apply Teflon tape sealant to male threads only.

DWG# 930-1

Switch Clamping Plate Terminal

Fig. 2

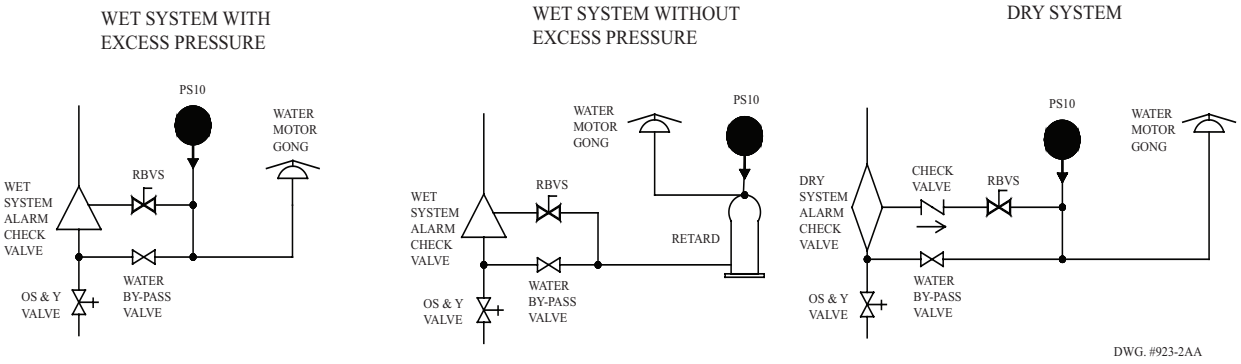


⚠ WARNING

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 becomes dislodged from under the terminal.

Typical Sprinkler Applications

Fig. 3

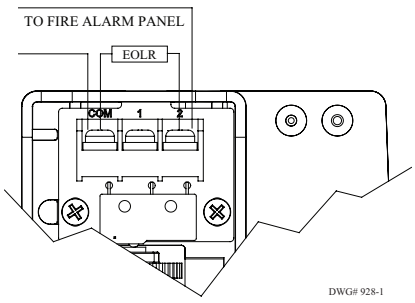


⚠ CAUTION

Closing of any shutoff valves between the alarm check valve and the PS10 will render the PS10 inoperative. To comply with NFPA-72 any such valve shall be electrically supervised with a supervisory switch such as Potter Model RBVS.

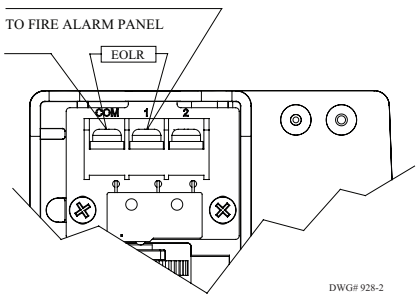
Low Pressure Signal Connection

Fig. 4



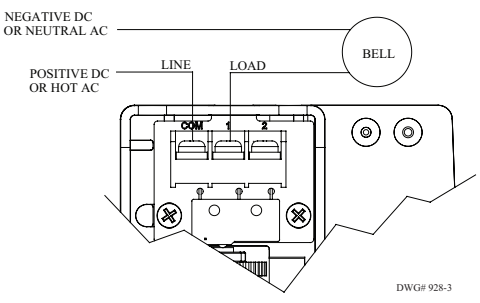
Waterflow Signal Connection

Fig. 5



Local Bell For Waterflow Connection

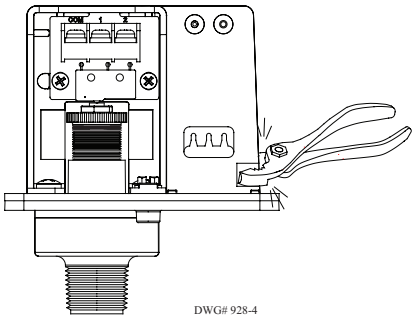
Fig. 6



One Conduit Wiring

Fig. 7

Break out thin section of divider to provide path for wires when wiring both switches from one conduit entrance.



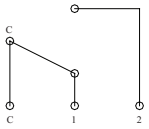
DWG# 928-4

Switch Operation

Fig. 8

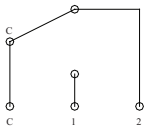
Terminal
C: Common
1: Closed when installed under normal system pressure.
2: Open when installed under normal system pressure. Closes on pressure drop. Use for low pressure supervision.

W/ PRESSURE APPLIED



Terminal
1: Open with no pressure supplied. Closes upon detection of pressure. Use for waterflow indication.
2: Closed with no pressure applied.

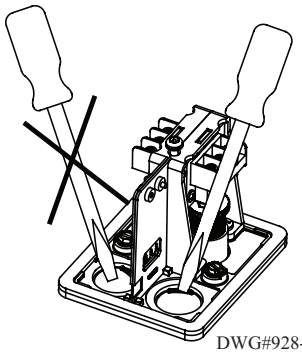
W/O PRESSURE APPLIED



DWG#928-6

Removing Knockouts

Fig. 9



DWG#928-5

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Read all instructions carefully and understand them before starting installation. Save instructions for future use. Failure to read and understand instructions could result in improper operation of device resulting in serious injury or death.
- Risk of explosion. Not for use is hazardous locations. Serious injury or death could result.

⚠ CAUTION

- Do not tighten by grasping the switch enclosure. Use wrenching flats on the bushing only. Failure to install properly could damage the switch and cause improper operation resulting in damage to equipment and property.
- To seal threads, apply Teflon tape to male threads only. Using joint compounds or cement can obstruct the pressure port inlet and result in improper device operation and damage to equipment.
- Do not over tighten the device, standard piping practices apply.

Engineer/Architect Specifications Pressure Type Waterflow Switch

Pressure type waterflow switches; shall be a Model PS10 as manufactured by Potter Electric Signal Company, St Louis MO., and shall be installed on the fire sprinkler system as shown and or specified herein.

Switches shall be provided with a ½" NPT male pressure connection and shall be connected to the alarm port outlet of; Wet Pipe Alarm Valves, Dry Pipe Valves, Pre-Action Valves, or Deluge Valves. The pressure switch shall be actuated when the alarm line pressure reaches 4 - 8 PSI (0,27 - 0,55 BAR).

Pressure type waterflow switches shall have a maximum service pressure rating of 300 PSI (20,68 BAR) and shall be factory adjusted to operate on a pressure increase of 4 - 8 PSI (0,27 - 0,55 BAR)

Pressure switch shall have one or two form C contacts, switch contact rating 10.1 Amps at 125/250 VAC, 2.0 Amps at 30 VDC.

Pressure type waterflow switches shall have two conduit entrances one for each individual switch compartment to facilitate the use of dissimilar voltages for each individual switch.

The cover of the pressure type waterflow switch shall be Zinc die-cast with rain lip and shall attach with one tamper resistant screw. The Pressure type waterflow switch shall be suitable for indoor or outdoor service with a NEMA 4/IP66 rating.

The pressure type waterflow switch shall be UL Ulc and CSFM listed, FM and LPC approved and NYMEA accepted.

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POTTER
The Symbol of Protection

PS40 SERIES
SUPERVISORY PRESSURE SWITCH

UL, cUL, and CSFM Listed, FM and LPC Approved, NYMEA Accepted, CE Marked

Dimensions: 3.78" (9,6cm)W x 3.20" (8,1cm)D x 4.22" (10,7cm)H

Conduit Entrance: Two knockouts provided for 1/2" conduit. Individual switch compartments and ground screw suitable for dissimilar voltages

Enclosure: Cover- Die-cast with textured red powdercoat finish, single cover screw and rain lip.
Base- Die-cast

Pressure Connection: Nylon 1/2" NPT male

Factory Adjustment: PS40-1 operates on decrease at 30 PSI (2,1 BAR)
PS40-2 operates in increase at 50 PSI (3,5 BAR) and on decrease at 30 PSI (2,1 BAR)

Pressure Range: 10-60 PSI (,7 - 4,1 BAR)

Differential: Typical 1 lb. at 10 PSI (,07 at ,7 BAR)
4 lbs at 60 PSI (,28 at 4,1 BAR)

Maximum System Pressure: 300 PSI (20,68 BAR)

Switch Contacts: SPDT (Form C)
10.1 Amps at 125/250VAC, 2.0 Amps at 30VDC
One SPDT in PS40-1, Two SPDT in PS40-2

Environmental Specifications:
NEMA 4/IP66 Rated Enclosure - indoor or outdoor when used with NEMA 4 conduit fittings.
Temperature range: -40°F to 140°F (-40°C to 60°C)

Tamper: Cover incorporates tamper resistant fastener that requires a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090200. See bulletin #5401200 PSCTSK.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential Occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Ordering Information

Model	Description	Stock No.
PS40-1	Pressure switch with one set SPDT contacts	1340403
PS40-2	Pressure switch with two sets SPDT contacts	1340404
	Hex Key	5250062
	Cover Tamper Switch Kit	0090200
BVL	Bleeder valve	1000018

Installation

The Potter PS40 Series Supervisory Pressure Actuated Switches are designed primarily to detect an increase and/or decrease from normal system pressure in automatic fire sprinkler systems. Typical applications are: Dry pipe systems, pre-action air/nitrogen supervision, pressure tanks, air supplies, and water supplies. The PS40 switch is factory set for 40 PSI (2,8 BAR) normal system pressure. The switch marked with the word LOW is set to operate at a pressure decrease of 10 PSI (,7 BAR) at 30 PSI (2,1 BAR). The switch marked with the word HIGH is set to operate at a pressure increase of 10 PSI (,7 BAR) at 50 PSI (3,5 BAR). See section heading **Adjustments and Testing** if other than factory set point is required.

1. Connect the PS40 to the system side of any shutoff or check valve.
2. Apply Teflon tape to the threaded male connection on the device. (Do not use pipe dope)
3. Device should be mounted in the upright position. (Threaded connection down)
4. Tighten the device using a wrench on the flats on the device.

Wiring Instructions

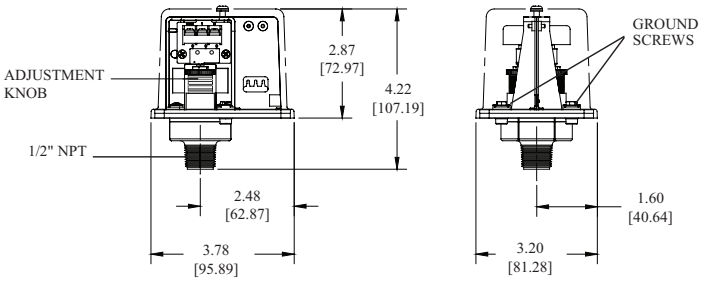
1. Remove the tamper resistant screw with the special key provided.
2. Carefully place a screwdriver on the edge of the knockout and sharply apply a force sufficient to dislodge the knockout plug. See Fig. 9
3. Run wires through an approved conduit connector and affix the connector to the device. A NEMA-4 rated conduit fitting is required for outdoor use.
4. Connect the wires to the appropriate terminal connections for the service intended. See Figures 2,4,5,6, and 8

Adjustment And Testing

The operation of the pressure supervisory switch should be tested upon completion of installation and periodically thereafter in accordance with the applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).
Note: Testing the PS40 may activate other system connected devices.
The use of a Potter BVL (see product bulletin 8900067 for details) is recommended to facilitate setting and testing of the PS40 pressure switch. When a BVL (bleeder valve) is used, the pressure to the switch can be isolated and bled from the exhaust port on the BVL without effecting the supervisory pressure of the entire system. See Fig. 3
The operation point of the PS40 Pressure Switch can be adjusted to any point between 10 and 60 PSI (0,7 - 4,11 BAR) by turning the adjustment knob(s) clockwise to raise the actuation point and counter clockwise to lower the actuation point. In the case of the PS40-2, both switches operate independent of each other. Each switch may be independently adjusted to actuate at any point acrosss the switch adjustment range. Initial adjustment can be made with a visual reference from the top of the adjustment knob across to the printed scale on the switch bracket. Final adjustments should be verified with a pressure gauge.

PS40 SERIES
SUPERVISORY PRESSURE SWITCH

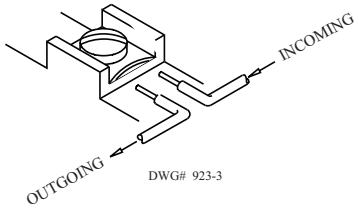
Dimensions
Fig. 1



NOTE: To prevent leakage, apply Teflon tape sealant to male threads only.

DWG# 930-1

Switch Clamping Plate Terminal
Fig. 2

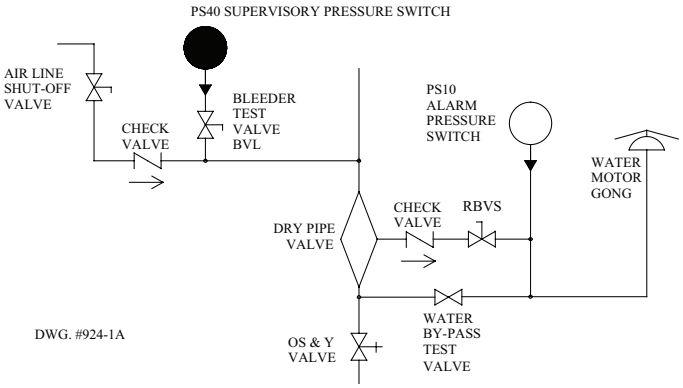


DWG# 923-3

⚠ 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 becomes dislodged from under the terminal.

Typical Sprinkler Applications
Fig. 3



DWG. #924-1A

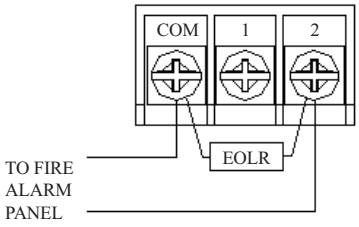
⚠ CAUTION

Closing of any shutoff valves between the alarm check valve and the PS10 will render the PS10 inoperative. To comply with IBC, IFC, and NFPA-13, any such valve shall be electrically supervised with a supervisory switch such as Potter Model RBVS.

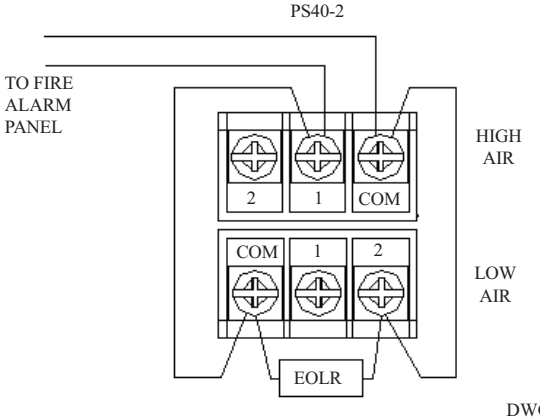
Typical Connections
Fig. 4

WITH NORMAL SYSTEM PRESSURE APPLIED LOW -TERMINAL 2 CLOSES ON PRESSURE DROP.

PS40-1



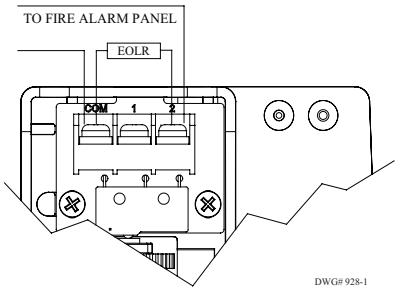
PS40-2



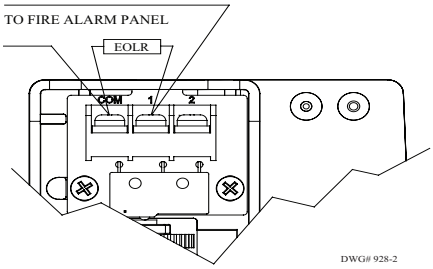
WITH NORMAL SYSTEM PRESSURE APPLIED HIGH - TERMINAL 1 WILL CLOSE ON PRESSURE INCREASE.

DWG# 930-2

Low Pressure Signal Connection
Fig. 5

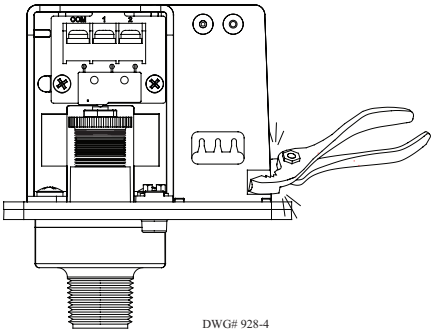


High Pressure Signal Connection
Fig. 6



One Conduit Wiring
Fig. 7

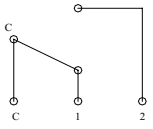
Break out thin section of divider to provide path for wires when wiring both switches from one conduit entrance.



Changing Pressure
(With normal system pressure)
Fig. 8

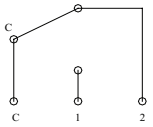
Terminal
C: Common
1: Closed when installed under normal system pressure.
2: Open when installed under normal system pressure. Closes on pressure drop. Use for low air signal.

LOW PRESSURE SWITCH



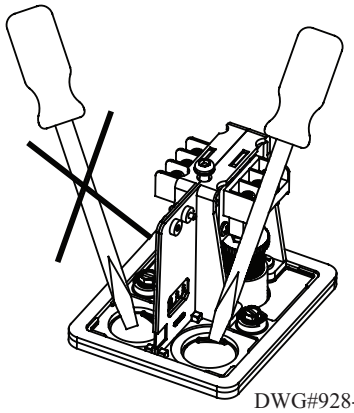
Terminal
1: Open when installed under normal system pressure. Closes on increase in pressure. Use for high air signal.
2: Closed under normal system pressure.

HIGH PRESSURE SWITCH



DWG# 930-3

Removing Knockouts
Fig. 9



DWG#928-5

Engineer/Architect Specifications Pressure Type Waterflow Switch

Pressure type supervisory switches; shall be a Model PS40 as manufactured by Potter Electric Signal Company, St. Louis, MO., and shall be installed on the fire sprinkler system as shown and or specified herein.

Switches shall be provided with a 1/2" NPT male pressure connection to be connected into the air supply line on the system side of any shut-off valve. A Model BVL bleeder valve as supplied by Potter Electric Signal Company of St. Louis, MO., or equivalent shall be connected in line with the PS40 to provide a means of testing the operation of the supervisory switch. (See Fig. 3)

The switch unit shall contain SPDT (Form C) switch(es). One switch shall be set to operate at a pressure decrease of 10 PSI (0,7 BAR) from normal. If two switches are provided, the second switch shall be set to operate at a pressure increase of 10 PSI (0,7 BAR) from normal.

Switch contacts shall be rated at 10.1 Amps at 125/250VAC and 2.0 Amps at 30VDC. The units shall have a maximum pressure rating of 300 PSI (20,68 BAR) and shall be adjustable from 10 to 60 PSI (0,7 to 4,1 BAR).

Pressure switches shall have two conduit entrances, one for each individual switch compartment to facilitate the use of dissimilar voltages for each individual switch.

The cover of the pressure switch shall be zinc die-cast with rain lip and shall attach with one tamper resistant screw. The pressure switch shall be suitable for indoor or outdoor service with a NEMA-4/IP66 rating.

The pressure switch shall be UL, ULC, and CSFM listed, FM and LPC approved and NYMEA accepted.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Read all instructions carefully and understand them before starting installation. Save instructions for future use. Failure to read and understand instructions could result in improper operation of device resulting in serious injury or death.
- Risk of explosion. Not for use is hazardous locations. Serious injury or death could result.

⚠ CAUTION

- Do not tighten by grasping the switch enclosure. Use wrenching flats on the bushing only. Failure to install properly could damage the switch and cause improper operation resulting in damage to equipment and property.
- To seal threads, apply Teflon tape to male threads only. Using joint compounds or cement can obstruct the pressure port inlet and result in improper device operation and damage to equipment.
- Do not over tighten the device, standard piping practices apply.
- Do not apply any lubricant to any component of the pressure switch.

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VSR

VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

Flow Sensitivity Range for Signal:
4-10 GPM (15-38 LPM) - UL

Maximum Surge: 18 FPS (5.5 m/s)

Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC

Conduit Entrances: Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148
Replaceable Components: Retard/Switch Assembly, stock no. 1029030

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Important: This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

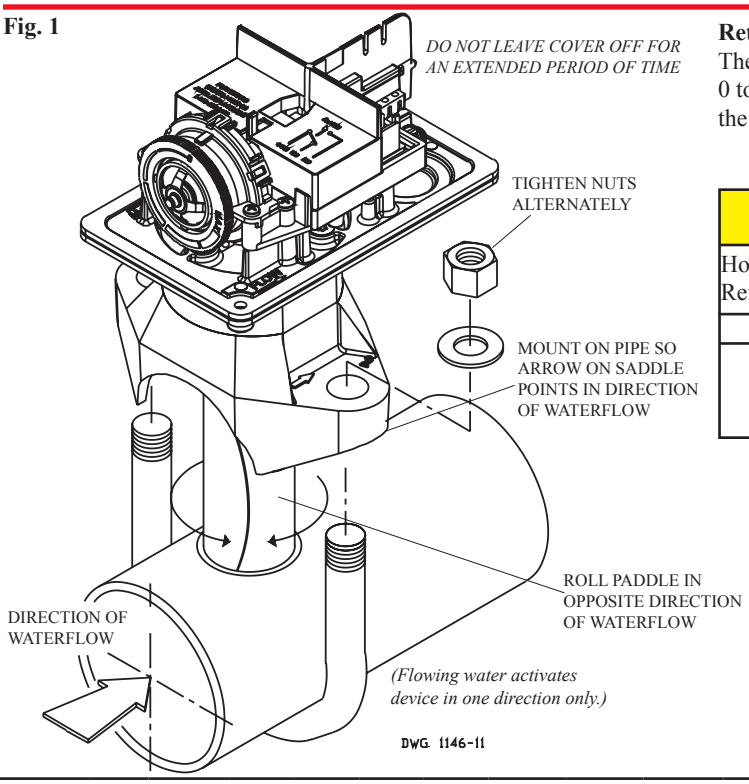
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

⚠ CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a qualified technician should disable the alarm system.

Fig. 1

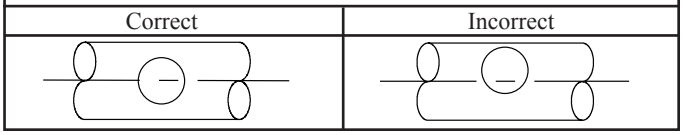


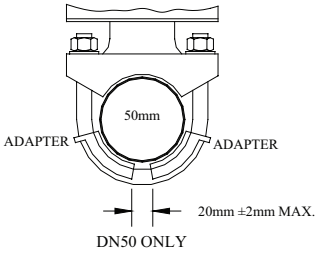
Retard Adjustment

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.





USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

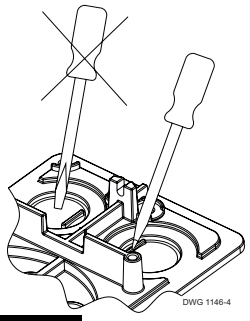
DWG# 1146-1F

Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque	
					Lightwall		Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	.065	1.651	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 + .125/- .062	33.0 ± 2.0	20	27
VSR-2 1/2	2.5	-	2.875	73.0	.084	2.134	0.120	3.05	0.203	5.16	-	-	-	-				
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	-	-	0.142	3.6	0.102	2.6				
VSR-3	3	DN80	3.500	88.9	.083	2.108	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0		
VSR-3 1/2	3.5	-	4.000	101.6	-	-	0.120	3.05	0.226	5.74	-	-	-	-				
VSR-4	4	DN100	4.500	114.3	.084	2.134	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2				
VSR-5	5	-	5.563	141.3	-	-	0.134	3.40	0.258	6.55	-	-	-	-				
VSR-6	6	DN150	6.625	168.3	.115	2.921	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0				
VSR-8	8	DN200	8.625	219.1	-	-	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5				

NOTE: For copper or plastic pipe use Model VSR-CF.

Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3
Break out thin section of cover when wiring both switches from one conduit entrance.

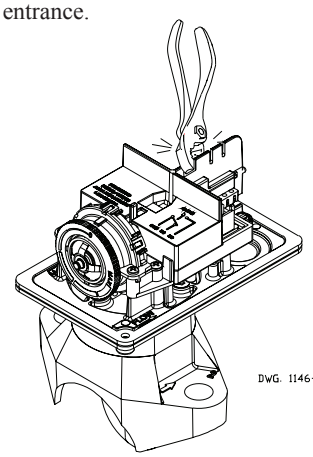
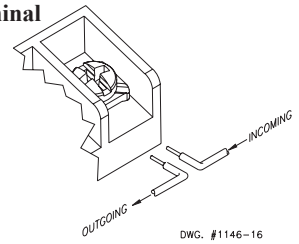


Fig. 4 Switch Terminal Connections Clamping Plate Terminal

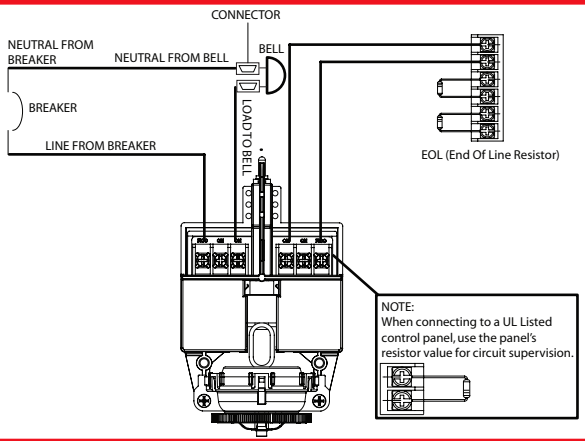


⚠ WARNING

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.

Fig. 5 Typical Electrical Connections



Notes:

1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).

Testing

The frequency of inspection and testing for the Model VSR and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

NOTICE Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Fig. 6 Mounting Dimensions

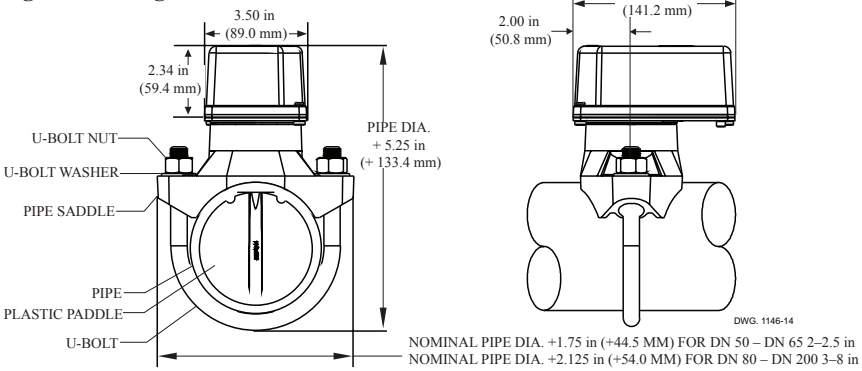
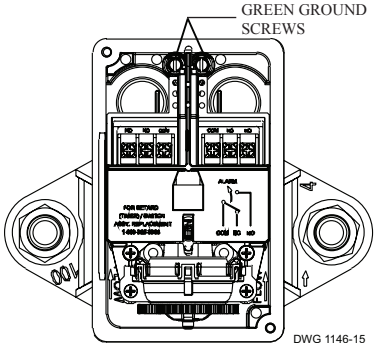


Fig. 7



Maintenance

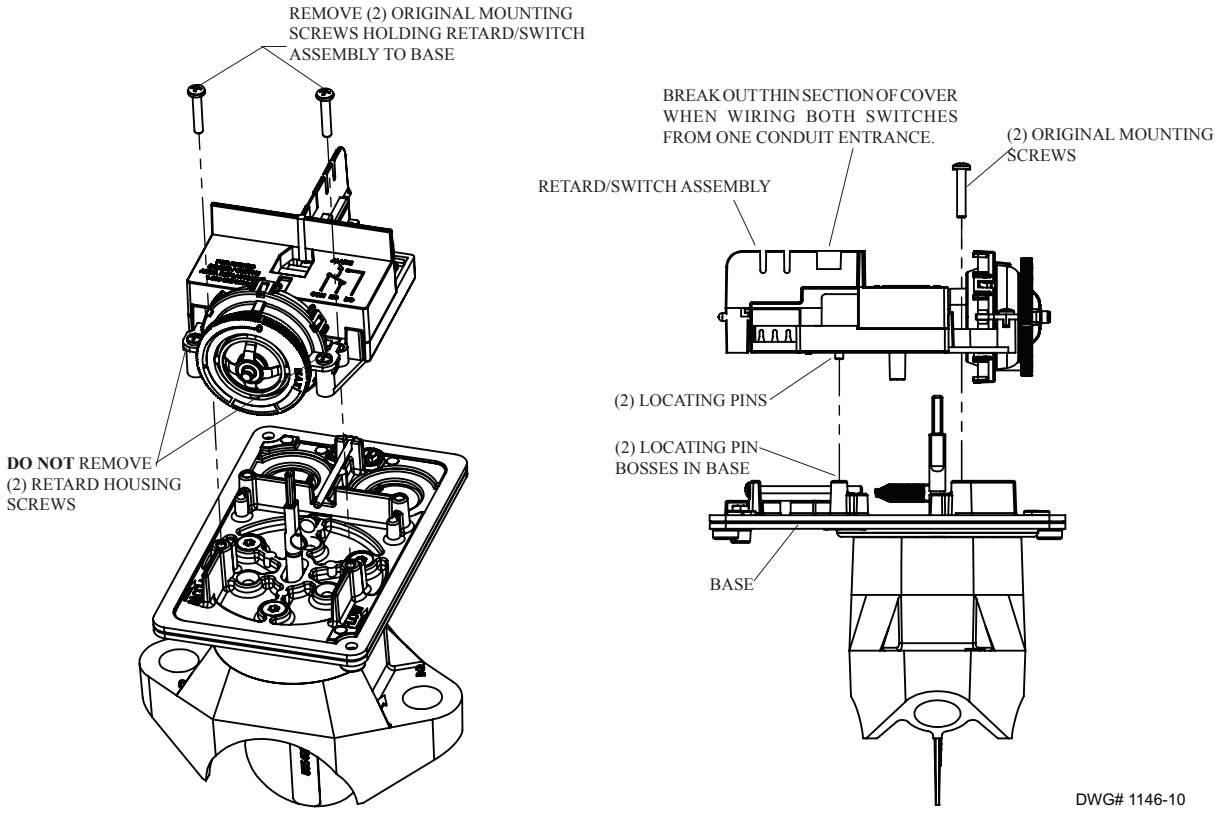
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 8). There is no maintenance required, only periodic testing and inspection.

Retard/Switch Assembly Replacement (See Fig. 8)

NOTICE The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 8



Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.

POTTER
The Symbol of Protection

OSYSU Series

Outside Screw and Yoke Valve Supervisory Switch

Features

- NEMA 4X* (IP 65) and 6P (IP 67)

  **Enclosure is 4X. For additional corrosion protection of mounting hardware, use model OSYSU-2 CRH*
- -40º to 140º (-40ºC to 60ºC) operating temperature range
- Visual switch indicators
- Two conduit entrances
- Adjustable length trip rod
- Accomodates up to 12AWG wire
- Three position switch detects tampering and valve closure
- Knurled mounting bracket prevents slipping
- Fine adjustment feature for fast, easy installation
- RoHS compliant
- One or two SPDT contact models (-1,-2)

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 OS&Y valve 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 OSYSU is used to monitor the open position of an OS&Y (outside screw and yoke) type gate valve. This device is available in two models; the OSYSU-1, containing one set of SPDT (Form C) contacts and the OSYSU-2, containing two sets of SPDT (Form C) contacts. These switches mount conveniently to most OS&Y valves ranging in size from 2" to 12" (50mm to 300mm). They will mount on some valves as small as ½" (12,5mm).
The cover is held in place by two tamper resistant screws that require a special tool to remove. The tool is furnished with each device.

Testing

The operation of the OSYSU and its associated protective monitoring system shall be inspected, tested, and maintained in accordance with all applicable local and national codes and standards and/or the Authority Having Jurisdiction (manufacturer recommends quarterly or more frequently). A minimum test shall consist of turning the valve wheel towards the closed position. The OSYSU shall operate within the first two revolutions of the wheel. Fully close the valve and ensure that the OSYSU does not restore. Fully open the valve and ensure that the OSYSU restores to normal only when the valve is fully opened.

⚠ CAUTION

Close the valve fully to determine that the stem threads do not activate the switch. The switch being activated by the stem threads could result in a ***false valve open*** indication.

Technical Specifications

Dimensions	See Fig 8
Weight	1.6 lbs (0,73 kg)
Enclosure	Cover: Die Cast Finish: Red Powder Coat Base: Die Cast Finish: Black Powder Coat All parts have corrosion resistant finishes
Cover Tamper	Tamper Resistant Screws Optional Cover Tamper Switch Available
Contact Ratings	OSYSU-1: One Set of SPDT (Form C) OSYSU-2: Two Sets of SPDT (Form C) 10.0 Amps at 125/250 VAC 2.0 Amps at 30VDC Resistive 10 mAmps minimum at 24 VDC
Environmental Limitations	-40º F to 140ºF (-40ºC to 60ºC) NEMA 4X (IP 65) and NEMA 6P (IP 67) Enclosure (Use suitably rated conduit and connector) Indoor or Outdoor Use (See OSYSU-EX Bulletin 5400705 for Hazardous locations)
Conduit Entrances	Two Knockouts for 1/2" conduit provided (See Notice on Page 6 and Fig. 9 on Page 5)
Service Use	NFPA 13, 13D, 13R, 72

Specifications subject to change without notice

Theory of Operation

The OSYSU is a 3 position switch. The center position is the normal installation position. Normal is when the switch is installed on the OS&Y valve, the valve is fully open and the trip rod of the OSYSU is in the groove of the valve stem. Closing the valve causes the trip rod to ride up out of the groove and activates the switches. Removing the OSYSU from the valve causes the spring to pull the trip rod in the other direction and activates the switches.

Visual Switch Status Indication

There are 3 visual indicators to determine the status of the switches.

Fig 1; the actuator button of the micro switches are on the raised section of the switch actuator.

Fig 2; the trip rod is perpendicular to the base and lined up with the alignment mark on the mounting bracket.

Fig 3; the white visual indicator is visible through the window on the back of the switch actuator.

A final test is to meter the contacts marked COM and N.O. to ensure they are an open circuit when the valve is open and that they close and have continuity within 2 revolutions of turning the valve handwheel towards the closed position and the contacts remain closed as the valve is completely closed and until the valve is completely opened when the trip rod drops back into the groove in the valve stem.

Fig 1

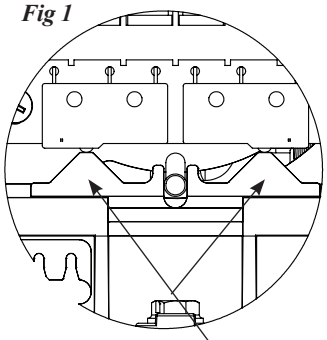


Fig 2

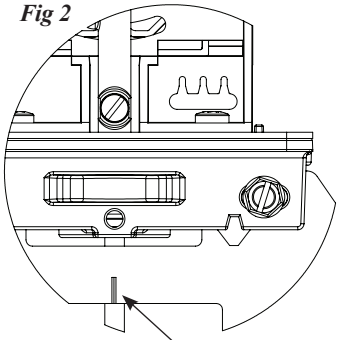


Fig 3

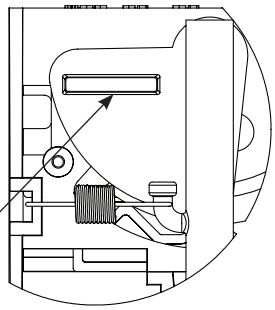


Fig 4

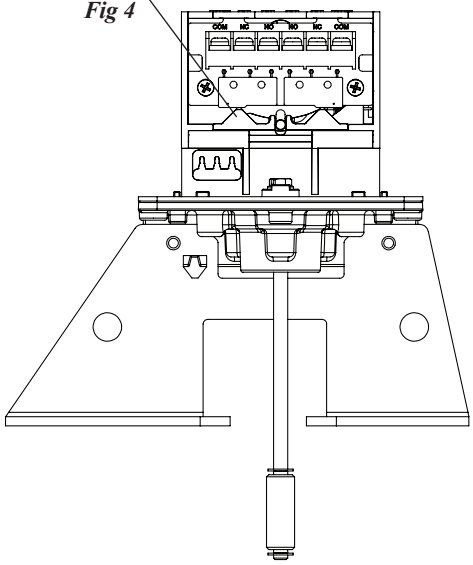


Fig 5

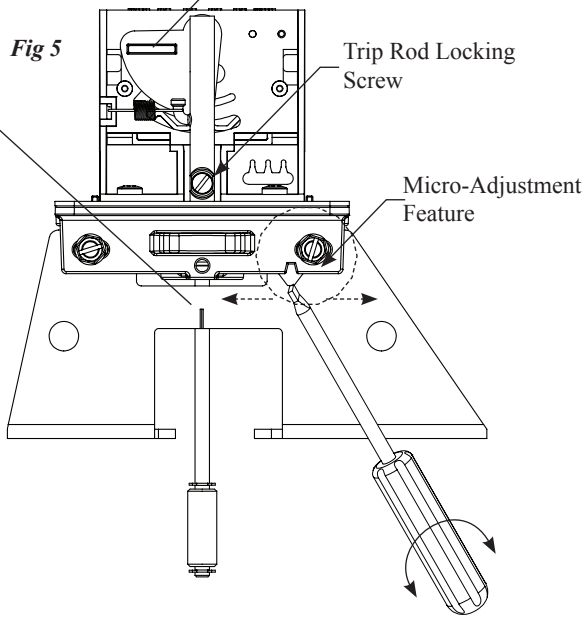
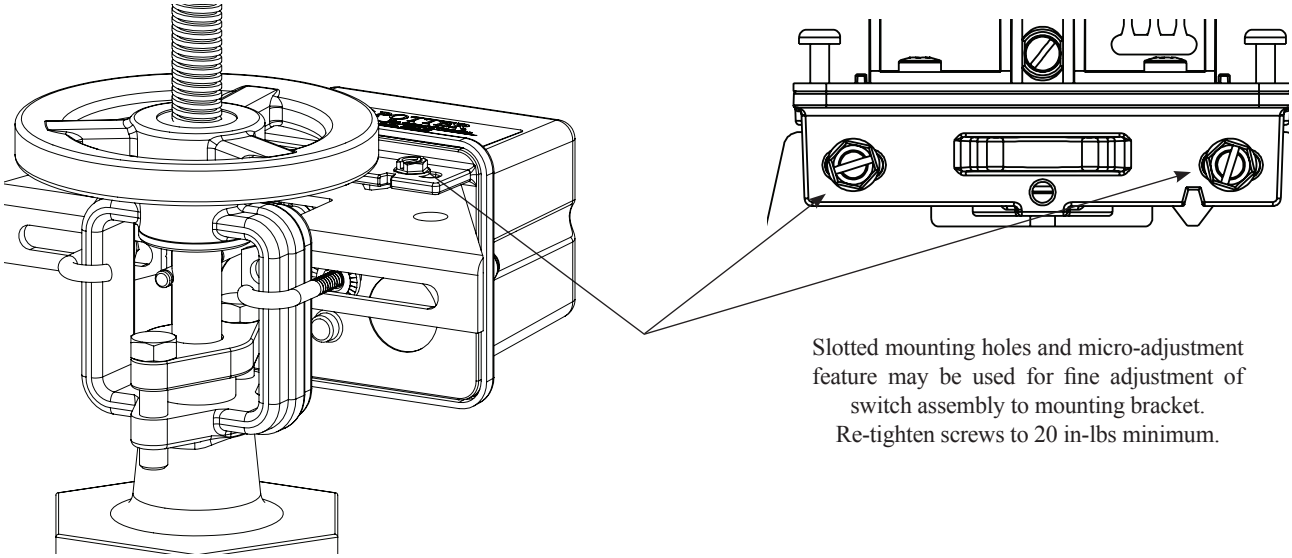


Fig 6

Small Valve Installation - 1/2” Through 2 1/2” Sizes



Slotted mounting holes and micro-adjustment feature may be used for fine adjustment of switch assembly to mounting bracket. Re-tighten screws to 20 in-lbs minimum.

Small Valve Installation

NOTE: If the valve stem is pre-grooved at 1/8” minimum depth; proceed to step 7.

1. Remove and discard "E" ring and roller from the trip rod.
2. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far as possible from the valve gland so that the spring loaded trip rod of the OSYSU is pulled against the non threaded portion of the valve stem. Position the OSYSU with the bracket near the handwheel as shown in Fig. 6 if possible to avoid creating a pinch point between the wheel and the OSYSU.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 5). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to 5 in-lbs minimum to hold the trip rod in place and properly seal the enclosure.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 10). Reinstall trip rod and repeat Step 3 procedure.
4. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied. On valves with limited clearance use J-hooks supplied instead of the carriage bolts and clamp bar to mount the OSYSU.
5. Mark the valve stem at the center of the trip rod.
6. Remove the OSYSU. Utilizing a 3/16” or 1/4” diameter straight file, file a 1/8” minimum depth groove centered on the mark on the valve stem. Deburr and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.

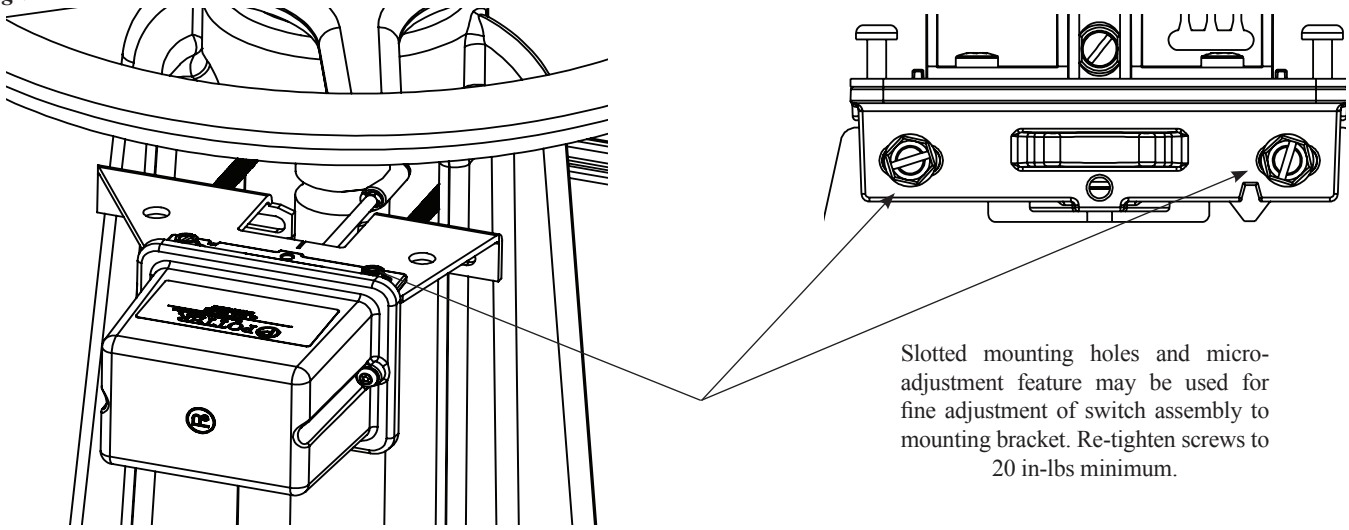
   NOTE: A groove depth of up to approximately 3/16” can make it easier to install the OSYSU so that it does not restore as it rolls over by the threads of the valve stem.
7. Mount the OSYSU on the valve yoke with the spring loaded trip rod of the OSYSU pulled against the valve stem and centered in the groove of the stem. If possible, position the OSYSU with the flat side of the bracket toward the hand wheel, as shown in Fig. 6, to help avoid creating a pinch point between the wheel and OSYSU. When in this preferred mounting position, it is usually best to use the white indicator visible through the window, as illustrated in Fig. 3, to aid in initially locating the OSYSU in the correct position on the yoke. If the unit must be installed inverted with the white indicator no longer easily visible, use the visual indicators of the actuator buttons on the micro-switches, as illustrated in Fig. 1, or the trip rod alignment mark on the bracket, as illustrated in Fig. 2 , to aid in initially locating the OSYSU.
8. Final adjustment can be made by slightly loosening the two screws on the bracket and using the fine adjustment feature (see Fig. 5). The adjustment is correct when the plungers on the switches are depressed by the actuator and there is no continuity between the COM and NO terminals on the switches.
9. Tighten the adjustment screws and all mounting hardware securely (20 in-lbs minimum). Check to insure that the rod moves out of the groove easily and that the switches activate within two turns when the valve is operated from the FULL OPEN towards the CLOSED position.
10. Reinstall the cover and tighten the cover screws to 15 in-lbs minimum to properly seal the enclosure.

⚠ CAUTION

Close the valve fully to determine that the stem threads do not activate the switch. The switch being activated by the stem threads could result in a ***false valve open*** indication.

Large Valve Installation - 3" Through 12" Sizes

Fig 7



Slotted mounting holes and micro-adjustment feature may be used for fine adjustment of switch assembly to mounting bracket. Re-tighten screws to 20 in-lbs minimum.

Large Valve Installation

NOTE: If the valve stem is pre-grooved at 1/8" minimum depth; proceed to step 6.

1. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far from the valve gland as possible so that the spring loaded trip rod of the OSYSU is pulled against the non threaded portion of the valve stem. Position the OSYSU with the bracket near the handwheel as shown in Fig. 7 if possible to avoid creating a pinch point between the wheel and the OSYSU.
2. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 5). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to 5 in-lbs minimum to hold the trip rod in place and properly seal the enclosure.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 10). Reinstall trip rod and repeat Step 3 procedure.
4. Mark the valve stem at the center of the trip rod.
5. Remove the OSYSU. Utilizing a 3/8" or ½" diameter straight file, file a 1/8" minimum depth groove centered on the mark on the valve stem. Deburr and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.

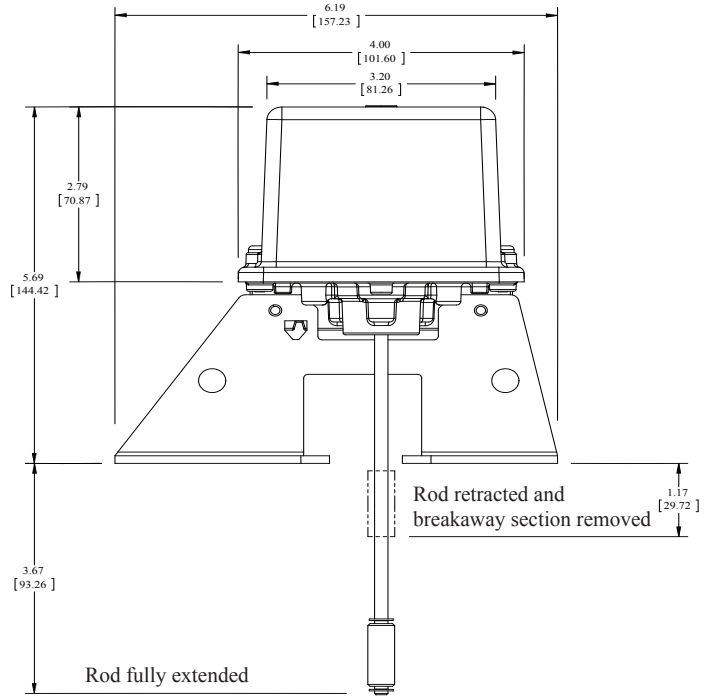
   NOTE: A groove depth of up to approximately 3/16" can make it easier to install the OSYSU so that it does not restore as it rolls over by the threads of the valve stem.
6. Mount the OSYSU on the valve yoke with the spring loaded trip rod of the OSYSU pulled against the valve stem and centered in the groove of the stem. If possible, position the OSYSU with the flat side of the bracket toward the hand wheel, as shown in Fig. 7, to help avoid creating a pinch point between the wheel and OSYSU. When in this preferred mounting position, it is usually best to use the white indicator visible through the window, as illustrated in Fig. 3, to aid in initially locating the OSYSU in the correct position on the yoke. If the unit must be installed inverted with the white indicator no longer easily visible, use the visual indicators of the actuator buttons on the micro-switches, as illustrated in Fig. 1, or the trip rod alignment mark on the bracket, as illustrated in Fig. 2 , to aid in initially locating the OSYSU.
7. Final adjustment can be made by slightly loosening the two screws on the bracket and using the fine adjustment feature (see Fig. 5). The adjustment is correct when the plungers on the switches are depressed by the actuator and there is no continuity between the COM and NO terminals on the switches.
8. Tighten the adjustment screws and mounting hardware securely (minimum 20 in-lbs). Check to insure that the rod moves out of the groove easily and that the switches activate within two turns when the valve is operated from the FULL OPEN towards the CLOSED position.
9. Reinstall the cover and tighten the cover screws to 15 in-lbs minimum to properly seal the enclosure.

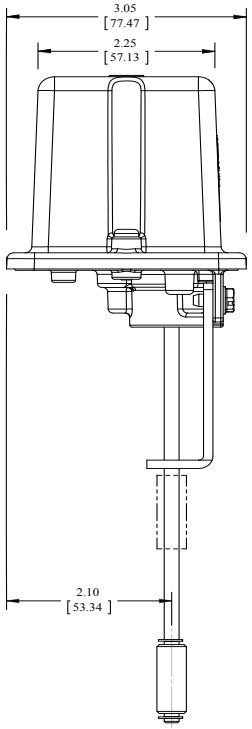
⚠ CAUTION

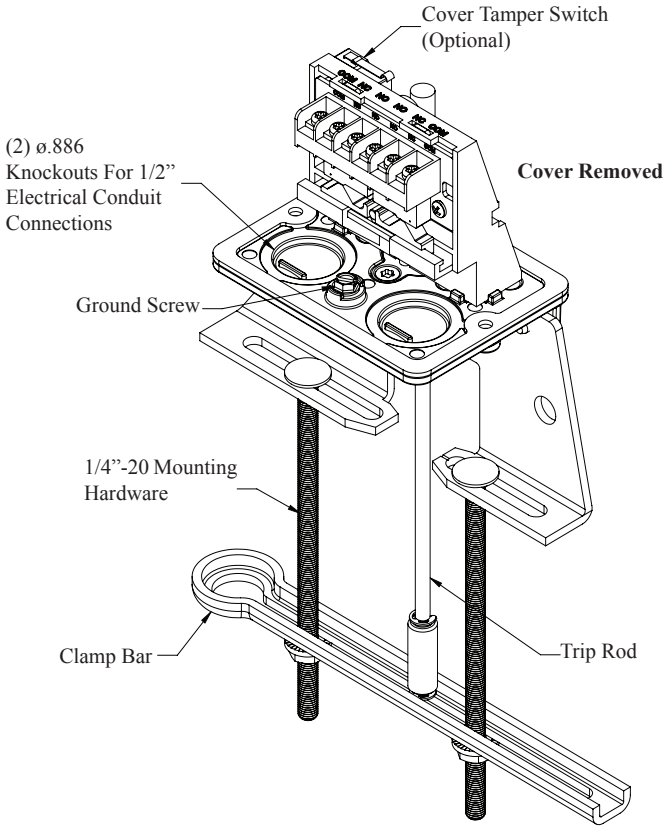
Close the valve fully to determine that the stem threads do not activate the switch. The switch being activated by the stem threads could result in a ***false valve open*** indication.

Dimensions

Fig 8



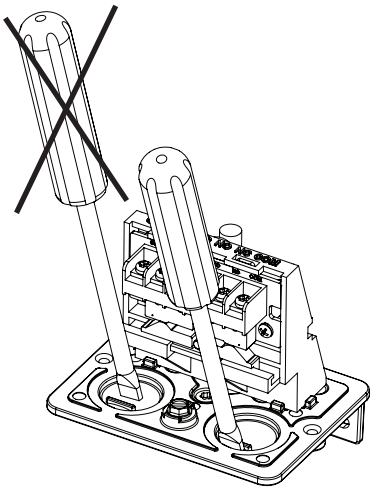




Knockout Removal

Fig 9

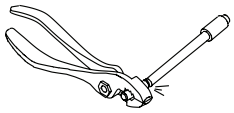
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTE: Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

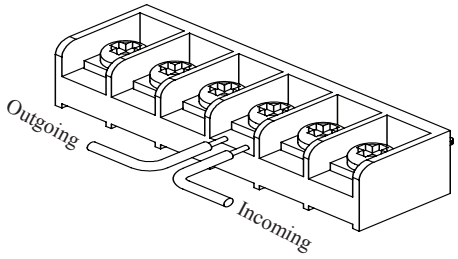
Breaking Excessive Rod Length

Fig 10



Switch Terminal Connections Clamping Plate Terminal

Fig 11



⚠ WARNING

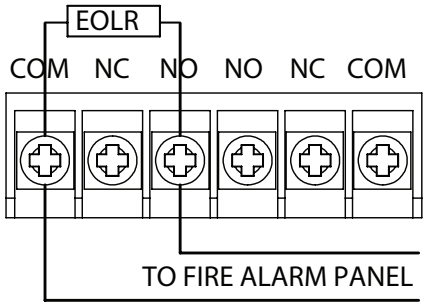
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render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

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, 4X, 6, 6P installations, the cover screws are recommended to be tightened to 15 in-lbs minimum and the trip rod locking screw tightened to 5 in-lbs minimum to properly seal the enclosure.

Typical Electrical Connections

Fig 12



Ordering Information

Model	Description	Stock No.
OSYSU-1	Outside Screw & Yoke Supervisory Switch (Single switch)	1010102
OSYSU-2	Outside Screw & Yoke Supervisory Switch (Double switch)	1010202
OSYSU-2 CRH	Outside Screw & Yoke Supervisory Switch (Double Switch). Corrosion resistant hardware of 316 stainless steel	1010210
	Cover Screw	5490424
	Hex Key for Cover Screws and Installation Adjustments	5250062
	Optional Cover Tamper Switch Kit	0090200

Engineering Specifications: OS&Y Valves

UL, CUL Listed / FM Approved and CE Marked valve supervisory switches shall be furnished and installed on all OS&Y type valves that can be used to shut off the flow of water to any portion of the fire sprinkler system, where indicated on the drawings and plans and as required by applicable local and national codes and standards. The supervisory switch shall be NEMA 4X and 6P rated and capable of being mounted in any position indoors or out and be completely submerged without allowing water to enter the enclosure.. The enclosure shall be held captive by tamper resistant screws. The device shall contain two ½" conduit entrances and one or two Single Pole Double Throw (SPDT) switches. There shall be a visual indicator to display the status of the switches. To aid in installation, it shall be possible to make fine adjustments to the position of the switch on the valve without loosening the mounting bracket from the valve. The device shall contain an adjustable length trip rod and roller, the trip rod shall be held captive by a set screw accessible upon removal of the cover. The switch contacts shall be rated at 10A, 125/250VAC and 2A, 30VDC. OS&Y Valve supervisory switch shall be model OSYSU-1 for the single switch model and OSYSU-2 for the two switch model 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.

Fire Sprinkler Stationay Compressors

Base Plate Mounted

Standard Features

- Heavy-duty single stage cast iron compressor pump Made in Somerset, PA USA
- Splash lubricated
- Belt driven with a large flywheel for extra cooling and easier start-up
- Each unit is filled with Jenny Ultimate Blue Compressor Pump Oil
- Directional air shroud for reduced pump temperatures
- Totally enclosed heavy-duty belt guard
- Powder coated, extra heavy steel base plate
- Large canister intake filter with replaceable filter elements
- Magnetic starter is included on all 5HP and larger units
- Industrial/Commercial grade UL Listed electric motor
- Thermal overload motor protection

F12S-30S

GC5S-30S

K15S-30S

Base Mounted

System Size: Maximum Gallons in system to be pumped to 40 PSI in 30 Minutes	Model	Pump	HP	Power Supply	Pump RPM	CFM del'd @ 40 PSI	Optional Auto Control Group
220	F13S-BS	F	1/3	115 Volt (through 2 HP) or 230 Volt 1 Phase	670	2.9	ACGF
290	F12S-BS		1/2		950	3.8	
350	F34S-BS		3/4		1200	4.4	
425	K34S-BS	K			520	5.3	ACGK
480	F1S-BS	F	1		1430	6.0	ACGF
600	K1S-BS	K			790	7.4	ACGK
885	K15S-BS		1-1/2	208, 230, 460 or 575 Volt 3 Phase	1140	10.9	
985	K2S-BS		2		1280	12.4	
1215	G2S-BS	G			630	15.1	ACGD
1775	G3S-BS		3		950	21.8	
1950	GC5S-BS		5		1030	24.2	ACGJ
2115	J5S-BS	J			830	26.0	

Tank Mounted/30 Gallon

220	F13S-30UMS	F	1/3	115 Volt (through 2 HP) 230 Volt 1 Phase	670	2.9	
290	F12S-30UMS		1/2		950	3.8	
350	F34S-30UMS		3/4		1200	4.4	
425	K34S-30UMS	K			520	5.3	
480	F1S-30UMS	F	1		1430	6.0	
600	K1S-30UMS	K			790	7.4	
885	K15S-30UMS		1-1/2	208, 230, 460 or 575 Volt 3 Phase	1140	10.9	
985	K2S-30UMS		2		1280	12.4	
1215	G2S-30UMS	G			630	15.1	
1775	G3S-30UMS		3		950	21.8	
1950	GC5S-30UMS	GC	5		1030	24.2	
2115	J5S-30UMS	J			830	26.0	

Tank Mounted

Additional Standard Features

- Tanks are powder coated and ASME certified
- Protectively mounted fittings
- Manual tank drain(s)
- Large canister intake filter with replaceable filter elements
- Special unloading valves to assist in motor starting
- Tank gauge
- Pressure relief safety valve
- Auto Start/Stop control with pressure unloader set at 25-40 PSI

Options

ASME National Board tank
Magnetic starter
17 gallon tank ■ Vertical tank
Low oil level switch ■ Oil sight glass
Automatic tank drain ■ Air line filter
Aftercooler ■ Dryer
Control Group

Intentionally Blank

POTTER
The Symbol of Protection

BELLS
PBA-AC & MBA-DC

UL, ULC, and FM Approved
Sizes Available: 6" (150mm), 8" (200mm) and 10" (250mm)
Voltages Available: 24VAC
120VAC
12VDC (10.2 to 15.6) Polarized
24VDC (20.4 to 31.2) Polarized
Service Use: Fire Alarm
General Signaling
Burglar Alarm
Environment: Indoor or outdoor use (See Note 1)
-40° to 150°F (-40° to 66°C)
(Outdoor use requires weatherproof backbox.)
Termination: AC Bells - 4 No. 18 AWG stranded wires
DC Bells - Terminal strip
Finish: Red powder coating
Optional: Model BBK-1 weatherproof backbox
Model BBX-1 deep weatherproof backbox

These vibrating type bells are designed for use as fire, burglar or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4" (101mm) square electrical box for indoor use or on a model BBK-1 weatherproof backbox or BBX-1 deep weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1, Stock No. 1500001.

Notes:
1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C).
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to MBA DC bells.

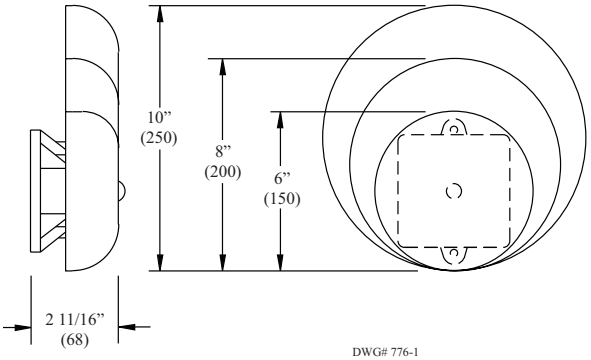
Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	MBA-6-12	1750070	.12A	85	76
8 (200)	12VDC	MBA-8-12	1750080	.12A	90	77
10 (250)	12VDC	MBA-10-12	1750060	.12A	92	78
6 (150)	24VDC	MBA-6-24	1750100	.06A	87	77
8 (200)	24VDC	MBA-8-24	1750110	.06A	91	79
10 (250)	24VDC	MBA-10-24	1750090	.06A	94	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

All DC bells are polarized and have built-in transient protection.
* Does not have ULC listing.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or BBX-1. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

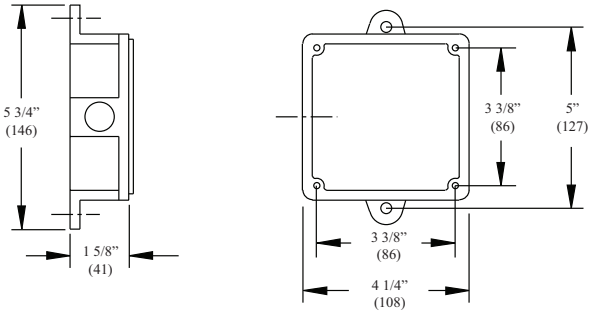
Bells Dimensions Inches (mm)
Fig. 1



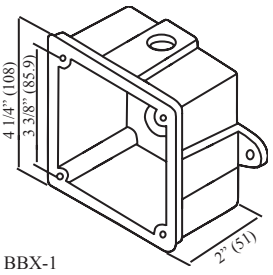
DWG# 776-1

Weatherproof Backbox Dimensions Inches (mm)
Fig. 2

Box has one threaded 1/2" conduit entrance

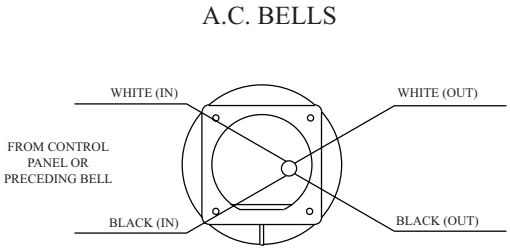


DWG# 776-2



BBX-1

Wiring (rear view)
Fig. 3

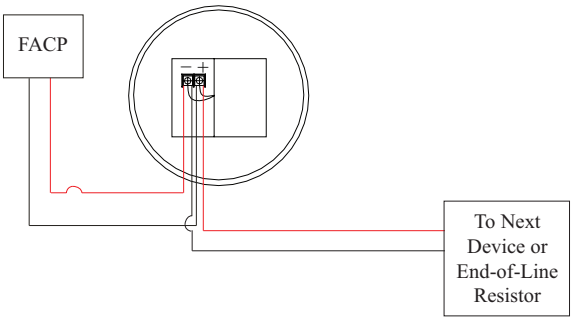


CAUTION:
WHEN ELECTRICAL SUPERVISION IS REQUIRED USE IN AND OUT LEADS AS SHOWN.

NOTES:

1. WHEN USING AC BELLS, TERMINATE EACH EXTRA WIRE SEPARATELY AFTER LAST BELL.
2. END-OF-LINE RESISTOR IS NOT REQUIRED ON AC BELLS.

DWG# 776-3



Installation

1. The bell shall be installed in accordance with NFPA 13, 72, or local AHJ. The top of the device shall be no less than 90" AFF and not less than 6" below the ceiling.
2. Remove the gong.
3. Connect wiring (see Fig. 3).
4. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
5. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
6. Test all bells for proper operation and observe that they can be heard where required (bells must be heard in all areas as designated by the authority having jurisdiction).

⚠ WARNING

Failure to install striker down will prevent bell from operating.