Fire Protection

BERMAD Fire Protection

Hydraulic Control Valves 400E & 700 Series

Contents

BERMAD Fire Protection

Helping to protect your most precious resources

Efficient, smart and reliable solutions for protecting your most precious resources are as vital as the resources themselves!

BERMAD Fire Protection Solutions offer nothing less.

Founded in 1965, **BERMAD** knows the value of reliable protection and how best to harness it to customers' full advantage.

Today **BERMAD** serves global customers in a wide range of fire protection applications.

Bringing together its expertise and know-how, leading-edge technology and precision engineering, **BERMAD** provides comprehensive customized solutions for fire protection systems in petrochemical plants - offshore & onshore, refineries, power stations, and public buildings.

BERMAD - in any location throughout the world

BERMAD Fire Protection

Fire Protection Approvals & Certifications

UL LISTED	UNDERWRITERS LABORATORIES	Special System Water Control Valves, Deluge Type (VLFT) Special System Water Control Valves, Pressure Reducing Type (VLMT) Special System Water Control Valves, Double Interlock Type (VLJH)
FM APPROVED	FACTORY MUTUAL RESEARCH CORPORATION	Pressure Relief Valves Process Control Valves
VdS	VDS SCHADENVERHUETUNG	German and European Norm Certification for Fire Protection Deluge Valve
Lloyd's Register	LLOYD'S REGISTER	Type Approval for Hydraulically Operated Valves for Fire Protection System Fire Test Certificate
ABS TYPE APPROVAL PROGRAM	AMERICAN BUREAU OF SHIPPING	Type Approval (RQS) Type Approval for Hydraulically Operated Valves, panels and cabinets for Fire Protection System Fire Test Certificate
PKN	PKN, Polish	This product complies with PKN-Polish National Standard
GOSSTANDART OF RUSSIA	GOST, Russia	The product complies with the Russian Federation Std. GOST R 50460
NFPA®	NATIONAL FIRE PROTECTION ASSOCIATION	NFPA 11 Low-Expansion Foam NFPA 13 Sprinkler System Installation NFPA 15 Water Spray Fix System NFPA 16 Deluge Foam-Water System NFPA 20 Centrifugal Fire Pumps NFPA 24 Private Fire Service Mains NFPA 25 Water-Based Fire Protection Systems

Other Approvals & Certifications

IQNet – ISO 9001-2000	INTERNATIONAL	Certified quality system
WRAS Water Regulations Advisory Scheme	WRAS, UK	The product complies with the Water Regulation Advisory Scheme of UK and BS 6920
DVGW Zertifizierungsstelle (in process)	DVGW, Germany	Compliance with the European Standard EN 1074 – Valves for water supply.
AFNOR CERTIFICATION Groupe AFNOR	ACS, France	Tests are based on the French standard XPP 41-250-1 and -2 adapted. Acceptance criteria are defined in the French circular dated 25 Nov 2002.
ÖVGW	ÖVGW, Austria	The product complies with the criteria of the Austrian Std. ÖNORM B 5014 and EN 1074 – Valves for water supply.
BELGAQUA	BELGAQUA, Belgium	The product complies with the Belgian Standards for materials in contact with drinking water
NSF®	NSF 61, USA	The product complies with the NSF/ ANSI 61 Std. – Valves for Water Supply
CNAS	China National Approval for Deluge Valves	Chinese National Standard GB 5135.5-2003, Automatic Sprinkler Systems Part 5: Deluge Alarm Valves

Fire Protection

FP | 2" | 400E-2M

Category	Code
Standard	FP
Seawater	FS
Foam Concentrate	FC

Group	Model
Classic Deluge	Electrically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)(3)
	Electro-Pneumatically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)(3)
	Pneumatically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)(3)
	Hydraulically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)
	Hydraulically Controlled, Anti-Columning Deluge Valve with EasyLock Manual Reset (1)(2)
Combination Pressure Control Deluge	Electric Pressure Control Deluge Valve with Manual
	Electric Pressure Control, On-Off Deluge Valve (2)
	Electro-Pneumatic Pressure Control, On-Off Deluge
	Pneumatic Pressure Control, On-Off Deluge Valve (2)
	Hydraulic Pressure Control, On-Off Deluge Valve (2)
On-Off Deluge	Electrically Controlled, On-Off Deluge Valve (2)
	Electro-Pneumatically Controlled, On-Off Deluge Valve
	Pneumatically Controlled, On-Off Deluge Valve (2)
	Hydraulically Controlled, On-Off Deluge Valve (2)
	Hydraulic Hydrant Valve
	Locally Operated Monitor Valve

Size
50 mm
65 mm
80 mm
100 mm
150 mm
200 mm
250 mm
300 mm

Ordering Guide

January 2011

BERMAD

Ordering Guide

FP — 2" — 400E-2M

Category	Code
Standard	FP
Seawater	FS
Foam Concentrate	FC

Valve Size	
1½"	40 mm
2"	50 mm
2½"	65 mm
3"	80 mm
4"	100 mm
6"	150 mm
8"	200 mm
10"	250 mm
12"	300 mm

Group	Model	Code (8)
Classic Deluge	Electrically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)(3)	400E-2M
	Electro-Pneumatically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)(3)	400E-3M
	Pneumatically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)(3)	400E-4M
	Hydraulically Controlled Deluge Valve with EasyLock Manual Reset (1)(2)	400E-1M
	Hydraulically Controlled, Anti-Columning Deluge Valve with EasyLock Manual Reset (1)(2)	400E-5M
Combination Pressure Control Deluge	Electric Pressure Control Deluge Valve with Manual Reset (1)(2)	400E-2MC
	Electric Pressure Control, On-Off Deluge Valve (2)	400E-3DC
	Electro-Pneumatic Pressure Control, On-Off Deluge Valve (2)	400E-6DC
	Pneumatic Pressure Control, On-Off Deluge Valve (2)	400E-4DC
	Hydraulic Pressure Control, On-Off Deluge Valve (2)	400E-5DC
On-Off Deluge	Electrically Controlled, On-Off Deluge Valve (2)	400E-3D
	Electrically Controlled, On-Off Deluge Valve with Electric Remote Reset Latch (2)	400E-3D-RL
	Electro-Pneumatically Controlled, On-Off Deluge Valve (2)	400E-6D
	Pneumatically Controlled, On-Off Deluge Valve (2)	400E-4D
	Hydraulically Controlled, On-Off Deluge Valve (2)	400E-5D
Manually Operated	Hydraulic Hydrant Valve	405-02
	Locally Operated Monitor Valve	405-11
	Pressure Regulating Hydrant Valve	420-HY
Remote Control	Solenoid Activated, Remote Controlled Monitor Valve	400E-3X
	Electro-Pneumatically Operated, Remote Controlled Monitor Valve	400E-6X
	Pneumatically Operated, Remote Controlled Monitor Valve	400E-4X
	Hydraulically Operated, Remote Controlled Monitor Valve	400E-5X
Pre-action & Dry Pipe	Single Interlock Pre-action, Electric Release System (2)(6)	400E-7M
	Double Interlock Pre-action, Electric-Electric Release System (2)(6)	400E-7BM
	Double Interlock Pre-action, Electric-Pneumatic Release System (2)(6)	400E-7DM
	Dry Pipe Control Valve (2)(6)	400E-DP
Pressure Control	Pressure Reducing Valve	420-00
	Pressure Reducing Valve (5)	720-UL
	Pressure Relief Valve (4)	430-UF
	Pressure Relief Valve (5)	730-UF
	Pressure Relief Valve with Electric Override	430-59
	Pressure Relief Valve with Electric Override	730-59
	Differential Pressure Sustaining Valve (3)	436-00
Level Control	Level Control Valve with Modulating Horizontal Float	450-60
	Level Control Valve with Bi-Level Electric Float	450-65
	Level Control Valve with Bi-Level Vertical Float	450-66
	Level Control Valve with Altitude Pilot (7)	450-80

Notes:

(1) Deluge Valves With EasyLock Manual Reset are provided with Full Trim, including drain and indicating components (A items)
(2) UL Listed for sizes 1½, 2, 2½, 3, 4, 6 & 8"
(3) VdS Configuration for sizes 2, 3, 4, 6 & 8", Add "VDS" Sufix To Type Code (example: 400E-2M-VDS)
(4) UL Listed and FM Approved for 2, 2½, 3, 4 & 6"
(5) UL Listed for sizes 2, 2½, 3, 4, 6 & 8"
Max inlet: 2 to 6": 350 psi (24 bar), 8": 175 psi (12 bar), Set: 30 - 165 psi (2 - 11.5 bar).
Order "A3" or "25" End Connections code for pressure rating above 250 psi (17 bar)
(6) Pre-action & Dry Pipe Valves Including Full Trim (A) and Trimmed Check Valve
(7) Altitude pilot adjustment Ranges :
"M6" for 2-14 m / 7-46 ft (standard), "M5" for 5-22 m / 17-72 ft, "M4" for 15-35 m / 49-115 ft and "M8" for 25-70 m / 82-230 ft.
(8) Replace the first code digit with "7" when 700 valve is selected

BERMAD Standard Configuration

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Ordering Guide

G | C | A5 | PR | 4DC | NN | 7P7K

Valve Pattern	Code
Globe Type (400 Standard)	**G**
Y Type (700 only)	Y
Angle (700 only)	A

Body Material	Code
Ductile Iron (Standard)	**C**
Cast Steel	S
Stainless Steel 316	N
Bronze	B
Nickel Al. Bronze	U

For others consult BERMAD.

End Connections	Code
ANSI #150RF (Standard)	**A5**
ANSI#150FF	a5
ANSI#300RF (1)	A3
ISO-PN16	16
ISO-PN25 (1)	25
Grooved ANSI C-606-81 (2)	VI

Notes:
(1) 700 Models only
(2) For 2", 3", 4", 6" and 8" only
For others consult BERMAD.

Coating	Code
Polyester Red (Standard)	**PR**
High Built Epoxy Red	ER
Uncoated	UC

Voltage - Main Valve Position (When Solenoid De-Energized)	Code
24VDC - N.C. (Standard)	**4DC**
24VDC - N.O.	4DO
24VDC - Magna Latch	4DS
110VDC - N.C.	5DC
110VDC - N.O.	5DO
110V/50-60 - N.C.	5AC
110V/50-60 - N.O.	5AO
220V/50-60 - N.C.	2AC
220V/50-60 - N.O.	2AO

Tubing & Fittings	Code
Stainless Steel 316 (Standard)	**NN**
Monel	MM

For others consult BERMAD.

Options	Code
Pressure Switch, General Purpose (8)	P
Ex Proof Pressure Switch (8)	P7
EExd ATEX Pressure Switch (8)	P9
Single Limit Switch, General Purpose	S
Single Ex Proof, Limit Switch	S7
Single EExd Proximity Limit Switch	S9
Double EExd Proximity Limit Switch	SS9
Pressure Gauge Assembly (8)	6
S.S Glycerin Pressure Gauge Assembly (8)	6n
Monel Pressure Gauge Assembly (8)	6m
Ex Proof NEC Class 1 Div.1 Solenoid	7
EExd ATEX Solenoid	9
Drip Check (9)	DC
Drain Valve (9)	DV
Manual Emergency Release Box (9)	D
Mechanical Latching	H
Water Motor Alarm Assembly (8)	W
Special Elastomer (10)	E
Large Control Filter	F
Valve Position Indicator	I
Junction Box	J
S.S. Solenoid Valve	K
S.S. 316 Trim Accessories (11)	N
Pressure Transmitter (8)	Q

Notes:
(8) Instrument Supplied loose.
(9) Available for Models 3D, 4D, 5D, 6D, 3DC, 4DC, 5DC & 6DC only.
(10) NBR or EPDM - Consult BERMAD for availability.
(11) Not including Solenoid Valves & Pressure Gauges

Separate Items & System Components

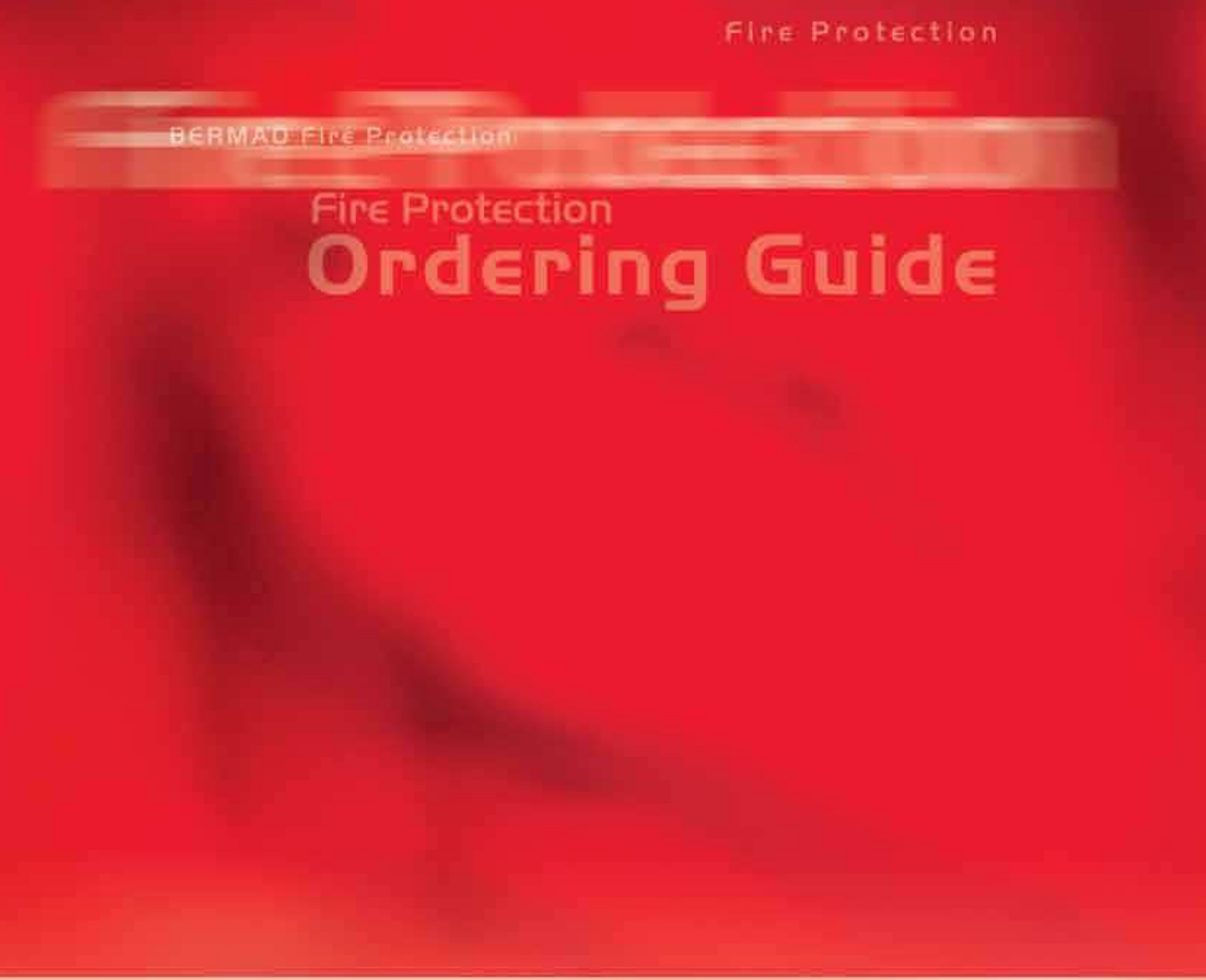
Description	BERMAD Catalog Number
Water Motor Alarm Assy. (W) w/Strainer for Deluge/Preaction System	9901240028
AMD-74, Air Maintenance Device w/Regulator for External Pressure Supply	TEX0000003
AMD-75, Air Maintenance Device w/Regulator for External Pressure Supply - All S.S 316	Consult Bermad
AMD-76 Air Maintenance Device Regulated By-Pass Pressure Supply	TEX0000009
Standard Manual Release Station Model-D w/S.S. 304 Box-Brass valve	2920400093
S.S. 316 Manual Release Station Model-DN w/S.S. 316 Box	29204S1093

BERMAD Standard Configuration

BERMAD Fire Protection

Fire Protection

Ordering Guide



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Classic Deluge Valves

These BERMAD Deluge Valves include Manual EasyLock Reset for latching the valve open in response to an electric, hydraulic, pneumatic, or electro-pneumatic signal. The Deluge Valve resets to the closed position only upon local manual reset activation.

Electrically Controlled Deluge Valve

with EasyLock™ Manual Reset

Model: FP 400E-2M

UL LISTED

Typical Applications

- Automatic spray or foam systems
- Petrochemical facilities
- Tunnels
- Power plants & transformers
- Flammable materials storage
- Aviation & airports

Features and Benefits

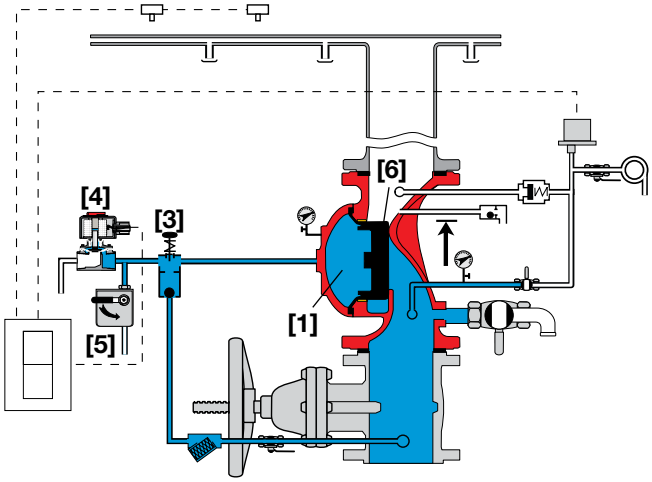
- **Latch open –** Closes upon local reset only
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

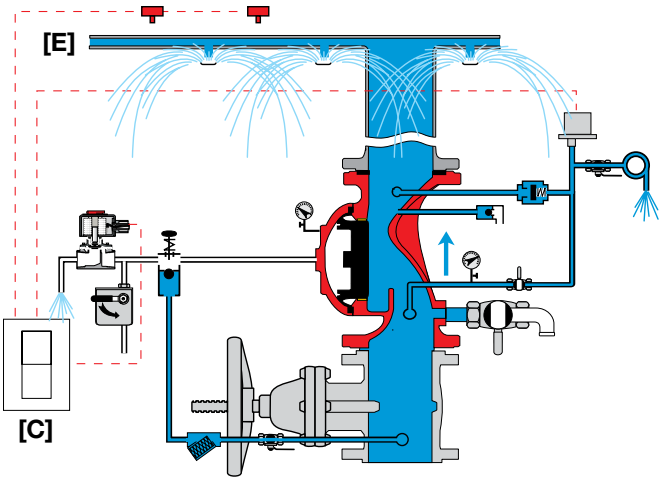
- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Explosion-proof** for hazardous locations (code: 7/8/9)
- **Seawater service** (add FS as prefix to model)
- **Hydraulic release**
- **Valve Position Single/Double Limit Switches**

Operation

The BERMAD Model FP 400E-2M is suitable for systems that include electric fire detection and a piping system with a wide variety of open nozzles.
In the SET position, the line-pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]** and through an EasyLock Manual Reset **[3]**, is trapped by the EasyLock internal check valve, by a closed 2-Way Solenoid Valve **[4]**, and by a closed Manual Emergency Release **[5]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[6]**, sealing it drip-tight and keeping the system piping dry.
Under FIRE or TEST conditions, an electric detection system **[E]**, through a control panel **[C]**, triggers the Solenoid Valve to open. Pressure is released from the control chamber by the opened Solenoid Valve, or the Manual Emergency Release. The EasyLock prevents line-pressure from entering the control chamber, allowing the main valve to latch open and water to flow into the system piping and to the alarm device.



Valve Closed (set position)



Valve Open (operating condition)

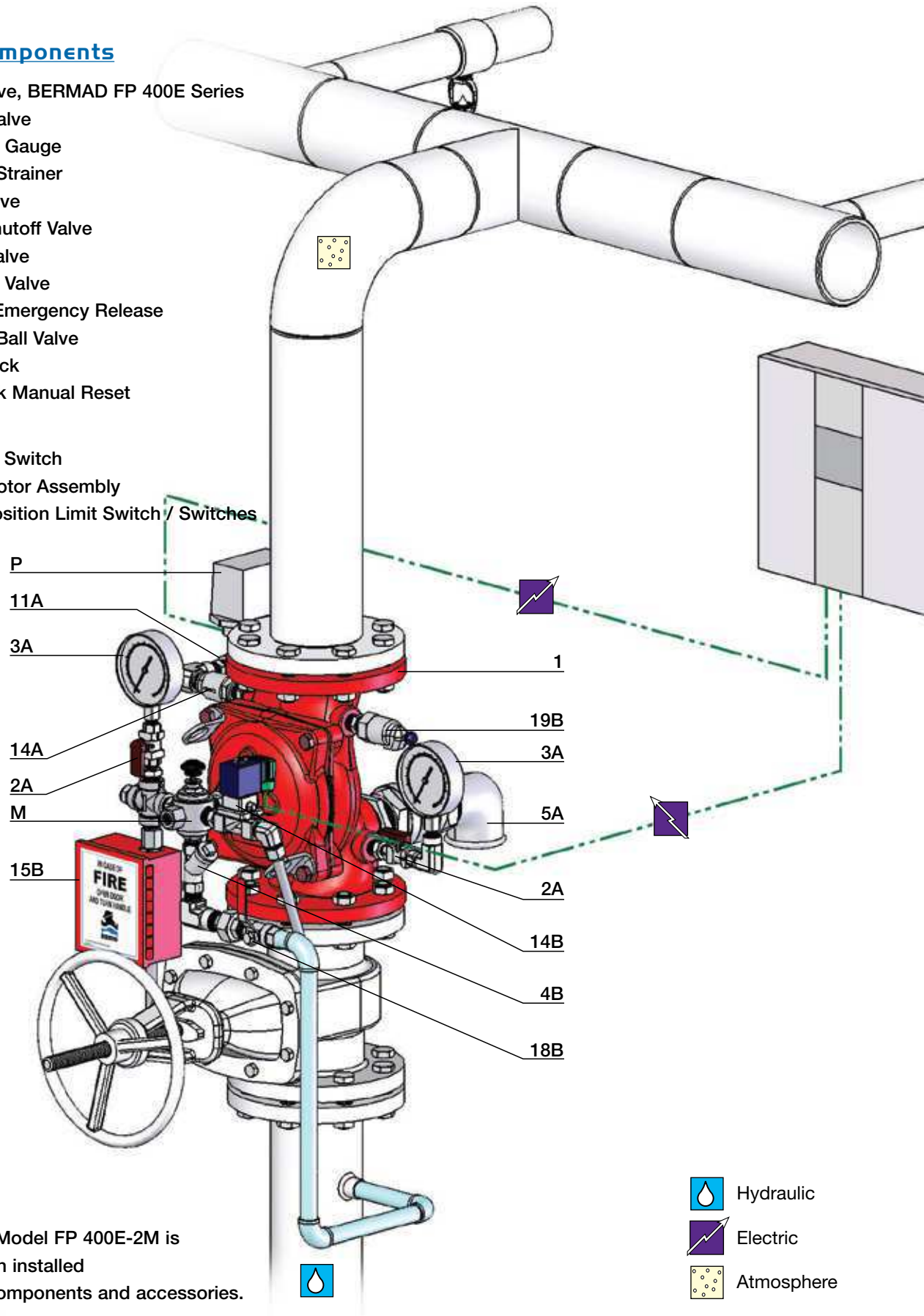
Engineer Specifications

- The deluge valve shall be a UL-Listed, electrically controlled elastomeric type globe valve with a rolling-diaphragm.
- The valve shall have an unobstructed flow path with no stem guide or supporting ribs.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service, enabling all necessary inspection and servicing.
- The control trim materials shall consist of S.S.316 tubing and fittings, and plated brass accessories including local EasyLock Manual Reset, 2-way Solenoid Pilot Valve, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Electrically Controlled Deluge Valve shall latch open in response to an electric signal. The valve shall reset to the closed position only upon local manual activation of the reset device.

System Components

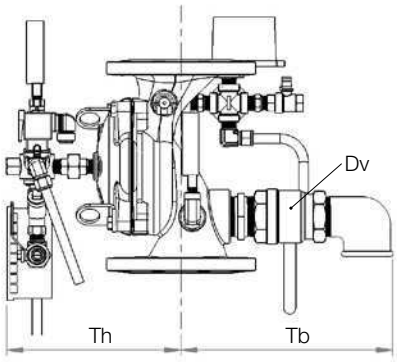
1 - Main Valve, BERMAD FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
11A -Alarm Shutoff Valve
14A - Check Valve
14B - Solenoid Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
M - EasyLock Manual Reset

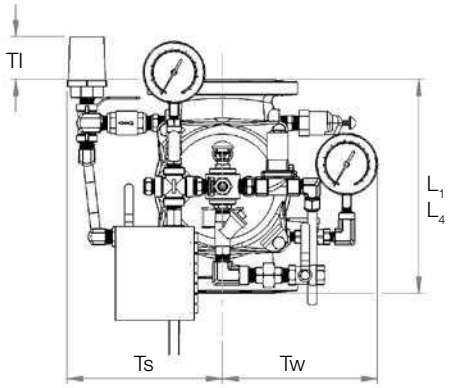
Optional
P - Pressure Switch
W - Water Motor Assembly
S - Valve Position Limit Switch / Switches



UL Listed
The BERMAD Model FP 400E-2M is UL-Listed when installed with specific components and accessories.

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tl	142	5 5/8	142	5 5/8	119	4 11/16	84	3 5/16	57	2 1/4	-	-	-	-	-	-
	Tw	228	9	220	8 11/16	243	9 9/16	253	10	312	12 5/16	326	12 13/16	346	13 5/8	391	15 3/8
	Ts	228	9	220	8 11/16	243	9 9/16	253	10	318	12 1/2	326	12 13/16	326	12 13/16	391	15 3/8
	Th	226	8 7/8	242	9 1/2	262	10 5/16	261	10 5/16	356	14	407	16	407	16	546	21 1/2
	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8
	Dv Ø	¾"		1½"		1½"		2"		2"		2"		2"		2"	

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating*
- Max. working pressure: 250 psi (17 bar)

* Pressure rating might be limited due to solenoid valve rating

Wet Pilot Line Elevation
When used, refer to "Wet Pilot Line Maximum Elevation Above Valve" chart, Model FP 400E-1M

Manufacturers Standard Materials
Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Red (RAL 3002)

Optional Materials
Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valves
Standard
- 2-Way Pilot Operated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL – Listed

Options (see also ordering guide)
- Hazardous locations:
- Class I Division 1, Gr. A, B, C, D, T4 (code 7)
- ATEX, EEx em IIC T4 (code 8)
- ATEX, EEx d IIC T4/5 (code 9)
- Voltage: see ordering guide (voltage options)
- Stainless Steel 316 body material (code K)

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Electro-Pneumatically Controlled Deluge Valve

with EasyLock™ Manual Reset

Model: FP 400E-3M

UL LISTED

Typical Applications

- Automatic spray or foam systems
- Offshore platforms
- Marine environments
- Sea water / corrosive water supplies
- Foam fire systems
- Increased reliable response by dry solenoid
- Dual redundant detection systems

Features and Benefits

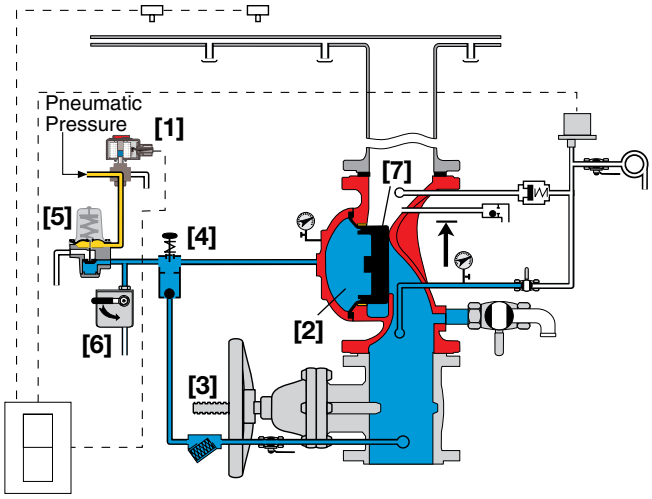
- **Dry solenoid –** Suitable for corrosive water or foam
- **Latch open –** Closes upon local reset only
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

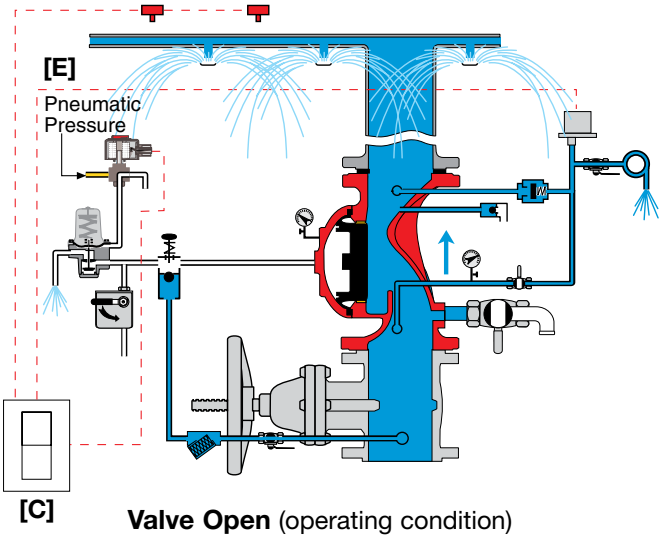
- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Explosion-proof** for hazardous locations (code: 7/8/9)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

The BERMAD Model FP 400E-3M is suitable for systems that include electric fire detection and a piping system with a wide variety of open nozzles. Being electro-pneumatically controlled, the Model FP 400E-3M is recommended in cases, such as seawater installations, where it is advantageous to keep the solenoid **[1]** dry.
In the SET position, the line-pressure supplied to the main valve's control chamber **[2]** via the priming line **[3]** and through an EasyLock Manual Reset, **[4]** is trapped by the EasyLock internal check valve, by a closed Pneumatic Pressure Operated Relief Valve (PORV) **[5]**, and a closed Manual Emergency Release **[6]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[7]**, sealing it drip-tight and keeping the system piping dry. The PORV is held closed by the maintained pneumatic pressure, supplied through the Solenoid **[1]**.
Under FIRE or TEST conditions, an electric detection system **[E]**, through a control panel **[C]**, triggers the Solenoid to release the trapped pneumatic pressure from the PORV, thereby opening it. Pressure is then released from the control chamber through the opened PORV, or the Manual Emergency Release. The EasyLock prevents line-pressure from entering the control chamber, allowing the main valve to latch open and water to flow into the system piping and to the alarm device.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

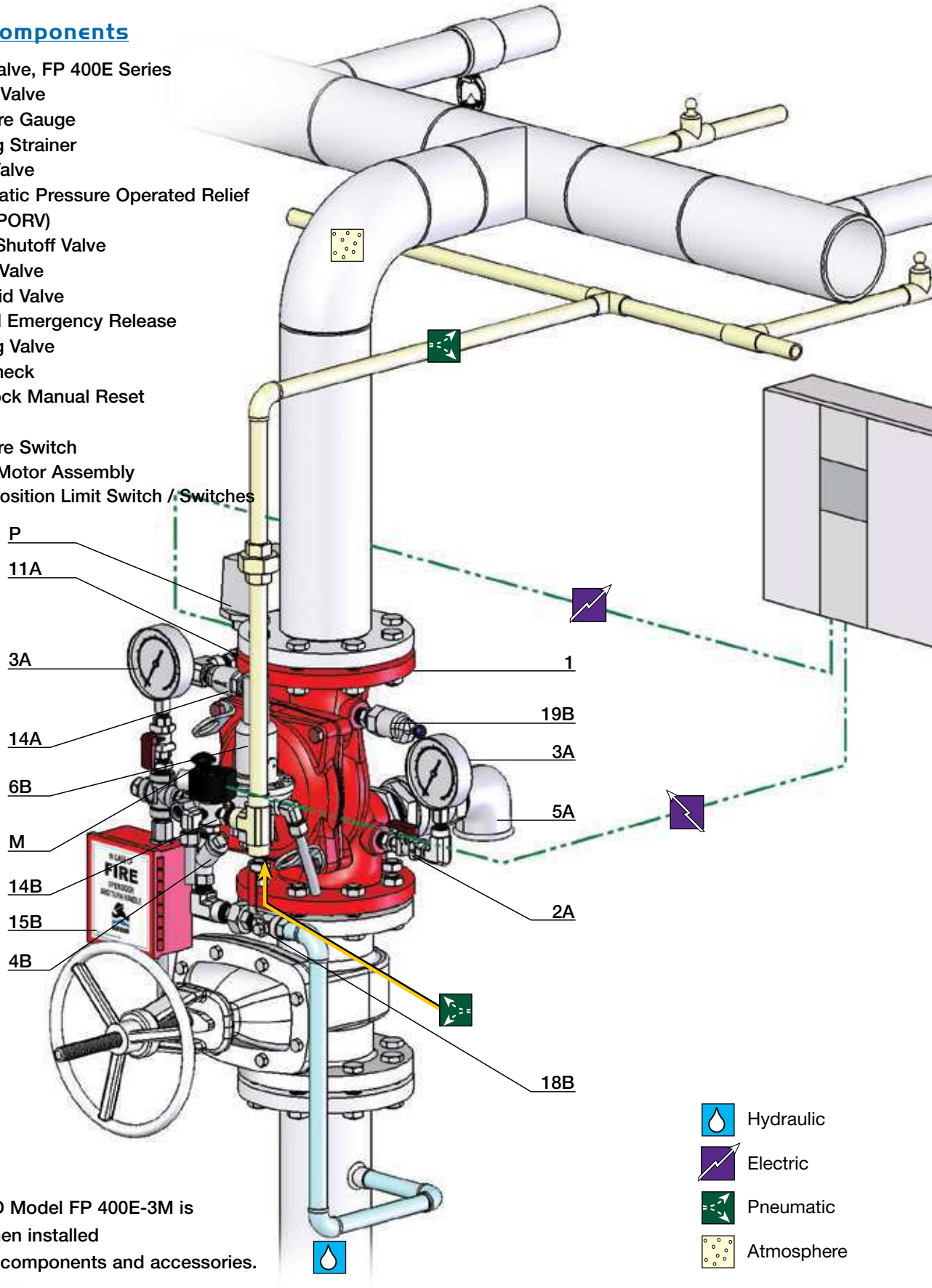
- The deluge valve shall be a UL-Listed, electro-pneumatically controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of S.S.316 tubing and fittings, and plated brass accessories, including local **EasyLock** Manual Reset, PORV pneumatic pilot valve, 3-way Solenoid valve, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The electro-pneumatic deluge valve shall latch open in response to an electric signal. The valve shall reset to the closed position only upon local activation of the manual reset device.

System Components

1 - Main Valve, FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
6B - Pneumatic Pressure Operated Relief Valve (PORV)
11A - Alarm Shutoff Valve
14A - Check Valve
14B - Solenoid Valve
15B - Manual Emergency Release
18B - Priming Valve
19B - Drip Check
M - EasyLock Manual Reset

Optional

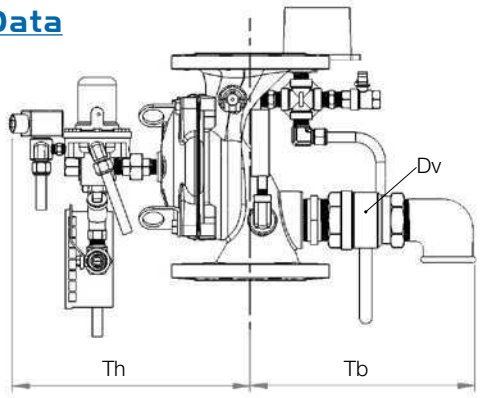
P - Pressure Switch
W - Water Motor Assembly
S - Valve Position Limit Switch / Switches

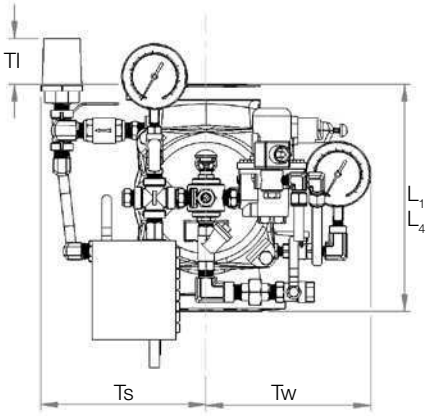


UL Listed

The BERMAD Model FP 400E-3M is UL-Listed when installed with specific components and accessories.

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tl	142	5 5/8	142	5 5/8	119	4 11/16	84	3 5/16	57	2 1/4	-	-	-	-	-	-
	Tw	228	9	220	8 11/16	243	9 9/16	253	10	312	12 5/16	326	12 13/16	346	13 5/8	391	15 3/8
	Ts	228	9	220	8 11/16	243	9 9/16	253	10	318	12 1/2	326	12 13/16	326	12 13/16	391	15 3/8
	Th	226	8 7/8	242	9 1/2	262	10 5/16	261	10 5/16	356	14	407	16	407	16	546	21 1/2
	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8
	Dv Ø	¾"		1½"		1½"		2"		2"		2"		2"		2"	

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

PORV Setting
Valve opens on pilot line pressure drop factory set: 20 psi (1.5 bar)

Manufacturers Standard Materials
Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials
Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Built Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valves
Standard
- 3-Way, direct actuated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL – Listed

Options (see also ordering guide)
- Hazardous locations:
- Class I Division 1, Gr. A, B, C, D, T4 (code 7)
- Class I Division 2, Gr. A, B, C, D, T4
- ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage options)
- Stainless Steel 316 body material (code K)

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Pneumatically Controlled Deluge Valve

with EasyLock™ Manual Reset

Model: FP 400E-4M

UL LISTED

Typical Applications

- Automatic spray or foam systems
- Offshore installations
- Marine environments
- Freezing environments
- Seawater / corrosive water supplies
- Foam applications

Features and Benefits

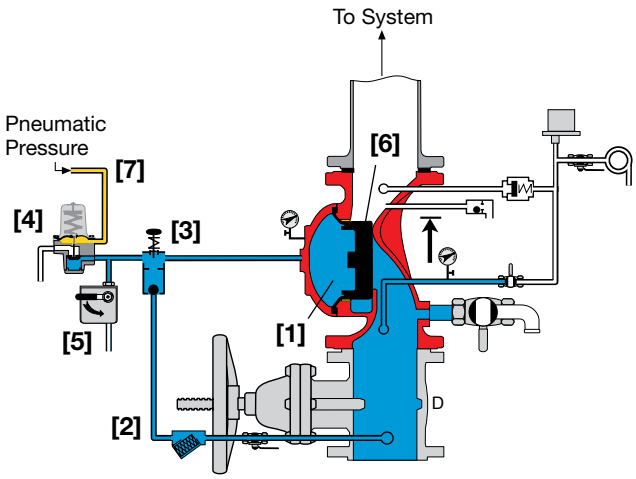
- **Pneumatic PORV –** Best suited for corrosive and freezing conditions
- **Latch open –** Closes upon local reset only
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal downtime

Optional Features

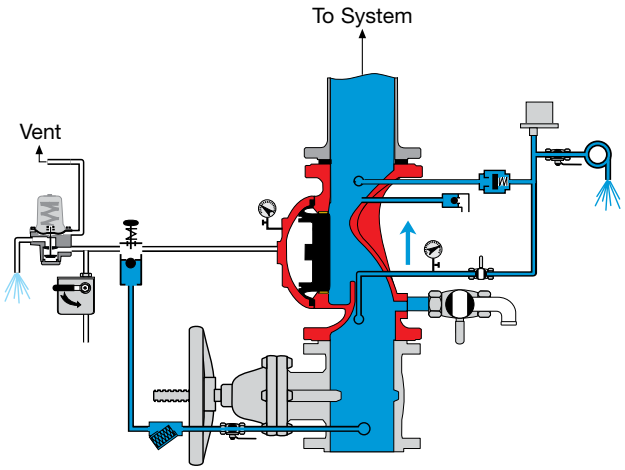
- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

BERMAD's Model FP 400E-4M is suitable for systems that include dry pilot lines with closed pneumatic fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. Since it is pneumatically controlled, the Model FP 400E–4M is recommended for environments with freezing temperatures and/or corrosive water supply.
In the SET position, the line-pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]** and through an EasyLock Manual Reset **[3]**, is trapped by the EasyLock internal check valve, by a closed Pneumatic Pressure Operated Relief Valve (PORV) **[4]** and by a closed Manual Emergency Release **[5]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[6]**, sealing it drip-tight and keeping the system piping dry. The PORV is held closed by the pneumatic pressure maintained in the dry pilot line **[7]**.
Under FIRE or TEST conditions, a pilot line pneumatic pressure drop opens the PORV. Pressure is then released from the main valve's control chamber through the opened PORV, or the Manual Emergency Release. The EasyLock prevents line pressure from entering the control chamber, allowing the main valve to latch open and water to flow into the system piping and to the alarm device.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

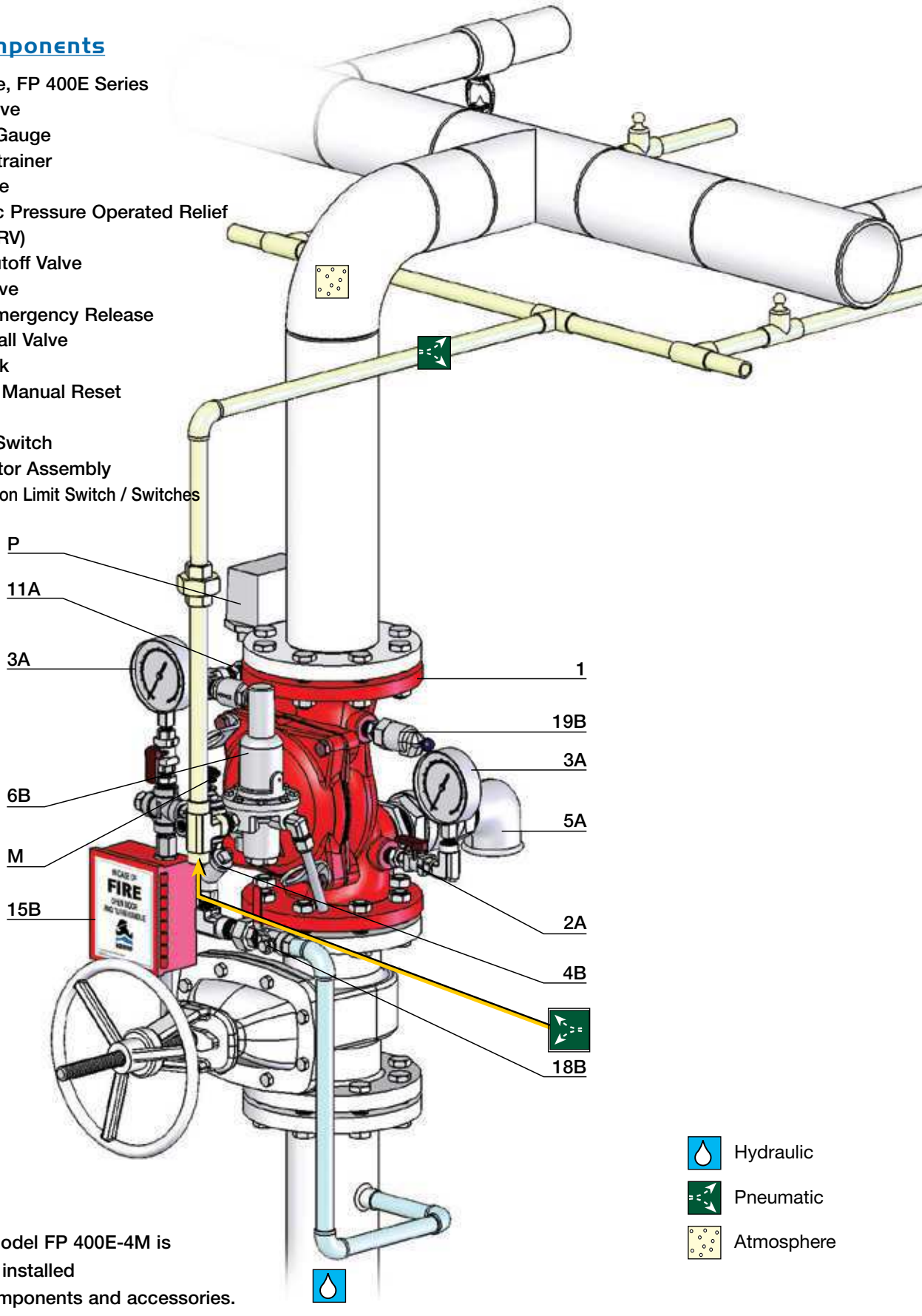
- The Deluge Valve shall be a UL-Listed, pneumatically controlled elastomeric type globe valve with a **rolling-diaphragm.**
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of S.S.316 tubing and fittings, and plated brass accessories, including local **EasyLock** Manual Reset, PORV Pneumatic Pilot Valve, Y Strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Pneumatically Controlled Deluge Valve shall latch open in response to activation of a releasing device. The valve shall reset the closed position only upon local manual activation of the reset device.

System Components

1 - Main Valve, FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
6B - Pneumatic Pressure Operated Relief Valve (PORV)
11A - Alarm Shutoff Valve
14A - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
M - EasyLock Manual Reset

Optional

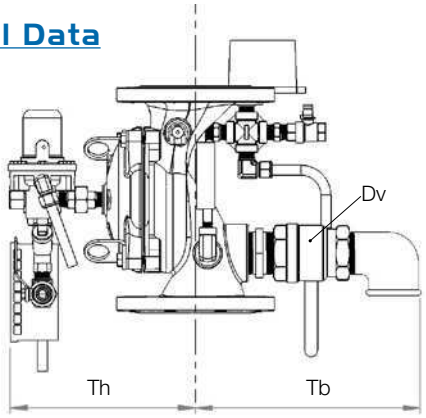
P - Pressure Switch
W - Water Motor Assembly
S - Valve Position Limit Switch / Switches

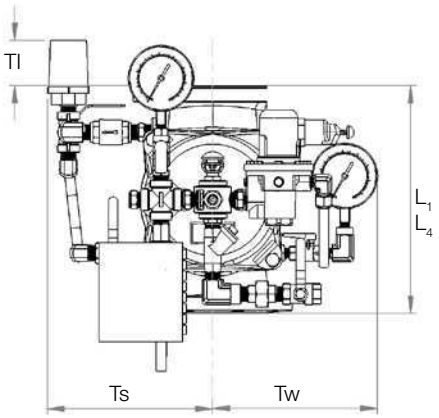


UL Listed

The BERMAD Model FP 400E-4M is UL-Listed when installed with specific components and accessories.

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tl	142	5 5/8	142	5 5/8	119	4 11/16	84	3 5/16	57	2 1/4	-	-	-	-	-	-
	Tw	228	9	220	8 11/16	243	9 9/16	253	10	312	12 5/16	326	12 13/16	346	13 5/8	391	15 3/8
	Ts	228	9	220	8 11/16	243	9 9/16	253	10	318	12 1/2	326	12 13/16	326	12 13/16	391	15 3/8
	Th	226	8 7/8	242	9 1/2	262	10 5/16	261	10 5/16	356	14	407	16	407	16	546	21 1/2
	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8
	Dv Ø	¾"		1½"		1½"		2"		2"		2"		2"		2"	

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

PORV Setting
Valve opens on pilot line pressure drop factory set: 20 psi (1.5 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Built Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

DOWNLOAD PDF VERSION

Hydraulically Controlled Deluge Valve

with EasyLock™ Manual Reset

Model: FP 400E-1M

UL LISTED

Typical Applications

- Automatic spray or foam systems
- Petrochemical facilities
- Flammable materials storage
- Gas storage tanks
- Hydraulic remote controlled systems

Features and Benefits

- **Latch open –** Closes upon local reset only
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full-bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

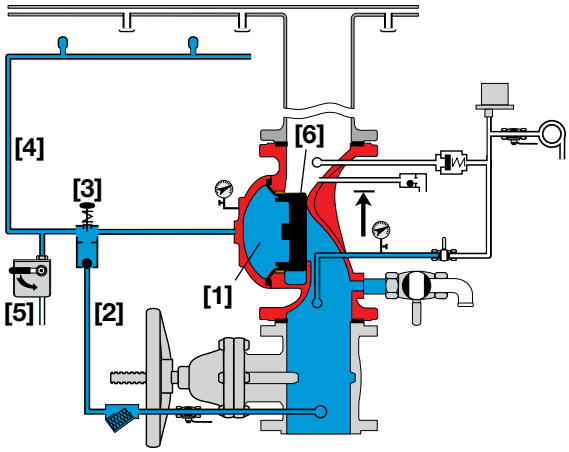
- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

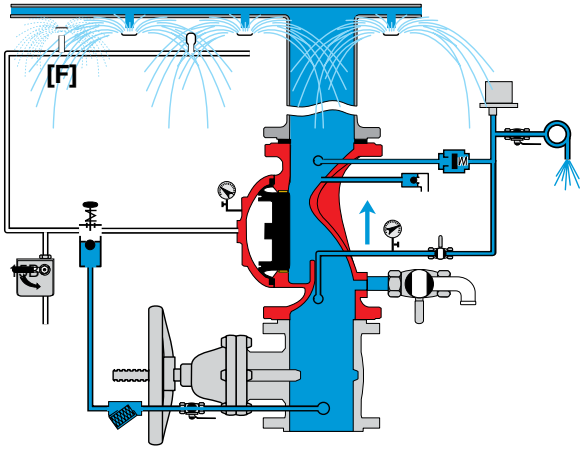
The BERMAD Model FP 400E-1M is suitable for systems that include wet pilot lines with closed fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. The typical wet pilot line is installed in a covered area and connected to the valve trim.

In the SET position, the line-pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]** and through an EasyLock Manual Reset **[3]**, is trapped by the EasyLock internal check valve, by the closed wet pilot line **[4]**, and by a closed Manual Emergency Release **[5]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[6]**, sealing it drip-tight and keeping the system piping dry.

Under FIRE or TEST conditions, water is released from the control chamber through the opened thermal release **[F]** of the wet pilot line, or the Manual Emergency Release. The EasyLock prevents line-pressure from entering the control chamber, allowing the main valve to latch open and water to flow into the system piping and to the alarm device.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

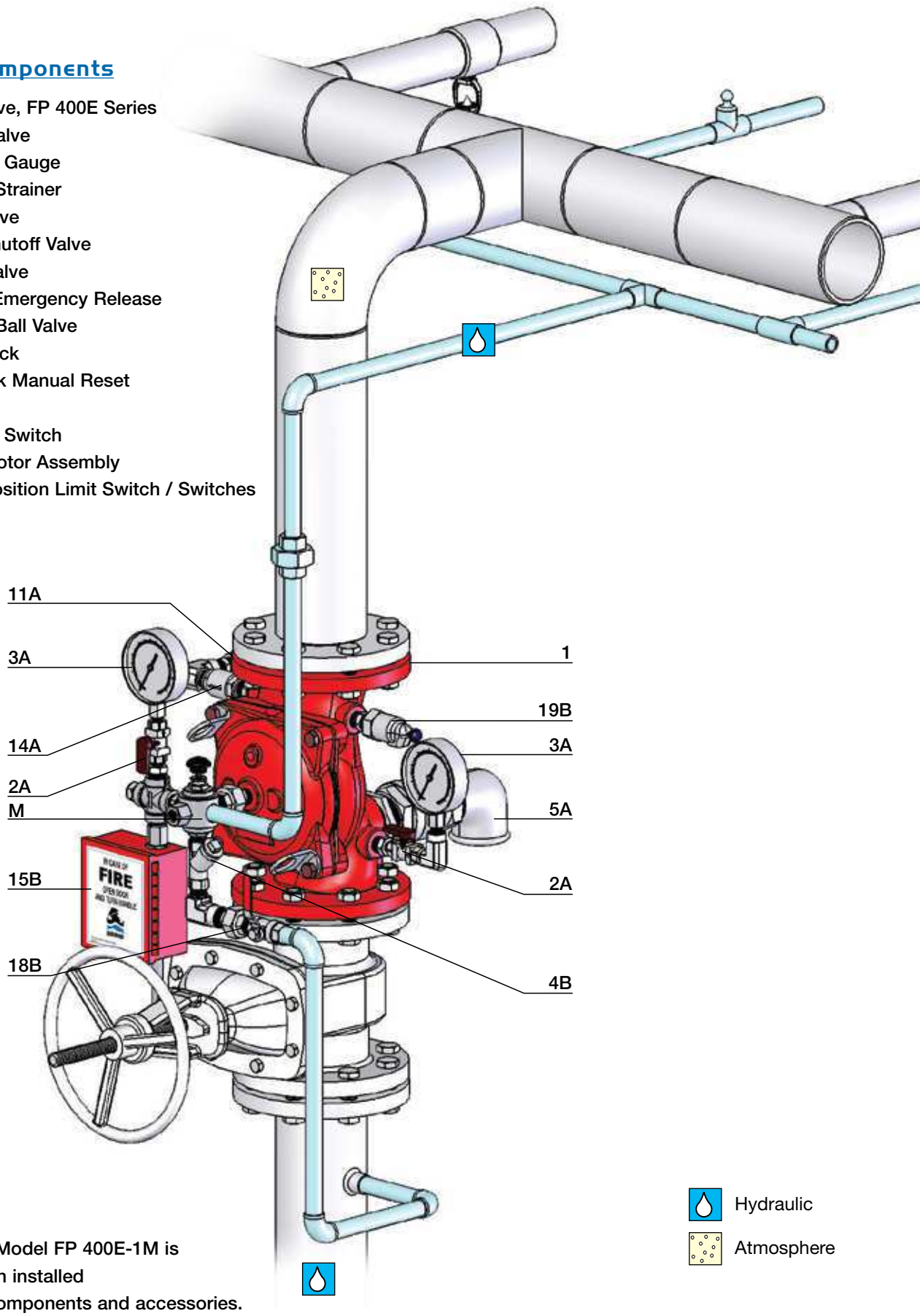
- The deluge valve shall be a UL-Listed, hydraulically controlled, elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path** with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of S.S.316 tubing and fittings, and plated brass accessories including local **EasyLock** Manual Reset, Y Strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Hydraulically Controlled Deluge Valve shall latch open in response to activation of a releasing device. The valve shall reset to the closed position, only upon local manual activation of the reset device.

System Components

1 - Main Valve, FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
11A - Alarm Shutoff Valve
14A - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
M - EasyLock Manual Reset

Optional

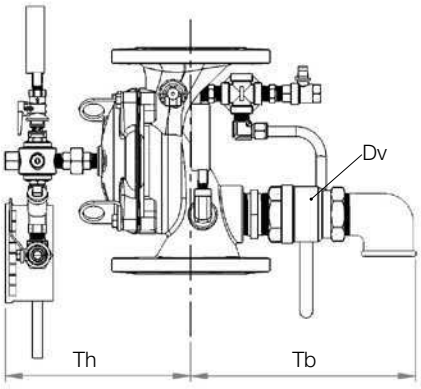
P - Pressure Switch
W - Water Motor Assembly
S - Valve Position Limit Switch / Switches

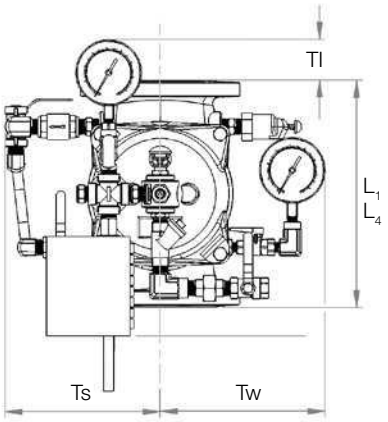


UL Listed
The BERMAD Model FP 400E-1M is UL-Listed when installed with specific components and accessories.

Hydraulic
Atmosphere

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tl	142	5 5/8	142	5 5/8	119	4 11/16	84	3 5/16	57	2 1/4	-	-	-	-	-	-
	Tw	228	9	220	8 11/16	243	9 9/16	253	10	312	12 5/16	326	12 13/16	346	13 5/8	391	15 3/8
	Ts	228	9	220	8 11/16	243	9 9/16	253	10	318	12 1/2	326	12 13/16	326	12 13/16	391	15 3/8
	Th	226	8 7/8	242	9 1/2	262	10 5/16	261	10 5/16	356	14	407	16	407	16	546	21 1/2
	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8
	Dv Ø	¾"		1½"		1½"		2"		2"		2"		2"		2"	

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

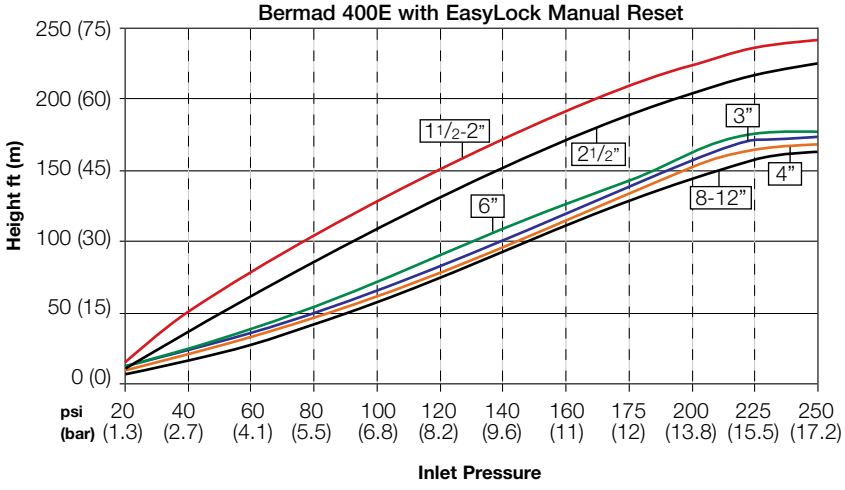
Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

Wet Pilot line Maximum Elevation Above Valve
Bermad 400E with EasyLock Manual Reset



Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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Hydraulically Controlled, Anti-Columning Deluge Valve

with EasyLock™ Manual Reset

Model: FP 400E-5M

UL LISTED

Typical Applications

- Automatic spray or foam systems
- Petrochemical facilities
- Power plants & transformers
- Flammable materials storage
- Hydraulic remote controlled systems
- Gas storage tanks

Features and Benefits

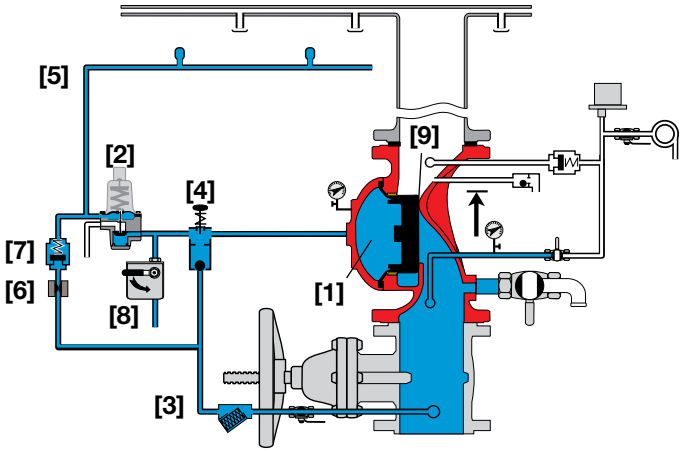
- **Latch open –** Closes upon local reset only
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full-bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

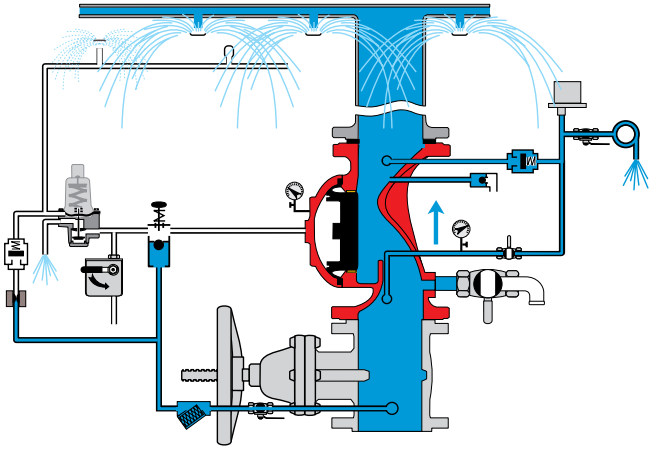
- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

The BERMAD Model FP 400E-5M is suitable for systems that include wet pilot lines with closed fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. Providing boosted local pressure release from its control chamber, Model FP 400E-5M is recommended for systems with a remote and/or elevated fusible plugs line.
In the SET position, line-pressure supplied to both the main valve's control chamber **[1]** and to an Adjustable Pressure Operated Relief Valve (PORV-A) **[2]** via the priming line **[3]**, an EasyLock Manual Reset **[4]**, the wet pilot line **[5]** restriction **[6]**, and a check valve **[7]** is trapped by the EasyLock internal check valve, by the closed PORV, and a closed Manual Emergency Release **[8]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[9]**, sealing it drip-tight and keeping the system piping dry. The AORV is held closed by the line pressure in the wet pilot line.
Under FIRE or TEST conditions, a pilot line hydraulic pressure drop opens the AORV. Pressure is then released from the main valve's control chamber through the opened AORV, or the Manual Emergency Release. The EasyLock prevents line pressure from entering the control chamber, allowing the main valve to latch open and water to flow into the system piping and to the alarm device.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

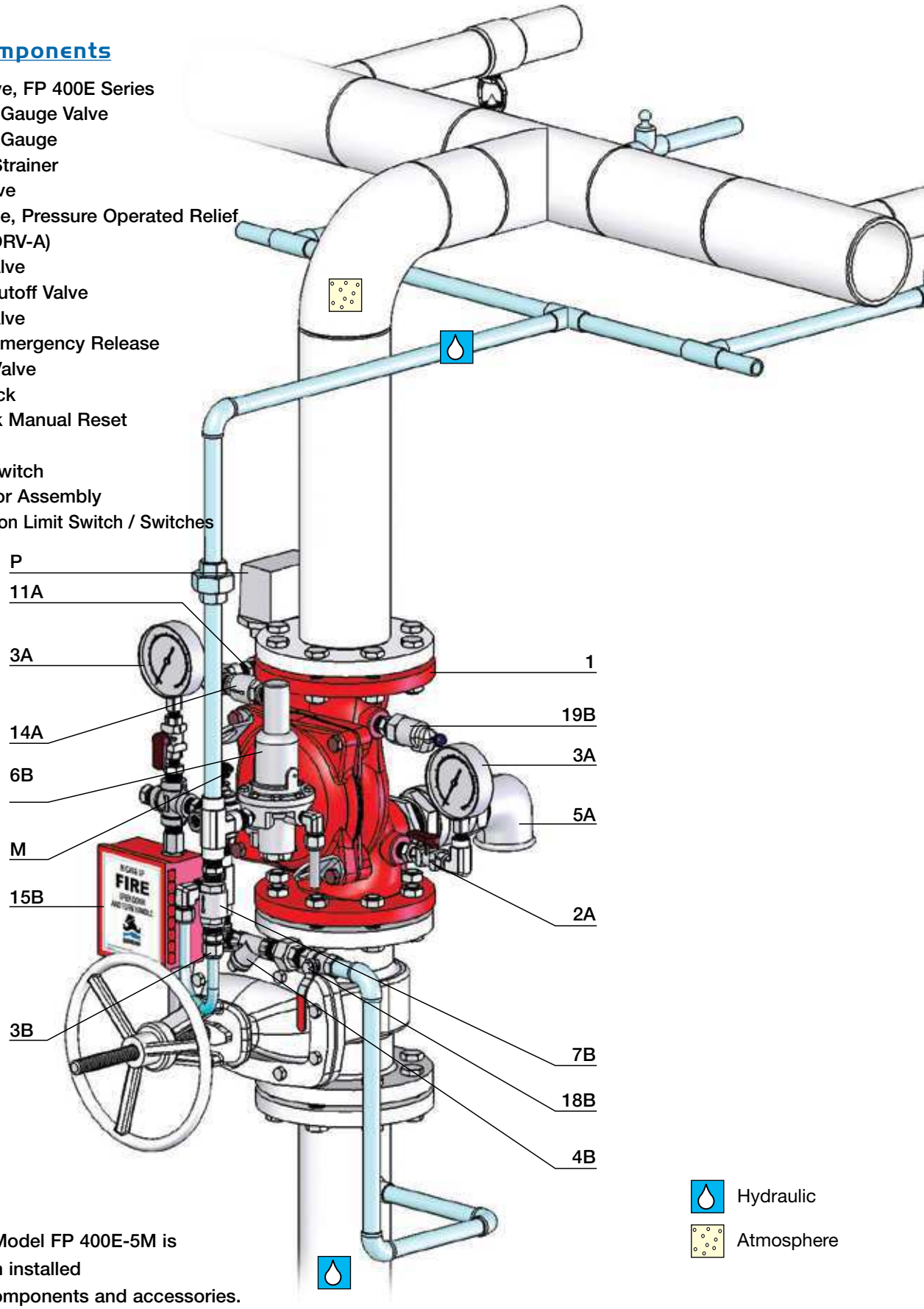
- The deluge valve shall be a UL-Listed, hydraulically controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path** with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of S.S.316 tubing and fittings, and plated brass accessories, including local **EasyLock** Manual Reset, PORV-A adjustable hydraulic pilot valve, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
  The Hydraulically Controlled, Anti-Columning Deluge Valve shall latch open in response to activation of a releasing device. The valve shall reset to the closed position only upon local manual activation of the reset device.

System Components

1 - Main Valve, FP 400E Series
2A - Pressure Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
6B - Adjustable, Pressure Operated Relief Valve (PORV-A)
7B - Check Valve
11A - Alarm Shutoff Valve
14A - Check Valve
15B - Manual Emergency Release
18B - Priming Valve
19B - Drip Check
M - EasyLock Manual Reset

Optional

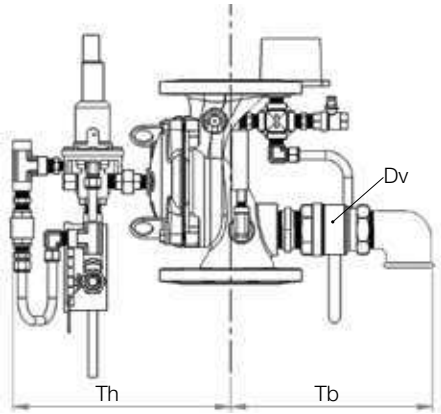
P - Pressure Switch
W - Water Motor Assembly
S - Valve Position Limit Switch / Switches

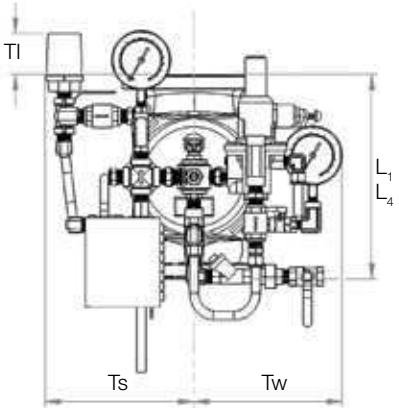


UL Listed

The BERMAD Model FP 400E-5M is UL-Listed when installed with specific components and accessories.

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tl	142	5 5/8	142	5 5/8	119	4 11/16	84	3 5/16	57	2 1/4	-	-	-	-	-	-
	Tw	228	9	220	8 11/16	243	9 9/16	253	10	312	12 5/16	326	12 13/16	346	13 5/8	391	15 3/8
	Ts	228	9	220	8 11/16	243	9 9/16	253	10	318	12 1/2	326	12 13/16	326	12 13/16	391	15 3/8
	Th	226	8 7/8	242	9 1/2	262	10 5/16	261	10 5/16	356	14	407	16	407	16	546	21 1/2
	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8
	Dv Ø	¾"		1½"		1½"		2"		2"		2"		2"		2"	

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

PORV Setting
Valve opens on pilot line pressure drop
- **Factory Set: 72 psi (5 bar)**
- **Adjustable Range: 10-115 psi (0.7-8 bar)**

Warning: The release point must be set at the maximum elevation of the highest wet pilot line release device above the main valve plus at least 10 psi (0.7 bar).

Manufacturers Standard Materials
Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials
Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Built Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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Combination Pressure Control Deluge Valves

The BERMAD Combination Pressure Control Deluge Valves are suitable for flow control in large scale firewater systems. The valves can be activated in response to an electric, hydraulic, pneumatic, or electro-pneumatic signal. When open, the valves continuously reduce higher upstream pressure to a lower pre-set down-stream pressure, maintaining flow per system design.

Electric Pressure Control Deluge Valve

with EasyLock™ Manual Reset

Model: FP 400E-2MC

Typical Applications

- Fluctuating or over pressure
- Petrochemical facilities
- Tunnels
- Power plants & transformers
- Flammable materials storage
- Aviation & airports

Features and Benefits

- **Pressure control function –** Constant preset downstream pressure
- **Latch open –** Closes upon local reset only
- **One-piece molded elastomeric moving part –** No maintenance required
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

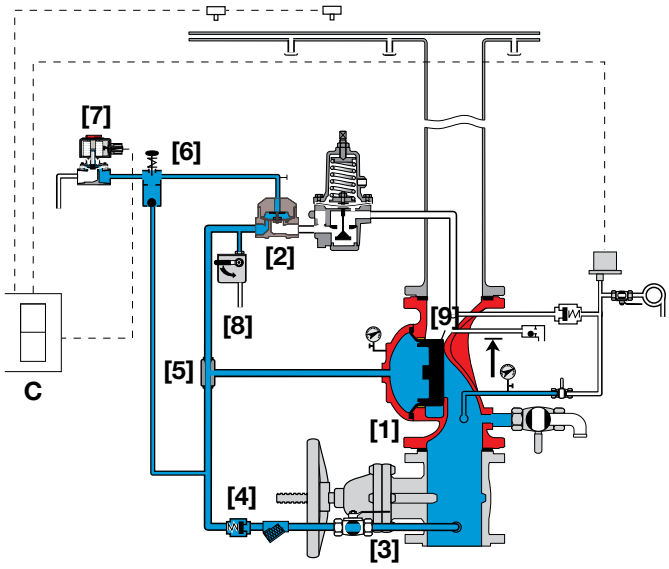
- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Explosion-proof for hazardous locations** (code: 7/8/9)
- **Hydraulic release** (requires trim extension)
- **Valve Position Single/Double Limit Switches**

Operation

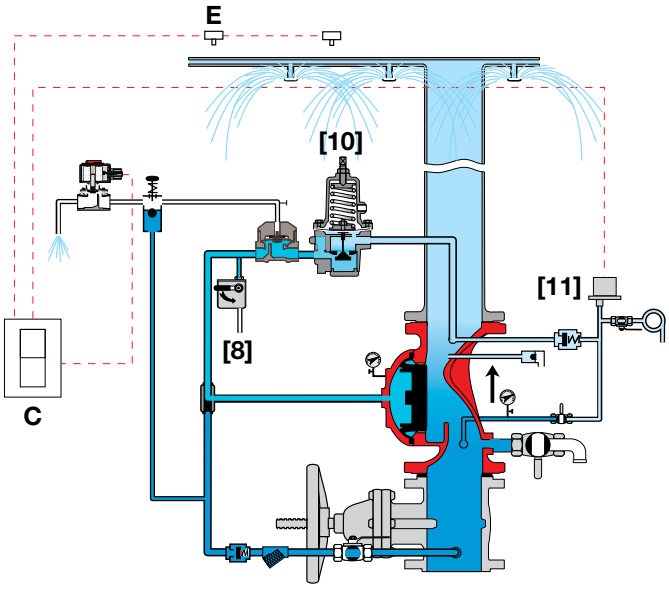
The BERMAD Model FP 400E-2MC is suitable for systems that include electric fire detection and a piping system with a wide variety of open nozzles. Combining a pressure control feature, the model FP 400E-2MC is recommended for systems with high pressure supply source and/or with relatively low flow.

In the SET position, the line-pressure supplied to both the main valve's control chamber **[1]** and to a Hydraulic Relay Valve (HRV) **[2]** via the priming line **[3]**, and through a Check Valve **[4]**, an Accelerator **[5]** with priming restriction, and an EasyLock Manual Reset **[6]** is trapped by the Check Valve, by the closed HRV, by a Solenoid Valve **[7]**, and by a closed Manual Emergency Release **[8]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[9]**, sealing it drip-tight and keeping the system piping dry.

Under FIRE condition, an electric signal triggers the Solenoid Valve to open, opening the HRV. Pressure is then released from the main valve's control chamber to the downstream, the open HRV and the Pressure Reducing (PR) Pilot valve **[10]**. The EasyLock prevents line-pressure from entering the HRV, allowing the main valve to latch open, and water to flow into the system piping and to the alarm device **[11]**. Should system pressure rise above PR pilot setting, the PR pilot throttles, thereby enabling pressure to accumulate in the valve control chamber. This causes the 400E-2MC to throttle closed, decreasing system pressure to PR pilot setting. The Manual Emergency Release [8], overrides the PR pilot, causing the FP 400E-2MC to open fully.



Valve Closed (set position)



Valve Open (operating condition)

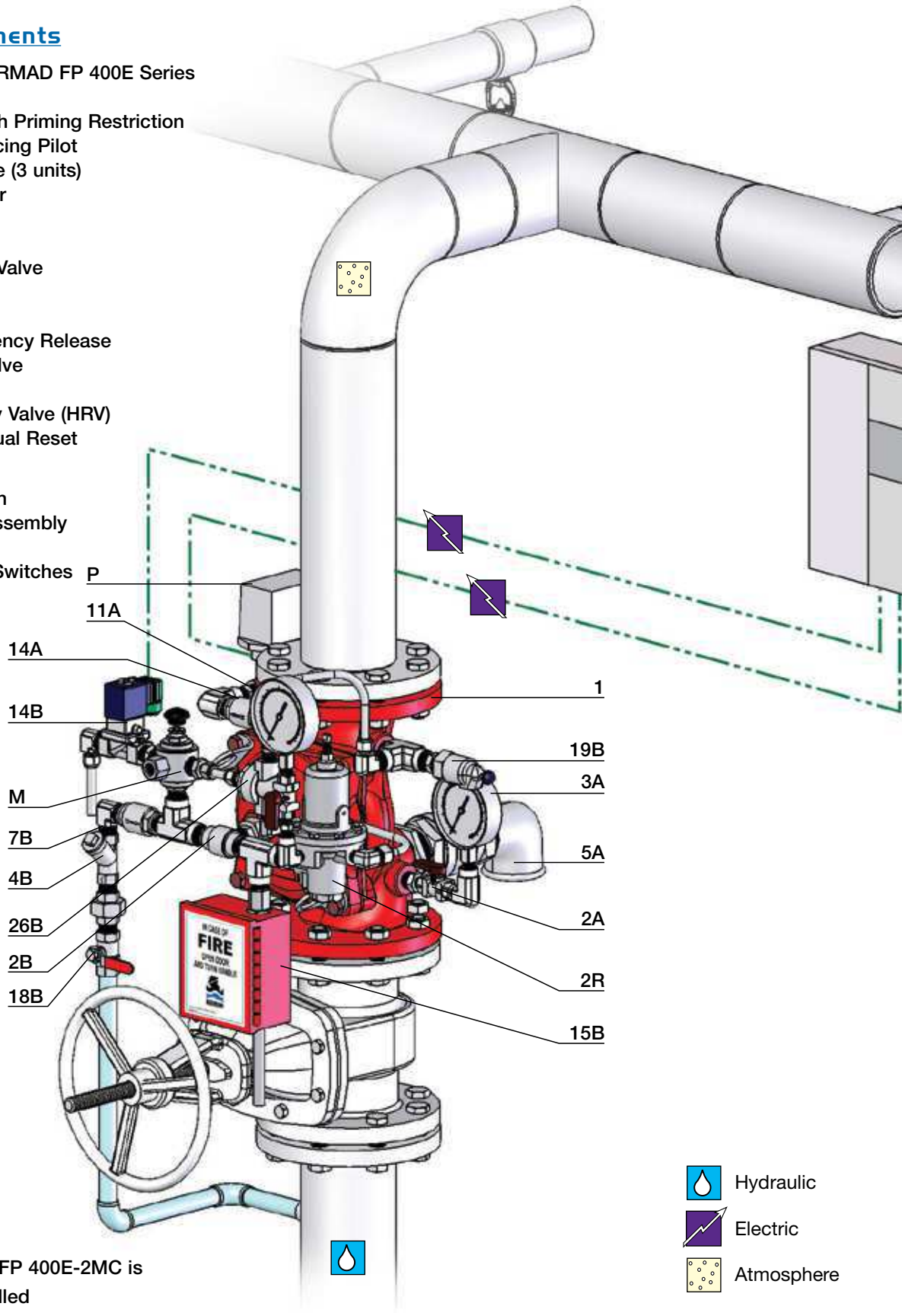
Engineer Specifications

- The deluge valve shall be a UL-Listed, electrically controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including local **EasyLock** Manual Reset, 2-way Solenoid Pilot Valve, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Pressure Control and Electrically Controlled Deluge Valve shall latch open in response to activation of the solenoid, reducing higher upstream pressure to lower preset downstream pressure. The valve shall reset to the closed position only upon local manual activation of the reset device.

System Components

1 - Main Valve, BERMAD FP 400E Series
2A - Gauge Valve
2B - Accelerator with Priming Restriction
2R - Pressure Reducing Pilot
3A - Pressure Gauge (3 units)
4B - Priming Strainer
5A - Drain Valve
7B - Check Valve
11A - Alarm Shutoff Valve
14A - Check Valve
14B - Solenoid Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
26B - Hydraulic Relay Valve (HRV)
M - EasyLock Manual Reset

Optional
P - Pressure Switch
W - Water Motor Assembly
S - Valve Position Limit Switch / Switches



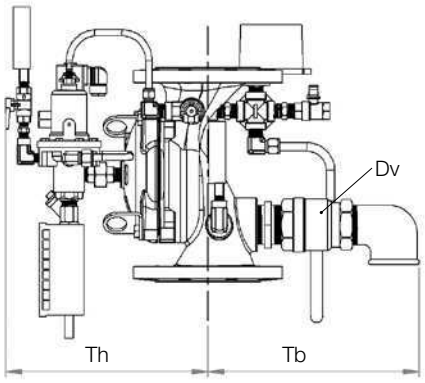
UL Listed
The BERMAD Model FP 400E-2MC is UL-Listed when installed with specific components and accessories.

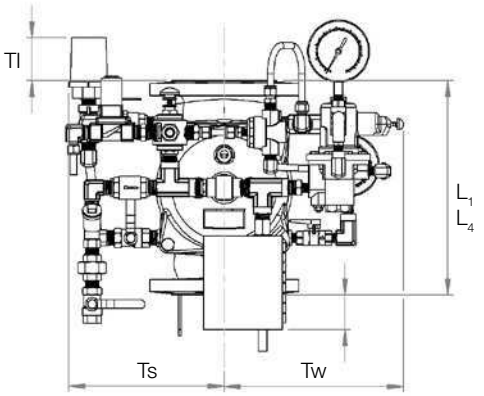
BERMAD Fire Protection

Model: FP 400E-2MC

400 Series

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
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	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8
	Dv Ø	¾"		1½"		1½"		2"		2"		2"		2"		2"	

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

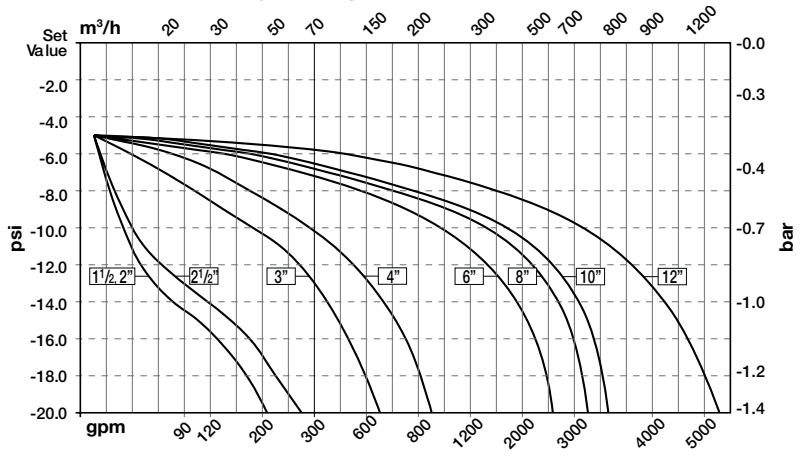
Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating*
- Max. inlet: 250 psi (17 bar)
- Set: 30-165 psi (4.5-11.5 bar)

* Pressure rating might be limited due to solenoid valve rating

Valve Outlet Pressure Fall-off Characteristics On Inlet Under Set Pressure



Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Forged Brass pressure reducing pilot with St. St. 304 internals & NBR elastomers
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valves

Standard
- 2-way Pilot Operated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - ATEX, EEx em IIC T4 (code 8)
  - ATEX, EEx d IIC T4/5 (code 9)
- Voltage: see o… …oltage option table)
- Stainless … …terial (code K)

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BERMAD Fire Protection

400 Series

Electric Pressure Control, On-Off Deluge Valve

Model: FP 400E-3DC

UL LISTED

Typical Applications

- Fluctuating or over pressure
- Water/foam fire systems
- Deluge & spray systems
- Petrochemical facilities
- Flammable materials storage
- Marine environments
- Gas storage tanks
- Remote monitor

Features and Benefits

- **Pressure control function –** Constant preset downstream pressure
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

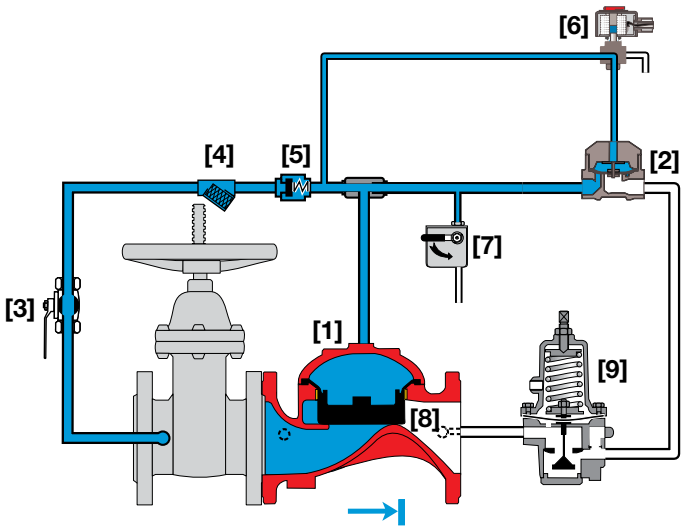
- **Alarm pressure-switch** (code: P or P7)
- **Explosion-proof for hazardous locations** (code: 7/8/9)
- **Fail-safe open** (energized to close main valve)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

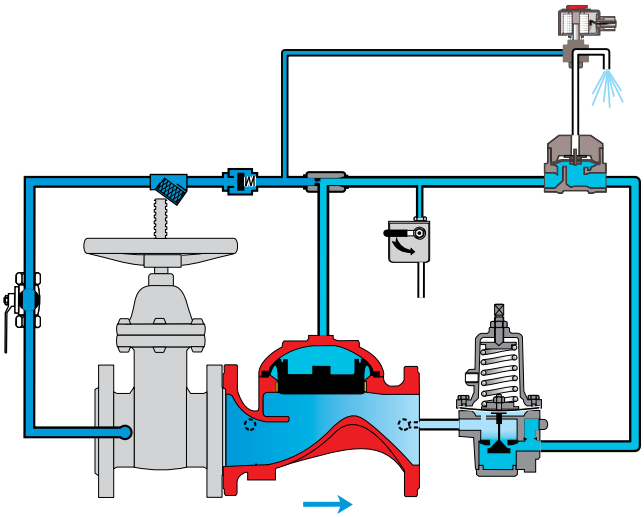
The BERMAD Model FP 400E-3DC is suitable for systems that include electric fire detection and a piping system with a wide variety of open nozzles. Combining a pressure control feature, the FP 400E-3DC is recommended for systems with high pressure supply source and/or relatively low flow.

In the SET position, the line-pressure supplied to both the main valve's control chamber **[1]** and a 2-way Hydraulic Relay Valve (HRV-2) **[2]** via the priming line **[3]** and through a Check Valve **[4]**, an Accelerator **[5]** with priming restriction, and a Solenoid **[6]**, is trapped by the Check Valve, by the closed HRV, and by a closed Manual Emergency Release **[7]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[8]**, sealing it drip tight and keeping the system piping dry. The HRV is held closed by the line-pressure, supplied through the Solenoid.

Under FIRE condition, an electric signal triggers the Solenoid to open the HRV. Pressure is then released from the main valve control chamber to the downstream, through the open HRV and the Pressure Reducing (PR) Pilot valve **[9]**, allowing the main valve to open, and water to flow into the system piping and to the alarm device. Should system pressure rise above PR pilot setting, the PR pilot throttles, thereby enabling pressure to accumulate in the valve's control chamber. This causes the FP 400E-3DC to throttle closed, decreasing system pressure to PR pilot setting. The Manual Emergency Release **[7],** overrides the PR pilot, causing the valve to open fully.



Valve Closed (set position)



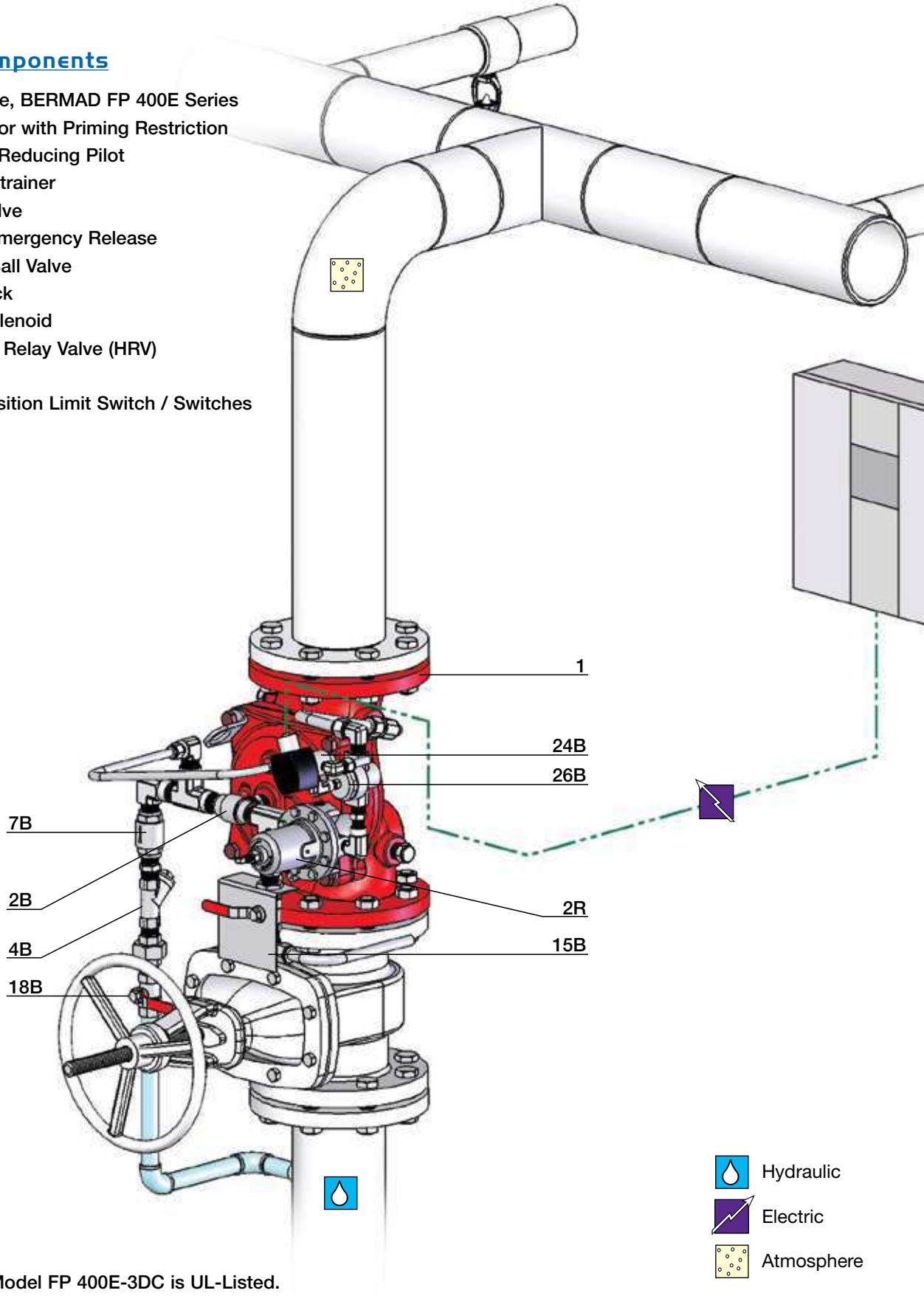
Valve Open (operating condition)

Engineer Specifications

- The On-Off deluge valve shall be a UL-Listed, solenoid remote controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including Accelerator, 3-way Solenoid, HRV hydraulic actuated pilot valve, 2-Way Pressure Reducing Pilot, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Pressure Control and Solenoid Remote Controlled, On-Off Deluge Valve shall open and close in response to activation of the solenoid, reducing higher upstream pressure to preset lower downstream pressure.

System Components

1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator with Priming Restriction
2R - Pressure Reducing Pilot
4B - Priming Strainer
7B - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
24B - 3-Way Solenoid
26B - Hydraulic Relay Valve (HRV)
Optional
S - Valve Position Limit Switch / Switches



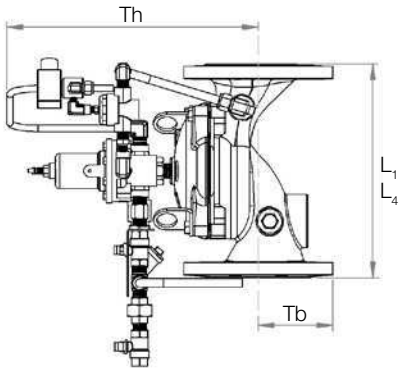
UL Listed
The BERMAD Model FP 400E-3DC is UL-Listed.
The installation shall include Indicating and Drain Components.

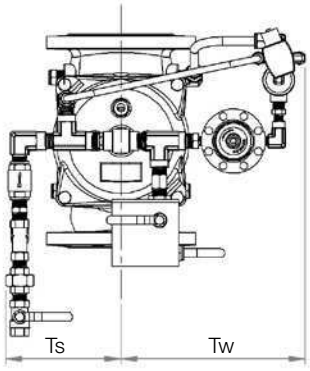
BERMAD Fire Protection

Model: FP 400E-3DC

400 Series

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	228	9	220	8 11/16	243	9 9/16	253	10	312	12 5/16	326	12 13/16	346	13 5/8	391	15 3/8
	Ts	228	9	220	8 11/16	243	9 9/16	253	10	318	12 1/2	326	12 13/16	326	12 13/16	391	15 3/8
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	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

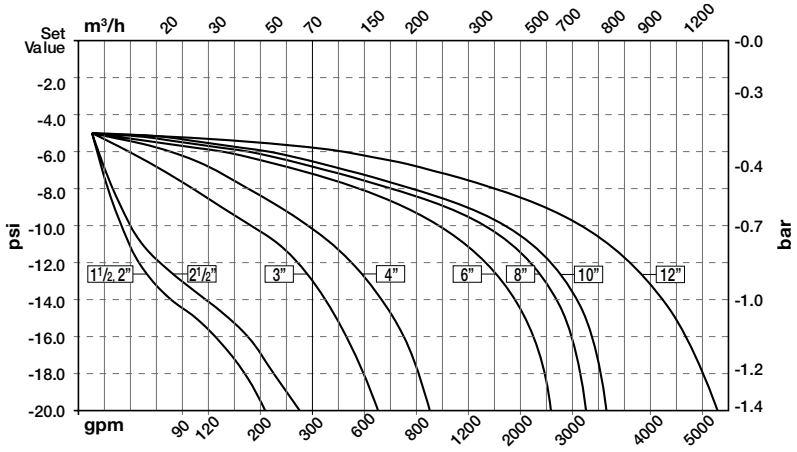
Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating*
- Max. inlet: 250 psi (17 bar)
- Set: 30-165 psi (4.5-11.5 bar)

* Pressure rating might be limited due to solenoid valve rating

Valve Outlet Pressure Fall-off Characteristics On Inlet Under Set Pressure



Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Forged Brass pressure reducing pilot with St. St. 304 internals & NBR elastomers
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valves

Standard
- 3-Way direct actuated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - Class I Division 2, Gr. A, B, C, D, T4
  - ATEX, EEx [illegible]ode 9)
- Voltage: see [illegible]ltage option table)
- Stainless [illegible]erial (code K)

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Electro-Pneumatic Pressure Control, On-Off Deluge Valve

Model: FP 400E-6DC

LISTED

Typical Applications

- Fluctuating or over pressure
- Offshore platforms
- Marine environments
- Seawater/corrosive water supplies
- Foam fire systems
- Increased reliable response by dry solenoid
- Redundant safety detection systems

Features and Benefits

- **Pressure control function –** Constant preset downstream pressure
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Dry solenoid –** Suitable for corrosive water or foam
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

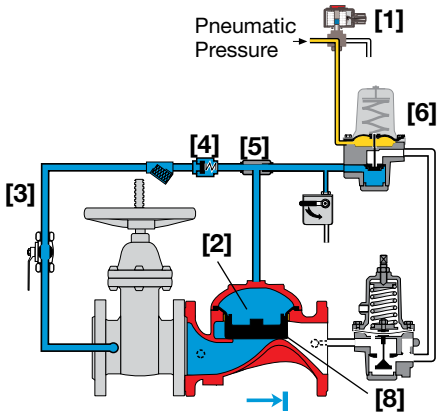
Optional Features

- **Alarm pressure-switch** (code: P or P7)
- **Explosion-proof for hazardous locations** (code: 7/8/9)
- **Fail-safe open** (energized to close main valve)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

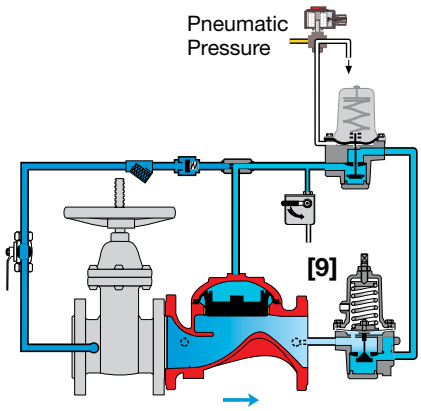
Operation

BERMAD's Model FP 400E-6DC is suitable for systems that include redundant safety (electric and pneumatic) fire detection and piping systems with a wide variety of open nozzles. Since it is pneumatically controlled, the Model FP 400E-6DC is recommended where it is advantageous to keep the solenoid **[1]** dry, such as seawater installations. Combining a pressure reducing feature, it is also suitable for systems with high pressure supply source and/or relatively low flow. In the SET position, the line-pressure supplied to the main valve's control chamber **[2]** via the priming line **[3]**, through a Check Valve **[4]**, and an Accelerator **[5]** with priming restriction, is trapped by the Check Valve, by a closed Pneumatic Pressure Operated Relief Valve (PORV) **[6]**, and by a closed Manual Emergency Release **[7]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[8]**, sealing it drip-tight and keeping the system piping dry. The PORV is held closed by the pneumatic pressure maintained in the dry pilot line, supplied through the Solenoid **[1]**.

Under FIRE condition, a dry pilot line pneumatic pressure drop, or an electric signal that triggers the Solenoid, opens the PORV. Pressure is then released from the main valve's control chamber to the downstream, through the open HRV and the Pressure Reducing (PR) Pilot valve **[9]**, This allows the main valve to open, and water to flow into the system piping and to the alarm device. Should system pressure rise above PR pilot setting, the PR pilot throttles, thereby enabling pressure to accumulate in the valve control chamber. This causes the FP 400E-6DC to throttle closed, decreasing system pressure to PR pilot setting. The Manual Emergency Release **[7]**, overrides the PR pilot, causing the valve to open fully.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

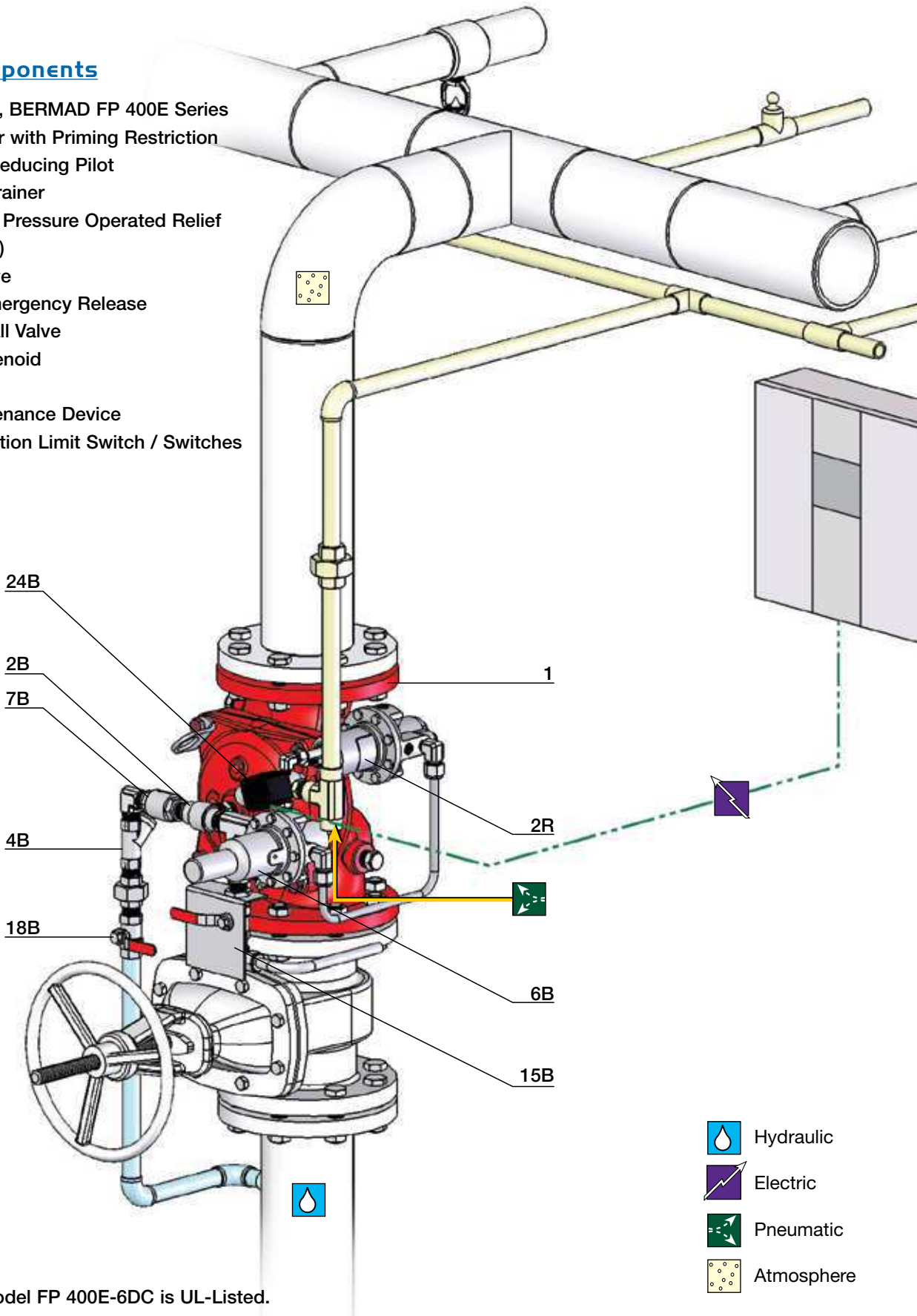
- The On-Off deluge valve shall be a UL-Listed, electro-pneumatically remote controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including Accelerator, PORV pneumatic pilot valve, 3-way Solenoid, 2-Way Pressure Reducing Pilot, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Pressure Control and Electro-Pneumatically Remote Controlled, On-Off Deluge Valve shall open and close in response to activation of the solenoid and to dry line pneumatic pressure, reducing higher upstream pressure to pre-set lower downstream pressure.

System Components

1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator with Priming Restriction
2R - Pressure Reducing Pilot
4B - Priming Strainer
6B - Pneumatic Pressure Operated Relief Valve (PORV)
7B - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
24B - 3-Way Solenoid

Optional

AMD - Air Maintenance Device
S - Valve Position Limit Switch / Switches



UL Listed

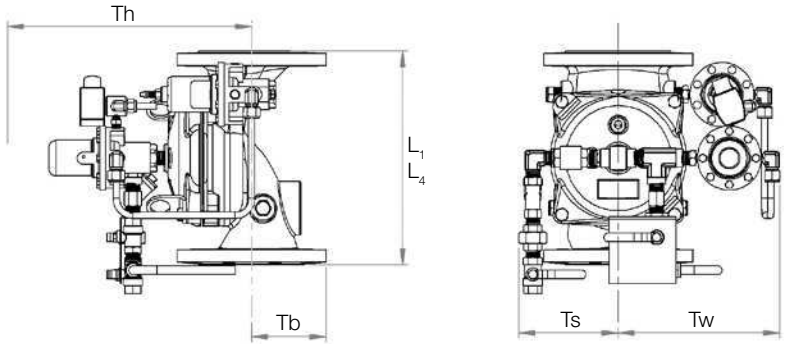
The BERMAD Model FP 400E-6DC is UL-Listed.
The installation shall include Indicating and Drain Components.

BERMAD Fire Protection

Model: FP 400E-6DC

400 Series

Technical Data



Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
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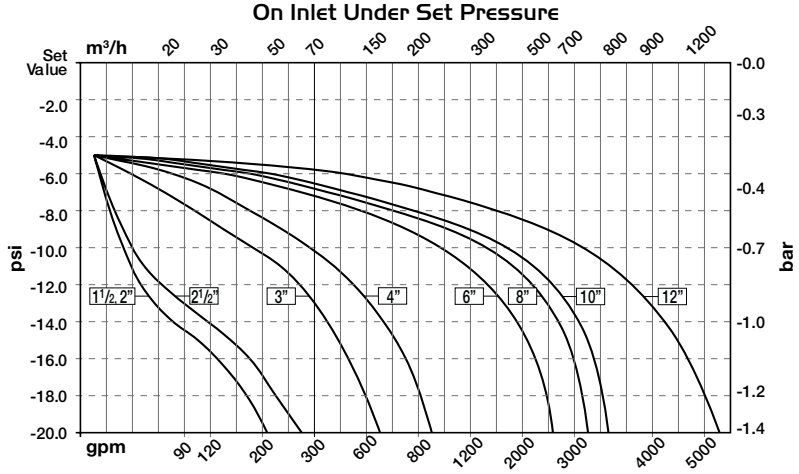
Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Valve Outlet Pressure Fall-off Characteristics On Inlet Under Set Pressure



Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. inlet: 250 psi (17 bar)
- Set: 30-165 psi (4.5-11.5 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Forged Brass pressure reducing pilot with St. St. 304 internals & NBR elastomers
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

PORV set - opens on pressure drop
- Factory set: 20 psi (1.5 bar)

PORV setting

Valve opens on pilot line pressure drop
- Factory set: 20 psi (1.5 bar)

Solenoid Pilot Valves

Standard
- 3-Way direct actuated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - Class I Division 2, Gr. A, B, C, D, T4
  - ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage option table)
- Stainless steel 316 body material (code K)

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Pneumatic Pressure Control, On-Off Deluge Valve

Model: FP 400E-4DC

UL LISTED

Typical Applications

- Fluctuating or over pressure
- Offshore platforms
- Marine environments
- Freezing environments
- Seawater/corrosive water supplies
- Foam applications
- Remote monitor

Features and Benefits

- **Pressure control function –** Constant preset downstream pressure
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

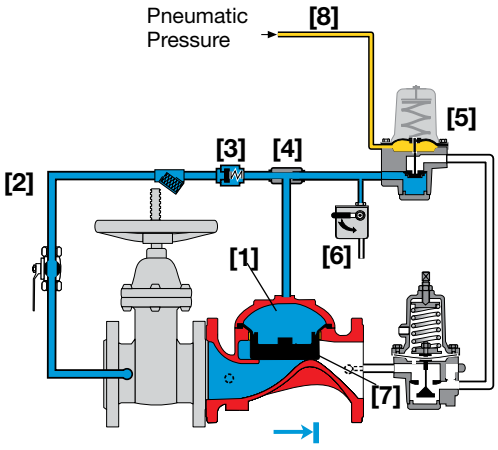
- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Seawater** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

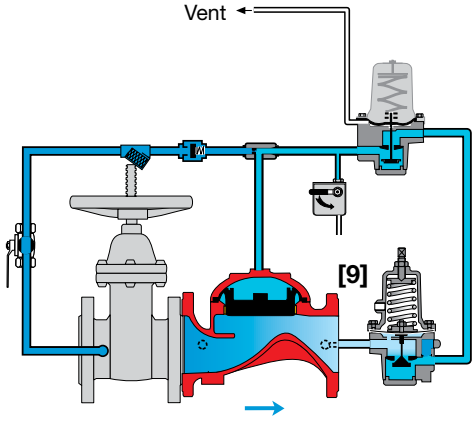
BERMAD Model Model FP 400E-4DC is suitable for systems that include dry pilot lines with closed pneumatic fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. Since it is pneumatically controlled, the Model FP 400E-4DC is recommended for environments with freezing temperatures and/or corrosive water supply. Combining a pressure control feature, it's also suitable for systems with high pressure supply source and/or relatively low flow.

In the SET position, line-pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]**, and through a Check Valve **[3]**, and an Accelerator **[4]** with priming restriction, is trapped by the Check Valve, by a closed Pneumatic Pressure Operated Relief Valve (PORV) **[5]**, and by a closed Manual Emergency Release **[6]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[7]**, sealing it drip-tight and keeping the system piping dry. The PORV is held closed by the pneumatic pressure maintained in the dry pilot line **[8]**.

Under FIRE condition, a dry line pneumatic pressure drop opens the PORV. Pressure is then released from the main valve control chamber to the downstream, throughthe open PORV and the Pressure Reducing (PR) Pilot valve **[9]**, allowing the main valve to open, and water to flow into the system piping and to the alarm device. Should system pressure rise above PR pilot setting, the PR pilot throttles, thereby enabling pressure to accumulate in the valve control chamber. This causes the FP 400E-4DC to throttle closed, decreasing system pressure to PR pilot setting. The Manual Emergency Release **[6]**, overrides the PR pilot, causing the FP 400E-4DC to open fully.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

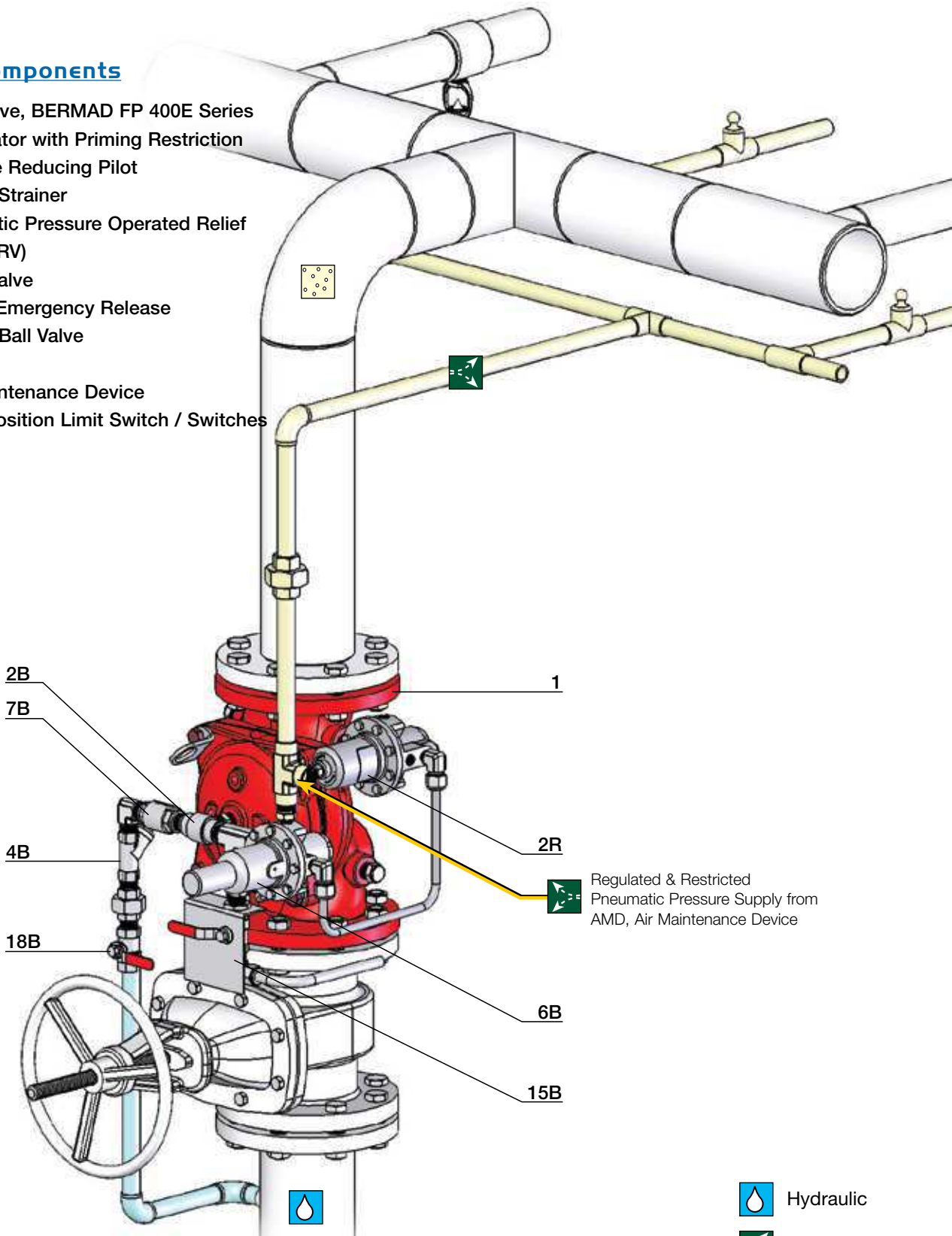
- The On-Off deluge valve shall be a UL-Listed, pneumatically remote controlled elastomeric type globe valv with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including Accelerator, PORV pneumatic pilot valve, 2-Way Pressure Reducing Pilot, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Pressure Control and Pneumatically Remote Controlled, On-Off Deluge Valve shall open and close in response to dry line pneumatic pressure drop, reducing higher upstream pressure to preset lower downstream pressure.

System Components

1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator with Priming Restriction
2R - Pressure Reducing Pilot
4B - Priming Strainer
6B - Pneumatic Pressure Operated Relief Valve (PORV)
7B - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve

Optional

AMD - Air Maintenance Device
S - Valve Position Limit Switch / Switches



UL Listed

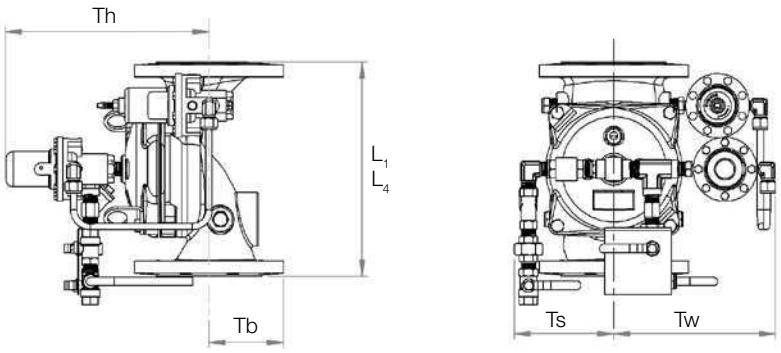
The BERMAD Model FP 400E-4DC is UL-Listed.
The installation shall include Indicating and Drain Components.

BERMAD Fire Protection

Model: FP 400E-4DC

400 Series

Technical Data



Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
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	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
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	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

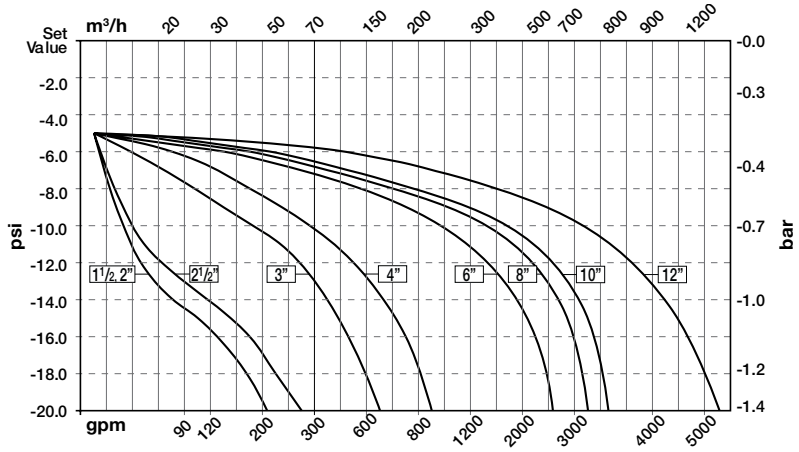
Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. inlet: 250 psi (17 bar)
- Set: 30-165 psi (4.5-11.5 bar)

Valve Outlet Pressure Fall-off Characteristics On Inlet Under Set Pressure



Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Forged Brass pressure reducing pilot with St. St. 304 internals & NBR elastomers
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

PORV setting

Valve opens on pilot line pressure drop
- Factory set: 20 psi (1.5 bar)

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Hydraulic Pressure Control, On-Off Deluge Valve

Model: FP 400E-5DC

UL LISTED

Typical Applications

- Fluctuating or over pressure
- Petrochemical facilities
- Tunnels
- Power plants & transformers
- Flammable materials storage
- Gas storage tanks
- Hydraulic remote controlled systems

Features and Benefits

- **Pressure control function –** Constant preset downstream pressure
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

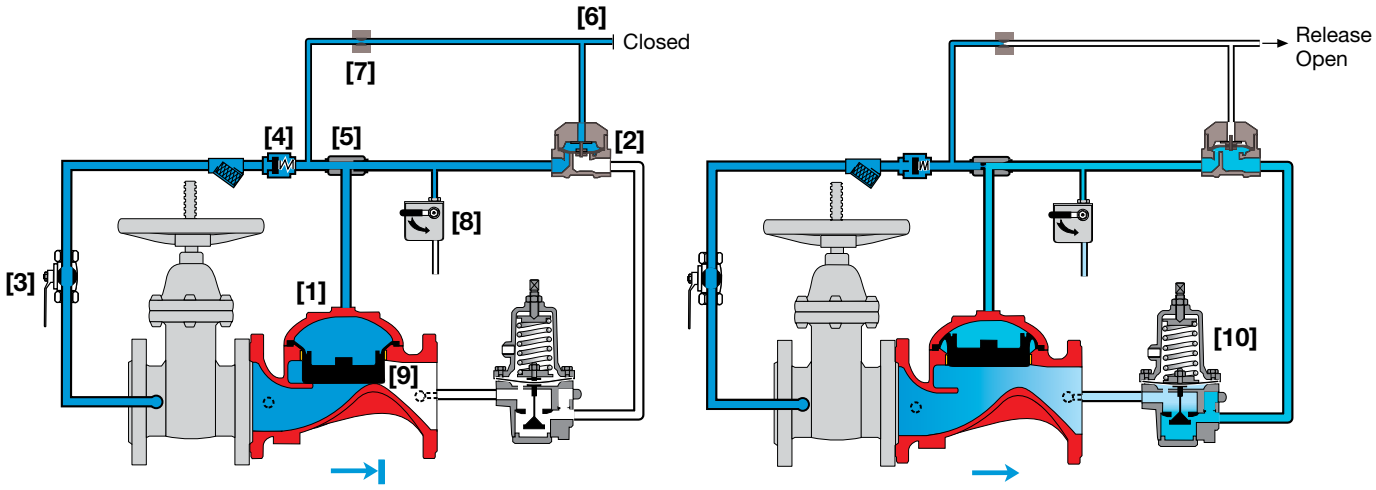
Optional Features

- **Water motor alarm**
- **Alarm pressure-switch** (code: P or P7)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

The BERMAD Model FP 400E-5DC is suitable for systems that include wet pilot lines with closed fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. Providing boosted local pressure release from its control chamber, Model FP 400E-5DC is recommended for systems with remote and/or elevated fusible plug lines. Combining a pressure control feature, it is also suitable for systems with high pressure supply source and/or relatively low flow.

In the SET position the line-pressure, supplied to both the main valve control chamber **[1]** and to a Hydraulic Relay Valve (HRV) **[2]** via the priming line **[3]**, and through a Check Valve **[4]**, an Accelerator **[5]** with priming restriction, and the wet-pilot line **[6]** Restriction **[7]**, is trapped by the Check Valve, by the closed HRV, and by a closed Manual Emergency Release **[8]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[9]**, sealing it drip-tight and keeping the system piping dry. The HRV is held closed by the line pressure in the wet pilot line. Under FIRE condition, a pilot line hydraulic pressure drop opens the HRV. Pressure is then released from the main valve's control chamber to the downstream, through the open HRV and the Pressure Reducing (PR) Pilot valve **[10]**. This allows the main valve to open, and water to flow into the system piping and to the alarm device. Should system pressure rise above PR pilot setting, the PR pilot throttles, thereby enabling pressure to accumulate in the valve control chamber. This causes the FP 400E-5DC to throttle closed, decreasing system pressure to PR pilot setting. The Manual Emergency Release **[8],** overrides the PR pilot, causing the valve to open fully.



Valve Closed (set position)

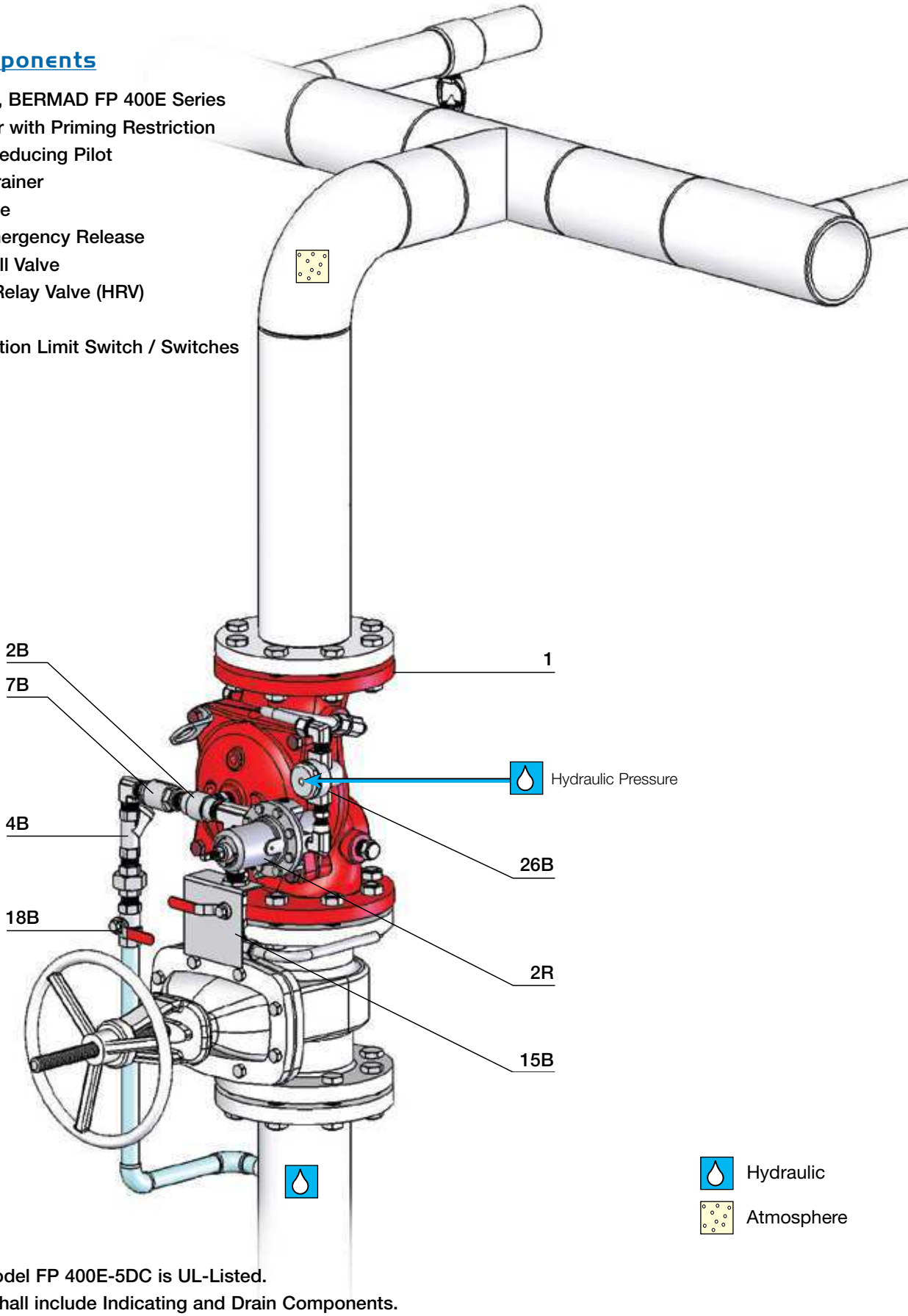
Valve Open (operating condition)

Engineer Specifications

- The On-Off deluge valve shall be a UL-Listed, hydraulically remote controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including Accelerator, HRV hydraulic actuated pilot valve, 2-Way Pressure Reducing Pilot, Y strainer and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Pressure Control and Hydraulically Remote Controlled, On-Off Deluge Valve shall open and close in response to pilot line pressure drop, reducing higher upstream pressure to preset lo wer downstream pressure.

System Components

1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator with Priming Restriction
2R - Pressure Reducing Pilot
4B - Priming Strainer
7B - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
26B - Hydraulic Relay Valve (HRV)
Optional
S - Valve Position Limit Switch / Switches



UL Listed

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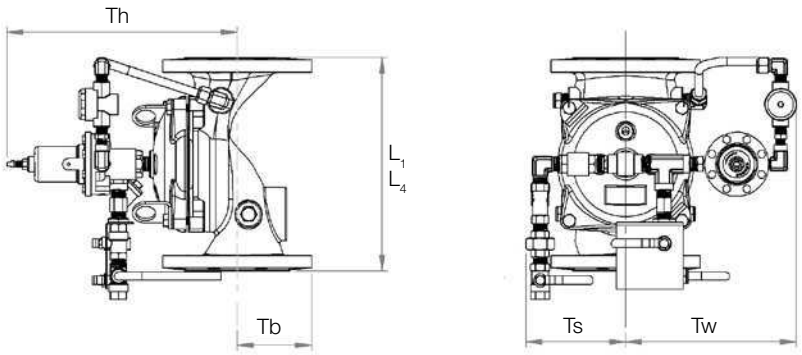
The installation shall include Indicating and Drain Components.

BERMAD Fire Protection

Model: FP 400E-5DC

400 Series

Technical Data



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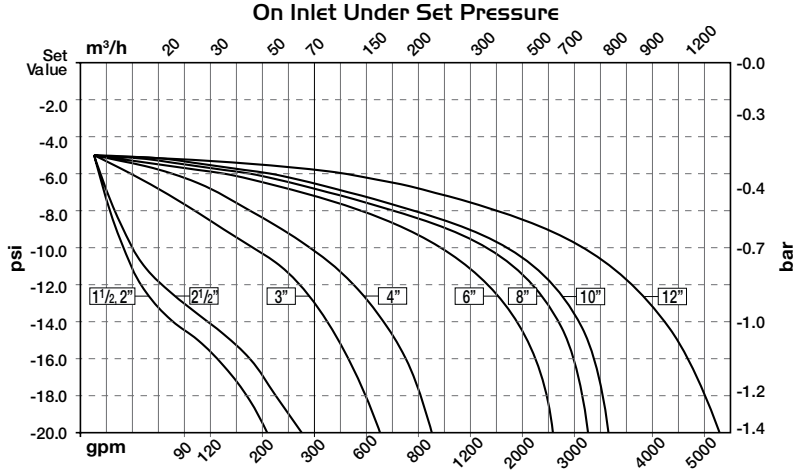

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- Stainless Steel 316 tubing & fittings

Elastomers
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Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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On-Off Deluge Valves

The BERMAD On-Off Deluge Valves are intended for use in industrial remote resetting systems. The Deluge Valve can be electrically, hydraulically, pneumatically or electro-pneumatically remotely controlled to open and to reset closed.

Electrically Controlled On-Off Deluge Valve

Model: FP 400E-3D

UL LISTED

Typical Applications

- Water/foam fire systems
- Deluge & spray systems
- Petrochemical facilities
- Flammable materials storage
- Marine enviroments
- Gas storage tanks

Features and Benefits

- **3-way solenoid valve –** Flexible configuration
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free Full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

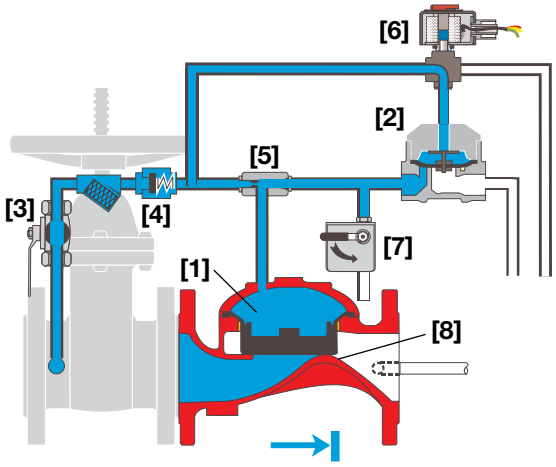
- **Alarm pressure-switch** (code: P or P7)
- **Explosion-proof** for hazardous locations (code: 7/8/9)
- **Fail-safe open** (energized to close main valve)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

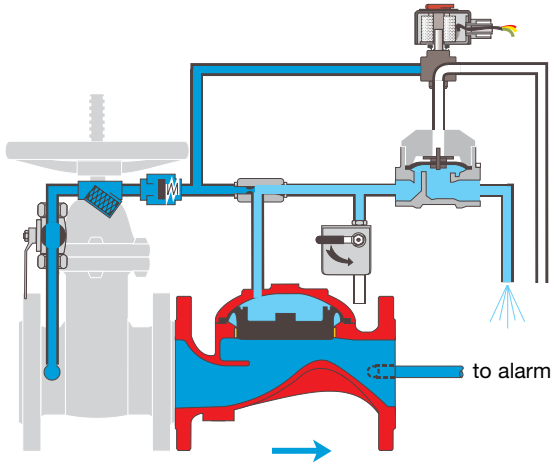
The BERMAD Model FP 400E-3D is suitable for systems that include electric fire detection and a piping system with a wide variety of open nozzles.

In the SET position, the line-pressure, which is supplied to both the main valve's control chamber **[1]** and a Hydraulic Relay Valve (HRV-2) **[2]**, through the priming line **[3]**, a Check Valve **[4]**, an Accelerator **[5]** with priming restriction and a 3-Way Solenoid **[6]**, is trapped by the Check Valve, by the closed HRV-2, and by a closed Manual Emergency Release **[7]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[8]**, sealing it drip-tight and keeping the system piping dry. The HRV-2 is held closed by the line-pressure through the solenoid.

Under FIRE or TEST conditions, an electric detection system working through a control panel, triggers the solenoid to open the HRV-2, causing water to exit through the Accelerator faster than it can be supplied. Pressure is then released from the main valve control chamber by the opened HRV-2 or the Manual Emergency Release, allowing the main valve to open and water to flow into the system piping and to the alarm device (if mounted).



Valve Closed (set position)



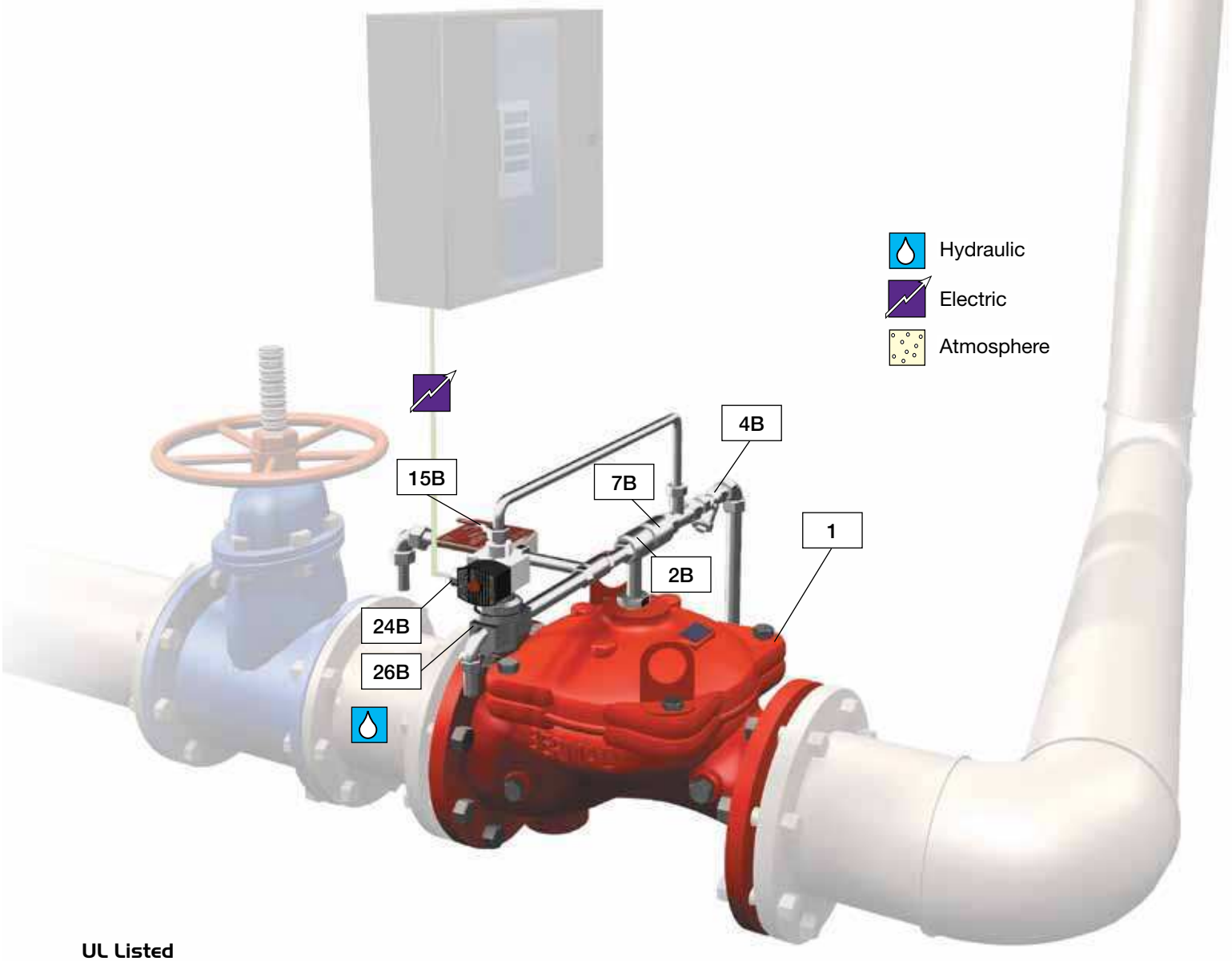
Valve Open (operating condition)

Engineer Specifications

- The On-Off deluge valve shall be a UL-Listed, electrically controlled elastomeric type globe valve with a rolling-diaphragm.
- The valve shall have an unobstructed flow path, with no stem guide or supporting ribs.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall be S.S.316 tubing and fittings and plated brass accessories, including, Y strainer, 3-Way Solenoid, Accelerator, Hydraulic Relay Valve (HRV-2) and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Electrically Controlled, On-Off Deluge Valve shall open in response to an electric signal.

System Components

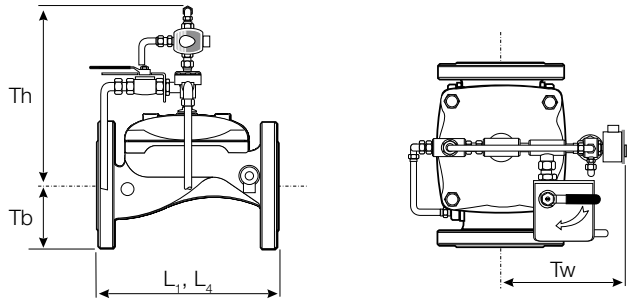
1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator with Priming Restriction
4B - Priming Strainer
7B - Check Valve
15B - Manual Emergency Release
24B - 3-Way Solenoid
26B - Hydraulic Relay Valve (HRV-2)
Optional
P - Pressure Switch
S - Valve Position Limit Switch / Switches



UL Listed

The BERMAD Model FP 400E-3D is UL-Listed.
The installation shall include Indicating and Drain Components.

Technical Data



Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	205	8 1/16	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16
	Tb	64	2 8/16	78	3 1/16	89	3 8/16	100	3 15/16	115	4 8/16	140	5 8/16	172	6 12/16	204	8 1/16	242	9 8/16
	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating*
- Max. working pressure: 250 psi (17 bar)

* Pressure rating might be limited due to solenoid valve rating

Manufacturers Standard Materials
Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Poleyester, Red (RAL 3002)

Optional Materials
Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valves
Standard
- 3-Way, direct actuated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL – Listed

Options (see also ordering guide)
- Hazardous locations:
- Class I Division 1, Gr. A, B, C, D, T4 (code 7)
- Class I Division 2, Gr. A, B, C, D, T4
- ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage options)
- Stainless Steel 316 body material (code K)

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Electrically Controlled On-Off Deluge Valve

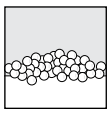
with Electric Remote Reset Latch

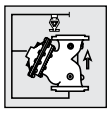
Model: FP 400E-3D-RL

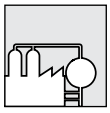
Description

The BERMAD 400E-3D-RL Deluge Valve is suitable for use with remote controlled or/and automatic water spray or foam deluge systems that include electric detection and piping systems with open nozzles.
This BERMAD Deluge Valve is equipped with two solenoid valves and Double-Acting Relay Valve (DRV) which trips the deluge valve into an open position during the Opening solenoid activation. The valve will then latch in its last position. The 400E-3D-RL will reset remotely via short pulse to activate the Closing solenoid coil.

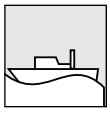
Typical Applications

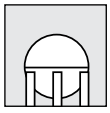

Water/foam fire systems


Deluge & spray systems


Petrochemical facilities


Flammable materials storage


Marine enviroments


Gas storage tanks

Features and Benefits

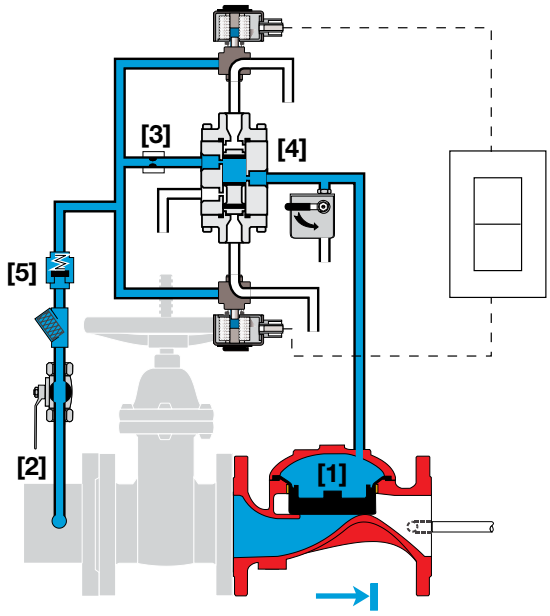
- **Low Power DC Current –** Suitable as battery backup
- **Electric Remote Reset Latch (RL) –** Safety feature
- **Latched at Last Position –** Safer and energy-saving
- **One-piece molded elastomeric moving part –** No maintenance required
- **Obstacle-Free Full Bore –** Uncompromising reliability
- **Factory Pre-Assembled Trim –** Out-of-box quality
- **In-Line Serviceable –** Minimal downtime

Optional Features

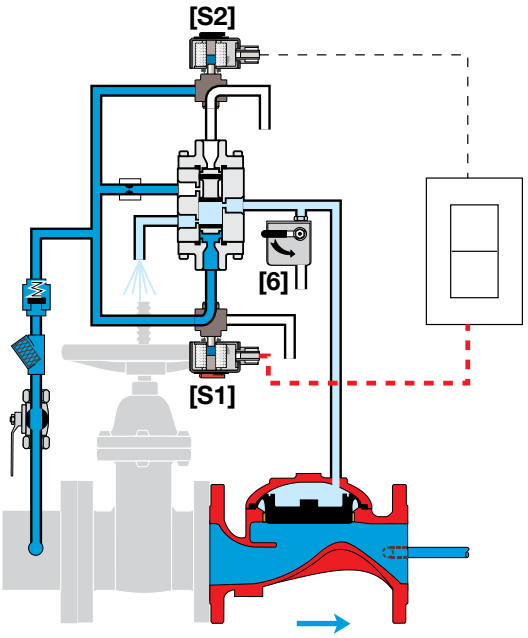
- **Solenoids for hazardous locations**
- **Limit Switch for hazardous locations**
- **Alarm Pressure Switch for hazardous locations**
- **Foam Concentrate Configuration** (FC prefix)
- **Valve Position Single/Double Limit Switches**

Operation

In the SET position, water pressure is supplied to the BERMAD Deluge Valve control chamber **[1]** via the priming line **[2]** , Restriction Orifice **[3]** and through a DRV **[4]** Double-Acting Relay Valve. The Deluge Valve is trapped by the Check Valve **[5]**. The trapped water pressure holds the main valve's diaphragm and plug against the valve seat, creating a tight shutoff and keeping the system piping dry. The DRV remains in its last position supplying water pressure to the control chamber with both solenoid coils de-energized. This keeps the BERMAD Deluge Valve closed.
In fire or test conditions, the electric control system transmits an electric pulse that triggers the Opening Solenoid Coil **[S1]**, which in turn activates the DRV to switch to the Release position. Pressure is then released from the Deluge Valve control chamber, allowing water to flow into the system piping and to the alarm device. The valve can also be operated via the Local Manual Emergency Release **[6]**.
After operation, the DRV ensures that the BERMAD Deluge Valve will latch in its Open Position. The valve will reset remotely via short pulse which activates the Closing Solenoid Coil **[S2]** and causes the DRV to shift to the normal supply position.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

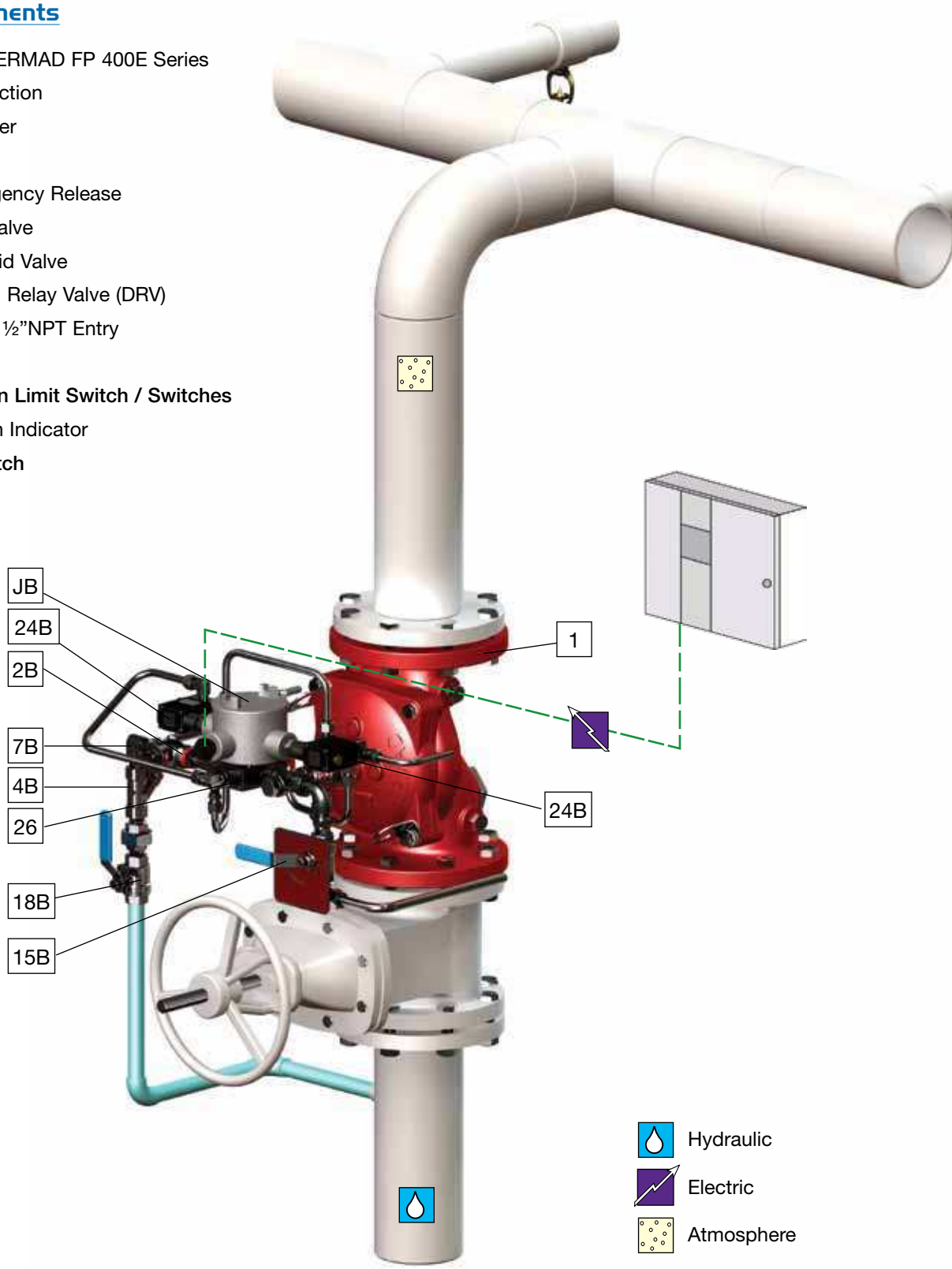
- The Deluge Valve shall be Electrically Controlled On-Off with Remote Reset Latch feature specifically UL-Listed as such.
- The Deluge Valve shall be an elastomeric globe type of unobstructed flow path, with no stem guide or supporting ribs. The valve actuation shall be accomplished by a single piece rolling-diaphragm, with a rugged radial seal disk. The diaphragm assembly shall be the only moving part. The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The valve operation will be On-Off Control type, using separate electric pulse to operate and close the Deluge Valve to enable Latched Opening With Electrically Remote Reset.
- The control trim shall be pre-assembled and shall include a Dual 3-Way Solenoid valve, DRV (Double-Acting Relay Valve), Y strainer and Manual Emergency Release.
- The control trim shall be pre-assembled with the main Deluge Valve and hydraulically tested at the manufacturer's ISO 9000 and 9001 certified factory prior to shipment.
- The Deluge Valve will be locked (latched) in its last position and Reset Remotely in response to an electric signal activating the closing solenoid coil.

System Components

1 - Main Valve, BERMAD FP 400E Series
2B - Priming Restriction
4B - Priming Strainer
7B - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
24B - 3-Way Solenoid Valve
26 - Double-Acting Relay Valve (DRV)
JB - Junction Box, ½"NPT Entry

Optional

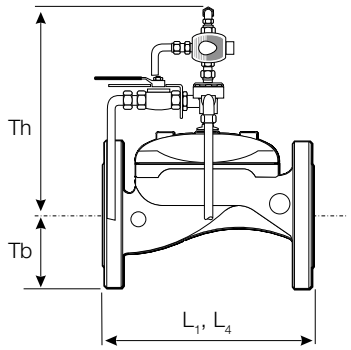
S - Valve Position Limit Switch / Switches
I - Visual Position Indicator
P - Pressure Switch

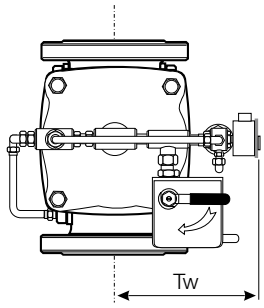


Note

The BERMAD Model FP 400E-3D-RL is UL-Listed when installed with specific components and accessories.

Technical Data





Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	N/A	N/A	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16
	Tb	64	2 8/16	78	3 1/16	89	3 8/16	100	3 15/16	115	4 8/16	140	5 8/16	172	6 12/16	204	8 1/16	242	9 8/16
	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Ni. Al. Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Approvals
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"
- ABS and Lloyds Register approved, sizes 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"

Pressure Rating*
- Max. for Class #150/PN16: 250 psi (17 bar)

Electrical Requirements
- Operation to open/close by 3 wires (dual coil), 0.45 amp rating
- Minimum pulse period: 100 ms to open and 100 ms to close the valve.

* Pressure rating might be limited due to solenoid valve rating

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316 CF8M
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Valves

Standard
- 2 units 3-way, direct acting, continues duty
- Enclosure: General purpose watertight, NEMA 4 / IP65, Class F
- Power: 24VDC, 8 watts
- UL – Listed

Options (see also ordering guide)
- Hazardous locations:
- Class I Division 1, Gr. A, B, C, D, T4 (code 7)
- Class I Division 2, Gr. A, B, C, D, T4
- ATEX, EEx d IIC T6 (code 9)
- Voltage: see ordering guide (voltage options)
- Stainless Steel 316 body material (code K)

Optional Instrumentations
- Proximity Limit switches (Explosion proof)
- Alarm Pressure switch
- Pressure Indi
- Valve Visu or Stem

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Electro-Pneumatically Controlled On-Off Deluge Valve

Model: FP 400E-6D

LISTED

Typical Applications

- Offshore platforms
- Marine environments
- Sea water/corrosive water supplies
- Foam fire systems
- Increased reliability of dry solenoid response
- Dual redundant detection systems

Features and Benefits

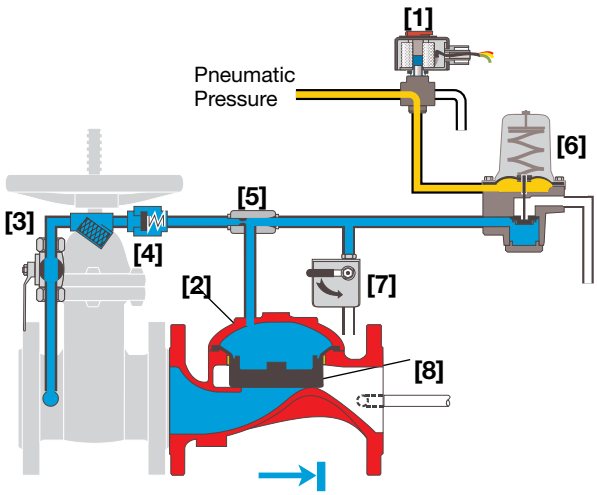
- **Dry solenoid –** Suitable for corrosive water or foam
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

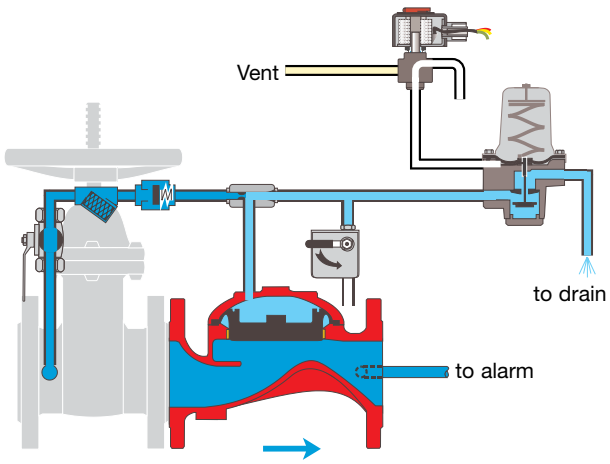
- **Alarm pressure-switch** (code: P or P7)
- **Explosion-proof for hazardous locations** (code: 7/8/9)
- **Fail-safe open** (Energized to close main valve)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

The BERMAD Model FP 400E–6D is suitable for systems that include electric fire detection and piping systems with a wide variety of open nozzles. Being pneumatically controlled, the Model FP 400E–6D is recommended for those cases, such as seawater installations, where it is advantageous to keep the solenoid **[1]** dry.
In the SET position the line-pressure, which is supplied to the main valve's control chamber **[2]** through the priming line **[3]**, a Check Valve **[4]**, and an Accelerator **[5]** with priming restriction, is trapped by the Check Valve, by a closed Pneumatic Pressure Operated Relief Valve (PORV) **[6]** and a closed Manual Emergency Release **[7]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[8]**, sealing it drip-tight and keeping the system piping dry. The PORV is held closed by the dry pilot line pneumatic pressure through the Solenoid.
Under FIRE or TEST conditions, a dry pilot line pneumatic pressure drop, or an electric signal that triggers the Solenoid, opens the PORV causing water to exit through the Accelerator faster than it can be supplied. Pressure is then released from the main valve's control chamber through the opened PORV or the Manual Emergency Release, allowing the main valve to fully open, and water to flow into the system piping and to the alarm device (if mounted).



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

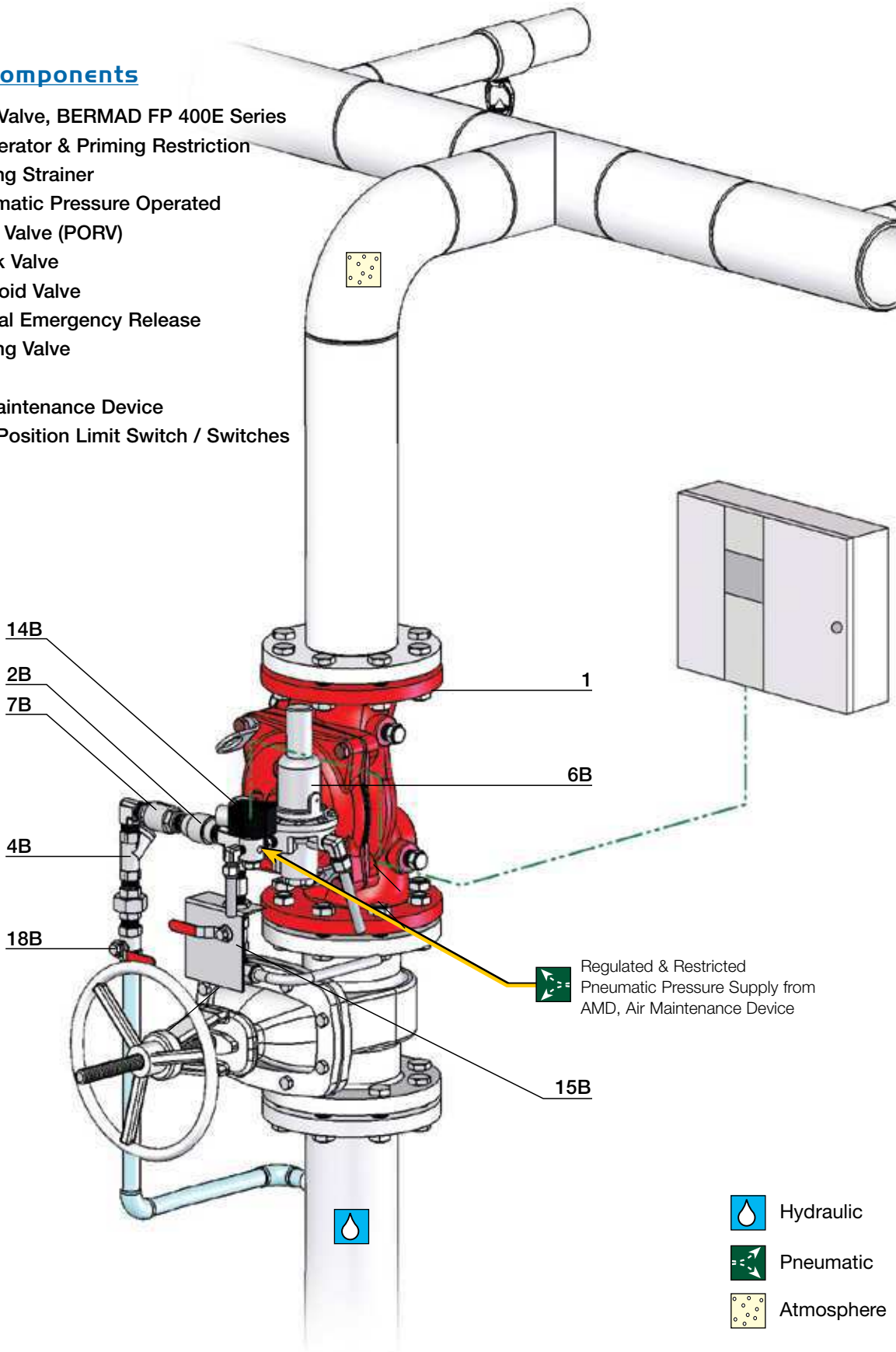
- The On-Off deluge valve shall be a UL-Listed, electro-pneumatically controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall be S.S.316 tubing and fittings and plated brass accessories, including Y strainer, Accelerator, 3-way Solenoid, PORV, pneumatic pilot valve and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Electro-Pneumatically Controlled, On-Off Deluge Valve shall open in response to an electric signal or to a dry pilot line pneumatic pressure drop.

System Components

1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator & Priming Restriction
4B - Priming Strainer
6B - Pneumatic Pressure Operated Relief Valve (PORV)
7B - Check Valve
14B - Solenoid Valve
15B - Manual Emergency Release
18B - Priming Valve

Optional

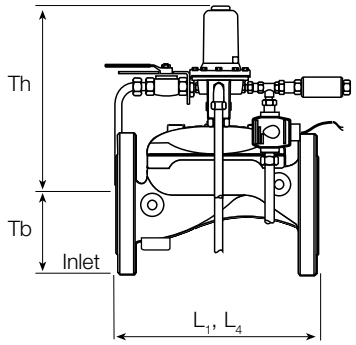
AMD - Air Maintenance Device
S - Valve Position Limit Switch / Switches

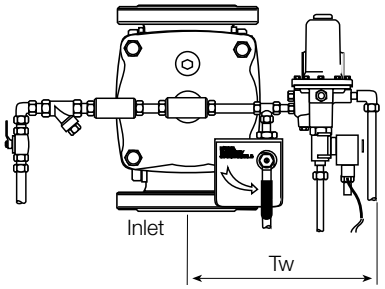


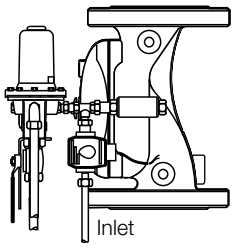
UL Listed

The BERMAD Model FP 400E-6D is UL-Listed.
The installation shall include Indicating and Drain Components.

Technical Data







Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	205	8 1/16	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16
	Tb	64	2 8/16	78	3 1/16	89	3 8/16	100	3 15/16	115	4 8/16	140	5 8/16	172	6 12/16	204	8 1/16	242	9 8/16
	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

PORV Setting
Valve opens on pilot line pressure drop factory set: 20 psi (1.5 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel) and Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valve

Standard
- 3-Way, direct actuated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
- Class I Division 1, Gr. A, B, C, D, T4 (code 7)
- Class I Division 2, Gr. A, B, C, D, T4
- ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage options)
- Stainless steel 316 body material (code K)

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Pneumatically Controlled, On-Off Deluge Valve

Model: FP 400E-4D

UL LISTED

Typical Applications

- Offshore installations
- Marine environments
- Self contained dry systems
- Freezing environments
- Sea water/corrosive water supplies
- Foam applications
- Single interlock pre-action

Features and Benefits

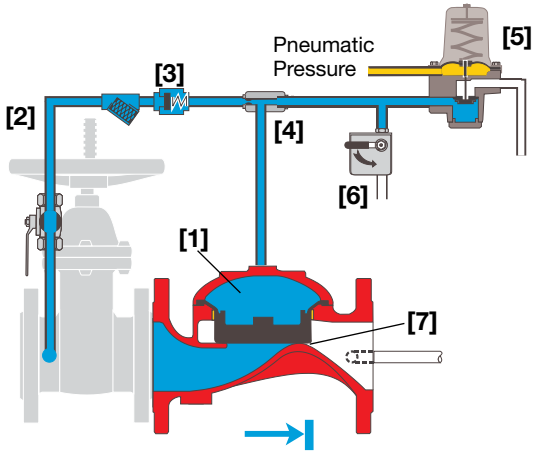
- **Pneumatic PORV –** Best suited for corrosive and freezing conditions
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

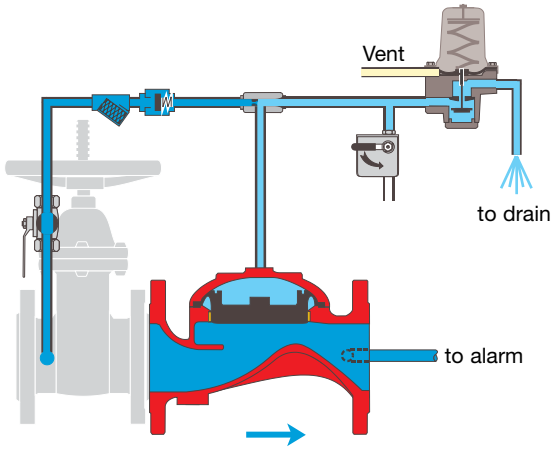
- **Alarm pressure-switch** (option code: P or P7)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

The BERMAD Model FP 400E–4D is suitable for systems that include dry pilot lines with pneumatic closed fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. Being pneumatically controlled, the Model FP 400E–4D is recommended in freezing environments and/or with corrosive water supply.
In the SET position the line-pressure, which is supplied to the main valve's control chamber **[1]** through the priming line **[2]**, a Check Valve **[3]** and an Accelerator **[4]** with priming restriction, is trapped by the Check Valve, by a Pneumatic Pressure Operated Relief Valve (PORV) **[5],** held closed, and by a closed Manual Emergency Release **[6]**. The trapped pressuer holds the main valve's diaphragm and plug against the valve seat **[7]**, sealing it drip-tight and keeping the system piping dry. The PORV is held closed by the maintained pneumatic pressure in the detection dry pilot line.
Under FIRE or TEST conditions, a pilot line pneumatic pressure drop, opens the PORV causing water to exit through the Accelerator faster than it can be supplied. Pressure is then released from the main valve control chamber through the opened PORV, or the Manual Emergency Release, allowing the main valve to fully open and water to flow into the system piping and to the alarm device (if mounted).



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

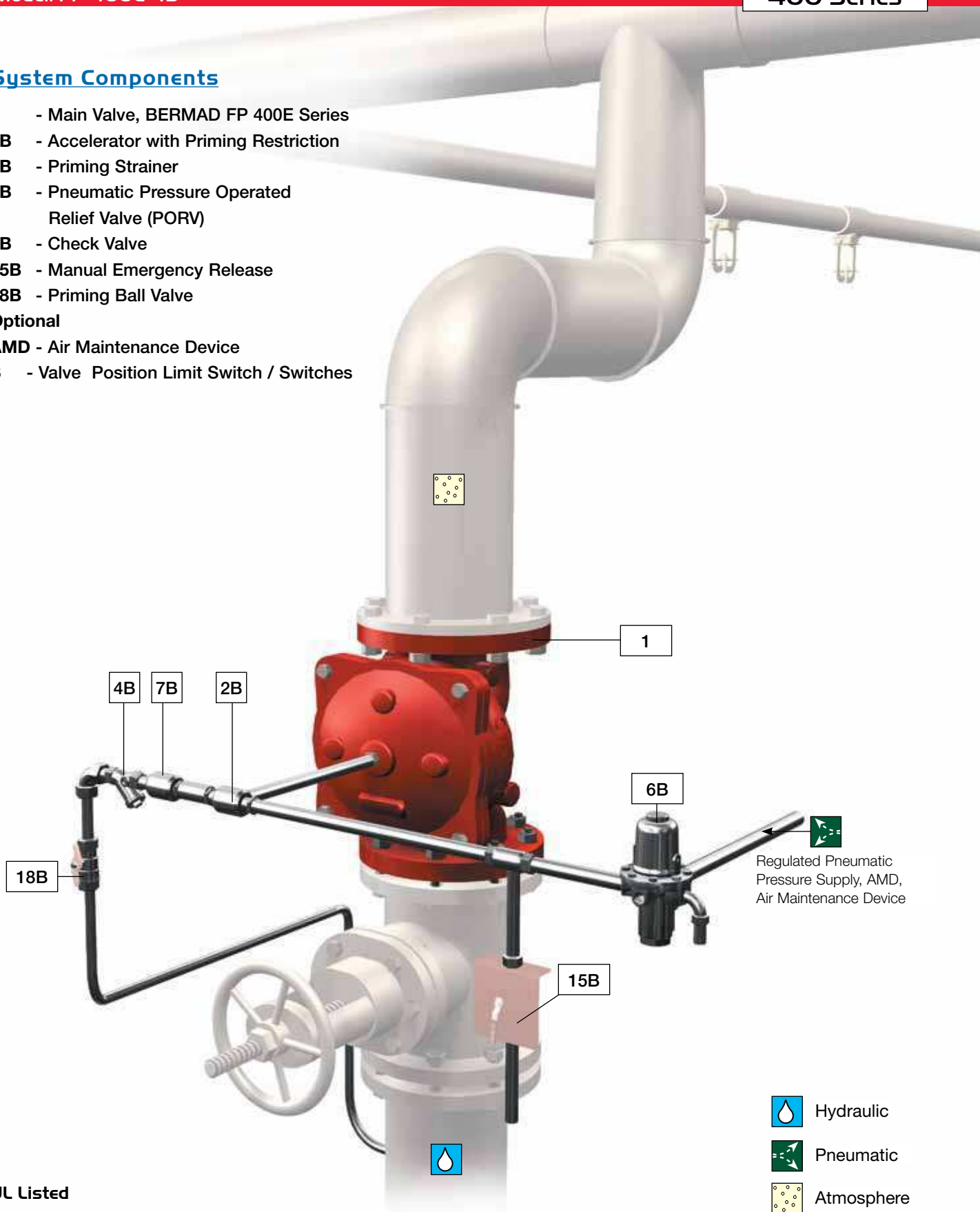
- The On-Off deluge valve shall be a UL-Listed, pneumatically controlled, elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall be S.S.316 tubing and fittings and plated brass accessories, including Y strainer, Accelerator, Pressure-Operated Relief Valve, and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The pneumatically controlled, On-Off deluge valve shall open in response to pilot line pneumatic pressure drop.

System Components

1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator with Priming Restriction
4B - Priming Strainer
6B - Pneumatic Pressure Operated Relief Valve (PORV)
7B - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve

Optional

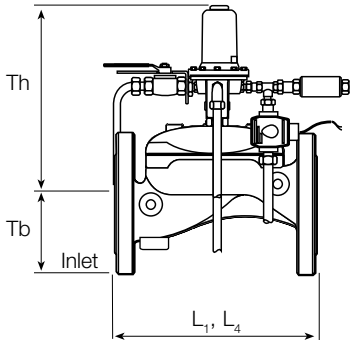
AMD - Air Maintenance Device
S - Valve Position Limit Switch / Switches

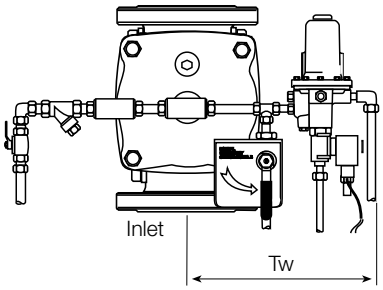


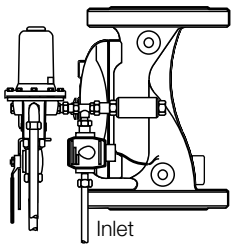
UL Listed

The BERMAD Model FP 400E-4D is UL-Listed.
The installation shall include Indicating and Drain Components.

Technical Data







Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	205	8 1/16	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16
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	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

PORV Setting
Valve opens on pilot line pressure drop factory set: 20 psi (1.5 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel) and Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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Hydraulically Controlled, On-Off Deluge Valve

Model: FP 400E-5D

UL LISTED

Typical Applications

- Petrochemical facilities
- Tunnels
- Power plants & transformers
- Flammable material storage
- Gas storage tanks
- Hydraulic remote controlled systems

Features and Benefits

- **Local release HRV –** Quick opening for long hydraulic remote control piping lines
- **Remote reset –** Shut-off on remote command
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Obstacle-free full bore –** Uncompromising reliability
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

Optional Features

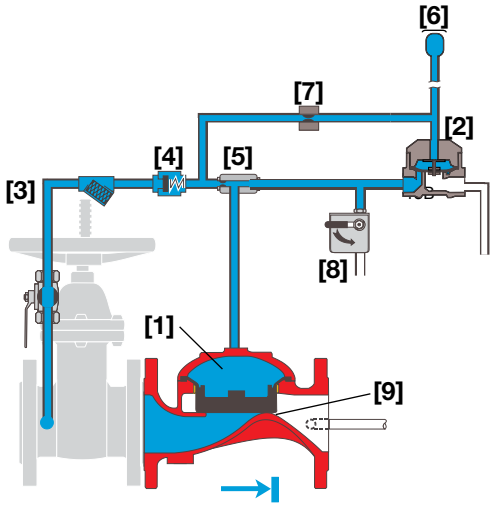
- **Alarm pressure-switch** (option code: P or P7)
- **Seawater service** (add FS as prefix to model)
- **Valve Position Single/Double Limit Switches**

Operation

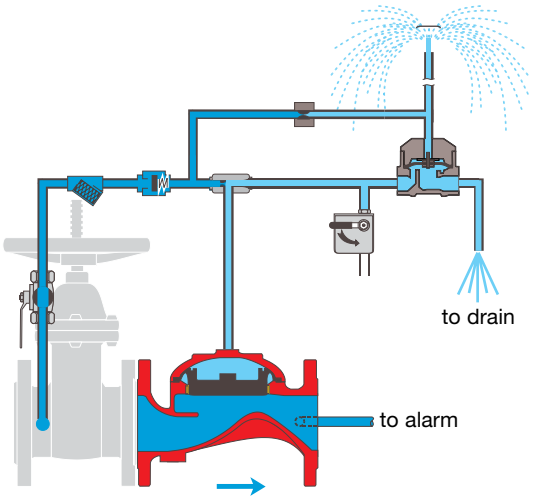
The BERMAD Model FP 400E–5D is suitable for systems that include wet pilot lines with closed fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. The typical wet pilot line, is installed in the covered area and connected to the valve trim. Providing boosted local pressure release from its control chamber, the Model FP 400E–5D is recommended for systems with remote and/or elevated pilot line fusible plugs.

In the SET position line-pressure, which is supplied to both the main valve's control chamber **[1]** and a Hydraulic Relay Valve (HRV-2) **[2]** by the priming line **[3]**, through a Check Valve **[4]**, an Accelerator **[5]** with priming restriction and the wet pilot line **[6]** restriction **[7]**, is trapped by the Check Valve, by the closed HRV-2, by the closed wet pilot line and by a closed Manual Emergency Release **[8]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[9]**, sealing it drip-tight and keeping the system piping dry. The HRV-2 is held closed by the pressure in the wet pilot line.

Under FIRE or TEST conditions, a pilot line hydraulic pressure drop opens the HRV-2 causing water to exit through the Accelerator faster than it can be supplied. Pressure is then released from the main valve's control chamber through the opened HRV-2, or the Manual Emergency Release, allowing the main valve to fully open and water to flow into the system piping and to the alarm device (if mounted).



Valve Closed (set position)



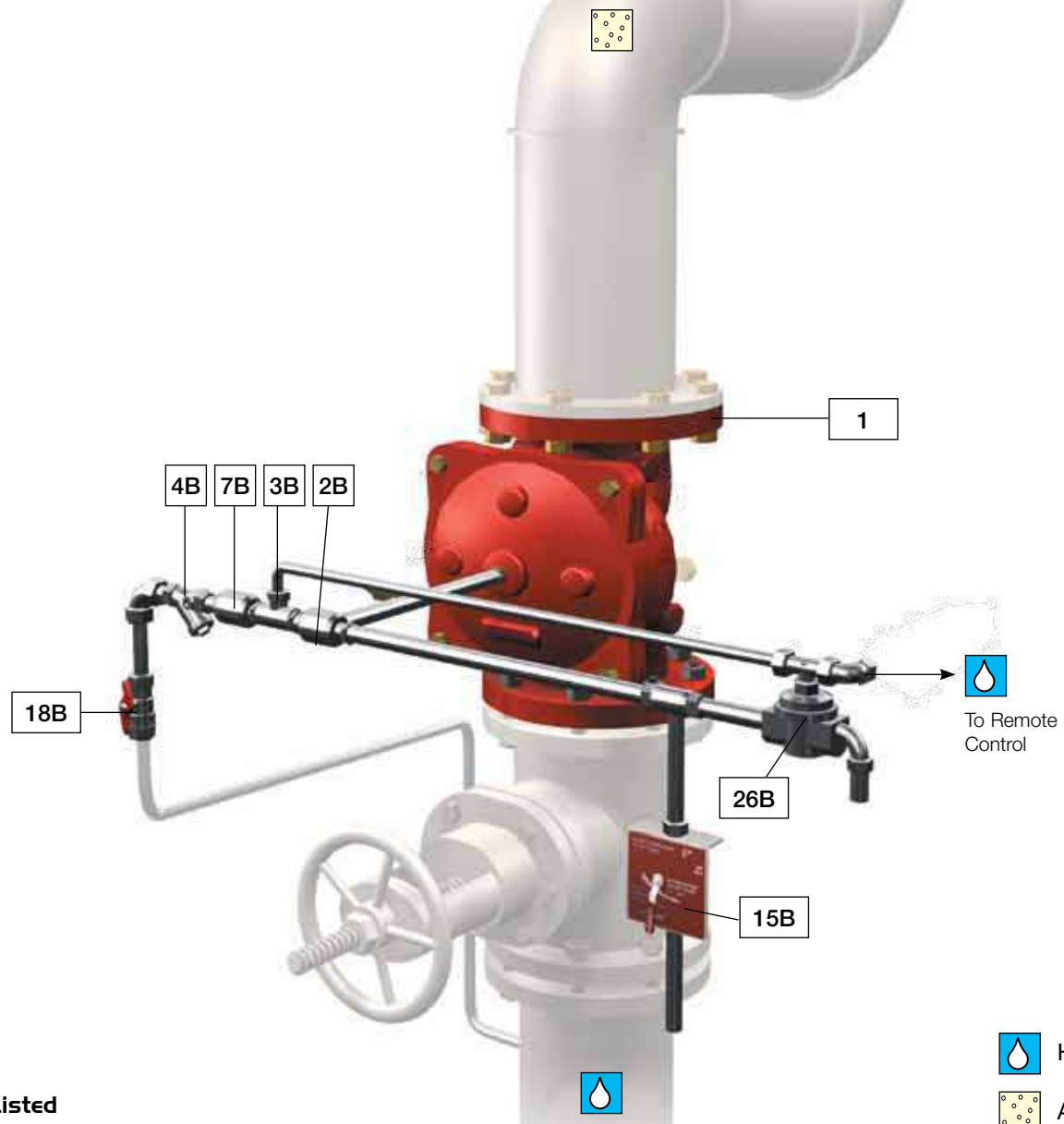
Valve Open (operating condition)

Engineer Specifications

- The On-Off deluge valve shall be a UL-Listed, hydraulically controlled, elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall be S.S.316 tubing and fittings and plated brass accessories, including Y strainer, Accelerator, Hydraulic Relay Valve (HRV-2), and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Hydraulically Controlled, On-Off Deluge Valve shall fully open in response to a wet pilot line hydraulic pressure drop.

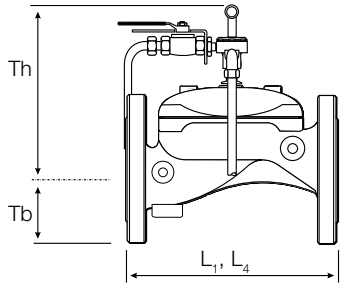
System Components

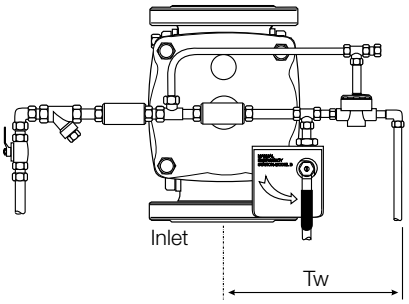
1 - Main Valve, BERMAD FP 400E Series
2B - Accelerator with Priming Restriction
3B - Orifice Assembly
4B - Priming Strainer
7B - Check Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
26B - Hydraulic Relay Valve (HRV-2)
Optional
S - Valve Position Limit Switch / Switches

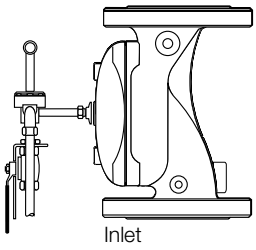


UL Listed
The BERMAD Model FP 400E-5D is UL-Listed.
The installation shall include Indicating and Drain Components.

Technical Data







Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
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	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel) and Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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BERMAD Fire Protection

Manually Operated & Hydrant Valves

The BERMAD Manually Operated hydraulic Valves and Hydrant Valves provide easy actuation, on-call reliability, and smooth opening and closing.

Locally Operated Monitor Valve

Model: FP 405-11

Typical Applications

- Fire hydrant and monitor valves
- Hydraulic remote controlled systems
- zone isolating valve
- Manual operated flood valve
- Hydraulically operated hydrants
- Gas & oil storage tanks

Features and Benefits

- **Quick & easy operation –** Requires only ¼ turn of the pilot valve handle
- **One-piece molded elastomeric moving part –** No maintenance required
- **In-line, quick cover removal –** Minimal downtime
- **Simple design –** Cost effective
- **Unobstructed flow path –** No supporting ribs

Optional Features

- **Seawater service** (add FS as prefix to model)
- **Corrosive environment materials** (see last page)
- **Foam resistant materials and coatings**
- **Remote hydraulic control**

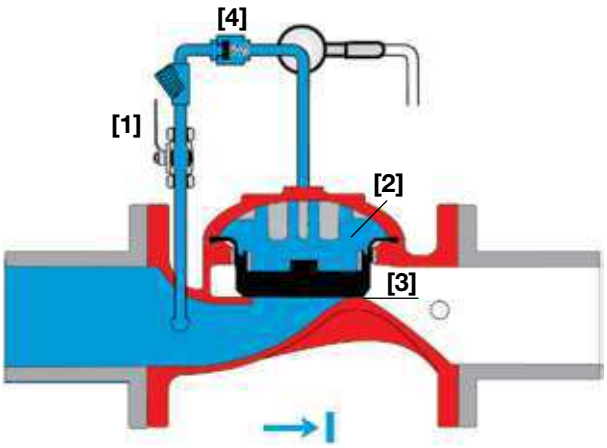
Operation

The BERMAD Model FP 405-11 is a simply designed, manually operated, on/off valve. It is particularly suited for monitors and industrial high capacity hydrants.

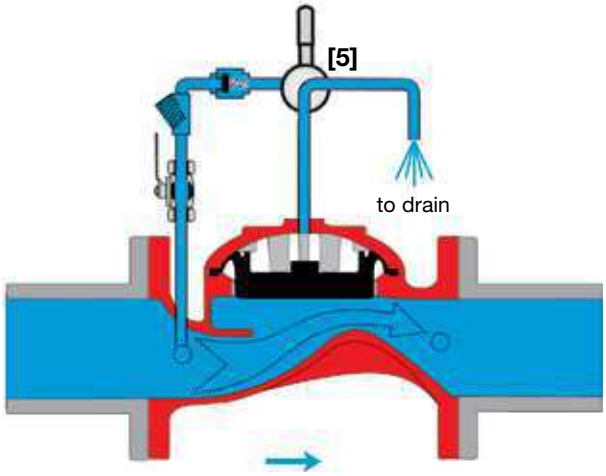
The Model FP 405-11 is held closed by line-pressure **[1]** applied to the control chamber **[2]** of the valve. The closed valve prevents the water (or water foam) from passing through the valve, keeping the downstream piping dry.

In the set position, the line pressure is applied to the control chamber of the valve. The pressure holds the main valve's diaphragm and plug against the valve seat **[3]**. Seal is drip tight. The Check Valve **[4]** traps high pressure peaks ensuring that the valve remains locked in the closed position to maintain drip tight sealing.

To open, a ¼ turn of the Manual Release Pilot **[5]** handle releases pressure from the control chamber through the opened Manual Release Valve. The diaphragm plug is then pushed open by the upstrim force at its bottom, allowing water to flow into the system.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

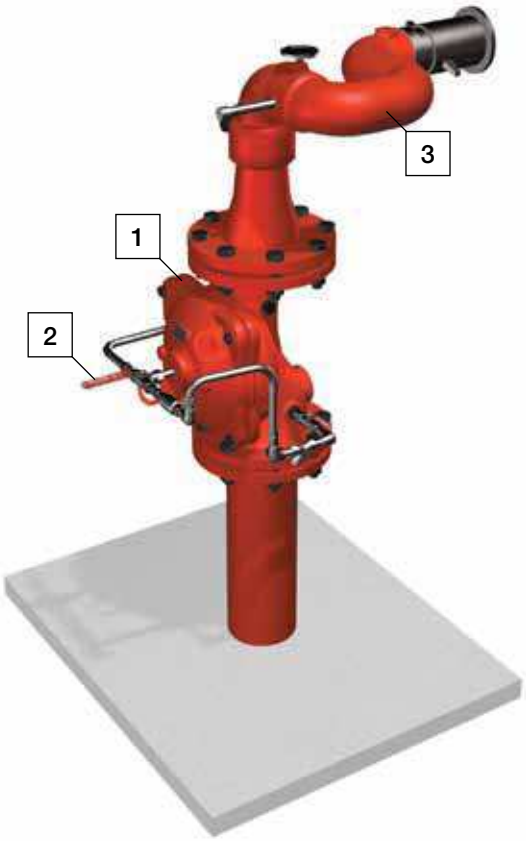
- The valve shall be a hydraulic controlled, elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim shall consist of non-corrosive tubing and fittings, Manual Release Pilot, Check Valve and Y strainer.
- The valve trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Local Manually Operated Monitor Valve Model FP 405-II

This line pressure powered on/off valve replaces mechanical valves that often stick after long periods
in the closed position. This valve is built to react smoothly and easily following any passage of time, from either the closed or open position.

System Components

1 - Main Valve, Bermad Model FP-405-11
2 - Manual Release Pilot
3 - Fire Monitor



Remote Controlled Monitor System (with Foam Concentrate Injection)

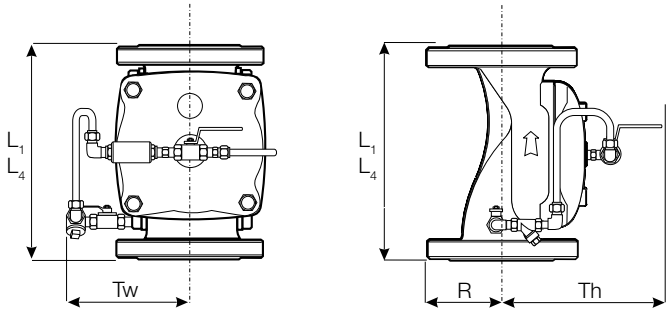
Monitors located in hazardous areas should be operated from a remote panel in order to ensure their
safe activation under fire conditions.
Applying the Bermad Model FP 400E-5X to control Oscillating, Elevated and Pre-cooling spraying Monitors ensures quick response to any situation by an easy ¼ turn of the valve remoted pilot handle.

System Components

1 - Main Valve, BERMAD Model 400E-5X
2 - Remote Manual Release Pilot
3 - Remote Fire Monitor

Note: Graphics are for illustration only

Technical Data



Size		1½", 2"		2½"		3"		4"		6"		8"		10"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	N/A	N/A	500	19 11/16	N/A	N/A
	Tw	318	12 1/2	329	12 15/16	340	13 3/8	352	13 13/16	393	15 1/2	423	16 5/8	443	17 7/16
	Th	232	9 1/8	244	9 5/8	265	10 3/8	285	11 1/4	360	14 3/16	415	16 5/16	413	16 1/4
	R	78	3 1/16	89	3 1/2	100	3 15/16	112	4 7/16	140	5 1/2	170	6 11/16	203	8

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"

Pressure Rating
- Max. working pressure: 235 psi (16 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & elastomer

Control Trim System
- Brass control components/accessories
- Forged Brass fittings & Copper tubing

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Power Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216-WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel) and Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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Hydraulic Hydrant Valve

Model: FP 405-02

Typical Applications

Industrial fire fighting hydrant replacing mechanical valves

Petrochemical plant

Gas & oil storage tanks

Operation

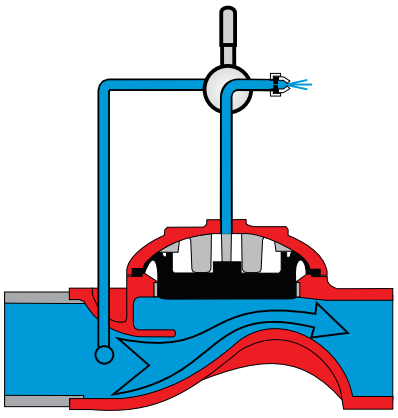
The BERMAD Model FP 405-02 is a simply designed, manually operated, on/off valve. It is particularly suited for industrial hydrants.
The valve is held closed when line pressure is applied to the control chamber. Sealing is drip tight keeping the downstream piping dry.
To open, pressure is manually released from the control chamber by a ¼ turn of the Manual Release Pilot handle.

Features and Benefits

- **Easy manual opening requires only ¼ turn of pilot handle**
- **One-piece molded elastomeric moving part –** No maintenance required
- **Quick cover removal –** Minimal down time
- **Never "sticks" closed –** Reliability
- **Simple design**

Optional Features

- **Seawater service** (Add FS as prefix to model)
- **Corrosive environment materials**
- **Foam resistant coating**
- **Storz quick coupling connector**

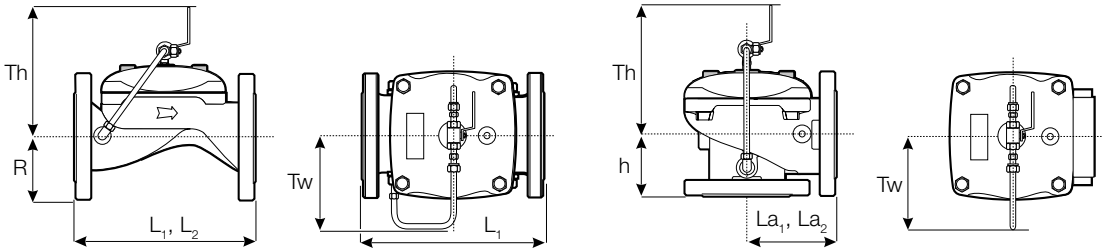


Valve Open

Engineer Specifications

- The valve shall be a line pressure driven, elastomeric type globe valve with a **rolling-diaphragm**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- The valve cover shall be removable for in-line service, enabling all necessary inspection and servicing.
- The manual release pilot valve shall be supplied assembled with the main valve. It shall require only ¼ turn for full opening or closing. It shall be equipped with a device to regulate the opening speed.
- The valve trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 & 9001 certified factory.

Technical Data



Size		2”		2½”		3”		4”		6”	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A
	La_1 (1)	121	3 3/4	N/A	N/A	153	9 13/16	160	6 5/16	N/A	N/A
	La_2 (2)	284	11 3/16	N/A	N/A	300	6	313	12 5/16	341	13 7/16
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8
	h	83	3 1/4	N/A	N/A	101	4	112	4 7/16	N/A	N/A
	RF	78	3 1/8	89	3 4/8	100	3 7/8	115	4 4/8	140	5 4/8

Notes:
1. L_1 & La_1 are for flanged ANSI #125 / #150 and ISO PN16.
2. L_2 & La_2 are for threaded female, NPT or ISO-7-Rp.
3. Data is for maximum envelope dimensions, component positioning may vary.
4. Provide adequate space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze), B16.1 (Cast Iron), ISO PN16
- Threaded: NPT or ISO-7-Rp for 2 & 3”

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 1½, 2, 2½, 3, 4 & 6”
- Angle: 2, 3 & 4”

Pressure Rating
- Max. working pressure: 235 psi (16 bar)

Manufacturers Standard Materials

Main valve body and cover
- Cast Iron ASTM A126 class B(1)

Valve wetted parts
- Stainless Steel and Natural Rubber

Control System
- Brass with Copper tubing

Elastomers
- Nylon fabric reinforced polyisoprene

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body and accessories
- Carbon Steel ASTM A216-WCB(1)
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control System
- Stainless Steel 316

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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Pressure Regulating Hydrant Valve

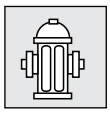
Model: FP 420-HY

Description

This valve serves as a pressure reducing valve connection between a high pressure water supply and fire hoses. It meets NFPA-14 regulations, limiting outlet pressure to 100 psi (6.9 bar), regardless of varying pressure and/or flow.

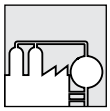
Typical Applications

High pressure reduction to fire hose

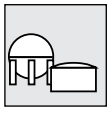


Industrial fire fighting hydrant

Aviation & airports fire fighting hydrant



Petrochemical plant fire fighting hydrant



Oil & gas storage and fire fighting hydrant

Features and Benefits

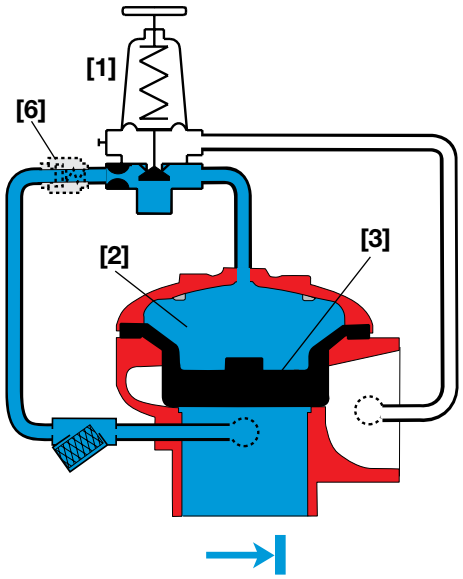
- **Factory preset for maximum outlet pressure –** Protects fire fighter from excess pressure
- **Hydraulically balanced –** In open and closed positions
- **Opening-speed control –** With intermediate lock position
- **In-line, quick cover removal –** Minimal downtime
- **One-piece molded elastomeric moving part –** No maintenance required
- **Easily adjustable outlet pressure**

Optional Features

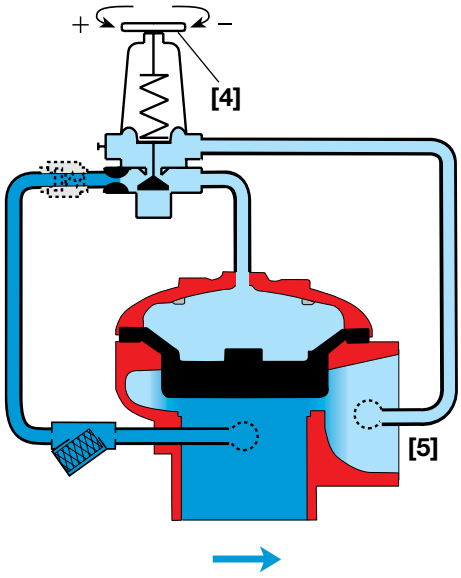
- **Manual override for full opening** (code: Z)
- **Mechanical closure**
- **Storz quick-coupling connector**
- **Check-lock** (code: II)
- **Valve Position Single/Double Limit Switches**

Operation

The BERMAD Model FP 420-HY serves as a high pressure reducing hydrant valve suited for hose connections and for fire hoses.
In the closed position, the Model FP 420-HY is held closed by line-pressure supplied through the Pressure Reducing Pilot valve **[1]** to the main valve's control chamber **[2]**. The pressure, multiplied by the surface area of the diaphragm **[3]**, creates a differential closing force resulting in the valve remaining sealed, keeping the downstream piping dry.
As the hand wheel **[4]** of the Pressure Reducing Pilot valve is turned counter-clockwise, pressure is released from the valve's control chamber to the downstream allowing the valve to open. The outlet water pressure **[5]** rises in proportion to the amount that the hand wheel is turned. When the hand wheel is fully opened, the outlet water pressure rises to the factory preset maximum pressure.
In case of emergency, connect a flexible fire hose to the valve, and gradually turn the hand wheel counter-clockwise to open.
The Check-Valve option **[6]** (ordering code 11) traps high pressure peaks ensuring that the valve remains locked in the closed position to maintain drip tight sealing.



Valve Closed



Valve Open (regulating pressure)

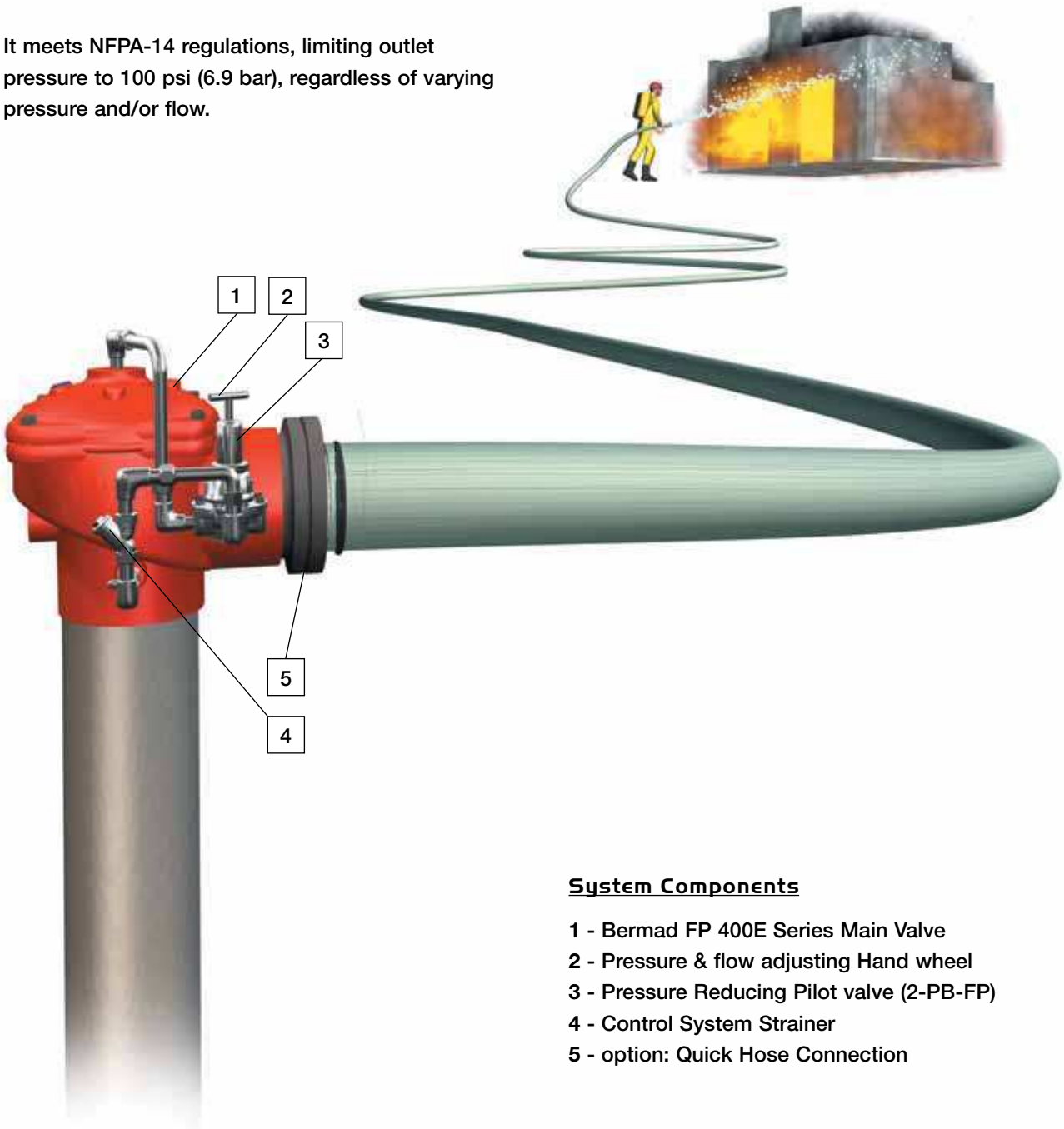
Engineer Specifications

- The valve shall be a self actuated pressure reducing, elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path** with no **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The diaphragm assembly shall be peripherally guided and shall form a sealed chamber in the upper portion of the valve.
- The valve cover shall be removable for in-line service enabling all necessary inspection and ser vicing.
- The control pilot system, including direct acting, flow and pressure adjusting hand wheel, shall be integrated into the main valve, hydraulically tested, and supplied as an assembly.
- The control trim shall be pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Typical Installation

The Model FP 420-HY meets the standards of advanced fire protection systems and protects those systems against excess pressure by limiting outlet pressure to a preset maximum.

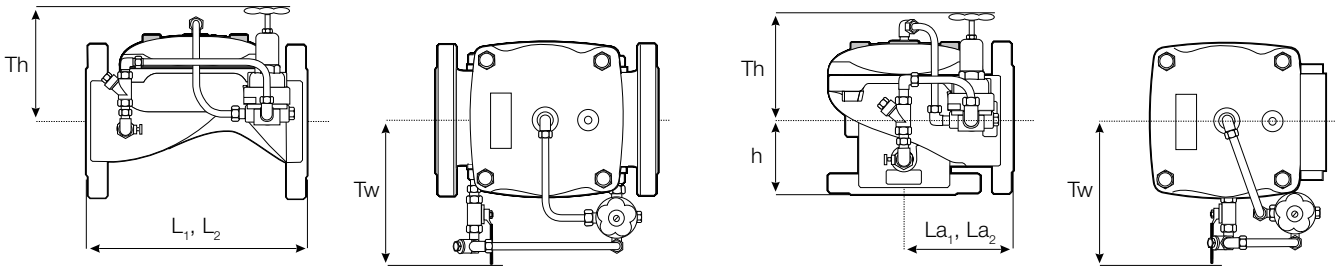
It meets NFPA-14 regulations, limiting outlet pressure to 100 psi (6.9 bar), regardless of varying pressure and/or flow.



System Components

1 - Bermad FP 400E Series Main Valve
2 - Pressure & flow adjusting Hand wheel
3 - Pressure Reducing Pilot valve (2-PB-FP)
4 - Control System Strainer
5 - option: Quick Hose Connection

Technical Data



Size		1½", 2"		2½"		3"		4"		6"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A
	La_1 (1)	121	3 3/4	N/A	N/A	153	6	160	6 5/16	N/A	N/A
	La_2 (2)	284	11 3/16	N/A	N/A	300	11 3/16	313	12 5/16	341	13 7/16
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8
	h	83	3 1/4	N/A	N/A	101	4	112	4 7/16	N/A	N/A

Notes:
1. L_1 & La_1 are for flanged ANSI #125 / #150 and ISO PN16.
2. L_2 & La_2 are for threaded female, NPT or ISO-7-Rp.
3. Data is for maximum envelope dimensions, component positioning may vary.
4. Provide adequate space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 - 50°C (33 - 122°F)

Available Sizes
- Globe: 1½, 2, 2½, 3, 4 & 6"
- Angle: 2, 3 & 4"

Pressure Raing
- Max inlet: 250 psi (17 bar)
- Set: Standard limit, 100 psi (7 bar)

Approvals
- ABS
- Lloyd's Registered

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Forged Brass fittings & Copper tubing

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216-WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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BERMAD Fire Protection

Fire Protection

Monitor Valves

The BERMAD Remote Controlled Monitor Valves are activated to open and to close by electric, hydraulic, pneumatic or electro-pneumatic signal.
They provide secured actuation and smooth opening and closing.

BERMAD

Solenoid Activated, Remote Controlled Monitor Valve

Model: FP 400E-3X

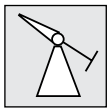
Size: 1½" - 3"

Size: 4" - 12"

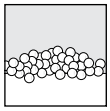
Description

The Bermad Remote Controlled On-Off valves replace motor driven valves or actuated quarter turn valves. They are especially suitable for oscillating or remote controlled Monitors, and for installation in modern foam systems where a shut-off function is required. The hydraulic actuation by a compact solenoid is resource saving, while providing maximum safety.

Typical Applications



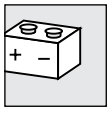
Remote monitor



Foam systems

Zone isolating, on-off remote control

Offshore platforms / marine vessels



Emergency low DC power activation

Features and Benefits

- **3-Way control system –** Avoids continuous releasing
- **Simple design –** Cost effective
- **Smooth opening and closing characteristics –** Prevents water surge
- **One-piece molded elastomeric moving part –** No maintenance required
- **Quick cover removal –** Minimal downtime

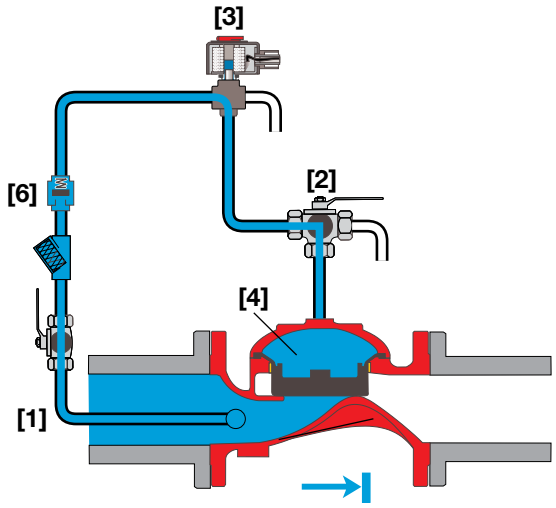
Optional Features

- **Seawater service** (add FS as prefix to model)
- **Foam concentrate service** (add FC as prefix to model)
- **Explosion-proof for hazardous locations** (code: 7/8/9)
- **Electric indication** (Limit Switch or Pressure Switch)
- **Valve Position Single/Double Limit Switches**

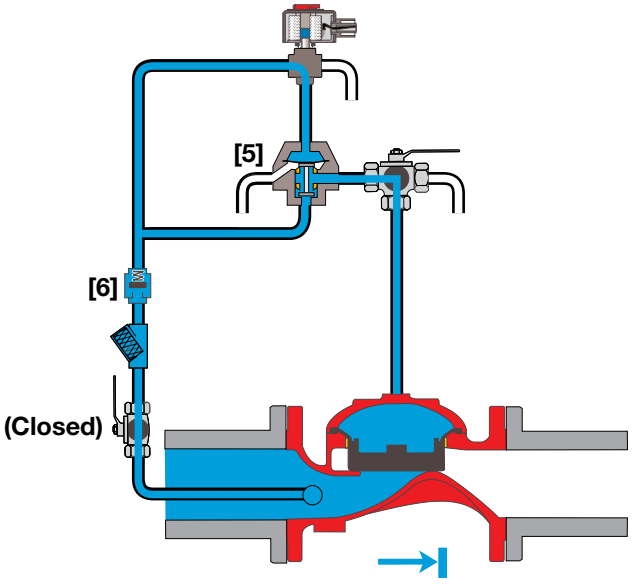
Operation

The Model FP 400E-3X is an on/off solenoid controlled valve designed to open and close drip-tight in response to an electric signal. It is a line pressure driven, diaphragm actuated globe valve. The valve uses line-pressure **[1]** to develop maximum hydraulic power and does not require external power. Through the override cock valve **[2],** the 3-way solenoid **[3]** either applies upstream pressure to the valves control chamber **[4]** to close the main valve, or vents the control chamber allowing the main valve to open. For 4" valves and larger, an accelerator **[5]** quickens valve reaction. The Model FP 400E-3X can be supplied in either the standard normally closed (energize to open) or the optional fail-safe open (energize to close) configuration. The solenoid can be supplied in various voltages and specifications. The Check Valve [6] traps high pressure peaks, ensuring that the valve remains locked in the closed position to maintain drip-tight sealing.

1½"-3" Configuration (Closed)



4"-12" Configuration (Closed)



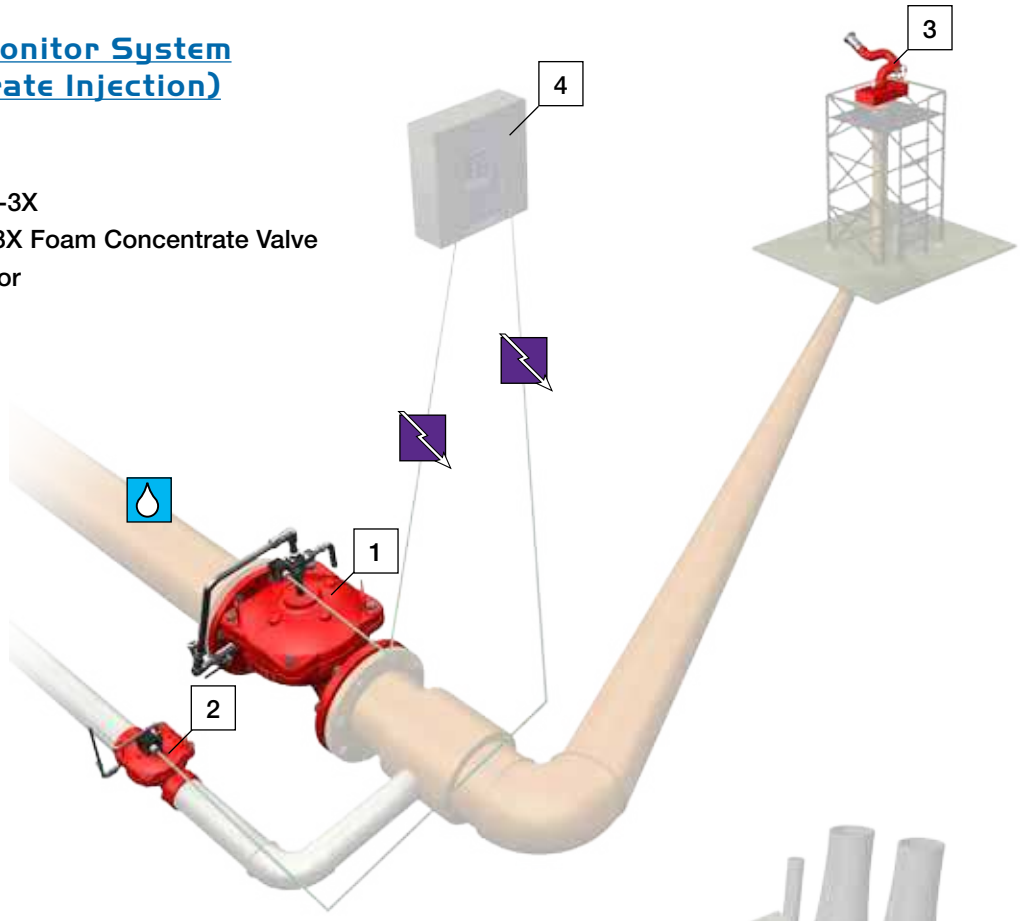
Engineer Specifications

- The valve shall be solenoid operated elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim shall consist of non-corrosive tubing and fittings, and plated brass accessories, including 3-Way Solenoid Valve, Y strainer, 3-Way Manual Override Valve and check valve. Valves 4" and larger shall be supplied with a 3-Way accelerator.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Solenoid Controlled Valve shall open and close in response to an electric signal.

Remote Controlled Monitor System (with Foam Concentrate Injection)

System Components

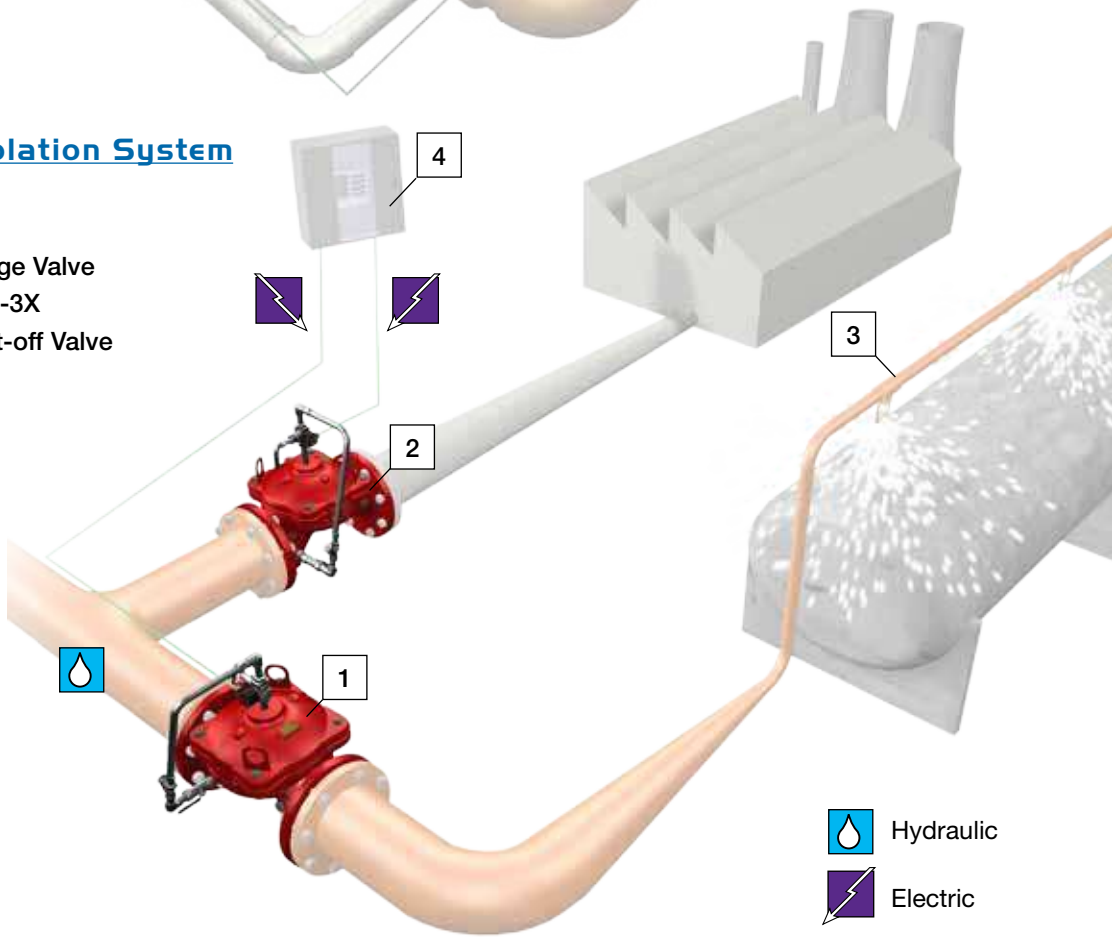
1 - BERMAD Model FP 400E-3X
2 - Bermad Model FC 400E-3X Foam Concentrate Valve
3 - Remote Controlled Monitor
4 - Control Panel



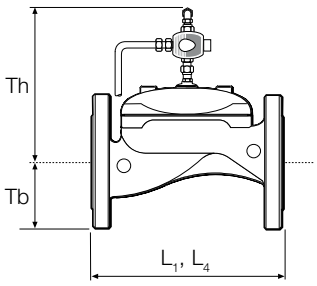
Emergency Zone Isolation System

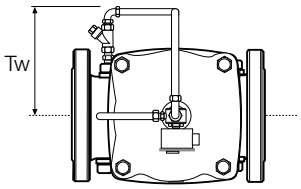
System Components

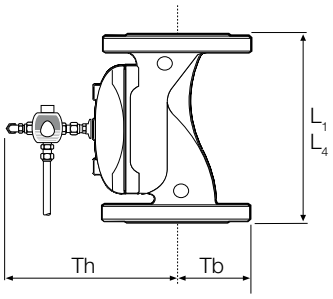
1 - BERMAD FP 400E Deluge Valve
2 - Bermad Model FP 400E-3X
Remote Controlled Shut-off Valve
3 - Deluge Spray System
4 - Control Panel



Technical Data







Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	205	8 1/16	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16
	Tb	64	2 8/16	78	3 1/16	89	3 8/16	100	3 15/16	115	4 8/16	140	5 8/16	172	6 12/16	204	8 1/16	242	9 8/16
	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"

Pressure Rating*
- Max. working pressure: 250 psi (17 bar)

* Pressure rating might be limited due to solenoid valve rating

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valve

Standard
- 3-Way, direct actuated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - Class I Division 2, Gr. A, B, C, D, T4
  - ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage option table)
- Stainless steel 316 body material (code K)

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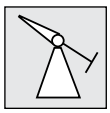
Electro-Pneumatically Operated, Remote Controlled Monitor Valve

Model: FP 400E-6X

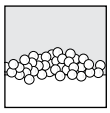
Description

The Bermad Remote Controlled On-Off valves replace motor driven valves or actuated quarter turn valves. They are especially suitable for oscillating or remote controlled Monitors, and for installation in modern foam systems where a shut-off function is required. The Electro-Pneumatically actuation by a compact solenoid is resource saving, while providing maximum safety also in seawater and foam concentrate applications.

Typical Applications

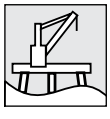


Remote monitor



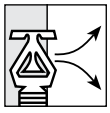
Foam systems

Zone isolating, on-off remote control



Offshore platforms / marine vessels

Sea water/corrosive water supplies



Increased reliability of dry solenoid

Features and Benefits

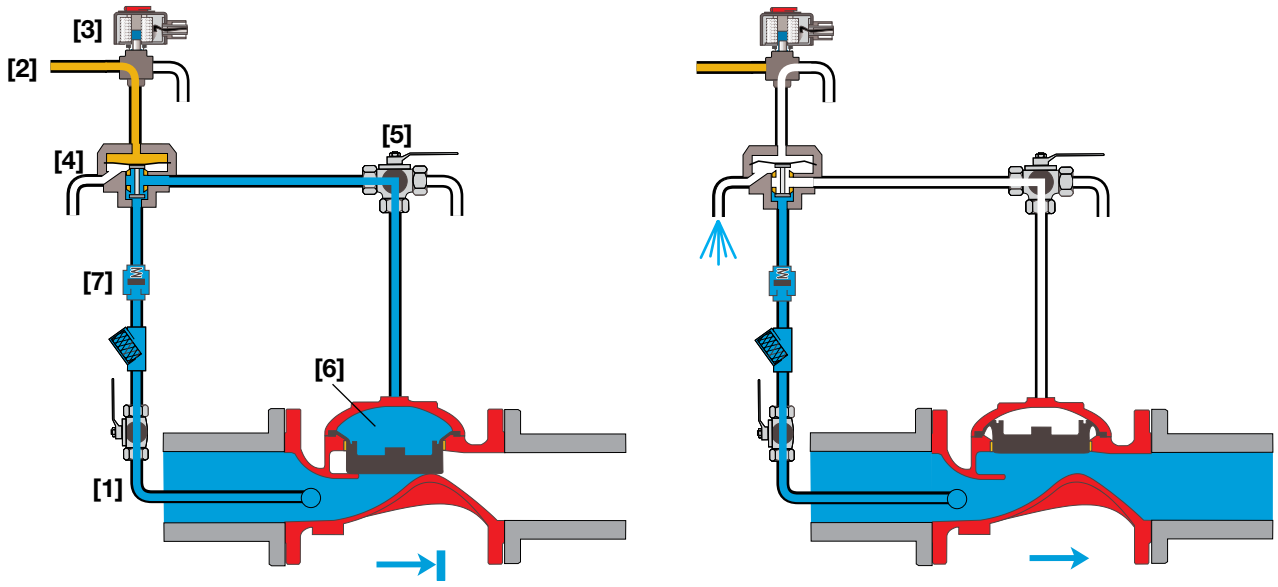
- **3-Way control system –** Avoids continuous releasing
- **Simple design –** Cost effective
- **Smooth opening and closing characteristics –** Prevents water surge
- **One-piece molded elastomeric moving part –** No maintenance required
- **Quick cover removal –** Minimal downtime
- **Remote reset –** Shut-off on remote command

Optional Features

- **Seawater service** (add FS as prefix to model)
- **Foam concentrate service** (add FC as prefix to model)
- **Explosion-proof for hazardous locations** (code: 7/8/9)
- **Dry solenoid pilot valve** (for corrosive media)
- **Electric indication** (Limit Switch or Pressure Switch)
- **Valve Position Single/Double Limit Switches**

Operation

The Model FP 400E-6X is an on/off solenoid controlled valve designed to open and close drip-tight in response to an electric signal, using external pneumatic pressure (see data for minimum air pressure supply). It is a line pressure driven, diaphragm actuated globe valve, which harnesses line pressure **[1]** to develop maximum hydraulic power. Dry pilot line pneumatic pressure **[2]** is applied, through a 3-Way Solenoid **[3]**, to a 3-way Relay Valve (HRV-3) **[4]**, opening it. Through the override cock valve **[5]**, the HRV-3 applies upstream pressure to the valve's control chamber **[6]** closing the main valve.
The Model FP 400E-6X can be supplied in either the standard normally closed (energize to open) or the optional fail safe open (energize to close) configuration. The solenoid can be supplied in various voltages and specifications.
The Check Valve **[7]** traps high pressure peaks, ensuring that the valve remains locked in the closed position to maintain drip-tight sealing.



Valve Closed (set position)

Valve Open (operating condition)

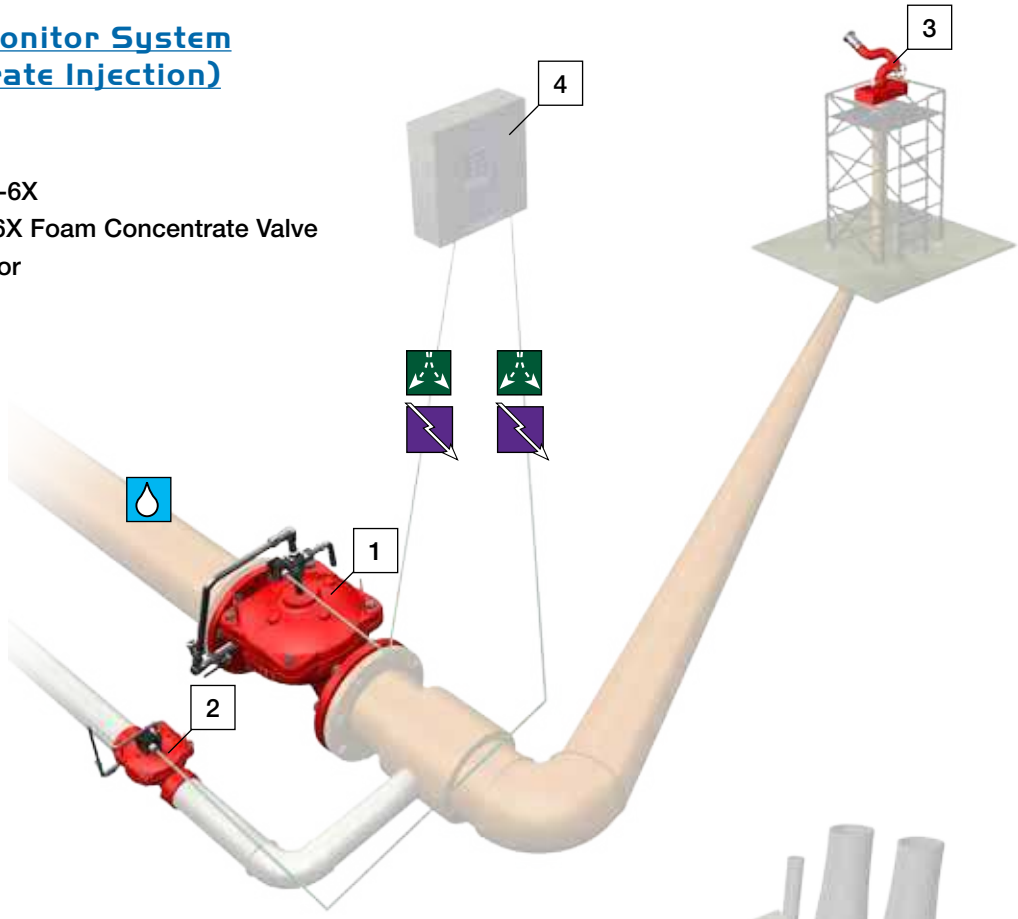
Engineer Specifications

- The valve shall be electro-pneumatically operated elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim shall consist of non-corrosive tubing and fittings, and plated brass accessories, including 3-Way Solenoid Valve, 3-Way Relay Valve HRV-3, Y strainer, 3-Way Manual Override Valve and check valve.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Electro-Pneumatically Controlled Valve shall open and close in response to an electric signal or to a dry pilot line pneumatic pressure drop.

Remote Controlled Monitor System (with Foam Concentrate Injection)

System Components

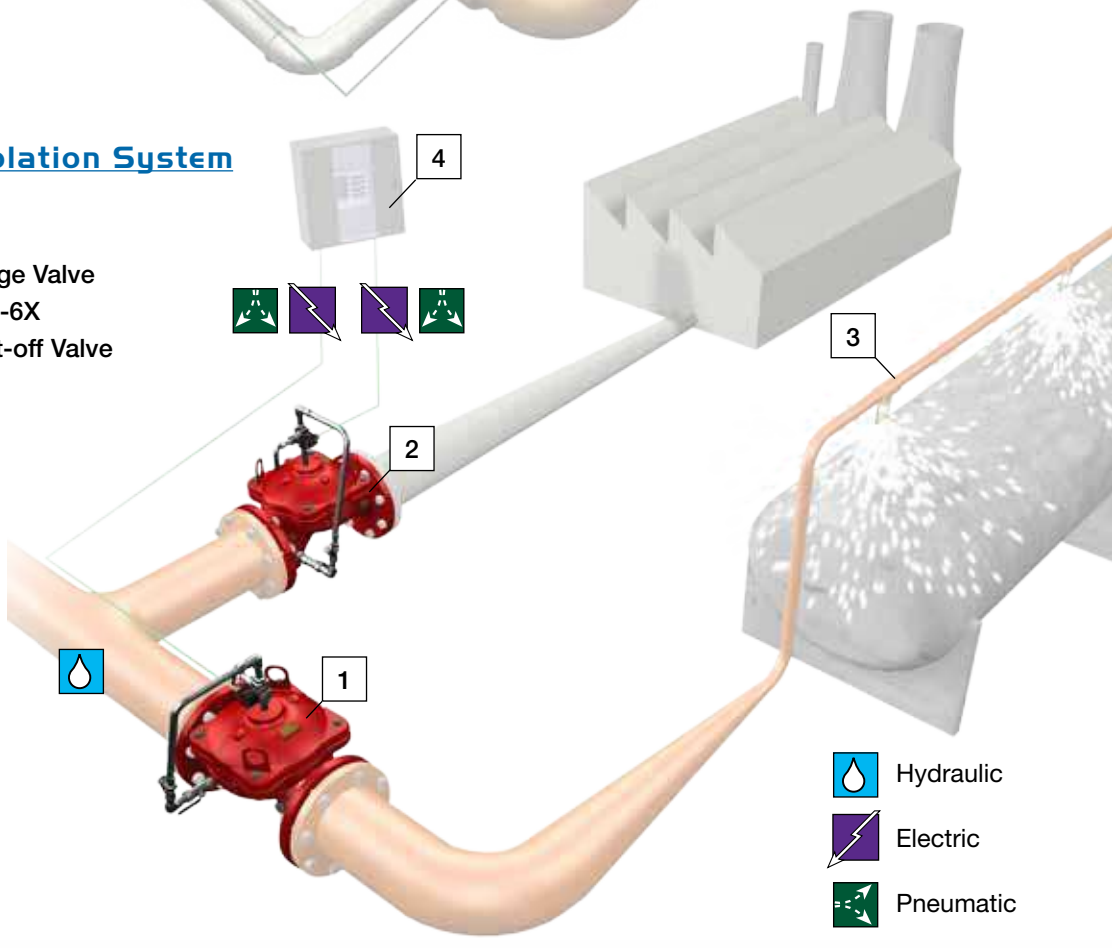
1 - BERMAD Model FP 400E-6X
2 - Bermad Model FC 400E-6X Foam Concentrate Valve
3 - Remote Controlled Monitor
4 - Control Panel



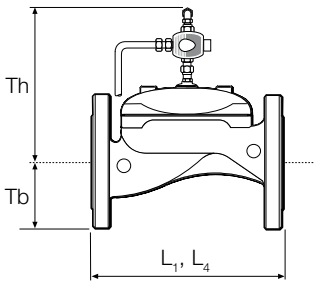
Emergency Zone Isolation System

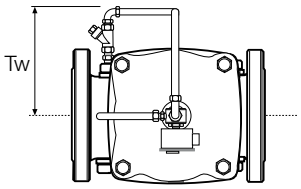
System Components

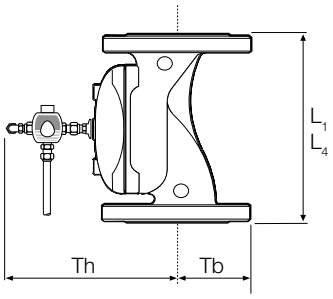
1 - BERMAD FP 400E Deluge Valve
2 - Bermad Model FP 400E-6X
Remote Controlled Shut-off Valve
3 - Deluge Spray System
4 - Control Panel



Technical Data







Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	205	8 1/16	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16
	Tb	64	2 8/16	78	3 1/16	89	3 8/16	100	3 15/16	115	4 8/16	140	5 8/16	172	6 12/16	204	8 1/16	242	9 8/16
	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

Air Pressure supply
- Valve opens on pneumatic pressure drop
- Minimum Pneumatic pressure – 5 bar
- Pneumatic Pilot line must be continually pressurized to keep the main valve closed.
- Optional: Fail Safe Close (pressure to open)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valve

Standard
- 3-Way, direct actuated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - Class I Division 2, Gr. A, B, C, D, T4
  - ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage option table)
- Stainless steel 316 body material (code K)

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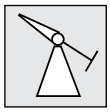
Pneumatically Operated, Remote Controlled Monitor Valve

Model: FP 400E-4X

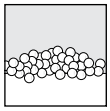
Description

The Bermad Remote Controlled On-Off valves replace motor driven valves or actuated quarter turn valves. They are especially suitable for oscillating or remote controlled Monitors, and for installation in modern foam systems where a shut-off function is required. The Pneumatically actuation provides maximum safety also in seawater and foam concentrate applications.

Typical Applications

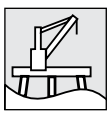


Remote monitor



Foam systems

Zone isolating, on-off remote control



Offshore platforms / marine vessels

Sea water/corrosive water supplies

Features and Benefits

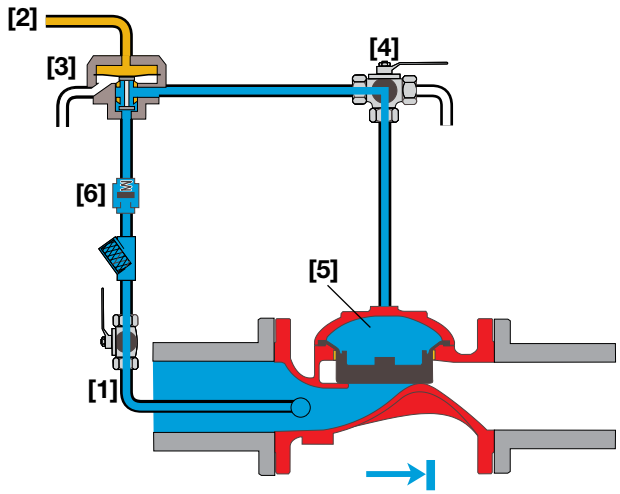
- **3-Way control system –** Avoids continuous releasing
- **Smooth opening and closing characteristics –** Prevents water surge
- **One-piece molded elastomeric moving part –** No maintenance required
- **Quick cover removal –** Minimal downtime

Optional Features

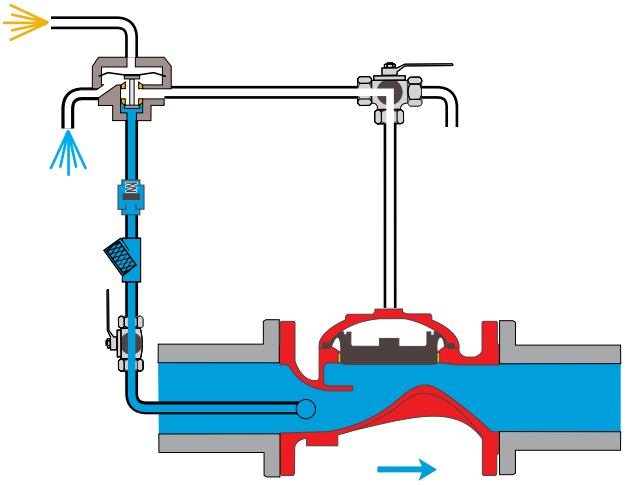
- **Seawater service** (add FS as prefix to model)
- **Foam concentrate service** (add FC as prefix to model)
- **Electric indication** (Limit Switch or Pressure Switch)
- **Valve Position Single/Double Limit Switches**

Operation

The Model FP 400E-4X is an on/off pneumaticlly remote controlled valve designed to open and close drip-tight in response to an external pneumatic pressure command. It is a line pressure driven, diaphragm actuated globe valve, which harnesses line pressure **[1]** to develop maximum hydraulic power. Dry pilot line pneumatic pressure **[2]** is applied, to a 3-Way Relay Valve (HRV-3) **[3]** , opening it. Through the override cock valve **[4]**, the HRV-3 applies upstream pressure to the valve's control chamber **[5]** closing the main valve drip tight.
Under FIRE condition, a dry pilot line pneumatic pressure drop, closes the HRV-3, which then vents the valve's control chamber allowing the main valve to open.
The Check Valve [6] traps high pressure peaks, ensuring that the valve remains locked in the closed position to maintain drip-tight sealing.



Valve Closed (set position)



Valve Open (operating condition)

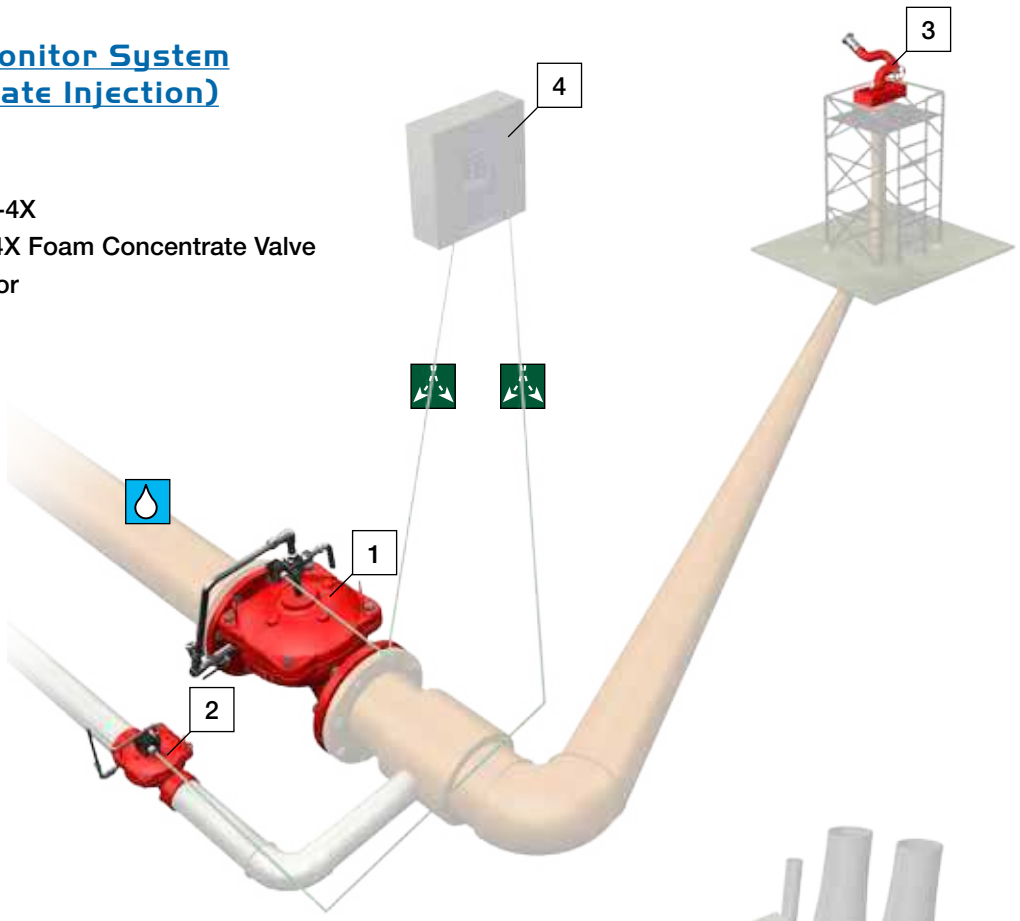
Engineer Specifications

- The valve shall be pneumatically operated elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim shall consist of non-corrosive tubing and fittings, and plated brass accessories, including 3-way Relay Valve (HRV-3), Y strainer, 3-Way Manual Override Valve and check valve.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Pneumatically Controlled Valve shall open and close in response to a dry pilot line pneumatic pressure drop.

Remote Controlled Monitor System (with Foam Concentrate Injection)

System Components

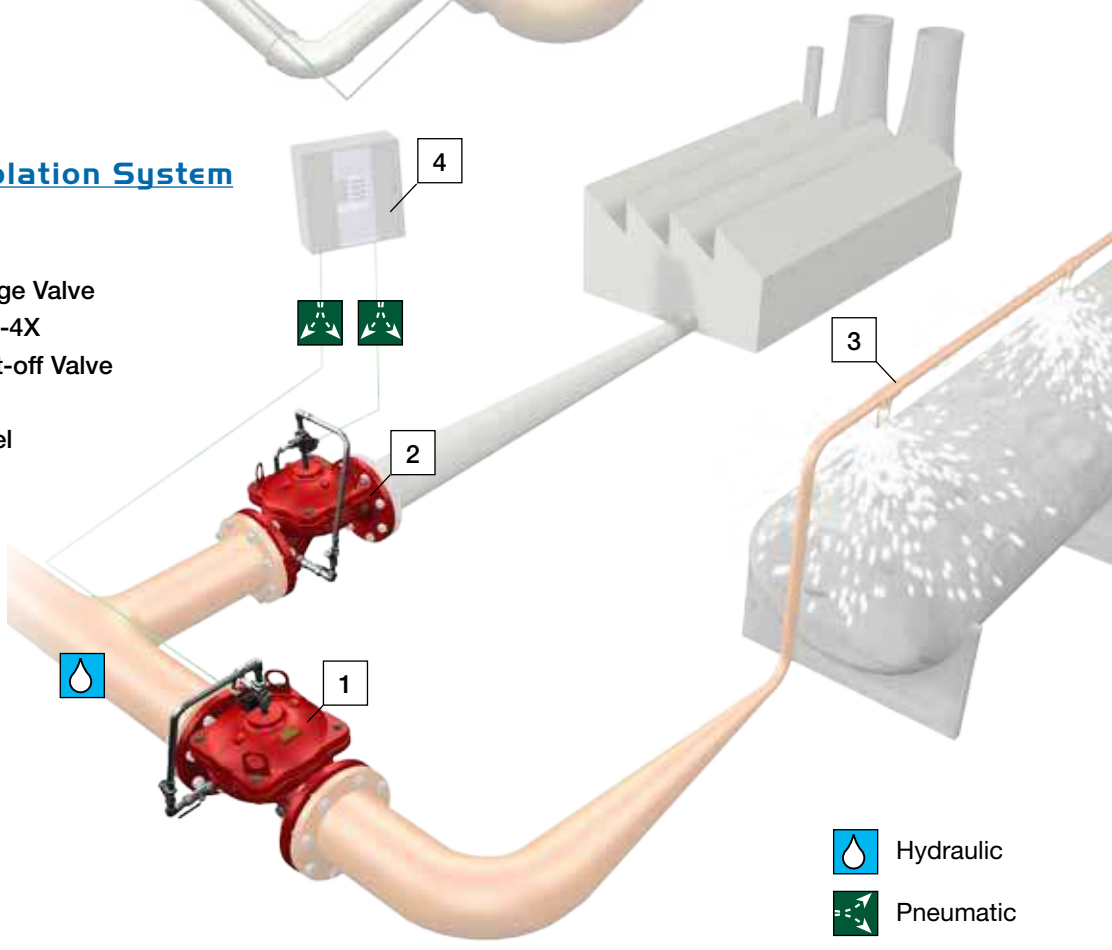
1 - BERMAD Model FP 400E-4X
2 - Bermad Model FC 400E-4X Foam Concentrate Valve
3 - Remote Controlled Monitor
4 - Pneumatic Control Panel



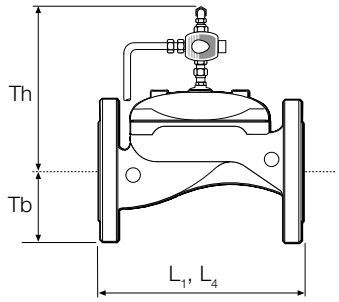
Emergency Zone Isolation System

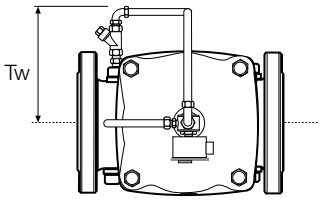
System Components

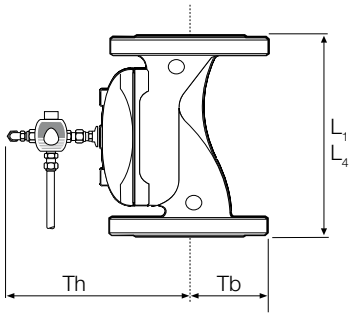
1 - BERMAD FP 400E Deluge Valve
2 - Bermad Model FP 400E-4X
Remote Controlled Shut-off Valve
3 - Deluge Spray System
4 - Pneumatic Control Panel



Technical Data







Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	205	8 1/16	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16	255	10 1/16
	Tb	64	2 8/16	78	3 1/16	89	3 8/16	100	3 15/16	115	4 8/16	140	5 8/16	172	6 12/16	204	8 1/16	242	9 8/16
	Th	289	11 6/16	289	11 6/16	301	11 14/16	325	12 13/16	345	13 9/16	420	16 9/16	471	18 9/16	471	18 9/16	588	23 2/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

Air Pressure supply
- Valve opens on pneumatic pressure drop
- Minimum Pneumatic pressure – 5 bar
- Pneumatic Pilot line must be continually pressurized to keep the main valve closed.
- Optional: Fail Safe Close (pressure to open)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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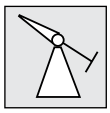
Hydraulically Operated, Remote Controlled Monitor Valve

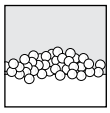
Model: FP 400E-5X

Description

The Bermad Remote Controlled On-Off valves replace motor driven valves or actuated quarter turn valves. They are especially suitable for oscillating or remote controlled Monitors, and for installation in modern foam systems where a shut-off function is required. The Hydraulic actuation with boosted local pressure release from the valve's control chamber, provides maximum safety also in systems with long hydraulic remote control piping lines.

Typical Applications


Remote monitor

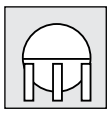

Foam systems

Zone isolating, on-off remote control


Hydraulic remote controlled systems


Offshore platforms / marine vessels


Sea water/corrosive water supplies


Gas storage tanks

Features and Benefits

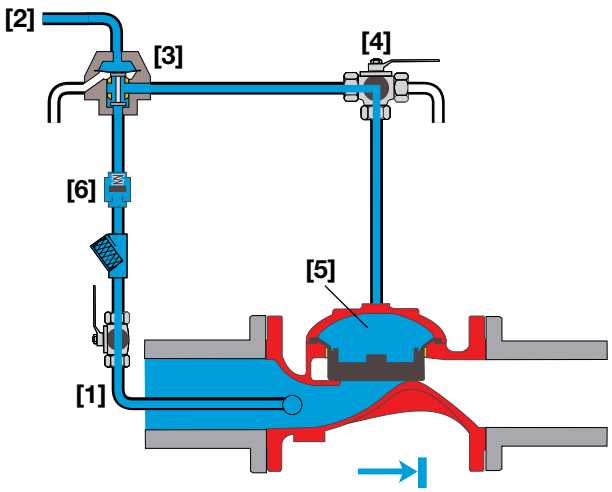
- **3-Way control system –** Avoids continuous releasing
- **Simple design –** Cost effective
- **Smooth opening and closing characteristics –** Prevents water surge
- **One-piece molded elastomeric moving part –** No maintenance required
- **Quick cover removal –** Minimal downtime
- **Remote reset –** Shut-off on remote command

Optional Features

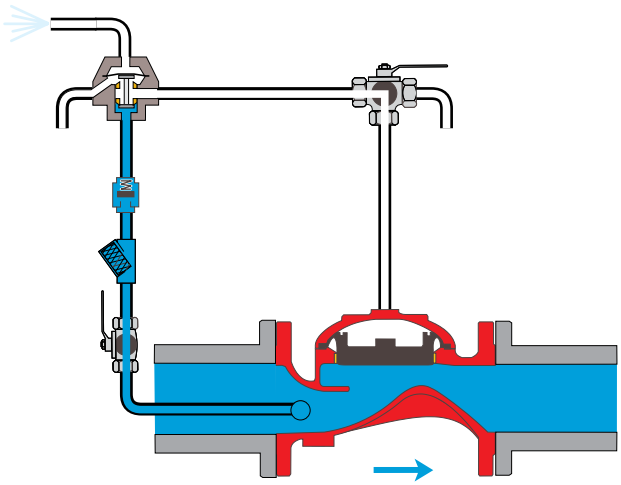
- **Seawater service** (add FS as prefix to model)
- **Foam concentrate service** (add FC as prefix to model)
- **Valve position indicator**
- **Electric indication** (Limit Switch or Pressure Switch)
- **Valve Position Single/Double Limit Switches**

Operation

The Model FP 400E-5X is an on/off hydraulic remote controlled valve designed to open and close drip tight in response to an external hydraulic pressure command. It is a line pressure driven, diaphragm actuated globe valve, which harnesses line pressure **[1]** to develop maximum hydraulic power. Wet pilot line hydraulic pressure **[2]** is applied, to a 3-way Hydraulic Relay Valve (HRV-3) **[3]**, opening it. Through the override cock valve **[4]**, the HRV-3 applies upstream pressure to the valve's control chamber **[5]** closing the main valve.
Under FIRE condition, a wet pilot line hydraulic pressure drop closes the HRV-3, which then vents the valve's control chamber allowing the main valve to open.
The Check Valve **[6]** traps high pressure peaks, ensuring that the valve remains locked in the closed position to maintain drip-tight sealing.



Valve Closed (set position)



Valve Open (operating condition)

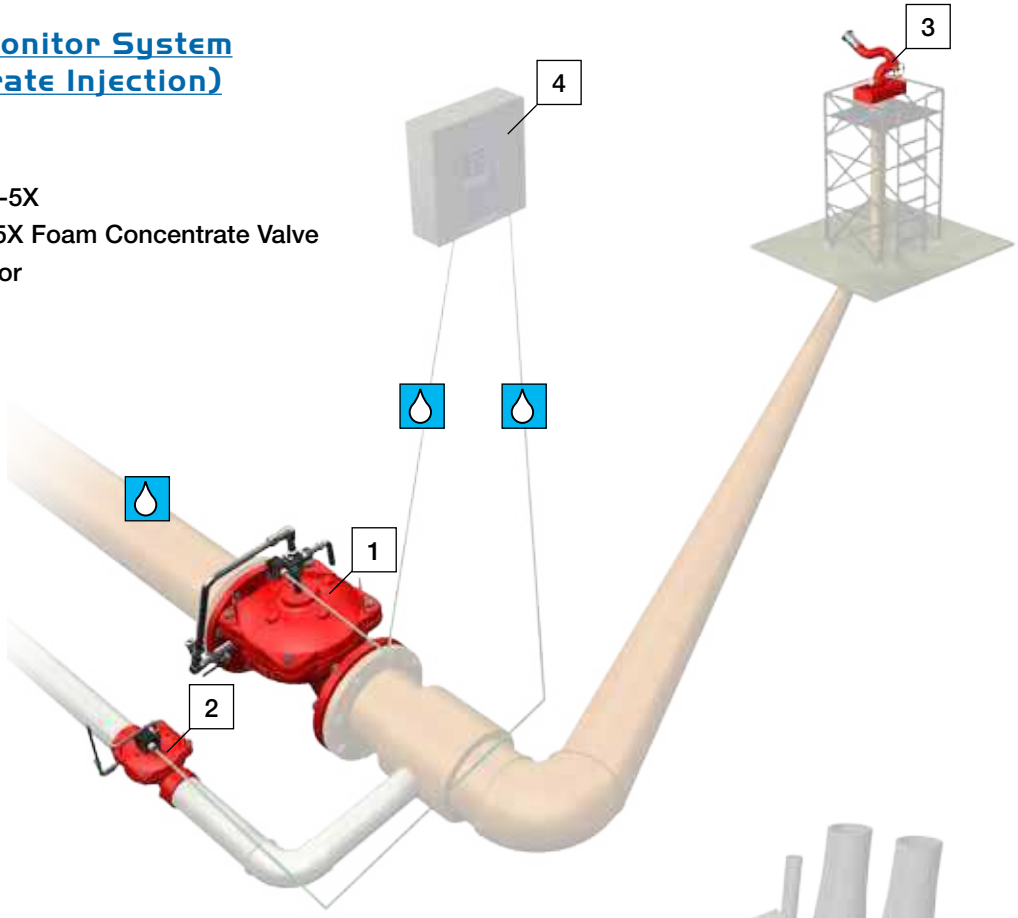
Engineer Specifications

- The valve shall be hydraulically operated elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim shall consist of non-corrosive tubing and fittings, and plated brass accessories, including 3-way Hydraulic Relay Valve (HRV-3), Y strainer, 3-Way Manual Override Valve and check valve.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Hydraulically Controlled Valve shall open and close in response to a wet pilot line hydraulic pressure drop.

Remote Controlled Monitor System (with Foam Concentrate Injection)

System Components

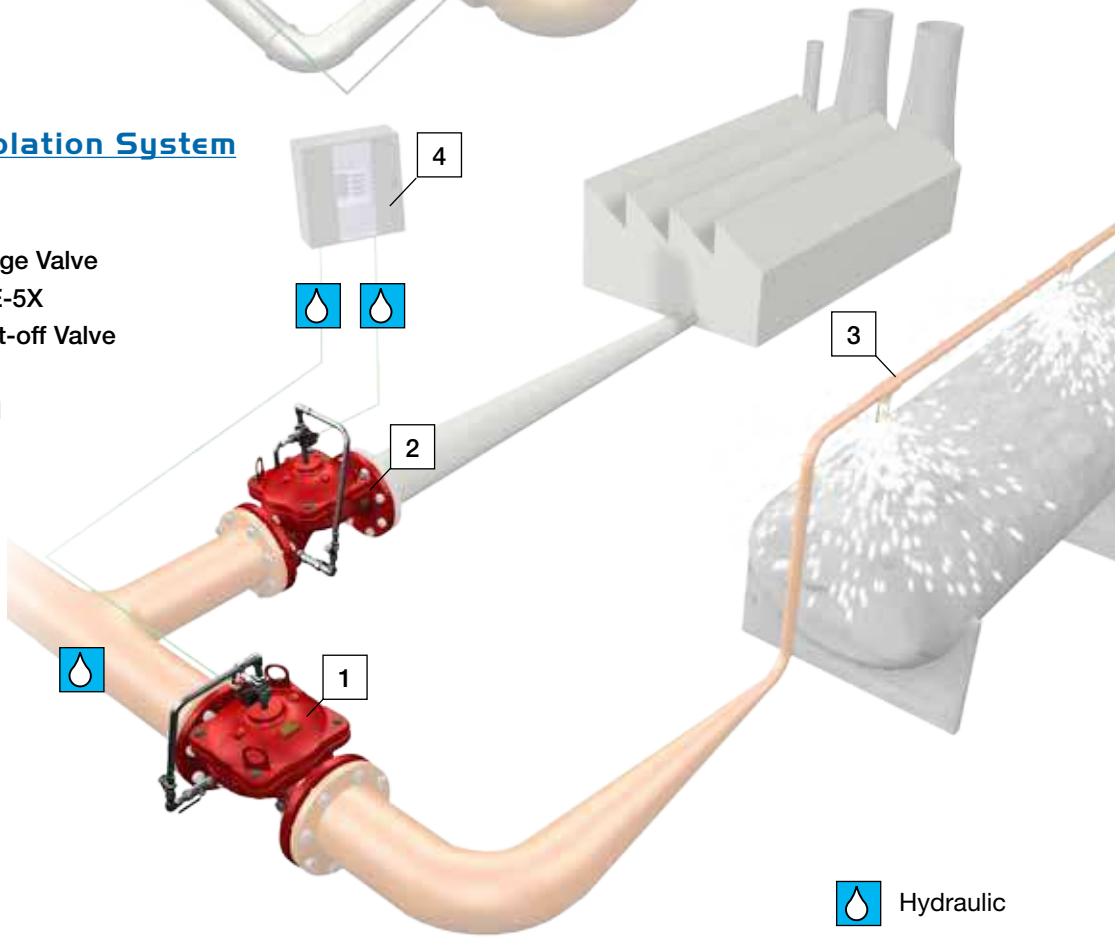
1 - BERMAD Model FP 400E-5X
2 - Bermad Model FC 400E-5X Foam Concentrate Valve
3 - Remote Controlled Monitor
4 - Control Panel



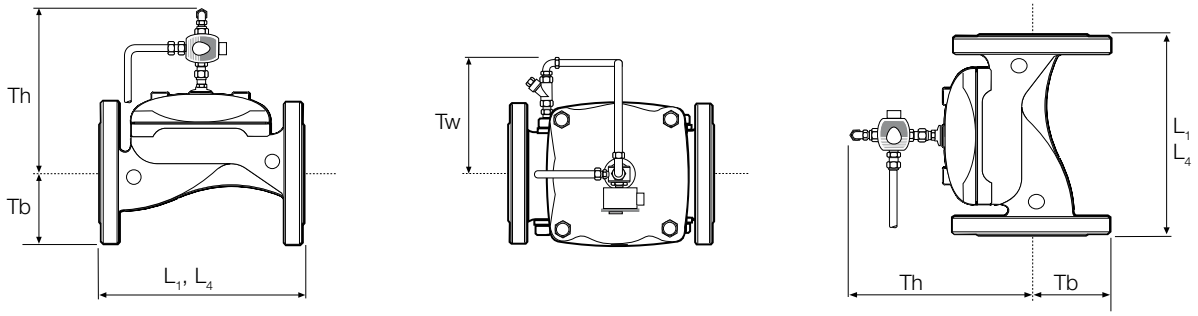
Emergency Zone Isolation System

System Components

1 - BERMAD FP 400E Deluge Valve
2 - Bermad Model FP 400E-5X
Remote Controlled Shut-off Valve
3 - Deluge Spray System
4 - Hydraulic Control Panel



Technical Data



Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	205	8 1/16	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	607	23 14/16	725	28 9/16
	L_4 (2)	205	8 1/16	205	8 1/16	N/A	N/A	257	10 2/16	320	12 10/16	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	133	5 4/16	133	5 4/16	139	5 8/16	142	5 9/16	163	6 7/16	211	8 5/16	255	8 14/16	255	8 14/16	289	11 6/16
	Tb	64	2 8/16	78	3 1/16	89	3 8/16	100	3 15/16	115	4 8/16	140	5 8/16	172	6 12/16	204	8 1/16	242	9 8/16
	Th	145	5 11/16	145	5 11/16	157	6 3/16	181	7 2/16	201	7 15/16	276	10 14/16	327	12 14/16	327	12 14/16	444	17 8/16

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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Foam Concentrate Valves

The BERMAD Foam Concentrate Valves are built of high-grade materials to meet the aggressive ingredients of the foam concentration. The valves can be activated by electric, hydraulic, pneumatic or electro-pneumatic signal.
On-Off Valves, Pressure Reducing On-Off Valves - for low injection pressure systems and Zero Pressure, On-Off Valves - for atmospheric foam concentrate reservoirs, are available.

Zero Pressure, Solenoid Activated, Foam-Concentrate Valve

Model: FC 700E-3X-BO

Description

The BERMAD FC 700E-3X-N-BO is a Double Chambered hydraulically powered Foam-concentrate valve, which is electrically activated by a solenoid valve. The valve is actuated by fire water from the Main, which makes it independent from the foam concentrate line's pressure. Hence it may operate when line pressure is low or even in non-pressurized systems. This makes it best suited for installation at the discharge of atmospheric tanks.
The valve is Fail-safe Close and designed with an "over the seat flow" opening to ensure drip-tight sealing and safe operation.
The FC 700E-3X-N-BO replaces mechanical actuated valves or pilot-operated solenoid valves, providing safer operation of modern foam systems, thus assuring maximum reliability of the entire fire-fighting system.

Typical Applications

- Foam systems
- Zone isolating, on-off remote control
- Marine environments
- Emergency low DC power activation

Features and Benefits

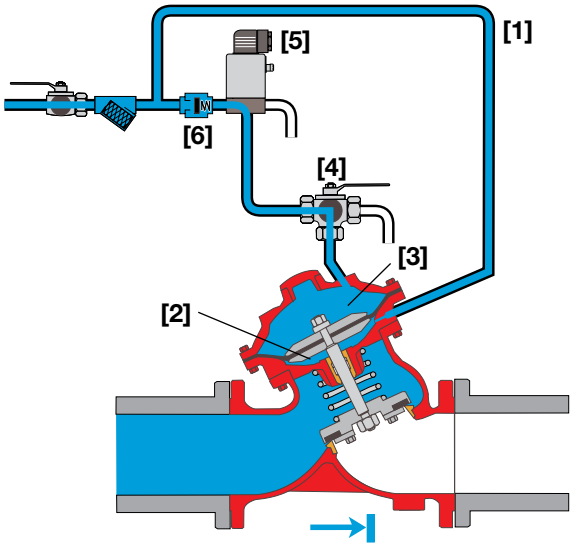
- **Double chambered Actuation –** Zero Line Pressure
- **Obstacle free full bore –** Uncompromising reliability
- **In line serviceable –** Minimum downtime and easy maintenance
- **Electric Remote Opening –** Automatically copntrolled
- **3-Way control system –** avoids continuous releasing

Optional Features

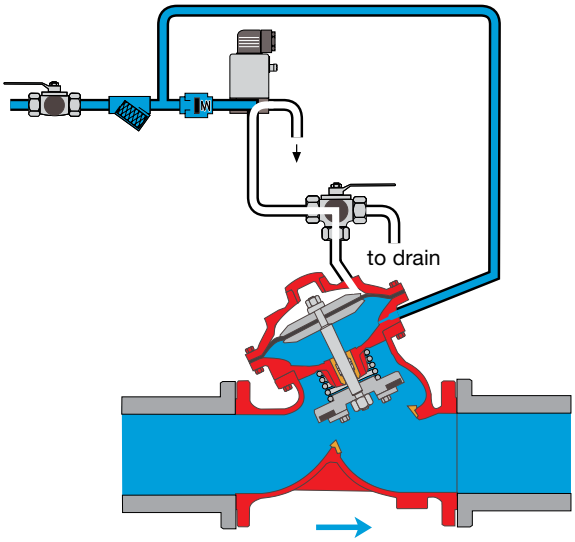
- **Explosion-proof for hazardous locations** (code: 7/8/9)
- **Valve position indicator**
- **Electric indication** (Limit Switch or Pressure Switch)

Operation

The BERMAD FC 700E-3X-N-BO is a Water Actuated Foam-concentrate valve, it is double chambered actuated valve, hydraulically powered opening and “over the seat flow” with Fail safe Close feature. The FC-700E-3X-BO is a “Y” pattern, diaphragm actuated, double chambered, water driven valve that required firewater external source, as a priming pressure to be able to activate. The water priming line pressure **[1]** is connected to both Lower **[2]** and Upper **[3]** control cambers. The pressure to the upper chamber is provided trough a manual override valve **[4]** and trough the 3-Way solenoid valve **[5]**. The check valve **[6]** traps high pressure peaks in the main line ensuring that the main valve remains locked in the closed position to maintain a drip tight sealing.
The 3-Way solenoid valve applies water pressure to the upper control chamber balancing the diaphragm and enable the spring to push the seal disc to the seat thus holding the main valve closed and sealed. When the solenoid is energized the valve upper chamber is vented while lower chamber is fully pressurized, the actuator is hydraulically powered, allowing the valve seal disc to open and fluid to flow through the valve discharge to the system.



Valve Closed (set position)



Valve Open (operating condition)

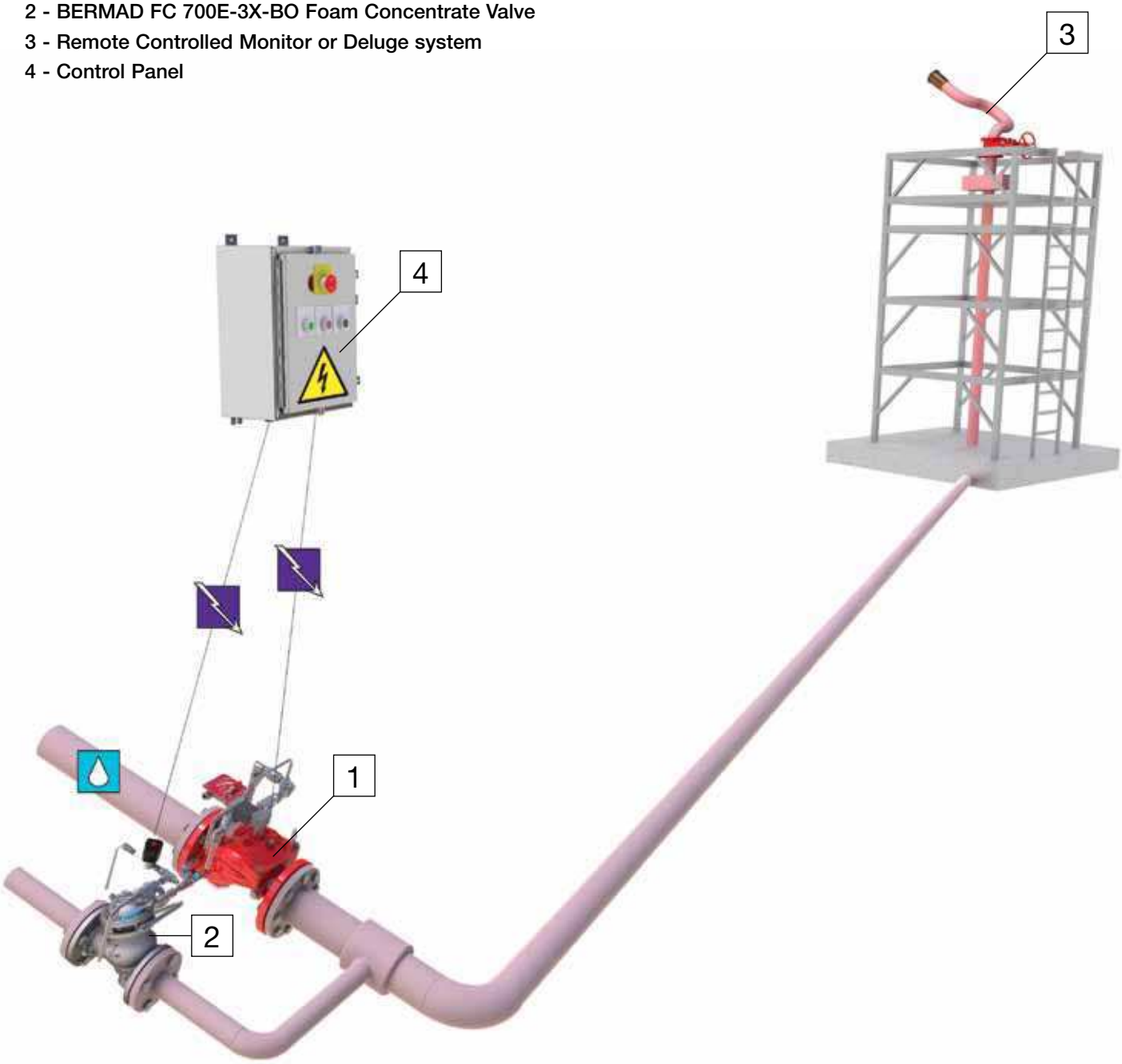
Engineer Specifications

- The valve shall be a solenoid controlled “Y” pattern body with **integral unitized double chamber actuator**.
- Valve actuation shall be accomplished by one moving assembly, which shall include the diaphragm assembly, a flat seal disk and a stainless steel stem.
- All valve body and internal parts shall be of stainless steel and have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- The valve actuator shall be removable for quick in-line service enabling all necessary inspection and servicing.
- The control trim shall consist of stainless steel 316 tubing, fittings and accessories, including stainless steel 3-Way
- The control Trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Solenoid Controlled Valve shall open and close in response to an electric signal.

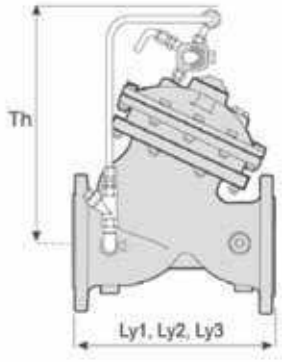
Remote Controlled Monitor System (with Foam Concentrate Injection)

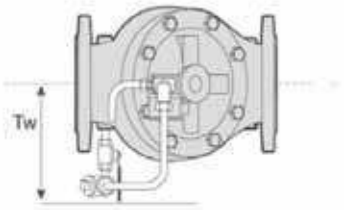
System Components

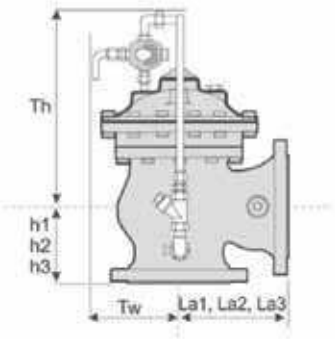
1 - BERMAD Deluge valve
2 - BERMAD FC 700E-3X-BO Foam Concentrate Valve
3 - Remote Controlled Monitor or Deluge system
4 - Control Panel



Technical Data







Size		1½"		2"		2½"		3"		4"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	Ly_1 (1)	205	8 1/16	205	8 1/16	209	8 1/4	250	9 7/8	320	12 5/8
	Ly_2 (2)	155	6 1/8	155	6 1/8	212	8 3/8	250	9 13/16	N/A	N/A
	Ly_3 (3)	210	8 1/4	210	8 1/4	212	8 3/8	264	10 7/16	335	13 1/4
	La_1 (1)	121	4 3/4	121	4 3/4	140	5 1/2	152	6	190	7 1/2
	La_2 (2)	120	4 3/4	120	4 3/4	140	5 1/2	159	6 1/4	N/A	N/A
	La_3 (3)	127	5	127	5	149	5 7/8	159	6 1/4	200	7 7/8
	Tw	191	7 1/2	191	7 1/2	191	7 1/2	207	8 1/16	242	9 1/2
	Th	312	12 5/16	312	12 5/16	312	12 5/16	364	14 1/2	405	15 15/16
	h_1 (1)	82	3 1/4	82	3 1/4	102	4	102	4	127	5
	h_2 (2)	82	3 1/4	82	3 1/4	102	4	114	4 1/2	N/A	N/A
	h_3 (3)	89	3 1/2	89	3 1/2	109	4 5/16	108	4 1/4	135	5 5/16

Notes:
1. Ly_1, La_1 & h_1 for flanged ANSI #150 and ISO PN16
2. Ly_2, La_2 & h_2 for threaded female, NPT or BSP
3. Ly_3, La_3 & h_3 for flanged ANSI #300 and ISO PN25
4. Dimentions are maximum
5. Provide adequate clearance around valve for maintenance

Connection Standard
B16.5 Stainless Steel
B16.24 Bronze

Fluid Temperature
- 0.5 – 80°C (33 – 180°F)

Sizes ("Y", "G" & Angle)
- "Y" or Angle: 1½, 2, 2½, 3 & 4

Pressure Rating
- Max. for Class #150/PN16: 250 psi (17 bar)
- Max. for Class #300/PN25: 400 psi (28 bar)

Manufacturers Standard Materials

Main valve body and cover
- Stainless Steel 316 CF8M

Main valve internals
- Stainless Steel 316

Control Trim
- Stainless Steel 316 components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- NBR (Buna-N)

Coating
- Externally, Electrostatic Powder Polyester, Red (RAL 3002)

Optional Materials

Main valve body/internals
- Ni-Al-Bronze ASTM B-148

Solenoid Pilot Valve

Standard
- 3-Way, direct actuated type
- Stainless Steel body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, IP65, Class F
- Power: 24VDC, 8 watts

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - Class I Division 2, Gr. A, B, C, D, T4
  - ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage option table)

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Zero Pressure, Hydraulically controlled, Foam Concentrate Valve

Model: FC 700E-5X-BO

Description

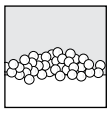
The BERMAD FC 700E-5X-N-BO is a Double Chambered hydraulically powered Foam-concentrate valve. The valve is actuated by fire water from the Main, which makes it independent from the foam concentrate line's pressure. Hence it may operate when line pressure is low or even in non-pressurized systems. This makes it best suited for installation at the discharge of atmospheric tanks.

The FC 700E-5X-N-BO is controlled by pilot line pressure which is related to the main deluge valve's trim, allowing the foam concentrate valve to open simultaneously with the main valve, providing flow at the same time with the water discharge, thus assuring an immediate supply of foam solution into the system piping.

The valve is Fail-safe Close and designed with an "over the seat flow" opening to ensure drip-tight sealing and safe operation.

This Bermad valve replaces ¼ turn actuated valves or pilot-operated solenoid valves in order to provide safer operation of modern foam systems, thus assuring maximum reliability of entire fire-fighting system.

Typical Applications

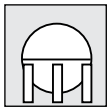


Foam systems

Zone isolating, on-off remote control

Hydraulic remote controlled systems

Offshore platforms / marine vessels



Gas storage tanks

Features and Benefits

- **Double chambered Actuation** – Zero Line Pressure
- **Obstacle free full bore** – Uncompromising reliability
- **In line serviceable** – Minimum downtime and easy maintenance
- **Simultaneous opening with the main deluge valve** – immediate Foam supply
- **3-Way control system** – avoids continuous releasing
- **Fail safe** – safe operation and drip-tight sealing
- **Suited for Water or Air pilot line pressure**

Optional Features

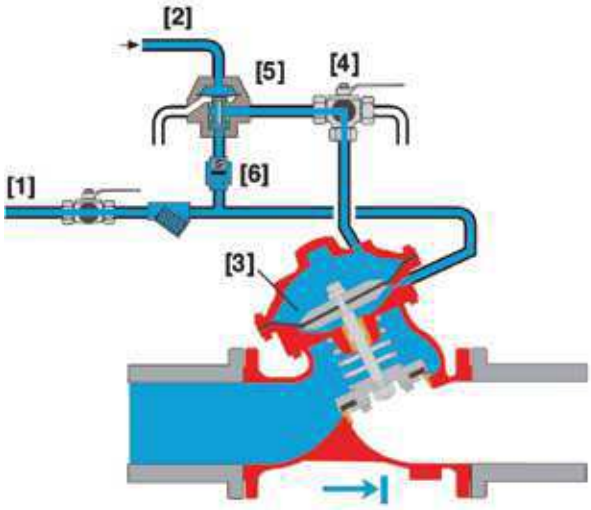
- **Valve position indicator**
- **Electric indication** (Limit Switch)

Operation

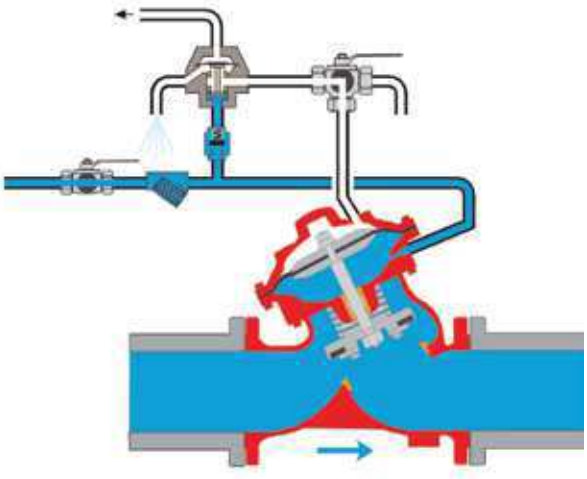
The BERMAD FC 700E-5X-N-BO is a Water Actuated Foam-concentrate valve, it is double chambered actuated valve, hydraulically powered opening and "over the seat flow" with Fail safe Close feature. The FC-700E-5X-BO is a “Y” pattern, diaphragm actuated, double chambered, water driven valve that requires firewater external source, as a priming pressure to be able to activate.

The water priming line pressure **[1]** is connected to both Lower **[2]** and Upper **[3]** control cambers. The pressure to the upper chamber is provided trough a manual override valve [**4]** and trough the Relay Valve **[5]**. The check valve **[6]** traps high pressure peaks in the main line ensuring that the main valve remains locked in the closed position to maintain a drip tight sealing. The hydraulic pilot line applies control pressure to the Relay Valve diaphragm to apply water pressure to the upper control chamber balancing the diaphragm and enable the spring to push the seal disc to the seat thus holding the main valve closed and sealed.

When the pilot line pressure is released the relay valve is activated and vents the valve upper control chamber, while lower chamber is fully pressurized, the actuator is hydraulically powered, allowing the valve seal disc to open and fluid to flow through the valve discharge to the system.



Valve Closed (set position)



Valve Open (operating condition)

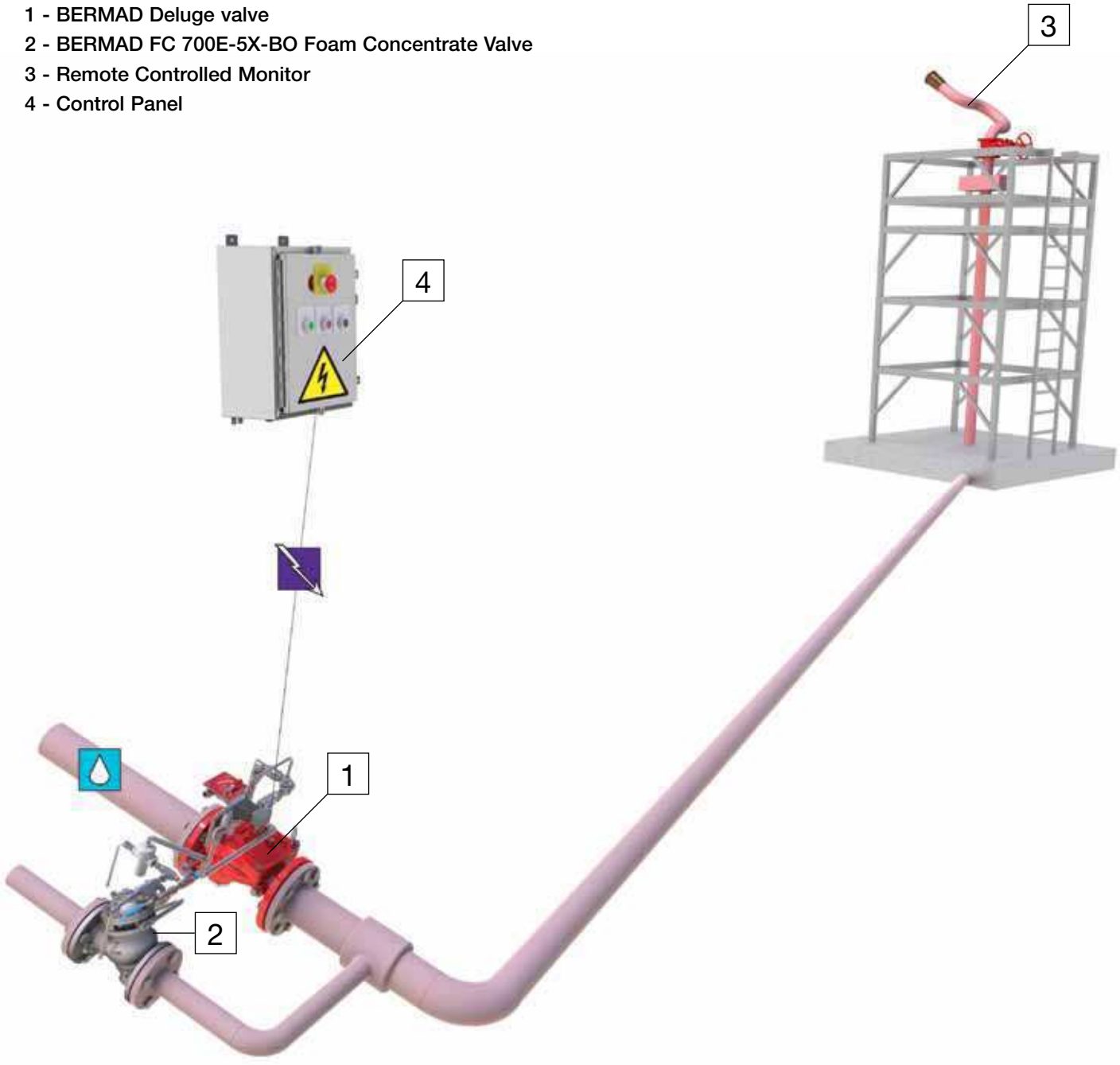
Engineer Specifications

- The valve shall be a hydraulically operated “Y” pattern body with **integral unitized double chamber actuator**.
- Valve actuation shall be accomplished by one moving assembly, which shall include the diaphragm assembly, a flat seal disk and a stainless steel stem.
- All valve body and internal parts shall be of stainless steel and have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- The valve actuator shall be removable for quick in-line service enabling all necessary inspection and servicing.
- The control trim shall consist of stainless steel 316 tubing, fittings and accessories, including stainless steel HRV-3 (3-Way Relay Valve), Y strainer, 3-Way Manual Override Valve and check valve.
- The control Trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Hydraulically Operated Valve shall open and close in response to the dry pilot line hydraulic pressure status.

Remote Controlled Monitor System (with Foam Concentrate Injection)

System Components

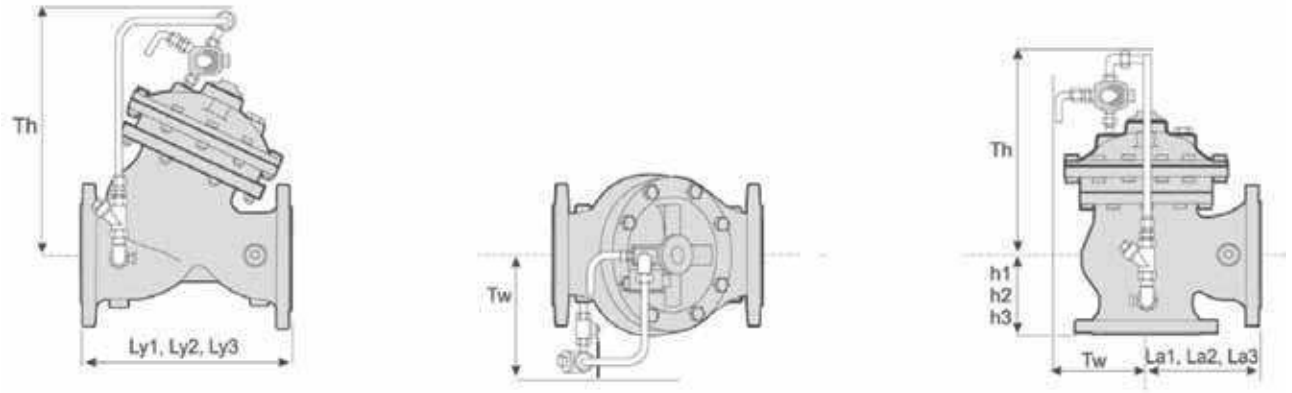
1 - BERMAD Deluge valve
2 - BERMAD FC 700E-5X-BO Foam Concentrate Valve
3 - Remote Controlled Monitor
4 - Control Panel



Hydraulic

Electric

Technical Data



Size		1½"		2"		2½"		3"		4"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	Ly_1 (1)	205	8 1/16	205	8 1/16	209	8 1/4	250	9 7/8	320	12 5/8
	Ly_2 (2)	155	6 1/8	155	6 1/8	212	8 3/8	250	9 13/16	N/A	N/A
	Ly_3 (3)	210	8 1/4	210	8 1/4	212	8 3/8	264	10 7/16	335	13 1/4
	La_1 (1)	121	4 3/4	121	4 3/4	140	5 1/2	152	6	190	7 1/2
	La_2 (2)	120	4 3/4	120	4 3/4	140	5 1/2	159	6 1/4	N/A	N/A
	La_3 (3)	127	5	127	5	149	5 7/8	159	6 1/4	200	7 7/8
	Tw	191	7 1/2	191	7 1/2	191	7 1/2	207	8 1/16	242	9 1/2
	Th	312	12 5/16	312	12 5/16	312	12 5/16	364	14 1/2	405	15 15/16
	h_1 (1)	82	3 1/4	82	3 1/4	102	4	102	4	127	5
	h_2 (2)	82	3 1/4	82	3 1/4	102	4	114	4 1/2	N/A	N/A
	h_3 (3)	89	3 1/2	89	3 1/2	109	4 5/16	108	4 1/4	135	5 5/16

Notes:
1. Ly_1, La_1 & h_1 for flanged ANSI #150 and ISO PN16
2. Ly_2, La_2 & h_2 for threaded female, NPT or BSP
3. Ly_3, La_3 & h_3 for flanged ANSI #300 and ISO PN25
4. Dimentions are maximum
5. Provide adequate clearance around valve for maintenance

Connection Standard
B16.5 Stainless Steel
B16.24 Bronze

Fluid Temperature
- 0.5 – 80°C (33 – 180°F)

Sizes ("Y", "G" & Angle)
- "Y" or Angle: 1½, 2, 2½, 3 & 4

Pressure Rating
- Max. for Class #150/PN16: 250 psi (17 bar)
- Max. for Class #300/PN25: 400 psi (28 bar)

Manufacturers Standard Materials

Main valve body and cover
- Stainless Steel 316 CF8M

Main valve internals
- Stainless Steel 316

Control Trim
- Stainless Steel 316 components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- NBR (Buna-N)

Coating
- Externally, Electrostatic Powder Polyester, Red (RAL 3002)

Optional Materials

Main valve body/internals
- Ni-Al-Bronze ASTM B-148

Pilot Control Pressure
- Valve opens on pilot line pressure drop

In case of Pneumatic Pilot Line
- Minimum Pneumatic pressure supply – 5 bar
- Pneumatic Pilot line must be continually pressurized to keep the main valve closed.

Option
- Fail Safe Close (pressure to open)

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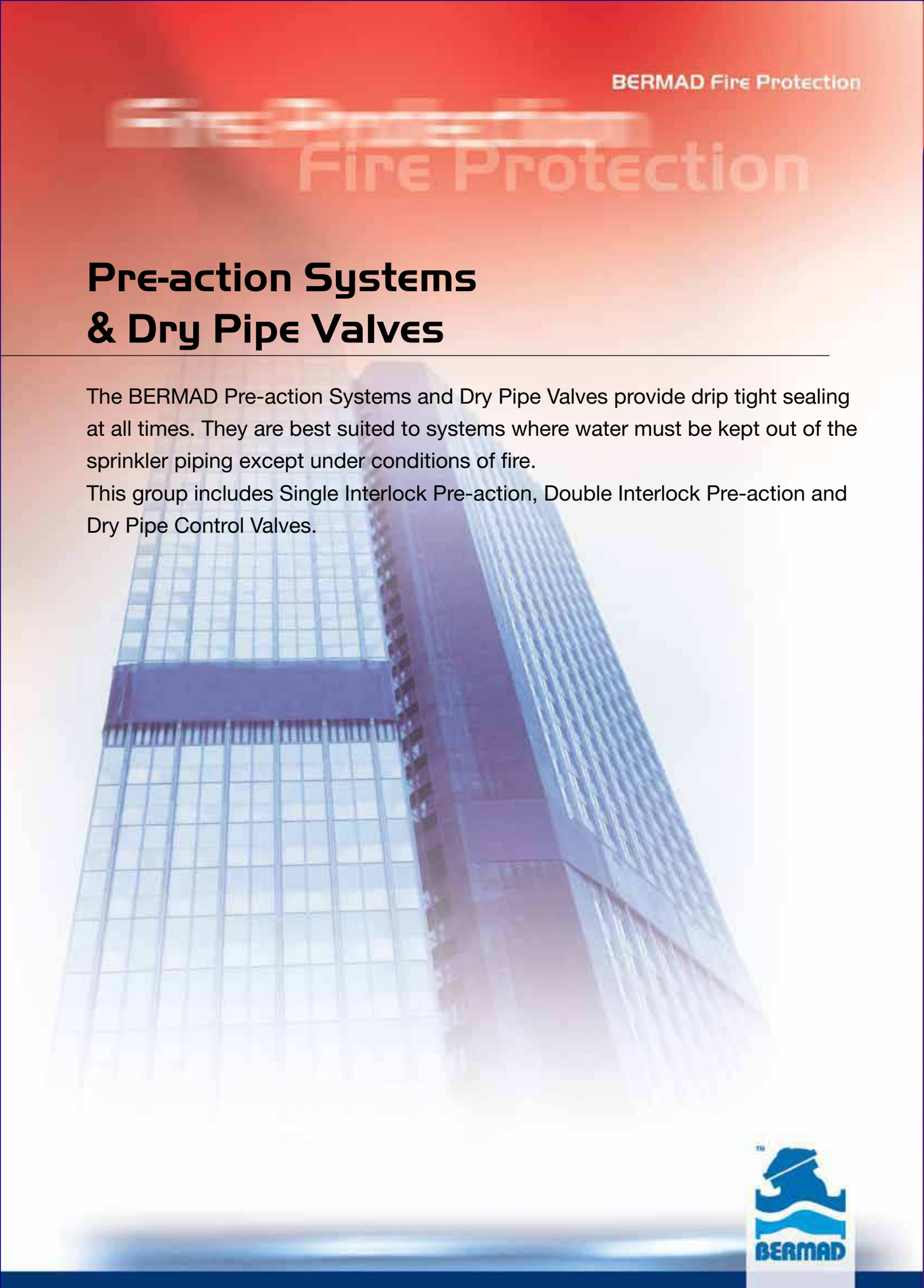
BERMAD Fire Protection

Fire Protection

Pre-action Systems & Dry Pipe Valves

The BERMAD Pre-action Systems and Dry Pipe Valves provide drip tight sealing at all times. They are best suited to systems where water must be kept out of the sprinkler piping except under conditions of fire.

This group includes Single Interlock Pre-action, Double Interlock Pre-action and Dry Pipe Control Valves.



BERMAD

Single Interlock Pre-action, Electric Release System

Model: FP 400E-7M

Description

The BERMAD Model FP 400E-7M Single Interlock Pre-Action Release System is suitable for use in systems requiring that water be kept out of the sprinkler piping until an electric detecting device has been activated. Single Interlock Pre-Action Systems include automatic sprinklers attached to a dry sprinkler piping system, with a supplementary electric detection system installed in the same area. This system admits water into the sprinkler piping upon activation of the detection system. Water is discharged only through sprinklers that have been opened due to excessive heat. When a Supervised System is required, a pneumatic low pressure supply shall be provided.
An anti-flooding feature is provided by utilizing an in-line check valve, which creates an intermediate vented chamber using a Normally Open drip-check.

Typical Applications

Water damageable material storage:
- Computer & Electronics Rooms
- Libraries, Museums & Archives
- Telecommunications equipment
- Cable spreading rooms
- Oil-filled-transformer rooms

Freezing conditions

Features and Benefits

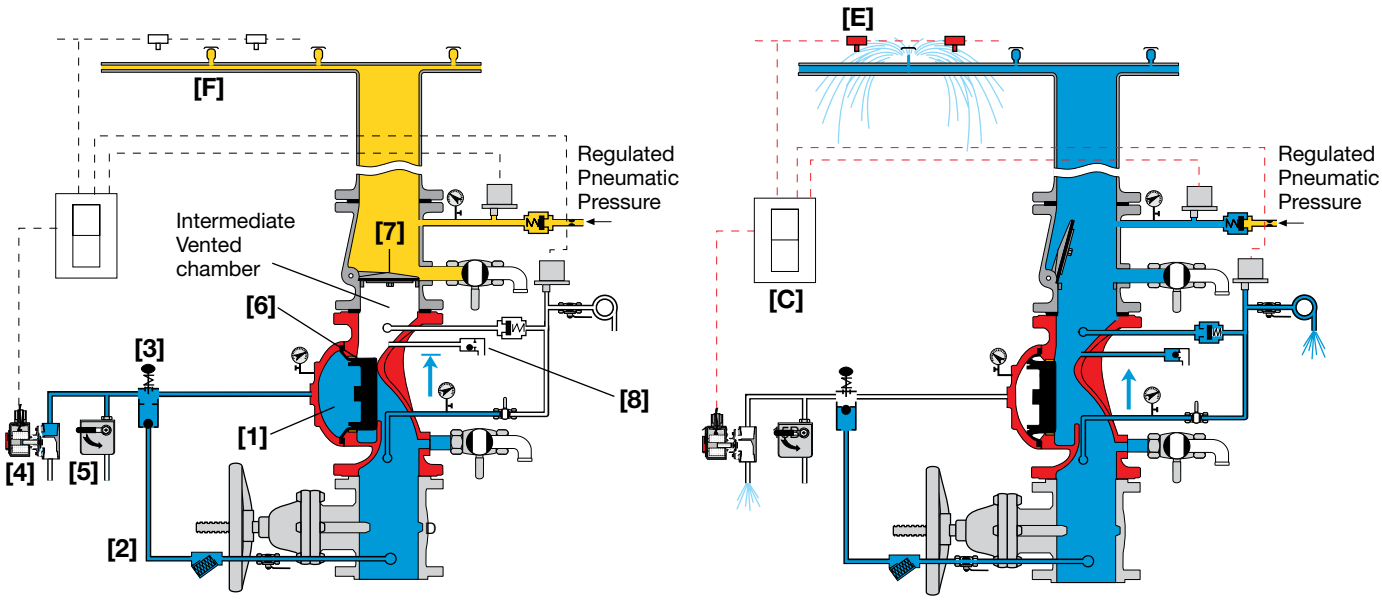
- **Latch open -** Closes only upon local reset
- **Factory pre-assembled trim –** Out-of box-quality
- **In-line serviceable –** Minimal down time
- **In-line Check Valve –** intermediate vented **chamber-** Anti flooding
- **One-piece molded elastomeric moving part –** No maintenance required

Optional Features

- **Air Maintenance Device** (AMD)
- **Water motor alarm**
- **Valve Position Single/Double Limit Switches**

Operation

In the SET position, the line pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]** and through an EasyLock Manual Reset **[3]**, is trapped by the Easy Lock internal check valve, by a closed Solenoid Valve **[4]** and by a closed Manual Emergency Release **[5]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[6]**, sealing it bubble tight. The piping system is filled with supervised low air pressure to ensure all sprinklers **[F]** are sealed. An intermediate vented chamber is created by an in-line swing check valve **[7]**, and a Normally Open drip-check **[8]**. When sprinklers are activated, the lower air pressure is detected by an electric air pressure monitor, which activates the alarm, while the main valve remains closed.
In the event of FIRE, an electric detection system **[E]**, working through a control panel **[C]**, triggers the Solenoid Valve to open. Pressure is then released from the main valve's control chamber through the opened Solenoid Valve (or the Manual Emergency Release). The EasyLock prevents line pressure from entering the control chamber, allowing the pre-action valve to latch open and water to flow into the system piping.



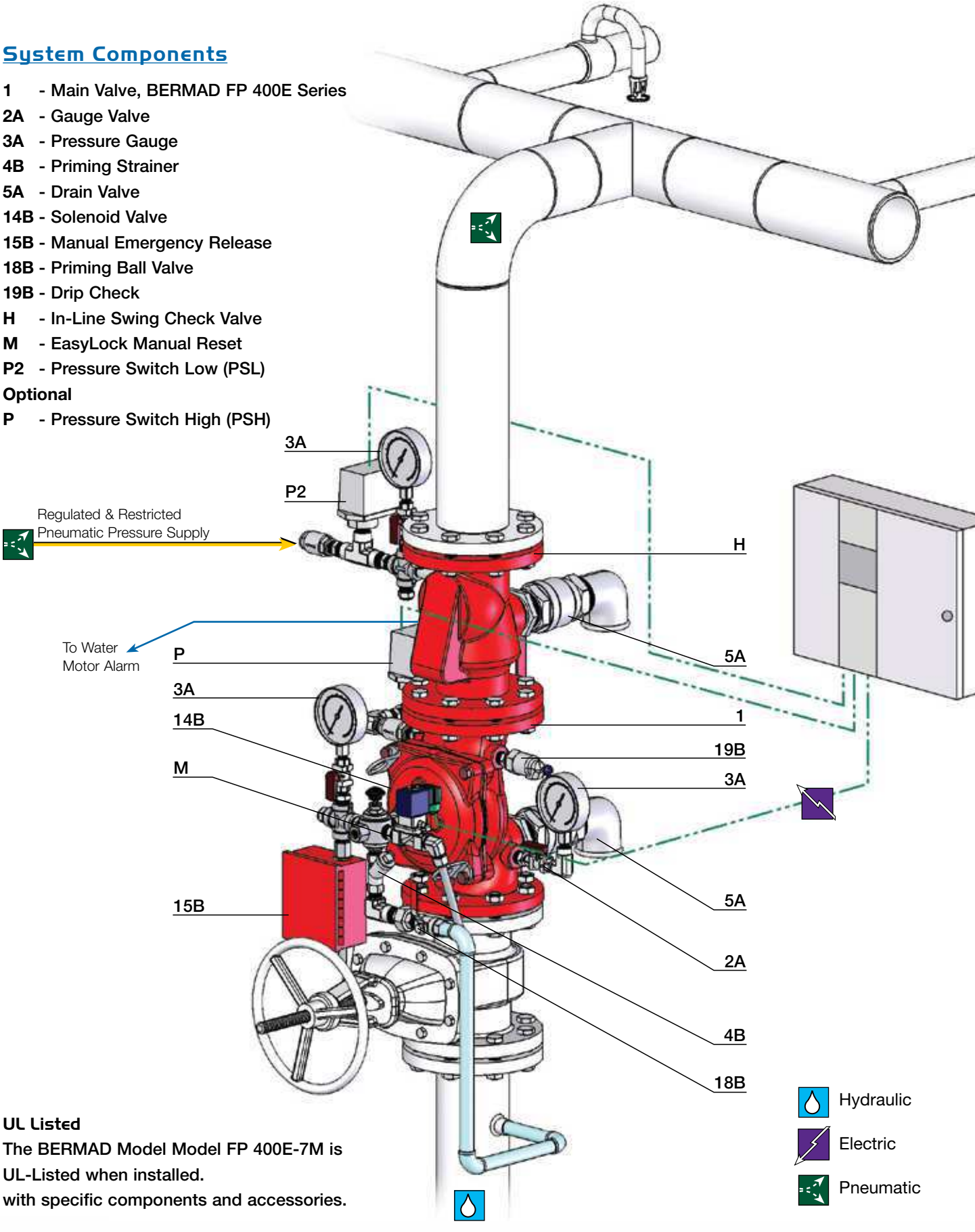
Set Position **Operating Condition**

Engineer Specifications

- The pre-action valve shall be a UL-Listed, electrically controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, in line swing check valve with resilient seal, local **EasyLock** Manual Reset, 2-Way Solenoid Pilot Valve, Y strainer, Automatic drip check with manual knob and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Single Interlock Pre-action, Electric Release System shall latch open in response to the solenoid activation. The valve shall reset to the closed position only upon local manual activation of the reset device.

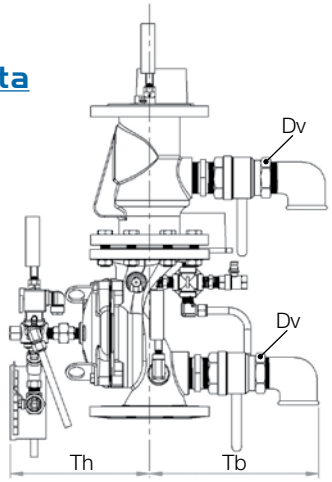
System Components

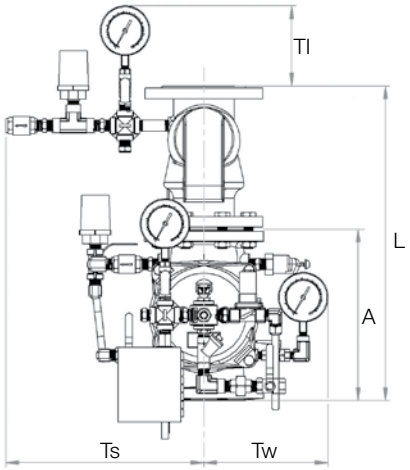
1 - Main Valve, BERMAD FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
14B - Solenoid Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
H - In-Line Swing Check Valve
M - EasyLock Manual Reset
P2 - Pressure Switch Low (PSL)
Optional
P - Pressure Switch High (PSH)



UL Listed
The BERMAD Model Model FP 400E-7M is UL-Listed when installed.
with specific components and accessories.

Technical Data





Size		2”		3”		4”		6”		8”	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	377	14 13/16	450	17 3/4	536	21 3/16	720	28 6/16	865	34 1/16
	L_4 (1)	377	14 13/16	443	17 7/8	536	21 3/16	720	28 6/16	865	34 1/16
	Tl	150	5 7/8	149	5 7/8	150	5 7/8	135	5 5/16	135	5 5/16
	Tw	208	8 3/16	223	8 3/4	233	9 3/16	272	10 11/16	326	12 13/16
	Ts	363	14 1/4	367	14 7/16	371	14 5/8	398	15 11/16	428	16 7/8
	Th	205	8 1/16	241	9 1/2	261	10 1/4	336	13 1/4	407	16
	Tb	230	9 1/16	300	11 13/16	317	12 1/2	338	13 5/16	405	15 15/16
	Dv Ø	3/4”		1 1/2”		1 1/2”		2”		2”	

Notes:
1. L_1 and L_4 are for flanged ANSI #150 and ISO PN16.
2. Provide adequate space around valve for maintenance.
3. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- • Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8”

Leakage Class
- Class VI (ANSI B16.104)

Sizes
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10”

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Pressure Rating*
- Max. working pressure: 250 psi (17 bar)

* Pressure rating might be limited due to solenoid valve rating

Air Pressure Requirements
- Valve opens on pneumatic pressure drop
- Working pressure 7 – 10psi (0.5 – 0.7 bar)
- Air must be regulated and continually compressed
- Low-pressure alarm switch is factory set to operate at 6psi (0.4 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Poleyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valve

Standard model
- 2-Way Pilot Operated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - ATEX, EEx em IIC T4 (code 8)
  - ATEX, EEx d IIC T4/5 (code 9)
- Voltage: see ordering guide (voltage optio
- Stainless s aterial (code K)

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Double Interlock Pre-action, Electric-Electric Release System

Model: FP 400E-7BM

Description

The BERMAD Model FP 400E-7BM Double Interlock Pre-Action, Electric-Electric Release System is suitable for use in systems requiring that water be kept out of the sprinkler piping until an electric detecting device and a sprinkler have both been activated. Electric-Electric double interlock systems include automatic sprinklers attached to a dry sprinkler piping system, along with a supplementary electric detection system wired to a Cross-Zone releasing control panel, and an Electric Supervised System of low air pressure in the sprinkler system piping. The Double Interlock Pre-Action System admits water into the sprinkler piping only when both the detection device and the supervised systems simultaneously signal the control panel to trigger the solenoid valve.
An anti-flooding feature is provided by utilizing an in-line check valve, which creates an intermediate vented chamber using a Normally Open drip-check.

Typical Applications

Water damageable material storage:
- Computer & Electronics Rooms
- Libraries, Museums & Archives
- Telecommunications equipment
- Cable spreading rooms
- Oil-filled-transformer rooms

Freezing conditions

Features and Benefits

- **Latch open -** Closes only upon local reset
- **Factory pre-assembled trim –** Out-of box-quality
- **In-line serviceable –** Minimal down time
- **In-line Check Valve –** intermediate vented **chamber-** Anti flooding
- **One-piece molded elastomeric moving part –** No maintenance required

Optional Features

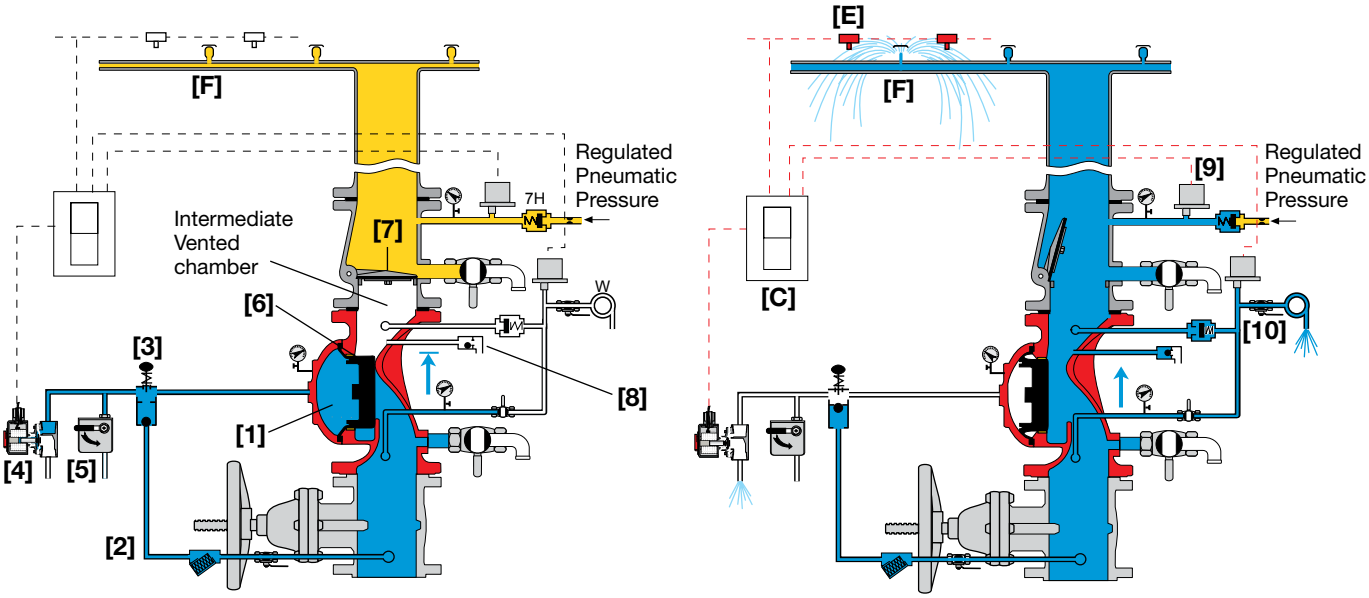
- **Air Maintenance Device** (AMD)
- **Water motor alarm**
- **Valve Position Single/Double Limit Switches**

Operation

In the SET position, the line pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]** and through an EasyLock Manual Reset **[3]**, is trapped by the Easy Lock internal check valve, by a closed Solenoid Valve **[4]** and by a closed Manual Emergency Release **[5]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[6]**, sealing it bubble tight. The piping system is filled with supervised low air pressure to ensure all automatic sprinklers **[F]** are sealed. An intermediate vented chamber is created by an in-line swing check valve **[7]**, and a Normally Open drip-check **[8]**.

In the event of FIRE, upon activation of both the electric detection system **(E)** and the low-air pressure switch **[9],** that is activated by the air pressure drop in the system piping due to opened sprinkler head **(F).**

The Cross-Zone Releasing control panel **[C]** triggers the Solenoid Valve to open, water pressure is then released from the main valve's control chamber. The EasyLock prevents line pressure from entering the control chamber, allowing the pre-action valve to latch open and water to flow into the system piping and to alarm device **[10]**.



Set Position **Operating Condition**

Engineer Specifications

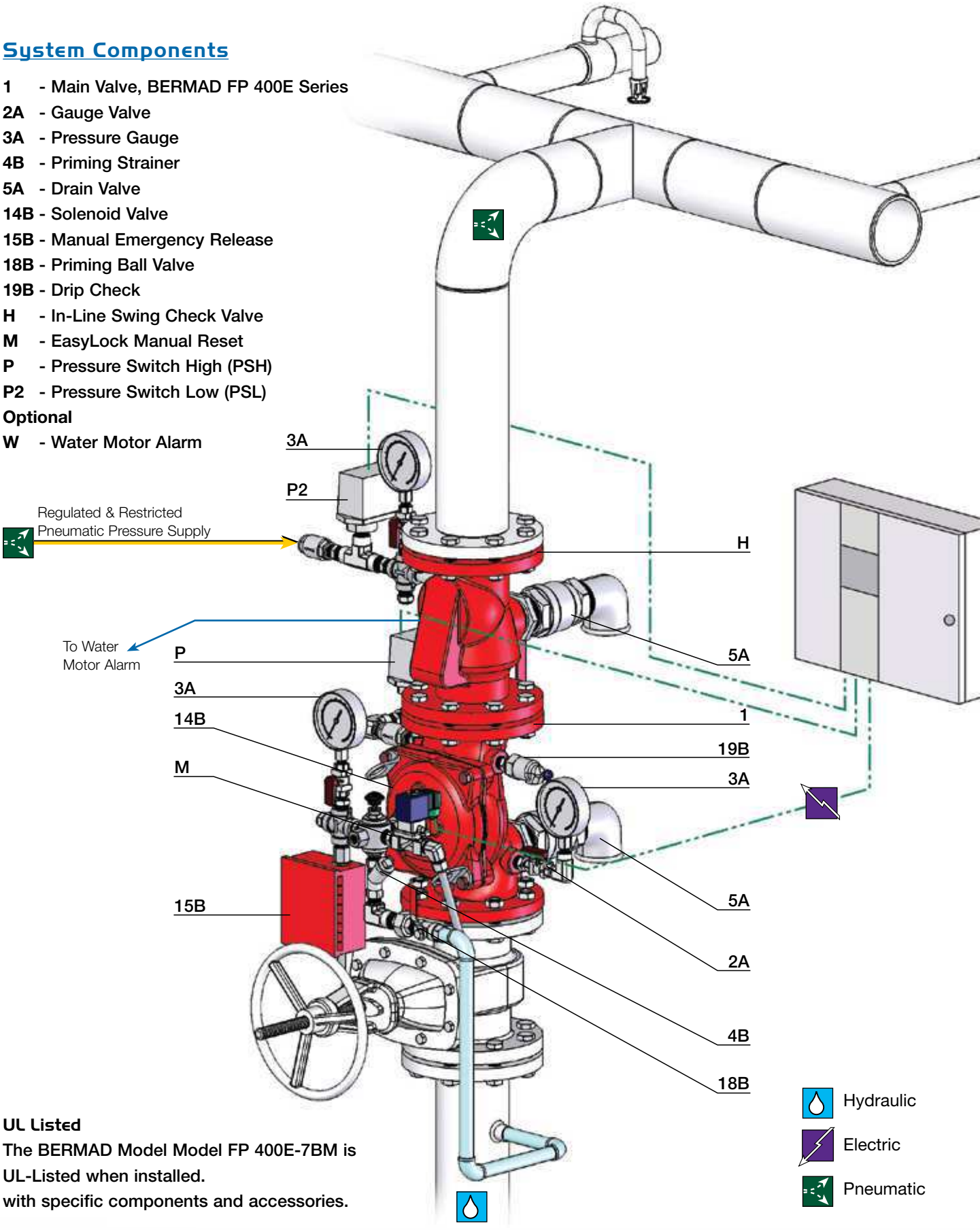
- The pre-action valve shall be a UL-Listed, electrically controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including in line swing check valve with resilient seal, local **EasyLock** Manual Reset, 2-Way Solenoid Pilot Valve, Y strainer, Automatic drip check with manual knob and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Double Interlock Pre-action, Electric-Electric Release System shall consist of pressure switch low and shall be wired to a Cross-Zone releasing panel.

System Components

1 - Main Valve, BERMAD FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
14B - Solenoid Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
H - In-Line Swing Check Valve
M - EasyLock Manual Reset
P - Pressure Switch High (PSH)
P2 - Pressure Switch Low (PSL)

Optional

W - Water Motor Alarm



UL Listed

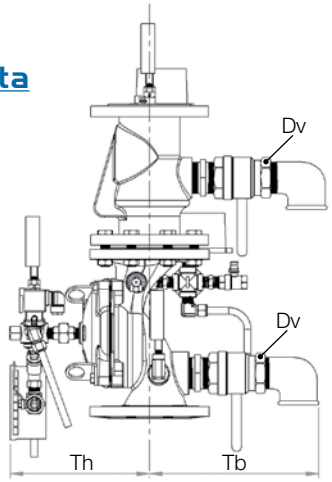
The BERMAD Model Model FP 400E-7BM is UL-Listed when installed.
with specific components and accessories.

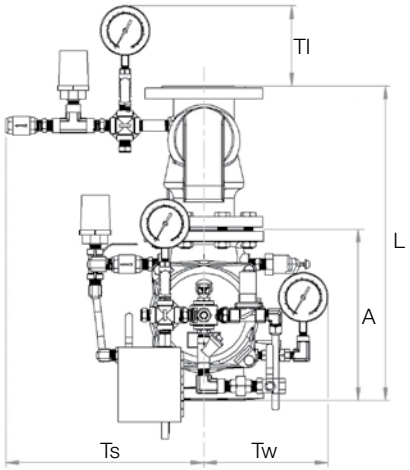
BERMAD Fire Protection

Model: FP 400E-7BM

400 Series

Technical Data





Size		2”		3”		4”		6”		8”	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	377	14 13/16	450	17 3/4	536	21 3/16	720	28 6/16	865	34 1/16
	L_4 (1)	377	14 13/16	443	17 7/8	536	21 3/16	720	28 6/16	N/A	34 1/16
	Tl	150	5 7/8	149	5 7/8	150	5 7/8	135	5 5/16	135	5 5/16
	Tw	208	8 3/16	223	8 3/4	233	9 3/16	272	10 11/16	326	12 13/16
	Ts	363	14 1/4	367	14 7/16	371	14 5/8	398	15 11/16	428	16 7/8
	Th	205	8 1/16	241	9 1/2	261	10 1/4	336	13 1/4	407	16
	Tb	230	9 1/16	300	11 13/16	317	12 1/2	338	13 5/16	405	15 15/16
	Dv Ø	3/4”		1 1/2”		1 1/2”		2”		2”	

Notes:
1. L_1 and L_4 are for flanged ANSI #150 and ISO PN16.
2. Provide adequate space around valve for maintenance.
3. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- • Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8”

Leakage Class
- Class VI (ANSI B16.104)

Sizes
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10”

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Pressure Rating*
- Max. working pressure: 250 psi (17 bar)

* Pressure rating might be limited due to solenoid valve rating

Air Pressure Requirements
- Valve opens on pneumatic pressure drop
- Working pressure 7 – 10psi (0.5 – 0.7 bar)
- Air must be regulated and continually compressed
- Low-pressure alarm switch is factory set to operate at 6psi (0.4 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Poleyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valve

Standard model
- 2-Way Pilot Operated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - ATEX, EEx em IIC T4 (code 8)
  - ATEX, EEx d IIC T4/5 (code 9)
- Voltage: see ordering guide (voltage optio
- Stainless s aterial (code K)

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Double Interlock Pre-action, Electric-Pneumatic Release System

Model: FP 400E-7DM

Description

The BERMAD Model FP 400E-7DM Double Interlock Pre-Action, Electric-Pneumatic Release System is suitable for use in systems requiring that water be kept out of the sprinkler piping until an electric detecting device and a sprinkler have both been activated. Electric-Pneumatic Double Interlock Systems include automatic sprinklers attached to a dry sprinkler piping system, with a supplementary Electric Detection System and a Pneumatic Supervised System of low air pressure in the system piping. The Supervised System consists of a Pneumatic Pilot Valve (PORV), and pneumatic low pressure supply. The Double Interlock Pre-Action System admits water into the sprinkler piping only when the detection system triggers the solenoid valve through the control panel, while the PORV is simultaneously activated due to the pressure drop in the Supervised System.

An anti-flooding feature is provided by utilizing an in-line check valve, which creates an intermediate vented chamber using a Normally Open drip-check.

Typical Applications

Water damageable material storage:

- Computer & Electronics Rooms
- Libraries, Museums & Archives
- Telecommunications equipment
- Cable spreading rooms
- Oil-filled-transformer rooms

Freezing conditions

Features and Benefits

- **Latch open -** Closes only upon local reset
- **Factory pre-assembled trim –** Out-of box-quality
- **In-line serviceable –** Minimal down time
- **In-line Check Valve –** intermediate vented **chamber-** Anti flooding
- **One-piece molded elastomeric moving part –** No maintenance required

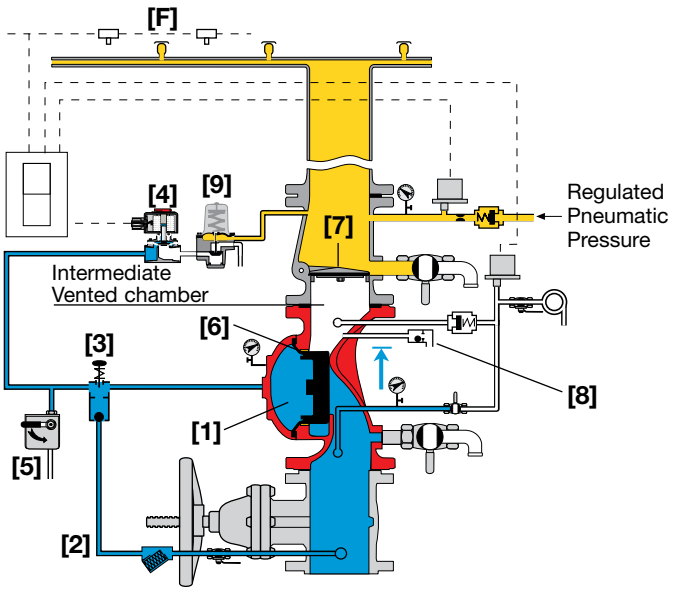
Optional Features

- **Air Maintenance Device** (AMD)
- **Water motor alarm**
- **Valve Position Single/Double Limit Switches**

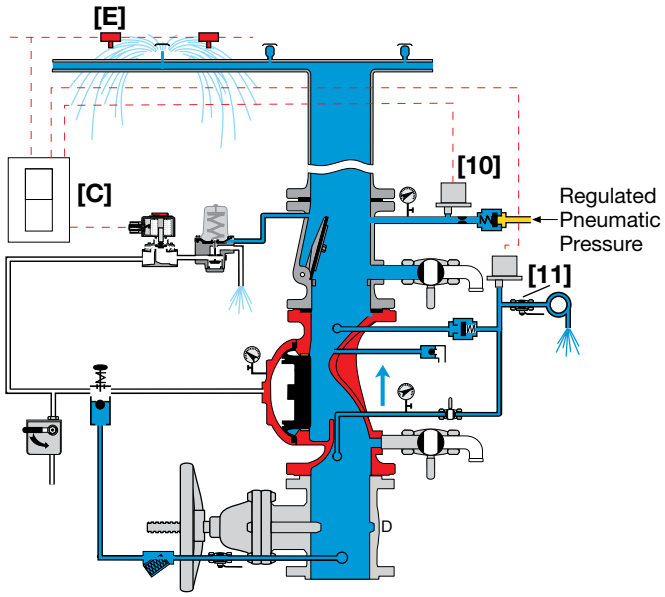
Operation

In the SET position, the line pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]** and through an EasyLock Manual Reset **[3]**, is trapped by the EasyLock internal check valve, by a closed Solenoid Valve **[4]** and by a closed Manual Emergency Release **[5]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[6]**, sealing it bubble tight. The piping system is filled with monitored low air pressure to ensure all sprinklers **[F]** are sealed. An intermediate vented chamber is created by an in-line swing check valve **[7]**, and a Normally Open drip-check **[8]**.

In the event of FIRE, automatic sprinkler activation causes a pneumatic pressure drop that opens a Pneumatic Pilot Valve (PORV) **[9]** and activates air pressure switch low **[10]**, while the main valve remains closed. Only when both the PORV and the Solenoid Valve open (triggered by the electric detection system **[E]**, through a control panel **[C]**), pressure is released from the main valve's control chamber, through the opened Solenoid Valve and PORV (or the Manual Emergency Release). The EasyLock prevents line pressure from entering the control chamber, allowing the pre-action valve to latch open and water to flow into the system piping and to alarm device **[11]**.



Set Position



Operating Condition

Engineer Specifications

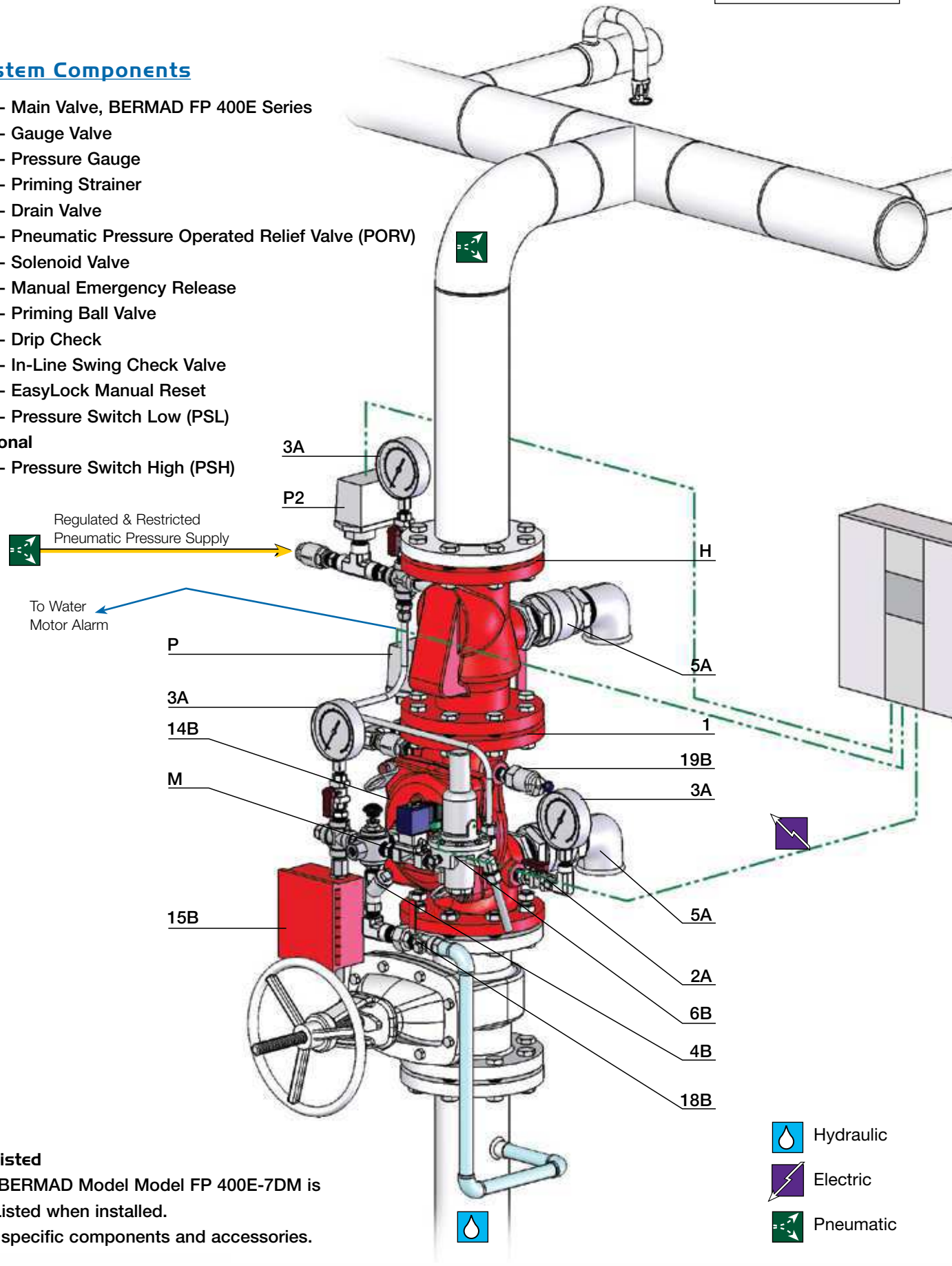
- The pre-action valve shall be a UL-Listed, electrically-controlled elastomeric type globe valve with a **rolling-diaphragm**.
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including in-line swing check valve with resilient seal, local EasyLock Manual Reset, 2-Way Solenoid Pilot Valve, PORV pneumatic pilot valve, Y strainer, Automatic drip check with manual knob and Manual Emergency Release.
- The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.
- The Double Interlock Pre-action, Electric-Pneumatic Release System shall latch open in response to simultaneous activation of both the solenoid and a releasing device. The system shall reset to the closed position only upon local manual activation of the reset device.

System Components

1 - Main Valve, BERMAD FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
6B - Pneumatic Pressure Operated Relief Valve (PORV)
14B - Solenoid Valve
15B - Manual Emergency Release
18B - Priming Ball Valve
19B - Drip Check
H - In-Line Swing Check Valve
M - EasyLock Manual Reset
P2 - Pressure Switch Low (PSL)

Optional

P - Pressure Switch High (PSH)



UL Listed

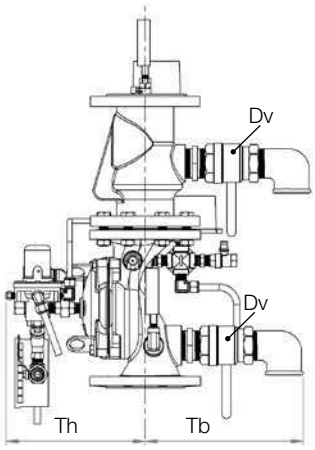
The BERMAD Model Model FP 400E-7DM is UL-Listed when installed.
with specific components and accessories.

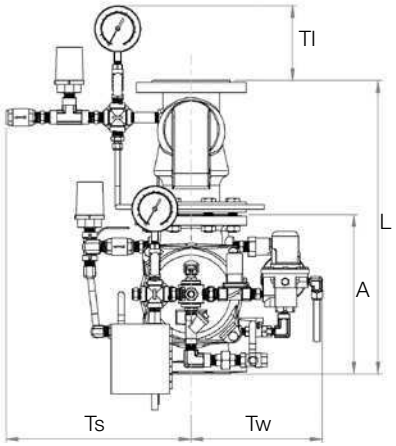
BERMAD Fire Protection

Model: FP 400E-7DM

400 Series

Technical Data





Size		2”		3”		4”		6”		8”	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	377	14 13/16	450	17 3/4	536	21 3/16	720	28 6/16	865	34 1/16
	L_4 (1)	377	14 13/16	443	17 7/8	536	21 3/16	720	28 6/16	N/A	34 1/16
	Tl	150	5 7/8	149	5 7/8	150	5 7/8	135	5 5/16	135	5 5/16
	Tw	208	8 3/16	223	8 3/4	233	9 3/16	272	10 11/16	326	12 13/16
	Ts	363	14 1/4	367	14 7/16	371	14 5/8	398	15 11/16	428	16 7/8
	Th	205	8 1/16	241	9 1/2	261	10 1/4	336	13 1/4	407	16
	Tb	230	9 1/16	300	11 13/16	317	12 1/2	338	13 5/16	405	15 15/16
	Dv Ø	3/4”		1 1/2”		1 1/2”		2”		2”	

Notes:
1. L_1 and L_4 are for flanged ANSI #150 and ISO PN16.
2. Provide adequate space around valve for maintenance.
3. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- • Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8”

Leakage Class
- Class VI (ANSI B16.104)

Sizes
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10”

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Pressure Rating*
- Max. working pressure: 250 psi (17 bar)

* Pressure rating might be limited due to solenoid valve rating

Air Pressure Requirements
- Valve opens on pneumatic pressure drop
- PORV factory set to open: below 20 psi (1.5 bar)
- Air must be regulated and continually maintained to be 30 - 35 psi (2.1 - 2.4 bar)
- Low-pressure alarm switch is factory set to operate at 6psi (0.4 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Poleyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valve

Standard model
- 2-Way Pilot Operated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - ATEX, EEx em IIC T4 (code 8)
  - ATEX, EEx d IIC T4/5 (code 9)
- Voltage: see ordering guide (voltage optio
- Stainless s aterial (code K)

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Dry Pipe Control Valve

Model: FP 400E-DP

UL LISTED

Description

The BERMAD Model 400E-DP, Dry Pipe Control Valve, is suitable for dry pipe systems with automatic sprinklers attached to a dry sprinkler piping system, with a supplementary electric monitoring system and a Pneumatic Supervised System of air pressure in the system piping, installed in the same area.

Typical Applications

- Freezing conditions
- Dry Sprinklers Systems

Features and Benefits

- **Latch open –** Closes only upon local reset
- **Factory pre-assembled trim –** Out-of box-quality
- **One-piece molded elastomeric moving part –** No maintenance required

Optional Features

- **Air Maintenance Device (AMD)**
- **Alarm pressure switch (PSH)**
- **Air-Low pressure switch (PSL)**
- **Water motor alarm**
- **Valve Position Single/Double Limit Switches**

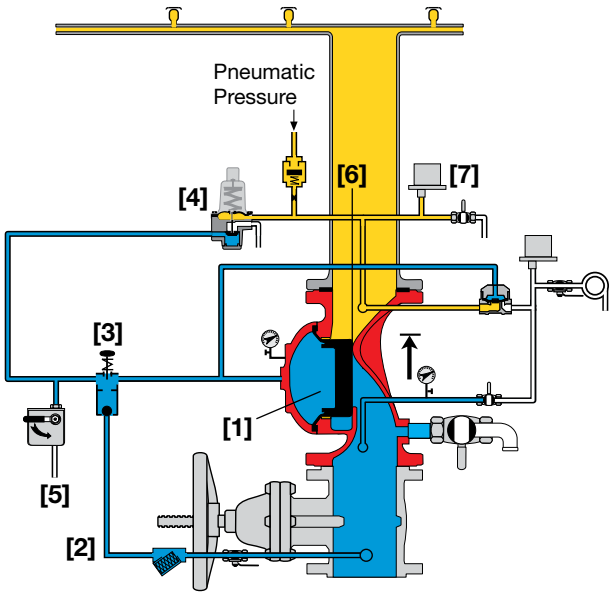
Operation

In the SET position, the line pressure supplied to the main valve's control chamber **[1]** via the priming line **[2]** and through an EasyLock Reset device (EMR) **[3]**, is trapped by the EMR's internal check valve, PORV-M (Latching type, Pressure Operated Relief Valve) **[4]**, and by a closed Manual Emergency Release **[5]**. The trapped pressure holds the main valve's diaphragm and plug against the valve seat **[6]**, sealing it bubble tight and keeping the system piping dry. The PORV-M is held closed by 2 bars air pressure maintained in the closed sprinkler system, the low air pressure can be monitored by a PSL (pressure switch low, optional) **[7]**.

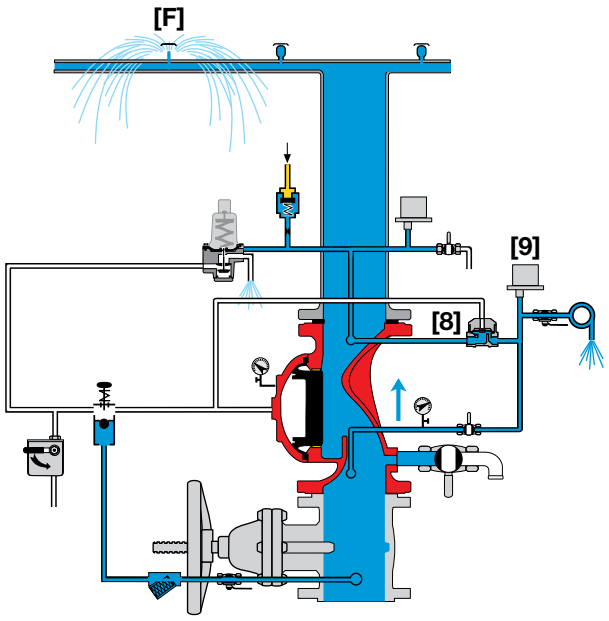
Under fire conditions, activation of an automatic sprinkler **[F]** causes a pneumatic pressure drop that opens the PORV-M. Water pressure is then released from the main valve's control chamber, through the opened PORV-M.

The EMR prevents line pressure from entering the control chamber, allowing the main valve to latch open and water to flow into the system piping and discharge through sprinklers that have been opened due to excessive heat.

The released water also causes the Alarm Hydraulic Relay Valve (HRV-2) **[8]** to open, allowing water to flow to the Water Alarm Pressure Switch High (PSH) and/or Water Motor Alarm Gong **[9]**.



Valve Closed (set position)



Valve Open (operating condition)

Engineer Specifications

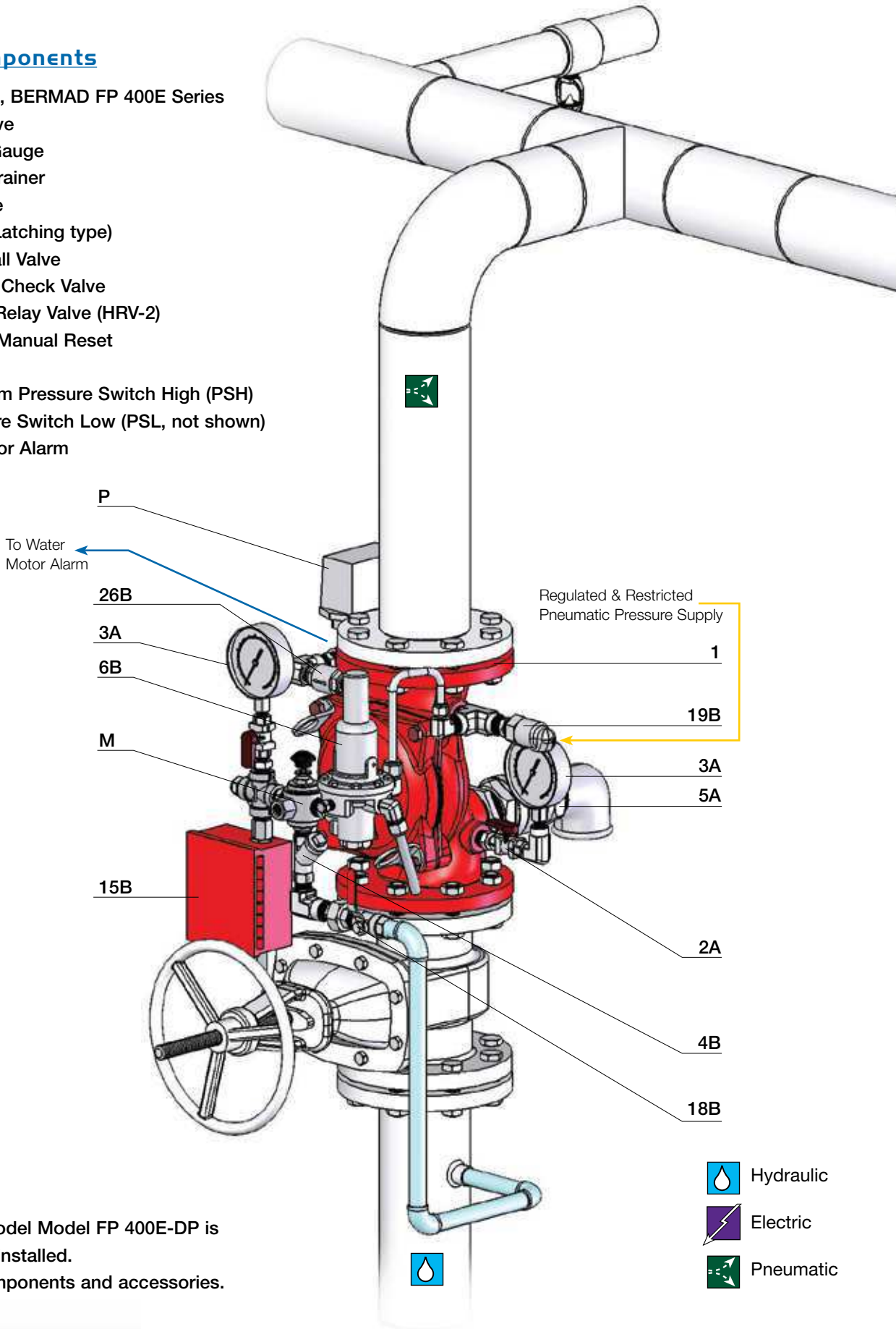
- The Dry Pipe Control valve shall be a UL Listed, pneumatically controlled elastomeric type globe valve with a **rolling-diaphragm**
- The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
- Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
- The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
- The control trim materials shall consist of St.St. 316 tubing and fittings, and plated brass accessories, including local "EasyLock Manual Reset" (EMR), PORV-M latching type pneumatic pilot valve.
  Air supply spring-loaded check valve , Hydraulic Relay valve (HRV-2), Y strainer and Manual Emergency Release.
- The Trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 & 9001 certified factory.
- The Dry Pipe Control Valve shall latch open in response to activation of a releasing device. The valve shall reset to close only upon local manual activation of the reset device.

System Components

1 - Main Valve, BERMAD FP 400E Series
2A - Gauge Valve
3A - Pressure Gauge
4B - Priming Strainer
5A - Drain Valve
6B - PORV-M (Latching type)
18B - Priming Ball Valve
19B - Air Supply Check Valve
26B - Hydraulic Relay Valve (HRV-2)
M - EasyLock Manual Reset

Optional

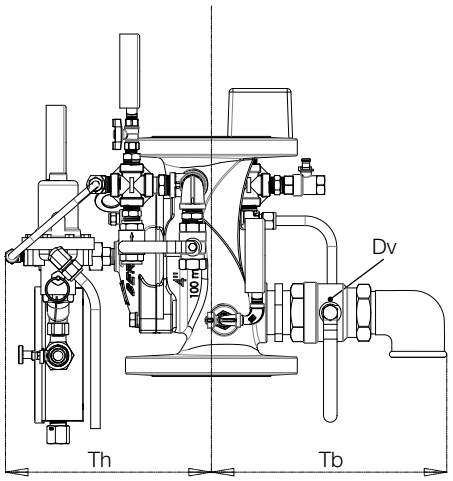
P - Water Alarm Pressure Switch High (PSH)
P2 - Air Pressure Switch Low (PSL, not shown)
W - Water Motor Alarm

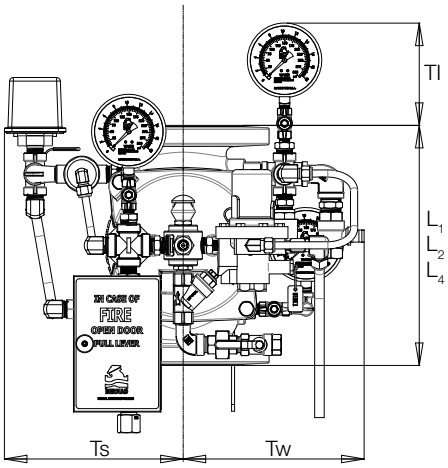


UL Listed

The BERMAD Model Model FP 400E-DP is UL-Listed when installed.
with specific components and accessories.

Technical Data





Size		1½", 2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/16	205	8 1/16	257	10 1/8	320	12 5/8	415	16 5/16	500	19 11/16	605	23 13/16	725	28 9/16
	L_4 (2)	205	8 1/16	N/A	N/A	250	9 13/16	320	12 5/8	415	16 5/16	500	19 11/16	N/A	N/A	N/A	N/A
	Tl	142	5 5/8	142	5 5/8	119	4 11/16	84	3 5/16	57	2 1/4	-	-	-	-	-	-
	Tw	228	9	220	8 11/16	243	9 9/16	253	10	312	12 5/16	326	12 13/16	346	13 5/8	391	15 3/8
	Ts	228	9	220	8 11/16	243	9 9/16	253	10	318	12 1/2	326	12 13/16	326	12 13/16	391	15 3/8
	Th	226	8 7/8	242	9 1/2	262	10 5/16	261	10 5/16	356	14	407	16	407	16	546	21 1/2
	Tb	278	10 1/16	289	11 3/8	300	11 13/16	337	13 1/4	378	14 7/8	405	15 15/16	413	16 1/4	473	18 5/8
	Dv Ø	¾"		1½"		1½"		2"		2"		2"		2"		2"	

Notes:
1. L_1 is for flanged ANSI #150 and ISO PN16.
2. L_4 is for grooved end connections (Ductile Iron Only).
3. Provide adequate space around valve for maintenance.
4. Data is for envelope dimensions, specific component positioning may vary.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) or ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL-Listed for sizes 1½, 2, 2½, 3, 4, 6, 8 & 10"

Pressure Rating
- Max. working pressure: 250 psi (17 bar)

PORV Setting
Valve opens on pilot line pressure drop factory set: 20 psi (1.5 bar)

Manufacturers Standard Materials
Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel 304 & Cast Iron

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Nylon fabric reinforced polyisoprene NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials
Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Ni-Al-Bronze
- Hastalloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Built Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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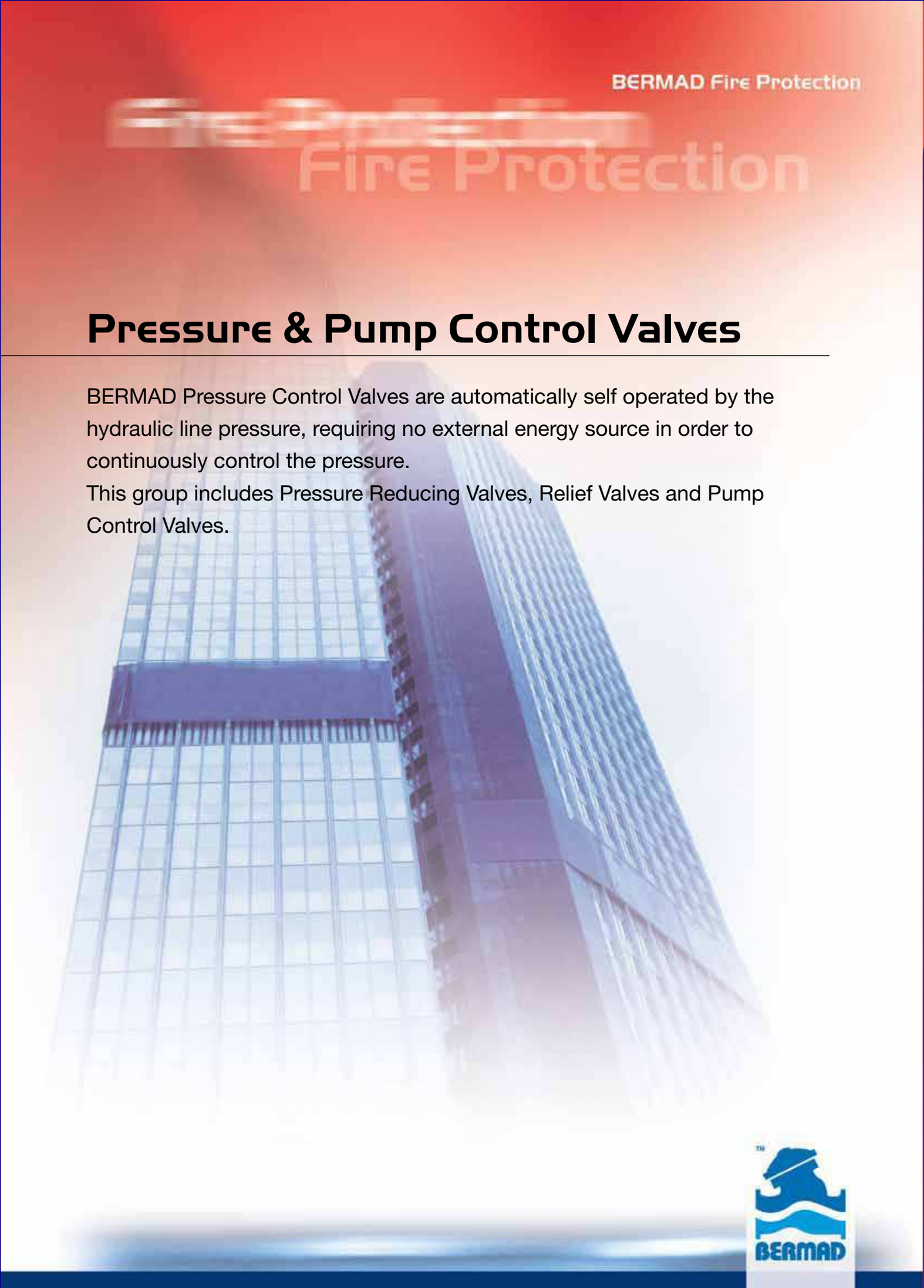
Pressure & Pump Control Valves

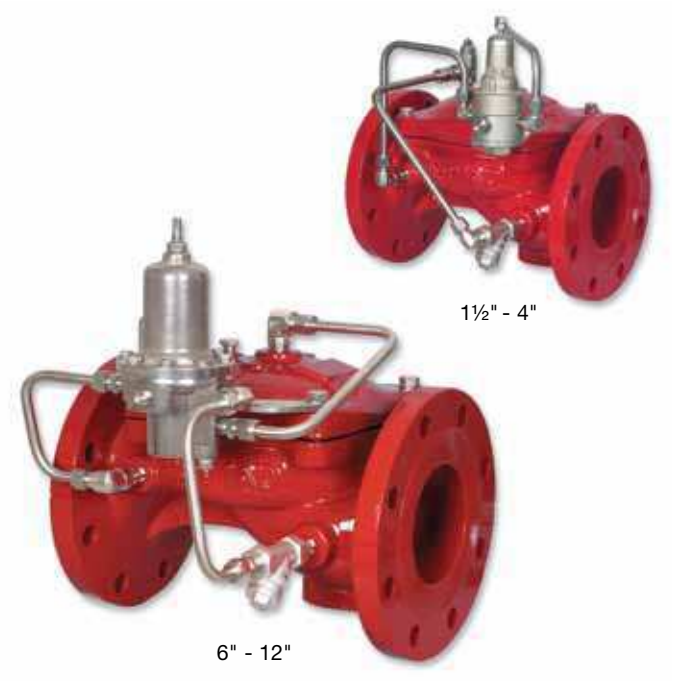
BERMAD Pressure Control Valves are automatically self operated by the hydraulic line pressure, requiring no external energy source in order to continuously control the pressure.

This group includes Pressure Reducing Valves, Relief Valves and Pump Control Valves.



Pressure Reducing Valve

Model: FP 420-00



Description

The Model FP 420-00 Pressure Reducing Valve is a hydraulically self operated, diaphragm actuated control valve that reduces high, unstable upstream pressure to maintain precise stable downstream pressure, regardless of flactuating demand or varying upstream pressure.

Typical Applications

- Hose station feeds
- Sprinkler systems with over pressure
- Deluge systems with over pressure
- Foam systems
- Fire hydrant water supply

Features and Benefits

- **Advanced Elastomeric Globe type –** Low pressure loss
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Factory pre-assembled trim –** Out-of-Box Quality
- **In-line serviceable –** Minimal down time

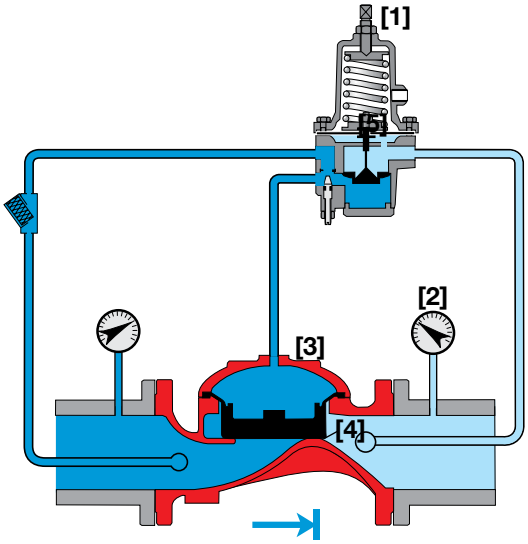
Optional Features

- **Large control filter** (code: F)
- **Seawater service**
- **Valve Position Single/Double Limit Switches**

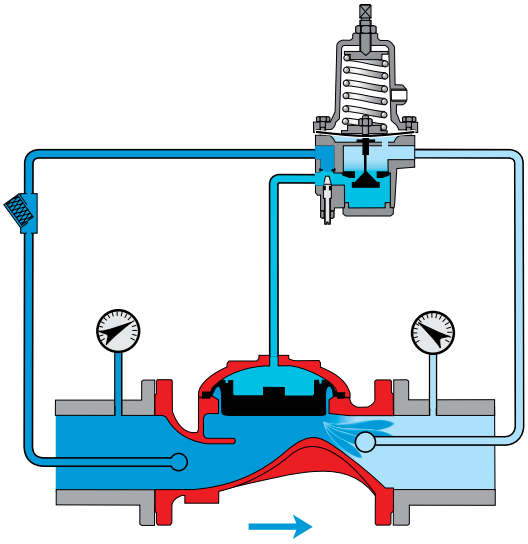
Note: Optional features can be mixed and matched. Consult your Bermad representative for full details

Operation

The BERMAD Model FP 420-00, pilot operated pressure reducing valve automatically and accurately reduces upstream water pressure to a specific, adjustable value. The FP 420-00 operates under both flowing and non-flowing (static) conditions. The Pressure Reducing Pilot **[1]** senses downstream pressure **[2]** and in real time modulates the main valve **[3]** to maintain the constant downstream pressure.
In no-flow static conditions, should the downstream pressure start rising above pilot setting, the pilot closes, shutting the main valve drip-tight **[4]** to maintain the allowable downstream pressure.



Valve Closed (static condition)



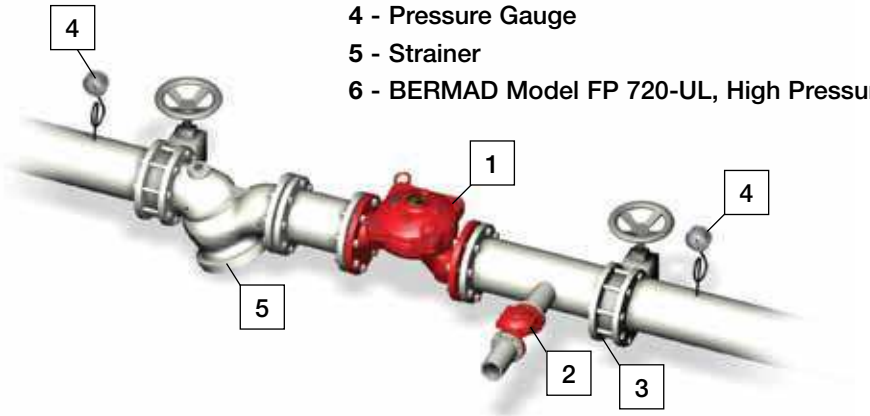
Valve Open (flowing condition)

Engineer Specifications

The pressure reducing valve shall eliminate downstream over-pressure, maintaining a constant downstream delivery pressure, regardless of varying pressures and/or flows.
The main valve shall be an elastomeric type globe valve with a rolling-diaphragm.
Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Typical Installations

Standard Pressure Reducing System

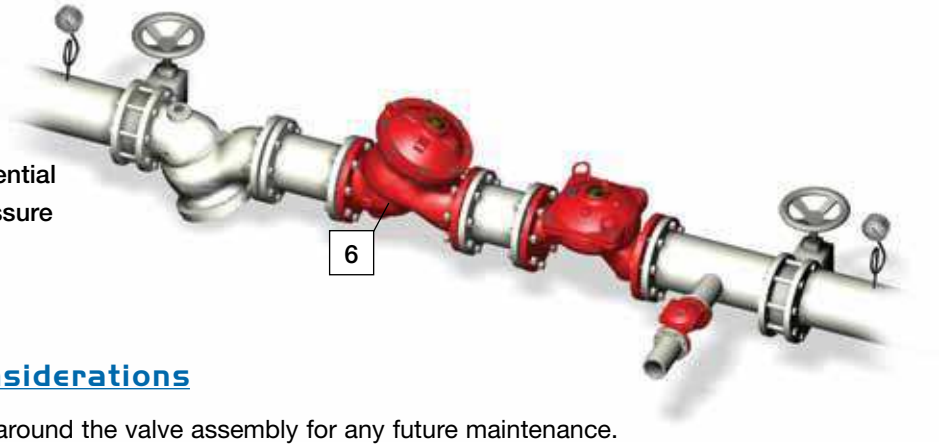


Parallel Pressure Reducing System

- Wide flow range
- Redundant safety
- Serviceable with zero down time

Two-Stage Pressure Reducing System

- High pressure differential
- Added reduced pressure zone protection



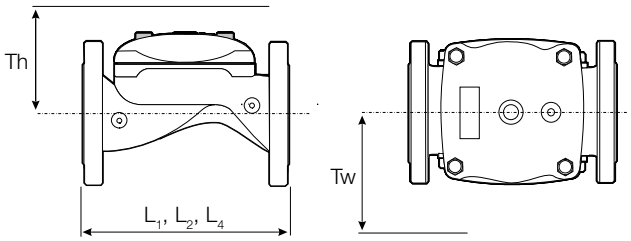
System Components

1 - BERMAD Model FP 420-00
2 - BERMAD Model FP-430-UF Pressure Relief Valve
3 - Isolating Valve
4 - Pressure Gauge
5 - Strainer
6 - BERMAD Model FP 720-UL, High Pressure Reducing Valve

Installation Considerations

- Allow enough room around the valve assembly for any future maintenance.
- Install isolating valves upstream and downstream of the system.
- Install the valve horizontally with the cover facing up (consult Bermad for other configurations).
- Install a relief valve (recommended: BERMAD Model FP 430-UF) of the appropriate size on the downstream side of the FP 420-00, as required by NFPA-20 standard.
- Install a pressure gauge on each side of the system.

Technical Data



Size		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	L_4 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. L_4 is for grooved end connections (Ductile Iron Only).
4. Tw & Th are max. for pilot system.
5. Data is for envelope dimensions, component positioning may vary.
6. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 2, 2½, 3, 4, 6, 8, 10 & 12"

Pressure Rating
- Max. inlet: 250 psi (17 bar)
- Set: 30 - 165 psi (2 - 11.5 bar)
- Test : 365 psi (25 bar)

Approvals
- ABS
- Lloyd's Registered

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

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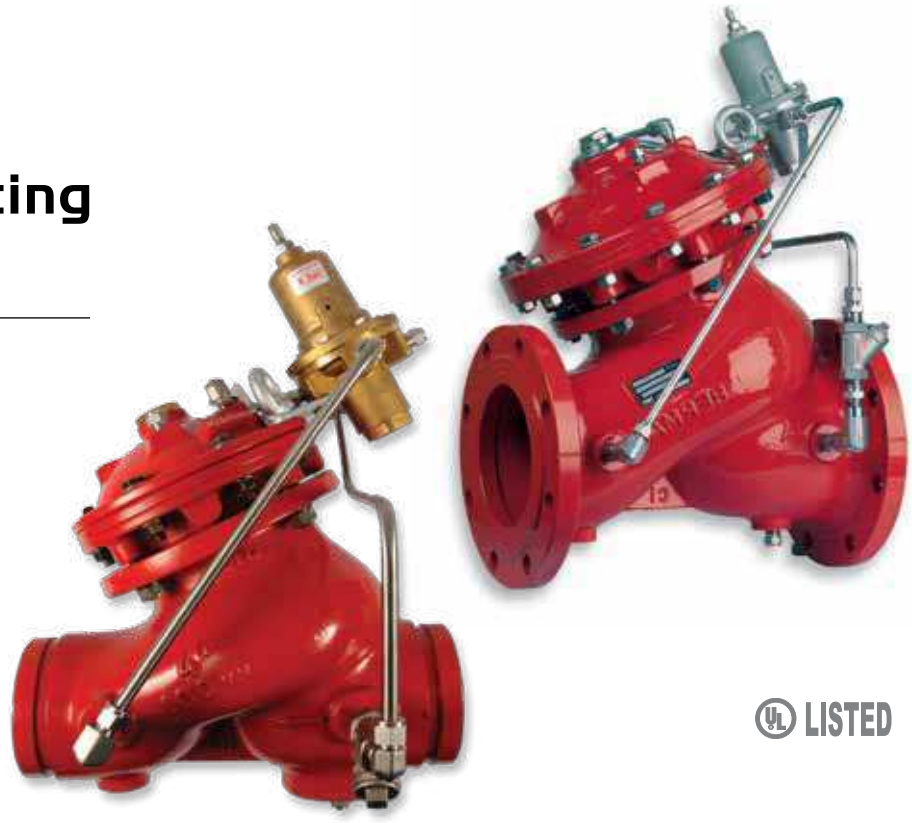
Pressure Reducing Valve

Model: FP 720-UL



UL LISTED

Description

The Model FP 720-UL reduces high, unstable upstream pressure to maintain precise stable downstream pressure, regardless of changing upstream pressure or flow, and requires only existing line pressure to operate.

Typical Applications

- Hose station feeds
- Sprinkler systems with over pressure
- Deluge systems with over pressure
- Foam systems
- Fire hydrant water supply

Features and Benefits

- **Minimized pressure loss**
  - Unobstructed flow path
  - Advanced “Y”, or angle pattern
  - Wide range flow V-Port Throttling Plug
- **Advanced pilot system with adjustable closing speed –** Accurately maintains static and dynamic pressure
- **Double chambered unitized actuator**
  - Easy, in-line inspection ensures minimal down time
  - **Quick and smooth valve action**
- **Replaceable stainless steel valve seat –** Long valve life

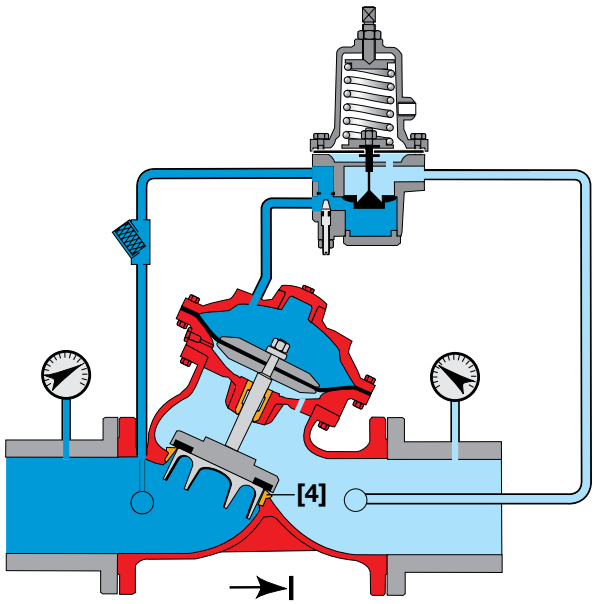
Optional Features

- **Large control filter** (code: F)
- **Seawater service FS as prefix to model**

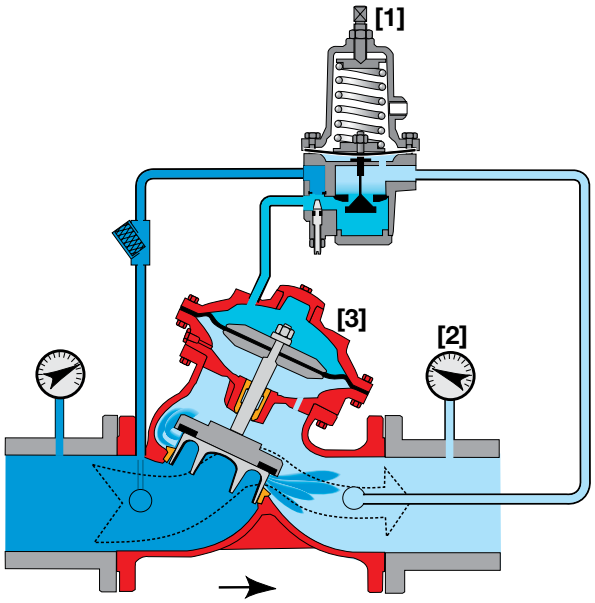
Note: Optional features can be mixed and matched. Consult your Bermad representative for full details.

Operation

The BERMAD Model FP 720-UL, pilot operated pressure reducing valve automatically and accurately reduces downstream water pressure to a specific, adjustable value. The FP 720-UL operates under both flowing and non-flowing (static) conditions. The Pressure Reducing Pilot **[1]** senses downstream pressure **[2]** and in real time modulates the main valve **[3]** to maintain a constant downstream pressure.
In no-flow static conditions, should the downstream pressure start rising above pilot setting, the pilot closes, shutting the main valve drip-tight sealing **[4]** to maintain the allowable downstream pressure.



Valve Closed (static condition)



Valve Open (flowing condition)

Engineer Specifications

The Pressure Reducing Valve shall be UL Listed for fire protection. It shall eliminate downstream over-pressure, maintaining a constant downstream delivery pressure, regardless of varying pressures and/or flows.
The main valve shall be a diaphragm actuated, “Y” pattern (or angle) valve.
Valve actuation shall be accomplished by one moving assembly containing a double chambered actuator, which shall include a stainless steel stem and a resilient elastomeric seal held by a flat seal disk and creating a drip tight seal against the seat.
The valve seat shall be removable and made of stainless steel. The seat bore net area shall be no less than that of the valve nominal diameter and shall have an **unobstructed flow path** with no stem guide or **supporting ribs**.
All necessary inspection and servicing shall be possible in-line.
The valve shall be UL-Listed as a pressure controlling water control valve.
The Pressure Reducing Pilot Valve shall be UL-Listed as part of the assembly.
The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Typical Installations

Standard Pressure Reducing System

Parallel Pressure Reducing System

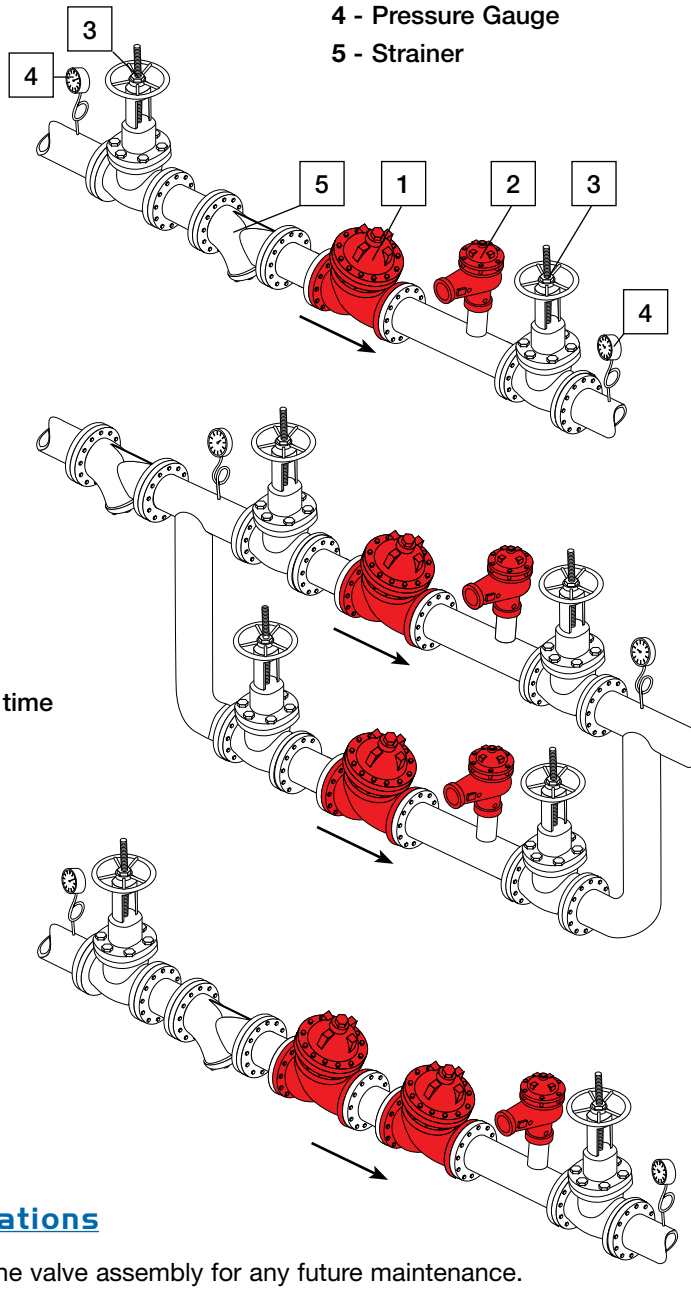
- Wide flow range
- Redundant safety
- Serviceable with zero down time

Two-Stage Pressure Reducing System

- High pressure differential
- Added reduced pressure zone protection

System Components

1 - BERMAD Model FP 720-UL
2 - Pressure Relief Valve (BERMAD Model FP 730-UF)
3 - Isolating Valve
4 - Pressure Gauge
5 - Strainer



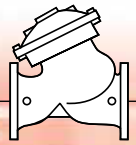
Installation Considerations

- Allow enough room around the valve assembly for any future maintenance.
- Install isolating valves upstream and downstream of the valve system.
- Install the valve horizontally with the cover facing up.
- Install a UL-Listed relief valve (recommended: BERMAD Model FP 730-UF) of the appropriate size on the downstream side of the FP 720-UL, as required by NFPA-20 standard.
- Install a UL-Listed pressure gauge on both sides of the valve.

UL Listed

The BERMAD Model FP 720-UL is UL-Listed when installed as a unit.

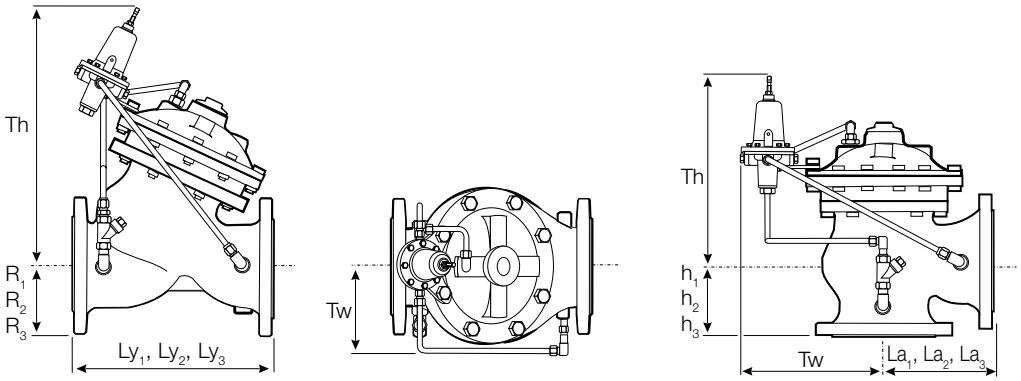
BERMAD Fire Protection



Model: FP 720-UL

700 Series

Technical Data



Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"		14"		16"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	Ly_1 (1)	205	8 1/16	205	8 1/16	209	8 1/4	250	9 7/8	320	12 5/8	415	16 3/8	500	19 11/16	605	23 13/16	725	28 9/16	733	28 7/8	990	39
	Ly_2 (2)	155	6 1/8	155	6 1/8	212	8 3/8	250	9 13/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ly_3 (3)	210	8 1/4	210	8 1/4	212	8 3/8	264	10 7/16	335	13 1/4	433	17 1/16	524	20 5/8	637	25	762	30	767	30 3/16	1,024	40 3/4
	La_1 (1)	121	4 3/4	121	4 3/4	140	5 1/2	152	6	190	7 1/2	225	8 7/8	265	10 7/16	320	12 5/8	396	15 9/16	400	15 3/4	450	17 3/4
	La_2 (2)	120	4 3/4	120	4 3/4	140	5 1/2	159	6 1/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	La_3 (3)	127	5	127	5	149	5 7/8	159	6 1/4	200	7 7/8	234	9 3/16	277	10 7/8	336	13 1/4	415	16 5/16	419	16 1/2	467	18 3/8
	h_1 (1)	82	3 1/4	82	3 1/4	102	4	102	4	127	5	152	6	203	8	219	8 5/8	275	10 13/16	275	10 13/16	369	14 1/2
	h_2 (2)	82	3 1/4	82	3 1/4	102	4	114	4 1/2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	h_3 (3)	89	3 1/2	89	3 1/2	109	4 5/16	108	4 1/4	135	5 5/16	165	6 1/2	216	8 1/2	235	9 1/4	294	11 1/2	294	11 1/2	386	5 3/16
	R_1 (1)	75	2 15/16	83	3 1/4	93	3 5/8	100	3 15/16	114	4 1/2	140	5 1/2	171	6 3/4	203	8	241	9 1/2	267	10 1/2	298	11 3/4
	R_2 (2)	40	1 9/16	40	1 9/16	48	1 7/8	55	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R_3 (3)	78	3 1/16	83	3 1/4	95	3 3/4	108	4 1/4	127	5	159	6 1/4	191	7 1/2	222	8 3/4	260	10 1/4	292	11 1/2	324	12 3/4
	Tw	191	7 1/2	191	7 1/2	191	7 1/2	207	8 1/16	242	9 1/2	290	11 7/16	325	12 13/16	370	14 9/16	515	20 1/4	525	20 11/16	610	24
	Th	312	12 5/16	312	12 5/16	312	12 5/16	364	14 1/2	405	15 15/16	505	20	566	22 5/16	639	25 3/16	449	17 11/16	449	17 11/16	541	21 5/16

Notes:
1. Ly_1 for ANSI#150, ISO PN16 & Grooved ends (see available sizes below)
2. La_1 & h_1 for Angle body, ANSI#150 and ISO PN16.
3. Ly_2, La_2 & h_2 for threaded female, NPT or BSP.
4. Ly_3, La_3 & h_3 for flanged ANSI #300 and ISO PN25.
5. Data is for maximum envelope dimensions, component positioning may vary.
6. Provide adequate space around valve for maintenance.

Connection Standard
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze), ISO PN16
- Threaded: NPT or BSP 2, 2½ & 3"

Water Temperature
- 0.5 - 80°C (33 - 180°F)

Sizes ("Y" & Angle)
- Available Y: 1½ - 20"
- Angle: 1½ – 18"
- 24-36" Globe
- UL-Listed: 2, 2½, 3, 4, 6 & 8"

Pressure Rating
- UL-Listed 2 - 6": 300 psi (21 bar)
  8" to : 175 psi (12 bar)
- Max. for Class#150: 250 psi (17 bar)
- Max. for Class#300: 400 psi (28 bar)
- Max. for Grooved ends: 400 psi (28 bar)
- Setting range: 30 - 165 psi (2 - 11.5 bar)
- Test pressure: 450 psi (31 bar)

Manufacturers Standard Materials
Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials
Main valve body/internals
- Carbon Steel ASTM A-216-WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148
- Titanium
- Duplex
- Hastalloy

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastalloy C-276

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Approvals
- UL Listed for: Special system water control valves (VLMT), Pressure Reducing and Pressure Control type for Fire Protection Systems.
- ABS
- Lloyd's Registered

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Pressure Relief Valve

Model: FP 430-UF

FM APPROVED

UL LISTED

APPROVED

Description

The BERMAD Model FP 430-UF pilot operated valve prevents over pressure, maintaining a constant preset system pressure regardless of fluctuating demands.
UL-Listed (up to 175 psi) and FM-Approved according to NFPA-20.
The valve offers reliable performance in:
Refineries, petrochemical complexes, tank farms,
high-rise buildings, aviation, marine and on-shore installations.

Typical Applications

- Pressure relief for individual diesel fire pump
- Pump station pressure relief
- Centralized thermal pressure relief
- Foam recirculation; maintains required foam pressure
- Zone safety relief

Features and Benefits

- **Advanced Elastomeric Globe type –** Low pressure loss
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **In-line serviceable –** Minimal down time

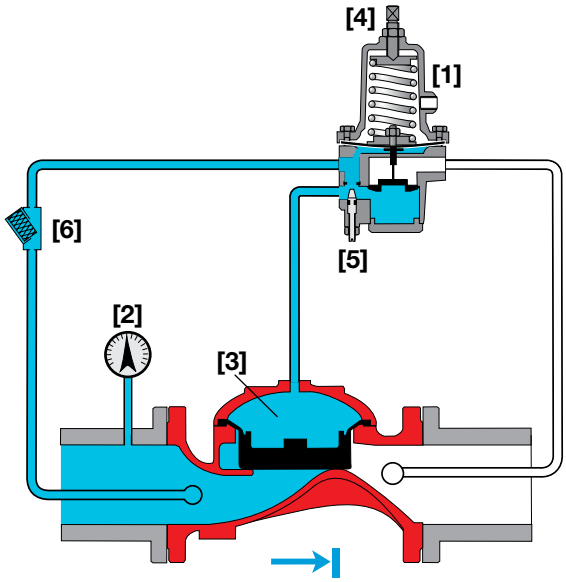
Optional Features

- **Large control filter** (code: F)
- **Seawater service construction**
- **Valve Position Single/Double Limit Switches**

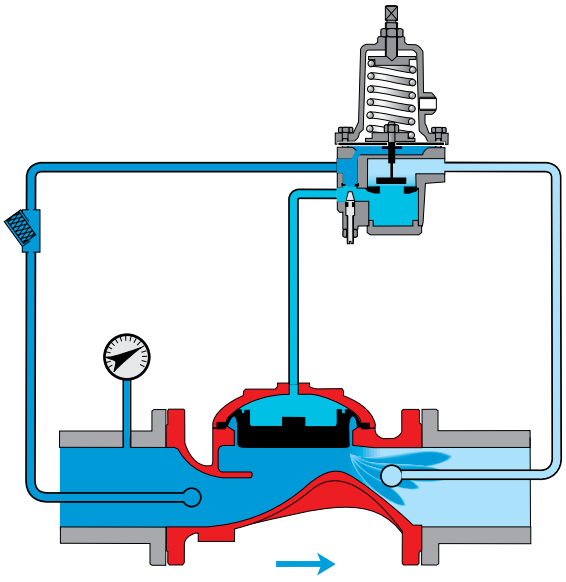
Note: Optional features can be mixed and matched.
Consult your local BERMAD representative for full details

Operation

The BERMAD Model FP 430-UF remains closed as long as the sensed upstream pressure is lower than the adjustable set point. When the Pressure Relief Pilot **[1]** senses upstream pressure **[2]** that is higher than the pilot setting, it acts upon the control chamber **[3]** causing the main valve to modulate open, relieving excess pressure to either a reservoir or sump, thus preventing system over pressure. The Pressure Relief Pilot is equipped with an adjusting screw **[4]** to preset the desired upstream pressure, and an integral adjustable needle valve **[5]** to control the main valve closing speed. The valve's unique design provides quick reaction to system demand and keeps pressure loss at a minimum. The control system is equipped with a control strainer **[6]**.



Valve Closed



Valve Open (pressure-relief)

Engineer Specifications

The Pressure Relief Valve shall be UL-Listed, FM-Approved, and hydraulic pilot controlled. The main valve shall be an elastomeric type globe valve with a rolling-diaphragm.

Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.

The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**.

The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.

The pilot system shall be field adjustable, with adjustable valve closing speed integrated into the main valve, hydraulically tested and supplied as an assembly consisting of:

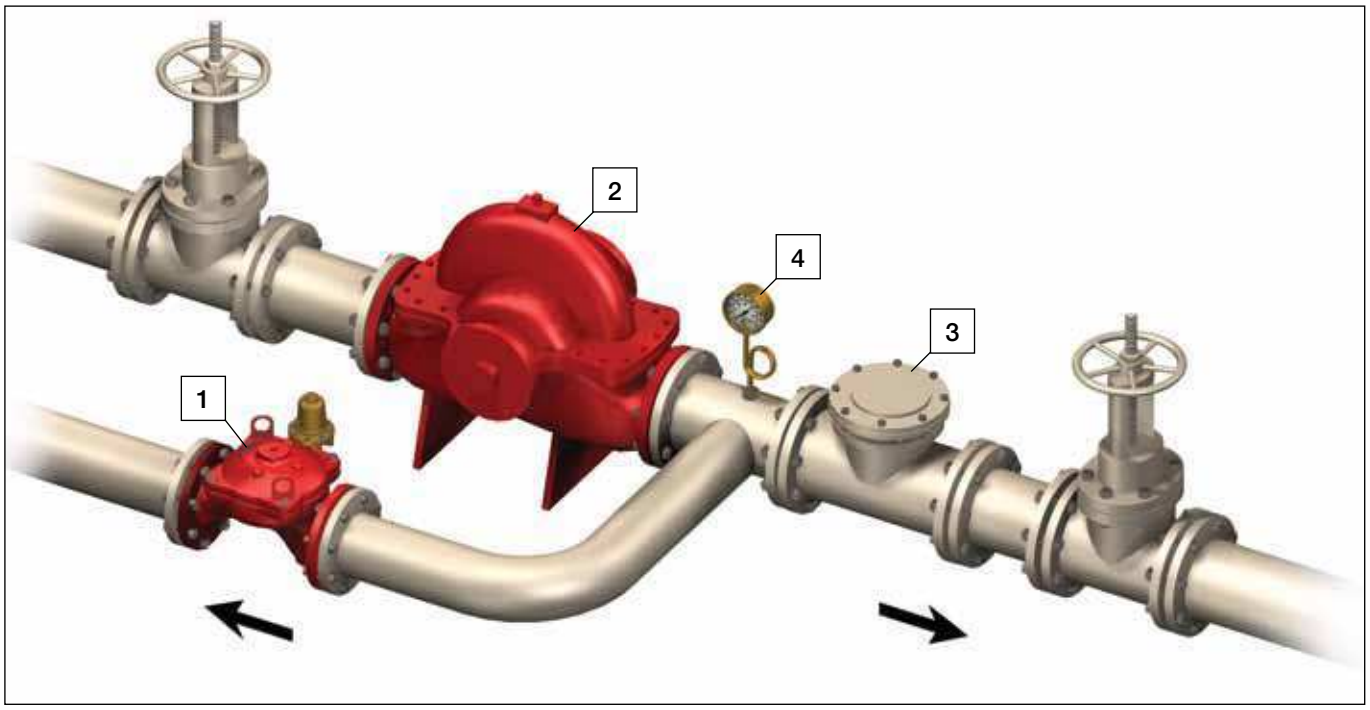
- Relief pilot valve UL-Listed and FM-Approved as part of the assembly with built-in, internal needle valve
- "Y" strainer

The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Typical Installations

System Components

1 - BERMAD Model FP 430-UF
2 - Fire Pump
3 - Check Valve
4 - Pressure Gauge



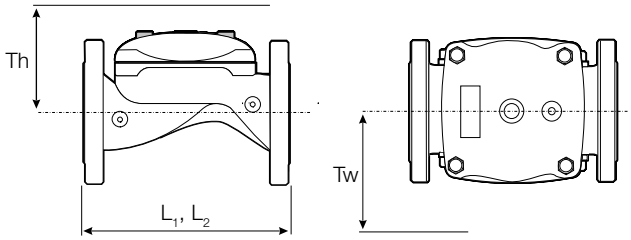
Installation Considerations

- Valve size should be no less than NFPA-20 requirements.
- Provide adequate clearance around valve for maintenance, ensuring that the actuator can be easily removed.
- Design installation with the valve cover up for best performance.
- Ensure that before the valve is installed, instructions are given to flush the pipeline at full flow.

Approvals

The BERMAD Model FP 430-UF is UL-Listed and FM-Approved when installed as a unit.

Technical Data



Size		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 2, 2½, 3, 4, 6, 8, 10 & 12"
- UL Listed and FM approved: 2, 2½, 3, 4 & 6"

UL Listed / FM Pressure Rating
- Max. inlet: 175 psi (12 bar)
- Set: 30 - 175 psi (2 - 12 bar)
- Test: 365 psi (25 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Approvals
- UL Listed - Fire Pump Relief Valve (QXZQ)
- FM Approved - Water Relief Valve and Fire Pump Relief Valve
- ISO 9001 QA certified
- ABS approval 2-12"
- Lloyd's Registered 2-12"

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Pressure Relief Valve

Model: FP 730-UF

APPROVED

Description

The BERMAD Model FP 730-UF pilot operated valve prevents over pressure, maintaining a constant preset system pressure regardless of fluctuating demands.
It is UL-Listed (up to 350 psi) and FM-Approved according to NFPA-20.
The valve offers reliable performance in:
Refineries, petrochemical complexes, tank farms, high-rise buildings, aviation and airports, marine and on-shore installations.

Typical Applications

- Pressure relief for individual diesel fire pump
- Pump station pressure relief
- Centralized thermal pressure relief
- Foam recirculation; maintains required foam pressure
- Zone safety relief

Features and Benefits

- **Hydraulically powered valve seal design**
  - Closes drip-tight time after time
  - Eliminates jamming problems
- **Hydro-efficient body design**
  - Wide rangeability
  - Unrestricted flow path
- **Double-chambered unitized actuator**
  - Easy, inline inspection ensures minimal down time
  - Quick and smooth valve action

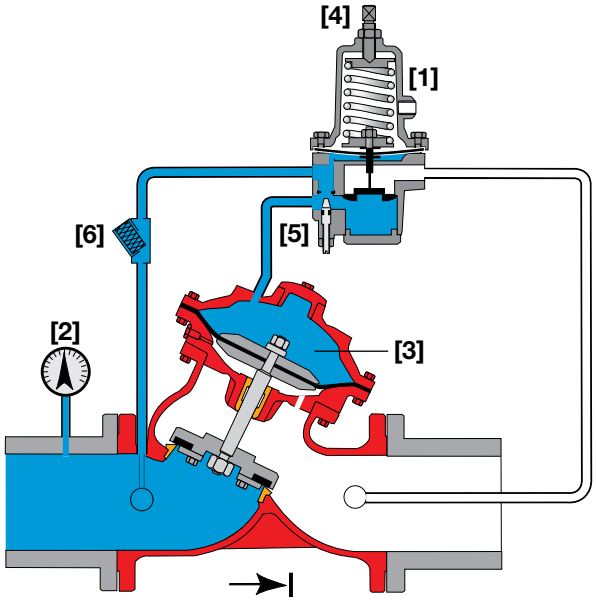
Optional Features

- **Large control filter** (code: F)
- **Seawater service construction**

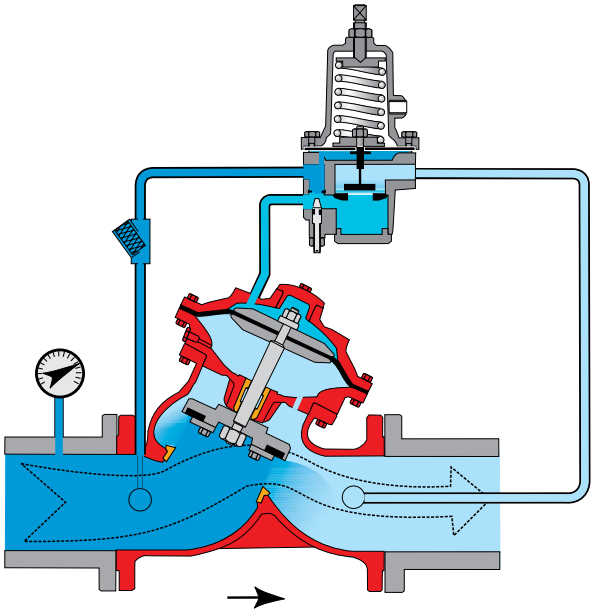
Note: Optional features can be mixed and matched.
Consult your local BERMAD representative for full details.

Operation

The BERMAD Model FP 730-UF remains closed as long as the sensed inlet pressure is lower than the adjustable set point. When the Pressure Relief Pilot **[1]** senses inlet pressure **[2]** that is higher than the pilot setting, it acts upon the control chamber **[3]** causing the main valve to modulate open, relieveing excess pressure to either the reservoir or sump, thus preventing system over pressure. The Pressure Relief Pilot is equipped with an adjusting screw **[4]** to preset the desired inlet pressure and an integral adjustable needle valve **[5]** to control the main valve closing speed. The valve's unique design quick reaction to system demand and keeps pressure loss at a minimum. The control system is equipped with a control strainer **[6]**.



Valve Closed



Valve Open (pressure relief)

Engineer Specifications

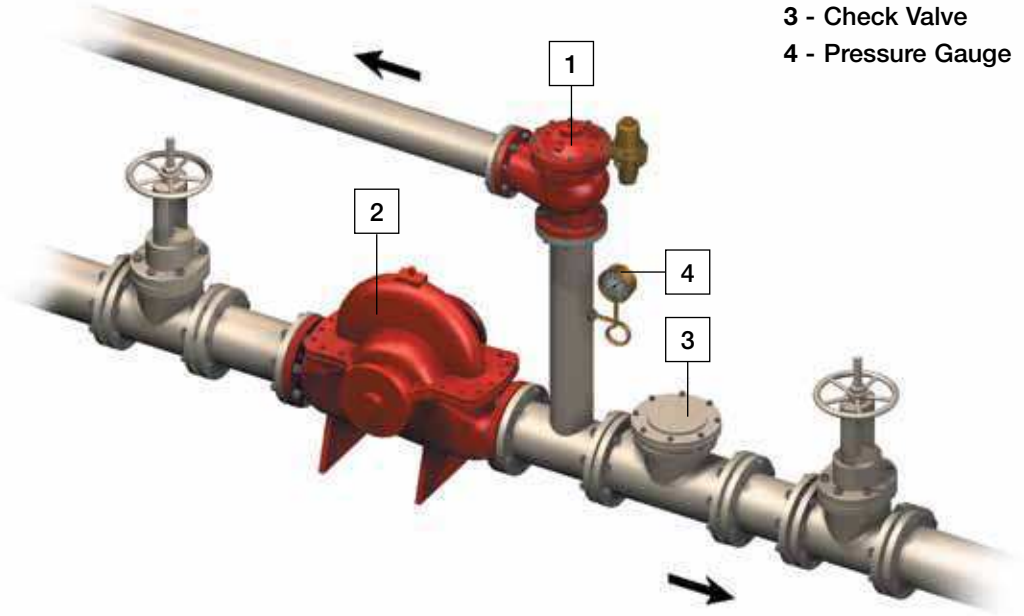
The Pressure Relief Valve shall be UL-Listed, FM-Approved and hydraulic pilot controlled. The main valve shall be an angle or "Y" pattern. All necessary inspection and servicing of the main valve shall be possible in-line.
Valve actuation shall be accomplished by a double chambered actuator, which shall include a stainless steel stem and a flat seal disk creating a drip tight seal.
The valve seat shall be made of stainless steel and have an **unobstructed flow path**, with no stem guide or **supporting ribs**.
The pilot system shall be field adjustable, with adjustable valve closing speed, integrated to the main valve, hydraulically tested and supplied as an assembly consisting of:

- Relief pilot valve UL-Listed and FM-Approved as part of the assembly with built-in, internal needle valve
- "Y" strainer

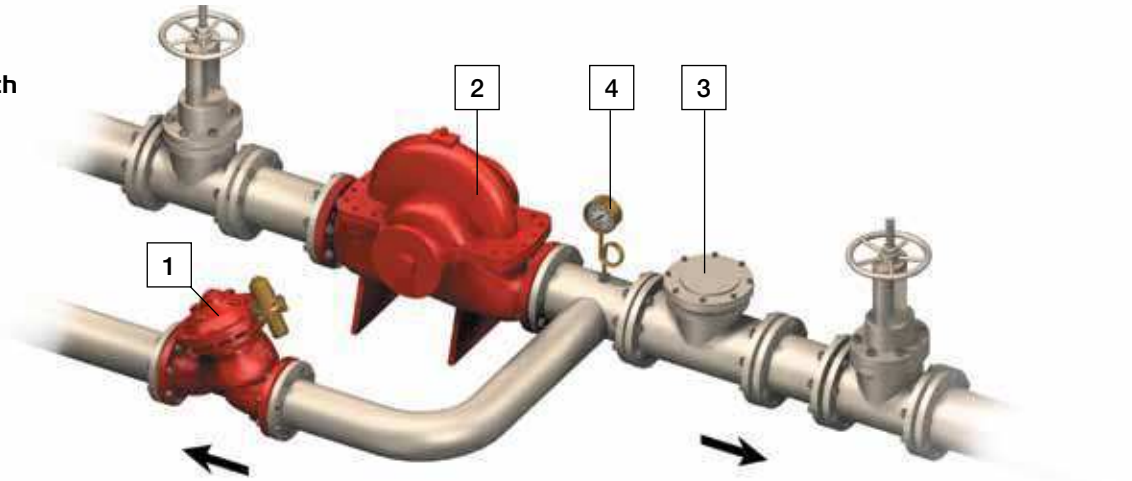
The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Typical Installations

Installation with Angle pressure relief valve



Installation with "Y" Pattern relief valve



System Components

1 - BERMAD Model FP 730-UF
2 - Fire Pump
3 - Check Valve
4 - Pressure Gauge

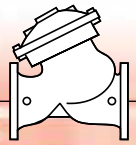
Installation Considerations

- Valve size should be no less than NFPA-20 requirements.
- Provide adequate clearance around valve for maintenance, ensuring that the actuator can be easily removed.
- Design installation with the valve cover up for best performance.
- Ensure that before the valve is installed, instructions are given to flush the pipeline at full flow.

UL Listed

The BERMAD Model FP 730-UF is UL-Listed and FM-Approved when installed as a unit.

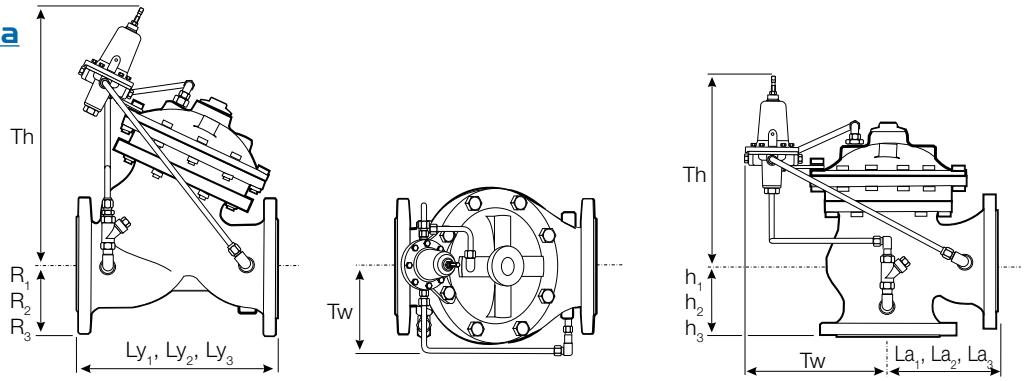
BERMAD Fire Protection



Model: FP 730-UF

700 Series

Technical Data



Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"		14"		16"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	Ly_1 (1)	205	8 1/16	205	8 1/16	209	8 1/4	250	9 7/8	320	12 5/8	415	16 3/8	500	19 11/16	605	23 13/16	725	28 9/16	733	28 7/8	990	39
	Ly_2 (2)	155	6 1/8	155	6 1/8	212	8 3/8	250	9 13/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ly_3 (3)	210	8 1/4	210	8 1/4	212	8 3/8	264	10 7/16	335	13 1/4	433	17 1/16	524	20 5/8	637	25	762	30	767	30 3/16	1,024	40 3/4
	La_1 (1)	121	4 3/4	121	4 3/4	140	5 1/2	152	6	190	7 1/2	225	8 7/8	265	10 7/16	320	12 5/8	396	15 9/16	400	15 3/4	450	17 3/4
	La_2 (2)	120	4 3/4	120	4 3/4	140	5 1/2	159	6 1/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	La_3 (3)	127	5	127	5	149	5 7/8	159	6 1/4	200	7 7/8	234	9 3/16	277	10 7/8	336	13 1/4	415	16 5/16	419	16 1/2	467	18 3/8
	h_1 (1)	82	3 1/4	82	3 1/4	102	4	102	4	127	5	152	6	203	8	219	8 5/8	275	10 13/16	275	10 13/16	369	14 1/2
	h_2 (2)	82	3 1/4	82	3 1/4	102	4	114	4 1/2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	h_3 (3)	89	3 1/2	89	3 1/2	109	4 5/16	108	4 1/4	135	5 5/16	165	6 1/2	216	8 1/2	235	9 1/4	294	11 1/2	294	11 1/2	386	5 3/16
	R_1 (1)	75	2 15/16	83	3 1/4	93	3 5/8	100	3 15/16	114	4 1/2	140	5 1/2	171	6 3/4	203	8	241	9 1/2	267	10 1/2	298	11 3/4
	R_2 (2)	40	1 9/16	40	1 9/16	48	1 7/8	55	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R_3 (3)	78	3 1/16	83	3 1/4	95	3 3/4	108	4 1/4	127	5	159	6 1/4	191	7 1/2	222	8 3/4	260	10 1/4	292	11 1/2	324	12 3/4
	Tw	191	7 1/2	191	7 1/2	191	7 1/2	207	8 1/16	242	9 1/2	290	11 7/16	325	12 13/16	370	14 9/16	515	20 1/4	525	20 11/16	610	24
	Th	312	12 5/16	312	12 5/16	312	12 5/16	364	14 1/2	405	15 15/16	505	20	566	22 5/16	639	25 3/16	449	17 11/16	449	17 11/16	541	21 5/16

Notes:
1. Ly_1 for ANSI#150, ISO PN16 & Grooved ends (see available sizes below)
2. La_1 & h_1 for Angle body, ANSI#150 and ISO PN16.
3. Ly_2, La_2 & h_2 for threaded female, NPT or BSP.
4. Ly_3, La_3 & h_3 for flanged ANSI #300 and ISO PN25.
5. Data is for maximum envelope dimensions, component positioning may vary.
6. Provide adequate space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze), ISO PN16
- Threaded: NPT or ISO-7-Rp 2, 2½ & 3"
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 - 80°C (33 - 180°F)

Sizes ("Y" & Angle)
- Available Y: 1½ - 20", Angle: 1½ – 18"
- UL Listed and FM approved: 2, 2½, 3, 4, 6 & 8"

Pressure Rating
- Class #150: 30 – 235 psi (2 – 15 bar)
- Class #300: 100 – 350 psi (7 – 24 bar)

UL Listed Adjusting Pressure
- 2 to 6": 350 psi (24 bar)
- 8": 175 psi (12 bar)

Manufacturers Standard Materials
Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel, Bronze and coated Steel

Control Trim System
- Brass control components/accessories
- Forged Brass fittings & Copper tubing

Elastomers
- NBR (Buna-N)

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials
Main valve body/internals
- Carbon Steel ASTM A-216-WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148
- Titanium
- Duplex
- Hastalloy

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastalloy C-276

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Approvals
- UL Listed - Fire Pump Relief Valve (QXZQ)
- FM Approved - Water Relief Valve and Fire Pump Relief Valve
- ISO 9001 QA certified
- ABS
- Lloyd's Registered

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Pressure Relief Valve

with Electric Override

Model: FP 430-59

Description

The BERMAD Model FP 430-59 combines fire pump relief with a pre-opening feature to anticipate pump start-up surge. The valve opens fully by means of electric override upon pump start-up, and continues to function as a pressure relief valve.

The valve performs reliably in high capacity fire pump systems.

Typical Applications

- Individual high capacity fire-pumps
- Petrochemical complexes and refineries
- Harbors and Airports
- Foam recirculation; maintains required foam pressure

Features and Benefits

- **Hydraulically powered valve design –** Eliminates jamming problems
- **Closes drip-tight time after time**
- **One-piece molded elastomeric moving part –** No maintenance required
- **Dual pilot valve parallel system, hydraulic & electric**
- **Quick response with minimal power requirement**
- **Continues to act as relief valve upon electric failure**
- **Hydro-efficient body design**
  - Wide rangeability
  - Unrestricted flow path
- **In-line servicable –** minimal down time

Optional Features

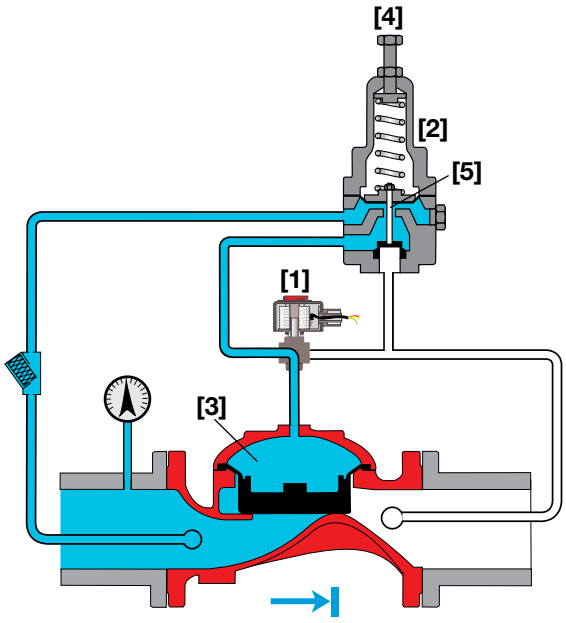
- **Hazardous locations solenoid**
- **Electric limit-switch and/or valve position flow indicator**
- **Large control filter** (code: F)
- **Seawater service construction**
- **Valve Position Single/Double Limit Switches**

Note: Optional features can be mixed and matched.
Consult your local BERMAD representative for full details

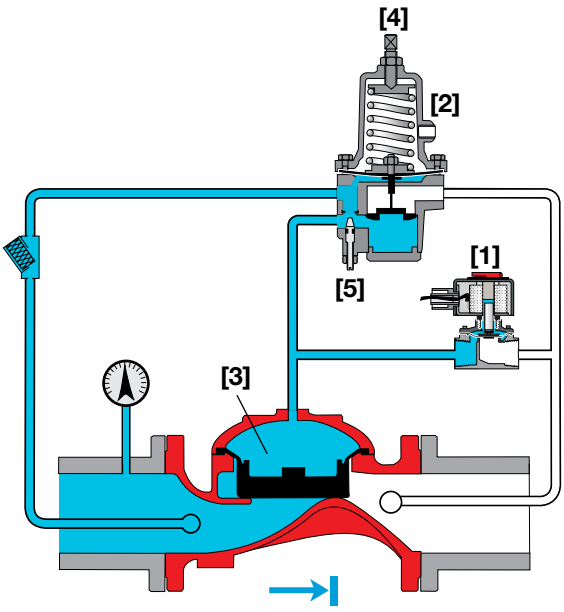
Operation

The BERMAD Model FP 430-59 is equipped with 2 parallel control systems to provide both pressure relief (via hydraulic pilot valve) and pump start-up surge anticipation (via solenoid valve):

- Simultaneously with electrically powering the pump to start, an electric command is sent to the Solenoid Valve **[1]**. This fully opens the main valve, ensuring that pump start-up sudden flow and pressure surge will be relieved and will not cause a water hammer effect. Via a timer, the electric power is kept active long enough to ensure functionality. After the electric command is turned off, the pump pressure relief feature remains active.
- When the Pressure Sustaining (PS) Pilot **[2]** senses upstream pressure that is higher than its set point, it acts upon the main valve control chamber **[3]** causing the main valve to modulate open, relieving excess pressure to either a reservoir or sump. The PS Pilot is equipped with an adjusting screw **[4]** to preset the desired upstream pressure and an integral needle valve **[5]** to control the main valve closing speed.



1.5 - 4” Configuration (Close)



6” - 12” Configuration (Close)

Engineer Specifications

The pressure relief valve shall be both solenoid pilot and hydraulic pilot controlled. The main valve shall be an elastomeric type globe valve with a rolling-diaphragm.
Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
The valve shall have an unobstructed flow path, with no stem guide or supporting ribs.
The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
The pilot system shall be field adjustable, with adjustable valve closing speed, integrated into the main valve, hydraulically-tested and supplied as an assembly consisting of:

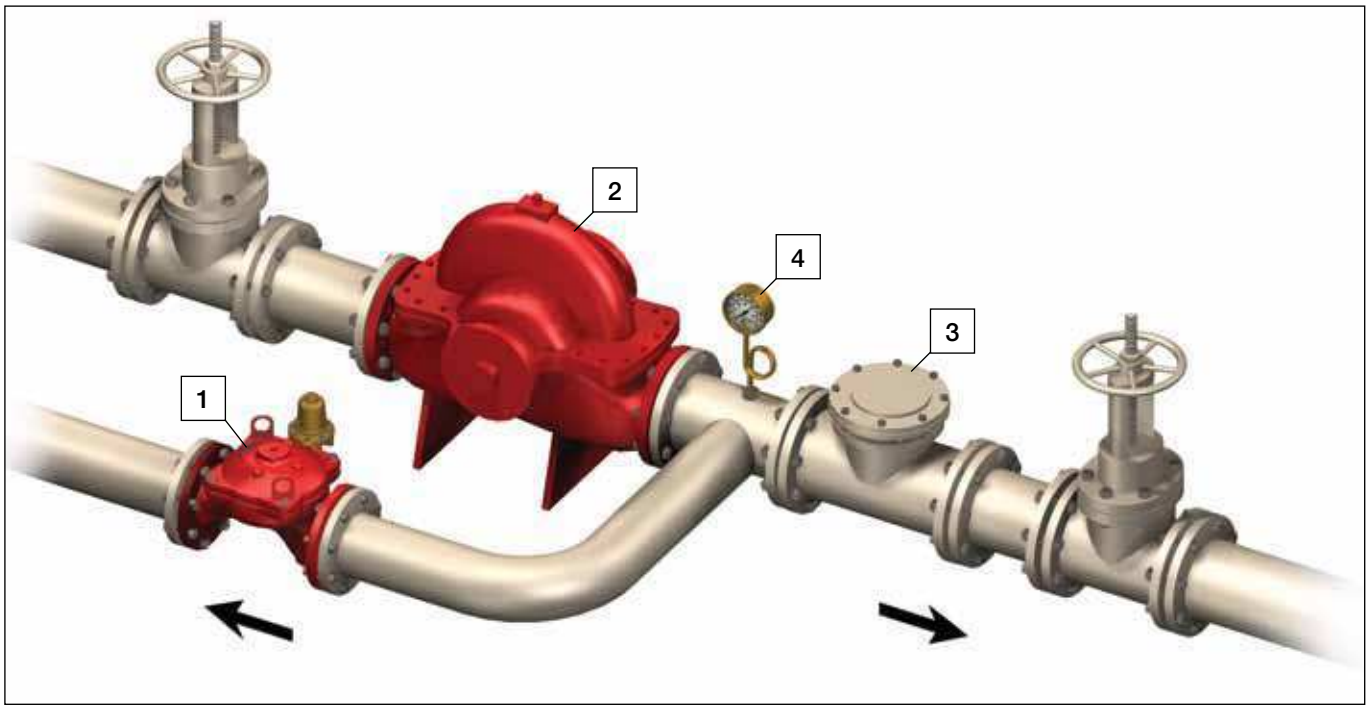
- Relief pilot valve with built-in, internal needle valve (6”-12” only)
- Solenoid valve
- “Y” strainer

The control line shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Typical Installations

System Components

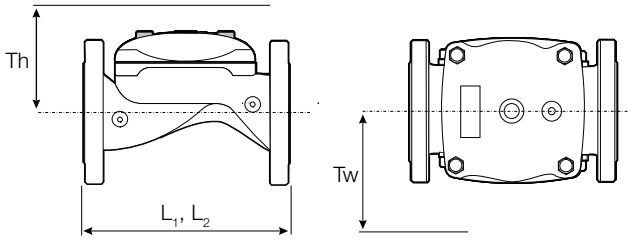
1 - BERMAD Model FP 430-59
2 - Fire Pump
3 - Check Valve
4 - Pressure Gauge



Installation Considerations

- Valve size should be no less than NFPA-20 requirements.
- Provide adequate clearance around valve for maintenance, ensuring that the actuator can be easily removed.
- Design installation with the valve cover up for best performance.
- Ensure that before the valve is installed, pipeline is flushed at full flow.

Technical Data



Size		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 2, 2½, 3, 4, 6, 8, 10 & 12"
- Angle: 2, 3 & 4"

Standard Pressure Rating
- Max. inlet: 175 psi (12 bar)
- Set: 30 - 175 psi (2 - 12 bar)
- Test: 365 psi (25 bar)

* Pressure rating might be limited due to solenoid valve rating

Approvals
- ABS
- Lloyd's Registered

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316

Coating
- Fusion-Bonded Epoxy with UV Protection, Anti-Corrosion
- High Build Epoxy

Solenoid Pilot Valve

Standard
- 2-Way (6-12") / 3-Way (2-4"), direct type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - Class I Division 2, Gr. A, B, C, D, T4
  - ATEX, EEx d IIC T5 (code 9)
- Voltage: see ordering guide (voltage option table)
- Stainless steel 316 body material (code K)

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Pressure Relief Valve

with Electric Override

Model: FP 730-59

Description

The BERMAD Model FP 730-59 combines fire pump relief with a pre-opening feature to anticipate pump start-up surge. The valve opens fully by means of an electric override upon the start-up and continues to perform as a pressure relief valve.

The valve offers reliable performance for high capacity fire pump systems.

Typical Applications

- Individual high capacity fire pumps
- Petrochemical complexes and refineries
- Harbors and airports
- Large scale industrial plants

Features and Benefits

- **Hydraulically powered valve design –** Eliminates jamming problems
- **Dual parallel pilot valve system, hydraulic & electric**
- **Continues to act as relief valve upon electric failure**
- **Quick response with minimal power requirement**
- **Hydro-efficient body design**
  - Wide rangeability
  - Unrestricted flow path
- **Double chambered unitized actuator**
  - Easy, inline inspection ensures minimal down time
  - Quick and smooth valve action

Optional Features

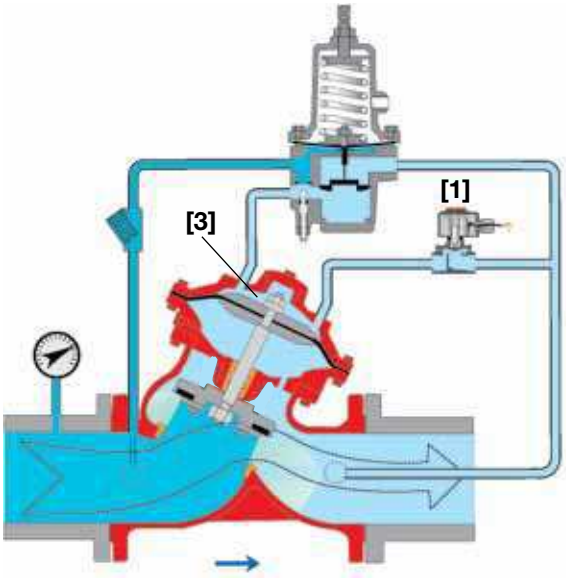
- **Hazardous locations solenoid**
- **Electric limit switch and/or valve position flow indicator**
- **Large control filter** (code: F)
- **Seawater service construction**

Note: Optional features can be mixed and matched.
Consult your local BERMAD representative for full details.

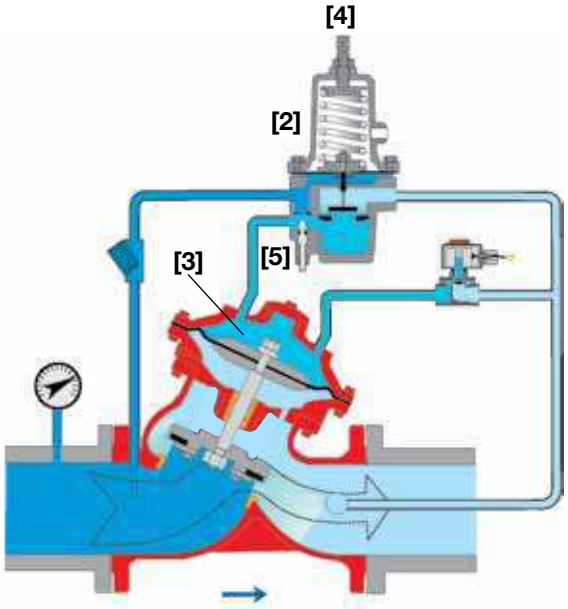
Operation

The BERMAD Model FP 730-59 is equipped with 2 parallel control systems to provide both pressure-relief (via hydraulic pilot valve) and pump start-up surge anticipation (via solenoid valve):

- Simultaneously with electrically powering the pump to start, an electric command is sent to the Solenoid Valve **[1]**, opening it. This immediately releases pressure from the control chamber, fully opening the main valve, ensuring that sudden flow and pressure surge from pump start-up will be relieved and will not cause a water hammer effect. A timer keeps the electric power active long enough to ensure functionality. After the electric command is turned off, the pump pressure relief feature remains active.
- When the Pressuee Relief Pilot **[2]** senses inlet pressure that is higher than its set point, it acts upon the main valve control chamber **[3]** causing the main valve to modulate open, relieving excess pressure to either a reservoir or sump. The pilot valve is equipped with an adjusting screw **[4]** to preset the desired inlet pressure, and an internal adjustable needle valve **[5]** to control the main valve closing speed.



Valve Fully Open (surge prevention)



Valve Modulating (excess pressure relief)

Engineer Specifications

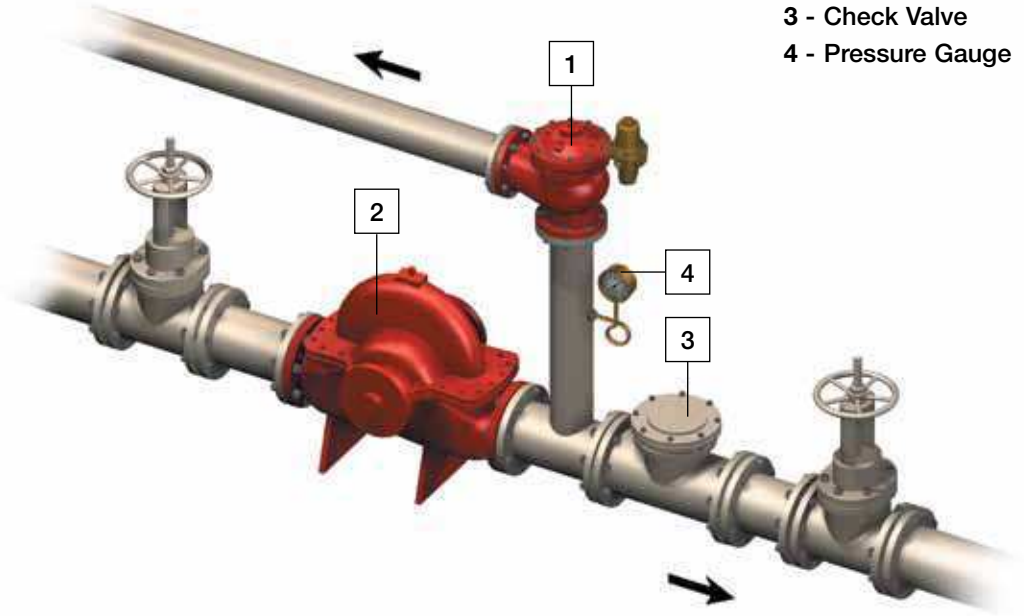
The Pressure Relief Valve shall be both solenoid pilot and hydraulic pilot controlled. The main valve shall be an angle or "Y" pattern. All necessary inspection and servicing of the main valve shall be possible in-line.
Valve actuation shall be accomplished by a double chambered actuator, which shall include a stainless steel stem and a flat seal disk creating a drip-tight seal.
The valve seat shall be made of stainless steel and have an unobstructed flow path, with no stem guide or supporting ribs.
The pilot system shall be field adjustable, with adjustable valve closing speed integrated into the main valve, hydraulically tested and supplied as an assembly consisting of:

- Relief pilot valve with built-in internal needle valve
- N.C. 2-Way solenoid pilot valve.
- "Y" strainer

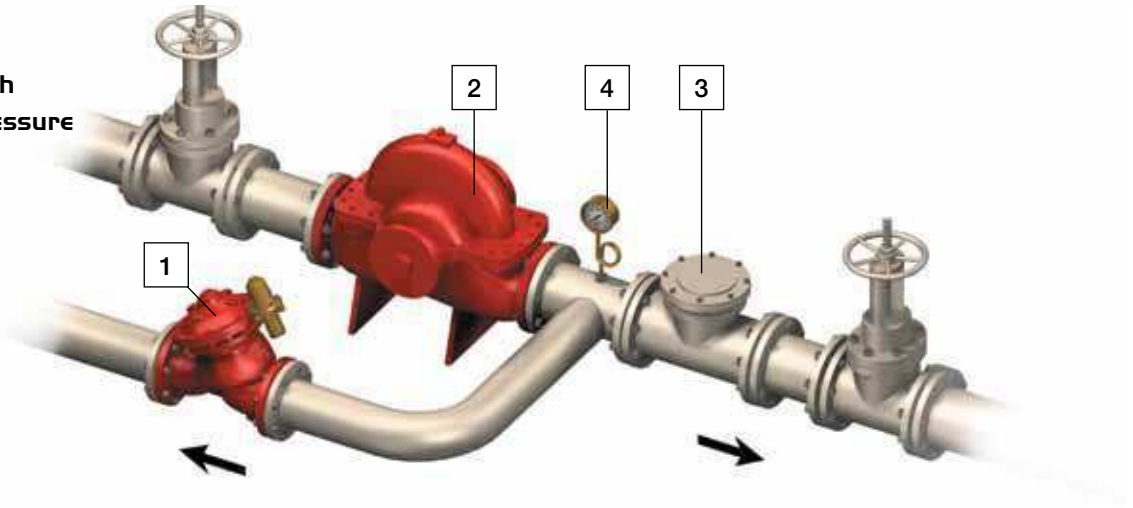
The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

Typical Installations

Installation with Angle pressure relief valve



Installation with "Y" Pattern pressure relief valve



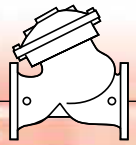
System Components

1 - BERMAD Model FP 730-59
2 - Fire Pump
3 - Check Valve
4 - Pressure Gauge

Installation Considerations

- Valve size should be no less than NFPA-20 requirements.
- Provide adequate clearance around valve for maintenance, ensuring that the actuator can be easily removed.
- Design installation with the valve cover up for best performance.
- Ensure that before the valve is installed, pipeline is flushed at full flow.

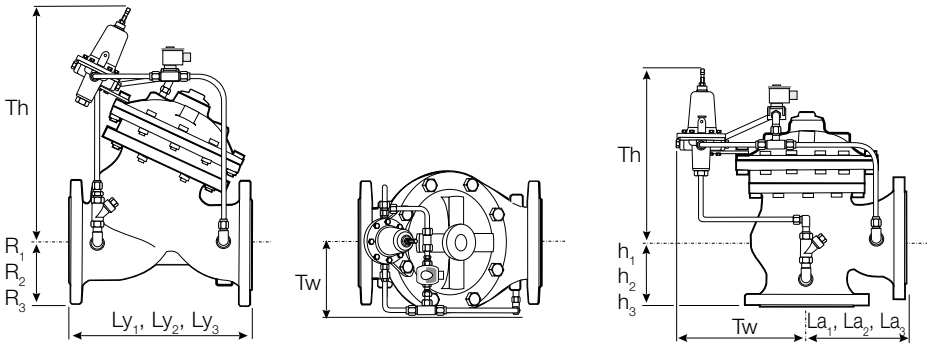
BERMAD Fire Protection



Model: FP 730-59

700 Series

Technical Data



Size		1½"		2"		2½"		3"		4"		6"		8"		10"		12"		14"		16"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	Ly_1 (1)	205	8 1/16	205	8 1/16	209	8 1/4	250	9 7/8	320	12 5/8	415	16 3/8	500	19 11/16	605	23 13/16	725	28 9/16	733	28 7/8	990	39
	Ly_2 (2)	155	6 1/8	155	6 1/8	212	8 3/8	250	9 13/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ly_3 (3)	210	8 1/4	210	8 1/4	212	8 3/8	264	10 7/16	335	13 1/4	433	17 1/16	524	20 5/8	637	25	762	30	767	30 3/16	1,024	40 3/4
	La_1 (1)	121	4 3/4	121	4 3/4	140	5 1/2	152	6	190	7 1/2	225	8 7/8	265	10 7/16	320	12 5/8	396	15 9/16	400	15 3/4	450	17 3/4
	La_2 (2)	120	4 3/4	120	4 3/4	140	5 1/2	159	6 1/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	La_3 (3)	127	5	127	5	149	5 7/8	159	6 1/4	200	7 7/8	234	9 3/16	277	10 7/8	336	13 1/4	415	16 5/16	419	16 1/2	467	18 3/8
	h_1 (1)	82	3 1/4	82	3 1/4	102	4	102	4	127	5	152	6	203	8	219	8 5/8	275	10 13/16	275	10 13/16	369	14 1/2
	h_2 (2)	82	3 1/4	82	3 1/4	102	4	114	4 1/2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	h_3 (3)	89	3 1/2	89	3 1/2	109	4 5/16	108	4 1/4	135	5 5/16	165	6 1/2	216	8 1/2	235	9 1/4	294	11 1/2	294	11 1/2	386	5 3/16
	R_1 (1)	75	2 15/16	83	3 1/4	93	3 5/8	100	3 15/16	114	4 1/2	140	5 1/2	171	6 3/4	203	8	241	9 1/2	267	10 1/2	298	11 3/4
	R_2 (2)	40	1 9/16	40	1 9/16	48	1 7/8	55	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R_3 (3)	78	3 1/16	83	3 1/4	95	3 3/4	108	4 1/4	127	5	159	6 1/4	191	7 1/2	222	8 3/4	260	10 1/4	292	11 1/2	324	12 3/4
	Tw	191	7 1/2	191	7 1/2	191	7 1/2	207	8 1/16	242	9 1/2	290	11 7/16	325	12 13/16	370	14 9/16	515	20 1/4	525	20 11/16	610	24
	Th	312	12 5/16	312	12 5/16	312	12 5/16	364	14 1/2	405	15 15/16	505	20	566	22 5/16	639	25 3/16	449	17 11/16	449	17 11/16	541	21 5/16

Notes:

1. Ly_1 for ANSI#150, ISO PN16 & Grooved ends (see available sizes below)
2. La_1 & h_1 for Angle body, ANSI#150 and ISO PN16.
3. Ly_2, La_2 & h_2 for threaded female, NPT or BSP.
4. Ly_3, La_3 & h_3 for flanged ANSI #300 and ISO PN25.
5. Data is for maximum envelope dimensions, component positioning may vary.
6. Provide adequate space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze), ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"

Water Temperature
- 0.5 - 80°C (33 - 180°F)

Sizes ("Y" & Angle)
- Available Y: 1½ - 20"
- Angle: 1½ – 18"

Pressure Rating
- Max. for Class #150/PN16: 200 psi (15 bar)
- Test: 450 psi (31 bar)

* Pressure rating might be limited due to solenoid valve rating

Approvals
- ABS
- Lloyd's Registered

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel, Bronze and coated Steel

Control Trim
- Brass components/accessories
- Forged Brass fittings & Copper tubing

Elastomers
- NBR (Buna-N)

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body/internals
- Carbon Steel ASTM A-216-WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148
- Titanium
- Duplex
- Hastalloy

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastalloy C-276

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Solenoid Pilot Valve

Standard model
- 2-Way Pilot Operated type
- Brass body
- Main valve closed when de-energized
- Enclosure: General purpose watertight, NEMA 4 and 4X / IP65, Class F
- Power: 24VDC, 8 watts
- UL - Listed

Options (see also ordering guide)
- Hazardous locations:
  - Class I Division 1, Gr. A, B, C, D, T4 (code 7)
  - ATEX, EEx em IIC T4 (code 8)
  - ATEX, EEx d IIC T4/5 (code 9)
- Voltage: see [illegible]de (voltage o[illegible]
- Stainless [illegible]erial (code K)

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Differential Pressure Sustaining Valve

Model: FP 436

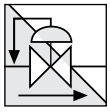
Description

The Model FP 436 Differential Pressure Sustaining Valve is a hydraulically operated, diaphragm actuated, control valve that sustains a minimum pre-set, differential pressure between two points regardless of fluctuating flow or varying upstream pressure.

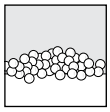
Typical Applications

Pump overload & cavitation protection

Safeguarding pump minimum flow



Emergency filter by-pass



Foam recirculation; maintains required foam pressure

Balancing between circuits in systems

Features and Benefits

- **Hydraulically powered valve design**
  - Closes drip tight time after time
  - Eliminates jamming problems
- **Hydro-efficient body design**
  - Wide rangeability
  - Unrestricted flow path
- **One-piece molded elastomeric moving part –** No maintenance required
- **Simple design –** Cost effective
- **Factory pre-assembled trim –** Out-of-box quality
- **In-line serviceable –** Minimal down time

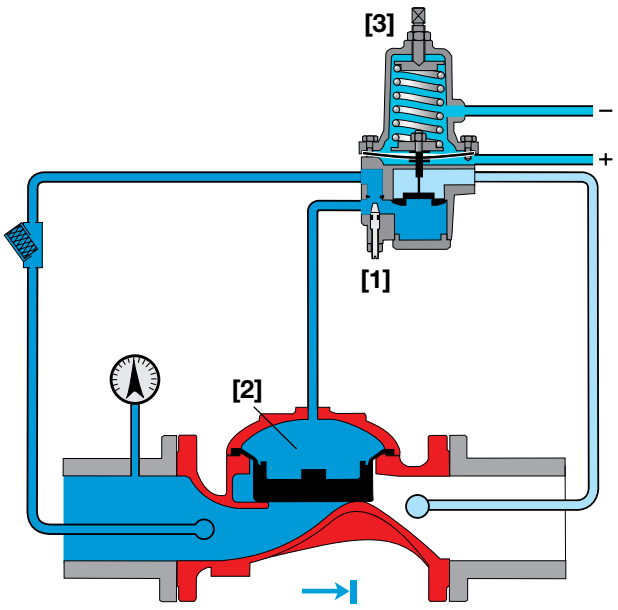
Optional Features

- **Large control filter** (code: F)
- **Valve position flow indicator**
- **Seawater service construction**
- **Valve Position Single/Double Limit Switches**

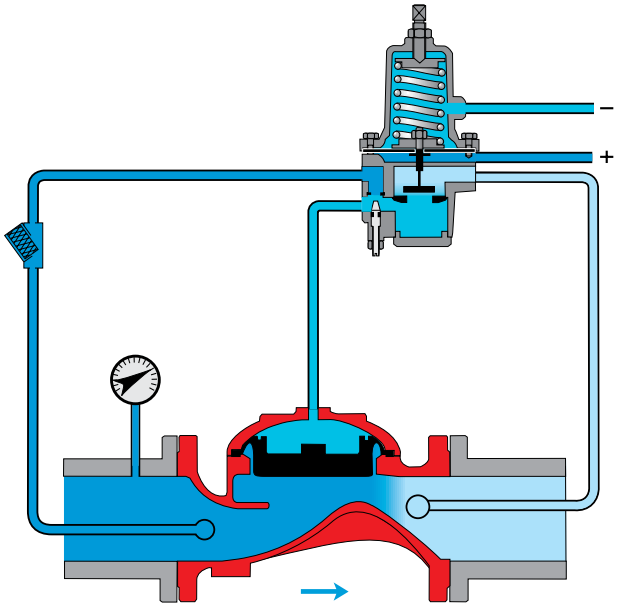
Note: Optional features can be mixed and matched.
Consult your local BERMAD representative for full details

Operation

The BERMAD Model FP 436 is a pilot controlled valve equipped with an adjustable, 2-Way, Differential Pressure Sustaining Pilot. The needle valve **[1]** which controls the closing speed, continuously allows flow from valve inlet into the control chamber **[2]**. The pilot **[3]**, locally or remotely, senses both high pressure below its diaphragm and low pressure above it.Should differential pressure fall below pilot setting, the pilot throttles, enabling pressure to accumulate in the control chamber, causing the main valve to throttle, sustaining differential pressure at the pilot setting.
Should differential pressure rise above pilot setting, the pilot releases accumulated pressure causing the main valve to modulate open.



Valve Closed (static condition)



Valve Modulafe (flowing condition)

Engineer Specifications

The Differential Pressure Sustaining Valve shall sustain a minimum pre-set, differential pressure between two points regardless of fluctuating flow or varying upstream pressure.
The main valve shall be an elastomeric type globe (or angle) valve with a rolling-diaphragm. Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
The valve shall have an unobstructed flow path, with no stem guide or supporting ribs.
The valve shall have a removable cover for quick in-line service enabling all necessary inspection and servicing.
The pilot system shall be field adjustable, with adjustable valve closing speed integrated into the main valve, hydraulically tested and supplied as an assembly consisting of:

- Differential Pressure Sustaining Pilot Valve as part of the assembly with built-in, internal needle valve
- “Y” strainer

The control trim shall be supplied as an assembly, pre-assembled and hydraulically tested at an ISO 9000 and 9001 certified factory.

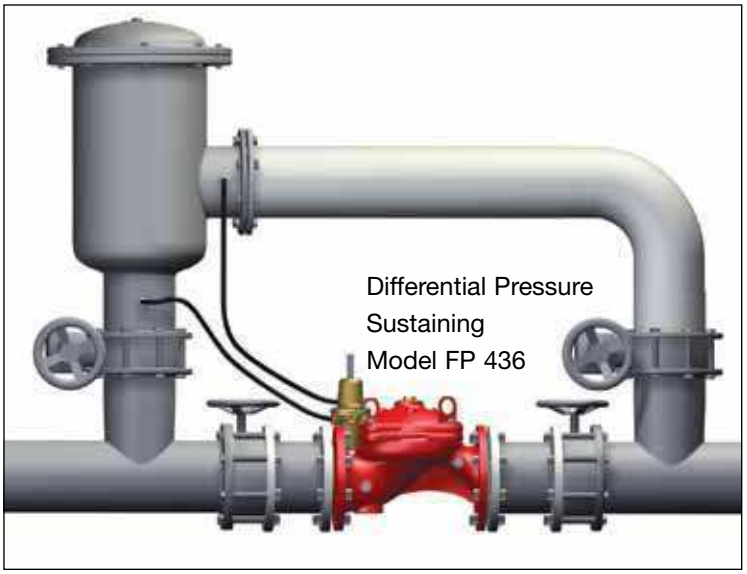
Typical Installations

Emergency Filter By-pass

In filtration systems there are two cases in witch by-passing the filter is essential:

- Blocked filter
  (potentially causing element collapse)
- Demand for Emergency Fire water

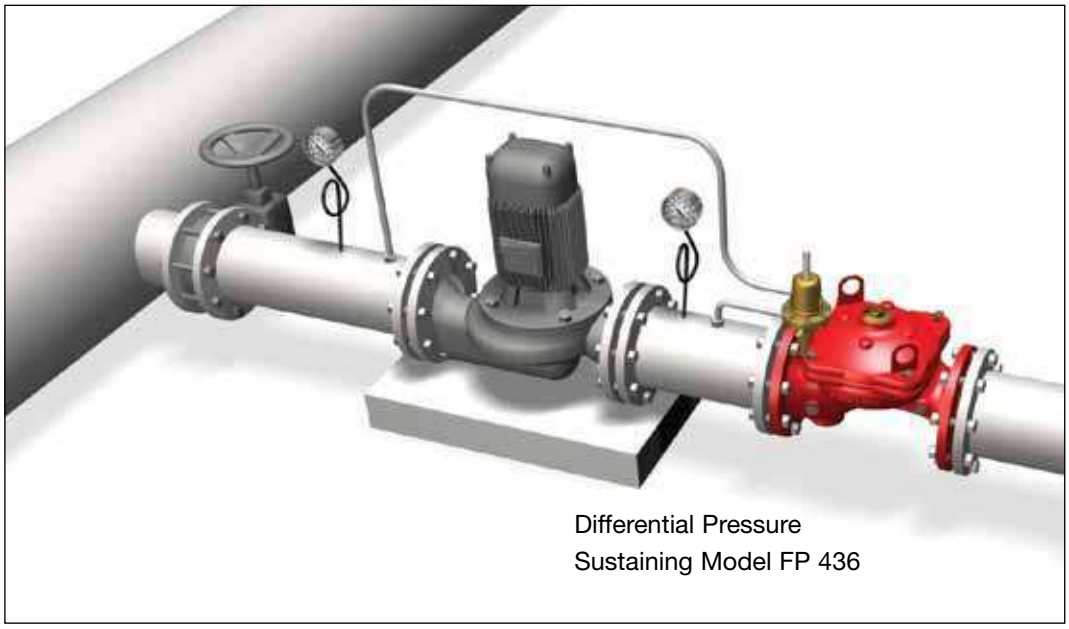
The Model FP 436, installed as a by-pass, progressively compensates for excessive demand.
Adding feature “S” incorporates alarm signaling attribute.



Differential Pressure Sustaining Model FP 436

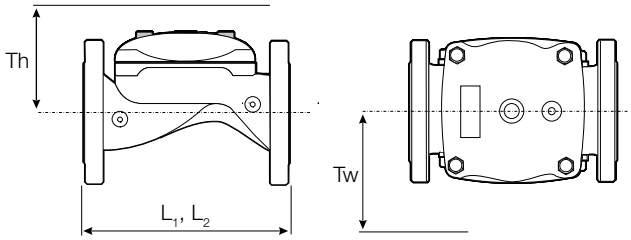
Pump Overload & Cavitation Protection

Where suction pressure regimes vary, the Model FP 436 is needed to limit pump flow by sustaining pump differential pressure, and preventing pump overload and cavitation damage caused by excessive demand.
Adding check feature “20”, saves the cost of a line sized check valve.



Differential Pressure Sustaining Model FP 436

Technical Data



Size		2”		2½”		3”		4”		6”		8”		10”		12”	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze)
- ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8”

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 2, 2½, 3, 4, 6, 8, 10 & 12”
- Angle: 2, 3, & 4”

Standard Pressure Rating
- Max. inlet: 175 psi (12 bar)
- Set: 7 - 90psi (0.5 - 6 bar)
- Test: 365 psi (25 bar)

Approvals
- ABS
- Lloyd’s Registered

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body and accessories
- Carbon Steel ASTM A-216-WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control System
- Stainless Steel 316

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

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Hydraulically Operated Fire Pump Control Valve Non-Slam Operation

with Opening Speed for Surge Control

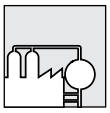
Model: FP 760-02

Description

The BERMAD Model 760-02 Fire Pump control valve is a hydraulically operated diaphragm actuated control valve that operates independently and provides smooth firepump startup and shutdown, preventing typical water surge, which usually occurs during sudden stoppage of flow.
At the fire pump startup the 760-02 valve will open smoothly in a controlled manner.
During pump shutoff, the 760-02 valve will close smoothly and will prevent back-flow and seal tight.

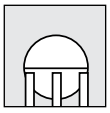
Typical Applications

Individual high capacity fire pumps



Petrochemical complexes and refineries

FPSO and Offshore platforms



Large scale industrial plants

Features and Benefits

- **Line-pressure driven –** Independent operation
- **Double chambered**
- **Powered opening and closing**
- **Tight Shutoff**
- **Protected diaphragm**
- **Eliminates Pump Startup Surge**
- **In-line serviceable –** Easy maintenance
- **Obstacle free, full bore –** Uncompromising reliability

Optional Features

- **Electric limit switch and/or valve position flow indicator**
- **Seawater service construction –** marked “FS” prefix

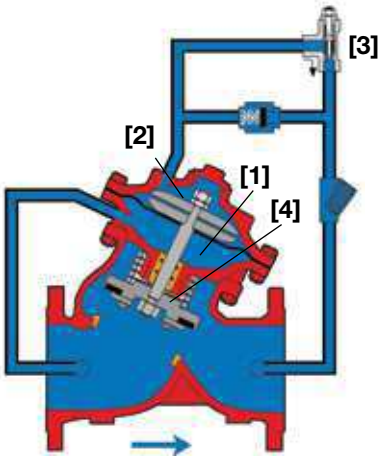
Operation

The BERMAD Model 760-02 is a double chambered, hydraulically operated, diaphragm actuated control valve that operates Independently of valve differential pressure.

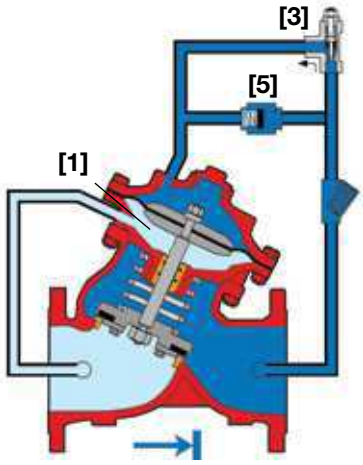
During flow conditions, the higher upstream pressure is applied to the lower control chamber **[1]**, while the fluid of the upper control chamber **[2]** is released through the opening speed control device **[3]**. The opening force coupled with the upstream pressure exerted on the bottom-side of the seal disk **[4]** powerfully opens the valve.

Should pressure conditions reverse, the greater downstream pressure shall apply to the upper control chamber through the "free-flow" direction of the check valve **[5]**. This develops a closing force that coupled with the forces being applied to the top-side of the seal disk by the reversed flow and the actuator spring, and cause the valve to positively close, sealing drip tight. The pressure released from the lower chamber **[1]**, provides cushioning for smooth non-slam operation.

The opening speed control can be adjusted by the flow controls **[3]**.



Valve Open



Valve closed

Engineer Specifications

The Hydraulically Operated Fire Pump Control Valve shall be powered open during flow conditions by the superior upstream pressure. When downstream pressure exceeds upstream pressure, the check valve shall gradually shut off drip tight, preventing back flow.

The main valve shall be a center guided, diaphragm actuated globe valve with a Y style body. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings, or supporting ribs.

All valve components shall be accessible and serviceable without removing the valve from the pipeline.

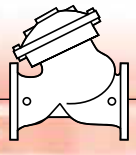
The actuator assembly shall be double chambered with a sealed inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall be center guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal.

The control system shall consist of a One-Way Adjustable Flow Control Pilot valve, an Opening Speed Control Device, check valve and pilot line water supply filter.

All fittings shall be forged stainless steel 316 and tubing shall be of stainless steel 316. The assembled valve shall be hydraulically tested by the main valve manufacturer.

The valve assembly shall be Lloyd's Register and ABS type approved and valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard.

BERMAD Fire Protection



Model: FP 760-02

700 Series

Typical Applications

Pump Control & Check Valve

In this system, a pump battery supplies the main line through a manifold.

The Model 760-02 installed downstream from each pump:

- Prevents reverse flow from damaging pump
- Provides smooth start-up and shutdown of supplementary pumps
- Allows surge-free switching between “on-duty” pumps
- Smooth reaction of main fire pump as a result of Jockey pump pressure drop while system demand increases

When system demand is greater tahn pump capacity

- During empty pipeline / dry-pipe filling
- When pump specification is higher than system resistance

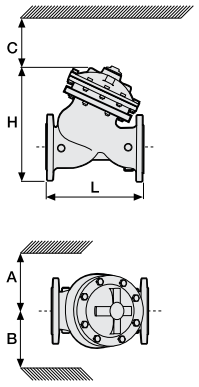
BERMAD offline pump control valve (model 430-59 / 730-59 / 748) add a pressure features to the Model 760-02 ensuring that high capacity pumps operate within design specifications.

Technical Data

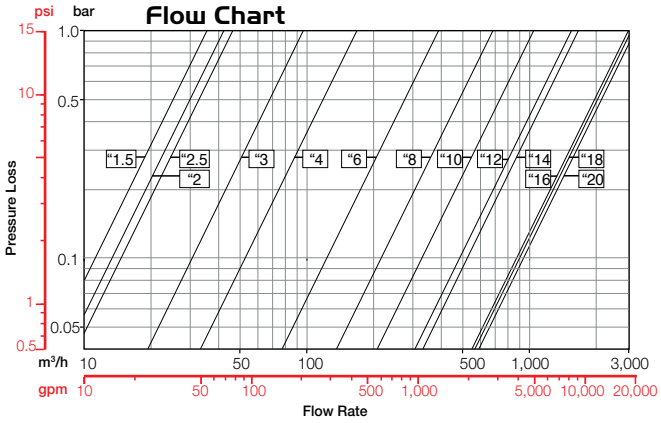
Dimentions and Weights

Size		A, B		C		L		H		Weight	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	kg	lbs
40	1½”	350	14	180	7	205	8.1	239	9.4	9.1	20
50	2	350	14	180	7	210	8.3	244	9.6	10.6	23
65	2½”	350	14	180	7	222	8.7	257	10.1	13	29
80	3”	370	15	230	9	250	9.8	305	12.0	22	49
100	4”	395	16	275	11	320	12.6	366	14.4	37	82
150	6”	430	17	385	15	415	16.3	492	19.4	75	165
200	8”	475	19	460	18	500	19.7	584	23.0	125	276
250	10”	520	21	580	23	605	23.8	724	28.5	217	478
300	12”	545	22	685	27	725	28.5	840	33.1	370	816
350	14”	545	22	685	27	733	28.9	866	34.1	381	840
400	16”	645	26	965	38	990	39.0	1108	43.6	846	1865
450	18”	645	26	965	38	1000	39.4	1127	44.4	945	2083
500	20”	645	26	965	38	1100	43.3	1167	45.9	962	2121

Data is for Y-pattern, flanged, PN16 valves
Weight is for PN16 basic valves
“C” enables removing the actuator in one unit
“L”, ISO standard lengths available
For more dimensions and weights tables, refer to Engineering Section



Flow Chart



Data is for Y-pattern, throttling plug (U-Type) valves
For more flow charts, refer to Engineering Section

Main Valve

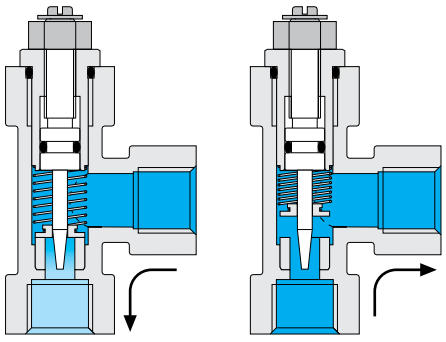
Valve Patterns: “Y” (globe) & angle
Size Range: 11/2–20” (40-500 mm)
For sizes 24-32"; 600-800 mm,
Consult BERMAD
End Connections (Pressure Ratings):
Flanged: ANSI B16.42 (Ductile Iron),
B16.5 (Steel & Stainless Steel),
B16.24 (Bronze), B16.1 (Cast Iron),
ISO PN16 or PN25
Working Temperature:
Water up to 80°C (180°F)
Standard Materials:
Body & Actuator: Ductile Iron
Internals:
Stainless Steel, Bronze & coated Steel
Diaphragm:
NBR Nylon fabric-reinforced
Seals: NBR

Coating:
Electrostatic Powder Coating Polyester,
Red (RAL 3002)
Optional: High Build Epoxy Fusion-Bonded
with UV Protection

Control System

Standard Materials:
Accessories:
Bronze, Brass, Stainless Steel & NBR
Tubing & Fittings: Stainless steel 316
Other Materiels: Consult BERMAD
Approvals:
Lloyd’s Register and ABS type approved for
fire protection

One-Way Flow Control Operation Modes



" Restriction Direction"

" Free-flow Direction"

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Level Control Valves

BERMAD Level Control Valves combine hydraulic line pressure control for opening and smooth closing with the simplicity of a float or level control pilot. External installation of the main valve facilitates maintenance.

Level Control Valve

with Modulating Horizontal Float

Model: FP 450-60

- Reservoir filling
  - Low volume reservoirs
  - Large surface area reservoirs

Description

The Model FP 450-60 Level Control Valve with Modulating Horizontal Float is a hydraulically controlled, diaphragm actuated, control valve that controls reservoir filling to maintain constant water level, regardless of fluctuating demand.

Features and Benefits

- **Line pressure driven –** Independent operation
- **Modulating hydraulic float control**
  - **"Always Full" reservoir**
- **One-piece molded elastomeric moving part –** No maintenance required
- **Dynamically restrained actuation**
  - **Moderate valve reaction**
  - **Non-slam closing**
- **Balanced rolling-diaphragm**
  - **High flow capacity**
  - **Very low opening and closing pressure requirements**
- **In-line serviceable –** Easy maintenance
- **Flexible design –** Easy addition of features
- **External installation –** Pilot operated

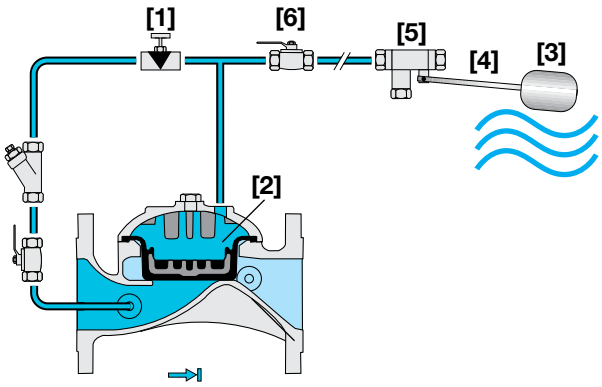
Major Additional Features

- Pressure sustaining – **453-60**
- Flow control – **457-60-U**
- Electric float backup – **450-60-65**

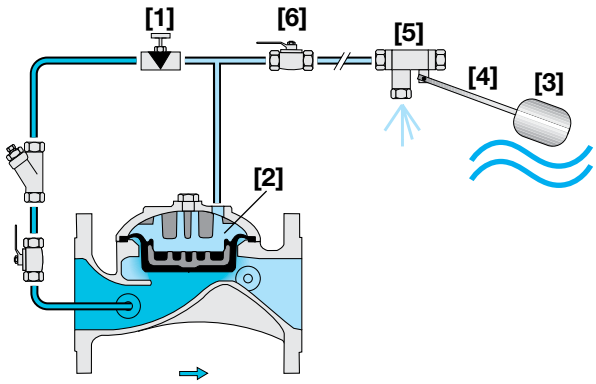
For further options, See relevant BERMAD publications.

Operation

The Model FP 450-60 is a float controlled valve equipped with a 2-way, horizontal float pilot assembly.
The needle valve **[1]** continuously allows flow from the valve inlet into the control chamber **[2]**. The float **[3]** is attached to the float pilot arm **[4]**. The location of the float assembly and the position of the float determines the level setting.
Should the level rise toward the setting, the float pilot **[5]** throttles, pressure in the control chamber accumulates causing the main valve to throttle closed, reducing filling rate, and eventually closing drip tight.
Should the level fall, the float pilot releases pressure from the control chamber causing the main valve to modulate open. The needle valve controls the closing speed. The cock valve **[6]** enables manual closing.



Valve Closed



Valve Open

Engineer Specifications

The Level Control Valve shall control reservoir filling to maintain constant water level regardless of fluctuating demand.
Main Valve: The main valve shall be an elastomeric type globe (or angle) valve with a rolling-diaphragm. The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**. The body and cover shall be ductile iron. All external bolts and nuts shall be of Stainless Steel 316. All valve components shall be accessible and serviceable without removing the valve from the pipeline.
Actuation: Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
Control System: The control system shall consist of a 2-way, stainless steel horizontal float pilot assembly, a needle valve, isolating cock valves, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested.
Quality Assurance: The valve manufacturer shall be certified according to the ISO 9000 and 9001 Quality Assurance Standard.

Typical Applications

Large Fire Water Reservoirs

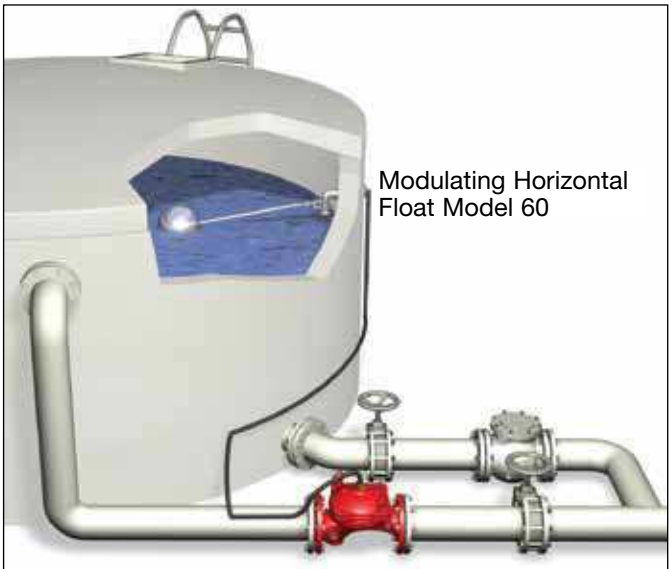
Mechanical level control valves present various issues:

- Valves are often at inaccessible locations
- Float and arm assemblies are heavy and cumbersome
- Relatively low maximum pressure
- Tendency for mechanical devices to leak
- Increased valve corrosion due to humid environment inside the tank
- Difficult maintenance

The Model FP 450-60 overcomes these difficulties by applying a float pilot, separated from the the valve itself, which controls a Hydraulic Valve.

Consider replacing the “60” horizontal float assembly with the “67” vertical float assembly for:

- Heavy duty service
- Easy level setting
- Aggressive or corrosive fluids



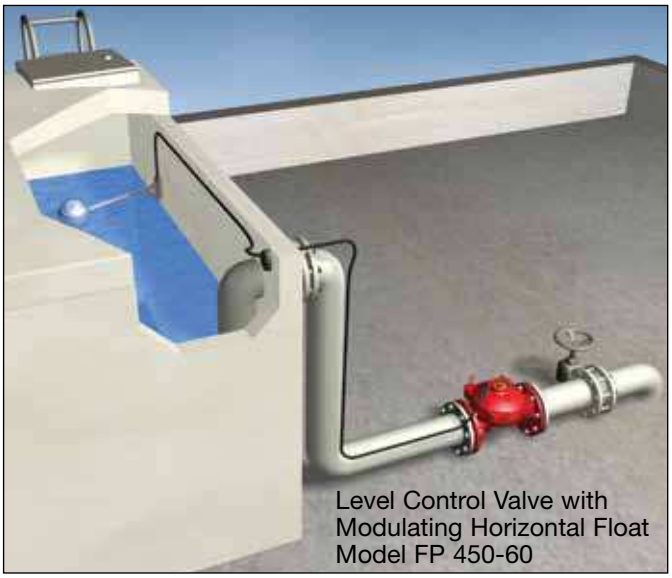
Level Control Valve with
Modulating Horizontal Float
Model FP 450-60

Rooftop Reservoirs

Rooftop reservoir level control is attained by electric control of the basement pumps according to reservoir level. As overflow of a rooftop reservoir can cause costly damage, hydraulic back-up protection is recommended. Where system design requires an “always full” rooftop reservoir, the Model FP 450-60 Modulating
Level Control Valve:

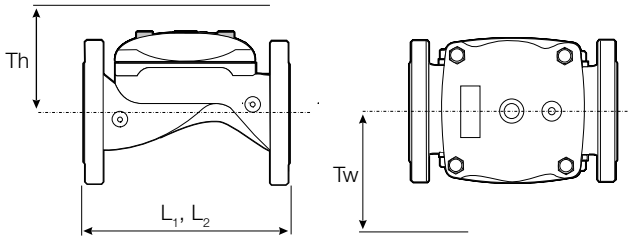
- Modulates open immediately when level starts dropping
- Closes securely to prevent overflow

Secured closing, even after long periods of the valve being open, is ensured by the fully developed hydraulic closing force applied over the peripherally, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk.



Level Control Valve with
Modulating Horizontal Float
Model FP 450-60

Technical Data



Size		2”		2½”		3”		4”		6”		8”		10”		12”	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze), B16.1 (Cast Iron), ISO PN16
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3”

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 1½, 2, 2½, 3, 4, 6, 8, 10 & 12”
- Angle: 2, 3 & 4”

Pressure Rating
- Max. inlet: 250 psi (17 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Float Data

Standard Materials:
- Pilot body: Stainless Steel
- Float: Stainless Steel
- Float rod: Stainless steel

Working temperature:
- Water up to 50ºC (122ºF)

Pressure rating:
- 16 bar (230 psi)

Ports:
- ½” ISO-7-Rp

If inlet pressure is below 0.7 bar (10 psi) or above 10 bar (150 psi) consult factory

DOWNLOAD PDF VERSION

2-Way Modulating Horizontal Float

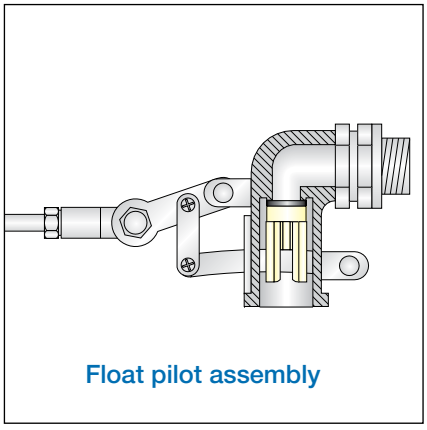
Model #60

This 2-way, modulating horizontal float, is actuated by a float either pulling the float pilot arm down, when level drops, or floating it up when level rises. The float pilot throttles closed as level rises towards set-point, eventually closing drip-tight.

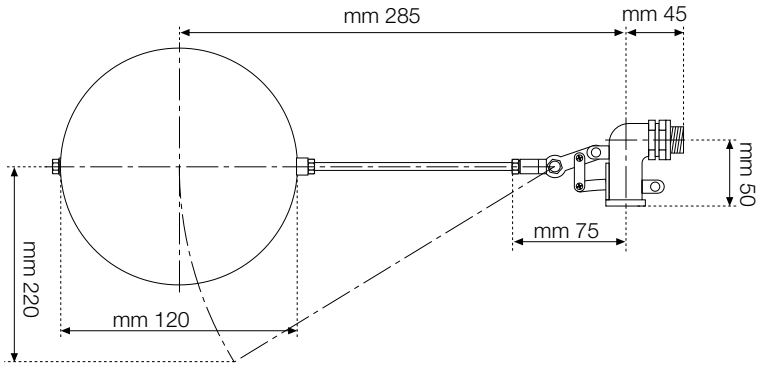
Technical Data

Pressure rating: 16 bar (230 psi)
Working temperature: Water up to 55°C (125°F)
Flow factor: Kv 1.4 (Cv 1.6)
Ports: 1/2”
Standard materials:
Pilot body: Stainless steel
Float: Stainless steel
Float rod: Stainless steel

Notes: Float hydraulic connections: shall be ½” pipe or larger



Float pilot assembly



Level Control Valve

with Bi-Level Electronic Float

Model: FP 450-65

- Reservoir filling
  - Very low supply pressure
  - Low noise generation
  - Energy cost critical systems
  - Systems with poor water quality

Description

The Model FP 450-65 Level Control Valve with Bi-Level Electric Float is a hydraulically operated, diaphragm actuated, control valve that controls reservoir filling in response to an electric float switch signal.
The valve fully opens at pre-set low level and shutts at pre-set high level.

Features and Benefits

- **Line-pressure driven –** Independent operation
- **Bi-Level electric float switch**
  - On/off service
  - No hydraulic sensing tubes
  - Suited to various float switches
- **Solenoid controlled**
  - Low power consumption
  - Normally Open or Normally Closed main valve
- **One-piece molded elastomeric moving part –** No maintenance required
- **Dynamically restrained actuation**
  - Non-slam closing
- **Balanced rolling-**diaphragm
  - High flow capacity
  - Very low opening & closing pressure requirement
- **In-line serviceable –** Easy maintenance
- **Flexible design –** Easy addition of features
- **External installation –** Pilot operated

Major Additional Features

- Closing surge prevention – **450-65-49**
- Hydraulic float back-up – **450-65-66**
- Altitude pilot back-up – **450-65-80**
- Relief override – **450-65-3Q**
- Pressure sustaining valve – **453-65**
- Flow control valve – **457-65-U**

For further options, See relevant BERMAD publications.

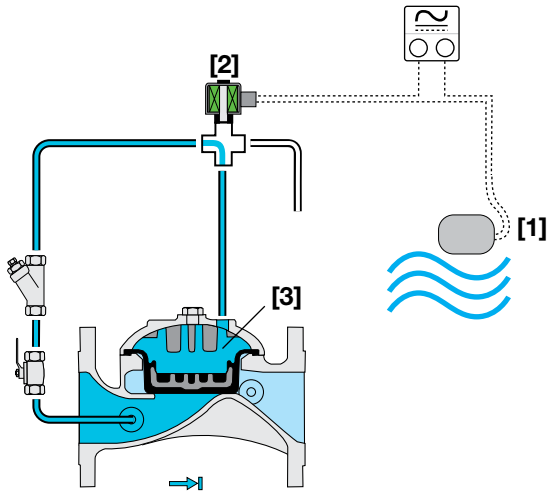
Operation

The Model FP 450-65 is a solenoid controlled valve equipped with a bi-level, electric float switch* and a solenoid pilot**. The float switch **[1]** closes at a pre-set low level energizing the solenoid **[2]**, and opens at a pre-set high level, de-energizing The solenoid. Should the level drop, the solenoid is energized, causing the control chamber **[3]** to vent, opening the main valve. Should the level rise, the solenoid is de-energized, and pressure is applied to the control chamber harnessing line pressure to close the main valve.

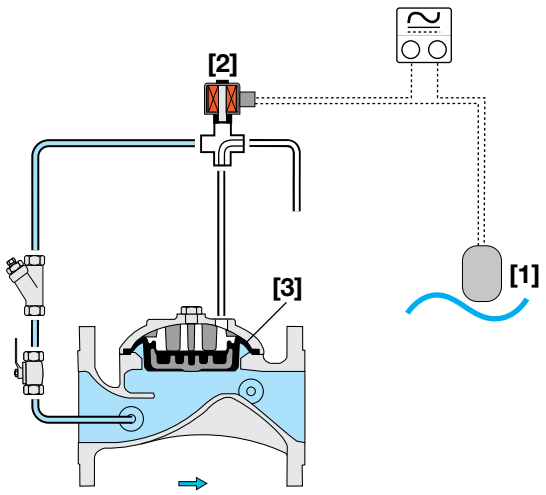
For 8" (200 mm) valves and larger, an accelerator quickens valve response.

* Other switching means are available.

** Normally closed, and normally open main valves are available.



Valve Closed



Valve Open

Engineer Specifications

The Level Control Valve shall control reservoir filling in response to an electric float switch signal, opening at pre-set low level and shutting at pre-set high level.

Main Valve: The main valve shall be an elastomeric type globe (or angle) valve with a rolling-diaphragm. The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**. The body and cover shall be ductile iron. All external bolts and nuts shall be of Stainless Steel 316. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

Actuation: Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.

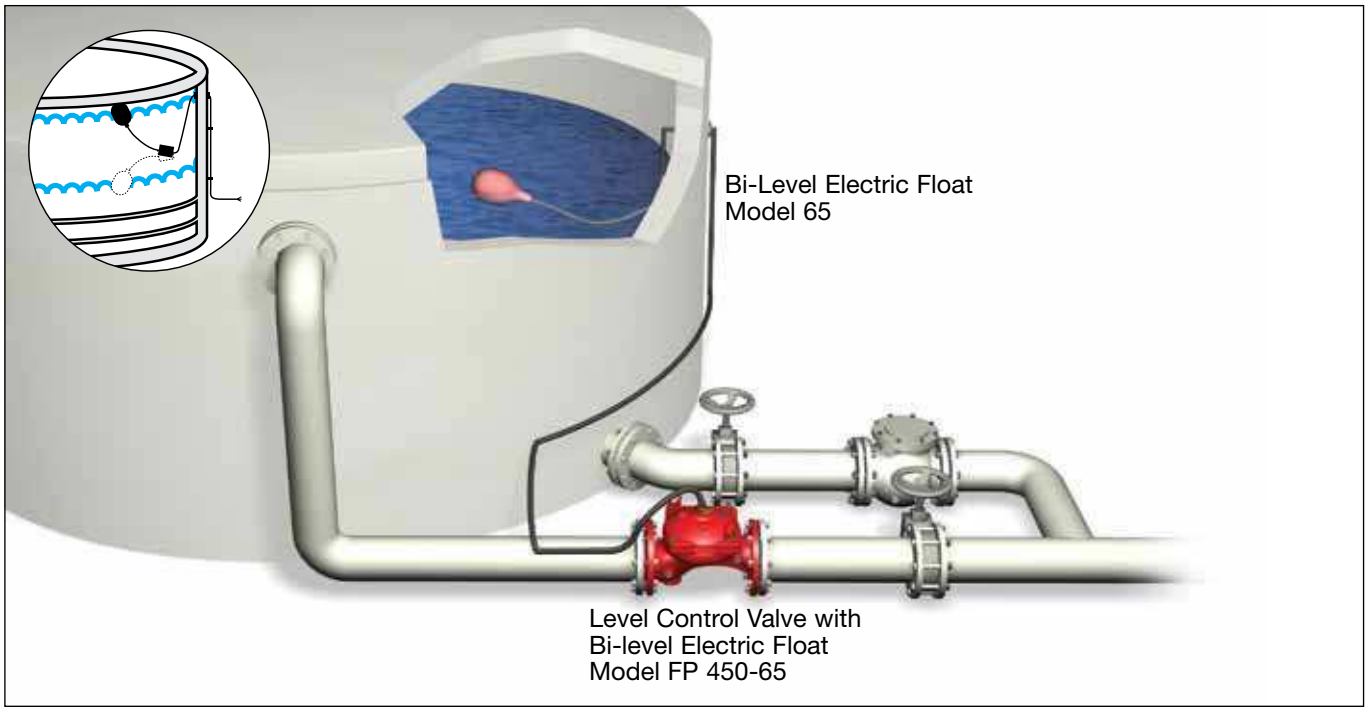
Control System: The control system shall consist of an electrical level sensor, a solenoid pilot (for 10" and larger valves, an accelerator shall be added to the solenoid), an isolating cock valve, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested.

Quality Assurance: The valve manufacturer shall be certified according to the ISO 9000 and 9001 Quality Assurance Standard.

Typical Applications

Infrastructure Installation

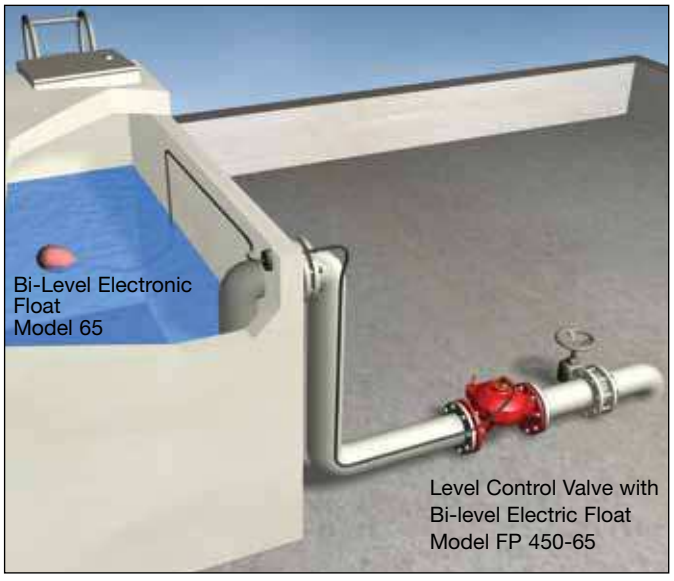
Reservoirs vary in their characteristics – location, elevation, filling and emptying flow and pressure, surface area, etc. These various characteristics require various level control valve solutions.
The Model FP 450-65 is the ideal solution for level control in reservoirs – shallow and deep, low and high elevation, rooftop and basement, in water towers, and wherever electric power is available.



Level Control Valve with
Bi-level Electric Float
Model FP 450-65

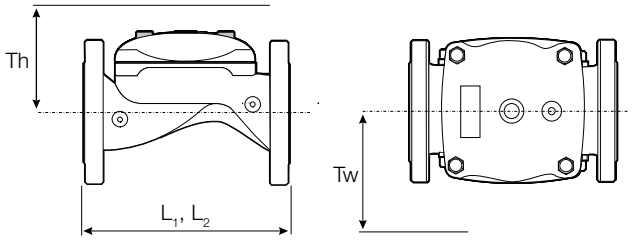
Rooftop Reservoirs

Rooftop reservoir level control is attained by electric control of the basement pumps according to reservoir level. As overflow of a rooftop reservoir can cause costly damage, additional backup protection is recommended. The Model FP 450-65 is suited to this function. When open, it presents minimal interference, but when needed, it shuts off securely.
To prioritize pressure to upper floor consumers or fire protection system, install the
Model FP 430-UF Pressure Sustaining Valve upstream from the Model FP 450-65.



Level Control Valve with
Bi-level Electric Float
Model FP 450-65

Technical Data



Size		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- Angle: 2, 3 & 4"

Pressure Rating
- Max. inlet: 250 psi (17 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Float switch Data

Max. Current: 16A@250V
Fluid specific weight: 0.95-1.10
Working temperature:
Water up to 60°C (140°F)
Dimensions:
- Length – 124 mm (4.9")
- Width – 90 mm (3.5")
- Cable length – 4.9 m (16 ft.)

Solenoid Electrical Data:

Voltages:
- (ac): 24, 110-120, 220-240, (50-60 Hz)
- (dc): 12, 24, 110, 220

Power Consumption:
- (ac): 30 VA, inrush; 15 VA (8W), holding or 70 VA, inrush; 40 VA (17.1W), holding
- (dc): 8-11.6W

Values might vary acc... ...ific solenoid model

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Level Control Valve

with Bi-Level Vertical Float

Model: FP 450-66

- Reservoir filling
  - Very low supply pressure
  - Low noise generation
  - Energy cost critical systems
  - Systems with poor water quality

Description

The Model FP 450-66 Level Control Valve with Bi-Level Vertical Float is a hydraulically controlled, diaphragm actuated control valve that controls reservoir filling in response to a hydraulic on/off float pressure commands. The Valve opens at pre-set low level and shuts at pre-set high level.

Features and Benefits

- **Line-pressure driven –** Independent operation
- **Bi-Level electric float switch**
  - On/off service
  - Suitable for low quality water
- **One-piece molded elastomeric moving part –** No maintenance required
- **Dynamically restrained actuation**
  - Non-slam closing
- **Balanced rolling-**diaphragm
  - High flow capacity
  - Very low opening & closing pressure requirement
- **External installation**
  - Easy access to valve & float
  - Easy level setting
  - Less wear and tear
- **In-line serviceable –** Easy maintenance
- **Flexible design –** Easy addition of features

Major Additional Features

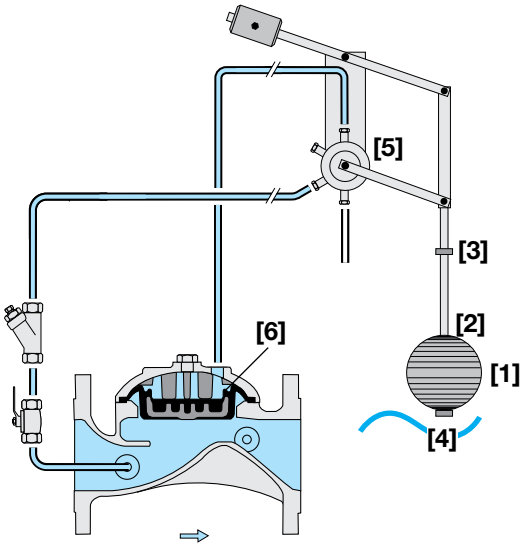
- Pressure sustaining – **453-66**
- Electric float backup – **450-66-65**
- Flow control – **457-66-U**

For further options, See relevant BERMAD publications.

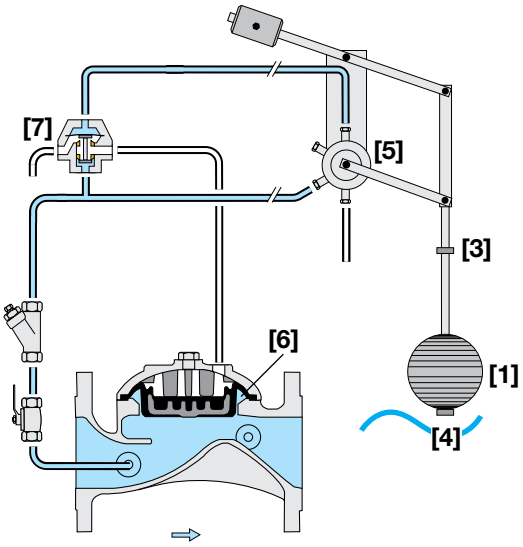
Operation

The Model FP 450-66 is a float controlled valve equipped with a 4-way, “last position”, bi-level float pilot assembly. The float **[1]** slides along the rod **[2]**. When the float reaches either the adjustable high **[3]** or low **[4]** level stoppers, it either pulls the rod assembly down or pushes it up, switching the float pilot **[5]** position. When the float is between the adjustable stoppers, the main valve remains in its last position.
At high level, the float pilot applies pressure to the control chamber **[6],** powerfully shutting off the main valve.
At low level, the float pilot vents the control chamber, powerfully opening the main valve.
For 8” valves and larger, an accelerator **[7]** quickens valve response.

Size Range 1½”-6”



Size Range 8”-12”



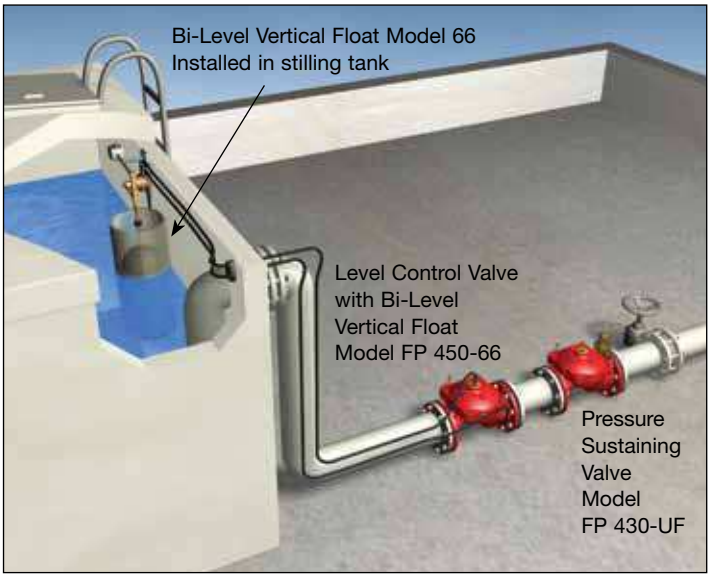
Engineer Specifications

The Level Control Valve shall hydraulically open at pre-set low level, and shut at pre-set high level.
Main Valve: The main valve shall be an elastomeric type globe (or angle) valve with a rolling-diaphragm. The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**. The body and cover shall be ductile iron. All external bolts and nuts shall be of stainless steel 316. All valve components shall be accessible and serviceable without removing the valve from the pipeline.
Actuation: Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
Quality Assurance: The valve manufacturer shall be certified according to the ISO 9000 and 9001 Quality Assurance Standard.

Typical Applications

Infrastructure Installation

Rooftop reservoir level control is attained by electric control of the basement pumps according to reservoir level. As overflow of a rooftop reservoir can cause costly damage, hydraulic backup protection is recommended.
The Model FP 450-66 is suited to this function. When open, it presents minimal interference, but when needed, it shuts off securely.
To prioritize pressure to upper floor consumers or fire protection system, install the
Model FP 430-UF Pressure Sustaining Valve upstream from the Model FP 450-66.

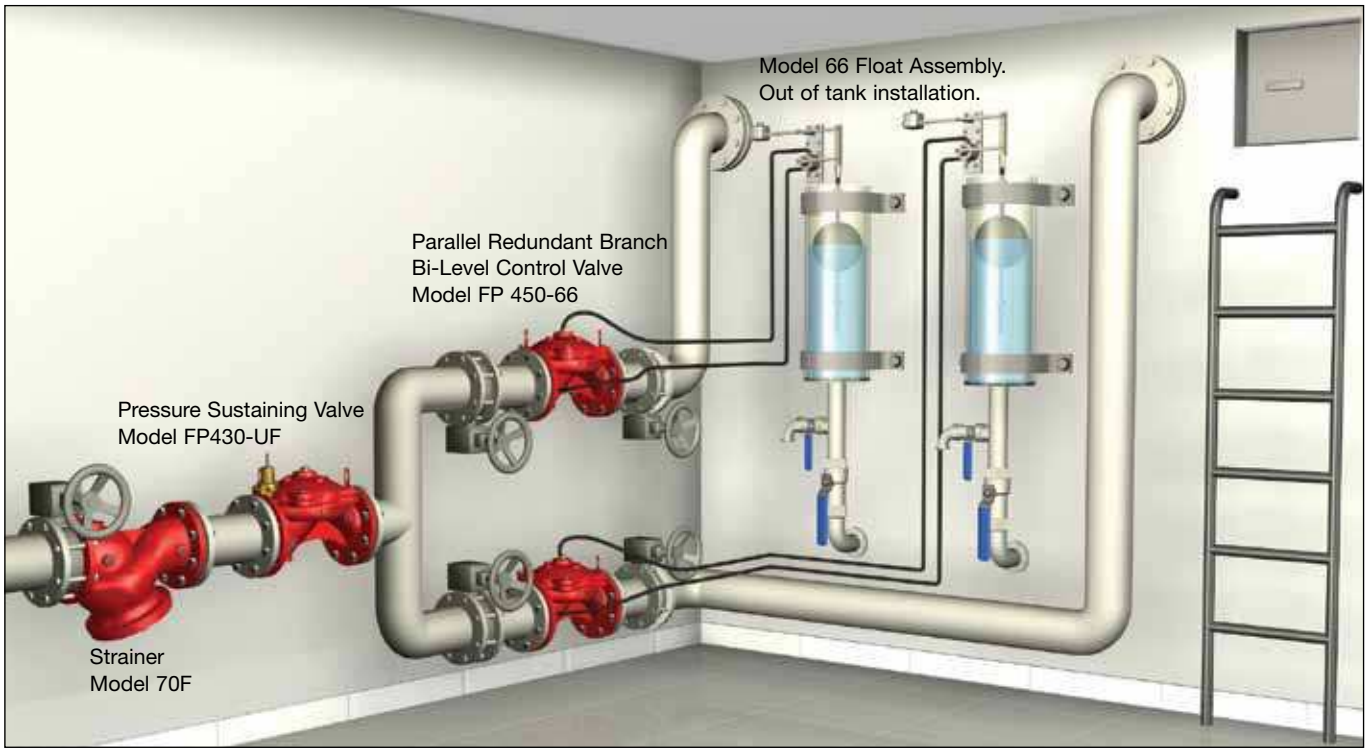


Basement Reservoirs

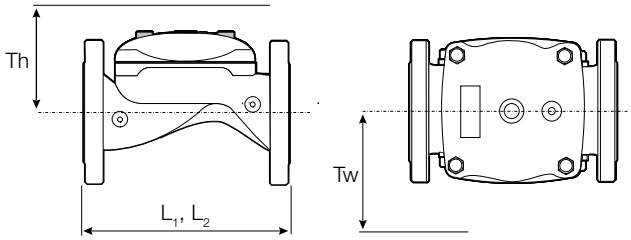
Basement reservoir design requires consideration of specific issues:

- Supply cut-off is unacceptable.
- Reservoir overflow might damage expensive equipment.
- Noise level and duration should be limited.
- Municipal supply pressure might be low.

The Model FP 450-66, as part of a Reservoir Fill-Up system, fulfills these requirements and more.



Technical Data



Size		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- Angle: 2, 3 & 4"

Pressure Rating
- Max. inlet: 250 psi (17 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Float Data

Standard Materials:
- Pilot body: Brass
- Seals: NBR (Buna N)
- Internals: Stainless Steel & Brass
- Lever system: Brass
- Float: Plastic
- Float rod: Stainless Steel
- Base plate: Fusion bonded epoxy coated Stainless Steel

Optional materials: Stainless Steel metal parts and float, FPM (Viton®) seals

General Information:
- Minimum level differential: 15 cm (6")
- Maximum level differential: 54 cm (21")
- Each extension rod adds 56 cm (22"), one extension rod supplied
- Extra counterweight required if second extension rod used see BERMAD float installation r ons

If inlet pressure r above 10 bar (150 psi), cons

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4-Way Bi-Level Vertical Float

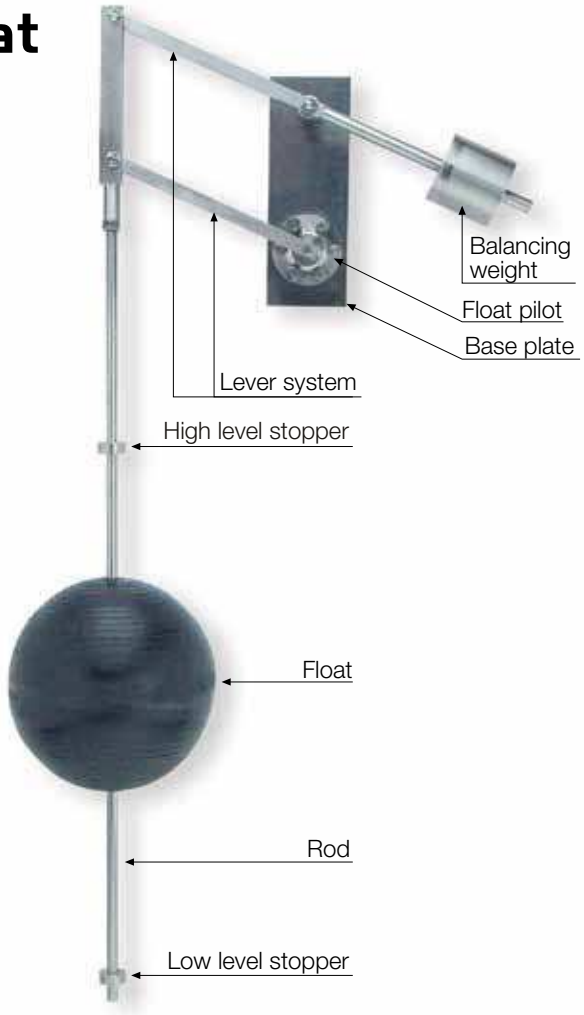
Model: #66

This 4-Way, adjustable, last position bi-level vertical float, is actuated by the float sliding along the rod assembly to either pull it down or float it up, switching the float pilot position. When the float is between the adjustable high and low level stoppers, the main valve remains in its last position.

The float pilot directs flow and pressure between its ports:

- When the float pushes the upper stopper up, it connects port “P” to “C1” and port “C2” to “V.”
- When the float pulls the lower stopper down, it connects port “P” to “C2” and port “C1” to “V.”

The extendable rod is to be balanced by counterweights installed on the lever system according to rod length and system pressure.

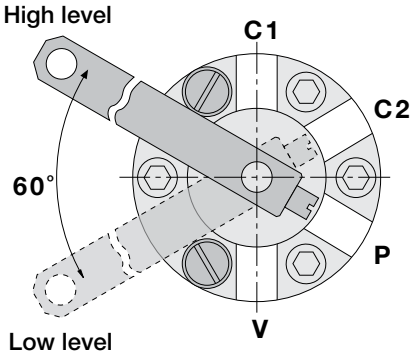


Technical Data

Pressure Rating: 25 bar (350 psi)
Working Temperature: Water up to 80˚C (180˚F)
Flow Factor: Kv 0.17 (Cv 0.2)
Ports: 1/8” NPT
Standard Materials:
4-Way pilot body: Brass
Elastomers: NBR
Internals: Stainless Steel & Brass
Lever System: Brass
Float: Plastic
Float Rod: Stainless Steel
Base Plate: Fusion bonded epoxy coated Steel
Optional Materials:
Metal Parts: Stainless Steel, Nickel Aluminum Bronze, Hastalloy
Elastomers: FPM (Viton®)

Connections:

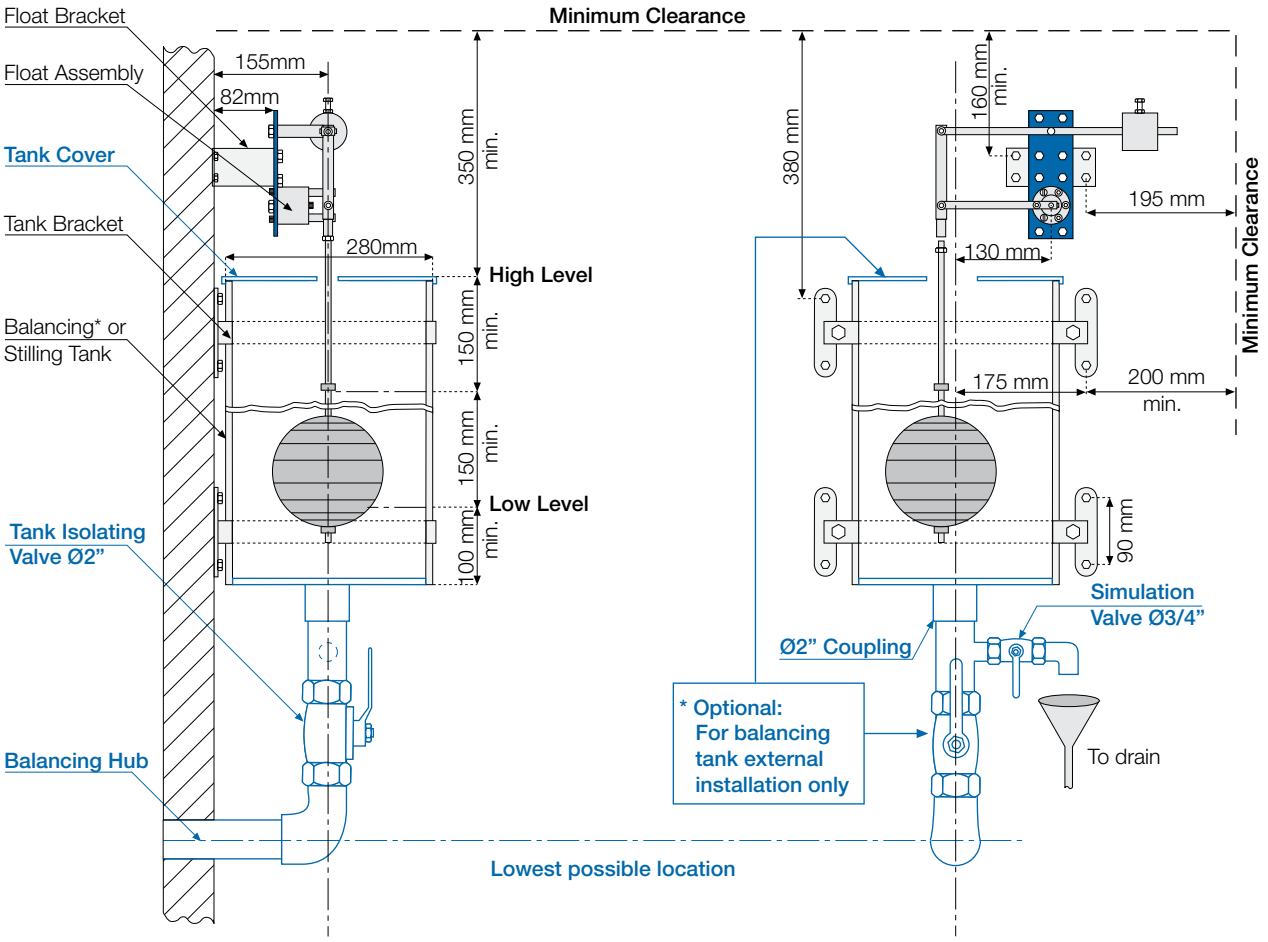
Port	Reservoir inlet	Reservoir outlet
C1	Upper control chamber	Lower control chamber
C2	Lower control chamber (or plugged)	Upper control chamber
P	Upstream pressure	Upstream pressure
V	Vent	Vent



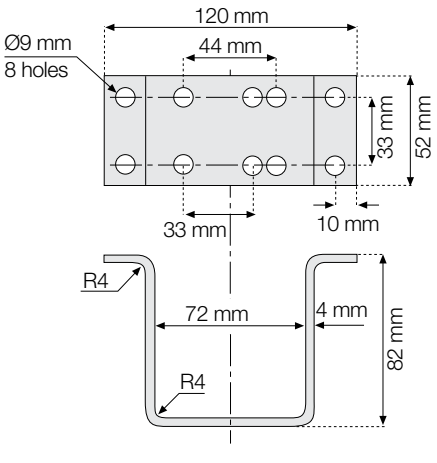
Notes:

- Minimum level differential: 15 cm (6”)
- Maximum level differential: 54 cm (21”)
- Each extension rod adds 56 cm (22”). One extension rod supplied
- Extra counterweight required if second extension rod used
- Float hydraulic connections: 3 tubes size 3/8”

Typical Installation

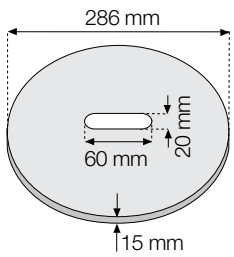


Float 66 Bracket

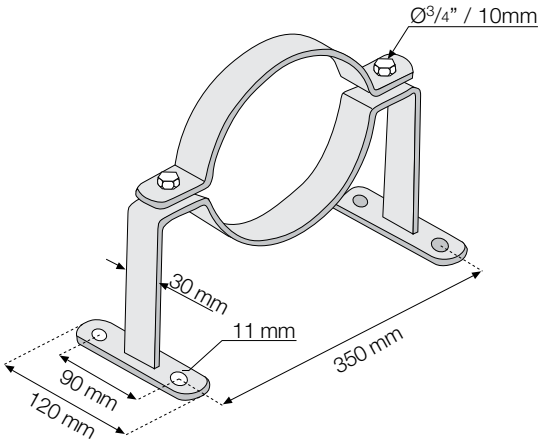


L Unfolded = 265 mm

Tank Cover



Tank Bracket

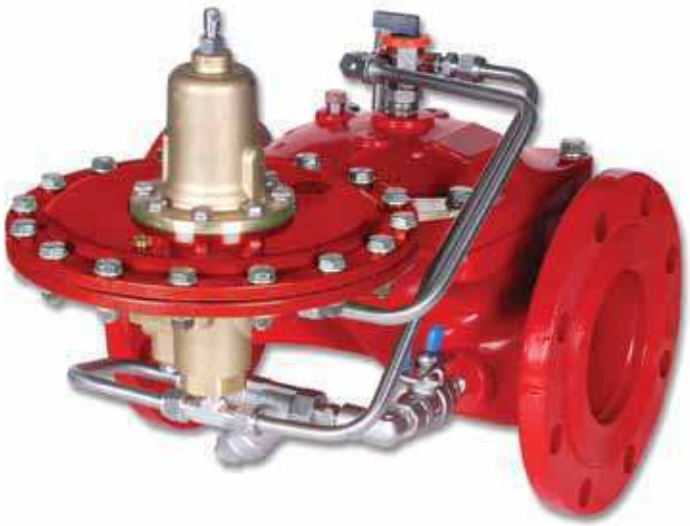


Level Control Valve

with Altitude Pilot

Model: FP 450-80

- High level reservoirs & water towers
- Energy cost critical systems
- Systems with poor water quality
- Inherent refreshing
- Level sustaining at reservoir outlet



Description

The Model FP 450-80 Level Control Valve is a hydraulically controlled, diaphragm actuated, control valve that shuts at pre-set high reservoir level and fully opens in response to an approximately one-meter (three-foot) level drop, as sensed by the 3-Way altitude pilot mounted on the main valve.

Features and Benefits

- **Line-pressure driven –** Independent operation
- **Bi-level altitude pilot**
  - **No float, simple installation**
  - **On/Off service**
  - **Suitable for low quality water**
- **One-piece molded elastomeric moving part –** No maintenance required
- **Dynamically restrained actuation**
  - **Non-slam closing**
- **Balanced rolling-diaphragm**
  - **High flow capacity**
  - **Very low opening & closing pressure requirement**
- **External installation**
  - **Easy access to valve**
  - **Easy level setting**
  - **Less wear and tear**
- **In-line serviceable –** Easy maintenance
- **Flexible design –** Easy addition of features

Major Additional Features

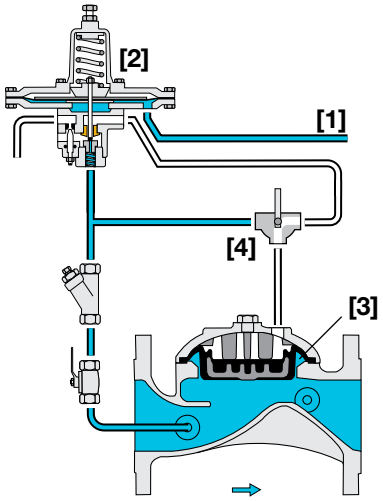
- 2-14 meter Setting Altitude Pilot – **FP 450-80-M6**
- 5-22 meter Setting Altitude Pilot – **FP 450-80-M5**
- 15-35 meter Setting Altitude Pilot – **FP 450-80-M4**
- 25-70 meter Setting Altitude Pilot – **FP 450-80-M8**
- Modulating altitude control – **FP 450-82**
- Pressure sustaining (for 450-80) – **453-80**
- Pressure sustaining (for 450-82) – **453-82**

For further options, See relevant BERMAD publications.

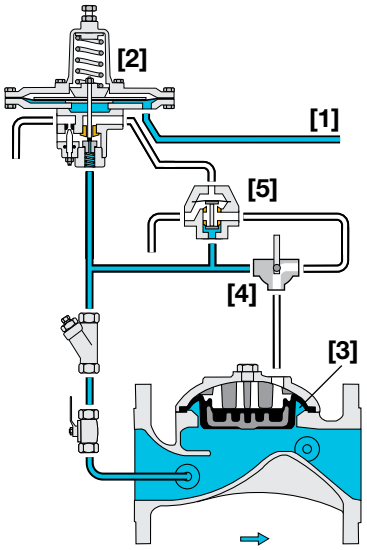
Operation

The Model FP 450-80 is a pilot controlled valve equipped with an adjustable, 3-way, altitude pilot. The pilot senses the static head of the reservoir level via a tube **[1]** connected to a “still point” at the bottom of the reservoir.
Should static head rise to pilot setting, the pilot **[2]** applies pressure to the control chamber **[3]** via cock valve **[4],** powering the main valve to shut.
Should static head fall below pilot setting by approximately 1m (3 ft), the pilot vents the control chamber, causing the main valve to fully open.
The 3-way cock valve **[4]** enables manual closing of the main valve.
For 8” valves and larger, an accelerator **[5]** quickens valve response.

Size Range 1½”-6”



Size Range 8”-12”



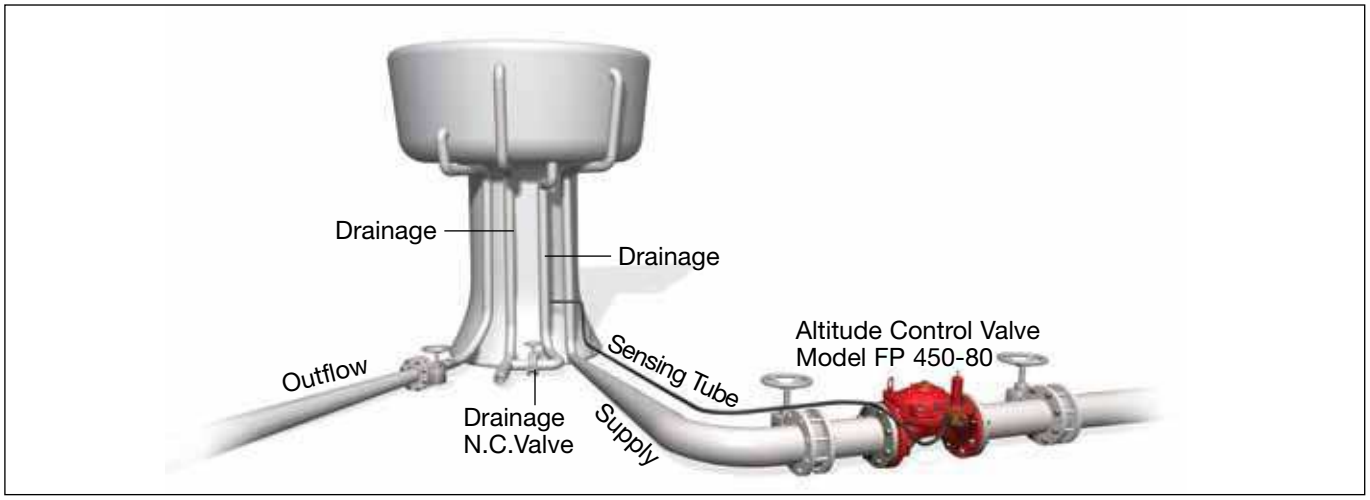
Engineer Specifications

The Level Control Valve shall shut at pre-set high reservoir level and fully open in response to an approximately one-meter (three-foot) level drop, as sensed by the 3-way altitude pilot mounted on the main valve.
Main Valve: The main valve shall be an elastomeric type globe (or angle) valve with a rolling-diaphragm. The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**. The body and cover shall be ductile iron. All external bolts and nuts shall be of Stainless Steel 316. All valve components shall be accessible and serviceable without removing the valve from the pipeline.
Actuation: Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.
Control System: The control system shall consist of a 3-way, altitude pilot valve with a covered, centered spring and 8” (200 mm) sensing diaphragm, (for 10” and larger valves, an accelerator shall be added), an isolating cock valve, a 3-way cock valve, and a filter. All fittings shall be of stainless steel. The assembled valve shall be hydraulically tested.
Quality Assurance: The valve manufacturer shall be certified according to the ISO 9000 and 9001 Quality Assurance Standard.

Typical Applications

Bi-Level Water Towers

The Model FP 450-80 senses the static head of the water level in the tank by means of a high sensitivity pilot. To do so accurately, the sensing tube end must be connected to a “still point” at the bottom of the tank. The drainage pipe provides this “still point”, a location not influenced by flow velocity as in filling and outflow pipes.



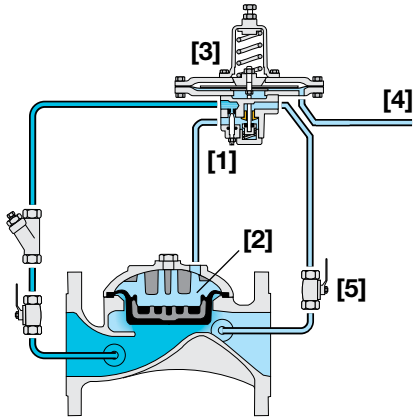
“Always Full” - Shallow Reservoirs

In these reservoirs, the water level should be kept as constant as possible.
The Level Control Valve with modulating altitude pilot Model FP 450-82 is well suited to fulfill this requirement. The altitude pilot is highly sensitive to changes and accurately maintains level within a few centimeters.
To do so, the sensing tube end must be connected to a “still point” at the bottom of the reservoir.

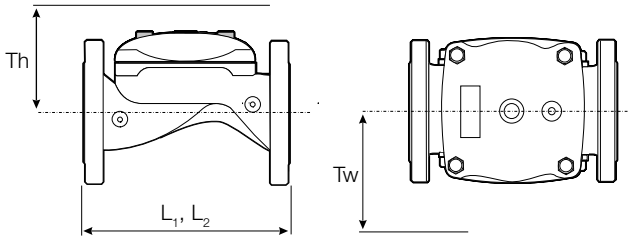
Level Control Valve with Modulating Altitude Pilot Model FP 450-82

Level Control Valve with Modulating Altitude Pilot Model FP 450-82

The Model FP 450-82 modifies the Model FP 450-80 “On-Off” feature into a modulating feature to maintain an “always full” reservoir.
The needle valve **[1]** continuously allows flow from valve inlet into the control chamber **[2]**. The pilot **[3]** senses static head via sensing tube **[4]**.
Should the static head rise towards pilot setting, the pilot throttles, causing the main valve to throttle closed, reducing filling rate, eventually closing drip tight.
The downstream cock valve **[5]** enables manual control closing.



Technical Data



Size		1½,2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	500	19 11/16	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"

Water Temperature
- 0.5 – 50°C (33 – 122°F)

Available Sizes
- Globe: 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- Angle: 2, 3 & 4"

Pressure Rating
- Max. inlet: 250 psi (17 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

Altitude Pilot Data

Standard Materials:
- Body & cover: Brass, Bronze or Stainless Steel
- Elastomers: NBR (Buna N)
- Springs: Galvanized Steel or Stainless Steel
- Internals: Stainless Steel
- Diaphragm covers: Fusion bonded epoxy coated Steel or Stainless Steel

General Information
- Altitude Adjustment Range Table:

Code	meter	feet
M6	2-14	7-46
M5	5-22	17-72
M4	15-35	49-115
M8	25-70	82-230

- Shut-off level r ity: 10 cm (4")
- Re-openin m (3 ft) below sh

Altitude Pilot Valve

Model #82

This pilot valve is used with the Altitude Level Control Valve and integrates all principal functions of a 2-Way control circuit in a single assembly.
It is a high sensitivity, direct acting valve, actuated by a pressure responsive diaphragm, which tends to reach equilibrium with the a spring force.
The pilot valve modulates closed as water level rises above set point. An integral needle valve acts as an upstream flow restrictor as well as a closing speed control.

Features

- Integral needle valve
- Differential pressure sensing (model #7)

Typical Applications

- Modulating Altitude Control Valves sizes 1½-14”

Technical Data

Pressure Rating: 16 bar (235 psi)
Working Temperature: Water up to 80˚C (180˚F)
Flow Factor: Kv 1.0 (Cv 1.2)
Standard Materials:
Body: Brass
Diaphragm Housing: Fusion bonded epoxy coated Steel
Elastomers: NBR
Internals: Stainless Steel & Brass
Spring: Galvanized Steel
Optional Materials:
Stainless Steel, Nickel
Aluminum Bronze, Hastalloy

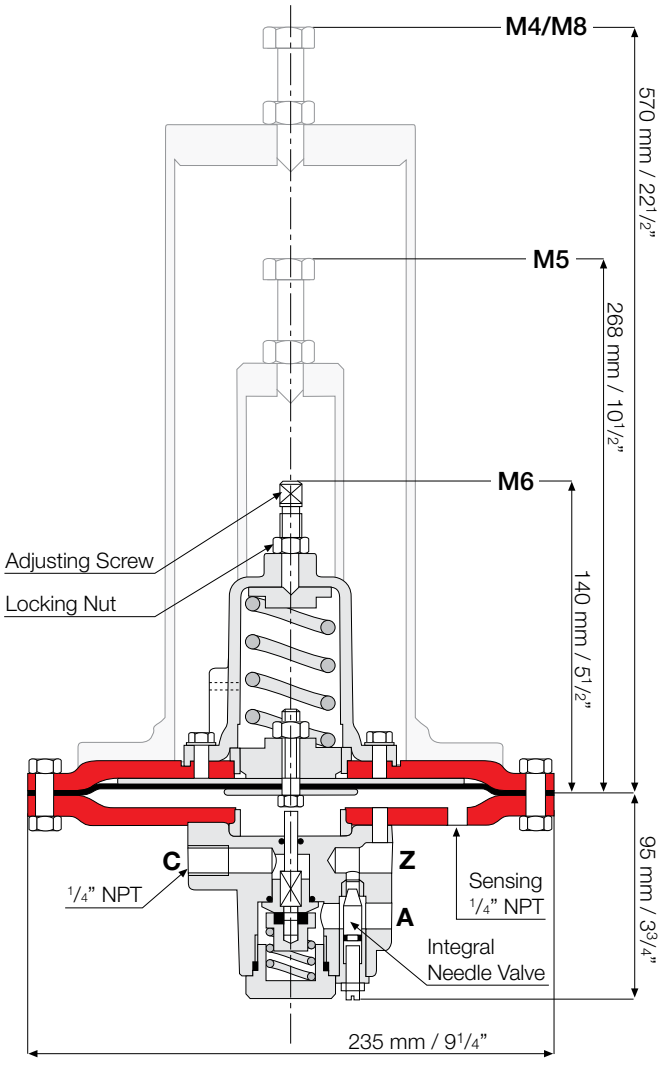
Adjustment Range

Code	Pilot	
	Meter	Feet
M6	**2-14**	**7-46**
M5	5-22	17-72
M4	15-35	49-115
M8	25-70	82-230

Standard
Optional

Connections

Z - Upstream
A - Valve control chamber
C - Downstream
Sensing - For altitude control – still point at reservoir bottom



Weights: **M6 -10 Kg / 22 lbs.** **M5 -11 Kg / 24 lbs.**
M4 -19 Kg / 42 lbs. **M8 -22 Kg / 49 lbs.**

BERMAD Fire Protection

Fire Protection

Valve Data and Engineering Information

BERMAD

FP 400E Deluge Valve Data

Description

BERMAD FP 400E Deluge Valves are elastomeric- type globe valves that are rolling-diaphragm actuated, with an integral, solid, resilient seal. These automatic water control valves are designed for vertical or horizontal installation and are available in diameter sizes from 1½" to 14" (DN40 to DN350).

The BERMAD FP 400E valves are used for water flow control in Deluge, Combination Pressure Control Deluge, Preaction or Water/Foam systems, and are manufactured from various materials and coatings to suit all kind of industrial specifications.

The FP 400E Deluge Valve is held closed by system water pressure trapped in the control chamber. When the releasing system operates, pressure is released from the control chamber, and the seal disc opens to allow water to flow into the system.

The design of the FP 400E valve body includes a single, full bore seat with unobstructed flow path, free of any in-line ribs, supporting cage, or shafts.

The unique hydro-dynamic globe design provides high flow capabilities with minimum head loss. The cover is removable via four (4) fastening bolts (up to 10") for quick in-line inspection and servicing.

The internal design of the FP 400E valve is based on innovative technology using advanced rubber-based materials to achieve a solid, one-piece, elastomeric assembly including flexible fiber reinforced diaphragm, vulcanized with a rugged radial seal disk, and together providing resilient, drip-tight sealing. The elastomeric assembly is carefully balanced and peripherally supported to avoid tension and protect the elastomer, resulting in long-life, controlled actuation, even under harsh conditions.

The elastomeric assembly can be easily removed from the valve body with no need for disassembling the valve from the line.

Accessories

The BERMAD FP 400E Deluge Valve are trimmed with the original components and accessories per specification and in accordance with valve functions and applications.

Where additional specifications and/or signaling devices are required for a specific application, refer to system data for the system used, and to the BERMAD data sheet and Installation, Operation & Maintenance for specific model required.

Main Features

- One-piece molded elastomeric moving part – No maintenance required
- In-line serviceable, field replaceable internal parts
- Obstacle free, full bore
- Available in corrosion resistant materials
- Designed to be reset without opening the valve
- Compatible with electric/hydraulic/pneumatic release and pressure control trim systems

Approvals

- UL Listed to UL 260 from 5 to 250 psi (0.3 to 17.2 bar) Working Pressure, 1-½" through 10" (DN40 through DN250)
- ABS Approved for 300 psi (21 bar) maximum working pressure, 1-½" through 14" (DN40 through DN350)
- Lloyd's Register Type Approval for 300 psi (21 bar) maximum working pressure, 1-½" through 14" (DN40 through DN350)
- Fire Test Certified to ISO 6182 part 5, 1-½" through 12" (DN40 through DN300)

Notes:

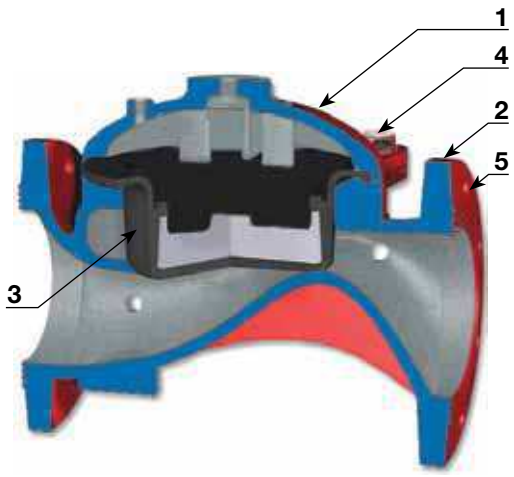
1. The FP 400E valve shall be trimmed with specific components & accessories.
2. The FP 400E valve must be installed and maintained in compliance with the most recent BERMAD publications.

Construction Materials

The BERMAD FP 400E valves are available in a variety of materials to ensure optimal suitability for a wide range of applications. When the valve is designed for external corrosive environments and/or internal corrosive fluid, an adequate Body and Cover resistant material shall be used.

It is recommended to apply the "High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion" specification (as shown below) when the valve is used in corrosive environments such as seashore, chemical environments or petrochemicals and other industrial processing plants.

Note: in case of Seawater service, brackish/ desalinated water or if Foam Concentrate is used please refer to BERMAD FS 400E series engineering data.



Standard Configurations

Item Number	Description	Code		
		FP-C-PR	FP-C-ER	FP-S-ER
1	Cover	Ductile Iron	Ductile Iron	Cast Steel
2	Valve Body	Ductile Iron	Ductile Iron	Cast Steel
3	Elastomeric Assembly	NR with VRSD*	NR with VRSD*	NR with VRSD*
4	External Bolts / Nuts	S.S. 316	S.S. 316	S.S. 316
5	Coating	Polyester	H.B. Epoxy	H.B. Epoxy

* VRSD - Vulcanized Radial Seal Disk

Specifications

Castings

- Ductile Iron to ASTM A536 65-45-12 (coated)
- Cast Steel ASTM A216 Grade WCB (coated)
- Nickel Aluminum Bronze ASTM B148 C95800
- Stainless Steel 316 ASTM A351 Grade CF8M
- Hastelloy C-276

Standard Bolting:

- Stainless Steel 316 to ASTM A320 Gr.B8F
  Option: Internal Spring - S.S. 302 or Inconel

Elastomer

- NR, Polyamide fabric reinforced Polyisoprene, Temperature Rating 50°C
- NBR, Polyamide fabric reinforced Nitrile (Buna-N), Temperature Rating 80°C
- EPDM, Polyamide fabric reinforced Ethylene-Propylene, Temperature Rating 90°C

Coating

- Electrostatic Powder Coating Polyester
- High Built Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion
- Color: Fire Red to RAL 3002

Note: Internal & External coating applied on Ductile Iron or Cast Steel Castings only.

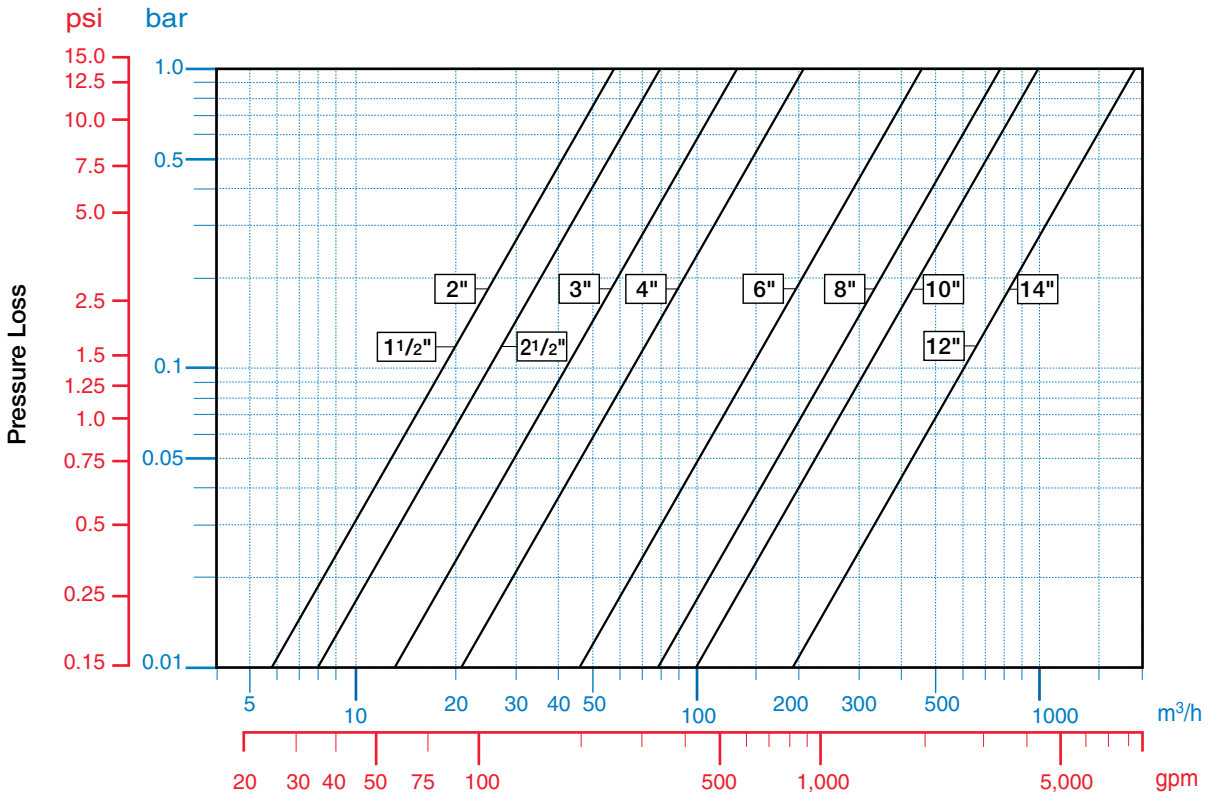
Pressure Rating

Material	End Connection Standard Inlet & Outlet	Class & Type	Max. working Pressure	
			psi	bar
Ductile Iron	Flanged ANSI B16.42	#150RF	250	17.4
	Flanged ISO 7005-2	PN16	235	16
	Grooved ANSI C606	250	250	17.4
	Threaded ISO-7-RP/NPT	250	250	17.4
Cast Steel	Flanged ANSI B16.5	#150RF	250	17.4
	Flanged ISO 7005-2	PN16	235	16
Stainless Steel	Flanged ANSI B16.5	#150RF	250	17.4
	Flanged ISO 7005-2	PN16	235	16
Ni-Al Bronze	Flanged ANSI B16.24	#150RF	250	17.4
	Flanged ISO 7005-2	PN16	235	16

Notes:

1. To attach a grooved valve to flanged line or vice versa, apply a grooved-flange adapter suited to the designated conditions.
2. Factory pressure testing: Each valve is tested at 375 psi (26 bar)
3. Water Temperature: 0.5 - 50ºC (33 - 122ºF) for standard construction.
4. Standard flange facing: Raised Face (RF), Serrated Finish. Flat Face (FF) flanges available on request.

Flow Chart



Flow Properties

DN	40	50	65	80	100	150	200	250	300	350
Inch	**1½"**	**2"**	**2½"**	**3"**	**4"**	**6"**	**8"**	**10"**	**12"**	**14"**
Kv	57	57	78	136	204	458	781	829	1,932	1,932
Cv	66	66	90	157	236	529	902	957	2,231	2,231
K	3.2	3.2	4.2	2.9	4.0	4.0	4.4	3.9	3.6	3.6
Leq-m	9.1	9.1	12.1	13.7	14	27.4	45.8	108	57	57
Leq-feet	30	30	40	45	46	90	150	354	187	187

Valve flow coefficient, Kv or Cv $Kv(Cv)=Q\sqrt{\frac{Gf}{\Delta P}}$

Where:
Kv = Valve flow coefficient (flow in m^3/h at 1bar Diff. Press.)
Cv = Valve flow coefficient (flow in gpm at 1psi Diff. Press.)
Q = Flow rate (m^3/h ; gpm)
ΔP = Differential pressure (bar ; psi)
Gf = Liquid specific gravity (Water = 1.0)

Cv = 1.155 Kv

Flow resistance or Head loss coefficient, $K=\Delta H\ \frac{2g}{V^2}$

Where:
K = Flow resistance or Head loss coefficient (dimensionless)
ΔH = Head loss (m ; feet)
V = Nominal size flow velocity (m/sec ; feet/sec.)
g = Acceleration of gravity (9.81 m/sec^2 ; 32.18 $feet/sec^2$)

Equivalent Pipe Length, Leq $Leq=Lk\cdot D$

Where:
Leq = Equivalent nominal pipe length (m ; feet)
Lk = Equivalent length coefficient for turbulent flow in clean commercial steel pipe (SCH 40)
D = Nominal pipe diameter (m; feet)

Note:
The Leq values given are for general consideration only.
Actual Leq may vary somewhat with each of the valve sizes.

Si Metric

Flanged

	Size DN mm (inch)	40 (1½")	50 (2")	65 (2½")	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")	350 (14")
ANSI #150, ISO PN 16	LF (mm)	205	205	205	257	320	415	500	605	725	741
	W (mm)	155	155	178	200	223	306	365	405	610	597
	H (mm)	74	74	86	110	130	205	256	256	373	373
	RF (mm)	64	78	89	100	115	140	172	204	242	267
	a (1) (inch)	½	½	½	½	½	½	½	½	½	½
	b (1) (inch)	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
	c (1) (inch)	½	½	½	½	½	½	½	½	½	½
	d (2) (inch)	¾	¾	1.5	1.5	2	2	2	2	2	2
	Control Vol.(3) (Lit.)	0.12	0.12	0.18	0.29	0.67	1.94	3.86	3.86	13.8	14
	Weight (Kg)	8	9	10.5	19	28	68	125	140	220	235

Grooved

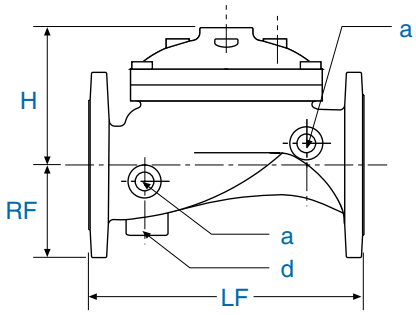
	Size DN mm (inch)	50 (2")	80 (3")	100 (4")	150 (6")	200 (8")
Grooved	LG (mm)	205	250	320	415	500
	W (mm)	120	175	200	306	365
	H (mm)	74	110	130	205	256
	RG (mm)	30.2	44.5	57.2	84.2	110
	a (1) (inch)	½	½	½	½	½
	b (1) (inch)	¼	¼	¼	¼	¼
	c (1) (inch)	½	½	½	½	½
	d (2) (inch)	¾	1½	2	2	2
	Control Vol.(3) (Lit.)	0.12	0.29	0.67	1.94	3.86
	Weight (Kg)	5	10.6	16.2	49	108

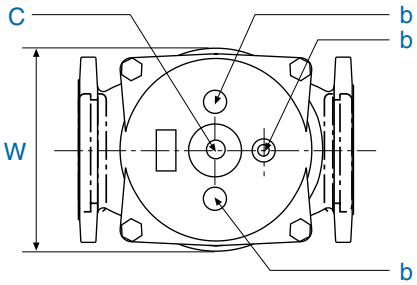
Threaded

	Size DN mm (inch)	40 (1½")	50 (2")	65 (2½")
ISO-7-Rp or NPT(F)	LT (mm)	180	180	210
	W (mm)	120	120	129
	H (mm)	74	74	87
	RT (mm)	30	37.5	40
	a (1) (inch)	½	½	½
	b (1) (inch)	¼	¼	¼
	c (1) (inch)	½	½	½
	d (2) (inch)	¾	¾	1½
	Control Vol.(3) (Lit.)	0.12	0.12	0.18
	Weight (Kg)	4	4	5.7

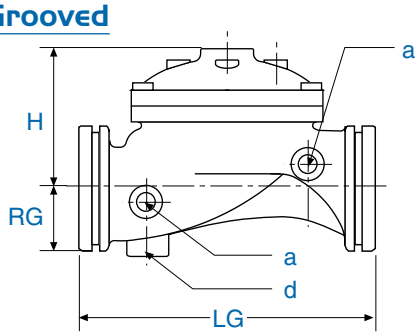
(1) (a), (b), (c) are NPT Thread ports
(2) (d) is BSPT threaded drain port
(3) (Control Volume) is Control Chamber Displacement Volume of Liquid pushed when valve opens

Flanged





Grooved



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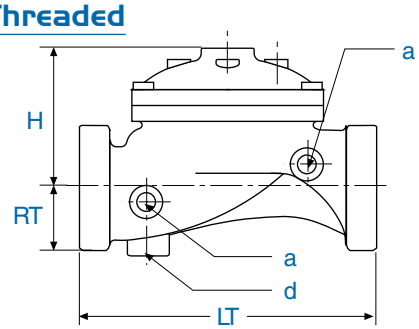


US English

Flanged

	Size	1½	2	2½	3	4	6	8	10	12	14
ANSI #150, ISO PN 16	LF (inch)	8 1/8	8 1/8	8 1/8	10 1/8	12 5/8	16 3/8	19 5/8	23 13/16	28 4/8	29 1/8
	W (inch)	6 1/8	6 1/8	7	7 7/8	8 6/8	12	14 3/8	16	24	23 4/8
	H (inch)	2 7/8	2 7/8	3 3/8	4 3/8	5 1/8	8 1/8	10 1/8	10 1/8	14 5/8	14 5/8
	RF (inch)	2 4/8	3 1/8	3 4/8	3 7/8	4 4/8	5 4/8	6 6/8	8	9 4/8	10 4/8
	a (1) (inch)	½	½	½	½	½	½	½	½	½	½
	b (1) (inch)	¼	¼	¼	¼	¼	¼	¼	¼	3/8	3/8
	c (1) (inch)	½	½	½	½	½	½	½	½	½	½
	d (2) (inch)	¾	¾	1.5	1.5	2	2	2	2	2	2
	Control Vol.(3) (Gal.)	0.03	0.03	0.05	0.08	0.18	0.51	1.02	1.02	3.65	3.70
	Weight (Lbs.)	18	20	23	42	62	150	276	309	485	518

Grooved

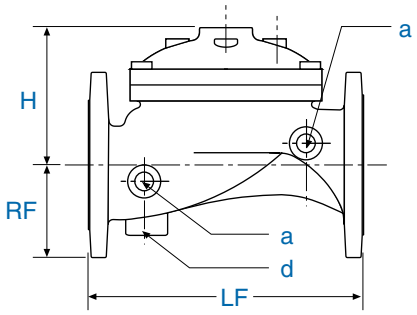
	Size (inch)	2	3	4	6	8
Grooved	LG (inch)	8 1/16	9 13/16	12 5/8	16 5/16	19 5/8
	W (inch)	4¾	6 7/8	7 7/8	12 1/16	14 3/8
	H (inch)	2 15/16	4 5/16	5 1/8	12 9/16	10 1/8
	RG (inch)	1 3/16	1¾	2¼	3¼	4 3/8
	a (1) (inch)	½	½	½	½	½
	b (1) (inch)	¼	¼	¼	¼	¼
	c (1) (inch)	½	½	½	½	½
	d (2) (inch)	¾	1½	2	2	2
	Control Vol.(3) (Gal.)	0.03	0.08	0.18	0.51	1.02
	Weight (Lbs.)	11	23	36	108	238

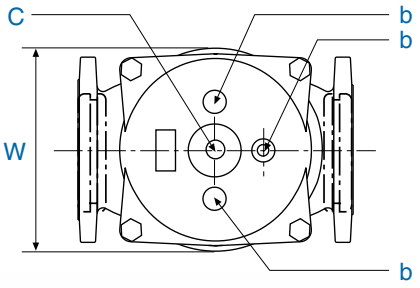
Threaded

	Size (inch)	1½	2	2½
ISO-7-Rp or NPT(F)	LT (inch)	7 1/16	7 1/16	8 1/4
	W (inch)	4 3/4	4 3/4	5 1/16
	H (inch)	2 7/8	2 15/16	3 7/16
	RT (inch)	1 3/6	1 9/16	1 9/16
	a (1) (inch)	½	½	½
	b (1) (inch)	¼	¼	¼
	c (1) (inch)	½	½	½
	d (2) (inch)	¾	¾	1½
	Control Vol.(3) (Gal.)	0.03	0.03	0.05
	Weight (Lbs.)	9	9	13

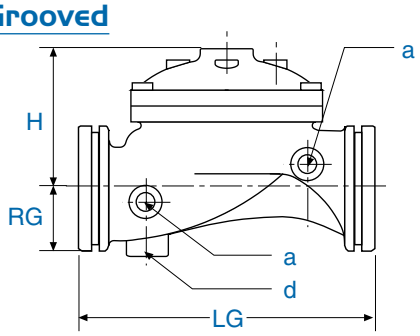
(1) (a), (b), (c) are NPT Thread ports
(2) (d) is BSPT threaded drain port
(3) (Control Volume) is Control Chamber Displacement Volume of Liquid pushed when valve opens

Flanged

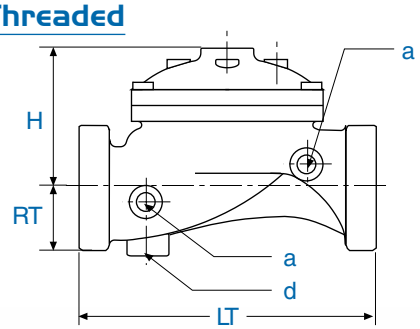




Grooved



Threaded



Installation

Proper operation of the FP 400E Deluge Valves depends upon their trim being installed in accordance with the appropriate trim configuration.

Notes:

- Wet pilot height should not exceed “Maximum Elevation Above Valve" (see data for specific model).
- Any deviation in trim size or arrangement may adversely affect the proper operation of the deluge valve.
- All the pilot system devices, must be UL Listed and compatible with the particular deluge system. Refer to current “UL Listed Fire Protection Equipment Directory”.

Warning: The deluge valve and trim must be installed only in areas where they will not be subject to freezing temperatures.

Installation Instructions

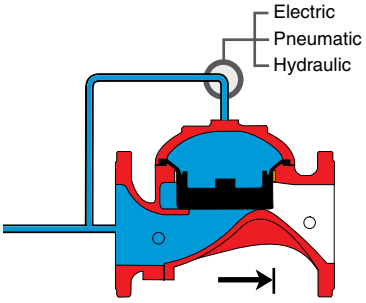
1. Allow enough room around the valve assembly for any adjustments and future maintenance.
2. Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Not flushing the line may result in the valve being rendered inoperable.
3. Install the valve in the pipeline so that the valve flow arrow appearing on the body casting is pointing in the desired direction. Ensure that the valve is positioned so that the cover can be easily removed for future maintenance.
4. Ensure that the Control Trim is mounted properly and all other components are positioned correctly as per illustration.
5. After installation in the main line, carefully inspect/ correct any damaged accessories, piping, tubing, or fittings. Ensure that there are no leaks.
6. Install the components comprising the Deluge Trim Package in their proper positions in compliance with all instructions, drawings, and technical specifications describing the BERMAD Deluge Valve, according to the relevant illustration.
7. All additional accessories, although not packed together with the BERMAD Deluge Valve, must be installed as shown in the relevant P&ID and other illustrations.

Operation

Principle of Operation

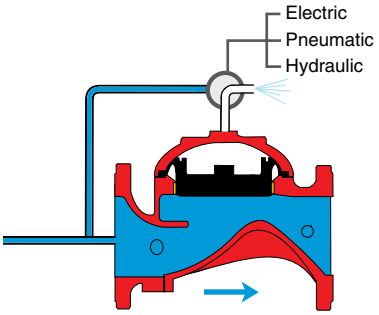
The BERMAD FP 400E Deluge Valve (assembled with specific trim) is suitable for systems that include adequate detecting and piping systems with open nozzles. The deluge valve prevents water from entering system piping until required. The deluge valve is kept closed by pressure applied to the control chamber through a restricted priming line.
In the SET position, the water pressure supplied through the priming line is trapped in the control chamber of the deluge valve by a check valve, and by the normally closed release device.
The pressure trapped in the control chamber of the deluge valve presses the valve seal disc down, thereby sealing the valve and keeping the system piping dry.
Under Test or Fire conditions, when the pressure is released from the control chamber by the opening of the automatic releasing device or by manual release, the deluge valve opens and allows the inlet supply water to flow through the valve and into the system piping and alarm devices.

Warning: Whenever the handle of the Manual Emergency Release is pulled, pressure is released from the control chamber, the deluge valve will open, and water will flow into system piping and alarm devices.



Valve Closed (Set Position)

Line pressure applied to the control chamber of the valve creates a superior force that moves the valve to the closed position and provides drip tight sealing.



Valve Open (Operating Conditions)

Releasing the pressure from the control chamber to atmosphere or some other lower pressure zone causes the line pressure acting on the seal disc to move the valve to the open position.

Placing in Service/Resetting

The deluge valve and the control trim shall be Place in Service with accordance to the most recent IOM procedures for the specific model.
After all relevant instructions are performed, slowly open the supply-isolating valve and check that no water flows into the system.
The system is now operational and in stand-by mode.

Maintenance

Bermad Deluge Valves require no lubrication, no packing tightening, and require minimum maintenance.

Removing the System from Service

Warning: When taking a deluge system out of service, a fire patrol should be established in the system area. If automatic fire alarm signaling equipment is utilized, the proper authority should be notified that the system is being removed from service. The insuring body and owner's representative should also be notified when the system is being taken out of service.

WARNING:

Do not turn off the water supply to make repairs without placing a roving fire patrol in the area covered by the system. The patrol should continue until the system is back in service.

Prior to turning off any valves or water supply, notify local site fire officials.

Removal Instructions

1. Shut off the main supply-isolating valve.
2. Close the priming line valve to the deluge valve control chamber.
3. Open all drain valves.
4. Release the water pressure from the control chamber of the deluge valve by pulling the manual emergency release.
5. Place "Fire Protection System Out of Service" signs in the area protected by the system.

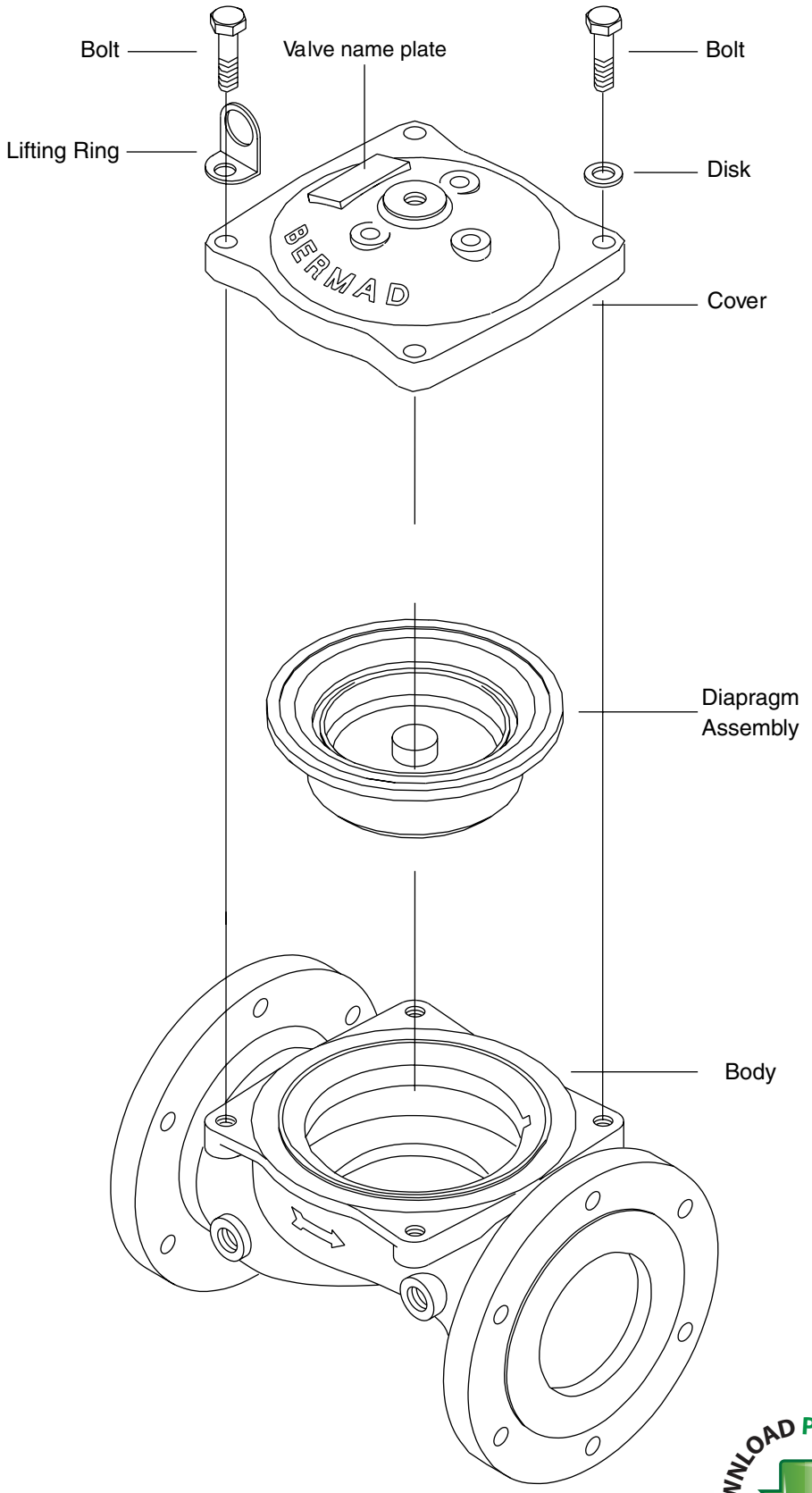
Inspection and Testing

1. **Warning:** Do not turn the water supply off to make repairs without placing a roving fire patrol in the area covered by the system. The patrol should continue until the system is back in service.
2. Prior to turning off any valves or activating any alarms, notify local security guards and the central alarm station, if used, to avoid signaling a false alarm.
3. The deluge valve and the control trim shall be maintained with accordance to the most recent IOM procedures for the specific model. A periodic test schedule should be established also with accordance to the site conditions and owner regulations.
4. Take all additional measures as required by NFPA-25 "standard for the inspection, testing, and maintenance of water-based fire protection systems".
5. The system should be checked weekly for "Normal Conditions".
6. Clean the priming strainer prior to any resetting of the deluge valve.
7. The deluge valve must be activated at full flow at least annually. Take all necessary precautions to drain water and prevent damage in the area protected by the system.
8. After about five years of operation, replacement of the diaphragm assembly is recommended. Remove the cover, clean the valve body from sediments, clean the control tubing entry holes, and install a new diaphragm assembly in place.

Spare Parts

1. The Diaphragm Assembly is the only spare part needed for the main deluge valve, see attached "Valve Disassembly and Parts Breakdown Illustration".
2. It is not recommended to store spare rubber parts for long periods (rubber in improper storage conditions can harden and crack).
3. Contact your Bermad representative and order new rubber parts when required.

Valve Disassembling Parts Breakdown



700E Deluge Valve Data

Description

BERMAD 700E Deluge Valves are globe valves with integral unitized double chamber actuator that consists of one single moving assembly, which includes a diaphragm assembly, a flat seal disk and a stainless steel removable seat. These automatic water control valves are designed for high pressure service, in vertical or horizontal installations and are available in diameter sizes from 1½" to 16"; DN40 to DN400.

The BERMAD 700E valves are used for water flow control in Deluge, Pressure Control Deluge, Preaction or Water/ Foam systems, and are manufactured from materials suitable for freshwater or alternative for seawater, foam concentrate or other corrosive fluids.

The 700E Deluge Valve is held closed by system water pressure trapped in the control chamber. When the releasing system operates, pressure is released from the control chamber, and the seal disc opens to allow water to flow into the system.

The 700E valve body design includes a single, full bore seat with unobstructed flow path, free of any in-line ribs, supporting cage, or stem guides.

The 700E "Y Type" design provides high flow capabilities with minimum head loss.

The integral unitized double-chambered actuator provides a combination of positive, immediate response with smooth hammer-free, drip-tight closing.

The whole actuator can be easily removed for a quick in-line inspection and servicing.

Valve actuation is accomplished by one moving assembly which includes a replaceable flat diaphragm, harnessed to the diaphragm assembly, a stainless steel stem and a flat seal disk assembly.

The balanced seal-disk assembly with its resilient seal enables controlled actuation, high durability and perfect drip-tight sealing, even under harsh conditions.

Accessories

The BERMAD 700E Deluge Valve shall be trimmed with the original components and accessories per specification and in accordance with valve functions and applications.

Where additional specifications and/or signaling devices are required for a specific application, refer to system data for the system used, and to the BERMAD data sheet and Installation, Operation & Maintenance for specific model required.

Main Features

- High Pressure Construction – 400 psi (28 bar) rating available
- Integral unitized double chamber actuator with single moving assembly
- In-line serviceable, field replaceable internals
- Obstacle free, full bore
- Available in corrosion resistant materials
- Designed to be reset without opening the valve
- Compatible with electric/hydraulic/pneumatic release and pressure control trim systems

Approvals

- UL Listed to UL 260 from 5 to 300 psi; 0.3 to 21 bar WP, 2" through 10"; DN50 through DN250
- ABS Approved for 300 psi; 21 bar WP, 1½" through 12"; DN40 through DN300
- Lloyd's Register Type Approval for 300 psi; 21 bar WP, 1½" through 16"; DN40 through DN400
- Fire Test Certified to ISO 6182 part 5, 1½" through 16"; DN40 through DN400

Notes:

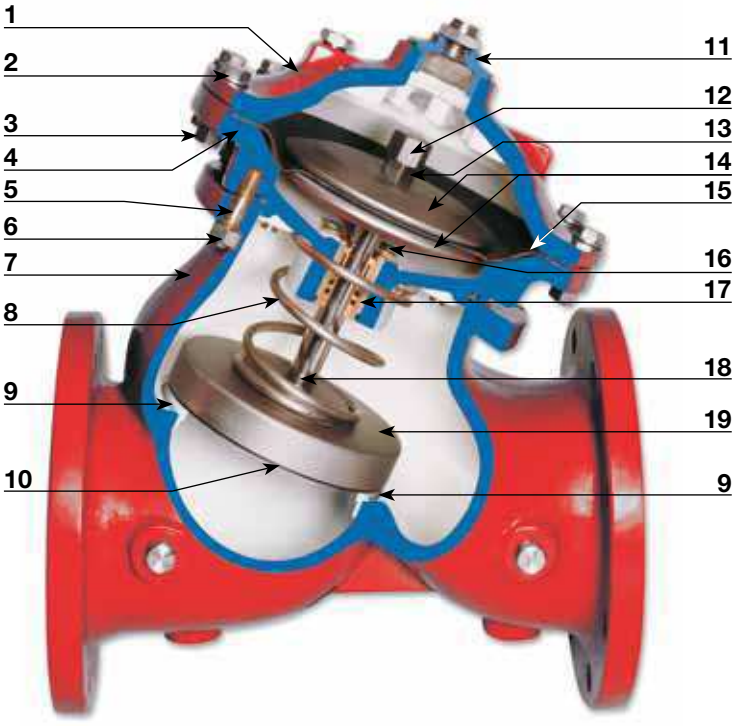
1. The 700E valve shall be trimmed with specific components & accessories.
2. The 700E valve must be installed and maintained in compliance with the most recent BERMAD publications.

Construction Materials

The BERMAD 700E valves are available in a variety of materials to ensure optimal suitability for a wide range of applications. For operation involving exposure to internal and/or external corrosive conditions, valves are constructed from corrosion-resistant materials making them suitable for use with seawater, brackish water, or corrosive environments such as seashore, petrochemical and other industrial facilities.

Standard Configurations

Item Number	Description	Firewater Valve
1	Cover	Ductile Iron
2	Cover Bolt	Z.C. Plated Steel
3	Cover Nut	Z.C. Plated Steel
4	Separation Partition	Ductile Iron
5	Stud	Z.C. Plated Steel
6	Stud Nut	Z.C. Plated Steel
7	Valve Body	Ductile Iron
8	Spring	S.S. 302
9	Removable Seat	S.S. 304
10	Seal	NBR (Buna-N)
11	Upper Plug (6-20")	Brass
12	Shaft Lock Nut	S.S. 303
13	Shaft Nut	S.S. 303
14	Diaphragm Washers	S.S. 431
15	Diaphragm	NBR (Buna-N)
16	Bearing Screw	S.S. 303
17	Bearing	Bronze
18	Shaft	S.S. 303
19	Seal Disk	S.S. 431



Specifications

Castings

- Ductile Iron to ASTM A536 65-45-12 (coated)
- Cast Steel ASTM A216 Grade WCB (coated)
- Nickel Aluminum Bronze ASTM B148 C95800
- Stainless Steel 316 ASTM A351 Grade CF8M
- Super Duplex ASTM A890 Grade 5A
- Hastelloy C-276

Bolting:

- Standard External Bolting: Zinc Plated Steel
- Optional: S.S.316 to ASTM A320 Gr.B8F

Internal Wetted Parts:

- Stainless Steel 303 ASTM A582 95B S30300A
- Stainless Steel 304 ASTM A743 Grade CF8
- Stainless Steel 431 ASTM A743 Grade CA15M
- Bronze ASTM B505 Grade C83600
- Internal Spring - S.S. 302

Optional Internal Wetted Parts:

- Stainless Steel 316 ASTM A351 Grade CF8M
- Nickel Aluminum Bronze ASTM B148 C95800
- Monel 400
- Hastelloy C-276
- Internal Spring - Inconel

Elastomers (Diaphragm & Seals)

- NBR, Polyamide fabric reinforced Nitrile (Buna-N), Temperature Rating 80°C
- EPDM, Polyamide fabric reinforced Ethylene-Propylene, Temperature Rating 90°C

Coating

- Electrostatic Powder Coating Polyester
- High Built Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion
- Color: Fire Red to RAL 3002

Note: Internal & External coating applied on Ductile Iron or Cast Steel Castings only.

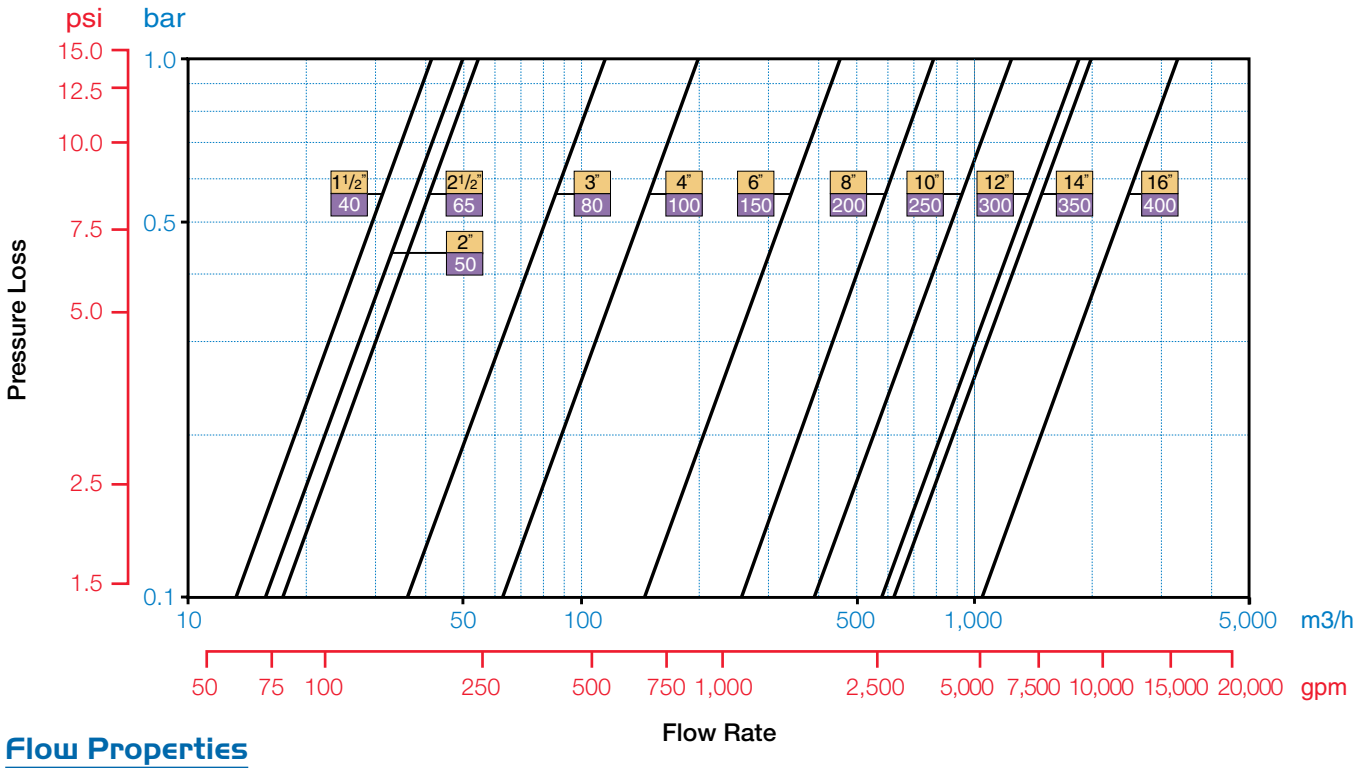
Pressure Rating

Material	End Connection Standard Inlet & Outlet	Class & Type	Max. working pressure	
			psi	bar
Ductile Iron	Flanged ANSI B16.42	#150RF	250	17.4
	Flanged ANSI B16.42	#300RF	400	28
	Flanged ISO 7005-2	PN 16	235	16
	Flanged ISO 7005-2	PN 25	365	25
	Grooved ANSI C606	300	400	25
	Threaded BSP/NPT	300/PN25	400	25
Cast Steel & Stainless Steel	Flanged ANSI B16.5	#150RF	250	17.4
	Flanged ANSI B16.5	#300RF	400	28
	Flanged ISO 7005-2	PN16	235	16
	Flanged ISO 7005-2	PN25	365	25
	Threaded BSP/NPT	300/PN25	400	25
Ni-Al Bronze	Flanged ANSI B16.24	#150RF	250	17.4
	Flanged ANSI B16.24	#300RF	400	28
	Flanged ISO 7005-2	PN 16	235	16
	Flanged ISO 7005-2	PN25	365	25

Note:

1. Factory pressure testing: Each valve is tested at 1.6 of pressure rating.
2. Water Temperature: 0.5 - 50ºC (33 - 122ºF)
3. Standard flange facing: Raised Face (RF), Serrated Finish. Flat Face (FF) flanges available on request.

Flow Chart



Flow Properties

DN		40-50	65	80	100	150	200	250	300	350	400
Inch		1½"-2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"
"Y"-Type	Kv-Y	50	55	115	200	460	815	1,250	1,850	1,990	3,310
	Cv-Y	58	64	133	230	530	940	1,440	2,140	2,300	3,820
	K-Y	3.9	9.2	4.9	3.9	3.7	3.8	3.9	3.7	5.9	3.7
	Leq-m, Y	10.3	33.4	21.6	23	37.5	53.9	70	85.6	159.9	112.7
	Leq-feet, Y	33.8	109.5	70.8	75.6	123	176.9	229.5	280.8	524.5	369.6
Angle	Kv-A	55	61	127	220	506	897	1,375	2,035	2,189	3,641
	Cv-A	64	70	146	250	580	1,040	1,590	2,350	2,530	4,210
	K-A	3.2	7.6	4.0	3.2	3.1	3.1	3.2	3.1	4.9	3.0
	Leq-m, A	8.5	27.6	17.8	19.0	37.0	44.6	57.8	70.7	132.1	93.1
	Leq-feet, A	28	90.5	58.5	62.5	101.6	146.2	189.7	232	433.4	305.5

Valve flow coefficient, Kv or Cv $Kv(Cv)=Q\sqrt{\frac{Gf}{\Delta P}}$

Where:
Kv = Valve flow coefficient (flow in m^3/h at 1bar Diff. Press.)
Cv = Valve flow coefficient (flow in gpm at 1psi Diff. Press.)
Q = Flow rate (m^3/h ; gpm)
ΔP = Differential pressure (bar ; psi)
Gf = Liquid specific gravity (Water = 1.0)

Cv = 1.155 Kv

Flow resistance or Head loss coefficient, $K=\Delta H\ \frac{2g}{V^2}$

Where:
K = Flow resistance or Head loss coefficient (dimensionless)
ΔH = Head loss (m ; feet)
V = Nominal size flow velocity (m/sec ; feet/sec.)
g = Acceleration of gravity (9.81 m/sec^2 ; 32.18 $feet/sec^2$)

Equivalent Pipe Length, Leq **Leq=Lk·D**

Where:
Leq = Equivalent nominal pipe length (m ; feet)
Lk = Equivalent length coefficient for turbulent flow in clean commercial steel pipe (SCH 40)
D = Nominal pipe diameter (m; feet)

Note:
The Leq values given are for general consideration only. Actual Leq may vary somewhat with each of the valve sizes.

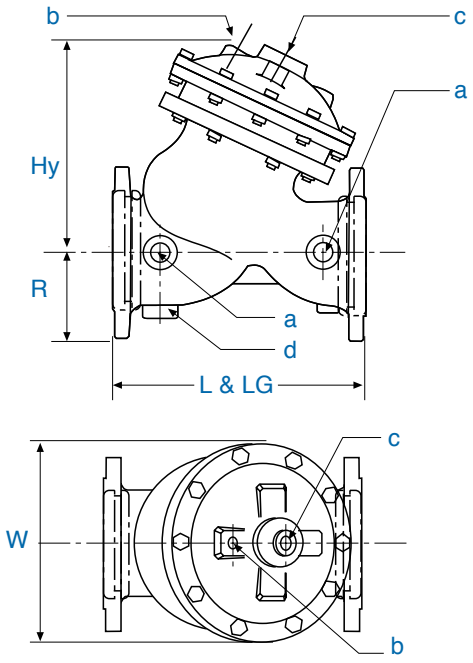
Si Metric

Flanged

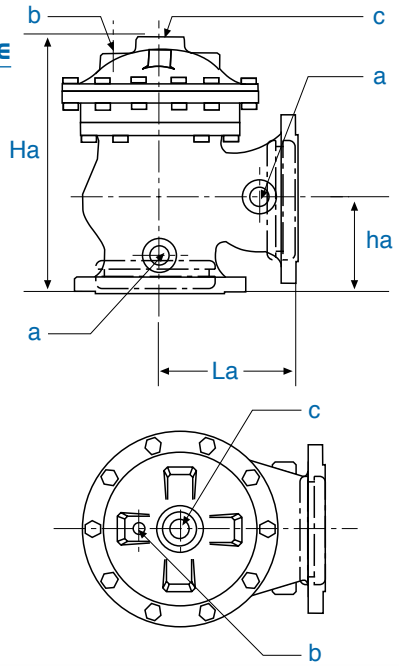
	Size DN mm (inch)		40 (1½")	50 (2")	65 (2½")	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")	350 (14")	400 (16")
ANSI #150, ISO PN 16	L	(mm)	10	205	222	250	320	415	500	605	725	733	990
	LG[4]	(mm)	N/A	N/A	N/A	250	320	415	500	N/A	N/A	N/A	N/A
	W	(mm)	165	165	178	200	223	320	390	480	550	550	740
	R	(mm)	78	83	95	100	115	143	172	204	242	268	300
	La	(mm)	124	124	149	152	190	225	265	320	396	400	450
	ha	(inch)	85	85	109	102	127	152	203	219	273	279	369
	Hy	(inch)	239	244	257	305	366	492	584	724	840	866	1,108
	Ha	(inch)	227	227	241	281	342	441	545	633	777	781	1,082
	Weight Y	(kg)	10.6	10.6	13	22	37	75	125	217	370	381	846
	Weight A	(kg)	10	10	12	21.5	35	71	118	205	350	370	800
ANSI #300, ISO PN 25	L	(mm)	210	210	222	264	335	433	524	637	762	767	1,024
	W	(mm)	165	165	185	207	250	320	390	480	550	570	740
	R	(mm)	78	83	95	105	127	159	191	223	261	295	325
	La	(mm)	124	124	149	159	200	234	277	336	415	419	467
	ha	(inch)	85	85	109	109	127	165	216	236	294	299	386
	Hy	(inch)	239	244	257	314	378	508	602	742	859	893	1,133
	Ha	(inch)	227	227	251	287	650	454	558	649	796	801	1,099
	Weight Y	(kg)	12.2	12.2	15	25	43	85	146	245	410	434	900
	Weight A	(kg)	11.5	11.5	13.5	23	41	81	138	233	390	421	855
Ports	a[1]	(mm)	½	½	½	½	½	½	½	½	½	½	½
	b[1]	(mm)	½	½	½	½	½	½	½	½	½	½	½
	c[1]	(mm)	¾	¾	¾	¾	¾	2	2	2	2	2	2
	d[2] (optional)	(mm)	¾	¾	1½	1½	2	2	2	2	2	2	2
	Control Vol. [3]	(Liter)	0.125	0.125	0.125	0.3	0.45	2.15	4.5	8.5	12.4	12.4	29.9

(1) (a), (b), (c) are NPT thread ports
(2) (d) is BSPT threaded Optional drain port
(3) (Control Volume) is Control Chamber Displacement Volume of liquid pushed when valve opens
(4) LG for Grooved ends (see available sizes)

Y Body Type



Angle Body Type



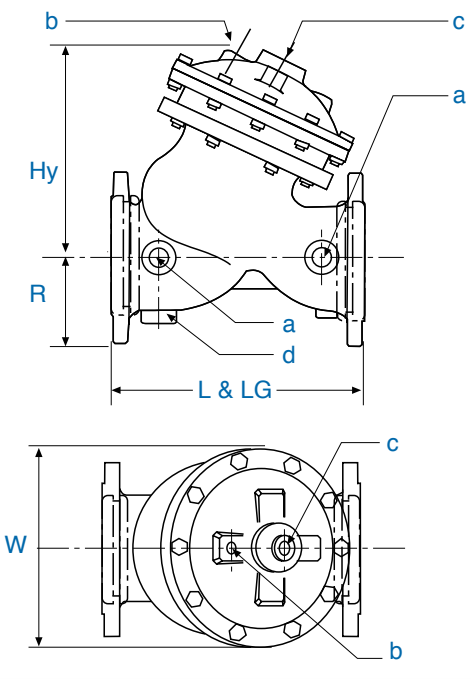
US English

Flanged

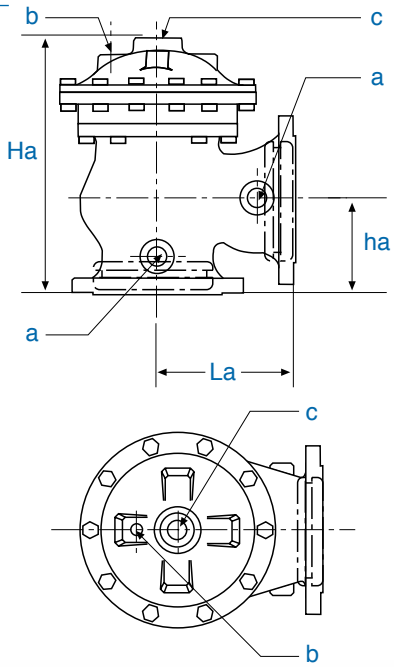
	Size (inch)		1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"
ANSI #150, ISO PN 16	L	(inch)	8.1	8.1	8.3	9.8	12.6	16.3	19.7	23.8	28.5	28.9	39.0
	LG(4)	(inch)	N/A	N/A	N/A	9.8	12.6	16.3	19.7	B/A	B/A	B/A	B/A
	W	(inch)	6.1	6.1	7.0	7.9	8.8	12.6	15.4	18.9	21.7	21.7	29.1
	R	(inch)	3.1	3.3	3.7	3.9	4.5	5.6	6.8	8.0	9.5	10.6	11.8
	La	(inch)	4.9	4.9	5.9	6.0	7.5	8.9	10.4	12.6	15.6	15.7	17.7
	ha	(inch)	3.3	3.3	4.3	4	5	6	8	8.6	10.7	11	14.5
	Hy	(inch)	9.4	9.6	10.1	12	14.4	19.4	23	28.5	33.1	34.1	43.6
	Ha	(inch)	8.9	8.9	9.9	11.1	13.5	17.4	21.5	24.9	30.6	30.7	42.6
	Weight Y	(lb)	23	23	29	49	82	165	276	478	816	840	1,865
	Weight A	(lb)	22	22	27	47	77	157	260	452	772	216	1,764
ANSI #300, ISO PN 25	L	(inch)	8.3	8.3	8.7	10.4	13.2	17	20.6	25.1	30	30.2	40.3
	W	(inch)	6.5	6.5	7.3	8.1	9.8	12.6	15.4	18.9	21.7	22.4	29.1
	R	(inch)	3.1	3.3	3.7	4.1	5	6.3	7.5	8.8	10.3	11.6	12.8
	La	(inch)	4.9	4.9	5.9	6.3	7.9	9.2	10.9	13.2	16.3	16.5	18.4
	ha	(inch)	3.3	3.3	4.3	4.3	5.3	6.5	8.5	9.3	11.6	11.8	15.2
	Hy	(inch)	9.4	9.6	10.1	12.4	14.9	20	23.7	29.2	33.8	35.2	44.6
	Ha	(inch)	8.9	8.9	9.9	11.3	13.8	17.9	22	25.6	31.3	31.5	43.3
	Weight Y	(lb)	27	27	33	55	95	187	322	540	904	957	1,984
	Weight A	(lb)	25	25	30	51	90	179	304	514	860	928	1,88
Ports	a (1)	(inch)	½	½	½	½	½	½	½	½	½	½	½
	b (1)	(inch)	½	½	½	½	½	½	½	½	½	½	½
	c (1)	(inch)	¾	¾	¾	¾	¾	2	2	2	2	2	2
	d (2) (optional)	(inch)	¾	¾	1½	1½	2	2	2	2	2	2	2
	Control Vol. (3)	(Gal.)	0.04	0.04	0.04	0.08	0.12	0.57	1.19	2.25	3.28	3.28	7.88

(1) (a), (b), (c) are NPT thread ports
(2) (d) is BSPT threaded Optional drain port
(3) (Control Volume) is Control Chamber Displacement Volume of liquid pushed when valve opens
(4) LG for Grooved ends (see available sizes)

Y Body Type



Angle Body Type



Installation

Proper operation of the 700E Deluge Valves depends upon their trim being installed in accordance with the appropriate trim configuration.

Notes:

- Wet pilot height should not exceed “Maximum Elevation Above Valve” (see data for specific model).
- Any deviation in trim size or arrangement may adversely affect the proper operation of the deluge valve.
- All the pilot system devices, must be UL Listed and compatible with the particular deluge system. Refer to current “UL Listed Fire Protection Equipment Directory”.

Warning: The deluge valve and trim must be installed only in areas where they will not be subject to freezing temperatures.

Installation Instructions

1. Allow enough room around the valve assembly for any adjustments and future maintenance.
2. Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Not flushing the line may result in the valve’s becoming inoperable.
3. Install the valve in the pipeline so that the valve flow arrow appearing on the body casting is pointing in the desired direction. Ensure that the valve is positioned so that the actuator assembly can be easily removed for future maintenance.
4. Ensure that the Control Trim is mounted properly and all other components are positioned correctly as per illustration.
5. After installation in the main line, carefully inspect/ correct any damaged accessories, piping, tubing, or fittings. Ensure that there are no leaks.
6. Install the components comprising the Deluge Trim Package in their proper positions in compliance with all instructions, drawings, and technical specifications describing the BERMAD Deluge Valve, according to the relevant illustration.
7. All additional accessories, although not packed together with the BERMAD Deluge Valve, must be installed as shown in the relevant P&ID and other illustrations.

Operation

Principle of Operation

The BERMAD 700E Deluge Valve (assembled with specific trim) is suitable for systems that include adequate detecting and piping systems with open nozzles. The deluge valve prevents water from entering system piping until required. The deluge valve is kept closed by pressure applied to the upper control chamber through a restricted priming line.

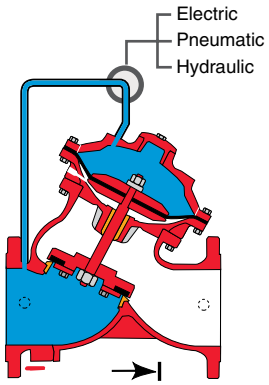
In the SET position, the water pressure supplied through

the priming line is trapped in the upper control chamber of the deluge valve by a check valve, and by the normally closed release device.

The pressure trapped in the upper control chamber of the deluge valve presses the valve seal disk down, thereby sealing the valve and keeping the system piping dry.

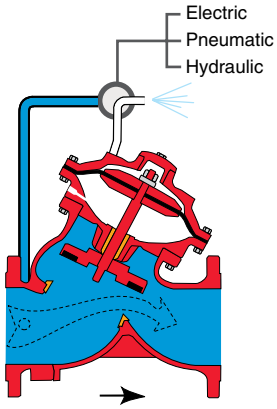
Under conditions of FIRE, when the pressure is released from the upper control chamber by the opening of the automatic releasing device or by manual release, the deluge valve opens and allows the inlet supply water to flow through the valve and into the system piping and alarm devices.

Warning: Whenever the handle of the Manual Emergency Release is pulled, pressure is released from the upper control chamber, the deluge valve will open, and water will flow into system piping and alarm devices.



Valve Closed (Set Position)

Line pressure applied to the upper control chamber of the valve creates a superior force that moves the valve to the closed position and provides drip tight sealing.



Valve Open (Operating Conditions)

Releasing the pressure from the upper control chamber to atmosphere or some other lower pressure zone causes the line pressure acting on the seal disc to move the valve to the open position.

Placing in Service/Resetting

The deluge valve and the control trim shall be Placed in Service with accordance to the most recent IOM procedures for the specific model.

After all relevant instructions are performed, slowly open the supply-isolating valve and check that no water flows into the system.

The system is now operational and in stand-by mode.

Maintenance

Bermad Deluge Valves require no lubrication, no packing tightening, and require a minimum of maintenance.

Removing the System from Service

Warning: When taking a deluge system out of service, a fire patrol should be established in the system area. If automatic fire alarm signaling equipment is utilized, the proper authority should be notified that the system is being removed from service. The insuring body and owner's representative should also be notified when the system is being taken out of service.

Removal Instructions

1. Shut off the main supply-isolating valve.
2. Close the priming line valve to the deluge valve control chamber.
3. Open all drain valves.
4. Release the water pressure from the control chamber of the deluge valve by pulling the manual emergency release.
5. Place "Fire Protection System Out of Service" signs in the area protected by the system.

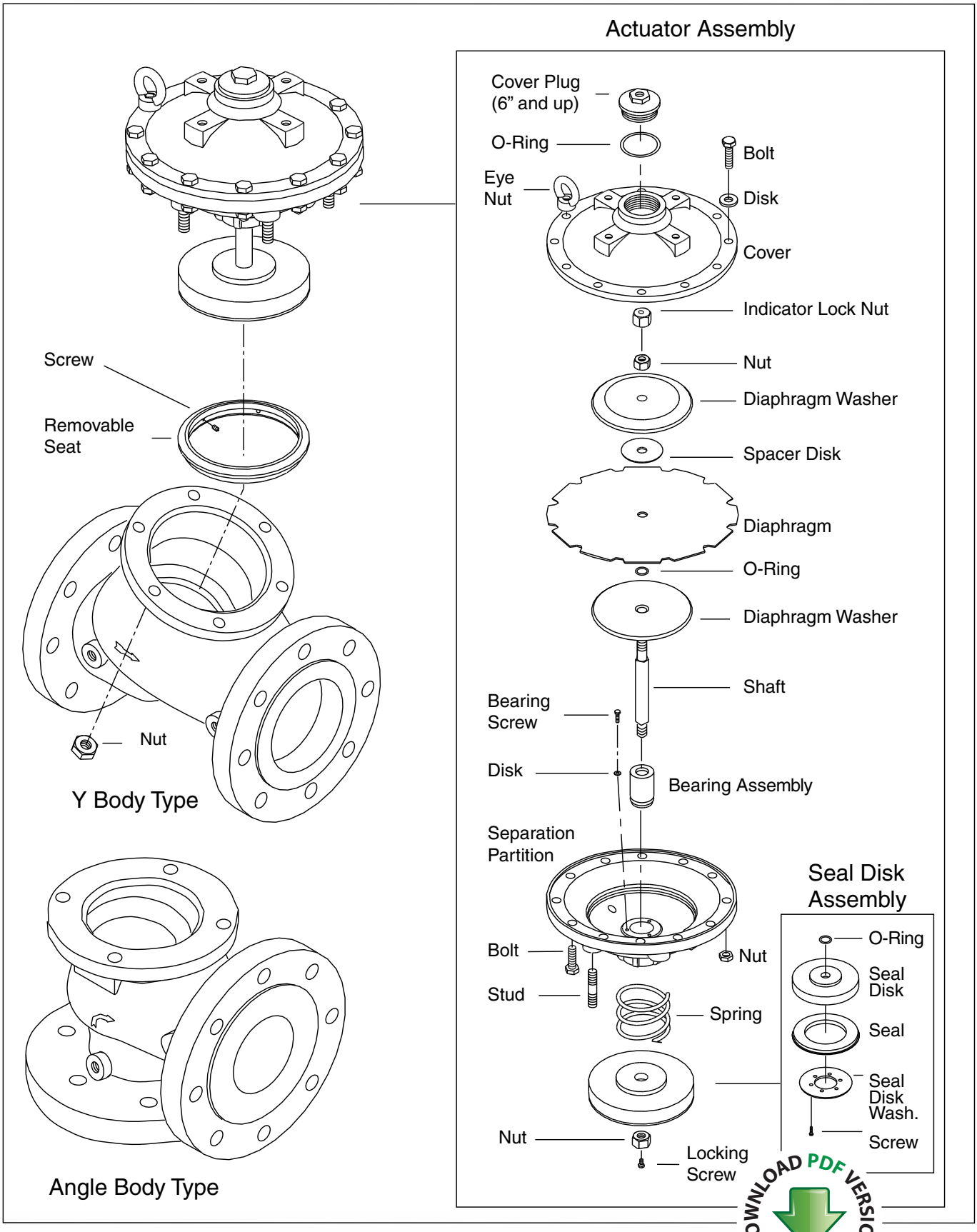
Inspection and Testing

1. **Warning:**Do not turn off the water supply to make repairs without placing a roving fire patrol in the area covered by the system. The patrol should continue until the system is back in service.
2. Prior to turning off any valves or activating any alarms, notify local security guards and the central alarm station, if used, to avoid signaling a false alarm.
3. The deluge valve and the control trim shall be maintained with accordance to the most recent IOM procedures for the specific model. A periodic test schedule should be established also with accordance to the site conditions and owner regulations.
4. Take all additional measures as required by NFPA-25 "standard for the inspection, testing, and maintenance of water-based fire protection systems".
5. The system should be checked weekly for "Normal Conditions".
6. Clean the priming strainer prior to any resetting of the deluge valve.
7. The deluge valve must be activated at full flow at least annually. Take all necessary precautions to drain water and prevent damage in the area protected by the system.
8. After about five years of operation, replacement of diaphragm and other elastomers is recommended. Remove the actuator and disassemble it. Clean the seat area from sediments, clean the control tubing entry holes, and install a new diaphragm and other elastomers in place.

Spare Parts

1. The Diaphragm and the Seals are the only spare parts needed for the main deluge valve, see attached "Valve Disassembly and Parts Breakdown" illustration.
2. It is not recommended to store spare rubber parts for long periods (rubber in improper storage conditions can harden and crack).
3. Contact your Bermad representative and order new rubber parts when required.

Valve Disassembling Parts Breakdown



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Accessories and System Components

BERMAD

2-Way Solenoid Valve

This solenoid valve is a 2-Way pilot operated diaphragm plunger type, requiring a minimum differential pressure to operate properly. It has an internal pilot and a bleed orifice, which enables it to use line pressure for operation. The solenoid valve's design allows for a small overall dimension and a high flow-capacity, which provides a long-life in normal non-corrosive conditions. The solenoids coil is continuous duty design, with an Epoxy molded construction. This 2-Way solenoid valve is suitable for activating BERMAD Deluge valves, Preaction Valves and other Hydraulic Control Valves.

Features

- High flow capacity, 12 mm orifice min.
- Internal pilot operated
- One-piece molded epoxy enclosure

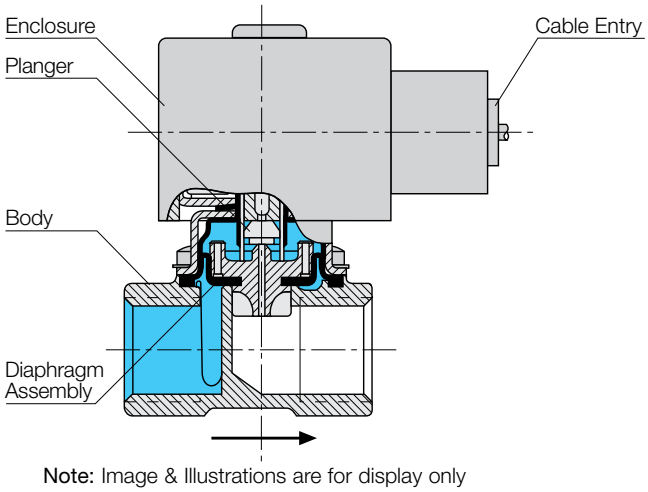
Power

- 8 Watts, 24V DC or 120, 220 VAC/50-60 Hz
- Tolerance: ±10%

Materials

- **Body:** Brass
- **Internals:** Stainless steel
- **Diaphragm:** NBR
- **Enclosure:** Molded Epoxy
- **Optional:** Stainless Steel 316 body

Typical Construction



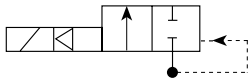
Note: Image & Illustrations are for display only

Installation and Maintenance

The Solenoid Valve is the most critical unit in the Deluge system, it should be installed and wired by qualified and trained personnel only.
The coil should be wired in accordance with the requirements of the applied norm such as NEC, NEMA, IEC, or ATEX codes. Ensure that the voltage supply and frequency corresponds with the markings that appear on the enclosure label. A conduit hub on the enclosure side must be supported against torque during the assembly. Use appropriate tools while tightening a fitting into the conduit connector. Attention must be paid that a Torque of 20Nm is not exceeded. After installation, the cable or conduit must be well supported to avoid excessive load on the conduit hub.

Warning: This product shall be installed and wired by an authorize electrician only. The conduit hub on the enclosure must be supported against torque during assembly by using appropriate tools. While tightening a fitting into the conduit hub, attention must be paid that a max. torque of 20Nm is
not exceeded.
Maintenance: Proper operation of the Solenoid Valve should be periodically verified. Testing and Maintenance should be done according to the IOM (Installation Operation & Maintenance) manual for the specific Bermad Valve in use. It is recommended that the Solenoid Valve be inspected monthly for proper wiring and for leakage. The Solenoid valve must be Tested annually. It must be operated when maximum system working conditions are applied to simulate the extreme conditions. The unit should be replaced if a malfunction occurs.

Circuit Functions



2/2-Way, normally closed

Technical Data

General purpose, model 5281A-GP

This solenoid valve is used in non-classified locations where no special certification is required. It is rated for IP 65 ingress protection, continuous duty design with class F coil insulation. This type is equipped with integral cable plug to ISO 4400 (DIN connector) of PA material, including screw terminals (max. 0.75 mm^2 lead), including gland for 5-6 mm cable entry.

UL-Listed, model 5281A-UL or 5282A-UL

This solenoid valve is UL-Listed, it is also FM approved to be used in Class I Division 2, Groups A, B, C, D hazardous locations, where flammable materials are present abnormally. It is rated for IP 65 ingress protection, continuous duty design with T4 class F coil insulation. This type is equipped with integral cable plug type 2509 of PA material, including screw terminals (max. 0.75 mm^2 lead) with ½" NPT cable entry.

Exproof Div. I, model 5281A-EX or 5282A-EX

This Explosion proof solenoid valve is FM approved to be used in Class I Div. 1 and 2 Groups A, B, C, D and Class II Groups E, F, G hazardous locations according to ANSI/NFPA 70, NEC 500, where hazardous materials are present intermittently. The solenoid enclosure is watertight, NEMA 4, 7, 9 rated, continuous duty design with T4 class F coil insulation. This type is provided with flying leads and ½" NPT metal conduit hub.

ATEX, €Ex em II T4, model 5281A-EM

This solenoid valve is ATEX certified for hazardous locations II 2 G EEx em II T4, area classification for zone 1 or zone 2 according to ATEX directive 94/9/EC.
It is rated for IP 65 ingress protection, continuous duty design with class F coil insulation.
This enclosure is of Encapsulated type of protection and is equipped with an integral Reinforced PA terminal box, including screw terminals with cable gland entry.

ATEX, €Ex d IIC T6, model SX12-3701

This solenoid valve is ATEX certified for hazardous locations II 2 G EEx d IIC T6, area classification for zone 1 or zone 2 according to ATEX directive 94/9/EC.
It is rated for IP 66 ingress protection, continuous duty design with class F coil insulation (optional: class H).
This enclosure is "EExd" Flame Proof design and is equipped with an integral epoxy coated aluminum terminal box, including screw terminals, with ½" NPT cable entry.
The solenoid valve body is constructed of Stainless steel 316

Solenoid Valve Selection Table

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size"	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
5281A-GP	N.C.	Brass	General Purpose	-	DIN Plug	½	13	0.3-16	8	(1)
5281A-UL		Brass	Div. 2	-	½" NPT Plug	½	13	0.3-16	8	UL (2), FM (6)
8320G207		Brass	General Purpose	-	½" NPT	½	12	0.5-12	10.6	UL (2)
5281A-EX		Brass	Div. 1	7	½" NPT	½	13	0.3-16	8	FM (3)
FE8320G207		Brass	Div. 1	7	½" NPT	½	12	0.5-12	10.6	FM (3)
5281A-EM		Brass	EEx em II T4	8	Gland	½	13	0.3-16	8	ATEX (5)
5282A-UL		SS316	Div. 2	-	½" NPT Plug	½	13	0.3-16	8	UL (2), FM (3)
5282A-EX		SS316	Div. 1	7	½" NPT	½	13	0.3-16	8	FM (3)
SX12-3701		SS316	EEx d IIC T6	9	½" NPT	½	12	0.5-16	8	ATEX (4)

Notes:
(1) General purpose / watertight, IP 65 Ingress Protection to IEC Spec.
(2) UL-Listed for Fire Protection Special Systems (UL429A).
(3) FM/UL Approved for hazardous locations Class I, Division 1, Groups A, B, C, D; Class II Gr. E, F, G.
(4) ATEX certified for hazardous locations II 2 G EEx d IIC (gas group A, B, C) T6, IP 66 Ingress Protection to IEC
(5) ATEX certified for hazardous locations II 2 EEx em II T4, IP 65 Ingress Protection to IEC Spec.
(6) FM Approved for Class I, Div 2, Groups A, B, C, D.

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3-Way Solenoid Valve

Isolating Membrane type

This solenoid valve is an isolated type with an Elastomeric membrane that hermetically isolates the solenoid actuator from the fluid, making it less sensitive to abrasive, corrosive or contaminated fluids thus providing a safe, and long-life operation. The unique pivoted armature switching mechanism does not require a minimum operating pressure and is unaffected by its mounting position.
The solenoids coil is continuous duty design and is encapsulated in a compact Epoxy construction that is suited for corrosive environments.
The 3-Way solenoid valve, Isolating Membrane type is suitable for activating BERMAD Deluge or other water Control Valves using freshwater, corrosive, contaminated fluids or air.

Features

- No mechanical wetted parts
- Solenoid isolated from fluid
- Suitable for freshwater/seawater or air
- Stainless Steel 316 construction

Power

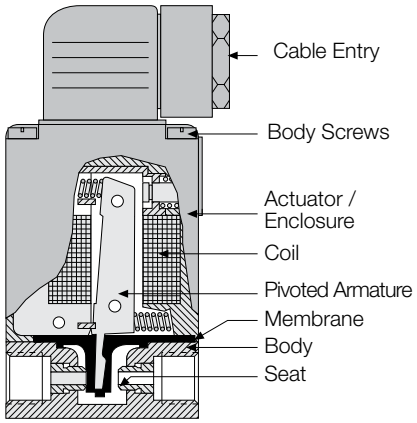
- 8 Watts, 24V DC or 120, 220 VAC /50-60 Hz.
- Tolerance: ±10%

Materials

- Body: Brass or Stainless Steel 316L
- Internals: Stainless steel
- Elastomeric Membrane: NBR
- Enclosure: Molded Epoxy

Temperature

- Nominal Ambient(1): 0.5° to 50°C (33° to 125°F)
- Maximum Fluid: 80°C (176°F)



Note: Image & Illustrations are for display only

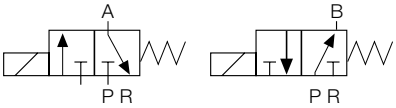
Notes:
(1) Max. ambient temperature is determined under continuously energized conditions.

Installation and Maintenance

The Solenoid Valve is the most critical unit in the Deluge system, it should be installed and wired by qualified and trained personnel only.
The coil should be wired in accordance with the requirements of the applied norm such as NEC, NEMA, IEC, or ATEX codes. Ensure that the voltage supply and frequency corresponds with the markings that appear on the enclosure label.
After installation, the cable or conduit must be well supported to avoid excessive load on the conduit hub.
Warning: The solenoid enclosure bolts must not be loosened or disassembled. Loosening or disassembling the solenoid enclosure may result in changing of the factory seal adjustment and may effect the proper operation of the valve, rendering void the warranty and the manufacture liability.

This product shall be wired by an authorized electrician only. The conduit hub on the enclosure must be supported against torque during the assembly using appropriate tools. While tightening a fitting into the conduit hub, attention must be paid that a max. torque of 20Nm is not exceeded.
Maintenance: Proper operation of the Solenoid Valve should be periodically verified.
Testing and Maintenance should be done according to the IOM (Installation Operation & Maintenance) Manual for the specific Bermad Valve in use. It is recommended that the Solenoid Valve be inspected monthly for proper wiring and for leakage. The Solenoid valve must be Tested Annually. It must be operated when maximum system working conditions are applied to simulate the extreme conditions. The unit should be replaced if a malfunction occurs.

Circuit Functions



3/2-Way Normally Closed (C)

3/2-Way Normally Open (D)

Technical Data

General purpose, model 0330-GP

This solenoid valve is used in non-classified locations where no special certification is required. It is rated for IP 65 ingress protection, continuous duty design with class F coil insulation. This type is equipped with integral cable plug to ISO 4400 (DIN connector) of PA material, including screw terminals (max. 0.75 mm^2 lead), including gland for 5-6 mm cable entry.

UL-Listed, model 0330-UL

This solenoid valve is UL certified, to be installed on Bermad UL-Listed valves, it is also FM approved to be used in Class I Division 2, T4 to NEC 500 hazardous locations, where flammable materials are present abnormally. It is rated for IP 65 ingress protection, continuous duty design with class F coil insulation. This type is equipped with integral cable plug type 2509 of PA material, including screw terminals (max. 0.75 mm2 lead), with ½" NPT cable entry.

Exproof NEC Div. I, model 0330-EX

This Explosion proof solenoid valve is UL certified to be installed on Bermad UL-Listed valves, FM approved to be used in Class I Div. 1 and 2 Groups A, B, C, D and Class II Groups E, F, G hazardous locations according to ANSI/ NFPA 70, NEC 500, where hazardous materials are present intermittently. The solenoid enclosure is watertight, NEMA 4, 7, 9 rated, continuous duty design with T4 class F coil insulation. This type is provided with flying leads and ½" NPT metal conduit hub.

Special Versions

These valves include ATEX certified enclosures, see EExd Solenoid valves.

Solenoid Valve Selection Table

Isolated Membrane type

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size"	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
0330C-GP	N.C.	Brass	General Propose	-	DIN Plug	¼	2	16	8	(1)
0330C-UL		Brass	Div. 2	-	½" NPT, Plug	¼	2	16	8	UL/FM (2)
0330C-EX		Brass	Div. 1	7	½" NPT	¼	2	16	8	UL/FM (2),(3)
0330C-GP		SS316	General Propose	-	DIN Plug	¼	2	16	8	(1)
0330C-UL		SS316	Div. 2	-	½" NPT, Plug	¼	2	16	8	UL/FM (2)
0330C-EX		SS316	Div. 1	7	½" NPT	¼	2	16	8	UL/FM (2),(3)
0330D-GP	N.O.	Brass	General Propose	-	DIN Plug	¼	2	16	8	(1)
0330D-UL		Brass	Div. 2	-	½" NPT, Plug	¼	2	16	8	UL/FM (2)
0330D-EX		Brass	Div. 1	7	½" NPT	¼	2	16	8	UL/FM (2),(3)
0330D-GP		SS316	General Propose	-	DIN Plug	¼	2	16	8	(1)
0330D-UL		SS316	Div. 2	-	½" NPT, Plug	¼	2	16	8	UL/FM (2)
0330D-EX		SS316	Div. 1	7	½" NPT	¼	2	16	8	UL/FM (2),(3)

Notes:
(1) General purpose / watertight, IP 65 Ingress Protection to IEC Spec.
(2) UL-Listed for Fire Protection Special Systems (UL429A). FM Approved for Class I, Div 2, Groups A, B, C, D
(3) FM Approved for hazardous locations Class I, Division 1, Groups A, B, C, D; Class II Gr. E, F, G
(4) Specifications subject to change without notice.

EExd 3-Way Solenoid Valve

Flameproof Type

This EExd solenoid valve is equipped with a heavy-duty enclosure of Flame proof design. It is suitable for use in hazardous locations, where hazardous materials are present intermittently and defined by zones 1 or zone 2, Group II apparatus category according to ATEX 94/9/EC Directive.
This solenoid construction is designed for outdoor industrial applications, the solenoid enclosure and construction are designed to withstand an internal explosion and prevent the transmission of the explosion to the explosive environment surrounding the enclosure. The solenoids coil is IP66 (minimum) ingress protection rated, continuous duty design with class F insulation. This solenoid valve is suitable for activating BERMAD Deluge and other hydraulically controlled valves, used with filtered firewater or pneumatic supply.

Features

- Integral Terminal Box
- Interchangeable coil
- IP 66 ingress protection
- Heavy Duty construction

Power

- 8 Watts, 24 VDC or 120, 220 VAC/50-60 Hz.
- Tolerance: ±10%

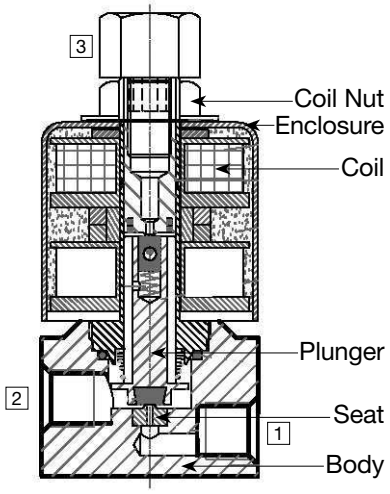
Materials

- Body: Stainless steel 316
- Internals: Stainless steel, NBR seals
- Enclosure: Epoxy Coated Aluminum

Temperature

- Nominal Ambient(1): 0.5° to 50°C (33° to 125°F)
- Maximum Fluid: 80°C (176°F)

Notes:
(1) Max. ambient temperature is determined under continuously energized conditions.



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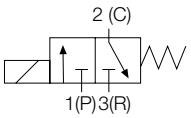
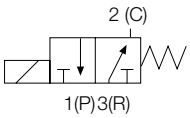
Installation and Maintenance

The Solenoid Valve is the most critical unit in the Deluge system. It should be installed and wired by qualified and trained personnel only. The coil should be wired in accordance with the requirements of the applied norm such as IEC or ATEX codes. Ensure that the voltage supply and frequency corresponds with the marking appeared on the enclosure label.
Warning: This product shall be installed and wired by an authorized electrician only. The conduit hub on the enclosure must be supported against torque during the assembly by using appropriate tools. While tightening a fitting into the conduit hub, attention must be paid that a max. torque of 20Nm is not exceeded.
Maintenance: Proper operation of the Solenoid Valve should be periodically verified. Testing and Maintenance should be done according to the IOM (Installation Operation & Maintenance) manual for the specific Bermad Valve in use. It is recommended that the Solenoid Valve be inspected monthly for proper wiring and for leakage. The Solenoid valve must be tested annually. It must be operated when maximum system working conditions are applied to simulate the extreme conditions. The unit should be replaced if a malfunction occurs.

Circuit Functions



3/2-Way Normally Closed



3/2-Way Normally Open

Technical Data

Bermad EExd standard solenoid valve, model SX-3701

This solenoid valve is ATEX certified for hazardous locations II 2 G EEx d IIC T6, area classification for zone 1 or zone 2 according to ATEX directive 94/9/EC.
It is rated for IP 66 ingress protection, continuous duty design with class F coil insulation.
This enclosure is "EExd" Flame Proof design and is equipped with an integral epoxy coated aluminum terminal box, including screw terminals, with ½" NPT cable entry.
The solenoid valve body is constructed of Stainless steel 316

Special Executions - Options

- Isolated Design for Corrosive Fluids
- Seawater construction
- Harsh environments / offshore Enclosure
- High temperature coil insulation - H class

For further details and options please refer to the solenoids selection table.

Solenoid Valve Selection Table

EExd standard type

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size"	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
SX-3701-NC	N.C.	SS316	EEx d IIC T6	9	½" NPT	¼	1.6	16	8	ATEX (4)
SX-3701-NO	N.O.	SS316	EEx d IIC T6	9	½" NPT	¼	1.6	16	8	ATEX (4)

Isolated types for Corrosive Fluids

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size"	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
SM1304U	UNI	Al. Bronze	EEx d IIC T6	9	M20x1.5	¼	7	20	9.6	ATEX (4)
SM1304S	UNI	SS316	EEx d IIC T6	9	M20x1.5	¼	7	20	9.6	ATEX (4)

Harsh environments, Low Power

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size"	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
ED8320515	UNI	SS316	EEx d IIB T6	9	½" NPT	¼	1.6	4	2.9	ATEX (4), (6)
SM1304S	UNI	SS316	EEx d IIC T6	9	M20x1.5	¼	7	20	4.5	ATEX (4)
SM1303S	UNI	SS316	EEx d IIC T6	9	M20x1.5	¼	2	12	3	ATEX (4)

Special Versions

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
6014C-ia	N.C.	SS316	EEx ia IIC T6	8	DIN Plug	1/8	1	10	0.4	(2), (3)
6014D-EExm	N.O.	Brass	EEx m II T4	8	PA Cable Gland	¼	2	16	8	(1), (2)

Notes:
(1) General purpose / watertight, IP 65 Ingress Protection to IEC Spec.
(2) ATEX Certified for hazardous locations
(3) used only with Pneumatic pressure actuation.
(4) ATEX certified for hazardous locations II 2 G EEx d IIC (gas group A, B, C) T6, IP 66 Ingress Protection to IEC Spec.
(5) Specifications subject to change without notice.
(6) Not including terminal box, for use only with pneumatic pressure supply.

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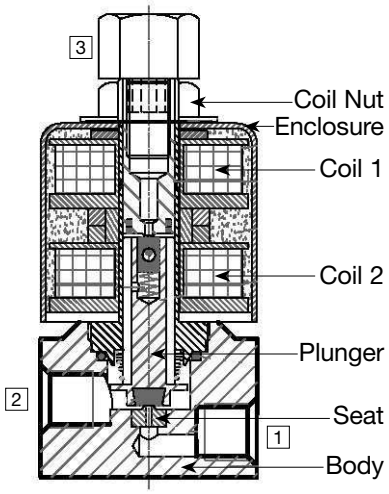
Latching 3-Way Solenoid Valve

The Latching solenoid valves are normally de-energized and are activated to operate the BERMAD valve by an electrical pulse, latching it in the release position.
Magna-Latch solenoid valve consists of two coils that are incorporated in one enclosure. It is activated to release the control pressure by means of a short electrical impulse signal to the “Pull” coil, the solenoid actuator is then latched in the energized position by a permanent Holding Magnet. To Reset the system, an electrical pulse should be applied to the De-latch coil, creating a counter-force which overcomes the magnet and allows the actuator to return to its normal position. The Magna-Latch Solenoid valve is typically used to enable safe remote control of the BERMAD Deluge valve and other water control valves, by latching the valve in its open position for safe discharge of firewater.
Mechanical-Latch solenoid valve (Electrically tripped), is activated to release the control pressure by means of an electrical pulse to the coil, when the solenoid actuator is de-energized, the solenoid valve will remain latched in the release position. Mechanical - Latch type is equipped with a manual reset lever to enable local Reset (De-Latch) to return it to normal position, while the coil is de-energized.
Latching solenoid valves are also used in areas where the system runs on limited power supply. They require only 50ms pulse duration to operate with minimal electric current to reduce demand of the power supply, enabling the batteries power capacity to be reduced and increase system reliability.



Note: Image & Illustrations are for display only

Features

- Low energy consumption
- Safer operation of hydraulic valves
- Brass or Stainless Steel 316 construction
- Isolated type are available, Refer to Selection table

Power

- 11 Watts, 24 VDC
- Tolerance: ±10%
- 50ms minimum pulse duration

Materials

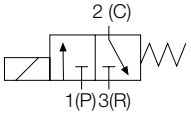
- Body: Brass or Stainless Steel 316
- Internals: Stainless steel
- Elastomers: NBR
- Enclosure: refer to the Selection table

Temperature

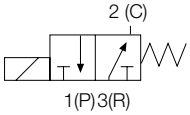
- Nominal Ambient(1): 50°C (125°F)
- Maximum Fluid: 80°C (176°F)

Notes:
(1) Max. ambient temperature is determined under continuously energized conditions.

Circuit Functions



3/2-Way Normally Closed



3/2-Way Normally Open

Installation

The Solenoid Valve is the most critical unit in the Deluge system. It should be installed and wired by qualified and trained personnel only. The coil should be wired according to the design wiring drawings and in accordance with the requirements of the applied norm such as NEC, NEMA, IEC, or ATEX codes. Ensure that the voltage supply and frequency corresponds with the markings that appear on the enclosure label. Provide cable of sufficient rating for operating solenoid. The maximum power rating of the solenoid is < 20W and cable should not be less than 1.5 mm^2.
Warning: Prevent power supply to Common and Latch simultaneously with De-latch terminals. This product shall be installed and wired by an authorized electrician only. The conduit hub on the enclosure must be supported against torque during assembly by using appropriate tools while tightening a fitting into the conduit hub, attention must be paid that a max. torque of 20Nm is not exceeded.

Technical Data

Magna-Latch General Purpose, model 0332D-GP & BE-370D-LC

The General Purpose magna-latch solenoid valve is used in non-classified locations where no special certification required. It is rated for IP 65 Ingress protection, with class F coil insulation.

Magna-Latch EExd, model SX13-3701-LC

This EExd magna-latch solenoid valve is ATEX certified for hazardous locations II 2 G EEx d IIC T6, area classification for zone 1, or zone 2, according to ATEX directive 94/9/EC. It is rated for IP 66 Ingress protection, with class F coil insulation.

This enclosure is an "EExd" Flame Proof design and equipped with an integral epoxy coated aluminum terminal box, including screw terminals, with ½" NPT cable entry.

Mechanical-Latch type, EExd (with manual reset)

This Mechanical-latch solenoid valve is De-Energized in normal position, the coil should be energized to change to "Release" position and Latch the solenoid valve in that position. When the coil is De-energized it remains Latched. The solenoid valve is equipped with a manual reseting lever to enable local manual "De-Latching" while the solenoid is de-energized. This Mechanical - latch solenoid valve is ATEX certified for hazardous locations II 2 G EEx d IIC T6, area classification for zone 1 or zone 2, according to ATEX directive 94/9/EC. It is rated for IP 66 or IP 67 Ingress protection. This enclosure is an "EExd" Flame Proof design and equipped with an integral terminal box, including screw terminals.

Model SX13-3701-ML is equipped with an epoxy coated aluminum enclosure, with ½" NPT cable entry.

Model SM1304B and SM1304S are equipped with a Stainless steel enclosure, with M20x1.5 cable entry.

Solenoid Valve Selection Table

Magna-Latch type

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size"	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
0332D-GP	Last Position	Brass	General Purpose	-	DIN Plug	¼	2	16	11	(1)
BE-0370D-LC		SS316	General Purpose	-	½" NPT	¼	1.6	25	11	(1)
SX-3701-LC		SS316	EEx d IIC T6	9	½" NPT	¼	1.6	16	11	ATEX (4)

Mechanical-Latch type

Model	Normally	Body Materials	Enclosure Type / Class	Code	Cable Entry	Port Size"	Orifice mm	Pres. Bar	Power Watts	Approval See Notes
SX-3701-ML	N.O.	SS316	EEx d IIC T6	9	½" NPT	¼	1.6	16	11	ATEX (4)
SM1304B		Al. Bronze	EEx d IIC T6	9	M20x1.5	¼	7	20	9.6	ATEX (4)
SM1304S		SS316	EEx d IIC T6	9	M20x1.5	¼	7	20	4.5	ATEX (4)

Notes:
(1) General purpose / watertight, IP 65 Ingress Protection to IEC Spec.
(4) ATEX certified for hazardous locations II 2 G EEx d IIC (gas group A, B, C) T6, IP 66 Ingress Protection to IEC Spec.
(5) Specifications subject to change without notice.

Pressure Reducing Pilot Valve

Model #2UL

This pilot valve integrates all the principal functions of a two-way control circuit into a single assembly. It is a direct acting valve, actuated by a pressure responsive diaphragm, which tends to reach equilibrium with the set spring force. When used in a pressure reducing circuit, the pilot modulates closed as downstream pressure rises above set point. An integral needle valve acts as an upstream flow restrictor as well as a closing speed control.

Features

- Integral needle valve
- Internal pressure sensing

Typical Applications

- Pressure reducing valves

Approvals

- UL Listed when installed on Bermad UL-Listed valve configurations

Technical Data

Pressure Rating: 40 bar (600 psi)
Working Temperature: Water up to 80˚C (180˚F)
Flow Factor: Kv 1.0 (Cv 1.2)
Standard Materials:
Body & cover: Brass
Elastomers: NBR (Buna N)
Internals: Stainless Steel & Brass
Spring: Galvanized Steel
Optional Materials:

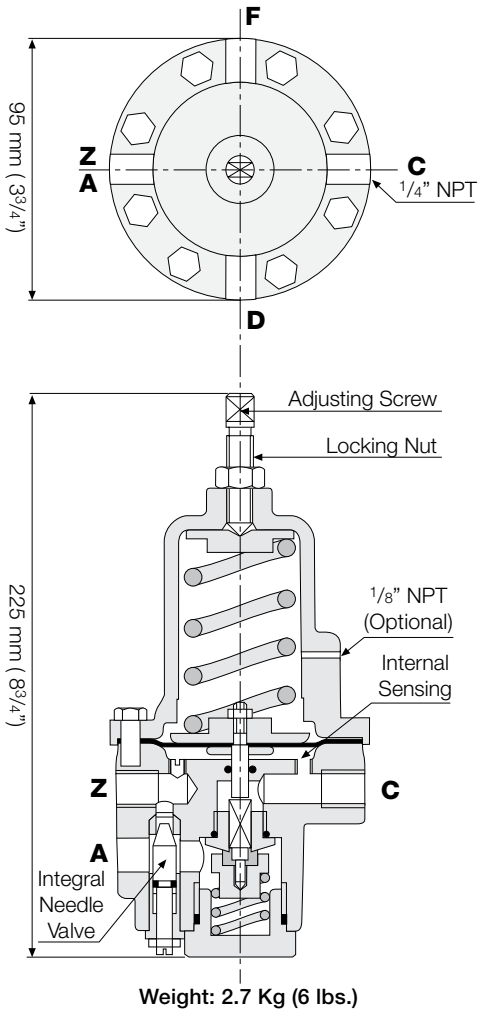
- All Stainless Steel 316, CF8M Body
- Nickel Aluminum Bronze ASTM B148
- Hastalloy C-276

Adjustment Range*

Spring	Pressure		
	bar	psi	
16	2-11.5	30-165	Standard

Connections

Z - Upstream **A -** Valve control chamber **C -** Downstream
F/D - External sensing/pressure gauge



Weight: 2.7 Kg (6 lbs.)

Note:
* UL-Listed pressure setting range

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Pressure Reducing Pilot Valve

Model #2PB

This is a direct acting valve, actuated by a pressure responsive diaphragm, which tends to reach equilibrium with the set spring force. Its fully balanced trim ensures high accuracy and stability.
When used in a pressure reducing circuit, the pilot modulates closed as downstream pressure rises above set point.

Features

- Internal pressure sensing

Typical Applications

- Pressure reducing valves sizes 1½-4”

Technical Data

Pressure Rating: 25 bar (350 psi)
Working Temperature: Water up to 80˚C (180˚F)
Flow Factor: Kv 0.46 (Cv 0.54)
Standard Materials:
Body: Stainless Steel 316
Cover: Stainless Steel 316
Elastomers: NBR (Buna N)
Internals: Stainless Steel
Spring: Galvanized Steel
Optional Materials:
Metal Parts: Stainless Steel 316

Adjustment Range*

Spring	Pressure	
	bar	psi
M	2-11.5	30-165

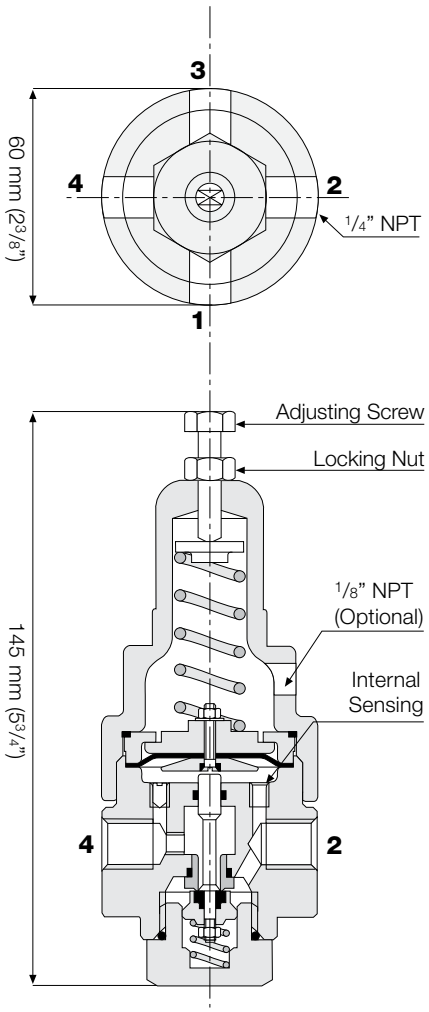
Connections

1 - Remote sensing (optional) or pressure gauge
2 - Downstream
3 - Remote sensing (optional) or pressure gauge
4 - Valve control chamber **

Note:

* Listed pressure setting range

** Upstream pressure is connected to valve control chamber via a restriction.



Weight: 1.5 Kg (3.3 lbs.)

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Pressure Sustaining Pilot Valve

Model #3UL

This pilot integrates all the principal functions of a two-way control circuit into a single assembly. It is a direct acting valve, actuated by a pressure responsive diaphragm, which tends to reach equilibrium with the set spring force. When used in a pressure relief/sustaining circuit, the pilot modulates open as upstream pressure rises above set point.
An integral needle valve acts as an upstream flow restrictor as well as a closing speed control.

Features

- Integral needle valve
- Internal or external pressure sensing
- Differential pressure sensing (Option)

Typical Applications

- Pressure relief valve (Standard model #3)
- Differential Pressure sustaining valve (Modified to differential sensing #3D)
- Pump suction control valve (Modified to external sensing #3R)

Approvals:

- UL Listed when installed on Bermad Models 430-UF, 730-UF & 730R-UL
- FM Approved when installed on Bermad Model 430-UF & 730-UF

Technical Data

Pressure Rating: 40 bar (600 psi)
Working Temperature:
Water up to 80˚C (180˚F)
Flow Factor: Kv 1.1 (Cv 1.3)
Standard Materials:
Body & cover: Brass
Elastomers: NBR (Buna N)
Internals: Stainless Steel & Brass
Spring: Galvanized Steel

Optional Materials:

- All Stainless Steel 316
- Nickel Aluminum Bronze ASTM B148
- Hastalloy C-276

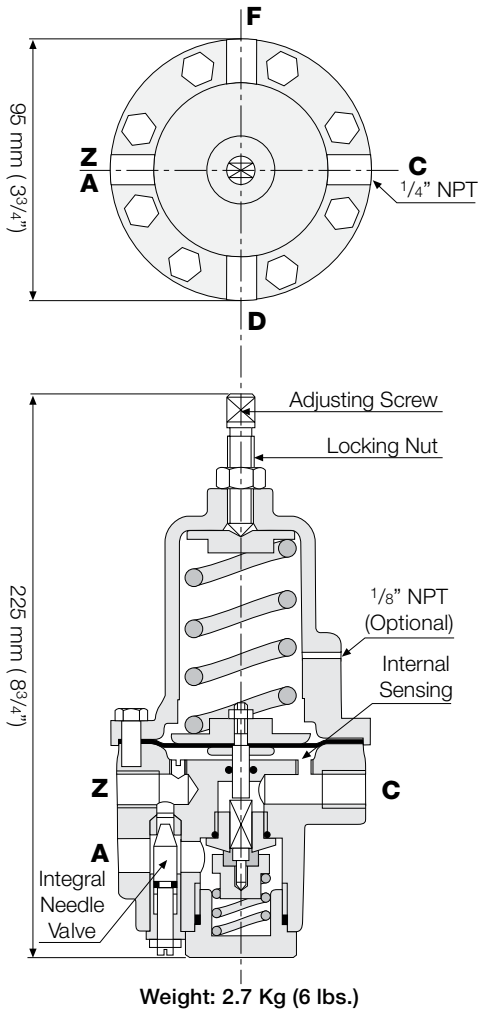
Adjustment Range

Spring	Pressure		Application
	bar	psi	
16	1-16	15-230	Class # 150/PN16
10	0.8-10	11-150	730R/436/736
16*	2-30	30-430	Class # 300/PN25

* With high pressure setting kit.

Connections

Z - Upstream **A -** Valve control chamber
C - Downstream **F/D -** External sensing/pressure gauge



Weight: 2.7 Kg (6 lbs.)

* High pressure setting kit add 15 mm (5/8") to pilot height.

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Quick Pressure Relief Pilot Valve

Model PC-3Q

This pilot valve integrates all the principal functions of a two-way control circuit in a single assembly.
It is a direct acting valve, actuated by a pressure responsive diaphragm, which tends to reach equilibrium with the set spring force.
The pilot opens as upstream pressure rises above the set point.
An integral restriction acts as an upstream flow restrictor enabling smooth valve closing and simplifying the control circuit.

Features

- Internal restriction

Application

- Pressure relief valve sizes 1½-4”

Technical Data

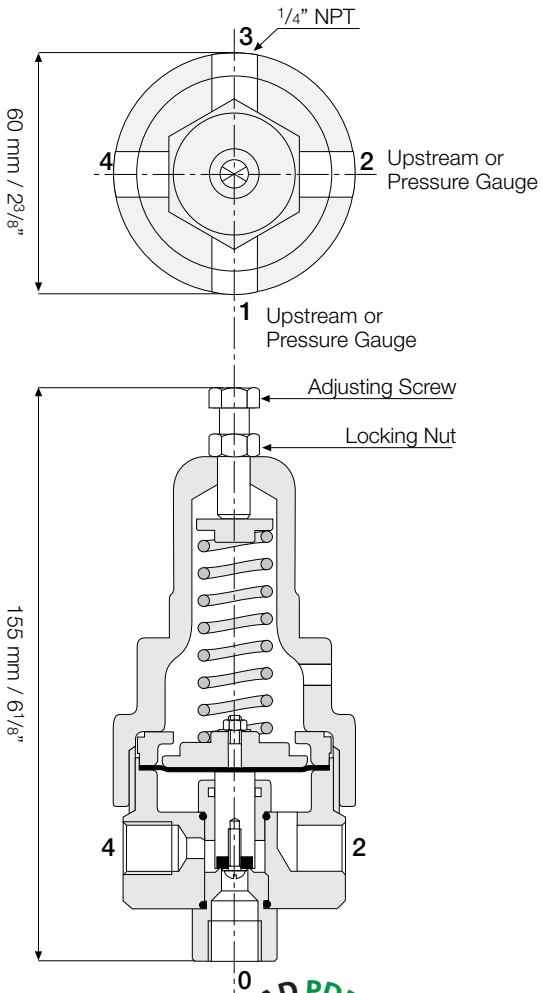
Pressure Rating: 16 bar (230 psi)
Working Temperature: Water up to 80˚C (180˚F)
Flow Factor: Kv 0.75 (Cv 0.88)
Standard Materials:
Body & cover: Brass
Elastomers: NBR (Buna N)
Internals: Stainless Steel & Brass
Spring: Galvanized Steel.
Optional Materials:
All Stainless Steel 316

Adjustment Range

Spring	Pressure	
	bar	psi
G	1-12	15-175

Connections

1 - Upstream or pressure gauge
2 - Upstream or pressure gauge
3 - Valve control chamber (when 4 is plugged)
4 - Valve control chamber (when 3 is plugged)
0 - Downstream



Weight: 1.0 kg

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Pressure Operated Relief Valve

Model PORV-O

The PORV is a direct acting on/off valve, actuated by a pressure responsive diaphragm, which tends to reach equilibrium with an adjustable set spring force.
The PORV is held closed by pneumatic or hydraulic pressure, sensed at its control chamber (under the diaphragm).
It opens in response to a pressure drop of the wet/dry pilot line to below the set point, and/or in response to pressure being drained from its control chamber by a solenoid or other releasing device.
The PORV is UL Listed when installed as part of the control trim of UL Listed deluge valves.

Materials

Body
- Stainless Steel 316 ASTM A351 Grade CF8M
- Forged Brass
- Nickel Aluminum Bronze ASTM B148 C95800

Springs
- Stainless Steel

Elastomers
- NBR

Wetted Parts
- Stainless Steel 303 & Brass (standard)
- Stainless Steel 316
- Monel 400
- Hastalloy C-276

Orifice
- 9 mm

Pressure Adjustment
Valve opens when pilot line pressure drop to the Setting Point
- Standard factory set: 1.5 bar (22 psi)

Pressure Rating
- 21 bar (300 psi)

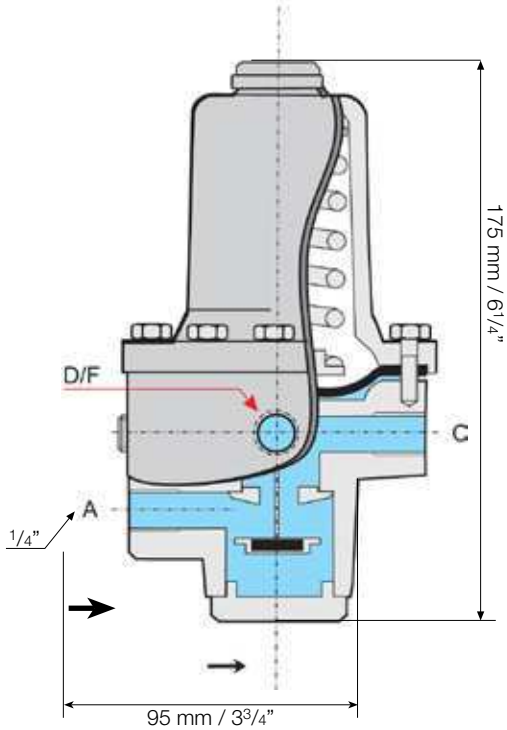
Temperature
- Water upto 80˚C (180˚F)

Flow factor
- KV: 1.0 (CV:1.2)

Connections
- ¼" NPT

Approvals[1]
- UL-Listed
- VdS Certified

Option:
- Mechanical Latching type with Manual Reset, model PORV-M.
  The PORV-M latches on its open position when pilot line pressure drops below the set point.



Weight: 2.7 Kg / 6 lbs.

Nr d on specific Bermad Deluge valve

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Pressure Operated Relief Valve

Adjustable Type Model: PORV-A

The PORV-A is a direct acting on/off valve, actuated by a pressure responsive diaphragm, which tends to reach equilibrium with an adjustable set spring force. The PORV-A is held closed by pneumatic or hydraulic pressure, sensed at its control chamber (under the diaphragm).
It opens in response to a pressure drop of the wet/dry pilot line to below the set point, and/or in response to pressure being drained from its control chamber by a solenoid or other releasing device.
The PORV-A is UL Listed when installed as part of the control trim of UL Listed deluge valves.

Materials

Body
- Stainless Steel 316 ASTM A351 Grade CF8M
- Forged Brass
- Nickel Aluminum Bronze ASTM B148 C95800

Springs
- Stainless Steel

Elastomers
- NBR

Wetted Parts
- Stainless Steel 303 & Brass (standard)
- Stainless Steel 316
- Monel 400
- Hastalloy C-276

Orifice
- 9 mm

Pressure Adjustment
Valve opens when pilot line pressure drop to the Setting Point
- Standard factory set: 5 bar (75 psi)
- Setting Range: 0.5 - 8 bar (7 - 115 psi)

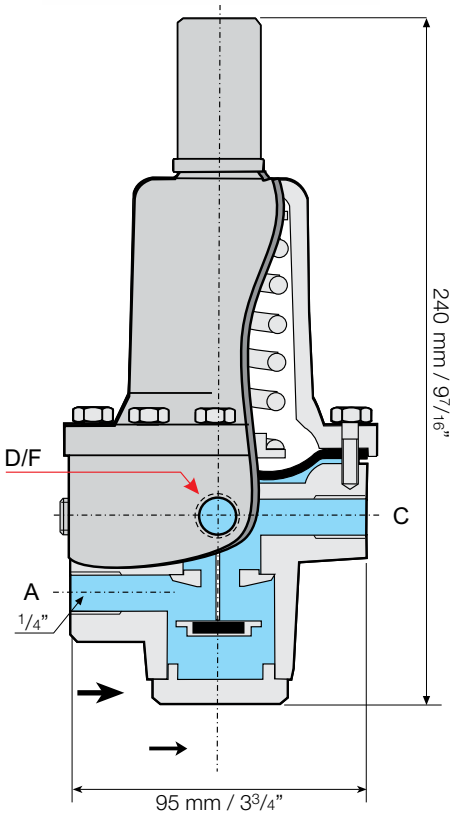
Pressure Rating
- 21 bar (300 psi)

Temperature
- Water upto 80˚C (180˚F)

Flow factor
- KV: 1.0 (CV:1.2)

Connections
- ¼" NPT

Approvals[1]
- UL-Listed



Weight: 2.7 Kg / 6 lbs.

Note: 1: when installed on specific Bermad Deluge valve

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Hydraulic Relay Valve (HRV-2)

The HRV-2 is used as a hydraulic relay pilot valve for local release of the Bermad's deluge valve control chamber.
It is held closed by the water pressure applied through the solenoid valve or by the wet pilot line. It is UL Listed when installed as part of the control trim of deluge valves.

Brass Construction

Corrosion Resistant Construction

Materials

Body

- Nickel plated Brass
- Stainless Steel 316

Elastomers

- NBR

Wetted Parts

- Brass
- Stainless Steel 316

Orifice

- 3/8" (9 mm)

Pressure Rating

- 21 bar (300 psi)

Temperature

- Water up to 80°C (180°F)

Flow factor

- KV 1.3 (CV 1.5)

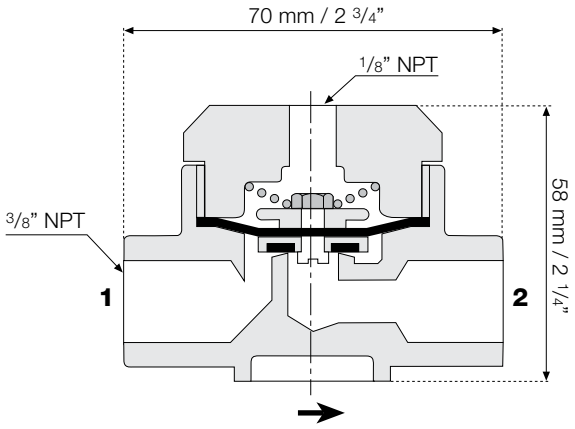
End Connections

- 3/8" NPT

Approvals

- UL-Listed

Note: 1: when installed on specific Bermad Deluge valve



Weight (Brass): 0.6 Kg / 1.3 lbs.

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3-Way N.C. Accelerator (HRV-3)

The HRV-3 is used to relay and accelerate hydraulic signals, making the opening and closing of large size valves significantly quicker.
In response to pressure status in its control chamber, the HRV-3 directs flow and pressure between its ports in the following manner:

- In response to pressure applied to its control chamber, the HRV-3 connects port “0” to port “2”.
- In response to pressure released from its control chamber, the HRV-3 connects port “2” to port “1”.

Line pressure is applied to the HRV-3 control chamber through a solenoid or other device.

Brass Construction

Corrosion Resistant Construction

Materials

Body & cover

- Nickel plated Brass
- Stainless Steel 316

Elastomers

- NBR

Wetted Parts

- Brass and Stainless Steel
- Stainless Steel 316

Orifice

- 3/8” (9 mm)

Pressure rating

- 21 bar (300 psi)

Flow factor

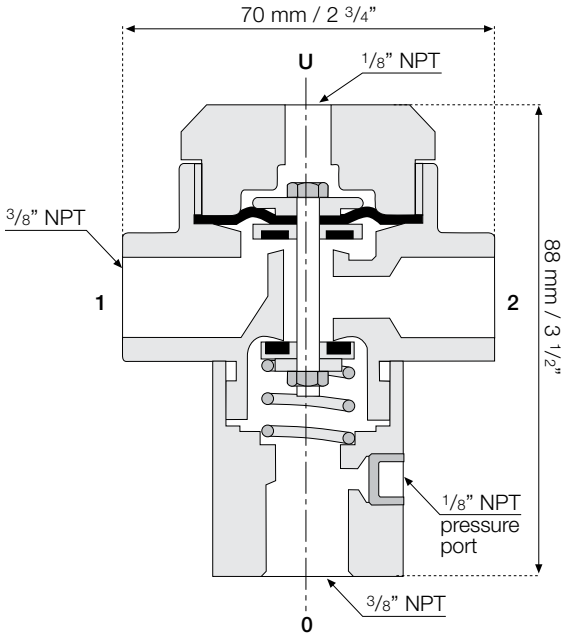
Closing: Ports 0 to 2 & 1 to 2: Kv 1.2 (Cv 1.4)
Opening: Ports 2 to 1 & 2 to 0: Kv 1.0 (Cv 1.2)

End Connections

- 3/8” NPT

Connections:

Port	
0	Upstream pressure
2	Control chamber
1	Vent
U	Command



Weight: 0.8 Kg / 1.7 lbs.

Accelerator with Priming Restriction

As part of the control trim, this venturi action accelerator speeds up the release of the main valve control chamber enabling faster full opening of the deluge valve. Water exits the accelerator faster than it can be supplied, through the restriction to the valve control chamber, accelerating the opening of the main valve.

Materials

Body & Restriction

- Stainless Steel 316
- Monel (alloy 400)

Models

- 2436 - For 1½ - 4" valves
- 3248 - For 6 - 10" valves
- 4272 - For 12 - 14" valves

Pressure Rating

- 25 bar (365 psi)

Connections

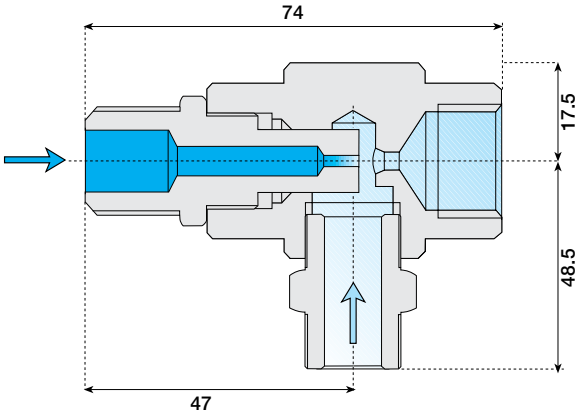
- Inlet: ½" NPT male
- Outlet: ½" NPT female

Approvals*

- UL Listed
- VdS Certified

Note:

* Approved/Listed when installed on Bermad Deluge valve.



EasyLock™ Manual Reset

The Bermad EasyLock Manual Reset is an automatic Latching device that holds the Bermad Deluge valve in its open position when the valve has been activated by a releasing device.
The EasyLock blocks the Deluge priming line, preventing Water from entering the valve control chamber and the releasing devices, thus effectively latches the Deluge valve open. The EasyLock allows the deluge valve to close only upon a local reset, while manually pushing the Reset Knob.
The EasyLock consists of an integrated spring-loaded check valve. A Safety Ball Drip vents any accidental leak to ensure that the Deluge valve remains latched.

Features

- Automatically Operated by Line Pressure
- Integral Spring Loaded Check valve
- Safe Design - Elastomeric Moving Parts

Materials

Standard Materials:

- Body: Nickel Plated Brass
- Stem: Stainless Steel 316
- Elastomeric Ball: FPM (Viton®)
- Springs: Stainless Steel 302

Stainless Steel Construction:

- Body: Stainless Steel 316
- Stem: Stainless Steel 316
- Elastomeric Ball: FPM (Viton®)
- Springs: Stainless Steel 316

NAB construction:

- Body: Ni-Al-Bronze ASTM B148 C95500
- Stem: Monel 400
- Elastomeric Ball: FPM (Viton®)
- Spring: Stainless Steel 316 (dry), Inconel (internal)

Hydraulic Data

- Pressure Rating: 25 bar (365 psi)
- Working Temperature: Water up to 80°C (180°F)
- Flow Factor: Kv 0.46 (Cv 0.54)

Connections

- Inlet: ½" NPT male
- Outlets: ½" NPT female, 3 ports

Approvals (1)

- UL Listed
- VdS Approved

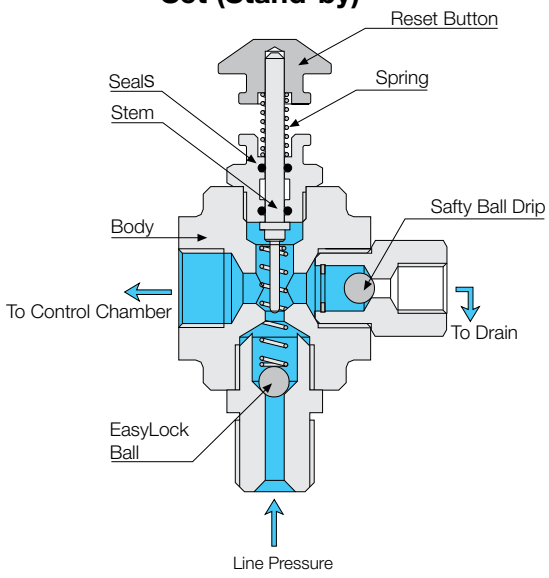
Care and Maintenance

The Bermad EasyLock® is maintenance free, however a Y Control Strainer with a minimum of 500 micron filter, should be installed on the upstream of the device in order to prevent residuals from entering the sealing area. The filter element should be cleaned after the first valve operation/start-up and at least quarterly.

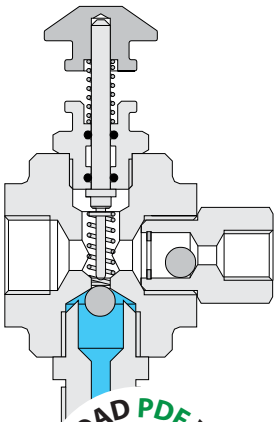
Notes:

(1) Approved when installed on Bermad Deluge Valve with specific trim model

Set (Stand-by)



Operation (Latched)



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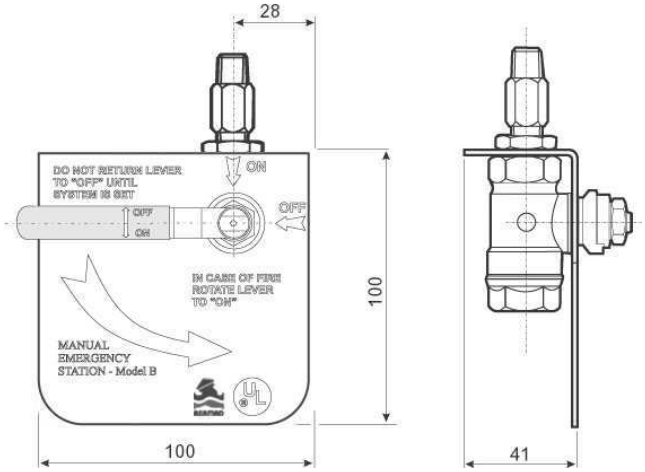
Manual Emergency Release

Model B

Manual Emergency Release is a normally closed release device, used for manually opening a deluge valve.
It is connected to the BERMAD on-off deluge valves standard control trim and can also be mounted on a wet or dry pilot line for additional manual remote operation.
UL Listed for Special Fire Protection Systems.

Models

- Model B - Standard
- Model BN - All Stainless Steel 316
- Model BM - Monel (for Seawater)



Material Of Construction

Model B - (Standard)

- Release Valve: Nickel Plated Brass
- Seals: PTFE
- Mounting plate: Stainless Steel 304 with epoxy marking
- Fittings: Stainless Steel 316
- Nuts: Stainless Steel 316

Model BN - (SS316 Construction)

- Release Valve: Stainless Steel 316
- Seals: PTFE
- Mounting plate: Stainless Steel 316 with epoxy marking
- Fittings: Stainless Steel 316
- Bolts/Nuts: Stainless Steel 316

Model BM - Monel (Seawater) Construction

- Release Valve: Monel 400
- Seals: PTFE
- Mounting plate: Stainless Steel 316 with epoxy marking
- Fittings: Monel 400
- Bolts/Nuts: Stainless Steel 316

Pressure Rating

- Water: 400 psi (27.5 bar)

End Connections

- ½" NPT
- Male inlet, female outlet

Approvals

- UL Listed for Fire Protection Systems [1]

Notes:

[1] Approved when installed on Bermad Deluge valve

[2] For more details about the release valve, see BERMAD publication "2-Way Ball Valve"

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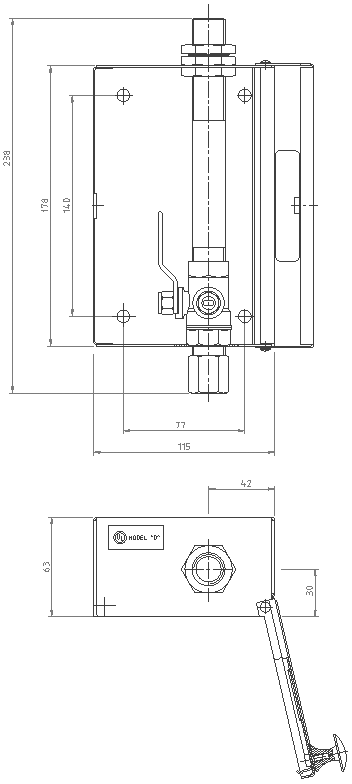
Manual Emergency Release

Model D

Manual Emergency Release is a normally closed release device, used for manually opening a deluge valve.
It is connected to BERMAD Classic deluge, Pre-action or Dry pipe valves standard control trim and can also be mounted on the wet or dry pilot line, as a remote manual operated station.
The Manual Emergency Release stainless steel 316 assembly version (Model DN) is suited for corrosion resistent requirements.
UL Listed for Special Fire Protection Systems[1].

Models

- Model D - Standard
- Model DN - All Stainless Steel 316
- Model DM - Monel valve Wetted parts, Stainless Steel Box



Material Of Construction

Model D - (Standard)

- Release Valve: Nickel Plated Brass
- Seals: PTFE
- Mounting Box: Polyester coated Stainless Steel 304
- Fittings: Stainless Steel 316
- Nuts: Stainless Steel 316
- Label: Molded PVC

Model DN - (All SS316)

- Release Valve: Stainless Steel 316
- Seals: PTFE
- Mounting Box: Polyester coated Stainless Steel 316
- Fittings: Stainless Steel 316
- Nuts: Stainless Steel 316
- Label: Molded PVC

Model DM - Monel (Seawater)

- Release Valve: Monel 400
- Seals: PTFE
- Mounting Box: Polyester coated Stainless Steel 316
- Fittings: Stainless Steel 316
- Nuts: Stainless Steel 316
- Label: Molded PVC

Pressure Rating

- Water: 400 psi (27.5 bar)

End Connections

- ½" NPT
- Male inlet, female outlet

Approvals

- UL Listed for Fire Protection Special Systems [1]

Notes:

[1] Approved when installed on Bermad Deluge valve
[2] For more details about the release valve, see BERMAD publication "2-Way Ball Valve"

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2-Way Ball Valve

This full bore Ball Valve provides quick and easy on/off manual control for manual release, isolating valves and drains.

Materials

Body
- Forged Brass
- Stainless Steel 316
- Monel 400 (¼, ⅜, ½ and ¾")
- Al. Bronz (1½ and 2")

Ball
- Nickel and Chromium plated
- Stainless Steel 316 (1)

Seats
- PTFE

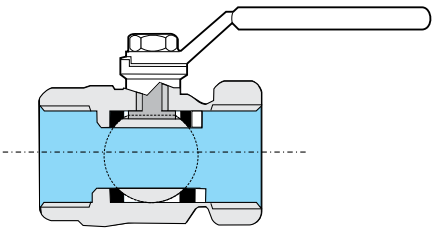
Stem seal
- PTFE washers
- FPM O-ring

Handle
- Galvanized Steel
- Stainless Steel 316 (1)

Pressure Rating
- Water: 400 psi (27.5 bar)

End Connections
- ¼, ⅜, ½, ¾, 1½, 2" NPT

Approvals
- UL listed (2)



3-Way Ball Valve

This 3-Way valve is used as a local or remote pilot valve, providing quick and easy 2-position on/off manual control.

Materials

Body
- Brass
- Stainless Steel 316

Ball
- Nickel plated Brass
- Stainless Steel 316(1)

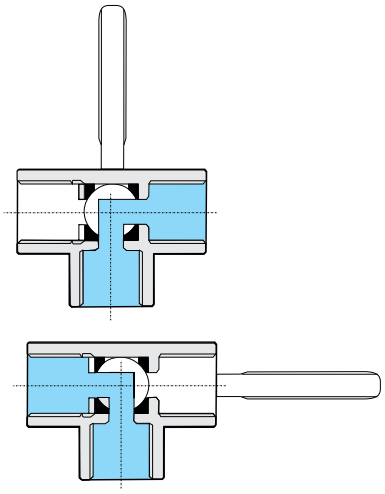
Seats
- PTFE

Stem Seal
- FPM O-ring

Handle
- Stainless Steel

Pressure Rating
- Water: 400 psi (27.5 bar)

End Connections
- ¼, ⅜ or ½" NPT



Note 1: Available on Stainless Steel valve only

No ce with UL subject 258
(T , for Brass construction only

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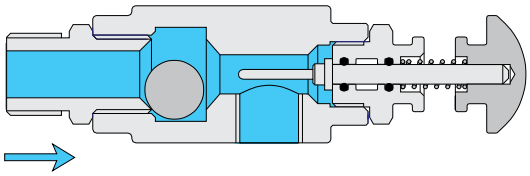
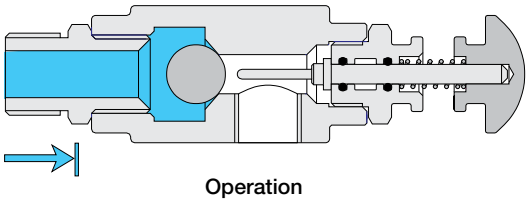
Automatic Drip Check

The Automatic Drip Check shall be mounted horizontally at the low point of the system it drains leakage or fluid accumulation from a dry piping system. This normally open Drip Check closes upon increase in flow velocity and automatically reopens upon decrease of system pressure. The manual release knob can be used to verify that the piping is completely drained



Drain



Operation

Material

Standard

- Body: Nickel Plated Brass
- Stem: Stainless Steel 316
- Seals: EPDM
- Ball: Stainless Steel 316

Stainless Steel 316 Construction

- Body: Stainless Steel 316
- Stem: Stainless Steel 316
- Seals: EPDM
- Ball: Stainless Steel 316

Ni.Al.Bronze (Seawater) Construction

- Body: Ni.Al. Bronze ASTM B148 C95800
- Stem: Monel 400
- Seals: EPDM
- Ball: Ni.Al. Bronze

Connections

- Inlet: ½" NPT male
- Drain: ¼" NPT female

Approvals

- UL Listed
- EN and VdS requirements compliance

Pressure Rating

- 25 bar (365 psi)

Practical Properties

- Minimum required flow for closing: 554l/h (2.44 gpm)
- Closed at 0.12 bar (1.76 psi), maximum
- Reopens at 0.04 bar (0.59 psi), minimum

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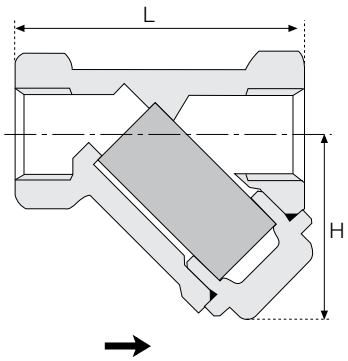
"Y" Control Striner

The "Y" Strainer with a stainless steel or Monel screen is used in all BERMAD Water Control Valves, including Deluge Valves, Preaction Valves, Pressure Control Valves, Monitor Valves and Remote Control Valves.
The "Y" Strainer is located at the pressure supply or priming line to protect the control trim components from suspended particles or debris.

Fig. 1

Fig. 2



Materials

Brass Construction (Fig. 1):

- **Body:** Nickel plated Brass
- **Cover Plug:** Brass
- **Screen:** Stainless Steel
- **Gasket:** Non-Asbestos Fiber

Stainless Steel Construction (Fig. 2):

- **Body:** Stainless Steel 316
- **Cover Plug:** Stainless Steel 316
- **Screen:** Stainless Steel 316
- **Gasket:** PTFE

NAB construction (Fig 1):

- **Body:** Al-Bronze ASTM B148 C95500
- **Cover Plug:** Al-Bronze ASTM B148 C95500
- **Screen:** Monel K500
- **Gasket:** PTFE

Filter Elements

- 500 micron (35 mesh)

Pressure Rating

- Max working pressure: 25 bar (350 psi)

DN End Connections

- ¼", ⅜" or ½" NPT

Maintenance

The "Y" Strainer should be cleaned after the first valve operation/start-up and at least quarterly.
The cleaning is done by carefully opening the screwed cover plug, after closing the priming ball valve, and flushing the screen with a stream of water or compressed air.

Note: Illustrations are for display only

Dimenssions Table

		¼"		⅜"		½"	
		mm	inch	mm	inch	mm	inch
Brass	H	39.5	1 9/16	39.5	1 9/16	39.5	1 9/16
	L	53	2 1/16	53	2 1/16	53	2 1/16
St. St.	H	47	1 7/8	47	1 7/8	50	1
	L	57	2 1/4	57	2 1/4	61	2 7/16
NAB	H	40	1 9/16	40	1 9/16	41	1 5/8
	L	55	2 3/16	55	2 3/16	58	2 5/16

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Large Control Filter

The large control filter is used for filtration of dirty control fluid that might quickly block standard control filters. This larger filter increases the reliability of the control valve system and aids in eliminating false operation.

Materials

Standard Construction:

- Body: Carbon Steel, Red Epoxy coated
- Covers: Brass
- Stem & Nut: Stainless Steel 304
- Filter Discs: Polypropylene, 60 mesh
- Gaskets: NBR O-rings

Stainless Steel Construction:

- Body: Stainless Steel 316, uncoated
- Covers: Stainless Steel 316, uncoated
- Stem & Nut: Stainless Steel 316
- Filter Discs: Polypropylene, 60 mesh
- Gaskets: NBR O-rings

NAB construction:

- Body: Ni-Al-Bronze ASTM B148 C95800
- Covers: Ni-Al-Bronze ASTM B148 C95800
- Stem: Ni-Al-Bronze
- Nut (dry): Stainless Steel 316
- Filter Discs: Polypropylene, 60 mesh
- Gaskets: NBR O-rings

Max Temperature

- Water: 180˚F (80˚C)

Pressure Rating

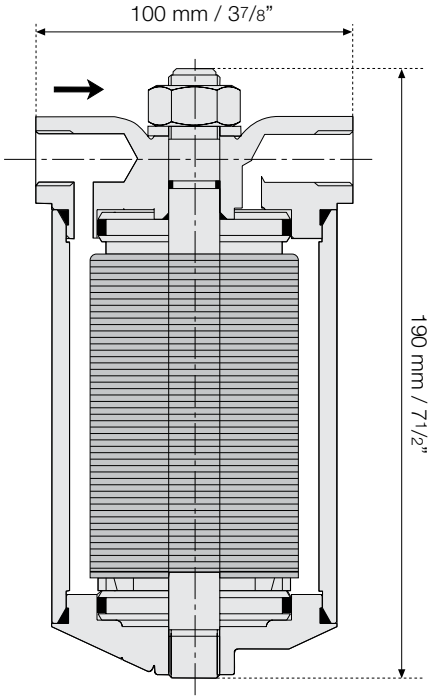
- 350 psi (25 bar)

End Connections

- 3/8" NPT female

Weight

- 6 lbs. (2.7 kg)



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Control Spring loaded Check Valve (SLC)

These spring loaded, non-return valves provide free flow in one direction, while preventing flow in the opposite direction and can be installed in any orientation.

Fig. 1

Materials

Body	Spring	Seat	Wetted Moving Parts
Brass (Fig.1)	St. St. 302	NBR	Brass
St. St. 316 (Fig.2)	St. St. 316	FPM	St. St. 316

Pressure Rating

- 25 bar (365 psi)

End Connections

- ¼"(1), ⅜ or ½" NPT

Note 1: Available on Stainless Steel 316 valve only

Fig. 2

Control Swing Check Valve (CLC)

These swing, non-return valves provide free flow in one direction, while preventing flow in the opposite direction. Their hydraulic streamlined body design, together with their swing-type clapper, presents very low friction loss & opening point, and immediate closing.
The CSC can be installed horizontally (clapper shaft – upwards) or vertically (flow arrow - pointing upward).

Materials

Body

- Stainless steel 316
- Nickel Al. Bronze

Seat

- Stainless steel 316
- Nickel Al. Bronze

Wetted moving parts

- Stainless steel 316
- Monel 400

Body seal

- PTFE

Pressure Rating

- 25 bar (365 psi)

End Connections

- ⅜ or ½" NPT

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Plastic Pressure Gauge

This Pressure Gauge provides visual indication of water or air pressure in BERMAD's water control vales, such as Deluge, Preaction, Pressure Control and Remote Control Valves. The core of the Pressure Gauge is a spring suspended movement, which is resistant to reasonable levels of shock, vibration and pulsation, and long lasting performance.
The case provides impact resistance, corrosion resistance and is rated for IP 65 ingress protection.
This Pressure Gauge complied with EN 837-1 & ASME B40.100 design, UL-Listed and FM approved for Fire Protection Systems.

Approvals

- UL Listed
- FM Approved

Materials

- Case: Black ABS
- Window: Polycarbonate
- Dial: Coated Steel
- Pointer: Aluminum
- Bourdon Tube: Bronze
- Socket: Brass

End Connections

- ¼" NPT (F)

Case Scale

- 0-21 bar/0-300 psi

Dial Size

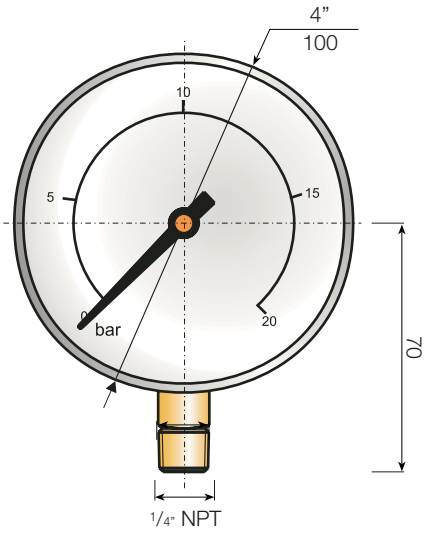
- 4" (100 mm)

Accuracy

- 3% of full scale (ASME B40.100 Grade B)

Temperature Range

- -40°C to 60°C (-40°F to 140°F)



Installation:

Gauges must be handled with care. They must be stored in a cool, dry place in their original shipping box. Never install gauges that have been dropped or damaged in anyway. Such gauges should be destroyed immediately.
Adequate heat must be provided where gauges are installed. The gauges must be protected from mechanical damage.
Install the gauges according to the following steps:

1. Apply a small amount of pipe-joint compound or tape to the external threads of the gauge only. Take care that no joint compound is allowed into the orifice of the gauge.
2. Turn the unit clock wise to thread the gauge into the outlet of the coupling.
   DO NOT overtighten the gauge.

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Stainless Steel Pressure Gauge

This Stainless Steel Bourdon Tube Pressure Gauge is recomended for corrosive environments and corrosive Liquid media. The Pressure Gauge provides visual indication of water or air pressure in Bermad's water control vales, such as Deluge, Preaction, Pressure Control and Remote Control valves that are intended to be installed in corrosive sites such as chemical, petro-chemical, power plants, mining, on-shore and offshore environments. The core of the Pressure Gauge is a spring suspended movement, which is resistant to shock, vibration and pulsation, thus assuring accurate and long lasting performance. The Glycerin liquid filled case is suitable for high dynamic pressure pulsations or vibrations, with excellent shock resistance. The pressure gauge utilizes an impact/heat resistant window, rated for IP 65 ingress protection per EN 60 529 / IEC 529 and complies with EN 837-1 design.

Materials

- Socket and Bourdon Tube: Stainless Steel 316
  Option: Monel 400
- Case: Stainless Steel, Glycerin filled
  Option: Stainless Steel 316, Glycerin filled
- Window: Laminated safety glass
- Dial: Aluminum
- Pointer: Aluminum

End Connections

- ¼" NPT

Dual Scale

- 0-20 bar/0-300 psi

Case Size

- 100 mm (4")

Accuracy

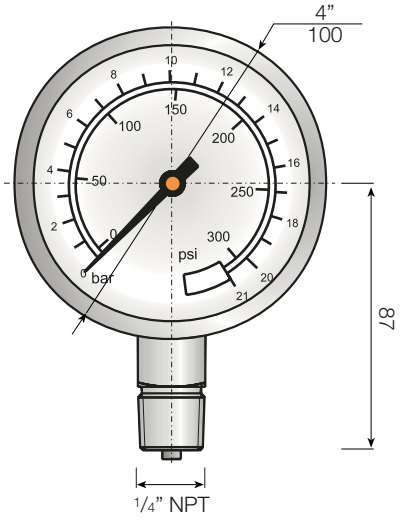
- 1% of full scale

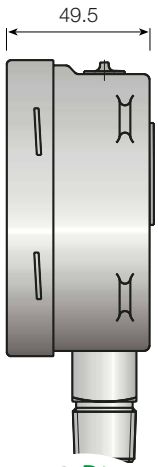
Temperature Range

- Ambient: -40°C to 65°C (-40°F to 150°F)
- Max. Fluid: 100°C (212°F)

Ingress Protection

IP 65 per EN 60 529 / IEC 529





Installation:

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2. Turn the unit clock wise to thread the gauge into the outlet of the coupling.
   DO NOT overtighten the gauge.

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General Purpose Pressure Switch

Model PS-10

These adjustable, pre-set Pressure Switches are suitable for pressure and/or flow detection in BERMAD valve systems such as Deluge or Pre-action, or with other control valves for non-hazardous locations. The Pressure Switches are also used to provide a low pressure supervisory signal for BERMAD Pre-action Systems or Pneumatically controlled deluge valves.

Features

- Solid metal enclosure
- NEMA 4 / IP 55 watertight and dust proof - For indoor or outdoor use
- 17 bar (250 psi) system pressure rated
- One SPDT or two SPDT version for DPDT action (marked with 2A suffix)
- Convenient field adjustments
- Global approvals
- Reliable and dependable device

Approvals

- UL Listed
- FM Approved
- VdS Approved
- LPC Approved
- CE Certified

Materials

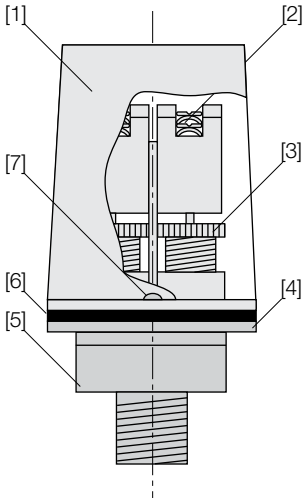
- Wetted parts: Thermo plastic, corrosion resistant
- Cover: Die Cast Aluminum with textured red powder coat finish
- Base: Zinc-plated Steel

End Connections

- Pressure: ½" NPT (M)
- Electric: 12 mm Conduit Hole

Typical Installation

The Pressure Switch shall be connected to the BERMAD valve alarm discharge piping. Ensure that no shut-off valves are located between the alarm piping and the Pressure Switch. The device should be mounted in an upright position. A IP 55/NEMA 4 or
IP 65 electric connection is required for outdoor installations.



Major Parts
[1] Cover
[2] Terminal screws
[3] Adjustment knob
[4] Base
[5] Pressure connection
[6] Gasket
[7] Cover screw

DOWNLOAD PDF VERSION

Technical Data

Pressure Rating

- 17 bar (250 psi)

Pressure Setting & Ronge

- Model PS10
  - Factory set: +/- 1.0 bar (15 psi)
  - Adjusting range: 0.3 - 1.4 bar (4 to 20 psi)
  - Deadband: 0.13 bar (2 psi) typical

Electrical Ratings

- 15 Amps @ 125/250VAC
- 2.5 Amps @ 30VDC
- Single or dual SPDT (from C)

Enclosure Class

- NEMA 4 weather-proof IP 55 rated

Ambient Temperature

- -40°C to 60°C (-40°F to 140°F)

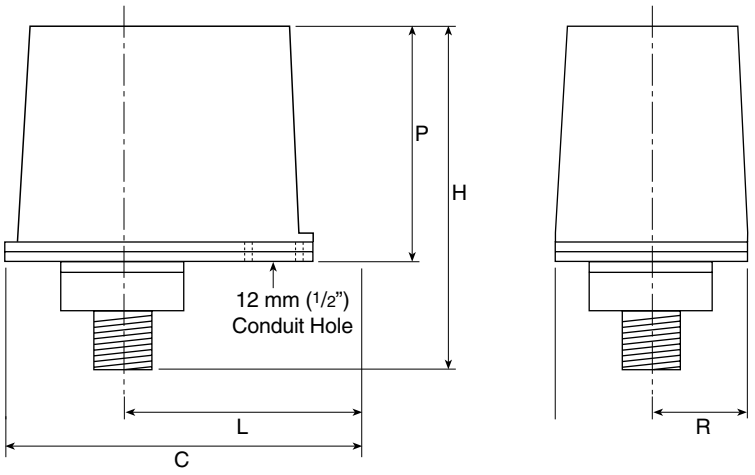
Weight

- Approx. 0.60 kg (21 oz)

Installation - Caution

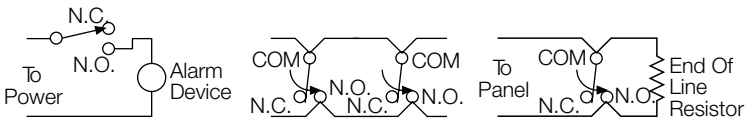
An uninsulated section of a single conductor should not be looped around the terminal to serve as two separate connections.
The wire must be severed, thereby providing supervision of the connection in the event that the wire becomes dislodged from under the terminal.

Note:
To prevent leakage, apply teflon tape sealant to male threads only.
Warning:
Use of pipe joint cement may result in obstruction of the aperture and loss of signal.



	mm	inch
H	107.2	4.22
P	73	2.87
L	63	2.48
C	96	3.78
R	40.7	1.60

Typical Electrical Connections

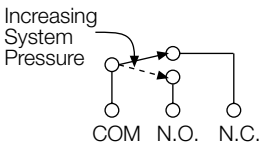


Local Alarm
Non-Supervised

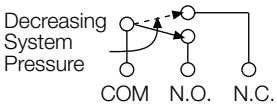
Style D (Class A)
Supervised Loop

Style B (Class B)
Supervised Circuit

Pressure Switch Termination



Typical Waterflow Alarm



Typical Low Pressure Supervision

Testing

Test by opening the water bypass alarm test valve.
Caution: The above test might also activate any other circuit closer or water motor gongs that are present on the system.

Note:
The operation of the PS-10 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).

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Explosion-Proof Pressure Switch

Model PS-12

The PS-12 Pressure Switch is for use in conjunction with BERMAD Deluge or other types of water control valves, to indicate discharge water pressure. This Pressure Switch offers reliability, repeatability and durability in a compact design. It is ideal for operation under the harsh conditions of DIV.1 or Zone 1 (II 2 G/D EEx d IIC T6 Certified) hazardous locations.
At the heart of the PS-12 is a snap action Belleville spring assembly, which transfers motion to a hermetically sealed 5 amp vibration resistant microswitch.
Applications: Chemical plants, refineries, gas and petroleum installations, offshore and marine vessels.

Features

- Stainless Steel construction
- Vibration resistant technology
- Hermetically sealed switch enclosure
- Convenient field adjustments
- Global approvals for hazardous locations
- Strain relief, high over pressure
- Mechanical contact lifecycle: 10 million cycle

Approvals

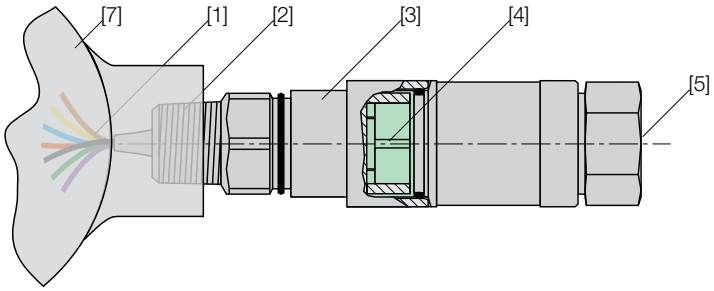
- UL Listed for hazardous locations
  Class I Div.1 & 2
- CENELEC Certified to ATEX directive
  II 2 G/D EEx d IIC T6
- CSA Certified for Class I, Zone 1, Group IIC
- IP66 Certified

Materials

- Wetted parts: Stainless Steel 316
- Option: Monel 400
- Hausing: Stainless Steel 316
- Diaphragm: Teflon® coated polyamide
- O-ring: NBR (Buna-N)
- Aluminum terminal box

End Connections

- Pressure: ½" NPT (F)
- Electric: ½" NPT (M)



Major Parts
[1] Factory sealed leadwires
[2] Electric port connection
[3] Adjustment access cover
[4] Slotted adjustment screw
[5] Pressure connection (sensor)
[6] Switch housing
[7] Terminal Box (option)

Technical Data

Model Selection

- **Model 12-SHSN3B (standard):** one SPDT, S.S. 316 wetted parts
- **Model 12-SHDN3C:** two SPDT for DPDT action, S.S. 316 wetted parts
- **Model 12-SHSN3B/M:** one SPDT for DPDT action, Monel wetted parts

Pressure Setting & Range

- **Factory Set:** 2.5 bar high, 2.1 bar low
- **Adjustable range:** 1.0 to 3.8 bar (15 to 55 psi)
- **Deadband:** 0.2 bar low to 0.6 bar high (3 to 8 psi)
- **Max. working pressure:** 41 bar (600 psi)
- **Set point repeatability:** ±1% of adjustable range

Electrical Ratings

- 5 amp at 250 VAC
- 5 amp resistive and 3 amp inductive at 28 VDC
- Silver contacts

Enclosures Class

- NEMA 4X, 7 and 9(1) Classification Explosion-proof and watertight combination Class I Division 1 & 2 Groups A, B, C, D. Class II Division 1 & 2 Groups E, F, G
- ATEX Classification(2)
  II 2 G/D EEx d IIC T6 Certified to ATEX directive
  IP 66 Certified, CE marked

Note:

(1) UL-Listed for hazardous locations (UL file # E40857), CSA Class I, Zone 1, Group IIC.

(2) Demko A/S certified to ATEX Directive (94/9 EC) II 2 G/D EEx d IIC T6, IP 66 EN 50 014, EN 50 018, EN 50 281,EN 60529 (Certificate #DEMKO 03 ATEX 0252466)

Ambient Temperature

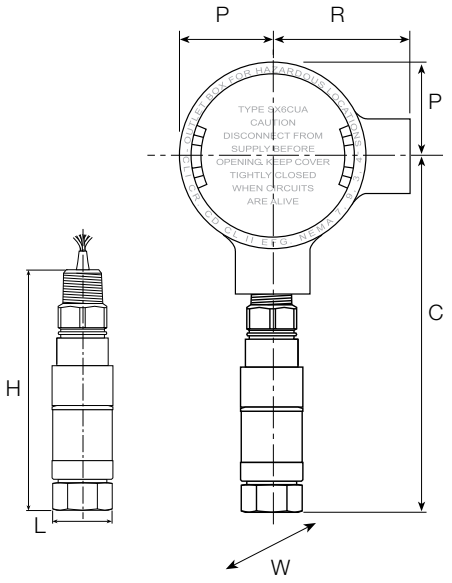
- **Storage and operation:** -50°C to +80°C (-58°F to +176°F)

Leadwires

- Standard wire length: 180 cm (72”) when pressure switch is supplied without terminal box

Weight

- Pressure switch: approx. 0.34 kg (12 oz)
- Pressure switch with terminal box: approx. 1.13 kg (40 oz)



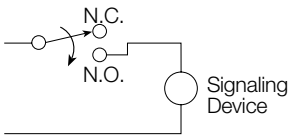
Pressure Switch

	mm	inch
H	124	4 7/8
L	31.7	1 1/4

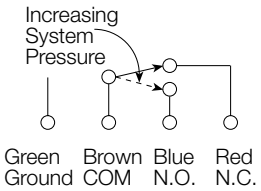
Pressure Switch with Terminal Box

	mm	inch
P	48	1 7/8
R	70	2 3/4
C	185	7 3/8
W	85	3 3/8

Typical Electrical Connections



Typical Local Alarm Circuit



Typical Waterflow Alarm

Water Motor Alarm

The Water Motor Alarm is a hydromechanical automatic sound warning device actuated by water flow. It sounds a continuous alarm while a Deluge or Water Control Valve operates.
This unit is suitable for wall or pipe mounting and is suited for outdoor installation.
The Water Motor Alarm gong assembly package is supplied loose and includes a ¾" strainer.

Features

- Self contained, line pressure operated
- Quick and positive operation
- Weather-proof
- No cover needed, suited for outdoor installation

Approvals

- UL Listed
- Option: FM Approved

Materials

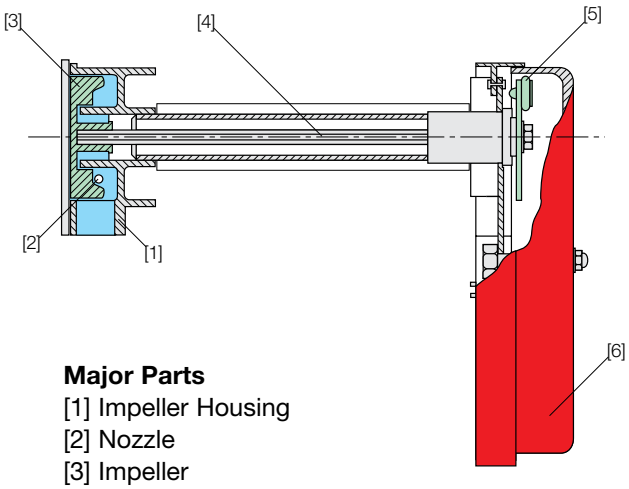
- Gong: Aluminum
- Housing: Aluminum
- Bolts & Nuts: Galvanized Steel
- Impeller: Delrin
- Nozzle: Brass

End Connections

- Inlet: ¾" NPT (F)
- Oulet drain: 1" NPT (F)

Operation

When a Deluge Valve is activated, water flows through the valve's trim, discharges to a strainer and into the water motor inlet. From the inlet, the water flows through a nozzle [2] which directs the stream to the impeller [3]. The stream turns the impeller and drive shaft [4], causing the striker arm [5] to rotate, thus producing a continuous alarm. The water is discharged through a 1" (25 mm) drain outlet at the bottom of the impeller housing. The discharged water must be piped through the wall to atmosphere or to a suitable open drain.



Major Parts
[1] Impeller Housing
[2] Nozzle
[3] Impeller
[4] Drive Shaft
[5] Alarm Arm Assembly
[6] Gong

Technical Data

Gong Specifications:

- Outlet Sound: 90 dB
- Diameter: 223 mm (9")

Water Working Pressure:

- Max: 12 bar (175 psi)
- Min: 1 bar (15 psi)

Shipping Weight:

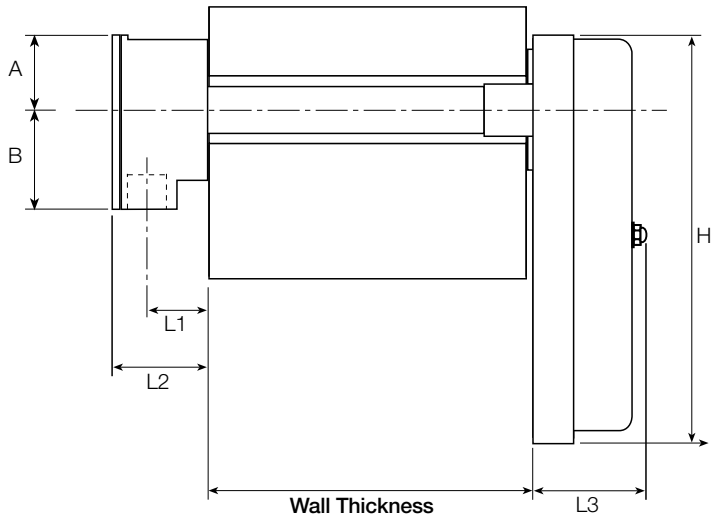
- 3.3 kg (7.5 lbs)

Accessories:

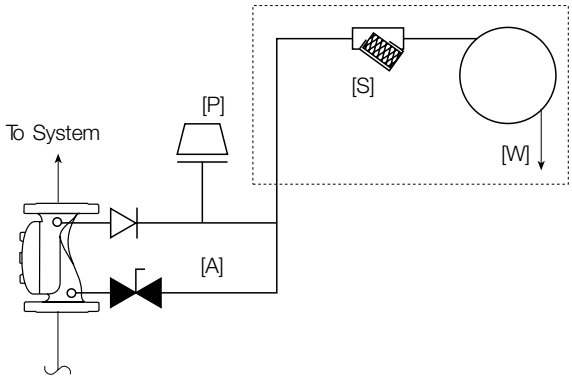
- The package also includes the required ¾" (20 mm) NPT strainer for installation on the alarm line.

Design Requirements:

- Locate the Water Motor Alarm on an exterior wall as close as practical to the valve being monitored for water flow. A strainer (¾", included in package) is required on the alarm line.
  The location must be easily accessible for cleaning.
- The alarm line pipe must be 20ND (¾") in size with 22.8m (75ft) maximum total length of pipe with minimum number of fittings. If the length of the pipe exceeds 22.8m (75ft), then a larger pipe size must be used to reduce hydraulic friction loss. The sprinkler alarm should not be located more than 1.8m (6ft) above alarm valve.



	mm	inch
A	57	2 1/4
B	70	2 3/4
H	233	9
L1	41	1 5/4
L2	71	2 3/4
L3	89	3 1/2



Major Parts

[A] Valve Trim Accessories
[P] Pressure Switch
[S] Strainer
[W] Water Motor Alarm

Proximity Limit Switch

Model S9/SS9

This Limit Switch Assembly is a an accessory which, enables remote signaling upon the opening or closing of the BERMAD Deluge valve or other types of Water Control Valves. It is equipped with one or two switches actuated by the closing or opening of the valve.
This limit switch assembly is suitable for harsh environments, it is all 316 Stainless steel construction equipped with a rigid proximity magnetic switch sensor. The switch is suitable for hazardous locations, ATEX certified for Category II 2G EEx d IIC T6 and UL-Listed for Class I, Division 1, Groups A, B, C, D and Class II, Division 1, Groups E, F, G to NEC 500, NEMA 4,4X, 7, 9.
The proximity sensor is hermetically sealed and requires a ferromagnetic target to operate the internal switch.
The switch is equipped with Tungsten contacts and is electrically rated for 2 Amps at 24VDC.

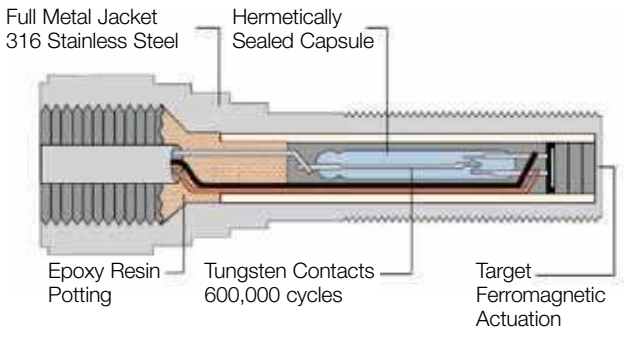
Proximity Limit Switch Assembly
(Double Switch Shown)

Two versions are available:
- Single limit switch assembly:
  Equipped with one SPDT, signaling closed or open valve position.
- Double limit switch assembly:
  Equipped with two SPDT, signaling closed and fully open valve positions.

Technical Data

Switch type

- All Stainless steel 316, corrosion-resistant
- Proximity magnetic switch sensor
- ATEX, UL and Inmetro certified for Zone 1
- Hermetically Sealed dry contact - Improves Safety
- SPDT (single pole double throw), 1NO, 1NC
- Tungsten contacts
- Galvanized isolated
- IP 67 rated
- 3 Amps/120VAC, 1.5 Amps/240VAC, 2 Amps/24VDC rated
- Sensor rated temperature: -30 to +90°C



Proximity Limit Switch Sensor

Features

- Rigid construction
- Vibration resistant technology
- Switching element with snap-action contact

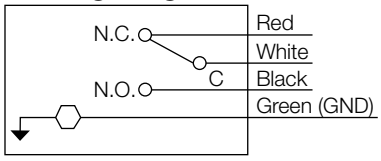
Material of Constructions

- Valve plug, cover plug, Bracket nut, cam: Stainless steel 316
- Wetted parts: Stainless steel 316
- Sensor: Stainless steel 316

Optional Materials:

- Ni.Al.Bronze and Monel wetted parts
- H[illegible]76 wetted parts

Wiring Diagram



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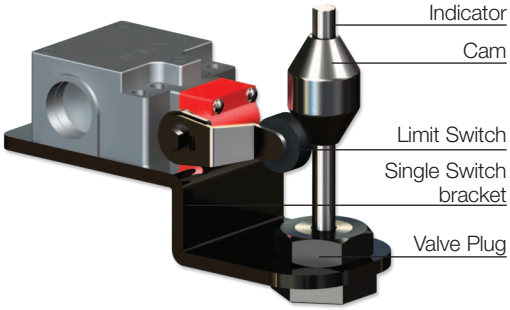
Mechanical Limit Switch

Model S

This Valve Position Limit Switch enables a remote signaling upon the opening or closing of the BERMAD Deluge valve or other types of Water Control Valves. It is equipped with one or two electrical switches actuated by the closing or opening of the valve.
The following are available:

- Single limit switch assembly:
  Equipped with one SPDT, signaling closed valve position
- Double limit switch assembly: Equipped with two SPDT, signaling closed and fully open valve positions
- Weather Proof Switch unit - General Purpose



Single Limit Switch Assembly

Technical Data

Switch type

- SPDT (single pole double throw), 1NO, 1NC
- Silver contacts
- Galvanized isolated
- IP 66 rated
- 5 Amps normal at 220VAC rated
- Power: 125VAC, 250VAC, 24VDC, 125VDC and 250VDC
- Ambient temperature: -30 to 55°C

Features

- Rigid construction
- Vibration resistant technology
- Switching element with snap-action contact

Material of Constructions

- Enclosure: Epoxy coated aluminum.
- Valve plug, cover plug, Bracket nut, cam: Brass
- Internal parts: Stainless steel 303/304

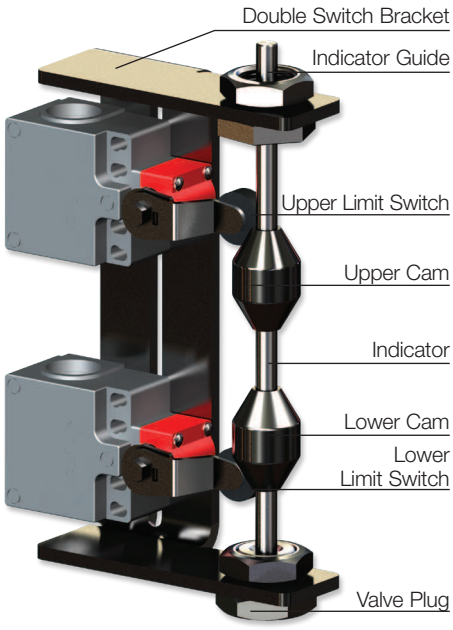
Optional Materials:

Stainless steel 316

Limit Switch Specifications

General Purpose Limit Switch, model S

This limit switch is used in safe area or non-classified locations. It is rated for IP 66 ingress protection. This switch unit is UL 508, IEC 60947-5-1 and GB14048.5-2001 approved for safe area. It is rated for 10 Amp for a short circuits, 6 Amp at 125, 250 VAC and 6 Amp at 24VDC, 1.1 Amp at 125VDC, 0.4 Amps at 250VDC. Amps inductive at 28VDC with 5 Amp at 250VAC. The limit switch is furnished with Silver contacts, SPDT type (1NO, 1NC). The switch unit enclosure includes integral epoxy coated aluminum terminal box with internal terminal blocks, M20x1.5 conduit entry.



Double Limit Switch Assembly

DOWNLOAD PDF VERSION

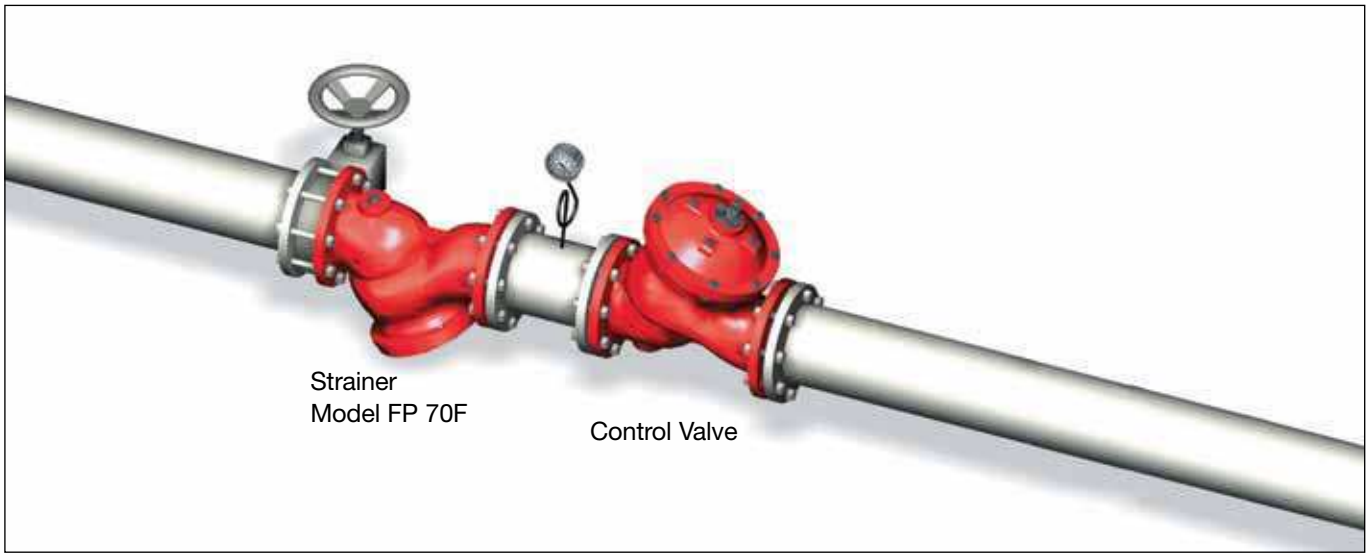
Strainer

Model: FP 70F

The BERMAD FP 70F Strainer is designed to remove foreign matter such as stones, sticks, etc, from the pipeline.
It is recommended to install the strainer upstream from control valves, flow meters and other system appliances.

- Large trap capacity
- Low pressure loss
- Blow-off port for easy cleaning

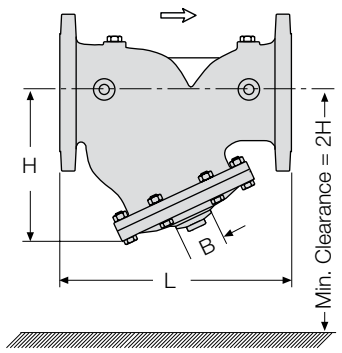
Typical application



Technical Data

Size		L		L1		H		W		W1		B
mm	inch	mm	inch	mm	inch	mm	inch	kg	lbs	kg	lbs	mm
40	1½"	205	8.1	210	8.3	125	4.9	6.5	14.3	7.8	17.2	¾"
50	2	205	8.1	210	8.3	125	4.9	8.0	17.6	10	22.0	
65	2½"	205	8.1	210	8.3	125	4.9	10.4	22.9	12.8	28.2	
80	3"	250	9.8	264	10.4	170	6.7	17	37.5	20	44	1½"
100	4"	320	12.6	335	13.2	210	8.3	28	61.7	34	75	
150	6"	415	16.3	433	17.0	270	10.6	48	106	58	128	2"
200	8"	500	19.7	524	20.6	330	13.0	75	165	95	210	
250	10"	605	23.8	637	25.1	420	16.5	125	276	153	337	
300	12"	725	28.5	762	30.0	480	18.9	225	496	266	586	
350	14"	733	28.9	767	30.2	480	18.9	235	518	288	635	
400	16"	990	39.0	1,024	40.3	620	24.4	535	1,180	590	1,300	3"
450	18"	1,000	39.4	1,030	40.5	620	24.4	670	1,477	735	1,620	
500	20"	1,100	43.3	1,136	44.7	620	24.4	760	1,675	835	1,840	

L,W – ANSI 150
L1,W1 – ISO 25; ANSI 300
"L", ISO standard lengths available
B – Blow-off port



Basket Hole Diameter (mm)

Stainless Steel 304 (Standard)

2"	3-4"	6-20"
1.5	3.0	5.0

St.St. 316 or Monel (Optional)

2-6"	8-20"
2.0	3.0

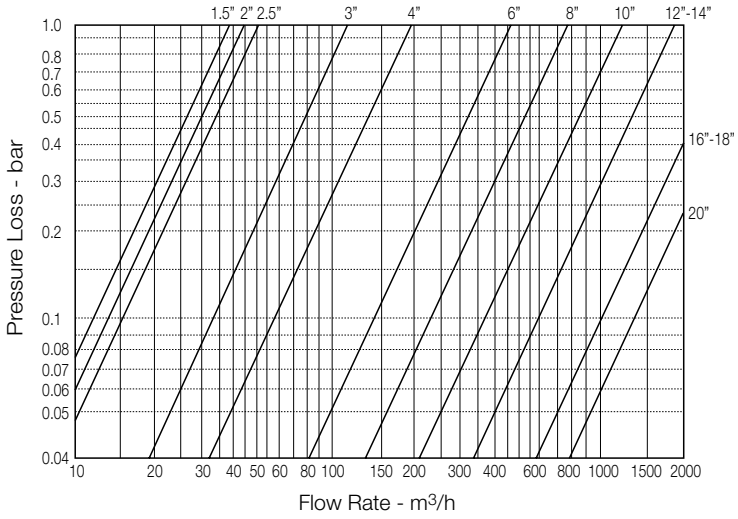
Specifications

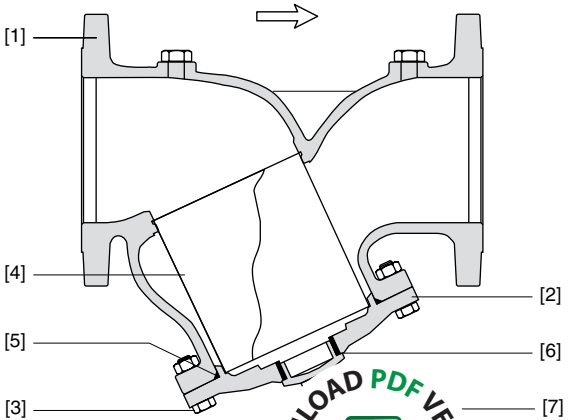
Patterns: "Y" (globe) & angle
Size Range: 11/2 - 20" (40-500 mm)
End Connections (Pressure Ratings):
Flanged: ISO PN16, PN25
(ANSI Class 150, 300)
Threaded: BSP or NPT
Others: Available on request
Working Temperature: Water up to 80°C (180°F)
Standard Materials:
Body: Ductile Iron
Cover: Steel
Screen / Basket: Stainless Steel 304
Seals: NBR (Buna N)
Coating:
RAL 3002 (Red), Electrostatic Polyester Powder or High Build Epoxy Fusion-Bonded (optional)

[1] Strainer Body: Ductile Iron ASTM A536 65-45-12
Ni.Al. Bronze ASTM B148 C95800
Cast Steel ASTM A216-WCB
[2] Strainer Cover: Ductile Iron ASTM A536 65-45-12
Ni.Al. Bronze ASTM B148 C95800
Cast Steel ASTM A216-WCB
[3] Nuts & Bolts: Zinc Plated Steel, Option: St.St. 316
[4] Screen: St.St. 304, Option: 316 or Monel
[5] Body O-ring: NBR (Buna-N)
[6] Plug O-ring: NBR (Buna-N)
[7] Blow-off Plug: Brass, Option: St.St. 316 Or Ni. Al. Bronze(1)

Notes:
(1) Option Drain Ball Valve: St.St. 316
Or Al. Bronze Ball Valve, PTFE Seals

Flow Chart





DOWNLOAD PDF VERSION

AMD with Adjustable Regulator

Model AMD-74

Description

The Bermad AMD Air Maintenance Device is a pressure control unit that automatically regulates the supplied air pressure to a constant preset value. It is suited for use with dry pilot actuated Deluge systems as well as Dry Pipe and Pre-action systems.
The AMD shall be utilized in applications where there is a compressed air or nitrogen source, which is provided at a higher pressure than the desired system pressure, including a field-adjustable pressure regulator.
The supply system shall include an air tank, (separately provided) connected to specific port.

Construction Materials:

Brass accessories and Stainless steel fittings

- Maximum Inlet Air (or Nitrogen) Supply Pressure: 12 bar / 175 psi
- Field-Adjustable Outlet Pressure Range: 1.0 to 7.0 bar / 15 to 100 psi

Options:

- All Stainless steel 316 (model: AMD-75)
- Inlet and outlet pressure gauges (Code 6n6n)
- Pressure Switch Low, Ex.proof (Code P7)
- Pressure Transmitter, Ex.proof (Code Q)

Figure 1

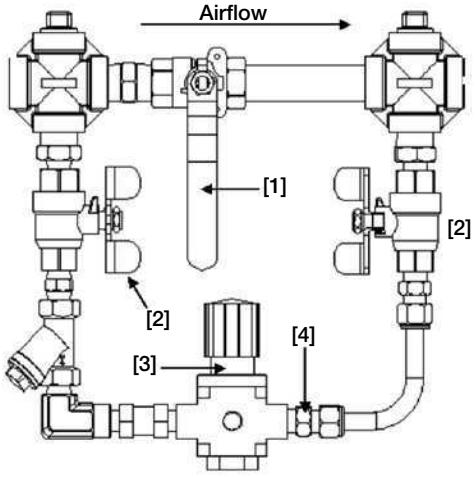


Figure 2

Principal of Operation

The AMD Air Pressure Maintenance Device regulates and restricts airflow. The N.C. By-Pass Valve [1] in the AMD is opened to instantly fill the system during the initial pressurization. Once the required system pressure has been reached, the By-Pass Valve will be closed and locked with a Tamper-Proof arrangement to allow restricted airflow through the fixed orifice.
The Air Supply Isolating Valves [2] must be in the open position to place the AMD in the automatic operation mode.
If a small leak in the system occurs, the Pressure Regulator [3] will automatically maintain system pressure at the preset level. The Restriction orifice [4] in the tube fitting limits the flow of air from the Pressure Regulator into the system to a value, which is significantly lower than it will be exhausted by a release device operation. The device will maintain air pressure in the system for a limited period of time in the event that the air supply is interrupted.

Installation

The AMD Automatic Air Maintenance Device must be installed in accordance with the following instructions:

1. The air or nitrogen supply provided to the Air Pressure Maintenance Device must be continuous, clean, dry, and oil free.

Notes:

- Instrument Air supply is recommended, however suitable consideration must be given to the removal of excessive moisture from the compressed air supply.
- Before the valve is installed, flush the pipeline to remove any dirt, debris, etc. Not flushing the line may result in system malfunctioning.

2. Unions should be installed upstream and downstream of the Air Pressure Maintenance Device to allow easy removal for servicing.
3. Connect the air supply to the AMD's inlet port, also connect the AMD's outlet port to with a minimum of " (DN15) pipe size.
4. Provide wiring the any installed instrumentations as with according to the manufacturer instructions.

Placing in Service & Resetting Procedure

The Model AMD Automatic Air Maintenance Device must be set in accordance with the following instructions:

1. Determine the pressure that meets the minimum requirements of the system to be pressurized.
2. Close the AMD By-Pass Valve, Supply Isolating Valve.
3. If the AMD requires adjustment, the Pressure Regulator adjusting screw must be turned counter-clockwise completely (the screw must be loose) to reduce the system pressure to “0”.
4. Open the Air Supply Isolating Valve and the Air Tank isolating valve. Apply air pressure supply to the AMD and to the air tank, the inlet pressure gauge shall indicate high and stable pressure supply.
5. Open the By-Pass Valve slowly to pressurize the system while observing the outlet pressure gauge. Close the By-Pass Valve and Lock it with the Tamper-Proof arrangement, after the system pressure has been stabilized to the required system pressure, as determined in step 1.

Adjustment

While observing the outlet pressure gauge, adjust the outlet pressure of the pressure regulator. Slowly turn the adjusting screw clockwise to increase pressure or counter-clockwise to decrease pressure.
After the pressure regulator is set, lock the adjusting screw in that position with its fastening nut.
Any installed instrumentations shall be calibrated with according to manufacturer instructions.

1. The Air System Pressure should be set at the minimum required value, in order to minimize the system response time, the recommended setting is approx. 0.4 bar / 5.5 psi above the release device trip point.
2. If the system was over-pressurized during fill and adjustment, the system pressure must be released and reduced to the desired value.
3. The AMD will then automatically maintain the preset system pressure. The Check Valve prevents bleeding down of the system pressure.

Maintenance

The following inspection procedure shall be performed, in addition to any specific requirements of the NFPA 25 and also to any requirements of the authorities having jurisdiction. The Air Pressure Maintenance Device should be checked for correct pressure regulation after installation or repair by noting the air pressure reading within the system. If adjustment
is necessary, refer to the ‘Adjustment” paragraph above. Any malfunction must be immediately corrected. The installing contractor or product supplier should be contacted in relation to any questions. It is recommended that the AMD be inspected, tested, and maintained by a qualified Inspection Service.

Notes:

1. Prior to any maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.
2. After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.
3. It is also recommended that accumulated moisture be removed from air supply moisture filtration equipment, at least quarterly. More frequent inspections may be necessary in particularly humid environments

Inspection and Testing

The Model AMD must be inspected quarterly in accordance with the following instructions:

1. Verify that the By-Pass Valve is closed and Locked with Tamper-Proof arrangement
2. Verify that the Air Supply Isolating Valve is Open and verify that any control valve in the air supply trim to the system being pressurized is open.
3. Verify that the system pressure is essentially the same as the previously established requirement. If adjustment is necessary refer to the ‘Adjustment” paragraph above.
4. Release accumulated moisture from Air Tank by opening the drain valve slowly.

The Air Maintenance Device is now ready for service.

AMD with Adjustable Regulator

All Stainless Steel 316 Construction

Model AMD-75

AMD-75 with PSL and PI (see options)

Description

The Bermad AMD Air Maintenance Device is a pressure control unit that automatically regulates the supplied air pressure to a constant preset value. It is suited for use with dry pilot actuated Deluge systems as well as Dry Pipe and Pre-action systems.
The AMD shall be utilized in applications where there is a compressed air or nitrogen source, which is provided at a higher pressure than the desired system pressure, including a field-adjustable pressure regulator.
The supply system shall include an air tank, (separately provided) connected to specific port.

Construction Materials:

Stainless steel 316 accessories and fittings

- Maximum Inlet Air (or Nitrogen) Supply Pressure: 12 bar / 175 psi
- Field-Adjustable Outlet Pressure Range: 1.0 to 7.0 bar / 15 to 100 psi

Options:

- Stainless steel back plate panel
- Brackets for direct mounting on Bermad deluge valve
- Air tank, Stainless steel (Code AT)
- Inlet and outlet pressure gauges (Code 6n6n)
- Pressure Switch Low, Ex.proof (Code P7)
- Pressure Transmitter, Ex.proof (Code Q)

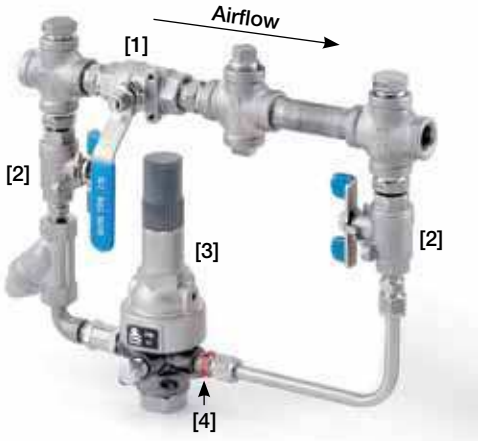
Principal of Operation

The AMD Air Pressure Maintenance Device regulates and restricts airflow. The N.C. By-Pass Valve [1] in the AMD is opened to instantly fill the system during the initial pressurization. Once the required system pressure has been reached, the By-Pass Valve will be closed and locked with a Tamper-Proof arrangement to allow restricted airflow through the fixed orifice.
The Air Supply Isolating Valves [2] must be in the open position to place the AMD in the automatic operation mode.
If a small leak in the system occurs, the Pressure Regulator [3] will automatically maintain system pressure at the preset level. The Restriction orifice [4] in the tube fitting limits the flow of air from the Pressure Regulator into the system to a value, which is significantly lower than it will be exhausted by a release device operation. The device will maintain air pressure in the system for a limited period of time in the event that the air supply is interrupted.

Installation

The AMD Automatic Air Maintenance Device must be installed in accordance with the following instructions:

1. The air or nitrogen supply provided to the Air Pressure Maintenance Device must be continuous, clean, dry, and oil free.



AMD-75 Standard features

Notes:

- Instrument Air supply is recommended, however suitable consideration must be given to the removal of excessive moisture from the compressed air supply.
- Before the valve is installed, flush the pipeline to remove any dirt, debris, etc. Not flushing the line may result in system malfunctioning.

2. Unions should be installed upstream and downstream of the Air Pressure Maintenance Device to allow easy removal for servicing.
3. Connect the air supply to the AMD's inlet port, also connect the AMD's outlet port to with a minimum of " (DN15) pipe size.
4. Provide wiring the any installed instrumentations as with according to the manufacturer instructions.

Placing in Service & Resetting Procedure

The Model AMD Automatic Air Maintenance Device must be set in accordance with the following instructions:

1. Determine the pressure that meets the minimum requirements of the system to be pressurized.
2. Close the AMD By-Pass Valve, Supply Isolating Valve.
3. If the AMD requires adjustment, the Pressure Regulator adjusting screw must be turned counter-clockwise completely (the screw must be loose) to reduce the system pressure to “0”.
4. Open the Air Supply Isolating Valve and the Air Tank isolating valve. Apply air pressure supply to the AMD and to the air tank, the inlet pressure gauge shall indicate high and stable pressure supply.
5. Open the By-Pass Valve slowly to pressurize the system while observing the outlet pressure gauge. Close the By-Pass Valve and Lock it with the Tamper-Proof arrangement, after the system pressure has been stabilized to the required system pressure, as determined in step 1.

Adjustment

While observing the outlet pressure gauge, adjust the outlet pressure of the pressure regulator. Slowly turn the adjusting screw clockwise to increase pressure or counter-clockwise to decrease pressure.
After the pressure regulator is set, lock the adjusting screw in that position with its fastening nut.
Any installed instrumentations shall be calibrated with according to manufacturer instructions.

1. The Air System Pressure should be set at the minimum required value, in order to minimize the system response time, the recommended setting is approx. 0.4 bar / 5.5 psi above the release device trip point.
2. If the system was over-pressurized during fill and adjustment, the system pressure must be released and reduced to the desired value.
3. The AMD will then automatically maintain the preset system pressure. The Check Valve prevents bleeding down of the system pressure.

Maintenance

The following inspection procedure shall be performed, in addition to any specific requirements of the NFPA 25 and also to any requirements of the authorities having jurisdiction. The Air Pressure Maintenance Device should be checked for correct pressure regulation after installation or repair by noting the air pressure reading within the system. If adjustment
is necessary, refer to the ‘Adjustment” paragraph above. Any malfunction must be immediately corrected. The installing contractor or product supplier should be contacted in relation to any questions. It is recommended that the AMD be inspected, tested, and maintained by a qualified Inspection Service.

Notes:

1. Prior to any maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.
2. After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.
3. It is also recommended that accumulated moisture be removed from air supply moisture filtration equipment, at least quarterly. More frequent inspections may be necessary in particularly humid environments

Inspection and Testing

The Model AMD must be inspected quarterly in accordance with the following instructions:

1. Verify that the By-Pass Valve is closed and Locked with Tamper-Proof arrangement
2. Verify that the Air Supply Isolating Valve is Open and verify that any control valve in the air supply trim to the system being pressurized is open.
3. Verify that the system pressure is essentially the same as the previously established requirement. If adjustment is necessary refer to the ‘Adjustment” paragraph above.
4. Release accumulated moisture from Air Tank by opening the drain valve slowly.

The Air Maintenance Device is now ready for service.

Swing Check Valve (SC)

This Swing Check Valve is intended for installation in Preaction systems using supervisory pressure as low as 1 psi.
The Swing Check Valve provides compact, lightweight design for easy and comfortable installation. Its hydraulic streamlined body design and spring loaded elastomer faced clapper, presents very low friction loss, non-slam closing characteristics and leak free sealing.

Features

- Grooved end connections (Flange adaptors available)
- Compact, lightweight design.
- Streamlined body design provides very low friction loss.
- Non-slamming, spring loaded clapper
- Elastomer faced clapper provides leak free sealing

Approvals

- UL Listed and FM Approved for horizontal and vertical installation.

Materials

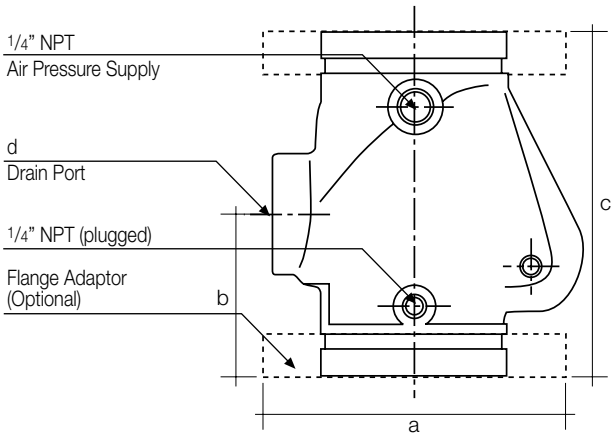
- Body: Coated Ductile Iron
- Internals: Stainless Steel and Bronze
- Seal: EPDM

Pressure rating

- Rated working pressure 250 psi.
- Factory hydrostatic test pressure 500 psi.

End connections

- Grooved ANSI/AWWA C606, 2-8”



Installation:

When the Swing Check Valves are installed vertically, the direction of the flow arrow must point upward.
In Preaction systems, the valves must be installed vertically and primed with water up to the main drain port.

Maintenance:

The Swing Check Valve and associated equipment should periodically be given a thorough inspection and test, see BERMAD Installation Operation and Maintenance (IOM) instructions for specific system; also refer to NFPA 25.
Check Valves should be inspected and operated at least annually. Parts should be replaced as required.

Valve Size	Dimensions			
	mm			inch
	a	b	c	d
2”; DN50	156	81	172	¾"
3”; DN80	200	100	193	1¼"
4”; DN100	224	101	216	2"
6”; DN150	280	130	305	2”
8”; DN200	340	254	365	2”

BERMAD Fire Protection

Hydraulic Control Valves

Control Solutions with the Power to Protect

BERMAD - The Company

Since its foundation in 1965, BERMAD has focused its efforts on innovation, quality and reliability, with the result that today, BERMAD is acknowledged as one of the world's foremost suppliers of control valves for water-based fire protection systems.

BERMAD control valves can be found throughout the world, vital components of fire protection systems in high risk areas such as petroleum and other flammable material installations, stations, and so on. Locations where BERMAD products are a regularly employed include the USA, Australia, South Africa, New Zealand, Thailand, Italy, Brazil, Mexico, UK, Far East, Middle East, Western Europe and North Sea offshore installations.

Widely diversified, BERMAD designs and manufactures automatic control valves as well as a range of other water management equipment for a variety of fire protection system applications, and for the petroleum industry. Its versatility and reliability, from sophisticated R&D and engineering, to dependable service and maintenance, have resulted in BERMAD valves being exclusively specified by engineers, consultants, and professional fire protection authorities in the field.

Quality assurance and control at BERMAD are ISO 9002 certified and are maintained by a highly trained and experienced staff, using the most advanced materials, production processes and sophisticated hydraulic testing facilities.

All BERMAD models, which are UL Listed, FM Approved, and VdS Certified, undergo periodic inspection by UL, FM, and VdS representatives.

BERMAD'S attention to detail and quality has resulted in innovative products.

Some of these products introduced new concepts and better solutions for a range of fire protection applications.

UL LISTED

FM APPROVED

BERMAD Worldwide

Fire Protection



VdS

Lloyd's Register TA TYPE APPROVED

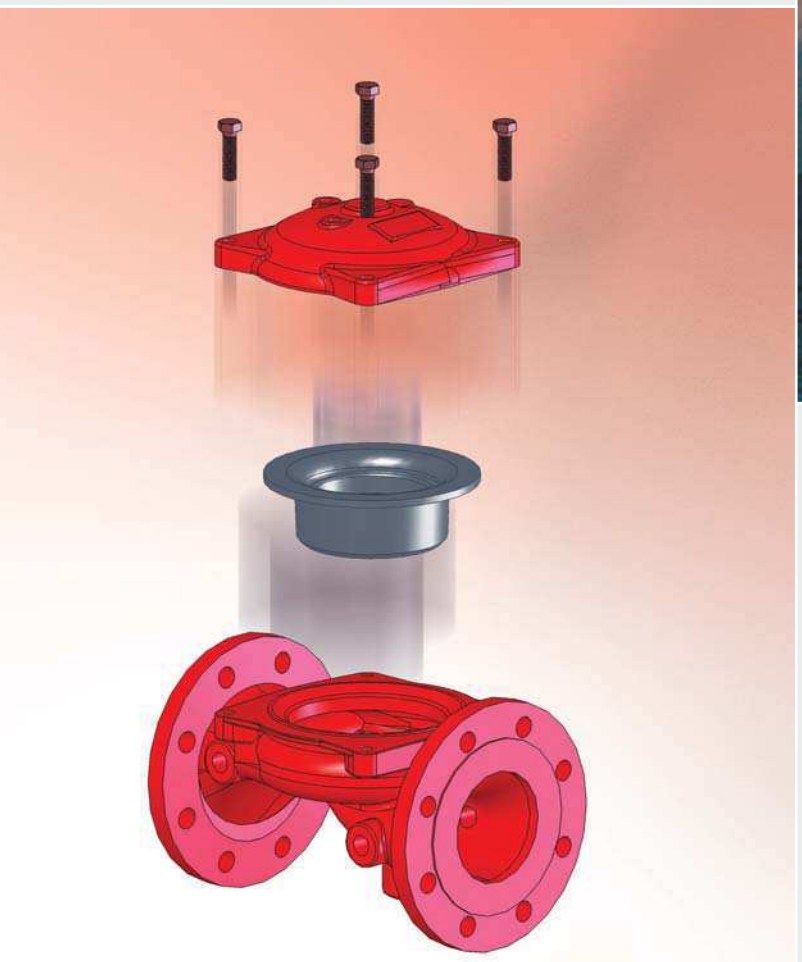
NFPA®

ABS TYPE APPROVAL PROGRAM

CERTIFIED QUALITY SYSTEM CQS ISO 9000/EN 29002

BERMAD - The Ultimate Fire Protection Valve

- Simple design
- One piece, solid elastomeric assembly
- Obstacle free, full bore
- In-line serviceable
- Large range of approved sizes & applications
- Vertical & horizontal installation
- Ability to control pressure during operation
- Flange, groove & threaded connections



Special Hazard Solutions

BERMAD produces fire protection systems for the oil and gas industries, petrochemical power plants, aviation, and marine and off-shore industries.

In high risk installations, heavy damage can be prevented by a fast and effective response of the fire protection system. BERMAD has the know-how, the experience and the proven ability to provide effective control solutions for hazardous environments.

Dedicated Pre-Sale Service

BERMAD provides free pre-sale service to determine what materials best suit the liquid in question, corrosiveness of the environment and the specific application.

Foam System Control Valve

Various foam systems have specific requirements, each demanding a different solution.
BERMAD's experienced engineering staff tailors each solution to the needs of your particualr system.

Sea Water Service

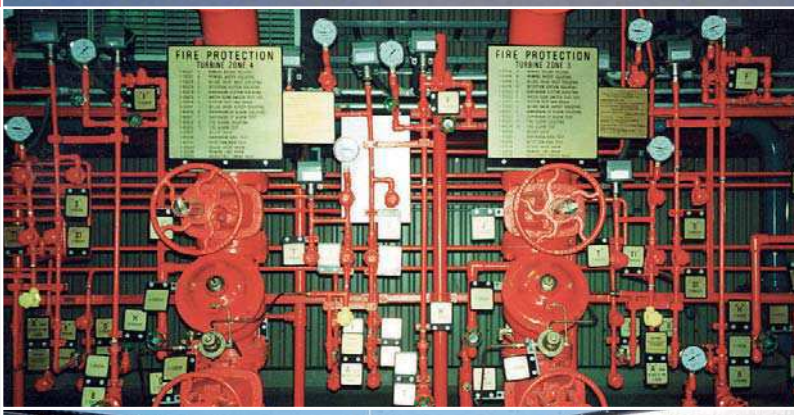
The use of sea water in fire fighting requires that special attention be paid to the control valve construction materials. BERMAD offers a complete line of Sea Water Service valves, designed to meet your particular system requirements.

BERMAD Deluge Valves

The BERMAD DELUGE applications

The BERMAD Deluge Valve is a high quality, dependable, and fast-opening valve for use in deluge, pre-action and in On/Off water spray or foam systems.
The BERMAD Deluge Valve is known for its ability to withstand pressure hammers and false tripping.

The BERMAD Deluge Valve can be reset locally or remotely, installed either horizontally, vertically, or in an angle formation, and does not require dismantling in order to be serviced.



BERMAD Deluge Valves are available in several Approved Models, either electrically, hydraulically, pneumatically or elctro-pneumatically actuated. This gives BERMAD the flexibility to meet various applications, providing each of them the required Deluge Valve with the appropriate operating system and accessories.

Classic Deluge - Includes a local EasyLock manual reset
Combination Pressure Deluge - Includes a pressure control feature when operating
On-Off Deluge - Includes a remote reset ability
Preaction Valve - Includes single and double electric pneumatic release system

BERMAD Remote Control Valves

BERMAD Remote Controlled Applications

BERMAD Self Operated Electric, Hydraulic, Pneumatic or Electro-Pneumatic Remote Control valves are designed for use in remotely controlled systems such as:

- Remote-control Monitors
- Remote control isolating applications
- Foam systems

BERMAD solenoid controlled valves require minimal electric power and reduce costs of electric installations.

Optional accessories include: manual override device, a visual indicator, an electrical limit switch, and a valve opening/closing speed adjustment device.

Available sizes: 1"-20".

Also available: Combination remote control shut-off valve with regulation feature.


SOLUCAO = AGUA +

BERMAD Manually Operated And Hydrant Valves

BERMAD Manually Operated Applications

The fast response of a fire protection system is critical to its effectiveness. Every minute required for full opening of a mechanical valve can be costly.

BERMAD'S Hydraulic Hydrant enables fast and easy operation by a single 90° twist of a 1/2" control ball valve handle.

The valve can be utilized for operating a water/foam monitor or shutting off water lines.

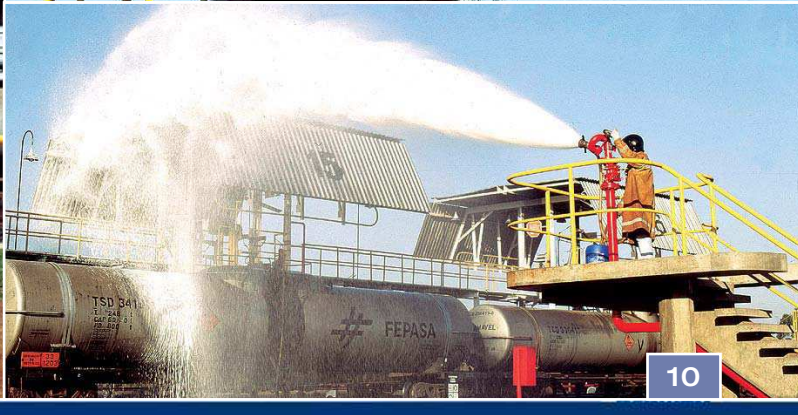
Dependability

The BERMAD Hydraulic Hydrant Valve does not jam, even after remaining closed over a long period of time. Never needing special servicing, the valve's reinforced elastomeric diaphragm ensures long life cycle.

Pressure Regulating Hydrant

The BERMAD Pressure Regulating Hydrant is designed to protect the fire hose system against excess pressure by limiting maximum outlet pressure to a preset point, not exceeding 100PSI (6.9 Bar), according to NFPA-14 standard recomendations.

The Hydrant Valve maintains a fully controlled opening speed and flow capacity.


FEPASA

BERMAD Fire Pump Control Applications

Fire Pump Pressure Relief Valve

The BERMAD high performance Pump Relief Valve is specifically designed and UL/FM approved for fire protection systems. The valve opens quickly to relieve excess pressure in the system and maintains a constant pressure in the fire pump discharge, regardless of flow rate throughout the system.

A unique hydrodynamic design gives BERMAD'S valve a higher relief capacity than any competing relief valve on the market.

The hydraulic pilot system maintains a fixed relief pressure with high accuracy and dependability, eliminating the typical leakage and jamming problems found in mechanical, spring-loaded relief valves.

Pump Suction Control Valve

BERMAD's UL Listed Pump Suction Control Valve was designed especially for pressure control of fire pump suction in municipal or other water supply applications.

The valve operates automatically and ensures that the suction pressure will not fall below a pre-set minimum.

Pressure Sustaining & Back Pressure Valve for In-Line Applications

BERMAD's Pressure Sustaining & Back Pressure Valve accurately maintains a constant pre-set upstream pressure, regardless of changing upstream potential or system demand.

Water Hammer and Surge Control

The Surge Effect is very common in advanced fire fighting systems requiring extremely rapid fire pump activation in order to provide high water pressure and flow.

BERMAD supplies proven solutions to protect pumps, instrumentation and pipelines from dangerous surges and pressure waves formed by flow changes. For this purpose, BERMAD's line of control valves contains a number of models which are especially adapted for use in fire fighting systems.

Pump Control Valve

When installed at the fire pump outlet, BERMAD's Pump Control Valve inhibits start-up pressure surges and eliminates unexpected shut-off surges.

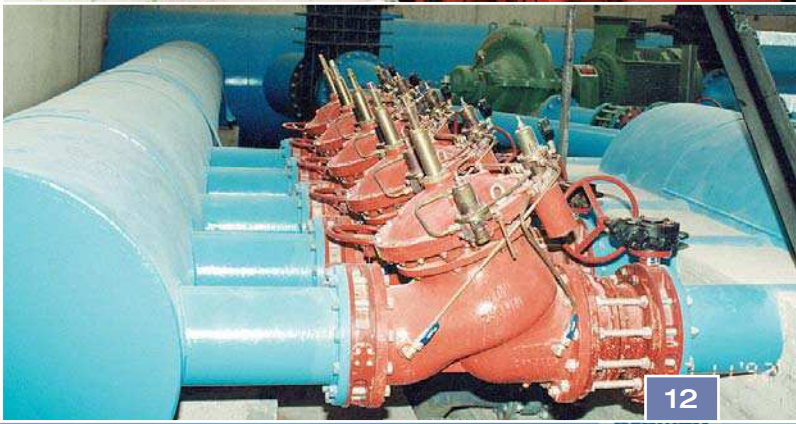
Non-Slam Check Valve

The BERMAD Non-Slam Check Valve inhibits start-up pressure surge in fire pumps by controlling the opening of the hydraulic check valve and provides non-slam operation during pump shut-off with drip-tight sealing.

Pump Relief with Surge Anticipating Feature

This valve combines a fire pump pressure release feature with a pre-opening feature to anticipate start-up surge. This combination is designed for use with large volume electric and diesel-powered fire pumps.

Other combinations of features are available.



BERMAD Pressure Reducing Valve

BERMAD's UL Listed Pressure Reducing Valve functions automatically to reduce high, unstable supply pressure and maintain a precise, stable, pre-set pressure regardless of changing upstream pressure or flow.

An optional unique V-port plug improves the valve's capacity to cope with flow ranges far below today's norm.

The valve's unique design endows it with quick reaction to system demads, and keeps pressure loss at a minimum.

Main applications:

- **Hose station feeds** where fire header pressure is over 100 PSI (6.9 bar), according to NFPA-14 standard recommendations.
- **Sprinkler systems** where supply pressure is above requirments.
- **Deluge systems:** The valve will eliminate excessive flow rates and surge damage.
- **Foam systems:** Bermad PRV will maintain the precise water foam pressure designed for the nozzles.
- **Fire hydrant water supply:** Prevents hose over-pressure hazards, allowing the operator to work safely in pressure ranges below 100 PSI (6.9 bar), as specified by NFPA standard recommendations.

BERMAD Level Control Valves for Water Reservoir

Float Valves

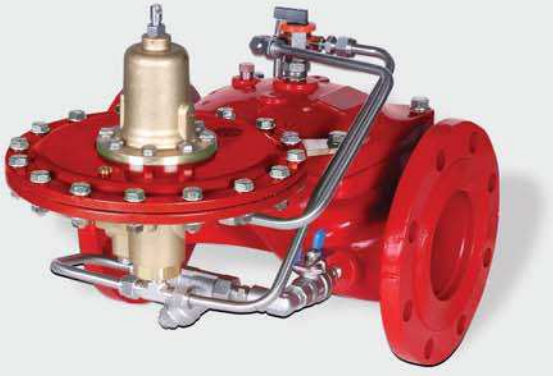
BERMAD Float Valves open to fill reservoirs, tanks, etc. When water rises to a predetermined level, float action will cause the pilot to close the main valve.

For cases in which a fully opened valve is required during low supply pressure, a special model has been designed with 4-way operation, enabling full opening and complete closure at two defined and adjustable levels.

Altitude Valves

BERMAD Altitude Valves control water level in reservoirs to prevent spills, without using external control devices such as floats, etc.

An Altitude Valve will remain fully open until a closing command is transmitted by an Altitude Pilot Valve.



BERMAD

Control solutions with the power to protect

Bermadfire@bermad.com • www.bermad.com

PCXPE05

BERMAD Fire Protection

Basic Valve Drawings

Dear User,
You may find 2D and 3D drawings of basic Bermad Fire Protection valves in the following directories which are located in the root directory of this CD.

2D-400-G Basic valves AutoCAD files

- 2in 400 G Flange.DWG
- 2in-400 G Grooved.DWG
- 2.5in 400 G Flange.DWG
- 3in 400 G Flange.DWG
- 3in 400 G Grooved.DWG
- 3in 400 G Grooved.DWG
- 4in-400 G Flange.DWG
- 4in-400 G Grooved.DWG
- 6in-400 G Flange.DWG
- 6in-400 G Groove.DWG
- 8in-400 G Flange.DWG
- 10in-400 G Flange.DWG
- 12in 400 G Flange.DWG
- 14in-400 G Flange.DWG

3D-400-G Basic valves Para-Solid (x_t) files

- 2in 400 G Flange.x_t
- 2in-400 G Grooved. x_t
- 2.5in 400 G Flange. x_t
- 3in 400 G Flange. x_t
- 3in 400 G Grooved. x_t
- 4in-400 G Flange. x_t
- 4in-400 G Grooved. x_t
- 6in-400 G Flange. x_t
- 6in-400 G Groove. x_t
- 8in-400 G Flange. x_t
- 10in-400 G Flange. x_t
- 12in 400 G Flange. x_t
- 14in-400 G Flange. x_t

Fire Protection

Fire Protection

BERMAD Fire Protection

Hydraulic Control Valves

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PBXPE08 11