

ELECTRO-PNEUMATIC, PRESSURE CONTROL ON-OFF DELUGE VALVE

Model FP-400Y-6DC

The BERMAD Model 400Y-6DC is an elastomeric, hydraulic line pressure operated deluge valve, designed specifically for advanced fire protection systems and the latest industry standards.

The 400Y 6DC is activated by a fall in pneumatic pressure to the relay valve on the control trim. A fall in pneumatic pressure can be from a dry pilot line, a remote pneumatic release, or from an electric signal to the 3- 3Way solenoid.

When open an integrated pressure control pilot valve regulates the main valve to maintain a precise, stable pre-set downstream pressure.

An optional valve position indicator can include a limit switch suitable for Fire & Gas monitoring systems.

The 400Y-6DC is ideal for open-nozzle systems with a high pressure water supply. It is available with electrical components to suit any hazardous location.



Features & Benefits

- Safety and reliability
 - Time proven, simple design with a fail safe actuation
 - Single piece rugged elastomer, VRSD technology
 - Obstacle-free, uninterrupted flow path
 - No mechanical moving parts
 - Shuts off on remote command
 - Ensures precise, stable downstream water pressure
 - Valve position limit switches (optional)
- High performance
 - Very high flow efficiency
 - Straight through Y type body
 - Approved for PN25 / 365 psi
- Specifically-designed for fire protection
 - Face-to-face length standardized to ISO 5752 EN 558-1
 - Meets the requirements of the industry standards
- Quick and easy maintenance
 - In-line serviceable
 - Fast and easy cover removal
 - Swivel mounted drain valves (for valves 3" and larger)

Typical Applications

- Remote Control Water Spray Systems
- Foam applications
- Corrosive water systems
- High Pressure Water Supply
- Dual redundant detection systems

Approvals



UL-Listed
Special System Water Control
Valves, Deluge Type (VLFT)
Sizes 1½" - 16"



Det Norske Veritas
Type Approval
Sizes 1½" to 16"



ABS
American Bureau of Shipping
Type Approval
Sizes 1½" - 12"

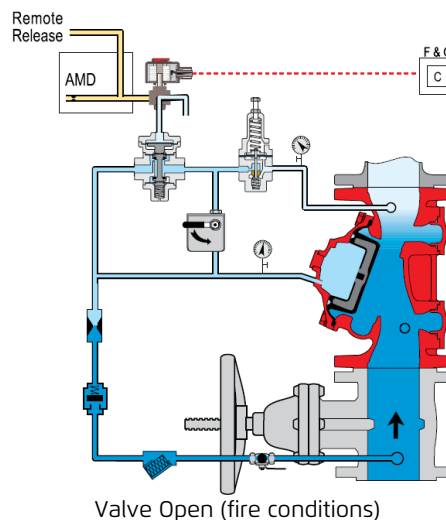
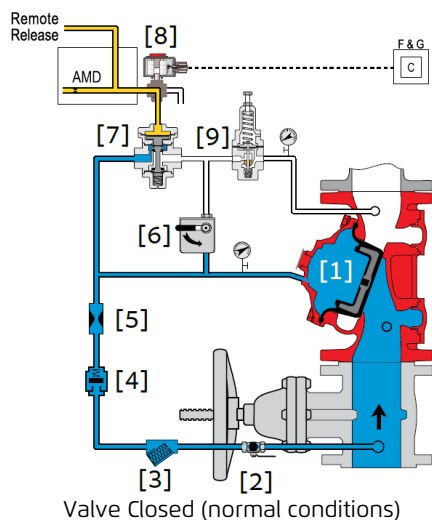


Lloyd's Register
Type Approval
Sizes 1½" - 10"

Additional Features

- Valve position limit switches
- Alarm pressure switch
- Air Maintenance Device
- Drain valve/s inlet/outlet
- Corrosion resistant zinc based high build epoxy coating

Operation

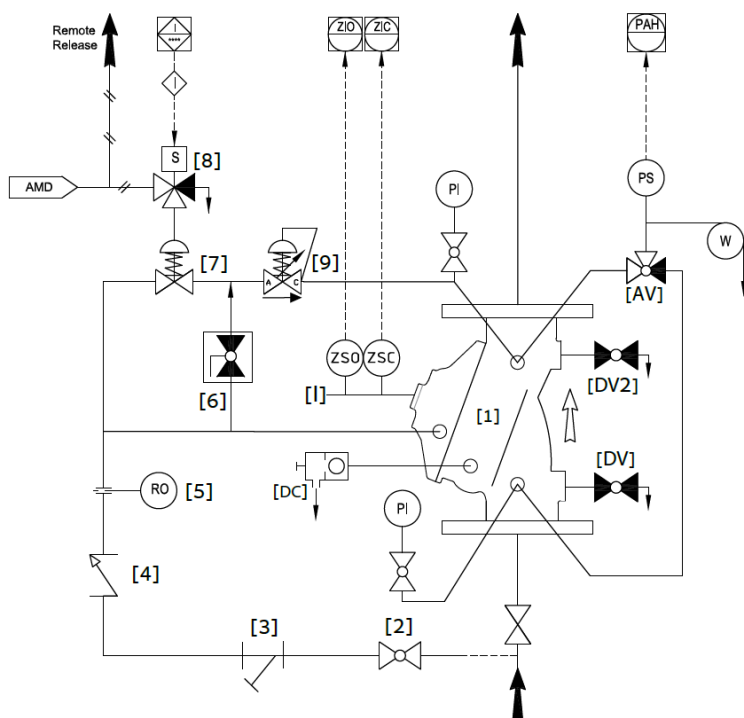


The BERMAD model 400Y-6DC is held closed by water pressure in the control chamber [1]. Upon release of pressure from the control chamber, the valve opens.

Under NORMAL conditions, water pressure is supplied to the control chamber via the priming line [2] and strainer [3], restriction orifice [5] and is then trapped in the control chamber by a check valve [4], manual emergency release [6], and a relay valve (URV) [7] that is held closed by pneumatic pressure supplied through Normally De-Energized, three-way solenoid valve [8]. The water pressure trapped in the main valve control chamber holds the diaphragm against the valve seat, sealing it drip-tight and keeping the system pipes dry.

Under FIRE conditions, water pressure is released from the control chamber, either with the manual emergency release, or by the URV opening. The URV opens in response either to a decrease in pneumatic pilot-line pressure [E] or to the solenoid valve being energized by the fire & gas control system [C]. This opens the 400Y-6DC deluge valve, allowing water to flow into the system piping and to the alarm device/s [10]. The pressure-control pilot valve [9] modulates the main valve to maintain the set outlet pressure.

System P&ID



Components	
1	BERMAD 400Y Deluge Valve
2	Priming Ball Valve
3	Priming Strainer
4	Check Valve
5	Restriction Orifice
6	Manual Emergency Release
7	URV, Pilot Valve
8	3-Way NC Solenoid Valve
9	Pressure Control Pilot Valve

Optional System Items	
PS	Pressure Switch
W	Water Motor Alarm
ZS	Limit Switch Assembly
AMD	Air Maintenance Device
I	Visual Valve Position indicator
DV	Drain Valve*
PI	Pressure Gauge*
AV	3-way Alarm Test Valve*
DC	Automatic Drip Check Valve*

* Included with suffix A in valve code (drain and indicating components)
See code designations and "factory supplied additional items" on page 4

System Installation

A typical installation of the BERMAD model 400Y-6DC features actuation by way of a fall in pneumatic pressure to the control chamber of the 2-Way Universal Relay Valve.

It can also be actuated electrically by a signal from a fire & gas control system or an on-site emergency pushbutton. A pressure control pilot valve integrated in the control trim ensures a precise and stable pre-set downstream water pressure. When open, and fitted with a limit switch the valve can send a feedback signal to a remote valve position monitoring system.

Optional System Items



Pressure Gauge



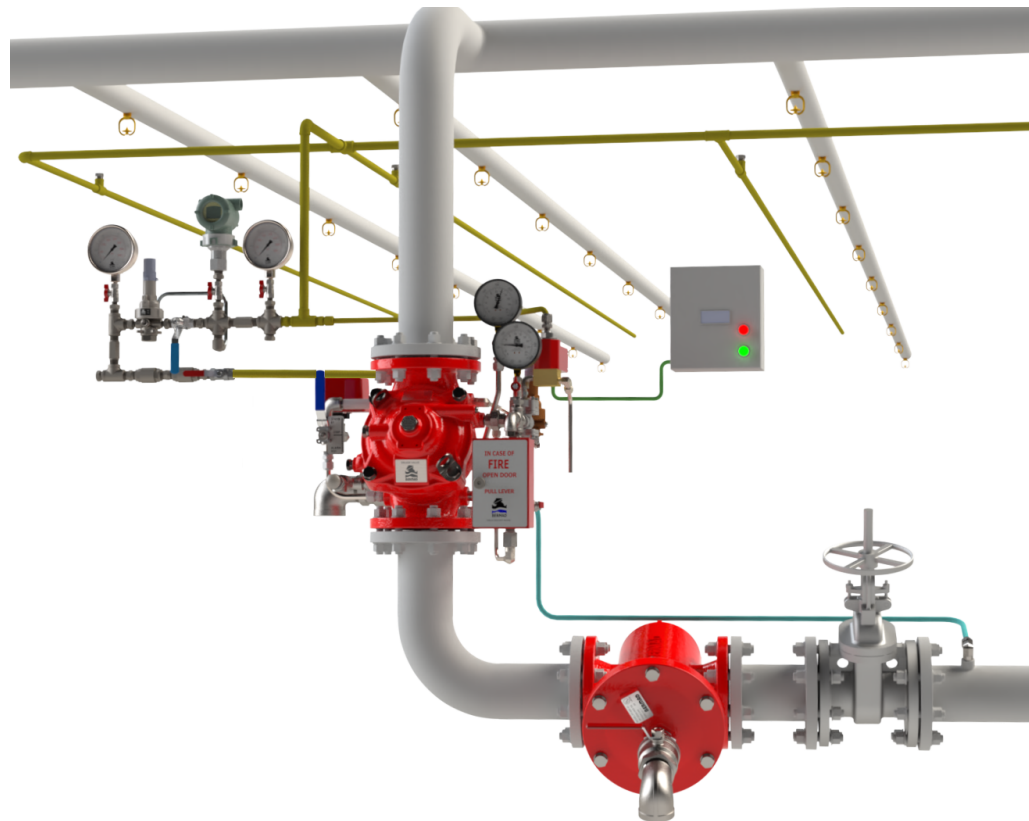
Exd Pressure
Switch - Stainless
Steel Enclosure for
Harsh
Environments



Proximity S.S.316
Limit Switch



Basket Strainer -
60F



Suggested Specifications

The deluge valve shall be UL-listed, 365-psi/25-bar rated, with a straight-through Ytypebody.

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

The deluge valve shall have no mechanical moving parts, and the actuation shall utilize a single-piece diaphragm assembly of VRSD technology.

The valve shall be coated internally and externally with UV protection. Optional: C5-VH grade of ISO-12944 standard against corrosive conditions.

The solenoid valve shall be a 3-way FM and UL429A-listed for 365 psi/25 bar with 65% of the rated voltage.

The control trim shall include a pressure control pilot valve, an auxiliary relay valve, a manual emergency release unit, a Y-type strainer, two 4-inch pressure gauges, an automatic drip-check with manual override, and a ball drain valve with a 360-degree swivel.

A valve position indicator shall be provided, and equipped with two proximity limit switches.

Removing the valve cover for full inspection and maintenance shall be in-line and not require removal of the control trim.

The deluge valve and control trim shall be pre-assembled and hydraulically tested by a UL/FM and ISO 9000, 9001 certified factory.

Technical Data

Available Sizes:

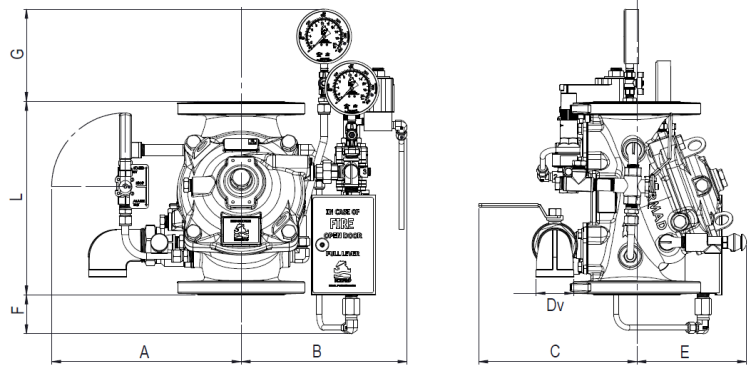
Flanged- 1½, 2, 3, 4, 6, 8, 10, 12, 14 & 16"
Grooved- 1½, 2, 3, 4, 6, 8 & 10"

Pressure Rating:

ANSI#150 - 17.2 bar | 250 psi
ANSI#300 - 1½" to 10" - 25 bar | 365 psi
ANSI#300 - 12" to 16" - 20 bar | 300 psi
Grooved - 17.2 / 25 bar | 250 / 365 psi
Setting range: 4 - 12 bar | 60 - 175 psi

Elastomer:

HTNR - Fabric Reinforced High Temperature Compound - See engineering data



Valve Size	L #150 mm in	L Grooved mm in	L #300 mm in	A mm in	B mm in	C mm in	øD in	E mm in	F mm in	G mm in	Weight #150 kg lb	Weight #300 kg lb
DN40 1½"	230 9.1	230 9.1	230 9.1	293 11.5	232 9.1	177 7	¾"	215 8.5	166 6.5	130 5.1	19 40	20 45
DN50 2"	230 9.1	230 9.1	238 9.4	293 11.5	232 9.1	177 7	¾"	215 8.5	166 6.5	130 5.1	19 42	20 44
DN65 2½"	235 9.3	235 9.3	241 9.5	293 11.6	232 7.2	177 7.2	1½"	215 8.5	164 6.5	123 4.8	24 53	26 57
DN80 3"	310 12.2	310 12.2	326 12.8	313 12.3	292 11.5	177 7	1½"	186 7.3	97 3.8	100 3.9	38 84	39 8.6
DN100 4"	350 13.8	350 13.8	368 14.5	343 13.5	300 9.8	287 11.3	2"	199 7.8	71 2.8	167 6.6	52 114	59 130
DN150 6"	480 18.9	480 18.9	506 19.9	358 14	354 13.9	302 11.9	2"	234 9.2	-	35 1.4	100 220	120 264
DN200 8"	600 23.6	600 23.6	626 24.7	392 15.4	431 17	317 12.5	2"	301 11.8	-	-	169 372	189 416
DN250 10"	730 28.7	730 28.7	730 28.7	406 16	431 17	317 12.5	2"	301 11.8	-	-	202 444	238 524
DN300 12"	850 33.5	-	888 35	478 18.8	496 19.5	380 15	2"	441 17.4	-	-	358 788	398 876
DN350 14"	980 38.6	-	980 38.6	478 18.8	496 19.5	379 14.9	2"	441 17.4	-	-	394 867	454 999
DN400 16"	1100 43.3	-	1100 43.3	478 18.8	496 19.5	405 16.1	2"	417 15.9	-	-	445 980	564 1241

IMPORTANT: Dimensions for the trim envelope or extents refer to a vertical orientation and may vary with specific component positioning - Apart from the "L" dimension, allow a tolerance of at least ±15%

Valve Code Designations

FP	6"	400Y-6D	03	V	C	A5	ER	4DC	NN	N6nW																																																																																																																																							
<table><tr><th>Category</th><th>Code</th></tr><tr><td>Standard</td><td>FP</td></tr><tr><td>Seawater</td><td>FS</td></tr><tr><td>Foam</td><td>FC</td></tr></table>	Category	Code	Standard	FP	Seawater	FS	Foam	FC	<table><tr><th>Valve Size</th><th></th></tr><tr><td>1½"</td><td>40 mm</td></tr><tr><td>2"</td><td>50 mm</td></tr><tr><td>2½"</td><td>60 mm⁽⁶⁾</td></tr><tr><td>3"</td><td>80 mm</td></tr><tr><td>4"</td><td>100 mm</td></tr><tr><td>6"</td><td>150 mm</td></tr><tr><td>8"</td><td>200 mm</td></tr><tr><td>10"</td><td>250 mm</td></tr><tr><td>12"</td><td>300 mm</td></tr><tr><td>14"</td><td>350 mm</td></tr><tr><td>16"</td><td>400 mm</td></tr></table>	Valve Size		1½"	40 mm	2"	50 mm	2½"	60 mm ⁽⁶⁾	3"	80 mm	4"	100 mm	6"	150 mm	8"	200 mm	10"	250 mm	12"	300 mm	14"	350 mm	16"	400 mm	<table><tr><th>Installation</th><th>Code</th></tr><tr><td>Vertical</td><td>V</td></tr><tr><td>Horizontal</td><td>H</td></tr></table>	Installation	Code	Vertical	V	Horizontal	H	<table><tr><th>Material Body & Cover⁽¹⁾</th><th>Code</th></tr><tr><td>Ductile Iron A356⁽²⁾</td><td>C</td></tr><tr><td>Steel ASTM A216 WCB⁽²⁾</td><td>S</td></tr><tr><td>Stainless Steel 316</td><td>N</td></tr><tr><td>Nickel Al Bronze C95800</td><td>U</td></tr><tr><td>Super Duplex Grade 5A</td><td>D</td></tr></table>	Material Body & Cover ⁽¹⁾	Code	Ductile Iron A356 ⁽²⁾	C	Steel ASTM A216 WCB ⁽²⁾	S	Stainless Steel 316	N	Nickel Al Bronze C95800	U	Super Duplex Grade 5A	D	<table><tr><th>Coating</th><th>Code</th></tr><tr><td>High Build Epoxy</td><td>ER</td></tr><tr><td>Zinc Based High Build Epoxy⁽⁵⁾</td><td>ZR</td></tr><tr><td>Uncoated</td><td>UC</td></tr></table>	Coating	Code	High Build Epoxy	ER	Zinc Based High Build Epoxy ⁽⁵⁾	ZR	Uncoated	UC	<table><tr><th>Voltage - Main Valve N.O or N.C *</th><th>Code</th></tr><tr><td>24VDC - N.C.</td><td>4DC</td></tr><tr><td>24VDC - N.O.</td><td>4DO</td></tr><tr><td>24VDC - Latch</td><td>4DS</td></tr><tr><td>110VDC - N.C.</td><td>5DC</td></tr><tr><td>110VDC - N.O.</td><td>5DO</td></tr><tr><td>110 - 120/AC - N.C.</td><td>5AC</td></tr><tr><td>110 - 120/AC - N.C.</td><td>5AO</td></tr><tr><td>220 - 240/AC - N.C.</td><td>2AC</td></tr><tr><td>221 - 240/AC - N.C.</td><td>2AO</td></tr></table>	Voltage - Main Valve N.O or N.C *	Code	24VDC - N.C.	4DC	24VDC - N.O.	4DO	24VDC - Latch	4DS	110VDC - N.C.	5DC	110VDC - N.O.	5DO	110 - 120/AC - N.C.	5AC	110 - 120/AC - N.C.	5AO	220 - 240/AC - N.C.	2AC	221 - 240/AC - N.C.	2AO	<table><tr><th>Factory Supplied Additional Items</th><th>Code</th></tr><tr><td>General Purpose NEMA-4 Pressure Switch⁽³⁾</td><td>P</td></tr><tr><td>Ex Proof NEC, Div.1 Pressure Switch⁽³⁾</td><td>P7</td></tr><tr><td>Ex d ATEX Pressure Switch⁽³⁾</td><td>P9</td></tr><tr><td>Ex d Pressure Switch, SS316 Enclosure⁽³⁾</td><td>P9Jn</td></tr><tr><td>Ex d Pressure Switch, SS316 Enclosure, Monel Sensor⁽³⁾</td><td>P9mJn</td></tr><tr><td>Single Limit Switch, General Purpose</td><td>S</td></tr><tr><td>Single Ex d Proximity limit Switch</td><td>S9</td></tr><tr><td>Double Ex d Proximity Limit Switch</td><td>SS9</td></tr><tr><td>Double Ex d Proximity Limit Switch with SS316 Junction Box</td><td>SS9Jn</td></tr><tr><td>Pressure Gauge Assembly⁽³⁾</td><td>6</td></tr><tr><td>S.S Glycerin Pressure Gauge Assembly⁽³⁾</td><td>6n</td></tr><tr><td>Monel Pressure Gauge Assembly⁽³⁾</td><td>6m</td></tr><tr><td>Ex Proof NEC Class 1 Div 1 Solenoid</td><td>7</td></tr><tr><td>Ex. d ATEX Solenoid</td><td>9</td></tr><tr><td>Magna Latch – 2 wires</td><td>H2</td></tr><tr><td>Magna Latch – 3 wires</td><td>H3</td></tr><tr><td>Stainless steel 316 Solenoid Valve</td><td>K</td></tr><tr><td>Drain Valve</td><td>DV</td></tr><tr><td>Water Motor Alarm Assembly⁽³⁾</td><td>W</td></tr><tr><td>Large Control Filter</td><td>F</td></tr><tr><td>Valve Position Indicator</td><td>I</td></tr><tr><td>S.S 316 Trim Accessories</td><td>N</td></tr><tr><td>S.S Solenoid Valve</td><td>K</td></tr><tr><td>Pressure Transmitter⁽³⁾</td><td>Q</td></tr><tr><td>Drain and Indicating Components</td><td>A</td></tr></table>	Factory Supplied Additional Items	Code	General Purpose NEMA-4 Pressure Switch ⁽³⁾	P	Ex Proof NEC, Div.1 Pressure Switch ⁽³⁾	P7	Ex d ATEX Pressure Switch ⁽³⁾	P9	Ex d Pressure Switch, SS316 Enclosure ⁽³⁾	P9Jn	Ex d Pressure Switch, SS316 Enclosure, Monel Sensor ⁽³⁾	P9mJn	Single Limit Switch, General Purpose	S	Single Ex d Proximity limit Switch	S9	Double Ex d Proximity Limit Switch	SS9	Double Ex d Proximity Limit Switch with SS316 Junction Box	SS9Jn	Pressure Gauge Assembly ⁽³⁾	6	S.S Glycerin Pressure Gauge Assembly ⁽³⁾	6n	Monel Pressure Gauge Assembly ⁽³⁾	6m	Ex Proof NEC Class 1 Div 1 Solenoid	7	Ex. d ATEX Solenoid	9	Magna Latch – 2 wires	H2	Magna Latch – 3 wires	H3	Stainless steel 316 Solenoid Valve	K	Drain Valve	DV	Water Motor Alarm Assembly ⁽³⁾	W	Large Control Filter	F	Valve Position Indicator	I	S.S 316 Trim Accessories	N	S.S Solenoid Valve	K	Pressure Transmitter ⁽³⁾	Q	Drain and Indicating Components	A	<table><tr><th>Tubing & Fittings</th><th>Code</th></tr><tr><td>Stainless Steel 316</td><td>NN</td></tr><tr><td>Monel 400</td><td>MM</td></tr><tr><td>Super Duplex</td><td>DD</td></tr></table>	Tubing & Fittings	Code	Stainless Steel 316	NN	Monel 400	MM	Super Duplex	DD
Category	Code																																																																																																																																																
Standard	FP																																																																																																																																																
Seawater	FS																																																																																																																																																
Foam	FC																																																																																																																																																
Valve Size																																																																																																																																																	
1½"	40 mm																																																																																																																																																
2"	50 mm																																																																																																																																																
2½"	60 mm ⁽⁶⁾																																																																																																																																																
3"	80 mm																																																																																																																																																
4"	100 mm																																																																																																																																																
6"	150 mm																																																																																																																																																
8"	200 mm																																																																																																																																																
10"	250 mm																																																																																																																																																
12"	300 mm																																																																																																																																																
14"	350 mm																																																																																																																																																
16"	400 mm																																																																																																																																																
Installation	Code																																																																																																																																																
Vertical	V																																																																																																																																																
Horizontal	H																																																																																																																																																
Material Body & Cover ⁽¹⁾	Code																																																																																																																																																
Ductile Iron A356 ⁽²⁾	C																																																																																																																																																
Steel ASTM A216 WCB ⁽²⁾	S																																																																																																																																																
Stainless Steel 316	N																																																																																																																																																
Nickel Al Bronze C95800	U																																																																																																																																																
Super Duplex Grade 5A	D																																																																																																																																																
Coating	Code																																																																																																																																																
High Build Epoxy	ER																																																																																																																																																
Zinc Based High Build Epoxy ⁽⁵⁾	ZR																																																																																																																																																
Uncoated	UC																																																																																																																																																
Voltage - Main Valve N.O or N.C *	Code																																																																																																																																																
24VDC - N.C.	4DC																																																																																																																																																
24VDC - N.O.	4DO																																																																																																																																																
24VDC - Latch	4DS																																																																																																																																																
110VDC - N.C.	5DC																																																																																																																																																
110VDC - N.O.	5DO																																																																																																																																																
110 - 120/AC - N.C.	5AC																																																																																																																																																
110 - 120/AC - N.C.	5AO																																																																																																																																																
220 - 240/AC - N.C.	2AC																																																																																																																																																
221 - 240/AC - N.C.	2AO																																																																																																																																																
Factory Supplied Additional Items	Code																																																																																																																																																
General Purpose NEMA-4 Pressure Switch ⁽³⁾	P																																																																																																																																																
Ex Proof NEC, Div.1 Pressure Switch ⁽³⁾	P7																																																																																																																																																
Ex d ATEX Pressure Switch ⁽³⁾	P9																																																																																																																																																
Ex d Pressure Switch, SS316 Enclosure ⁽³⁾	P9Jn																																																																																																																																																
Ex d Pressure Switch, SS316 Enclosure, Monel Sensor ⁽³⁾	P9mJn																																																																																																																																																
Single Limit Switch, General Purpose	S																																																																																																																																																
Single Ex d Proximity limit Switch	S9																																																																																																																																																
Double Ex d Proximity Limit Switch	SS9																																																																																																																																																
Double Ex d Proximity Limit Switch with SS316 Junction Box	SS9Jn																																																																																																																																																
Pressure Gauge Assembly ⁽³⁾	6																																																																																																																																																
S.S Glycerin Pressure Gauge Assembly ⁽³⁾	6n																																																																																																																																																
Monel Pressure Gauge Assembly ⁽³⁾	6m																																																																																																																																																
Ex Proof NEC Class 1 Div 1 Solenoid	7																																																																																																																																																
Ex. d ATEX Solenoid	9																																																																																																																																																
Magna Latch – 2 wires	H2																																																																																																																																																
Magna Latch – 3 wires	H3																																																																																																																																																
Stainless steel 316 Solenoid Valve	K																																																																																																																																																
Drain Valve	DV																																																																																																																																																
Water Motor Alarm Assembly ⁽³⁾	W																																																																																																																																																
Large Control Filter	F																																																																																																																																																
Valve Position Indicator	I																																																																																																																																																
S.S 316 Trim Accessories	N																																																																																																																																																
S.S Solenoid Valve	K																																																																																																																																																
Pressure Transmitter ⁽³⁾	Q																																																																																																																																																
Drain and Indicating Components	A																																																																																																																																																
Tubing & Fittings	Code																																																																																																																																																
Stainless Steel 316	NN																																																																																																																																																
Monel 400	MM																																																																																																																																																
Super Duplex	DD																																																																																																																																																
		<table><tr><th>End Connections</th><th>Code</th></tr><tr><td>ANSI#150RF</td><td>A5</td></tr><tr><td>ANSI#150FF</td><td>a5</td></tr><tr><td>ANSI#300RF</td><td>A3</td></tr><tr><td>ANSI#300FF</td><td>a3</td></tr><tr><td>ISO PN16</td><td>16</td></tr><tr><td>ISO PN25</td><td>25</td></tr><tr><td>Grooved Class 250psi/17.2bar⁽⁵⁾</td><td>V1</td></tr><tr><td>Grooved Class 365psi/25bar⁽⁵⁾</td><td>V2</td></tr></table>	End Connections	Code	ANSI#150RF	A5	ANSI#150FF	a5	ANSI#300RF	A3	ANSI#300FF	a3	ISO PN16	16	ISO PN25	25	Grooved Class 250psi/17.2bar ⁽⁵⁾	V1	Grooved Class 365psi/25bar ⁽⁵⁾	V2																																																																																																																													
End Connections	Code																																																																																																																																																
ANSI#150RF	A5																																																																																																																																																
ANSI#150FF	a5																																																																																																																																																
ANSI#300RF	A3																																																																																																																																																
ANSI#300FF	a3																																																																																																																																																
ISO PN16	16																																																																																																																																																
ISO PN25	25																																																																																																																																																
Grooved Class 250psi/17.2bar ⁽⁵⁾	V1																																																																																																																																																
Grooved Class 365psi/25bar ⁽⁵⁾	V2																																																																																																																																																
		<table><tr><th>Additional Feature</th><th>Code</th></tr><tr><td>Closing Speed Control</td><td>01</td></tr><tr><td>Opening Speed Control</td><td>02</td></tr><tr><td>Opening & Closing Speed Control</td><td>03</td></tr><tr><td>None</td><td>-</td></tr></table>	Additional Feature	Code	Closing Speed Control	01	Opening Speed Control	02	Opening & Closing Speed Control	03	None	-																																																																																																																																					
Additional Feature	Code																																																																																																																																																
Closing Speed Control	01																																																																																																																																																
Opening Speed Control	02																																																																																																																																																
Opening & Closing Speed Control	03																																																																																																																																																
None	-																																																																																																																																																

Notes:

(1) Other materials available see engineering data

(2) Coated internally and externally

(3) Supplied loose

(4) Consult BERMAD for availability

(5) For valves up to and including 10"

(6) Available in Ductile Iron only

Notes:

- (1) Other materials available see engineering data
- (2) Coated internally and externally
- (3) Supplied loose
- (4) Consult BERMAD for availability
- (5) For valves up to and including 10"
- (6) Available in Ductile Iron only

* NO or NC refers to the main valve status when the Solenoid is de-energized

*More options available – consult BERMAD