

HYDRAULICALLY CONTROLLED ANTI-COLUMNING DELUGE VALVE WITH LOCAL RESET

Model FP-400E-5M

The BERMAD model 400E-5M is an elastomeric, hydraulic, line pressure operated deluge valve, designed specifically for advanced fire protection systems and the latest industry standards. The 400E-5M is activated by a pressure operated relay valve, which latches the main valve open until locally reset. The 400E-5M is ideal for systems with remote or elevated wet pilot lines, due to its boosted local pressure release. The optional valve position indicator can include a limit switch suitable for Fire & Gas monitoring systems.



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
 - Latches open: remains open until reset locally
 - Valve position limit switches (optional)
 - Meets the requirements of the industry standards
- Quick and easy maintenance
 - Designed for high reliability and easy maintenance
 - In-line serviceable
 - Fast and easy cover removal

Typical Applications

- Highly elevated wet pilot lines
- Automatic water spray systems
- Hydraulic remote controlled systems
- Foam applications

Approvals



UL-Listed
Special System Water Control
Valves, Deluge Type (VLFT)
Sizes 1½" - 10"



Det Norske Veritas
Type Approval
Sizes 1½" to 12"



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

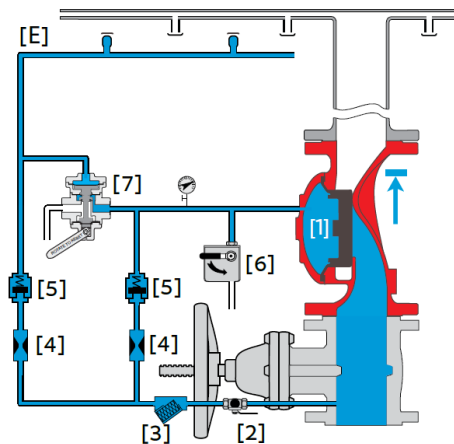


Lloyd's Register
Type Approval
Sizes 1½" - 10"

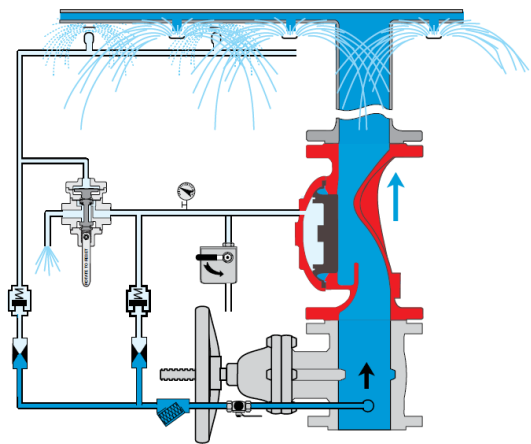
Additional Features

- Valve position limit switches
- Alarm pressure switch
- Water motor alarm
- Seawater compatibility
- Corrosion resistant zinc based high build epoxy coating

Operation



Valve Closed (normal conditions)



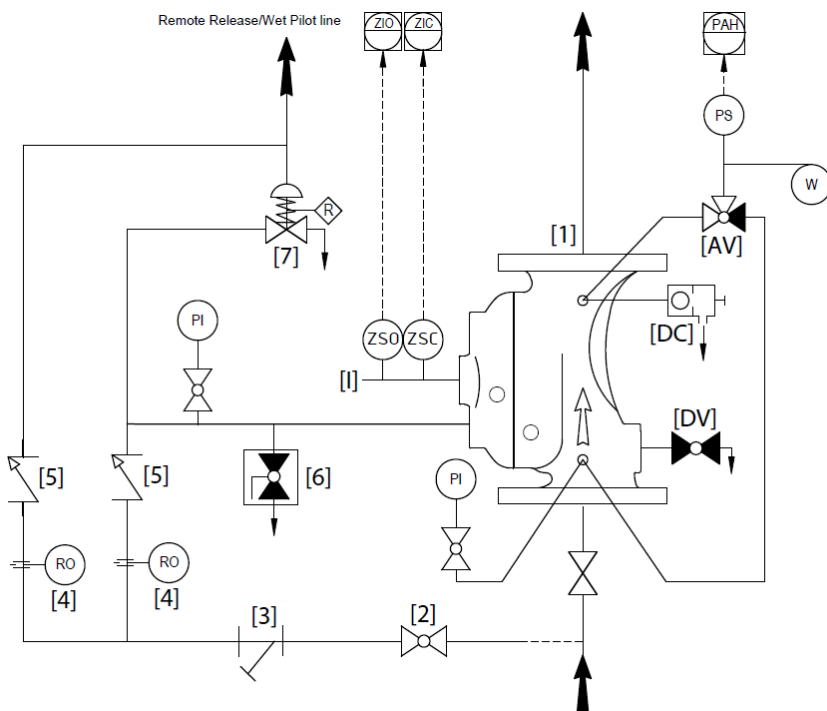
Valve Open (fire conditions)

The BERMAD model 400E-5M 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], and a restriction orifice [5] and then trapped in the control chamber by a check valve [4], a manual emergency release [6], and a relay valve (URV-M) [7] that is held closed by hydraulic pilot line pressure [E]. The water pressure trapped in the 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-M opening automatically in response to a decrease in hydraulic pilot-line pressure. This latches the 400E-5M deluge valve open, allowing water to flow into the system piping and to the alarm device [9]. The URV-M is factory set to operate where the highest release device is installed at a height of less than 35 mtr/115 ft above the valve. Additional spring tension can be set to suit greater elevations, up to a maximum of 70 meters above the valve (refer to the Valve Code Designation on the last page).

System P&ID



Components	
1	BERMAD 400E Deluge Valve
2	Priming Ball Valve
3	Priming Strainer
4	Check Valve
5	Restriction Orifice
6	Manual Emergency Release
7	URV-2-M Relay Valve

Optional System Items	
PS	Pressure Switch
W	Water Motor Alarm
ZS	Limit Switch Assembly
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 400E-5M features automatic actuation via a pressure operated relay valve, triggered by a wet pilot line with closed fusible plugs elevated above the deluge valve. When open and fitted with a limit switch, the valve sends a feedback signal to the remote valve position monitoring system.

Optional System Items



Single Ex d
Proximity S.S.316
Limit Switch



Water Motor Alarm



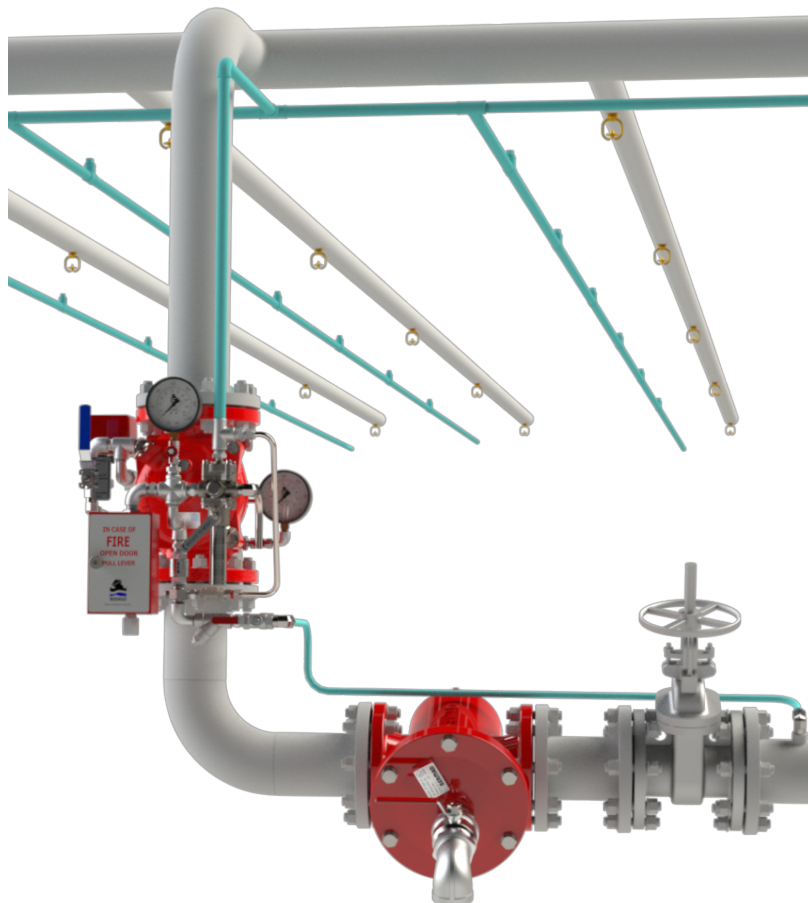
Pressure Gauge



Exd Pressure
Switch - Stainless
Steel Enclosure for
Harsh



Environments
Basket Strainer -
60F



Suggested Specifications

The deluge valve shall be UL-listed, 250 psi/17.2 bar rated.

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 control trim shall include an auxiliary latching relay valve, a manual emergency release unit, a Y-type strainer, two 4-inch pressure gauges, and an automatic drip-check with manual override.

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 valve from the pipeline.

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, 2½, 3, 4, 6, 8, 10 & 12"

Grooved- 2, 3, 4, 6 & 8"

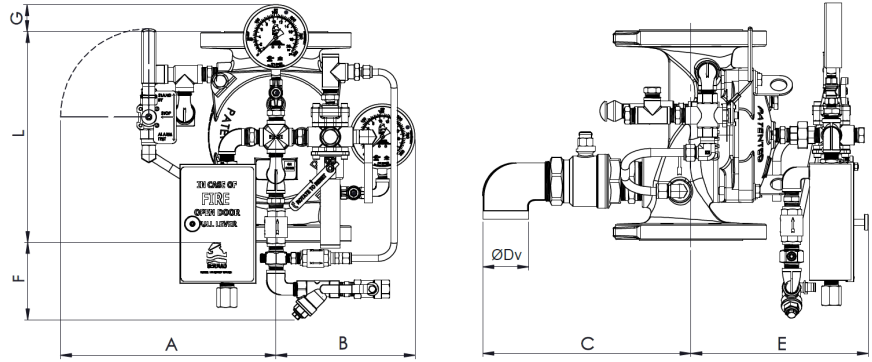
Pressure Rating:

ANSI#150 - 17.2 bar | 250 psi

Grooved - 17.2 bar | 250 psi

Elastomer:

HTNR with VRSD- Fabric Reinforced High Temperature Compound - See engineering data



Valve Size	L #150 mm in	L Grooved 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
DN40 1½"	205 8.1	-	313 12.3	221 8.7	199 7.8	¾"	245 9.6	115 4.5	50 2	17 37
DN50 2"	205 8.1	205 8.1	313 12.3	221 8.7	199 7.8	1½"	245 9.6	115 4.5	50 2	18 40
DN65 2½"	205 8.1	-	325 12.8	221 8.7	253 10	1½"	247 9.7	115 4.5	50 2	21 46
DN80 3"	257 10.1	250 9.8	345 13.6	221 8.7	266 10.5	1½"	280 11	89 3.5	49 2	29 64
DN100 4"	320 12.6	320 12.6	328 12.9	221 8.7	316 12.4	2"	300 11.8	57 2.2	18 0.7	43 95
DN150 6"	415 16.3	415 16.3	349 13.7	190 7.4	347 13.7	2"	377 14.8	10 0.4	-	87 191
DN200 8"	500 19.7	-	383 15.1	220 8.7	364 14.3	2"	427 16.8	-	-	149 328
DN250 10"	605 23.8	-	396 15.6	230 9	384 15.1	2"	425 16.7	-	-	166 365
DN300 12"	725 28.5	-	438 17.2	283 11.1	422 16.6	2"	522 20.6	-	-	254 20.6

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"	400E-5M	M6	03	V	C	A5	PR	NN	N6W																																																																																																																																			
<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 Concentrate</td><td>FC</td></tr></table>	Category	Code	Standard	FP	Seawater	FS	Foam Concentrate	FC	<table><tr><th>Valve Size</th><td></td></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</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></table>	Valve Size		1½"	40 mm	2"	50 mm	2½"	60 mm	3"	80 mm	4"	100 mm	6"	150 mm	8"	200 mm	10"	250 mm	12"	300 mm	<table><tr><th>Additional Feature</th><th>Code</th></tr><tr><td>Closing speed</td><td>01</td></tr><tr><td>Opening speed</td><td>02</td></tr><tr><td>Opening & Closing speed</td><td>03</td></tr><tr><td>None</td><td>-</td></tr></table>	Additional Feature	Code	Closing speed	01	Opening speed	02	Opening & Closing speed	03	None	-	<table><tr><th>Pilot Line Trip Point Setting</th><th>Code</th></tr><tr><td>Max elevation 35m/115ft ⁽⁵⁾</td><td>M6</td></tr><tr><td>Max elevation 70m/230ft ⁽⁶⁾</td><td>M7</td></tr></table>	Pilot Line Trip Point Setting	Code	Max elevation 35m/115ft ⁽⁵⁾	M6	Max elevation 70m/230ft ⁽⁶⁾	M7	<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>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>ISO PN16</td><td>16</td></tr><tr><td>Grooved ANSI C606</td><td>VI</td></tr></table>	End Connections	Code	ANSI#150RF	A5	ANSI#150FF	a5	ISO PN16	16	Grooved ANSI C606	VI	<table><tr><th>Coating ⁽²⁾</th><th>Code</th></tr><tr><td>High Build Epoxy</td><td>ER</td></tr><tr><td>Zinc Based High Build Epoxy</td><td>ZR</td></tr><tr><td>Uncoated</td><td>UC</td></tr></table>	Coating ⁽²⁾	Code	High Build Epoxy	ER	Zinc Based High Build Epoxy	ZR	Uncoated	UC	<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	<table><tr><th>Material Body & Cover ⁽¹⁾</th><th>Code</th></tr><tr><td>Ductile Iron A536 ⁽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 A536 ⁽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>Factory Fitted Options</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>Drain Valve</td><td>DV</td></tr><tr><td>Manual Emergency Release Box</td><td>D</td></tr><tr><td>Water Motor Alarm Assembly ⁽³⁾</td><td>W</td></tr><tr><td>Special Elastomer</td><td>E ⁽⁴⁾</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>Pressure Transmitter ⁽³⁾</td><td>Q</td></tr><tr><td>Drain and Indicating Components</td><td>A</td></tr></table>	Factory Fitted Options	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	Drain Valve	DV	Manual Emergency Release Box	D	Water Motor Alarm Assembly ⁽³⁾	W	Special Elastomer	E ⁽⁴⁾	Large Control Filter	F	Valve Position Indicator	I	S.S 316 Trim Accessories	N	Pressure Transmitter ⁽³⁾	Q	Drain and Indicating Components	A
Category	Code																																																																																																																																												
Standard	FP																																																																																																																																												
Seawater	FS																																																																																																																																												
Foam Concentrate	FC																																																																																																																																												
Valve Size																																																																																																																																													
1½"	40 mm																																																																																																																																												
2"	50 mm																																																																																																																																												
2½"	60 mm																																																																																																																																												
3"	80 mm																																																																																																																																												
4"	100 mm																																																																																																																																												
6"	150 mm																																																																																																																																												
8"	200 mm																																																																																																																																												
10"	250 mm																																																																																																																																												
12"	300 mm																																																																																																																																												
Additional Feature	Code																																																																																																																																												
Closing speed	01																																																																																																																																												
Opening speed	02																																																																																																																																												
Opening & Closing speed	03																																																																																																																																												
None	-																																																																																																																																												
Pilot Line Trip Point Setting	Code																																																																																																																																												
Max elevation 35m/115ft ⁽⁵⁾	M6																																																																																																																																												
Max elevation 70m/230ft ⁽⁶⁾	M7																																																																																																																																												
Installation	Code																																																																																																																																												
Vertical	V																																																																																																																																												
Horizontal	H																																																																																																																																												
End Connections	Code																																																																																																																																												
ANSI#150RF	A5																																																																																																																																												
ANSI#150FF	a5																																																																																																																																												
ISO PN16	16																																																																																																																																												
Grooved ANSI C606	VI																																																																																																																																												
Coating ⁽²⁾	Code																																																																																																																																												
High Build Epoxy	ER																																																																																																																																												
Zinc Based High Build Epoxy	ZR																																																																																																																																												
Uncoated	UC																																																																																																																																												
Tubing & Fittings	Code																																																																																																																																												
Stainless Steel 316	NN																																																																																																																																												
Monel 400	MM																																																																																																																																												
Super Duplex	DD																																																																																																																																												
Material Body & Cover ⁽¹⁾	Code																																																																																																																																												
Ductile Iron A536 ⁽²⁾	C																																																																																																																																												
Steel ASTM A216 WCB ⁽²⁾	S																																																																																																																																												
Stainless Steel 316	N																																																																																																																																												
Nickel Al Bronze C95800	U																																																																																																																																												
Super Duplex Grade 5A	D																																																																																																																																												
Factory Fitted Options	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																																																																																																																																												
Drain Valve	DV																																																																																																																																												
Manual Emergency Release Box	D																																																																																																																																												
Water Motor Alarm Assembly ⁽³⁾	W																																																																																																																																												
Special Elastomer	E ⁽⁴⁾																																																																																																																																												
Large Control Filter	F																																																																																																																																												
Valve Position Indicator	I																																																																																																																																												
S.S 316 Trim Accessories	N																																																																																																																																												
Pressure Transmitter ⁽³⁾	Q																																																																																																																																												
Drain and Indicating Components	A																																																																																																																																												

Notes:

⁽¹⁾ Other materials available, see engineering data

⁽²⁾ Coated internally and externally

⁽³⁾ Supplied loose

⁽⁴⁾ Consult BERMAD for availability

⁽⁵⁾ Minimum supply pressure to the Deluge Valve shall be at least 5.0 barg

⁽⁶⁾ Minimum working pressure to the Deluge Valve shall

Notes:

⁽¹⁾ Other materials available, see engineering data

⁽²⁾ Coated internally and externally

⁽³⁾ Supplied loose

⁽⁴⁾ Consult BERMAD for availability

⁽⁵⁾ Minimum supply pressure to the Deluge Valve shall be at least 5.0 barg

⁽⁶⁾ Minimum supply pressure to the Deluge Valve shall be at least 8.5 barg

* More options available - contact BERMAD