

**400E** Series

## 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.



#### **Benefits and Features**

#### Safety and reliability

- <sup>•</sup> Time proven, simple design with a fail safe actuation
- Single piece, rugged elastomeric diaphragm seal -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 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
- Automatic foam systems

## Approvals

C UL US LISTED	UL-Listed Special System Water Control Valves, Deluge Type (VLFT) Sizes 1½" - 10"
ĴÅ DNV	Det Norske Veritas Type Approval Sizes 1½" - 12"
ABS TIPE APPROVAL PROGRAM	American Bureau of Shipping Type Approval Sizes 1½" - 12"
Heyder	Lloyd's Register Type Approval Sizes 1½" - 10"

## **Additional Features**

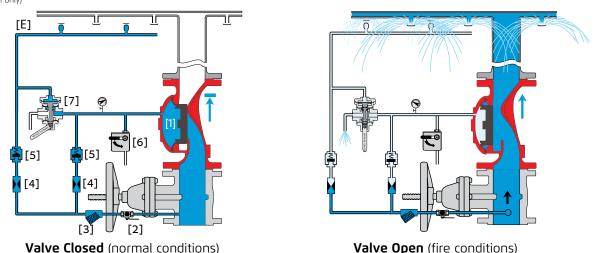
- Valve position limit switches
- Alarm pressure switch
- Water motor alarm
- Sea water compatibility



# **BERMAD** Fire Protection —

#### Operation



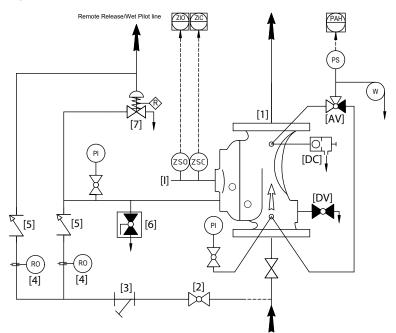


The BERMAD model 400E-5M is held closed by water pressure in the control chamber [1]. Upon release of pressure from the control chamber, the valve opens.

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

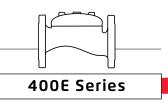
**400E** Series

- 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**

- ZS Limit Switch Assembly
- I Visual Indicator
- PS Pressure Switch
- W Water Motor Alarm
- PI Pressure Gauge\*
- DC Automatic Drip Check Valve\*
- AV 3-Way Alarm Test Valve\*
- DV Drain Valve\*
- \* Included with suffix A in valve code (drain and indicating components) See code designations and additional Factory Fitted Options on page 4

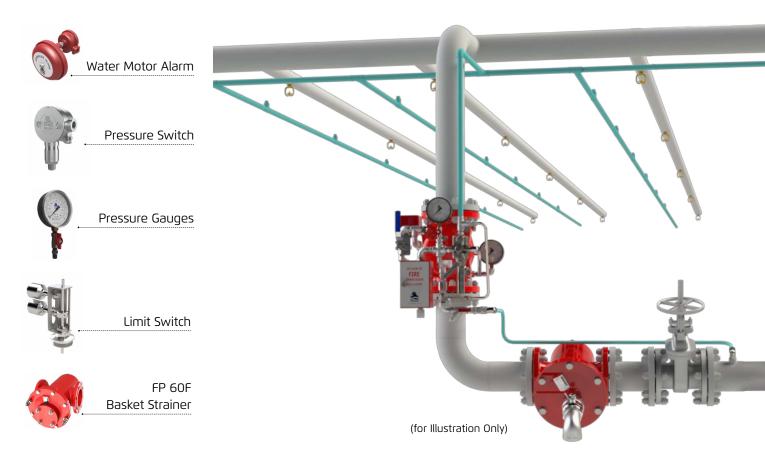




#### **System Installation**

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**



### **Suggested Specifications**

The deluge valve shall be UL-listed.

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

Valve actuation shall be accomplished by a single-piece, rolling diaphragm bonded with a rugged radial seal disk with VRSD technology.

The diaphragm assembly shall be the only moving part.

The deluge valve shall include a latching relay valve, a Y-type strainer, a ball drain valve, an automatic drip-check with manual override, 4-inch pressure gauges, and a manual emergency release housed in a 316 stainless steel box.

Removing the valve cover for inspection and full maintenance shall be in line and not require removal of the valve from the piping line.

The deluge valve and its entire control trim shall be supplied pre-assembled and hydraulically tested in compliance to the UL 260 standard, by a factory certified to ISO 9000 and 9001 quality assurance standard.



## BERMAD Fire Protection -

#### Model FP 400E - 5M

**400E** Series

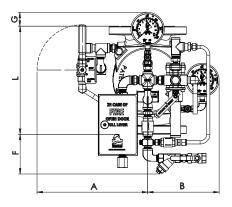
## **Technical Data**

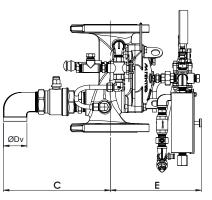
#### Available Sizes (inch)

- Flanged 11/2, 2, 21/2, 3, 4, 6, 8, 10 & 12"
- Grooved 2, 3, 4, 6 & 8"

#### Pressure Rating

- 17.2 bar / 250 psi
- Elastomer
- HTNR with VRSD- Fabric Reinforced High Temperature Compound -See engineering data





Valve Size	1½″ DN40		2″ DN50		2½" DN65		3″ DN80		4″ DN100		6″ DN150		8″ DN200		10″ DN250		12″ DN300	
VOIVE SIZE	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
L #150	205	8.1	205	8.1	205	8.1	257	10.1	320	12.6	415	16.3	500	19.7	605	23.8	725	28.5
L Grooved	-	-	205	8.1	-	-	250	9.8	320	12.6	415	16.3	500	19.7	-	-	-	-
A	313	12.3	313	12.3	325	12.8	345	13.6	328	12.9	349	13.7	383	15.1	396	15.6	438	17.2
В	221	8.7	221	8.7	221	8.7	221	8.7	221	8.7	190	7.4	220	8.7	230	9	283	11.1
С	199	7.8	199	7.8	253	10.0	266	10.5	316	12.4	347	13.7	364	14.3	384	15.1	422	16.6
ØDv 3⁄4″		3/2	, ″ 1	11/2″		11⁄2″		2″		2″		2″		2″		2″		
E	245	9.6	245	9.6	247	9.7	280	11	300	11.8	377	14.8	427	16.8	425	16.7	522	20.6
F	115	4.5	115	4.5	115	4.5	89	3.5	57	2.2	10	0.4	-	-	-	-	-	-
G	50	2	50	2	50	2	49	2	18	0.7	-	-	-	-	-	-	-	-
Kg / lb	g / lb 17 / 37		18 /	40	40 21 / 46		29 / 64		43 / 95		87 / 191		149 / 328		166 / 365		254 / 559	

IMPORTANT: Dimensions for the trim envelope or extents refer to a vertical orientation and may vary with specific component positioning - allow a tolerance of at least ±10%.

## Valve Code Designations

Category       Code         Standard       FP         Seawater       FS         Foam       Coloring speed       02         Opening Seed       02         Opening Seed       02         Opening Seed       03         None       -         Valve Size       Foam         1½       40 mm         2*       50 mm         3*       80 mm         4*       100 mm         6*       150 mm         3*       80 mm         4*       100 mm         6*       150 mm         10*       250 mm         12*       300 mm         Note:       Vertical         Wort Size       Vertical         12*       300 mm         10*       250 mm         12*       300 mm         10*       250 mm         12*       300 mm         10*       250 mm         12*       300 mm         10*       Extension (attribute for A536 line)         12*       300 mm         10*       Extension (attribute for A536 line)         10*       Coatel internality and externa					2											
Standard       FP         Standard       FP         Seawater       FS         foam       Opening speed       02         Opening speed       03         None       -         Valve Size       -         1½*       40 mm         2*       50 mm         2*       50 mm         2*       50 mm         2*       50 mm         2*/*       60 mm         3*       80 mm         4*       100 mm         6*       150 mm         8*       200 mm         10*       250 mm         2*       300 mm             Note:       Installation         Coade       Vertical         Valve Size       Vertical         10*       250 mm         12*       300 mm           Notes:       Material Body & Cover <sup>(0)</sup> Code         **       100 mm       Stainless Steel 316       NN         **       200 mm       Vertical       V         12*       300 mm       Material Body & Cover <sup>(0)</sup> Code         **       Ductile Iron A536	FP		6″		400E-5M	Me	5	- C	V		С	A5	PR	N	1	N6M
Standard       FP         Standard       FP         Seawater       FS         Foam       FC         Opening speed       02         Opening & Closing speed       03         None       -         Valve Size       -         TV/*       40 mm         2*       50 mm         2*/*       50 mm         2*/*       50 mm         3*       80 mm         4*       100 mm         3*       80 mm         4*       100 mm         5*       500 mm         3*       80 mm         6*       150 mm         8*       200 mm         10*       250 mm         12*       300 mm         10*       Exe Angre			_	1												
Standard       FP         Standard       FP         Seawater       FS         foam       Opening speed       02         Opening speed       03         None       -         Valve Size       -         1½*       40 mm         2*       50 mm         2*       50 mm         2*       50 mm         2*       50 mm         2*/*       60 mm         3*       80 mm         4*       100 mm         6*       150 mm         8*       200 mm         10*       250 mm         2*       300 mm             Note:       Installation         Coade       Vertical         Valve Size       Vertical         10*       250 mm         12*       300 mm           Notes:       Material Body & Cover <sup>(0)</sup> Code         **       100 mm       Stainless Steel 316       NN         **       200 mm       Vertical       V         12*       300 mm       Material Body & Cover <sup>(0)</sup> Code         **       Ductile Iron A536	Cateo	οιν	Code		Additional Feature		Code		End Connections			Factor	v Fitted Ontion	s		Code
Seawater       FS       Opening speed       O2         Foam       FC       Opening speed       O2         Opening Speed       O3       Opening Speed       O3         None       Opening Speed       O3       Special Eastomer       Ex Proof NEC, Div.1 Pressure Switch <sup>(3)</sup> P         Valve Size       Pilot Line Trip Point Setting       Code       Vilot Special Eastomer       P         1½*       40 mm       FC       Max elevation 35m/115ft <sup>(6)</sup> M6         2½*       60 mm       Max elevation 70m/230ft <sup>(6)</sup> M7         3*       80 mm       Max elevation 70m/230ft <sup>(6)</sup> M7         4*       100 mm       Installation       Code       Sigle Fittings       Code         Stainless Steel 316       NN       Monel 400       MM       Sigle Code       Sigle Code         12*       300 mm       Vertical       V       Vertical       V       Opening Speed       Opening Speed       Opening Speed         0       Uncoated       UC       Vertical       V       Opening Speed       Special Eastomer       Special Eastomer       Op													<i>,</i>		e Switch (3	
Form       FC       Opening & Closing speed       03       ISO PNI6       16         None       - </td <td></td> <td></td> <td>FS</td> <td></td> <td>51</td> <td></td> <td>P7</td>			FS		51											P7
Concentrate       rc       None       Ex d Pressure Switch, SS316 Enclosure (3)       P         Valve Size       Single Linit Switch, Galve Size       Single Size       Single Linit Switch With       Size       Size       Single Valve Notion Box       Valve Size       Valve Assembly (9)       Valve       Size       Siz					1 31	beed										P9
Valve Size       Monel Sensor <sup>(3)</sup> Single Limit Switch, General Purpose       Single Limit Switch, General Purpose       Single Single Stat Proximity Limit Switch       Single Single Single Stat Proximity Limit Switch       Single Sing			FC		1 3 31	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-					Ex d P	ressure Switch	, SS316 Enclo	osure <sup>(3)</sup>	P9Jn
Valve Size       Image: Single Limit Switch, General Purpose       Single Limit Switch, General Purpose         1½"       40 mm       Pilot Line Trip Point Setting Code       Zinc Based High Build Epoxy       ZR         2"       50 mm       Max elevation 35m/115ft <sup>(i)</sup> M6       Max elevation 70m/230ft <sup>(i)</sup> M7       ZR         3"       80 mm       Installation       Code       Uc       Double Ex d Proximity Limit Switch with SS316 Junction Box       SS316 Junction Box         4"       100 mm       Installation       Code       Stainless Steel 316       NN         8"       200 mm       Vertical       V       Monel 400       MM         10"       250 mm       Vertical       V       Doublex       Double X       Double X         12"       300 mm       More Irabia available, see engineering data       Material Body & Cover <sup>(i)</sup> Code       Maual Emergency Release Box       Maual Emergency Release Box         "Other materials available, see engineering data       Steel ASTM A216 WCB <sup>(2)</sup> S       S       S3 16 Tim Accessories       S         "Other materials available, see engineering data       Stainless Steel 316       N       S       Ss 36 Trim Accessories       S         "Other materials available, see engineering data       Stainless Steel 316       N       S		J.								do 🗸		Ex d P	ressure Switch			P9mJr
1½"       40 mm       Pilot Line Trip Point Setting Code       Max elevation 35m/115ft <sup>(n)</sup> M6       Single Ex d Proximity limit Switch       Single Ex d Proximity limi	Valve	Size					•					Single	Limit Switch, G	eneral Purp	ose	S
2"       50 mm       Max elevation 35m/115ft <sup>(5)</sup> M6 Max elevation 70m/230ft <sup>(6)</sup> M7       M6 Max elevation 70m/230ft <sup>(6)</sup> M7       Double £x d Proximity Limit Switch       S         3"       80 mm       Installation       Code       UC       Double £x d Proximity Limit Switch with SS316 Junction B0x       S         6"       150 mm       Installation       Code       NN       Monel 400       MM       S       S       Glycerin Pressure Gauge Assembly <sup>(9)</sup> G         10"       250 mm       Vertical       V       Horizontal       H       Double £x d Proximity Limit Switch with SS316 Junction B0x       S       Glycerin Pressure Gauge Assembly <sup>(9)</sup> G         12"       300 mm       Vertical       V       Horizontal       H       Double £x d Proximity Limit Switch with SS316 Junction B0x       S       Glycerin Pressure Gauge Assembly <sup>(9)</sup> G         12"       300 mm       Worter       Material Body & Cover <sup>(0)</sup> Code       Data m Assembly <sup>(9)</sup> G         12"       300 mm       Vertical internally and externally       H       Ductile Iron A536 <sup>(2)</sup> C       S       Special Elastomer       G         12"       300 mm       Supplied loose       Ductile Iron A536 <sup>(2)</sup> C       S       Stainless Steel 316       N	11⁄2"	40 mm	п		Pilot Line Trip Point S	etting	Code		Zinc Based High			Single	Ex d Proximity	limit Switch	1	S9
3"       80 mm       Installation       Code       Installation       Code       SS316 Junction Box       Pressure Gauge Assembly <sup>(3)</sup> SS316 Junction Box	2"	50 mm	n		Max elevation 35m/1	115ft (5)	M6			R		Doubl	e Ex d Proximit	y Limit Swit	ch	SS9
4"       100 mm       100 mm       Code       Stainless Steel 316       NN         6"       150 mm       Vertical       V       Stainless Steel 316       NN         8"       200 mm       Vertical       V       Nonel 400       MM         10"       250 mm       Horizontal       H       Super Duplex       DD       Drain Valve       Manual Emergency Release Box       Manual Emergency Release Box       Material Body & Cover(*)       Water Motor Alarm Assembly(*)       Material Body & Cover(*)       Special Elastomer       Special Elastomer       Special Elastomer       Special Elastomer       Special Elastomer       Special Flatter       Special Elastomer       Special E					Max elevation 70m/2	30ft (6)	M7		Uncoated U	С		Doubl SS316	e Ex d Proximit Junction Box	y Limit Swit	ch with	SS9Jr
6"       150 mm       Installation       Code         8"       200 mm       Vertical       V         10"       250 mm       Vertical       V         Horizontal       H       Super Duplex       DD         Notes:         0"       Other materials available, see engineering data       Material Body & Cover <sup>(1)</sup> Code         Ductile Iron A536 (2)       C       Stainless Steel 316       N         Supplied loose       Supplied loose       Stainless Steel 316       N         9 Consult BERMAD for availability       Nickel Al Bronze C95800       U       Pressure Transmitter <sup>(3)</sup> Pressure Transmitter <sup>(3)</sup>	-								Tubing & Fittings		Codo	Pressu	ire Gauge Asse	embly (3)		6
O mm       Vertical       V         8"       200 mm       Vertical       V         10"       250 mm       Horizontal       Monel 400       MM         12"       300 mm       Monel 400       MM         Notes:       Material Body & Cover <sup>(1)</sup> Code         **       Ductile Iron A536 <sup>(2)</sup> C         **       Supplied loose       Stainless Steel 316       N         **       Nickel Al Bronze C95800       U       Pressure Transmitter <sup>(3)</sup>					Installation		Codo					S.S Gly	cerin Pressure	Gauge Asse	embly (3)	6n
10"       250 mm       Horizontal       H       Super Duplex       DD       Manual Emergency Release Box       Manual Emergency Release Box         12"       300 mm       Material Body & Cover <sup>(1)</sup> Code       Special Elastomer       Borain Valve       Water Motor Alarm Assembly <sup>(3)</sup> Elastomer       Borain Valve       Special Elastomer       Borain Valve       Borain Valve       Water Motor Alarm Assembly <sup>(3)</sup> Elastomer       Borain Valve       Borain Va	-											Mone	Pressure Gaug	ge Assembl	/ (3)	6m
Notes:       Material Body & Cover <sup>(1)</sup> Code       Special Elastomer       Material Elastomer       Materiala Elastomer       Mater       Mater<	-											Drain	Valve			DV
Material Body & Cover (1)       Code       Special Elastomer       Feature         ************************************					Honzontar			L	эарег варкех		00	Manua	al Emergency R	elease Box		D
Works.       Ductile Iron A536 (2)       C       Large Control Filter         ** Obter materials available, see engineering data       Ductile Iron A536 (2)       C       Large Control Filter         ** Supplied loose       Steel ASTM A216 WCB (2)       S       Valve Position Indicator         ** Supplied loose       Stainless Steel 316       N       S.S 316 Trim Accessories         ** Minimum supply pressure to the Deluge Valve shall       Nickel Al Bronze C95800       U       Pressure Transmitter (3)	12	300 11	111								•	Water	Motor Alarm A	ssembly (3)		W
(2)       Coated internally and externally       Steel ASTM A216 WCB (2)       S       Valve Position Indicator         (3)       Supplied loose       Stainless Steel 316       N       S.S 316 Trim Accessories         (4)       Consult BERMAD for availability       Stainless Steel 316       N       S.S 316 Trim Accessories         (5)       Minimum supply pressure to the Deluge Valve shall       Nickel Al Bronze 095800       U       Pressure Transmitter (3)	Notes:								Material Body & Cove	r <sup>(1)</sup>	Code	Specia	l Elastomer			E (4)
<sup>3</sup> Supplied loose     Statiless Steel 316     N     S.S. 316 Trim Accessories <sup>4</sup> Consult BERMAD for availability     Stainless Steel 316     N     S.S. 316 Trim Accessories <sup>5</sup> Minimum supply pressure to the Deluge Valve shall     Nickel Al Bronze C95800     U     Pressure Transmitter <sup>(3)</sup>	<sup>(1)</sup> Other materials available, see engineering data								Ductile Iron A536 (2)		С	Large	Large Control Filter			F
<sup>4)</sup> Consult BERMAD for availability     Stainless Steel 316     N     S.S 316 Trim Accessories <sup>5)</sup> Minimum supply pressure to the Deluge Valve shall     Nickel Al Bronze C95800     U     Pressure Transmitter <sup>(3)</sup>									Steel ASTM A216 WCE	3 (2)	S	Valve	ve Position Indicator			1
									Stainless Steel 316		Ν	S.S 316 Trim Accessories				N
									Nickel Al Bronze C958	U	Pressure Transmitter (3)				Q	
be at least 5.0 barg <sup>(6)</sup> Minimum supply pressure to the Deluge Valve shall <sup>(6)</sup> Minimum supply pressure to the Deluge Valve shall <sup>(6)</sup>	<sup>(6)</sup> Minimum supply pressure to the Deluge Valve shall								Super Duplex Grade 5	5A	D	Drain	and Indicating	Component	s	A

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

\* More options available - contact BERMAD



#### www.bermad.com