

## Pneumatic Pressure Control On-Off Deluge Valve

### Model FP 400E - 4DC

The BERMAD model 400E-4DC is an elastomeric hydraulic, line pressure operated, deluge valve, designed specifically for advanced fire protection systems and the latest industry standards.

The 400E-4DC is activated by a relay valve, held closed by pneumatic pressure. Opening and closing of the deluge valve can be controlled remotely.

An integrated pressure control pilot valve ensures a stable and precise pre-set downstream water pressure.

The BERMAD 400E-4DC is suitable for open-nozzle systems with a high pressure water supply. The pneumatic control makes it ideal for use in freezing environments and corrosive media.

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



(for illustration Only)

### Benefits and Features

#### ■ Safety and reliability

- 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
- 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

- Remote control water spray systems
- Foam applications
- Corrosive water supplies
- High pressure water supply
- Freezing conditions

### Approvals



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



Det Norske Veritas  
Type Approval  
Sizes 1½" - 12"



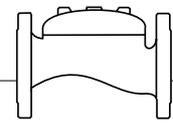
American Bureau of Shipping  
Type Approval  
Sizes 1½" - 12"



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

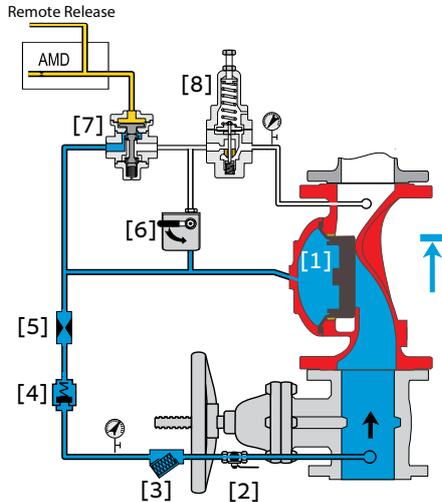
### Additional Options

- Valve position limit switches
- Alarm pressure switch
- Air maintenance device
- Sea water compatibility

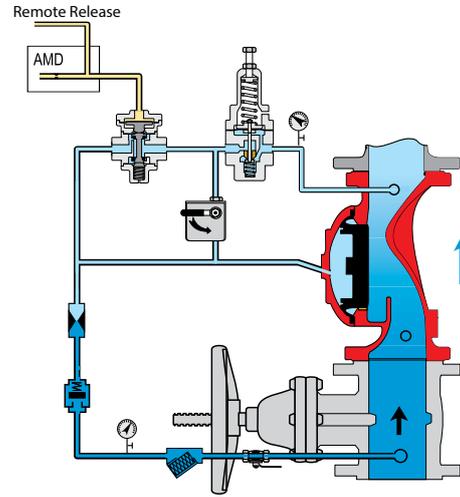


## Operation

(for Illustration Only)



**Valve Closed** (normal conditions)



**Valve Open** (fire conditions)

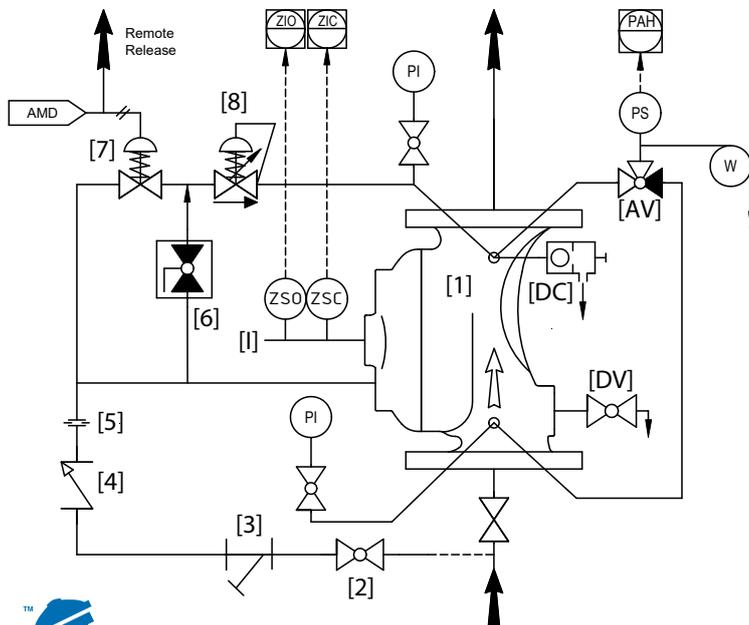
The BERMAD model 400E-4DC is held closed by water pressure in the control chamber [1]. Upon release of pressure from the control chamber, the valve opens.

Under NORMAL conditions, water pressure is supplied to the control chamber via the priming line [2] strainer [3] and restriction orifice [5], it 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 in the dry pilot line [E]. 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 in response to a decrease in pneumatic pilot-line pressure. This opens the 400E-4DC deluge valve, allowing water to flow into the system piping and to the alarm device [9]. The pressure-reducing pilot valve [8] senses changes in outlet pressure and, modulates the main valve to maintain the set downstream pressure.

When outlet pressure changes, the pressure-reducing pilot opens or closes in response. This regulates the pressure in the main valve's control chamber, thus modulating the position of the diaphragm seal disk to maintain the set downstream pressure.

## System P&ID



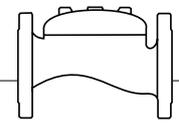
## Components

- 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 Hydraulic Relay Valve
- 8 Pressure Control Pilot Valve

## Optional System Items

- PI Pressure Gauge\*
- I Valve Position Indicator
- DC Drip Check\*
- AV 3-Way Alarm Valve\*
- DV Drain Valve\*
- PS Pressure Switch
- ZS Limit Switch Assembly
- W Water Motor Alarm

\* Included with suffix A in valve code (drain and indicating components) See code designations and additional Factory Fitted Options on last page

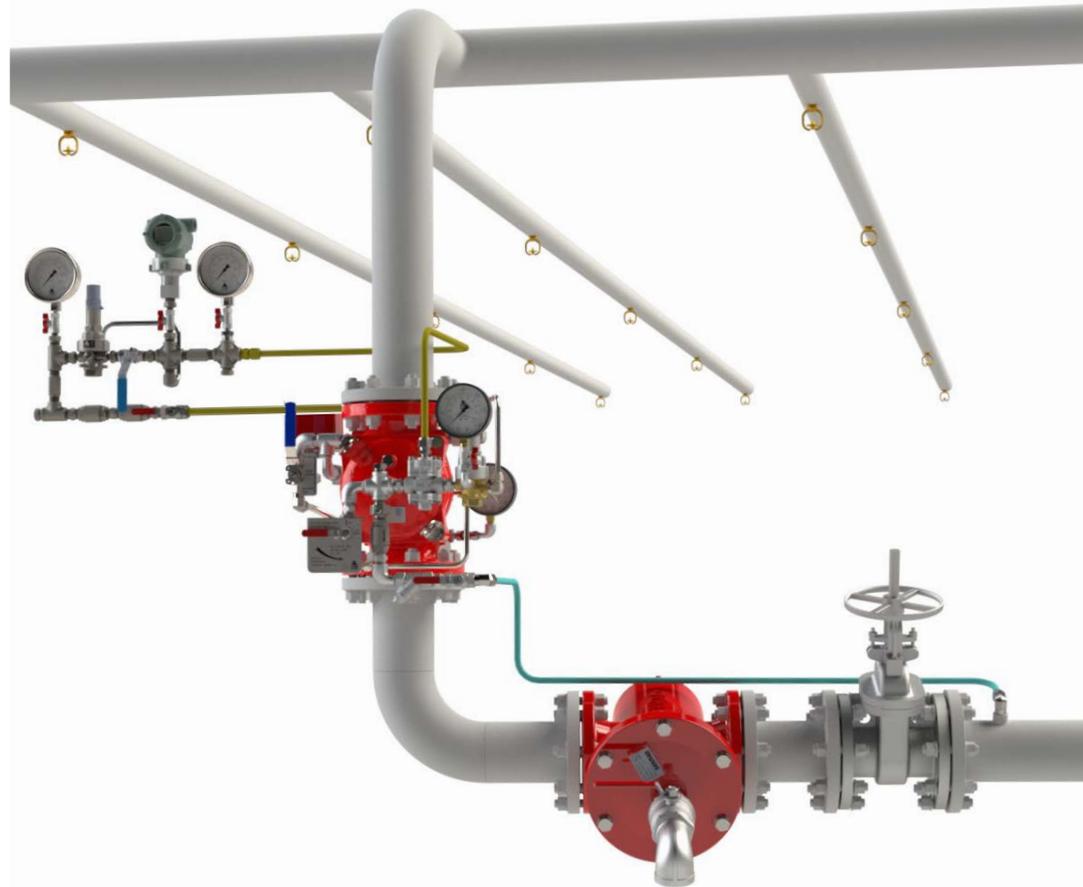


## System Installation

A typical installation of the BERMAD model 400E-4DC features actuation by way of a fall in pneumatic pressure to the control chamber of the 2-Way Universal Relay Valve. When open, and fitted with a limit switch the valve can send a feedback signal to a remote valve position monitoring system.

A pressure reducing pilot valve integrated in the control trim ensures a precise and stable pre-set downstream water pressure.

## Optional System Items



(for Illustration Only)

## 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.

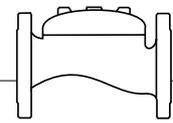
The diaphragm assembly shall be the only moving part.

The deluge valve shall include a 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



400E Series

Model FP 400E - 4DC

## Technical Data

### Available Sizes (inch)

- Flanged - 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- Grooved - 2, 3, 4, 6 & 8"

### Pressure Rating

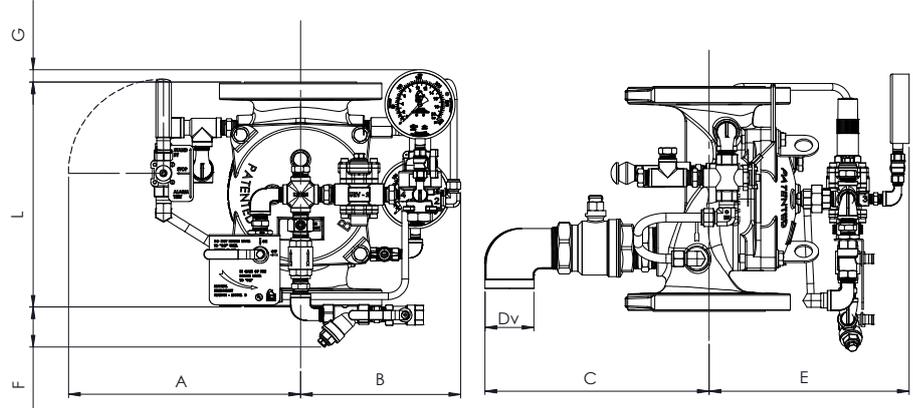
- 17.2 bar / 250 psi

### Recommended Air Pressure

- 2.5 bar

### Elastomer

- HTNR with VRSD - Fabric Reinforced High Temperature, see engineering data



Valve Size	1½" DN40		2" DN50		2½" DN65		3" DN80		4" DN100		6" DN150		8" DN200		10" DN250		12" DN300	
	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
B	225	8.8	225	8.8	225	8.8	225	8.8	225	8.8	215	8.5	245	9.6	255	10	308	12
C	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	¾"		¾"		1½"		1½"		2"		2"		2"		2"		2"	
E	227	8.9	227	8.9	229	9	263	10.4	282	11.1	359	14.1	409	16.1	407	16	504	19.8
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	1.9	18	0.7	-	-	-	-	-	-	-	-
Kg / lb	17 / 38		18 / 40		21 / 46		29 / 64		43 / 95		87 / 192		149 / 329		166 / 366		254 / 560	

**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

FP 6" 400E 4DC 03 V C A5 PR NN N6nW

Category	code	Additional Feature	Code	End Connections	code	Factory Fitted Options*	Code
Standard	FP	Closing speed	01	ANSI#150RF	A5	General Purpose Pressure Switch <sup>(3)</sup>	P
Seawater	FS	Opening speed	02	ANSI#150FF	a5	Ex Proof NEC, Div.1 Pressure Switch <sup>(3)</sup>	P7
Foam Concentrate	FC	Opening & Closing speed	03	ISO PN16	16	Ex d ATEX Pressure Switch <sup>(3)</sup>	P9
		None	-	Grooved 235psi/PN16, ANSI C606	VI	Ex d Pressure Switch, SS316 Enclosure <sup>(3)</sup>	P9Jn
						Ex d Pressure Switch, SS316 Enclosure, Monel Sensor <sup>(3)</sup>	P9mJn
						Single Limit Switch, General Purpose	S
						Single Ex d Proximity Limit Switch	S9
						Pressure Gauge Assembly	6
						S.S Glycerin Pressure Gauge Assembly <sup>(3)</sup>	6n
						Monel Pressure Gauge Assembly	6m
						Downstream Drain Valve	DV
						Manual Emergency Release Box	D
						Water Motor Alarm Assembly <sup>(3)</sup>	W
						Special Elastomer	E <sup>(4)</sup>
						Large Control Filter	F
						Valve Position Indicator	I
						Stainless Steel 316 Trim Accessories	N
						Pressure Transmitter	Q
						Drain and Indicating Components	A

**Notes:**

- Other materials available, see engineering data
- Coated internally and externally
- Supplied loose
- Consult BERMAD for availability.

\* More options available - contact BERMAD



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