# ELECTRIC PRESSURE CONTROL ON-OFF DELUGE VALVE

## Model FP-400Y-2DC

The BERMAD model 400Y-2DC is an elastomeric, hydraulic, line pressure operated deluge valve, designed specifically for advanced fire protection systems and the latest industry standards.
The 400Y-2DC is activated by a 2-way solenoid valve by which opening and closing of the deluge valve may be controlled remotely.
An integrated pressure reducing pilot ensures a precise and stable pre-set downstream water pressure.
The 400Y-2DC is ideal for open-nozzle systems with a high pressure water supply and is available with electric components to suit any hazardous location.
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
  - Shuts off on remote command
  - Ensures precise, stable downstream water pressure
  - Valve position limit switches (optional)
- 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)

### Approvals

| | |
|---|---|
| c UL us LISTED | UL-Listed<br>Special System Water Control Valves, Deluge Type (VLFT)<br>Sizes 1½" - 16" |
| FM APPROVED | FM Approved<br>for Deluge Sprinkler Systems<br>Sizes 1½" - 8" |
| DNV | Det Norske Veritas<br>Type Approval<br>Sizes 1½" to 16" |
| ABS TYPE APPROVED PRODUCT | ABS<br>American Bureau of Shipping<br>Type Approval<br>Sizes 1½" - 12" |
| Lloyd's Register TA | Lloyd's Register<br>Type Approval<br>Sizes 1½" - 10" |

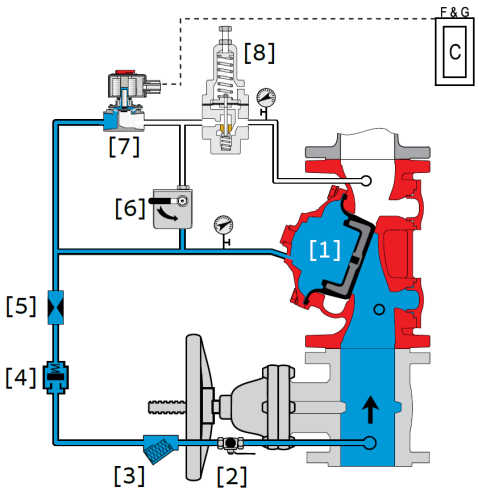
### Typical Applications

- Remote Control Water Spray Systems
- Foam applications
- High Pressure Water Supply
- Zonal Pressure Control

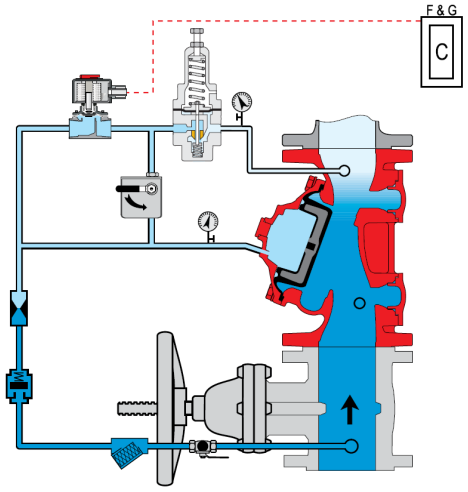
### Additional Features

- Valve position limit switches
- Seawater compatibility
- Alarm pressure switch
- Drain valve/s inlet/outlet
- For "automatic activation" select BERMAD local or remote reset model
- Corrosion resistant zinc based high build epoxy coating

## Operation



Valve Closed (normal conditions)



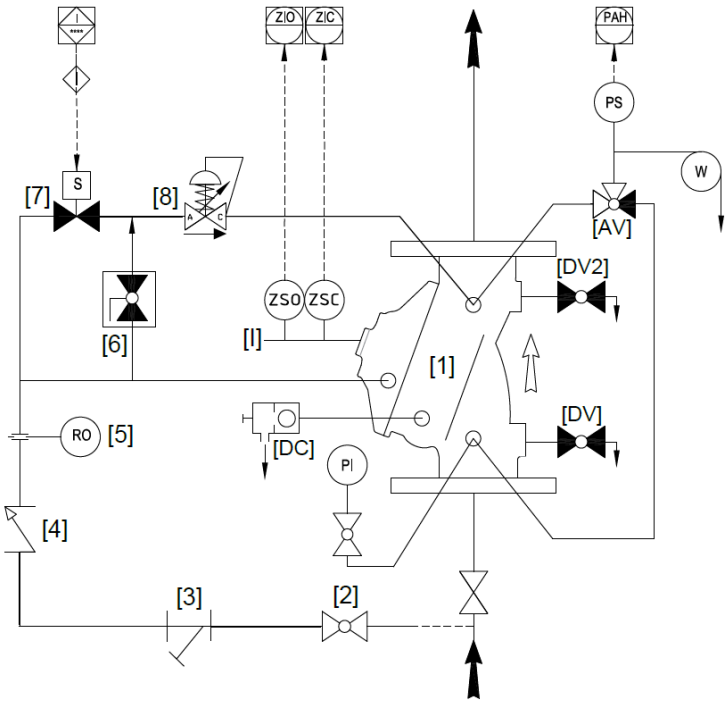
Valve Open (fire conditions)

**The BERMAD model 400Y-2DC** 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] restriction orifice [5], and strainer [3], and is then trapped in the control chamber by a check valve [4], manual emergency release [6], a 2-Way Normally De-Energized solenoid valve [7]. The water pressure trapped in the main valve control chamber holds the diaphragm against the valve seat, sealing it driptight 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 HRV opening in response to the solenoid valve being energized by the fire & gas control system [C]. This opens the 400Y-2DC deluge valve, allowing water to flow into the system piping and to the alarm device [10]. The pressure-reducing pilot valve [9] senses changes in outlet pressure and, modulates the main valve to maintain the set downstream 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 | 2-way Solenoid valve |
| 8 | Pressure Reducing Pilot Valve |

| | Optional System Items |
|---|---|
| PS | Pressure Switch |
| W | Water Motor Alarm |
| ZS | Limit Switch Assembly |
| DV2 | Downstream Drain valve |
| 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-2DC features actuation via a hydraulic relay valve and 2-way solenoid valve, triggered by a signal from a fire & gas control system or an on-site emergency pushbutton. 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

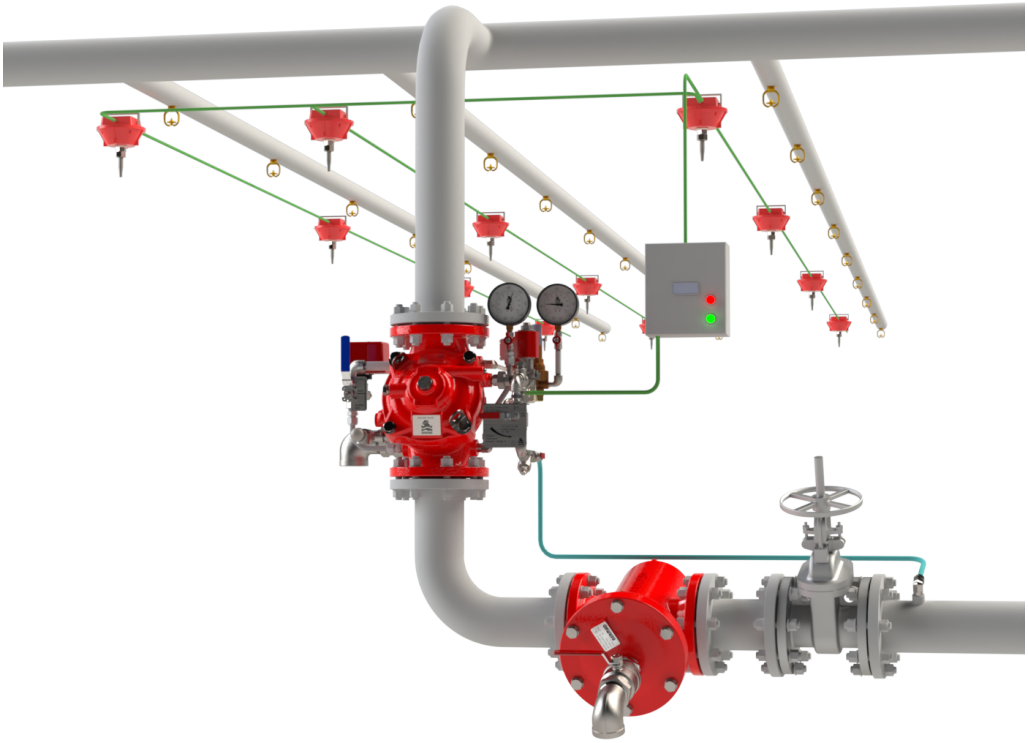
Pressure Gauge

Single Ex d Proximity S.S.316 Limit Switch

Visual Position Indicator, Linear

Exd Pressure Switch - Stainless Steel Enclosure for Harsh Environments

Basket Strainer - 60F



## Suggested Specifications

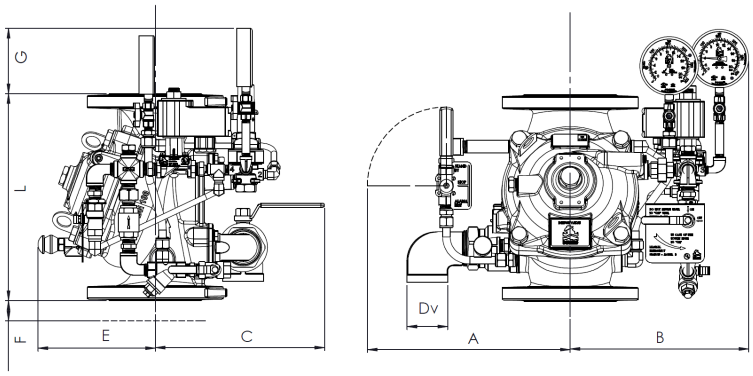
The deluge valve shall be UL-listed, 365-psi/25-bar rated, with a straight-through, Ytypebody.
The valve shall have an unobstructed flow path, with no stem guide or supporting ribs.
The deluge valve shall have no mechanical moving parts, and the actuation shall utilize a single-piece diaphragm assembly 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 2-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, 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, 2½, 3, 4, 6, 8, 10, 12, 14 & 16"
Grooved- 1½, 2, 2½, 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 | 282 \| 11.1 | 177 \| 7 | ¾" | 215 \| 8.5 | 91 \| 3.6 | 166 \| 6.5 | 19 \| 42 | 22 \| 49 |
| DN50 \| 2" | 230 \| 9.1 | 230 \| 9.1 | 238 \| 9.4 | 293 \| 11.5 | 282 \| 11.1 | 177 \| 7 | ¾" | 215 \| 8.5 | 91 \| 3.6 | 166 \| 6.5 | 20 \| 44 | 22 \| 49 |
| DN65 \| 2½" | 235 \| 9.3 | 235 \| 9.3 | 241 \| 9.5 | 293 \| 11.6 | 282 \| 11.1 | 177 \| 7.2 | 1" | 184 \| 7.3 | 88 \| 3.5 | 152 \| 6 | 24 \| 53 | 30 \| 66 |
| DN80 \| 3" | 310 \| 12.2 | 310 \| 12.2 | 326 \| 12.8 | 313 \| 12.3 | 294 \| 11.6 | 177 \| 7 | 1½" | 186 \| 7.3 | 21 \| 0.8 | 124 \| 4.9 | 37 \| 82 | 43 \| 95 |
| DN100 \| 4" | 350 \| 13.8 | 350 \| 13.8 | 368 \| 14.5 | 343 \| 13.5 | 302 \| 11.9 | 287 \| 11.3 | 2" | 199 \| 7.8 | - | 113 \| 4.4 | 51 \| 112 | 58 \| 128 |
| DN150 \| 6" | 480 \| 18.9 | 480 \| 18.9 | 506 \| 19.9 | 358 \| 14 | 356 \| 14 | 302 \| 11.9 | 2" | 234 \| 9.2 | - | 72 \| 2.8 | 99 \| 218 | 120 \| 264 |
| DN200 \| 8" | 600 \| 23.6 | 600 \| 23.6 | 626 \| 24.7 | 392 \| 15.4 | 433 \| 17 | 317 \| 12.5 | 2" | 301 \| 11.9 | - | 37 \| 1.5 | 168 \| 370 | 190 \| 418 |
| DN250 \| 10" | 730 \| 28.7 | 730 \| 28.7 | 730 \| 28.7 | 406 \| 16 | 433 \| 17 | 317 \| 12.5 | 2" | 301 \| 11.9 | - | - | 201 \| 442 | 235 \| 517 |
| DN300 \| 12" | 850 \| 33.5 | - | 888 \| 35 | 478 \| 18.8 | 463 \| 18.2 | 380 \| 15 | 2" | 441 \| 17.4 | - | 14 \| 0.5 | 365 \| 803 | 405 \| 891 |
| DN350 \| 14" | 980 \| 38.6 | - | 980 \| 38.6 | 478 \| 18.8 | 463 \| 18.2 | 379 \| 14.9 | 2" | 441 \| 17.4 | - | - | 401 \| 882 | 470 \| 1034 |
| DN400 \| 16" | 1100 \| 43.3 | - | 1100 \| 43.3 | 478 \| 18.8 | 463 \| 18.3 | 405 \| 16.1 | 2" | 417 \| 16.4 | - | - | 452 \| 995 | 572 \| 1259 |

**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-2DC | 03 | V | C | A5 | ER | 4DC | NN | N6nW

| 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 |

**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

| 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 |

| 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) | VI |
| Grooved Class 365psi/25bar(5) | V2 |

| Additional Feature | Code |
|---|---|
| Closing Speed Control | 01 |
| Opening Speed Control | 02 |
| Opening & Closing Speed Control | 03 |
| None | - |

| 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 |
| 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 |

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

| Tubing & Fittings | Code |
|---|---|
| Stainless Steel 316 | NN |
| Monel 400 | MM |
| Super Duplex | DD |

| Factory Supplied Additional Items | Code |
|---|---|
| General Purpose NEMA-4 Pressure Switch | 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 |
| 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 |

*More options available – consult BERMAD