FIG. 1006, DELUGE VALVE, PN16/25

Size: DN 65 - 300 mm

SPECIFICATION

Type: Pilot control valve.
Working pressure: 16/25 bar.
Flanged to JIS 10/16K, BS4504 PN16/25, ANSI Class 150

PRESSURE/TEMPERATURE RATINGS	
Working pressure	16/25 bar
Testing Pressure	Shell: 24/37.5 bar, Seat: 17/26 Bar
Working temperature	-10°C to 80°C
Suitable Media	

MATERIALS			
Part	Meterial	ASTM Spec.	EN Spec.
Body, cover	Ductile iron	A536 65-45-12	1563 EN-JS1050
Diaphragm type	Rubber EPDM	-	-
Bolt/nut	Stainless steel 410	A276 S410 00	970 410 S21
Fitting	Stainless steel 304 Carbon Steel	A276 S304 00 -	970 304 C15 -
Painting	Red Epoxy Coating		

Figure 1: Deluge valve PN16/25

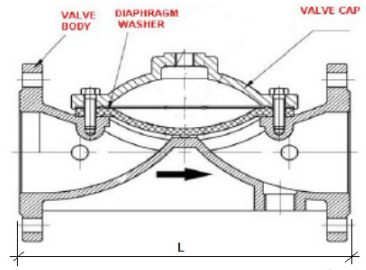

Figure 2: Structure valve PN16/25

FUNCTION: Opens on demand to provide water flow to the fire protection sprinkler system. Pilot system can be hydraulically, pneumatically, or manually operated. Opening of valve is by electrical signal to solenoid or manual opening.

OPERATION:

- Deluge valve is controlled by a 2-way direct-acting solenoid which controls the position of the Pneumatic/ Hydraulic pilot.
- When the solenoid is de-energized, ports 1 and 3 are connected (port 2 is blocked). Pressure is routed to the cover of the pneumatic/hydraulic control. The pneumatic/hydraulic control closes, closing the main valve.
- When the solenoid is energized, port 1 and 2 are connected (port 3 is blocked). The cover of the pneumatic/ hydraulic control is vented. The control opens, opening the main valve.
- An isolator valve in the control circuit provides a manual by-pass/override of the pneumatic/hydraulic control. Opening the isolator valve will open the main valve. This isolator valve is to be closed during normal operation.

START-UP: Start-up of the deluge valve requires that proper procedures be flowed: 1-Clear the line of slag and other debris. 2-Close upstream system isolator valve, if so equipped. 3-Install the valve so that the flow arrow marked on the valve body matches the flow through the line. 4-Ensure that the manual by-pass isolator valve is closed. 5-Connect actuating air/hydraulic pressure source to port 3 of the solenoid control.

Step 1: Energize the solenoid to check actuation and to confirm connection to power source.

Step 2: De-energize the solenoid for initial valve filling.

Step 3: Activate the air/hydraulic pressure source.

Step 4: Pressure the line, opening the upstream isolator valve slowly. Open manual by-pass isolator valve to ensure that the main valve opens. Manual by-pass isolator valve must be closed during normal operation of valve.

Step 5: Partially open the manual isolator valve to vent air trapped in the cover chamber. Close when fluid begins to vent. Caution: do not remove or loosen top cover plug while valve is under pressure.

Step 6: Energize the solenoid. This will vent the pneumatic/hydraulic control cover chamber, causing the main valve to open.

Step 7: De-energize the solenoid. This will pressure the pneumatic/hydraulic control cover chamber, causing the main valve to close.

Using Manual

Automatic Sprinkler System For Deluge Valve

1. INTRODUCTION AND APPLICATION:

Deluge valve (as shown in Figure 1) ,which is mainly composed of the valve body (structure shown in Figure 2), water alarm gong, pressure switch, anti-reset device, automatic drip valve, solenoid valve and connecting pipe fittings is a direct sealed diaphragm valves widely used in various types of open systems such as automatic sprinkler system, water curtain system, water mist system, enjoying advantages of simple ness in structure, reliance in performance, flexibility in installation and convenience in maintenance.

2. SPECIFICATION AND MAIN TECHNICAL PARAMETER

(a) Specification

Size (mm)	Nominal Diameter (mm)	Strength Test (MPa)	Sealing Test (MPa)	Rated W.P. Range (MPa)	Hydraulic Friction (MPa)	Starting Time (S)
DN65	65	2.4/3.75	1.7/25	0.14~1.2	≤0.05	≤15
DN80	80					
DN100	100					
DN125	125					
DN150	150					≤60
DN200	200					
DN250	250					
DN300	300					

(b) Structural Dimension (PN16)							
Size (mm)	Flange Outside dia. (mm)	Centre-to-Centre Distance for Symmetrical Screw Holes(mm)	Dia. Of Screw Hole	No. of Screw Hole	Drainage Outlet Thread (in)	Connect Thread of Water Gong (in)	Face to Face (L=mm)
DN65	185	145	16	4	G1"	G3/4"	274
DN80	200	160	18	8	G1"	G3/4"	340
DN100	220	180	18	8	G1"	G3/4"	370
DN125	250	210	18	8	G1"	G3/4"	375
DN150	285	240	22	8	G1"	G3/4"	460
DN200	340	295	22	12	G1 1/2"	G3/4"	500
DN250	410	355	26	12	G1 1/2"	G3/4"	570
DN300	460	410	26	12	G1 1/2"	G3/4"	620

(c) Structural Dimension (PN25)							
Size (mm)	Flange Outside dia. (mm)	Centre-to-Centre Distance for Symmetrical Screw Holes(mm)	Dia. Of Screw Hole	No. of Screw Hole	Drainage Outlet Thread (in)	Connect Thread of Water Gong (in)	Face to Face (L=mm)
DN65	185	145	16	8	G1"	G3/4"	274
DN80	200	160	18	8	G1"	G3/4"	340
DN100	235	190	22	8	G1"	G3/4"	370
DN125	270	220	26	8	G1"	G3/4"	375
DN150	300	250	26	8	G1"	G3/4"	460
DN200	360	310	26	12	G1 1/2"	G3/4"	500
DN250	425	370	29	12	G1 1/2"	G3/4"	560
DN300	485	430	29	16	G1 1/2"	G3/4"	620

3. WORKING PRINCIPLE

Automatic sprinkler deluge system consists of deluge valve, either open type or water mist or water curtain type sprinkler head, fire sensors (electronic detectors, closed-head sprinkler), water alarm gong, pressure switches and electric control panel. The deluge valve holds down the water in the water supply side of the pipe network by sealing rubber when system has been in a standby situation and there is no water in the system pipelines. Deluge valve starts either electrically or manually or by means of drive pipe. It depends on the on-site situation.

The water pressure level in the diaphragm chamber determines either starting or closing valve. The water is kept holding down and cannot go up into system pipeline when the pressure in the chamber is equal to or above that of supplying water. To the contrary, the supplying water runs upwards through chamber in case that solenoid valve is activated or emergency manual quick opening valve is open or close sprinkler starts working which makes pressure in the diaphragm chamber reduces to certain point.

Anti-reset device in the deluge valve insures that the system would not be undesirably shut off during fire extinguishing due to electricity supply failure whether the solenoid valve or manual quick open valve has been re-close or not after diaphragm chamber pressure has been given out. The chamber still remains no pressure and valve being open with anti-reset device when controlling fire. The valve closes again when opening the reset ball valve after fire is controlled.

(1) Electric panel control:

The electrical detector in the protected area transmits fire signal to electrical control panel which identifies and sends out the starting signal to the solenoid valve and diaphragm pressure releases then valve starts working.

(2) Connection conveyance pipe control:

Installation the close heat-responsive sprinkler detector in the protected area and have it connected with diaphragm chamber by means of piping. The diaphragm pressure falls down to start the deluge valve then fire water goes into the pipeline network from supply side and distribute in the protected area after sprinkler activates. The connection conveyance pipes can be controlled either hydraulically or pneumatically to separately shape wet type or dry type deluge system.

(3) Manual start control:

Manual start method is usually for regulation and test or emergency start. Open the manual start valve to release pressure the diaphragm chamber and then valve starts pushing water run into the system pipeline and extinguish fire via open sprinklers.

4. INSTALLATION

(1) Get the valve out of package and check that there is dross in the valve chamber or pipe outlets.

(2) Work of assembly, regulation, adjustment and test must be carried out by special people of required qualification or experienced technical personnel. All deluge valves have been subject to sealing test under 2.4 MPa before selling thus disassembly by users is seriously forbidden.

(3) The system must be installed in warm and bright rooms and there should be 0.5 m surrounding spacing.

(4) Control valves must be installed hand in hand in both water supply side and system side to facilitate regulation test and maintenance. The pipelines must be cleaned with clear water without muds to protect the reset ball valve before installation in accordance with the Code for Installation Work.

(5) Valve can be installed either vertically or horizontally. But the magnetic core of solenoid valve must be kept vertical with its installation method.

(6) Use reset ball valve and emergency manual quick opening valve properly to avoid loss.

(7) A filter valve is necessarily required before the inlet of valve keep waste avoiding sealing failure and wrong actions according to Code for Automatic Sprinkler System GB50054-2001.

(8) A check valve is needed before inlet of deluge valve to evade wrong actions when there are multiplied linked deluge alarm group.

5. REGULATION AND TEST

The standby status of valve must be restored after regulation and test and extinguishing fire in compliance with the following tips:

(1) Shut of control valve in the water-supply side.

(2) Open the deluge valve, drain valve, alarm valve, and all auxiliary drain valves in the system to drain out the remain water in the system. Dripping no water means dripping completion.

(3) Close the emergency manual quick opening valve and test alarm valve then open reset ball valve; Meanwhile close the side of the control valve in the deluge valve system.

(4) Press the “Reset” button in the control panel to have the electronic control system reset and solenoid valve closed.

(5) Slowly open control valve in the water supply side until the pressure gauge for water supply and diaphragm chamber pressure gauge indicates the same level and then open control valve at full degree.

6. ALARMING TEST

We suggest that the test being performed quarterly in accordance with the following tips:

(1) Close the valve for water gong to prevent water from running into system side.

(2) Open test valve for alarm gong and check that pressure switch works alarming.

(3) Shut off test valve and reopen water gong valve to restore standby situation.

7. OPEN-CLOSE FUNCTIONAL TEST

The test is made preferably annually and in warm season. Precautions for leakage during test must be taken and draining devices should be installed in those pipelines that water accumulates. Should you take some methods in case of failure in opening valves or alternatively use a water control valve to avoid all those steps mentioned above, tips for test is as follows:

(1) Notice those personnel and departments related.

(2) Have the linked electronic detector started to open the deluge valve. E.g. Open test valve in the control pipelines in dry or wet system.

(3) Check that the system has sufficient water supply.

(4) Make the system restore standby status in accordance with Tips for Adjust after the test is completed.

8. MAINTENANCE

Precautions must be made and people should be on duty for fire security after related people or department have been noticed of the fire extinguishing disability of the system due to maintenance or other reasons.

Tips for valve functional suspension:

(1) Shut of control valve in system side.

(2) Open all drip valves.

(3) Shut off water-supply valve for diaphragm chamber. It is good time for maintenance.

Tips for chamber maintenance.

(1) Remove the copper pipe from the valve bonnet and loosen the flexible joint and have screws separated from valve bonnet, then get the rubber diaphragm, spring, supporting piece removed.

(2) Check up the diaphragm. Slight deformation is normal. Have it renewed in case that there is obvious deformation, bulge.

(3) Clean all the above accessories and chamber. Put diaphragm, supporting piece, spring, valve cover in order and tighten the screw bolts to insure its sealing performance. It must be insured that diaphragm seal interface must be consistent with seal groove on the sphere during installation, and support piece, spring and diaphragm and the valve cover must be stuck with slots. Any assembly failure may cause the valve not to work normally.

Note:

- Maintenance of deluge valve must be undertaken by those of required qualification experienced technical personnel. Pilot control lines will be upon each country.

- Design and specifications are subject to change without prior notice.

Warning: Fire precautions must be taken during maintenance, for the system has been disabled. DO NOT OPEN VALVE COVER IN PRESSURE CONDITION.