

# DELUGE VALVE

## MODEL: FIG 120B

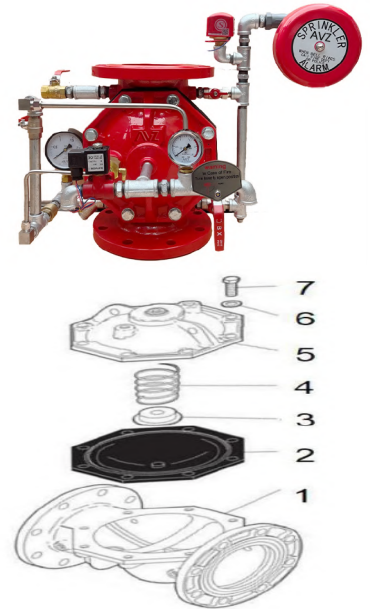


### SPECIFICATION

Type: Pilot control valve, Working pressure: 16bar.  
Flanged to BS4504 PN16

PRESSURE/TEMPERATURE RATINGS	
Working pressure	16 Bar
Working temperature	-10°C to 80°C

MATERIALS			
Part	Material	ASTM Spec	EN Spec
Body, Cover	Ductile iron	A536 65-45-12	1563 EN-JS1050
Diaphragm type	Rubber EPDM		
Spring Seat	Stainless steel	A276 S304 00	907 304 C15
Fitting	Stainless steel 304 Carbon Steel	A276 S304 00 -	907 304 C15 -
Painting	Red Epoxy Coating		



### 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.

### START-UP

Start-up of the deluge valve requires that proper procedures be followed: 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.

### 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 structure, reliance in performance, flexibility in installation and convenience in maintenance.

## SPECIFICATION AND MAIN TECHNICAL PARAMETER

### → Dimensions

Unit:mm

Size	Height of Alarm valve	Outside diameter of flange	Inside diameter of flange screw hole	Diameter of screw hole	Quantity of screw hole
DN65	326	200	160	19	4
DN80	330	220	180	19	8
DN100	330	266	230	19	8
DN150	400	285	240	23	8
DN200	508	340	295	23	12

## 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



## **INSTALLATION**

- (1) Get the valve out of package and check that there is no debris 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.

## **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 off 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

## **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 off 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.