

MODEL : SD-A

TECHNICAL DATA:

NOMINAL SIZE	: 200, 150, 100, 80, & 50 NB
RATED WORKING PRESSURE	: 12.3 Kg./Sq.Cm. (175 PSI)
THREADED OPENING	: BSPT (NPT - Optional)
MOUNTING	: 90° pattern inlet to outlet vertical mounting
FACTORY HYDROSTATIC TEST PRESSURE	: 25Kg./sq.cm. (350 psi)
FLANGE CONNECTION	: IS: 1538 or ANSI B 16.5
RECOMMENDED FLOW RATE	: 200NB - 300 to 1150 m3/hr 150NB - 170 to 650 m3/hr 100NB - 50 to 225 m3/hr 80NB - 30 to 110 m3/hr 50NB - 10 to 55 m3/hr
FRictional LOSS IN TERMS OF EQUIVALENT LENGTH OF PIPE (C-120)	: 200NB - 26.00 metres 150NB - 19.00 metres 80NB - 5.50 metres 50NB - 1.80 metres
WET PILOT SPRINKLER HEIGHT LIMITATION	: 200NB - 228 Kg. 150NB - 145 Kg. 100NB - 78 Kg. 80NB - 52 Kg. 50NB - 47 Kg.
FINISH	: Fire red epoxy painted
APPROVAL	: UL listed
ORDERING INFORMATION	: Size of valve flange connection and trim details



pressure because of the 2 : 1 differential pressure design. On detection of fire the top chamber is vented to atmosphere through the outlet port via opened actuation devices. The top chamber pressure cannot be replenished through the restricted inlet port, thus it reaches less than half the supply pressure instantaneously and the upward force of the supply pressure lifts the clapper allowing water to enter the system piping network and alarm devices.

TRIM DESCRIPTION

a) BASIC TRIM

The basic trim is required on all Shield Deluge valve regardless of release system. It contains those components which are required in all types of installation, such as the main drain valve, priming connection, drip check valve, emergency release valve and pressure gauges.

Deluge Valve is known as a system control valve in a deluge system, which is used for fast application of water in a spray system. They are used to protect areas such as power transformer installation, storage tank, conveyor protection etc. With the addition of foaming agent they do protect aircraft hanger and inflammable liquid fire.

VALVE OPERATION

Shield Deluge valve is a quick release, hydraulically operated diaphragm actuated type of valve. It has three chambers, isolated from each other by the diaphragm operated clapper and seat seal. While in SET position, water pressure is transmitted through an external bypass check valve and restriction orifice from the system supply side to the top chamber, so that supply pressure in the top chamber act across the diaphragm operated clapper which holds the seat against the inlet supply



b) DRY PILOT TRIM (PNEUMATIC RELEASE)

Dry pilot operation uses a pilot line of closed Sprinkler/QB detector containing air under pressure, located in the area to be protected. It requires regulated dry air supply with main supply point through restricted orifice. The pilot line is connected directly on the top of POSITIVE DRAIN ACTUATOR (PDA). The bottom of PDA is connected to the top chamber of the deluge valve. When the air pressure drops, due to release of any of the release devices on detection of fire, the diaphragm of PDA is lifted and allows the water to drain. This reduces the water pressure in the top chamber of the deluge valve and when the pressure in the top chamber reaches 50% of the supply pressure, the deluge valve opens. The direct drain of PDA start when the top chamber pressure of deluge valve reaches approximately 0.5 Kg/sq.cm. This positive drain will not permit the deluge valve to close unless the PDA is set manually. The recommended air supply pressure is as per TABLE-1.

c) WET PILOT TRIM (HYDRAULIC RELEASE)

Wet pilot operation uses a pilot line of closed sprinkler containing pressurised water, supplied through the upstream side of the deluge valve, through a restricted orifice. All the release lines are connected to a common release line. Due to release of any one of the release device, the water pressure in the top chamber of the deluge valve reaches 50% of the supply pressure, the deluge valve opens.

CAUTION

While using a deluge valve in the wet pilot system the height and the length of the wet pilot detection line is to be limited as shown in the wet pilot sprinkler height limitation graph as shown in this catalogue.

d) ELECTRIC RELEASE TRIM

To actuate a deluge valve electrically, a solenoid valve is provided to drain the water from the top chamber of the deluge valve. A pressure switch is provided to activate an electric alarm, to shut down the desired equipment or to give "Tripped" indication to the deluge valve. In addition to this a pressure switch can also monitor "Low air pressure" and "Fire condition" when used in dry pilot air line.

e) TEST AND ALARM TRIM WITH SPRINKLER ALARM

This trim is supplied with the sprinkler alarm bell, which bells on actuation of the deluge valve. A test valve is provided to test the normal operation of the sprinkler alarm bell.

LINE WATER PRESSURE Kg./ Sq.cm. MAXIMUM	AIR PRESSURE IN DETECTION LINE Kg./ Sq.cm.	
	MINIMUM	MAXIMUM
2	1.5	3.0
4	2.0	3.5
6	2.5	4.0
8	3.0	4.5
10	3.5	5.0
12	3.5	5.0

TABLE-1.

RESETTING PROCEDURE FOR THE DELUGE VALVE

- (i) Close the upstream side stop valve provided below the deluge valve.
- (ii) Open both the drain valves and close them when the flow of water has ceased.
- (iii) Inspect and release if required, or close the section of the detection system subjected to "Fire condition".
- (iv)
 - (a) In case of dry pilot detection system, open the air supply valve to build-up air pressure as shown in TABLE-1. Open the priming valve fully and press hold the knob of PDA till the water gauge indicate full service line pressure, then release the PDA knob. Open the upstream side of the stop valve provided below the deluge valve. No water should flow into the system, this can be checked by depressing the drip check valve knob.

CAUTION

- (a) Do not close the priming valve, down stream and upstream stop valves, while the system is in service.
- (b) The releasing device must be maintained in the open position, when actuated, to prevent the deluge valve from closure.

SYSTEM TESTING PROCEDURE

- (i) Keep the upstream side of the stop valve partially open. Open the upstream side of the drain valve, to maintain a minimum pressure of 3 bar on the upstream side of the deluge valve. To avoid damage, close down the system side stop valve. This valve is to be kept in open position after the testing is completed.
- (ii) Open the system side drain valve of the deluge valve.
- (iii) Let any of the release devices to trip. This will result in a sudden drop of water pressure in the deluge valve top chamber, resulting the deluge valve to open. The water flowing through the down stream side drain valve confirms that the deluge valve has actuated. Close the upstream side stop valve immediately.
- (iv) Reset the valve as per the procedure given under heading "RESETTING PROCEDURE FOR THE DELUGE VALVE".

INSPECTION AND MAINTENANCE

All the newly installed system piping network must be flushed properly before placing the deluge valve in service. A qualified and trained person must commission the system. After few initial successful tests, an authorised person must be trained to perform the inspection and testing of the system. It is recommended to have regular inspection and test run of the system as per NFPA guidelines or in accordance to the organisation having local jurisdiction.

WARNING

Inspection and testing is to be carried out only by authorised and trained personnel.
DO NOT TURN OFF



Shield/2005 - Shield reserves the right to change the contents without notice.

The water supply or close any valve to make repair(s) or test the valve, without placing a roving fire patrol in the area covered by the system. Also inform the local security personnel and central alarm station, so that a false alarm is not signalled. It is recommended to carry out physical inspection of the system at least twice in a week. The inspection should verify that all the control valves are in proper position as per the system requirement and no damage has taken place to any component.

(ii) NORMAL CONDITION

- (a) All main valves are open and are sealed with tamper proof seal.
- (b) Drain valves must be kept closed.
- (c) No leak or drip is detected from the drip valve.
- (d) All the gauges except the system side waterpressure gauge, should show the required pressure.
- (e) There should be no leakage in the system.

(iii) NORMAL CONDITION TEST

- (a) The system should be checked for normal condition at least once in a week.
- (b) Test the sprinkler alarm bell or electric alarm by turning the alarm test valve to the test position. The alarm should sound. This test should be carried out at least once in a week.
- (c) Depress the drip valve knob. Significant water accumulation indicates a possible seat leakage.
- (d) Conduct the water flow test as per the procedure of system testing at least once in a month.

(iv) PERIODIC CHECK

Conduct the water flow test by actuating few of the release devices provided in the system. Clean all strainer(s) and priming line restriction.

This test is to be carried out at least once in three months.

ABNORMAL CONDITION

(i) ALARM FAILS TO SOUND

- (a) Check for any obstruction in the alarm test line, make sure that the sprinkler alarm is free to operate.
- (b) If an electric alarm is provided, check the electrical circuitry to the alarm.

(ii) FALSE TRIPS

- (a) Check the priming valve, clogged priming line, restriction orifice check valve or strainer.
- (b) Leakage in the release system.
- (c) The deluge air panel orifice clogged or low supply pressure.

(iii) LEAKAGE THROUGH THE DELUGE VALVE

- (a) Damaged deluge valve seat or obstruction on the seat face by foreign object.
- (b) Leakage in release system.
- (c) Partly clogged priming line restriction orifice check valve.
- (d) Low air pressure on release system line or leakage in release system.
- (e) PDA seat leakage due to seat damage or obstruction on seat face by foreign objects (in dry pilot system only)

NOTE

The listing of UL is valid only when the Deluge Valve is installed with Shield trim set as per Shield trim drawing.

