

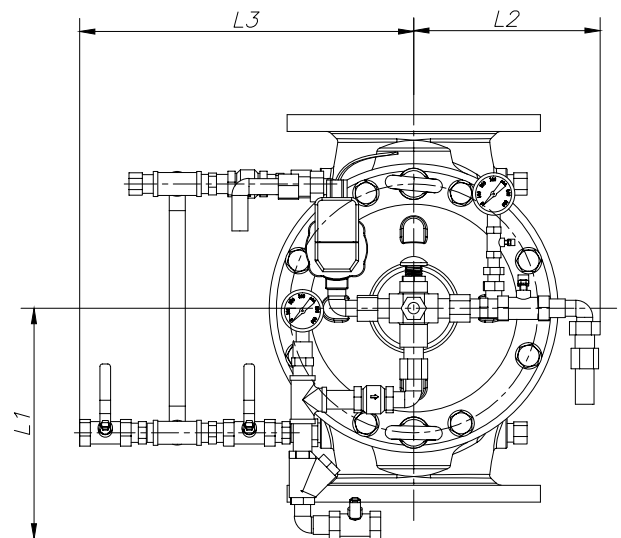
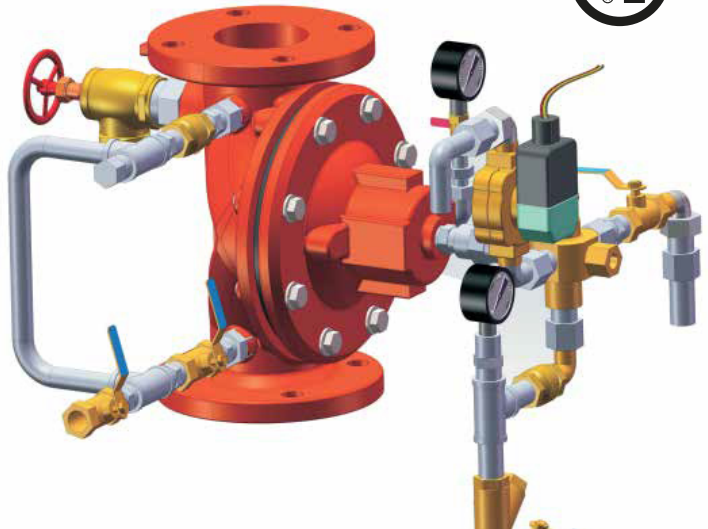
## DELUGE VALVE

MODEL: SD-DVH300



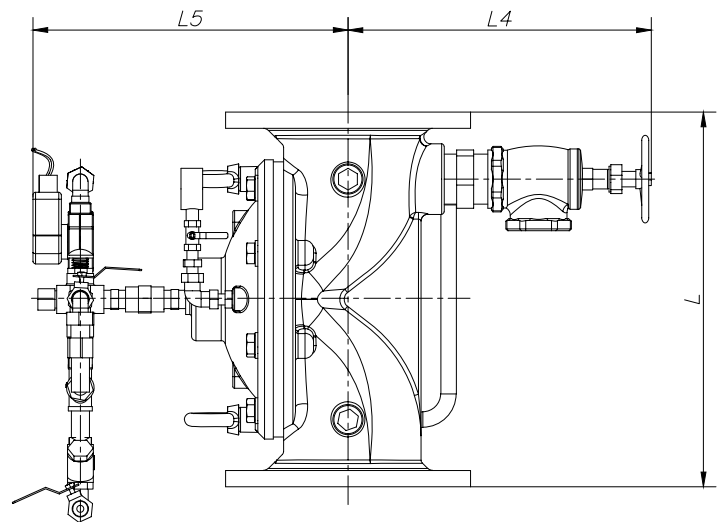
### TECHNICAL SPECIFICATION

- Nominal Size: 50, 65, 80, 100, 150, 200, 250, 300 NB
- End connection: Flange x Flange, Flange x Groove, Groove x Groove
- Working Pressure 300 psi
- Mode of actuation:-
  - Wet Pilot actuation
  - Dry Pilot actuation
  - Electrical actuation
- Flange connections ANSI B16.5, Class 150 (Other flange types are available upon request).
- Grooved connections are cut in accordance with standard groove specification for steel pipe.
- High Pressure, High Flow Deluge System Superior design featuring exceptionally low pressure losses at high flow rates.
- Low to negligible lifelong maintenance costs to no wetted metallic and mechanical moving parts design.
- For use in dry pipe (automatic sprinkler) fire protection system.
- Automatic or local manual emergency actuation  
Hazardous - flammable and explosion classified are fire suppression.
- Use for electrical signal trigger system and pipeline connection diagram system, manual-reset.
- Onshore & Offshore, naval, industrial, commercial & residential fire suppression
- Installed both vertical and horizontal orientation.
- Fusion Bonded epoxy coated interior and exterior to AWWA C550 standard.



### MATERIAL SPECIFICATION

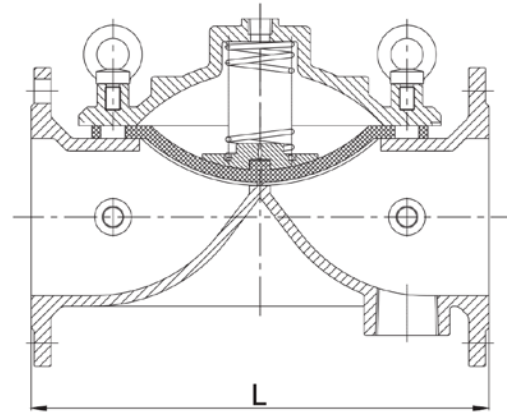
Part	Material
Body	Ductile Iron
Bonnet	Ductile Iron
Bonnet Fasteners	Carbon Steel
Diaphragm	Nylon Reinforced Rubber/ EPDM/NBR
Spring	Stainless Steel
Tube	Stainless Steel
Pipe Fittings	Malleable Iron
Ball Valve	Brass
Solenoid Valve	Brass
Check Valve 1/2"	Brass
Y Strainer 1/2"	Brass
Angle Valve	Brass
Water Relay	Brass
Drip Valve	Brass



## DIMENSIONS

Size	L	L1	L2	L3	L4	L5
2"	233	300	200	400	310	300
2.5"	290	300	200	400	330	310
3"	310	300	200	410	330	360
4"	356	300	200	420	350	360
5"	370	300	200	430	360	360
6"	436	300	200	450	380	380
8"	530	300	210	470	400	450
10"	636	320	250	500	430	480
12"	835	420	340	530	470	520

Unit:mm



## GENERAL DESCRIPTION

SHIELD deluge valve Model: SD-DVH300 is diaphragm structure, size from 2inch to 12inch, it can be installed in a vertical or horizontal orientation. It can be used as a water supply automatic control valve in fire protection systems. Selecting suitable piping accessories can provide a fire alarm signal when system is activated.

The valve has an external reset function, without having to open the inspection hole, the pressurized diaphragm chamber can be reset. In addition to the diaphragm, the valve has no disc and other parts; it is a simple structure. The valve is lined and coated with corrosion resistant fusion bonded epoxy and resin, making it suitable for use in harsh environments.

## WORKING PRINCIPLE

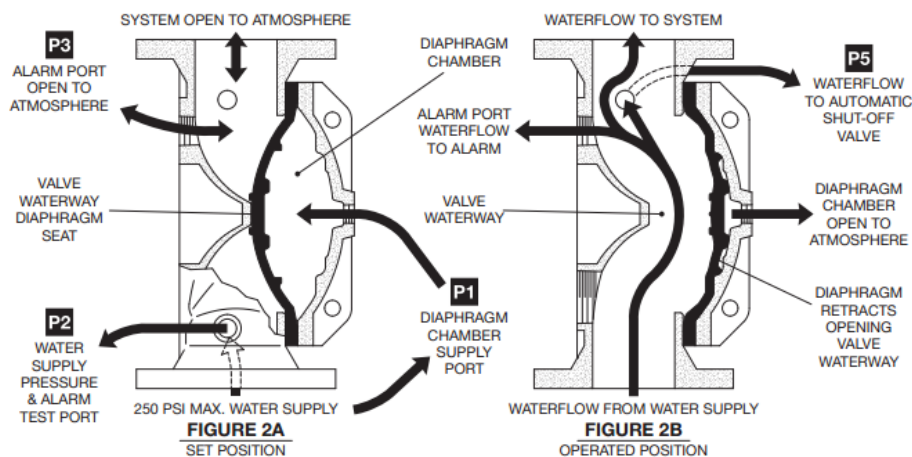
SHIELD deluge valve Model: SD-DVH300 is a diaphragm style valve that depends upon water pressure in the Diaphragm Chamber to hold the Diaphragm closed against the water supply pressure.

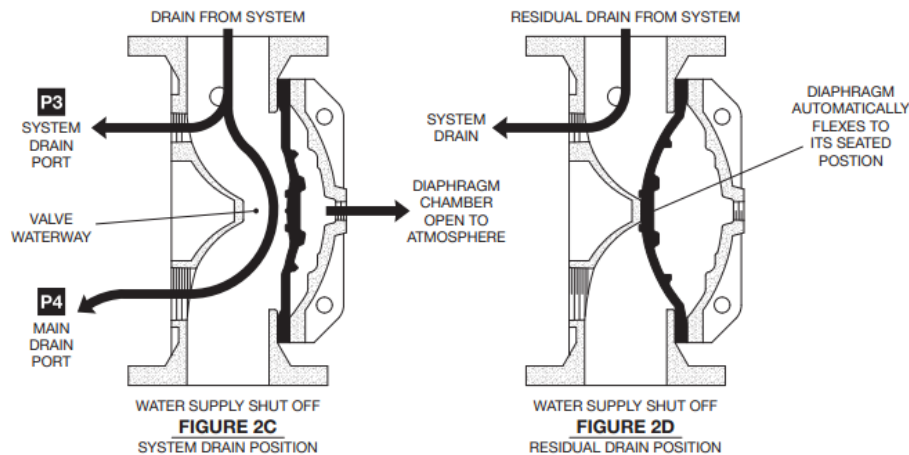
When the Valve is set for service, the Diaphragm Chamber is pressurized through the trim connections from the inlet side of the system's main control valve

Opening an actuation device, for example the solenoid valve in the Electric Actuation Trim, releases water from the Diaphragm Chamber faster than it can be replenished through restriction provided by the diaphragm chamber supply connection provided in the applicable trim arrangements.

This results in a rapid pressure drop in the Diaphragm Chamber and the force differential applied through the Diaphragm to hold the Diaphragm in the set position is reduced below the valve trip point.

The water supply pressure then forces the Diaphragm open, permitting water to flow into the system piping.





## NOTES

The epoxy resin coating for the SD-DVH300 Deluge Valve provides corrosion resistance and is intended to extend the life of the SD-DVH300 Deluge Valve when exposed to internal and external corrosive conditions.

Although the epoxy resin coating is intended to resist corrosion, it is recommended that the end user or other technical expert familiar with conditions at the proposed installation be consulted with respect to the suitability of this coating for a given corrosive condition.

Deluge systems using a seawater or brackish water supply require special considerations in order to extend the life of the valve and trim.

This type of system ideally should be configured with a primary source of clean fresh water (e.g., a pressurized water tank) and only upon system operation is the secondary water supply (seawater or brackish water) allowed to enter the system.

After the system operation, the system should then be thoroughly flushed with clean fresh water. Following this recommendation will increase the service life of the Valve and Trim.

## INSTALLATION

- Install the deluge valve in a readily visible and accessible location.
- Before trim installation, clean all nipples, fittings, and devices to ensure they are free of scale and burrs. Use pipe-thread sealant sparingly on male pipe threads only.
- Exercise care to ensure that check valves, strainers, and globe valves are installed with the flow arrows in the proper direction.
- Drain tubing must be installed with smooth bends that will not restrict flow.
- Ensure suitable provision exists for disposal of drain water (as in the case of a flow test via the Main Drain Valve). Direct drain water so that it cannot cause accidental damage to property or danger to persons
- Connect the Diaphragm Chamber Supply Control Valve to the inlet side of the Main Control/Shut-Off Valve to facilitate setting the valve.
- The connection to the Diaphragm Chamber Supply Control Valve should be as short as practical and from the same water supply as the system.
- Make conduit and electrical connections in accordance with the requirements of the authority having jurisdiction and/or the National Electrical Code (NFPA 70).

## NOTES

Proper operation of the SD-DVH300 Deluge Valves depends upon their trim being installed in accordance with the instructions given in their respective Technical Data Sheet.

Failure to follow the appropriate trim diagram may prevent the SD-DVH300 Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.

The Deluge Valves must be installed in a readily visible and accessible location.

The Valves associated trim, and wet pilot lines must be maintained at a minimum temperature of 40°F (4.4°C). Heat tracing of the Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that can prevent proper operation.

## **MAINTENANCE**

The following procedures and inspections must be performed as indicated, in addition to any specific requirements of the NFPA. Any impairment must be immediately corrected.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection system from the proper authorities and notify all personnel who may be affected by this action.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national code.

When the system is using either a seawater or brackish water supply, internal and external inspection of the SD-DVH300 Deluge Valve and Trim is essential. Parts showing any signs of corrosion must be replaced to ensure the integrity of the system.

## **DROP IN WATER SUPPLY PRESSURE BELOW NORMAL RANGE**

If the water supply pressure is significantly reduced below the normally expected static pressure range (as could occur in the case of a water main break or repair), and there is a subsequent drop in the diaphragm chamber water pressure below its normal range (due, for example, to a leak in a piping connection to or from the diaphragm chamber or, a leak in the diaphragm chamber check valve caused by dirt or debris in the check valve seal area), a deluge valve such as the SD-DVH300 could inadvertently trip, if its water supply pressure is quickly restored.

A drop in the water supply pressure to below its normal range (as in the case of an interrupted water supply condition) constitutes an emergency impairment as defined by NFPA 25. Should this condition occur, immediately close the main control valve and utilize the following procedure to reset the system:

- Prior to the water supply pressure being restored to the closed main control valve, note the pressure indicated by the diaphragm chamber pressure gauge and determine if the pressure is within the normally expected range.
- If the diaphragm chamber pressure is below the normal range, check for and correct any source of leakage from the diaphragm chamber prior to resetting the system.
- After the water supply pressure is restored to the main control valve, reset the SD-DVH300 Deluge Valve in accordance with the Valve Setting Procedure section.

## **ANNUAL OPERATION TEST PROCEDURE**

Proper operation of the SD-DVH300 Valve (i.e., opening of the SD-DVH300 Valve as during a fire condition) must be verified at least once a year as follows:

- If water must be prevented from flowing beyond the riser, perform the following steps:
  - a. Close the Main Control Valve.
  - b. Open the Main Drain Valve.
  - c. Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain Valve.
  - d. Close the Main Drain Valve
- Determine the type of actuation/detection system and operate the SD-DVH300 Valve accordingly.

**NOTES**

Be prepared to quickly perform Steps 3, 4, and 5 if water must be prevented from flowing beyond the riser.

Wet Pilot Actuation - Open the Inspector's Test Connection.

Electric Actuation - Test the deluge releasing panel (automatic control unit) in accordance with the manufacturer's instructions to energize the solenoid valve.

- Verify that the SD-DVH300 Valve has tripped, as indicated by the flow of water into the system.
- Close the system's Main Control Valve.
- Close the Diaphragm Chamber Supply Control Valve.
- Reset the SD-DVH300 Deluge Valve in accordance with the Valve Setting Procedure provided as applicable.

**INTERNAL VALVE INSPECTION**

Once every five years during the annual operational test procedure and prior to the SD-DVH300 Valve being reset, the interior of the SD-DVH300 Valve must be cleaned and inspected for wear and damage. Damaged or worn parts must be replaced. (Replacement of the Diaphragm every ten years is recommended.)

When reinstall the Diaphragm Cover, the Diaphragm Cover Fasteners must be uniformly and securely tightened using a cross-draw sequence. After tightening, double-check to make certain that all the Diaphragm Cover Fasteners are securely tightened.

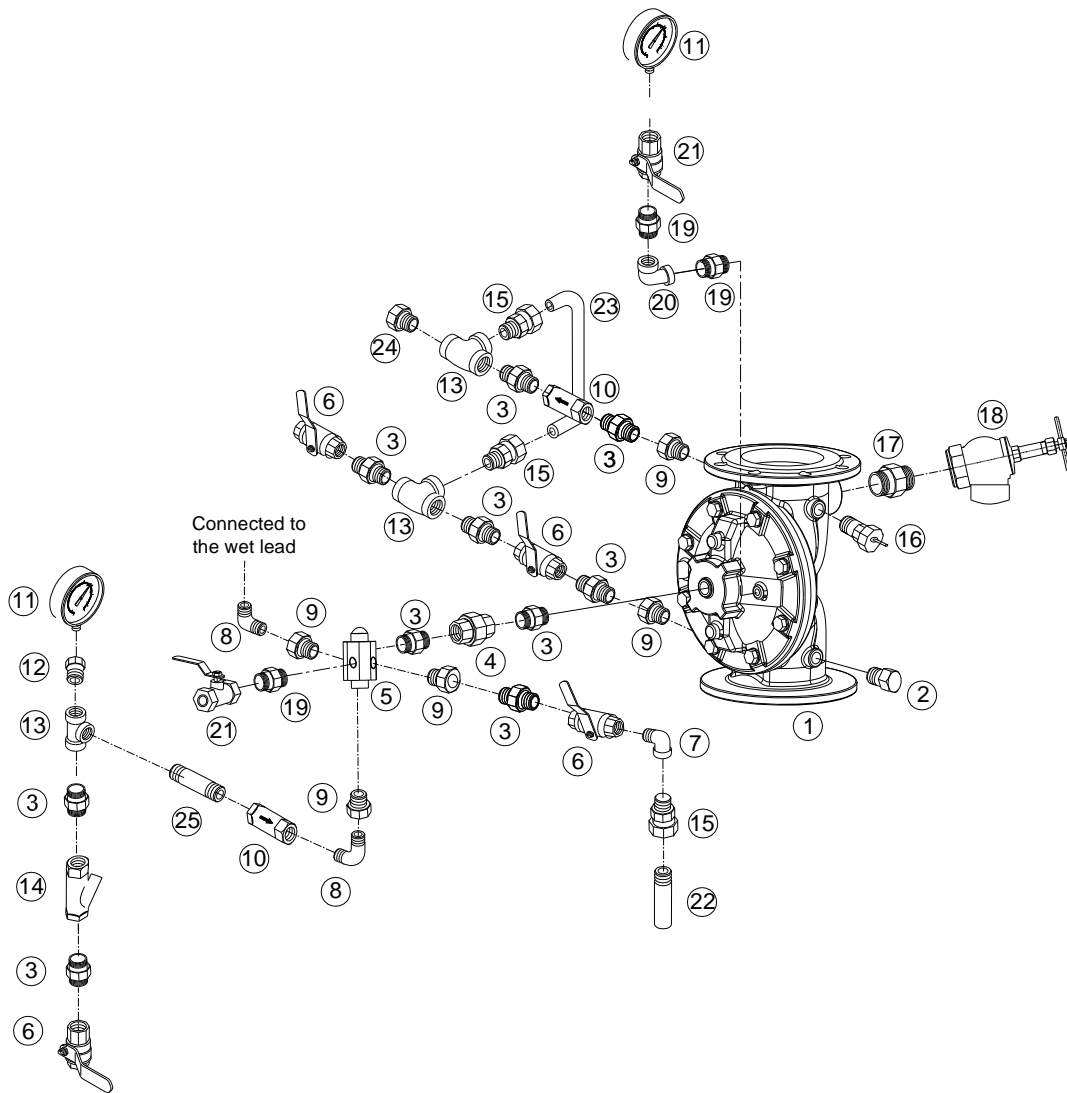
**NOTES**

If the water supply contains chemicals which tend to attack a Nylon fabric reinforced, natural rubber or the five-year inspection indicates a build up of debris within the valve that could affect its proper operation, then the frequency of the internal valve inspection procedure must be appropriately increased.

If the system has a seawater or brackish water supply, then the frequency of the internal valve inspection procedure must be appropriately increased. (An annual internal valve inspection for a system having a seawater or brackish water supply is recommended.) Make certain that the Diaphragm is correctly oriented; otherwise, the SD-DVH300 cannot be properly set. Under tightening the Diaphragm Cover Bolts can result in internal and external leakage.

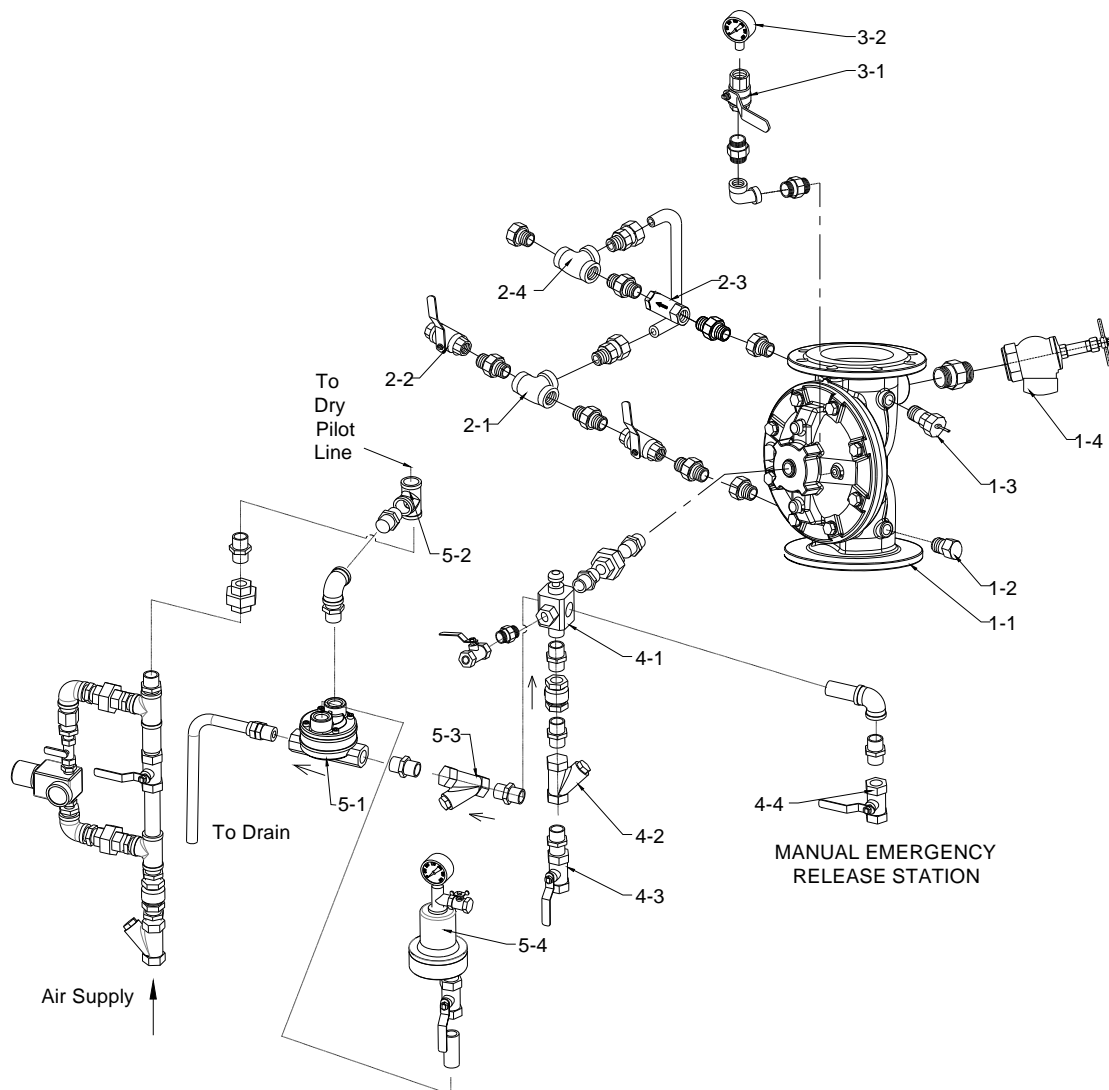
## THE DELUGE VALVE WORKING SYSTEM

### WET PILOT SPRINKLER PIPELINE TRIGGER SYSTEM



Item	Part Name	Material	Item	Part Name	Material
1	Main Valve	Assembly	15	Sleeve Joint	SS304
2	½" NPT Plug	Malleable Iron	16	Drip Valve	Brass
3	½" Pipe Fittings	Malleable Iron	17	Pipe Fitting	Malleable Iron
4	½" Pipe Fittings	Malleable Iron	18	Globe Valve	Brass
5	Hydraulic relay	Assembly	19	¼" Pipe Fitting	Malleable Iron
6	½" Ball Valve	Brass	20	¼" 90° Elbow	Malleable Iron
7	½" 90° Elbow	Malleable Iron	21	¼" Ball Valve	Brass
8	½" 90° Elbow	Malleable Iron	22	Drain Valve	SS304
9	½" Pipe Fittings	Malleable Iron	23	Pipe	SS304
10	½" Check Valve	Brass	24	Reducer Union	Malleable Iron
11	Pressure Gauge	Brass	25	½" Pipe Fitting	SS304
12	Reducer Union	Malleable Iron			
13	½" Tee Joint	Malleable Iron			
14	½" Y-Strainer	Brass			

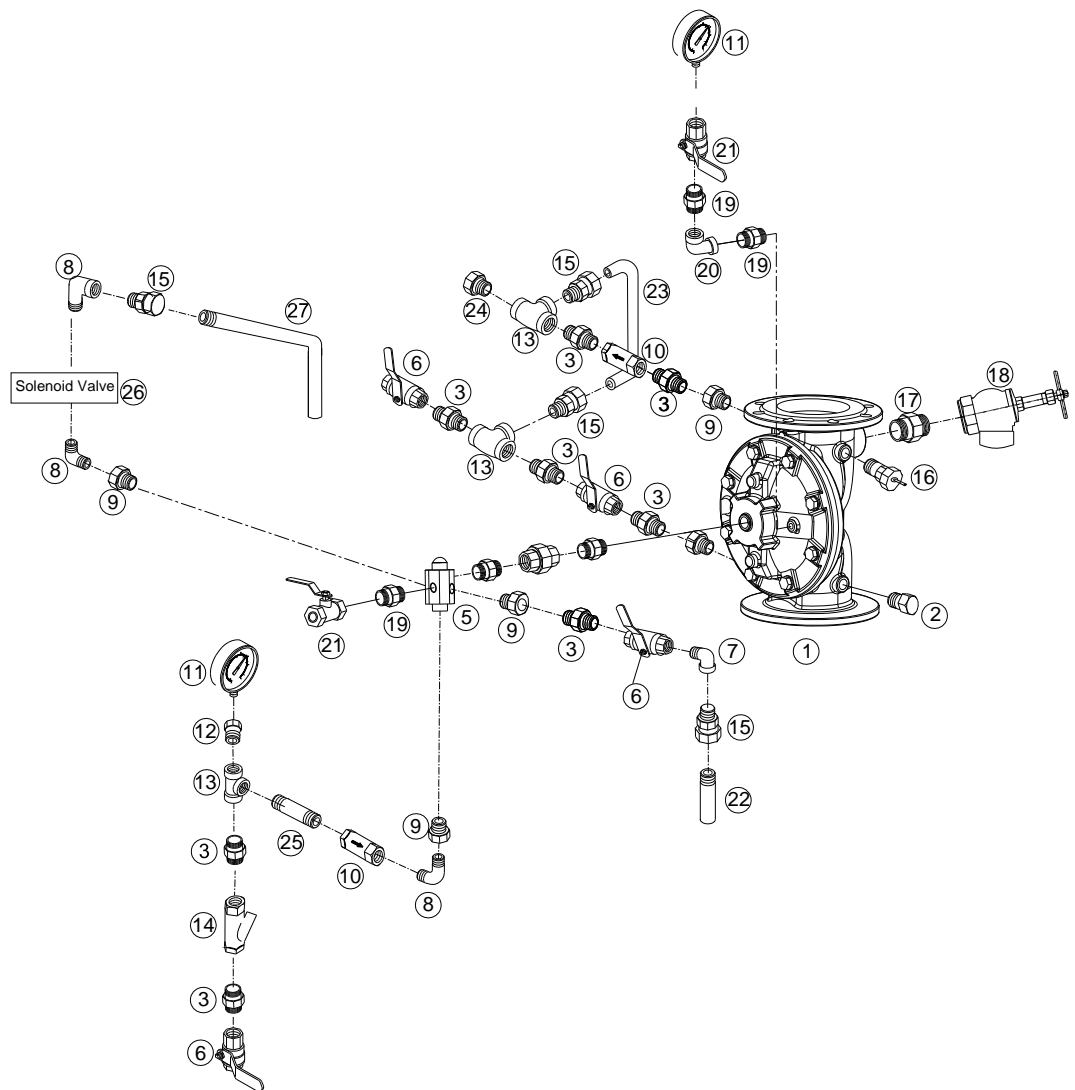
## DRY PILOT SPRINKLER PIPELINE TRIGGER SYSTEM



Item	Part Name	Material	Item	Part Name	Material
1-1	Main Valve	Assembly	3-2	Pressure Gauge	Assembly
1-2	1/2" NPT Plug	Malleable Iron	4-1	Water Relay	Brass
1-3	Drip Valve	Brass	4-2	1/2" Y-Strainer	Brass
1-4	Angle Valve	Brass	4-3	1/2" Ball Valve	Brass
2-1	1/2" Tee Joint	Malleable Iron	4-4	1/2" Ball Valve	Brass
2-2	1/2" Ball Valve	Brass	5-1	Low-Pressure Drain Valve	Bronze
2-3	1/2" Check Valve	Brass	5-2	1/2" Tee Joint	Malleable Iron
2-4	1/2" Tee Joint	Malleable Iron	5-3	1/2" Y-Strainer	Brass
3-1	1/4" Ball Valve	Brass	5-4	Accelerator	Assembly



## ELECTRICAL SIGNAL TRIGGER SYSTEM



Item	Part Name	Material	Item	Part Name	Material
1	Main Valve	Assembly	16	Drip Valve	Brass
2	½" NPT Plug	Malleable Iron	17	Pipe Fitting	Malleable Iron
3	½" Pipe Fittings	Malleable Iron	18	Globe Valve	Brass
4	½" Pipe Fittings	Malleable Iron	19	¼" Pipe Fitting	Malleable Iron
5	Hydraulic relay	Assembly	20	¼" 90° Elbow	Malleable Iron
6	½" Ball Valve	SS304	21	¼" Ball Valve	Brass
7	½" 90° Elbow	Malleable Iron	22	Drain Valve	SS304
8	½" 90° Elbow	Brass	23	Pipe	SS304
9	½" Pipe Fittings	Malleable Iron	24	Reducer Union	SS304
10	½" Check Valve	Brass	25	½" Pipe Fitting	SS304
11	Pressure Gauge	Brass	26	Solenoid Valve	Assembly
12	Reducer Union	Malleable Iron	27	Drain Valve	SS304
13	½" Tee Joint	Malleable Iron			
14	½" Y-Strainer	Brass			
15	Sleeve Joint	SS304			



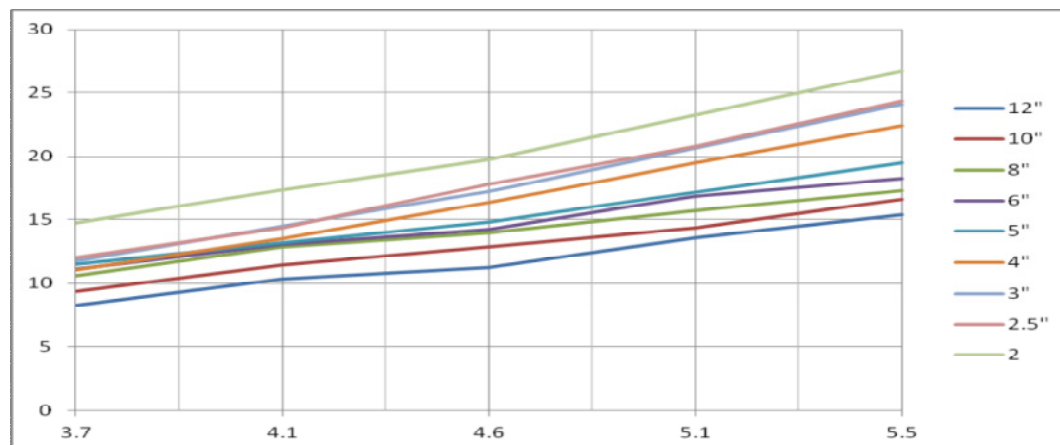
## AIR PRESSURE SETTINGS

Water Pressure		MIN	
psi	KPa	psi	KPa
20-60	138-414	9.5	65
61-100	415-690	12	83
101-140	691-966	15	103
141-175	967-1207	18	125
176-250	1208-1725	21	145
251-300	1726-2070	24	166

## HEAD LOSS

SHIELD Model: SD-DVH300 deluge valve adopts the unique design of diaphragm, so that it has the smallest head loss.

Flow velocity(m/s)	Head Loss (KPa)								
	12"	10"	8"	6"	5"	4"	3"	2.5"	2"
3.7	8.27	9.36	10.62	11.14	11.5	11.06	11.78	11.99	14.72
4.1	10.36	11.47	12.83	13.06	13.17	13.53	14.44	14.37	17.4
4.6	11.23	12.83	13.94	14.21	14.82	16.36	17.27	17.8	19.77
5.1	13.57	14.31	15.67	16.84	17.17	19.47	20.65	20.76	23.24
5.5	15.36	16.58	17.33	18.26	19.5	22.4	24.05	24.33	26.72



## ORDERING INFORMATION

If ordering please indicate the following contents:

- The deluge valve system type (wet lead nozzle pipe or electrical signals in the guidance system)
- The deluge valve nominal diameter
- Installation (vertical or horizontal)
- The deluge valve connection flange (FL\*FL/FL\*GR/GR\*GR)
- Pipe fittings material requirements (stainless steel or galvanized)
- Use indoor or outdoor