

## DELUGE VALVE

**MODEL: SD-DVA**



### TECHNICAL DATA :

Nominal Size	200, 150, 100, 80 & 50NB
Material	Cast Iron
Maximum Working Pressure	12 Bar (175 Psi)
Threaded Opening	BSPT
Testing Pressure	350 PSI
Mounting	90° pattern inlet to outlet vertical mounting
Factory Hydrostatic Test Pressure	25 Kg./sq.cm. (350 Psi)
Flange Connection	ANSI B 16.1 FF # 125 (Flange drilling matching to ANSI B 16.5 # 150)
Trim	Galvanized Steel with Brass Valves
Wet Pilot Sprinkler Height Limitation	As per graph in the catalogue
Net Weight without Trim	200NB - 214 Kg 150NB - 131 Kg 100NB - 77 Kg 80NB - 50 Kg 50NB - 47 Kg
Finish	Red RAL 3000
Ordering Information	Specify: 1) Size of valve 2) Trim type - Dry Pilot/Wet Pilot Electric Release Test & Alarm

### DESCRIPTION

Deluge Valve is known as a system control valve in a deluge system, used for fast application of water in a spray system. Deluge valve protects areas such as power transformer installation, storage tank, conveyor protection and other industrial application etc. With the addition of foaming agent deluge valve can be used to protect aircraft hangar and inflammable liquid fire.

### VALVE OPERATION

Deluge valve is a quick release, hydraulically operated diaphragm 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 acts across the diaphragm operated clapper which holds the seat against the inlet supply pressure because of differential



pressure design.

On detection of fire the top chamber is vented to atmosphere through the outlet port via opened actuation device(s). 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 deluge valve regardless of the 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.

#### b) DRY PILOT TRIM (PNEUMATIC RELEASE)

Dry pilot operation uses a pilot line of closed Sprinklers / QB detectors 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 to 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 starts when the top chamber pressure of deluge valve reaches approximately 0.7 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 below table.

LINE WATER PRESSURE Kg./ Sq.cm. MAXIMUM	AIR PRESSURE IN DETECTION LINE Kg./ Sq.cm.	
	MINIMUM	MAXIMUM
2	1.2	3.0
4	1.5	3.0
6	2.0	3.5
8	2.5	3.5
10	3.0	3.5
12	3.5	4.0

#### c) WET PILOT TRIM (HYDRAULIC RELEASE)

Wet pilot operation uses a pilot line of closed sprinklers 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 devices, 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 given in the wet pilot sprinkler height limitation graph.

#### 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 panel.

In addition to this two nos of pressure switches can be used to monitor "Low air pressure" and "Fire condition" when used in dry pilot airline.

#### 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.

Note: Trim without Test and Alarm trim, without Drain & drip valve can be supplied for which please contact marketing.

#### RESETTING PROCEDURE

1. Close the upstream side stop valve provide below the deluge valve.
2. Open both the drain valves and close them when the flow of water has ceased.
3. Inspect and release if required, or close the section of the detection system subjected to "Fire condition".

4. 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 pressure gauge indicate full service line pressure and 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

- Do not close the priming valve, downstream and upstream stop valves, while the system is in service.
- The releasing device must be maintained in the open position, when actuated, to prevent the deluge valve from closure.
- 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 limitation graph.
- Do not connect the Sprinkler Alarm outlet drain line to close a common drain as it may create back pressure and Sprinkler Alarm may not function.
- Deluge valve must have support to absorb sudden opening or closing vibration shock to the piping.
- The responsibility of maintenance of the protection system and devices in proper operating condition lies with the owner of the system.
- Deluge Valve & its trim shall be maintained at a minimum temperature of 4°C, Heat tracing is not permitted.
- Deluge Valve must be used in pressurised system

#### SYSTEM TESTING PROCEDURE

1. 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 Kg./sq. cm on the upstream side of the deluge valve. To avoid water damage close the system side stop valve. This valve is to be kept in open position after the testing is completed.
2. Open the system side drain valve of the deluge valve.
3. 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 downstream side drain valve confirms that the deluge valve has actuated, immediately close the upstream side stop valve.
4. Once testing is over reset the valve as per 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 inspection and testing of the system. It is recommended to have regular inspection and test run the system as per NFPA guidelines or in accordance with the guideline laid down by the organisation having local jurisdiction.

### (i) WARNING

Inspection and testing is to be carried out only by authorised and trained personnel. DO NOT TURN OFF the water supply or close any valve to make repair(s) or test the valve, without placing a roving fire patrol in the area protected by the system. Also inform the local security personnel and central alarm station, so that a false alarm is not signaled. 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

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

### (iii) NORMAL CONDITION TEST

- The system should be checked for normal condition at least once a month.
- 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.
- Depress the drip valve knob. Significant water accumulation indicates a possible seat leakage.
- 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 six months.

## ABNORMAL CONDITION

### (i) ALARM FAILS TO SOUND

- Check for any obstruction in the alarm test line, Ensure that the sprinkler alarm is freely operating.
- If an electric alarm is provided, check the electrical circuitry to the alarm.

### (ii) FALSE TRIPS

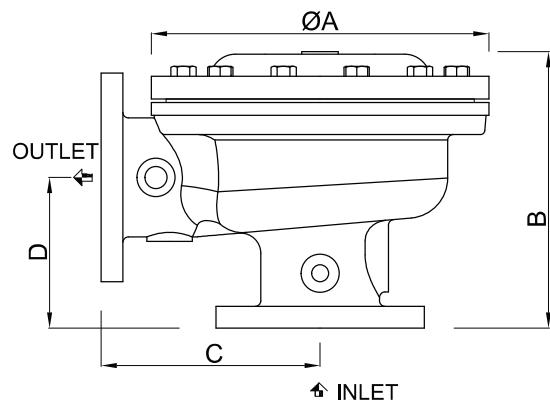
- Check for clogging in priming line, restriction orifice check valve, priming valve & strainer.
- Leakage in the release system.
- The deluge air panel orifice clogged or low supply pressure.

### (iii) LEAKAGE THROUGH THE DELUGE VALVE

- Damaged deluge valve seat or obstruction on the seat face by foreign object.
- Leakage in release system.
- Partly clogged priming line, restriction check valve.
- Low air pressure on system line or leakage in release system.
- PDA seat leakage due to seat damage or obstruction on seat face by foreign objects (in dry pilot system only)
- Leakage through bypass valve if installed in the system.

### NOTE:

- UL Listing is valid only when Deluge Valve is installed with trim set as per trim drawing.
- The trip time of deluge valve on device through detection network, will depend on volume of detection network. If the trip time of deluge valve is more, then it can be substantially reduced by installing check valve in branch of release line in the detection network. The check valve flow shall be towards releasing device.
- The pneumatic system must have restricted orifice at air or gas supply point. The restriction nozzle are supplied with dry pilot actuation trim.
- The Solenoid Valve provided for electric operation of the deluge valve and all released device must have minimum of 9.5mm orifice diameter, otherwise the deluge valve trip time will be quite high or deluge valve may not trip.



## DIMENSIONS

SIZE	A	B	C	D
200 NB	540	455	330	230
150 NB	464	382	300	200
100 NB	370	304	240	165
80 NB	316	272	210	135
50 NB	316	272	210	135

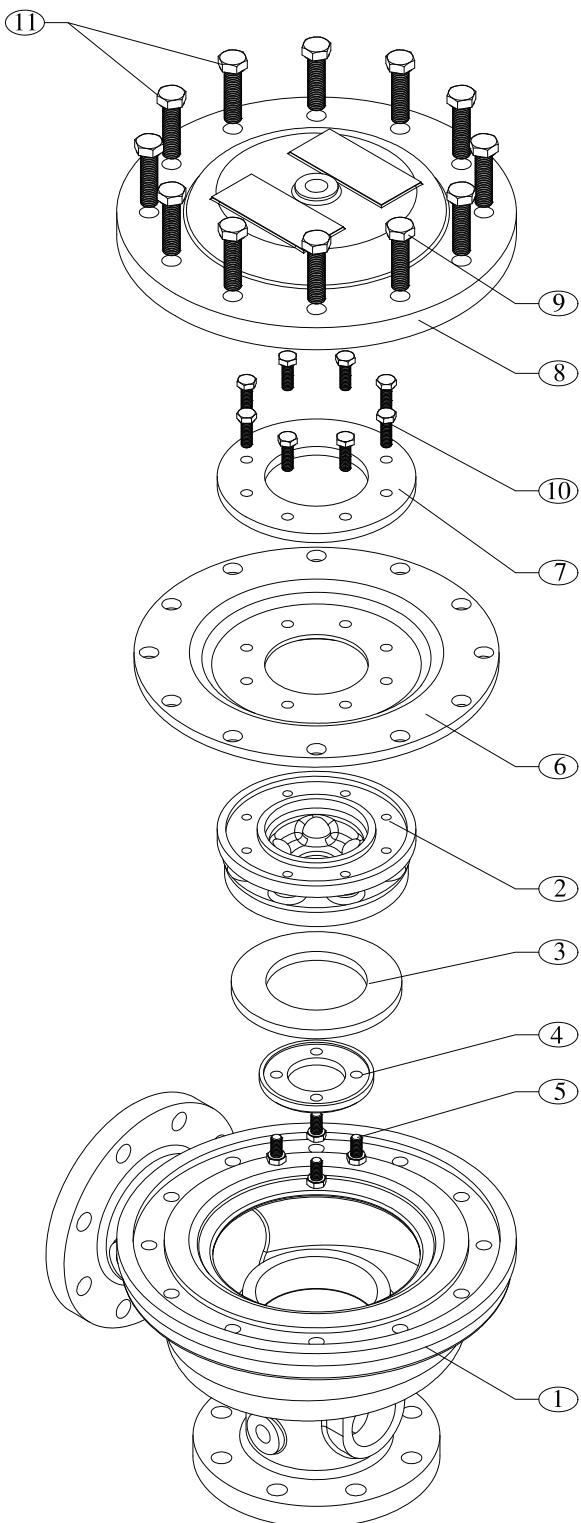
## DELUGE VALVE PART LIST

ITEM	PART NO.					DESCRIPTION	QTY.					MATERIAL SPECIFICATION
	200 NB	150 NB	100 NB	80 NB	50 NB		200 NB	150 NB	100 NB	80 NB	50 NB	
1	NA	NA	NA	NA	NA	Housing	1	1	1	1	1	Cast Iron
2	A2002	A1502	A1002	A8002	A5002	Clapper	1	1	1	1	1	Ductile Iron
3	A2003	A1503	A1003	A8003	A5003	Rubber Seat	1	1	1	1	1	Neoprene Rubber
4	A2004	A1504	A1004	A8004	A5004	Rubber Clamp	1	1	1	1	1	Ductile Iron*
5	A2005	A1505	A1005	A8005	A5005	Bolt (M10X20)	6	4	4	3	3	Stainless Steel
6	A2006	A1506	A1006	A8006	A5006	Diaphragm	1	1	1	1	1	Neoprene Rubber
7	A2007	A1507	A1007	A8007	A5007	Clamp Ring	1	1	1	1	1	Ductile Iron*
8	NA	NA	NA	NA	NA	Cover	1	1	1	1	1	Cast Iron
9	A2009	A1509	--	--	--	Bolt (M20X70)	14	14	--	--	--	Carbon Steel
	--	--	A1009	--	--	Bolt (M16x60)	--	--	10	--	--	Carbon Steel
	--	--	--	A8009	A5009	Bolt (M16X55)	--	--	--	10	12	Carbon Steel
10	A2010	A1510	A1010	A8010	A5010	Bolt (M10X30)	12	12	8	8	8	Stainless Steel
11	A2011	A1511	--	--	--	Bolt (M20X50)	2	2	--	--	--	Carbon Steel
	--	--	A1011	--	--	Bolt (M16X50)	--	--	2	--	--	Carbon Steel
	--	--	--	A8011	--	Bolt (M16X45)	--	--	--	2	--	Carbon Steel

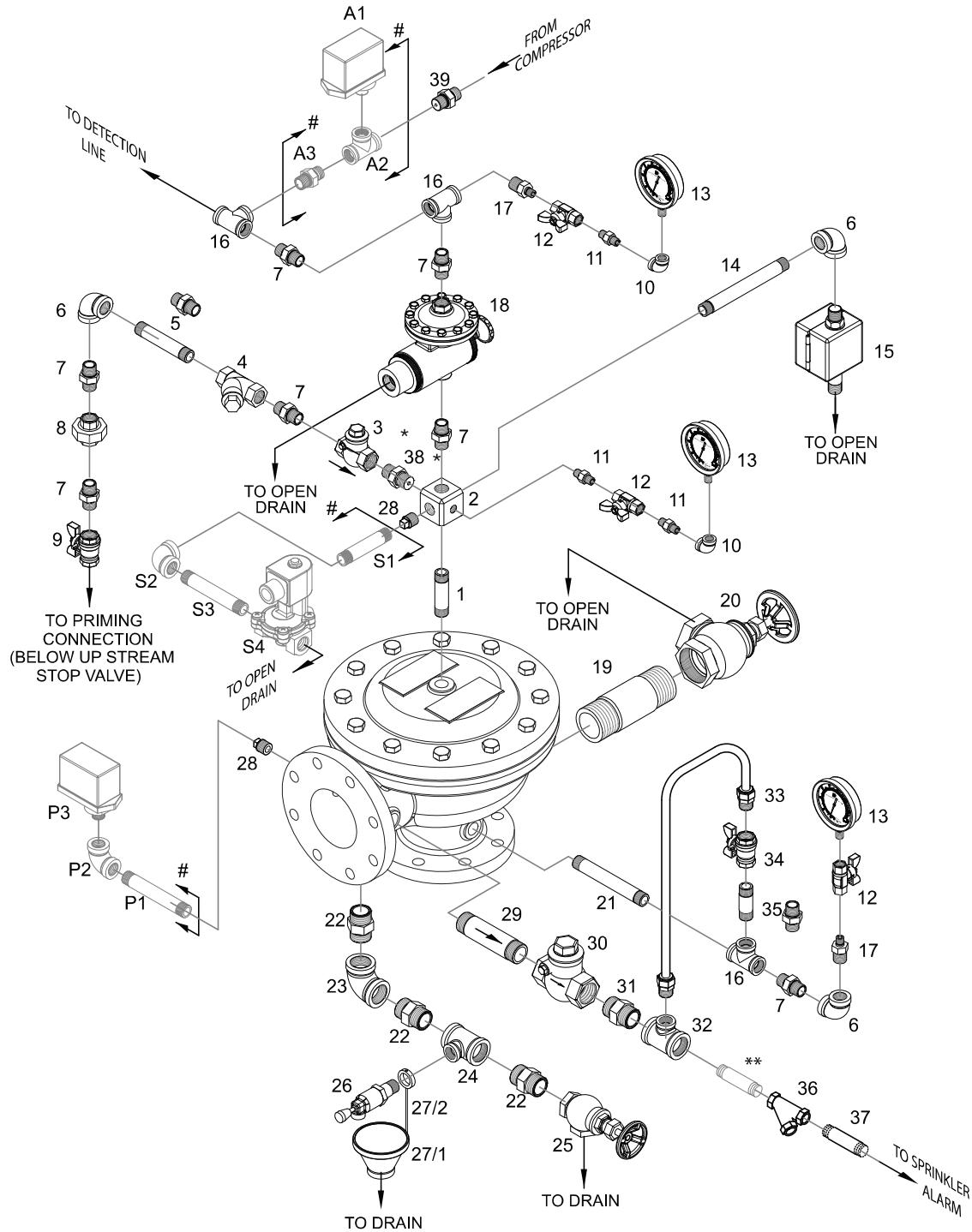
NA- Parts replacement not available.

\* Ductile Iron is standard supply, bronze & stainless steel is optional supply.

## DELUGE VALVE MODEL - SD-DVA



## PNEUMATIC & ELECTRIC RELEASE TRIM WITH TEST & ALARM TRIM FOR DELUGE VALVE



Note: When electric trim is supplied then Sl.No. 28 Plug not required.

# Electric Trim optional.

\*\* Suit at site by installer.

\* Supplied fitted together.

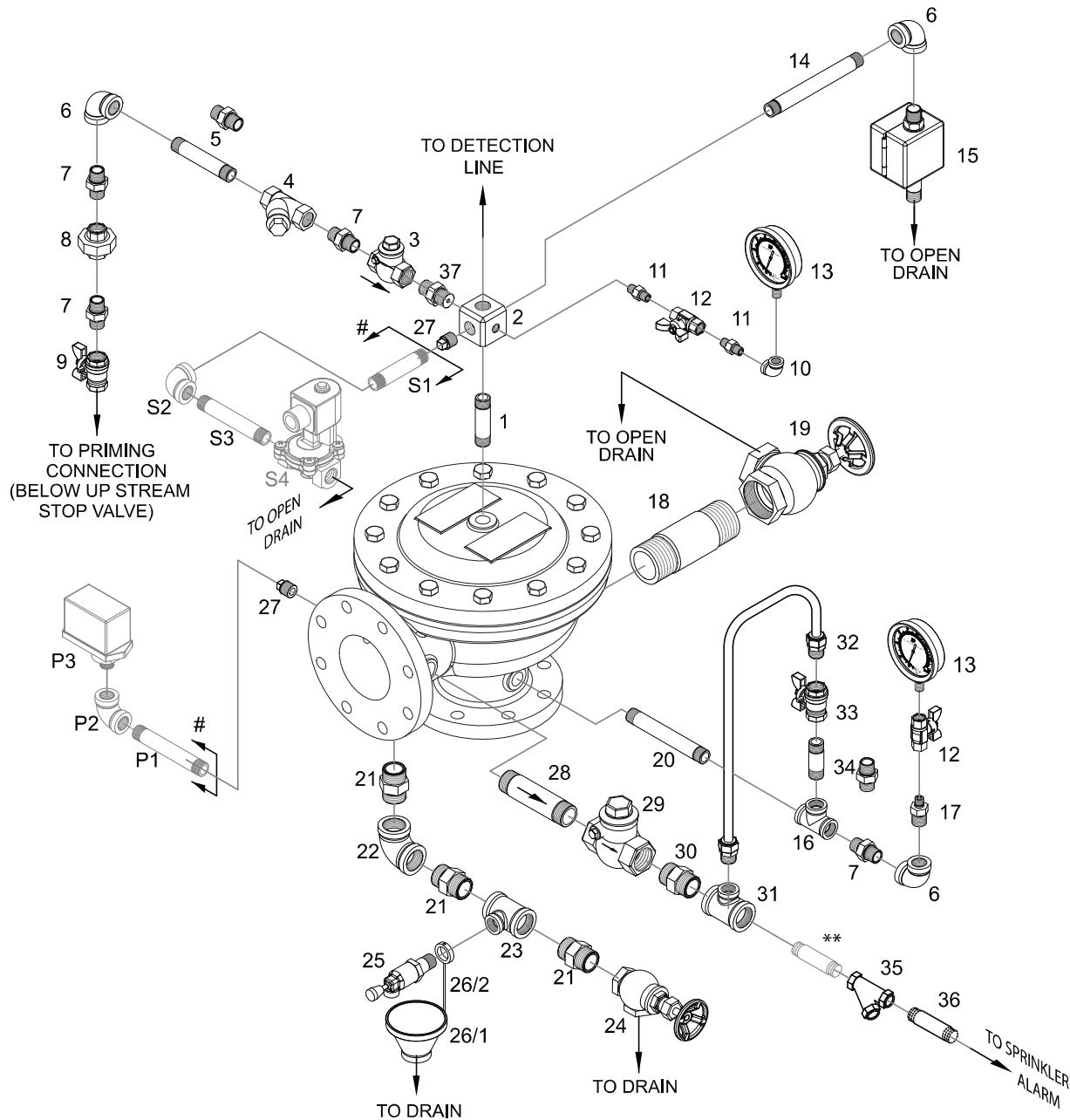
## PNEUMATIC &amp; ELECTRIC RELEASE TRIM WITH TEST &amp; ALARM TRIM FOR DELUGE VALVE

ITEM NO.	CODE NO.	DESCRIPTION	SIZE	QTY				
				200NB	150 NB	100 NB	80 NB	50 NB
1	A01	Pipe Nipple	1/2" X 80 mm Long	1	1	1	1	1
2	A02	6 Way Manifold	---	1	1	1	1	1
3	A03	Swing Check Valve*	1/2"	1	1	1	1	1
4	A04	Y Strainer	1/2"	1	1	1	1	1
5	A05/1	Pipe Nipple	1/2" X 110 mm Long	1	1	---	---	---
5	A05/2	Hex Nipple	1/2"	---	---	1	1	1
6	A06	Elbow	1/2"	3	3	3	3	3
7	A07	Hex Nipple	1/2"	7	7	7	7	7
8	A08	Union	1/2"	1	1	1	1	1
9	A09	Ball Valve	1/2"	1	1	1	1	1
10	A10	Elbow	1/4"	2	2	2	2	2
11	A11	Hex Nipple	1/4"	3	3	3	3	3
12	A12	Gauge Valve	1/4"	3	3	3	3	3
13	A13	Pressure Gauge	1/4"	3	3	3	3	3
14	A14/1	Pipe Nipple	1/2" X 300 mm Long	1	---	---	---	---
14	A14/2	Pipe Nipple	1/2" X 255 mm Long	---	1	---	---	---
14	A14/3	Pipe Nipple	1/2" X 210 mm Long	---	---	1	---	---
14	A14/4	Pipe Nipple	1/2" X 180 mm Long	---	---	---	1	1
15	A15	Emergency Release station	---	1	1	1	1	1
16	A16	Tee	1/2"	3	3	3	3	3
17	A17	Reducing Hex Nipple	1/2" X 1/4"	2	2	2	2	2
18	A18	Positive Drain Actuator	---	1	1	1	1	1
19	A19/1	Pipe Nipple	2" X 110 mm Long	1	1	1	--	--
19	A19/2	Pipe Nipple	1-1/4" X 110 mm Long	---	---	---	1	1
20	A20/1	Angle Valve	2"	1	1	1	--	--
20	A20/2	Angle Valve	1-1/4"	---	---	---	1	1
21	A21/1	Pipe Nipple	1/2" X 150 mm Long	1	1	---	---	---
21	A21/2	Pipe Nipple	1/2" X 130 mm Long	---	---	1	1	1
22	A22/1	Hex Nipple	1"	3	3	3	--	--
22	A22/2	Hex Nipple	3/4"	---	---	---	3	3
23	A23/1	Elbow	1"	1	1	1	--	--
23	A23/2	Elbow	3/4"	---	---	---	1	1
24	A24/1	Reducing Tee	1" X 1/2" X 1"	1	1	1	--	--
24	A24/2	Reducing Tee	3/4" X 1/2" X 3/4"	---	---	---	1	1

\* Supplied fitted together.

ITEM NO.	CODE NO.	DESCRIPTION	SIZE	QTY				
				200 NB	150 NB	100 NB	80 NB	50 NB
25	A25/1	Angle Valve	1"	1	1	1	---	---
25	A25/2	Angle Valve	¾"	---	---	---	1	1
26	A26	Drip Valve	½"	1	1	1	1	1
27/1	A27/1	Funnel	---	1	1	1	1	1
27/2	A27/2	Funnel Holder	---	1	1	1	1	1
28	A28	Plug	½"	2	2	2	2	2
29	A29	Pipe Nipple	¾" X 100 mm Long	1	1	1	1	1
30	A30	Swing Check Valve	¾"	1	1	1	1	1
31	A31	Hex Nipple	¾"	1	1	1	1	1
32	A32	Reducing Tee	¾" X ½" X ¾"	1	1	1	1	1
33	A33/1	Copper Tube Assembly	½"	1	---	---	---	---
33	A33/2	Copper Tube Assembly	½"	---	1	---	---	---
33	A33/3	Copper Tube Assembly	½"	---	---	1	---	---
33	A3¾	Copper Tube Assembly	½"	---	---	---	1	1
34	A34	Ball Valve	½"	1	1	1	1	1
35	A35/1	Pipe Nipple	½" X 80 mm Long	1	---	---	---	---
35	A35/2	Hex Nipple	½"	---	1	1	1	1
36	A36	Y Type Strainer	¾"	1	1	1	1	1
37	A37	Pipe Nipple	¾" X 80 mm Long	1	1	1	1	1
38	A38	Orifice Nozzle (Priming Line)*	½"	1	1	1	1	1
39	A39	Orifice Nozzle (Air Line)	½"	1	1	1	1	1
Electric Trim for Pressure Switch (Optional)								
P1	A40	Pipe Nipple	½" X 135 mm Long	1	1	1	1	1
P2	A41	Elbow	½"	1	1	1	1	1
P3	A42	Pressure Switch (DV Outlet)	½"	1	1	1	1	1
A1	A43	Pressure Switch (Air Line)	½"	1	1	1	1	1
A2	A44	Tee	½"	1	1	1	1	1
A3	A45	Hex Nipple	½"	1	1	1	1	1
Electric Trim for Solenoid Valve (Optional)								
S1	A46	Pipe Nipple	½" X 130 mm Long	1	1	1	---	---
S1	A47	Pipe Nipple	½" X 130 mm Long	---	---	---	1	1
S2	A48	Elbow	½"	1	1	1	1	1
S3	A49	Pipe Nipple	½" X 180 mm Long	1	1	1	---	---
S3	A50	Pipe Nipple	½" X 135 mm Long	---	---	---	1	1
S4	A51	Solenoid Valve	½" Size, Two Way	1	1	1	1	1

## HYDRAULIC & ELECTRIC RELEASE TRIM WITH TEST & ALARM TRIM FOR DELUGE VALVE



Note: When electric trim is supplied then Sl.No. 28 Plug not required.

# Electric Trim optional.

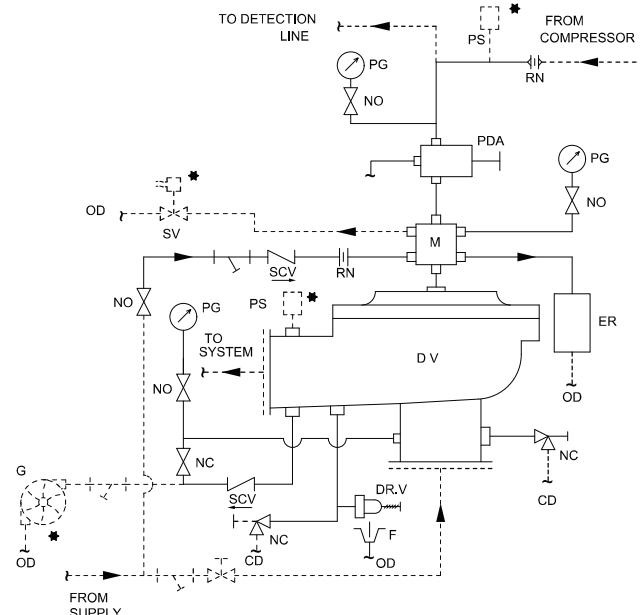
\*\* Suit at site by installer.

## HYDRAULIC &amp; ELECTRIC RELEASE TRIM WITH TEST &amp; ALARM TRIM FOR DELUGE VALVE

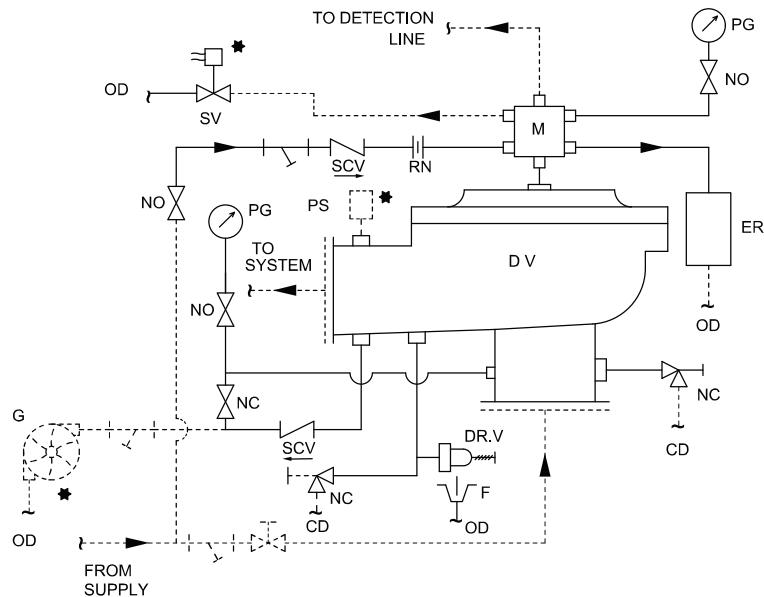
ITEM NO.	CODE NO.	DESCRIPTION	SIZE	QTY				
				200NB	150 NB	100 NB	80 NB	50 NB
1	A01	Pipe Nipple	½" X 80 mm Long	1	1	1	1	1
2	A02	6 Way Manifold	---	1	1	1	1	1
3	A03	Swing Check Valve	½"	1	1	1	1	1
4	A04	Y Strainer	½"	1	1	1	1	1
5	A05/1	Pipe Nipple	½" X 110 mm Long	1	1	---	---	---
5	A05/2	Hex Nipple	½"	---	---	1	1	1
6	A06	Elbow	½"	3	3	3	3	3
7	A07	Hex Nipple	½"	4	4	4	4	4
8	A08t	Union	½"	1	1	1	1	1
9	A09	Ball Valve	½"	1	1	1	1	1
10	A10	Elbow	¼"	1	1	1	1	1
11	A11	Hex Nipple	¼"	2	2	2	2	2
12	A12	Gauge Valve	¼"	2	2	2	2	2
13	A13	Pressure Gauge	¼"	2	2	2	2	2
14	A14/1	Pipe Nipple	½" X 300 mm Long	1	---	---	---	---
14	A14/2	Pipe Nipple	½" X 255 mm Long	---	1	---	---	---
14	A14/3	Pipe Nipple	½" X 210 mm Long	---	---	1	---	---
14	A14/4	Pipe Nipple	½" X 180 mm Long	---	---	---	1	1
15	A15	Emergency Release station	---	1	1	1	1	1
16	A16	Tee	½"	1	1	1	1	1
17	A17	Reducing Hex Nipple	½" X ¼"	1	1	1	1	1
18	A19/1	Pipe Nipple	2" X 110 mm Long	1	1	1	---	---
18	A19/2	Pipe Nipple	1 - ¼" X 110 mm Long	---	---	---	1	1
19	A20/1	Angle Valve	2"	1	1	1	---	---
19	A20/2	Angle Valve	1 - ¼"	---	---	---	1	1
20	A21/1	Pipe Nipple	½" X 150 mm Long	1	1	---	---	---
20	A2½	Pipe Nipple	½" X 130 mm Long	---	---	1	1	1
21	A22/1	Hex Nipple	1"	3	3	3	---	---
21	A22/2	Hex Nipple	¾"	---	---	---	3	3
22	A23/1	Elbow	1"	1	1	1	---	---
22	A23/2	Elbow	¾"	---	---	---	1	1
23	A24/1	Reducing Tee	1" X ½" X 1"	1	1	1	---	---
23	A24/2	Reducing Tee	¾" X ½" X ¾"	---	---	---	1	1
24	A25/1	Angle Valve	1"	1	1	1	---	---
24	A25/2	Angle Valve	¾"	---	---	---	1	1
25	A26	Drip Valve	½"	1	1	1	1	1
26/1	A27/1	Funnel	---	1	1	1	1	1
26/2	A27/2	Funnel Holder	---	1	1	1	1	1
27	A28	Plug	½"	2	2	2	2	2
28	A29	Pipe Nipple	¾" X 100 mm Long	1	1	1	1	1

ITEM NO.	CODE NO.	DESCRIPTION	SIZE	QTY				
				200 NB	150 NB	100 NB	80 NB	50 NB
29	A30	Swing Check Valve	3/4"	1	1	1	1	1
30	A31	Hex Nipple	3/4"	1	1	1	1	1
31	A32	Reducing Tee	3/4" X 1/2" X 3/4"	1	--	1	1	1
32	A33/1	Copper Tube Assembly	1/2"	1	--	--	--	--
32	A33/2	Copper Tube Assembly	1/2"	--	1	--	--	--
32	A33/3	Copper Tube Assembly	1/2"	--	--	1	--	--
32	A33/4	Copper Tube Assembly	1/2"	--	--	--	1	1
33	A34	Ball Valve	1/2"	1	1	1	1	1
34	A35/1	Pipe Nipple	1/2" X 80 mm Long	1	1	1	1	1
34	A35/2	Hex Nipple	1/2"	--	1	1	1	1
35	A36	Y Type Strainer	3/4"	1	1	1	1	1
36	A37	Pipe Nipple	3/4" X 80 mm Long	1	1	1	1	1
37	A38	Orifice Nozzle (Priming Line)	1/2"	1	1	1	1	1
Electric Trim for Pressure Switch (Optional)								
P1	A40	Pipe Nipple	1/2" X 135 mm Long	1	1	1	1	1
P2	A41	Elbow	1/2"	1	1	1	1	1
P3	A42	Pressure Switch (DV Outlet)	1/2" (M)	1	1	1	1	1
Electric Trim for Solenoid Valve (Optional)								
S1	A46	Pipe Nipple	1/2" X 130 mm Long	1	1	1	--	--
S1	A47	Pipe Nipple	1/2" X 130 mm Long	--	--	--	1	1
S2	A48	Elbow	1/2"	1	1	1	1	1
S3	A49	Pipe Nipple	1/2" X 180 mm Long	1	1	1	--	--
S3	A50	Pipe Nipple	1/2" X 135 mm Long	--	--	--	1	1
S4	A51	Solenoid Valve	1/2" Size, Two Way	1	1	1	1	1

### ELECTRIC & PNEUMATIC RELEASE TRIM - SCHEMATIC



#### ELECTRIC & HYDRAULIC RELEASE TRIM - SCHEMATIC

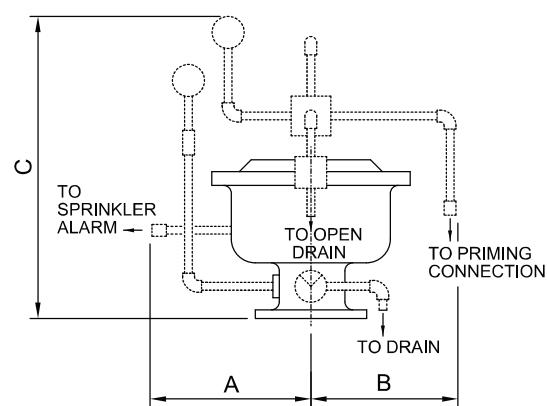
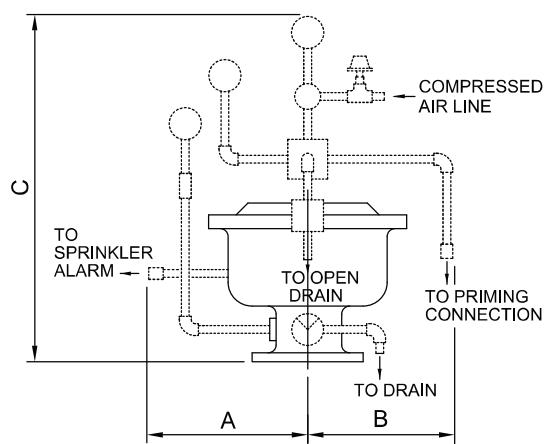
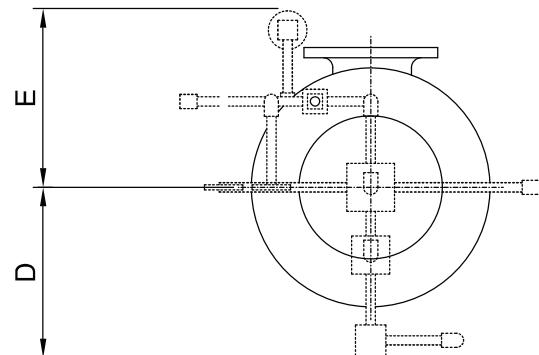
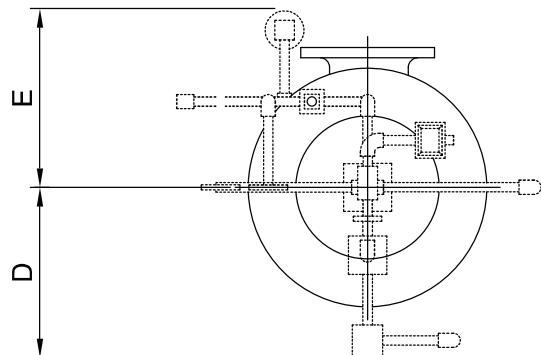


## Abbreviation & Symbols

	Valve		Angle Valve	PS	Pressure Switch	DRV	Drip Valve
NR	Non Return Valve		Deluge Valve		Stop Valve	F	Funnel
ER	Emergency Release Box		Optional		Commen Drain	---	By User
M	Six Way Manifold		Sprinkler Alarm	SCV	Swing Check Valve	OD	Open Drain
RN	Restriction Nozzle		Pressure Gauge	SV	Solenoid Valve		Strainer
PDA	Positive Drain Actuator	NO	Normally Open	NC	Normally Closed		

PNEUMATIC AND ELECTRIC  
RELEASE TRIM

HYDRAULIC AND ELECTRIC  
RELEASE TRIM



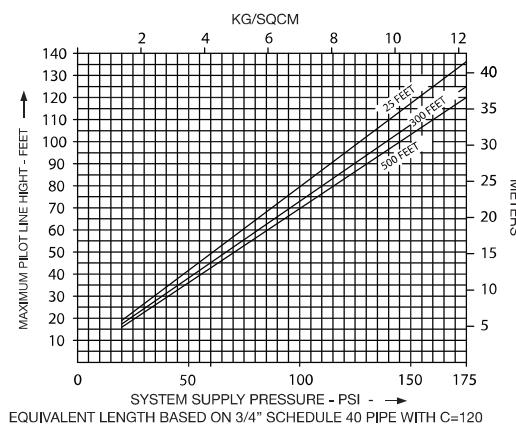
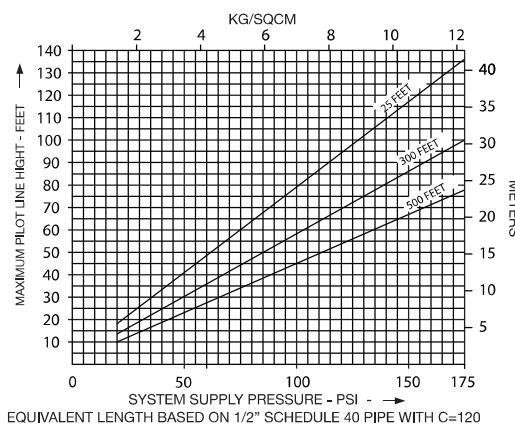
Installation measurement in mm.  
(Approximate)

SIZE	200 NB	150 NB	100 NB	80 NB	50 NB
A	390	370	370	350	350
B	525	500	450	450	450
C	1050	1025	950	930	930
D	510	500	450	450	450
E	500	480	420	410	410

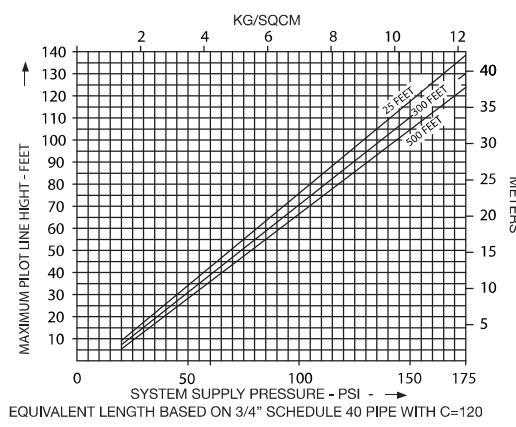
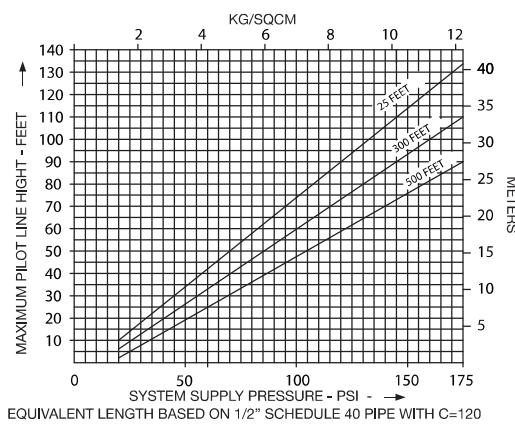
Installation measurement in mm.  
(Approximate)

SIZE	200 NB	150 NB	100 NB	80 NB	50 NB
A	390	370	370	350	350
B	525	500	450	450	450
C	875	800	750	700	700
D	510	500	450	450	450
E	500	480	420	410	410

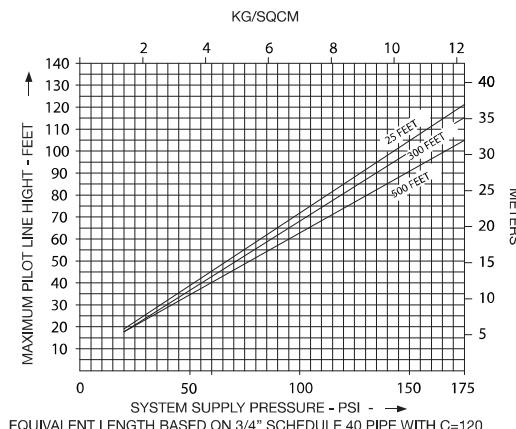
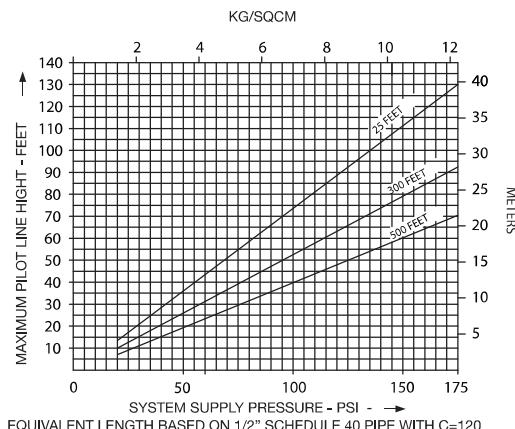
## WET PILOT SPRINKLER HEIGHT LIMITATION OF 200 NB



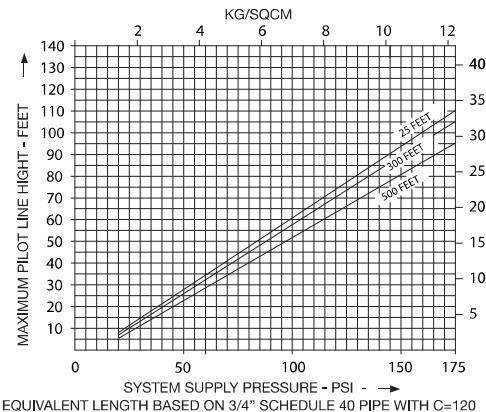
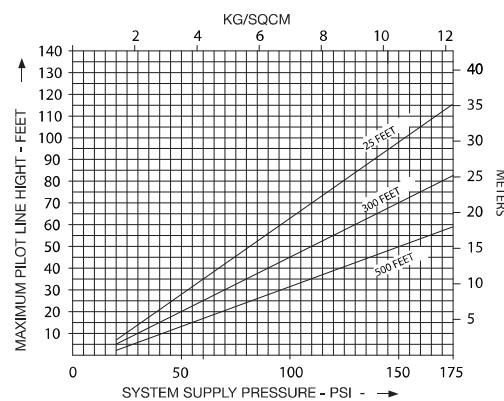
## WET PILOT SPRINKLER HEIGHT LIMITATION OF 150 NB



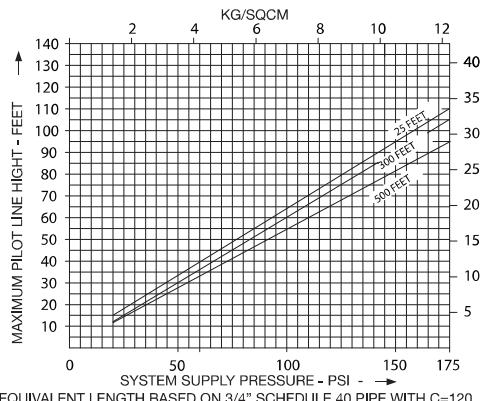
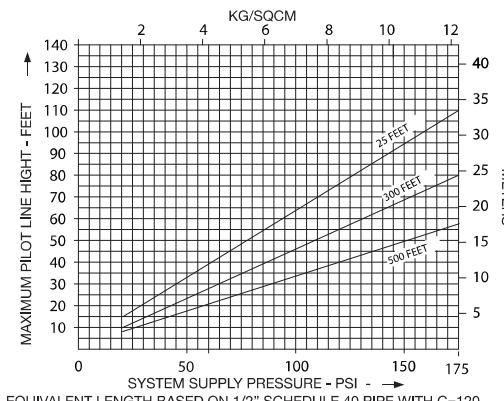
## WET PILOT SPRINKLER HEIGHT LIMITATION OF 100 NB



## WET PILOT SPRINKLER HEIGHT LIMITATION OF 80 NB

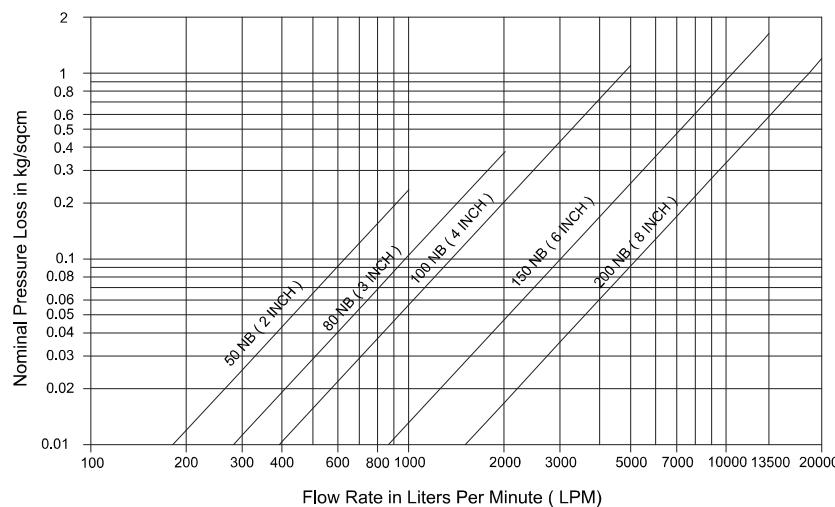


## WET PILOT SPRINKLER HEIGHT LIMITATION OF 50 NB



## NOMINAL PRESSURE LOSS VS FLOW - DELUGE VALVE MODEL SD-DVA

Nominal Pressure Loss vs Flow - Deluge Valve ( Model-SD-DVA)



## DELUGE VALVE

**MODEL: SD-DVH2**

### TECHNICAL SPECIFICATION

Normal Size	200,150,100, 80, 50 NB
Material	Cast Steel (20 to 250 PSI)
Service Pressure	1.4 to 17.5 Bar (20 to 250 PSI)
Threaded Opening	BSPT
Mounting	Vertical or Horizontal
Factory Hydrostatic Test Pressure	35 Kg/sq.cm. (500 PSI)
Flange Connection	ANSI B 16.5 # 150 RF (FF-Optional)
Wet Pilot Sprinkler	As per graph in the catalogue
Net Weight without Trim	200 NB - 163 Kg 150 NB - 86 Kg 100 NB - 56 Kg 80 NB - 38 Kg 50 NB - 33 Kg
FINISH	RAL 3000
Ordering Information	1. Size of Valve 2. Flange specification 3. Valve trim vertical or horizontal 4. Trim type

### DESCRIPTION

Deluge Valve is known as a system control valve in a deluge system, used for fast application of water in a spray system. Deluge valve protects areas such as power transformer installation, storage tank, conveyor protection and other industrial application etc. With the addition of foaming agent deluge valve can be used to protect aircraft hangar and inflammable liquid fire.

### VALVE OPERATION

SHIELD Deluge valve is a quick release, hydraulically operated diaphragm 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 acts across the diaphragm operated clapper which holds the seat against the inlet supply pressure because of the 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, and



the upward force of the supply pressure lifts the clapper allowing the water flow to the system piping network and alarm devices.

### TRIM DESCRIPTION

The trims are functionally termed as Dry Pilot Trim, Wet Pilot Trim, Electric Trim and Test and Alarm Trim as per the method of actuation of the deluge valve.

The functionality of these trims is described below.

#### a) BASIC TRIM

Dry pilot operation uses a pilot line of closed Sprinkles/QB detectors 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 air pressure to be maintained as specified in the catalogue of Dry Pilot Actuator. The pilot line is connected to air inlet side of actuator. The top chamber of the deluge valve is connected to water inlet side of actuator. When there is an air pressure drop, or due to release of any of the release device on detection of fire, the diaphragm of actuator is lifted and allows the water to drain. This releases the water pressure in the top chamber of the deluge valve, allowing the deluge valve to open and water to flow into the system piping & alarm devices. Recommended air supply pressure for dry pilot trim system is 3.5 kg/sq.cm.

User must install non return valve at air supply connection to deluge valve trim.

#### b) DRY PILOT TRIM (PNEUMATIC RELEASE)

Wet pilot operation uses a pilot line of closed Sprinklers/QB Detectors containing pressurized 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 drops and the Deluge valve opens.

**c) 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 of the Deluge valve. In addition to this a pressure switch can also monitor "Low air pressure" and "Fire condition" when used in dry pilot airline.

**d) TEST AND ALARM TRIM**

This trim is supplied with a test valve is provided to test the normal operation of the sprinkler alarm bell. The sprinkler alarm can be supplied additionally, which bells on actuation of the Deluge valve.

**e) DRAIN AND DRIP TRIM**

This consists of main and system drain valve in addition with drip valve.

are optional.

**b) Type SH2-TWD and SH2-TDD**

This trim type is a combination of components of normal trim along with the drip and drain trim. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

**c) Type SH2-TWT and SH2-TDT**

This trim type is a combination of components of normal trim along with the test and alarm trim. In dry pilot trim, an actuator is provided. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

**d) Type SH2-NTW and SH2-NTD**

This trim type is a combination of components of normal trim along with the test and alarm trim as well as the drip and drain trim. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

**TRIM TYPES**

The trims are designated as following.

**W** = Wet Pilot trim. **D** = Dry Pilot Trim

**a) Type SH2-TW and SH2-TD**

This type of trim is basic trim required to operate the deluge valve. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation

TRIM MODEL NO.	TRIM DESCRIPTION	MOUNTING	SCHEMATIC NO.
SH2-TW	Basic Wet Pilot Trim	Vertical	Schematic 1
SH2-TD	Basic Dry Pilot Trim	Vertical	Schematic 2
SH2-TWT	Basic Wet Pilot Trim with Test and Alarm Trim	Vertical	Schematic 3
SH2-TDT	Basic Dry Pilot Trim with Test and Alarm Trim	Vertical	Schematic 4
SH2-TWD	Basic Wet Pilot Trim with Drip and Drain Trim	Vertical	Schematic 5
SH2-TDD	Basic Dry Pilot Trim with Drip and Drain Trim	Vertical	Schematic 6
SH2-NTW	Basic Wet Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Vertical	Schematic 7
SH2-NTD	Basic Dry Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Vertical	Schematic 8
SH2-TW	Basic Wet Pilot Trim	Horizontal	Schematic 9
SH2-TD	Basic Dry Pilot Trim	Horizontal	Schematic 10
SH2-TWT	Basic Wet Pilot Trim with Test and Alarm Trim	Horizontal	Schematic 11
SH2-TDT	Basic Dry Pilot Trim with Test and Alarm Trim	Horizontal	Schematic 12
SH2-TWD	Basic Wet Pilot Trim with Drip and Drain Trim	Horizontal	Schematic 13
SH2-TDD	Basic Dry Pilot Trim with Drip and Drain Trim	Horizontal	Schematic 14
SH2-NTW	Basic Wet Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Horizontal	Schematic 15
SH2-NTD	Basic Dry Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Horizontal	Schematic 16

**RESETTING PROCEDURE**

1. Close the upstream side stop valve provided below the deluge valve to cease the flow of water.
2. Open both the drain valves/ drain plugs and close when the flow of water has ceased.
3. Close the release device/replace the Sprinkler if release was through Sprinkler/ QB Detector.
4. Inspect and release if required, or close the section of the detection system subjected to "Fire condition".
5. In case of dry pilot detection system, open the air supply valve to build-up air pressure. Open the priming valve fully. Open the upstream side of the stop valve provided below the Deluge valve. No water should flow into the system.
6. Where priming shut off valve (optional) is provided for resetting, then the water need to be drained from upstream side of valve.

**Note:** The valve can be reset without undergoing above procedure, by just closing/replacing the release device as valve is auto reset type. The reset time may be long or cause vibration while closing depending on back pressure at the outlet of the valve.

**CAUTION**

- Do not close the downstream and upstream stop valves, while the system is in service.
- The releasing device must be maintained in open position, when actuated, to prevent the deluge valve from closure if anti shut off valve is not provided.
- While using a Deluge valve in the wet pilot system, the height and length of the wet pilot detection line is to be limited, as shown in the wet pilot sprinkler height limitation graph.
- Do not connect the Sprinkler Alarm outlet drain line to close a common drain as it may create back pressure and Sprinkler Alarm may not function.
- Deluge valve must have support to absorb sudden opening or closing vibration shock to the piping.
- To avoid water damage, take precautions when opening the water supply main control valve, since water will flow from all open system valves.
- The responsibility of maintenance of the protection system & devices in proper operating condition lies with the owner of the system.
- Deluge Valve & its trim shall be maintained at a minimum temperature of 4°C, Heat tracing is not permitted.
- Deluge Valve must be used in pressurised system.

**INSPECTION AND MAINTENANCE**

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 authorized person must be trained to perform inspection and testing of the system. It is recommended to have regular inspection and test run of the system as per NFPA guideline or in accordance to the organisation having local jurisdiction.

**(i) WARNING**

Inspection and testing is to be carried out only by authorised and trained personnel. DO NOT TURN OFF 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 there is no false alarm signal.

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 that there are no damages to any component. The frequency of inspections must be increased in the presence of contaminated water supplies, corrosive/ scaling water supplies, and corrosive atmospheres.

**(ii) NORMAL CONDITION**

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

**(iii) NORMAL CONDITION TEST**

- The system should be checked for normal condition at least once in a week
- 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
- Depress the drip valve knob. Significant accumulation indicates a possible seat leakage
- Conduct the water flow test as per the procedure of system testing at least once 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

- Check for any obstruction in the alarm test line, make certain that the sprinkler alarm is free to operate
- If an electric alarm is provided, check the electrical circuitry to the alarm

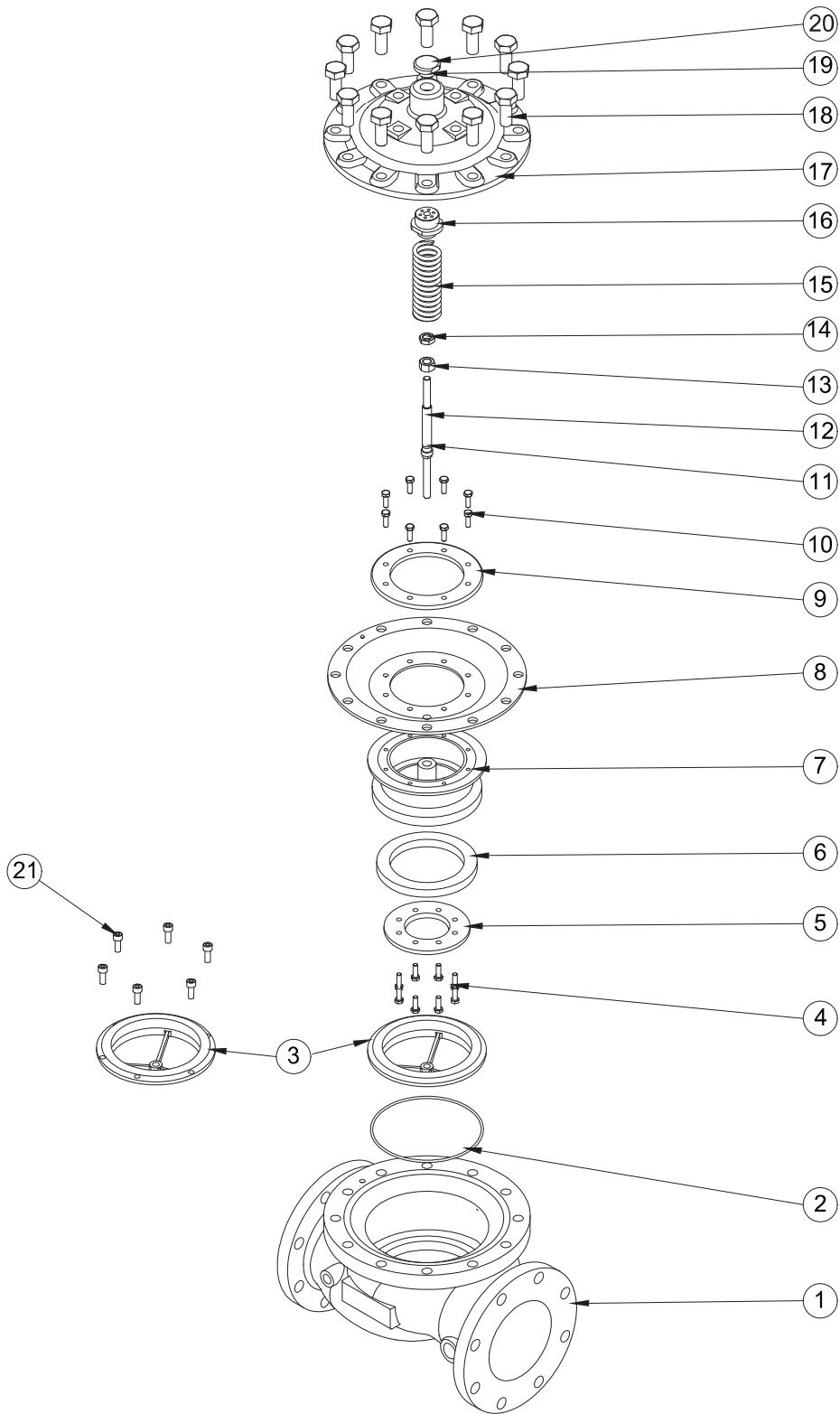
#### (ii) FALSE TRIPS

- Check for clogging in priming line, restriction orifice check valve, priming valve & strainer
- Leakage in the release system
- The deluge air panel orifice clogged or low supply pressure

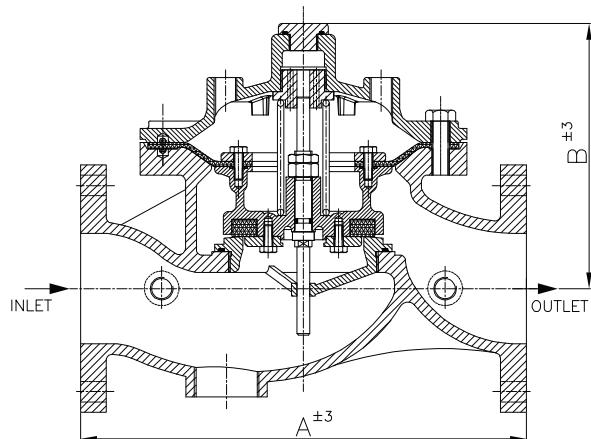
#### (iii) LEAKAGE THROUGH THE DELUGE VALVE

- Damaged deluge valve seat or obstruction on the seat face by foreign object
- Leakage in release system
- Partly clogged priming line restriction orifice check valve
- Low air pressure on release system line or leakage in release system

## DELUGE VALVE MODEL - SD-DVH2



## DELUGE VALVE MODEL - SD-DVH2



Dimension in mm. (Approximate)

Valve Nominal Size	'A'	'B'
200 NB	552	332
150 NB	462	282
100 NB	412	245
80 NB	372	232
50 NB	320	232

### PART LIST

ITEM	PART NO.					DESCRIPTION	QTY.				MATERIAL SPECIFICATION
	200 NB	150 NB	100 NB	80 NB	50 NB		200 NB	150 NB	100 NB	80/50 NB	
1	NA	NA	NA	NA	NA	Housing	1	1	1	1	Cast Steel
2	H2202	H2602	H2102	H2802	H2502	"O" Ring	1	1	1	1	Neoprene Rubber
3	H2203	H2603	H2103	H2803	H2503	Seat	1	1	1	1	Stainless Steel*
4	H2204	H2604	H2104	---	---	Bolt	8	4	4	---	Stainless Steel
5	H2205	H2605	H2105	H2805	H2505	Rubber Clamp	1	1	1	1	Ductile Iron**
6	H2206	H2606	H2106	H2806	H2506	Rubber Seat	1	1	1	1	Neoprene Rubber
7	H2207	H2607	H2107	H2807	H2507	Clapper	1	1	1	1	Ductile Iron**
8	H2208	H2608	H2108	H2808	H2508	Diaphram	1	1	1	1	Neoprene Rubber
9	H2209	H2609	H2109	H2809	H2509	Clamp Ring	1	1	1	1	Ductile Iron**
10	H2210	H2610	H2110	H2810	H2510	Bolt	12	8	8	8	Stainless Steel
11	H2211	H2611	H2111	H2811	H2511	"O" Ring	1	1	1	1	Neoprene Rubber
12	H2212	H2612	H2112	H2812	H2512	Spindle	1	1	1	1	Stainless Steel
13	H2213	H2613	H2113	H2813	H2513	Nut	1	1	1	1	Stainless Steel
14	H2214	H2614	H2114	H2814	H2514	Lock Nut	1	1	1	1	Stainless Steel
15	H2215	H2615	H2115	H2815	H2515	Spring	1	1	1	1	Stainless Steel
16	H2216	H2616	H2116	H2816	H2516	Adaptor	1	1	1	1	Brass
17	NA	NA	NA	NA	NA	Cover	1	1	1	1	Cast Steel
18	H2218	H2618	H2118	H2818	H2518	Bolt	16	12	12	12	Carbon Steel
19	H2219	H2619	H2119	H2819	H2519	"O" Ring	1	1	1	1	Neoprene Rubber
20	H2220	H2620	H2120	H2820	H2520	Plug	1	1	1	1	Steel Plated
21	H2221	---	---	---	---	Allen Bolt	6	---	---	---	Stainless Steel

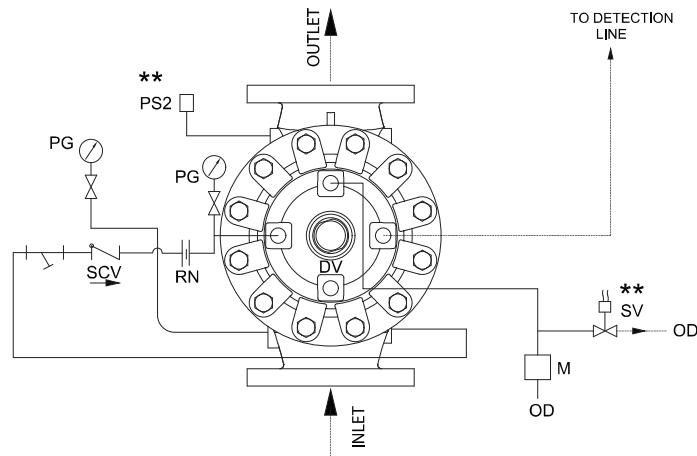
NA - Part Replacement Not Available

\* Stainless Steel is standard supply Bronze is optional supply.

\*\* Ductile Iron is standard supply Bronze/Stainless Steel is optional supply.

**SCHEMATIC FOR WET PILOT BASIC TRIM  
FOR VERTICAL MOUNTING**

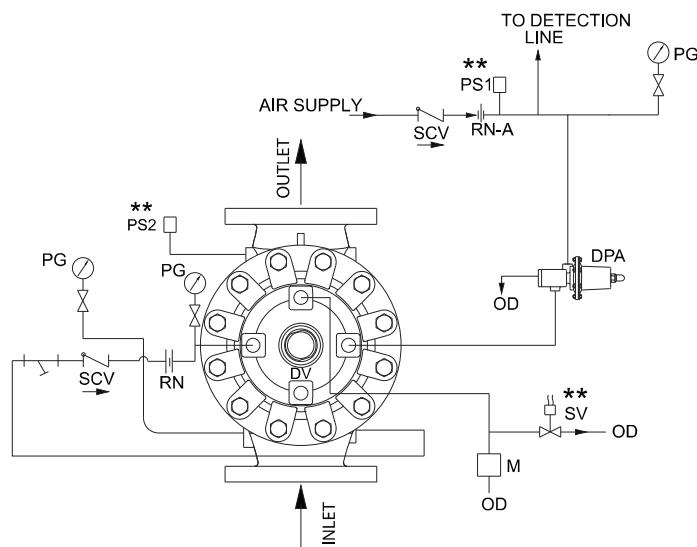
**SH2-TW**



**SCHEMATIC 1**

**SCHEMATIC FOR DRY PILOT BASIC TRIM  
FOR VERTICAL MOUNTING**

**SH2-TD**

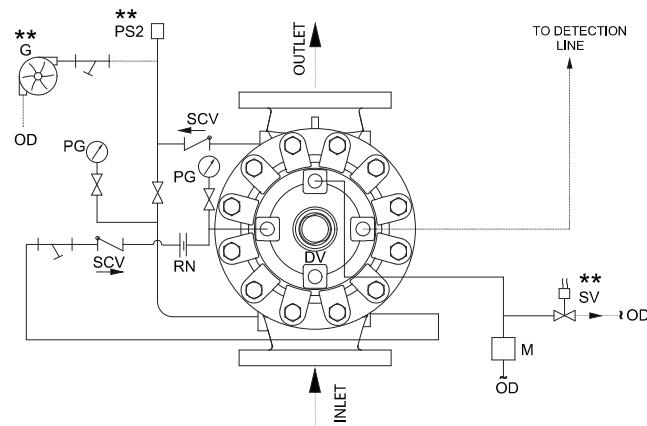


**SCHEMATIC 2**

DV	Deluge Valve	▷	Valve	↑	Swing Check Valve
SV	Solenoid Valve	--	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	▷	DPA
M	Emergency Release Station	└─┐	Strainer	RN-A	Dry Pilot Actuator
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Restriction Nozzle (Air Line)
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge	SCV	Swing Check Valve
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST & ALARM TRIM  
FOR VERTICAL MOUNTING**

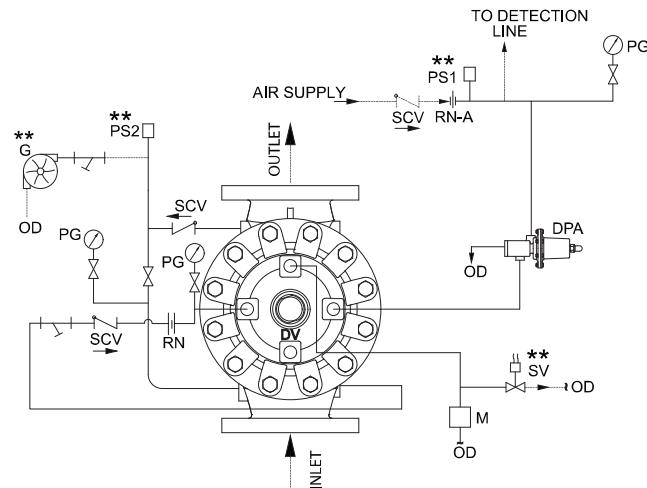
**SH2-TWT**



**SCHEMATIC 3**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST & ALARM TRIM  
FOR VERTICAL MOUNTING**

**SH2-TDT**



**SCHEMATIC 4**

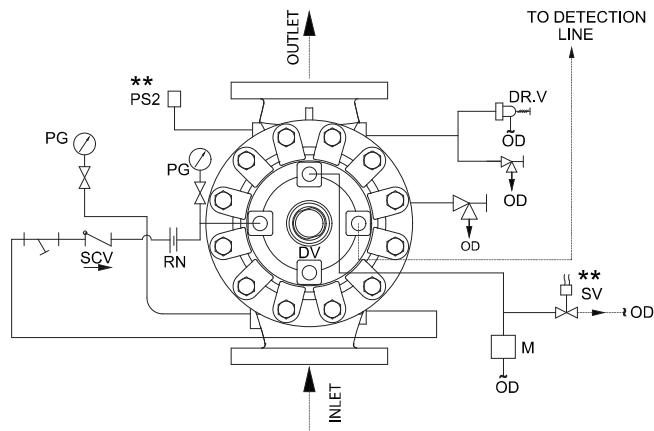
DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

▷	Valve
---	By User
**	Optional
↓	Strainer
OD	Open Drain
PG	Pressure Gauge

↷	Swing Check Valve
↗	Angle Valve
DPA	Dry Pilot Actuator
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH DRIP & DRAIN TRIM  
FOR VERTICAL MOUNTING**

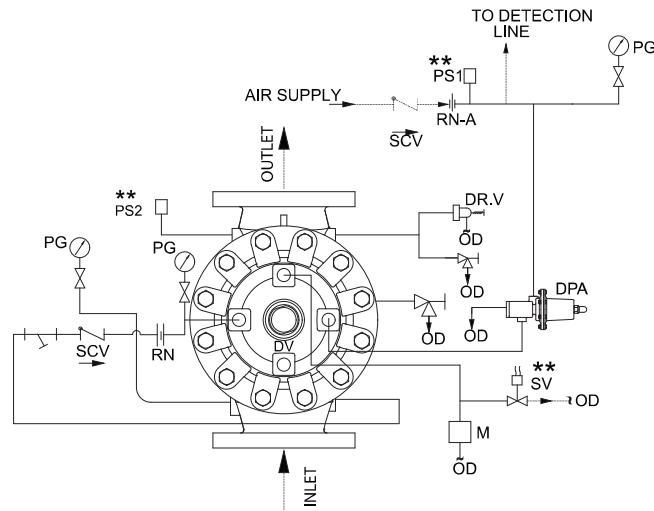
**SH2-TWD**



**SCHEMATIC 5**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH DRIP & DRAIN TRIM  
FOR VERTICAL MOUNTING**

**SH2-TDD**

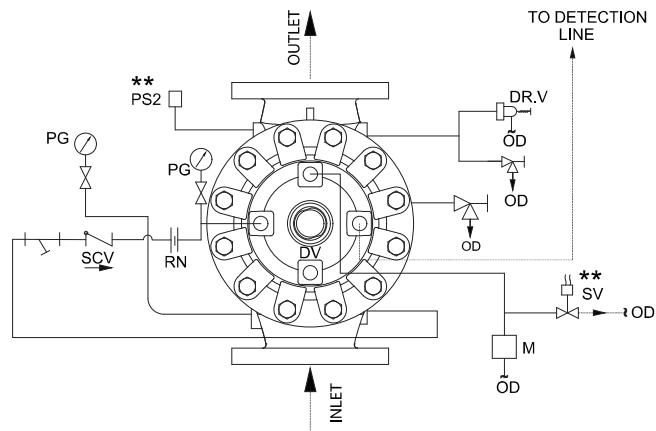


**SCHEMATIC 6**

DV	Deluge Valve	▷	Valve	▷	Swing Check Valve
SV	Solenoid Valve	--	By User	--	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	▷	DPA
M	Emergency Release Station	---	Strainer	RN-A	Dry Pilot Actuator
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Restriction Nozzle (Air Line)
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		Swing Check Valve
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH DRIP & DRAIN TRIM  
FOR VERTICAL MOUNTING**

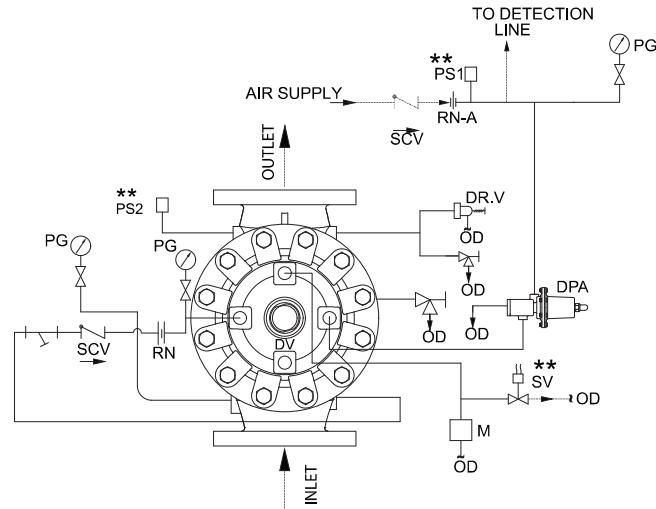
**SH2-TWD**



**SCHEMATIC 5**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH DRIP & DRAIN TRIM  
FOR VERTICAL MOUNTING**

**SH2-TDD**



**SCHEMATIC 6**

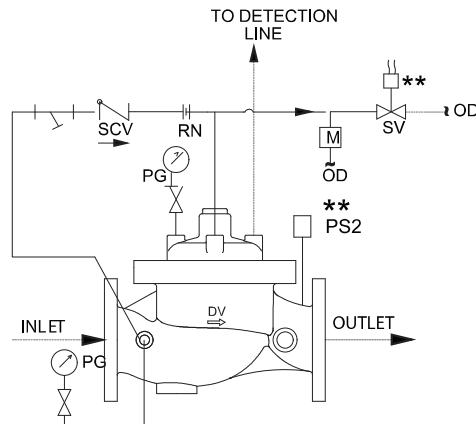
DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

☒	Valve
---	By User
**	Optional
⤒	Strainer
OD	Open Drain
PG	Pressure Gauge

⤓	Swing Check Valve
⤔	Angle Valve
DPA	Dry Pilot Actuator
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

**SCHEMATIC FOR WET PILOT BASIC TRIM  
FOR HORIZONTAL MOUNTING**

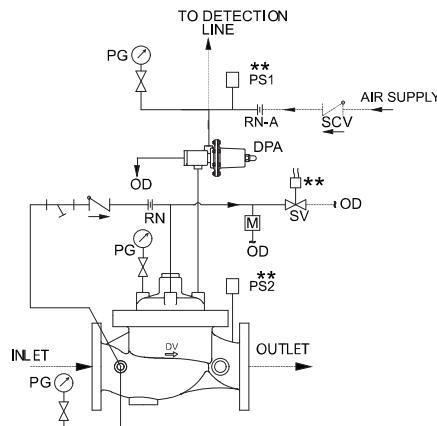
SH2-TW



SCHEMATIC 9

**SCHEMATIC FOR DRY PILOT BASIC TRIM  
FOR HORIZONTAL MOUNTING**

SH2-TD



SCHEMATIC 10

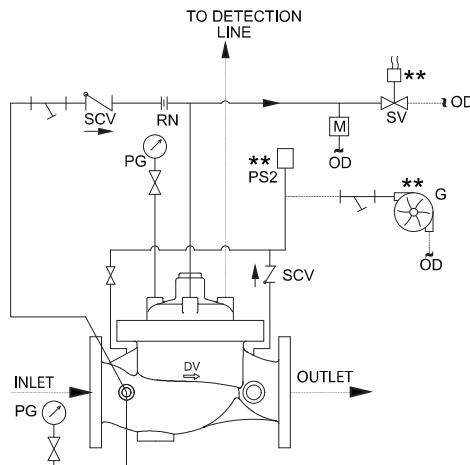
DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

☒	Valve
---	By User
**	Optional
└─┘	Strainer
OD	Open Drain
PG	Pressure Gauge

↑	Swing Check Valve
↖	Angle Valve
DPA	Dry Pilot Actuator
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR HORIZONTAL MOUNTING**

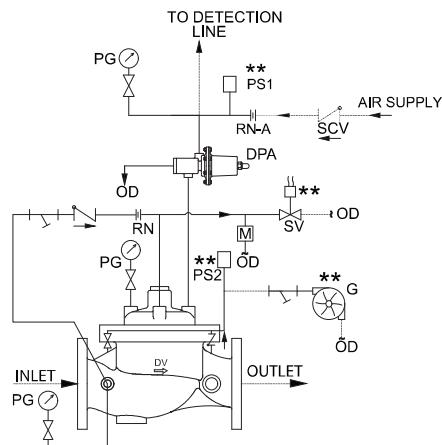
**SH2-TWT**



**SCHEMATIC 11**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR HORIZONTAL MOUNTING**

**SH2-TDT**



**SCHEMATIC 12**

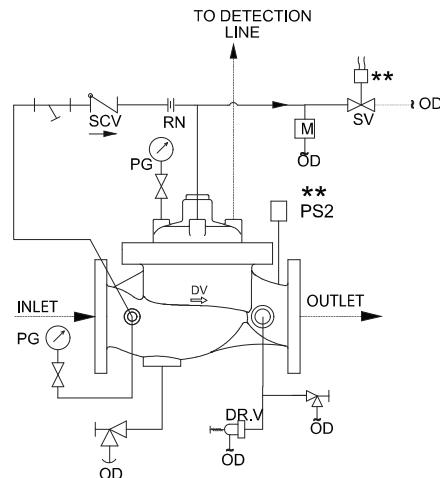
DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

▷	Valve
--	By User
**	Optional
↓	Strainer
OD	Open Drain
PG	Pressure Gauge

↷	Swing Check Valve
↗	Angle Valve
**	DPA
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR HORIZONTAL MOUNTING**

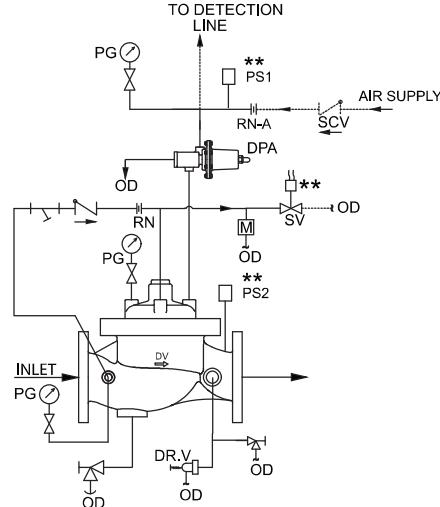
**SH2-TWD**



**SCHEMATIC 13**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR HORIZONTAL MOUNTING**

**SH2-TDD**

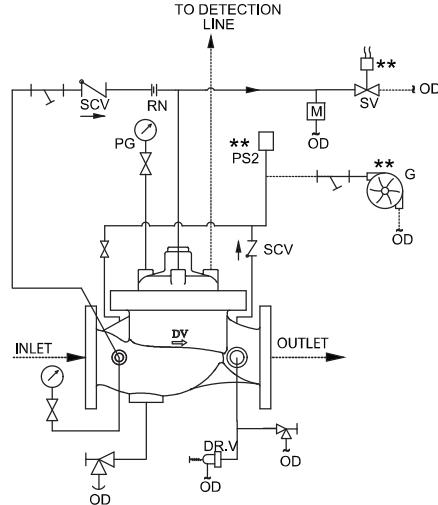


**SCHEMATIC 14**

DV	Deluge Valve	▷	Valve	↑	Swing Check Valve
SV	Solenoid Valve	--	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING**

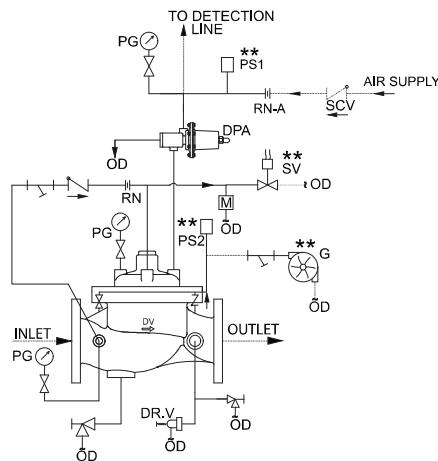
**SH2-NTW**



**SCHEMATIC 15**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING**

**SH2-NTD**



**SCHEMATIC 16**

DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

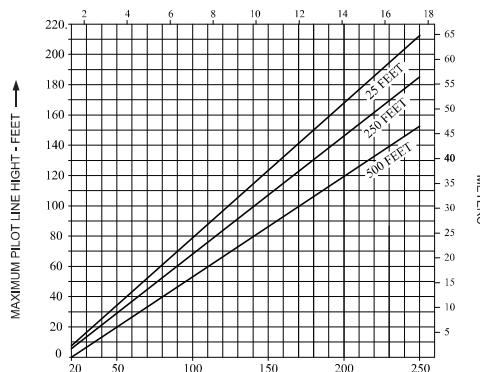
▷	Valve
--	By User
**	Optional
↓	Strainer
OD	Open Drain
PG	Pressure Gauge

↷	Swing Check Valve
↗	Angle Valve
DPA	Dry Pilot Actuator
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

## SPRINKLER HEIGHT LIMITATION

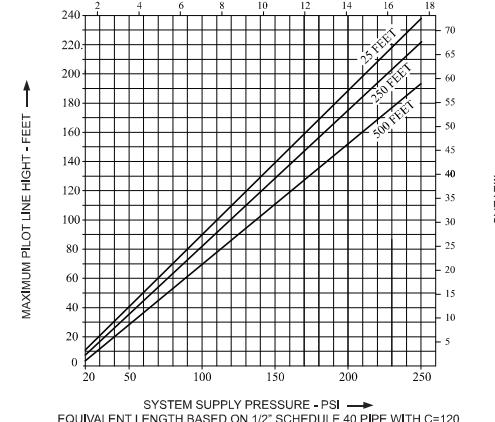
**DV 200NB**

KG/SQCM



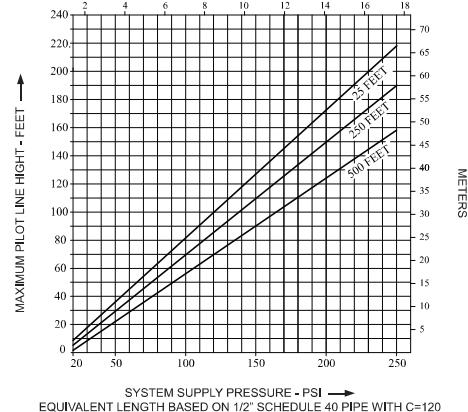
**DV 150NB**

KG/SQCM



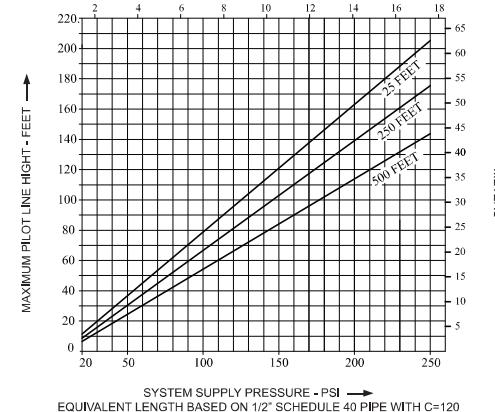
**DV 100NB**

KG/SQCM



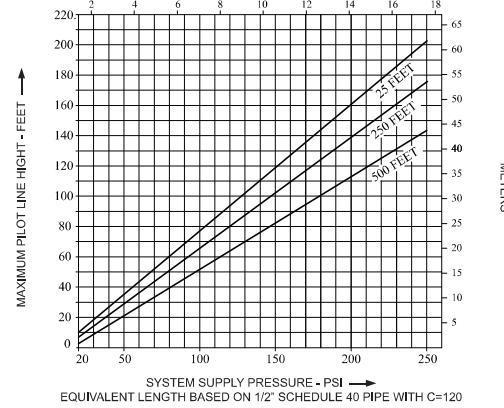
**DV 80NB**

KG/SQCM



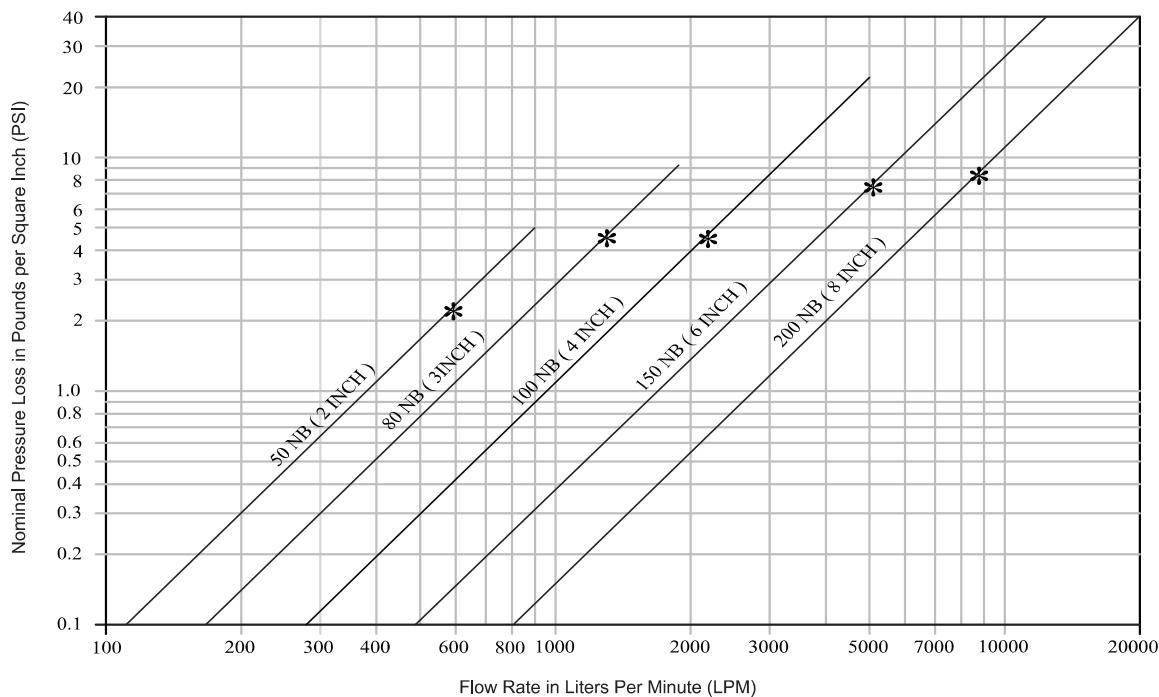
**DV - 50NB**

KG/SQCM



**NOMINAL PRESSURE LOSS VS FLOW**

(\* Flow at 15 feet per second [4.57 meter per second])



- \* 2.3 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 594 LPM thru 50NB DV
- \* 4.7 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 1308 LPM thru 80NB DV
- \* 4.7 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 2255 LPM thru 100NB DV
- \* 7.5 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 5117 LPM thru 150NB DV
- \* 8.4 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 8854 LPM thru 200NB DV

# DELUGE VALVE

**MODEL: SD-DVH3**



## TECHNICAL SPECIFICATION

Normal Size	200,150,100, 80, 50 NB
Material	Ductile Iron ASTM A536-77 Grade 65-45-12
Sevice Pressure	1.4 to 17.5 Bar (20 to 250 PSI)
Threaded Opening	BSPT
Mounting	Vertical or Horizontal
Factory Hydrostatic Test Pressure	35 Kg/sq.cm. (500 PSI)
Flange Connection	ANSI B 16.5 # 150 FF (RF-Optional)
Wet Pilot Sprinkler	As per graph in the catalogue
Net Weight without Trim	200 NB - 153 Kg 150 NB - 79 Kg 100 NB - 50 Kg 80 NB - 35 Kg 50 NB - 32 Kg
FINISH	RAL 3000
Ordering Information	1. Size of Valve 2. Flange specification 3. Valve trim vertical or horizontal 4. Trim type

## DESCRIPTION

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

## VALVE OPERATION

SHIELD Deluge valve is a quick release, hydraulically operated diaphragm 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 pressure because of the 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, and the



upward force of the supply pressure lifts the clapper allowing the water flow to the system piping network and alarm devices.

## TRIM DESCRIPTION

The trims are functionally termed as Dry Pilot Trim, Wet Pilot Trim, Electric Trim and Test and Alarm Trim as per the method of actuation of the deluge valve.

The functionality of these trims is described below.

### a) DRY PILOT TRIM (PNEUMATIC RELEASE)

Dry pilot operation uses a pilot line of closed Sprinkles/QB detectors 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 air pressure to be maintained as specified in the catalogue of Dry Pilot Actuator. The pilot line is connected to air inlet side of actuator. The top chamber of the deluge valve is connected to water inlet side of actuator.

When there is an air pressure drop, or due to release of any of the release device on detection of fire, the diaphragm of actuator is lifted and allows the water to drain. This releases the water pressure in the top chamber of the deluge valve, allowing the deluge valve to open and water to flow into the system piping & alarm devices. Recommended air supply pressure for dry pilot trim system is 3.5 kg/sq.cm.

User must install non return valve at air supply connection to deluge valve trim.

### b) WET PILOT TRIM (HYDRAULIC RELEASE)

Wet pilot operation uses a pilot line of closed Sprinklers/QB detectors containing pressurized 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 drops and the Deluge valve opens.

**c) 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 of 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.

**d) TEST AND ALARM TRIM**

This trim is supplied with a test valve is provided to test the normal operation of the sprinkler alarm bell. The sprinkler alarm can be supplied additionally, which bells on actuation of the Deluge valve.

**e) DRAIN AND DRIP TRIM**

This consists of main and system drain valve in addition with drip valve.

**TRIM TYPES**

The trims are designated as following.

W =Wet Pilot trim. D = Dry Pilot Trim

**a) Type SH3-TW and SH3-TD**

This type of trim is basic trim required to operate the deluge valve. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

**b) Type SH3-TWD and SH3-TDD**

This trim type is a combination of components of normal trim along with the drip and drain trim. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

**c) Type SH3-TWT and SH3-TDT**

This trim type is a combination of components of normal trim along with the test and alarm trim. In dry pilot trim, an actuator is provided. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

**d) Type SH3-NTW and SH3-NTD**

This trim type is a combination of components of normal trim along with the test and alarm trim as well as the drip and drain trim. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

TRIM MODEL NO.	TRIM DESCRIPTION	MOUNTING	SCHEMATIC NO.
SH3-TW	Basic Wet Pilot Trim	Vertical	Schematic 1
SH3-TD	Basic Dry Pilot Trim	Vertical	Schematic 2
SH3-TWT	Basic Wet Pilot Trim with Test and Alarm Trim	Vertical	Schematic 3
SH3-TDT	Basic Dry Pilot Trim with Test and Alarm Trim	Vertical	Schematic 4
SH3-TWD	Basic Wet Pilot Trim with Drip and Drain Trim	Vertical	Schematic 5
SH3-TDD	Basic Dry Pilot Trim with Drip and Drain Trim	Vertical	Schematic 6
SH3-NTW	Basic Wet Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Vertical	Schematic 7
SH3-NTD	Basic Dry Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Vertical	Schematic 8
SH3-TW	Basic Wet Pilot Trim	Horizontal	Schematic 9
SH3-TD	Basic Dry Pilot Trim	Horizontal	Schematic 10
SH3-TWT	Basic Wet Pilot Trim with Test and Alarm Trim	Horizontal	Schematic 11
SH3-TDT	Basic Dry Pilot Trim with Test and Alarm Trim	Horizontal	Schematic 12
SH3-TWD	Basic Wet Pilot Trim with Drip and Drain Trim	Horizontal	Schematic 13
SH3-TDD	Basic Dry Pilot Trim with Drip and Drain Trim	Horizontal	Schematic 14
SH3-NTW	Basic Wet Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Horizontal	Schematic 15
SH3-NTD	Basic Dry Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Horizontal	Schematic 16

## RESETTING PROCEDURE FOR THE DELUGE VALVE

### VALVE

1. Close the upstream side stop valve provided below the deluge valve
2. Open both the drain valves/ drain plugs and close when the flow of water has ceased
3. Close the release device/replace the Sprinkler if release was through Sprinkler/QB Detector
4. Inspect and release if required, or close the section of the detection system subjected to "Fire condition"
5. In case of dry pilot detection system, open the air supply valve to build-up air pressure. Open the priming valve fully. Open the upstream side of the stop valve provided below the Deluge valve. No water should flow into the system.
6. Where priming shut off valve is provided for resetting, in addition to above steps press the knob on actuator while resetting

### CAUTION

- Do not close the priming valve, downstream and upstream stop valves, while the system is in service.
- The releasing device must be maintained in the open position, when actuated, to prevent the deluge valve from closure if anti shut off valve is not provided.
- 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.
- Do not connect the Sprinkler Alarm outlet drain line to close a common drain as it may create back pressure and Sprinkler Alarm may not function.
- Deluge valve must have support to absorb sudden opening or closing vibration shock to the piping.
- To avoid water damage, take precautions when opening the water supply main control valve, since water will flow from all open system valves.
- The responsibility of maintenance of the protection system and devices in proper operating condition lies with the owner of the system.

## SYSTEM TESTING PROCEDURE

1. Keep the upstream side of the stop valve partially open. To avoid water flow to system side close the system side stop valve. This valve is to be kept in open position after the testing is completed.
2. Let any of the release devices to trip. This will result in a sudden drop of water pressure in the deluge valve top chamber which in turn will open the deluge valve. Close the upstream side stop valve immediately.
3. Reset the valve as per the procedure given under heading "RESETTING PROCEDURE FOR THE DELUGE VALVE"

## INSPECTION AND MAINTENANCE

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 authorized person must be trained to perform inspection and testing of the system. It is recommended to have regular inspection and test run of the system as per NFPA guideline or in accordance to the organisation having local jurisdiction.

### (i) WARNING

Inspection and testing is to be carried out only by authorised and trained personnel. DO NOT TURN OFF 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 there is no false alarm signal.

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 that there are no damages to any component.

The frequency of inspections must be increased in the presence of contaminated water supplies, corrosive/scaling water supplies, and corrosive atmospheres.

### (ii) NORMAL CONDITION

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

### (iii) NORMAL CONDITION TEST

- The system should be checked for normal condition at least once in a week
- 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
- Depress the drip valve knob. Significant accumulation indicates a possible seat leakage
- Conduct the water flow test as per the procedure of system testing at least once 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

- Check for any obstruction in the alarm test line, make certain that the sprinkler alarm is free to operate
- If an electric alarm is provided, check the electrical circuitry to the alarm

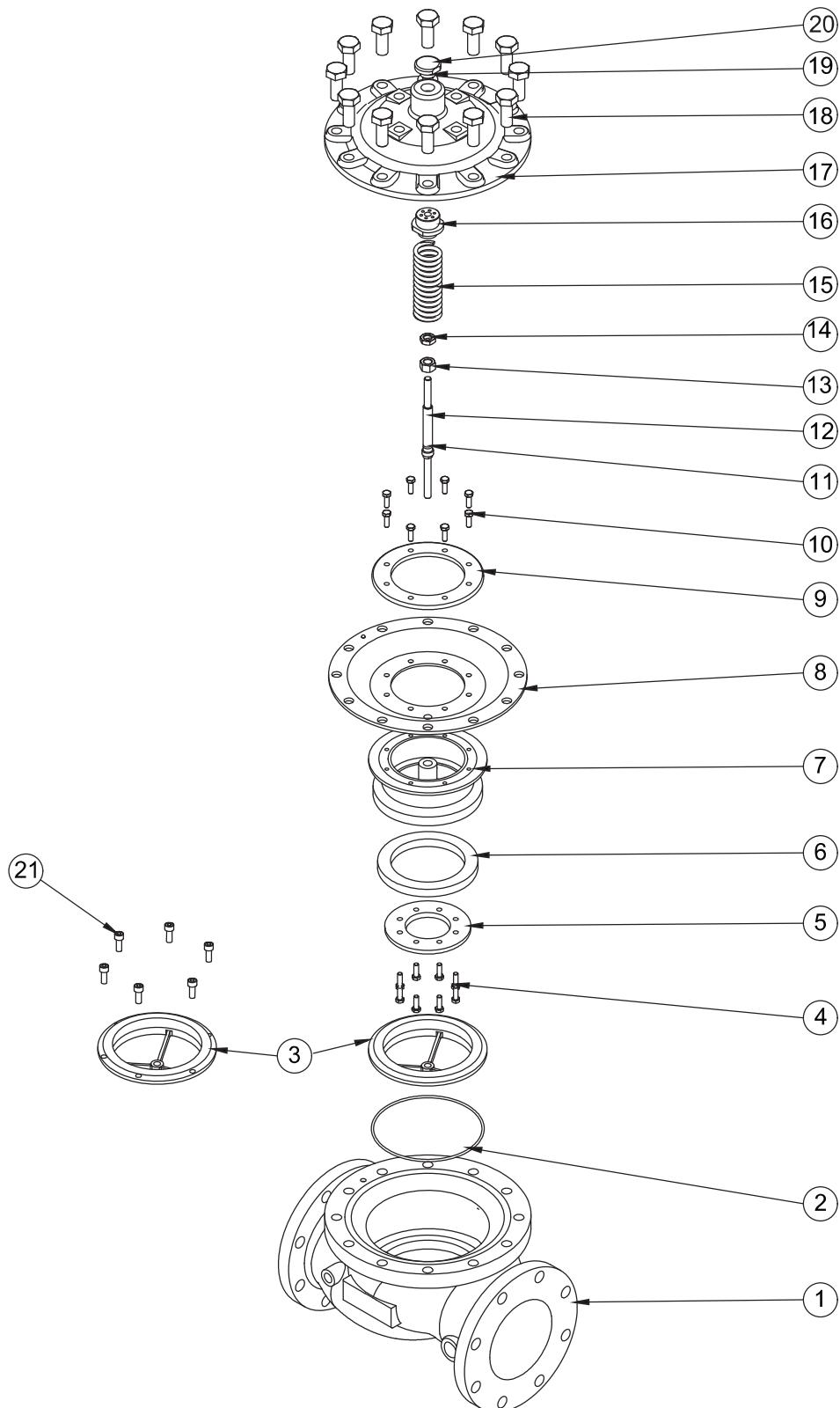
### (ii) FALSE TRIPS

- Check for clogging in priming line, restriction orifice check valve, priming valve & strainer
- Leakage in the release system
- The deluge air panel orifice clogged or low supply pressure

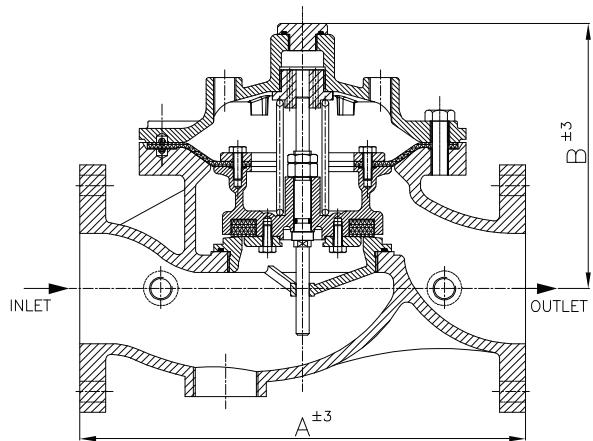
### (iii) LEAKAGE THROUGH THE DELUGE VALVE

- Damaged deluge valve seat or obstruction on the seat face by foreign object
- Leakage in release system
- Partly clogged priming line restriction orifice check valve
- Low air pressure on release system line or leakage in release system

## NOMINAL PRESSURE LOSS VS FLOW



## DELUGE VALVE MODEL - SD-DVH3



Dimension in mm. (Approximate)

Valve Nominal Size	'A'	'B'
200 NB	552	332
150 NB	462	282
100 NB	412	245
80 NB	372	232
50 NB	320	232

## PART LIST

ITEM	PART NO.					DESCRIPTION	QTY.				MATERIAL SPECIFICATION
	200 NB	150 NB	100 NB	80 NB	50 NB		200 NB	150 NB	100 NB	80/50NB	
1	NA	NA	NA	NA	NA	Housing	1	1	1	1	Ductile Iron
2	H3202	H3602	H3102	H3802	H3502	"O" Ring	1	1	1	1	Neoprene Rubber
3	H3203	H3603	H3103	H3803	H3503	Seat	1	1	1	1	Stainless Steel*
4	H3204	H3604	H3104	---	---	Bolt	8	4	4	--	Stainless Steel
5	H3205	H3605	H3105	H3805	H3505	Rubber Clamp	1	1	1	1	Ductile Iron**
6	H3206	H3606	H3106	H3806	H3506	Rubber Seat	1	1	1	1	Neoprene Rubber
7	H3207	H3607	H3107	H3807	H3507	Clapper	1	1	1	1	Ductile Iron**
8	H3208	H3608	H3108	H3808	H3508	Diaphram	1	1	1	1	Neoprene Rubber
9	H3209	H3609	H3109	H3809	H3509	Clamp Ring	1	1	1	1	Ductile Iron**
10	H3210	H3610	H3110	H3810	H3510	Bolt	12	8	8	8	Stainless Steel
11	H3211	H3611	H3111	H3811	H3511	"O" Ring	1	1	1	1	Neoprene Rubber
12	H3212	H3612	H3112	H3812	H3512	Spindle	1	1	1	1	Stainless Steel
13	H3213	H3613	H3113	H3813	H3513	Nut	1	1	1	1	Stainless Steel
14	H3214	H3614	H3114	H3814	H3514	Lock Nut	1	1	1	1	Stainless Steel
15	H3215	H3615	H3115	H3815	H3515	Spring	1	1	1	1	Stainless Steel
16	H3216	H3616	H3116	H3816	H3516	Adaptor	1	1	1	1	Brass
17	NA	NA	NA	NA	NA	Cover	1	1	1	1	Ductile Iron
18	H3218	H3618	H3118	H3818	H3518	Bolt	16	12	12	12	Carbon Steel
19	H3219	H3619	H3119	H3819	H3519	"O" Ring	1	1	1	1	Neoprene Rubber
20	H3220	H3621	H3120	H3820	H3520	Plug	1	1	1	1	Steel Plated
21	H3221	---	---	---	---	Allen Bolt	6	---	---	---	Stainless Steel

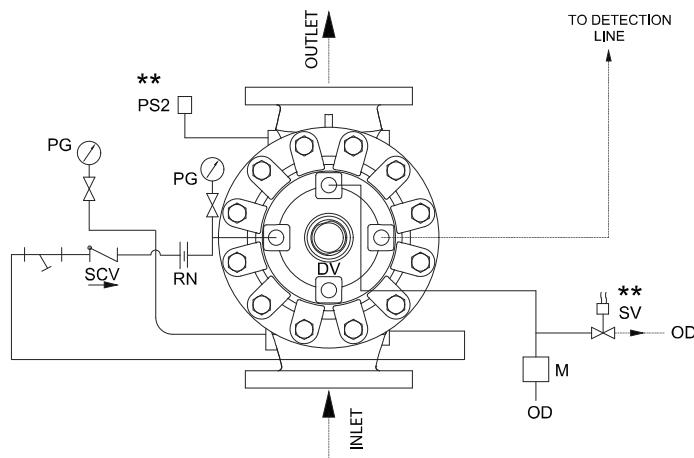
NA - Part Replacement Not Available

\* Stainless Steel is standard supply Bronze is optional supply.

\*\* Ductile Iron is standard supply Bronze/Stainless Steel is optional supply.

**SCHEMATIC FOR WET PILOT BASIC  
FOR VERTICAL MOUNTING**

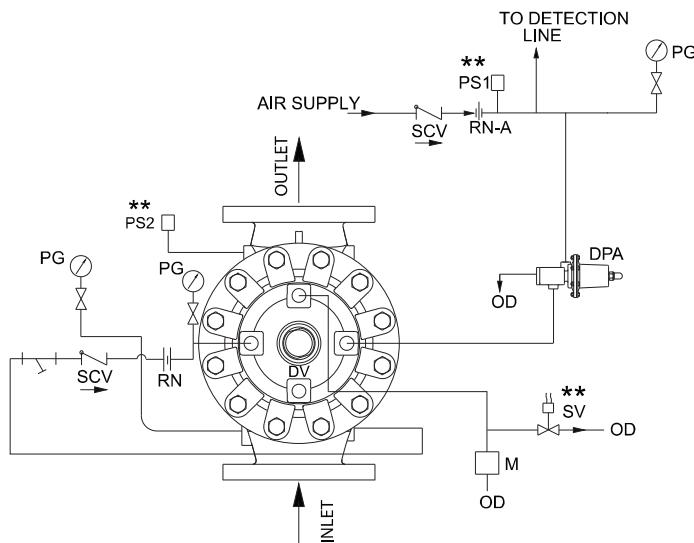
**SH3-TW**



**SCHEMATIC 1**

**SCHEMATIC FOR DRY PILOT BASIC TRIM  
FOR VERTICAL MOUNTING**

**SH3-TD**

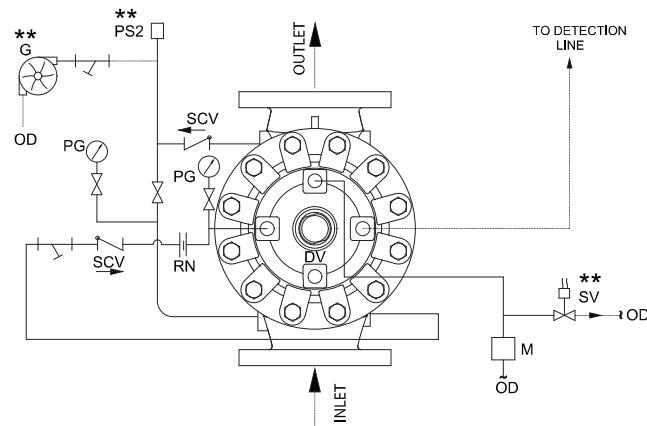


**SCHEMATIC 2**

DV	Deluge Valve	▷	Valve	↗	Swing Check Valve
SV	Solenoid Valve	--	By User	↖	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR VERTICAL MOUNTING**

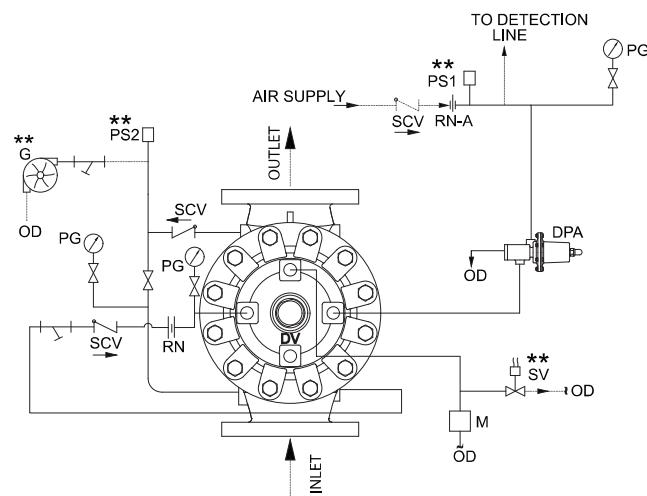
**SH3-TWT**



**SCHEMATIC 3**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR VERTICAL MOUNTING**

**SH3-TDT**

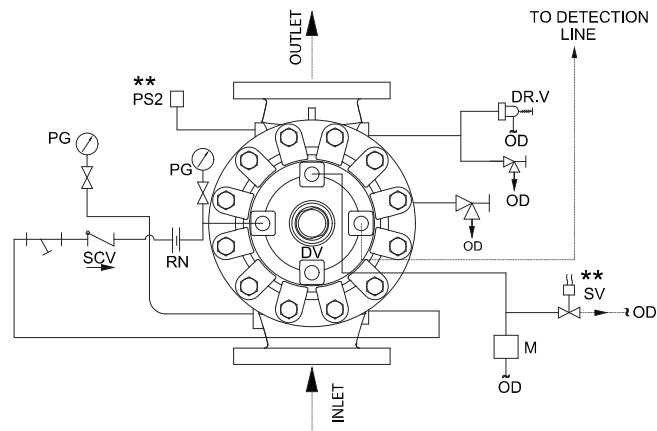


**SCHEMATIC 4**

DV	Deluge Valve	▷	Valve	↑	Swing Check Valve
SV	Solenoid Valve	--	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	↖	DPA
M	Emergency Release Station	↓	Strainer	RN-A	Dry Pilot Actuator
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Restriction Nozzle (Air Line)
PS1	Low Air Alarm Pressure Switch	PG	Pressure Guage		Swing Check Valve
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR VERTICAL MOUNTING**

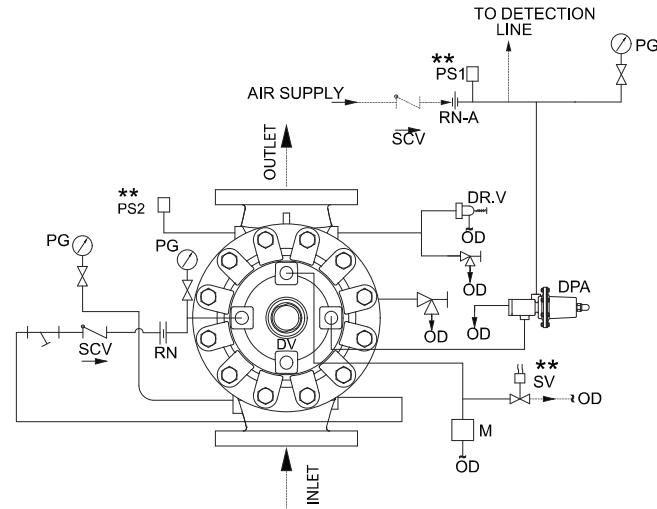
**SH3-TWD**



**SCHEMATIC 5**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR VERTICAL MOUNTING**

**SH3-TDD**

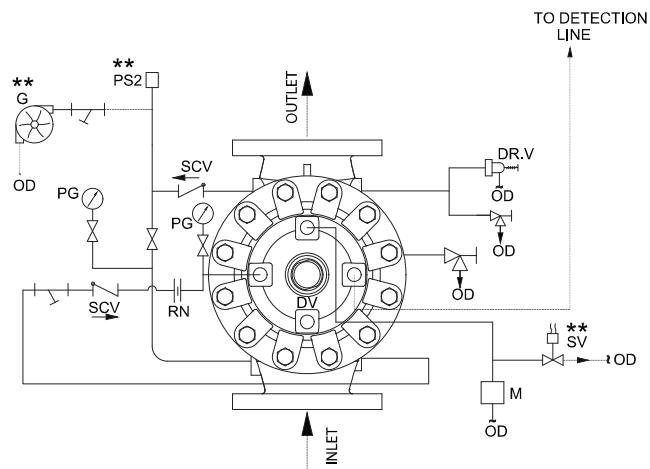


**SCHEMATIC 6**

DV	Deluge Valve	▷	Valve	▷	Swing Check Valve
SV	Solenoid Valve	--	By User	--	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	---	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM &  
DRIP AND DRAIN TRIM FOR VERTICAL MOUNTING**

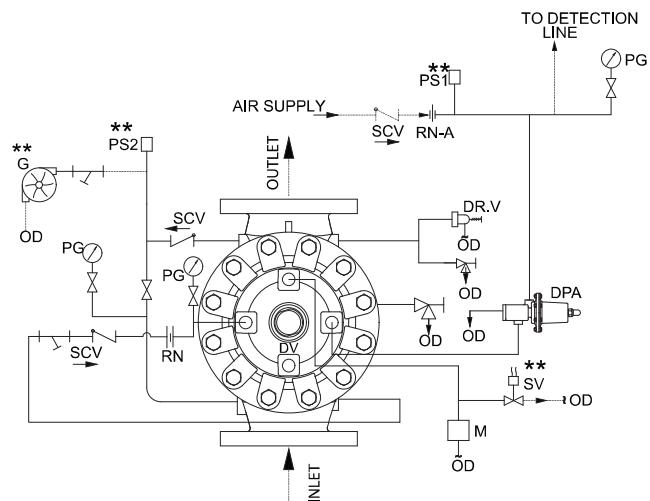
**SH3-NTW**



**SCHEMATIC 7**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM &  
DRIP AND DRAIN TRIM FOR VERTICAL MOUNTING**

**SH3-NTD**



**SCHEMATIC 8**

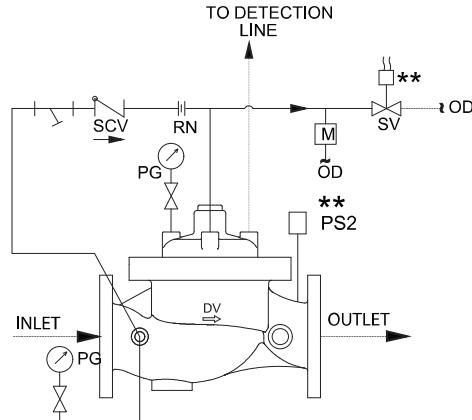
DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

□	Valve
---	By User
**	Optional
└─┐	Strainer
OD	Open Drain
PG	Pressure Gauge

↷	Swing Check Valve
↶	Angle Valve
DPA	Dry Pilot Actuator
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

**SCHEMATIC FOR WET PILOT BASIC TRIM  
FOR HORIZONTAL MOUNTING**

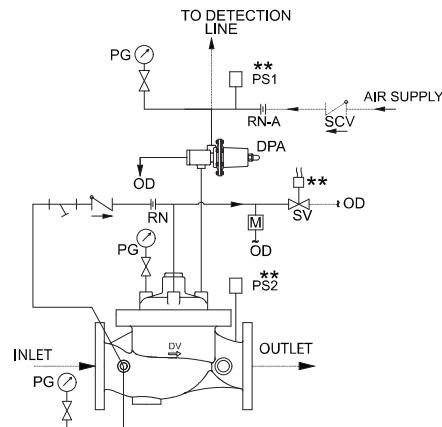
SH3-TW



SCHEMATIC 9

**SCHEMATIC FOR DRY PILOT BASIC TRIM  
FOR HORIZONTAL MOUNTING**

SH3-TD

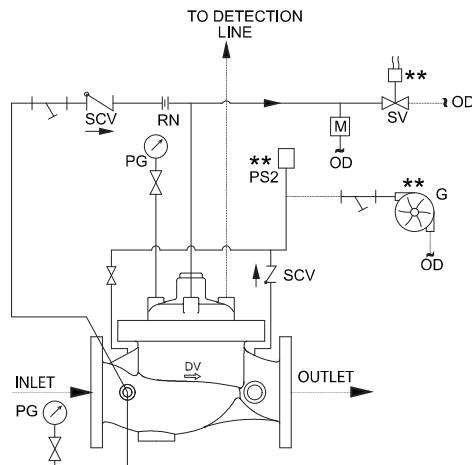


SCHEMATIC 10

DV	Deluge Valve	Valve	Swing Check Valve
SV	Solenoid Valve	-- By User	Angle Valve
G	Sprinkler Alarm (WMG)	** Optional	DPA
M	Emergency Release Station	Strainer	RN-A
RN	Restriction Nozzle (Priming Line)	OD Open Drain	SCV Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG Pressure Guage	
PS2	Waterflow Pressure Alarm Switch		

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR HORIZONTAL MOUNTING**

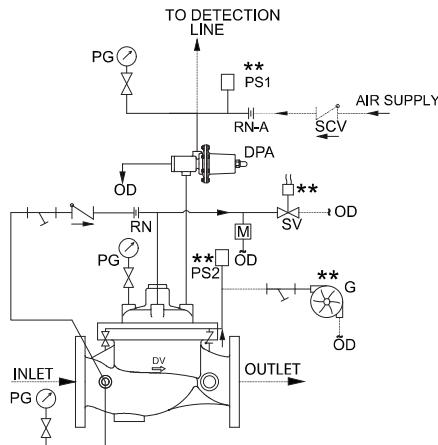
**SH3-TWT**



**SCHEMATIC 11**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR HORIZONTAL MOUNTING**

**SH3-TDT**



**SCHEMATIC 12**

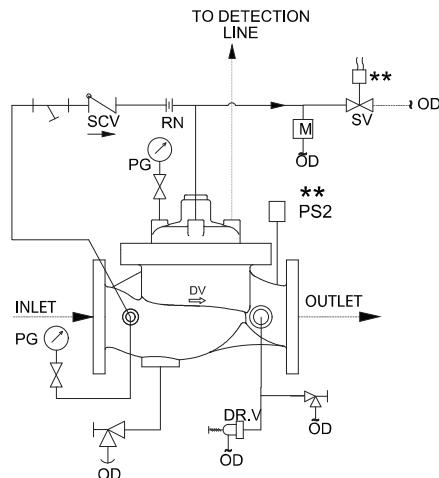
DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

▷	Valve
--	By User
**	Optional
↓	Strainer
OD	Open Drain
PG	Pressure Gauge

↷	Swing Check Valve
↗	Angle Valve
↷	DPA
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR HORIZONTAL MOUNTING**

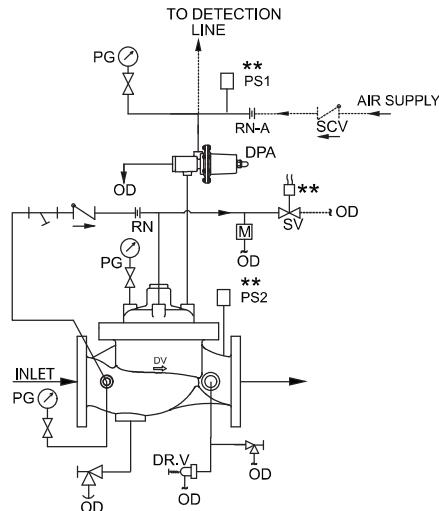
**SH3-TWD**



**SCHEMATIC 13**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR HORIZONTAL MOUNTING**

**SH3-TDD**

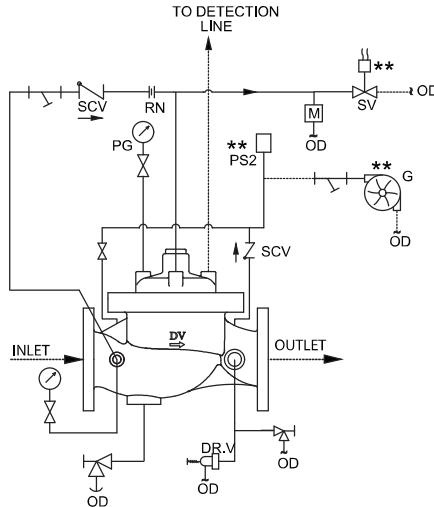


**SCHEMATIC 14**

DV	Deluge Valve	▷	Valve	↑	Swing Check Valve
SV	Solenoid Valve	---	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING**

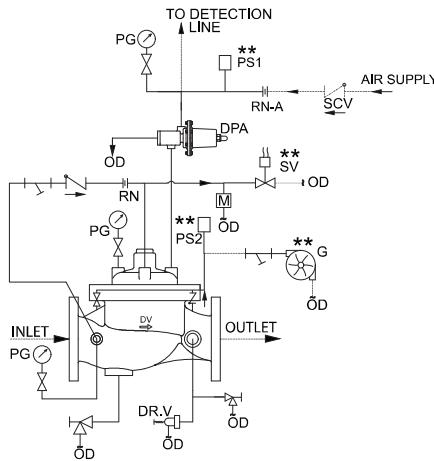
SH3-NTW



**SCHEMATIC 15**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING**

SH3-NTD



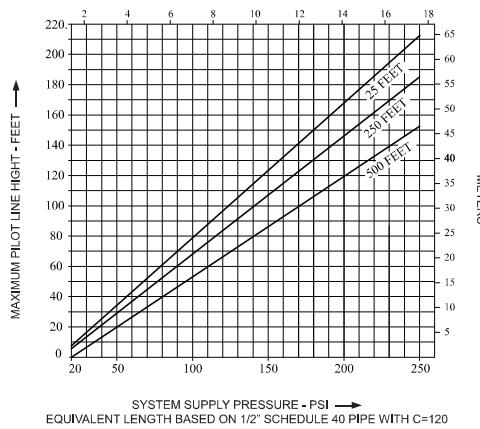
**SCHEMATIC 16**

DV	Deluge Valve	▷	Valve	↷	Swing Check Valve
SV	Solenoid Valve	--	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

## SPRINKLER HEIGHT LIMITATION

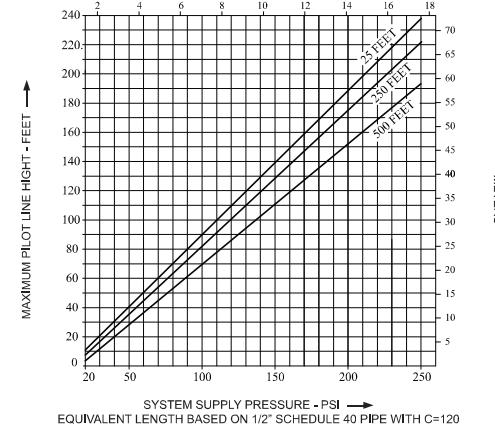
**DV 200NB**

KG/SQCM



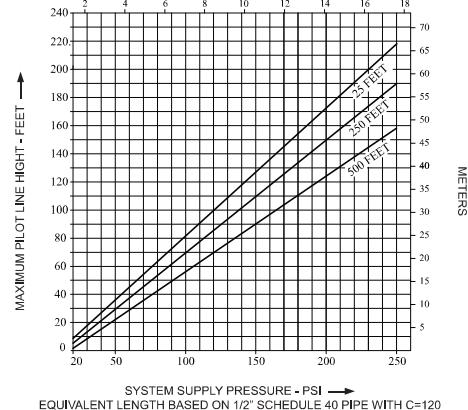
**DV 150NB**

KG/SQCM



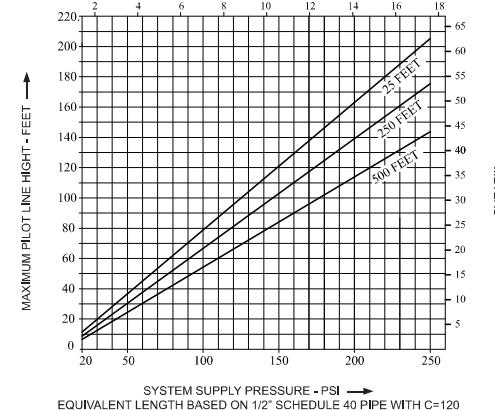
**DV 100NB**

KG/SQCM



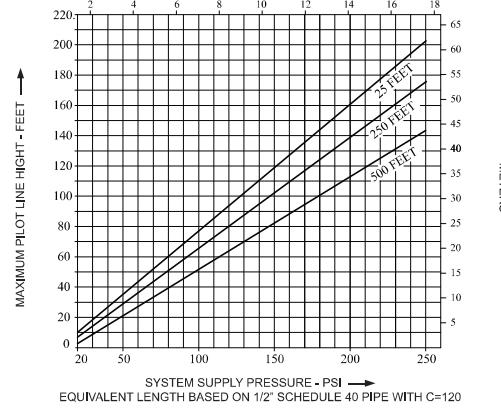
**DV 80NB**

KG/SQCM



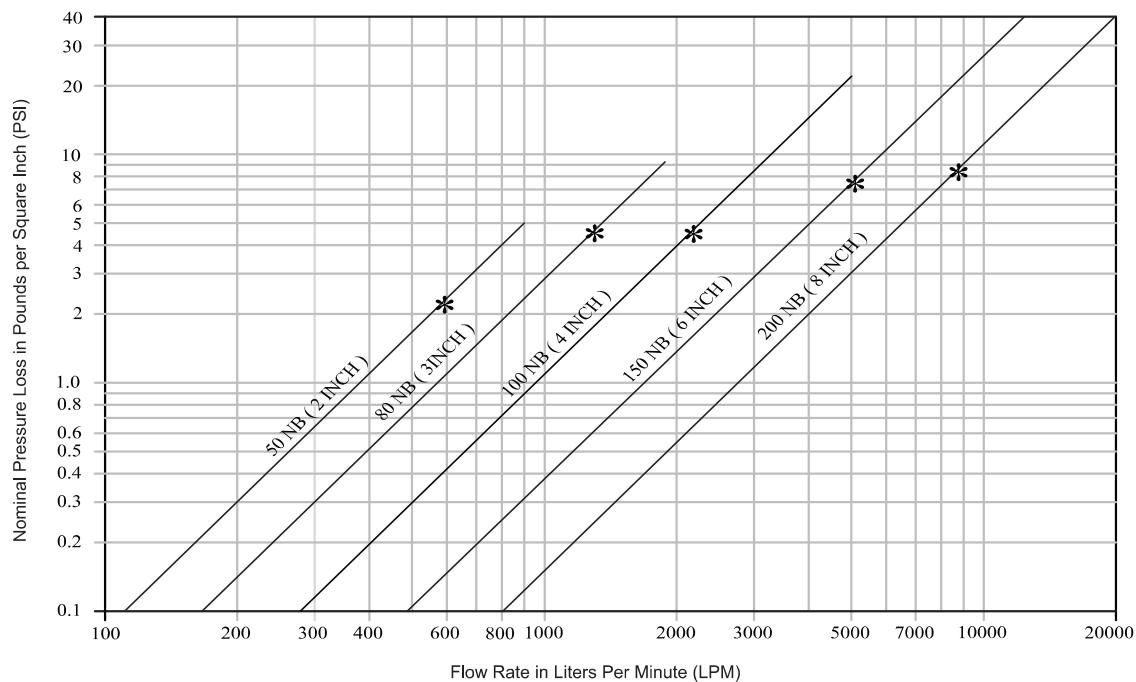
**DV - 50NB**

KG/SQCM



**NOMINAL PRESSURE LOSS VS FLOW**

(\* Flow at 15 feet per second [4.57 meter per second])



\* 2.3 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 594 LPM thru 50NB DV

\* 4.7 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 1308 LPM thru 80NB DV

\* 4.7 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 2255 LPM thru 100NB DV

\* 7.5 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 5117 LPM thru 150NB DV

\* 8.4 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 8854 LPM thru 200NB DV

## DELUGE VALVE

**MODEL: SD-DVH5**



### TECHNICAL SPECIFICATION

Normal Size	200,150,100, 80, 50 NB
Material	Nickel Aluminium Bronze
Service Pressure	1.4 to 17.5 Bar (20 to 250 PSI)
Threaded Opening	BSPT
Mounting	Vertical or Horizontal
Factory Hydrostatic Test Pressure	35 Kg/sq.cm. (500 PSI)
Flange Connection	ANSI B 16.5 # 150 FF
Wet Pilot Sprinkler	As per graph in the catalogue
Net Weight without Trim	200 NB - 154 Kg 150 NB - 82 Kg 100 NB - 55 Kg 80 NB - 36 Kg 50 NB - 31 Kg
FINISH	RAL 3000
Ordering Information	1. Size of Valve 2. Flange specification 3. Valve trim vertical or horizontal 4. Trim type

### DESCRIPTION

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

### VALVE OPERATION

SHIELD Deluge valve is a quick release, hydraulically operated diaphragm 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 acts across the diaphragm operated clapper which holds the seat against the inlet supply pressure because of the 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, and the upward force of the supply pressure lifts the clapper allowing the water flow to the system piping network and alarm devices.



### TRIM DESCRIPTION

The trims are functionally termed as Dry Pilot Trim, Wet Pilot Trim, Electric Trim and Test and Alarm Trim as per the method of actuation of the deluge valve. The functionality of these trims is described below.

#### a) DRY PILOT TRIM (PNEUMATIC RELEASE)

Dry pilot operation uses a pilot line of closed Sprinkles/QB detectors 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 air pressure to be maintained as specified in the catalogue of Dry Pilot Actuator. The pilot line is connected to air inlet side of actuator. The top chamber of the deluge valve is connected to water inlet side of actuator.

When there is an air pressure drop, or due to release of any of the release device on detection of fire, the diaphragm of actuator is lifted and allows the water to drain. This releases the water pressure in the top chamber of the deluge valve, allowing the deluge valve to open and water to flow into the system piping & alarm devices. Recommended air supply pressure for dry pilot trim system is 3.5 kg/sq.cm.

User must install non return valve at air supply connection to deluge valve trim.

#### b) WET PILOT TRIM (HYDRAULIC RELEASE)

Wet pilot operation uses a pilot line of closed Sprinklers/QB detectors containing pressurized 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 drops and the Deluge valve opens.

### c) 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 of 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.

### d) TEST AND ALARM TRIM

This trim is supplied with a test valve is provided to test the normal operation of the sprinkler alarm bell. The sprinkler alarm can be supplied additionally, which bells on actuation of the Deluge valve.

### e) DRAIN AND DRIP TRIM

This consists of main and system drain valve in addition with drip valve.

### TRIM TYPES

The trims are designated as following.

W = Wet Pilot trim. D = Dry Pilot Trim

### a) Type SH5-TW and SH5-TD

This type of trim is basic trim required to operate the deluge valve. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

### b) Type SH5-TWD and SH5-TDD

This trim type is a combination of components of normal trim along with the drip and drain trim. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

### c) Type SH5-TWT and SH5-TDT

This trim type is a combination of components of normal trim along with the test and alarm trim. In dry pilot trim, an actuator is provided. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

### d) Type SH5-NTW and SH5-NTD

This trim type is a combination of components of normal trim along with the test and alarm trim as well as the drip and drain trim. A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

TRIM MODEL NO.	TRIM DESCRIPTION	MOUNTING	SCHEMATIC NO.
SH5-TW	Basic Wet Pilot Trim	Vertical	Schematic 1
SH5-TD	Basic Dry Pilot Trim	Vertical	Schematic 2
SH5-TWT	Basic Wet Pilot Trim with Test and Alarm Trim	Vertical	Schematic 3
SH5-TDT	Basic Dry Pilot Trim with Test and Alarm Trim	Vertical	Schematic 4
SH5-TWD	Basic Wet Pilot Trim with Drip and Drain Trim	Vertical	Schematic 5
SH5-TDD	Basic Dry Pilot Trim with Drip and Drain Trim	Vertical	Schematic 6
SH5-NTW	Basic Wet Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Vertical	Schematic 7
SH5-NTD	Basic Dry Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Vertical	Schematic 8
SH5-TW	Basic Wet Pilot Trim	Horizontal	Schematic 9
SH5-TD	Basic Dry Pilot Trim	Horizontal	Schematic 10
SH5-TWT	Basic Wet Pilot Trim with Test and Alarm Trim	Horizontal	Schematic 11
SH5-TDT	Basic Dry Pilot Trim with Test and Alarm Trim	Horizontal	Schematic 12
SH5-TWD	Basic Wet Pilot Trim with Drip and Drain Trim	Horizontal	Schematic 13
SH5-TDD	Basic Dry Pilot Trim with Drip and Drain Trim	Horizontal	Schematic 14
SH5-NTW	Basic Wet Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Horizontal	Schematic 15
SH5-NTD	Basic Dry Pilot Trim with Test and Alarm Trim & Drip and Drain Trim	Horizontal	Schematic 16

**RESETTING PROCEDURE FOR THE DELUGE VALVE****VALVE**

1. Close the upstream side stop valve provided below the deluge valve
2. Open both the drain valves/ drain plugs and close when the flow of water has ceased
3. Close the release device/replace the Sprinkler if release was through Sprinkler/QB Detector
4. Inspect and release if required, or close the section of the detection system subjected to "Fire condition"
5. In case of dry pilot detection system, open the air supply valve to build-up air pressure. Open the priming valve fully. Open the upstream side of the stop valve provided below the Deluge valve. No water should flow into the system.
6. Where priming shut off valve (optional) is provided for resetting, then the water need to be drained from upstream side of valve.

**NOTE:** The valve can be reset without undergoing above procedure, by just closing/replacing the release device as valve is auto reset type. The reset time may be long or cause vibration while closing depending on back pressure at the outlet of the valve.

**CAUTION**

- Do not close the priming valve, downstream and upstream stop valves, while the system is in service.
- The releasing device must be maintained in the open position, when actuated, to prevent the deluge valve from closure if anti shut off valve is not provided.
- 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.
- Do not connect the Sprinkler Alarm outlet drain line to close a common drain as it may create back pressure and Sprinkler Alarm may not function.
- Deluge valve must have support to absorb sudden opening or closing vibration shock to the piping.
- To avoid water damage, take precautions when opening the water supply main control valve, since water will flow from all open system valves.
- The responsibility of maintenance of the protection system and devices in proper operating condition lies with the owner of the system.
- Deluge Valve & its trim shall be maintained at a minimum temperature of 4°C, Heat tracing is not permitted.
- Deluge Valve must be used in pressurised system

**SYSTEM TESTING PROCEDURE**

1. Keep the upstream side of the stop valve partially open. To avoid water flow to system side close the system side stop valve. This valve is to be kept in open position after the testing is completed.
2. Let any of the release devices to trip. This will result in a sudden drop of water pressure in the deluge valve top chamber which in turn will open the deluge valve. Close the upstream side stop valve immediately.
3. Reset the valve as per the procedure given under heading "RESETTING PROCEDURE FOR THE DELUGE VALVE"

**INSPECTION AND MAINTENANCE**

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 authorized person must be trained to perform inspection and testing of the system. It is recommended to have regular inspection and test run of the system as per NFPA guideline or in accordance to the organisation having local jurisdiction.

**(i) WARNING**

Inspection and testing is to be carried out only by authorised and trained personnel. DO NOT TURN OFF 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 there is no false alarm signal.

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 that there are no damages to any component.

The frequency of inspections must be increased in the presence of contaminated water supplies, corrosive/scaling water supplies, and corrosive atmospheres.

**(ii) NORMAL CONDITION**

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

### (iii) NORMAL CONDITION TEST

- The system should be checked for normal condition at least once in a week
- 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
- Depress the drip valve knob. Significant accumulation indicates a possible seat leakage
- Conduct the water flow test as per the procedure of system testing at least once 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

- Check for any obstruction in the alarm test line, make certain that the sprinkler alarm is free to operate
- If an electric alarm is provided, check the electrical circuitry to the alarm

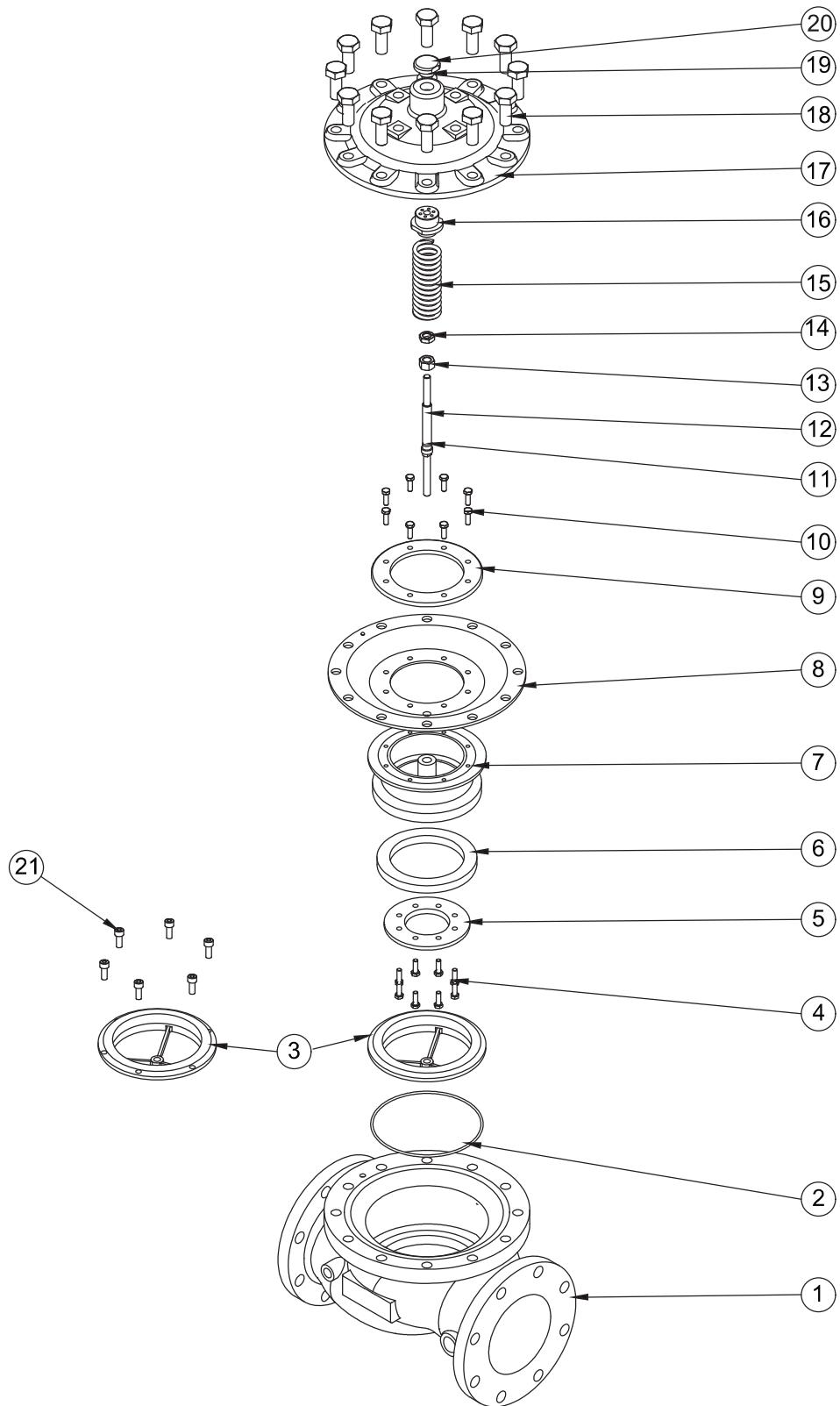
### (ii) FALSE TRIPS

- Check for clogging in priming line, restriction orifice check valve, priming valve & strainer
- Leakage in the release system
- The deluge air panel orifice clogged or low supply pressure

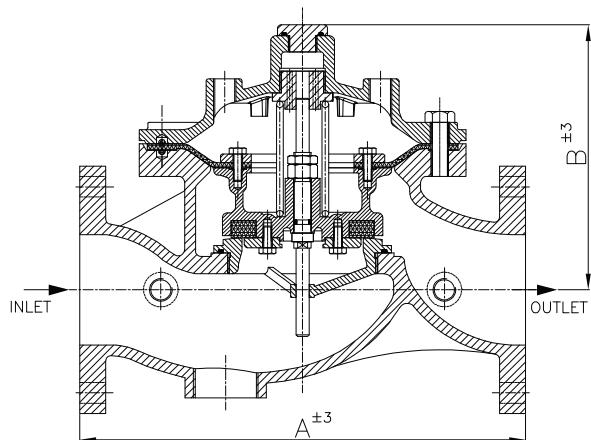
### (iii) LEAKAGE THROUGH THE DELUGE VALVE

- Damaged deluge valve seat or obstruction on the seat face by foreign object
- Leakage in release system
- Partly clogged priming line restriction orifice check valve
- Low air pressure on release system line or leakage in release system

## NOMINAL PRESSURE LOSS VS FLOW



## DELUGE VALVE MODEL - SD-DVH5



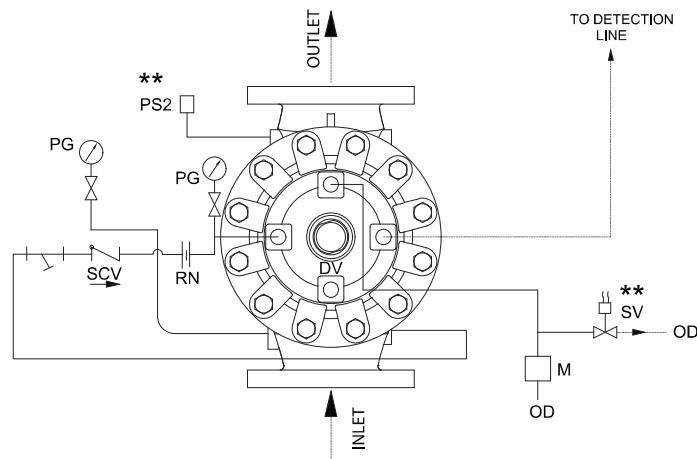
Dimension in mm. (Approximate)

Valve Nominal Size	'A'	'B'
200 NB	552	332
150 NB	462	282
100 NB	412	245
80 NB	372	232
50 NB	320	232

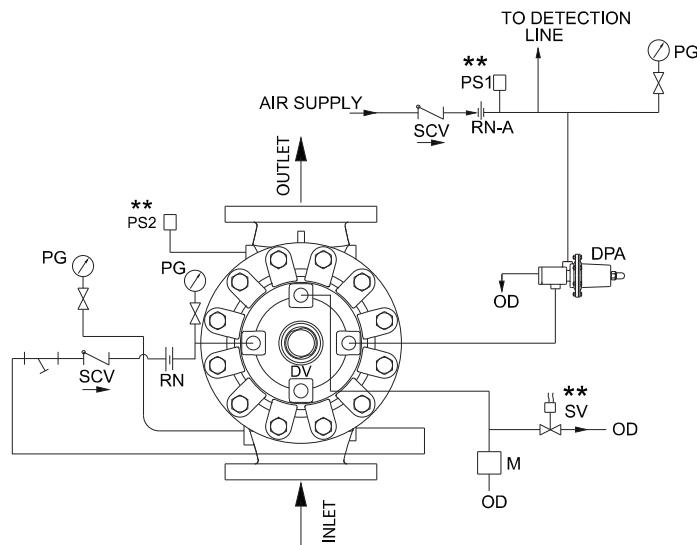
## PART LIST

ITEM	PART NO.					DESCRIPTION	QTY.				MATERIAL SPECIFICATION
	200 NB	150 NB	100 NB	80 NB	50 NB		200 NB	150 NB	100 NB	80/50NB	
1	H5201	H5601	H5101	H5801	H5501	Housing	1	1	1	1	Aluminium Bronze BS1400-AB2
2	H5202	H5602	H5102	H5802	H5502	"O" Ring	1	1	1	1	Neoprene Rubber
3	H5203	H5603	H5103	H3803	H5503	Seat	1	1	1	1	Aluminium Bronze BS1400-AB2
4	H5204	H5604	H5104	--	--	Bolt	8	4	4	--	Monel 400
5	H5205	H5605	H5105	H5805	H5505	Rubber Clamp	1	1	1	1	Aluminium Bronze BS1400-AB2
6	H5206	H5606	H5106	H5806	H5506	Rubber Seat	1	1	1	1	Neoprene Rubber
7	H5207	H5607	H5107	H5807	H5507	Clapper	1	1	1	1	Aluminium Bronze BS1400-AB2
8	H5208	H5608	H5108	H5808	H5508	Diaphram	1	1	1	1	Neoprene Rubber
9	H5209	H5609	H5109	H5809	H5509	Clamp Ring	1	1	1	1	Aluminium Bronze BS1400-AB2
10	H5210	H5610	H5110	H5810	H5510	Bolt	12	8	8	8	Monel 400
11	H5211	H5611	H5111	H5811	H5511	"O" Ring	1	1	1	1	Neoprene Rubber
12	H5212	H5612	H5112	H5812	H5512	Spindle	1	1	1	1	Monel 400
13	H5213	H5613	H5113	H5813	H5513	Nut	1	1	1	1	Monel 400
14	H5214	H5614	H5114	H5814	H5514	Lock Nut	1	1	1	1	Monel 400
15	H5215	H5615	H5115	H5815	H5515	Spring	1	1	1	1	Inconel-X-750
16	H5216	H5616	H5116	H5816	H5516	Adaptor	1	1	1	1	Aluminium Bronze BS1400-AB2
17	H5217	H5617	H5117	H5817	H5517	Cover	1	1	1	1	Aluminium Bronze BS1400-AB2
18	H5218	H5618	H5118	H5818	H5518	Bolt	16	12	12	12	Stainless Steel
19	H5219	H5619	H5119	H5819	H5519	"O" Ring	1	1	1	1	Neoprene Rubber
20	H5220	H5621	H5120	H5820	H5520	Plug	1	1	1	1	Aluminium Bronze BS1400-AB2
21	H5221	--	--	--	--	Allen Bolt	6	--	--	--	Monel 400

**SCHEMATIC FOR WET PILOT BASIC TRIM  
FOR VERTICAL MOUNTING**

**SH5-TW****SCHEMATIC 1**

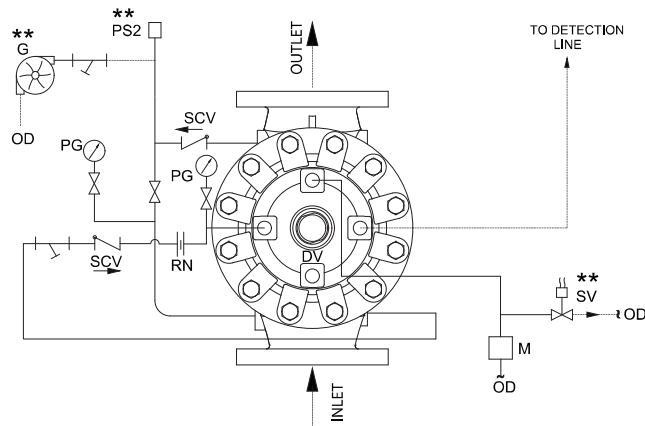
**SCHEMATIC FOR DRY PILOT BASIC TRIM  
FOR VERTICAL MOUNTING**

**SH5-TD****SCHEMATIC 2**

DV	Deluge Valve	▷	Valve	↖	Swing Check Valve
SV	Solenoid Valve	---	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	└─┐	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR VERTICAL MOUNTING**

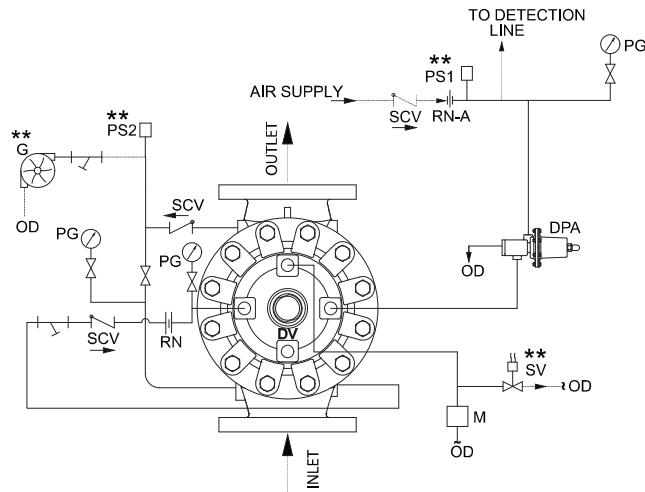
**SH5-TWT**



**SCHEMATIC 3**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR VERTICAL MOUNTING**

**SH5-TDT**



**SCHEMATIC 4**

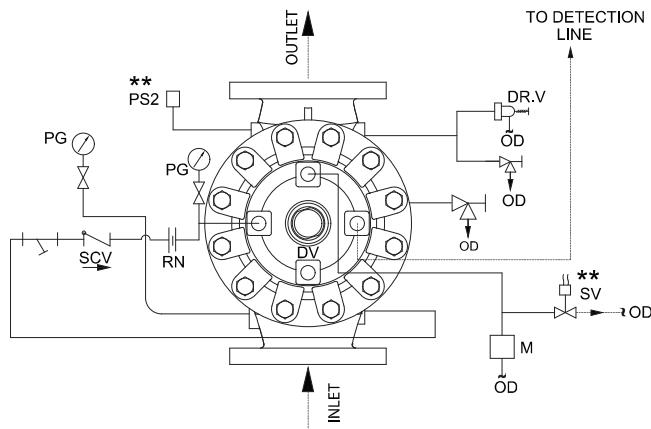
DV	Deluge Valve
SV	Solenoid Valve
G	Sprinkler Alarm (WMG)
M	Emergency Release Station
RN	Restriction Nozzle (Priming Line)
PS1	Low Air Alarm Pressure Switch
PS2	Waterflow Pressure Alarm Switch

▷	Valve
--	By User
**	Optional
↓	Strainer
OD	Open Drain
PG	Pressure Gauge

↷	Swing Check Valve
↗	Angle Valve
DPA	Dry Pilot Actuator
RN-A	Restriction Nozzle (Air Line)
SCV	Swing Check Valve

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR VERTICAL MOUNTING**

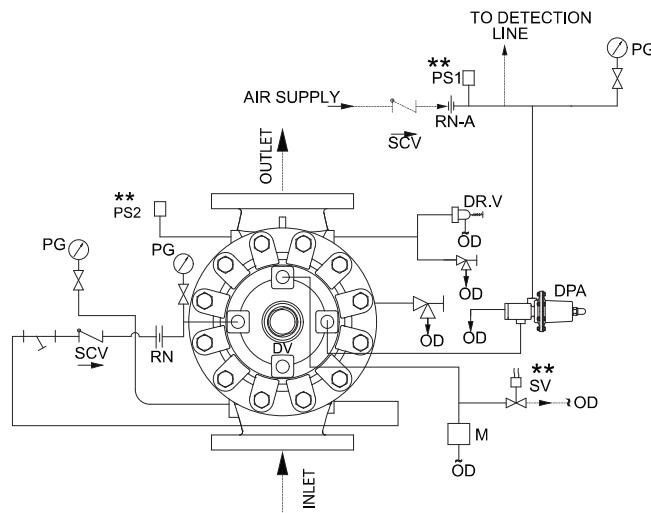
**SH5-TWD**



**SCHEMATIC 5**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR VERTICAL MOUNTING**

**SH5-TDD**

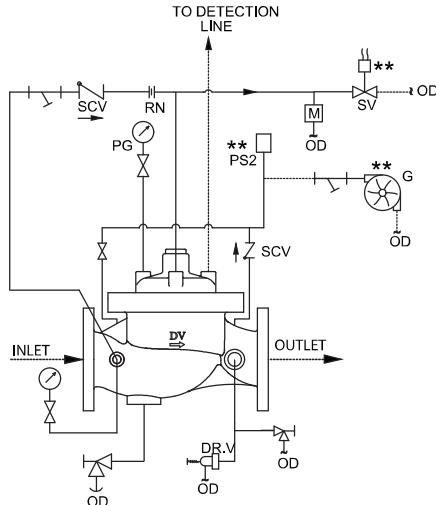


**SCHEMATIC 6**

DV	Deluge Valve	▷	Valve	↑	Swing Check Valve
SV	Solenoid Valve	---	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING**

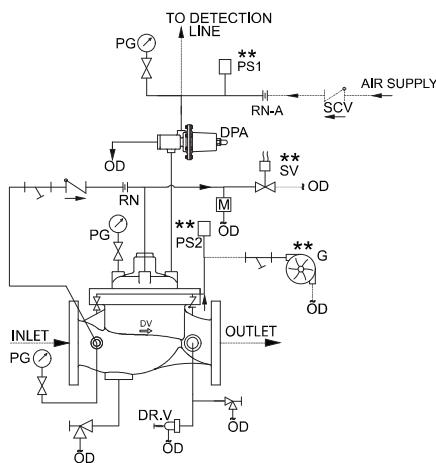
SH3-NTW



**SCHEMATIC 15**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING**

SH3-NTD

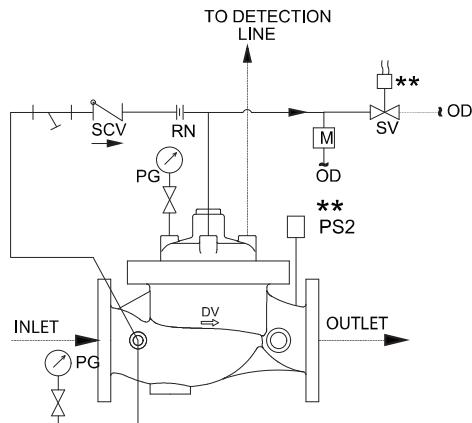


**SCHEMATIC 16**

DV	Deluge Valve	▷	Valve	↷	Swing Check Valve
SV	Solenoid Valve	--	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM  
FOR HORIZONTAL MOUNTING**

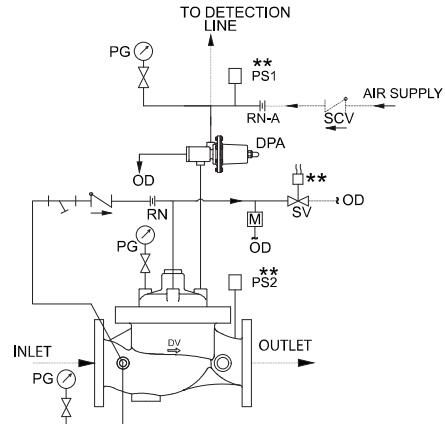
SH5-TW



SCHEMATIC 9

**SCHEMATIC FOR DRY PILOT BASIC TRIM  
FOR HORIZONTAL MOUNTING**

SH5-TD

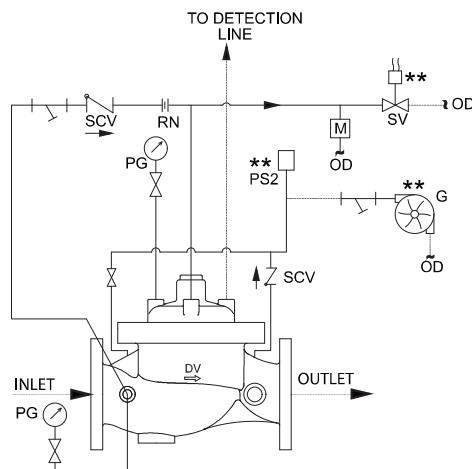


SCHEMATIC 10

DV	Deluge Valve	▷	Valve	↑	Swing Check Valve
SV	Solenoid Valve	---	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR HORIZONTAL MOUNTING**

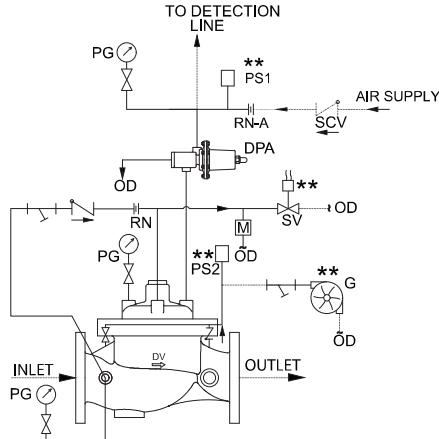
**SH5-TWT**



**SCHEMATIC 11**

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM  
FOR HORIZONTAL MOUNTING**

**SH5-TDT**

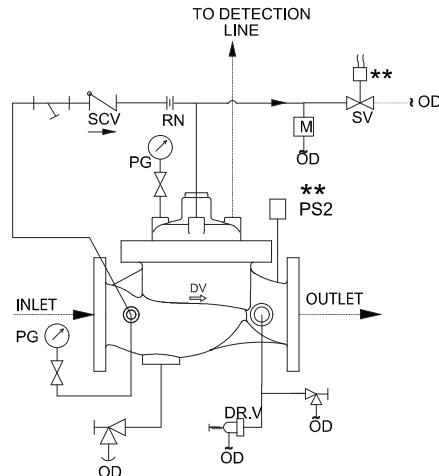


**SCHEMATIC 12**

DV	Deluge Valve	▷	Valve	↷	Swing Check Valve
SV	Solenoid Valve	---	By User	⤓	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	⤓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

**SCHEMATIC FOR WET PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR HORIZONTAL MOUNTING**

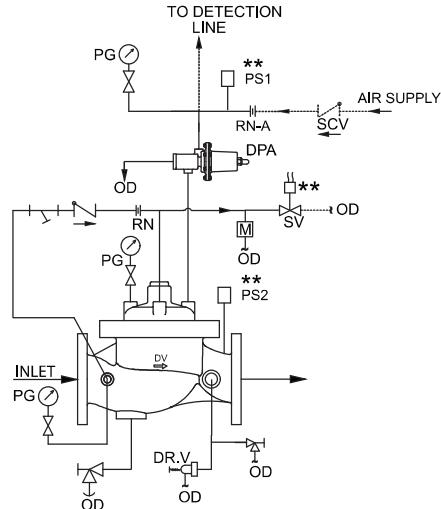
SH5-TWD



SCHEMATIC 13

**SCHEMATIC FOR DRY PILOT BASIC TRIM WITH DRIP AND DRAIN TRIM  
FOR HORIZONTAL MOUNTING**

SH5-TDD

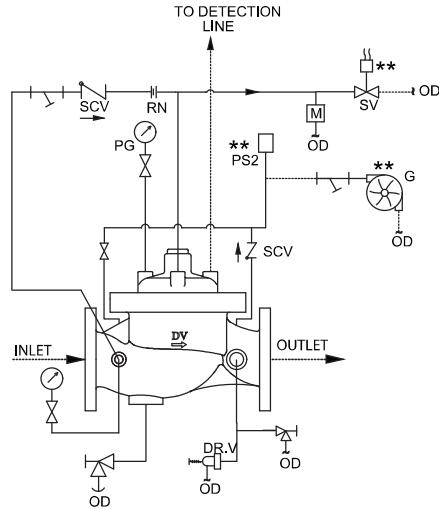


SCHEMATIC 14

DV	Deluge Valve	▷	Valve	↑	Swing Check Valve
SV	Solenoid Valve	--	By User	↗	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	↓	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

SCHEMATIC FOR WET PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING

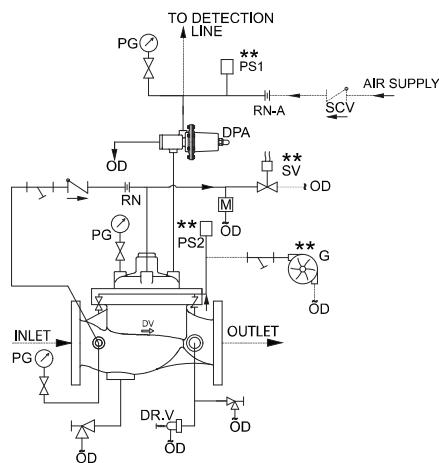
**SH5-NTW**



**SCHEMATIC 15**

SCHEMATIC FOR DRY PILOT BASIC TRIM WITH TEST AND ALARM TRIM & DRIP AND DRAIN TRIM FOR HORIZONTAL MOUNTING

**SH5-NTD**



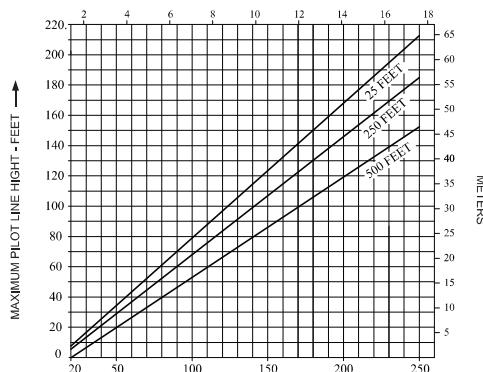
**SCHEMATIC 16**

DV	Deluge Valve	▷	Valve	↷	Swing Check Valve
SV	Solenoid Valve	---	By User	⤓	Angle Valve
G	Sprinkler Alarm (WMG)	**	Optional	DPA	Dry Pilot Actuator
M	Emergency Release Station	⤒	Strainer	RN-A	Restriction Nozzle (Air Line)
RN	Restriction Nozzle (Priming Line)	OD	Open Drain	SCV	Swing Check Valve
PS1	Low Air Alarm Pressure Switch	PG	Pressure Gauge		
PS2	Waterflow Pressure Alarm Switch				

## SPRINKLER HEIGHT LIMITATION

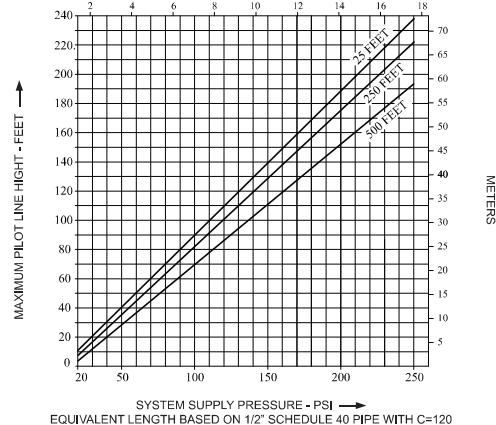
**DV 200NB**

KG/SQCM



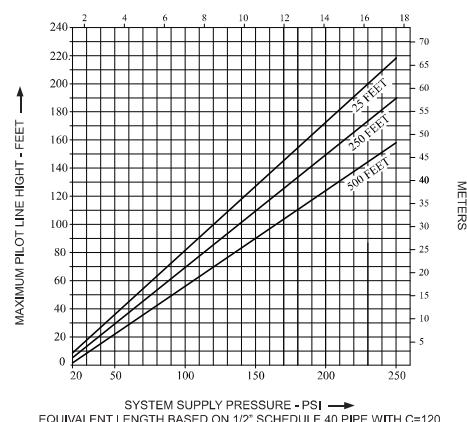
**DV 150NB**

KG/SQCM



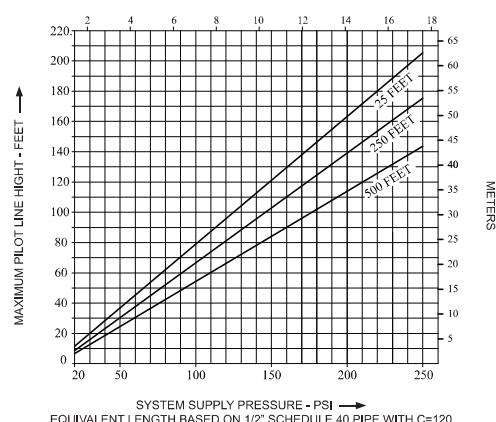
**DV 100NB**

KG/SQCM



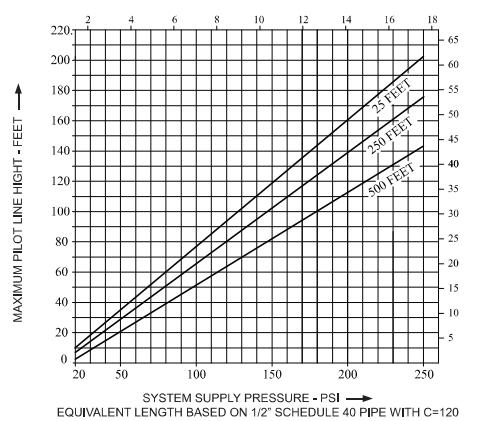
**DV 80NB**

KG/SQCM



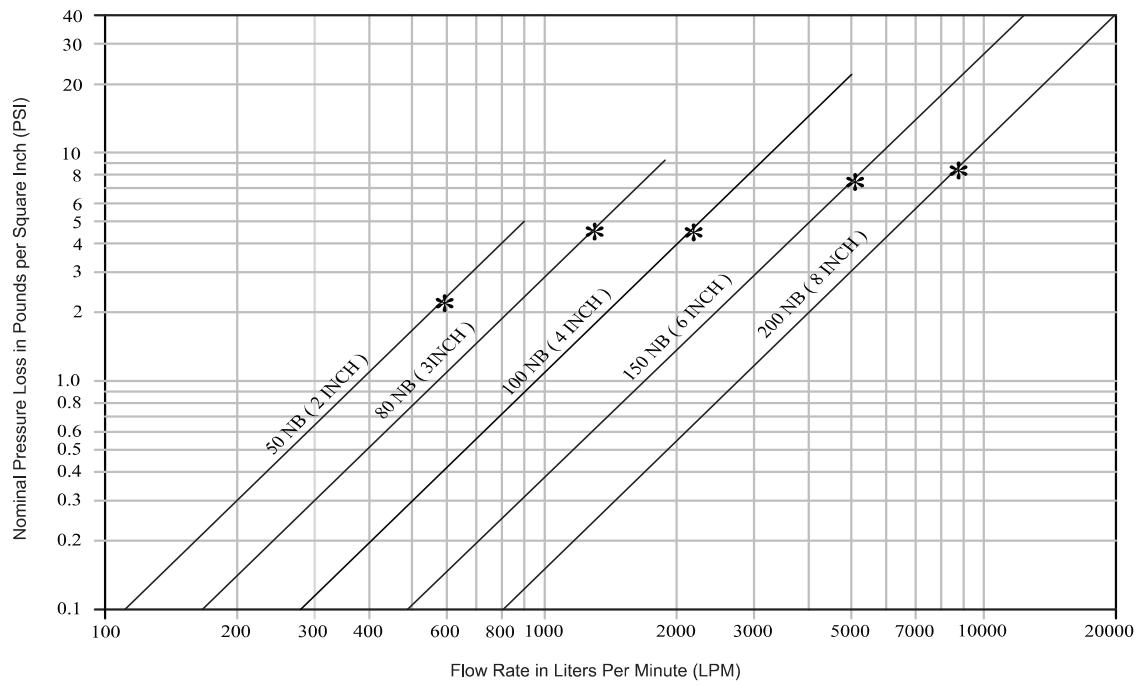
**DV - 50NB**

KG/SQCM



**NOMINAL PRESSURE LOSS VS FLOW**

(\* Flow at 15 feet per second [4.57 meter per second])



\* 2.3 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 594 LPM thru 50NB DV

\* 4.7 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 1308 LPM thru 80NB DV

\* 4.7 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 2255 LPM thru 100NB DV

\* 7.5 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 5117 LPM thru 150NB DV

\* 8.4 PSI Pressure loss @ 15 feet per second (4.57 met/sec) velocity having flow of 8854 LPM thru 200NB DV