

# De's Technico Pvt Ltd



# Deluge Valve Manual



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## CERTIFICATE

Management system as per  
**ISO 9001 : 2008**

In accordance with TÜV NORD CERT procedures, it is hereby certified that

**DE's TECHNICO PRIVATE LIMITED**  
WORKS & REGISTERED OFFICE:  
11, Bauria Industrial Estate, P.O.: Chak-Kashi,  
Dist: Howrah - 711 307, West Bengal,  
India  
and other location as per Annexure

applies a management system in line with the above standard for the following scope

**Design, Manufacture, Installation, Testing and Servicing of Fire Detection  
and Fire Protection Systems and Supply of Spare Parts**

Certificate Registration No. 44 100 16390905  
Audit Report No. 2.5-7178/2016

Valid until 14.09.2018  
(until 06.04.2019 in case of transition to ISO 9001:2015)

Certification Body  
at TÜV NORD CERT GmbH

Issue 06.04.2016  
Place : Mumbai

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.

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## CERTIFICATE OF COMPLIANCE

Certificate Number 20160420-EX26880  
Report Reference EX26880-20160420  
Issue Date 2016-APRIL-20

Issued to: DE'S TECHNICO PVT LTD  
MARTIN BURN BUSINESS PARK  
8TH FLOOR, ROOM NO. 804, BP-3  
SALT LAKE CITY, SECTOR - V  
KOLKATA WB 700091 INDIA

This is to certify that representative samples of SPECIAL SYSTEM WATER CONTROL VALVES, DELUGE TYPE

PD DRY PILOT, PD WET PILOT in the 4 and 6 in. nominal sizes with grooved ends for use in horizontal and vertical position for a rated working pressure not to exceed 250 psig.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 260, Dry Pipe and Deluge Valves for Fire-Protection Service.

Additional Information: See the UL Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

Bruce Wilmetts, Director North American Certification Program

UL LLC

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A Deluge Valve is the main control valve in Water based Automatic Fire Protection systems. It is a special purpose valve meant for use in extra high hazard area with rapidly spreading fire, protected by Medium Velocity & High Velocity Water Spray Systems and all Sprinkler Systems of:

- Pre - action
- Deluge type
- Large Foam Systems

The Deluge Valve releases water to a large number of nozzles on a single manual / automatic command & causes a Deluge of water spray. UL listed Deluge Valves from DTPL comes in 100 mm and 150 mm nominal sizes. It is suitable for both fresh water & marine application. It is constructed as per its application in the following ways:

- Fresh Water Application: Cast Steel body with SS & Bronze internals
- Marine Water Application Special Bronze/ SS body with SS/ Bronze internals

The Deluge Valve is connected to water spray pipe network for the risk to be protected. It holds back the water pressure under normal condition and opens up to cause a deluge of water spray when detector signals a FIRE condition.

The Deluge Valve actuating signal can be –

- Pneumatic
- Electric
- Hydraulic
- Manual

### **Working Principle of Deluge Valve**

The Detection system operates the Deluge Valve automatically. The valve is kept closed against the water pressure in the main fire water line, by means of the line pressure. When the detection system senses a fire, either there is a loss of pressure in the detection line or the Solenoid on the Deluge Valve is operated via an electric signal. The Isolation valves before & after the DV should always be kept open.



## 1. DRY TRIM

DV with the detector / pilot line charged with air is called Dry Type DV (Fig.1). In case of loss of air pressure, the water from the Pilot Valve is drained, which opens the Deluge Valve FULLY and INSTANTLY.

## 2. WET TRIM

Hydraulically controlled DV with the detector / Pilot line charged with water is called Wet Type DV (Fig.2). In case of loss of pressure, the water from main valve cover chamber drained directly and Deluge Valve opens FULLY and INSTANTLY.

## 3. ELECTRIC TRIM

The solenoid valve is energized by a detection system which opens the Deluge Valve FULLY and INSTANTLY. When the electric signal is de-energized, it resets the Deluge Valve automatically. Electric trim is useful in case of remote operation or operation from an electronic based detection system.



Figure 1

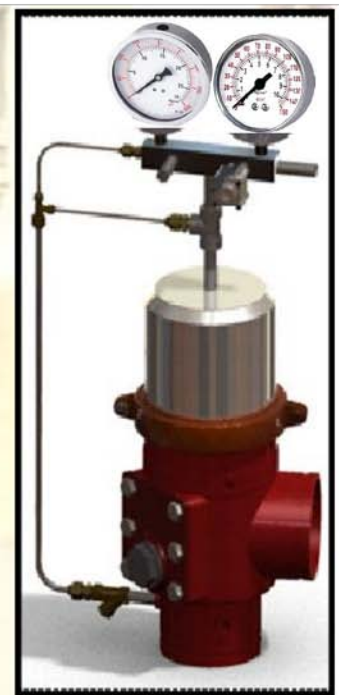


Figure 2

The test & drain feature is provided in each of the trim for test-reset of the Deluge Valve.

### Optional Accessories:

Each Deluge Valve has the following options:

1. A by-pass valve for emergency operation
2. Air or water operated alarm

1. Deluge Valve Body is made of Cast Carbon Steel. There is no pressure inside the body when Deluge Valve is in inactive condition. A disc (item. 6) is use to hold the water pressure from the supply line.

2. Top Cover is made of Stainless Steel. It is the main pressure containing part of Deluge Valve. The internal pressure inside the top cover is same as the water supply line pressure. This top cover is clamped with the Deluge Valve Body by a grooved coupling.

3. Piston Plate Assembly consists of top plate, middle plate and bottom plate with rubber bucket seals. It moves up and down inside top cover.

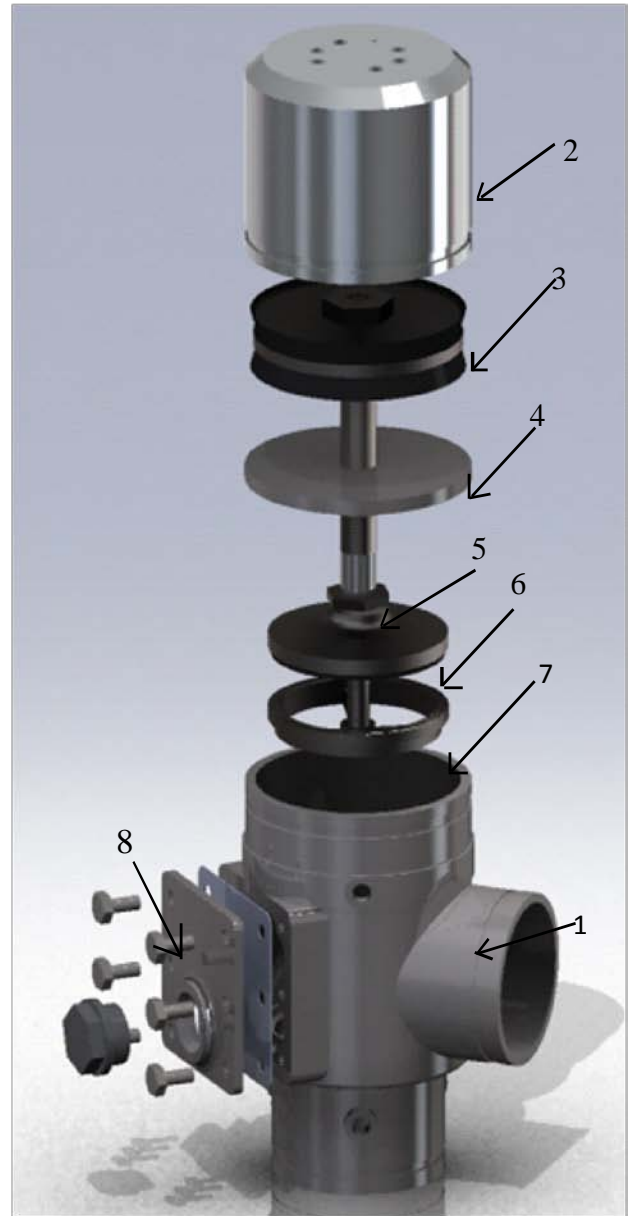
4. Middle Flange is made of Cast Steel. It divides Deluge Valve into two parts. Top part is pressure containing part and enclosed by top cover and bottom part is Deluge Valve body which is dry and empty.

5. Spindle is made of Cast Steel. It is use to transfer pressure from top cover to valve disc

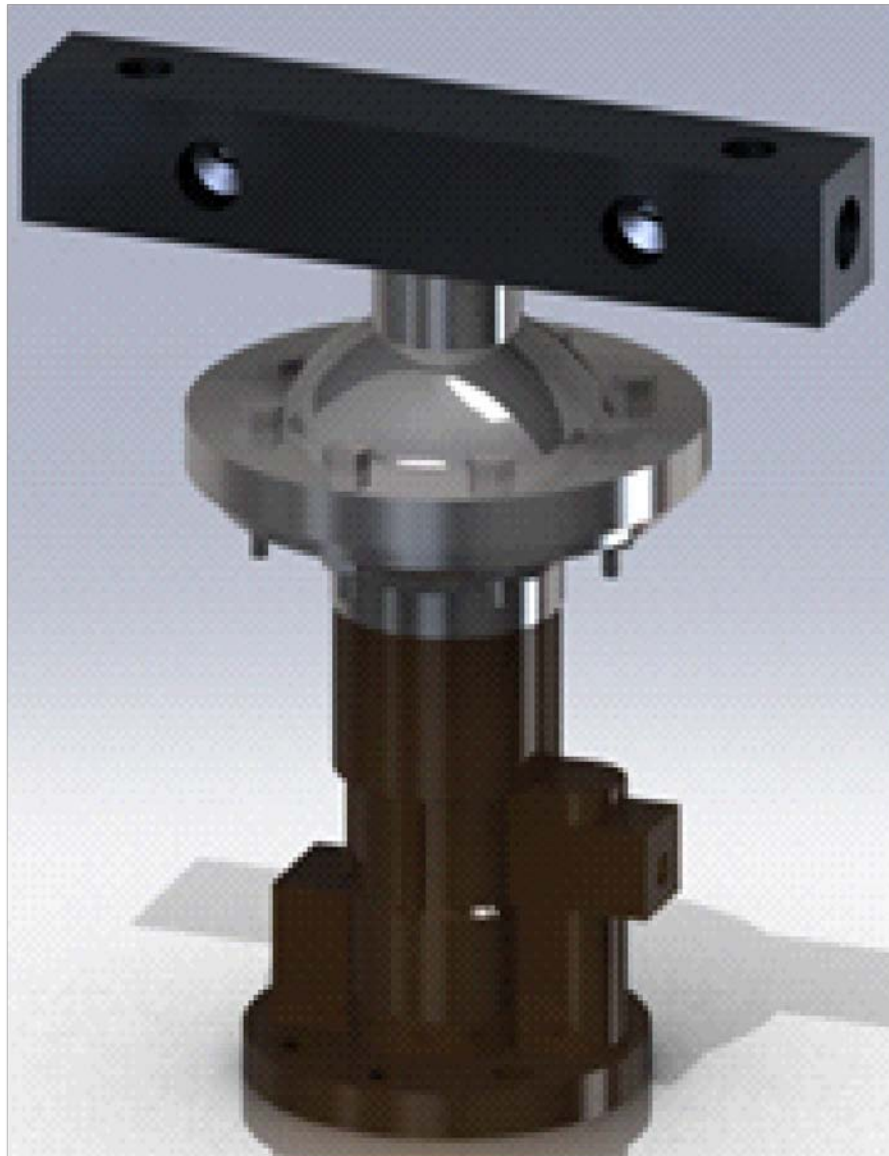
6. Valve Disc restricts entry of water from Fire water main to deluge system.

7. Valve Seat together make DV inlet leak proof.

8. Hand Hole is used for seat disc joint maintenance.



**Figure -3**



**Pilot Valve**

Figure - 4

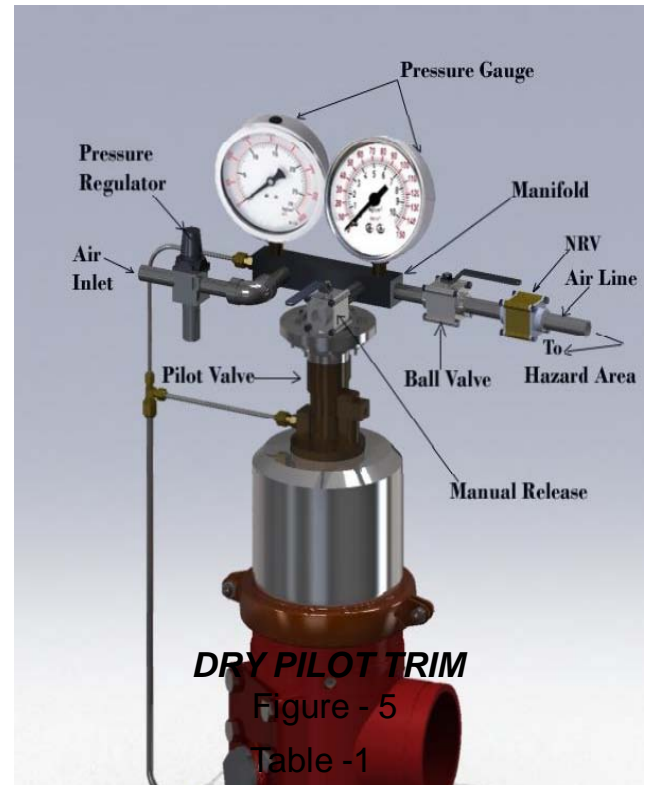
- 1. Pilot Valve (For Dry Type Only):-** Dry Pilot operation uses a Pilot line of closed QB detectors containing air under pressure, located in the area to be protected. It requires regulated dry air supply. The Pilot line is connected directly to the Top Cover of the Deluge Valve. When the air pressure drops the Deluge Valve opens.



## A. DRY PILOT TRIM (PNEUMATIC RELEASE)

Dry Pilot Trim system requires continuously available Air pressure -as mentioned in '**Table-1**' though Recommended maximum air supply pressure for Dry Pilot Trim system is 3.5 kg/sq.cm. Pressure regulator with Filter is required to maintain this pressure. This air supply connects with detection line as well as Pilot Valve through an air manifold. The top cover of the Deluge Valve is connected to water inlet side through Pilot Valve. A diaphragm operated shaft inside Pilot Valve keep open water way when it is pressurized by air. When there is an air pressure Drop due to release of any of the release device on detection of fire, the diaphragm of actuator is lift and allows the water to drain. At the same time it blocks the incoming water from water inlet. This causes water pressure Drop inside top cover and allowing the Deluge Valve open.

User must install non return valve at air supply connection to Deluge Valve Trim.



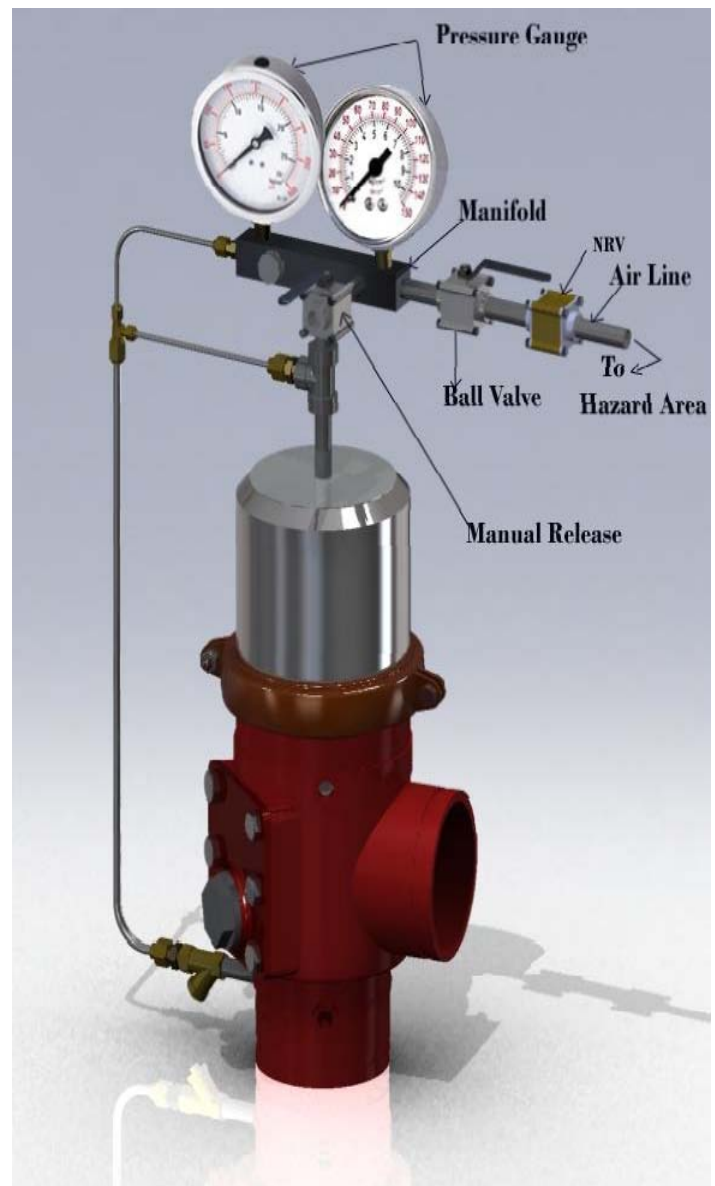
Water Line Pressure (Kg/Cm <sup>2</sup> )	Minimum Air Pressure in Detection Line (Kg/Cm <sup>2</sup> )			
	150 Nb		100 Nb	
	Horizontal	Vertical	Horizontal	Vertical
2	0.5	0.5	0.6	0.5
4	1.0	1.0	1.1	0.85
6	1.5	1.5	1.5	1.3
8	2.0	2.0	2.0	1.7
10	2.5	2.5	2.5	2.2
12	3.0	3.0	2.9	2.6



## **B. WET PILOT TRIM (HYDRAULIC RELEASE)**

In case of Wet Pilot system, the detection line and DV top cover both are pressurized by line pressure. [Wet Pilot system is sensitive to Drop of water pressure in the line, It is also related to volume of Water inside detection line. To stabilize, a hydro- pneumatic tank ( to be ordered separately) ensures stability of pressure inside the DV top cover and detection line]. All the release lines are connected to a common manifold. Due to release of any one of the release device, the water pressure in the top cover of the Deluge Valve Drops and the Deluge Valve opens.

*[Note: Please refer Wet Pilot sprinkler height and length limitation graph (Fig.1 to 5). Make sure that the installation is within these parameters. Please refer to drawing of Wet Pilot trim for installation.]*

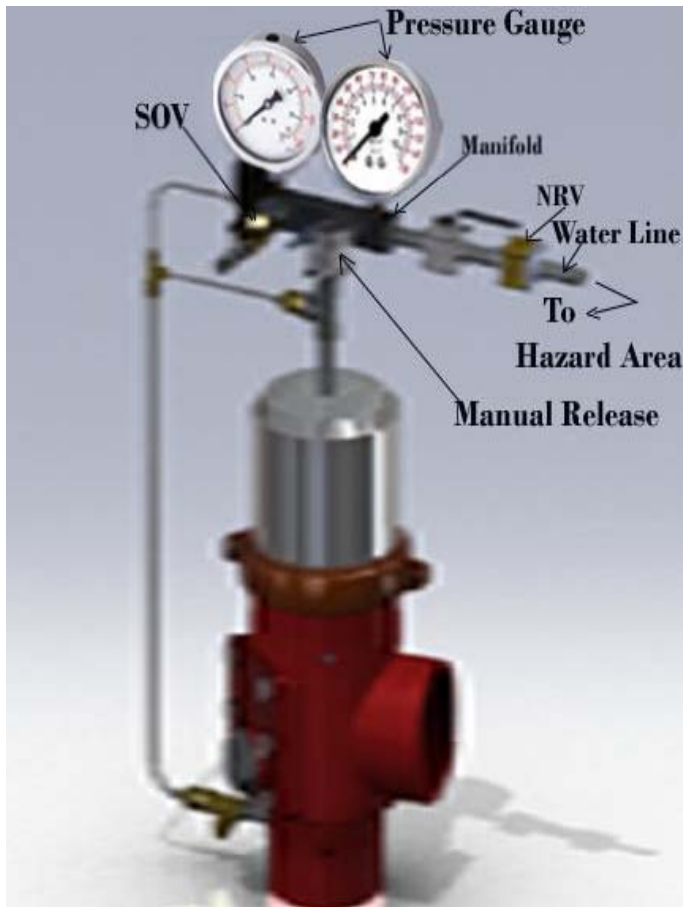


**WET PILOT TRIM**

Figure - 6

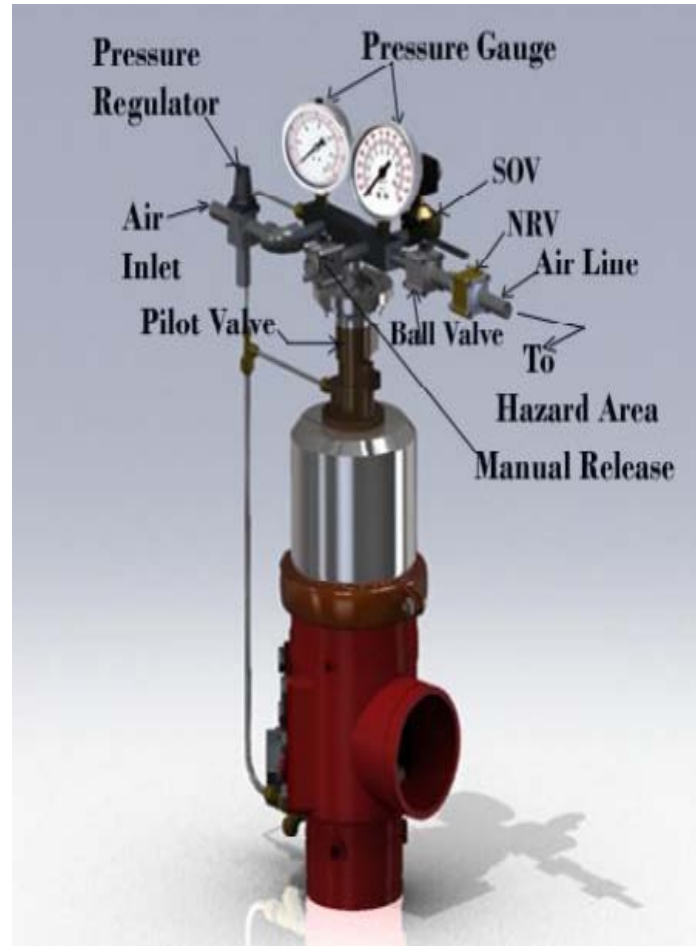
### c. *ELECTRIC RELEASE TRIM*

To actuate a Deluge Valve electrically, a solenoid valve(SOV) is provided with manifold to drain the water from the top chamber of the Deluge Valve. In case of wet system,SOV drains water and in case of Dry system it releases air from manifold. A pressure switch (optional) is provided to activate an electric alarm,to shut down the desired equipment or to give “DV ON” or “SPRAY ON” indication of the Deluge Valve



***ELECTRICAL TRIM FOR WET PILOT***

Figure - 8



***ELECTRICAL TRIM FOR DRY PILOT***

Figure -7



**Table-2**

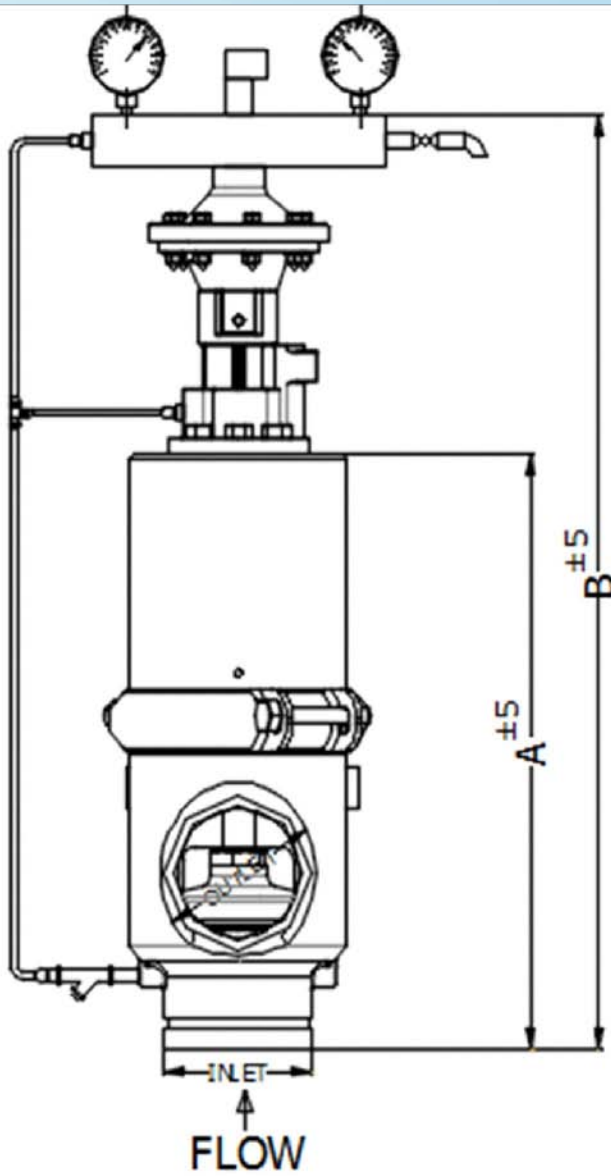
Model	PD-DRY / PD-WET
Nominal Size	100 Nb & 150 Nb
<b>Maximum Service Pressure</b>	<b>17.5 Kg/Cm<sup>2</sup> (250 PSI)</b>
Connection Type	Grooved (See note Below)
Mounting	Horizontal / Vertical
<b>Hydro Test Pressure</b>	<b>35 Kg/Cm<sup>2</sup> (500 PSI)</b>
Materials of Constructon	Refer ' <b>Table – 3</b> '
Minimum Air Pressure for Dry Type DV	Refer ' <b>Table – 1</b> '
Wet Pilot Sprinkler Height Limitation	As per Graph shown in this catalogue
Equivalent Length	
100 Nb Horizontal DV	15.6 Mtr.
100 Nb Vertical DV	18.9 Mtr.
150 Nb Horizontal DV	31.6 Mtr.
150 Nb Vertical DV	25.3 Mtr.



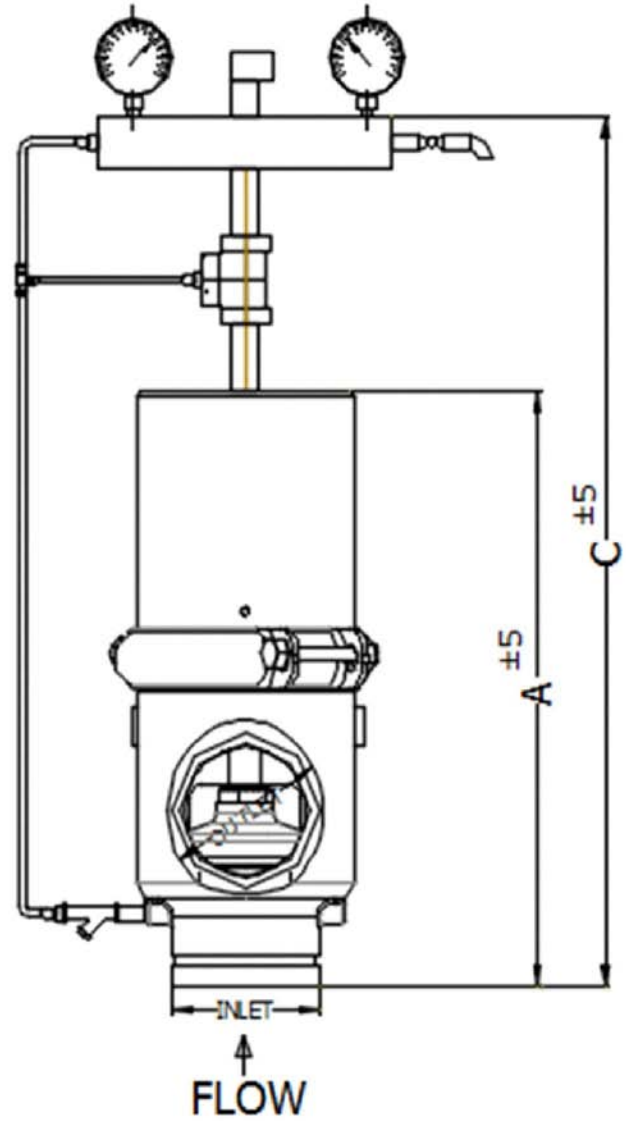
**Figure - 9**

**Note:** Grooved Deluge Valve can be used as a flanged DV By using Grooved Flange (Ref. Fig.9). During order Grooved Flange treated as a separate item and supply with extra cost.

**\*\* Please contact DTPL Technical Team for Deluge Valve 'K- Factor' & 'X-Factor' or any other technical assistance.**



GENERAL ASSEMBLY DRAWING  
FOR DRY TYPE DV  
(PD-DRY)



GENERAL ASSEMBLY DRAWING  
FOR WET TYPE DV  
(PD-WET)

DELUGE VALVE SIZE	DIMENSION				
	A	B	C	INLET	OUTLET
100 NB [4"]	440	859	808	100 NB	100 NB
150 NB [6"]	604	691	644	150 NB	150 NB

Figure - 10 & Figure - 11



# DELUGE VALVE PART DETAIL

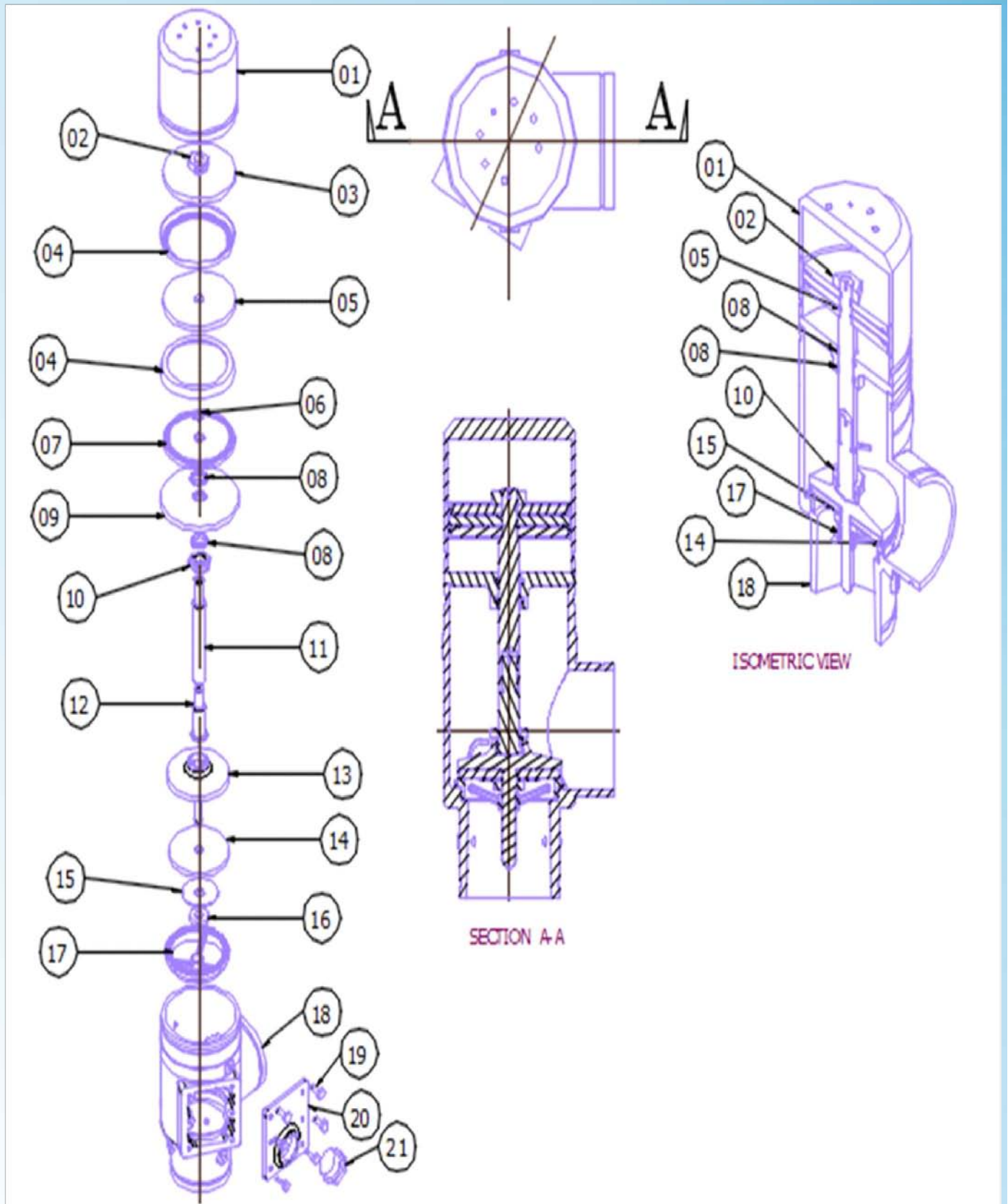


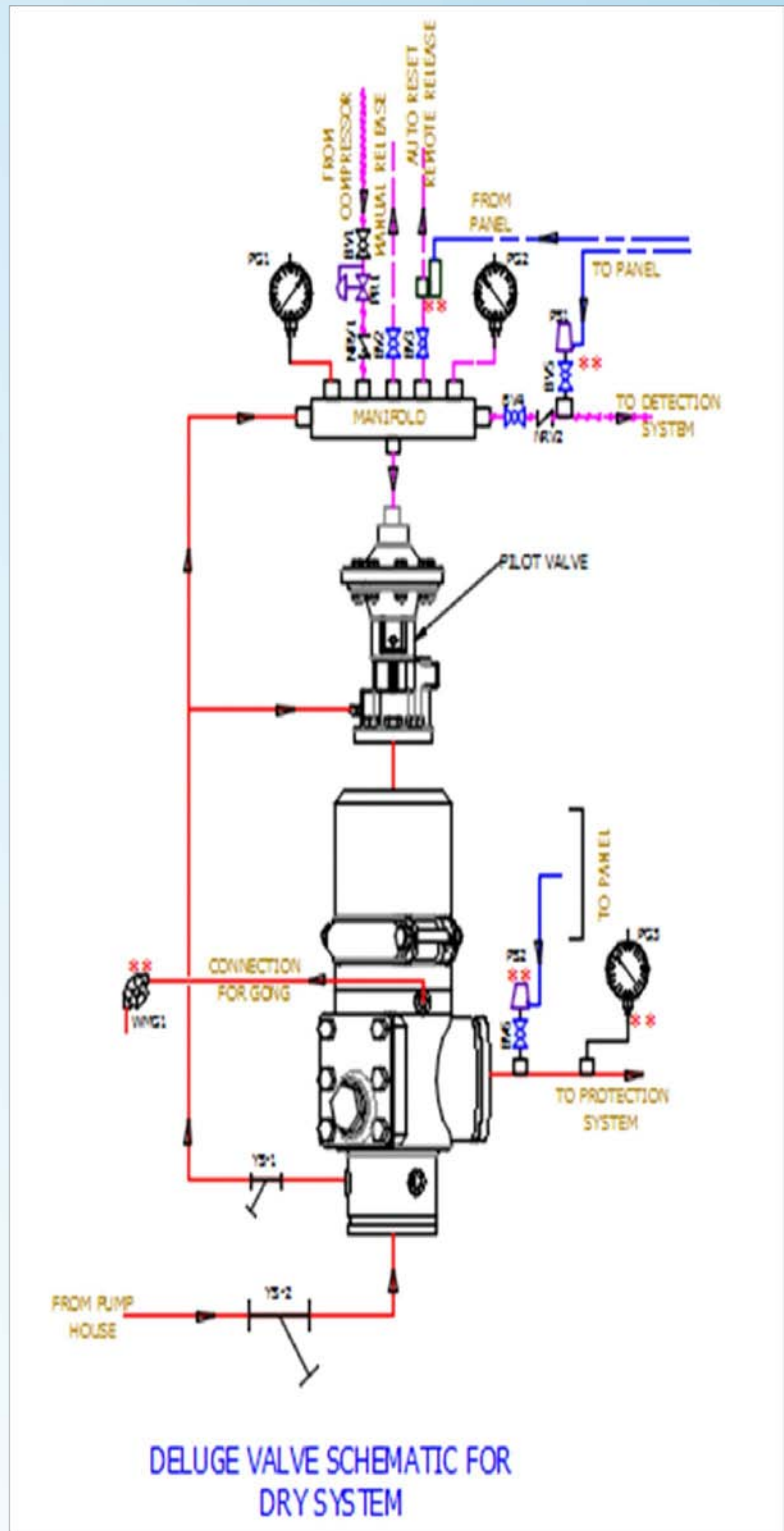
Figure - 12

**TABLE -3**












SL.NO	NAME	MATERIAL	STANDARD
1	TOP COVER PLATE	SS 304	ASTM A240 304
2	TOP COVER PIPE	SS 304	ASTM A312 TP 304/SCH. 40
3	SPINDLE LOCK NUT	BRASS	IS:319, Gr.2
4	TOP PLATE	SS 304	ASTM A240 TP 304
5	RUBBER 'U'-BUCKET	NEOPRENE RUBBER	.....
6	MIDDLE PLATE	SS 304	ASTM A240 304
7	RUBBER 'O' RING	NEOPRENE RUBBER	NEOPRENE
8	BOTTOM PLATE	SS 304	ASTM A240 TP 304
9	RUBBER BUSH	NEOPRENE RUBBER	.....
10	MIDDLE FLANGE	CAST CARBON STEEL	ASTM A 216 Gr. WCB
11	DISC HOLDER	BRASS	IS:319, Gr.2
12	TOP SPINDLE	SS 304	ASTM A 479 TP. 304
13	BOTTOM SPINDLE	SS 304	ASTM A 479 TP. 304
14	DELUGE VALVE DISC	SS 304	ASTM A351 CF8
15	RUBBER SEAT	NEOPRENE RUBBER	.....
16	VALVE SEAT WASHER	SS 304	ASTM A240 304
17	DISC LOCK NUT	BRASS	IS:319, Gr.2
18	DELUGE VALVE SEAT	SS 304/ BRONZE	ASTM A351 CF8 / IS:318 GR. LTB2
19	DELUGE VALVE BODY	CAST CARBON STEEL	ASTM A 216 Gr. WCB
20	BOLT FOR HAND HOLE	CARBON STEEL	ASTM A 193 GR. B7
21	HAND HOLE COVER	CAST CARBON STEEL	ASTM A 216 Gr. WCB
22	DRAIN PLUG	CI	IS:210 FG 200
23	GASKET FOR HAND HOLE COVER	CAF	IS:2712 Gr. W/1



# DV SCHEMATIC FOR DRY SYSTEM



### LEGENDS -

-  — PRESSURE GAUGE
-  — NON RETURN VALVE
-  — PRESSURE REGULATOR
-  — BALL VALVE
-  — SOLENOID VALVE
-  — PRESSURE SWITCH
-  — AIR LINE
-  — CABLE
-  — WATER LINE
-  — Y-STRAINER
-  — WATER MOTOR GONG

NOTE:-  
\*\* - OPTIONAL

Figure - 13

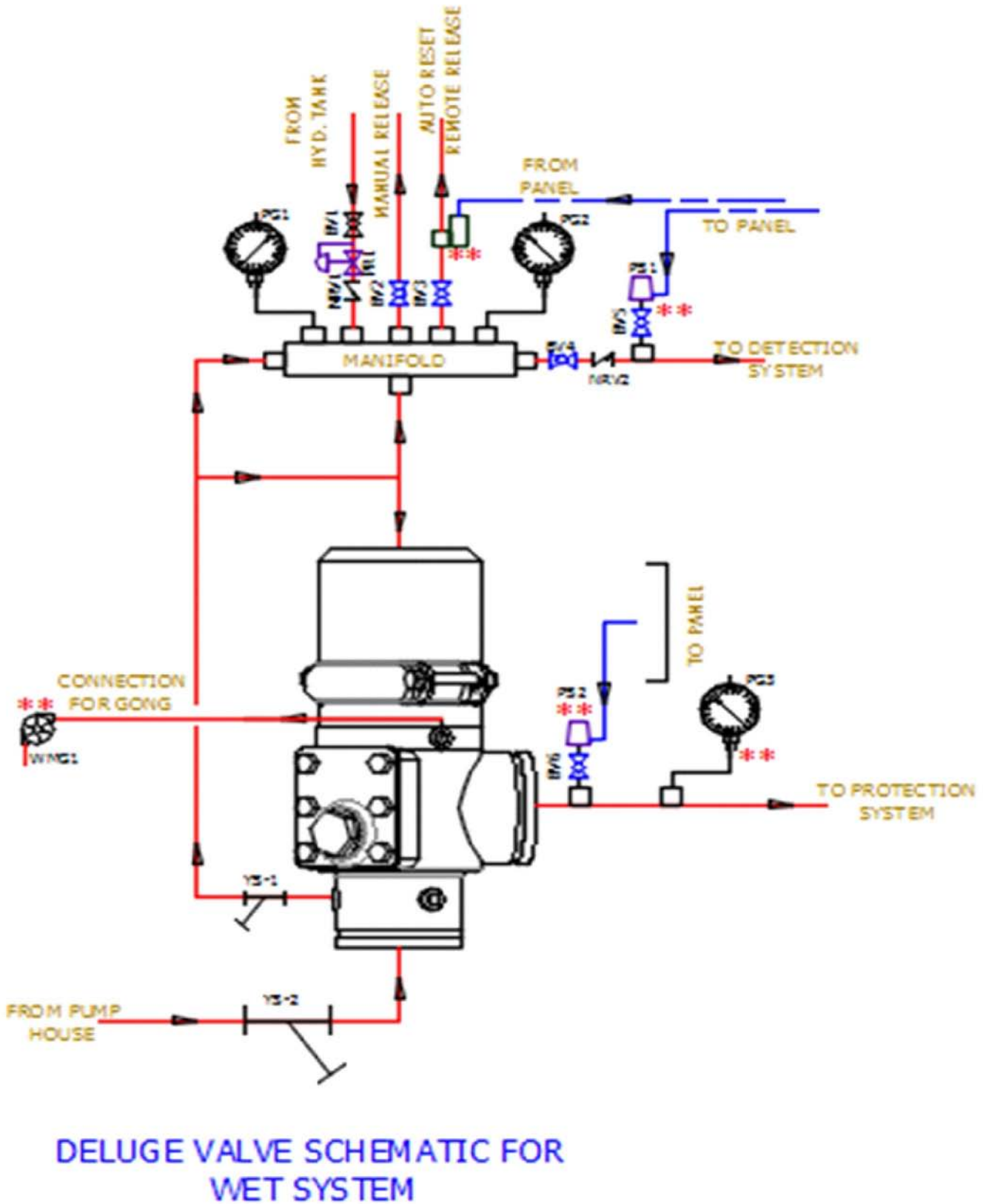
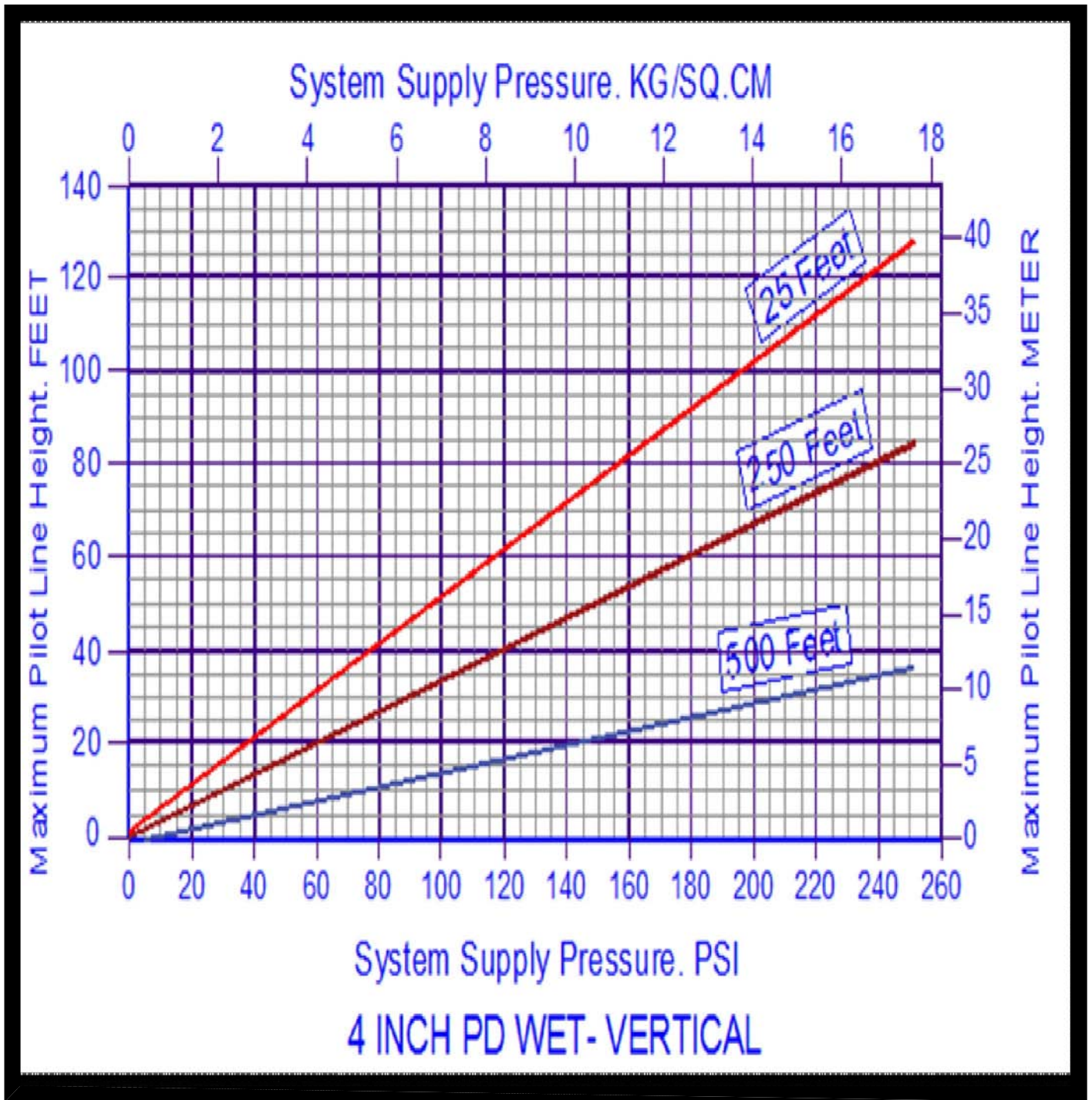


Figure - 14

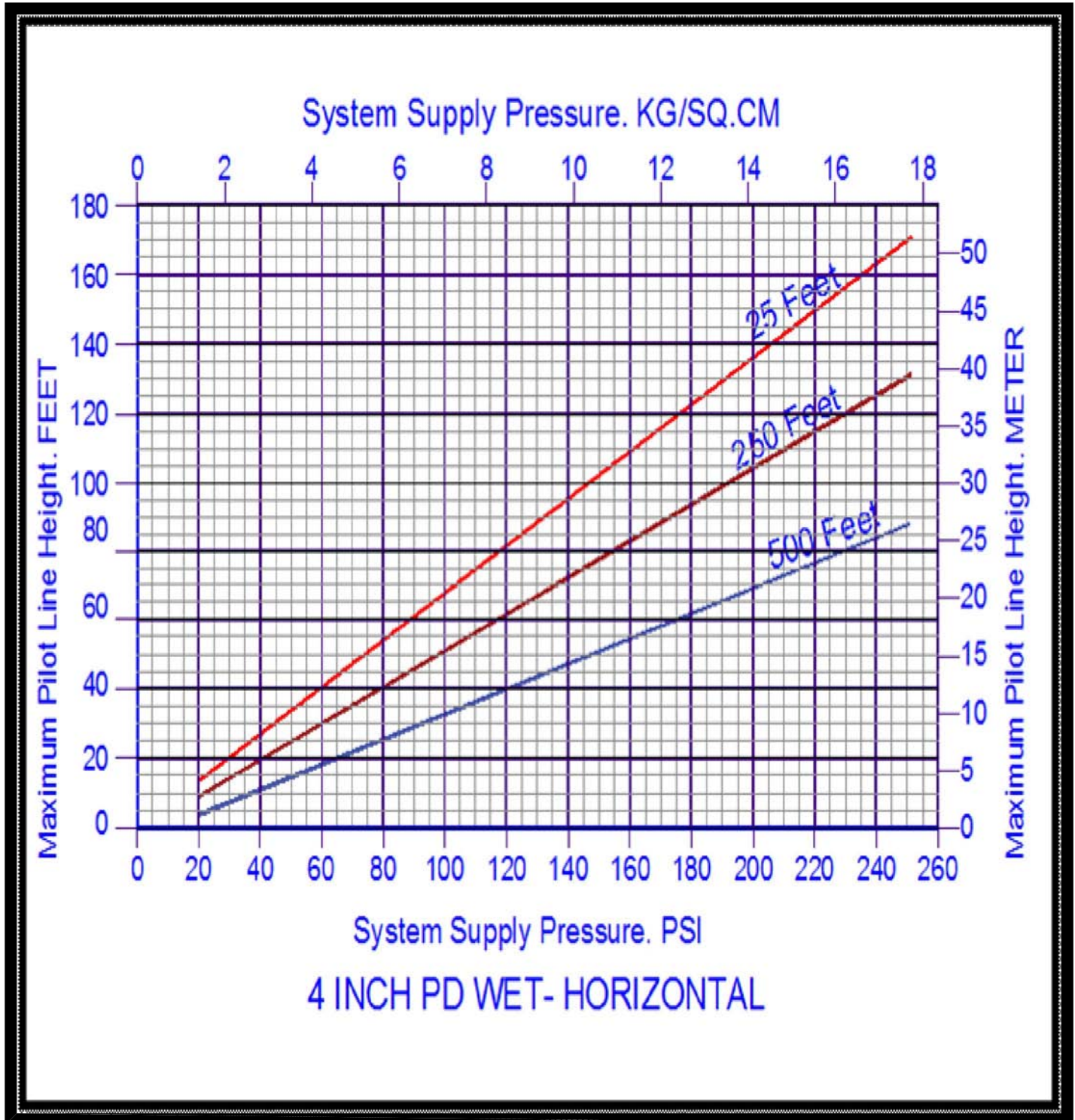


# WET PILOT SPRINKLER HEIGHT LIMITATION OF 100NB VERTICAL DV



Graph -1

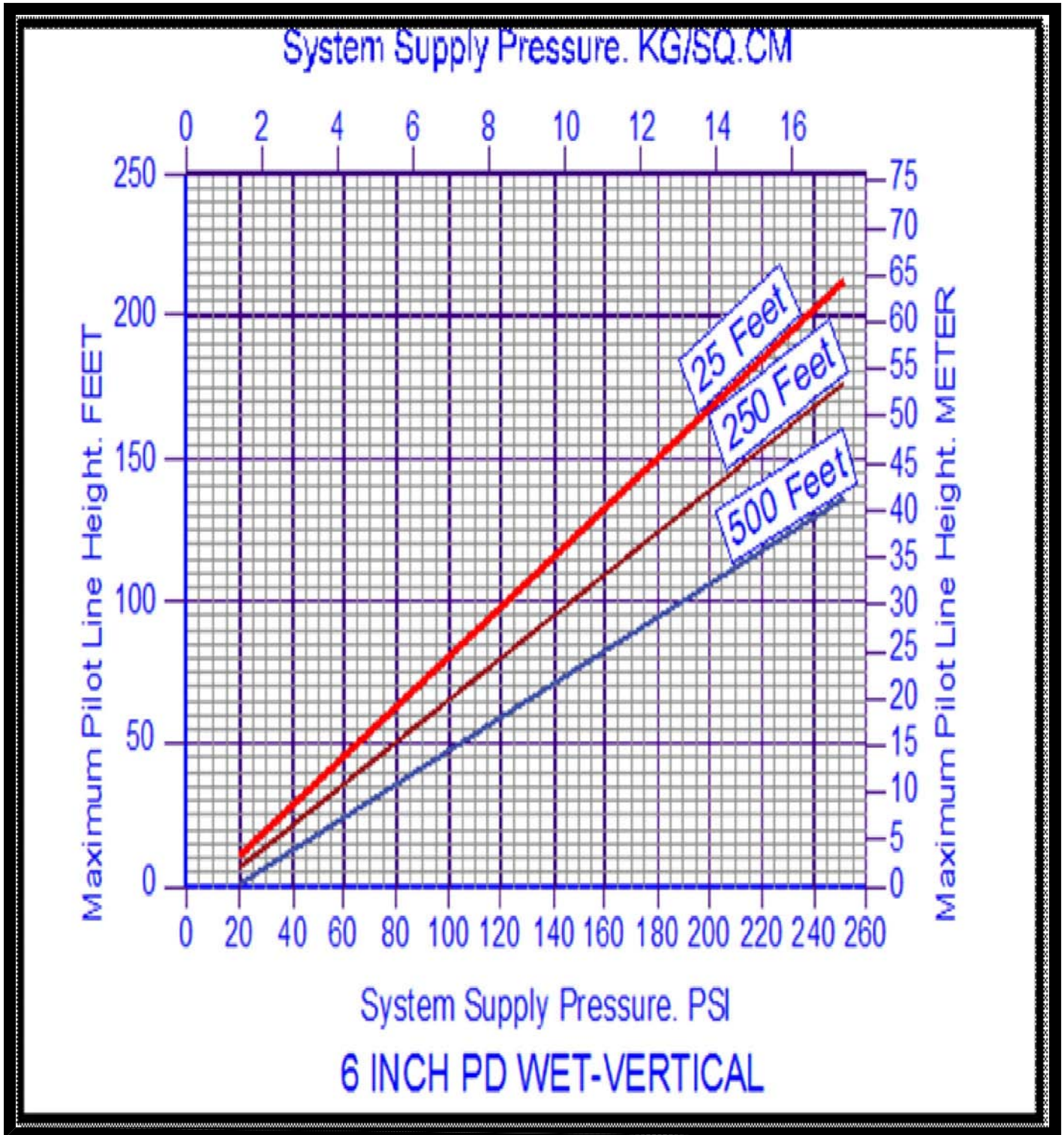
# WET PILOT SPRINKLER HEIGHT LIMITATION OF 100NB HORIZONTAL DV



Graph -2



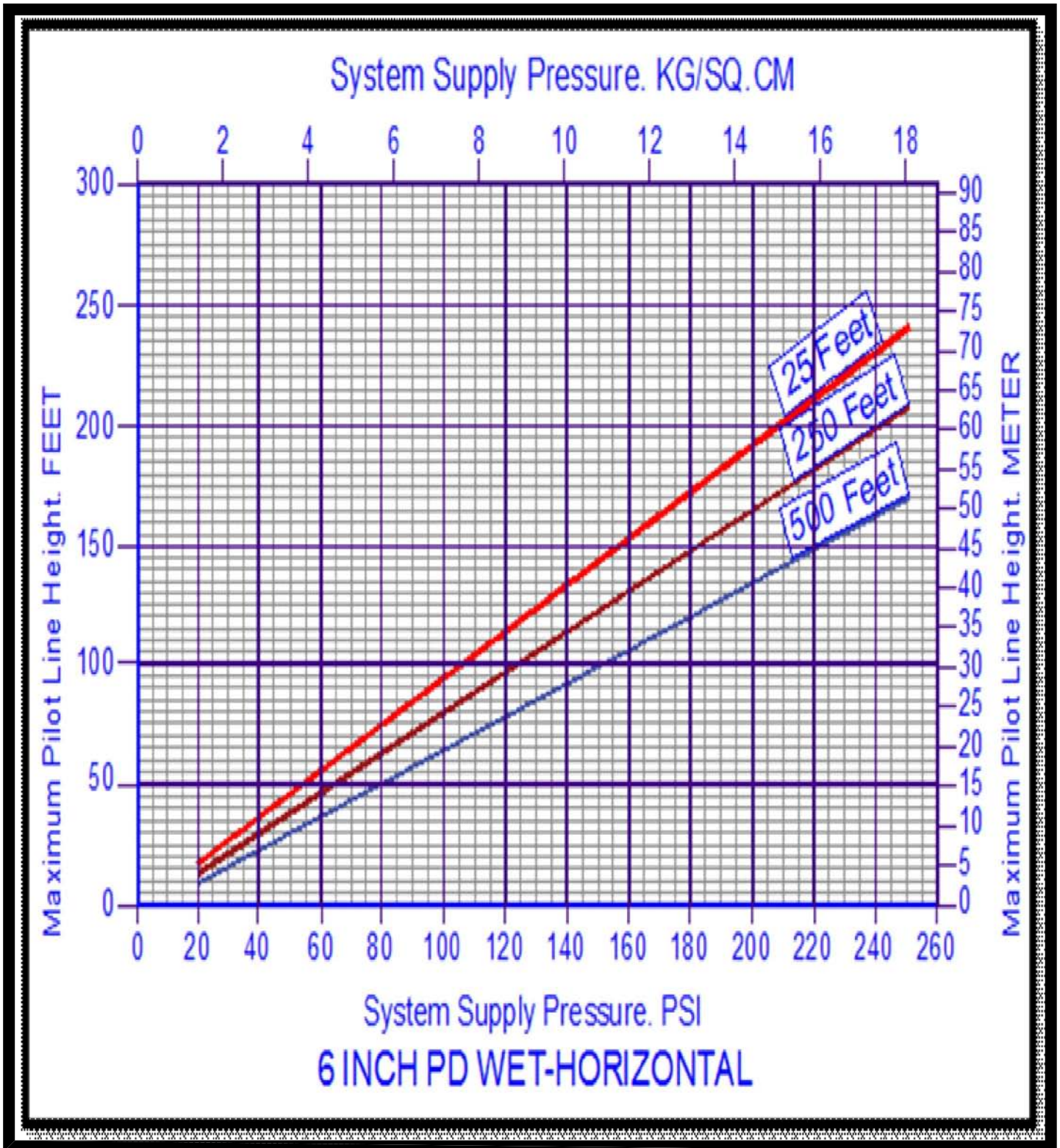
# WET PILOT SPRINKLER HEIGHT LIMITATION OF 150NB VERTICAL DV



Graph -3



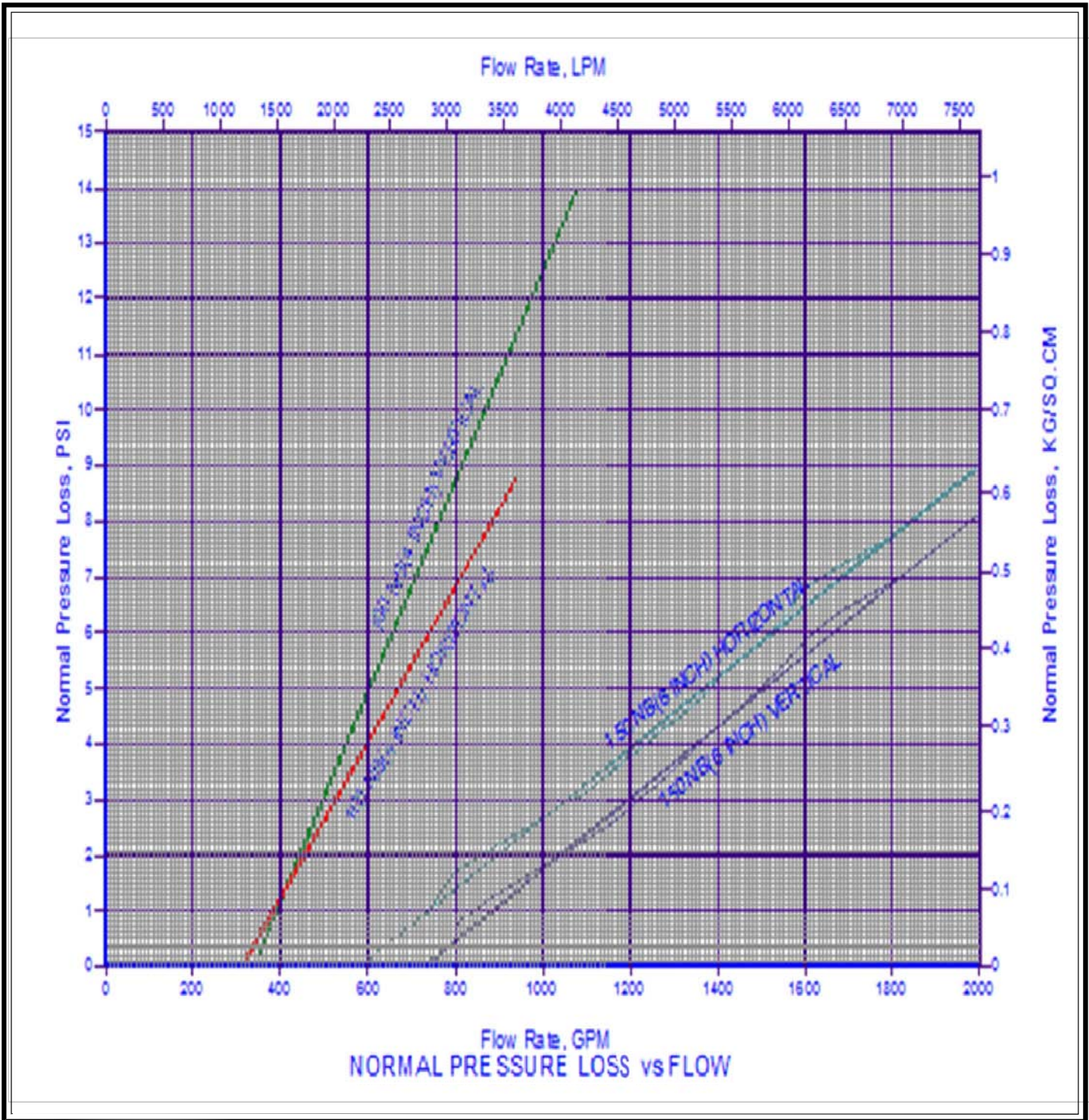
# WET PILOT SPRINKLER HEIGHT LIMITATION OF 150NB HORIZONTAL DV



Graph - 4



# GRAPHICAL DATA FOR HYDRAULIC FRICTION LOSS



Graph - 5





FIRE का DOCTOR

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