HD FIRE PROTECT
PVT. LTD.

DELUGE VALVE MODEL-H2
(CAST STEEL)

TECHNICAL DATA

MODEL
H2 - Cast Steel
ASTM A 216 WCB

NOMINAL SIZE
200, 150, 100, 80 & 50NB

SERVICE PRESSURE
1.4 to 17.5 Bar
(20 to 250 PSI)

END CONNECTION
Flange X Flange
Groove X Groove

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, SR
is standard supply.
(Contact HD Sales for other options)

WET PILOT SPRINKLER HEIGHT LIMITATION
As per graph in the catalogue

NET WEIGHT WITHOUT TRIM
FXF 163 Kg 145.5 Kg
GXG 86 Kg 75 Kg
56 Kg 45 Kg
38 Kg 32 Kg
33 Kg 29.8 Kg

FINISH
Red to RAL 3001

APPROVAL
UL Listed

ORDERING INFORMATION
1. Size of valve
2. Flange specification, or for Grooved end specify pipe outside diameter
3. Valve trim vertical or horizontal
4. Trim type

GROOVE PIPE SIZE:

<table>
<thead>
<tr>
<th>NOMINAL SIZE</th>
<th>Pipe OD in MM</th>
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<tbody>
<tr>
<td>2&quot; (50 NB)</td>
<td>60.3</td>
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<tr>
<td>3&quot; (80 NB)</td>
<td>89.0</td>
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<td>4&quot; (100 NB)</td>
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<tr>
<td>8&quot; (200 NB)</td>
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NOTE: FOR 6" (150 NB) STANDARD SUPPLY IS 168.3 MM OD PIPE GROOVE. FOR 165.1 MM SPECIFY IN ORDER

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
HD 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 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 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.

In dry pilot trim, an actuator (DPA) is provided. An optional Pneumatic Reset Device (PRD) can be provided, which acts as a manual reset device in the dry pilot line.

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 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.

<table>
<thead>
<tr>
<th>TRIM MODEL NO.</th>
<th>TRIM DESCRIPTION</th>
<th>MOUNTING</th>
<th>SCHEMATIC NO.</th>
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<tbody>
<tr>
<td>ETW</td>
<td>Basic Wet Pilot Trim</td>
<td>Vertical</td>
<td>Schematic 1</td>
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<tr>
<td>ETD</td>
<td>Basic Dry Pilot Trim</td>
<td>Vertical</td>
<td>Schematic 2</td>
</tr>
<tr>
<td>ETWT</td>
<td>Basic Wet Pilot Trim with Test &amp; Alarm Trim</td>
<td>Vertical</td>
<td>Schematic 3</td>
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<td>ETDT</td>
<td>Basic Dry Pilot Trim with Test &amp; Alarm Trim</td>
<td>Vertical</td>
<td>Schematic 4</td>
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<tr>
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<td>Basic Wet Pilot Trim with Drip &amp; Drain Trim</td>
<td>Vertical</td>
<td>Schematic 5</td>
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<td>ETDD</td>
<td>Basic Dry Pilot Trim with Drip &amp; Drain Trim</td>
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<td>Schematic 14</td>
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<td>Schematic 16</td>
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TRIM TYPES
The trims are designated as following:
W = Wet Pilot trim. D = Dry Pilot Trim

a) Type ET-W and ET-D
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 ET-W-D and ET-D-D
This trim type is a combination of components of the ET 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 ETW-T and ETD-T
This trim type is a combination of components of the ET trims along with the test and alarm trim. In dry pilot trim, an actuator DPA-H1 is provided with optional Pneumatic Reset Device (PRD-1). A solenoid valve for electric remote actuation and pressure switch for sensing & annunciation are optional.

d) Type NT-W and NT-D
This trim type is a combination of components of the ET 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.

B. When Priming connection is from the inlet of Deluge Valve (Auto resetting)

(i) The deluge valve will reset automatically when release devices which were responsible for deluge valve opening are closed or restored back to their original status, i.e closing of ERS or replacing the damaged Sprinkler if release was through Sprinkler/ QB Detector, or closing of Solenoid valve. The reset time may be long or cause vibration while closing, depending upon the system back pressure at the outlet of the valve.

(ii) If priming shut off valve (optional) is provided, then the pressure in the priming shutoff valve is to be relieved by turning 3-way valve provided in the trim to reset deluge valve.

CAUTION
(a) Do not close the priming valve, downstream and upstream stop valves, while system is in service
(b) 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
(c) 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
(d) Do not connect the Sprinkler Alarm outlet drain line to close a common drain as it may create back pressure & Sprinkler Alarm may not function
(e) Deluge valve must have support to absorb sudden opening or closing vibration shock to the piping
(f) To avoid water damage, take precautions when opening the water supply main control valve, since water will flow from all open system valves
(g) The responsibility of maintenance of the protection system and devices in proper operating condition lies with the owner of the system.
(h) Deluge Valve & its trim shall be maintained at a minimum temperature of 4°C. Heat tracing is not permitted.
(i) Deluge Valve must be used in pressurised system.

SYSTEM TESTING PROCEDURE
(i) 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.
(ii) 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.
(iii) 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

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

(iii) NORMAL CONDITION TEST

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

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

(ii) FALSE TRIPS

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

(iii) LEAKAGE THROUGH THE DELUGE VALVE

(a) Damaged deluge valve seat or obstruction on the seat face by foreign object
(b) Leakage in release system
(c) Partly clogged priming line restriction orifice check valve
(d) Low air pressure on release system line or leakage in release system

NOTE:

(1) UL Listing is valid only when Deluge Valve is installed with trim set as per trim drawing.
(2) The trip time of deluge valve on-off 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.
(3) The pneumatic system must have restricted orifice at air or gas supply point. The restriction nozzle are supplied with HD dry pilot actuation trim.
(4) UL Listing is valid only when Listed Solenoid Valve provided for electric operation of the deluge valve is retained in the trim. If any other solenoid valve is used, the deluge valve trip time may be quite high or deluge valve may not trip.
(5) The Pressure Gauges standard supply is 300 PSI for water gauge for system pressure upto 175 PSI. If system pressure is more than 175 PSI, then order for 600 PSI water pressure gauges.
DELUGE VALVE MODEL - H2 SIZE 200 / 150 / 100 / 80/ 50 NB

Groove X Groove

Flange to Flange
# DELUGE VALVE MODEL - H2 SIZE 200 / 150 / 100 / 80 / 50 NB

**DIMENSION** in millimeter (Approximate)

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<th>VALVE NOMINAL SIZE</th>
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<th>B</th>
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<td></td>
<td>F x F</td>
<td>G x G</td>
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<tr>
<td>200 NB</td>
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### MATERIAL SPECIFICATION

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* Stainless Steel is standard supply, Bronze is optional supply.
** Ductile Iron is standard supply, Bronze/Stainless Steel is optional supply.
*** EPDM is standard supply, Bronze/Stainless Steel is optional supply.
NA - PART REPLACEMENT NOT AVAILABLE
SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR VERTICAL MOUNTING

**ETW**

SCHEMATIC 1

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR VERTICAL MOUNTING

**ETD**

SCHEMATIC 2

**ABBREVIATION & SYMBOLS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>DV</td>
<td>DELUGE VALVE</td>
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<tr>
<td>M</td>
<td>EMERGENCY RELEASE STATION</td>
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<tr>
<td>RN</td>
<td>RESTRICTION NOZZLE (AIR LINE)</td>
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<tr>
<td>SV</td>
<td>SOLENOID VALVE</td>
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<td>PS1</td>
<td>LOW AIR ALARM PRESSURE SWITCH</td>
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<td>WATER FLOW PRESSURE ALARM SWITCH</td>
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<td>LOW AIR ALARM PRESSURE SWITCH**</td>
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SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR VERTICAL MOUNTING

ETWT

FLANGE X FLANGE

GROOVE X GROOVE

SCHEMATIC 3

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR VERTICAL MOUNTING

ETDT

FLANGE X FLANGE

GROOVE X GROOVE

SCHEMATIC 4

ABBREVIATION & SYMBOLS

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<th>Abbreviation</th>
<th>Symbol</th>
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SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR VERTICAL MOUNTING

SCHEMATIC 5

ETWD

FLANGE X FLANGE

GROOVE X GROOVE

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR VERTICAL MOUNTING

SCHEMATIC 6

ETDD

FLANGE X FLANGE

GROOVE X GROOVE

ABBREVIATION & SYMBOLS

DV  DELUGE VALVE
M  EMERGENCY RELEASE STATION
RN  RESTRICTION NOZZLE (AIR LINE)
SV  SOLENOID VALVE
PS1  LOW AIR ALARM PRESSURE SWITCH
PS2  WATER FLOW PRESSURE ALARM SWITCH
G  SPRINKLER ALARM (WMG)
PG  PRESSURE GUAGE
OD  OPEN DRAIN
DPA  DRY PILOT ACTUATOR
DR.V  DRIIP VALVE
NRV  NON RETURN VALVE
---  BY USER
**  OPTIONAL

NRV WITH RESTRICTION HEX NIPPLE

VALVE

STRAINER

ANGLE VALVE
SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE MODEL - H2 FOR VERTICAL MOUNTING

SCHEMATIC 7

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE MODEL - H2 FOR VERTICAL MOUNTING

SCHEMATIC 8

ABBREVIATION & SYMBOLS

DV DELUGE VALVE
M EMERGENCY RELEASE STATION
RN RESTRICTION NOZZLE (AIR LINE)
SV SOLENOID VALVE
PS1 LOW AIR ALARM PRESSURE SWITCH
PS2 WATER FLOW PRESSURE ALARM SWITCH
G SPRINKLER ALARM (WMG)
PG PRESSURE GUAGE
OD OPEN DRAIN
DPA DRY PILOT ACTUATOR
NRV NON RETURN VALVE
DR.V DRIIP VALVE
** NON RETURN VALVE WITH RESTRICTION HEX NIPPLE
** VALVE
** STRAINER
/\ ANGLE VALVE
--- BY USER
** OPTIONAL
SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR HORIZONTAL MOUNTING

SCHEMATIC 9

ETW

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR HORIZONTAL MOUNTING

SCHEMATIC 10

ETD

ABBREVIATION & SYMBOLS

DV DELUGE VALVE
M EMERGENCY RELEASE STATION
RN RESTRICTION NOZZLE (AIR LINE)
SV SOLENOID VALVE
PS1 LOW AIR ALARM PRESSURE SWITCH
PS2 WATER FLOW PRESSURE ALARM SWITCH

G SPRINKLER ALARM (WMG)
PG PRESSURE GAUGE
OD OPEN DRAIN
DPA DRY PILOT ACTUATOR
NRV NON RETURN VALVE
SV SOLENOID VALVE
PS1 LOW AIR ALARM PRESSURE SWITCH
PS2 WATER FLOW PRESSURE ALARM SWITCH

NRV WITH RESTRICTION HEX NIPPLE
=>> VALVE
1\ 1 STRAINER
--- BY USER

INLET
PG
OUTLET
PG

INLET
PG
OUTLET
PG

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OUTLET
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OUTLET
PG
SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE MODEL - H2 FOR HORIZONTAL MOUNTING

SCHEMATIC 11

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE MODEL - H2 FOR HORIZONTAL MOUNTING

SCHEMATIC 12

ABBREVIATION & SYMBOLS

- DV: DELUGE VALVE
- M: EMERGENCY RELEASE STATION
- RN: RESTRICTION NOZZLE (AIR LINE)
- SV: SOLENOID VALVE
- PS1: LOW AIR ALARM PRESSURE SWITCH
- PS2: WATER FLOW PRESSURE ALARM SWITCH
- G: SPRINKLER ALARM (WMG)
- PG: PRESSURE GAUGE
- OD: OPEN DRAIN
- DPA: DRY PILOT ACTUATOR
- NRV: NON RETURN VALVE
- PS1**: LOW AIR ALARM PRESSURE SWITCH
- PS2**: WATER FLOW PRESSURE ALARM SWITCH
- **: OPTIONAL
- ETWT: GROOVE X GROOVE
- ETDT: FLANGE X FLANGE
- NRV WITH RESTRICTION HEX NIPPLE
- VALVE
- STRAINER
- BY USER
SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR HORIZONTAL MOUNTING

ETWD

SCHEMATIC 13

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR HORIZONTAL MOUNTING

ETDD

SCHEMATIC 14

ABBREVIATION & SYMBOLS

DV  DELUGE VALVE
M  EMERGENCY RELEASE STATION
RN  RESTRICTION NOZZLE (AIR LINE)
SV  SOLENOID VALVE
PS1  LOW AIR ALARM PRESSURE SWITCH
PS2  WATER FLOW PRESSURE ALARM SWITCH
G  SPRINKLER ALARM (WMG)
NRV  NON RETURN VALVE
NRV WITH RESTRICTION HEX NIPPLE
PG  PRESSURE GUAGE
OD  OPEN DRAIN
DPA  DRY PILOT ACTUATOR
DR.V  DRIIP VALVE
---  BY USER
**  OPTIONAL
SCHEMATIC FOR WET PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR HORIZONTAL MOUNTING

SCHEMATIC FOR DRY PILOT BASIC TRIM FOR DELUGE VALVE
MODEL - H2 FOR HORIZONTAL MOUNTING

ABBREVIATION & SYMBOLS

- \textbf{DV} DELUGE VALVE
- \textbf{M} EMERGENCY RELEASE STATION
- \textbf{RN} RESTRICTION NOZZLE (AIR LINE)
- \textbf{SV} SOLENOID VALVE
- \textbf{PS1} LOW AIR ALARM PRESSURE SWITCH
- \textbf{PS2} WATER FLOW PRESSURE ALARM SWITCH
- \textbf{G} SPRINKLER ALARM (WMG)
- \textbf{PG} PRESSURE GUAGE
- \textbf{OD} OPEN DRAIN
- \textbf{DPA} DRY PILOT ACTUATOR
- \textbf{NRV} NON RETURN VALVE
- \textbf{DR.V} DRIP VALVE
- \textbf{PS1**} LOW AIR ALARM PRESSURE SWITCH
- \textbf{PS2**} WATER FLOW PRESSURE ALARM SWITCH
- \textbf{GROOVE X GROOVE}
- \textbf{FLANGE X FLANGE}
- \textbf{NTW}
- \textbf{NTD}
-OPTIONAL
SPRINKLER HEIGHT LIMITATION

DV 200NB

DV 150NB

DV 100NB

DV 80NB

DV - 50NB

SYSTEM SUPPLY PRESSURE - PSI

EQUIVALENT LENGTH BASED ON 1/2" SCHEDULE 40 PIPE WITH C=120

PVT. LTD.
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