FIRETECH
Transforming Challenges with Expertise

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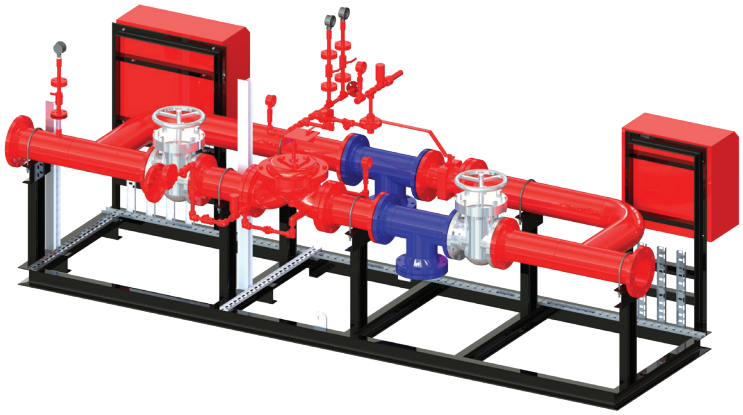

FIRETECH DELUGE VALVE SKID UNITS

- Quick response operation
- Custom designed for capacity, fitment & discharge method
- Factory tested for Plug and Play installation at Site
- Proven track record

DESCRIPTION

FIRETECH Deluge Valve Skid Units/Systems are self-contained units. Designed by factory-trained personnel, consisting of a Deluge Valve manufactured to UL standard, applicable trim assembly as per actuation method viz. pneumatic, hydraulic, electric, integrated Control Panel as per required specification, Strainer, Bypass Arrangement, Skid Frame etc. For customized application, please consult FIRETECH team for the use of most appropriate and suitable system design.

FIRETECH Deluge Valve Skid Units are carefully designed for compact and accurate operation of Deluge Valve. It is most ideal for full flooding application required for various industrial applications such as Water Spray System, Deluge Foam system etc. The Skids are suitable when number of personnel to operate firefighting system are limited, the location of application is remote or multiple hazards to be dealt with. These Skids are highly effective in areas where there are operational difficulties. These units provide ease of installation and operation at site because of complete integrated electro-mechanical system.

Please refer fig. 999-1 for the general arrangement of a typical FIRETECH Deluge Valve Skid Unit. The unit typically comprises of Deluge Valve, Trim Assembly, Strainer, Valves, Fittings, Base Frame and Control Panel. These units are carefully designed hydraulically for defect free functioning.

FIRETECH Deluge Valve Skid Systems are used in high-hazard areas such as Oil & Gas, Power Plants, Aircraft Hangars, Petrochemical Units, Marine Facilities, Chemical Plants, Warehouses etc. These systems are typically used in high-hazard areas where fire may spread rapidly as thy are very effective in releasing water or another

fire-fighting agent/suppressant to all the discharge devices simultaneously. Deluge Systems are used to allow for large amount of water to be dumped on a hazard quickly.

FIRETECH Deluge Skid Units are designed and manufactured to provide Manual, Semi-Automatic, and Automatic Operation Mode with an ease of operability and in various capacities. These systems are designed for operation by trained personnel.

OPERATION

FIRETECH Deluge Valve, while in SET position, water pressure is transmitted through a preassembled Bypass Check Valve, Isolation 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.

The test valve allows water to flow through the Deluge Valve to drain during testing of Deluge Valve and to drain water from distribution pipe after fire incidence. At all normal times and when testing the Deluge Valve according to various tests required, the body of the Deluge Valve should remain full of water.

WET PILOT/WET WITH ELECTRIC PILOT:-

When the detection system senses a fire, either there is a loss of pressure in the detection line or it gives electric signal. In case of loss of pressure, the water from the Cover Chamber is drained, which opens the Main Valve Cover Chamber, opening the Deluge Valve FULLY and INSTANTLY. In the case of electric signal, the 2/2 way Solenoid Valve is energized which opens the Deluge Valve. When the electric signal is de-energized, it closes/resets the Deluge Valve automatically.

DRY PILOT/DRY WITH ELECTRIC PILOT:- (RELEASE BY QBDs)

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 is to be maintained at 3.0 kg/sq.cm. The pilot line is connected to the air inlet side of actuator. The top chamber of the Deluge Valve is connected to the 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 3.0 - 3.5 kg/sq.cm. In dry pilot trim, a Dry Pilot Actuator FT-M-100 is provided. In the case of electric signal, the 2/2 way Solenoid Valve is energized which opens the Pilot Valve (FT-M-100) which opens the Deluge Valve. When the electric signal is de-energized, it closes/resets the Deluge Valve automatically

RESETTING OPERATION PROCEDURE:-

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.

CONSTRUCTION

FIRETECH Deluge Valve Skid Unit consists of an assembly of all fittings and instruments including Bypass Valve and Strainers incorporated into a single self-contained skid. In case required, the entire Skid Unit can also be covered on top with canopy, of appropriate size and strength. The FIRETECH Deluge Valve is fitted with an integral test and drain manifold. It consists of a test and Drain Valve and a Drip Plug.

FIRETECH 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. The drain pipe work is designed to periodically check the rate of flow available in the system to satisfy the requirements appropriate to the hazard class for which the Deluge Valve is provided. Flow measurement can be checked with differential pressure. Water operated alarm motor gang is connected to the test and drain valve so that it gives an alarm as the Deluge Valve opens.

Typically in a hydraulic detector network, tapping from fire water network is taken. Check Valve, Strainer And Restricted Orifice is provided in the detector network. Piping shall be as per relevant piping material specifications of end user. Refer a typical fig. No. 999-3 & 999-4 showing schematic details for Deluge Valve Skid Unit

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with hydraulic and dry detection system.
In addition to above, a pressure transmitter can be provided on the detection piping to give alarm at "Low pressure". Low pressure alarm shall be set as per the job specific requirement. When fire occurs and Deluge Valve opens, the alarm can also be given in local control panel, fire station and main control room. Provision of changing the set pressure of the alarm can also be provided.
The Deluge Valve is operated automatically through the Solenoid Operated Air/water Release Valve via Detection System. Provision is kept to manually operate the Solenoid Operated Valve through the push buttons provided in the local control panel and in the control room station.
If Deluge Valve Skid Unit is located in hazardous area, flameproof/ intrinsically safe alarm switch depending on rating of hazard can be provided. Installation of stop valve and outlet valve above Deluge Valve shall be as per the relevant piping material specification. The Deluge Valve can be tested for operation/opening at set pressure and operation of the alarms at set pressures. For testing and setting of Deluge Valve, a Priming Valve and a Vent Valve is provided with Deluge Valve Skid assembly. The Pressure Gauge shall be fitted immediately above the Deluge Valve on water supply line. Pressure Gauges shall be provided for 1-15 Kg/cm' range. The complete valve assembly is of good workmanship and finish, and it is designed free from burrs and sharp edges.

DELUGE VALVE CAPACITIES:-

MODEL	FX
NORMAL SIZES	2" (50MM) 2.5" (65MM) 3" (80MM) 4" (100MM) 6" (150MM) 8" (200MM) 10" (250MM)
SERVICE PRESSURE	1.4 TO 17.5 KG/CM2 (20 PSI TO 250 PSI)
HYDRO TEST PRESSURE	35 KG/CM2 (500 PSI)
FLANGED END CONNECTION	ANSI B 16.5 CL-150, RF
MOUNTING	HORIZONTALLY & VERTICALLY
APPROVAL	UL LISTED
THREADED OPENING	BSPT

OPTIONS AVAILABLE:-

- Wet Pilot Trim
- Dry Pilot Trim
- Wet With Electric TRIM Solenoid Valve 2/2 way NC type for Electric Actuation (energized to open)
- Dry With Electric Trim Solenoid Valve 2/2 way NC type for Electric Actuation (energized to open)
- Drain Valve 2 Nos. one each for inlet & outlet side
- Test Trim (isolation valve & check valve)

FIRETECH Deluge Valve Skid Panel

The Deluge Valve Panel (hereafter referred as DV Panel), shall do the following functions:-

- Actuate the SOV for opening the Deluge Valve
- Indicate and Confirm the SOV actuation (Both OFF and ON states); DV opening through downstream pressure transmitter feedback
- The panel shall give indication for 24V DC Power, from the Battery Backup Panel

The DV Panel shall have the following Push buttons for operation:-

- Start Push Button for Activation of the Solenoid Valve through DV Panel
- Emergency Push Button
- Stop Push Button for closing the Solenoid Valve through DV Panel.
- Alarm Reset to reset the Beacon Hooter mounted on the control panel
- Lamp Test feature to test if the pressure alarm indication (Low and High) LEDs are in working condition.
- Battery backup will have 110V/230V Control ON and 24V DC LED

FIRETECH Deluge Valve Skid Unit Working Philosophy:-

- Input 110 AC UPS power supply shall be given to the Battery Backup Panel, in turn 24 Volt from the Battery Back will be given to the control panel. This shall be indicated on the Battery Back Panel as Control ON 110V/230V and 24V D
- In the idle state Battery Back will have 110V control ON LED, 24V LED and Control Panel SOV OFF, 24V LED will be in ON Position and Low level and High Level LED will be in OFF Condition.
- The SOV operation can be achieved in the following 2 ways:-
  1. By pressing the Start Push Button on the panel
  2. By giving a input (Potential Free Contact), from a remote location DCS).

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▪ Any one of the above mentioned inputs shall trigger the SOV operation. This would in turn switch OFF the Solenoid Valve OFF indication and switch ON the Solenoid Valve ON indication.
▪ Once the SOV is operated the downstream pressure in the DV line shall increase, PT which is at the outlet of the DV will give the current output in 4-20mA. High pressure setting will be done on the controller in the DVLCP, once Outlet PT reaches the Higher pressure which is set in the DVLCP. Hooter will be activated and LED of High Pressure Alarm will be ON and also the Feedback of Higher Pressure in 4-20 mA will go to the DCS.
▪ The alarm reset function on the panel will silence the hooter. The hooter will be on for a minimum of 3 secs and cannot be reset before 3 secs from the time it is triggered.
▪ Resetting the alarm will silence the hooter; however, the indication of the alarm shall remain ON till Stop Push of SOV is pressed.

The DV operation can also happen through the QBD bursting on site.This will then give the following indications on the DV Panel:

▪ Low pressure PT will give the Command to the Process controller in the DVLCP
▪ Low pressure will be set in the Process controller of the DVLCP, when the Low pressure is detected by the PT. SOV will be activated from the DVLCP and Feedback of Low pressure in 4-20mA will be sent to the DCS from DVLCP.
▪ The Pressure Alarm (Low) LED shall be switched ON.
▪ High Pressure LED will be ON once the Down Stream PT is activated from the DVLCP which will activate Beacon Hooter, also Feedback of 4-20mA will go to DCS.
▪ Once the system is activated through the Low Pressure Transmitter, to shut off, the pressure should be built in the system by replacing the QBD till then the system will be in ON Position.

In case of any alarm, the hooter can be silenced, however the indications of Low Pressure and High Pressure in the DV Panels shall remain ON till the pressure in the respective lines is restored to normal levels.

The Lamp Test feature is given to test the Alarm LEDs (High & Low pressure) only. The other LEDs (110V/230V AC Power on the Battery Backup, 24V DC Power and Solenoid OFF Indication on the Control Panel) shall be normally ON and cannot be given a lamp testing feature.

Once the Main Power of 110V/230V is gone, Battery Backup will supply 24 Volt to the DVLCP in which the PT (High, Low) and SOV can be activated. Battery Backup will be provided for 30 Mins.

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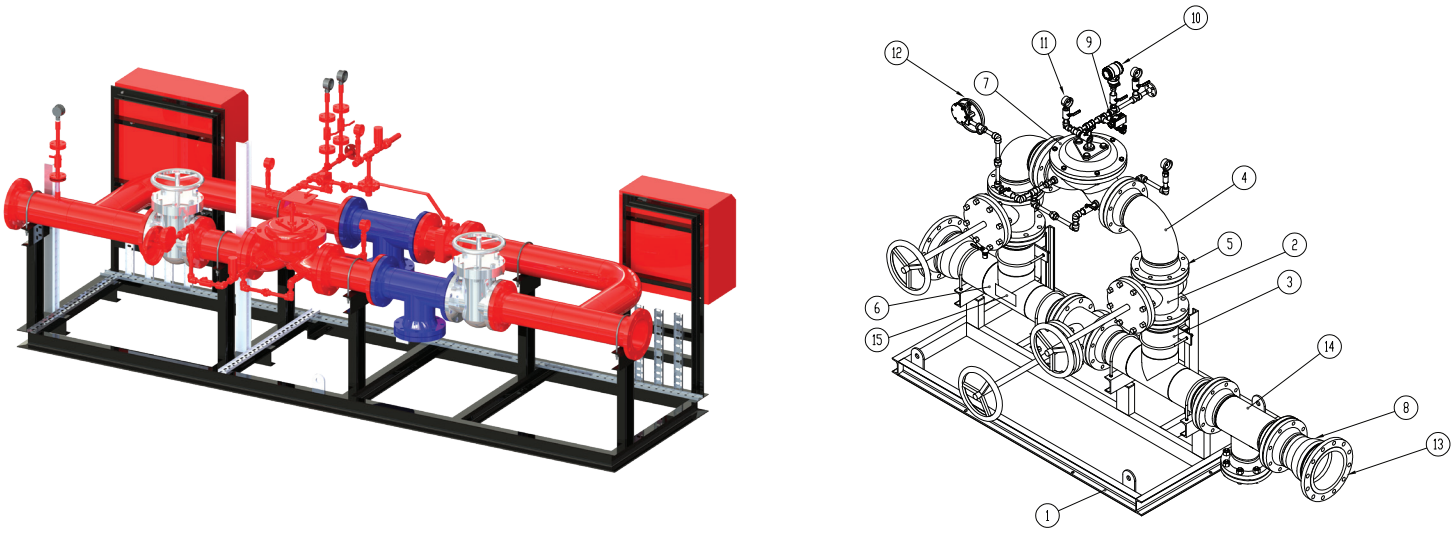

Fig. 999-1 FIRETECH Deluge Valve Skid Units (Customisable Options)

Fig. 999-2 FIRETECH Deluge Valve with Trim Assembly

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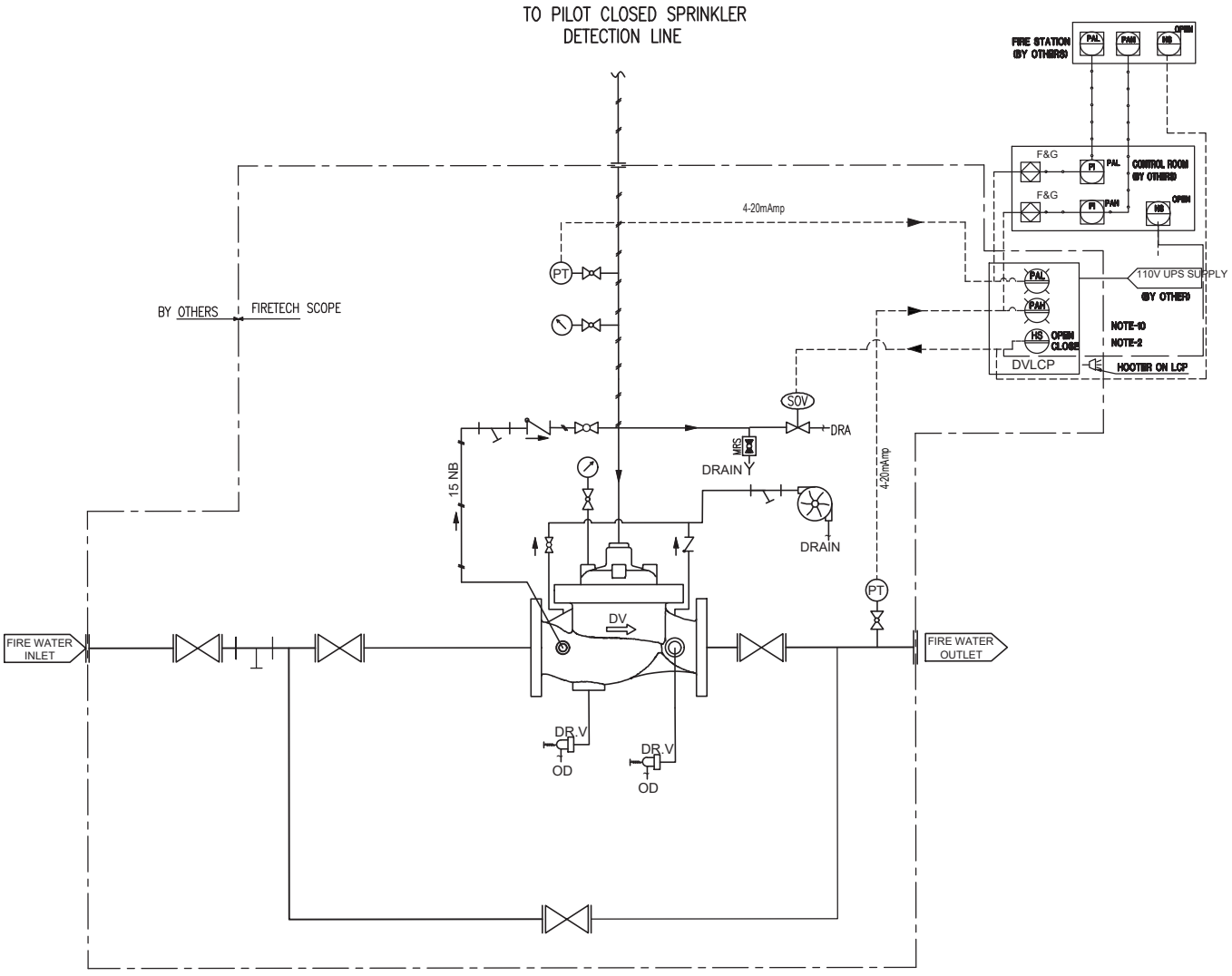

Fig. 999-3 FIRETECH Deluge Valve Skid Unit – Wet Trim P&ID

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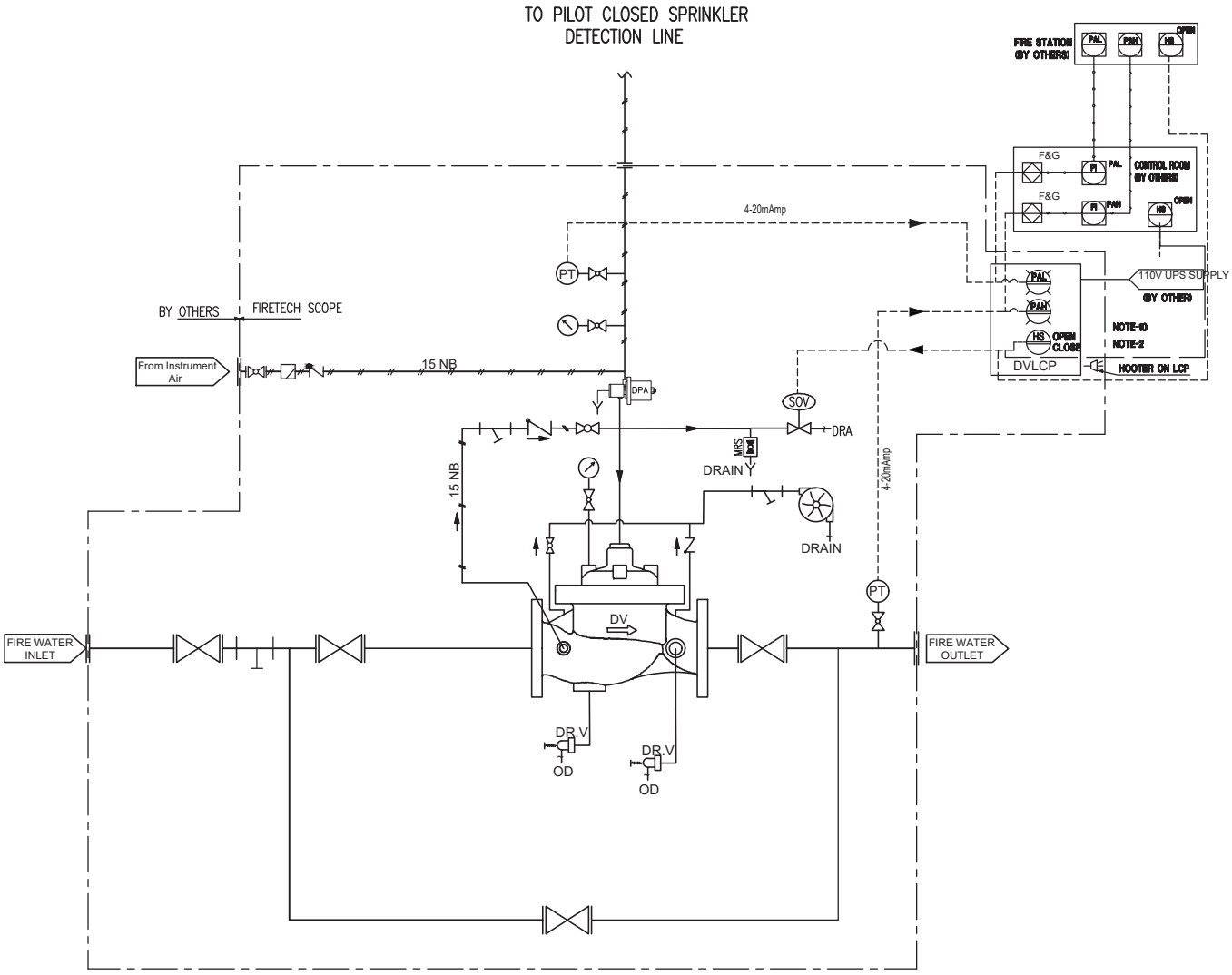

Fig. 999-4 FIRETECH Deluge Valve Skid Unit – Dry Trim P&ID

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