

# Deluge Valves





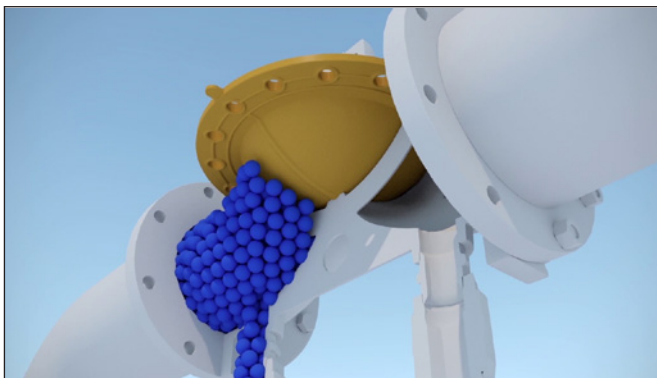
**FOREWORD**

Deluge valves are intended to respond quickly after fire detection, delivering large amounts of water over the entire protected area. SA Fire deluge valves are used to control water flow in deluge, pressure reducing and ON/OFF fire protection systems. They can be trimmed with electric, pneumatic, electro-pneumatic and hydraulic release systems (trims), depending on the specific application. SA Fire deluge valves are quick opening diaphragm type valves specifically designed for highly corrosive environments, such as petrochemical onshore and offshore installations. In this respect, the deluge valves and all their accessories are made of corrosion resistant materials, such as Nickel Aluminium Bronze, also suitable for sea water, foam concentrate and water foam solution. SA Fire deluge valves are manufactured for vertical or horizontal installation. The deluge valves and all their accessories have been designed according to NFPA 15, UL 260, and they are manufactured according to SA Fire's rigorous quality standards, using fully automatic CNC centres. All processes are carried out by highly skilled engineers and technicians providing SA Fire's customers with "state of the art" fire protection deluge valves.



**PRINCIPLE OF OPERATION**

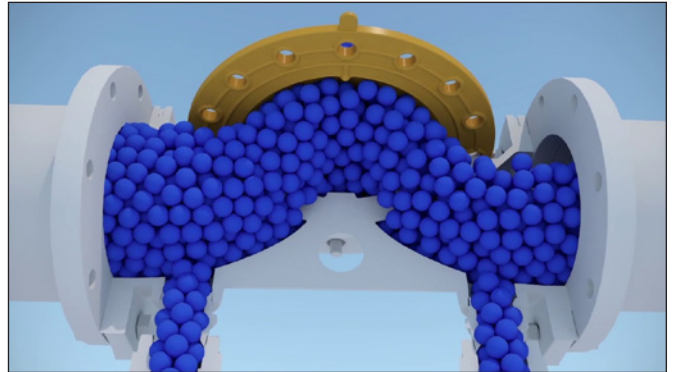
In the set position, the water is supplied to the priming chamber through the trim. The pressure of the water trapped in the priming chamber holds the diaphragm on the valve seat, keeping the valve closed. In fire conditions, the pressure



is released from the control chamber by an automatic or manual release device. The water supply pressure in the inlet chamber forces the diaphragm off the seat, allowing water to flow into the system and the alarm devices.

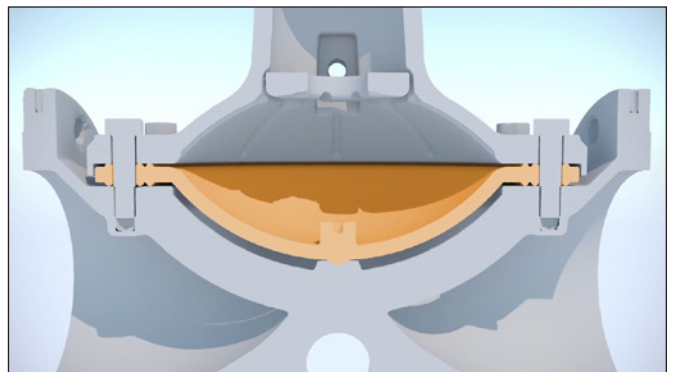
**DELUGE VALVE MODEL VD**

SA Fire deluge valves Model VD are traditional diaphragm type valves available in diameter sizes from 2" (DN 50) to 10" (DN 250). They have an inlet chamber, connected



to the supply side of the main line, an outlet chamber, connected to the fire suppression system side, and a priming chamber.

The inlet chamber and the outlet chamber are separated by the diaphragm that allows the valve to open and close. The diaphragm design, without mechanical moving parts, requires low maintenance and provides an obstacle free waterway,

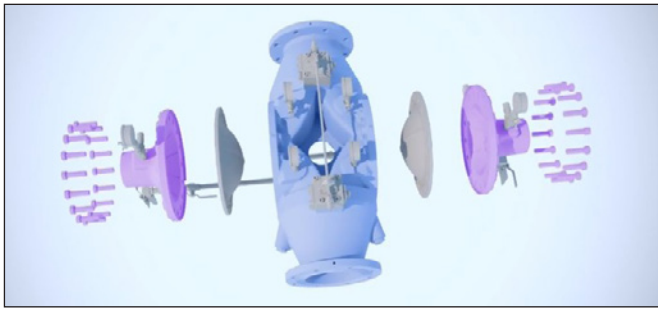


minimising the pressure loss through the valve. Model VD is specifically designed for harsh industrial environments such as onshore and offshore installations. It is suitable for use with sea water, foam concentrate or water foam solution. SA Fire deluge valves, Model VD, are **UL/cUL Listed**.

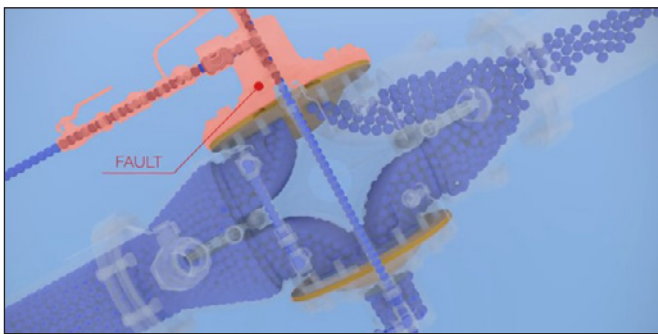
**DOUBLE CHAMBER DELUGE VALVE MODEL VDD**

The deluge valve Model VDD is an innovative concept valve designed for fire protection systems according to NFPA 15, UL 260 and IEC 61508/61511. The VDD deluge valve combines all the functions available on the traditional deluge valves with a **fully redundant architecture**, designed to achieve higher reliability.

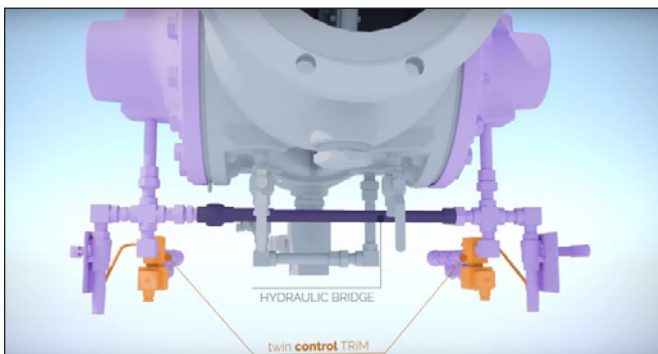
In fact, the VDD deluge valve has two priming chambers, each one provided with its own diaphragm (made of EPDM reinforced with Nylon) and actuation trim, which offer two



independent waterways to the water spray system  
 Each priming chamber provides the nominal design waterway for the fire protection system: in case of failure of one diaphragm, the opening of the other diaphragm allows the hydraulic waterway for the correct operation of the water spray system.



In practice, this new concept translates into a **built-in emergency bypass line** that operates on both priming chambers in hot back-up. Moreover, a **hydraulic bridge between the trims allows each trim to control both the diaphragms**, releasing the water trapped in the two priming chambers. If one trim should fail, the other trim can open both the priming chambers through the hydraulic bridge. Thus, **the double chamber deluge valve can overcome a double failure in the trim + priming chamber**. SA Fire deluge valves Model VDD are **UL/cUL Listed**.



**AVAILABLE MATERIALS FOR DELUGE VALVE MODELS VD AND VDD**

In line with SA Fire's ability to deliver a customised offering that meets the client's specification requirements, SA Fire

is able manufacture deluge valves in a variety of different materials such as Cast Iron, Cast Steel, Stainless Steel, Super Austenitic Stainless Steel, Duplex, Super Duplex, Hastelloy, Bronze, Nickle Aluminium Bronze, or Titanium.



The materials of construction make SA Fire's series of deluge valves suitable for being used with sea water or water foam solution within harsh industrial environments & offshore applications. The cover plate on the VD and the cover plates on the VDD allow in-line maintenance and field replacement of the diaphragm.





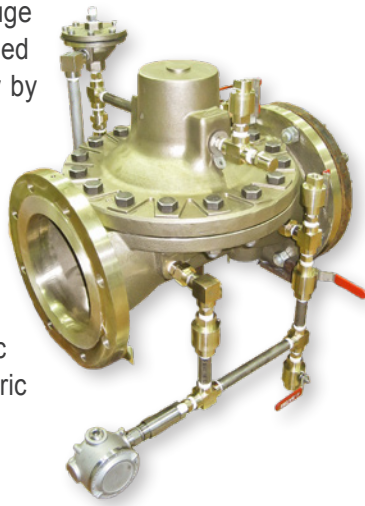
## CONTROL TRIMS

The SA Fire series of VD and VDD deluge valves are compatible with a variety of control trims which can be equipped to meet different requirement needs. The control trims, tubing and fittings are available in Stainless Steel, Monel, Bronze and Nickle Aluminium Bronze. The SA Fire control trims can be equipped with different water and pressure gauges for a host of project requirements.

In normal operating conditions the deluge valves are held closed by the water pressure in the control chamber. In fire conditions water is released from the control chamber through the opening of the solenoid valve in the control trim, and the valve latches open under the effect of the water supply pressure. The valve can be manually opened through the emergency manual release on the control trim. The valve can be remotely reset closing the solenoid valve.

The VD and VDD deluge valves can be controlled manually and automatically by the following trims:

- Electric
- Pneumatic
- Electro-pneumatic
- Hydraulic
- On/Off Electric
- On/Off Electro-pneumatic
- Pressure Reducing Electric
- Pressure Reducing Electro-pneumatic
- Pressure Reducing On/Off Electric
- Pressure Reducing On/Off Electro-pneumatic



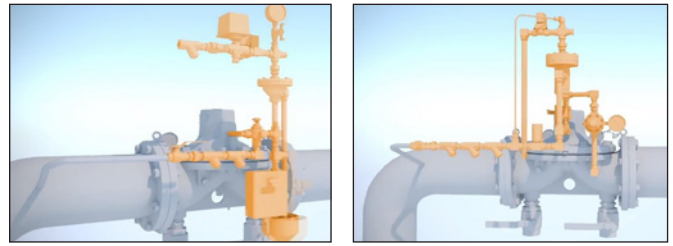
## ELECTRO-PNEUMATIC MODELS

The Electro-Pneumatic Deluge Valves are recommended for those applications where it is preferable to keep the solenoid valve dry, such as those with sea water or foam concentrate. The Electro-Pneumatic Deluge Valves are designed for external resetting, without opening the valve.

## ON/OFF ELECTRIC MODELS

The ON/OFF Deluge Valves with electric actuation can be equipped with the relevant accessories (pressure switch, water motor alarm), they can provide actuation of fire alarms upon system operation.

The deluge valve ON/OFF electric Mod. VD/OF/E is available in vertical or horizontal configuration.



## PRESSURE REDUCING ON/OFF ELECTRIC & ELECTRO-PNEUMATIC MODELS

The pressure reducing ON/OFF deluge valve models are available in diameter sizes from 2" (DN 50) to 10" (DN 250). The pressure reducing deluge valves models are used to control the pressure of water or foam/water flow for water spray or foam fire protection systems.

In normal operating conditions, the deluge valves are held closed by the control solenoid valve. In case of fire the solenoid valve will open allowing the valves to control the downstream pressure. When the solenoid valve is commanded to close also the deluge valve will return in closed position.

## Approvals

The SA Fire series of deluge valves have:

- UL/ cUL Listing
- DNV Approval
- Lloyds Register Fire Test Certification
- Lloyds Register Tight Shut Off Classification VI
- SIL 2/3 (for VDD models only)
- GOST TR Fire Safety

