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MODEL RCW DRY SYSTEM VALVE

GENERAL DESCRIPTION

The Globe Model RCW* dry valve is a hydraulically operated external resetting differential latching style valve. The Model RCW dry valve is used as an automatic water control valve in dry applications. The Model RCW dry valve serves as the primary water control valve installed in the water supply to a dry sprinkler system incorporating automatic (closed) sprinklers with compressed air or nitrogen within the system piping.

Setting of the Model RCW dry valve requires water pressure in the pressure chamber being maintained on the plunger rod. The pressure on the plunger rod forces the lever arm/roller assembly against the clapper which in turn keeps the supply water from entering the sprinkler system piping. Water pressure is provided to the pressure chamber through a connection to the main water supply at a point upstream of the system main control valve. This connection also supplies water pressure up to the dry pilot actuator.

The dry pilot actuator is held closed when in the normal set condition by air pressure in the system piping. When system air pressure is relieved via one or more operated sprinklers, the dry pilot actuator will open, allowing the pressurized water to be evacuated from the pressure chamber.

In the standby condition, the valve is normally closed and will automatically activate (trip) upon the activation of an automatic sprinkler, as a result of a fire condition. The RCW valve may also be operated by means of a manual release, which is provided in the trim, to override the normal activation sequence described above.

When heat from a fire opens an automatic sprinkler, water pressure in the pressure chamber decays resulting in the movement of the push rod assembly, releasing the lever arm/roller assembly from the clapper. The system water supply pressure forces the valve clapper open resulting in water flow into the system piping. Upon system activation, fire alarm signaling is provided by means of flowing water through the alarm port/intermediate chamber and associated alarm line trim. The flow of water activates a pressure switch which in turn notifies local alarms and/or an alarm signaling monitoring service. After the main control valve has been shut, the system drained, and any operated sprinklers replaced, the RCW dry valve is easily set/reset by means of pushing the reset knob. The system is now ready for the introduction of compressed air back into the system piping.

If the speed of operation of the dry valve needs to be increased, an optional accelerator can be utilized to decrease the trip time of the valve from the operation of a sprinkler or the inspectors test connection.

MODEL RCW DRY SYSTEM VALVE

TECHNICAL DATA

Approvals

- cULus
- FM

Maximum System Working Pressure

- 300 psi (20.6 Bar)

End Connections

- Groove x Groove

Materials of Construction

- See Technical Datasheet GFV-200 for materials of construction for the Model RCW Valve

***Patents Pending**

MODEL RCW DRY SYSTEM

The dry system trim is one optional trim arrangement for the Globe Model RCW valve. This arrangement is typically utilized when the system is subject to areas exposed to freezing or close to freezing temperatures. With this configuration, the detection system consists of automatic sprinklers spaced throughout the protection area. System air pressure is used to ensure the integrity of the system piping and used as the activation method for the valve.

Water pressure is maintained in the valve pressure chamber up to the dry pilot actuator through a restricted connection from the main water supply which is taken upstream of the system main control valve (The pressure chamber supply valve must remain in the open position at all times when the system is in service). The dry pilot actuator is normally held in the closed position by the system air pressure supplied through the automatic air or nitrogen maintenance device.

When an automatic sprinkler operates, the air flow rate through the open sprinkler is at a flow rate greater than that which can be supplied through the automatic air or nitrogen maintenance device. This causes a pressure drop in the system and the upper chamber of the dry pilot actuator. An optional accelerator can increase the rate at which the air decays on the dry pilot actuator, if a faster time to trip the Model RCW valve is required.

Once the pressure in the upper chamber of the dry pilot actuator drops sufficiently, the upper chamber can no longer hold the diaphragm in the closed position. The dry pilot actuator opens and allows water to flow from the pressure chamber to the drain at a flow rate greater than that which can be supplied through the restriction in the pressure chamber supply line. The opening of the dry pilot actuator results in a drop in pressure in the pressure chamber and the Model RCW valve operates (trips) allowing water to flow into the system piping. The automatic actuation of the feature of the valve can be bypassed by manually rotating the handle on the "Manual Control/ Emergency Release" valve located on the Model RCW trim to activate the Model RCW valve.

Note:

See recommended system air/nitrogen pressure and expected trip range below for the Model GDPA. More detailed information can be found about the Dry Pilot Actuator in Technical Data Sheet GFV550.

GDPA vs GDPA-LP

When choosing the dry pilot actuator for your system there are many factors which influence the fluid delivery time. These factors range from system geometry, riser location, sprinkler orifice size, supply pressure, pump ramping time and more. In certain systems, higher system air pressure can be advantageous over lower system air pressure and the opposite can also be true. Some things to consider when choosing the GDPA vs the GDPA-LP are discussed below.

The initial air pressure in a system may vary. For example in one system the initial air pressure may be set for 15 psi (1 Bar) and 45 psi (3.1 Bar) for the other. The system air pressure will decay at a faster rate with the higher initial system pressure. For a fixed pressure drop (i.e. 5 psi drop) will be reached more quickly with the higher initial air pressure than lower initial air pressure.

Unfortunately fluid delivery time is not just dependent on tripping the control valve but also dependent on the fluid moving through the system. As the water fills the system piping it can create a high pressure pocket of air at the inspectors test connection. This higher air pressure can slow the progress of the water progressing towards the inspectors test connection. This phenomenon typically happens with smaller K-factor sprinklers. This scenario may lend itself to choosing to utilize lower system air pressure and the GDPA-LP actuator.

In other circumstances, systems are center fed, meaning roughly half of the volume of piping is on one side of the riser and half on the other. In these scenarios, higher system air pressure can be beneficial to system delivery time as the higher air pressure will actually impede or stop the propagation of water in the direction opposite the inspectors test connection (ITC) and force the majority of the available water flow towards the ITC.

It would be impossible to run through every scenario possible but there are a few generalities which can be used as guidance. Generally end fed systems will achieve faster fluid delivery times with lower air pressure. Generally center fed systems with moderate to better than moderate water supplies will have faster

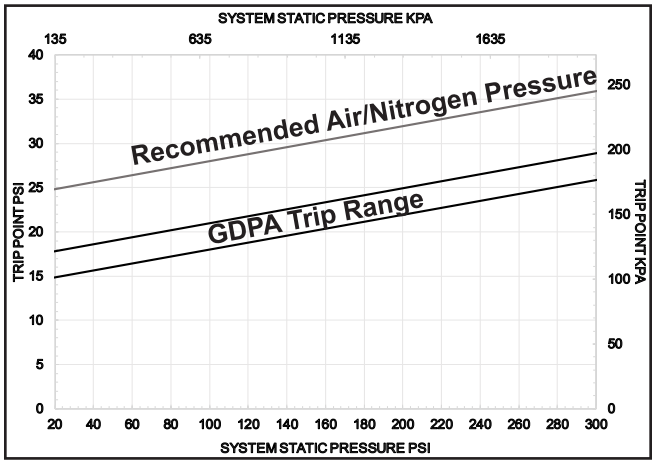


FIGURE 1:MODEL GDPA DRY PILOT TRIP RANGE

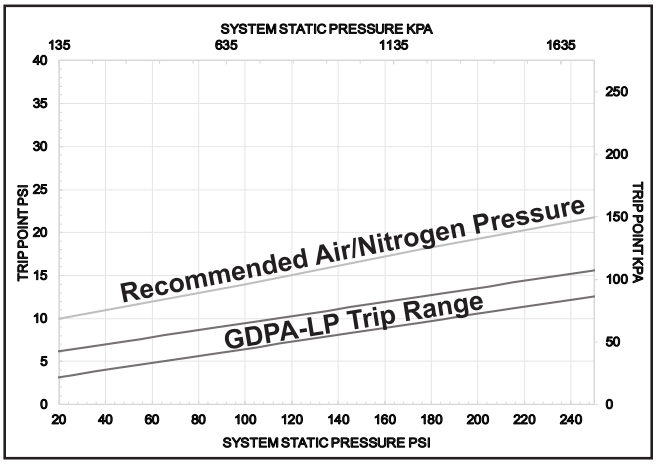


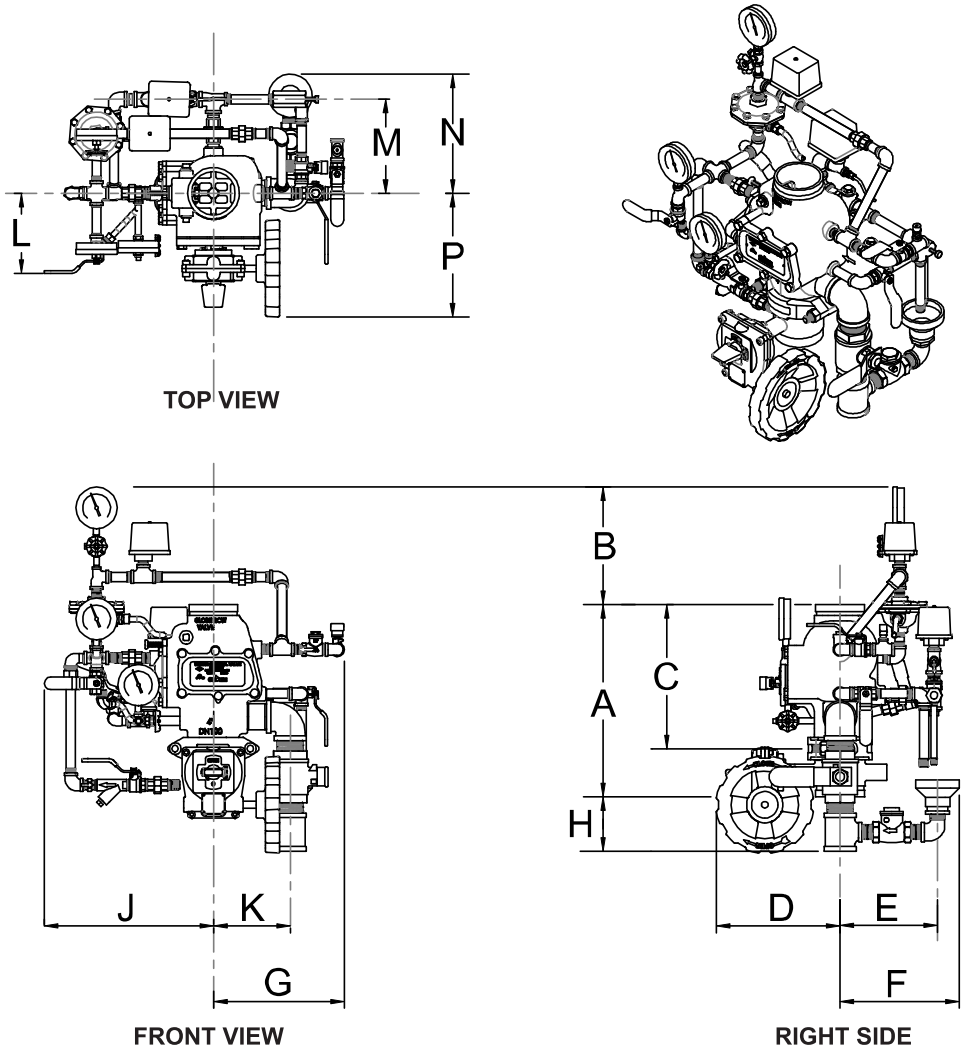
FIGURE 2:MODEL GDPA-LP DRY PILOT TRIP RANGE

fluid delivery times with higher air pressure. This is meant to be general guidance, and should be in no way taken as a guarantee of fluid delivery time. All systems and configurations are different and there are always exceptions to the rule.

GDPA-LP

The Model GDPA-LP is only recommended for system supply pressures up to 250 psi (17.2 Bar). The GDPA-LP is factory painted green to identify the low pressure version. The Model GDPA is the standard pressure actuator, while the GDPA-LP can be utilized for low system air pressures. The types of systems where the use of the GDPA-LP has the potential to be beneficial to system performance are: Dry Systems, and Double Interlock Electric/Pneumatic Systems. There is little to no advantage to utilizing the GDPA-LP in Single Interlock Dry Pilot, or Deluge Dry Pilot Systems, as the pilot lines generally have a very small volume and the valve trips very quickly no matter the pilot line pressure.

If you have any questions on the application of the GDPA vs the GDPA-LP contact Globe Sprinkler Technical Services.



Valve Size	Nominal Installation Dimensions Inches (mm)													
	A VALVE TOP TO BFV BOTTOM	B	C VALVE TOP TO VALVE BOTTOM	D	E	F	G	H	J	K	L	M	N	P
4" (DN100)	17.6 (447.7)	11 (279)	13.13 (333.5)	12 (304)	9.0 (228.6)	11.0 (279.4)	12.0 (304.8)	5 (127)	16 (406)	7.0 (177.8)	8 (203)	8.5 (216)	11.0 (279.4)	12 (304)
6" (DN150)	19.75 (501.6)	10 (254)	14.47 (367.5)	13 (330)	9.0 (228.6)	12 (304)	13 (330)	4.4 (111)	16 (406)	8.5 (216)	8 (203)	9.75 (247.6)	11.0 (279.4)	13 (330)

FIGURE 3:DRY ACTUATION TRIM DIMENSIONS