



BLAZE

Installation & Operation Manual

Deluge Valve (BT 5910)

Description :

The BT 5910 Deluge Valve is a diaphragm-operated automatic control valve designed for use in fire protection systems. It may be installed in either a vertical or horizontal position and controls the water supply during system operation. When used with the appropriate trim and release devices, the valve can also activate a fire alarm upon system operation.

The valve is engineered to provide high flow capacity with low pressure loss, ensuring efficient system performance. Its external reset mechanism allows the valve to be reset without removing the inspection cover, reducing maintenance time and simplifying servicing.

The BT 5910 features a simple and reliable design with minimal moving parts. The valve body is internally and externally coated with Fusion Bonded Epoxy (FBE) to provide excellent corrosion resistance, making it suitable for use in demanding indoor and outdoor environments.

Principle of Operation :

The BT 5910 Deluge Valve is a diaphragm-operated valve that remains closed by water pressure within the diaphragm chamber. Under normal operating conditions, the diaphragm chamber is pressurised through the control trim from the inlet side of the main water supply valve. This pressure keeps the diaphragm firmly seated, preventing water from entering the system.

When a release device, such as an electric solenoid valve, operates, water is discharged from the diaphragm chamber faster than it can be replenished through the restricted supply connection. As the diaphragm chamber pressure falls, the holding force on the diaphragm is reduced.

Once the pressure drops below the valve operating point, the incoming water supply pressure forces the diaphragm open, allowing water to flow through the valve and into the fire protection system.

Notes :

The BT 5910 Deluge Valve is protected with an internal and external Fusion Bonded Epoxy (FBE) coating, providing excellent corrosion resistance and extending the service life of the valve in demanding environments.

Before installation in corrosive environments, the suitability of the valve and its protective coating should be confirmed by a qualified engineer or system designer.

Where seawater or brackish water is used as the fire protection water supply, additional precautions should be taken to protect the valve and trim from corrosion. For optimum performance, it is recommended that the system is supplied with clean fresh water under normal conditions, with seawater or brackish water introduced only during system operation.



After the system has operated, thoroughly flush the valve, trim and associated pipework with clean fresh water to remove salt deposits and contaminants. Following this procedure will help maximise the service life of the valve and its components.

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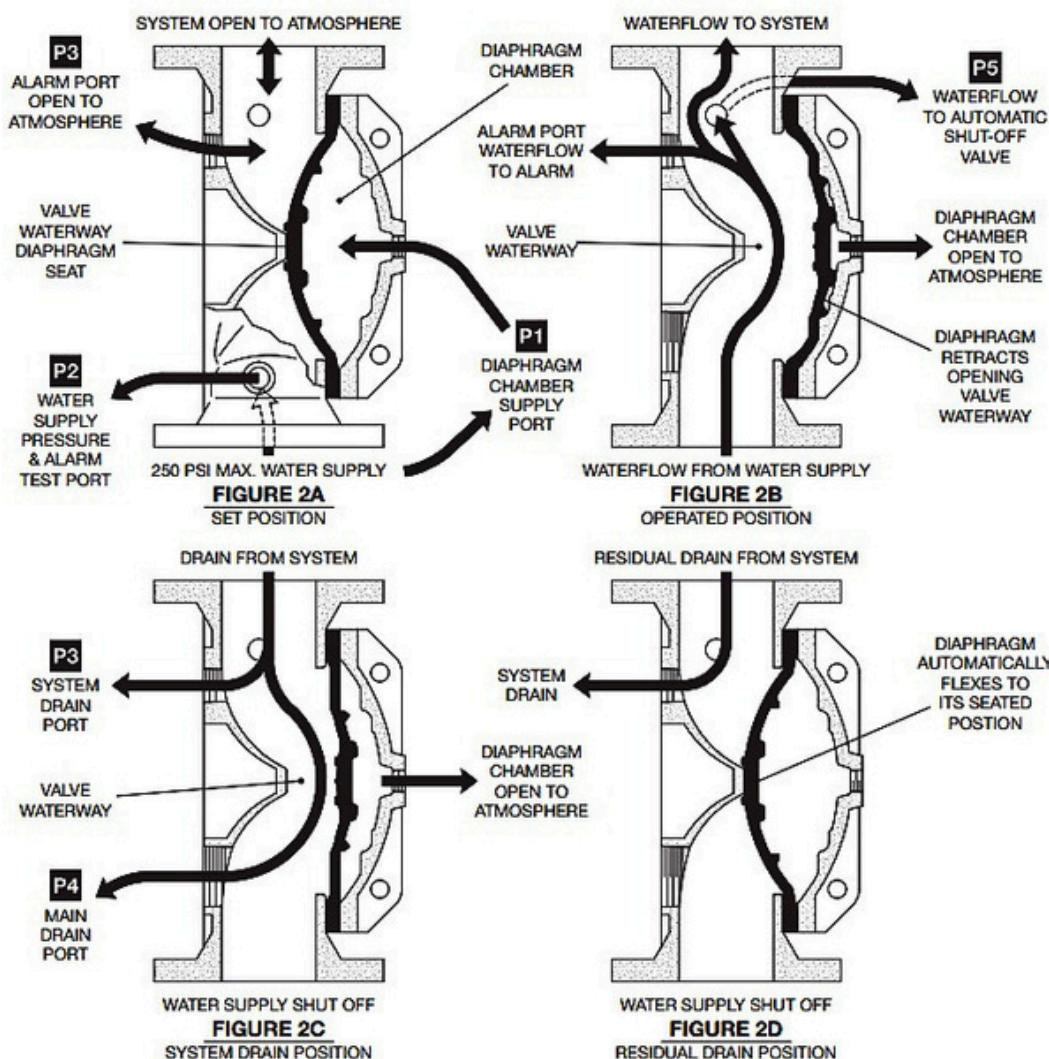
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Installation :

1. Install the BT 5910 Deluge Valve in a clearly visible and easily accessible location.
2. Before installing the trim, ensure that all nipples, fittings and components are clean and free from dirt, scale and burrs. Apply thread sealant sparingly to male threaded connections only.
3. Ensure that all check valves, strainers and globe valves are installed with the flow arrows pointing in the correct direction.
4. Install drain pipework with smooth bends to allow unrestricted water flow.
5. Provide a suitable drain to safely discharge water during testing or system operation without causing injury or property damage.
6. Connect the diaphragm chamber supply control valve to the inlet side of the main water supply control valve. Keep this connection as short as possible and use the same water supply as the system.

7. Complete all electrical wiring and conduit connections in accordance with the applicable electrical codes and the requirements of the Authority Having Jurisdiction (AHJ).

Notes :

- Install the control trim strictly in accordance with the applicable trim drawing and technical data sheet.
- Incorrect trim installation may prevent proper valve operation and could invalidate product approvals or warranty.
- The valve, trim and wet pilot lines must be protected from freezing and maintained at a minimum temperature of 4.4°C (40°F).
- Do not apply heat tracing directly to the valve or trim, as this may cause mineral deposits that could impair valve operation.

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Care and Maintenance :

The BT 5910 Deluge Valve should be inspected, tested and maintained regularly to ensure reliable operation. Any fault or impairment must be corrected immediately.

Before isolating the fire protection system for maintenance, obtain approval from the responsible authority and notify all personnel who may be affected by the system shutdown.

The system owner is responsible for ensuring that inspection, testing and maintenance are carried out in accordance with NFPA 25, applicable local regulations and the requirements of the Authority Having Jurisdiction (AHJ). It is recommended that all work is performed by qualified fire protection service personnel.

For systems using seawater or brackish water, the valve and trim should be inspected more frequently. Any components showing signs of corrosion, wear or damage should be replaced immediately to maintain the integrity and reliability of the fire protection system.

Low Water Supply Pressure :

If the water supply pressure falls significantly below its normal operating level, such as during a water main failure or maintenance, the pressure within the diaphragm chamber may also decrease. If the water supply is then restored rapidly while the diaphragm chamber pressure remains low, the BT 5910 Deluge Valve may operate unintentionally.

A reduction in water supply pressure below the normal operating range is considered an emergency impairment under NFPA 25.

If this condition occurs:

1. Close the main water supply control valve immediately.
2. Before restoring the water supply, check the diaphragm chamber pressure gauge and verify that the pressure is within the normal operating range.
3. If the diaphragm chamber pressure is low, inspect the diaphragm chamber and associated pipework for leaks or faulty components, and rectify any defects before resetting the valve.
4. Once the water supply has been restored, reset the BT 5910 Deluge Valve in accordance with the Valve Setting Procedure.

Annual Operation Test :

The BT 5910 Deluge Valve should be tested at least once a year to verify correct operation.

1. If water discharge beyond the riser must be prevented:
 - Close the Main Control Valve.
 - Open the Main Drain Valve.
 - Slowly open the Main Control Valve until water begins to flow from the Main Drain Valve.
 - Close the Main Drain Valve.

2. Operate the valve using the appropriate release system:

- Wet Pilot System: Open the Inspector's Test Connection.
- Electric Release System: Activate the solenoid valve using the fire alarm control panel or releasing panel in accordance with the manufacturer's instructions.

3. Verify that the BT 5910 Deluge Valve operates correctly and that water flows into the system.

4. Close the Main Control Valve.

5. Close the Diaphragm Chamber Supply Control Valve.

6. Reset the valve in accordance with the Valve Setting Procedure before returning the system to service.

Note: If water must be prevented from entering the system, be prepared to close the Main Control Valve immediately after verifying valve operation.

Internal Valve Inspection :

Carry out an internal inspection every five years during the annual operational test and before resetting the BT 9266 Deluge Valve. Clean the interior of the valve and inspect all components for wear, corrosion or damage. Replace any defective parts as required. It is recommended that the diaphragm is replaced every ten years.

When reinstalling the diaphragm cover, tighten the cover bolts evenly using a criss-cross (cross-draw) sequence to ensure uniform sealing. After tightening, recheck all bolts to confirm they are securely fastened.

Notes :

- If the water supply contains chemicals that may attack rubber components, or if excessive debris is found during inspection, increase the inspection frequency accordingly.
- For systems supplied with seawater or brackish water, more frequent internal inspections are recommended. An annual internal inspection is advised for these applications.
- Ensure the diaphragm is installed in the correct orientation before reassembly. Incorrect installation may prevent the valve from resetting properly.
- Insufficient tightening of the diaphragm cover bolts may result in internal or external leakage.

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Air Pressure Settings :

Water Pressure		MIN	
psi	KPa	psi	KPa
20-60	138-414	9.5	65
61-100	415-690	12	83
101-140	691-966	15	103
141-175	967-1207	18	125
176-250	1208-1725	21	145

Head Loss :

The BT 5910 Deluge Valve features a uniquely engineered diaphragm design that provides minimal head loss, allowing maximum water flow with reduced pressure drop. This optimised hydraulic performance ensures efficient system operation and rapid water delivery during fire protection applications.

Resetting Procedure :

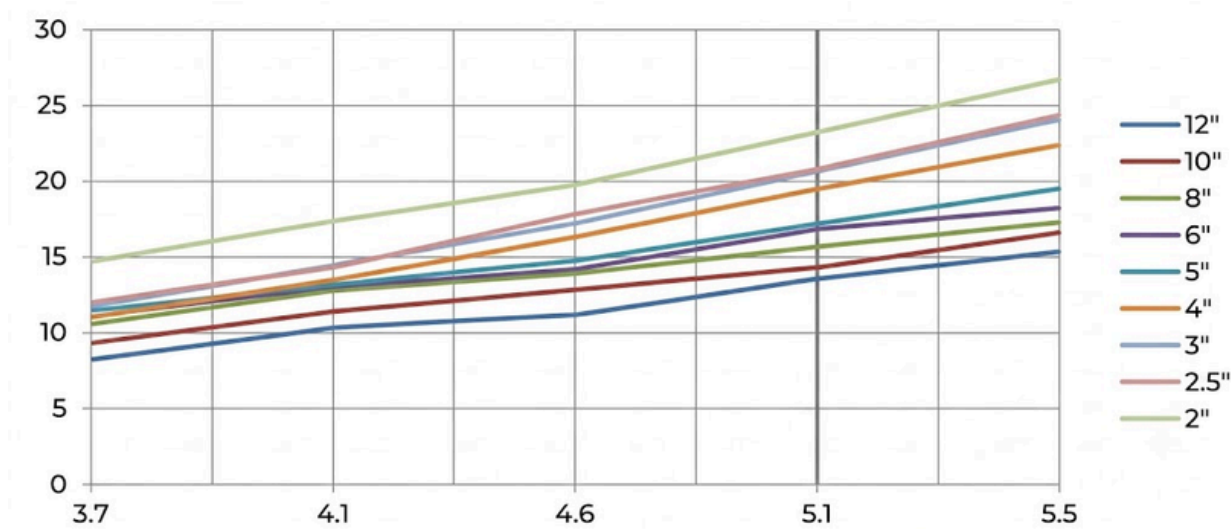
1. Close the Main Control Valve.
2. Open the Main Drain Valve to drain all water downstream of the main valve.
3. Ensure that both the manual ball valve and the solenoid valve are in the closed position.
4. Once the system has been fully drained, press and hold the manual reset device until the diaphragm chamber reaches its normal operating pressure.
5. Slowly open the Main Control Valve. The system will return to its normal standby condition.

Notes

Refer Ball Valve Position Guidelines as below

- For Electric Release Systems, Refer to Fig 1.
- For Wet Pilot Systems, Refer to Fig 2.
- For Dry Pilot Systems, Refer to Fig. 3.
- For Double Action Activation Systems, Refer to Fig 4.

Flow velocity (m/s)	Head Loss (KPa)								
	12"	10"	8"	6"	5"	4"	3"	2.5"	2"
3.7	8.27	9.36	10.62	11.14	11.5	11.06	11.78	11.99	14.72
4.1	10.36	11.47	12.83	13.06	13.17	13.53	14.44	14.37	17.4
4.6	11.23	12.83	13.94	14.21	14.82	16.36	17.27	17.8	19.77
5.1	13.57	14.31	15.67	16.84	17.17	19.47	20.65	20.76	23.24
5.5	15.36	16.58	17.33	18.26	19.5	22.4	24.05	24.33	26.72



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Ball Valve Position Guideline For Electric Actuation Trim :

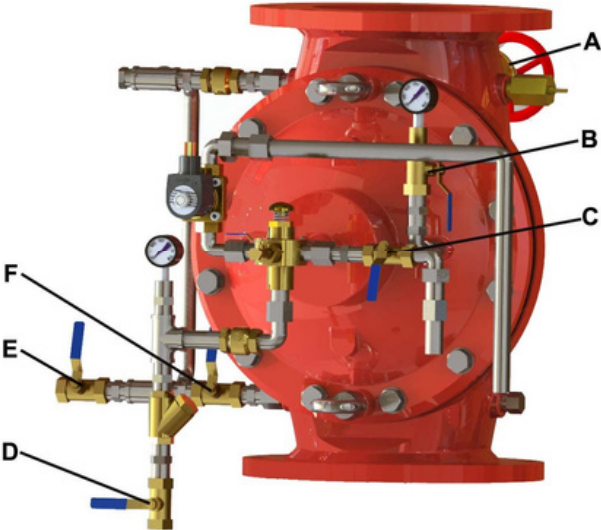
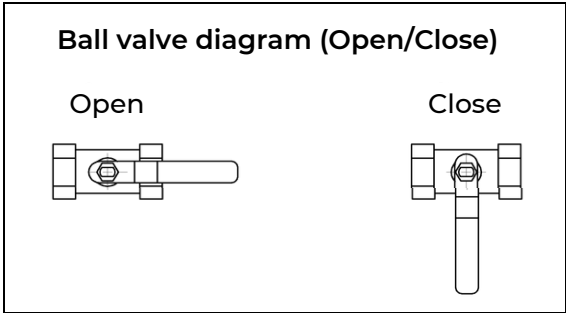


Fig. 1



	A	B	C	D	E	F
Position	Close	Open	Close	Open	Close	Close

Ball Valve Position Guideline For Wet Pilot Systems :

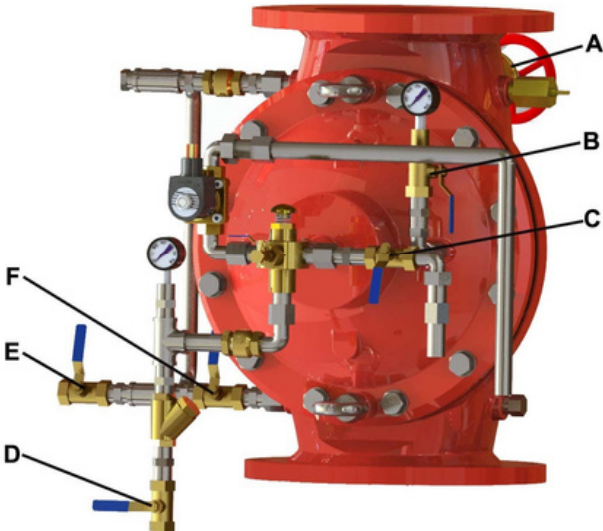
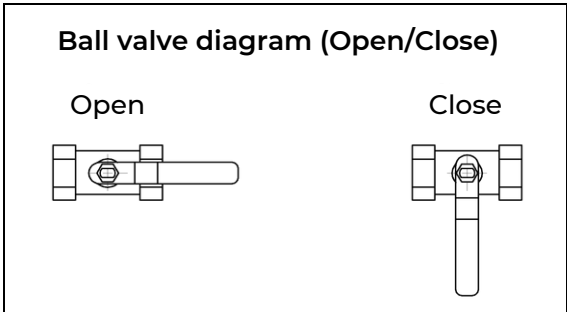


Fig. 2



	A	B	C	D	E	F
Position	Close	Open	Close	Open	Close	Close



Ball Valve Position Guideline For Dry Pilot Systems :

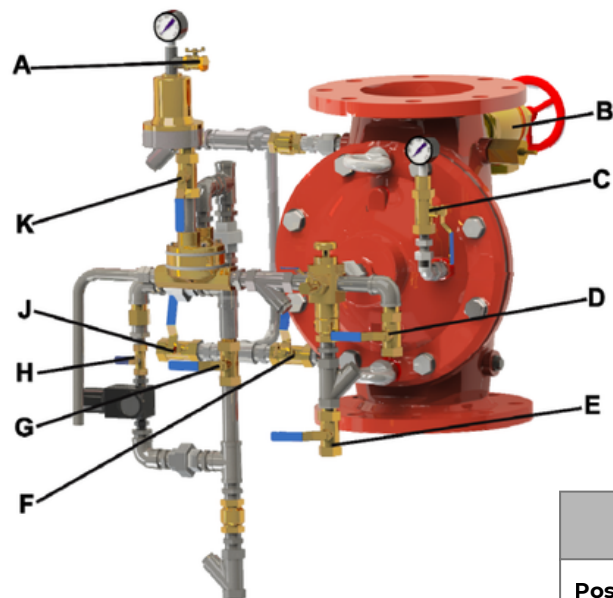
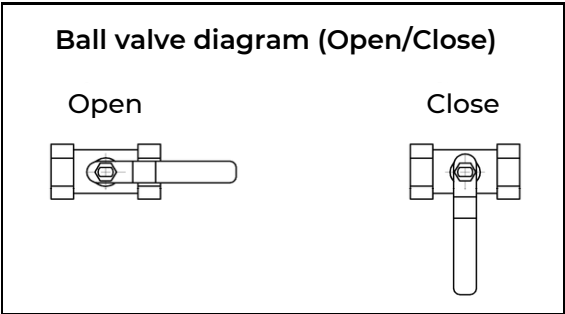


Fig. 3



	A	B	C	D	E	F	G	H	J	K
Position	Close	Open	Open	Close	Open	Close	Close	Open	Close	Open

Ball Valve Position Guideline For Double Action Activation Systems :

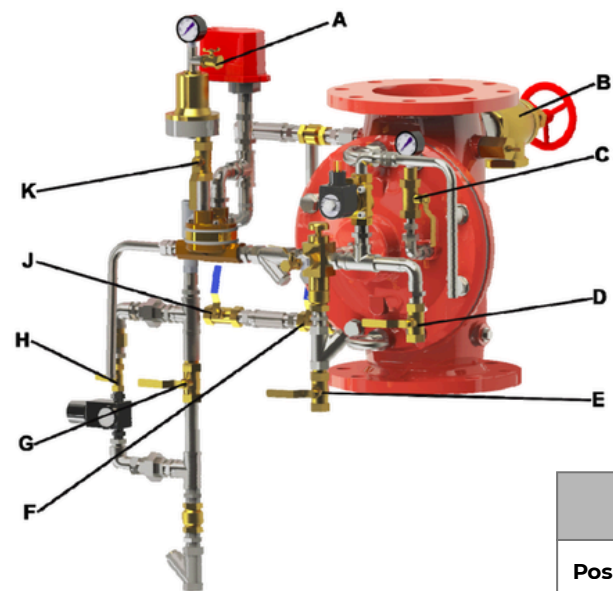
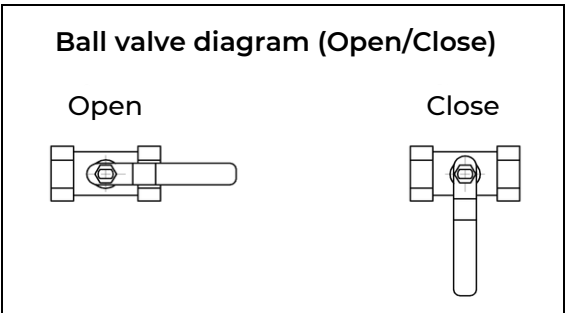


Fig. 4



	A	B	C	D	E	F	G	H	J	K
Position	Close	Close	Open	Close	Open	Close	Close	Open	Close	Open