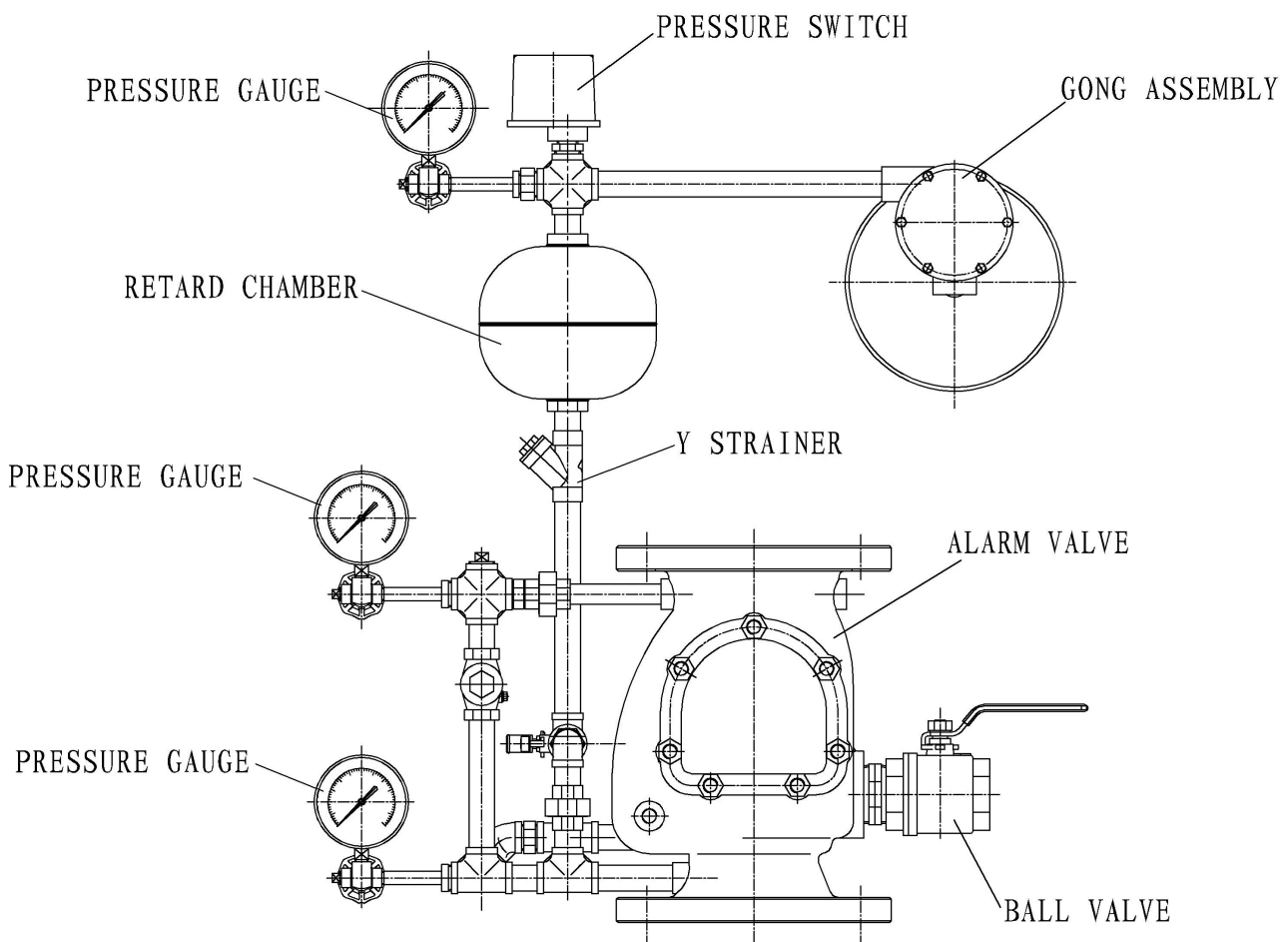


1. Notes:

The wet alarm valve is a kind of check valve that only allows water flow into the fire-sprinkling system in one direction and drives the supporting accessories to alarm under specified pressure and flow rate. Its functions in the system include: After the alarm water flow has been connected or disconnected and the sprinkler begins to act, the water flow will drive the alarm of the water motor alarm and the pressure switch; It prevents water from back flowing. The wet automatic sprinkler system composed by the wet alarm valve, pressure switch and sprinkler is a widely used fixed extinguishing system. The system pipe network is filled with clean water with a certain pressure all year round and has always been ready for providing service. When a fire breaks out in the protection zone, the temperature within the zone will rise, then the organic solution in the thermal sensitive components (glass ball) of the sprinkler will expand and produce great internal pressure until the glass ball shell breaks and triggers the water injection of the sprinkler and then the whole system to alarm, thus the purpose of fire alarm, fire control and firefighting is achieved.

This system is applicable to the places with the ambient temperature from 4°C to 70°C. This system is generally installed in the places with fire hazards, like the hotel, shopping mall, hospital, theater, office building, conference center, warehouse, high-rise building and underground garage. This system has the advantages of safety and reliability, high success rate in fire extinguishing and fire control, long service life, wide range of use, convenient in maintenance and low cost etc.

2. Product structure and working principle



Product structure diagram (Figure 1)

2.1 Product structure

As shown in Figure 1, LIFECO wet alarm instrument consists of wet alarm valve, delayer, water motor alarm, pressure switch, drain valve and filter etc.

2.1.1 Wet alarm valve

This wet alarm valve is a cover plate type alarm valve which mainly consists of the valve body, valve seat ring and valve disc. The valve body is separated into the upper chamber and lower chamber. The upper chamber (system side) is connected to the system pipe network, whereas the lower chamber (water supply side) is connected to the water resource. The valve body is equipped with seat ring inside and there are many small groove holes leading to the inlet pipe of the delayer on the seat ring.

When the system is in servo state, the small groove holes in the seat ring will be covered by the valve disc and the waterway leading to the water motor alarm will be blocked; When the pressure between the upper side and the lower side reaches a certain value, the valve disc will open (differential pressure start), and the water will flow from the water supply side to the system side, then the alarm bell will ring and the fire extinguishing system will begin to spray water; Because the bypass is installed with compensator, when there is a slight leakage in the pipe network of the system side or water source pressure fluctuates, replenish water for the pipe network through the compensator to balance the pressure between the upper chamber and the lower chamber and stabilize the valve disc, so that the false alarm can be avoided.

2.1.2 Delayer

Delayer is a cylinder-shaped water storage container with an inlet and an outlet. Its lower inlet is connected to the alarm port of the alarm valve and its upper outlet is connected to the water motor alarm and the pressure switch. Due to the fluctuation of the water source of the system, the valve disc may open suddenly. The water will enter the delayer after passing through the groove and the small holes in the seat ring. Because the fluctuation period is very short, the valve disc will return to its original position soon, so only a small amount water will flow into the delayer. Water collected by the delayer will be discharged from the orifice at the bottom. Because of the buffering effect of the delayer, the false alarm of the water powered alarm caused by the fluctuation of the water motor alarm can be avoided. The time needed for water flowing from the inlet to the outlet of the delayer is called delay time. The delay time of this instrument is 5-60S. When water flow stops, water in the delayer will be discharged from the orifice, and the discharge time is less than 5min.

2.1.3 Water motor alarm

The water motor alarm is an alarm instrument that will ring with water flow as its driving force. It is usually used as the supporting device of the alarm valve of the automatic fire-extinguishing sprinkler system. The water motor alarm consists of the alarm bell, bell clapper, rotation shaft, hydro-turbine and water pipes. When any sprinkler action or test valve of the automatic sprinkler system is opened, the alarm valve of the system automatically opens, then a small stream of water flows through the water supply pipe and impacts the turbine to rotate, which causes the hammer to continually impact the alarm bell and make a constant alarm.

2.2 Working principle

The wet alarm valve is constantly in the servo state, and the system side is filled with water of working pressure. Because the pressure between the system side and the water supply side can be balanced by the bypass pipe and the compensator, and the area of the upper pressure-bearing surface is larger than that of the lower pressure-bearing surface, the false alarm caused by the opening of the valve disc due to water pressure fluctuation can be effectively avoided. When a fire alarm occurs in the control zone of the automatic sprinkler system, the thermal sensitive component in the sealed sprinkler will blow up in heat and spray water automatically, then the system side pressure of the wet alarm valve will drop. Because of the throttling action of the bypass pipe, the pressure between the system side and the water supply side can't reach balance immediately. The valve disc will open automatically under the

effect of pressure difference and water from the water supply will flow into the pipe network of the system side for replenishment. Thus, the whole pipe network will be in the automatic fire extinguishing state. Meanwhile, due to a small amount of water flows to the delayer and the water motor alarm through the small holes in the seat ring, under certain pressure and flow rate, the water motor alarm will ring, then the pressure switch will transform the pressure signal into an electrical signal to start the fire pump and the auxiliary fire-fighting equipment for replenishing water and extinguishing the fire. Thus, the goal of automatic fire extinguishing and alarm is achieved.

3. Installation and commissioning

3.1 Installation

3.1.1 This instrument shall be installed in places where is easy to observe and access. Install The wet alarm valve vertically on the pipes which have been properly tested for its pressure and cleaned. Please note that the arrow for water flow direction is pointing upwards. Reserve enough operation space for repair and maintenance before installation;

3.1.2 Clean the system pipe network completely before installation. Ensure that the inner wall of the pipes is coated with rust-proof layer and there is no dreg or dirt in the pipes;

3.1.3 In order to facilitate the observation of the pipe in which an alarm occurs, it is recommended to discharge the water from an open port or have the water discharge state easy to be observed before installation.

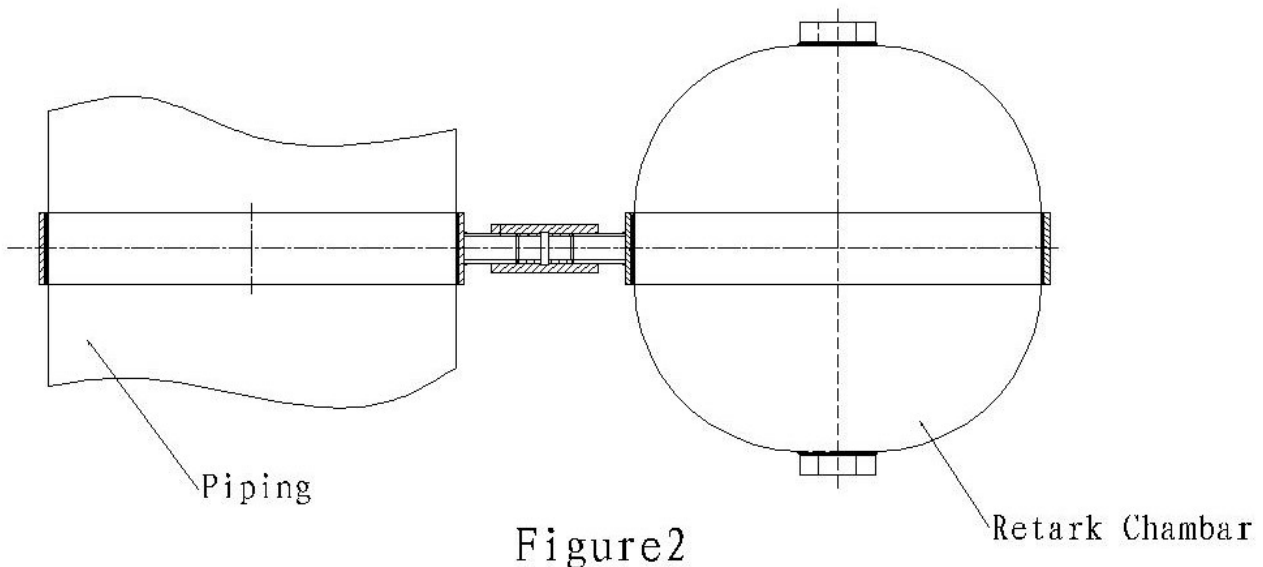
3.1.4 Check whether there is any damage at the joint between the wet alarm valve and the flange, check whether the seal is in good condition and whether the valve disc moves flexibly, carry out the leakage test with a pressure of two times of the rated working pressure. After the test, the valve disc shall be free of leakage; If there is any problem, replace the spare parts or clear the trouble before assembling the parts together.

3.1.5 Turn the pressure gauge to the position where the reading is clearly visible;

3.1.6 The pressure switch shall be installed on the top of the delayer. This pressure switch must be installed vertically and could only be used indoors. After installation, check if it acts reliably.

3.1.7 The water motor alarm shall be installed on the top of the delayer, after installation, check if it acts reliably.

3.1.8 With the exception of support from the trim piping, the ratard chamber will also be binded by a clamp with the piping to avoid any movement or looseness. Pls refer to figure 2 for detailed information



3.2 Commissioning

3.2.1 After the completion of the pipe network installation, inject water in the pipe network to increase its pressure gradually and expel all the air from it. When the pressure increases to the system working pressure, check if there is any leakage in the whole system. If there is no leakage, start the alarm test and the water supply test for the pipes.

3.2.2 Alarm test: Open the discharge ball valve on the wet alarm valve instrument. When the flow rate reaches a certain value, the water motor alarm and the pressure switch will act accordingly to alarm.

3.2.3 Close the alarm ball valve and open the alarm test ball valve, the water of the water supply side will flow into the alarm instrument directly. The alarm functions of the pressure switch and the water motor alarm can be tested too when the valve disc is not in the servo state.

3.2.4 Pipeline water supply test: When opening the discharge ball valve, a large amount water will flow out steadily. If that's the case, it shows that the water supply of the pipe network is smooth, otherwise, expel the air from the pipeline system and clear the blockage to ensure the smooth water flow in the pipes.

4. Periodical check and maintenance

4.1 Clean the dirt and foreign matters attached on the rubber seal surface of the valve disc. Generally, the service life of the rubber seals is no more than eighteen months. Replace the seals in time if they are worn out or aging.

4.2 Clean the dirt and foreign matters from the small holes and seal surface in the groove of the valve disc seals. Be careful not to scratch the surface and keep the small holes unobstructed. If the seal surface can't be repaired, replace it with a new one.

4.3 Clean the blockage in the filter of the alarm valve instrument timely and keep the pipeline unblocked.

4.4 Check and clean the dirt in the delayer, and be sure that the small throttle holes will not be blocked by foreign matters.

4.5 Check the water motor alarm every three months:

4.5.1 Turn on the alarm bell to check whether its sound is loud, immediately remove any trouble if found.

4.5.2 Remove the alarm shell and clear up the dirt and the sediment in the alarm, then reassemble the alarm shell and gaskets in turn.

4.5.3 Remove the leaking joints from the water-wheel and clear up the dirt in it.

4.6 Check the pressure switch periodically (it is recommended to test every three months or more frequently).

5. Causes and Troubleshooting of Common Faults

5.1 When a fault alarm occurs, check whether there is any obvious or hidden leakage at the pipe joints of the system side, or whether the seal between the valve disc components and the valve seat in the alarm valve is not sealed due to deformation or dirt and debris blocking. Remove the dirt and foreign matters or replace the seal.

5.2 When the throttling holes in the lower side of the delayer are blocked, the delayer will alarm or its delaying time will be shortened. And subsequently remove the cylindrical shell and the port of the throttling holes and wash them.

5.3 If the water pump does not respond when the test valve is open and reaches specified pressure, it might be because the setting value of the pressure switch is wrong, you should adjust the pressure adjusting nut in the pressure switch to the specified value.

5.4 If the water motor alarm does not act or ring loud enough, it might be because the control port is blocked or the bell clapper is stuck. Clean the spray nozzle, remove and wash the impeller and the bell clapper parts, and check if the impeller moves flexibly after reassembling.