

Information on Set-up, operation, service and maintenance

Model E / E3 DN100 (4"), DN150 (6"), DN200 (8") Wet Alarm Valve with E2 Euro Stainless Steel Trim

Model E/E3 with Stainless Steel Euro Trim

Approval No. G4060049 DN 100

Approval No. G4060050 DN 150

Approval No. G4060051 DN 200

Conforms to EN 12259-2 (CE)



Safety Information

- The applicable rules and regulations on accident prevention at the place of use of the equipment must be complied with.
- The wet alarm valve sets are built using state of the art technology and in accordance with recognized safety legislation. These systems should only be used:
 - a. for the intended purpose,
 - b. in a technically safe and fault-free condition.
 Any faults which could affect safety must be rectified immediately.
- The wet alarm valve stations are intended solely for use to supply of water within a fire extinguishing system.
- The use of this equipment for any other purpose, or for a purpose which extends beyond the intended use, shall be deemed misuse.
The intended purpose also includes:
 - Compliance with all information in Bulletin 409
 - Provision of inspection and maintenance work.

In addition to Bulletin 409, the generally applicable and national regulations on accident prevention and environmental protection must be provided complied with only qualified and trained personnel may work on the system.

- The recommended adjustment, maintenance and inspection works must be carried out on the due date.
- Protect all upstream and downstream system parts and operating media from unintentional operation.
- During all maintenance, inspection and repair work, ensure that the system is voltage-free and protect the mains switch from an unintentional restart.
- Provide a warning sign to prevent a restart.
- Check that any loosened screw connections are securely tightened.
- After completion of maintenance work, check that all safety equipment functions correctly.
- Never modify, alter or extend the valve sets without the manufacturer's approval. This also applies to welding of bearing parts.
- Any components which are not in perfect condition must be replaced immediately.
- Use original spare parts and consumables only.

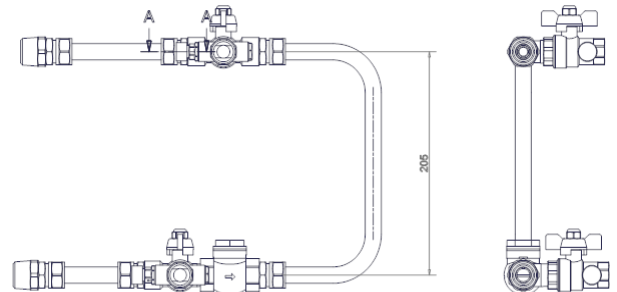
If parts supplied by a third party are installed, we cannot guarantee that these parts have been designed and manufactured to the required performance and safety standards. Use of non original parts will void all warranties.

- Handle and dispose of all substances and materials used correctly, in particular:
 - a. when working on lubrication systems and equipment,
 - b. when cleaning using solvents.

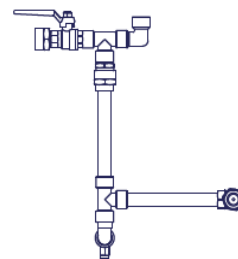
Scope of Supply

The wet alarm valve set trim is supplied in three assemblies.

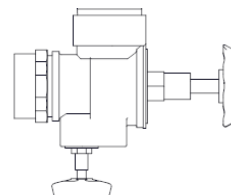
1. Bypass line



2. Alarm line



3. Test/drain valve



Assembly

Fit the connection pieces into the corresponding connections in the valve (WAF27/WAF24).

Now seal the test/drain valve with the conical 2" thread into the valve. Then (where applicable), fit the 2" bracket for the drain line.. Then (where applicable), fit the 2" bracket for the drain line. Then secure the alarm line using union nuts WAF30. If the optional retard chamber P/N 6303400530 is used, it must now be fitted to the alarm control valve with the restrictive orifice. Connect the alarm pressure switch to the retard chamber with the $\frac{3}{4}$ " outlet for the alarm line to the mechanical alarm gong. If the retard chamber is not used, install the alarm pressure switch with the $\frac{3}{4}$ " outlet for the alarm line to the mechanical alarm gong directly onto the alarm control valve. Ensure that the alarm pipe to the mechanical alarm is properly secured. Affix the sign for the alarm control valve either onto the retard chamber or the alarm control valve.

Finally, connect the bypass line to the valve using the two union nuts WAF24. We recommend that clamping ring unions are screwed in using a drop of oil. The water supply pressure gauge is below, the sprinkler pipe pressure gauge is above. Now install the optional supervision of the alarm control valve. The diagram shows an alternative set-up with two alarm pressure switches.

Warning: The assembly threads are jammed and compressed.

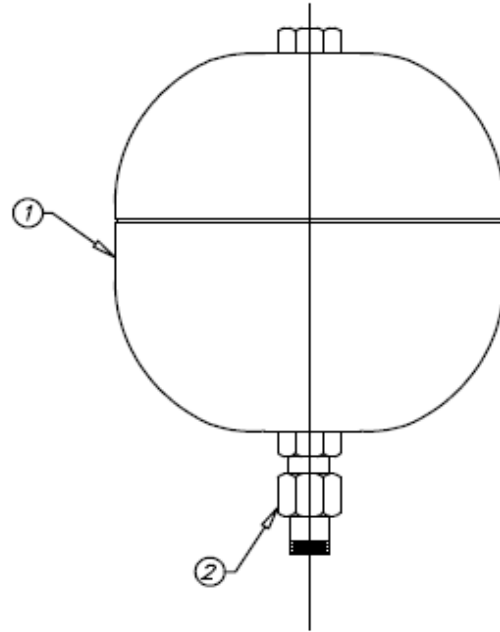
The following values must be specified according to VdS 2100-01:

Point 4.1.2 of the upper limit of the triggering threshold:

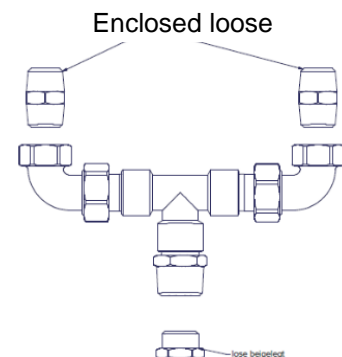
DN 200 – 51 l/min, DN 150 – 53 l/min and DN 100 – 34 l/min

Point 4.1.4 of the upper limit of the delay threshold:

DN 200, DN 150, DN 100 all 30 seconds



Optional retard chamber with restrictive orifice
Part no. 6303400530



Retrofit kit for 2 pressure switches
Part no. 6999996232

Trim Description

The basic trim components for the Reliable Alarm Valves Model E/E3 are designed for rapid, simple and compact attachment and serve as connection points for the alarms and other devices. They are also used for operational testing of the alarm devices without putting the system into operation.

Three basic trim sets are available for models E / E3:

- Constant pressure - retard unit not required.
- Variable pressure – retard unit required.
- Supervisory equipment according to VdS requirements (where required) must be ordered separately.

Operating instructions are not included in the scope of delivery. Automatic venting via the drip valve is possible.

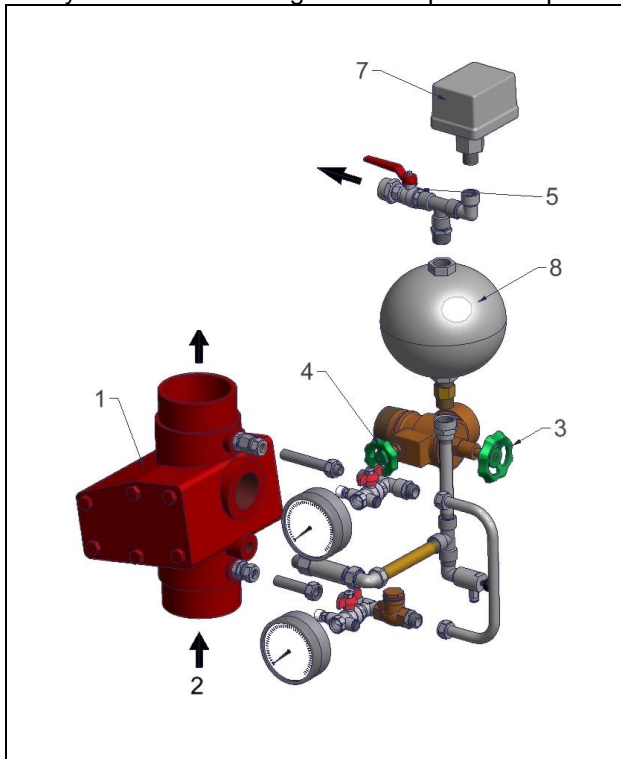


Figure 3

Model E3 Version Groove / Groove

Pos.	Designation
1	Wet alarm valve
2	Water supply
3	Main drain valve
4	Alarm test valve
5	Alarm shutoff valve

- 6 Automatic drain valve
- 7 Alarm pressure switch
- 8 Retard unit

Variable supply pressure

The normal position of the alarm valve is shown in Figure 2.

A water flow in the pipe system, resulting from one or several activated sprinklers, causes the valve clapper to open and water from the supply line to enter the sprinkler system for discharge over the source of the fire. The movement of the clapper (item 4) across the pin (item 8) opens the seat (item 3) and allows water to flow through the seat into the alarm channel. A continuous water flow fills the retard chamber and activates the alarm pressure switch and - if fitted - the mechanical alarm gong. A small amount of water is expelled simultaneously from the bleed valve. If the water stops flowing from the alarm valve, the clapper closes (item 4) and no further water flows to the retard chamber. The retard chamber and alarm line are drained via the bleed valve.

Practically all sprinkler pipe systems contain trapped air. If water hammer or a pressure spike occurs in the supply line, the rise in pressure compresses the trapped air and causes the alarm valve clapper intermittently to lift, which can cause false alarms. Reliable's alarm valve prevents a false alarm in these circumstances using two features:

- The bypass line equipped with the check valve diverts sudden increases in pressure from the supply line away from the alarm valve clapper. This creates over-pressure in the system, which pushes the clapper into the seat. In the event that a sudden high pressure increase raises the clapper away from its contact surface and allows water to flow into the alarm line, the retard chamber will become active.
- The inlet restrictive orifice in the retard chamber and the ball drip valve permits the drain-off of intermittent water before the chamber fills and an electrical and mechanical alarm is triggered.

Constant supply pressure

In systems in which the water pressure remains constant, the operation of the Alarm Valve Model E/E3 corresponds exactly to the description above, with one exception:

Description: The retard chamber is not necessary and water which passes through the seat in the contact surface of the alarm valve flows straight to the electrical and mechanical alarm devices, activating these devices.

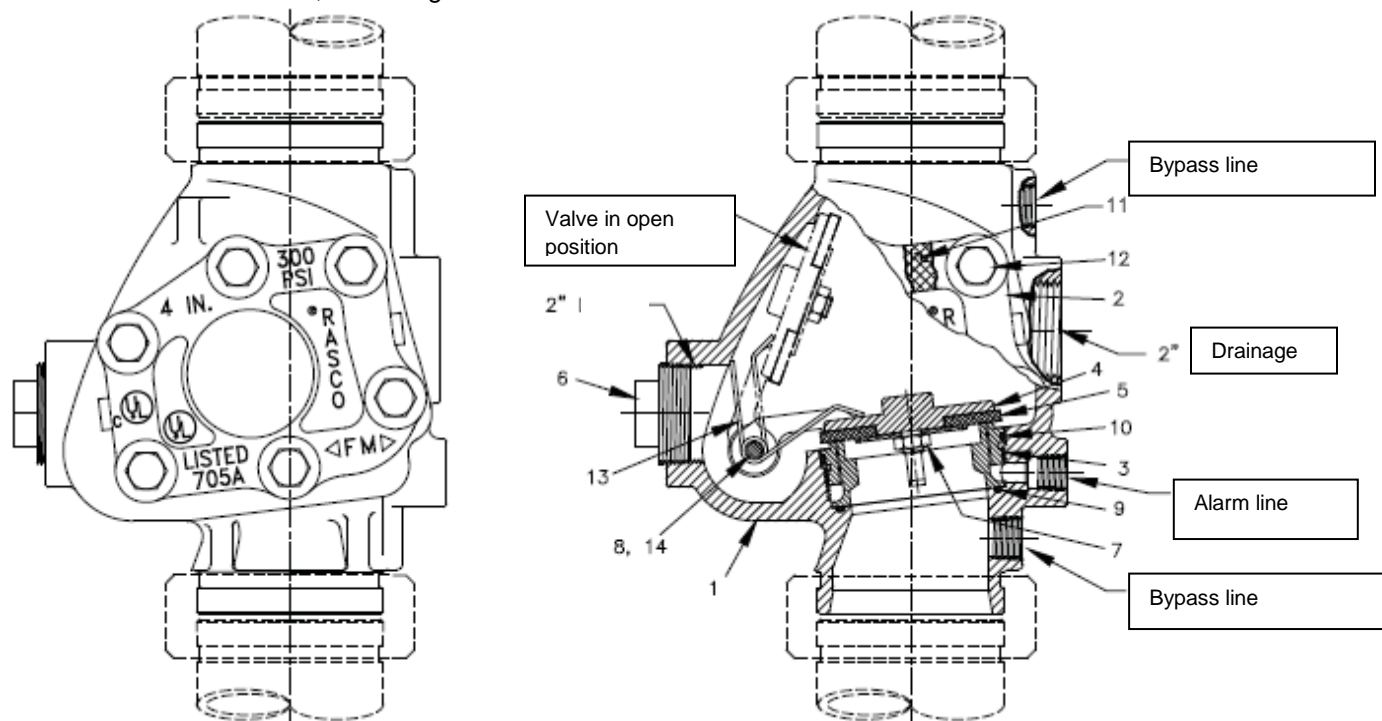


Figure 2

Pos.	Designation	Part number			Amount		
		DN 100	DN 150	DN 200	DN 100	DN 150	DN 200
1a	Body groove/groove	6102045519	6102065519	6102085519	1	1	1
1b	Body flange/groove	6102040531	6102060531	6102080531	1	1	1
1c	Body flange/flange	6102040500	6102060500	6102080500	1	1	1
2	Valve cover	92116304	92116306	92116308	1	1	1
3	Seat	96016124	96016126	96016128	1	1	1
4	Clapper with bearing parts	71020424	71020626	71020828	1	1	4
5	Clapper gasket with supporting disc	93416104	93416106	93416108	1	1	
6	Drain plugs (except metric valves)	95206104	95206104	95206104	1	1	
7	Supporting discs bolt/ nut	94906124	95606126	95606126	1	4	1
8	Pivot pin	95006124	95006126	95006128	1	1	
9	Seat O-ring	95436124	95436126	95436128	1	1	
10	Seat O-ring	95446124	95446126	95446128	1	1	
11	Valve cover gasket	93706124	93706126	93106128	1	1	
12	Valve cover bolts	91106124	91106126	91106126	6	6	6
13	Clapper spring	96406124	96406124	96406124	1	1	1
14	Screw plug	98604402	89044002	86044002	1	1	1
15	Retard chamber with restrictive orifice	6303400530	6303400530	6303400530			

Test

To test the operational readiness of the entire system, open the test valve, which should trigger an electrical and mechanical alarm. Opening the test valve corresponds to the opening of a sprinkler.

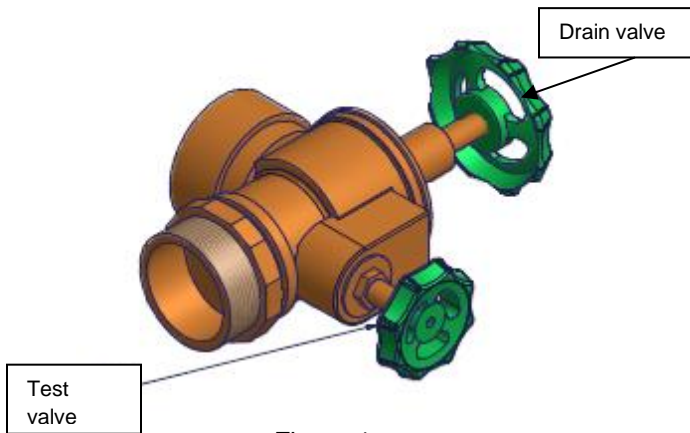


Figure 1

Testing with this valve gives the advantage that the valve clapper can also be tested.

If the mechanical alarm does not operate, please check and clean the filter in alarm line upstream of the alarm gong.

To check that the supply line allows the unobstructed supply of water, close the alarm control valve and slowly open the drain valve (Fig. 1). Once the test is complete, close the drain valve and open the alarm control valve. The alarm control valve must be supervised and secured according to the respective regulations.

Warning: Always inform the corresponding authorities/persons when working on the sprinkler system.

Maintenance

Reliable alarm valves and associated trim must undergo periodic inspection/testing. VdS CEA requires minimum periodic inspection, testing and maintenance. Alarm valves must undergo functional testing, cleaning, inspection and if necessary, replacement of parts once a year as a minimum. Malfunctions are indicated by one or more of the following symptoms:

1. **The mechanical alarm gong is not working:** (see **Test**).

2. **Continuous water flow in the drain line:**

- Open the drain valve (Fig. 1) to remove all loose particles from the valve seat. Close the drain valve and check whether the water flow has stopped.
- Close the main control valve and check whether water is coming from below or above the valve clapper.

Note: The lower pressure gauge (water supply) must display "0" when the main control valve is closed and the pressure across the ventilation valve has been reduced at the pressure gauge valve.

- If the water is coming from below the valve clapper, it will stop now.
- If the water is coming from above the clapper, it will continue to flow.

Note: To avoid downtimes, the following parts should be to hand before dismantling the valve:

- Seat installation tool: DN 100 Part No. 6881240000
DN 150 Part No. 6881260000
- Clapper gasket set (item 5)
- Cover gasket (item 11)
- O-rings (items 9+10)

3. **Remove valve clapper:** In both cases (a or b), the system must be drained by closing the main control valve and opening the drain valve. Remove the valve cover (item 2), the sealing plug on the clapper stem (item 14), the pivot pin (item 8) and remove the entire clapper. Warning: Press the spring (item 13) down when removing the pivot pin.

4. **Careful inspection for damage:**

- Damage to the clapper gasket – inspect the surface for embedded foreign bodies. Replace the gasket if damage is found (make sure that all parts are cleaned thoroughly prior to reassembly).
- Damage to the seat surface – clean the seat thoroughly. Inspect the seat for other damage in the seat or for stones or other foreign bodies in the seat groove. If the seat

or other valve parts are damaged, please contact Reliable.

5. Replacing the seat O-ring:

- a. Using the seat installation tool, carefully unscrew the seat (do not damage the seat surface).
- b. Remove the O-rings (items 9+10) and clean the O-ring groove and the sealing surface thoroughly. Check for damage or foreign bodies.
- c. Install the O-rings in the seat groove using a little lubricating grease. Never overtighten, twist or damage the O-rings in any other way.
- d. After checking the correct seat of the O-rings, carefully reassemble the seat using the seat installation tool.

6. Assembly of the alarm valve:

- a. Fully insert the clapper – Guide the pivot pin (item 8) into the clapper bore (item 4) – Press and hold the spring (item 13) and locate in the position between clapper and body and fully insert the pivot pin – Insert the screw plug.
- b. Lift the clapper and check for ease of movement and correct seating.
- c. Install the valve cover (item 2) and check that the gasket (item 11) is seated correctly. Tighten the bolts evenly.
- d. Close the drain valve. Slowly open the main control valve. Ensure that the alarm control valve and main control valve are secured in the open position.

False alarms

Generally water hammers in the water supply are the reason for false alarms and may occur if the system loses its effective over-pressure. The corresponding pressure displays shown on the water supply pressure gauge and the sprinkler pipe pressure gauge provide the visual warning that the over-pressure conditions are no longer in place. One or more of the following conditions can lead to a loss in pressure – unsealed system drain valves, leaks at

the seat (item 3) Fig. 2 of the alarm valve, leaks between the clapper (item 4) and the sealing surface (item 5) or leaks at the check valve in the bypass line.

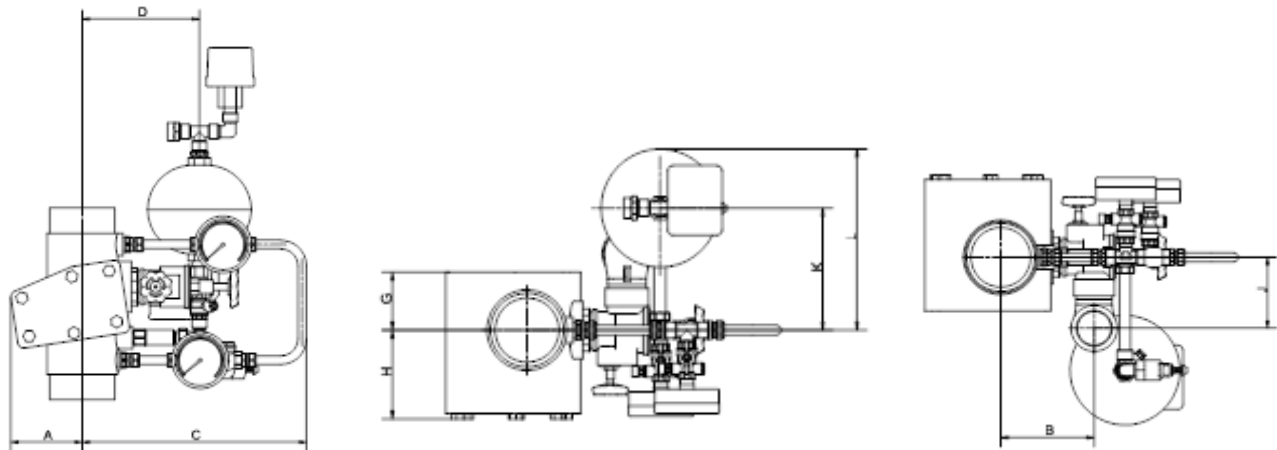
Troubleshooting measures:

1. Inspect all system drain valves for leak-tightness.
2. To locate and rectify a leak at the valve seat, proceed as described earlier.
3. To rectify a leak between the clapper and the sealing surface, proceed as described earlier.
4. To locate and rectify a leak at the check valve, proceed as described earlier:
 - a. Close the main control valve and depressurize the area between the clapper and the main control valve via the drain valve at the pressure gauge ball valve. If water continues to be expelled, the check valve must be cleaned and repaired, or replaced.
 - b. If the check valve in the bypass line is leaking, the entire system must be drained via the drain valve.
 - c. Following repair work, close the drain valve (Fig. 1) and slowly open the main control valve and monitor the system accordingly.
5. If it is not possible to fully drain the retard chamber and alarm line, false alarms may occur. Where this is the case, check for blockages in the restrictive orifice below the retard chamber and the bleed valve.

Intermittent alarms

Intermittent alarms are the result of airlocks in the sprinkler pipe system. To rectify the problem, slowly fill the system with water while ventilating the system via all system openings. If the system is put under pressure, venting at all high points including the sprinklers will be necessary.

If spare parts are required, use original Reliable parts only. When ordering spare parts, please state part number, part name, size, model and serial number.



Model E / E3 with Euro Trim Installation Dimensions in mm

	Valve	A	B	C	D	G	H	J	K	L
FL/FL	100	165	155	385	207	110	146	120	190	280
	150	185	185	410	220	143	178	120	190	280
	200	220	195	430	255	170	205	120	190	280
FL/Groove	100	165	155	385	207	110	146	120	190	280
	150	185	185	410	220	143	178	120	190	280
	200	220	195	430	255	170	205	120	190	280
Groove	100	165	155	385	207	89	146	120	190	280
	150	185	185	410	220	108	178	120	190	280
	200	220	195	430	255	135	205	120	190	280

Flange dimensions

Valve Nominal width DN	Flange Outer Ø D in mm	Bolt circle Ø k in mm	Hole Ø d in mm	Bolts Amount	Bolts n x Ø d	Pressure level
100	220	180	18	8	8 x M16	PN 10/16
150	285	240	22	8	8 x M20	PN 10/16
200	340	295	22	12	12 x M20	PN 16

Groove dimensions

Valve Nominal width DN	Outside diameter mm	Groove diameter mm	Groove width mm
100	114.0	110.1	9.5
150 (Europe)	168.0	164.0	9.5
150 (UK)	165.0	160.8	9.5
200	219.0	214.0	11