

GW MK3 HYDRAULIC/ELEC DELUGE INSTALLATION & OPERATION

100mm (4") 150mm (6") 200mm (8")



Read in conjunction with Hydraulic Deluge Valve Set Schematic (section 7).

1. PRINCIPLE OF OPERATION.

- 1.1. The clack is locked shut by water pressure on the rolling diaphragm (17) acting via the piston rod on the latch (22). The water pressure on the diaphragm is taken from below the lower isolation valve (20) via lockable ball valve (8), a filter (7) and non-return valve (6) and enters the diaphragm chamber via a restricted orifice (18) (built into the diaphragm chamber casting). If water is released from the large diaphragm chamber faster than it can be replaced from the supply via the restricted orifice the piston will release the latch and allow the clack to lift.
- 1.2. When the valve is to be opened the water pressure on the diaphragm is reduced by either:-
 - 1.2.1. Operation of the electrical solenoid valves (2) + (3) (electrical energy supplied from a control panel)
 - 1.2.2. Via the manual release dump valve (4)
 - 1.2.3. The activation of a frangible glass bulb detector head in a detection system.
- 1.3. Once the clack has lifted it will be held open by the latch (22) which will fall forward aided by a spring and stop the clack falling back onto its seat. While the clack is held open water in the valve body can enter the bell line via non-return valve (12) ring the water motor alarm bell (15) and activate the pressure switch (10). This will give a continuous warning that the system has been flooded until positive action is taken to close the bell line isolation valve (14) or re-seat the clack.
- 1.4. All ball valves are shown in the closed position for clarity. This does not represent their final position when the valve is in operation. Ball valves are shut when the handle is perpendicular to the pipe work.

2. TO SET THE VALVE (Operating Mode)

- 2.1. Isolate the valve by closing the lower butterfly valve (20). Isolate the water supply to the diaphragm (17) by closing ball valve (8). Ensure the bell test line valve (11) is locked shut.
- 2.2. If the valve has been tripped and water has filled the system open the main 2" drain valve (19) to drain the system completely and quickly. Make sure that the upper butterfly isolation valve (21) is open. Open the hydraulic chamber bleed bolt (16).
- 2.3. Remove the lower right hand bolt (when the valve is viewed from the front) from the front cover of the valve. Insert a screwdriver and engage with the slot in the latch (22) pin. Turn the screwdriver clockwise to force the piston and diaphragm (17) back [water may exit through the bleed nut (16)], allowing the latch (22) to swing back and the clack to drop onto its seat. (If the clack will not drop cleanly on to its seat follow the instructions below on how to change the clack seating.) Leave the lower right hand cover plate bolt out until the valve has been set since any leak past the clack will be detected by water exiting through this hole.
- 2.4. Ensure ball valve (4) is closed. Close main 2" drain valve (19). Ensure that the detector line (if fitted) is water-tight. Replace any detector heads which may have activated. Ensure that the solenoid valves (2) and (3) (if fitted) are closed.

The right is reserved to vary or modify any specifications without prior notice

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- 2.5. Close the bleed nut (16) finger tight. Open ball valve (8) and allow water to fill the hydraulic chamber forcing the rolling diaphragm (17) down under pressure, which in turn will force the latch (22) to secure the clack shut. Pressure gauge (5) should register the water pressure from the main supply. Slowly open the bleed nut (16) until clear water flows and any air in the chamber has been exhausted. Fully close and tighten the bleed nut (16).
- 2.6. Slowly open the lower butterfly isolation valve (20). If the clack has not seated correctly water will escape past the clack and exit through the lower right hand bolt hole in the valve front cover. If no water is seen after a few minutes replace the lower right hand cover plate bolt and fully open the butterfly valve (20) and secure in position with a padlock and chain or leather strap.
- 2.7. Ensure that the upper isolation butterfly valve (21) is secured in the open position with a padlock and chain or leather strap.
- 2.8. Ensure that the bell line isolation valve (14) is locked in the open position and the bell line test valve (11) is locked shut.
- 2.9. The valve is now set and in its operating mode.

3. TO TEST THE ALARM BELL AND ALARM PRESSURE SWITCH

- 3.1. The system should be tested weekly for correct operation of the water turbine and gong and its associated pressure switch. To test the alarm bell with the valve set and without tripping the valve and filling the system with water open ball valve (11). The bell should ring and a steady flow of water should be seen at the drip union (13). The pressure switch (10) should activate. Note the non return valve (12) will prevent water from entering the valve body.
- 3.2. Following a bell test close and lock ball valve (11). Ensure the bell line drains through the drip union (13) until it is dry.

4. TO TRIP TEST THE VALVE

- 4.1. It is possible to trip the valve (lifting the clack) without filling the system with water by closing the upper butterfly valve (21) and releasing water pressure on the diaphragm via methods described in 1.2.1, 1.2.2 & 1.2.3 above.
- 4.2. Once the valve has tripped re-set as described in section 2 above.

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5. TO REPLACE THE CLACK SEAL

- 5.1. Isolate the valve by closing the lower butterfly valve (20). Isolate the water supply to the diaphragm (17) by closing ball valve (8).
- 5.2. If the valve has been tripped and water has filled the system open the main 2" drain valve (19) to drain the system completely and quickly. Make sure that the upper butterfly isolation valve (21) is open. Open the hydraulic chamber bleed bolt (16).
- 5.3. Remove the valve access cover plate. Note, the highest bolt is fitted onto a stud to facilitate removal and replacement of the cover by allowing it to be hung from the stud while the remaining bolts are removed or put into position.
- 5.4. Two jacking bolt tappings are provided on either side of the access cover to be used if the cover is tight and cannot be freed easily from the valve body. If jacking screws are used ensure they are withdrawn and do not stop the cover from seating when it is replaced.
- 5.5. Replace the clack rubber seal and ensure that the clack is free on its hinge. Allow the clack to fall to its seated position. Replace the front access cover, tighten all bolts (check jacking bolts are fully withdrawn).
- 5.6. Reset valve as described in 2 above

6. TO REPLACE THE HYDRAULIC ROLLING DIAPHRAGM

- 6.1. Isolate the valve by closing the main lower supply butterfly valve (20) and the water supply to the hydraulic chamber via valve (8). Release any residual water pressure in the hydraulic chamber by opening the manual dump valve (4). Remove all water and drain pipe work from the diaphragm chamber.
- 6.2. The six larger bolts holding the hydraulic chamber to the valve body can be removed and the chamber lifted off exposing the hydraulic diaphragm and piston assembly which can be pulled free.
- 6.3. The hydraulic piston and diaphragm assembly is normally supplied as a complete unit. However if it is necessary to dismantle it the rolling diaphragm must be replaced with the rubberised face in contact with the water in the hydraulic chamber and the fabric side towards the main valve body (normally exposed to air unless the valve is tripped).
- 6.4. To assemble follow the procedure above in reverse order.

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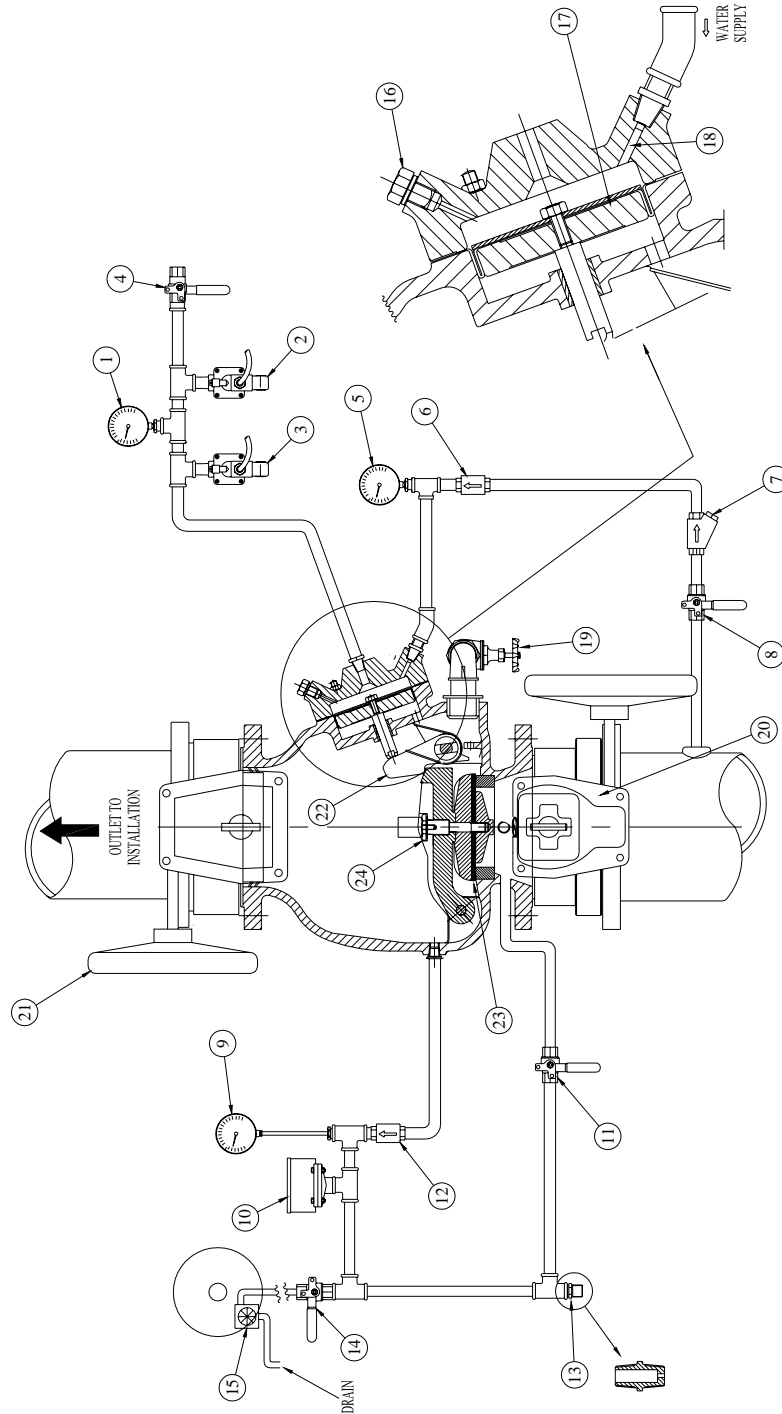
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7. HYDRAULIC DELUGE VALVE SET SCHEMATIC

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	PRESSURE GAUGE – TRIP LINE WITH NO LOSS COUPLING	13	DRAIN – 3mm ORICIFE
2	SOLENOID VALVE (OPTIONAL)	14	BALL VALVE – ISOLATE BELL
3	SOLENOID VALVE (OPTIONAL)	15	WATER TURBINE AND GONG (NOT STANDARD SUPPLY)
4	BALL VALVE - MANUAL RELEASE	16	HYDRAULIC DIAPHRAGM CHAMBER BLEED SCREW
5	PRESSURE GAUGE – WITH NO LOSS COUPLING – SUPPLY PRESSURE	17	HYDRAULIC DIAPHRAGM
6	NON-RETURN VALVE	18	RESTRICTED ORIFICE
7	FILTER	19	2" DRAIN
8	BALL VALVE – ISOLATE HYDRAULIC DIAPHRAGM CHAMBER	20	MAIN BUTTERFLY ISOLATION VALVE – SUPPLY
9	PRESSURE GAUGE – WITH NO LOSS COUPLING – SYSTEM PRESSURE	21	UPPER BUTTERFLY ISOLATION VALVE – SYSTEM
10	PRESSURE SWITCH – SYSTEM OPERATED	22	LEVER / LATCH
11	BALL VALVE – BELL TEST	23	RUBBER CLACK SEAL
12	NON-RETURN VALVE	24	RUBBER SEAT INSERT (200mm ONLY)



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