

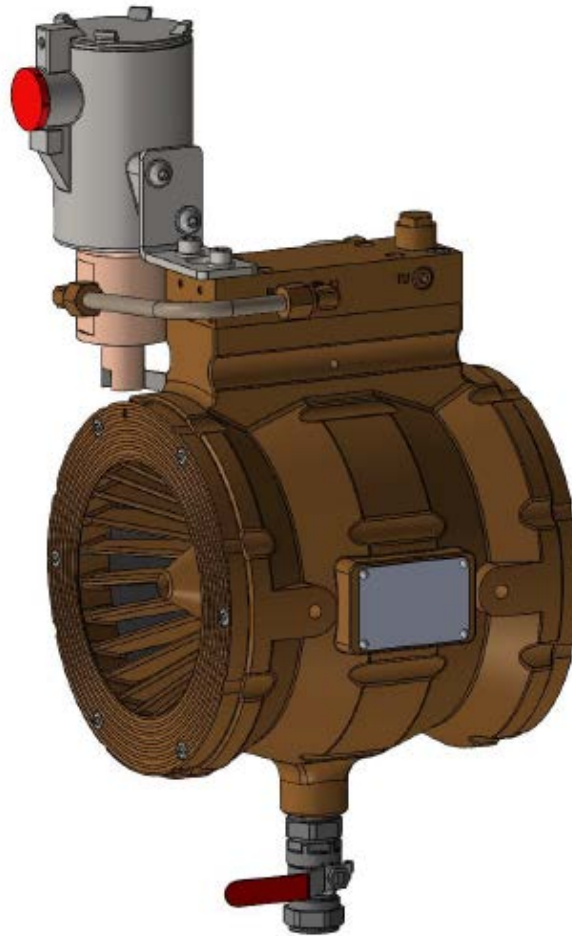
GW C-300 – AUTOMATIC WATER CONTROL VALVE (AWCV) WITH SOLENOID



GW SPRINKLER A/S

MANUAL

INSTALLATION, OPERATION & MAINTENANCE (IO&M)



GW C-300 AWCV with SOLENOID (non reg. Deluge valve)						
Material	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")
Ni. Al. Bronze	CV64.591.24	CV64.592.24	CV64.593.24	CV64.594.24	CV64.595.24	CV64.596.24
Super Duplex	CV64.591.26	CV64.592.26	CV64.593.26	CV64.594.26	CV64.595.26	CV64.596.26
Titanium	CV64.591.27	CV64.592.27	CV64.593.27	CV64.594.27	CV64.595.27	CV64.596.27

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HEALTH AND SAFETY AT WORK

Section 6 of the Health and Safety at Work act 1974 imposes specific duties on manufacturers, importers, designers and suppliers to ensure that articles supplied for use at work are safe and without risk to health.

The section states:

1. It shall be the duty of any person who designs, manufactures, imports or supplies any article for use at work -
 - a. to ensure, so far as is reasonably practicable, that the article is so designed and constructed as to be safe and without risks to health when properly used;
 - b. to carry out or arrange for the carrying out of such testing and examinations as may be necessary for the performance of the duty imposed on him by the preceding paragraph;
 - c. to take such steps as are necessary to secure that there will be available in connection with the use of the article at work adequate information about the use for which it is designed and has been tested, and about any conditions necessary to ensure that, when put to use, it will be safe and without risks to health.

2. It shall be the duty of any person who undertakes the design or manufacture of any article for use at work to carry out or arrange for the carrying out of any necessary research with a view to the discovery and, so far as is reasonably practicable, the elimination or minimisation of any risks to health or safety to which the design or article may give rise.

3. It shall be the duty of any person who erects or installs any article for use at work in any premises where the article is to be used by persons at work to ensure, so far as it is reasonably practicable, that nothing about the way in which it is erected or installed makes it unsafe or a risk to health when properly used.

The above is an extract from "Croners H&S Manual" - September 1987.

Service

The Health and Safety at Work Act 1974 imposes specific duties on the user of an installed system to ensure that the system is properly maintained in good repair so as to prevent danger. Advice is given in BS 7273: Part 1: 1990 - The Operation of Fire Protection Measures.

Support

After completing these procedures support is available by:

	International
Telephone	+45 64 72 20 55
Fax	+45 64 72 22 55
E-mail	Sales.dep@gwsprinkler.com

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INTRODUCTION

Function

The GW C-300 deluge valve is fitted in a fire water mains, or section supply branch pipes, in accordance with the requirements of NFPA 13/15 to:

- a) In stand-by position stay fully closed solely by utilizing the inlet (upstream) pressure as acting (closing) force.
- b) Upon instruction to provide a controlled opening – supplying a non-pressure regulated flow of water with no water hammer, and a very low pressure drop across the valve in the fully open position.
- c) Upon instruction to provide a controlled closing, thus eliminating the damaging effect of water hammer and reaction forces in the connected pipe work.

Principle of operation

In the closed position (Fig.1)), water from the upstream side (1) of the GW C-300 deluge valve is allowed, via a restrictor controlled port, to enter and pressurise the *sleeve cavity*, defined by the area (2) within the valve between the elastomeric sleeve (3) and the body casing (4) via the pilot system (5). This pressure prevents a flow through the valve by compressing the sleeve tightly around the inner core seat (6), thus maintaining the valve closed. It is this feature which keeps the valve closed also under surge conditions, as the high transient pressure is seen simultaneously at both the inlet of the valve and in the sleeve cavity, thereby allowing the sleeve compression in the seat area to keep a biasing action to the closed position.

The opening of the valve (Fig. 2) is achieved by releasing the pressure from the sleeve cavity via a restrictor controlled vent opening (7). The elastomeric sleeve expands, thus allowing water to flow through the valve.

Description of operation

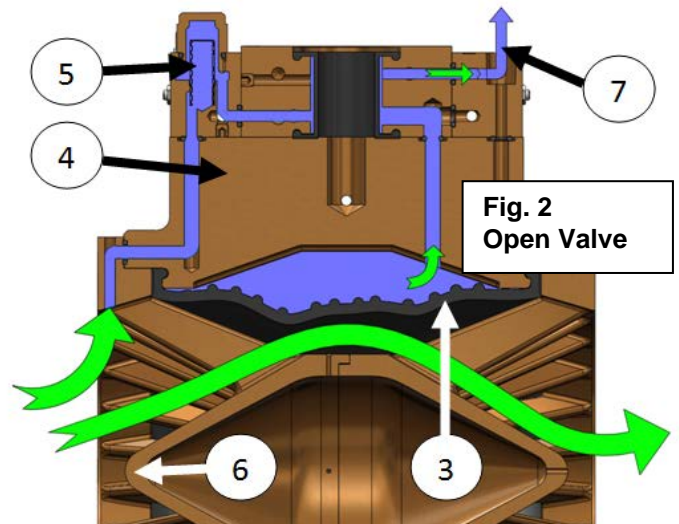
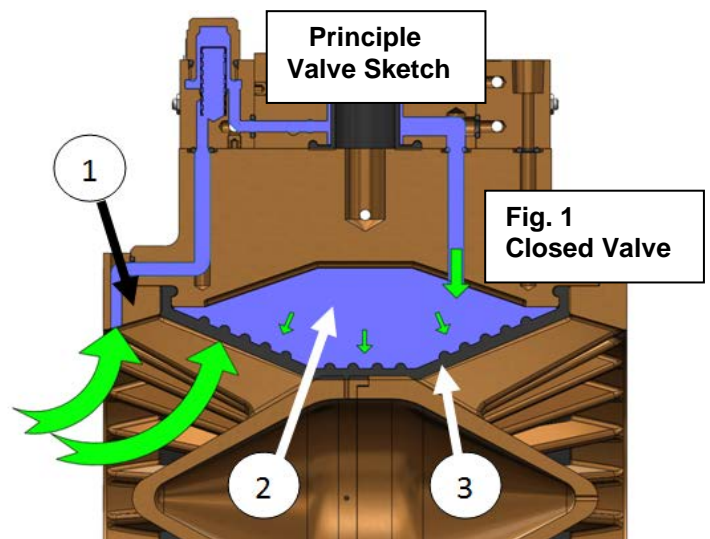
The GW C-300 deluge valve is closed, or maintained in the closed position, by diverting upstream water to the sleeve cavity. This is accomplished by the 3/2 way Solenoid Valve. Energizing the Solenoid Valve switches its position to “supply ON/ drain OFF”, which allows upstream water to flow to the sleeve cavity, thus closing the deluge valve.

De-energizing the Solenoid Valve, switches it's position to: “supply OFF/ drain ON”, which allows the water to drain from the sleeve cavity, thus opening the deluge valve.

The GW C-300 deluge valve can be operated manually by opening the Manual Release Valve fitted at the bottom of the valve body.

GW C-300 deluge valve body

The valve comprises of a tubular casing fitted, at the respective ends, with an inlet and outlet body (cone). Each inlet and outlet body incorporates a central tapered core (valve seat) surrounded by longitudinal slots which provide the water passage through the valve. These inlet and out bodies clamp an elastomeric (flow control) sleeve into the casing.



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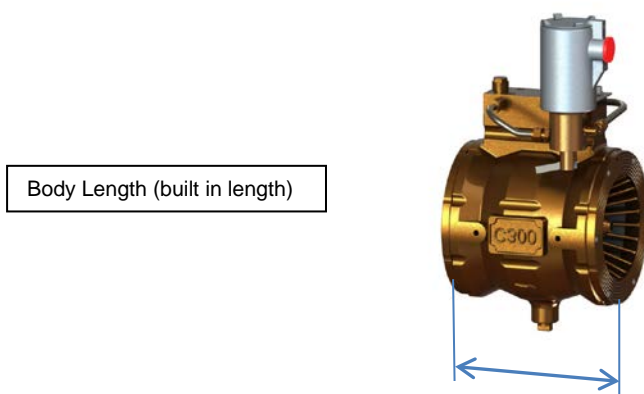
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TECHNICAL SPECIFICATION

Parameter	Range
Min. supply pressure	5 barg
Max. supply pressure	20 barg
Recommended pressure differential over valve	4 barg (to utilize full Kv)
Solenoid Valve	24 V DC / 9,6W / 20 bar

Line size dia. mm (inch)	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")
Body Length (mm)	167	167	237	304	350	440
~ Weight (Al.Bronze), Kg	20	25	44	63	103	180



Materials

	Ni. Al. Bronze
Casing and Inlet / Outlet Cone	ASTM B148 / UNS C95800
On/Off Block	CuAl10Ni5Fe4
Solenoid Valve (wetted parts)	CuAl10Ni5Fe4
Pipes	CuNi 90/10
Flow Control Sleeve	Natural Rubber
Pilot Sleeve	Natural Rubber

Optional materials: Super Duplex Cr.25
Titanium

Refer to GW C-300 Specification (document): 64 70481

Plug Tightness - ¼" set to 26 Nm
- ½" set to 58 Nm

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INSTALLATION

Preamble

The GW C-300 deluge valve assembly is designed to be clamped between pipe flanges to ANSI B16.5 Class 150 or 300 using full length studs, nuts and washers. The Valve may be positioned vertically or horizontally. Suitable sealing gaskets to ANSI B16.21 RF are to be inserted between flanged joints.

The water inlet supply to the valve should be equipped with a suitable strainer to prevent the ingress of harmful materials. Isolating butterfly type valve should be fitted upstream of the GW C-300 deluge valve assembly.

Upstream and downstream of the valve the pipe work should be straight for at least 3 pipe diameters without valves, bends or fittings. This will ensure that a stable flow regime exists at the entrance and exit from the valve. Ensure that the valve can be withdrawn from the pipework for routine maintenance/repair procedures. The larger valves may require the use of slings and strops when positioning. Lifting eye tapings are provided on the side of the larger valves (6" and larger). Care must be taken to ensure that the Solenoid Valve and small bore pipe work is **not** utilised for lifting.

Pressure gauges are to be provided to monitor the valve inlet and/or outlet pressure. For accurate readings the gauges should be located in straight lengths of pipework away from valves and fittings.

For test purposes a full bore test/drain outlet with separate isolation valve should be provided in the pipework on the outlet side of the GW C-300 deluge valve assembly.

The GW C-300 deluge valve sleeve vent (1/2" NPT) is supplied with a 1/2" isolating valve which acts as a means for air-bleeding of the sleeve cavity – as well as a manual release of the deluge valve, and shall be piped to waste.

The Solenoid Valve ("INLET" port, 1/4" NPT) should be piped to waste. (Tubing diameter min. 10 mm, maximum length 2 meters, using full flow fittings).

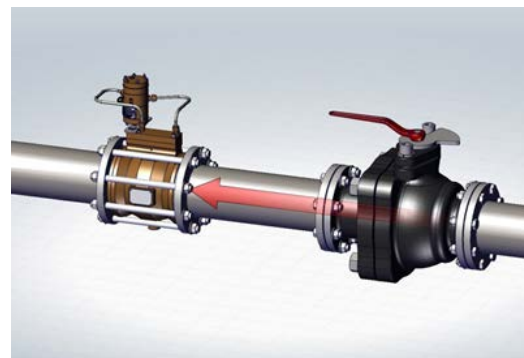
A pressure operated switch (to give remote indication of operation) may be connected to the discharge pipe work.

GW C-300 deluge valves shall be installed in such way to avoid physical damage and exposure to freezing temperatures.

Procedure (read in conjunction with Annex 1)

1. Ensure that the upstream isolating valve (4) is closed.
2. Ensure that all interfacing flange surfaces are clean and the arrow on the valve points in the flow direction (i.e. to the nozzles).
3. Locate and align the sealing gaskets on the water inlet and outlet flanges (gasket to ANSI B16.21 RF). Fit the tie-rods between the two flanges. Each tie-rod is fitted initially by inserting the top end through the upper flange from its underside with the lower end of the tie-rod canted outwards to clear the lower flange, then pull it through the upper flange and finally lower it down through the lower flange, installing isolation bushes if required.
4. Fit and tighten the nuts and washers on the tie-rods, ensuring at least 1 1/2 - 2 full threads are visible. Ensure the flanges are pulled down evenly to a maximum torque in accordance with the piping/bolting specification. The deluge valve casing and inlet and outlet bodies should be clamped to a point where there is no visible gap between casing and end cones – i.e. metal to metal.
5. Secure the drain pipe connection from manual release valve (3).
6. **De-energize** electrical power (9) to the Solenoid Valve (2), to switch the Solenoid Valve to the "supply ON/ drain OFF" position.
7. Continue onto *commissioning*.

NOTE: ON NO ACCOUNT SHOULD THE SMALL BORE PIPEWORK OR SOLENOID VALVE (OR OTHER FITTINGS) BE USED TO LIFT, SLING OR MANOEUVRE THE VALVE ASSEMBLY.



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COMMISSIONING (read in conjunction with Annex 1)

Preamble

Ensure an adequate water supply (20 bar max.).

It is essential that the operator, or commissioning engineer, reads these procedures prior to the operation of the valve. Failure to do so could result in the valve failing to open, or damage to the valve or pipework.

Any hydrostatic tests must be less than 20 barg.

The only commissioning procedure required for the GW C-300 deluge valve is to carry out a check of the installation and the operation of the Solenoid Valve prior to a functional test of the system.

It is recommended that the GW C-300 deluge valve response time check list (see page 26) is completed during commissioning and retained for future reference.

Checks

1. The GW C-300 deluge valve (1) outlet is connected to the protected area's distribution pipework (downstream) via an isolating valve (5).
2. The GW C-300 deluge valve upstream Isolating Valve (4) is closed.
3. The main water supply isolating valve is closed. (Clients Supply)
4. The GW C-300 deluge valve downstream Isolation Valve (5) is closed.
5. The system test/drain valve (6) is piped to waste/drain and closed.
6. The GW C-300 deluge valve sleeve cavity (jacket) outlet is piped to waste/drain via an isolating valve (3), and closed.
7. The Solenoid Valve (2) port (marked "INLET") is piped to waste/drain.
8. The Solenoid Valve is closed - i.e. de-energized (9).

Procedure

Stop the commissioning if any part of the pipe work or valve shows any leakage or erratic behaviour.

1. Open the Main water supply isolating valve. (Clients Supply)
2. Open the GW C-300 deluge valve sleeve cavity outlet valve (3) to bleed any trapped air.
3. Partially open the GW C-300 deluge valve upstream Isolation Valve (4) to fill the GW C-300 deluge valve (1) and the upstream pipework.
4. When plain water (no air) is trickling from the GW C-300 deluge valve sleeve cavity outlet pipe, **close** the 1/2" isolating valve (3).
5. Fully open the upstream Isolation Valve (4) to impose full water pressure on the GW C-300 deluge valve.
6. Open the test and drain valve (6).
7. Confirm that the GW C-300 deluge valve inlet pressure gauge (7) registers line pressure, and the GW C-300 deluge valve outlet pressure gauge (8) reads zero (= deluge valve is closed).
8. Confirm no water is flowing through the valve.
9. Energize the Solenoid Valve (2) – to drain the sleeve cavity thus opening the GW C-300 deluge valve.
NOTE: The Solenoid will latch in the open position!!
10. Observe the water discharging overboard from the system Test/Drain line. Allow the system to function for one minute approx. to prove correct operation and note the discharge pressure.
11. Close the GW C-300 deluge (1) valve by: de-energizing the Solenoid Valve **AND pushing the Latch located at the bottom of the Solenoid Valve back to perpendicular (90°) position!**

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12. IMPORTANT : FULL FLOODING TEST

This test must only be carried out with the full authority of the client as water will be discharged into the protected area !!.

13. Close the test valve (6) and **open the main discharge valve (5)** which will allow for deluge of the risk.
14. Energize the Solenoid Valve (2). **This will open / trip the GW C-300 deluge valve !!.**
15. Note the discharge pressure (8) and observe full and correct flow from all nozzles.
16. Close the GW C-300 deluge valve (1) by: **de-energizing** the Solenoid Valve AND pushing the Latch located at the bottom of the Solenoid Valve back to perpendicular (90°) position!
17. Open the system Test/Drain valve (6) in the GW C-300 deluge valve discharge pipework to drain the system pipework.
18. Close the system Test/Drain Valve (6) on the GW C-300 deluge valve discharge pipework.
19. The test is now completed.

Resetting procedure (after activation of GW C-300 deluge valve)

1. Close the GW C-300 deluge (1) valve by: de-energizing the Solenoid Valve AND pushing the Latch located at the bottom of the Solenoid Valve back to perpendicular (90°) position!
2. Attend the affected protected area.
3. Inspect all pipework and fittings for possible fire damage and carry out remedial repairs as necessary.
4. Open the system Test/Drain valve (6) to drain the surplus water downstream of the GW C-300 deluge valve.
5. Close the system Test/Drain valve (6).
6. Confirm that the pressure on the upstream side (7) of the GW C-300 deluge valve is at line pressure, and that the main downstream discharge valve (5) (to system/nozzles) is OPEN.

THE SYSTEM IS NOW FULLY REINSTATED.

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MAINTENANCE SCHEDULE

Inspection and testing should be carried out in accordance with NFPA Standards, the requirements of the Authority Having Jurisdiction (AHJ) – and the following instructions:

Monthly: Visual Inspection

- Check for no damage to valve, piping and trim parts.
- No leaking from tell-tale holes (body, pilot or actuator) and seals.
- Check that all valves and handles are in “In Service” position.
- Operate upstream (4) & downstream (5) isolating valves to avoid sticking *).

*)

The system design provides for isolating valves to remain in the OPEN position for long periods. Close and open the valve several times at monthly intervals to ensure freedom of movement. Leave and lock the valve in the OPEN position

6 months

- Conduct a **partial flow test** (see note below) adequate to move the sleeve from the seat.
- Check and rinse inlet-strainer.

12 months

- Conduct a **full flow test** at maximum pump capacity.
- Check that required downstream pressure/flow (8) is achieved.

36 months

- Replace the elastomeric sleeve, diaphragms and seals in service – and those held unused as spare stock. Spares should be used within a two year shelf life to provide a 3 year “in service” life (5 year total life).
- Check and rinse inlet-strainer.
- Check and clean all water channels/bores forming part of the valve and manifold block internal water way.

The “in service” life of the elastomeric sleeve can be extended annually to a **maximum “in service” period of 5 years** from the date of first installation – or 6 years from valve manufacture, whichever is the sooner, provided that a “maximum extension test” (see below) to fully stretch the flow control sleeve within the deluge valve body, is performed – AND is followed by a full flow test. Replace the elastomeric sleeve if the deluge valve does not seal 100% after “maximum extension test”.

NOTE: FLOW TESTS: Extract from NFPA 25: Records indicating the date the deluge valve was last tripped and the tripping time as well as the individual and organisation conducting the test shall be maintained at a location or in a manner readily available for review by the Authority Having Jurisdiction (AHJ).

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MAXIMUM EXTENSION TEST (read in conjunction with Annex 1)

NOTE: Stop the test if any part of the pipe work or valve shows any leaks or dangerous behaviour.

1. Ensure that the GW C-300 deluge valve upstream (4) and downstream (5) isolating valves and system test/drain valve (6) are closed – and the Solenoid Valve (2) is closed (de-energized).
2. Energize the Solenoid Valve, to drain the valve sleeve cavity – thus opening the GW C-300 deluge valve.
3. Open the GW-C-300 deluge valve sleeve vent outlet (manual release valve) (3) to fully drain the valve sleeve cavity.
4. Partially open the deluge valve upstream isolation valve (4) to fill the GW C-300 deluge valve and upstream pipe work.
5. When water has stopped trickling from the GW C-300 deluge valve sleeve cavity outlet pipe, close the manual release valve (3).
6. Fully open the deluge valve upstream isolation (4) valve to impose full pump water pressure on the deluge valve to fully stretch the elastomeric sleeve. Leave the valve pressurized for 1 minute. Check that downstream pressure (8) reads same pressure as inlet (upstream) pressure (7).
7. De-energize the Solenoid Valve AND push the Latch located at the bottom of the Solenoid Valve back to perpendicular (90°) position - allowing the Solenoid to operate (switch position) and impose full line pressure to the sleeve cavity to close the GW C-300 deluge valve.
8. Slowly open the downstream test and drain valve (6).
9. Confirm that the deluge valve inlet pressure gauge (7) registers line pressure and the deluge valve outlet pressure gauge (8) reads zero – and no water flows through the valve.
10. If the deluge valve does not fully seal, the elastomeric flow control sleeve should be replaced.
11. Close test/drain valve (6) and proceed with full flow test.

MAINTENANCE PROCEDURES

Valve Removal (read in conjunction with Annex 1)

Obtain a permit to disable the system.

Isolate the water supply to the GW C-300 deluge valve system.

IMPORTANT: If a by-pass system is fitted around the GW C-300 deluge valve assembly, ensure a water supply is available to this system to enable emergency operation when/while the GW C-300 deluge valve is removed.

1. Close the upstream Isolation Valve (4) and lock in position
2. Open the Test/Drain valve (6) to drain the GW C-300 deluge valve system pipework.
3. Operate (energize) the Solenoid Valve (2) to drain the water.
4. Disconnect the piped connection between the GW C-300 deluge manual release valve (3) and the drain pipe.
5. Disconnect the power supply (9) to the Solenoid Valve.
6. Release and remove the tie-rods securing/clamping the GW C-300 deluge valve.
7. Slacken the pipe supports, then gently jack the pipework apart and carefully withdraw the GW C-300 deluge valve, together with the sealing gaskets.

NOTE: When manhandling the GW C-300 deluge valve, consider its size and weight.

DO NOT USE THE SMALL BORE PIPEWORK, SOLENOID VALVE OR OTHER FITTINGS TO LIFT, SLING OR MANOEUVRE THE VALVE ASSEMBLY. For lifting - fit and use lifting eyes in tapped/threaded holes located on valve body exterior (on 6" valves and larger).

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Valve Elastomer Sleeve Renewal

Equipment Required

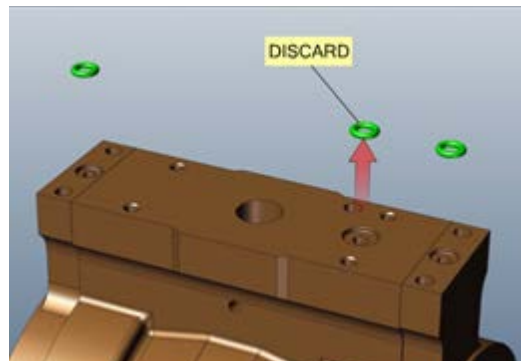
1. A set of appropriate sized A/F spanners and wrenches.
2. Valve Sleeve Spare Part Kit (according to data sheet: DV070 1001 A).
3. Rubber Lubricant Emulsion (1 litre bottle) - Part No. CV64/62163.

Renewal of Elastomeric Sleeve

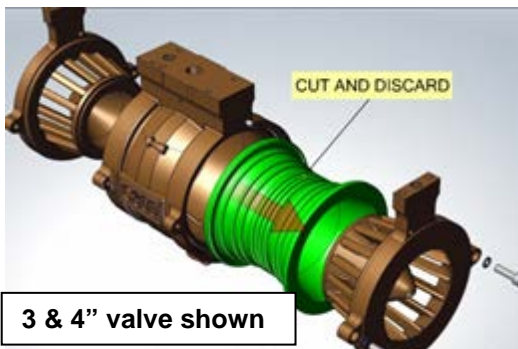
When the valve is removed for servicing, the opportunity should be taken to renew all elastomeric components associated with the GW C-300 deluge valve and the Pneumatic Actuator.



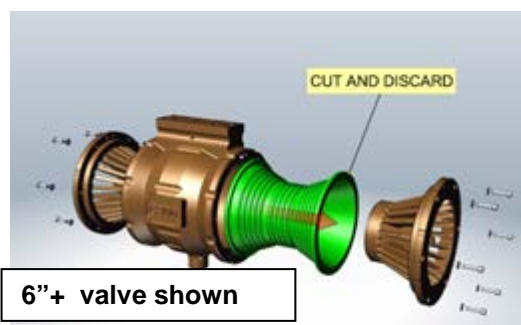
1. Support the Valve horizontally. Withdraw the Pneumatic Actuator (if fitted) and On/Off Block as a complete assembly by releasing the retaining bolts fitted.



2. Remove the 'O' sealing rings located in each of the three ports associated with the inlet body, the outlet body and the valve casing, and discard.



3. Stand the Valve on its outlet (see arrow on body) Release the bolts securing the inlet body to the casing and prise apart taking care not to damage the faces. Withdraw the inlet body and place on a clean surface.

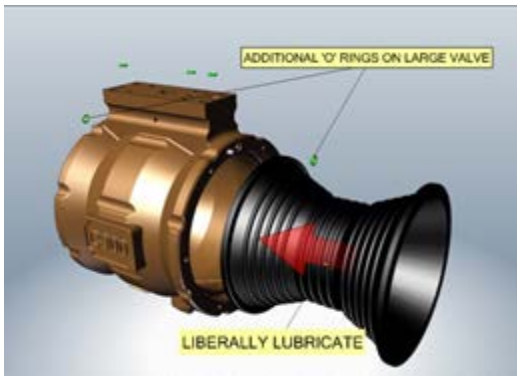


4. Invert the Valve and repeat the procedure for the outlet body, then the elastomeric sleeve may be pulled clear, cut and discarded. When disassembled, use the opportunity to check and clean the water intake bores located in the inlet & outlet cones, top inside.

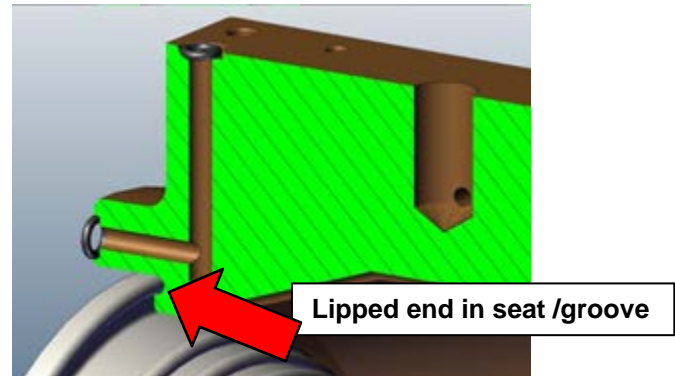
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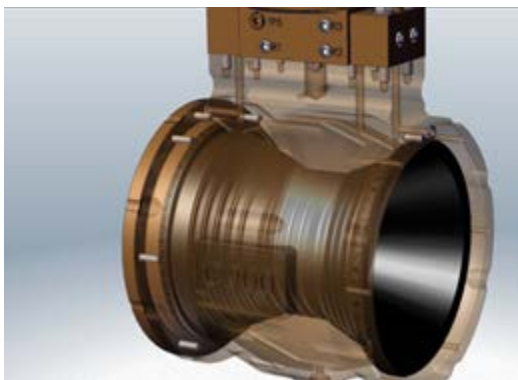
Assembly, all except 100mm (4”) Valves



1. Support the Valve casing horizontally. For the 150mm (6”) and larger valves, fit new O-Rings into the casing to seat on the Inlet and Outlet Cones.



2. Insert the replacement sleeve into the valve casing. Carefully work into position until each lipped end of the sleeve is seated in the groove each end of the casing.



3. Liberally apply Rubber Lubricant Emulsion to the elastomeric flow control sleeve inside surface to reduce friction when fitting the cones. Locate the inlet cone ensuring the core does not damage the sleeve's surface. Fit the body retaining bolts and evenly tighten down. Repeat for the outlet body.

Sleeve Assembly, 100mm (4”) Valve

The 100 mm elastomeric sleeve may appear undersized – but is designed this way! Liberally apply Rubber Lubricant Emulsion to the elastomeric flow control sleeve and ease the flow control sleeve onto the inlet body until it reaches the base. Carefully lower the casing over the sleeve taking note of its correct orientation. Then turn the valve over and partly secure the Inlet Body. Re-lubricate the downstream end of the sleeve. Carefully lower the outlet body into the sleeve. As the body is worked down, use a blunt instrument between the vanes (e.g., a small ring spanner) to push the sleeve outwards. When the sleeve is in position, partly tighten the securing bolts and nuts. In turn, slightly tighten the bolts on each end of the valve – so the end cones are “simultaneously” screwed in. Observe – and push/expand the elastomeric sleeve so its lip fits into the annular grooves.

All Valves

Select correct sized o-rings from the Spares Kit, lubricate and fit into the respective grooves on the valve and On/Off block interfaces. Secure the On/Off block to the valve by tightening the retaining bolts. It is recommended to secure the bolts by applying a few droplets of removable threadlocker – e.g. Loctite

Reinstatement Procedure

Follow the Installation Procedure.

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Solenoid Valve

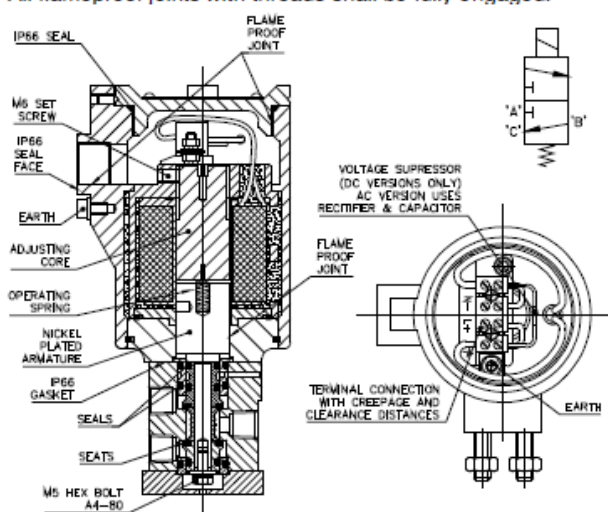
Storage and Handling

The ICO4 should not be stored in a corrosive environment. All ports should remain sealed and the valve markings made visible. Recommended storage temperature 5 to 25 °C, relative humidity <75%. Storage areas shall not contain ozone producing equipment (eg. welding equipment, mercury vapour lamps). Due attention should be paid to personal protection during handling.

Operation

All ICO4 solenoid valves consist of an Exd enclosure. In order for the enclosure to provide flameproof protection:

- None of the flameproof joints shall be damaged.
- All flameproof joints with threads shall be fully engaged.



The pressurised media is retained within the valve assembly (pressure boundary) by the mechanical strength of all its metal parts, seats and seals. Degradation of any of these components will cause the valve to leak.

The flow path of the media is altered by moving the spool assembly and engaging / disengaging the seats. The spool assembly can be moved by either:

- Energising the coil to produce an electromotive force.
- Applying a pressure to a piston.
- Applying a mechanical force to a linkage.
- Compressing a mechanical spring.

Restricting the spool movement or allowing the seats to degrade will not allow the flow to be re-directed.

The ICO4 has an IP66 rating. Degradation of the IP66 seals / gaskets / sealing faces or failure to tighten all sealing joints, will allow water to leak inside the enclosure.

For best practice, the valve should ideally be exercised at least once a month.

Removing an existing valve

Tools

Electrical 3mm Screw Driver

Allen Keys: 3/16", 2.5mm, 3mm, 4mm, 5mm, and 6mm.

A/F sockets: 8mm, 10mm, and 13mm. 5mm Tommy Bar.

1. Obtain work permit and check area for hazards.
2. Isolate valve from all pipeline and electrical supplies.
3. Loosen M5 locking screw and unscrew cover (ICO4S) or remove M6 cover bolts and cover (ICO4D).
4. Disconnect supply cable and remove.
5. Remove pipe connections from valve assembly.
6. Unscrew M8 mounting nuts (or M8 bolts) and remove the valve.

Installing a valve

General requirements

- Pipe work and media must be clean.
- Inlet filters are recommended (e.g. <10 microns).
- Prevent pipe sealant from entering the system.
- Use only correct tools. (i.e. as listed above)
- Do not use valve as a lever.
- Earth equipment to prevent the build up of an electrostatic charge.
- Ensure all interfacing equipment is rated to the expected duty conditions and will not degrade the integrity of the ICO4.

Mounting

Mount ICO4 using M8 mounting flange. Ensure M8 mounting bolts enter ICO4 mounting flange **TO A MAXIMUM DEPTH OF 8mm**. An ICO4 will function satisfactorily when mounted inclined from the vertical. However for maximum life and efficiency mount vertically. The ICO4 is not designed for use in high vibration applications. Do not invert. Do not mechanically stress the equipment.

High temperature applications

In applications where the media is > 90°C, a high temperature spacer shall be used. The high temperature spacer provides a thermal barrier between the media and the Exd enclosure. To ensure that the spacer performs its intended function:

- The user shall provide ventilation around the valve assembly, Exd enclosure and spacer.
- The valve assembly, Exd enclosure and spacer shall not be lagged.

Additionally, ensure all associated parts, including cable glands and cabling is fit for rated duty.

Low temperature applications

Contact Maxseal Sales for special operating conditions.

Procedure

1. Make connections to the valve ports as required. **DO NOT OVERTIGHTEN.**
2. Loosen M5 locking screw and remove solenoid cover.
3. Install cable using an appropriate certified gland fit for duty.
4. Make terminal connections as labelled. All terminals must be tightened before commissioning.
5. Replace solenoid cover and lock M5 locking screw.

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Solenoid Valve - Maintenance

It is recommended to refurbish/overhaul the Solenoid Valve in intervals of 5 years.

Spares

Only Maxseal spares kits should be used.

Main valve kit includes all seals, seats and operating spring.

Lubrication

-20°C to 90°C: Molycote 111 grease

-60°C to 50°C: Molycote 33 medium grease

Part A. Disassembling a valve

1. Remove manual reset lever retaining clip (if fitted).
2. Remove the Hex Head Bolts at the base of the valve body and remove valve body and armature assembly.
3. Secure armature with a *Tommy bar* and remove Hex Bolt/Nut at the base of the armature.
4. Separate all valve assembly components, noting orientation, sequence and position of parts,

Part B. Examining a valve's components

Examine and replace all worn or damaged parts.

The flameproof joints will retain their original certified clearances provided they are not damaged.

Replace all seals and operating springs with Maxseal spare parts kit. All seals should be lubricated and have no deformation. All seating and sealing faces should be free from contamination, marks, scratches, etc.

DO NOT MODIFY OR RECLAIM FLAMEPROOF JOINTS.

Part C. Assembling a valve

Smear all seals with recommended grease. Build assemblies in reverse order shown in part A.

Torque M5 bolts to 5Nm.

Part D. Adjusting & testing a valve

1. Loosen M5 locking screw and remove solenoid cover.
2. Make connections to valve ports as per markings.
3. Remove the M5 socket screw on the terminal plate and slide out terminal assembly to reveal core adjuster.
4. Loosen M6 core set screw.
5. Apply air to valve body and energise coil.
6. Screw down core to the point *just before* ports leak.
7. Screw core back a further 1/10 of a turn.
8. Lock M6 core set screw.
9. Ensure valve operates correctly at Nom Voltage $\pm 12\%$

Part E. Problems

If the ICO4 does not function as intended, do not install valve.

Repeat the maintenance procedures Parts A to D. If the problem persists contact Maxseal Sales.

If you are not sure about any application, maintenance or technical issue, contact Maxseal Sales for advice.

GW C-300 – AUTOMATIC WATER CONTROL VALVE (AWCV) WITH SOLENOID



GW SPRINKLER A/S

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SPARE PARTS LIST

Elastomeric Flow Control Sleeve c/w O-ring spares kit (for GW-C300 deluge valve).

(Data Sheet: DV070 1001A)

Size	80	100	150	200	250	300
Kit number	64/90119	64/90120	64/90121	64/90122	64/90123	64/90124

Solenoid Valve Spares Kit: BE27378

Comprising: various Soft Seals and Springs required for maintenance/service.

Common to all sizes of valve

Elastomeric Sleeves, Rolling Diaphragms and Seals should be stored in sealed light proof black bags. Spare stocks of sleeves, diaphragms and seals should be used within a two year shelf life to provide a three year in-service life (five year total life).

FAULT FINDING

Fault	Cause	Remedial Action
Valve does not open	WATER CANNOT ESCAPE FROM SLEEVE CAVITY	
	Rupture of flow control sleeve on inlet side of Valve	Renew sleeve
	Non operation of Solenoid Valve	Check power supply exists Check for water flow (must drain from "INLET" port)
	Restrictor TI screwed fully in	Adjust restrictor Renew pilot sleeve
Valve does not close	WATER CANNOT ENTER SLEEVE CAVITY	
	Inlet strainer clogged	Inspect and clean strainer
	Water supply from inlet to strainer blocked	Clean water supply bore
	Rupture of flow control sleeve on discharge side of Valve	Renew sleeve
	Restrictor TI screwed fully in	Adjust restrictor
	Non operation of Solenoid Valve	Check that Solenoid Valve is de-energized. If Manual Reset Latch is fitted make sure it is pushed to perpendicular position (90°) when de-energized

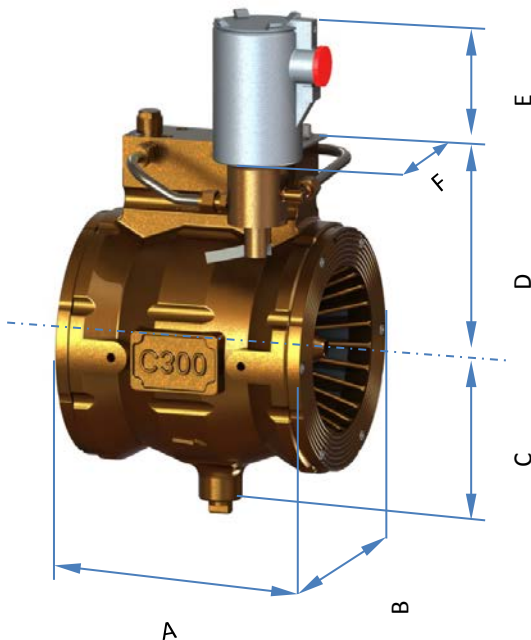
GW C-300 – AUTOMATIC WATER CONTROL VALVE (AWCV) WITH SOLENOID



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All dimensions in mm.

Valve Size	A	B **)	C *)	D	E	F
80 (3")	167	128	95	145	150	150
100 (4")	167	161	115	167	150	150
150 (6")	237	222	145	198	150	150
200 (8")	304	295	167	227	150	150
250 (10")	350	336	200	262	150	150
300 (12")	440	406	235	300	150	150

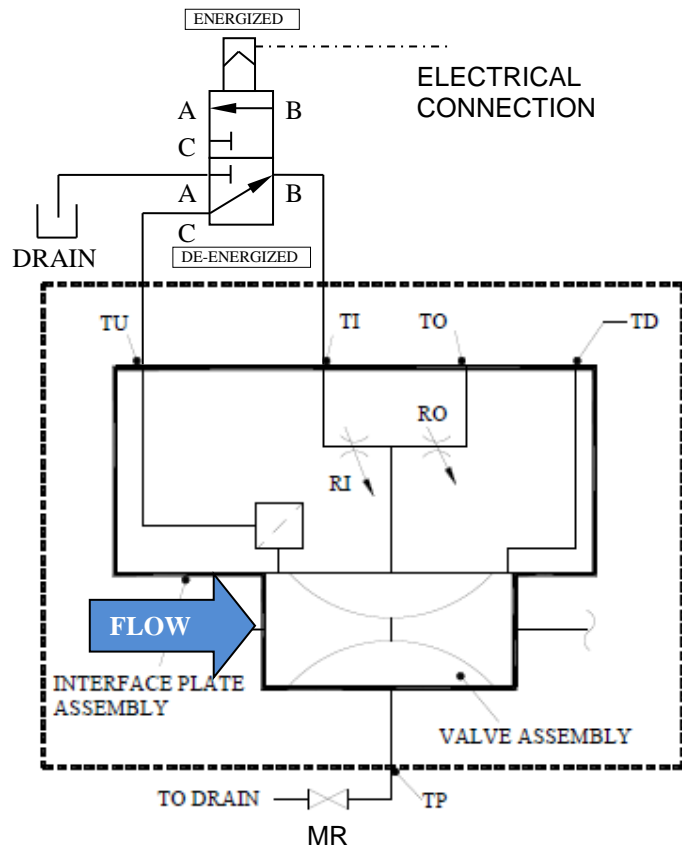
*) valve center to ½" boss end (unplugged).

**)) Fitment: Wafer fits between ANSI/ASME B16.5 Class 150 or 300 lbs. flanges using full length studs, nuts and washers. Gasket to ANSI B16.21 RF.

P & ID for GW C300 Deluge Valve Non Reg. with Solenoid

P & ID:

Port	Description	Size
RI	Inlet Restrictor (close)	
RO	Outlet Restrictor	
TU	Supply from upstream	¼" NPT
TI	Inlet sleeve cavity	¼" NPT
TO	Plugged	¼" NPT
TD	Plugged (downstream)	¼" NPT
TP	Plugged (manual release)	½" NPT
A	Solenoid INLET	¼" NPT
B	Solenoid OUTLET	¼" NPT
C	Solenoid EXHAUST	¼" NPT
MR	Manual Release Valve	½" NPT



GW C-300 – AUTOMATIC WATER CONTROL VALVE (AWCV) WITH SOLENOID

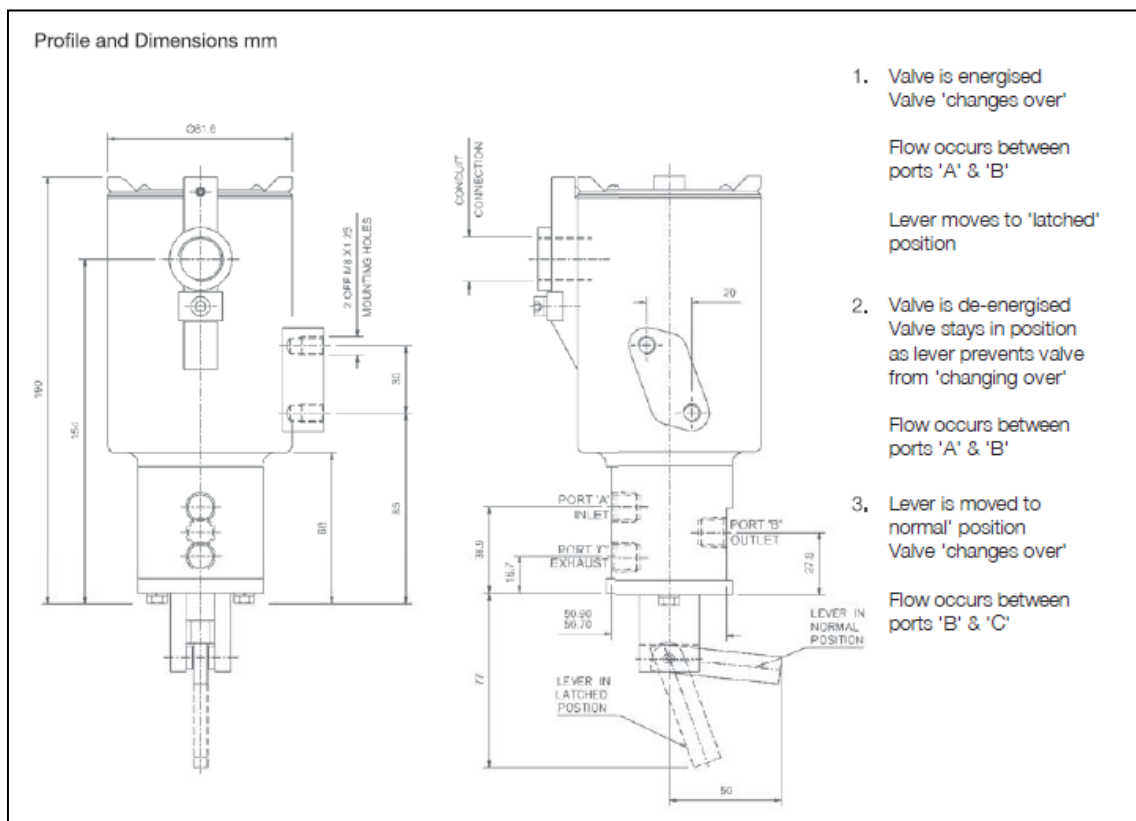


GW SPRINKLER A/S

MANUAL INSTALLATION, OPERATION & MAINTENANCE (IO&M)

Solenoid Data:

Type	ICO4S 1/4" 3/2 A-L-L
Materials of construction	
Pot & Cover	SS316
Valve body	Ni Al Bronze (sea water application)
O-rings	High Nitrile (NBR)
Coil insulation	Class H
Max. inlet pressure	20 bar
Flow Rates	Cv = 0,8 / Kv = 11,5
Temperature ratings	
media	Min/Max -20°/90°C
ambient	Min/Max 0°/60°C
Conduit Connection	M20 x 1,5 Conduit Thread
Power Consumption	9,6 W (for extreme service)
Voltage	24 DC
IP	IP66/X8 NEMA 4X
Configuration	NC (standard) / (NO (optional))
ATEX	Complies with ATEX Directive 94/9/EC
ATEX Code	Ex II 2 G Exd II C T6/T4



MANUAL

INSTALLATION, OPERATION & MAINTENANCE (IO&M)

Annex 1.

Valve & Instrumentation Schematic

POS.		In Service	POS.		In Service
1	GW C-300 Deluge valve		6	Test/ Drain Valve	Closed
2	Solenoid Valve 3/2 Way, (NC)	De-energized	7	Upstream Pressure Gauge	
3	1/2" Manual Release Valve	Closed	8	Downstream Pressure Gauge	
4	Upstream Isolation Valve	Open	9	Power Supply, 24 DC / 9,6 W	Off
5	Downstream Isolation Valve	Open	10	Manual Reset Latch	90° position

