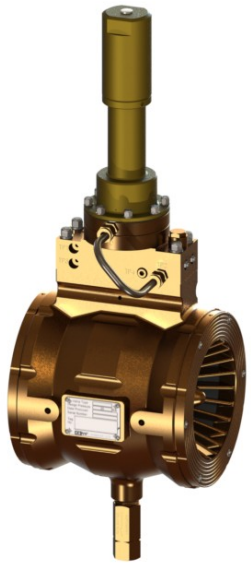
GW C300
FLUID CONTROL VALVE
PUMP CONTROL
PRESSURE REDUCING

GW SPRINKLER A/S



PART NUMBER			
	Ni Al Bronze	**Super Duplex**	**Titanium**
3”	64.570.24	64.570.26	64.570.27
4”	64.571.24	64.571.26	64.571.27
6”	64.572.24	64.572.26	64.572.27
8”	64.573.24	64.573.26	64.573.27
10”	64.574.24	64.574.26	64.574.27
12”	64.575.24	64.575.26	64.575.27

Introduction

The starting of down hole or submerged impeller dry riser fire water pumps can generate high pressures in the pump casing due to the accelerating water interface hitting the in-line check valve.
Reducing these surge pressures prevents over stressing of pipe work, valves, pump casings and bearings.
Pump start up surge pressures can be controlled to acceptable levels by initially directing the flow of water from the pump to drain through the GW C-300 Pump Control Valve. By gradually reducing the flow to drain, the supply is smoothly directed to the fire protection system.
The pump control valve is required to immediately open with minimum flow resistance at pump start-up, and then close under controlled conditions to bring the system pressure gently onto line.

Function

The GW C-300 Pump Control Valve is interactive with the firewater ring main and is directly operated by the water flow/pressure from the fire pump. Upon operation of the fire pump, the pump riser and pump control pipe work fills with water which then enters the Pump Control Valve inlet under pressure. Air from around the flow control sleeve is immediately vented via the vent valve, thus allowing the Pump Control Valve to open fully. This, in turn, initially directs the flow of water from the fire pump to drain/overboard.

As the pump outlet pressure increases, water passes via the internal filter, through restrictors R1 & R2 (see the P & ID) into the sleeve cavity, thus increasing the pressure in the valve casing and causing the vent valve to close. The Pump Control Valve immediately starts to close in order to build up and control the system pressure. The speed of closing being governed by restrictor R1.

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DATA SHEET No: DV050 1013 B

Date: 27.01.2016

The upstream pressure (supplied by the pump) is constantly sensed by the pilot valve. When the pressure increases to the set point, i.e. the required fire main pressure, the pilot valve closes thus stopping any more water entering the sleeve cavity.

Should the fire main pressure increase to a level above the set point, the pilot valve opens to allow water to flow from the sleeve cavity to overboard, the rate of this being governed by restrictor R3. The draining of the sleeve cavity opens the GW C-300 Pump Control Valve, and allows more water from the pump to be directed to drain – thus maintaining the pump supply at set-pressure.

The GW C-300 Pump Control Valve will continue to control the flow/pressure for as long as the fire pump is running.

The Auto Bleed Valve (PN: CV64.540.01) fitted at the bottom of the valve will drain the sleeve cavity in the stand by unpressurized condition, leaving the C-300 valve fully open.
To enable 100% drainage of the sleeve cavity, the C-300 valve should be fitted in the horizontal position, with the Auto Bleed Valve directed pendent downwards. Allow 20 minutes for full drainage of the valve sleeve cavity.

The Auto Bleed Valve automatically closes when hydraulic pressure is applied to the inlet.
The GW C-300 sprinkler valve is “self-powered” – and utilizes the system upstream (inlet) pressure to regulate and maintain the upstream pressure in line with the pre-determined set-pressure (= max .allowable pump supply pressure)
The valve principle is “elastomeric sleeve type” where the annular valve orifice is adjustable by expansion/contraction of the rubber flow sleeve.

Installation: Horizontally - with the Auto Bleed Valve pointing vertical down.

Fits between ANSI /ASME B16.5 Class 150 or 300 lbs. flanges.

Design: The GW C-300 deluge valve is developed and designed for maximum reliability when installed and operated in the harshest on-shore and off-shore environments. To prevent any malfunctioning due to components seizing, sticking or corroding, the number of moving mechanical parts has been reduced to an absolute minimum, and the few moving parts present are ALL 100% isolated from the flow media - i.e. no water contact.
The only moving components in contact with the flow media are the elastomeric parts.
A strainer is fitted in the inlet of the valve center block to prevent any debris from entering the hydraulic pilot regulating system.

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Pressure reduction: The GW C-300 Pump Control is designed to handle large pressure reductions, and minimize the effects of cavitation and noise. The multi-finger construction of the water passageways through the valve, in combination with the conical shaped core, ensures that the pressure is reduced at multiple sites, which avoids large cavitation concentrations and resultant noise and valve damage. The exiting cone in the valve outlet ensures that the cavitation stays longer in the water flow stream thus reducing concentrated damage to valve internals and pipework walls.

Material: All materials used in the valve have been rigorously selected to ensure durability when installed and operated in the heavy duty applications the valve is designed for.
All wetted parts are as standard in the material Nickel Aluminum Bronze and piping in CuNi 90/10.

Finish: Natural (metallic, non-painted surface).

Approval: No approval.

Specials: Client specified solutions can be accommodated on request – e.g. special instrumentation, special fittings, surface treatment, pressure-setting. Consult GW for options.

Weights:
(in kilograms, approximate)

	80mm (3”)	100mm (4”)	150mm (6”)	200mm (8”)	250mm (10”)	300mm (12”)
Ni. Al. Bronze	20	25	44	63	103	180
Super Duplex	21	27	48	68	108	187
Titanium	12	14	26	37	61	106

Maintenance: Every 3 year the valve should be disassembled, inspected and the elastomeric components replaced – i.e. 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).
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 manufacture, whichever is the sooner, provided that a “maximum extension test” (see IOM manual no. 6470441 to fully stretch the flow control sleeve within the deluge valve body, is performed.

Spare parts: Refer to data sheet no.: DV070 1001 - GW C-300 General Spares Schedule.

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Pressure data:

	Min.	Max.	Note
Design pressure		20 bar	
Regulated pressure (intlet pressure) – std.	**5 bar**	**17 bar**	(black spring) standard
Set-pressure (factory setting) – standard.		5 bar	(or to specification)
Reg. pressure (intlet pressure) – medium	7 bar	12 bar	(silver spring) **optional**
Regulated pressure (intlet pressure) – low	3 bar	7 bar	(blue spring) **optional**
Inlet pressure to achieve full open	4 bar		

Materials:

	Valve		
	Ni.Al.Bronze	Super Duplex	Titanium
Wetted parts	Ni. Al. Bronze to UNS C95800, UNS C63000	SuperDuplex Cr.25 to ASTM A890, UNS J92205	Titanium (unalloyed) to ASTM B367, B348 UNS R50400 – Gr.2
Non-wetted parts	Gun Metal to UNS C93200, St. Steel to UNS S31600 /03	Gun Metal (NiSn plated) UNS C93200, St.Steel to UNS S31600 /03	Gun Metal (NiSn plated) UNS C93200, St.Steel to UNS S31600 /03
Pipes	Cupronickel CuNi 9010, UNS C70600	Titanium (unalloyed) to ASTM B338, UNS R50400 – Gr.2	Titanium (unalloyed) to ASTM B338, UNS R50400 – Gr.2
Compress fittings	Ni. Al. Bronze to UNS C63000	SuperDuplex Cr.25 to UNS S32750	Titanium (unalloyed) to ASTM B348 UNS R50400 – Gr.2
Flow Ctrl. Sleeve	Natural Rubber	Natural Rubber	Natural Rubber

Material certification to EN10204 3.1, and PMI-test (Positive Material Identification) on request.

Pressure loss:

		80mm (3”)	100mm (4”)	150mm (6”)	200mm (8”)	250mm (10”)	300mm (12”)
	Cv	240	430	880	1790	2060	2990
	Kv	206	370	757	1540	1770	2570
Friction loss @ 50% of max. flow (bar)		0,11	0,32	0,11	0,19	-	-

Cv: Flow coefficient (imperial) = flow rate (US gal/min) across valve @ 1 psi head loss.
Kv: Flow factor (metric) = flow rate (m3/hr.) across valve @ 1 bar head loss.

Testing: Every valve is factory tested - i.e. static body & seat pressure test + functional flow test. An individual test report is issued for each valve.

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Set pressure

For pilot operated pressure reducing valves the SET-pressure is the outlet residual pressure for which the pilot regulator of the valve has been adjusted and is expected to maintain, regardless of changing flow rate and varying inlet pressures.

Valve sizing

As a rule of thumb, the GW C300 Pump Control Valve should be sized with a capacity to discharge **150%** of the max. flow generated by the pump in order to efficiently and safely handle the surge generated at pump start-up.
See Pump Control Valve Specification no. CV64/70515

Flow spec.

	80mm (3”)	100mm (4”)	150mm (6”)	200mm (8”)	250mm (10”)	300mm (12”)
Min. lpm	200	200	400	2.000	3.000	4.500
Max. lpm	3.000	5.000	11.200	20.000	30.000	45.000

Pressure gauges

Optional – on request (**not standard**).
The GW C-300 Pump Control Valve can be fitted with a Gauge Block on the upstream and downstream side of the Center Block. Each Gauge Block provides 3 off ¼” NPT female ports for connection of pressure gauge, pressure switch etc. All 3 ports can be blocked by a central restrictor, for safe in-service removal of connected instruments.

Environ-ment

The GW C-300 Pump Control Valves shall be installed in such way to avoid physical damage and exposure to freezing temperatures.

Service

If required, GW Sprinkler A/S can undertake a full overhaul/refurbishment of your GWC-300 deluge valve at the factory in Denmark. This will include complete dismantling of the valve, glass blast cleaning of corroded parts, assessment of wear/corrosion, replacement of elastomeric parts, replacement of corroded/damaged parts (in dialogue with customer),static pressure test, functional test, set-pressure adjustment, full test report.

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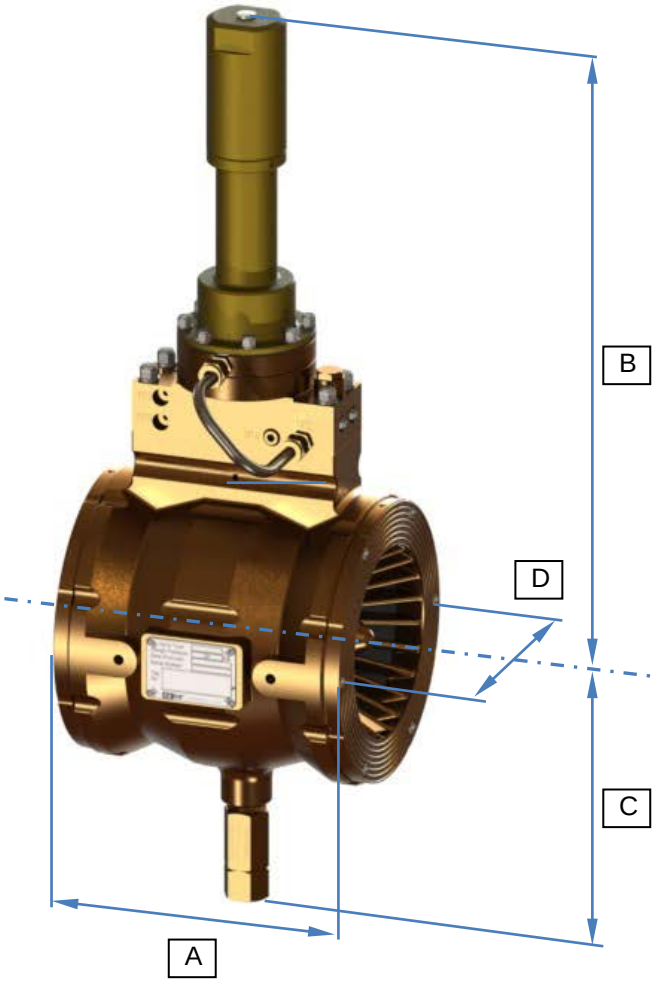
All dimensions in mm.

Valve size	A	B *)	C	D **)	
80 (3”)	167	438	179	128	
100 (4”)	167	460	199	161	
150 (6”)	237	491	229	222	
200 (8”)	304	520	251	295	
250 (10”)	350	555	284	336	
300 (12”)	440	593	315	406	

*) SET at 5 bar (black spring). Allow +150mm for removal of Adjusting Sleeve

**) 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.



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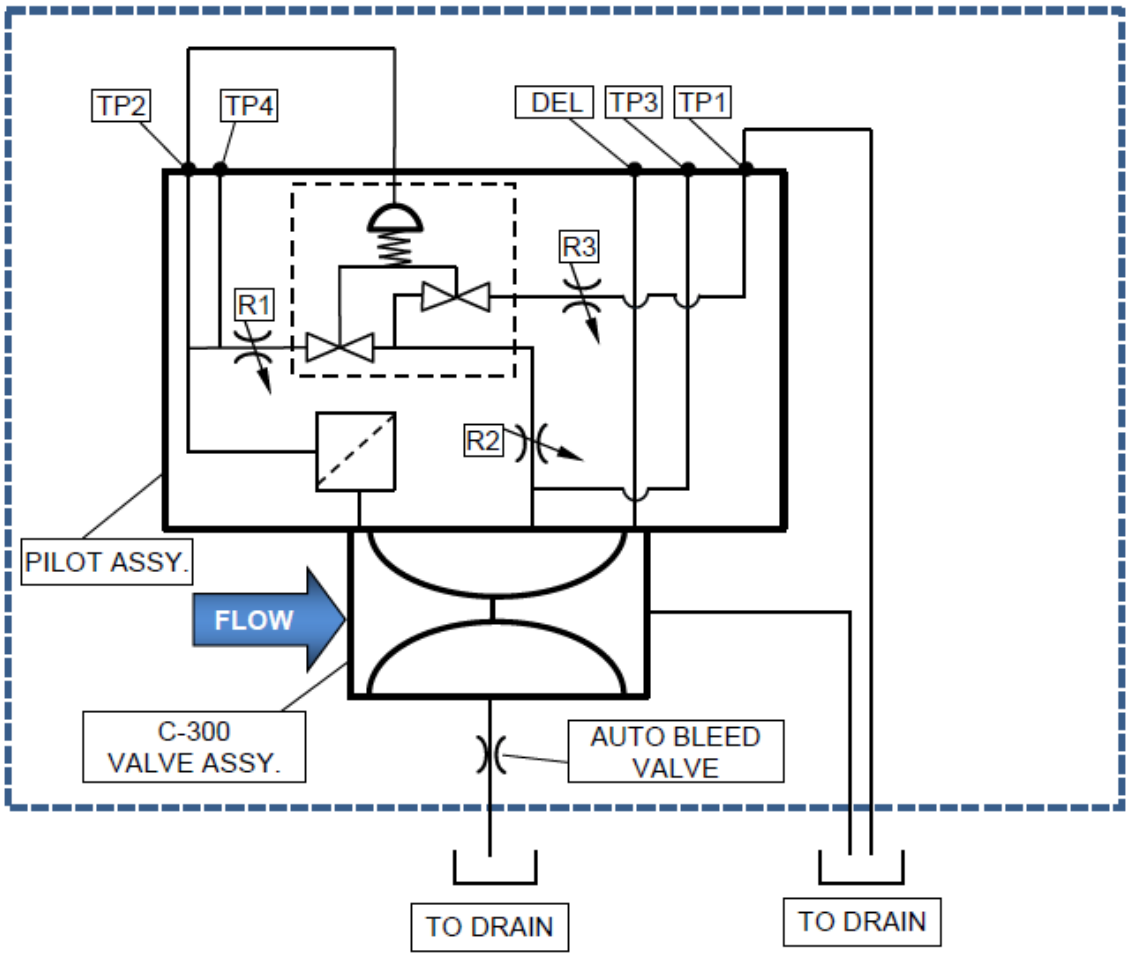
P & ID:

Port	Description	Size
R1	Inlet Restrictor (close)	
R2	Jacket Restrictor	
R3	Outlet Restrictor (open)	
TP1	Piped to drain	¼" NPT
TP2	Upstream sensing port	¼" NPT
TP3	Plugged	¼" NPT
TP4	Plugged	¼" NPT
TP5	Plugged	¼" NPT
DEL.	Plugged	¼" NPT

R = Restrictor (needle valve)
TP = Terminal Port

IO&M manual: 64 70603



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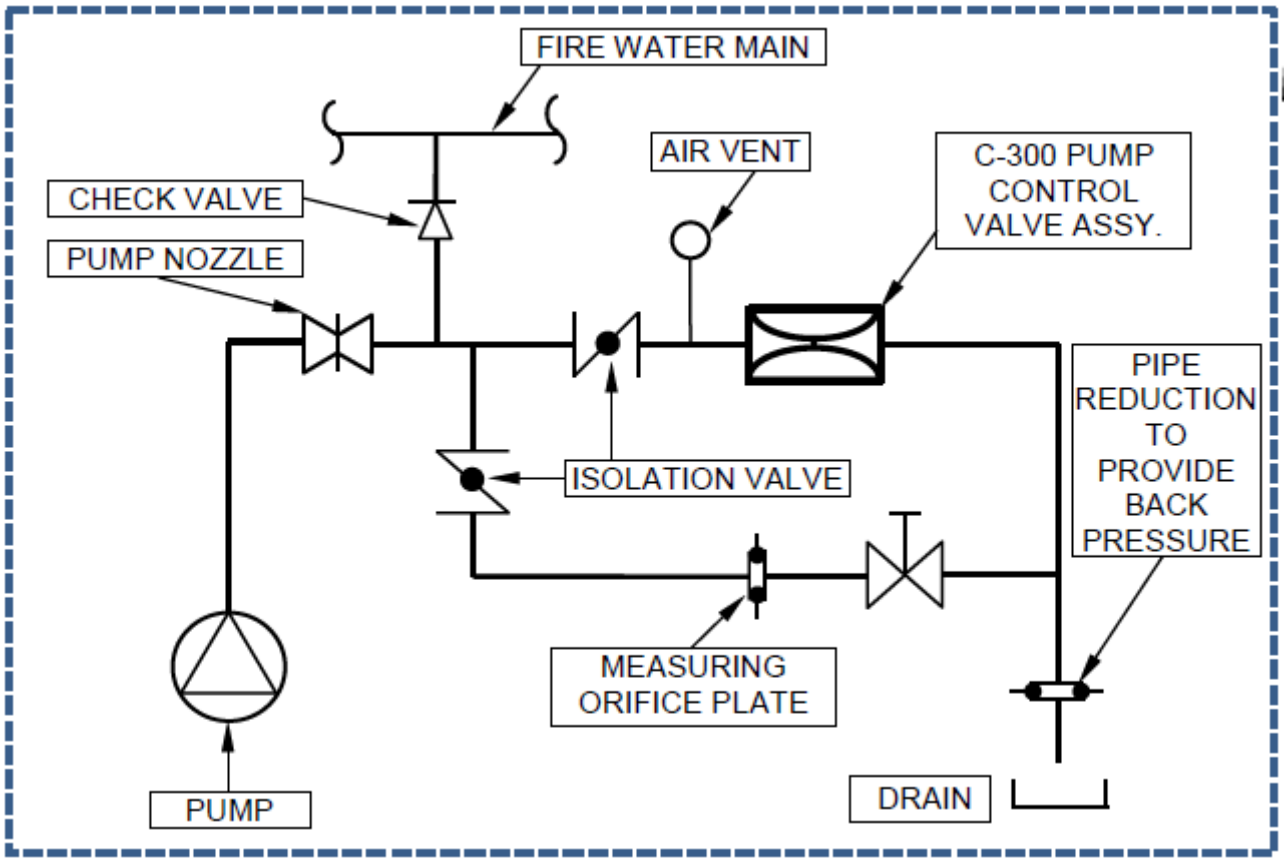
SYSTEM SCHEMATIC FOR PUMP CONTROL VALVE INSTALLATION



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