

# FlowCon By-Pass Assembly

*2-Union 3-Way By-Pass Assembly  
DN15-25 / 1/2"-1"*



## BENEFITS

- **Easy selection, installation, commissioning, control and maintenance** of the terminal unit arrangement
- Suitable for both **heating** and **cooling** applications
- **Reduced onsite labor time** due to finished valve sets, factory assembled and tested.
- DN15 / DN20 / DN25 **prefab-models** with 80 mm center distance
- **All wet components DeZincification Resistant**
- Constant built-in dimensions and **Flexibility** through **range of inserts**
- **Externally adjustability of flow** and always with **100% authority**
- Range of actuators – thermal ON/OFF, electrical modulating, 3-point floating or 2-position
- Range of control mode – linear or Equal%
- Insulation

## SPECIFICATIONS

### FlowCon By-Pass Assembly<sup>1</sup>

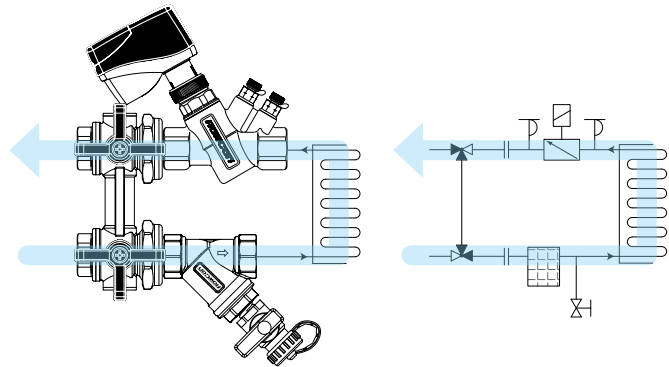
Static pressure:	2500 kPa / 360 psi
Media temperature:	-20°C to +120°C / -4°F to +248°F
Material:	
- Housings and cover:	Forged brass DZR ASTM CuZn36Pb2As (CW602N)
- O-rings:	EPDM
- By-Pass ball valves:	Chemically nickel-plated brass
- By-Pass handles, extended:	Painted aluminum
- Strainer mesh:	420 $\mu$ (=40 mesh) stainless steel
- Drain valve:	Brass DZR ASTM CuZn36Pb2As (CW602N)
- Drain ball valve:	Chemically nickel-plated brass
- Drain valve handle:	Painted aluminum
- Insulation:	EPP
End connection:	Female ISO
Housing taps:	1/4" ISO

Note 1: Assembly comes complete and fully pressure tested.

## PRINCIPLE OF OPERATION

### NORMAL OPERATION:

During **normal operation** the bypass is closed (both handles are positioned parallel with water flow), and water will flow through the strainer, into the FCU and return through the PICV valve. During this operation the PICV will balance the flow from closed valve to design flow depending on actual requirements and corresponding actuator position.

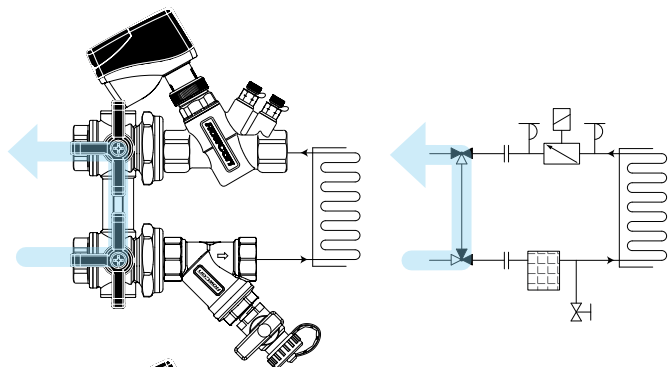


### BYPASS OPERATION:

#### Option 1.

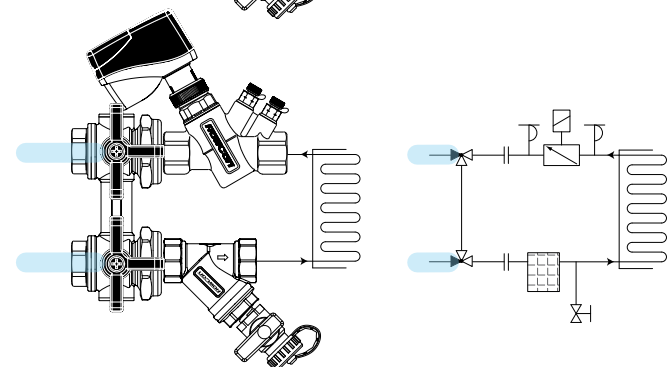
During **bypass operation** the FCU is isolated from the system. The FCU may, after draining, easily be serviced while the main system is running unaffectedly.

It will also be in bypass operation that the main system is flushed without compromising FCU components.



#### Option 2.

In addition, complete isolation of the FCU is possible providing closed bypass and isolated flow- and return-side.



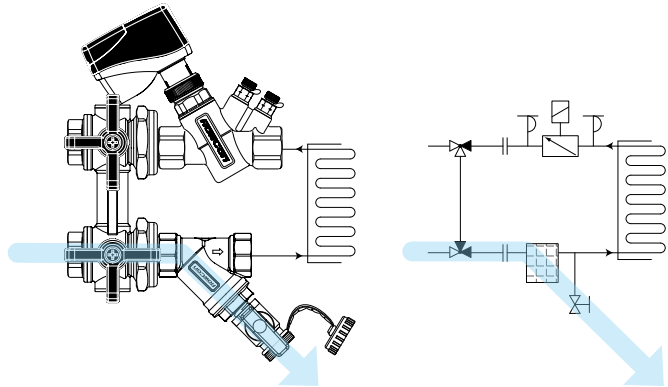
## PRINCIPLE OF OPERATION (...continued)

**FlowCon By-Pass Assembly supports flushing procedure according to BSRIA BG29/2021.**

### FORWARD FLUSHING OPERATION:

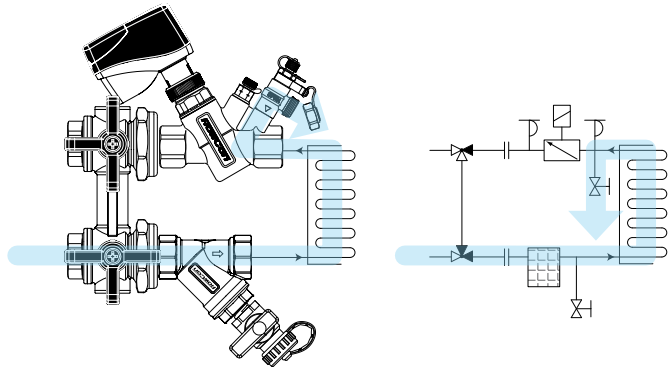
#### **Option 1.**

During flushing the system can be **forward flushed** through the supply-pipe strainer blow-down valve.



#### **Option 2 - Forward Flushing through Coil.**

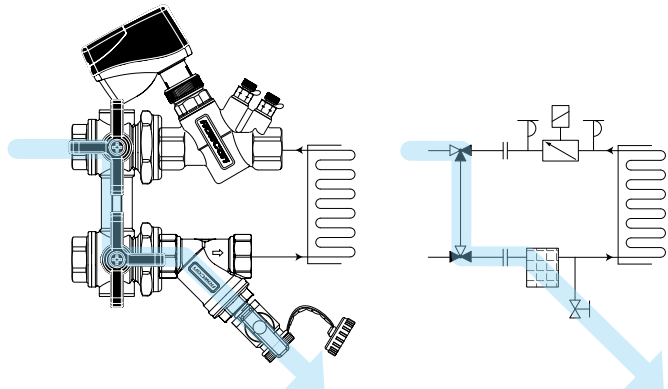
Optionally, the return-side FlowCon AB-housing plug may be fitted with a combi p/t drain valve and allow **forward flushing** of the FCU as well.



### BACK FLUSHING OPERATION:

#### **Option 1.**

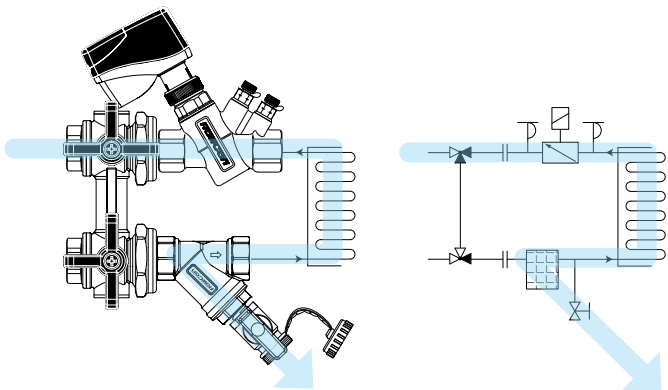
When system **back-flushing**, the bypass is opened and the system can be back-flushed unrestricted through the strainer blowdown valve.



#### **Option 2 - Back Flushing through Coil.**

As an alternative **back-flushing procedure**, the bypass is closed and the system can be back-flushed through PICV and FCU. It is recommended to set PICV setting to 5.0 to allow as much opening as possible.

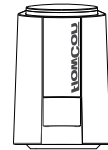
Alternatively, the PICV insert may be removed from valve housing and replaced with a flushing cap allowing unrestricted back-flushing through PICV housing, FCU and strainer blowdown valve.



## SPECIFICATIONS

### FlowCon FT Actuator (Thermal)

FlowCon Actuator <sup>2</sup>	FT.0.2	FT.0.3	FT.0.4
Supply voltage	24V AC -10%...+20%, 50/60 Hz	230V AC ±10%, 50/60 Hz	24V AC/DC -10%...+20%, 50/60 Hz
Type	Thermal	Thermal	Thermal
Power consumption	1.2 W	1.2 W	1.2 W
Control signal	Analog 0-10V	ON/OFF	ON/OFF
Failsafe function	Normally closed <sup>3</sup>	Normally closed <sup>3</sup>	Normally closed <sup>3</sup>
Operation time <sup>4</sup>	App. 4.5 minutes	App. 4.5 minutes	App. 4.5 minutes
Ambient temperature	0°C to +60°C / +32°F to +140°F	0°C to +60°C / +32°F to +140°F	0°C to +60°C / +32°F to +140°F
Protection	IP54, class III incl. upside-down	IP54, class II incl. upside-down	IP54, class III incl. upside-down
Cable	Fixed, 1 m / 3 ft	Fixed, 1 m / 3 ft	Fixed, 1 m / 3 ft
Weight	0.12 kg / 0.26 lb	0.11 kg / 0.24 lb	0.11 kg / 0.24 lb



FlowCon FT.0.2/0.3/0.4

Note 2: FlowCon warranty is voided using other actuators than supplied by FlowCon International.

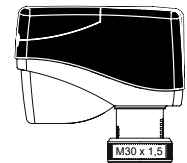
Note 3: To ensure that the valve is in an open position during commissioning, the actuator will be delivered in open position and remain in this position until it is electrically operated first time.

Note 4: Closing time is app. the double depending on ambient temperature.

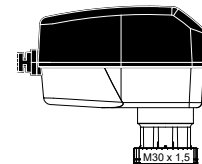
### FlowCon FN Actuator (Gear)

FlowCon Actuator <sup>5</sup>	FN.0.2	FNP.0.2	FNR.0.2	FNR.0.2-EQ
Supply voltage	24V AC/DC ±10%, 50/60 Hz	24V AC/DC ±10%, 50/60 Hz	24V AC/DC ±15%, 50/60 Hz	24V AC/DC ±15%, 50/60 Hz
Type	Electrical, bi-directional synchronous motor		Electrical, bi-directional step motor	
Power consumption	24V AC: 0.9VA standby / 2.5VA operating / 4.7VA max. 24V DC: 0.75W standby / 1.2W operating / 2.2W max.	24V AC: 0.9VA standby / 2.5VA operating / 4.7VA max. 24V DC: 0.75W standby / 1.2W operating / 2.2W max.	24V AC: 1VA standby / 6VA operating / 6VA max. 24V DC: 0.5W standby / 4W operating / 4W max.	24V AC: 1VA standby / 6VA operating / 6VA max. 24V DC: 0.5W standby / 4W operating / 4W max.
Control signal	Analog 0(2)-10V DC, <0.5mA	Analog 0(2)-10V DC, <0.5mA	Analog 0-10V DC	Analog 0-10V DC
Feedback	Yes, control signal	No	No	No
Failsafe function	Fail in place	Fail in place	Fail in place	Fail in place
Auto stroke	Yes	Yes	No	No
Operation time	max 22 sec/mm	max 22 sec/mm	max 5.5 sec/mm	max 5.5 sec/mm
Ambient temperature	0°C to +50°C / +32°F to +122°F	0°C to +50°C / +32°F to +122°F	0°C to +50°C / +32°F to +122°F	0°C to +50°C / +32°F to +122°F
Media temperature	0°C to +120°C / +32°F to +248°F	0°C to +120°C / +32°F to +248°F	0°C to +120°C / +32°F to +248°F	0°C to +120°C / +32°F to +248°F
Humidity rating	0..85% rH, no condensation	0..85% rH, no condensation	0..80% rH, no condensation	0..80% rH, no condensation
Protection	IP54 including upside-down, class III, indoor use only	IP54 including upside-down, class III, indoor use only	IP54 including upside-down, class III, indoor use only	IP54 including upside-down, class III, indoor use only
Cable	Fixed 5 x 0.5 mm <sup>2</sup> , 1.5 m / 5 x AWG20, 4.9 ft	Fixed 3 x 0.5 mm <sup>2</sup> , 1.5 m / 3 x AWG20, 4.9 ft	Fixed 3 x 0.22 mm <sup>2</sup> , 1.5 m / 3 x AWG24, 4.9 ft	Fixed 3 x 0.22 mm <sup>2</sup> , 1.5 m / 3 x AWG24, 4.9 ft
Closing point adjustment	During operation the actuator will self-adjust according to the closing point and stroke length of the valve			
Weight	0.25 kg / 0.55 lb	0.25 kg / 0.55 lb	0.23 kg / 0.51 lb	0.23 kg / 0.51 lb

FlowCon Actuator <sup>5</sup>	FNR.0.3	FN.0.4
Supply voltage	110/230V AC ±10%, 50/60 Hz	24V AC/DC ±10%, 50/60 Hz
Type	Electrical, bi-directional step motor	Electrical, bi-directional synchronous motor
Power consumption	1VA standby / 6VA operating / 8VA max.	24V AC: 0.9 VA standby / 2.5VA operating / 4.7VA max. 24V DC: 0.75W standby / 1.2W operating / 2.2W max.
Control signal	Digital 2-position / 3-point floating	Digital 2-position / 3-point floating
Feedback	No	No
Failsafe function	Fail in place	Fail in place
Auto stroke	No	Yes
Operation time	27.2 sec/mm	max 22 sec/mm
Ambient temperature	0°C to +50°C / +32°F to +122°F	0°C to +50°C / +32°F to +122°F
Media temperature	0°C to +120°C / +32°F to +122°F	0°C to +120°C / +32°F to +248°F
Humidity rating	0..80% rH, no condensation	0..85% rH, no condensation
Protection	IP54 including upside-down, class II, indoor use only	IP54 including upside-down, class III, indoor use only
Cable	Fixed 3 x 0.5 mm <sup>2</sup> , 1.5 m / 3 x AWG20, 4.9 ft	Fixed 3 x 0.5 mm <sup>2</sup> , 1.5 m / 3 x AWG20, 4.9 ft
Closing point adjustment	During operation the actuator will self-adjust according to the closing point and stroke length of the valve	
Weight	0.23 kg / 0.51 lb	0.25 kg / 0.55 lb



FlowCon FN.0.2/0.4 and FNP.0.2



FlowCon FNR.0.x

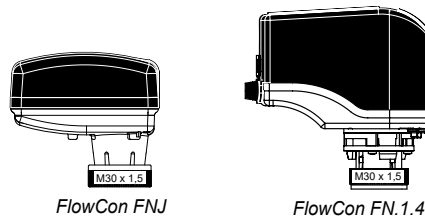
Note 5: FlowCon warranty is voided using other actuators than supplied by FlowCon International.

## SPECIFICATIONS

### FlowCon FN / FNJ Actuators (Gear, failsafe):

FlowCon Actuator <sup>6</sup>	FNJ.1.2	FNJ.1.2-EQ	FN.1.4
Supply voltage	24V AC/DC ±15%	24V AC/DC ±15%	24V AC/DC ±10%, 50/60 Hz
Type	Electrical, bi-directional synchronous motor		
Power consumption	24V AC: 2.5VA standby / 2.5VA operating / 5VA max. 24V DC: 1.5W standby / 1.5W operating / 3W max.	24V AC: 2.5VA standby / 2.5VA operating / 5VA max. 24V DC: 1.5W standby / 1.5W operating / 3W max.	4VA standby / 6VA operating / 10VA max.
Control signal	Analog 0-10V DC, linear	Analog 0-10V DC, equal%	Digital 2-position / 3-point floating
Feedback	Yes, 0-10V DC	Yes, 0-10V DC	No
Failsafe function	Close, optional open	Close, optional open	Optional open or close (set on actuator)
Auto stroke	No	No	No
Operation time	8 sec/mm	8 sec/mm	50 Hz: 18.5 sec/mm
Ambient temperature	0°C to +50°C / +32°F to +122°F	0°C to +50°C / +32°F to +122°F	+2°C to +50°C / +36°F to +122°F
Media temperature	0°C to +95°C / +32°F to +203°F	0°C to +95°C / +32°F to +203°F	-
Humidity rating	10..90% rH, no condensation	10..90% rH, no condensation	<95% rH, no condensation
Protection	IP54 no upside-down mounting, class III, indoor use only	IP54 no upside-down mounting, class III, indoor use only	IP54, class II
Cable	Plug-in, 4 wires x 0.35 mm <sup>2</sup> halogen free, 1.5 m 4 wires x AWG22 halogen free, 4.9 ft	Plug-in, 4 wires x 0.35 mm <sup>2</sup> halogen free, 1.5 m 4 wires x AWG22 halogen free, 4.9 ft	Fixed, 4 wires AWG22 halogen free cable, 1 m / 3 ft
Closing point adjustment	During operation the actuator will self-adjust according to the closing point of the valve		
Weight	0.30 kg / 0.66 lb	0.30 kg / 0.66 lb	0.30 kg / 0.66 lb

Note 6: FlowCon warranty is voided using other actuators than supplied by FlowCon International.



## SPECIFICATIONS

### **FlowCon Green/GreEQ insert**

Material:	
- Insert:	Glass-reinforced PSU/POM/PPS
- Metal components (internal):	Stainless steel
- O-rings:	EPDM
- Cone:	PPS
- Diaphragm:	EPDM
Maximum close off pressure:	800 kPa / 116 psi
Maximum operational $\Delta P$ :	800 kPaD / 116 psid
Control characteristic:	FlowCon Green: linear (may be converted to equal % on actuator) FlowCon GreEQ: equal%
Control range:	1:1000 / IEC 60534
Rangeability:	100:1
Turn down ratio:	100:1
Shut-off leakage:	ANSI / FCI 70-2 2006 / IEC 60534-4, Class IV
Weight:	0.17 kg / 0.36 lb

### **FlowCon Isolation shell**

Ambient temperature:	-55°C to +105°C / +67°F to 221°F, according to DIN53424
Material:	EPP (polypropylene foam)
Thermal conductivity:	38 mW/mK, according to DIN52612
Fire rating:	Class F, according to EN13501-1
Resistant to:	Water, sea water, glycol, silicone grease, alcohol (ethanol), soaps, deterative solutions (10% Extran MA01), mild acids (10% Nitric acid, 10% Sulfuric acid, 10% Hydrochloric acid)

### **FlowCon Flex hoses**

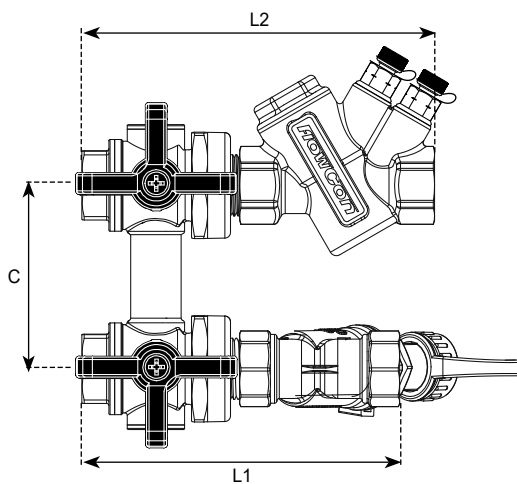
Static pressure:	3000 kPa / 435 psi Optional: 1500 kPa / 218 psi
Max. ambient temperature:	+65°C / +149°F
Media temperature:	-5°C to +90°C / +41°F to +194°F
Material:	
- Tube:	EPDM
- Braiding:	Stainless steel AISI 304
- Sleeves:	Stainless steel
- Fittings:	Brass ASTM CuZn39Pb3 (CW614N)
- Nuts:	Brass ASTM CuZn39Pb3 (CW614N)
Bending radius:	DN15 (1/2"): 90 mm / 3.54 in DN20 (3/4"): 90 mm / 3.54 in DN25 (1"): 110 mm / 4.33 in
End connections:	Male/Female ISO

## DIMENSIONS AND WEIGHT (NOMINAL)

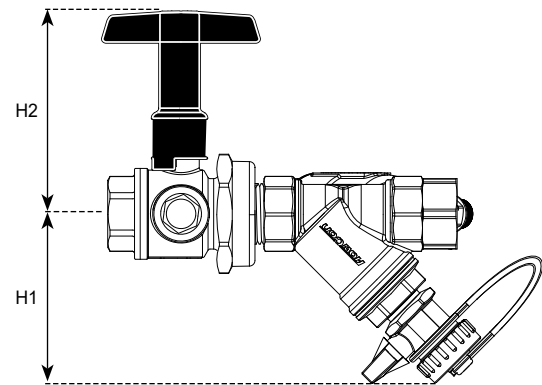
Model no.	Valve size	Insert size	C	L1	L2	H1	H2	D (depth)	Weight <sup>7</sup>
	mm (in)								
F3900.15.U.042.01.000.00.0.N.2	15 (1/2)	20 (3/4)	80 (3.15)	143 (5.63)	150 (5.90)	76 (2.99)	80 (3.15)	-	1.53 (3.37)
F3900.20.U.052.02.000.00.0.N.2	20 (3/4)			139 (5.47)	154 (6.06)	78 (3.07)		-	1.73 (3.81)
F3900.25.U.062.07.000.00.0.N.2	25 (1)			156 (6.14)	172 (6.77)	87 (3.43)		-	2.21 (4.87)

Note 7: Dimensions and weight do not include insert or actuator.

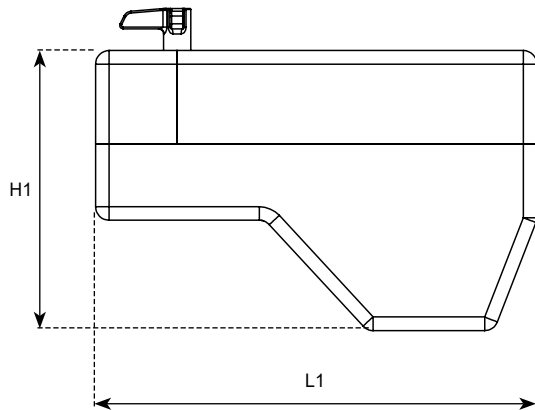
IF3950 (Insulation shell)	for DN15-20	-	-	228 (8.98)	-	158 (6.22)	-	210 (8.27)	0.155 (0.342)
IF3955 (Insulation shell)	for DN25	-	-	-	-	-	-	-	-



FlowCon By-Pass Assembly - top view



FlowCon By-Pass Assembly - side view



FlowCon Insulation Shell for By-Pass Assembly

## ACCESSORIES

- Side option: ACC10003
- P/t plug: ACC00113
- F-Strainer mesh: ACC11010 (DN15), ACC11020 (DN20), ACC11030 (DN25)
- Blowdown valve: ACC913302
- P/t drain: ACC00102
- Flushing cap: ACC0080
- Insulation shell: IF3950 (DN15/20), IF3955 (DN25).

## MODEL NUMBER SELECTION

**F3900 . U . . . . . Y . 2**

By-Pass size:

- 15** = DN15 / 1/2" female threaded
- 20** = DN20 / 3/4" female threaded
- 25** = DN25 / 1" female threaded

Handle orientation:

- U** = Up (standard)

Strainer size:

- 042** = DN15 / 1/2" strainer incl. blowdown
- 052** = DN20 / 3/4" strainer incl. blowdown
- 062** = DN25 / 1" strainer incl. blowdown

PICV housing size:

- 01** = DN15 / 1/2" AB housing incl. p/t plugs
- 02** = DN20 / 3/4" AB housing incl. p/t plugs
- 07** = DN25 / 1" AB housing incl. p/t plugs

PICV insert type:

- 000** = flushing cap
- G0** = Green.0 insert
- G1** = Green.1 insert
- G1HF** = Green.1 High Flow insert
- G0EQ** = GreEQ.0 insert
- G1EQ** = GreEQ.1 insert

Type of actuator:

- 00** = No actuator

	Thermal	Gear	Gear failsafe
24V modulating	<b>22</b> = FT.0.2	<b>32</b> = FN.0.2 <b>35</b> = FNP.0.2 <b>36</b> = FNR.0.2 <b>37</b> = FNR.0.2-EQ	<b>40</b> = FNJ.1.2 <b>41</b> = FNJ.1.2-EQ
230V	<b>23</b> = FT.0.3	<b>38</b> = FNR.0.3	
24V	<b>24</b> = FT.0.4	<b>34</b> = FN.0.4	<b>44</b> = FN.1.4

Flexible hoses:

- 0** = no flexible hoses (standard)
- G** = flexible hoses, coil side

Insulation:

- Y** = with insulation shell (standard)

Assembly

- 2** = assembled and tested (standard)

Example:

**F3900.20.U.052.02.G0.32.0.Y.2** = FlowCon By-Pass assembly with DN20 (3/4") female threaded connection incl. F-Strainer DN20 (3/4") ISO female threaded body DZR brass incl. blowdown and AB-housing DN20 (3/4") ISO female threaded body DZR brass incl. p/t plugs.

AB-housing includes a Green.0 insert and an electrical 24V modulating actuator.

### Please note:

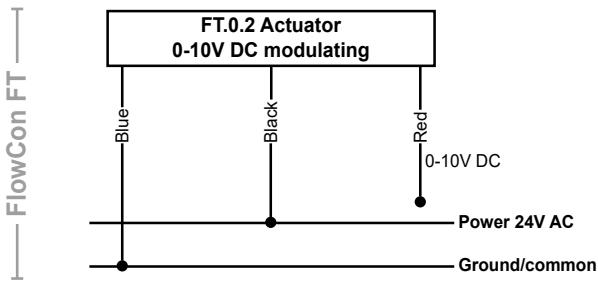
- Strainer will always be facing down, bypass handles will be facing up and PICV valve will be on its side.
- All By-Pass Assemblies come complete and fully pressure tested.
- Insert, actuator and insulation shell may be delivered separately.

For other configurations and options, please contact FlowCon International.

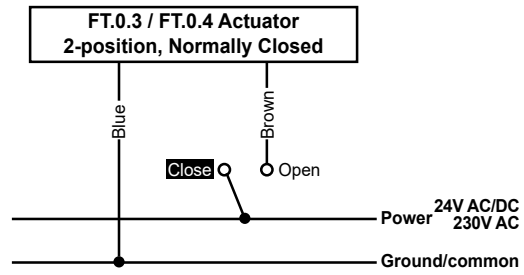


# WIRING INSTRUCTION

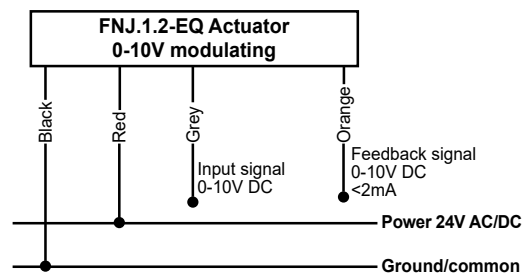
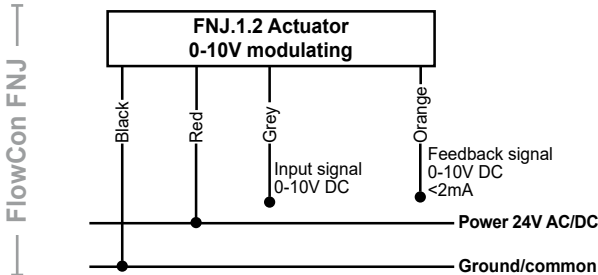
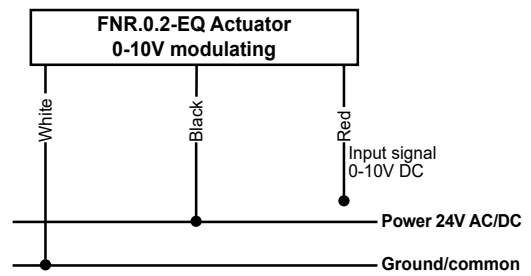
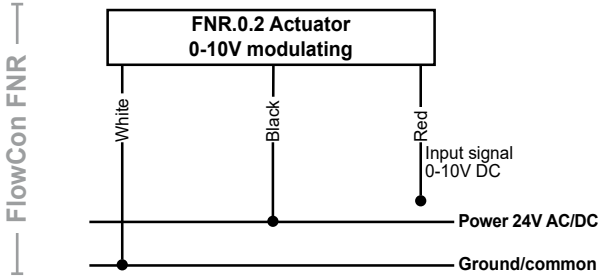
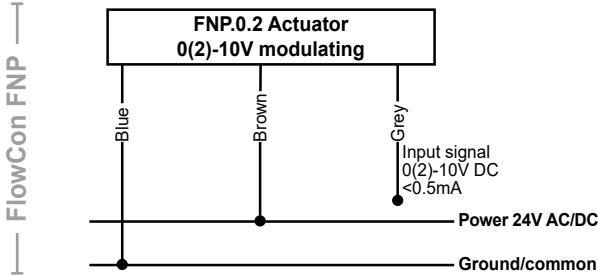
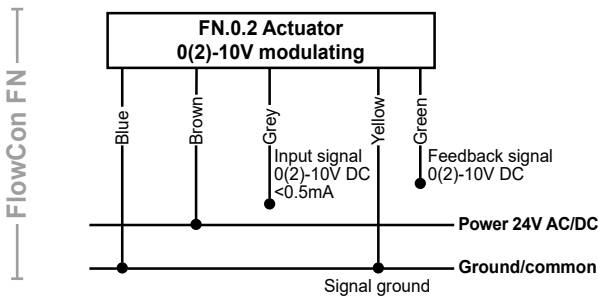
## THERMAL MODULATING



## THERMAL ON/OFF

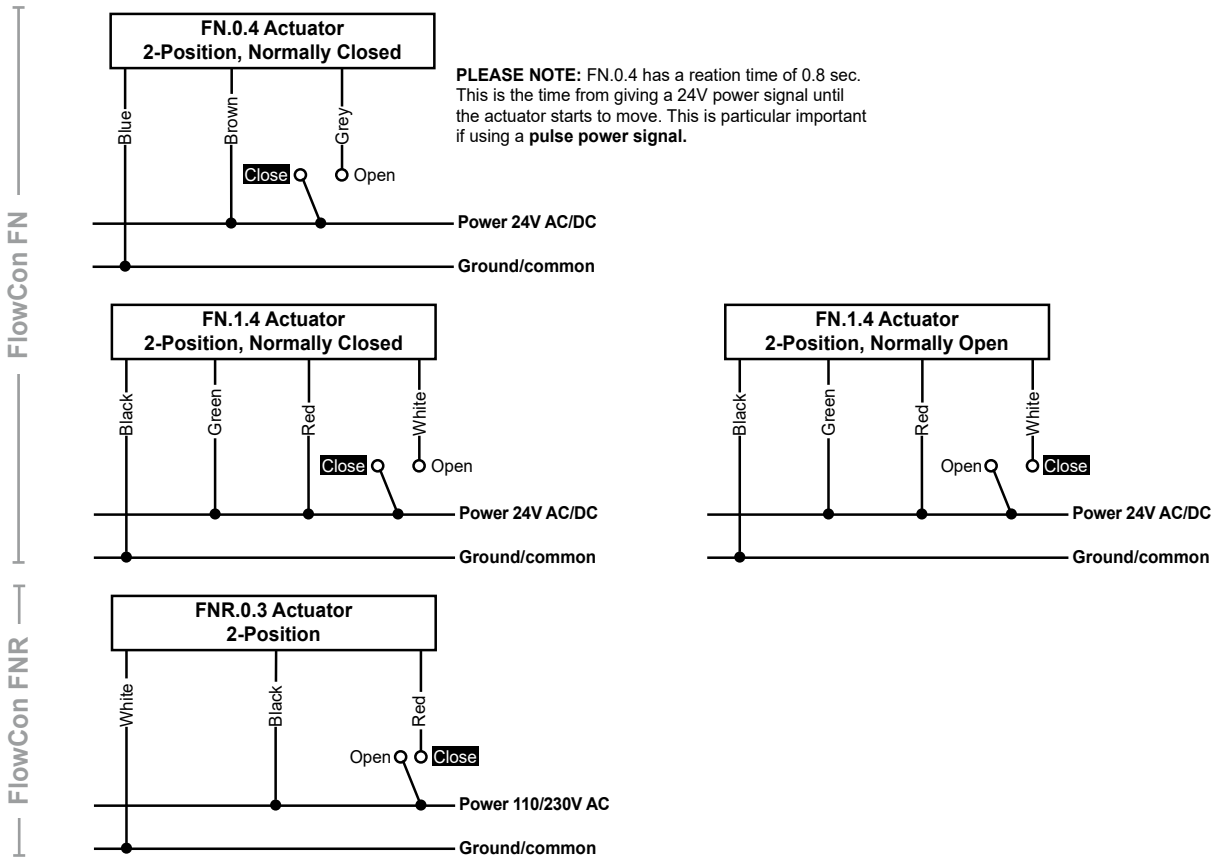


## ELECTRICAL MODULATING



## WIRING INSTRUCTION

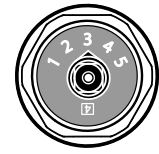
### ELECTRICAL 2-POSITION



## MAXIMUM FLOW RATE LIMITATION SETTINGS

FlowCon Green									
Insert size: 20 mm · 3/4"									
16-600 kPaD · 2.3-87 psid <sup>8</sup>			30-800 kPaD · 4.4-116 psid <sup>9</sup>			35-800 kPaD · 5.1-116 psid <sup>8</sup>			Setting
Green.0 (grey O-ring)			Green.1 (black O-ring)			Green.1HF (black O-ring)			
l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM	
-	-	-	0.0178	64	0.282	-	-	-	1.0
0.0103	37	0.163	0.0393	142	0.624	-	-	-	1.1
0.0233	84	0.370	0.0580	209	0.920	-	-	-	1.2
0.0322	116	0.510	0.0743	268	1.180	-	-	-	1.3
0.0419	151	0.664	0.0887	319	1.41	-	-	-	1.4
0.0500	180	0.792	0.102	366	1.61	0.172	620	2.73	1.5
0.0569	205	0.902	0.113	408	1.80	0.200	720	3.17	1.6
0.0650	234	1.03	0.124	446	1.96	0.228	820	3.61	1.7
0.0719	259	1.14	0.134	482	2.12	0.258	930	4.10	1.8
0.0781	281	1.24	0.143	516	2.27	0.294	1060	4.67	1.9
0.0839	302	1.33	0.152	549	2.42	0.325	1170	5.15	2.0
0.0889	320	1.41	0.161	580	2.56	0.350	1260	5.55	2.1
0.0942	339	1.49	0.170	611	2.69	0.375	1350	5.95	2.2
0.0981	353	1.55	0.178	641	2.82	0.396	1430	6.28	2.3
0.103	371	1.63	0.186	671	2.95	0.417	1500	6.61	2.4
0.106	381	1.68	0.194	700	3.08	0.439	1580	6.96	2.5
0.109	394	1.73	0.202	728	3.21	0.458	1650	7.27	2.6
0.113	406	1.79	0.210	756	3.33	0.481	1730	7.62	2.7
0.115	414	1.82	0.218	783	3.45	0.500	1800	7.93	2.8
0.119	428	1.88	0.225	810	3.56	0.522	1880	8.28	2.9
0.122	439	1.93	0.232	835	3.68	0.542	1950	8.59	3.0
0.125	449	1.98	0.239	860	3.79	0.550	1980	8.72	3.1
0.127	458	2.02	0.245	883	3.89	0.558	2010	8.85	3.2
0.130	468	2.06	0.252	906	3.99	0.567	2040	8.99	3.3
0.133	477	2.10	0.257	927	4.08	0.575	2070	9.12	3.4
0.135	486	2.14	0.263	946	4.17	0.583	2100	9.25	3.5
0.137	494	2.17	0.268	965	4.25	0.597	2150	9.47	3.6
0.140	503	2.21	0.273	982	4.32	0.611	2200	9.69	3.7
0.142	511	2.25	0.277	998	4.39	0.625	2250	9.91	3.8
0.144	518	2.28	0.281	1010	4.46	0.639	2300	10.1	3.9
0.146	526	2.31	0.285	1020	4.51	0.653	2350	10.4	4.0
0.148	532	2.34	0.288	1040	4.57	0.661	2380	10.5	4.1
0.149	538	2.37	0.291	1050	4.61	0.669	2410	10.6	4.2
0.151	544	2.39	0.294	1060	4.66	0.678	2440	10.7	4.3
0.153	549	2.42	0.296	1070	4.70	0.686	2470	10.9	4.4
0.154	553	2.43	0.299	1080	4.73	0.694	2500	11.0	4.5
0.155	559	2.46	0.301	1080	4.77	0.703	2530	11.1	4.6
0.156	563	2.48	0.303	1090	4.80	0.711	2560	11.3	4.7
0.158	567	2.50	0.305	1100	4.83	0.719	2590	11.4	4.8
0.159	571	2.51	0.307	1100	4.86	0.728	2620	11.5	4.9
0.160	575	2.53	0.308	1110	4.89	0.736	2650	11.7	5.0

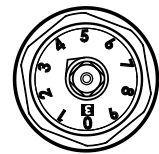
Nominal flow rate



A micrometer **setting of 3.4** as illustrated above corresponds to a maximum flow rate of

**Green.0:** 0.133 l/sec (2.10 GPM)

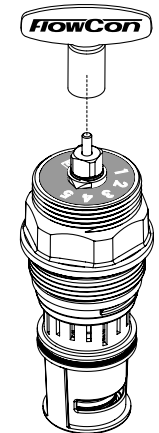
**Green.1:** 0.257 l/sec (4.08 GPM)



Scale setting for **Green.1HF** is reversed.

A micrometer **setting of 3.4** as illustrated above corresponds to a maximum flow rate of

**Green.1HF:** 0.575 l/sec (9.12 GPM)

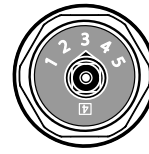


Use the special key (FlowCon part no. ACC0001) for micrometer setting.

Accuracy: Greatest of either ±10% of controlled flow rate or ±5% of maximum flow rate.  
 Note 8: If used in pressure range 200-600 kPaD (29-87 psid), accuracy of -20% / +0% applies.  
 Note 9: If used in pressure range 400-800 kPaD (58-116 psid), accuracy of -20% / +0% applies.

## MAXIMUM FLOW RATE LIMITATION SETTINGS

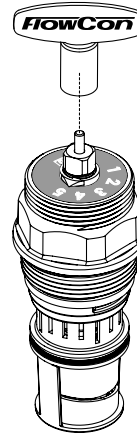
FlowCon GreEQ							
Insert size: 20 mm · 3/4"							
Nominal flow rate	16-600 kPaD · 2.3-87 psid <sup>10</sup>			30-800 kPaD · 4.4-116 psid <sup>11</sup>			Setting
	GreEQ.0 (grey O-ring)			GreEQ.1 (black O-ring)			
	l/sec	l/hr	GPM	l/sec	l/hr	GPM	
	0.00482	17.3	0.0763	0.00764	27.5	0.121	1.0
	0.00548	19.7	0.0868	0.00880	31.7	0.139	1.1
	0.00629	22.6	0.0995	0.0102	36.7	0.162	1.2
	0.00724	26.1	0.115	0.0119	42.8	0.188	1.3
	0.00836	30.1	0.132	0.0139	49.9	0.219	1.4
	0.00965	34.7	0.153	0.0161	58.0	0.255	1.5
	0.0111	40.0	0.176	0.0187	67.3	0.296	1.6
	0.0128	45.9	0.202	0.0216	77.6	0.342	1.7
	0.0146	52.5	0.231	0.0248	89.1	0.392	1.8
	0.0166	59.7	0.263	0.0283	102	0.448	1.9
	0.0188	67.7	0.298	0.0322	116	0.509	2.0
	0.0212	76.3	0.336	0.0364	131	0.576	2.1
	0.0238	85.6	0.377	0.0409	147	0.647	2.2
	0.0266	95.6	0.421	0.0457	164	0.723	2.3
	0.0295	106	0.467	0.0508	183	0.805	2.4
	0.0327	118	0.517	0.0563	202	0.891	2.5
	0.0360	129	0.569	0.0620	223	0.982	2.6
	0.0394	142	0.624	0.0680	245	1.08	2.7
	0.0431	155	0.681	0.0743	267	1.18	2.8
	0.0468	168	0.741	0.0809	291	1.28	2.9
	0.0507	182	0.803	0.0876	315	1.39	3.0
	0.0547	197	0.866	0.0946	340	1.50	3.1
	0.0588	212	0.931	0.102	366	1.61	3.2
	0.0630	227	0.998	0.109	392	1.73	3.3
	0.0673	242	1.07	0.117	419	1.84	3.4
	0.0716	258	1.13	0.124	446	1.96	3.5
	0.0760	273	1.20	0.132	474	2.08	3.6
	0.0804	289	1.27	0.139	501	2.21	3.7
	0.0847	305	1.34	0.147	529	2.33	3.8
	0.0890	320	1.41	0.155	557	2.45	3.9
	0.0933	336	1.48	0.162	584	2.57	4.0
	0.0975	351	1.54	0.170	611	2.69	4.1
	0.102	365	1.61	0.177	637	2.80	4.2
	0.105	379	1.67	0.184	662	2.91	4.3
	0.109	393	1.73	0.191	687	3.02	4.4
	0.113	406	1.78	0.198	711	3.13	4.5
	0.116	417	1.84	0.204	733	3.22	4.6
	0.119	428	1.88	0.209	754	3.32	4.7
	0.122	438	1.93	0.215	773	3.40	4.8
	0.124	447	1.97	0.220	790	3.48	4.9
	0.126	454	2.00	0.224	805	3.54	5.0



A micrometer **setting of 3.4** as illustrated above corresponds to a maximum flow rate of

**GreEQ.0:** 0.0673 l/sec (1.07 GPM)

**GreEQ.1:** 0.117 l/sec (1.84 GPM)



Use the special key (FlowCon part no. ACC0001) for micrometer setting.

Standard accuracy: Greatest of either ±10% of controlled flow rate or ±5% of maximum flow rate.

Note 10: If used in pressure range 200-600 kPaD (29-87 psid), greatest of either standard accuracy or -20% / +0% applies.

Note 11: If used in pressure range 400-800 kPaD (58-116 psid), greatest of either standard accuracy or -20% / +0% applies.

## GENERAL SPECIFICATIONS

### 1. TERMINAL BYPASS UNIT - FLOWCON BY-PASS ASSEMBLY

- 1.1. Contractor shall install valve set where indicated in drawings.
- 1.2. Valve set shall consist of a 3-way bypass unit, a strainer with blowdown valve and a PICV housing with flushing cap.
- 1.3. Valve set shall be prefab-models, factory assembled and tested.
- 1.4. Valve set center distance shall be 80 mm (3.15 in).

### 2. BY-PASS - FLOWCON BY-PASS UNIT

- 2.1. By-Pass shall consist of forged brass DZR ASTM CuZn36Pb2As rated at no less than 2500 kPa (360 psi) and +120°C (+248°F).
- 2.2. By-Pass shall include two 3-way isolating balls of nickel-plated brass.
- 2.3. By-Pass shall be operated by two extended 3-finger handles.

### 3. STRAINER - FLOWCON F-STRAINER

- 3.1. Housing shall consist of forged brass DZR ASTM CuZn36Pb2As rated at no less than 2500 kPa (360 psi) and +120°C (+248°F).
- 3.2. Housing shall be permanently marked to show direction of flow.
- 3.3. Housing shall be configured for strainer mesh accessibility.
- 3.4. Strainer mesh shall be 420µ.
- 3.5. Strainer blowdown valve shall be standard.

### 4. VALVE ACTUATOR

#### 4.a. FlowCon FT actuators

- 4.a.1. Actuator housing shall be rated to IP54, including upside-down mounting.
- 4.a.2. Actuator shall be driven by 24V or 230V AC, and shall depending on actuator choice accept 0-10V DC or ON/OFF control signal.
- 4.a.3. Actuator shall use full stroke and provide full authority.
- 4.a.4. Actuator shall have visible indication of stroke position.
- 4.a.5. Failsafe function shall be available on all version.

OR...

#### 4.b. FlowCon FN actuators

- 4.b.1. Actuator housing shall be rated to IP54. 360° mounting shall be acceptable.
- 4.b.2. Actuator shall be driven by 24V AC/DC, and shall depending on actuator choice accept 0(2)-10V DC, 3-point floating or 2-position control signal.
- 4.b.3. Actuator shall use full stroke and provide full authority.
- 4.b.4. Actuator shall have visible indication of stroke position.
- 4.b.5. Feedback signal equal to control signal shall be standard on modulating versions.
- 4.b.6. Failsafe version shall be available for 3-point floating and 2-position versions.
- 4.b.7. Optional auto stroke function shall be available on modulating version.
- 4.b.8. Override shall be possible.
- 4.b.9. LED indicator for actuator status shall be standard.
- 4.b.10. DIP switch settable control mode (linear flow or equal percentage) shall be standard.

OR...

#### 4.c. FlowCon FNP actuators

- 4.c.1. Actuator housing shall be rated to IP54. 360° mounting shall be acceptable.
- 4.c.2. Actuator shall be driven by 24V AC/DC and accept 0(2)-10V DC control signal.
- 4.c.3. Actuator shall use full stroke and provide full authority.
- 4.c.4. Actuator shall have visible indication of stroke position.
- 4.c.5. Optional auto stroke function shall be available on modulating version.
- 4.c.6. Override shall be possible.
- 4.c.7. LED indicator for actuator status shall be standard.
- 4.c.8. DIP switch settable control mode (linear flow or equal percentage) shall be standard.

OR...

#### 4.d. FlowCon FNR actuators

- 4.d.1. Actuator housing shall be rated to IP54. 360° mounting shall be acceptable.
- 4.d.2. Actuator shall be driven by 24V AC/DC or 110V/230V AC, and shall depending on actuator choice and accept 0(2)-10V DC, 3-point floating or 2-position control signal.
- 4.d.3. Actuator shall use full stroke and provide full authority.
- 4.d.4. Actuator shall have visible indication of stroke position.
- 4.d.5. Manual override shall be possible.

## GENERAL SPECIFICATIONS

OR....

### 4.e. **FlowCon FNJ actuators**

- 4.e.1. Actuator housing shall be rated to IP54. 180° mounting shall be acceptable.
- 4.e.2. Actuator shall be driven by 24V AC/DC, and shall accept 0-10V DC control signal.
- 4.e.3. Actuator shall use full stroke and provide full authority.
- 4.e.4. Actuator shall have visible indication of stroke position.
- 4.e.5. Feedback signal of 0-10V DC shall be standard.
- 4.e.6. Failsafe version shall be standard.

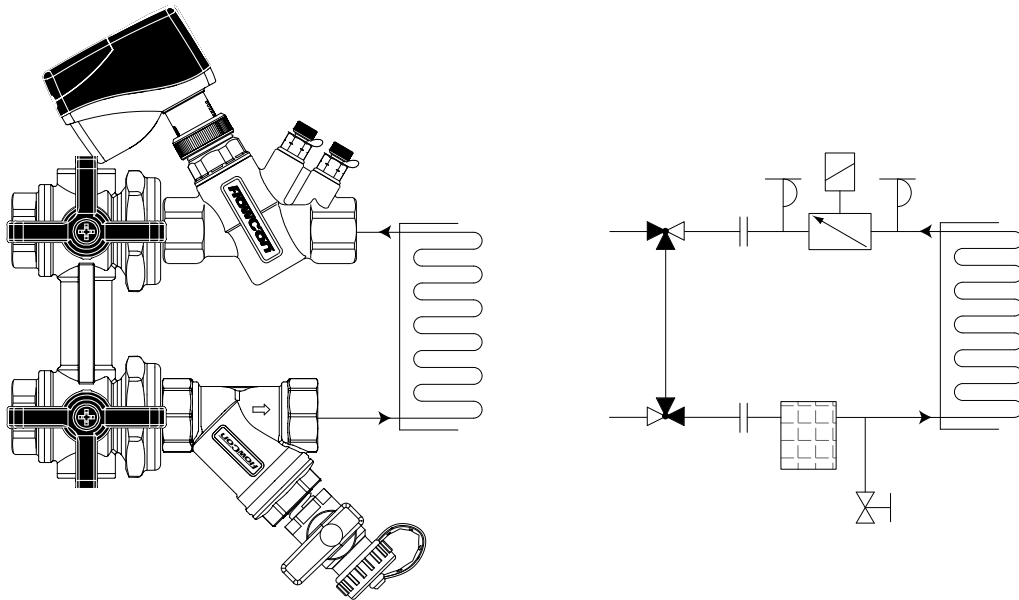
## 5. VALVE HOUSING - FLOWCON AB

- 5.1. Valve housing shall consist of forged brass DZR ASTM CuZn36Pb2As, rated at no less than 2500 kPa (360 psi) static pressure and +120°C (+248°F).
- 5.2. Valve housing shall be permanently marked to show direction of flow.
- 5.3. Pressure/temperature test plugs for verifying accuracy of flow performance shall be standard for all valve sizes.
- 5.4. Valve housing shall be configured for flow regulation unit accessibility.

## 6. FLOW REGULATION UNIT - FLOWCON GREEN INSERT / FLOWCON GREEQ INSERT

- 6.1. Flow regulation unit shall consist of glass-reinforced PSU/POM/PPS with an EPDM diaphragm.
- 6.2. Flow regulation unit shall be readily accessible, for change-out or maintenance.
- 6.3. Flow regulation unit shall be externally adjustable to 1 of 41 different flow rates without limiting the stroke length. Flow regulation unit shall be adjustable with the valve in-line and the system in operation.
- 6.4. Flow regulation unit shall be available in 3 different operational pressure ranges; minimum range shall be capable of being activated by 16 kPaD (2.3 psid). Further, the flow regulation unit shall be capable of controlling the flow within  $\pm 10\%$  of controlled flow or  $\pm 5\%$  of maximum flow.

## APPLICATION EXAMPLE DN20



## UPDATES

For latest updates please see [www.flowcon.com](http://www.flowcon.com)

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