

# FlowCon By-Pass Assembly

**2-Union 3-Way By-Pass Assembly  
20-25 mm / 3/4"-1"**



## SPECIFICATIONS

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

Static pressure:	2000 kPa / 290 psi
Media temperature:	-20°C to +120°C / -4°F to +248°F
Material:	
- Housings and cover:	Forged brass DZR ASTM CuZn36Pb2As (CW602N)
- Extension set:	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:	420μ (=40 mesh) stainless steel
- Drain valve:	Brass DZR ASTM CuZn36Pb2As (CW602N)
- Drain ball valve:	Chemically nickel-plated brass
- Drain valve handle:	Painted aluminium
End connection:	Female ISO
Body taps:	1/4" ISO

Note 1: Assembly comes complete and fully pressure tested.

## SPECIFICATIONS

### FlowCon Green 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:	linear (may be converted to equal % on actuator)
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 FT Actuator<sup>2</sup>

FlowCon Actuator <sup>5</sup>	FT.0.3	FT.0.4
Supply voltage	230V AC $\pm 10\%$ , 50/60 Hz	24V AC/DC -10%...+20%, 50/60 Hz
Type	Thermal	Thermal
Power consumption	1.2 W	1.2 W
Control signal	ON/OFF, normally closed	ON/OFF, normally closed
Failsafe function	Yes	Yes
Operation time <sup>3</sup>	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
Protection	IP54, Class II incl. upside-down	IP54, Class III incl. upside-down
Cable	Fixed, 1 meter / 3.3 ft	Fixed, 1 meter / 3.3 ft
Weight	0.11 kg / 0.24 lb	0.11 kg / 0.24 lb

Note 2: FlowCon warranty is voided using other actuators than supplied by FlowCon International.  
 Note 3: Closing time is app. the double depending on ambient temperature.

### FlowCon FN Actuator<sup>4</sup>

FlowCon Actuator <sup>5</sup>	FN.0.2	FN.0.3	FN.0.4	FN.1.2
Supply voltage	24V AC/DC $\pm 10\%$ , 50/60 Hz	110/230V AC $\pm 10\%$ , 50/60 Hz	24V AC/DC $\pm 10\%$ , 50/60 Hz	24V AC/DC $\pm 10\%$ , 50/60 Hz
Type	Electrical, bi-directional synchronous motor			
Power consumption	24V AC 2.5VA / 24V DC 1.2W	5VA	24V AC 2.5VA / 24V DC 1.2W	6VA, 10VA peak
Control signal	0(2)-10V DC, <0.5mA	2-position or 3-point floating	2-position or 3-point floating	Analog 0(2)-10V DC
Failsafe function	No	No	No	Yes
Operation time	22 sec/mm	18.5 sec/mm	22 sec/mm	50 Hz: 19 sec/mm
Ambient temperature	0°C to +50°C / +32°F to +122°F	+2°C to +50°C / +36°F to +122°F	0°C to +50°C / +32°F to +122°F	+2°C to +50°C / +36°F to +122°F
Protection	IP54, class III (IP40 upside-down), indoor use only	IP54, class II	IP54, class III (IP40 upside-down), indoor use only	IP54, class II
Cable	Fixed, 5 wires x 0.50 mm <sup>2</sup> , 1.5 m / AWG20, 4.9 ft	Fixed, 3 wires x 0.33 mm <sup>2</sup> , 1 m / AWG22, 3.3 ft	Fixed, 3 wires x 0.50 mm <sup>2</sup> , 1.5 m / AWG20, 4.9 ft	Fixed, 4 wires AWG22 halogen free cable, 1 m / 3 ft
Weight	0.25 kg / 0.55 lb	0.25 kg / 0.55 lb	0.25 kg / 0.55 lb	0.30 kg / 0.66 lb

Note 4: FlowCon warranty is voided using other actuators than supplied by FlowCon International.

## SPECIFICATIONS

### **FlowCon EVS with Stainless Steel insert**

Material:	
- Insert:	Stainless steel
- Body:	Brass ASTM B584 and polyoxymethylene
- Spring:	Stainless steel type 17-7
- Spindle:	Brass
- Seat plug and O-rings:	EPDM
Maximum close off pressure:	390 kPa / 57 psi
Maximum operational ΔP:	390 kPaD / 57 psid
Shut-off leakage:	IEC 60534-4, Class V
Weight:	0.16 kg / 0.35 lb

### **FlowCon EV Actuator<sup>5</sup>**

FlowCon Actuator <sup>5</sup>	EV.0.3	EV.0.4
Supply voltage	230V AC ±10%, 50/60 Hz	24V AC/DC -10%...+20%, 50/60 Hz
Type	Thermal	Thermal
Power consumption	1.0 W	1.0 W
Control signal	ON/OFF, normally closed	ON/OFF, normally closed
Failsafe function	Yes	Yes
Operation time <sup>6</sup>	App. 4 minutes	App. 4 minutes
Ambient temperature	0°C to +60°C / +32°F to +140°F	0°C to +60°C / +32°F to +140°F
Protection	IP54, Class II incl. upside-down	IP54, Class III incl. upside-down
Cable	Fixed, 1 meter / 3.3 ft	Fixed, 1 meter / 3.3 ft
Weight	0.116 kg / 0.26 lb	0.116 kg / 0.26 lb

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

Note 6: Closing time is app. the double depending on ambient temperature.

### **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)

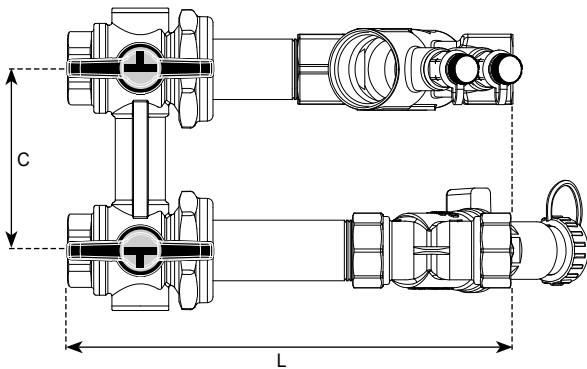
### **FlowCon Flex hoses**

Static pressure:	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 CuZn40Pb2 (CW617N)
- Nuts:	Brass ASTM CuZn39Pb3 (CW614N)
Working pressure:	600-1500 kPa / 87-218 psi
Bending radius:	DN20 (3/4"): 75 mm / 2.95 in DN25 (1"): 90 mm / 3.54 in
End connections:	Male/Female ISO

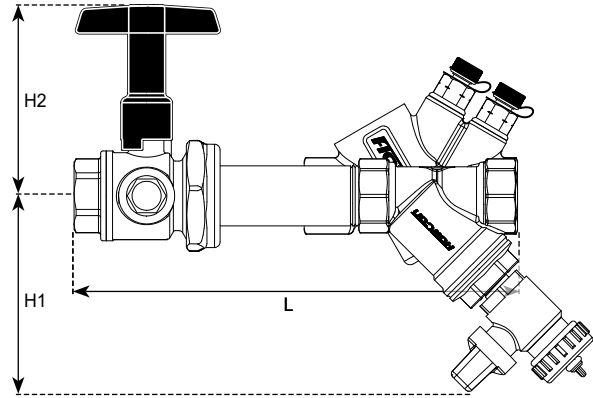
## DIMENSIONS AND WEIGHT (NOMINAL)

Model no.	Valve size	Insert size	C	L	H1	H2	D (depth)	Weight <sup>7</sup>
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	kg (lb)
F3900.20.U.052.02.000.00.0.N	20 (3/4)	20 (3/4)	80 (3.15)	197 (7.76)	88 (3.47)	80 (3.15)	-	2.21 (4.87)
F3900.20.U.062.07.000.00.0.N	25 (1)			204 (8.03)	96 (3.78)		-	2.32 (5.12)
IF39XX (Insulation shell)	-	-	-	290 (11.4)	192 (7.56)	-	190 (7.48)	0.21 (0.46)

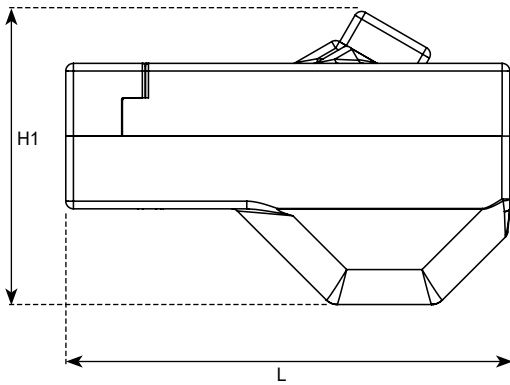
Note 7: Dimensions and weight do not include insert or actuator.



*FlowCon By-Pass Assembly - top view*



*FlowCon By-Pass Assembly - side view*



*FlowCon Insulation Shell for By-Pass Assembly*

## MODEL NUMBER SELECTION

**F3900**

Insert By-Pass size:  
**20**=small (standard)

Select handle orientation:  
**U**=Up (standard)

Select strainer type and size:  
**052**=20mm strainer incl. blowdown  
**062**=25mm strainer incl. blowdown

Select AB size (p/t plugs standard):  
**02**=20mm housing with p/t plugs  
**07**=25mm housing with p/t plugs

Select insert type:  
**000**=no insert  
**EVS**=EVS with SS insert  
**G0**=Green.0  
**G1**=Green.1

Select actuator type:  
**00**=no actuator  
**03**=EV.0.3, 230V thermal ON/OFF, NC – for EVS  
**04**=EV.0.4, 24V thermal ON/OFF, NC – for EVS  
**23**=FT.0.3, 230V thermal ON/OFF, NC – for Green  
**24**=FT.0.4, 24V thermal ON/OFF, NC – for Green  
**32**=FN.0.2, 24V electrical modulating – for Green  
**33**=FN.0.3, 230V electrical 3-point-floating/2-position – for Green  
**34**=FN.0.4, 24V electrical 3-point-floating/2-position – for Green  
**42**=FN.1.2, 24V electrical modulating/2-position failsafe – for Green

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

Select insulation:  
**N**=without insulation shell  
**Y**=with insulation shell

Example: F3900.20.U.062.07.G0.32.0.Y=FlowCon By-Pass assembly incl. F-Strainer 25 mm (1") ISO female threaded body DZR brass incl. blowdown and AB-housing 25 mm (1") ISO female threaded body DZR brass incl. p/t plugs. AB-housing includes a Green.0 insert and an electrical 24V modulating actuator.

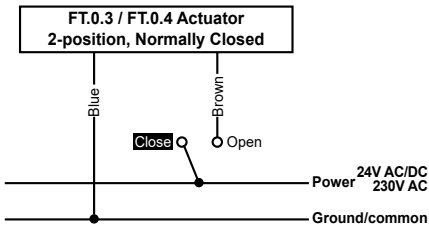
### Please note:

- $\Delta P$  range and max. flow for the insert is to be specified separately.
- Strainer will always be facing down, and bypass handles and outlet valve will be facing up.
- All By-Pass Assemblies come complete and fully pressure tested.
- Insert, actuator and insulation shell may be delivered separately.

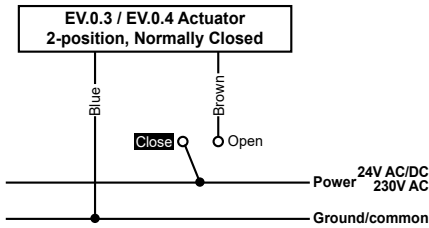
For other configurations and options, please see the FlowCon By-Pass technotes.

## WIRING INSTRUCTION

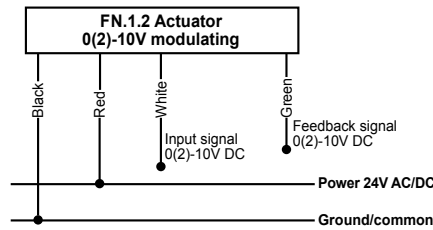
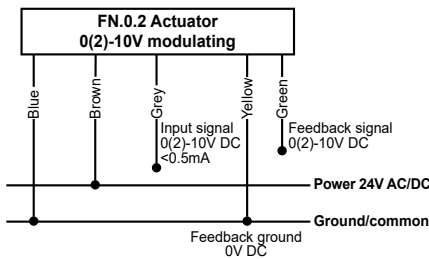
### FlowCon FT (digital)



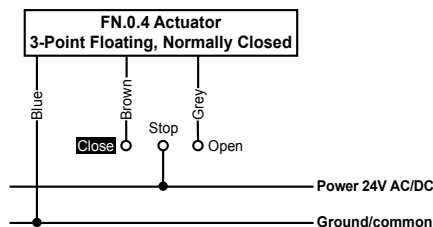
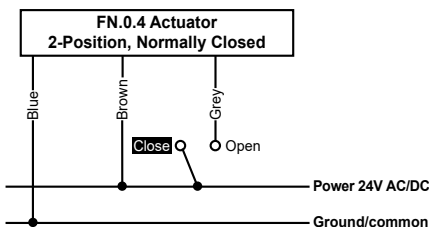
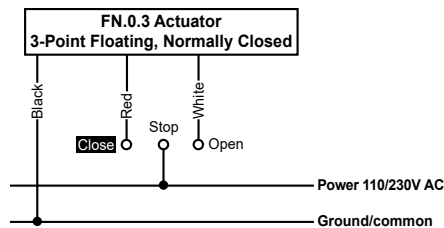
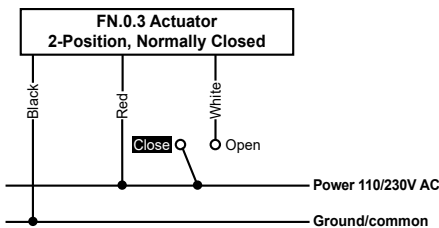
### FlowCon EV (digital)



### FlowCon FN (analog)



### FlowCon FN (digital)



## MAXIMUM FLOW RATE LIMITATION SETTINGS

FlowCon Stainless Steel									
Insert size: 20 mm · 3/4"									
Pressure range, ΔP:			10-95 kPaD 1-14 psid		22-210 kPaD 2-32 psid		40-390 kPaD 4-57 psid		
			Type 1		Type 2		Type 4		
Nominal flow rate	I/sec	I/hr	GPM	Marking	FlowCon	Marking	FlowCon	Marking	FlowCon
	0.0210	75.7	0.333	11-1	F360111				
0.0315	114	0.500	01-1	F360101					
0.0347	125	0.550			11-2	F360211			
0.0421	151	0.667	02-1	F360102					
0.0473	170	0.750			01-2	F360201	11-4	F360411	
0.0631	227	1.00	03-1	F360103	02-2	F360202	01-4	F360401	
0.0694	250	1.10							
0.0841	303	1.33	04-1	F360104			02-4	F360402	
0.0946	341	1.50			03-2	F360203			
0.105	379	1.67	05-1	F360105					
0.126	454	2.00	06-1	F360106	04-2	F360204	03-4	F360403	
0.147	530	2.33	07-1	F360107					
0.158	568	2.50			05-2	F360205			
0.168	606	2.67	08-1	F360108			04-4	F360404	
0.189	681	3.00			06-2	F360206			
0.210	757	3.33	10-1	F360110			05-4	F360405	
0.221	795	3.50			07-2	F360207			
0.252	908	4.00	12-1	F360112	08-2	F360208	06-4	F360406	
0.294	1060	4.67	14-1	F360114			07-4	F360407	
0.315	1140	5.00	16-1	F360116	10-2	F360210			
0.336	1210	5.33					08-4	F360408	
0.379	1360	6.00			12-2	F360212			
0.421	1511	6.67					10-4	F360410	
0.442	1590	7.00			14-2	F360214			
0.505	1820	8.00			16-2	F360216	12-4	F360412	
0.589	2120	9.33					14-4	F360414	
0.631	2270	10.0					16-4	F360416	

Accuracy: ±5% of controlled flow rate.

FlowCon Green							Setting
Insert size: 20 mm · 3/4"							
16-600 kPaD · 2.3-87 psid <sup>10</sup>			30-800 kPaD · 4.4-116 psid <sup>11</sup>				
FlowCon Green.0 (grey o-ring)			FlowCon Green.1 (black o-ring)				
Nominal flow rate	I/sec	I/hr	GPM	I/sec	I/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	1.5	
0.0569	205	0.902	0.113	408	1.80	1.6	
0.0650	234	1.03	0.124	446	1.96	1.7	
0.0719	259	1.14	0.134	482	2.12	1.8	
0.0781	281	1.24	0.143	516	2.27	1.9	
0.0839	302	1.33	0.152	549	2.42	2.0	
0.0889	320	1.41	0.161	580	2.56	2.1	
0.0942	339	1.49	0.170	611	2.69	2.2	
0.0981	353	1.55	0.178	641	2.82	2.3	
0.103	371	1.63	0.186	671	2.95	2.4	
0.106	381	1.68	0.194	700	3.08	2.5	
0.109	394	1.73	0.202	728	3.21	2.6	
0.113	406	1.79	0.210	756	3.33	2.7	
0.115	414	1.82	0.218	783	3.45	2.8	
0.119	428	1.88	0.225	810	3.56	2.9	
0.122	439	1.93	0.232	835	3.68	3.0	
0.125	449	1.98	0.239	860	3.79	3.1	
0.127	458	2.02	0.245	883	3.89	3.2	
0.130	468	2.06	0.252	906	3.99	3.3	
0.133	477	2.10	0.257	927	4.08	3.4	
0.135	486	2.14	0.263	946	4.17	3.5	
0.137	494	2.17	0.268	965	4.25	3.6	
0.140	503	2.21	0.273	982	4.32	3.7	
0.142	511	2.25	0.277	998	4.39	3.8	
0.144	518	2.28	0.281	1010	4.46	3.9	
0.146	526	2.31	0.285	1020	4.51	4.0	
0.148	532	2.34	0.288	1040	4.57	4.1	
0.149	538	2.37	0.291	1050	4.61	4.2	
0.151	544	2.39	0.294	1060	4.66	4.3	
0.153	549	2.42	0.296	1070	4.70	4.4	
0.154	553	2.43	0.299	1080	4.73	4.5	
0.155	559	2.46	0.301	1080	4.77	4.6	
0.156	563	2.48	0.303	1090	4.80	4.7	
0.158	567	2.50	0.305	1100	4.83	4.8	
0.159	571	2.51	0.307	1100	4.86	4.9	
0.160	575	2.53	0.308	1110	4.89	5.0	

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), accuracy of -20% / +0% applies.

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

## ACCESSORIES

- Side option: ACC10003
- P/t plug: ACC00113
- Extension set: ACC1540 (DN20), ACC1550 (DN25)
- F-Strainer mesh: ACC11020 (DN20), ACC11030 (DN25)
- Blowdown valve: ACC913302
- Flushing cap: ACC0080
- Insulation shell: IF3900 (DN20), IF3925 (DN25).

## GENERAL SPECIFICATIONS

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

- 1.1. Contractor shall install bypass and valves where indicated in drawings.

### 2. STRAINER - FLOWCON F-STRAINER

- 2.1. Housing shall consist of forged brass DZR ASTM CuZn36Pb2As rated at no less than 2000 kPa (290 psi) and +120°C (+248°F).
- 2.2. Housing shall be permanently marked to show direction of flow.
- 2.3. Housing shall be configured for strainer mesh accessibility.
- 2.4. Strainer mesh shall be 420 $\mu$ .
- 2.5. Strainer blowdown valve shall be standard.

### 3. VALVE ACTUATOR

- 3.a. FlowCon EV actuators or FT actuators
  - 3.a.1. Actuator housing shall be rated to IP54, including upside-down mounting.
  - 3.a.2. Actuator shall be driven by 24V or 230V AC and shall accept ON/OFF control signal.
  - 3.a.3. Actuator shall use full stroke and provide full authority.
  - 3.a.4. Actuator shall have visible indication of stroke position.
- 3.b. FlowCon FN actuators
  - 3.b.1. Actuator housing shall be rated to IP54. 360° mounting shall be acceptable, IP40 at 180°.
  - 3.b.2. Actuator shall be driven by 24V AC/DC or 110V/230V AC and shall depending on actuator choice accept 0(2)-10V DC, 3-point flowing or 2-position control signal.
  - 3.b.3. Actuator shall use full stroke and provide full authority.
  - 3.b.4. Actuator shall have visible indication of stroke position.

### 4. VALVE HOUSING – FlowCon AB

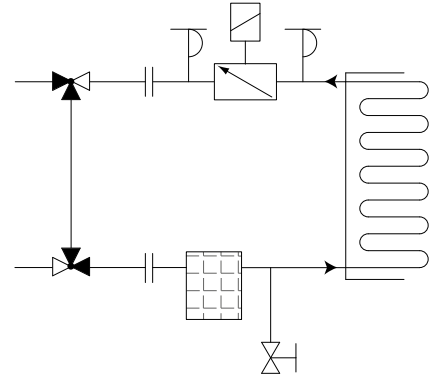
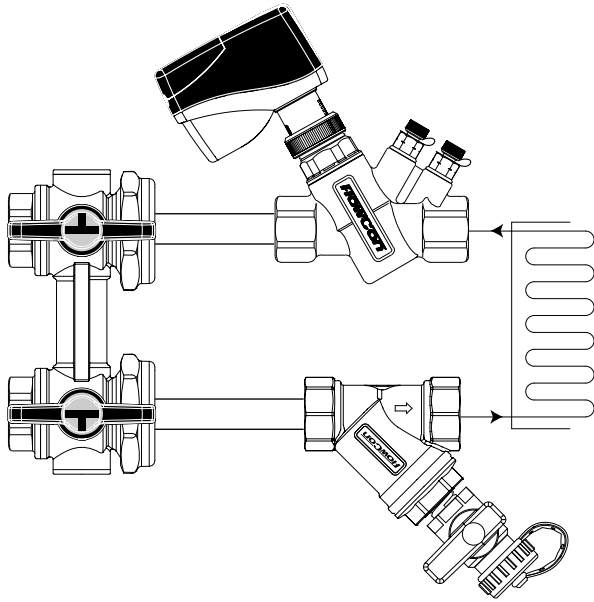
- 4.1. Valve housing shall consist of forged brass DZR ASTM CuZn36Pb2As, rated at no less than 2500 kPa (360 psi) static pressure and +120°C (+248°F).
- 4.2. Valve housing shall be permanently marked to show direction of flow.
- 4.3. Pressure /temperature test plugs for verifying accuracy of flow performance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

### 5. FLOW REGULATION UNIT

- 5.a. FlowCon Stainless Steel insert
  - 5.a.1. Flow regulation unit shall be manufactured of AISI type 304 stainless steel and stainless steel 17-7 spring.
  - 5.a.2. Flow regulation unit shall be readily accessible, for change-out or maintenance.
  - 5.a.3. Flow regulation unit shall be available in 3 different kPaD operational ranges; minimum range shall be capable of being activated by minimum 10 kPaD (1.45 psid). Further, the flow regulation unit shall be capable of controlling the flow within  $\pm 5\%$  of rated flow.
  - 5.a.4. Identification tags shall be available for all valves; tags shall be indelibly marked with part number and flow rate.
- 5.b. FlowCon Green insert
  - 5.b.1. Flow regulation unit shall consist of glass-reinforced PSU/POM/PPS with an EPDM diaphragm.
  - 5.b.2. Flow regulation unit shall be readily accessible, for change-out or maintenance.
  - 5.b.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.
  - 5.b.4. Flow regulation unit shall be available in 2 different kPaD operational ranges; minimum range shall be capable of being activated by minimum 16 kPaD (2.3 psid). Further, the flow regulation unit shall be capable of controlling the flow within  $\pm 10\%$  of rated flow or  $\pm 5\%$  of maximum flow.



## APPLICATION EXAMPLE DN40



## UPDATES

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

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