

FlowCon SM 15-40mm

Dynamic Self Balancing Control Valve



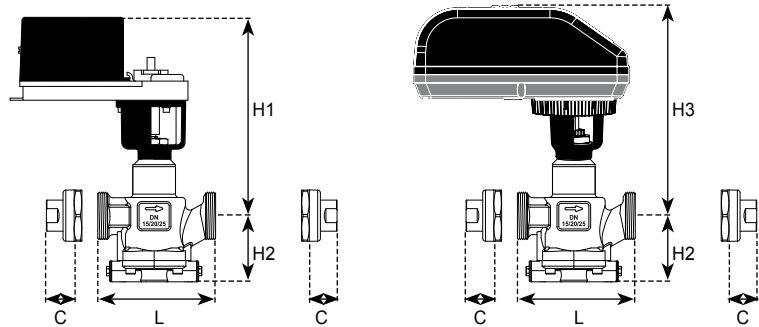
SPECIFICATIONS

Pressure rating:	2500 kPa / 360 psi
Temperature rating, media:	-20°C to +120°C / -4°F to +248°F
Temperature rating, ambient:	-10°C to +50°C / +14°F to +122°F
Material:	
- Diaphragm:	Hydrogenated acrylonitrile-butadiene-rubber
- Body:	Forged brass ASTM CuZn40Pb2
- Union end connections:	Brass alloy ISO or NPT
- O-rings:	EPDM
- Internal metal components:	Stainless steel
Body tappings :	1/4" NPT
Maximum close off pressure:	600 kPa / 87 psi
Maximum operational ΔP :	320 kPaD / 46 psid
Flow rate range:	0.176-2.34 l/sec / 2.78-37.1 GPM

DIMENSIONS AND WEIGHTS (NOMINAL) (measured in mm unless noted)

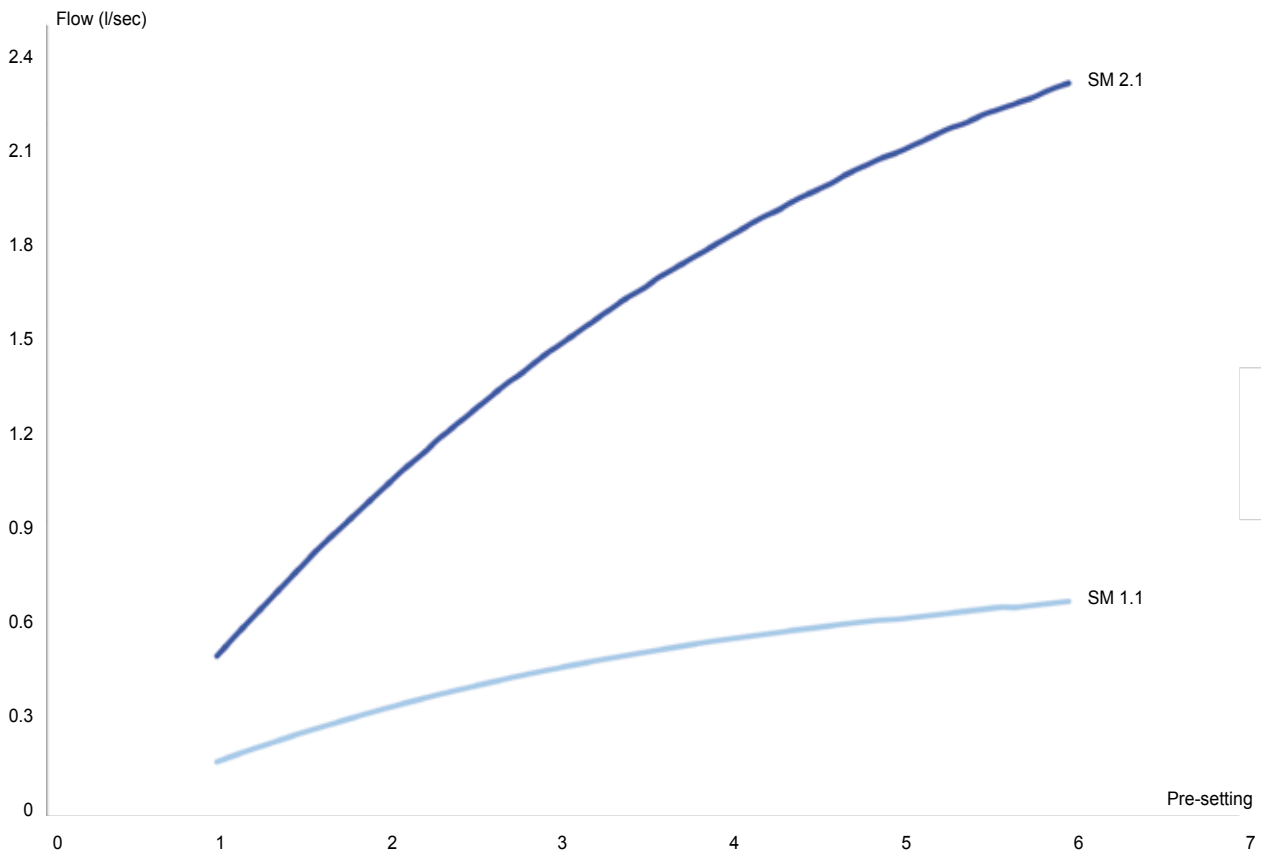
Model no.	Valve size	L	H1 with actuator SM.0.0.0.1	H2	H3 with actuator SM.0.0.0.3/4/5/6	End connections C'			Weight ² (kgs.) with actuator SM.0.0.0.1 (w/o end conn.)	Weight ² (kgs.) with actuator SM.0.0.0.3/4/5/6 (w/o end conn.)
						ISO Female	ISO Male	Sweat		
SM.1.1	15	108	182	59	185	22	25	20	2.6	2.9
	20					22	25	20		
	25					N/A	39	22		
SM.2.1	25	149	232	63	235	35	40	34	4.3	4.6
	32					33	40	37		
	40					33	42	N/A		

Note 1: Add end connection length to body length.
 Note 2: Weight includes valve and actuators.



FLOW RATE TABLE

Model no.	Valve size		Control range		Minimum setting			Maximum setting			Shut-off leakage
	mm	inch	kPaD	psid	l/sec	l/hr	GPM	l/sec	l/hr	GPM	
SM.1.1	15	1/2"	32-320	4.6-46	0.176	634	2.78	0.685	2470	10.9	Leakage<0.05% of Kvs Kvs=4.1 m³/hr
	20	3/4"									
	25	1"									
SM.2.1	25	1"	40-320	5.8-46	0.513	1850	8.13	2.34	8420	37.1	Leakage<0.05% of Kvs Kvs=12.6 m³/hr
	32	1 1/4"									
	40	1 1/2"									



MODEL NUMBER SELECTION

SM 1

Insert body size:
1=15-25mm, 1/2"-1" **2**=25-40mm, 1"-1 1/2"

Insert dP control range:
1=standard

Insert p/t plug requirements:
B=pressure/temperature plugs **P**=taps plugged (standard)

Insert actuator selection:
1=brush/basic (standard, SM.0.0.0.1) **3**=display (SM.0.0.0.3) **4**=display and failsafe (SM.0.0.0.4)
5=display and BACnet (SM.0.0.0.5) **6**=display, BACnet and failsafe (SM.0.0.0.6)

Insert inlet x outlet union end connections:

Body size	Female threaded	Male treaded	Sweat
15-25mm, 1/2"-1"	E =15mm=1/2" F =20mm=3/4"	H =15mm=1/2" I =20mm=3/4" J =25mm=1"	K =15mm L =18mm M =22mm
25-40mm, 1"-1 1/2"	G =25mm=1" P =32mm=1 1/4" Q =40mm=1 1/2"	J =25mm=1" S =32mm=1 1/4" T =40mm=1 1/2"	N =28mm W =35mm

Insert connections standard:
I=ISO **N**=NPT

Example: SM.2.1.B.1.Q.Q.I=SM 25-40mm body with p/t plugs, standard brush basic actuator and 40mm ISO female threaded end connections.

ACTUATOR SPECIFICATIONS³

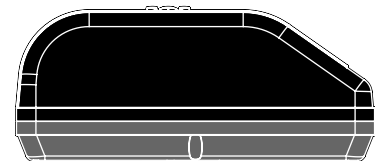
FlowCon SM.0.0.0.1 actuator

Supply voltage: 24V AC or 30V DC
 Power consumption: 20VA @ 26V AC
 Frequency: 50/60 HZ
 Control input: 2-10V DC, 4-20mA or 3-point floating
 Feedback position output: 2-10V DC or 4-20mA
 Turn time: 150 seconds (from closed to fully open valve)
 Electrical connection: 15mm grommet connection
 Direction of rotation: Bi-directional
 Humidity rating: Fully coated electronic board
 Housing material: Aluminium
 Housing insulation: IP42



FlowCon SM.0.0.0.3, SM.0.0.0.4, SM.0.0.0.5 (with BACnet) and SM.0.0.0.6 (with BACnet and failsafe) actuators

Supply voltage: 24V AC/DC
 Power consumption: 12VA
 Frequency: 50/60 HZ
 Control input: 0-10V DC, 2-10V DC, 0-20mA, 4-20mA, 2-position or 3-point floating
 Feedback position output: Automatic match of control input, 0-10V DC, 2-10V DC or 4-20mA
 Turn time: 190 seconds (from closed to fully open valve)
 Electrical connection: 5 wires 22 AWG halogen free cable, 1 meter
 For BACnet versions another 3 wires 22 AWG halogen free cable, 1 meter
 Direction of rotation: Bi-directional
 Humidity rating: 5 to 95% RH non condensing
 Housing material: UL94 V0-rated plastic
 Housing insulation: IP54 including up-side-down mounting
 Programming: External programming of all settings, interface of buttons and display
 Calibration: Automatic calibration at startup
 Valve - actuator coupling: Easy snap coupling
 BACnet device profile: BACnet Application Specific Controller (B-ASC) type server
 BACnet protocol: BACnet Master Slave/Token passing (MS/TP)
 BACnet baud rates supported: 9600, 19200, 38400 and 76800
 BACnet services (BIBBS) supported: DS-RP-B, DS-WP-B, DM-DDB-B, DM-DOB-B and DM-DCC-B.

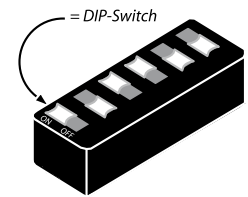


Note 3: FlowCon warranty is voided using other actuators than supplied or recommended by FlowCon International A/S.

FLOW RATE SETTING - VALVE SIZE DN15-DN40

Maximum Flow Rate					
DN15-DN25 · 1/2"-1"			DN25-DN40 · 1"-1 1/2"		
32-320 kPaD · 4.6-46 psid			40-320 kPaD · 5.8-46 psid		
SM.1.1			SM.2.1		
l/sec	l/hr	GPM	l/sec	l/hr	GPM
0.176	633	2.78	0.513	1850	8.13
0.195	702	3.09	0.573	2060	9.08
0.214	770	3.39	0.632	2280	10.0
0.233	838	3.69	0.690	2480	10.9
0.251	902	3.97	0.746	2690	11.8
0.268	964	4.24	0.802	2890	12.7
0.285	1030	4.51	0.856	3080	13.6
0.301	1080	4.77	0.909	3270	14.4
0.317	1140	5.02	0.961	3460	15.2
0.332	1200	5.26	1.01	3640	16.0
0.347	1250	5.50	1.06	3820	16.8
0.362	1300	5.73	1.11	4000	17.6
0.376	1350	5.96	1.16	4170	18.3
0.390	1400	6.18	1.20	4330	19.1
0.403	1450	6.38	1.25	4500	19.8
0.416	1500	6.59	1.29	4660	20.5
0.428	1540	6.78	1.34	4810	21.2
0.440	1580	6.97	1.38	4970	21.9
0.452	1630	7.16	1.42	5120	22.5
0.463	1670	7.33	1.46	5260	23.2
0.474	1710	7.51	1.50	5400	23.8
0.485	1750	7.68	1.54	5540	24.4
0.495	1780	7.84	1.58	5680	25.0
0.505	1820	8.00	1.61	5810	25.6
0.515	1850	8.16	1.65	5940	26.2
0.524	1890	8.30	1.69	6070	26.7
0.533	1920	8.44	1.72	6190	27.3
0.542	1950	8.59	1.75	6310	27.8
0.550	1980	8.71	1.79	6430	28.3
0.559	2010	8.86	1.82	6550	28.8
0.567	2040	8.98	1.85	6660	29.3
0.574	2070	9.09	1.88	6770	29.8
0.582	2100	9.22	1.91	6870	30.3
0.589	2120	9.33	1.94	6980	30.7
0.596	2150	9.44	1.97	7080	31.2
0.603	2170	9.55	1.99	7180	31.6
0.609	2190	9.66	2.02	7280	32.0
0.616	2220	9.76	2.05	7370	32.5
0.622	2240	9.85	2.07	7460	32.9
0.628	2260	9.95	2.10	7550	33.3
0.634	2280	10.1	2.12	7640	33.6
0.639	2300	10.1	2.15	7730	34.0
0.645	2320	10.2	2.17	7810	34.4
0.650	2340	10.3	2.19	7890	34.8
0.655	2360	10.4	2.22	7970	35.1
0.661	2380	10.5	2.24	8050	35.5
0.667	2400	10.6	2.26	8130	35.8
0.671	2420	10.6	2.28	8200	36.1
0.676	2430	10.7	2.30	8280	36.4
0.680	2450	10.8	2.32	8350	36.8
0.685	2470	10.9	2.34	8420	37.1

Maximum Flow Rate DIP Switch Settings						Stem Rotations From Closed
Used on SM.0.0.0.1						
1	2	3	4	5	6	Rotations
ON	ON	ON	ON	ON	ON	1.0
OFF	ON	ON	ON	ON	ON	1.1
ON	OFF	ON	ON	ON	ON	1.2
OFF	OFF	ON	ON	ON	ON	1.3
ON	ON	OFF	ON	ON	ON	1.4
OFF	ON	OFF	ON	ON	ON	1.5
ON	OFF	OFF	ON	ON	ON	1.6
OFF	OFF	OFF	ON	ON	ON	1.7
ON	ON	ON	OFF	ON	ON	1.8
OFF	ON	ON	OFF	ON	ON	1.9
ON	OFF	ON	OFF	ON	ON	2.0
OFF	OFF	ON	OFF	ON	ON	2.1
ON	ON	OFF	OFF	ON	ON	2.2
OFF	ON	OFF	OFF	ON	ON	2.3
ON	OFF	OFF	OFF	ON	ON	2.4
OFF	OFF	OFF	OFF	ON	ON	2.5
ON	ON	ON	ON	OFF	ON	2.6
OFF	ON	ON	ON	OFF	ON	2.7
ON	OFF	ON	ON	OFF	ON	2.8
OFF	OFF	ON	ON	OFF	ON	2.9
ON	ON	OFF	ON	OFF	ON	3.0
OFF	ON	OFF	ON	OFF	ON	3.1
ON	OFF	OFF	ON	OFF	ON	3.2
OFF	OFF	OFF	ON	OFF	ON	3.3
ON	ON	ON	OFF	OFF	ON	3.4
OFF	ON	ON	OFF	OFF	ON	3.5
ON	OFF	ON	OFF	OFF	ON	3.6
OFF	OFF	ON	OFF	OFF	ON	3.7
ON	ON	OFF	OFF	OFF	ON	3.8
OFF	ON	OFF	OFF	OFF	ON	3.9
ON	OFF	OFF	OFF	OFF	ON	4.0
OFF	OFF	OFF	OFF	OFF	ON	4.1
ON	ON	ON	ON	ON	OFF	4.2
OFF	ON	ON	ON	ON	OFF	4.3
ON	OFF	ON	ON	ON	OFF	4.4
OFF	OFF	ON	ON	ON	OFF	4.5
ON	ON	OFF	ON	ON	OFF	4.6
OFF	ON	OFF	ON	ON	OFF	4.7
ON	OFF	OFF	ON	ON	OFF	4.8
OFF	OFF	OFF	ON	ON	OFF	4.9
ON	ON	ON	OFF	ON	OFF	5.0
OFF	ON	ON	OFF	ON	OFF	5.1
ON	OFF	ON	OFF	ON	OFF	5.2
OFF	OFF	ON	OFF	ON	OFF	5.3
ON	ON	OFF	OFF	ON	OFF	5.4
OFF	ON	OFF	OFF	ON	OFF	5.5
ON	OFF	OFF	OFF	ON	OFF	5.6
OFF	OFF	OFF	OFF	ON	OFF	5.7
ON	ON	ON	ON	OFF	OFF	5.8
OFF	ON	ON	ON	OFF	OFF	5.9
ON	OFF	ON	ON	OFF	OFF	6.0



Example illustrated above:

ON-OFF-ON-ON-OFF-OFF

which gives a max flow of:

SM.1.1 - 0.685 l/sec and

SM.2.1 - 2.34 l/sec

(rotation 6.0).

Accuracy: Greatest of either ±5% of controlled flow rate or ±2% of maximum flow rate.

GENERAL DESCRIPTION

The SM Series are self balancing dynamic flow control valves that are pressure independent, two-way, modulating to accept digital or analog input signals. The valves accept 2-10V DC, 4-20mA or digital 3-point floating input signals. Each valve has an adjustable maximum flow rate setting to enable flow limitation and balancing to the coils or zones that the valves are controlling.

All SM actuators are microprocessor based with a self-calibrating feature.

The valves are all designed for double union piping connection.

They are available in two different valve bodies with end connections from 15mm-40mm.

GENERAL SPECIFICATIONS

1. PRESSURE INDEPENDENT DYNAMIC CONTROL VALVES - FLOWCON SM

- 1.1. Contractor shall install pressure independent dynamic control valves where indicated in drawings.
- 1.2. Valve shall be an electronic, dynamic, modulating, 2-way pressure independent control device.
- 1.3. Pressure independent dynamic control valve shall accurately control flow, independent of system pressure fluctuation.
- 1.4. Maximum flow setting shall be adjustable to 51 different settings within the range of the valve size.

2.a. VALVE ACTUATOR / FLOWCON SM.0.0.0.1

- 2.a.1. Valve actuator housing shall be rated to IP42.
- 2.a.2. Actuator shall be driven by a 24V AC or 30V DC motor, and shall accept 2-10V DC, 4-20mA or 3-point floating electric signal and shall include resistor to facilitate any of these signals.
- 2.a.3. Actuator shall be capable of providing 4-20mA or 2-10V DC feedback signal to the control system.
- 2.a.4. External LED read-out of current valve position and maximum valve position setting shall be available.

OR...

2.b. VALVE ACTUATOR / FLOWCON SM.0.0.0.3, SM.0.0.0.4, SM.0.0.0.5 and SM.0.0.0.6

- 2.b.1. Valve and actuator coupling shall have snap couplings for fast mounting and demounting.
- 2.b.2. Actuator housing shall be rated to IP54 including up-side-down mounting.
- 2.b.3. Actuator shall be driven by a 24V AC/DC motor and shall accept 0-10V DC, 2-10V DC, 0-20mA, 4-20mA, 2-position or 3-point floating electric input signal.
- 2.b.4. Actuator shall be capable of providing same as input, 4-20mA, 0-10V DC or 2-10V DC feedback signal to the control system.
- 2.b.5. Automatic calibration of valve position shall be standard.
- 2.b.6. Actuator shall include display and buttons for external programming of all settings.
- 2.b.7. External display of current valve flow, maximum valve flow, input signal, feedback signal and operational direction shall be standard.
- 2.b.8. Optional fail safe system to power valve to either open (max. setting) or closed position from any position in case of power failure shall be available.
- 2.b.9. Optional BACnet connection for remote setting and control of actuator shall be available.

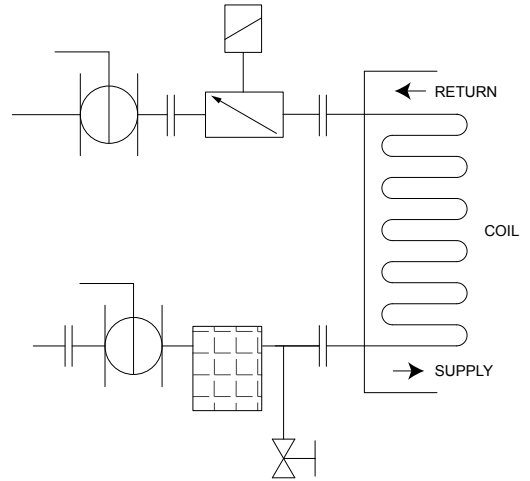
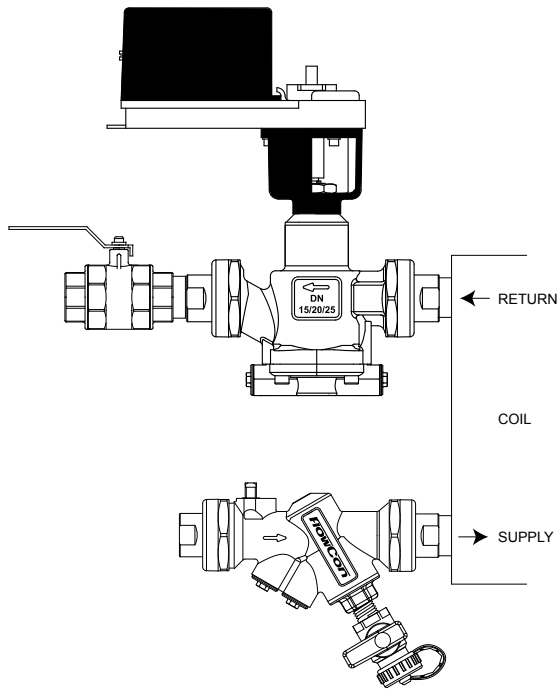
3. VALVE HOUSING

- 3.1. Valve housing shall consist of forged brass ASTM CuZn40Pb2, rated at no less than 2500 kPa static pressure and +120°C.
- 3.2. Valve housing shall be permanently marked to show direction of flow.
- 3.3. Valve housing shall be double union end constructed with a range of pipe connections available for the appropriate pipe size.
- 3.4. Optional dual pressure/temperature test plugs for verifying accuracy of flow performance shall be available for all valve sizes.

4. FLOW REGULATOR / AUTOMATIC BALANCING UNIT

- 4.1. Flow regulation unit shall be manufactured of stainless steel and hydrogenated acrylonitrile-butadiene-rubber and shall be capable of controlling flow within $\pm 5\%$ rated flow rate or $\pm 2\%$ of maximum flow rate.
- 4.2. Flow regulation unit shall be accessible for change-out maintenance.

APPLICATION AND SCHEMATIC EXAMPLE



UPDATES

For latest updates please see www.flowcon.com

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