

FlowCon SME



*100% Authority.
Pressure Independent Temperature Control
and Automatic Balancing*

FLOW

FlowCon SME

Pressure Independent Temperature Control and Dynamic Balancing



The FlowCon SME Cartridge is designed as a 3-in-1 solution combining a full stroke modulation control valve, an automatic balancing valve and a differential pressure control valve. This new cartridge includes an innovative self-adjustment feature, which enables each valve continuously to self-balance. This ensures delivery of precisely the flow rate required by each terminal unit, independent of pressure fluctuations in the hydronic system. Each FlowCon SME Cartridge can also be adjusted to set an accurate maximum flow rate limit to each circuit without stroke limitation.

The FlowCon SME Cartridge can be used in several different applications within heating or cooling such as fan-coil units, air-handler units and other terminal unit - wherever dynamic balancing and fully accurate temperature control are required, the SME Cartridge will be the ideal choice. It will be the easy solution to both designers, installers and end-users due to its user-friendly complete solution in one body and with one cartridge.

Applications

The SME cartridges can be used with the following FlowCon valves:

- FlowCon A (1/2", 3/4", 1")
- FlowCon AB (1/2", 3/4", 1", 1 1/4")
- FlowCon ABV1 (1/2", 3/4", 1")
- FlowCon ABV2 (1", 1 1/4", 1 1/2")

100% Valve Authority

The FlowCon SME is a 100% authority pressure independent flow control valve which instantaneously self-balance at all points of operation, even when there is variance in pressure differential.

100% authority pressure independent

As long as the pressure differential across the valve is within the operating range, the Cv of the valve is variable, being continuously regulated to keep the control

valve in constant authority. The SME Cartridge will in other words always use full stroke of the spindle offering the 100% authority for any of its 41 maximum flow settings.

Features and Benefits

- **3-in-1 combi valve**, modulating control valve, a dynamic flow limiter and a differential pressure control valve in one body.
- **Differential pressure independent.**
- **Full stroke modulation** at any desing flow.
- **100% authority** for any of the cartridge's flow setting.
- **Automatic system balancing**, the correct flow rate for each circuit is achieved automatically.
- **Dynamic balancing**, the correct flow rate is maintained as each valve continuously compensates for pressure fluctuations in the system.
- **Field adjustable**, flow rate can be changed on demand without removing the cartridge from the valve body.
- **Elimination of branch or "partner" balancing valves** which results in fewer total valves used in each project.
- **Easily accessible cartridge** for flow rate adjustment or maintenance.
- **Accuracy:** Greatest of either $\pm 10\%$ of controlled flow rate or $\pm 5\%$ of maximum flow rate.
- **Up to 41 different flow curves** in one and the same cartridge.
- **Choice of actuator**, electrical actuator 0(2)-10V modulating, electrical 3-point-floating, thermal ON/OFF or thermal modulating.
- **Built-in isolation ball valve** (FlowCon ABV).
- **Pressure/temperature measurement plugs** available for verifying operating differential pressure or checking ΔT across the coil (FlowCon AB / ABV).
- **Double union end connection** for ease of installation and wide selection of end fittings (FlowCon ABV) or **fixed end** female-by-female threaded (FlowCon A / AB).

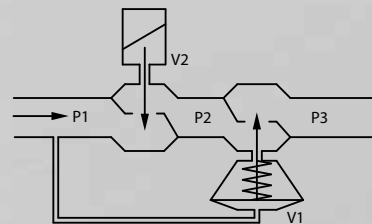


SME · 20mm · 3/4"							Setting	SME · 40mm · 1 1/2"		
Pressure range, ΔP: 16-200 kPaD · 2.3-29 psid			Pressure range, ΔP: 30-400 kPaD · 4.4-58 psid			Pressure range, ΔP*: 16-400 kPaD · 2.3-58 psid				
SME.0 (green o-ring)			SME.1 (black o-ring)			SME.2 (black o-ring)				
I/sec	I/hr	GPM	I/sec	I/hr	GPM	I/sec	I/hr	GPM		
-	-	-	-	-	-	1.0	0.240	865	3.81	
-	-	-	-	-	-	1.1	0.282	1010	4.46	
0.0111	40	0.176	0.0165	59.3	0.261	1.2	0.322	1160	5.1	
0.0167	60	0.264	0.0223	80.3	0.353	1.3	0.361	1300	5.72	
0.0172	62	0.273	0.0331	119	0.526	1.4	0.399	1430	6.32	
0.0298	107	0.472	0.0481	173	0.762	1.5	0.435	1570	6.90	
0.0419	151	0.664	0.0630	226	0.993	1.6	0.471	1700	7.47	
0.0536	193	0.850	0.0770	277	1.22	1.7	0.506	1820	8.02	
0.0649	234	1.03	0.0910	326	1.44	1.8	0.540	1940	8.56	
0.0758	273	1.20	0.104	374	1.65	1.9	0.573	2060	9.08	
0.0862	310	1.37	0.117	421	1.86	2.0	0.605	2180	9.59	
0.0963	347	1.53	0.130	467	2.06	2.1	0.636	2290	10.1	
0.106	381	1.68	0.142	511	2.25	2.2	0.667	2400	10.6	
0.115	415	1.83	0.154	554	2.44	2.3	0.696	2510	11.0	
0.124	447	1.97	0.166	596	2.62	2.4	0.725	2610	11.5	
0.133	477	2.10	0.177	636	2.80	2.5	0.753	2710	11.9	
0.141	507	2.23	0.188	675	2.97	2.6	0.780	2810	12.4	
0.148	534	2.35	0.198	712	3.14	2.7	0.807	2900	12.8	
0.156	561	2.47	0.208	748	3.29	2.8	0.832	3000	13.2	
0.163	586	2.58	0.218	783	3.45	2.9	0.858	3090	13.6	
0.169	610	2.69	0.227	816	3.59	3.0	0.882	3180	14.0	
0.176	633	2.79	0.236	848	3.74	3.1	0.906	3260	14.4	
0.182	654	2.88	0.244	879	3.87	3.2	0.930	3350	14.7	
0.187	674	2.97	0.252	908	4.00	3.3	0.953	3430	15.1	
0.193	693	3.05	0.260	936	4.12	3.4	0.975	3510	15.5	
0.197	711	3.13	0.268	963	4.24	3.5	0.997	3590	15.8	
0.202	727	3.20	0.275	988	4.35	3.6	1.02	3670	16.1	
0.206	743	3.27	0.281	1010	4.46	3.7	1.04	3740	16.5	
0.210	757	3.33	0.286	1030	4.56	3.8	1.06	3820	16.8	
0.214	770	3.39	0.295	1060	4.65	3.9	1.08	3890	17.1	
0.217	782	3.44	0.300	1080	4.74	4.0	1.10	3960	17.4	
0.220	793	3.49	0.303	1090	4.82	4.1	1.12	4030	17.7	
0.223	802	3.53	0.309	1110	4.89	4.2	1.14	4100	18.1	
0.225	811	3.57	0.314	1130	4.96	4.3	1.16	4170	18.4	
0.227	819	3.61	0.317	1140	5.03	4.4	1.18	4240	18.7	
0.229	826	3.63	0.320	1150	5.08	4.5	1.20	4300	19.0	
0.231	831	3.66	0.325	1170	5.13	4.6	1.21	4370	19.2	
0.232	836	3.68	0.328	1180	5.18	4.7	1.23	4440	19.5	
0.233	839	3.70	0.331	1190	5.22	4.8	1.25	4500	19.8	
0.234	842	3.71	0.331	1190	5.25	4.9	1.27	4570	20.1	
0.234	844	3.72	0.334	1200	5.28	5.0	1.29	4630	20.4	

Accuracy: Greatest of either ±10% of controlled flow rate or ±5% of maximum flow rate.
*at setting 2.6

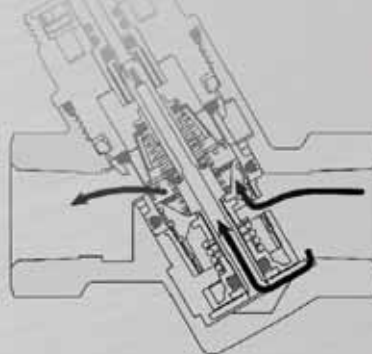
Principle of Operation

On closer examination of the inner workings of the FlowCon SME, the function is best described as 2 valves in 1. The first valve (V1) regulates the pressure differential across the second valve (V2) by means of a rolling diaphragm element counteracted by a spring. The second valve is a calibrated variable orifice device adjusted by the actuator (similar to a standard modulating control valve).



The diaphragm reacts to the system and regulates the pressure differential across the actuated control valve orifice to maintain its flow rate.

When pre-setting the maximum flow rate, the inlet orifice is changed in size sideways which does not interfere with the length of the stroke. When modulating, the orifice areas are affected by the actuator using the full stroke which results in the fact that the orifice area is changed in size in a vertical movement.



Hydronic Balance

The cartridge can be pre-set to limit the working range of the valve which limits the maximum flow rate through the valve. Consequently, hydronic balance is achieved automatically without the use of additional balancing valves.

Pre-setting the Maximum Flow Rate

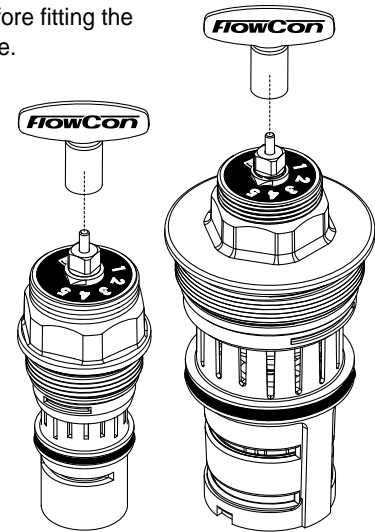
The valve is adjusted to a maximum flow rate limit by setting the scale located on the top of the SME Cartridge. The setting indicates one of maximum 41 possible max. flow rates from e.g. 3.81-20.4 GPM on SME.2 but since the setting is step less any flow rate in between will be obtainable. The setting is done by means of a special FlowCon key. With the actuator mounted, the pre-setting is "sealed" and the SME Cartridge eliminates any flow above the design flow.

For re-adjustment, simply re-move power from the actuator and re-move the actuator from the cartridge. Then dial in the new required maximum flow and re-apply the actuator and connect power again.

Actuator Mounting and Self-Calibration

When using the modulation actuator, always be sure that power supply is turned off and the actuator is in a fully open position (turn the actuator to this position if required) before fitting the actuator to the cartridge.

For further information please see the installation and operation instruction manuals.



Technical Data

For further information and part number selection please see FlowCon tech note.

For latest updates please see www.flowcon.com.

		A/AB/ABV 1/2"-1" with SME Cartridge	AB 1"-1 1/4" with SME Cartridge ABV 1"-1 1/2" with SME Cartridge
Static Pressure	(kPa)	2500	2500
	(psi)	360	360
Temperature Rating (media / ambient)	(°C)	-20 to +100 / 0 to +50	-20 to +100 / 0 to +50
	(°F)	-4 to +212 / +32 to +122	-4 to +212 / +32 to +122
Pressure Drop Data		NOTE: For pump head calculations, add the minimum pressure differential for the index circuit to the other components pressure losses (i.e. valves, coil, etc.)	
Valve Body	(Kv-value) (m³/hr)	2.6	12.5
	(Cv-value) (GPM)	3.0	14.5

SME Cartridge		SME.0 (green o-ring)	SME.1 (black o-ring)	SME.2 (black o-ring)
Pressure Differential	(kPaD)	16-200	30-400	16-400 (at setting 2.6)
	(psid)	2.3-29	4.4-58	2.3-58 (at setting 2.6)
Flow Rate	(l/sec)	0.0111-0.234	0.0165-0.334	0.240-1.29
	(GPM)	0.176-3.72	0.261-5.28	3.81-20.4



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