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A Griswold Controls LLC./FlowCon International Company

FlowCon SH

Externally Adjustable Dynamic Balancing Valve

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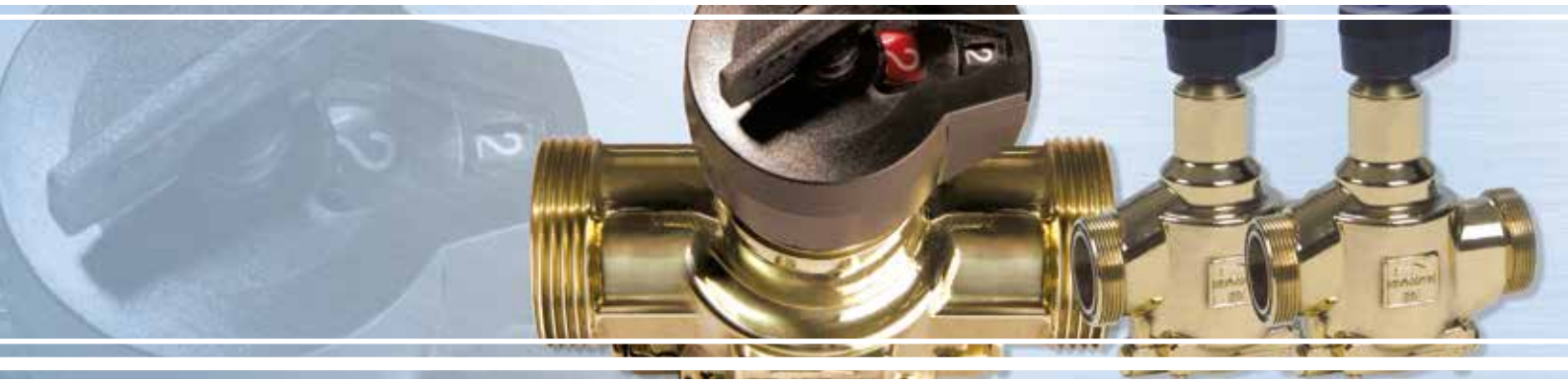


The FlowCon SH series of valves are dynamic flow controls which automatically limit the rate of flow to a pre-set, adjustable maximum.

Used as automatic/dynamic hydraulic balancing valves in multi circuit HVAC systems the more common applications include multiple fan coils, radiators and heat pumps. They can also be used in limiting the flow to individual heat exchangers or domestic water tanks.

Due to the fact that the FlowCon SH valves are externally adjustable, the desired maximum flow rate can be easily changed while the system is operating.

Features and Benefits

- **Automatic flow control,** balance is achieved automatically eliminating the need for manual balancing devices.
- **Easy flow rate setting selection,** determined by one flow rate table without the need of external measurements.
- **Easy adjustment** without disturbing the balance in the rest of the system.
- **51 distinct flow rate settings** per valve size and control range.
- **Accuracy:** Greatest of either ±5% of controlled flow rate or ±2% of maximum flow rate.
- **Tamper-proof,** adjustment unit is being operated by means of special FlowCon key.
- **Pressure/temperature measurement plugs** available for verifying operating pressure differential range.
- **Double union end connection** with a wide selection of end fittings, or **double flange connection** for ease of installation.

Adjustment

The internal mechanism is adjusted by an operation key which also turns the display mechanism. The numeric display shows two scales; one black reflecting full turns numbered 1 through 6, and one red reflecting tenths of full turns numbered 0 through 9. The number of turns reflects the flow rate selected (pls. see specific tech note for exact flow rates and settings).

After the flow rate is set, the valve automatically registers the system pressure conditions and adjusts its orifice area to limit the flow rate to the selected maximum. As system pressure conditions change, the valve will automatically adjust to maintain the selected flow rate. This eliminates the need to know exactly the distribution of pressure within a system.

Because of this dynamic reacting feature, one or more of the valves in the system can be re-adjusted without upsetting the other circuits.

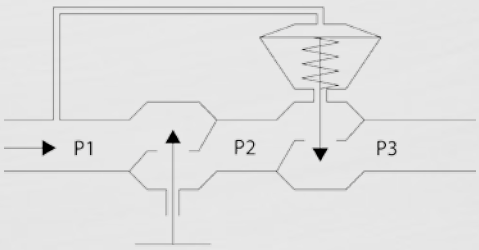
The flow rate through the valve can be verified by reading the pressure differential across the valve. The pressure test ports can be supplied with optional pressure/temperature test plugs for connecting conventional mechanical gauges or electronic sensors.

Principle of Operation

The FlowCon SH valves contain a diaphragm component mounted on a counter-acting spring which adjusts the pressure differential across a pre-set valve opening. The combined components operate very similar to two valves in series, where one is a pressure differential regulator and one an adjustable orifice. This is illustrated below.

Principle of Construction

On the below drawings P1 and P3 are system pressure, P1÷P3 is the total pressure drop across the valve. P2 is set by the diaphragm acting in reaction to P1 in the lower diaphragm chamber. Interacting with the spring, P1÷P2 remains constant, keeping a constant ΔP across the orifice areas. The result is a constant flow rate through the valve, independent of pressure fluctuations.



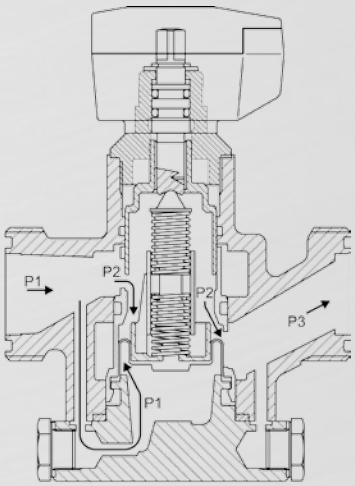
Installation

Contrary to traditional static balancing systems, dynamic balancing requires no main branch balancing valves. If a FlowCon SH valve is used at each terminal, the total flow rate of the branch will automatically be limited to the sum of the flow rates of the circuits.

The FlowCon SH valve can either be installed in the supply or return line. The valve should be positioned for easy access to the adjustment and pressure measurement devices. Unlike traditional balancing valves, placement of the FlowCon SH does not require lengths of pipe before or after the valve.

End Fittings

The FlowCon SH valves are available with optional union connections with a range of different end fittings. The end fittings are available in any combination of size and standard. Larger sizes are for flange connection (pls. see tech notes for further information).

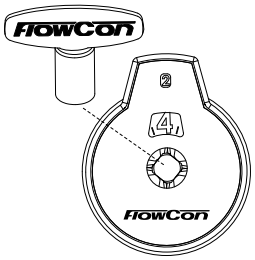


Flow Verification

Optional pressure/temperature test plugs are available for verifying the differential pressure across each FlowCon SH valve. They are fitted into 1/4" NPT female threaded ports. With the p/t plugs fitted, a pressure differential reading across the valve can be taken.

Flow Rate Setting

For adjusting the flow rate of the FlowCon SH valves use the special designed key (FlowCon part no. ACC0001). As an example, a micrometer setting at 2.4 corresponds to a flow rate of 0.29 l/sec for the valve in size 15/20/25.



Technical Data

For further information please see FlowCon tech note. For latest updates please see ***www.flowcon.com.***

		SH1 DN15/20/25	SH2 DN25/32/40	SH3 DN50/65/80			SH4 DN80/100			SH5 DN125/150	
Pressure Differential	(kPaD)	33-300	33-300	30-600	30-600	35-600	30-600	35-600	50-600	30-600	35-600
	(psid)	4.8-44	4.8-44	4.5-87	4.5-87	5.1-87	4.5-87	5.1-87	7.3-87	4.5-87	5.1-87
Flow Rate	(l/sec)	0.075-0.70	0.11-1.95	1.48-4.16	2.57-7.15	3.55-9.88	3.49-9.38	4.73-14.2	3.68-20.2	6.48-23.3	7.10-29.5
	(GPM)	1.20-11.1	1.70-30.9	23.4-66.0	40.7-113	56.3-157	55.4-149	75.0-225	58.3-320	103-369	113-468
Static Pressure	(kPa)	2500		4000							
	(psi)	360		580							
Temperature Rating (media / ambient)	(°C)	-20 to +120 / -10 to +54									
	(°F)	-4 to +248 / +14 to +131									

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.)

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