

# FlowCon A / AB / ABV



*The “Adjustable” Automatic Flow Control Valves*

# FLOW

# FlowCon A, AB and ABV

*Dynamic Balancing Valve with Adjustable Flow Cartridge*



The FlowCon A, AB and ABV automatic balancing valves are designed for balancing heating and air-conditioning terminal units by providing a constant flow rate with the added feature of being adjustable.

With these automatic balancing valves flow can be controlled with one of two different cartridges; either an internal composite cartridge or an externally adjustable E-JUST cartridge. Both cartridge-types keep the flow rate constant, even with system pressure conditions changing.

The main difference between these and other automatic balancing valves is that each flow control cartridge can be easily adjusted to a new flow rate if necessary.

## Standard Composite Cartridge

The standard composite cartridge is easily removed from the valve body and adjusted to one of eight different flow rates by means of an Allen Wrench. There are 14 different adjustable cartridges, totalling nearly 100 different flow rates available for valve sizes 15mm through 40mm.

## E-JUST Cartridge

The E-JUST cartridge can be externally adjusted to one of 41 flow rates even when the system is operating. The E-JUST cartridge is tamper-proof since adjustment is carried out by means of a special FlowCon key. Further the setting can be sealed with a top cover.

## Stainless Steel Cartridge

Alternatively, a factory pre-set stainless steel cartridge can be used together with an adaptor. These cartridges are single flow cartridges, but exchanging of the cartridge and adaptor is straight forward.

## Features and Benefits

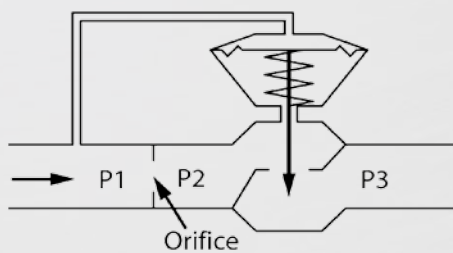
- **Automatic balancing**, the correct flow rate for each circuit is achieved automatically.
- **Dynamic balancing**, the correct flow rate is maintained as each valve compensates for pressure fluctuations in the system.
- **Field adjustable**, flow rate can be changed on demand, either internally or externally adjustment or cartridge exchange.
- **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** of  $\pm 10\%$  or 20 l/hr (standard composite cartridge) alternatively  $\pm 5\%$  of controlled flow rate or  $\pm 2\%$  of maximum flow rate (E-JUST cartridge). For stainless steel cartridges accuracy is  $\pm 5\%$ .
- **Built-in isolation ball valve** (FlowCon ABV).
- **Pressure/temperature measurement plugs** available for verifying operating differential pressure or checking  $\Delta T$  across the coil (FlowCon AB/ABV).
- **Double union end connection** for ease of installation and wide selection of end fittings (FlowCon ABV) or **fixed female threaded ends** (FlowCon A/AB).



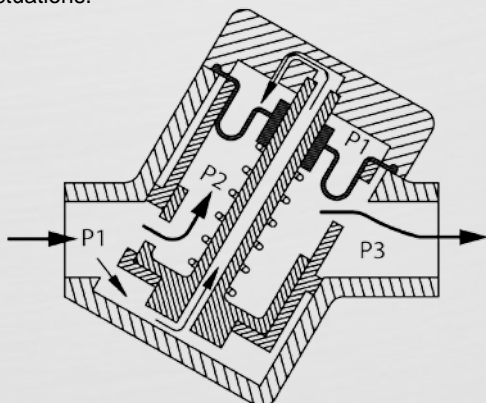
### Principle of Cartridge Operation

- FlowCon Composite  
and FlowCon E-JUST Cartridges

The flow control cartridge of FlowCon A/AB/ABV contains two interacting components; one that has an adjustable orifice, and one that regulates the pressure differential across the adjustable orifice.



For the FlowCon A/AB/ABV, the principle of operation is shown above and the principle of construction is shown below. P1 and P3 are system pressures, P1-P3 is the total pressure drop across the valve. P2 is set by the diaphragm acting in reaction to P1 in the upper diaphragm chamber. Interacting with the spring, P1-P2 remains constant, keeping a constant  $\Delta P$  across the orifice areas. The result is a constant flow rate through the valve, independent of pressure fluctuations.



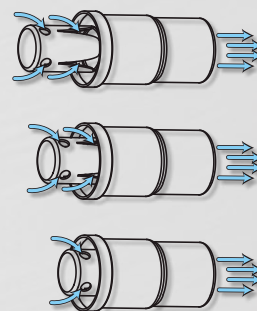
Below its pressure differential range, the valve acts as a fixed orifice. This allows a temperature control valve in the same circuit to operate with valve authority up to the set flow rate maximum.

In case the differential pressure is higher than the defined max.  $\Delta P$  for the cartridge, the diaphragm may be damaged.

### Principle of Cartridge Operation

- Stainless Steel Cartridges

Below its pressure differential range the stainless steel cartridge acts as a fixed orifice. This allows a modulating valve in the same circuit to operate with valve authority up to the flow rate specified for the FlowCon A/AB/ABV.



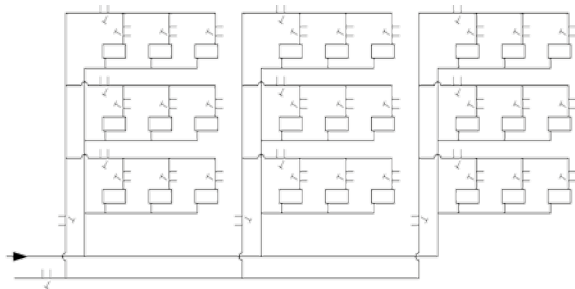
Within operating pressure differential range, the effective open orifice area of the cartridge is automatically adjusted to the point where the specified flow rate will be delivered (as the pressure differential increases, the open area closes and as it decreases, the area opens).

When the pressure differential range is exceeded, the valve again becomes a fixed orifice device. This ensures that no part of the system is starved or shut down.



## Automatic vs. Manual System Layout Comparison

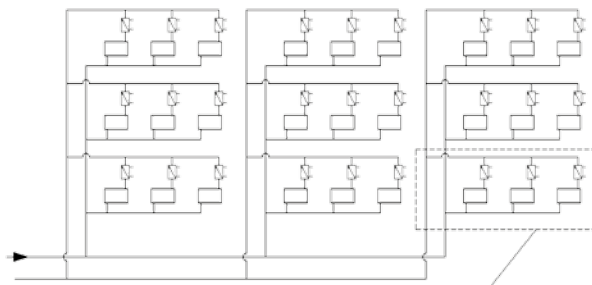
### Manually balanced system.



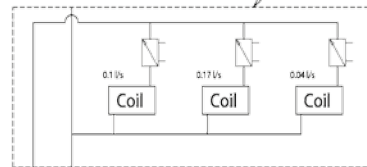
Total number of valves (manual) 40.

In addition to terminal unit valves, manual balancing requires "partner valves" located on the branches, risers and main.

### Automatic balanced system.



Total number of valves (automatic) 27.



Each branch is automatically balanced due to the correct balance of each coil. Sum total of 0.31 l/sec (branch).

NOTE: The location of the FlowCon A/AB/ABV does not require lengths of pipe before or after the valve.

### Technical Data

For further information and part number selection please see FlowCon tech note and the catalogue:

	A/AB DN15/20/25 ABV DN15/20/25		AB DN25/32 ABV DN25/32/40				AB DN40/50		
Static Pressure (kPa) (psi)	2500 360								
Temperature Rating (media/ambient) (°C) (°F)	-20 to +120 / 0 to +50 -4 to +248 / +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) (Cv-value)	2.6 3.0		12.5 14.5				23.0 30.4		
<b>Stainless Steel Cartridge</b>	<b>F3601xx</b>	<b>F3602xx</b>	<b>F3604xx</b>	<b>F3608xx</b>	<b>F3611xx</b>	<b>F3612xx</b>	<b>F3614xx</b>	<b>F3618xx</b>	N/A
Cartridge Size (mm) (inch)	20 3/4"	20 3/4"	20 3/4"	20 3/4"	40 1 1/2"	40 1 1/2"	40 1 1/2"	40 1 1/2"	
Pressure (kPaD) Differential (psid)	10-95 1-14	22-210 2-32	40-390 4-57	90-880 8-128	10-95 1-14	22-210 2-32	40-390 4-57	90-880 8-128	
Flow Rate (l/sec) (GPM)	0.0210-0.315 0.333-5.00	0.0347-0.505 0.550-8.00	0.0473-0.631 0.750-10.0	0.0694-1.01 1.10-16.0	0.189-0.925 3.00-14.7	0.284-1.39 4.50-22.0	0.379-1.85 6.00-29.3	0.568-2.78 9.00-44.0	
<b>Standard Composite Cartridge</b>	<b>ABV1.Y.x</b> grey/red/blue/black/green		<b>ABV1.G.x</b> grey/red/blue/black/green		<b>ABV2.X.x</b> red/white	<b>ABV2.C.x</b> red/white	<b>ABV2.D.x</b> red/white		
Cartridge Size (mm) (inch)	20 3/4"		20 3/4"		40 1 1/2"	40 1 1/2"	40 1 1/2"		
Pressure (kPaD) Differential (psid)	15-130 2.2-18.9		30-400 4.4-58		15-130 2.2-18.9	22-300 3.2-43.5	30-410 4.4-59.5		
Flow Rate (l/sec) (GPM)	0.0081-0.273 0.128-4.33		0.0117-0.408 0.185-6.46		0.17-0.85 2.69-13.5	0.23-1.21 3.65-19.2	0.27-1.43 4.28-22.7		
<b>E-JUST Cartridge</b>	<b>E-JUST1.Y.x</b> black/green	<b>E-JUST1.Y.R</b> red	<b>E-JUST1.G.R</b> red	<b>E-JUST1.G.x</b> black/green	<b>E-JUST2.Y.G</b> green		<b>E-JUST3.G.B</b> black		
Cartridge Size (mm) (inch)	20 3/4"	20 3/4"	20 3/4"	20 3/4"	40 1 1/2"		50 2"		
Pressure (kPaD) Differential (psid)	17-210 2.5-30	17-200 2.5-29	30-400 4.4-58	35-400 5.1-58	17-400 2.5-58		20-400 2.9-58		
Flow Rate (l/sec) (GPM)	0.0278-0.169 0.44-2.68	0.0767-0.229 1.22-3.60	0.113-0.352 1.79-5.57	0.0383-0.249 0.607-3.95	0.149-1.62 2.36-25.6		0.883-4.48 14.0-70.9		

