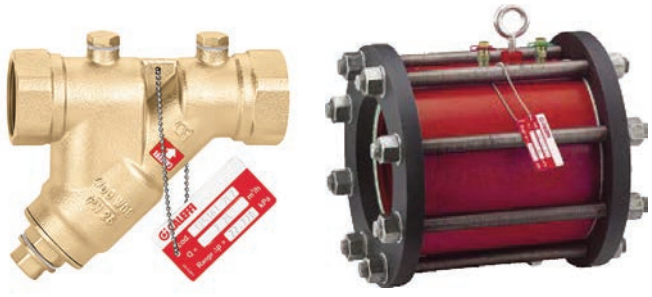
120, 125 &103

automatic balancing valves

altecnic

Caleffi group

120, 125 & 103 automatic balancing valves



Introduction

The Altecnic automatic balancing valves (ABV) are used to keep the flow rate constant, at the design value, in air conditioning and heating system.

They automatically balance the circuit by ensuring the design flow rate to each terminal unit irrespective of changes elsewhere in the system.

Altecnic automatic balancingl valves are available both as a flow regulator or complete with a ball shut-off valve.

Product Range

120	Automatic balancing valve with stainless steel cartridge and ball valve.
125	Automatic balancing valve with stainless steel cartridge.
103	Automatic balancing valve with stainless steel cartridges, wafer pattern for fitting between flanges.

Materials

Component	Material	Grade
120 & 125		
Body		
½", & ¾":	DZR	BS EN 12165 CW602N
1" to 2":	DZR	BS EN 1982 CB752S
Cartridge:	Stainless steel	BS EN 10088-2 (AISI 304)
Spring:	Stainless steel	BS EN 10270-3 (AISI 302)
Seals:	EPDM	
Pressure port plugs:	DZR	BS EN 12164 CW602N
120 Only		
Ball:	Brass Chrome plated	BS EN 12165 CW614N
Ball seat:	PTFE	
Stem seal:	EPDM & PTFE	
Lever:	Steel - zinc plated	
103		
Body	Cast iron	BS EN 1561 EN-JL1030
Cartridge:	Stainless steel	BS EN 10088-2 (AISI 304)
Spring:	Stainless steel	BS EN 10270-3 (AISI 302)
Seals:	Non-asbestos fibre	
Pressure port plugs:	DZR	BS EN 12164 CW602N

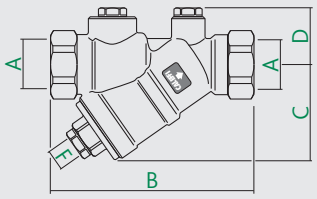
Technical Specification

Medium:		Water glycol solution
Max. percentage glycol:		50%
120 & 125		
Max.working pressure:		25 bar
Max. temperature range:	120	0 to 110˚C
	125	-20 to 110˚C
Δp range:		7 to 100 kPa 22 to 220 kPa 35 to 410 kPa
Flow range:		0.12 to 15.5 m^3/h 0.033 to 4.30 l/s
Accuracy:		±5%
103		
Max.working pressure:		16 bar
Max. temperature range:		-20 to 110˚C
Δp range:		22 to 220 kPa 35 to 410 kPa
Flow range:		9 to 3850 m^3/h 2.5 to 1,069 l/s
Accuracy:		±5%

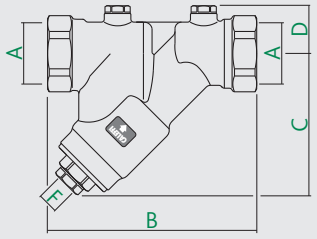
Connections

Pressure test ports - female:		¼" BS EN ISO 228
Main - female:	120 & 125	BS EN 10226-2
Main - Fitting between PN16 flanges:		
	103	BS EN 1092-1

Dimensions



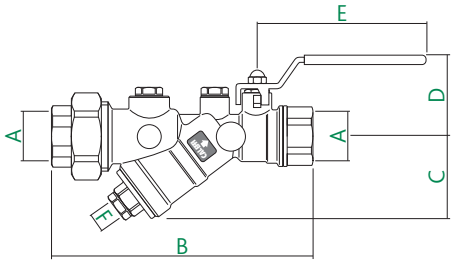
Code	A	B	C	D	F	kg
125141	Rc½	101	52.5	30	¼"	0.55
125151	Rc¾	106	52.5	30	¼"	0.58
125181	Rc1½	177	105	38.5	¼"	2.25
125191	Rc2	176	105	38.5	¼"	2.45
125101	Rc2½	230	133	48.5	¼"	4.36



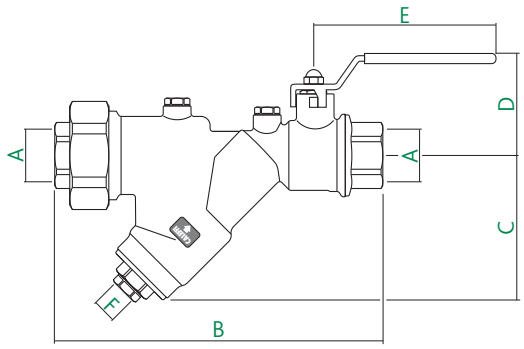
Code	A	B	C	D	F	kg
125161	Rc1	140.5	102	33.5	¼"	1.02
125171	Rc1¼	148	102	33.5	¼"	1.06

120, 125 & 103 automatic balancing valves

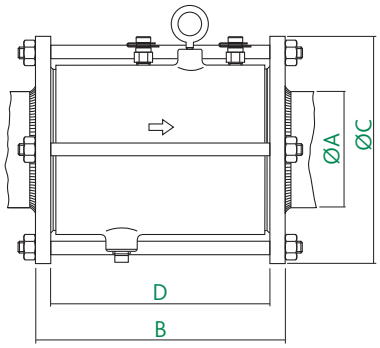
Dimensions



Code	A	B	C	D	E	F	kg
120141	Rc½	156.5	52.5	50	100	¼"	1.1
120151	Rc¾	159.5	52.5	50	100	¼"	1.1
120181	Rc1½	253	84	88	140	¼"	4.6
120191	Rc2	253	84	88	140	¼"	4.6



Code	A	B	C	D	E	F	kg
120161	Rc1	218.5	68	66	120	¼"	2.3
120171	Rc1¼	220.5	68	66	120	¼"	2.3



Code	A	B	C	D	kg
10311	DN65	208	185	172	7.5
10321	DN80	212	200	172	11.6
10331	DN100	216	220	172	12.4
10341	DN125	271	250	223	16.6
10351	DN150	271	285	223	24.1
10361	DN200	287	360	223	41.6
10371	DN250	295	425	223	58.1
10381	DN300	319	515	223	93.3
10391	DN350	311	555	223	108.2

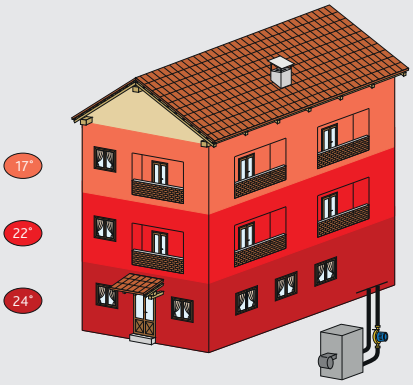
Circuit Balancing

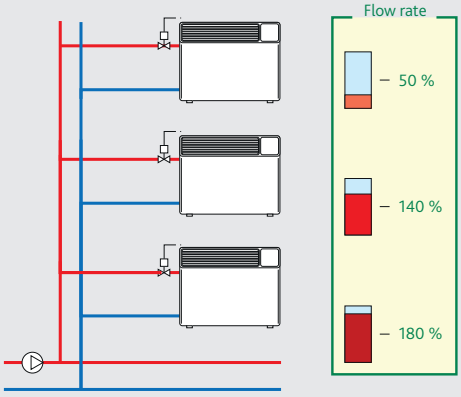
Modern heating and air-conditioning systems have to guarantee a high level of thermal comfort with a low energy consumption.

This means supplying the terminal emitters with the correct design flow rates, to produce balanced hydraulic circuits.

Unbalanced Circuits

In case of an unbalanced circuit, the hydraulic imbalance between emitters creates areas with temperatures which are not uniform, and, as a consequence, problems with thermal comfort and higher energy consumption.



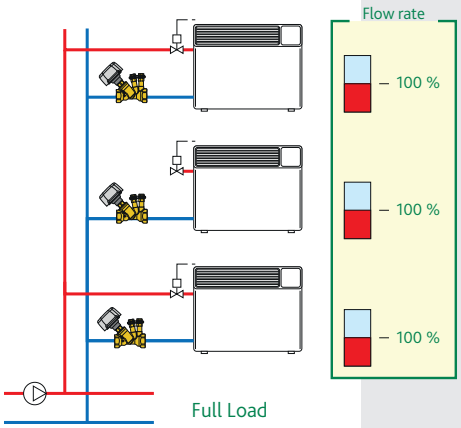


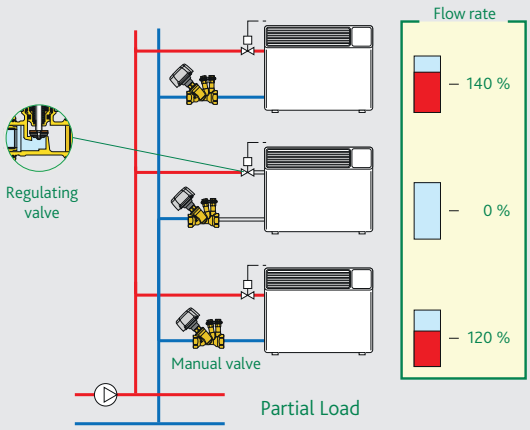
Circuit Balancing

Circuits Balanced by Manual Valves

Traditionally, circuits are balanced using manual balancing valves.

With manual balancing valves, the circuits are only balanced at full load conditions and any changes within the circuits can affect the balance and flow rate to individual circuits to a greater or lesser degree.



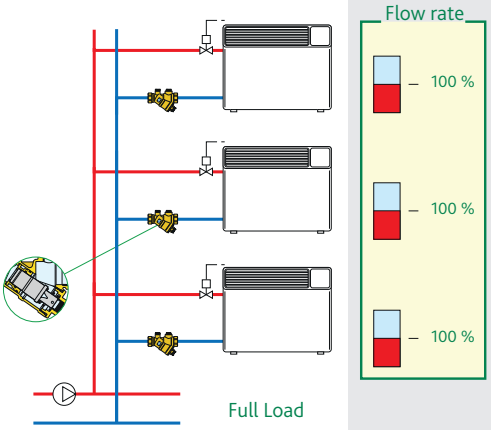


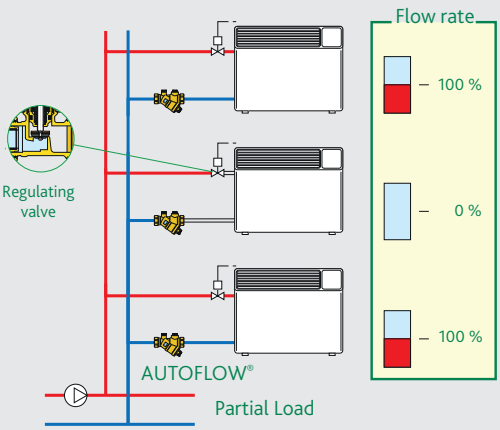
Circuits Balanced by Automatic Balancing Valves

AFC valves balance the circuit automatically, by ensuring each terminal emits the design flow rate.

Even in the case of partial circuit closure by means of the regulating valves, the flow rates in the open circuits remain constant at the designated value.

The system always maintains the greatest comfort and energy savings.





Function

The Altecnic automatic balancing valve is intended to maintain a constant flow rate when the upstream differential pressure varies.

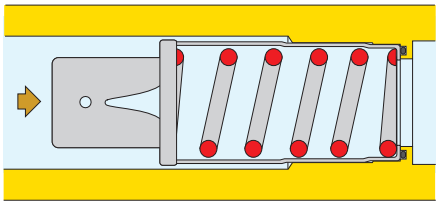
It is therefore necessary to refer to the Δp - flow rate diagram and to a basic diagram illustrating the operating methods and the relevant variable effects.

Operating principle

The regulating element of these devices is composed of a cylinder and a piston with fixed and variable geometry orifices, through which the fluid flows. The surface area of these orifices is governed by the piston movement when pushed by the flow. A specially calibrated spring counteracts this movement.

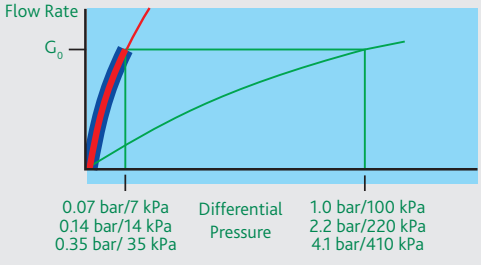
Altecnic automatic balancing valves are high performance automatic regulators. They regulate selected flow rates within a very tight tolerance (approx. 5%) and offer a wide range of operation.

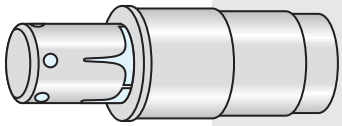
Below the Control Range



In this case, the regulating piston remains fully out without compressing the spring and gives the medium the maximum free flow area.

In practice, the piston acts as a fixed orifice and thus the flow through the ABV depends solely on the differential pressure.

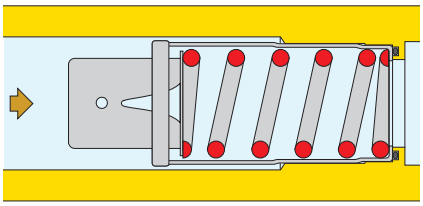




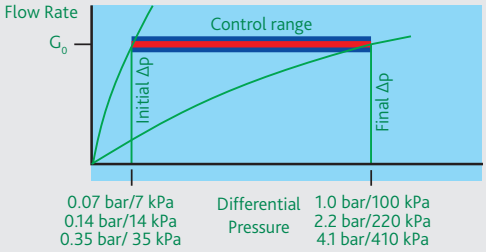
$Kv_{0.01}$=0.378 x G_0 Δp range 7 - 100 kPa
$Kv_{0.01}$=0.267 x G_0 Δp range 14 - 220 kPa
$Kv_{0.01}$=0.169 x G_0 Δp range 35 - 410 kPa where G_0 = design flow rate

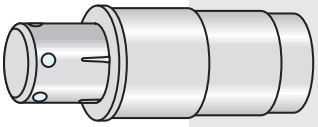
Operating principle

Within the Control Range

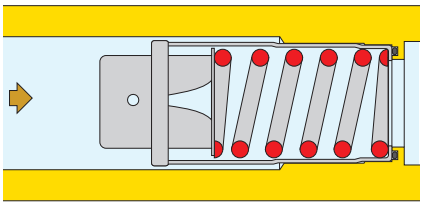


If the differential pressure is within the control range, the piston compresses the spring and gives the medium a free flow area to permit the designated flow to pass.



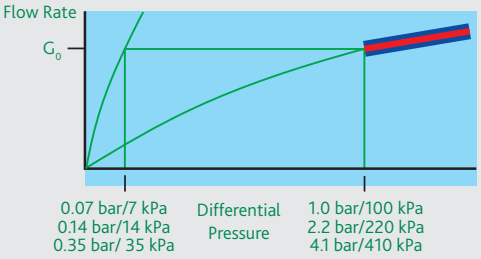


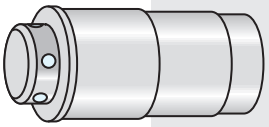
Above the Control Range



In this case, the piston is fully compressed and only allows flow through the fixed orifice.

The flow rate through the ABV thus depends solely on the differential pressure.





$Kv_{0.01}$=0.1 x G_0 Δp range 7 - 100 kPa
$Kv_{0.01}$=0.067 x G_0 Δp range 14 - 220 kPa
$Kv_{0.01}$=0.049 x G_0 Δp range 35 - 410 kPa where G_0 = design flow rate

Selecting the control range or Δp range of the AFC valve

Automatic balancing valves are available with different control ranges, so as to satisfy a wide array of system requirements.

By definition, the control range is contained between two differential pressure values:

range Δp: Δp_{flow} - Δp_{return}

The choice must be made taking into account the following:

- differential pressure at the start of the control range. This value must be added to the fixed loss of head in the circuit in the most unfavourable conditions. In this case it is necessary to evaluate the available pump head.
- differential pressure at the end of the control range. If this value is exceeded the cartridge spring is fully compressed and the device no longer performs any regulating action. It will be necessary to switch to a higher control range.

The following control ranges are available.

7 - 100 kPa 0.07 - 1 bar	Can be used in sealed circuits served by pumps with a limited head. For example in small heating systems with wall-mounted boilers that have their own internal circulator.
22- 220 kPa 0.22 - 2.2 bar	Can be used in the majority of sealed systems. The ample control range allows it to be inserted with a minimum additional differential pressure, amounting to 22 kPa.
35- 350 kPa 0.35 - 3.5 bar	Can be used in open systems, for example in water distribution systems or with high level of available head, for example in district heating systems. The high upper limit, 410 kPa (4.1 bar), makes proper operation possible within the control range.

Sizing the Circuit with Automatic Balancing Valves (ABVs)

Sizing the circuit containing Automatic balancing valves is particularly easy to accomplish.

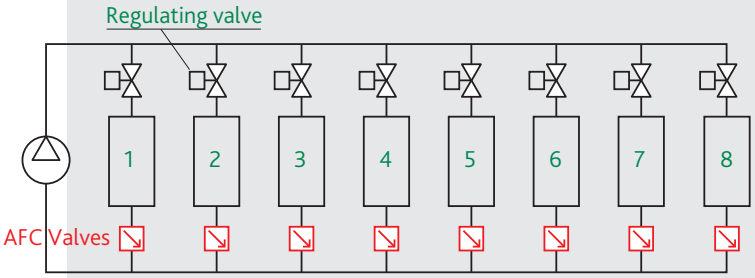
As illustrated alongside by the example diagrams, calculation of the loss of head in order to choose the pump is made by referring to the most unfavourable circuit and by adding this value to the minimum differential pressure required by the ABV.

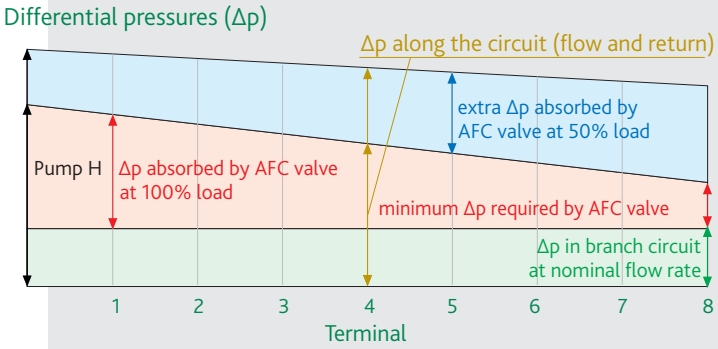
In the example the circuits have the same nominal flow rate.

The ABV, located on intermediate circuits, automatically absorb the excess differential pressure to ensure the corresponding nominal flow rate.

As the regulating valves open or close, the cartridge repositions itself dynamically to maintain the nominal flow rate (50% load = circuits 3, 5, 7, 8 closed).

For more detailed information on sizing a system with Altecnic Automatic Balancing valves, please refer to the Altecnic Technical Department.



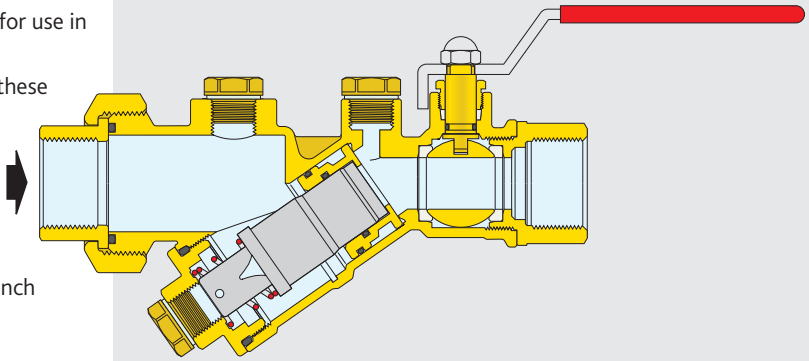


Construction Details

Stainless steel cartridge

The flow cartridge is made entirely of stainless steel, suitable for use in air conditioning and heating systems.

It is fully compatible with glycols and other additives used in these systems.



Wide range of working pressures

The flow cartridge provide precise regulation of the flow rate over a wide range of working pressures. It is factory calibrated to keep the flow rate within ±5% of the set value.

For these reasons it can be used in system circuits both as branch valves and directly at the terminal emitters.

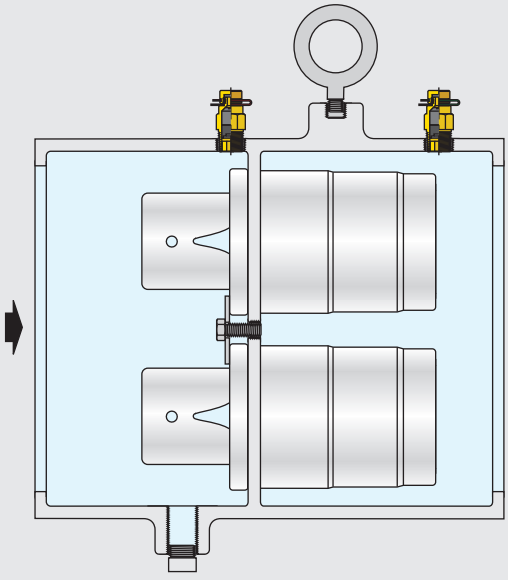
Ball valve

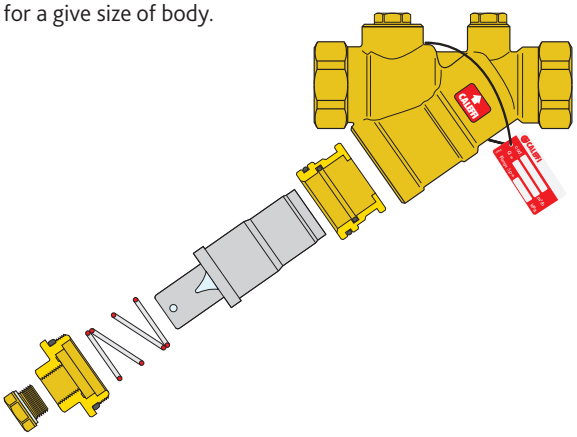
The control stem of the ball valve is blow-proof and the reversible closing lever is covered with vinyl.

Replaceable cartridge

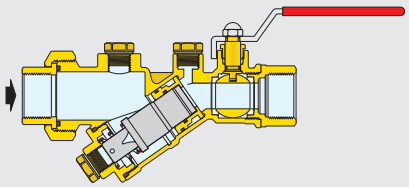
The flow cartridge is a complete assembly so as to permit easy removal from the body for inspection or replacement.

The cartridge is retained in the body by spring and some combinations require an adaptor piece, to allow greater flexibility in cartridge selection for a give size of body.





Flow Rate Table for 120 Series

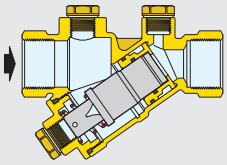


Code	Kv (m³/h)	Min Working Δp (kPa)	Δp Range (kPa)	Flow rate (m³/h)
120141•••	6.90	7	7 to 100	0.45, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0
120151•••	7.73	7	7 to 100	0.45, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0
120161•••	17.04	7	7 to 100	0.7, 0.8, 0.9, 1.0

Code	Kv (m³/h)	Min Working Δp (kPa)	Δp Range (kPa)	Flow rate (m³/h)
120141•••	6.90	22	22 to 220	0.12, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8
120151•••	7.73	22	22 to 220	0.12, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8
120161•••	17.04	22	22 to 220	0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25
120171•••	17.74	22	22 to 220	0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25
120181•••	47.24	22	22 to 220	2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0
120191•••	48.89	22	22 to 220	2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0

Code	Kv (m³/h)	Min Working Δp (kPa)	Δp Range (kPa)	Flow rate (m³/h)
120141•••	6.90	7	35 to 410	0.25, 0.35, 0.45, 0.55, 0.7, 0.9, 1.1, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75
120151•••	7.73	212	35 to 410	0.25, 0.35, 0.45, 0.55, 0.7, 0.9, 1.1, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75
120161•••	17.04	216	35 to 410	1.6, 1.8, 2.0, 2.25, 2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 6.0
120171•••	17.74	271	35 to 410	1.6, 1.8, 2.0, 2.25, 2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 6.0
120181•••	47.24	271	35 to 410	3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0, 12.0, 13.0, 14.5, 15.5
120191•••	48.89	287	35 to 410	3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0, 12.0, 13.0, 14.5, 15.5

Flow Rate Table for 125 Series



Code	Kv (m³/h)	Min Working Δp (kPa)	Δp Range (kPa)	Flow rate (m³/h)
125141•••	6.69	7	7 to 100	0.45, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0
125151•••	7.58	7	7 to 100	0.45, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0
125161•••	13.42	7	7 to 100	0.7, 0.8, 0.9, 1.0

Code	Kv (m³/h)	Min Working Δp (kPa)	Δp Range (kPa)	Flow rate (m³/h)
125141•••	6.69	22	22 to 220	0.12, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8
125151•••	7.58	22	22 to 220	0.12, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8
125161•••	13.42	22	22 to 220	0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25
125171•••	13.26	22	22 to 220	0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25
125181•••	34.72	22	22 to 220	2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0
125191•••	37.88	22	22 to 220	2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0
125101•••	75.82	22	22 to 220	9.0, 9.5, 10.0, 11.0, 12.0, 13.5, 14.5, 15.5, 16.5, 17.0, 18.0, 19.5, 20.5, 21.5, 22.5

Code	Kv (m³/h)	Min Working Δp (kPa)	Δp Range (kPa)	Flow rate (m³/h)
125141•••	6.69	35	35 to 410	0.25, 0.3, 0.35, 0.45, 0.55, 0.7, 0.9, 1.1, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75
125151•••	7.58	35	35 to 410	0.25, 0.3, 0.35, 0.45, 0.55, 0.7, 0.9, 1.1, 1.4, 1.6, 1.8, 2.0, 2.25, 2.5, 2.75
125161•••	13.42	35	35 to 410	2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 5.5, 6.0
125171•••	13.26	35	35 to 410	2.5, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 5.0, 5.5, 6.0
125181•••	34.72	35	35 to 410	3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0, 12.0, 13.0, 14.5, 15.5
125191•••	37.88	35	35 to 410	3.0, 3.25, 3.5, 3.75, 4.0, 4.25, 4.5, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 11.0, 12.0, 13.0, 14.5, 15.5
125101•••	75.82	35	35 to 410	6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 11.0, 18,0, 19.0, 20.0, 21.0, 22.0

Coding for ABV Cartridges

For correct identification of the 120 and 125 valves including the cartridge the code must be in the following order;

Complete Code

1st	2nd	3rd	4th	5th	6th	7th	8th	9th
			1		1			
Series				Size		Flow Rate & Δp Range		

Series

1st 2nd 3rd

The first three digits indicate the series

120	Automatic balancing valve with ball valve
125	Automatic balancing valve

Size

5th

The fifth digit indicate the size

Size	½"	¾"	1"	1¼"	1½"	2"	2½"
Digit	4	5	6	7	8	9	0

Flow Rate & Δp Range

7th 8th 9th

The last three digits indicate the flow rates available

with Δp range 7–100 kPa

m³/h	digit	m³/h	digit	m³/h	digit	m³/h	digit
0.45	S45	0.60	S60	0.80	S80	1.00	1S0
0.50	S50	0.70	S70	0.90	S90		

with Δp range 22–220 kPa

m³/h	digit	m³/h	digit	m³/h	digit	m³/h	digit	m³/h	digit	m³/h	digit
0.12	L12	0.70	L70	2.25	2L2	4.50	4L5	9.00	9L0	17.0	17L
0.15	L15	0.80	L80	2.50	2L5	5.00	5L0	9.50	9L5	18.0	18L
0.20	L20	0.90	L90	2.75	2L7	5.50	5L5	10.0	10L	19.5	19L
0.25	L25	1.00	1L0	3.00	3L0	6.00	6L0	11.0	11L	20.5	20L
0.30	L30	1.20	1L2	3.25	3L2	6.50	6L5	12.0	12L	21.5	21L
0.35	L35	1.40	1L4	3.50	3L5	7.00	7L0	13.5	13L	22.5	22L
0.40	L40	1.60	1L6	3.75	3L7	7.50	7L5	14.5	14L		
0.50	L50	1.80	1L8	4.00	4L0	8.00	8L0	15.5	15L		
0.60	L60	2.00	2L0	4.25	4L3	8.50	8L5	16.5	16L		

with Δp range 35–410 kPa

m³/h	digit	m³/h	digit	m³/h	digit	m³/h	digit	m³/h	digit	m³/h	digit
0.25	H25	1.60	1H6	3.50	3H5	6.50	6H5	11.0	11H	21.0	21H
0.35	H35	1.80	1H8	3.75	3H7	7.00	7H0	12.0	12H	22.0	22H
0.45	H45	2.00	2H0	4.00	4H0	7.50	7H5	13.0	13H		
0.55	H55	2.25	2H2	4.25	4H2	8.00	8H0	14.5	14H		
0.70	H70	2.50	2H5	4.50	4H5	8.50	8H5	15.5	15H		
0.90	H90	2.75	2H7	5.00	5H0	9.00	9H0	18.0	18H		
1.10	1H1	3.00	3H0	5.50	5H5	9.50	9H5	19.0	19H		
1.40	1H4	3.25	3H3	6.00	6H0	10.0	10H	20.0	20H		

Flow Rate Table for 103 Series

Code	DN	Min Working Δp (kPa)	Δp Range (kPa)	Flow rate (m³/h)
103111•••	65	22	22 to 220	9 to 22.5
103113•••	65	35	35 to 410	18 to 22.5
103121•••	80	22	22 to 220	18 to 22.5
103123•••	80	35	35 to 410	18 to 22.5
103131•••	100	22	22 to 220	18 to 22.5
103133•••	100	35	35 to 410	18 to 22.5
103141•••	125*	22	22 to 220	16.5 to 61
103143•••	125*	35	35 to 410	18 to 45
103151•••	150	22	22 to 220	16.5 to 122.5
103153•••	150	35	35 to 410	18 to 155
103161•••	200	22	22 to 220	32 to 215
103163•••	200	35	35 to 410	36 to 270
103171•••	250	22	22 to 220	64 to 338
103173•••	250	35	35 to 410	72 to 425
103181•••	300	22	22 to 220	95 to 460
103183•••	300	35	35 to 410	115 to 580
103191•••	350	22	22 to 220	160 to 580
103193•••	350	35	35 to 410	190 to 730

- The flow rates are available in increments of approximately 1 m³/h
- They are available on request with sizes from DN400 to DN800 with flow rates up to 3850 m³/h

* They are available on request with 4" ANSI flanges

Supplied with BS EN 1092-1 PN16 flanges, studs, gaskets and pressure test points.

Minimum differential pressure required

This is equal to the minimum working Δp of cartridge (22 or 35 kPa)

Example

$\Delta p_{required} = \Delta p_{AFC\ Valve}$ = 22 or 35 kPa; (0.22 or 0.35 bar)

Pump head $H = \Delta p_{circuit} + \Delta p_{required}$

Coding for Cartridges

For correct identification of the 103 valves including the cartridge the code must be in the following order;

Complete Code

1st	2nd	3rd	4th	5th	6th	7th	8th	9th
1	0	3	1					
Series				Size	Δp Range	Flow Rate		

Size — 5th digit: The fifth digit indicate the size

DN	65	80	100	125	150	200	250	300	350
Digit	1	2	3	4	5	6	7	8	9

Δp Range — 6th digit: The sixth digit indicate the differential pressure range Δp

kPa	22 to 220	35 to 410
Digit	1	3

Flow Rate — 7th 8th 9th: The last three digits indicate the flow rate values.
Please contact Altecnic Technical Department for the flow rate closest to the design flow rate.

Notes:

Installation of Automatic Flow Control Valve

In air-conditioning systems, ABVs must be installed on the circuit return pipe - see typical installation examples.

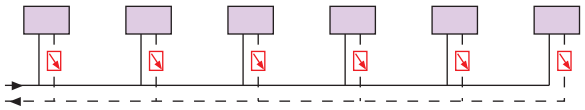
Sizing the system with Automatic Balancing Valve

For more detailed information on sizing a system with ABVs, please refer to the 2nd volume of the Altecnic Handbook and the technical bulletin "Dynamic balancing of hydronic circuits". This gives theoretical calculations, numerical examples and notes on the application of the above-mentioned devices in circuits.

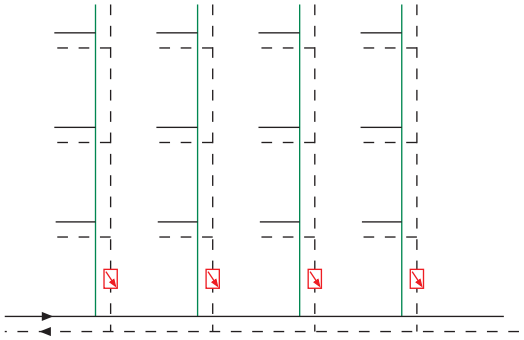
Medium

ABVs can be used with fluids other than water. In this case it is recommended to contact our Technical Department to select the most suitable product.

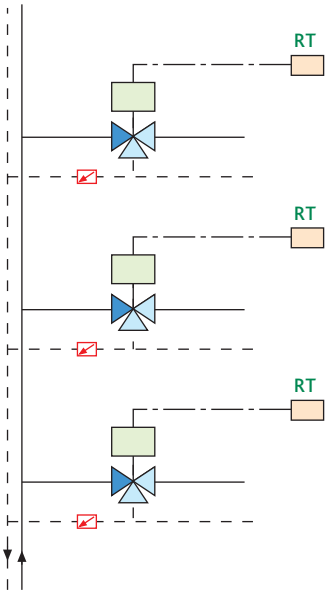
Typical Application for ABVs



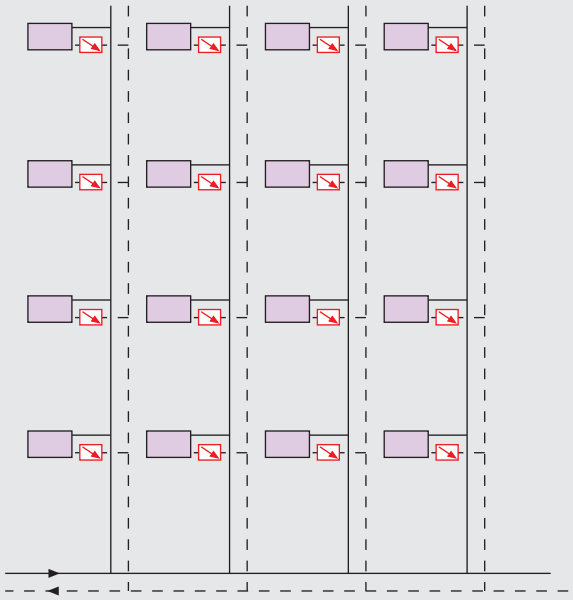
For use in line with various types of heat emitter: radiators, convectors, fan convectors, thermal strips, etc.



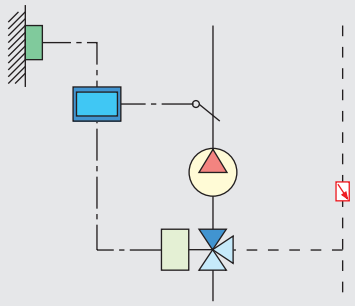
To regulate the flow rate in each riser or secondary branch of a system.



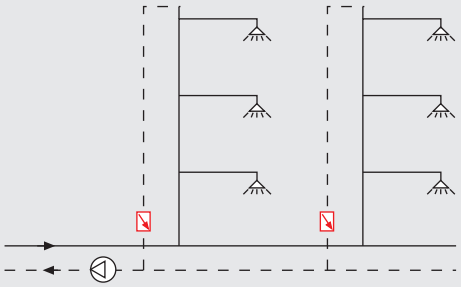
To guarantee the design flow rates (with open or closed valve) to the various zones of a system.



To ensure constant flow rates to each emitter.

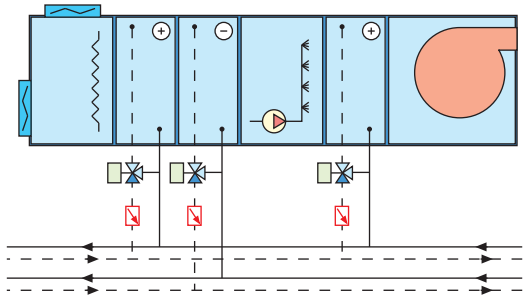


To ensure constant flow rates (in any valve position) in circuits with traditional temperature control.

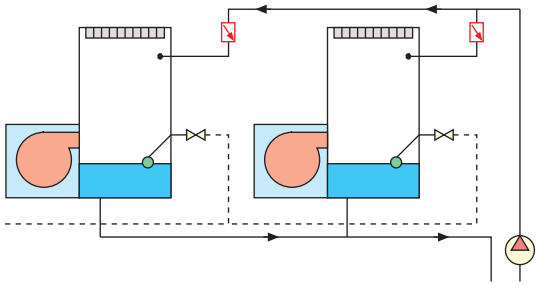


To balance circuits for hot water distribution.

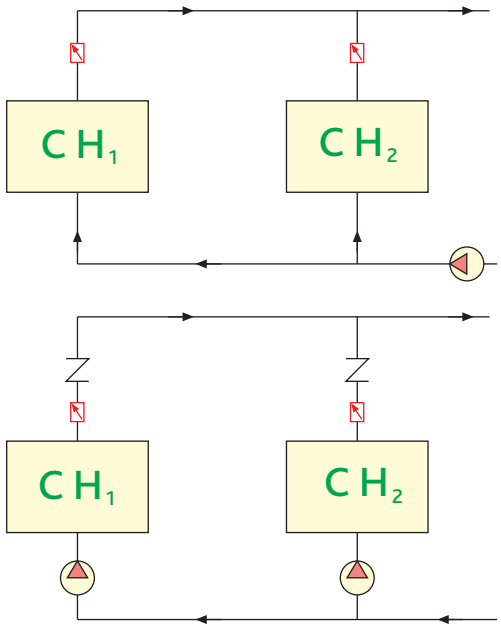
Typical Application for ABVs



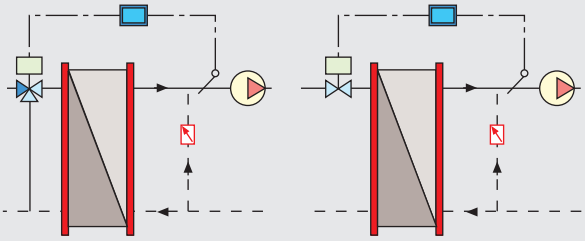
To balance circuits that serve air conditioning units.



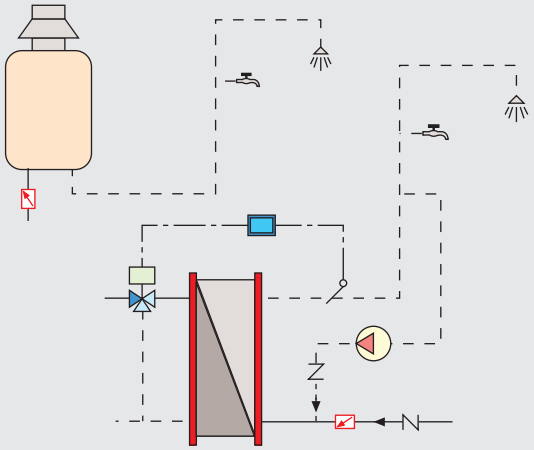
To balance circuits that serve cooling towers.



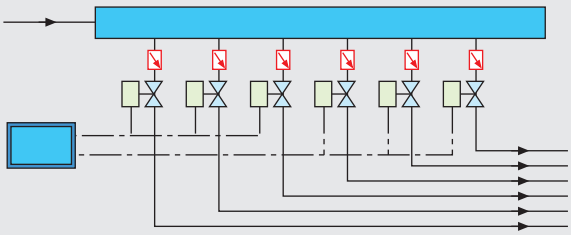
To balance the circuits that serve chiller unit evaporators or condensers.



To create heat exchanger flow balancing by-passes



To limit the hot water flow rate delivered in systems with instantaneous production or limited capacity.



To control the amount of delivered water and balance the various circuits in irrigation systems.

Typical Applications

To Balance heating and chilled water systems.

To limit the flow rate delivered to each user in district heating systems.

Suitable for industrial applications requiring water/solution to be delivered in a designated quantity.

Minimum differential pressure

Minimum differential pressure is the sum of two values;

The minimum working pressure of the AFC cartridge.

The Δp created by the design flow rate through the body only

This can be calculated using $kv_{0.01}$.

Example

125 AFC valve 1" size with flow rate G_0 = 2500 l/h, Δp range 22-220 kPa.

$$\Delta p_{required} = \Delta p_{Cartridge} + \Delta p_{Body} = 22 + (G_0/kv_{0.01})$$
$$= 22 + (2500/1342)^2 = 25.5 \text{ kPa}$$

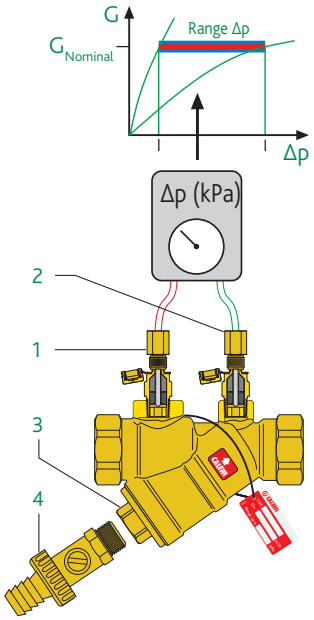
Pump head $H = \Delta p_{circuit} + \Delta p_{required}$

Checking the Flow Rate using the Pressure Ports

It is sufficient to check the differential pressure from upstream to downstream, using the pressure provided ports (1) - (2).

If the differential pressure is contained within the control range (range Δp) indicated on the data plate, then the flow rate is equal to the nominal value.

To take the measurement, simply use a differential pressure gauge. Snap-on pressure test ports 100 series and electronic measuring station 130 series can be used as accessories.



Drain Valve

The cover (3) contains a connection which can be used to fit a drain valve.

Electronic Manometer - 130

Electronic flow rate and differential pressure measuring station.

Supplied complete with shut-off valves and connection fittings.

May be used for Δp measurements and setting of balancing valves.

Bluetooth® transmission between Δp measuring station and remote control unit.

Versions complete with remote control unit with Windows Mobile® or with Android® application for Smartphone and Tablet.

Code

130006 - complete with remote control unit, with Android® application.

130005 - without remote unit, with Android® application.

Pressure Test Points - 100

Pair of pressure/temperature points.
Brass body.
EPDM seals.
Max. working pressure: 30 bar.
Working temperature range: -5 to 130°C
Connections: ¼" M.

Drain Valve - 538

Drain cock with hose connection.

Connections sizes ¼" and ½"

Max. working pressure: 10 bar.

Max. working temperature: 110°C

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