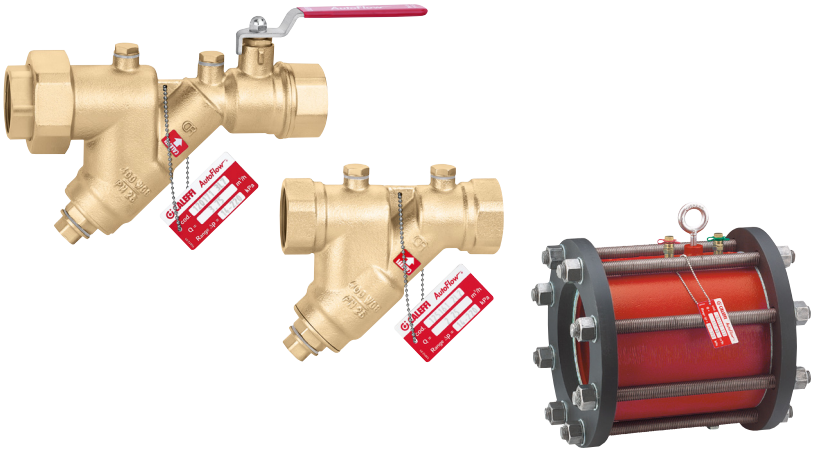
Automatic flow rate regulators with steel cartridge

120 - 125 - 103 series

AutoFlow®

01041/21 EN
replaces 01041/19 GB



Function

AUTOFLOW® devices are automatic flow rate regulators, which keep the flow rate constant in air conditioning and plumbing system circuits.
They are used to automatically balance the plumbing system, guaranteeing the design flow rate to each terminal.
The devices are available in both the flow rate regulator simple version and the shut-off ball equipped version.

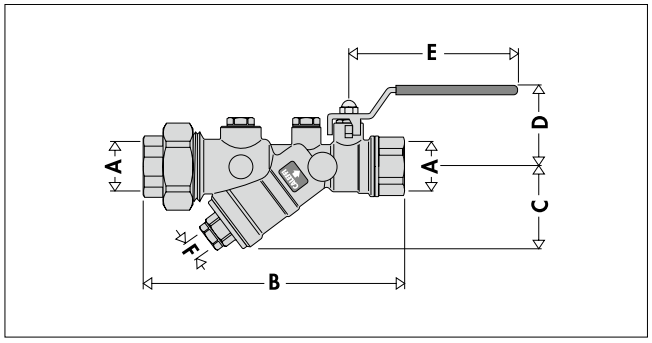
Product range

120 series	Automatic flow rate regulator with steel cartridge and ball valve	sizes 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2"
125 series	Automatic flow rate regulator with steel cartridge	sizes 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2" - 2 1/2"
103 series	Automatic flow rate regulator with steel cartridge, flanged version	sizes DN 65 - 80 - 100 - 125 - 150 - 200 - 250 - 300

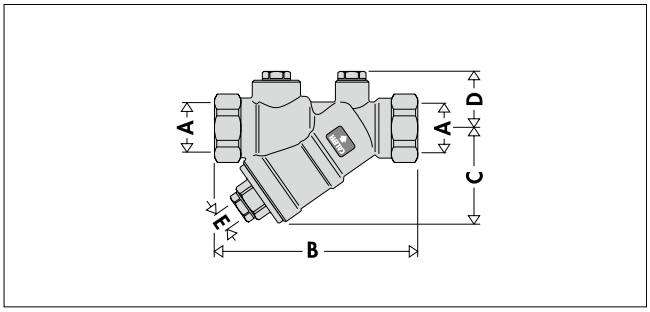
Technical specifications

series	120	125	103
Materials			
Body:	- 1/2"– 3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"–2": dezincification resistant alloy CR EN 1982 CC770S	- 1/2"– 3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"–2 1/2": dezincification resistant alloy CR EN 1982 CC770S	cast iron ASTM A126-61T
AUTOFLOW® cartridge:	stainless steel EN 10088-2 (AISI 304)	stainless steel EN 10088-2 (AISI 304)	stainless steel EN 10088-2 (AISI 304)
Spring:	stainless steel EN 10270-3 (AISI 302)	stainless steel EN 10270-3 (AISI 302)	stainless steel
Seals:	EPDM	EPDM	non-asbestos fibre
Ball:	brass EN 12165 CW614N, chrome plated	-	-
Ball seat	PTFE	-	-
Control stem seal:	EPDM + PTFE	-	-
Lever:	special galvanized steel	-	-
Pressure point plugs	dezincification resistant alloy CR EN 12164 CW602N	dezincification resistant alloy CR EN 12164 CW602N	-
Quick-fit pressure test ports	-	brass EN 12164 CW614N	-
Performance			
Medium:	water, glycol solutions	water, glycol solutions	water, glycol solutions
Max. percentage of glycol:	50 %	50 %	50 %
Maximum working pressure:	25 bar	25 bar	16 bar
Working temperature range:	0–110 °C	-20–110 °C	-20–110 °C
Δp range:	10–95 kPa; 22–210 kPa; 40–390 kPa	10–95 kPa; 22–210 kPa; 40–390 kPa	22–210 kPa; 40–390 kPa; 55–210 kPa
Flow rates:	0,12–15,5 m³/h	0,12–17 m³/h	9–4400 m³/h
Accuracy:	±5 %	±5 %	±5 %
Connections	1/2"–2" F with union x F (EN 10226-1)	1/2"–2 1/2" F x F (EN 10226-1)	DN 65–300 flanged PN 16 EN 1092-1
Pressure test port connections	1/4" F (ISO 228-1)	1/4" F (ISO 228-1)	1/4" F (ISO 228-1)

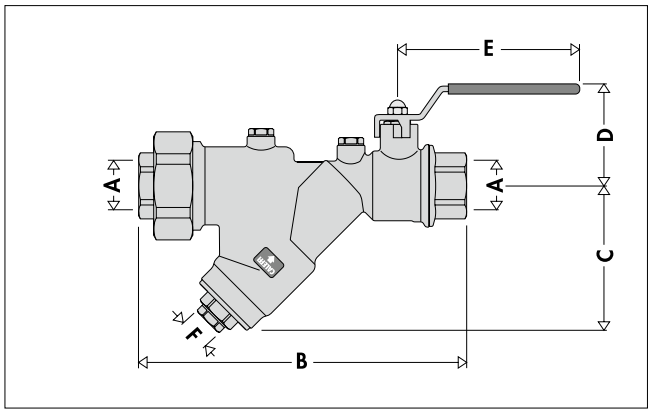
Dimensions



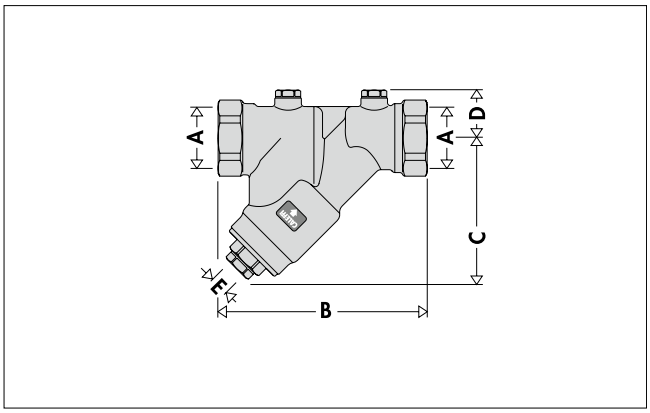
Code	A	B	C	D	E	F	Mass (kg)
120141 ...	1/2"	156,5	52,5	50	100	1/4"	1,10
120151 ...	3/4"	159,5	52,5	50	100	1/4"	1,10
120181 ...	1 1/2"	253	103	88	140	1/2"	4,60
120191 ...	2"	253	103	88	140	1/2"	4,60



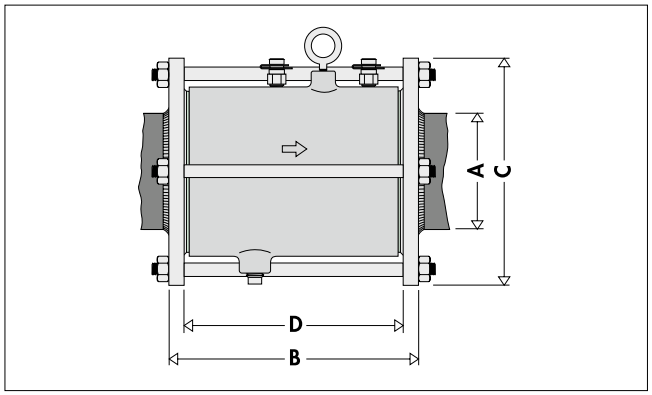
Code	A	B	C	D	E	Mass (kg)
125141 ...	1/2"	101	52,5	30	1/4"	0,55
125151 ...	3/4"	106	52,5	30	1/4"	0,58
125181 ...	1 1/2"	177	105	38,5	1/2"	2,25
125191 ...	2"	179	105	38,5	1/2"	2,45
125101 ...	2 1/2"	230	133	48,5	1/2"	4,36



Code	A	B	C	D	E	F	Mass (kg)
120161 ...	1"	218,5	96	66	120	1/2"	2,30
120171 ...	1 1/4"	220,5	96	66	120	1/2"	2,30



Code	A	B	C	D	E	Mass (kg)
125161 ...	1"	140,5	102	33,5	1/2"	1,02
125171 ...	1 1/4"	148	102	33,5	1/2"	1,16



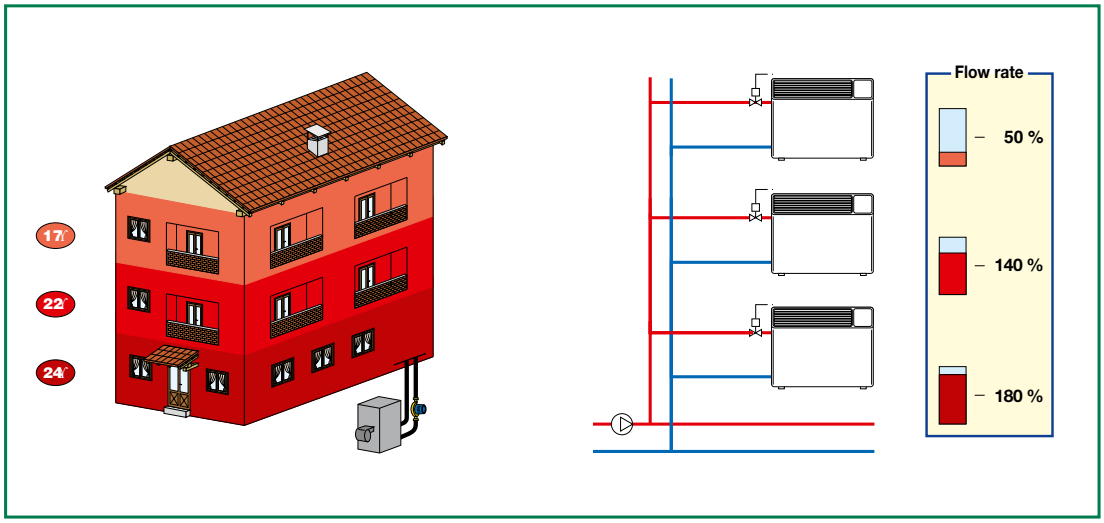
Code	A	B	C	D	Mass (kg)
10311. ...	DN 65	208	185	172	14
10312. ...	DN 80	212	200	172	16
10323. ...	DN 100	250	235	80	31
10314. ...	DN 125	271	250	198	29
10315. ...	DN 150	271	285	223	39
10316. ...	DN 200	287	360	223	59
10317. ...	DN 250	295	425	223	85
10318. ...	DN 300	319	515	223	112

Circuit balancing

Modern heating and air-conditioning systems have to guarantee a high level of thermal comfort with a low consumption of energy This means supplying the system terminals with the correct design flow rates, to produce balanced hydraulic circuits.

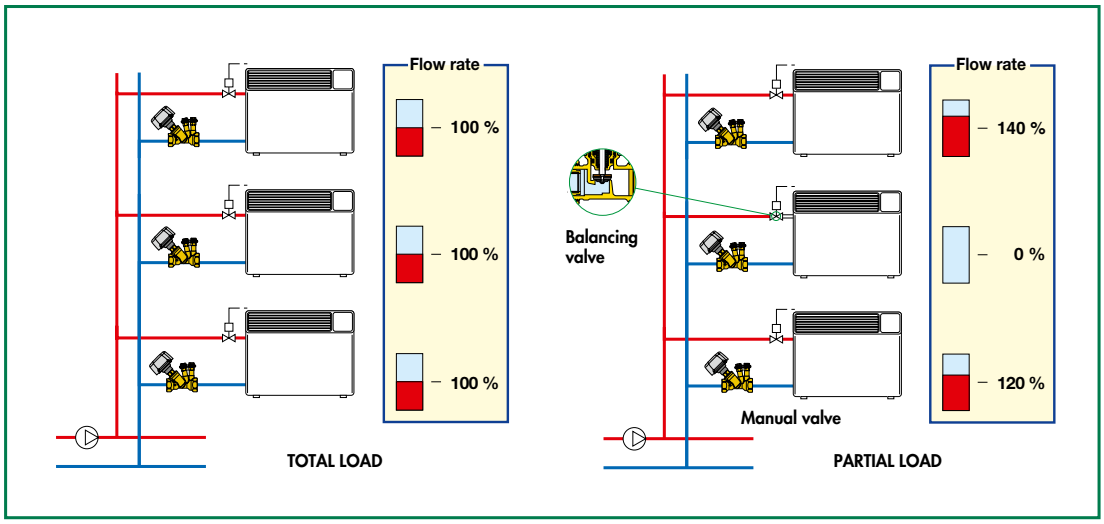
Unbalanced circuits

In unbalanced circuits, the hydraulic imbalance between terminals creates areas with non-uniform temperatures, resulting in problems with thermal comfort and higher energy consumption.



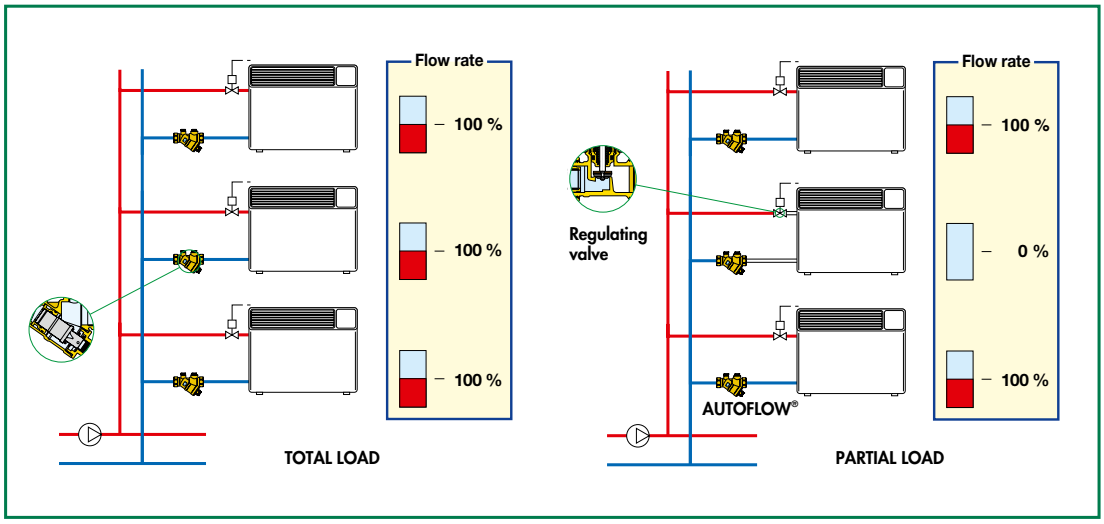
Circuits balanced with manual valves

Traditionally, hydraulic circuits are balanced using manual calibration valves. With these static devices, such circuits are difficult to balance perfectly and have operating limitations when the regulating valves close them partially. The flow rate in the open circuits **does not remain constant at the nominal value**.



Circuit balanced with AUTOFLOW®

The AUTOFLOW® devices balance the plumbing system automatically, ensuring that each terminal receives the design flow rate.
Even when the regulating valves close the circuit partially, the flow rates in the open circuits remain constant at the nominal value.
The system always guarantees the greatest comfort and the highest energy savings.

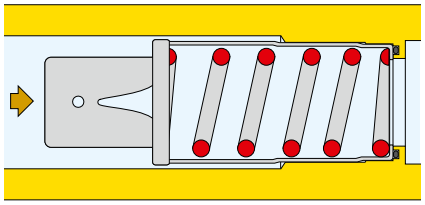


AUTOFLOW® devices

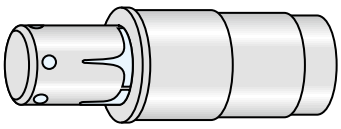
Function
The AUTOFLOW® device must guarantee a constant flow rate when the upstream/downstream differential pressure varies
It is therefore necessary to refer to the Δp - flow rate diagram and a basic diagram illustrating the operating modes and effects of the relevant variables.

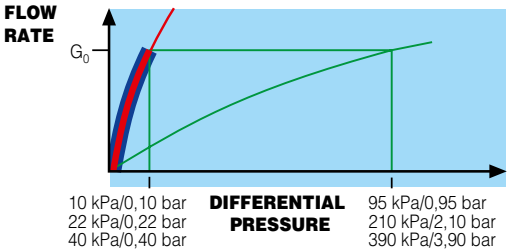
Operating principle
The regulating element of these devices is composed of a cylinder and a piston with fixed and variable geometry side open tubes through which the fluid flows. These apertures are governed by the piston movement actuated by the pressure of the medium. A specially calibrated spring counteracts this movement.
AUTOFLOW® devices are high-performance automatic regulators. They regulate the flow rates selected within a very tight tolerance (approx. 5 %) and offer a wide control range.

Below the working range



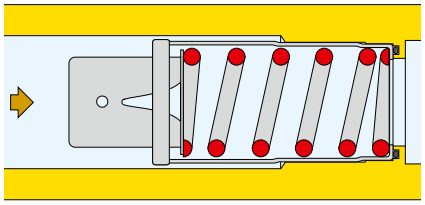
In this case, the regulating piston remains in equilibrium without compressing the spring and gives the fluid the maximum free flow area In practice, the piston acts as a fixed regulator, and so the flow through the AUTOFLOW® depends solely on the differential pressure.



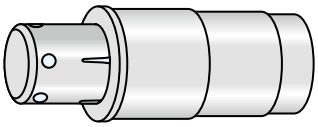


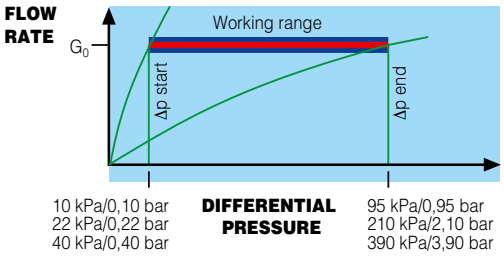
$Kv_{0,01}=0,316 \cdot G_0$ range Δp 10–95 kPa
$Kv_{0,01}=0,213 \cdot G_0$ range Δp 22–210 kPa
$Kv_{0,01}=0,158 \cdot G_0$ range Δp 40–390 kPa *where G_0 = nominal flow rate (l/h)*

Within the working range

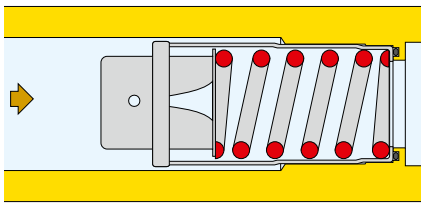


If the differential pressure is within the control range, the piston compresses the spring and gives the medium a free flow area to permit normal flow at the nominal rate for which the AUTOFLOW® is set.

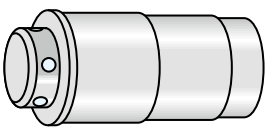


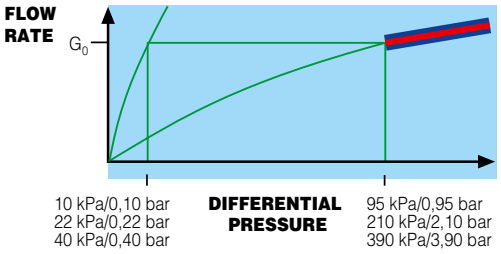


Above the working range



In this case, the piston compresses the spring fully and only leaves the fixed geometry aperture for the medium to pass through
As in the first case above, the piston acts as a fixed regulator The flow rate through the AUTOFLOW® therefore depends solely on the differential pressure.





$Kv_{0,01}=0,103 \cdot G_0$ range Δp 10 ÷ 95 kPa
$Kv_{0,01}=0,069 \cdot G_0$ range Δp 22 ÷ 210 kPa
$Kv_{0,01}=0,051 \cdot G_0$ range Δp 40 ÷ 390 kPa *where G_0= nominal flow rate (l/h)*

Selecting the control range or range Δp of the AUTOFLOW® device

AUTOFLOW® devices are available with different control ranges in order to meet a wide range of system requirements.
By definition, the control range is contained between two differential pressure values

$$\Delta p \text{ range: } \Delta p_{start} - \Delta p_{end}$$

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, you need to know the head of the pump at your disposal.
- **differential pressure at the end of the control range.** If this value is exceeded, the AUTOFLOW® spring will be fully compressed and the device will no longer perform any regulating action. It will be necessary to change to a higher control range

The following AUTOFLOW® control ranges are available.

10–95 kPa
0,10–0,95 bar
Can be used in closed circuits served by pumps with limited head.
For example, in small heating systems with wall-mounted boilers that have their own internal circulator.

22–210 kPa
0,22–2,10 bar
Can be used in the majority of closed circuit systems.
The wide control range means that it can be inserted with minimum additional "expenditure" of differential pressure, amounting to 22 kPa (0,22 bar).

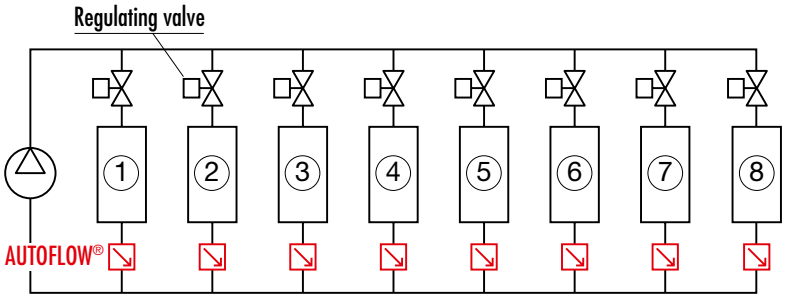
40–390 kPa
0,40–3,90 bar
Can be used in open circuit systems, for example in water distribution systems or systems in which there is a high level of head available, for example in district heating systems. The high upper limit of 390 kPa (3,9 bar) means that proper operation is possible without leaving the control range.

Dimensioning the circuit with AUTOFLOW®

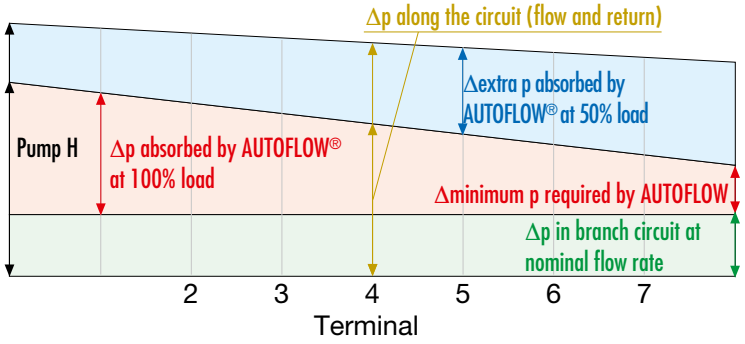
It is particularly easy to dimension a circuit containing AUTOFLOW®. As illustrated by the example diagrams shown alongside, the pressure drop caused by the choice of pump is calculated by referring to the hydraulically most disadvantaged circuit and adding this value to the minimum differential pressure required by the AUTOFLOW®. In the example the circuits have the same nominal flow rate.

The AUTOFLOW®devices on the intermediate circuits automatically absorb the excess differential pressure to ensure the corresponding nominal flow rate.
As the regulating valves open or close, the AUTOFLOW® repositions itself dynamically to maintain the nominal flow rate (50 % load = circuits 3, 5, 7, 8 closed).

For more detailed information on dimensioning a system with AUTOFLOW®, refer to the 2nd volume of the Caleffi handbooks and the "Dynamic balancing in plumbing circuits" technical bulletin. They give theoretical calculations, numerical examples and notes on the application of the above-mentioned devices in circuits.



Differential pressures (Δp range)



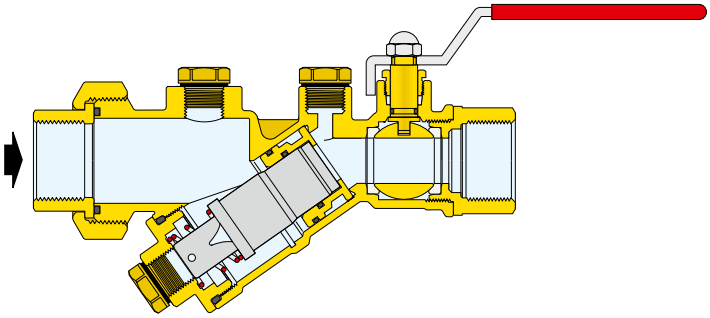
Construction details

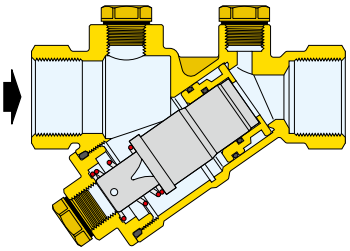
Steel regulator
The flow rate regulator element is made entirely of steel, suitable for use in air-conditioning and plumbing systems.
It is fully compatible with the glycols and additives used in the circuits.

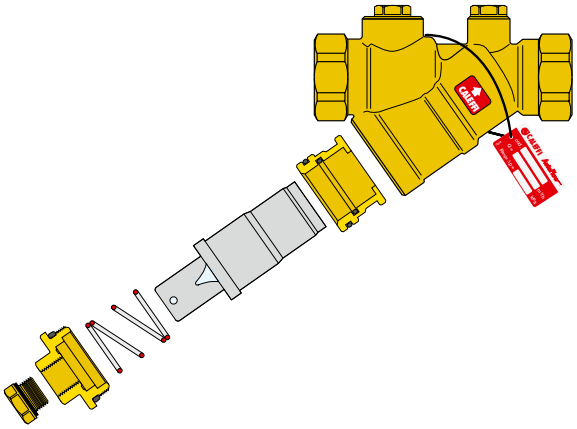
Wide range of working pressures
The regulator is able to provide precision regulation of the flow rate over a wide range of working pressures. It is factory calibrated to keep the flow rate automatically within ±5 % of the set value.
For these reasons it can be used in system circuits on both zone outlets and directly at the terminal emitters.

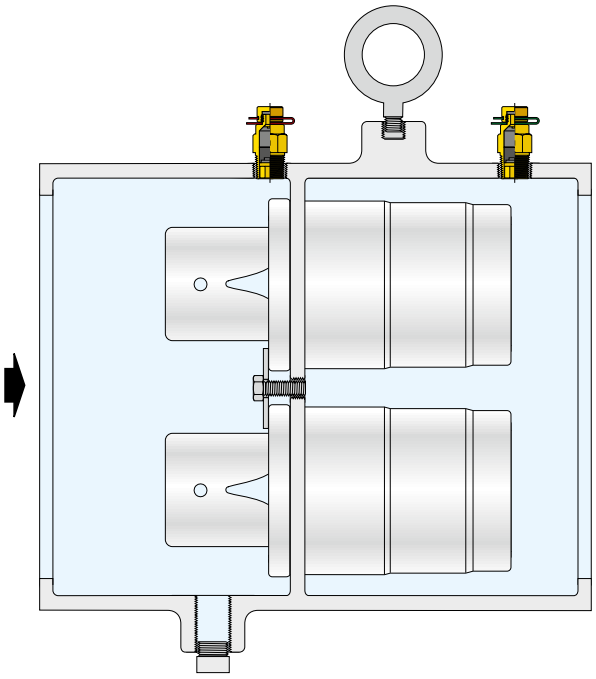
Ball valve
The control stem of the ball valve has an anti-removal device and the reversible closing lever is covered with vinyl

Replaceable cartridge
The internal regulator is assembled in the form of a self-contained cartridge so as to permit easy removal from the body for inspection or replacement.



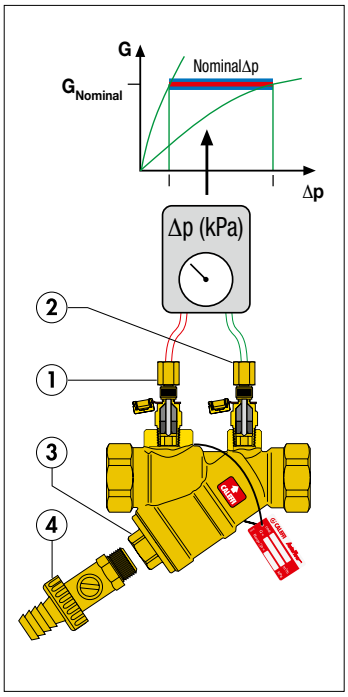






Pressure points - checking flow rate

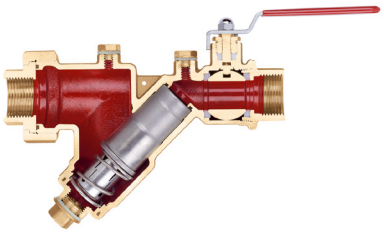
Given the dynamic characteristics of the device, it is sufficient to check the differential pressure upstream and downstream, using the pressure points (1) - (2) provided.
If the differential pressure is within the control range (Δp range) specified on the data plate, then the through flow rate is equal to the nominal value.
To make the measurement, simply use a differential pressure gauge.
100 series snap-on pressure test ports and a 130 series electronic measuring device can be used as accessories.



Cartridge plug
The cartridge plug (3) contains a connection that allows use of a circuit drain valve (4)

AUTOFLOW® flanged version
This is supplied complete with EN 1092-1 PN 16 flanges (PN 25 available to order), seals and quick-fit pressure test ports.

120 series flow rate tables

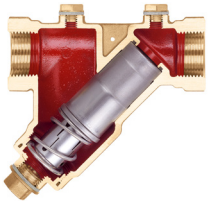


Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
120141 •••	6,90	10	10–95	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
120151 •••	7,73	10	10–95	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
120161 •••	17,04	10	10–95	0,7; 0,8; 0,9; 1,0

Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
120141 •••	6,90	22	22–210	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	22–210	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	22–210	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	22–210	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	22–210	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	22–210	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)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
120141 •••	6,90	40	40–390	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	40	40–390	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	40	40–390	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; 5,5; 6,0
120171 •••	17,74	40	40–390	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; 5,5; 6,0
120181 •••	47,24	40	40–390	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	40	40–390	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

125 series flow rate tables



Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
125141 •••	6,69	10	10–95	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
125151 •••	7,58	10	10–95	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
125161 •••	13,42	10	10–95	0,7; 0,8; 0,9; 1,0

Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
125141 •••	6,69	22	22–210	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	22–210	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	22–210	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	22–210	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	22–210	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 •••	37,38	22	22–210	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	22–210	9,0; 9,5; 10,0; 11,0; 12,0; 13,5; 14,5; 15,5; 16,5; 17,0;

Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
125141 •••	6,69	40	40–390	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
125151 •••	7,58	40	40–390	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
125161 •••	13,42	40	40–390	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	40	40–390	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	40	40–390	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 •••	37,38	40	40–390	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	40	40–390	6,5; 7,0; 7,5; 8,0; 8,5; 9,0; 9,5; 11,0;

Minimum differential pressure required
Given by the sum of two magnitudes:
1. The minimum working Δp of the AUTOFLOW® cartridge
2. The Δp required for the nominal flow rate to pass through the valve body.
   This value can be determined using the $Kv_{0,01}$ values specified above and with reference to the valve body alone

Example

125 series AUTOFLOW®, size 1" with flow rate G_0 = 2500 l/h and Δp range 22–210 kPa:

$\Delta p_{required} = \Delta p_{AUTOFLOW®} + \Delta p_{body} = 22 + (G_0 / Kv_{0,01})^2 = 22 + (2500 / 1342)^2 = 25,5$ kPa

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

Coding method for 120 - 125 series AUTOFLOW®

For proper identification of the device, fill in the chart indicating: the series, the size, the flow rate and theΔp.

Complete code

1st	2nd	3rd	4th	5th	6th	7th	8th	9th
			1		1			
Series				SIZE		FLOW RATE AND RANGEΔp		

Series

1st 2dn 3rd

The first three figures indicate the series

120	AUTOFLOW regulator®and ball valve
125	AUTOFLOW regulator®

SIZE

5th

The fifth figure indicates the size:

Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"
Digit	4	5	6	7	8	9	0

FLOW RATE AND RANGEΔp

7th 8th 9th

The last three figures indicate the available flow rate values:

with range Δp 10–95 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 range Δp 22–210 kPa

m³/h	cifra	m³/h	cifra	m³/h	cifra	m³/h	cifra	m³/h	cifra	m³/h	cifra
0,12	L12	0,60	L60	1,80	1L8	3,75	3L7	7,00	7L0	12,0	12L
0,15	L15	0,70	L70	2,00	2L0	4,00	4L0	7,50	7L5	13,5	13L
0,20	L20	0,80	L80	2,25	2L2	4,25	4L2	8,00	8L0	14,5	14L
0,25	L25	0,90	L90	2,50	2L5	4,50	4L5	8,50	8L5	15,5	15L
0,30	L30	1,00	1L0	2,75	2L7	5,00	5L0	9,00	9L0	16,5	16L
0,35	L35	1,20	1L2	3,00	3L0	5,50	5L5	9,50	9L5	17,0	17L
0,40	L40	1,40	1L4	3,25	3L2	6,00	6L0	10,0	10L		
0,50	L50	1,60	1L6	3,50	3L5	6,50	6L5	11,0	11L		

with range Δp 40–390 kPa

m³/h	cifra	m³/h	cifra	m³/h	cifra	m³/h	cifra	m³/h	cifra	m³/h	cifra
0,25	H25	1,10	1H1	2,50	2H5	4,00	4H0	6,50	6H5	10,0	10H
0,35	H35	1,40	1H4	2,75	2H7	4,25	4H2	7,00	7H0	11,0	11H
0,45	H45	1,60	1H6	3,00	3H0	4,50	4H5	7,50	7H5	12,0	12H
0,55	H55	1,80	1H8	3,25	3H2	5,00	5H0	8,00	8H0	13,0	13H
0,70	H70	2,00	2H0	3,50	3H5	5,50	5H5	8,50	8H5	14,5	14H
0,90	H90	2,25	2H2	3,75	3H7	6,00	6H0	9,00	9H0	15,5	15H

103 series flow rate tables

Code	DN	Minimum working Δp (kPa)	Flow rates (m³/h)	Δp range (kPa)
103111 •••	65	22	9–17	22–210
103113 •••	65	40	18–22	40–390
103114 •••	65	55	25–36	55–210
103121 •••	80	22	9–17	22–210
103123 •••	80	40	18–22	40–390
103124 •••	80	55	25–36	55–210
103231 •••	100**	22	18–34	22–210
103233 •••	100**	40	23–45	40–390
103234 •••	100**	55	46–73	55–210
103141 •••	125	22	18–34	22–210
103143 •••	125	40	23–45	40–390
103144 •••	125	55	46–73	55–210
103151 •••	150	22	40–68	22–210
103153 •••	150	40	40–91	40–390
103154 •••	150	55	92–145	55–210
103161 •••	200*	22	80–119	22–210
103163 •••	200*	40	80–159	40–390
103164 •••	200*	55	160–255	55–210
103171 •••	250*	22	110–187	22–210
103173 •••	250*	40	110–250	40–390
103174 •••	250*	55	251–400	55–210
103181 •••	300	22	150–255	22–210
103183 •••	300	40	150–341	40–390
103184 •••	300	55	342–545	55–210

Supplied complete with EN 1092-1 PN16 flanges, rods, sealing gaskets and quick-fit pressure test ports.

Minimum differential pressure required
This is equal to the minimum working Δp of the AUTOFLOW® cartridge (22, 40 or 55 kPa).

Example

$\Delta p_{required} = \Delta p_{AUTOFLOW®}$ = 22, 40 or 55 kPa;
0,22, 0,40 or 0,55 bar

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

** Supplied with ANSI flange*
***Available with DN100 size EN 1092-1 PN25 flanges on request*

Available in DN 350 to DN 1000 sizes on request, with flow rates up to 4400 m³/h.

To identify Autoflow devices and their codes correctly, contact Caleffi technical support in advance.

Coding method for 103 series AUTOFLOW®

For proper identification of the device, fill in the chart indicating: the size, the Δp range and the flow rate.

Complete code

1st	2nd	3rd	4th	5th	6th	7th	8th	9th
1	0	3	1					
Series				SIZE	RANGEΔp	FLOW RATE		

SIZE — 5th

The fifth figure indicates the size:

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

RANGEΔp — 6th

The sixth figure indicates the differential pressure range (Δprange):

kPa	22÷220	35÷410
Digit	1	3

FLOW RATE — 7th 8th 9th

For the selection of available values, refer to the current catalogue.

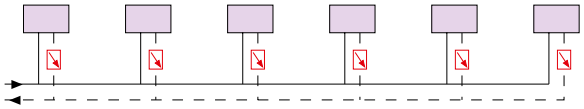
Notes

Installing AUTOFLOW®
In heating and air-conditioning systems, AUTOFLOW® devices must be installed on the circuit return pipe.
Some typical installation examples are given in the following pages

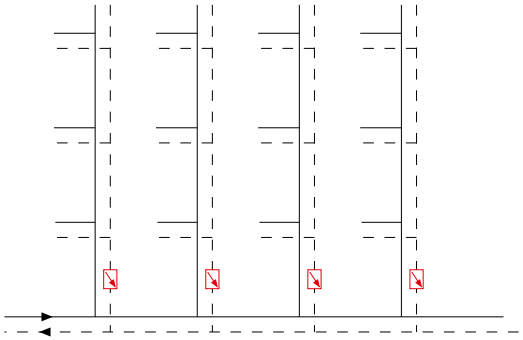
Dimensioning the system with AUTOFLOW®
For more detailed information on dimensioning a system with AUTOFLOW®, refer to the 2nd volume of the Caleffi handbooks and the "Dynamic balancing in plumbing circuits" technical bulletin. They give theoretical calculations, numerical examples and notes on the application of the above-mentioned devices in circuits.

Medium
AUTOFLOW® devices can be used with media that have characteristics other than those of water.
In this case it is recommended you contact our head office to select the most suitable product.

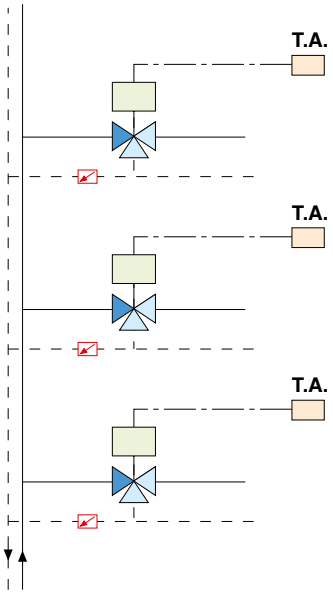
AUTOFLOW®applications ( )



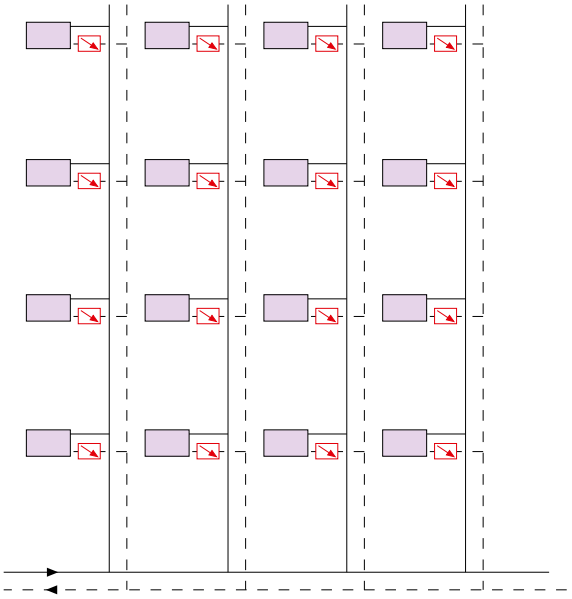
To serve a number of heating elements in line: radiators, convectors, fan-coils, fan heaters, heating strips, etc.



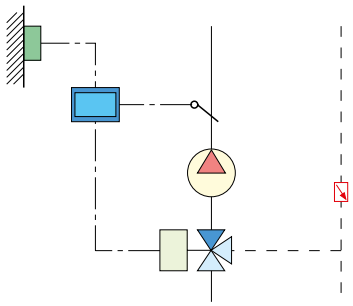
To adjust the flow rate in each column or in each secondary branch of a system.



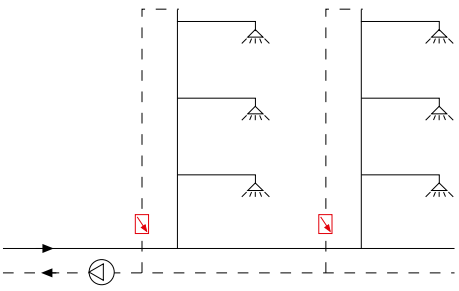
To guarantee the design flow rates (both with open valve and with closed valve) to the various areas in the system.



To ensure that the required amount of medium flows through each terminal.

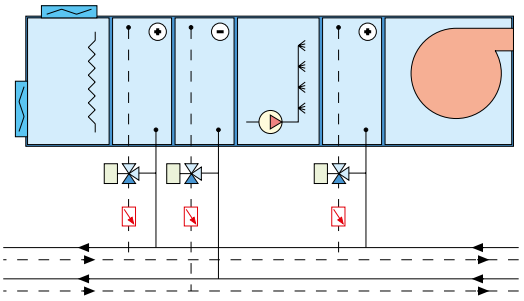


To allow constant flow rates (with the valve in any position) in circuits with traditional climate control.

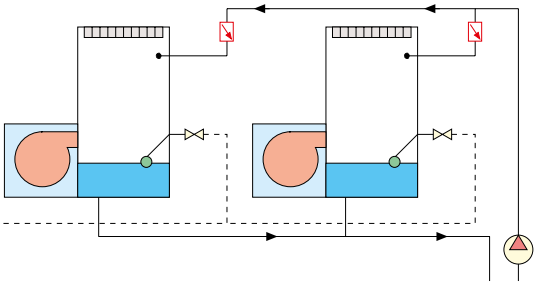


To balance sanitary water distribution circuits

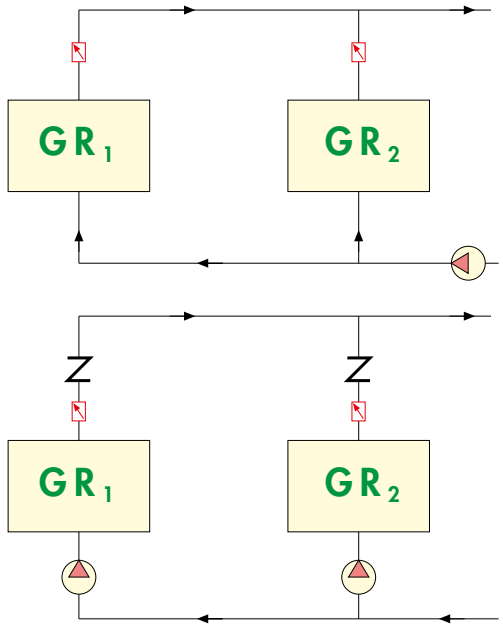
AUTOFLOW®applications ( )



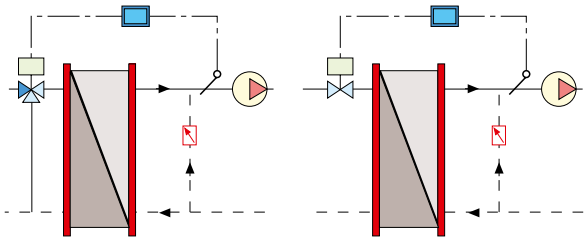
To balance circuits that serve air conditioning units



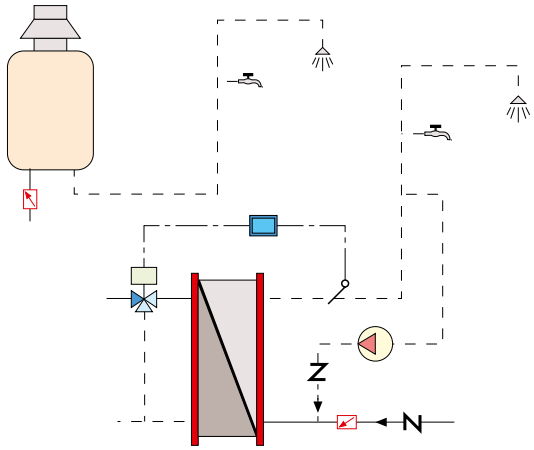
To balance circuits that serve cooling towers



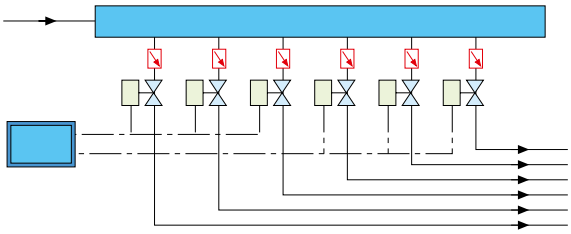
To balance the circuits that serve chiller unit evaporators or condensers.



To create flow rate balancing by-passes in heat exchangers.



To restrict the hot water delivery flow rate in instantaneous or limited-capacity hot water production systems.



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

To balance sanitary water distribution circuits.

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

For industrial type applications, such as
- control of water taken from wells,
- rooling of machinery at nominal conditions,
- balancing of extremely complex distribution systems

For further details, please consult Application Sheets No. 04301, 04302, 04303 and the "Dynamic balancing in plumbing circuits" Technical Bulletin.

SPECIFICATION SUMMARY

AUTOFLOW® 120 series version

AUTOFLOW® automatic flow rate regulator and ball valve. Suitable to maintain constant flow rate values as the operating conditions in the system change. 1/2” F connections with nut for F (from 1/2” to 2”). Dezincification resistant alloy body. Replaceable stainless steel inner cartridge. Stainless steel spring. EPDM seals. Chrome plated brass ball. EPDM and PTFE ball seat and control stem seal. Special galvanized steel lever. Dezincification resistant alloy pressure test port caps. Medium: water and glycol solutions. Max. percentage of glycol 50 %. Maximum working pressure 25 bar. Temperature range 0–110 °C. Working range Δp 10–95 kPa (22–210 and 40–390 kPa). Range of available flow rates: 0,12–15,5 m^3/h. Accuracy ±5 %. Suitable for fitting pressure points with 1/4” F connections and drain pipe.

AUTOFLOW® 125 series version

AUTOFLOW® automatic flow rate regulator. Suitable to maintain constant flow rate values as the operating conditions in the system change. 1/2" F connections (from 1/2" to 2 1/2"). Dezincification resistant alloy body. Replaceable stainless steel inner cartridge. Stainless steel spring. EPDM seals. Dezincification resistant alloy pressure test port caps. Medium: water and glycol solutions. Max. percentage of glycol 50 %. Maximum working pressure 25 bar. Temperature range -20–110 °C. Working range Δp 10–95 kPa (22–210 and 40–390 kPa). Range of available flow rates: 0,12–17,0 m^3/h. Accuracy ±5 %. Suitable for fitting pressure points with 1/4” F connections and drain pipe.

AUTOFLOW® 103 series

AUTOFLOW® automatic flow rate regulator. Suitable to maintain constant flow rate values as the operating conditions in the system change. DN 65 flanged connections (from DN 65 to DN 300) EN 1092-1. Cast iron body. Stainless steel inner cartridge. Stainless steel spring. Non-asbestos fibre seals. Medium: water and glycol solutions. Max. percentage of glycol 50 %. Maximum working pressure 16 bar. Temperature range -20–110 °C. Working range Δp 22–210 kPa (40–390 and 55–210 kPa). Range of available flow rates: 9–4400 m^3/h. Complete with quick-fit 1/4” pressure test ports, flanges, tie rods and gaskets.

Strainers

Function

These devices comprise a combination of a Y filter and a ball valve (120 series) or a Y filter alone (125 series) It is possible to inspect, clean and change the inner cartridge without having to remove the body of the device from the pipeline. They are suitable to fit pressure points to check the level of blockage in the inner filter and to connect a drain pipe to clean the inner filter without having to remove it from the body In the version with shutt-off valve, the ball valve control stem has an anti-removal device and the reversible closing lever is covered with vinyl

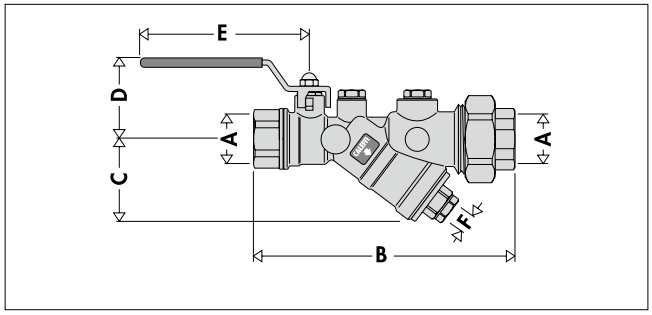
Product range

120 series Y-strainer with ball valve ____ sizes 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2"
125 series Y-strainer ____ sizes 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2 1/2"

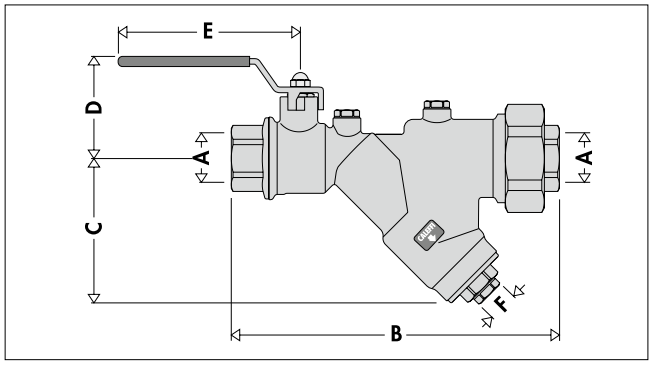
Technical specifications

series	120	125
Materials		
Body:	- 1/2"–3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"–2": dezincification resistant alloy CR EN 1982 CC770S	- 1/2"–3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"–2 1/2": dezincification resistant alloy CR EN 1982 CC770S
Strainer cartridge:	stainless steel	stainless steel
Seals:	EPDM	EPDM
Ball:	brass EN 12165 CW614N, chrome plated	-
Ball seat	PTFE	-
Control stem seal:	EPDM + PTFE	-
Lever	special galvanized steel	-
Pressure test port caps:	dezincification resistant alloy CR EN 12164 CW614N	dezincification resistant alloy CR EN 12164 CW614N
Performance		
Medium: water, glycol solutions	water glycol solutions	
Max. percentage of glycol:	50 %	50 %
Maximum working pressure:	25 bar	25 bar
Working temperature range:	0–110 °C	-20–110 °C
Strainer mesh size Ø:	1/2"–1 1/4": 0,87 mm; 1 1/2" and 2": 0,73 mm	1/2"-1 1/4": 0,87 mm; 1 1/2"-2 1/2 ": 0.73 mm
Connections	1/2"–2" F with union x F	1/2"–2 1/2" F x F
Pressure test port connections	1/4" (ISO 228-1) F	1/4" (ISO 228-1) F

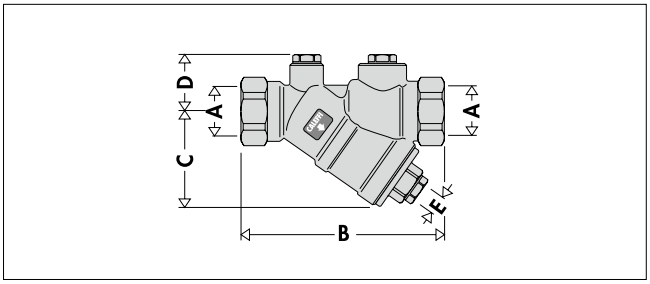
Dimensions



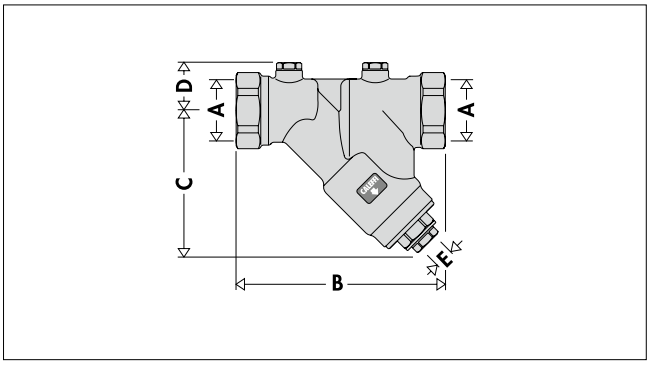
Code	A	B	C	D	E	F	Mass (kg)
120141 000	1/2"	156,5	52,5	50	100	1/4"	1,07
120151 000	3/4"	159,5	52,5	50	100	1/4"	1,07
120181 000	1 1/2"	253	103	88	140	1/2"	4,55
120191 000	2"	253	103	88	140	1/2"	4,55



Code	A	B	C	D	E	F	Mass (kg)
120161 000	1"	218,5	96	66	120	1/2"	2,26
120171 000	1 1/4"	220,5	96	66	120	1/2"	2,26



Code	A	B	C	D	E	Mass (kg)
125141 000	1/2"	101	52,5	30	1/4"	0,52
125151 000	3/4"	106	52,5	30	1/4"	0,55
125181 000	1 1/2"	177	105	38,5	1/2"	2,20
125191 000	2"	179	105	38,5	1/2"	2,45
125101 000	2 1/2"	230	133	48,5	1/2"	4,30



Code	A	B	C	D	E	Mass (kg)
125161 000	1"	140,5	102	33,5	1/2"	0,98
125171 000	1 1/4"	148	102	33,5	1/2"	1,12

Hydraulic characteristics

Code		Kv (m³/h)	Strainer mesh size Ø: (mm)
120141 000	1/2"	6,87	0,87
120151 000	3/4"	7,25	0,87
120161 000	1"	16,65	0,87
120171 000	1 1/4"	17,23	0,87
120181 000	1 1/2"	39,13	0,73
120191 000	2"	39,69	0,73

Code		Kv (m³/h	Strainer mesh size Ø: (mm)
125141 000	1/2"	6,88	0,87
125151 000	3/4"	7,05	0,87
125161 000	1"	14,10	0,87
125171 000	1 1/4"	14,94	0,87
125181 000	1 1/2"	32,27	0,73
125191 000	2"	36,21	0,73
125101 000	2 1/2"	68,25	0,73

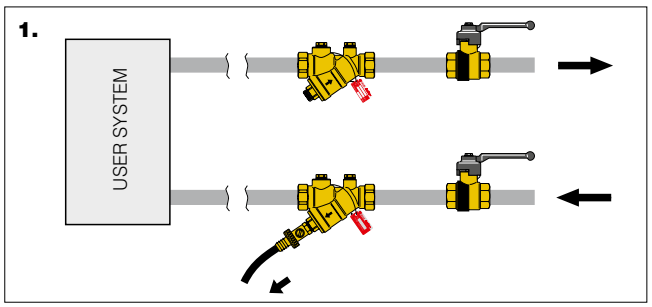
Head losses

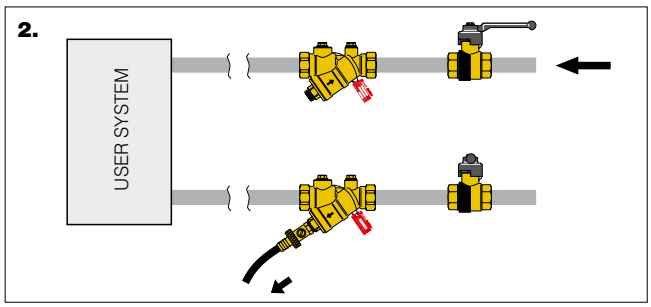
- The specified Kv values refer to the valve complete with strainer.

Strainer cleaning

The filter can be cleaned without removing it from the body

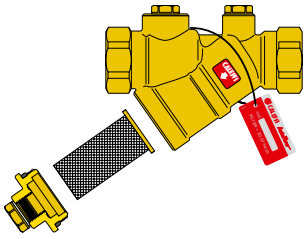
1. Opening the drain valve to allow the dirt to flow into the drain pipe.
2. Performing a reverse flow operation (the flow of water hits the strainer from the opposite side). The shut-off valve on the flow pipe should be closed before the drain valve is opened.



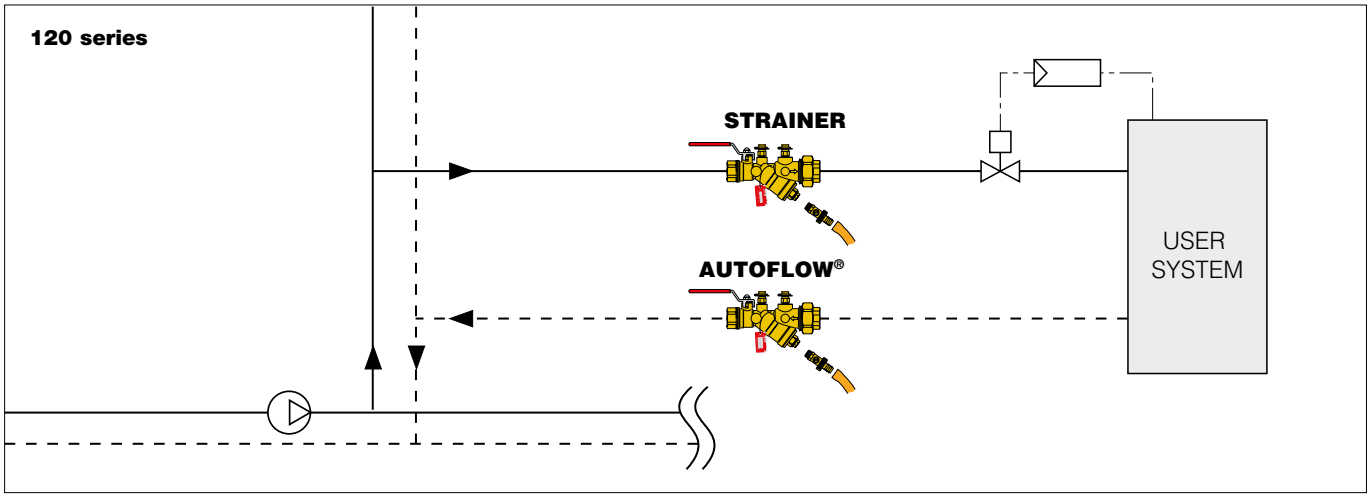


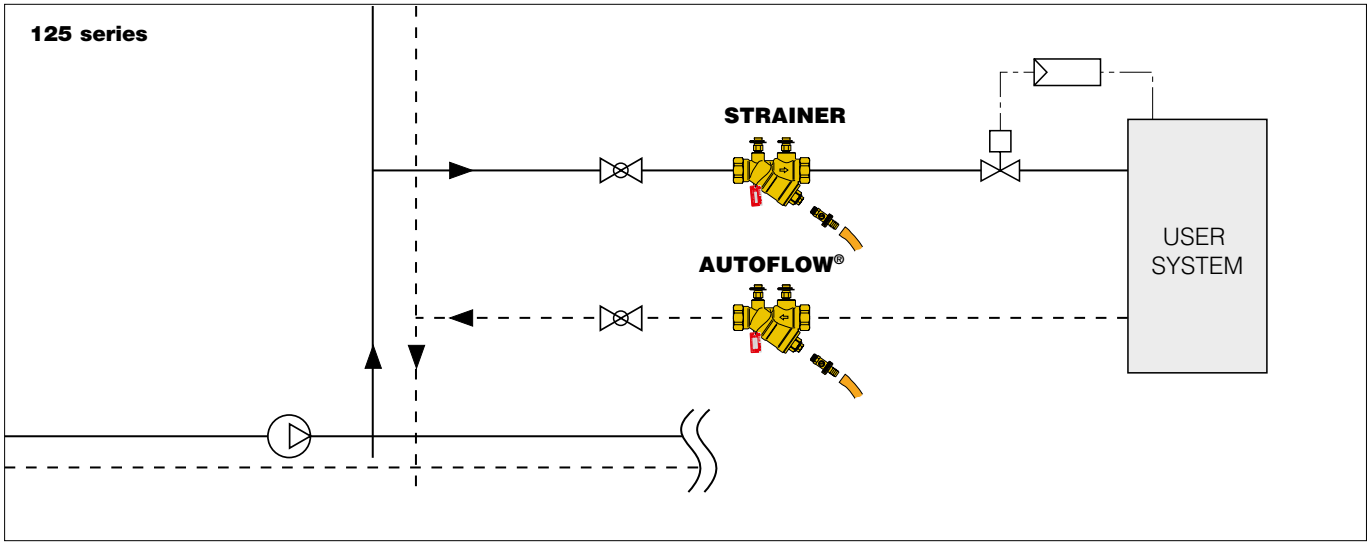
Inspecting the strainer

The filter is assembled in such a way as to permit easy removal from the body for inspection or replacement.



Application diagrams





SPECIFICATION SUMMARY

120 series Filter version

Y-filter and ball valve. 1/2” F connections with nut for F (from 1/2” to 2”). Dezincification resistant alloy body. Stainless steel internal strainer; mesh size 0,87 mm (for sizes from 1/2” to 1 1/4”; mesh size 0,73 mm for sizes 1 1/2” and 2”). EPDM seals. Chrome plated brass ball. Ball seat and control stem seal in PTFE. Special galvanized steel lever. Dezincification resistant alloy pressure test port caps. Medium: water and glycol solutions. Max. percentage of glycol 50 %. Maximum working pressure 25 bar. Temperature range 0–110 °C. Suitable for fitting pressure test ports with 1/4” F connections and drain pipe.

125 series Filter version

Y-filter. 1/2" F connections (from 1/2" to 2 1/2"). Dezincification resistant alloy body. Stainless steel internal strainer; mesh size 0,87 mm (for sizes from 1/2” to 1 1/4”; mesh size 0,73 mm for sizes 1 1/2” to 2 1/2”). EPDM seals. EPDM and PTFE ball seat and control stem seal. Special galvanized steel lever. Dezincification resistant alloy pressure test port caps. Medium: water and glycol solutions. Max. percentage of glycol 50 %. Maximum working pressure 25 bar. Temperature range -20–110 °C. Suitable for fitting pressure test ports with 1/4” F connections and drain pipe.

Accessories

130

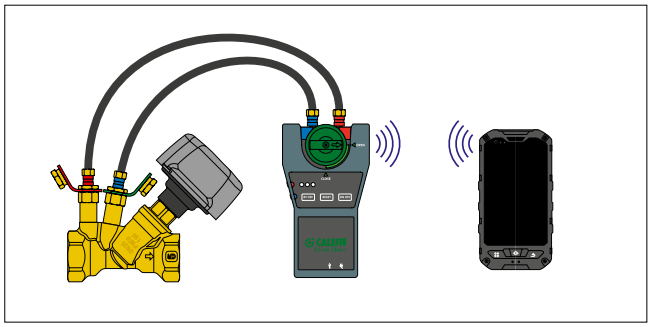
tech. broch. 01251

Electronic flow rate and differential pressure measuring station.
Supplied with shut-off valves and connection fittings.
May be used for flow rate measurement of 130, 131, 135 series balancing valves and of 683 series metering device
Can be used for measuring Δp
for automatic flow rate regulators.
Electric supply from battery.
Bluetooth® transmission between the Δp meter and remote control unit.
Versions complete with remote control unit with Android® application for Smartphones and Tablets.
Measurement range: 0–1000 kPa.
static Pmax: 1000 kPa.

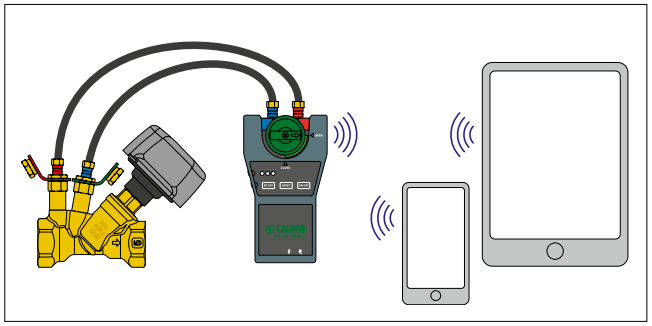
Code	
130006	complete with remote control unit, with Android® application
130005	without remote control unit, with Android® app

Smart Balancing Caleffi
Available app for smartphone.
Download for your Android® mobile phone.

Transmission via Bluetooth® to the terminal with Android® app



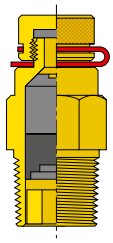
Transmission via Bluetooth® to Smartphone/Tablet with Android® app



100

Couple of quick-fit pressure/temperature ports
Their special construction allows rapid and accurate measurements ensuring leak tightness
Can be used for
- checking the working range of the AUTOFLOW®;
- checking the degree of strainer clogging;
- quantifying the thermal efficiency of terminal units.

Cap clamp available in the following colours:
- **Red** for upstream pressure test port.
- **Green** for downstream pressure test port.



Brass body.
EPDM seals.
Working temperature range: -5–130 °C
Max. working pressure: 30 bar.

Code	
100000	1/4”

100

Pair of fittings with quick-fit syringe for connection of pressure test ports to measuring instruments.
Female 1/4” threaded connection.
Max. working pressure: 10 bar.
Max. working temperature: 110 °C.

Code	
100010	1/4”

538

Drain cock
with hose connection and cap.
Max. working pressure 10 bar.
Max. working temperature 110 °C.

Code	
538201	1/4”
538400	1/2”

CALEFFI Hydronic Solutions
Caleffi S.p.A.
S.R. 229, no. 25 · 28010 Fontaneto d’Agogna (NO) - Italy -
Tel. +39 0322 8491 · Fax +39 0322 863723
info@caleffi.com · www.caleffi.com