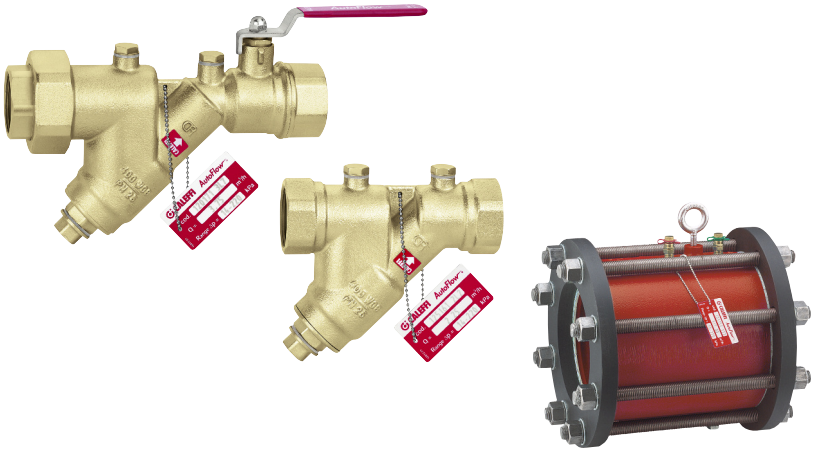
Automatic flow rate regulators with steel cartridge

120 - 125 - 103 series

AutoFlow®

ISO 9001 FM 21654

01041/18 GB
replaces dp 01041/17 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.

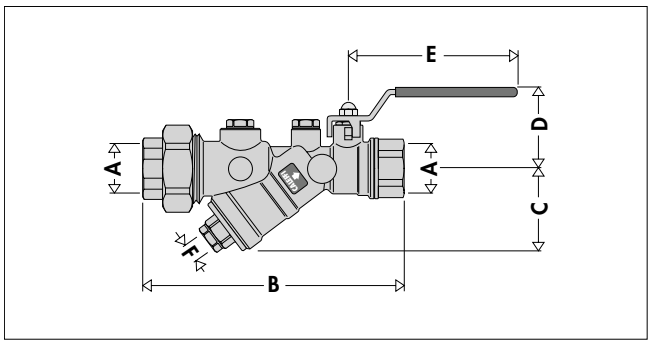
Product range

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

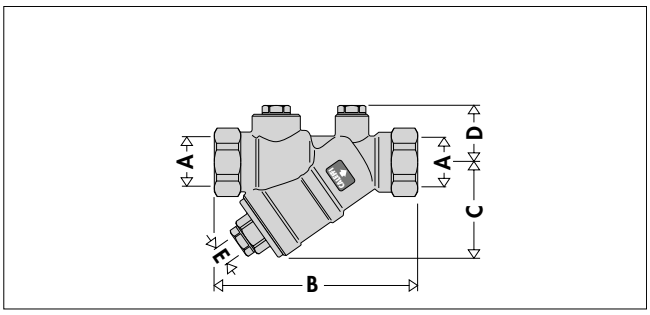
Technical specifications

series	120	125	103
Material			
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 EN 10270-3 (AISI 302)
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 test port caps:	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:	7–100 kPa; 22–220 kPa; 35–410 kPa	7–100 kPa; 22–220 kPa; 35–410 kPa	22–210 kPa; 40–390 kPa; 55–210 kPa
Flow rates:	0,12–15,5 m^3/h	0,12–17 m^3/h	9–4400 m^3/h
Accuracy:	±5%	±5%	±5%
Connections	1/2"–2" F with union x F	1/2"–2 1/2" F x F	DN 65–300 flanged PN 16 EN 1092-1
Pressure point connections	1/4" F	1/4" F	1/4" F

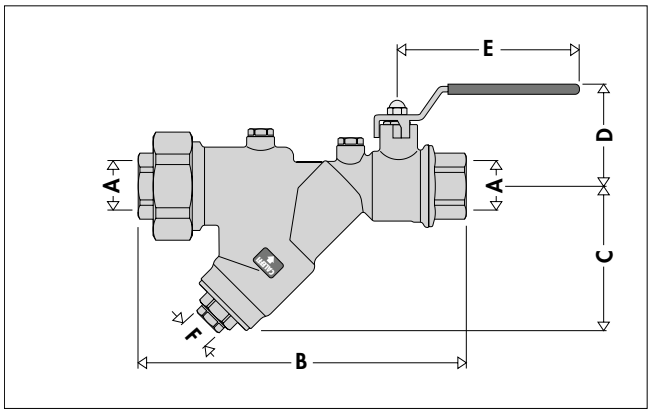
Dimensions



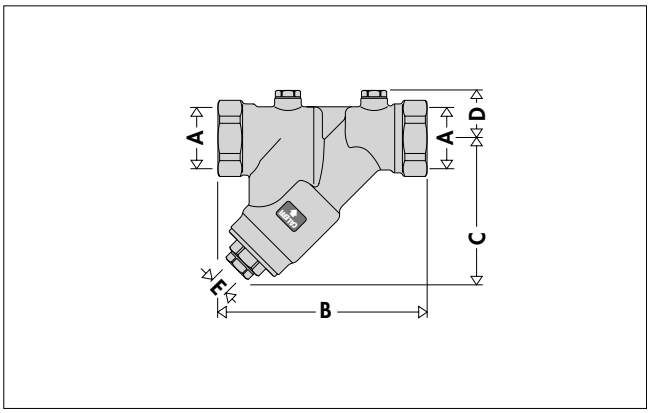
Code	A	B	C	D	E	F	Mass (kg)
120141 ...	1/2	156,5	52,5	50	100	1/4	1,10
120151 ...	3/4	159,5	52,5	50	100	1/4	1,10
120181 ...	1 1/2	253	103	88	140	1/2	4,60
120191 ...	2"	253	103	88	140	1/2	4,60



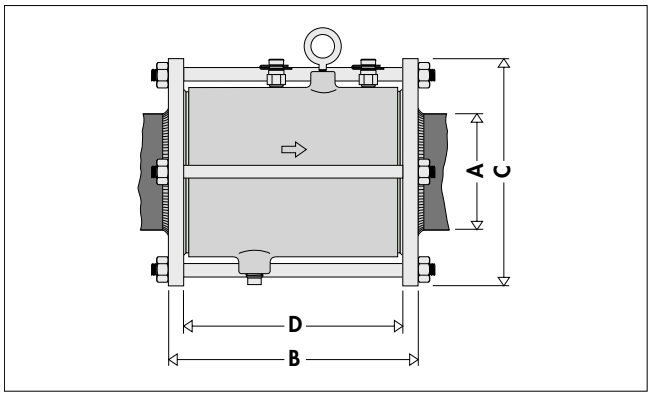
Code	A	B	C	D	E	Mass (kg)
125141 ...	1/2	101	52,5	30	1/4	0,55
125151 ...	3/4	106	52,5	30	1/4	0,58
125181 ...	1 1/2"	177	105	38,5	1/2	2,25
125191 ...	2"	179	105	38,5	1/2	2,45
125101 ...	2 1/2"	230	133	48,5	1/2"	4,36



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



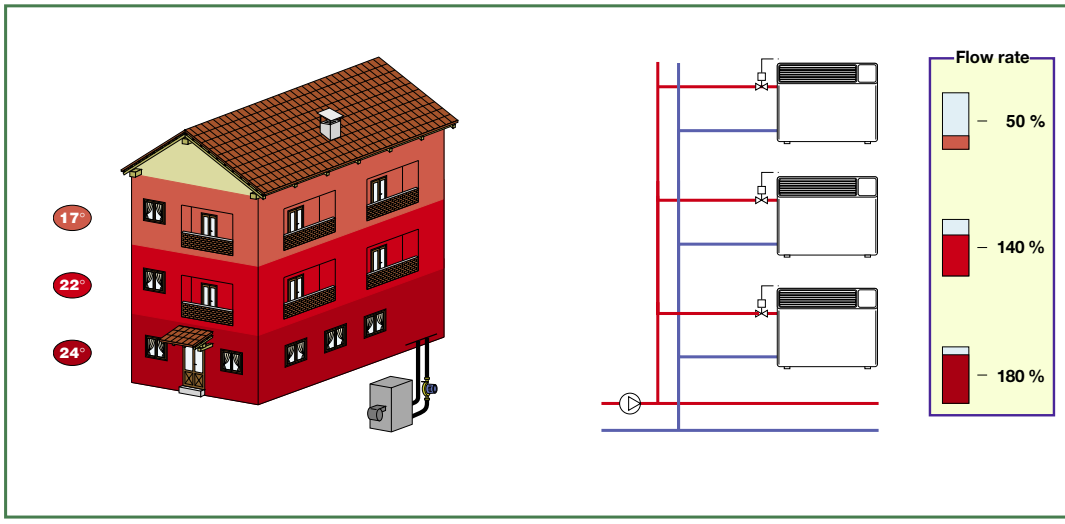
Code	A	B	C	D	Mass (kg)
10311. ...	DN 65	208	185	172	7,50
10321. ...	DN 80	212	200	172	11,58
10331. ...	DN 100	216	220	172	12,38
10341. ...	DN 125	271	250	198	16,55
10351. ...	DN 150	271	285	223	24,11
10361. ...	DN 200	287	360	223	41,62
10371. ...	DN 250	295	425	223	58,09
10381. ...	DN 300	319	515	223	93,27

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.

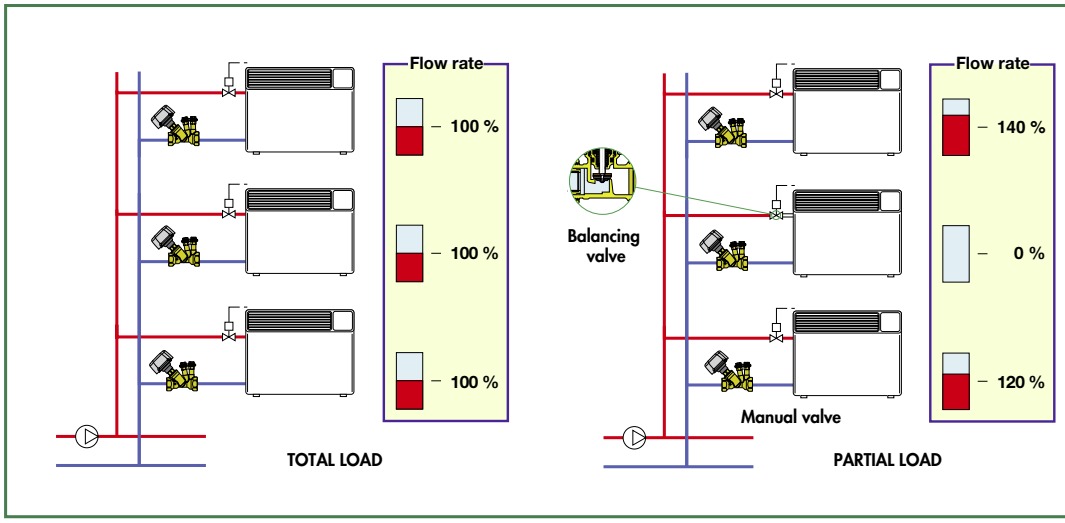
Unbalanced circuits

In the case of unbalanced circuits, the hydraulic imbalance between terminals creates areas with non-uniform temperatures, and as a consequence, problems with thermal comfort and higher energy consumption.



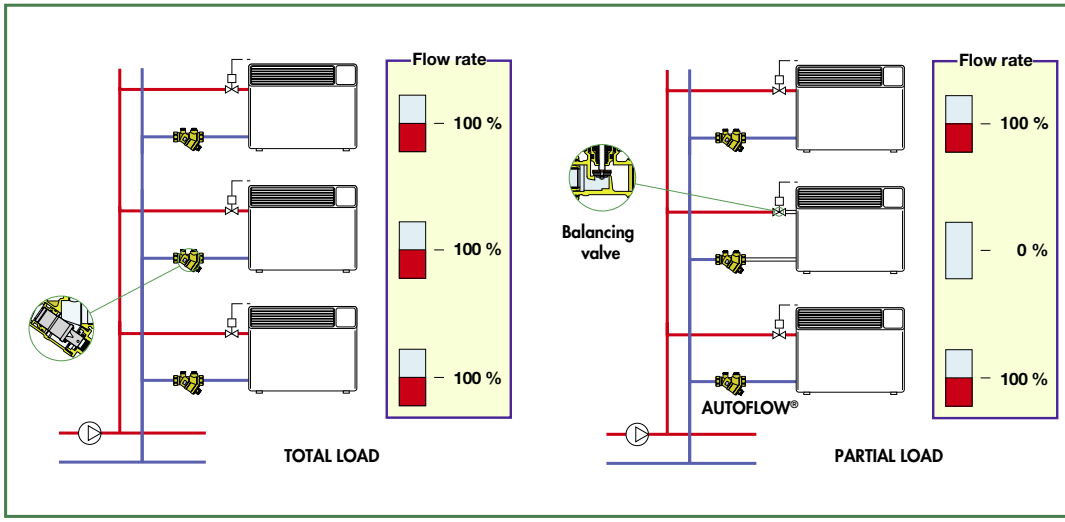
Circuits balanced with manual valves

Traditionally, hydraulic circuits are balanced using manual calibration valves. With these static-type devices, such circuits are difficult to balance perfectly and have operating limitations in the case of partial closure by means of the balancing valves. The flow rate in the open circuits **does not remain constant at the nominal value**.



Circuit balanced with AUTOFLOW®

AUTOFLOW® balances the plumbing system automatically, ensuring that each terminal receives the design flow rate.
Even in the case of partial circuit closure by means of the balancing valves, 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.

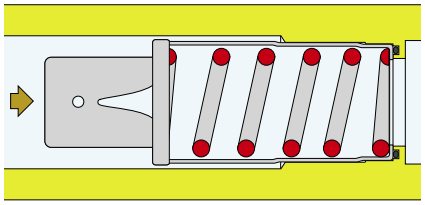


AUTOFLOW® devices

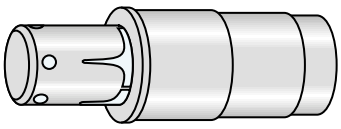
Function
The AUTOFLOW® device has to guarantee a constant flow rate when its upstream/downstream pressure differential varies.
It is therefore necessary to refer to the Δp - flow rate diagram and a basic diagram illustrating the methods of operation and the effects of the relevant variables.

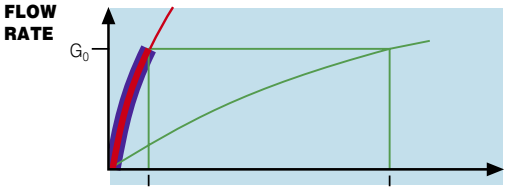
Operating principle
The regulating element of these devices is composed of a cylinder and a piston with fixed and variable geometry side open tubes through which the fluid flows. These apertures are governed by the piston movement actuated by the pressure of the medium. A specially calibrated spring 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



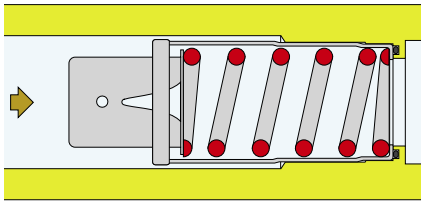
In this case, the regulating piston remains in equilibrium without compressing the spring and gives the fluid the maximum free flow area In practice, the piston acts as a fixed regulator and thus the flow through the AUTOFLOW® depends solely on the differential pressure.



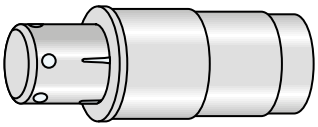


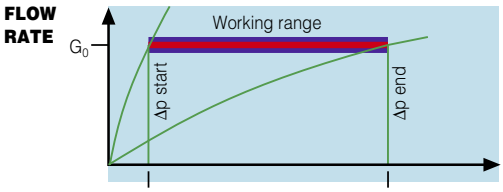
$Kv_{0.01}=0{,}378 \cdot G_0$ Δp range 7–100 kPa
$Kv_{0.01}=0{,}213 \cdot G_0$ Δp range 22–220 kPa
$Kv_{0.01}=0{,}169 \cdot G_0$ Δp range 35–410 kPa *where G_0 = nominal flow rate (l/h)*

Within the working range

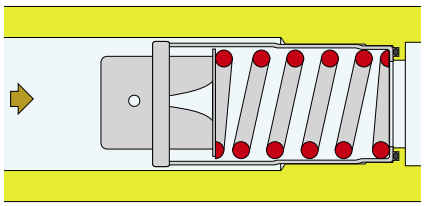


If the differential pressure is contained within the control range, the piston compresses the spring and gives the medium a free flow area to permit regular flow at the **nominal rate** for which the AUTOFLOW® is set up.

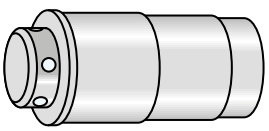


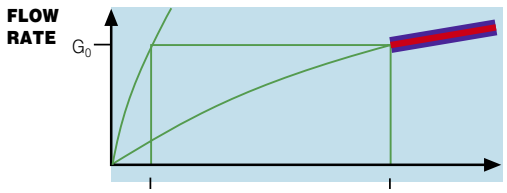


Above the working range



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® thus depends solely on the differential pressure.





$Kv_{0.01}=0{,}1 \cdot G_0$ Δp range 7–100 kPa
$Kv_{0.01}=0{,}067 \cdot G_0$ Δp range 22–220 kPa
$Kv_{0.01}=0{,}049 \cdot G_0$ Δp range 35–410 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, so as to satisfy a wide range of system requirements.
By definition, the control range is contained between two differential pressure values

Δp 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.

7–100 kPa
0,07–1 bar
Can be used in closed 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
0,22–2,20 bar
Can be used in the majority of closed circuit systems.
The ample control range means that it can be inserted with a minimum additional "expenditure" of differential pressure, amounting to 22 kPa (0,22 bar).

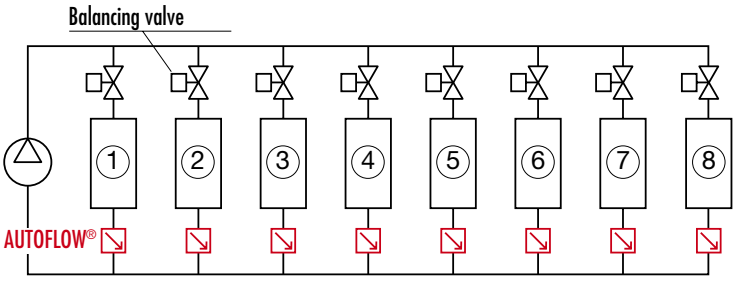
35–410 kPa
0,35–4,10 bar
Can be used in open circuit systems, for example in water distribution systems or systems in which there is a high level of head available 0,35–4,10 bar, for example in district heating systems. The high upper limit, 410 kPa (4,1 bar), means that proper operation is possible without leaving the control range.

Sizing the circuit with AUTOFLOW®

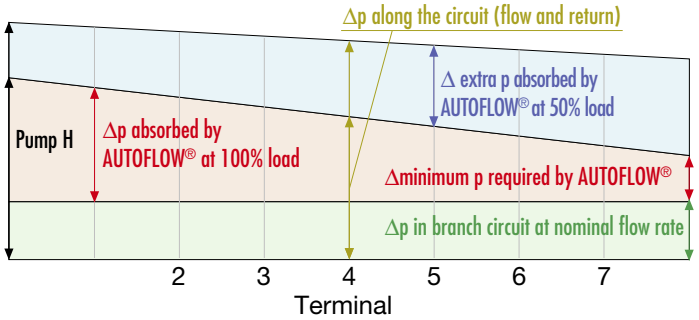
Sizing the circuit containing AUTOFLOW® is particularly easy to accomplish. As illustrated by the diagrams, shown alongside by way of example, the head loss attributable to the choice of pump is calculated by referring to the hydraulically most disadvantaged circuit and adding this value to the minimum differential pressure required by the AUTOFLOW®. In the example the circuits have the same nominal flow rate.

The AUTOFLOW® devices, located on intermediate circuits, automatically absorb the excess differential pressure to ensure the corresponding nominal flow rate.
As the balancing 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 sizing a system with AUTOFLOW®, please refer to the 2nd volume of the Quaderni Caleffi and the technical bulletin "Dynamic balancing in plumbing circuits". They give theoretical calculations, numerical examples and notes on the application of the above-mentioned devices in circuits.



Differential pressures (Δp range)



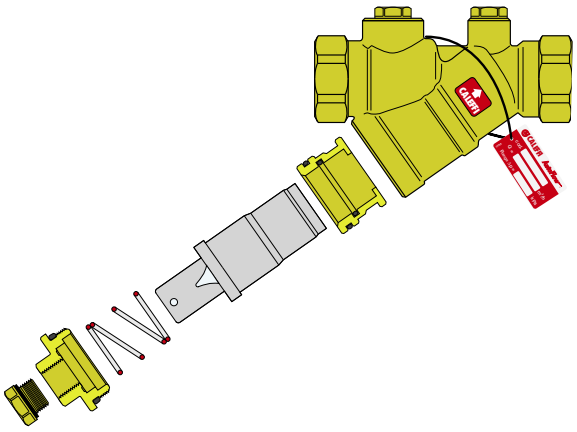
Construction details

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.

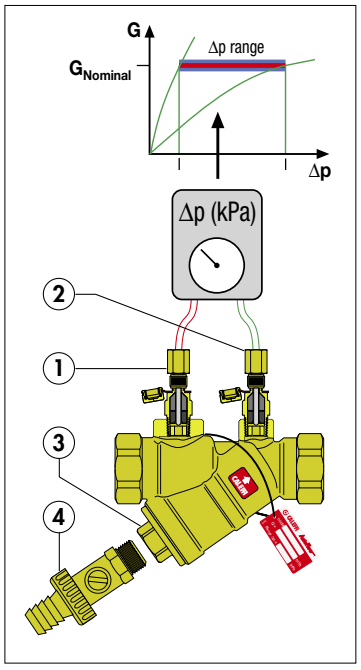
Wide range of working pressures
The regulator is able to provide precision regulation of the flow rate over a wide range of working pressures It is factory calibrated to keep the flow rate automatically within ±5% of the set value.
For these reasons it can be used in system circuits on both zone outlets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

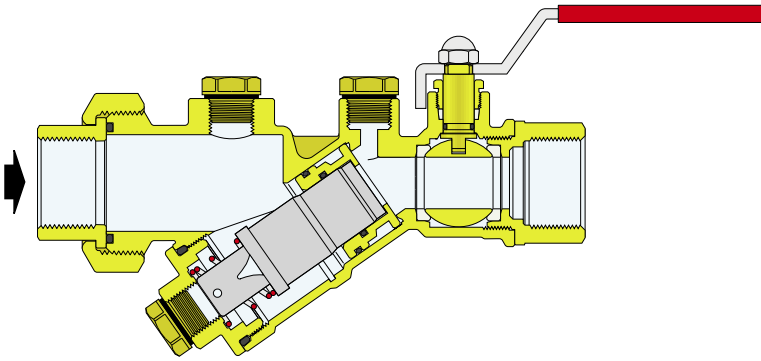
Replaceable cartridge
The internal regulator is assembled in the form of a self-contained cartridge so as to permit easy removal from the body for inspection or replacement.

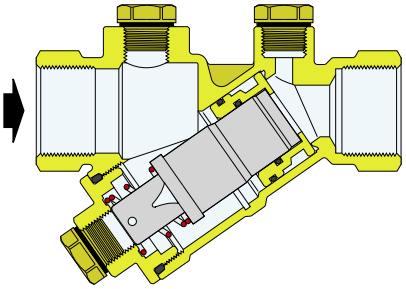


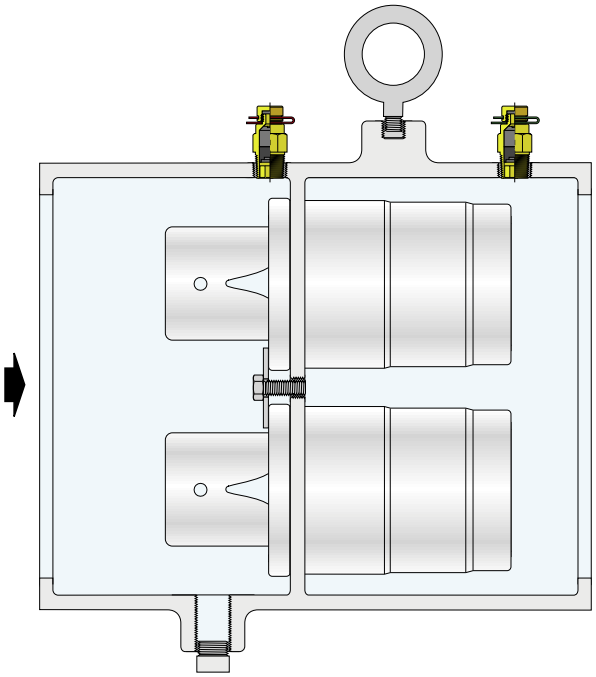
Pressure points - checking flow rate
Given the dynamic characteristics of the device, it is sufficient to check the differential pressure upstream and downstream, using the pressure points (1) - (2) provided.
If the differential pressure is contained within the control range (Δp range) indicated on the 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).

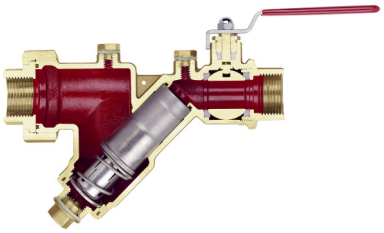






AUTOFLOW® flanged version
This is supplied complete with EN 1092-1 PN 16 flanges (PN 25 available to order), seals and quick-fit pressure test ports.

120 series flow rate tables

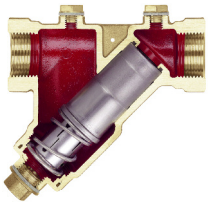


Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
120141 •••	6.90	7	7–100	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
120151 •••	7.73	7	7–100	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
120161 •••	17,04	7	7–100	0,7; 0,8; 0,9; 1,0

Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
120141 •••	6,90	22	22–220	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	22–220	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	22–220	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	22–220	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	22–220	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	22–220	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)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
120141 •••	6,90	35	35–410	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	35	35–410	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	35	35–410	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; 5,5; 6,0
120171 •••	17,74	35	35–410	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; 5,5; 6,0
120181 •••	47,24	35	35–410	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	35	35–410	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

125 series flow rate tables



Code	Kv (m³/h)	Minimum working Δp (kPa)	Δp range (kPa)	Flow rates (m³/h)
125141 •••	6,69	7	7–100	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
125151 •••	7,58	7	7–100	0,45; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0
125161 •••	13,42	7	7–100	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	22–220	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	22–220	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	22–220	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	22–220	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	22–220	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 •••	37,38	22	22–220	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	22–220	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	35	35–410	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
125151 •••	7,58	35	35–410	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
125161 •••	13,42	35	35–410	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	35–410	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	35–410	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 •••	37,38	35	35–410	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	35–410	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:
The minimum working Δp of the AUTOFLOW® cartridge
2. The Δp required for the nominal flow rate to pass through the valve body.
   This magnitude can be determined using the values $Kv_{0,01}$ indicated above and with reference to the valve body alone.

Example

AUTOFLOW® 125 series size 1" with flow rate G_0 = 2500 l/h and Δp range 22–220 kPa:

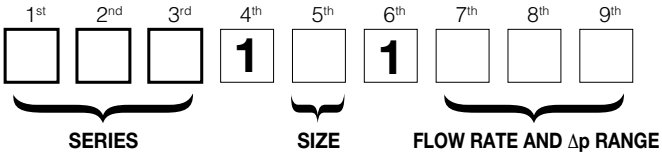
Required $\Delta p = \Delta p_{AUTOFLOW®} + \Delta p_{body} = 22 + (G_0 / Kv_{0,01})^2 = 22 + (2500 / 1342)^2 = 25,5$ kPa

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

Method of coding for AUTOFLOW® 120 - 125 series

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

Complete code



SERIES

1st 2nd 3rd

The first three digits indicate the series:

120	AUTOFLOW® regulator and ball valve
125	AUTOFLOW® regulator

SIZE

5th

The fifth digit 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 Δp RANGE

7th 8th 9th

The last three digits indicate the available flow rate values:

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		
0,20	L20	0,90	L90	2,75	2L7	5,50	5L5	10,0	10L		
0,25	L25	1,00	1L0	3,00	3L0	6,00	6L0	11,0	11L		
0,30	L30	1,20	1L2	3,25	3L2	6,50	6L5	12,0	12L		
0,35	L35	1,40	1L4	3,50	3L5	7,00	7L0	13,5	13L		
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	4L2	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	1,40	1H4	3,00	3H0	5,00	5H0	8,50	8H5	14,5	14H
0,35	H35	1,60	1H6	3,25	3H2	5,50	5H5	9,00	9H0	15,5	15H
0,45	H45	1,80	1H8	3,50	3H5	6,00	6H0	9,50	9H5		
0,55	H55	2,00	2H0	3,75	3H7	6,50	6H5	10,0	10H		
0,70	H70	2,25	2H2	4,00	4H0	7,00	7H0	11,0	11H		
0,90	H90	2,50	2H5	4,25	4H2	7,50	7H5	12,0	12H		
1,10	1H1	2,75	2H7	4,50	4H5	8,00	8H0	13,0	13H		

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
103131 ●●●	100	22	9÷ 17	22÷210
103133 ●●●	100	40	18÷ 22	40÷390
103134 ●●●	100	55	25÷ 36	55÷210
103431 ●●●	100*	22	18÷ 34	22÷210
103433 ●●●	100*	40	23÷ 45	40÷390
103434 ●●●	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 flanges PN 16, tie-rods, 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
Required Δp = $\Delta p_{AUTOFLOW®}$ =
22, 40 or 55 kPa; 0,22, 0,40 or 0,55 bar
Pump head H = $\Delta p_{circuit}$ + required Δp

* Supplied with 4" ANSI flanges.

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

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

Method of coding for AUTOFLOW® 103 series

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					
				SIZE	Δp RANGE	FLOW RATE		

SIZE — 5th

The fifth digit indicates the size:

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

Δp RANGE — 6th

The sixth digit indicates the differential pressure range (Δp range):

kPa	22–210	40–390	55–210
Digit	1	3	4

FLOW RATE — 7th 8th 9th

The last three digit indicate the flow rate values.
For the selection of available values, refer to the current catalogue.

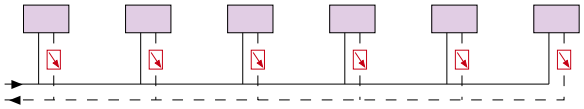
Notes

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

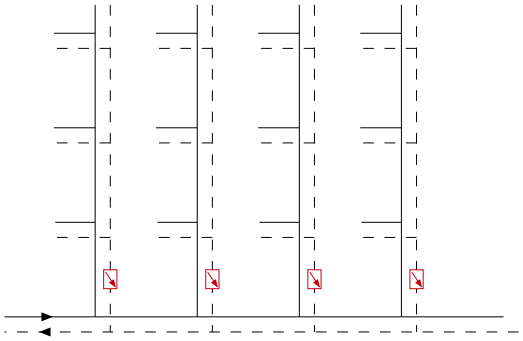
Sizing the system with AUTOFLOW®
For more detailed information on sizing a system with AUTOFLOW®, please refer to the 2nd volume of the Quaderni Caleffi and the technical bulletin "Dynamic balancing in plumbing circuits". They give theoretical calculations, numerical examples and notes on the application 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.

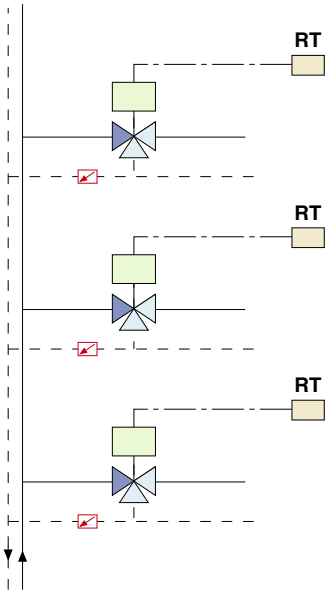
Applications of AUTOFLOW® ( )



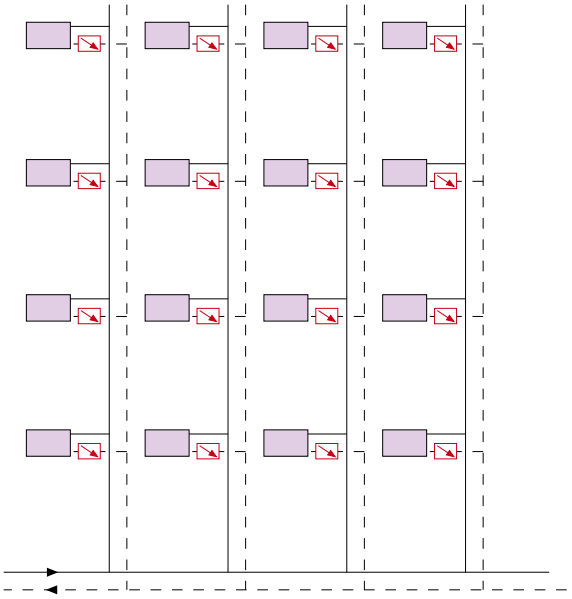
For use in line with various types of heat emitter: radiators, convectors, unit heaters, thermal strips, etc.



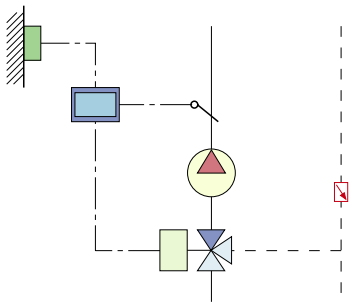
To adjust the flow rate in each column or in each secondary branch of a system.



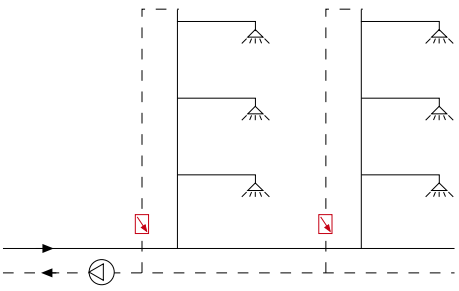
To guarantee the design flow rates (with open or closed valve) to the various zones of a system.



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

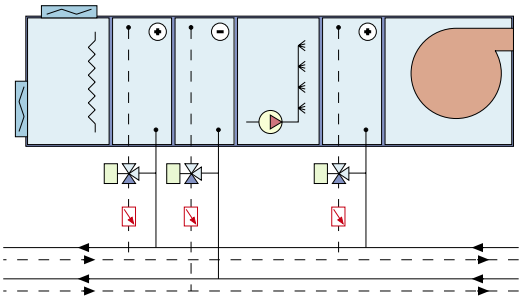


To allow constant flow rates (with the valve in any position) in circuits with traditional climate control.

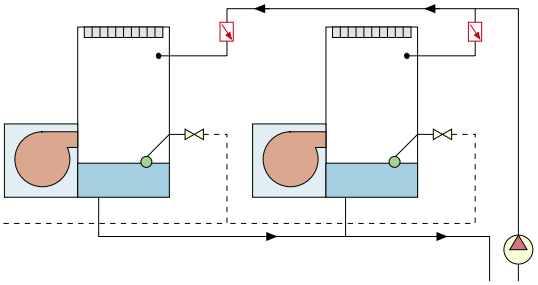


To balance sanitary water distribution circuits

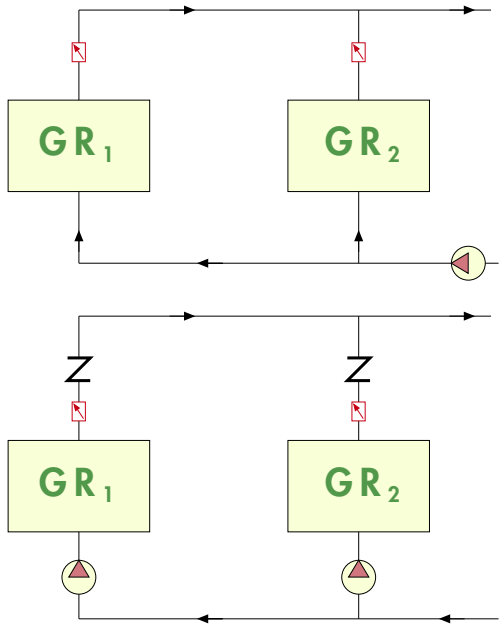
Applications of AUTOFLOW® ( )



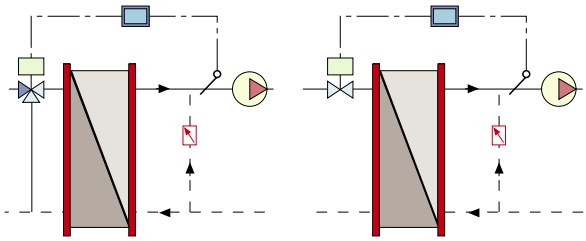
To balance circuits that serve air conditioning units.



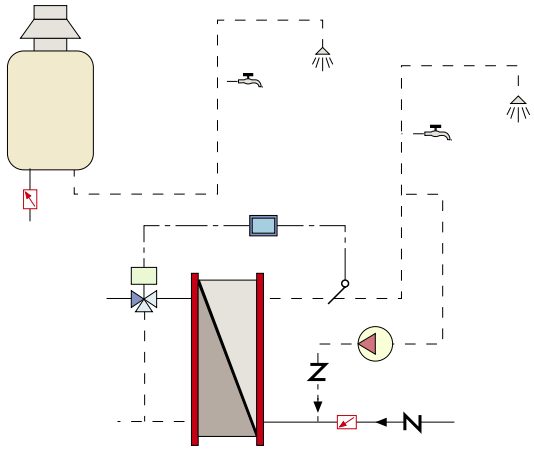
To balance circuits that serve cooling towers.



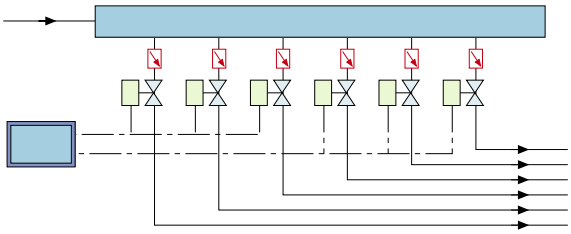
To balance the circuits that serve chiller unit evaporators or condensers.



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



To restrict the hot water delivery flow rate in instant 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,
- cooling of machinery at nominal conditions,
- balancing of extremely complex distribution systems.

For further details, please consult Application Sheets Nos. 04301, 04302, 04303 and the Technical Bulletin "Dynamic balancing in plumbing circuits".

SPECIFICATION SUMMARY

120 series, AUTOFLOW® 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. Ball seat and control stem seal in EPDM and PTFE. Special galvanized steel lever. Dezincification resistant alloy pressure test port caps. Medium: water and glycol solutions. Maximum percentage of glycol 50%. Maximum working pressure 25 bar. Temperature range 0–110°C. Working range Δp 7–100 kPa (22–220 and 35–410 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.

125 series, AUTOFLOW® 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. Maximum percentage of glycol 50%. Maximum working pressure 25 bar. Temperature range -20–110°C. Working range Δp 7–100 kPa (22–220 and 35–410 kPa). Range of available flow rates 0,12–17 m^3/h. Accuracy ±5%. Suitable for fitting pressure points with 1/4" F connections and drain pipe.

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. Maximum percentage of glycol 50%. Maximum working pressure 16 bar. Temperature range -20–110°C. Working range Δp 22–210 kPa (40–390 kPa 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-strainer and a ball valve (120 series) or a Y-strainer 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 for fitting pressure test ports to check inner strainer clogging and to connect a drain pipe to clean the inner strainer without having to remove it from the body. In the version with shut-off valve, the ball valve control stem has an anti-removal device and the reversible closing lever is covered with vinyl.

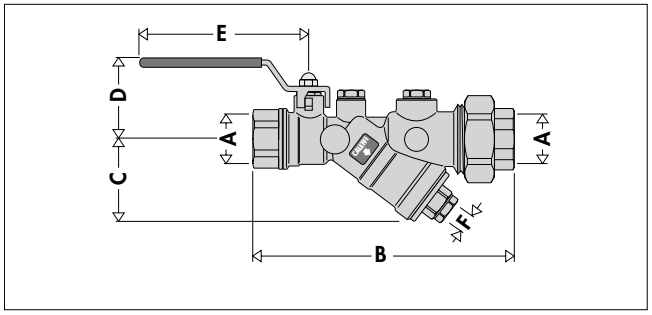
Product range

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"

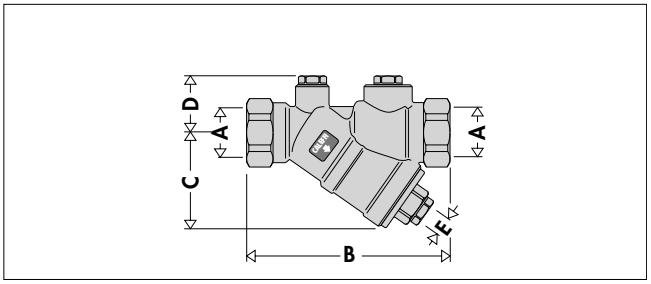
Technical specifications

series	120	125
Material		
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 point connections	1/4" F	1/4" F

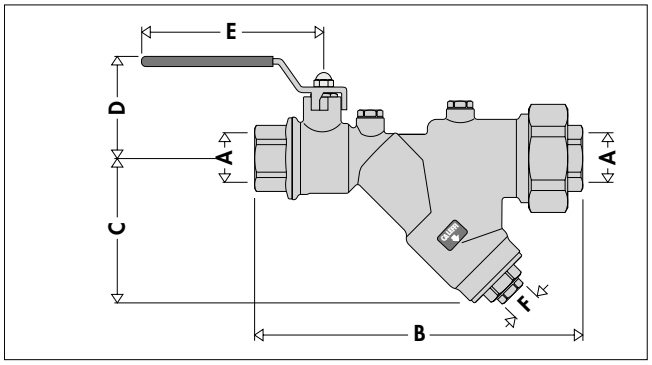
Dimensions



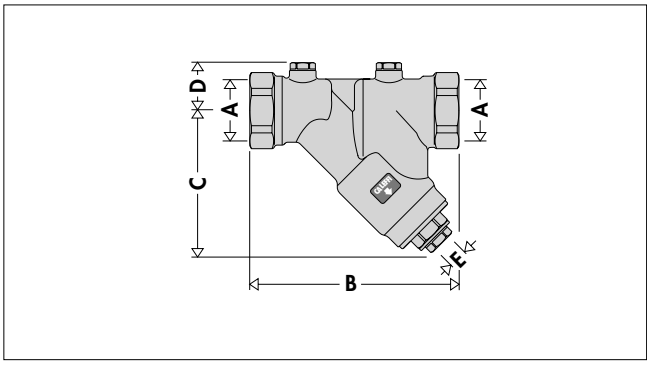
Code	A	B	C	D	E	F	Mass (kg)
120141 000	1/2	156,5	52,5	50	100	1/4	1,07
120151 000	3/4	159,5	52,5	50	100	1/4	1,07
120181 000	1 1/2	253	103	88	140	1/2	4,55
120191 000	2"	253	103	88	140	1/2	4,55



Code	A	B	C	D	E	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	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)
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

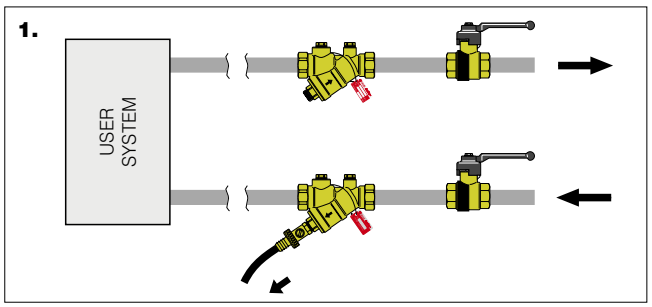
Code		Kv (m³/h)	Strainer mesh size Ø: (mm)
125141 000	1/2"	6,88	0,87
125151 000	3/4"	7,05	0,87
125161 000	1"	14,10	0,87
125171 000	1 1/4"	14,94	0,87
125181 000	1 1/2"	32,27	0,73
125191 000	2"	36,21	0,73
125101 000	2 1/2"	68,25	0,73

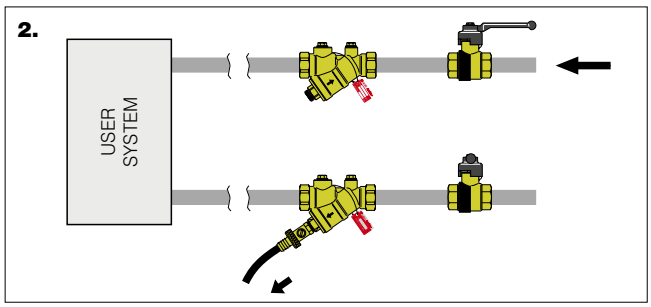
Head losses

The Kv values indicated refer to the valve complete with strainer.

Strainer cleaning

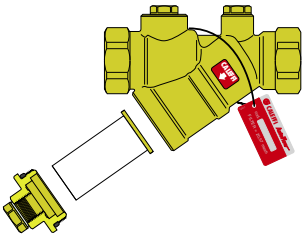
The filter can be cleaned without removing it from the body.
1. Opening the drain valve to allow the dirt to flow into the drain pipe.
2. Performing a reverse flow operation (the flow of water hits the filter from the opposite side). The shut-off valve on the flow pipe should be closed before the drain valve is opened.



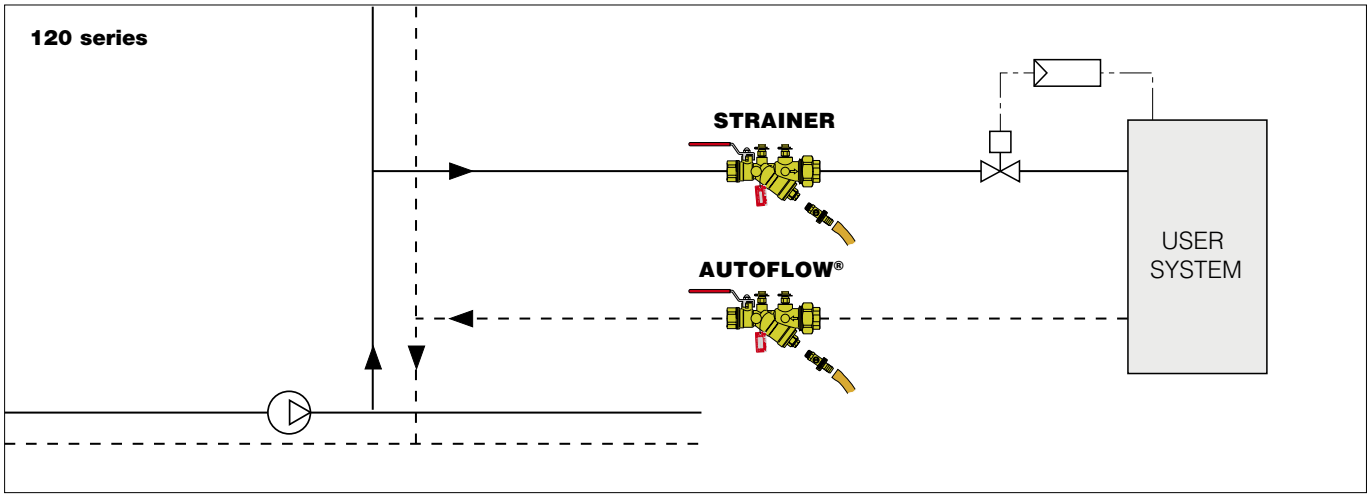


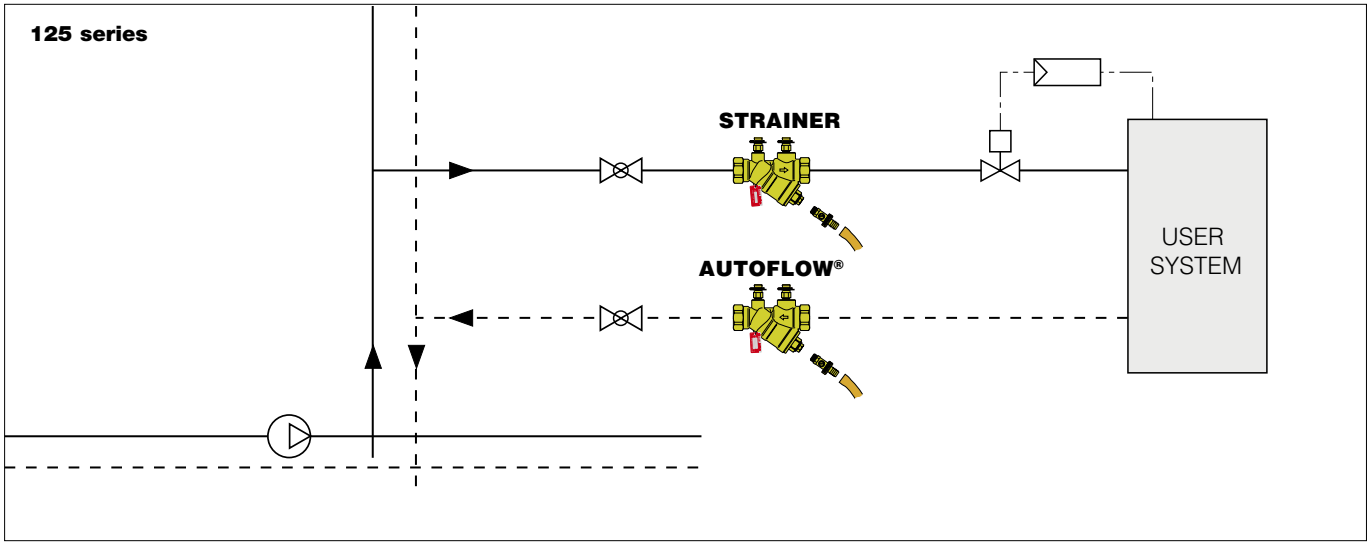
Inspecting the strainer

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, Strainer version

Y-strainer 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. Maximum 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, Strainer version

Y-strainer. 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. Ball seat and control stem seal in EPDM and PTFE Special galvanized steel lever. Dezincification resistant alloy pressure test port caps. Medium: water and glycol solutions. Maximum 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

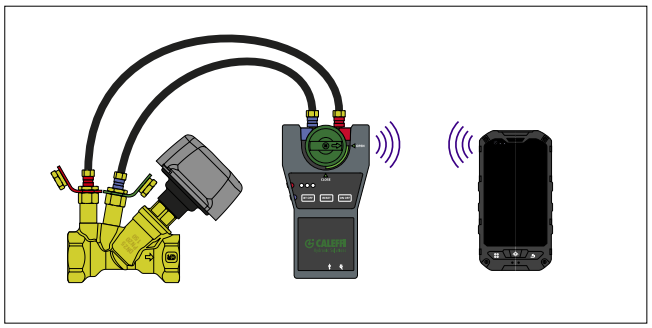
130

tech. broch. 01251

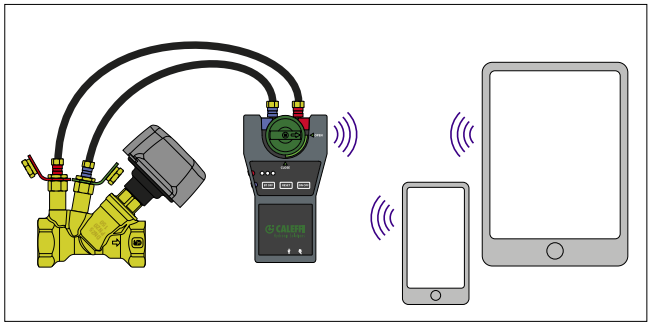
Electronic flow rate and differential pressure measuring station.
Supplied complete with shut-off valves and connection fittings.
May be used for flow rate measurement of 130, 142 series balancing valves and of 683 series metering device.
Can be used for measuring Δp for automatic flow rate regulators.
Electric supply from battery.
Bluetooth® transmission between Δp measuring station 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® app
130005	without remote control unit, with Android® app

Transmission via Bluetooth® to the terminal with Android® app



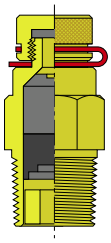
Transmission via Bluetooth®to Smartphone/Tablet with Android® app



100

Pair of fast-plug pressure/temperature test ports.
Their special construction allows rapid and accurate measurements ensuring leak tightness.
Can be used for:
- checking the working range of AUTOFLOW®;
- check the clog degree of strainers;
- checking the heat output of the 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 fast-plug 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”

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