Automatic flow rate regulator with stainless steel cartridge

120 - 125 - 103 series

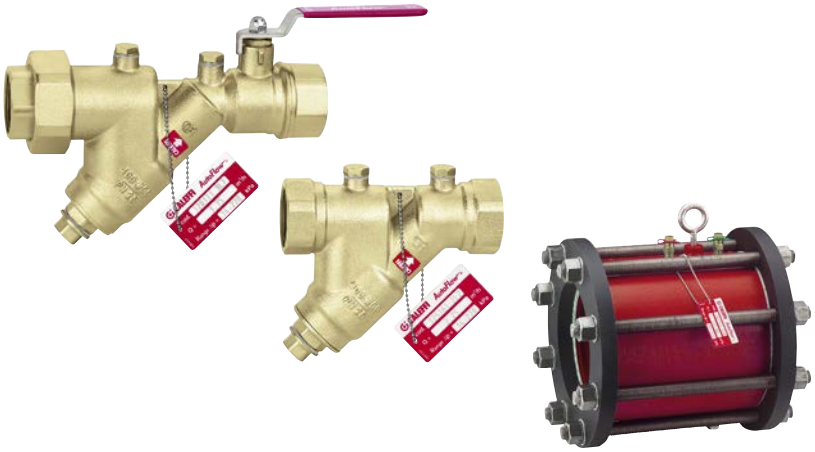
AutoFlow®

ISO 9001 FM 21654

ISO 9001 No. 0003

01041/14 GB

replaces dp 01041/07



Function

The AUTOFLOW® devices are automatic flow rate regulators. They are used to keep the flow rate constant, at the design value, in air conditioning and plumbing system circuits.
They automatically balance the hydronic circuit by ensuring the design flow rate to each terminal unit. The devices are available both as simple flow regulator and complete with ball shut-off valve.

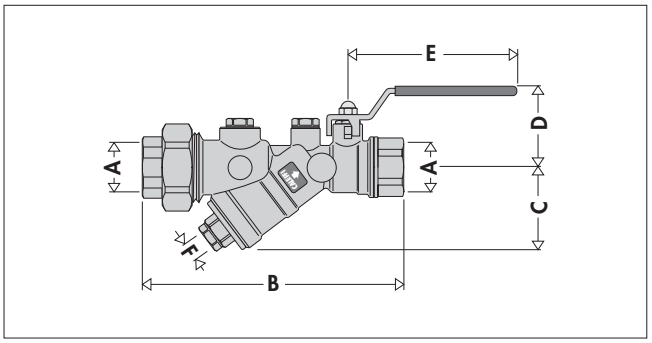
Product range

120 series	Automatic flow rate regulator with steel cartridge and ball valve	size 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2"
125 series	Automatic flow rate regulator with steel cartridge	size 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	size DN 65 - 80 - 100 - 125 - 150 - 200 - 250 - 300 - 350

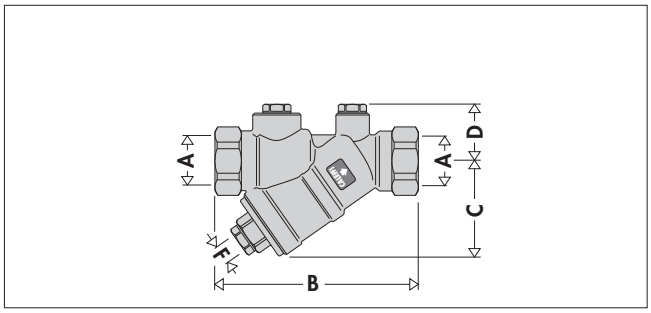
Technical specifications

series ⇨	120	125	103
Materials			
Body:	- 1/2"and 3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"– 2": dezincification resistant alloy CR EN 1982 CB752S	- 1/2" and 3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"– 2 1/2": dezincification resistant alloy CR EN 1982 CB752S	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	asbestos free fibre
Ball:	brass EN 12165 CW614N, chrome plated	-	-
Ball seat:	PTFE	-	-
Control stem seal:	EPDM + PTFE	-	-
Lever:	special zinc plated steel	-	-
Pressure test port plugs:	dezincification resistant alloy CR EN 12164 CW602N	dezincification resistant alloy CR EN 12164 CW602N	-
Fast-plug pressure test port:	-	-	brass EN 12164 CW614N
Performance			
Medium:	water, glycol solutions	water, glycol solutions	water, glycol solutions
Maximum percentage 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
Range Δp:	7–100 kPa; 22–220 kPa; 35–410 kPa	7–100 kPa; 22–220 kPa; 35–410 kPa	22–220 kPa; 35–410 kPa
Flow rates:	0,12–15,5 m^3/h	0,12–22,5 m^3/h	9–3850 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 65–350 flanged PN 16 EN 1092-1
Pressure ports connections	1/4" F	1/4" F	1/4" F

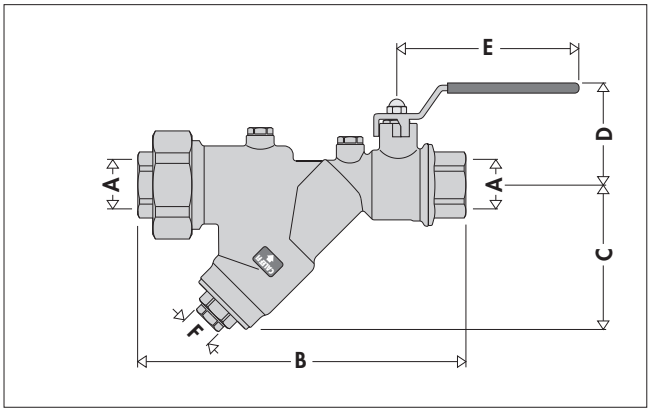
Dimensions



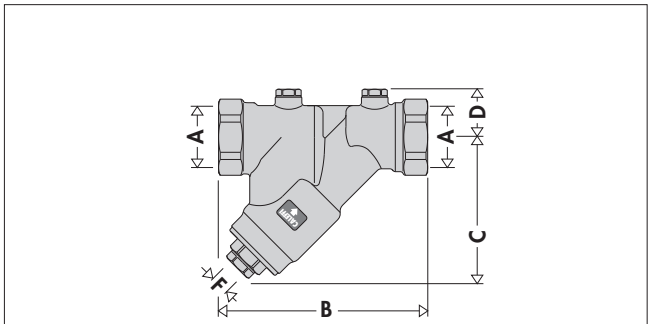
Code	A	B	C	D	E	F	Weight (kg)
120141 ...	1/2"	156,5	52,5	50	100	1/4"	1,10
120151 ...	3/4"	159,5	52,5	50	100	1/4"	1,10
120181 ...	1 1/2"	253	84	88	140	1/2"	4,60
120191 ...	2"	253	84	88	140	1/2"	4,60



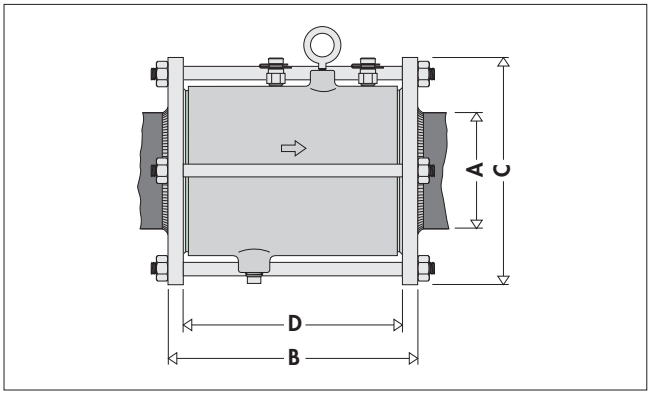
Code	A	B	C	D	F	Weight (kg)
125141 ...	1/2"	101	52,5	30	1/4"	0,55
125151 ...	3/4"	106	52,5	30	1/4"	0,58
125181 ...	1 1/2"	177	105	38,5	1/2"	2,25
125191 ...	2"	176	105	38,5	1/2"	2,45
125101 ...	2 1/2"	230	133	48,5	1/2"	4,36



Code	A	B	C	D	E	F	Weight (kg)
120161 ...	1"	218,5	68	66	120	1/2"	2,30
120171 ...	1 1/4"	220,5	68	66	120	1/2"	2,30



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



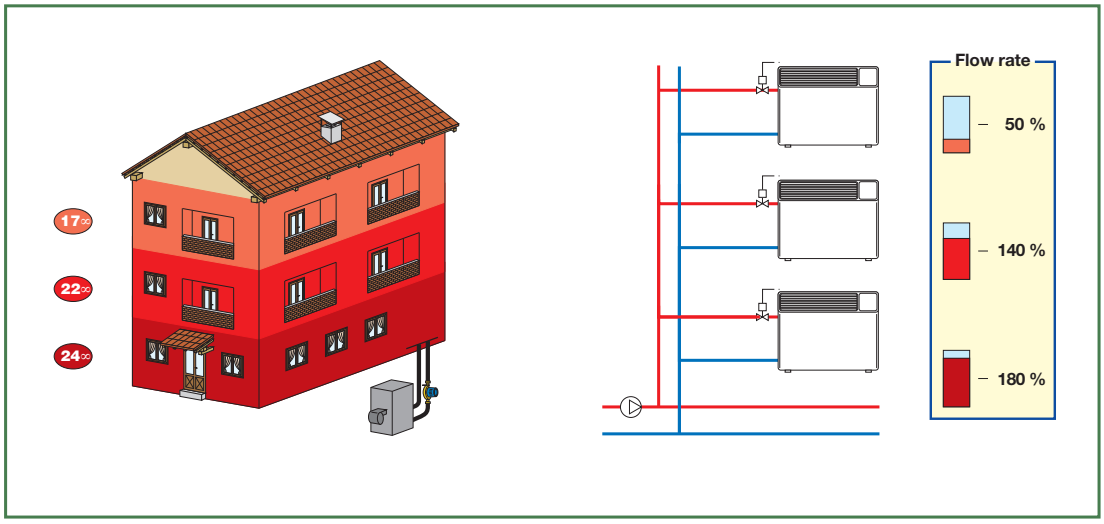
Code	A	B	C	D	Weight (kg)
10311. ...	DN 65	208	185	172	7,50
10321. ...	DN 80	212	200	172	11,58
10331. ...	DN 100	216	220	172	12,38
10341. ...	DN 125	271	250	223	16,55
10351. ...	DN 150	271	285	223	24,11
10361. ...	DN 200	287	360	223	41,62
10371. ...	DN 250	295	425	223	58,09
10381. ...	DN 300	319	515	223	93,27
10391. ...	DN 350	311	555	223	108,17

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 system terminal emitters with the correct design flow rates, to produce balanced hydraulic circuits.

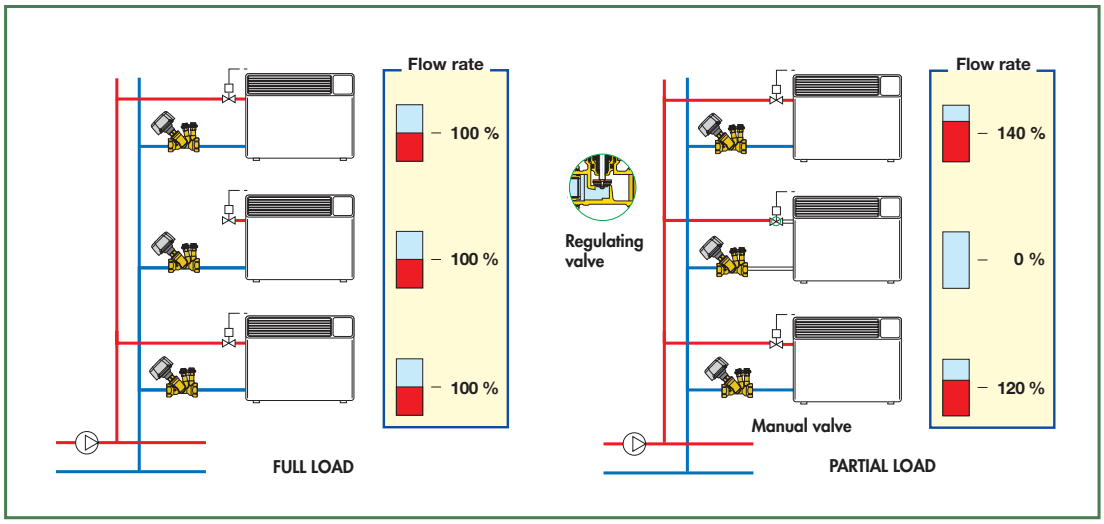
Unbalanced circuits

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



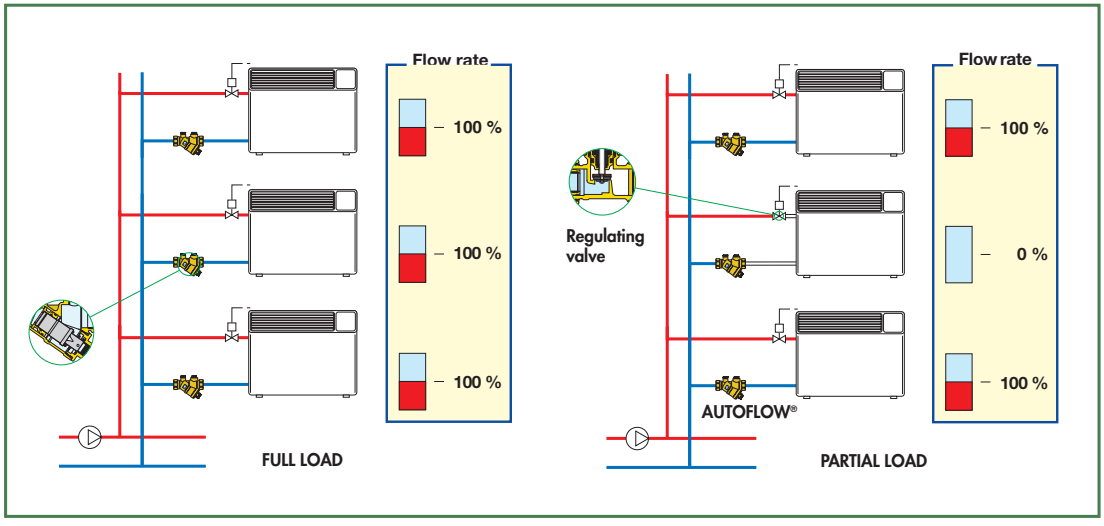
Circuits balanced with manual valves

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 case of partial closure by means of the regulating valves. The flow rate in the open circuits **does not remain constant at the nominal value.**



Circuits balanced with AUTOFLOW®

AUTOFLOW® balances the hydraulic circuit automatically, by ensuring to each terminal emitter 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 nominal value**. The system always guarantees the greatest comfort and the highest energy savings.

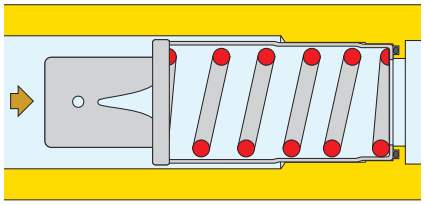


AUTOFLOW® devices

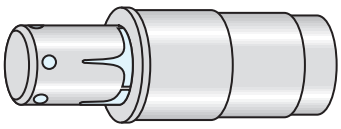
Function
The AUTOFLOW® device has to guarantee a constant flow rate when its upstream/downstream pressure differential varies.
It is therefore necessary to refer to the Δp - flow rate diagram and to a basic diagram illustrating the operation methods and the relevant variable effects.

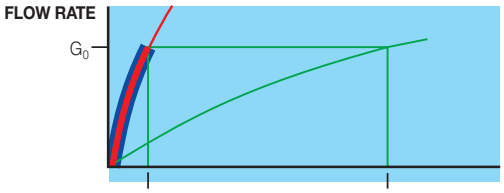
Operating principle
The regulating element of these devices is composed of a cilinder and a piston with fixed and variable geometry orifices, through which the fluid flows. The surface area of these orifices is governed by the piston movement when pushed by the flow. A specially calibrated spring counteracts this movement.
Autoflows 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 regulator and thus the flow through the AUTOFLOW® depends solely on the differential pressure.

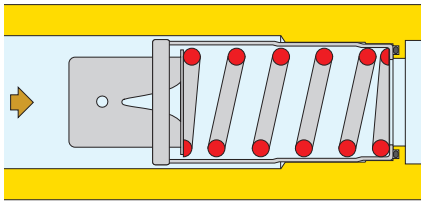




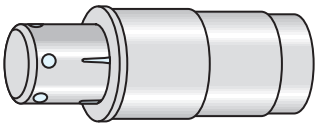
0,07 bar/7 kPa
0,14 bar/14 kPa
0,35 bar/35 kPa
DIFFERENTIAL PRESSURE
1 bar/100 kPa
2,20 bar/220 kPa
4,10 bar/410 kPa

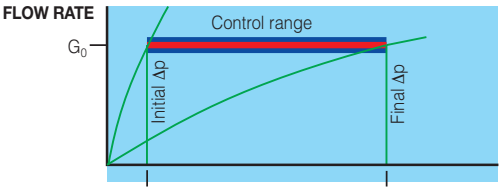
$kv_{0,01}=0,378 \cdot G_0$ Δp range 7–100 kPa
$kv_{0,01}=0,267 \cdot G_0$ Δp range 14–220 kPa
$kv_{0,01}=0,169 \cdot G_0$ Δp range 35–410 kPa
where G_0 = nominal flow rate

Within the control range



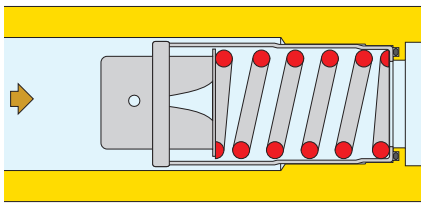
Se la pressione differenziale è compresa nel campo di lavoro, il pistone comprime la molla ed offre al fluido una sezione di libero passaggio tale da consentire il regolare flusso della **portata nominale** per cui l'AUTOFLOW® è abilitato.



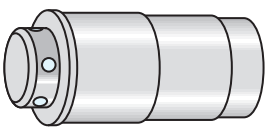


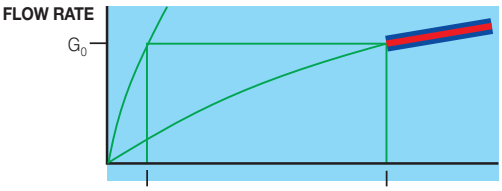
0,07 bar/7 kPa
0,14 bar/14 kPa
0,35 bar/35 kPa
DIFFERENTIAL PRESSURE
1 bar/100 kPa
2,20 bar/220 kPa
4,10 bar/410 kPa

Above the control range



In this case, the piston fully compresses the spring and only allows flow through the fixed geometry orifice.
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..





0,07 bar/7 kPa
0,14 bar/14 kPa
0,35 bar/35 kPa
DIFFERENTIAL PRESSURE
1 bar/100 kPa
2,20 bar/220 kPa
4,10 bar/410 kPa

$kv_{0,01}=0,1 \cdot G_0$ Δp range 7-100 kPa
$kv_{0,01}=0,067 \cdot G_0$ Δp range 14-220 kPa
$kv_{0,01}=0,049 \cdot G_0$ Δp range 35-410 kPa
where G_0 = nominal flow rate

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

AUTOFLOW® devices 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: $\Delta p_{start} - \Delta p_{end}$

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 it is necessary to evaluate the available pump head.
- **differential pressure at the end of the control range.** If this value is exceeded the AUTOFLOW® 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 AUTOFLOW® 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
0,22–2,20 bar
Can be used in the majority of sealed systems.
The ample control range allows it to be inserted with a minimum addition of differential pressure, amounting to 22 kPa (0,22 bar).

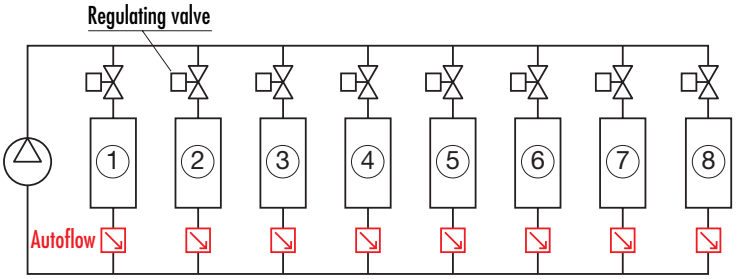
35–410 kPa
0,35–4,10 bar
Can be used in open systems, for example in water distribution systems or with high level of available head, for example in district heating systems. The high upper limit, 410 kPa (4,1 bar), makes proper operation possible within the control range.

Sizing the circuit with AUTOFLOW®

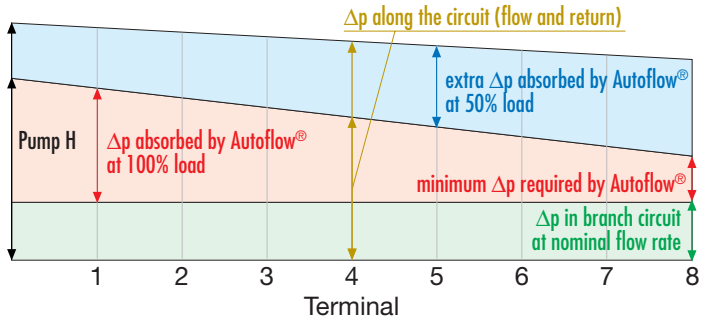
Sizing the circuit containing AUTOFLOW® valves is particularly easy to accomplish. As illustrated alongside by the example diagrams, calculation of the loss of head in order to choose the pump is made by referring to the hydraulically most unfavourable circuit and by adding this value to the minimum 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 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 sizing a system with AUTOFLOW®, please refer to the 2nd volume of the Handbooks Caleffi and the technical bulletin “Dynamic balancing of hydronic circuits”. They give theoretical calculations, numerical examples and notes on the application of the above-mentioned devices in circuits.



Differential pressures (Δp)



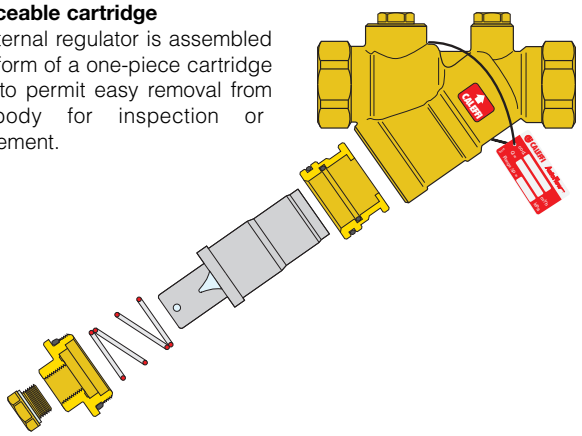
Construction details

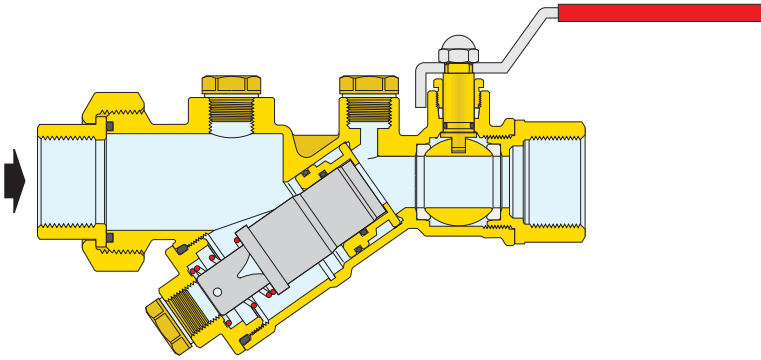
Steel regulator
The flow rate regulator is made entirely of steel, suitable for use in airconditioning and plumbing systems.
It is fully compatible with the glycols and additives used in the circuits.

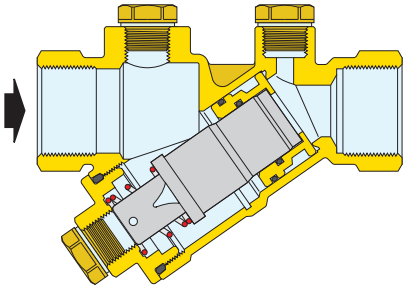
Wide range of working pressures
The regulator is able to provide precise regulation of the flow rate over a wide range of working pressures. It is factory calibrated to keep the flow rate automatically within ±5% of the set value.
For these reasons it can be used in system circuits both at zone branching 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 internal regulator is assembled in the form of a one-piece cartridge so as to permit easy removal from the body for inspection or replacement.

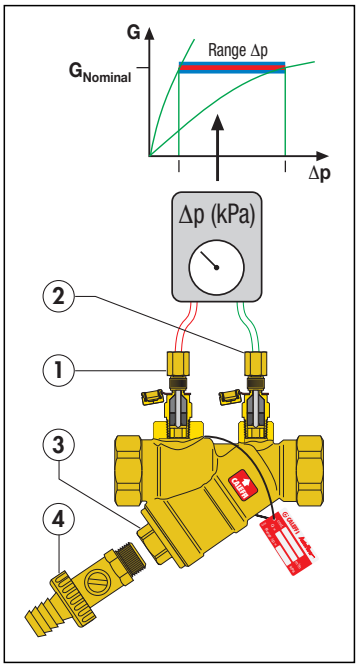


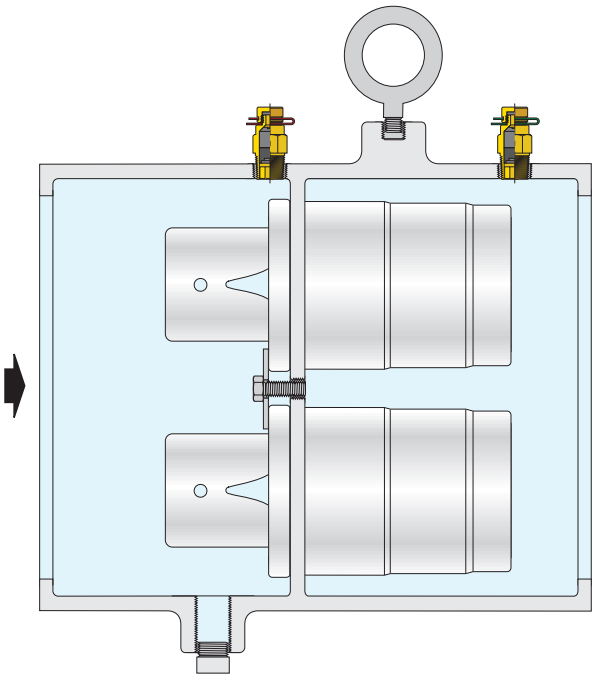




Pressure ports - checking flow rate
Known the device dynamic characteristics, it is sufficient to check the differential pressure from upstream to downstream, using the pressure provided ports (1) - (2).
If the differential pressure is contained within the control range (range Δp) indicated on the data plate, then the through 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.

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





AUTOFLOW® flanged version
This is supplied equipped with flanges EN 1092-1 PN 16 (on request PN 25), gaskets and quick-fit pressure test ports.

Flow rate tables for 120 series

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

Flow rate tables for 125 series

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; 18,0; 19,5; 20,5; 21,5; 22,5

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; 18,0; 19,0; 20,0; 21,0; 22,0;

Minimum differential pressure required
Given by the sum of two values:
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 calculated according to the values of kv0,01 stated above and referring to the valve body only.

Esempio

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

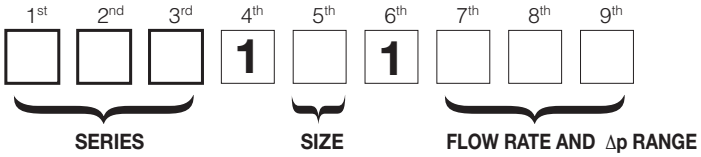
$\Delta p_{required} = \Delta p_{AUTOFLOW®} + \Delta p_{body} = 22 + (G_0 / Kv_{0,01})^2 = 22 + (2500 / 1342)^2 = 25,5$ kPa

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

Coding criteria for AUTOFLOW® 120 - 125 series

For correct identification of the device, fill in the form giving series No., size, construction, flow rates and 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 flow rate 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		

Δp range 14–220 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	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	1,60	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	3H2	6,00	6H0	10,0	10H	20,0	20H		

Flow rate tables for 103 series

Code	DN	Minimum working Δp (kPa)	Flow rates (m³/h)	Range Δp (kPa)
103111 ●●●	65	22	9 – 22,5	22–220
103113 ●●●	65	35	18 – 22,5	35–410
103121 ●●●	80	22	18 – 22,5	22–220
103123 ●●●	80	35	18 – 22,5	35–410
103131 ●●●	100	22	18 – 22,5	22–220
103133 ●●●	100	35	18 – 22,5	35–410
103141 ●●●	125 *	22	16,5 – 61	22–220
103143 ●●●	125 *	35	18 – 45	35–410
103151 ●●●	150	22	16,5 – 122,5	22–220
103153 ●●●	150	35	18 – 155	35–410
103161 ●●●	200	22	32 – 215	22–220
103163 ●●●	200	35	36 – 270	35–410
103171 ●●●	250	22	64 – 338	22–220
103173 ●●●	250	35	72 – 425	35–410
103181 ●●●	300	22	95 – 460	22–220
103183 ●●●	300	35	115 – 580	35–410
103191 ●●●	350	22	160 – 580	22–220
103193 ●●●	350	35	190 – 730	35–410

- The flow rates are available in increments of approximately 1 m³/h.
- They are available on request with sizes from DN 400 to DN 800, with flow rates up to 3850 m3/h.
** They are available on request with 4" ANSI flanges*

Supplied with EN 1092-1 PN16 flanges, rods, seals and quick-fit pressure ports.

Minimum differential pressure required
This is equal to the minimum working Δp of the Autoflow cartridge (22 or 35 kPa).

Example

$\Delta p_{required} = \Delta p_{AUTOFLOW®}$ = 22 or 35 kPa; 0,22 or 0,35 bar

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

Coding criteria for AUTOFLOW® 103 series

For correct identification of the device, fill in the form giving size, Δp range and flow rate

Complete code

1st	2nd	3rd	4th	5th	6th	7th	8th	9th
1	0	3	1					
SERIES				SIZE	Δp RANGE	FLOW RATE		

SIZE — 5th

The fifth digit indicates 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

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

kPa	14–220	35–410
Digit	1	3

FLOW RATE — 7th 8th 9th

The last three digits indicate the flow rate values. (See tables below and in the following page)

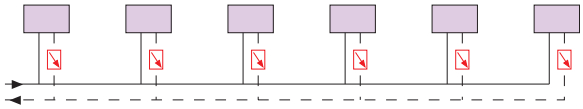
Notes

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.

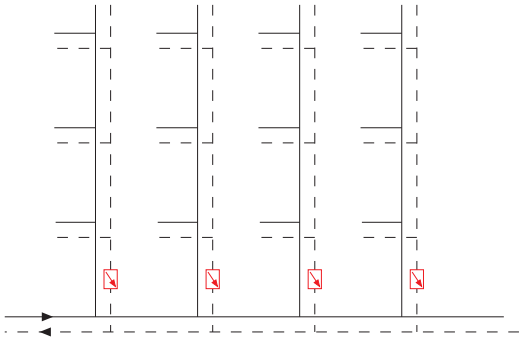
Sizing the system with AUTOFLOW®
For more detailed information on sizing a system with AUTOFLOW®, please refer to the 2nd volume of the Handbooks Caleffi and the technical bulletin "Dynamic balancing of hydronic circuits". They give theoretical calculations, numerical examples and notes on the application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

Medium
AUTOFLOW® devices can be used with fluids other than water.
In this case it is recommended to contact our head office to select the most suitable product

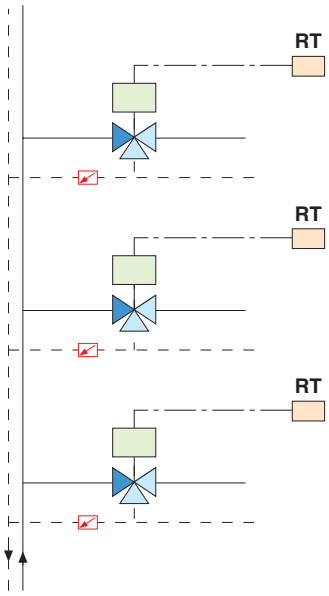
Applications of AUTOFLOW® ( )



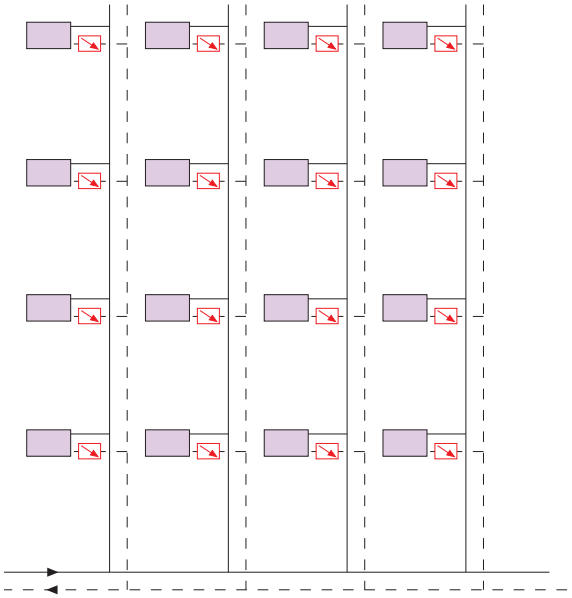
For use in line with various types of heat emitter: radiators, convectors, fan convectors, thermal strips, etc.



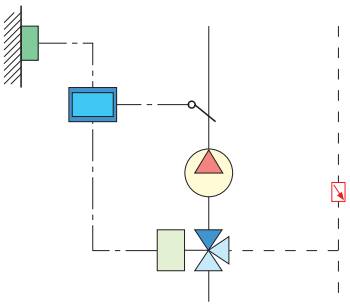
To regulate the flow rate in each riser or secondary branch of a system.



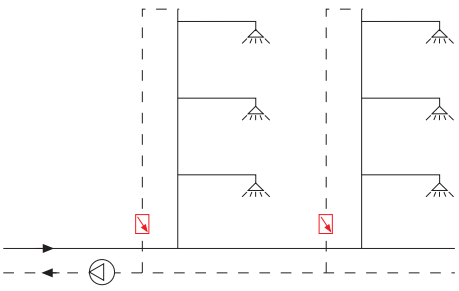
To guarantee the design flow rates (with open or closed valve) to the various zones of a system.



To ensure constant flow rates to each emitter.

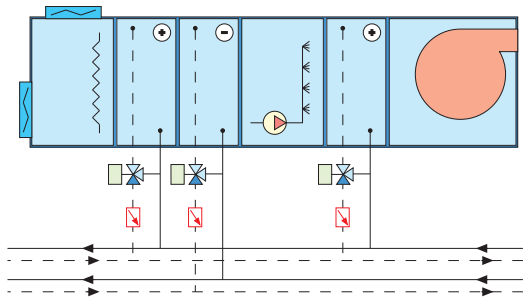


To ensure constant flow rates (in any valve position) in circuits with traditional temperature control.

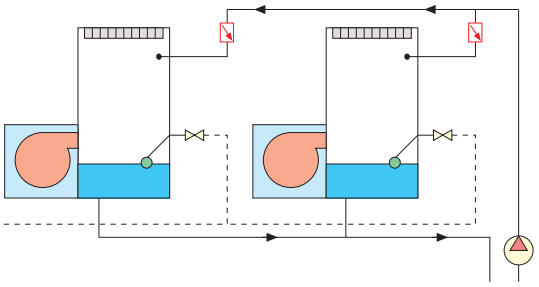


To balance circuits for hot water distribution.

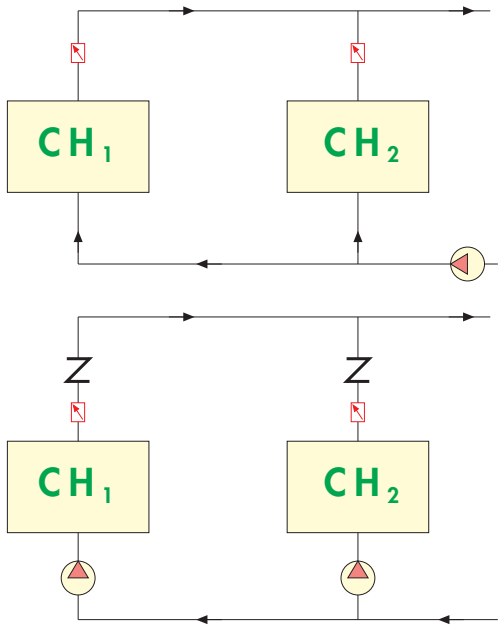
Applications of AUTOFLOW® ( )



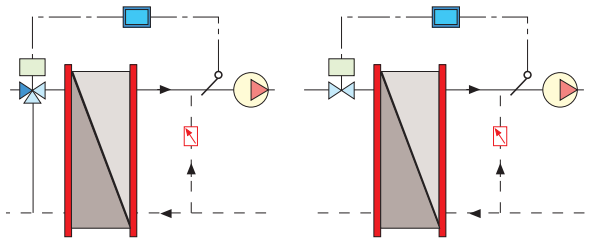
To balance circuits that serve air conditioning units.



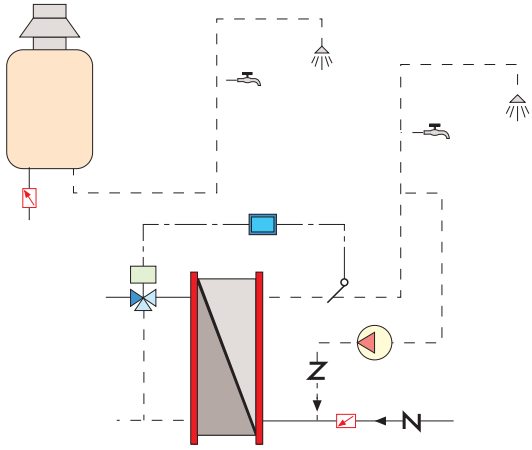
To balance circuits that serve cooling towers.



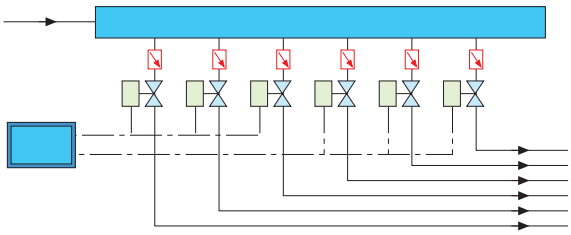
To balance the circuits that serve chiller unit evaporators or condensers.



To create 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.

To balance plumbing circuits.

To limit the flow rate delivered to each user in remote 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, consult Applications Sheets Nr. 04301, 04302, 04303 and the technical report "Dynamic Balancing of Hydronic Systems".

SPECIFICATION SUMMARIES

AUTOFLOW® version 120 series

Automatic flow regulator and ball valve, AUTOFLOW®. Suitable to maintain constant flow rate values as the operating conditions in the system change. 1/2" F connections with F union (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 zinc plated steel lever. Brass pressure port plugs. 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 ports with 1/4" F connections and drain pipe.

AUTOFLOW® version 125 series

Automatic flow regulator, AUTOFLOW®. Suitable to maintain constant flow rate values as the operating conditions in the system change. 1/2" F x F connections (from 1/2" to 2 1/2"). Dezincification resistant alloy body. Replaceable stainless steel inner cartridge. Stainless steel spring. EPDM seals. Brass pressure port plugs. 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: 0,12–22,5 m^3/h. Accuracy ±5%. Suitable for fitting pressure ports with 1/4" F connections and drain pipe.

103 series

Automatic flow regulator, AUTOFLOW®. Suitable to maintain constant flow rate values as the operating conditions in the system change. DN 65 flanged connections (from DN 65 to DN 350) EN1092-1. 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 22–220 kPa (and 35–410 kPa). Range of available flow rates: 9–3850 m^3/h. Complete with quick-fit 1/4" pressure test ports, counterflanges, 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 screen without having to remove the device body from the pipeline.
They are suitable to fit pressure ports to check the clog level within the inner strainer and to connect a drain pipe to clean the inner strainer without removing it from the body.
In the version with shut-off valve, the ball valve control stem is blow-proof and the reversible closing lever is covered with vinyl.

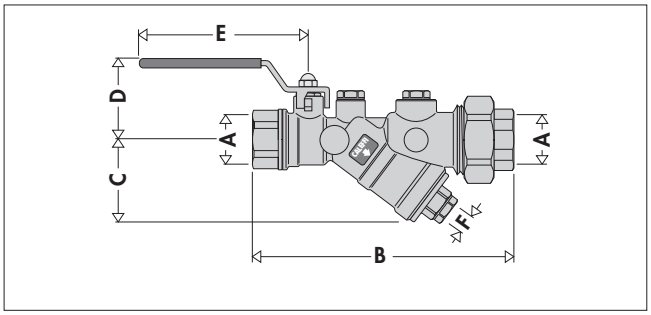
Product range

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"

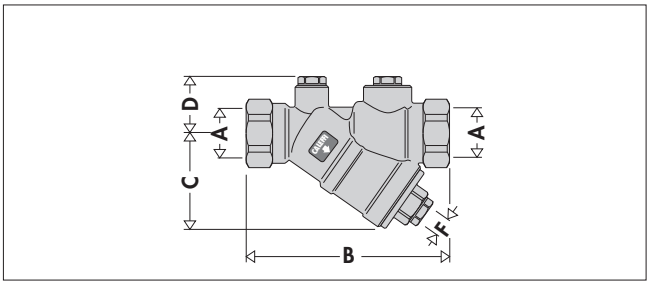
Technical specifications

series	120	125
Materials		
Body:	- 1/2" and 3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"– 2": dezincification resistant alloy CR EN 1982 CB752S	- 1/2"and 3/4": dezincification resistant alloy CR EN 12165 CW602N - 1"–2 1/2": dezincification resistant alloy CR EN 1982 CB752S
Strainer cartridge:	stainless stee	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 ports plugs:	dezincification resistant alloy CR EN 12164 CW614N	dezincification resistant alloy CR EN 12164 CW614N
Performance		
Medium:	water, glycol solutions	water, glycol solutions
Maximum percentage glycol:	50%	50%
Maximum working pressure:	25 bar	25 bar
Working temperature range:	0–110°C	-20–110°C
Strainer mesh Ø:	1/2"–1 1/4": 0,87 mm; 1 1/2" e 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 ports connections	1/4" F	1/4" F

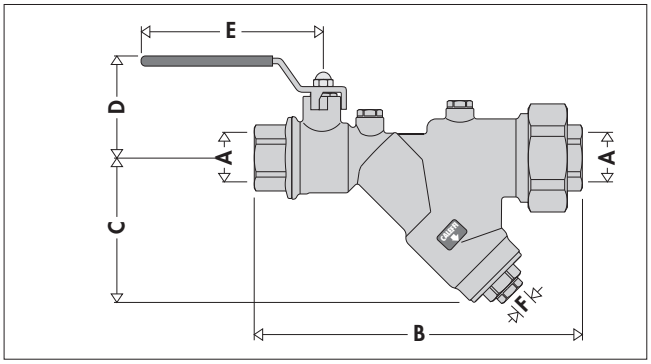
Dimensions



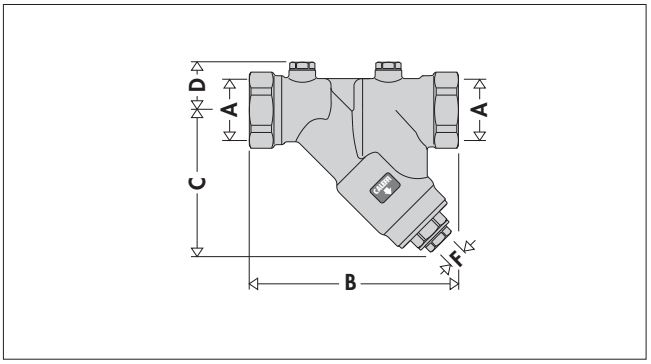
Code	A	B	C	D	E	F	Weight (kg)
120141 000	1/2"	156,5	52,5	50	100	1/4"	1,07
120151 000	3/4"	159,5	52,5	50	100	1/4"	1,07
120181 000	1 1/2"	253	84	88	140	1/2"	4,55
120191 000	2"	253	84	88	140	1/2"	4,55



Code	A	B	C	D	F	Weight (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"	176	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	Weight (kg)
120161 000	1"	218,5	68	66	120	1/2"	2,26
120171 000	1 1/4"	220,5	68	66	120	1/2"	2,26



Code	A	B	C	D	F	Weight (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)	Mesh 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)	Mesh 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

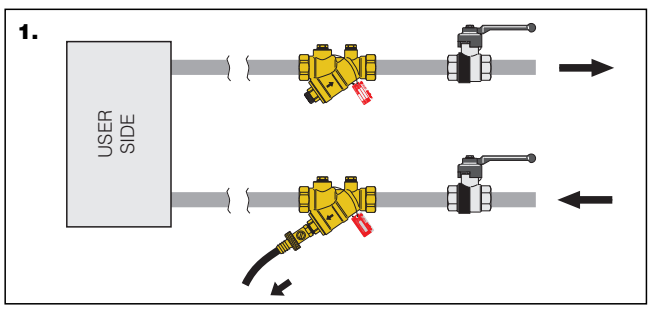
Pressure drop

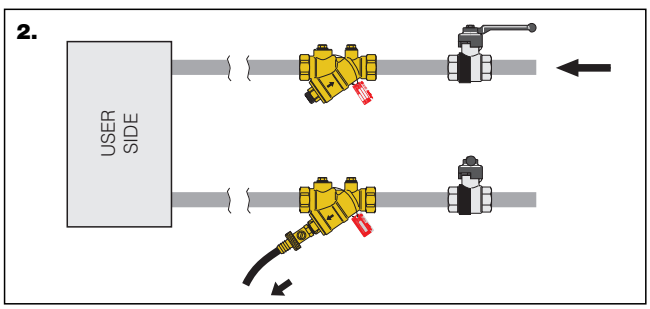
- The Kv value indicated refer to the valve complete with strainer

Strainer cleaning

The strainer can be cleaned without removing it from the body.

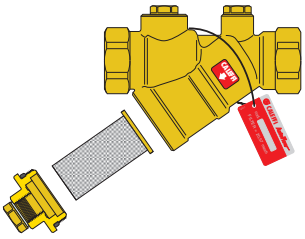
1. By opening the drain valve to allow the dirt to flow into the drain pipe.
2. By performing a reverse flow operation (the water flow hits the strainer from the opposite side). The shut-off valve on the flow pipe shuold be closed before the drain valve is opened.



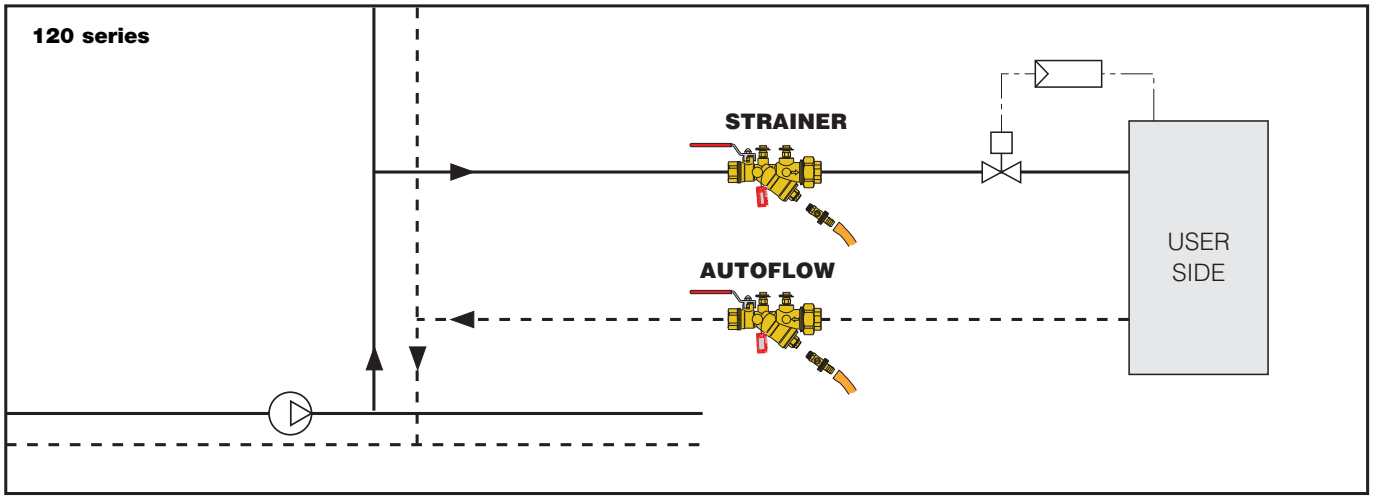


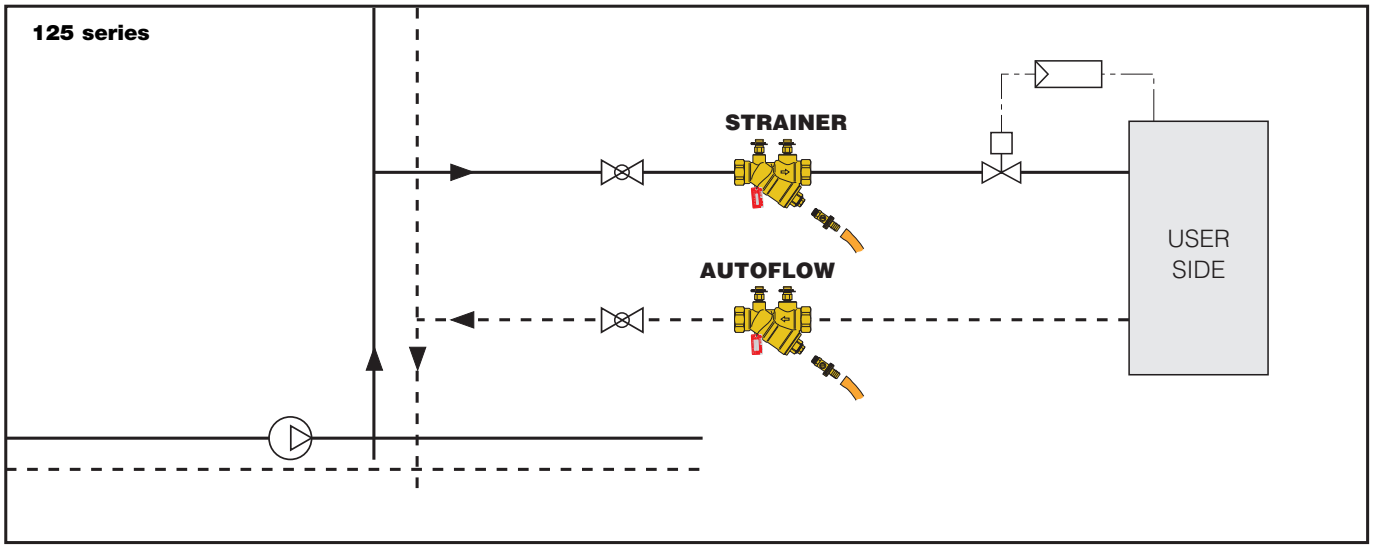
Inspecting the strainer

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



Application diagrams





SPECIFICATION SUMMARIES

Strainer version 120 series

Y-strainer and ball valve. 1/2" F connections with F union (from 1/2" to 2"). Dezincification resistant alloy body. Stainless steel inner strainer; strainer mesh 0,87 mm (for sizes 1/2" to 1 1/4"; strainer mesh 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 zinc plated steel lever. Brass pressure port plugs. Medium: water and glycol solutions. Maximum percentage of glycol 50%. Maximum working pressure 25 bar. Temperature range 0–110°C. Suitable for fitting pressure ports with 1/4" F connections and drain pipe.

Strainer version 125 series

Y-strainer. 1/2" F x F connections. Dezincification resistant alloy body. Stainless steel inner strainer; strainer mesh 0,87 mm (for sizes 1/2" to 1 1/4"; strainer mesh 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 zinc plated steel lever. Brass pressure port plugs. Medium: water and glycol solutions. Maximum percentage of glycol 50%. Maximum working pressure 25 bar. Temperature range -20–110°C. Suitable for fitting pressure ports with 1/4" F connections and drain pipe.

Accessories

130

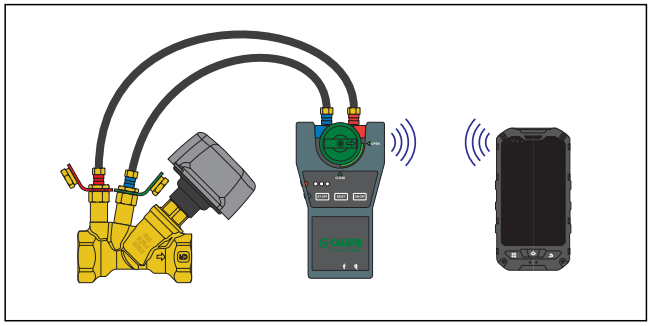
tech. broch. 01251

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

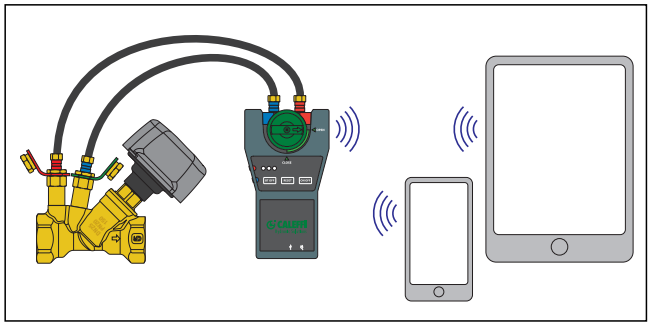
CE

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

Transmission via Bluetooth to the terminal



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

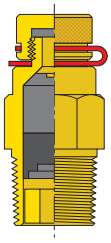


100

tech. broch. 01041

Pair of fast-plug pressure/temperature test ports.
Their special construction allows rapid and accurate measurements while ensuring leaktightness.
Can be used for:
- checking the working range of Autoflow
- checking the clog degree of strainers
- checking the heat output of the terminals.

Cap cover facing available in:
- **Red** for upstream pressure port.
- **Green** for downstream pressure port.



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

Code	
100000	1/4”

100

tech. broch. 01041

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

Code	
100010	1/4”

538

tech. broch. 01041

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

Code	
538201	1/4”
538400	1/2” with cap

We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice.

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