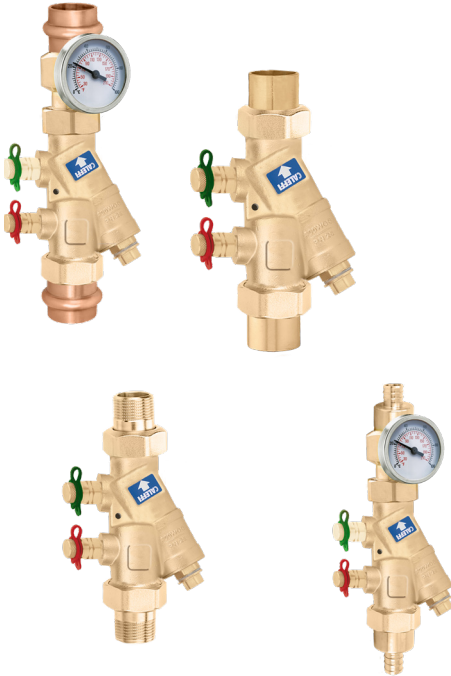


FlowCal™ & FlowCal+™ Low-lead Y-body dynamic flow balancing valve



128 series



Function

The FlowCal™ and FlowCal+™ 128 series Y-body dynamic flow balancing valve is pressure independent and maintains a fixed flow rate as differential pressures vary. It incorporates an exclusive flow cartridge, made of an anti-scale, low noise polymer. Constructed of DZR low-lead brass, FlowCal and FlowCal+ 128 series is ideally suited for use in plumbing applications such as hot water recirculation systems. The FlowCal+ 128 series provides a built-in check valve to protect against circuit thermo-siphoning, and the outlet temperature gauge (optional) verifies the fluid temperature in the circuit. Both 128 series versions can also be used in hydronic systems.

The FlowCal and FlowCal+ 128 series balancing valve is made of certified low-lead brass in a Y-pattern and uses the same flow cartridges as the Caleffi FlowCal and FlowCal+ 127 series. Because the body can remain in the piping, the y-body simplifies serviceability with an easy-to-remove flow cartridge for flushing and inline change out. It also includes factory-installed PT ports to verify and certify flow rates where required.

The FlowCal and FlowCal+ 128 series balancing valves are available with NPT male, sweat, press, PEX crimp and PEX expansion union connections. The union nut makes installation and maintenance fast, easy and efficient for a variety of tailpiece options.

Caleffi code 290030 full-port ball valve is designed for isolating the FlowCal and FlowCal+ 128 series. The isolation valve installs in between the valve body and the tailpiece fitting assembly. Male x Female configuration and bi-directional full ball valve flow capacity provides flexibility for using one or two isolation valves for the primary functioning valve. An optional stem extension is also available for those projects that require pipe insulation.

Product range

- 128AF series FlowCal y-body dynamic automatic balancing valve, with polymer cartridge, includes PT ports..... sizes ½", ¾", 1" NPT male, sweat, press, PEX crimp or PEX expansion union connections
- 128AFC series FlowCal+ y-body dynamic automatic balancing valve, with polymer cartridge, includes inlet check valve, PT ports, and optional dual-scale outlet temperature gauge..... sizes ½", ¾", 1" NPT male, sweat, press, PEX crimp or PEX expansion union connections

Technical specifications

Materials

Body:	DZR low-lead brass (<0.25% Lead content)	Optional dual-scale outlet 2" diameter temperature gauge:
Flow cartridge:	anti-scale polymer	Scale: 30 - 210°F and 0 - 100°C
Spring:	stainless steel	Accuracy: ± 6%
Seals:	peroxide-cured EPDM	

Performance

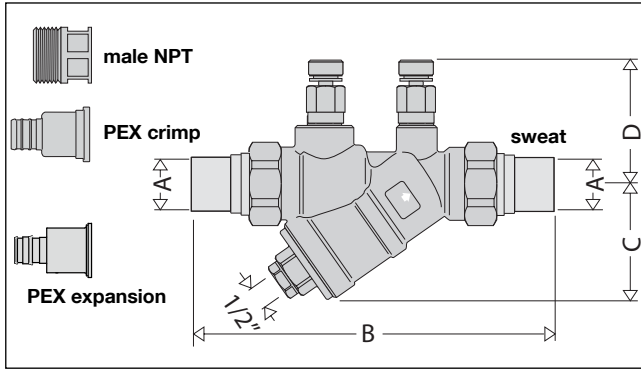
Medium:	water, glycol solutions
Max. percentage of glycol:	50%
Max. working pressure:	400 psi (28 bar)
Working temperature range:	32-212° F (0-100° C)
Connections:	
Main inlet/outlet:	1/2", 3/4" and 1" NPT male, sweat, press, PEX crimp or PEX expansion union
Lay length (press connection):	see page 2
Flow Rate:	21 fixed flow rate settings ranging from 0.35 - 10 GPM
Flow Accuracy:	± 10%
Differential Pressure Control Ranges:	2-14, 2-32, 4-34, 5-35 psid

Certifications

1. NSF/ANSI/CAN 372, Drinking Water System Components-Lead Content Reduction of Lead in Drinking Water Act, California Health and Safety Code 116875 S.3874, Reduction in Drinking Water Act, Vermont Act 193 - The Lead in Plumbing Supplies Law and Maryland's Lead Free Law HB.372, certified by ICC-ES, file PMG-1360.
2. PEX crimp fittings certified to ASTM F 1807.
3. PEX expansion fittings certified to ASTM F 1960.

US Patent: 7,246,635 B2.

Dimensions

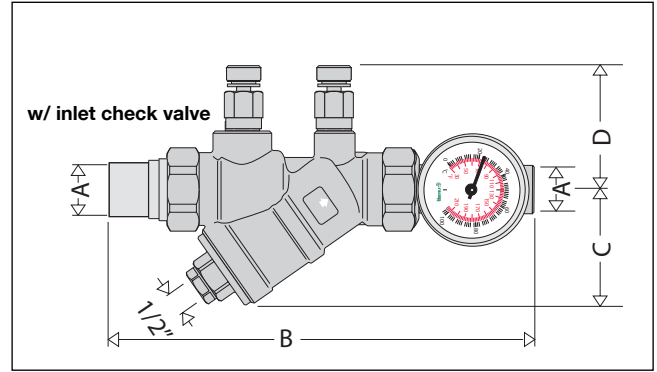


FlowCal and FlowCal+ with inlet check valve, no gauge

Code	A (union connections)	B	C	D	Wt (lb/kg)
128541AF ...	1/2" NPT male	4-11/16"	2"	2-13/16"	2.0/0.9
128542AF ...	1/2" PEX expansion	8-13/16"			2.0/0.9
128544AF ...	1/2" PEX crimp	7-13/16"			2.0/0.9
128546AF ...	1/2" press*	6-9/16"			2.0/0.9
128549AF ...	1/2" sweat	5-15/16"			1.8/0.8
128551AF ...	3/4" NPT male	4-5/8"			2.1/0.95
128552AF ...	3/4" PEX expansion	8-13/16"			2.1/0.95
128554AF ...	3/4" PEX crimp	7-13/16"			2.1/0.95
128556AF ...	3/4" press*	7-5/16"			2.1/0.95
128559AF ...	3/4" sweat	6-7/16"			2.0/0.9
128561AF ...	1" NPT male	7-3/16"			2.2/1.0
128562AF ...	1" PEX expansion	8-13/16"			2.2/1.0
128564AF ...	1" PEX crimp	8"			2.2/1.0
128566AF ...	1" press*	7-1/4"			2.2/1.0
128569AF ...	1" sweat	7-3/16"			2.2/1.0

*Lay length for press models

Size	128xxxAF	128xxxAFC no outlet gauge	128xxxAFC with outlet gauge
1/2 inch	5"	5-13/16"	8-1/16"
3/4 inch	5-7/16"	6"	8-1/4"
1 inch	5-7/16"	7"	9-1/4"



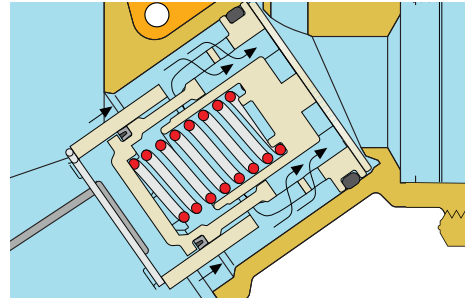
FlowCal+ with inlet check valve and gauge

Code	A (union connections)	B	C	D	Wt (lb/kg)
**128440AFC ...	1/2" NPT male	9-11/32"	2"	2-13/16"	2.0/0.9
128441AFC ...	1/2" NPT male	7-1/8"			1.8/0.8
**128443AFC ...	1/2" PEX expansion	11-1/16"			2.0/0.9
128442AFC ...	1/2" PEX expansion	8-13/16"			1.8/0.8
**128445AFC ...	1/2" PEX crimp	10-1/6"			2.0/0.9
128444AFC ...	1/2" PEX crimp	7-13/16"			1.8/0.8
**128447AFC ...	1/2" press*	9-11/16"			2.0/0.9
128446AFC ...	1/2" press*	7-1/2"			1.8/0.8
**128448AFC ...	1/2" sweat	8-13/16"			2.0/0.9
128449AFC ...	1/2" sweat	6-9/16"			1.8/0.8
**128450AFC ...	3/4" NPT male	9-1/4"			2.0/0.9
128451AFC ...	3/4" NPT male	7"			1.8/0.8
**128453AFC ...	3/4" PEX expansion	11-1/16"			2.0/0.9
128452AFC ...	3/4" PEX expansion	8-13/16"			1.8/0.8
**128455AFC ...	3/4" PEX crimp	10-1/16"			2.0/0.9
128454AFC ...	3/4" PEX crimp	7-13/16"			1.8/0.8
**128457AFC ...	3/4" press*	10-1/8"			2.0/0.9
128456AFC ...	3/4" press*	7-7/8"			1.8/0.8
**128458AFC ...	3/4" sweat	9-1/4"			2.0/0.9
128459AFC ...	3/4" sweat	7"			1.8/0.8
**128460AFC ...	1" NPT male	9-3/4"			2.0/0.9
128461AFC ...	1" NPT male	7-1/2"			1.8/0.8
**128463AFC ...	1" PEX expansion	11-1/16"			2.2/1.0
128462AFC ...	1" PEX expansion	8-13/16"			2.0/0.9
**128465AFC ...	1" PEX crimp	10-1/4"			2.2/1.0
128464AFC ...	1" PEX crimp	8"			2.0/0.9
**128467AFC ...	1" press*	11-1/8"			2.2/1.0
128466AFC ...	1" press*	8-13/16"			2.0/0.9
**128468AFC ...	1" sweat	9-7/16"			2.2/1.0
128469AFC ...	1" sweat	7-3/16"			2.0/0.9

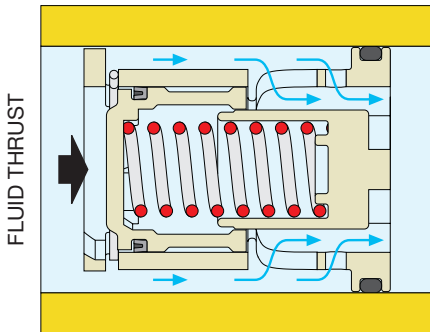
**with outlet temperature gauge

FlowCal Compact Dynamic Automatic Flow Balancing Valves

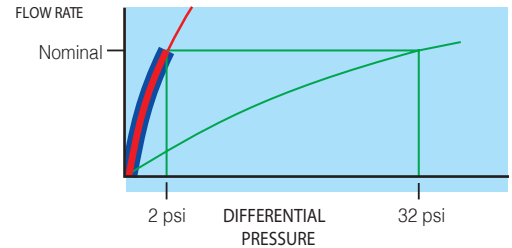
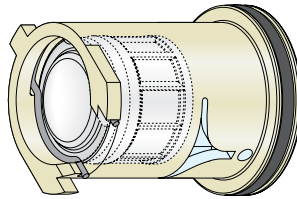
The FlowCal and FlowCal+ flow cartridge is composed of a cylinder, a spring-loaded piston, and a combination of fixed and variable geometric orifices through which the fluid flows. These variable orifice sizes increase or decrease by the piston movement, contingent on the system's fluid thrust. A specially calibrated spring counteracts this movement to regulate the amount of fluid that will pass through the valve orifices, maintaining a constant flow rate in the circuit.



Below the differential pressure control range (< 2 psid)*

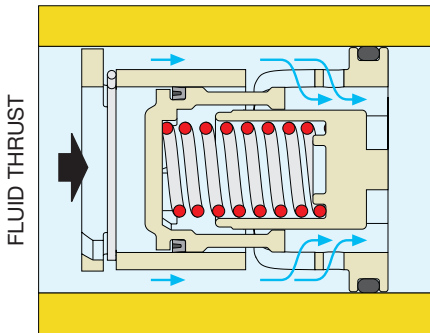


In this case, the spring-loaded regulating piston remains in equilibrium without compressing the spring and gives the fluid the maximum free flow area. When below the differential pressure control range the piston acts as a fixed orifice and thus the flow rate through the FlowCal depends only on the differential pressure.

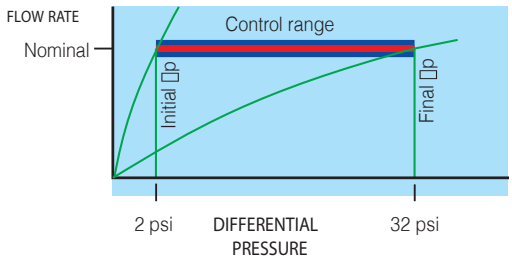
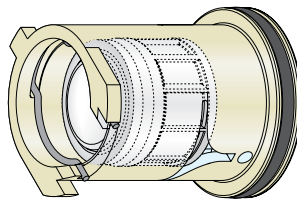


Range Δp 2-32 psi

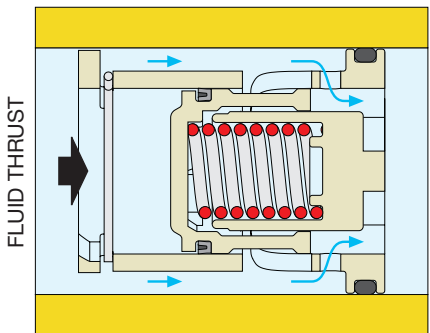
Within the differential pressure control range (2 - 32 psid)*



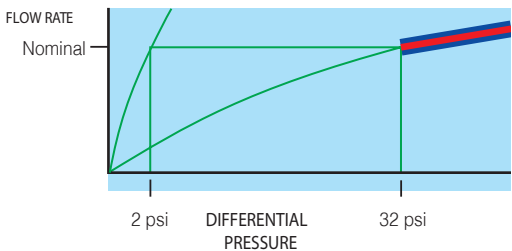
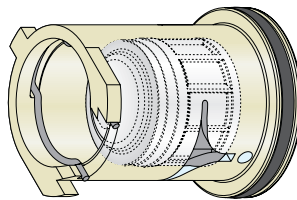
If the differential pressure is within the control range, the spring-loaded piston is positioned to give the fluid a free flow area permitting regular flow at the **nominal rate** for which the FlowCal is set up.



Above the differential pressure control range (> 32 psid)*



In this case, the spring-loaded piston fully compresses a spring and leaves only the fixed orifice for the fluid to pass through. The flow rate through the FlowCal depends only on the differential pressure.



Range Δp 2-32 psi

*These values are for this example. The same logic applies to the other Differential Pressure Control Ranges: 2 - 14, 4 - 34, and 5 - 35 psid.

Construction details

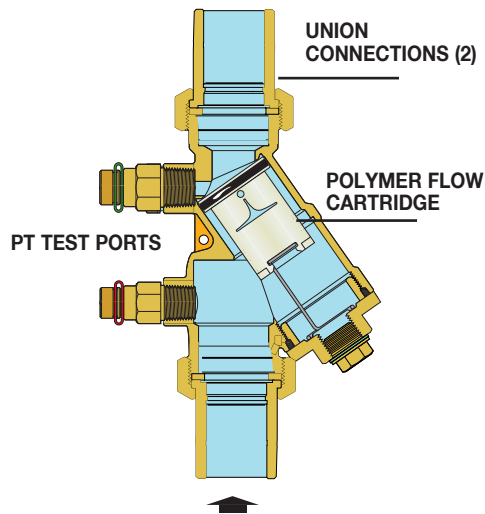
Polymer flow cartridge

The flow rate cartridge is made of an anti-scale polymer, specially engineered for use in cooling, heating and domestic water systems, to prevent mineral buildup in a wide range of working temperatures. It features high resistance to the abrasion caused by continuous fluid flow, is insensitive to the deposit of scale and is fully compatible with glycols and additives used in circuits.

Serviceable

The y-body style of the 128 series FlowCal and FlowCal+ balancing valves allow the body to remain in the piping which simplifies serviceability and cartridge cleanout. Also included are factory-installed PT ports for measurement verification.

FlowCal 128AF series

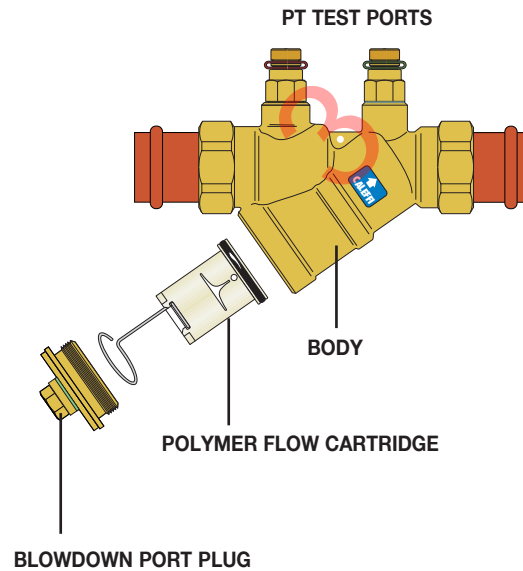


Exclusive design

With its exclusive design, the flow cartridge is able to accurately control the flow rate in a wide range of operating pressures. A special internal chamber acts as a damper for the vibrations resulting from fluid flow, for quiet operation. For these reasons it can be used in systems on zone branch circuits or directly at the terminals.

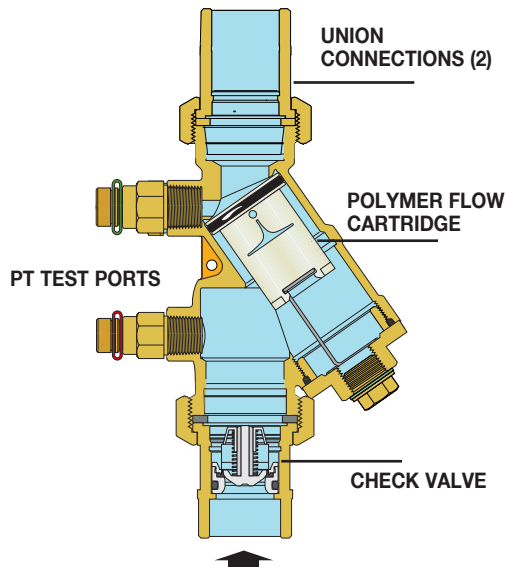
Replaceable cartridge

The internal regulator is assembled in the form of a self-contained cartridge to permit easy removal from the body for inspection or replacement. It is equipped with a special automatic installation mechanism with wire and an operating ring for fast and safe positioning without tools.



FlowCal+ 128AFC series

FlowCal+ models come with a check valve in the inlet tailpiece to prevent backward flow in domestic hot water recirculation applications. In addition, models are available with and without an outlet temperature gauge to verify water temperature when balancing the system. The standard FlowCal models do not include a check valve or outlet temperature gauge.



Order Code Numbering for FlowCal 128 series

Code	Description	Code	Description	Code	Description
128541AF ...	½" NPT male	128551AF ...	¾" NPT male	128561AF ...	1" NPT male, No gauge
128542AF ...	½" PEX expansion	128552AF ...	¾" PEX expansion	128562AF ...	1" PEX exp., No gauge
128544AF ...	½" PEX crimp	128554AF ...	¾" PEX crimp	128564AF ...	1" PEX crimp, No gauge
128546AF ...	½" press	128556AF ...	¾" press	128566AF ...	1" press, No gauge
128549AF ...	½" sweat	128559AF ...	¾" sweat	128569AF ...	1" sweat, No gauge

All fittings are union style. All codes have factory-installed PT ports.
FlowCal 128 series offer no outlet temperature gauge or inlet check valve.

Order Code Numbering for FlowCal+ 128 series

Code	Description	Code	Description	Code	Description
128440AFC ...	½" NPT male, gauge	128450AFC ...	¾" NPT male, gauge	128460AFC ...	1" NPT male, gauge
128441AFC ...	½" NPT male, No gauge	128451AFC ...	¾" NPT male, No gauge	128461AFC ...	1" NPT male, No gauge
128443AFC ...	½" PEX exp., gauge	128453AFC ...	¾" PEX exp., gauge	128463AFC ...	1" PEX exp., gauge
128442AFC ...	½" PEX exp., No gauge	128452AFC ...	¾" PEX exp., No gauge	128462AFC ...	1" PEX exp., No gauge
128445AFC ...	½" PEX crimp, gauge	128455AFC ...	¾" PEX crimp, gauge	128465AFC ...	1" PEX crimp, gauge
128444AFC ...	½" PEX crimp, No gauge	128454AFC ...	¾" PEX crimp, No gauge	128464AFC ...	1" PEX crimp, No gauge
128447AFC ...	½" press, gauge	128457AFC ...	¾" press, gauge	128467AFC ...	1" press, gauge
128446AFC ...	½" press, No gauge	128456AFC ...	¾" press, No gauge	128466AFC ...	1" press, No gauge
128448AFC ...	½" sweat, gauge	128458AFC ...	¾" sweat, gauge	128468AFC ...	1" sweat, gauge
128449AFC ...	½" sweat, No gauge	128459AFC ...	¾" sweat, No gauge	128469AFC ...	1" sweat, No gauge

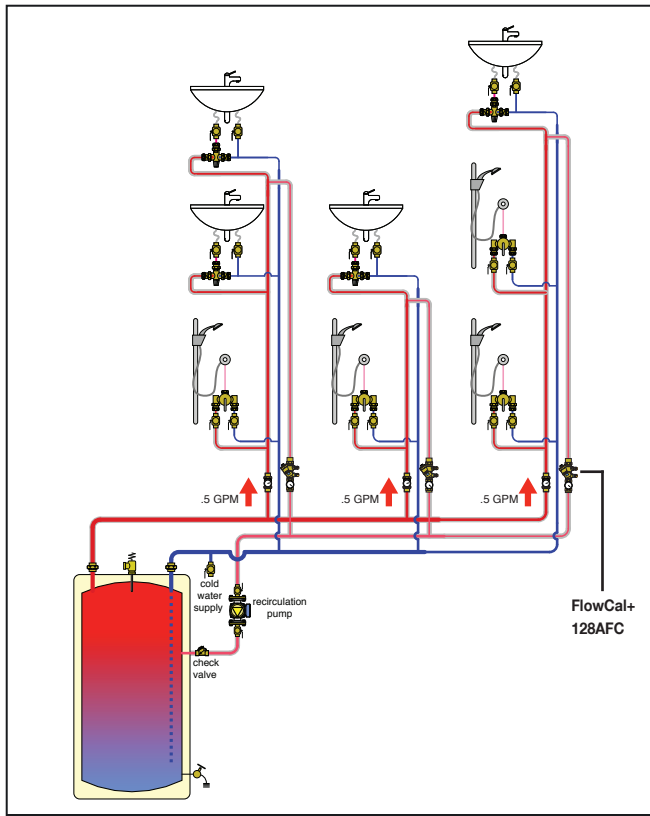
All fittings are union style. All codes have factory-installed PT ports.
FlowCal+ 128 series offer inlet check valves, and outlet temperature gauge as noted.

Flow rate (GPM)	Last 3 digits (AF/AFC__)	ΔP control ranges (psid)
0.35	G35	2 - 14
0.50	G50	
0.75	G75	
1.00	1G0	2 - 32
1.30	1G3	
1.50	1G5	
1.75	1G7	
2.00	2G0	
2.20	2G2	
2.50	2G5	

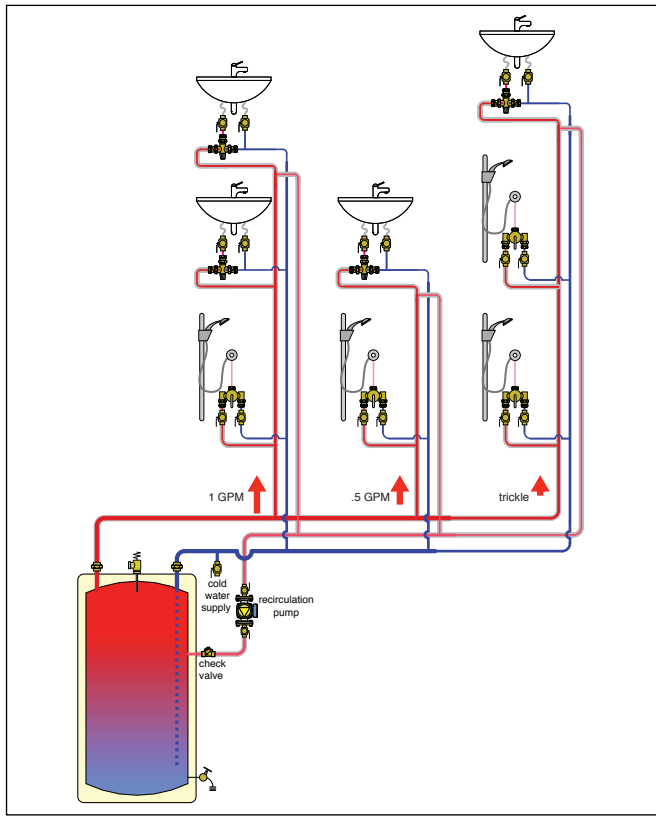
Flow rate (GPM)	Last 3 digits (AF/AFC__)	ΔP control ranges (psid)
2.60	2G6	2 - 32
3.00	3G0	
3.50	3G5	
4.00	4G0	
4.50	4G	
5.00	5G0	4 - 34
6.00	6G0	
7.00	7G0	
8.00	8G0	
9.00	9G0	5 - 35
10.00	10G	

Hot water recirculation

Balanced example



Unbalanced example



Balancing made fast, easy, and accurate with the Caleffi FlowCal+ 128 series balancing valve

Hot water recirculation systems are designed to minimize wait time for hot water to arrive when a fixture is opened. Systems left unbalanced or improperly balanced result in wasted water down the drain, a costly and environmentally unfriendly situation - not to mention the undesired annoyance placed on building occupants. Multiple hot and cold water risers are supplied from common hot and cold water mains. The number and type of fixtures served by each set of risers will often be different. A recirculation riser accompanies each set of hot and cold risers. A single circulator provides recirculation flow through the entire system. This type of piping network is similar to a 2-pipe direct return distribution system for hydronic heating. Because of differences in the lengths or sizes of both the main piping and riser piping, the recirculation flow through each set of risers is likely to be different. This can lead to different temperature drops between the beginning of a given hot water riser and the end of its associated return riser. This may cause the hot water temperature arriving at a distant fixture to be insufficient for the intended usage. This situation can be corrected by “balancing” the recirculation flow between the various sets of risers. The goal of such balancing is to establish recirculation flow rates that create equal temperature drop between the start of each hot water riser and the end of its associated return (recirculation) riser.

Balancing is enabled with the FlowCal+ pressure independent low-lead balancing valve, with fixed flow rate, presuming riser flow rates have been computed in advance. These valves will control to the design flowrate without the worry of pressure differentials affecting flow rates. The valves are multi-functional with a built-in check valve, to protect against circuit thermo-siphoning, and an optional outlet temperature gauge to verify water temperature. In addition, the FlowCal+ 128AFC series balancing valve includes PT test ports to verify and certify flow rates where required.

Accessories

PT test ports

Replacement fast-plug pressure/temperature test ports for FlowCal and FlowCal+ automatic flow balancing valves. Special construction enables rapid and accurate measurements without the need to leave expensive test equipment inline. The double-sealing core insures long and trouble-free service. Can be used for checking the operation of FlowCal balancing valve.



Low Lead brass body.
Nordel Core.

Working temperature range: 0–275°F (-18–135°C)
Max. working pressure: 435 psi (30 bar).

Code	Size
100001A	1/4" NPT PT Test Port and Cap, standard size, 1 1/2" length (pair)

538

Drain valve
with 3/4" garden hose connection.



Code	Size
538402 FD	1/2" NPT fits 1/2 - 1" 128 series FlowCal, FlowCal+

Isolation ball valve

Low lead Male x Female union fits 1" valves between body and tailpiece. See below.



Code	Size
290030	Isolation ball valve 1"M x 1"F union
NA10815	Stem extension for 290030



Isolation ball valves, installed on FlowCal+ with optional temperature gauge.



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SPECIFICATION SUMMARY

128AF series

Y-body dynamic automatic pressure independent flow balancing valve with polymer flow cartridge FlowCal. Connections ½", ¾", 1" NPT male, sweat, press, PEX crimp and PEX expansion union. PEX crimp fittings must comply with ASTM F 1807. PEX expansion fittings must comply with ASTM F 1960. DZR low-lead brass body (<0.25% lead content) certified by ICC-ES file PMG-1360. Meets requirements of NSF/ANSI/CAN 372. Anti-scale polymer cartridge. Stainless steel spring. Peroxide-cured EPDM seals. Provided with two pressure/temperature test ports, Caleffi code 100001A. Water and up to 50% maximum glycol solutions. Maximum working pressure 400 psi (28 bar). Working temperature range 32 to 212 degrees F (0 to 100 degrees C). Δp range 2–35 psi. Range of available flow rates for all connection sizes 0.35 - 10 gpm. Accuracy ±10%. Provide with optional inlet and outlet isolation ball valves, code 290030, separately sourced, field installed.

128AFC series

Y-body dynamic automatic pressure independent flow balancing valve with polymer flow cartridge FlowCal+. Connections ½", ¾", 1" NPT male, sweat, press, PEX crimp and PEX expansion union. PEX crimp fittings must comply with ASTM F 1807. PEX expansion fittings must comply with ASTM F 1960. DZR low-lead brass body (<0.25% lead content) certified by ICC-ES file PMG-1360. Meets requirements of NSF/ANSI/CAN 372. Anti-scale polymer cartridge. Stainless steel spring. Peroxide-cured EPDM seals. Provided with two pressure/temperature test ports, Caleffi code 100001A. Water and up to 50% maximum glycol solutions. Maximum working pressure 400 psi (28 bar). Working temperature range 32 to 212 degrees F (0 to 100 degrees C). Δp range 2–35 psi. Range of available flow rates for all connection sizes 0.35 - 10 gpm. Accuracy ±10%. Provided with inlet flow check valve and optional dual-scale outlet temperature gauge, 2 inch diameter, 30 to 210 degrees F and 0 to 100 degrees scale. Provide with optional inlet and outlet isolation ball valves, code 290030, separately sourced, field installed.

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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