

2020 PLUMBING AND HYDRONICS CATALOG

1 HYDRAULIC SEPARATORS

2 AIR AND DIRT SEPARATORS AND AIR VENTS

3 THERMOSTATIC RADIATOR VALVES

4 ZONE VALVES AND ZONE CONTROLS

5 DISTRIBUTION MANIFOLDS AND TEMPERATURE MIXING STATIONS

6A MIXING VALVES FOR PLUMBING AND HYDRONICS

6B BALANCING VALVES FOR PLUMBING AND HYDRONICS

6C PRVS, BACKFLOW PREVENTERS AND AIR VENT FOR PLUMBING

7 FILLING UNITS AND BOILER TRIM KITS

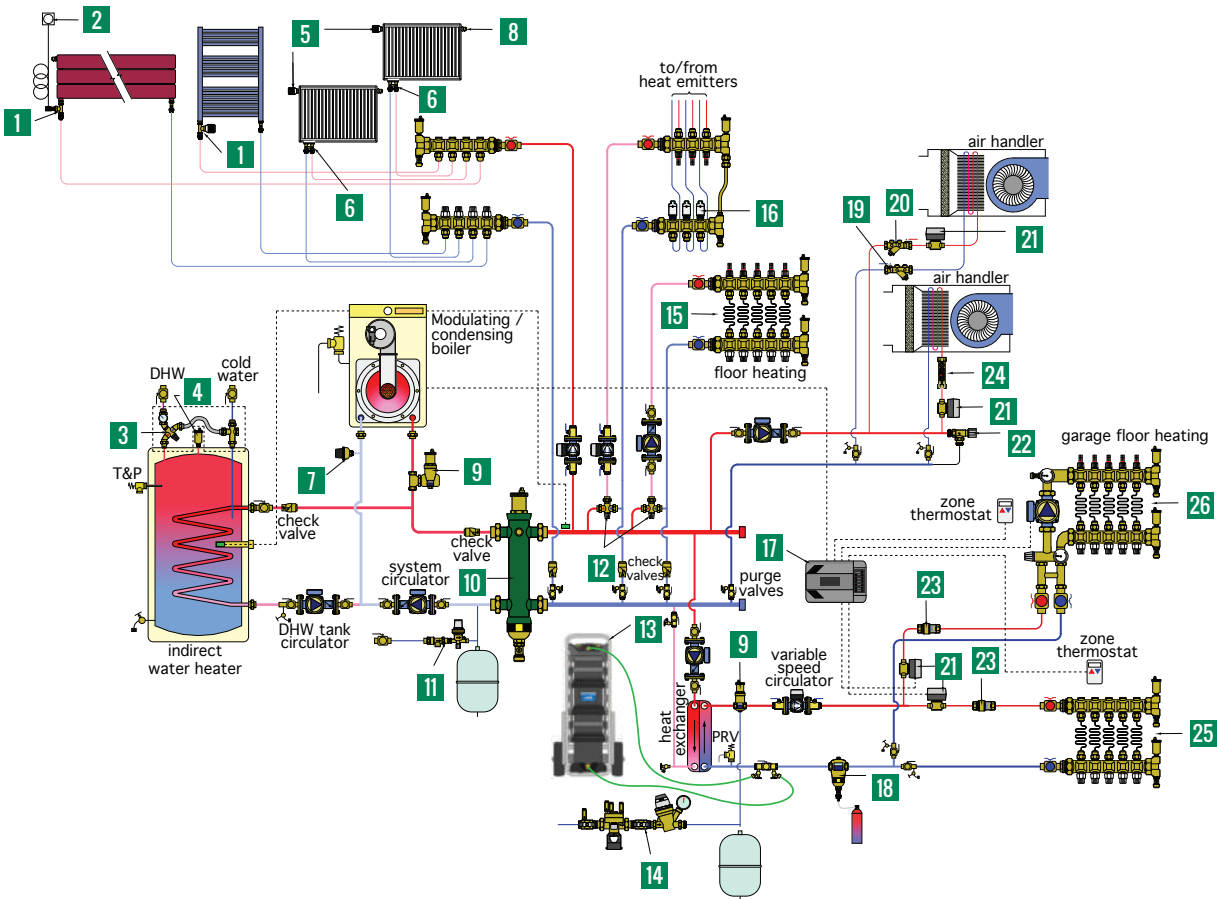
8 FITTINGS AND MISCELLANEOUS COMPONENTS

9 RENEWABLES, SOLAR, GEOTHERMAL AND BIOMASS DEVICES

10 HEAT METERS

11 INDEX

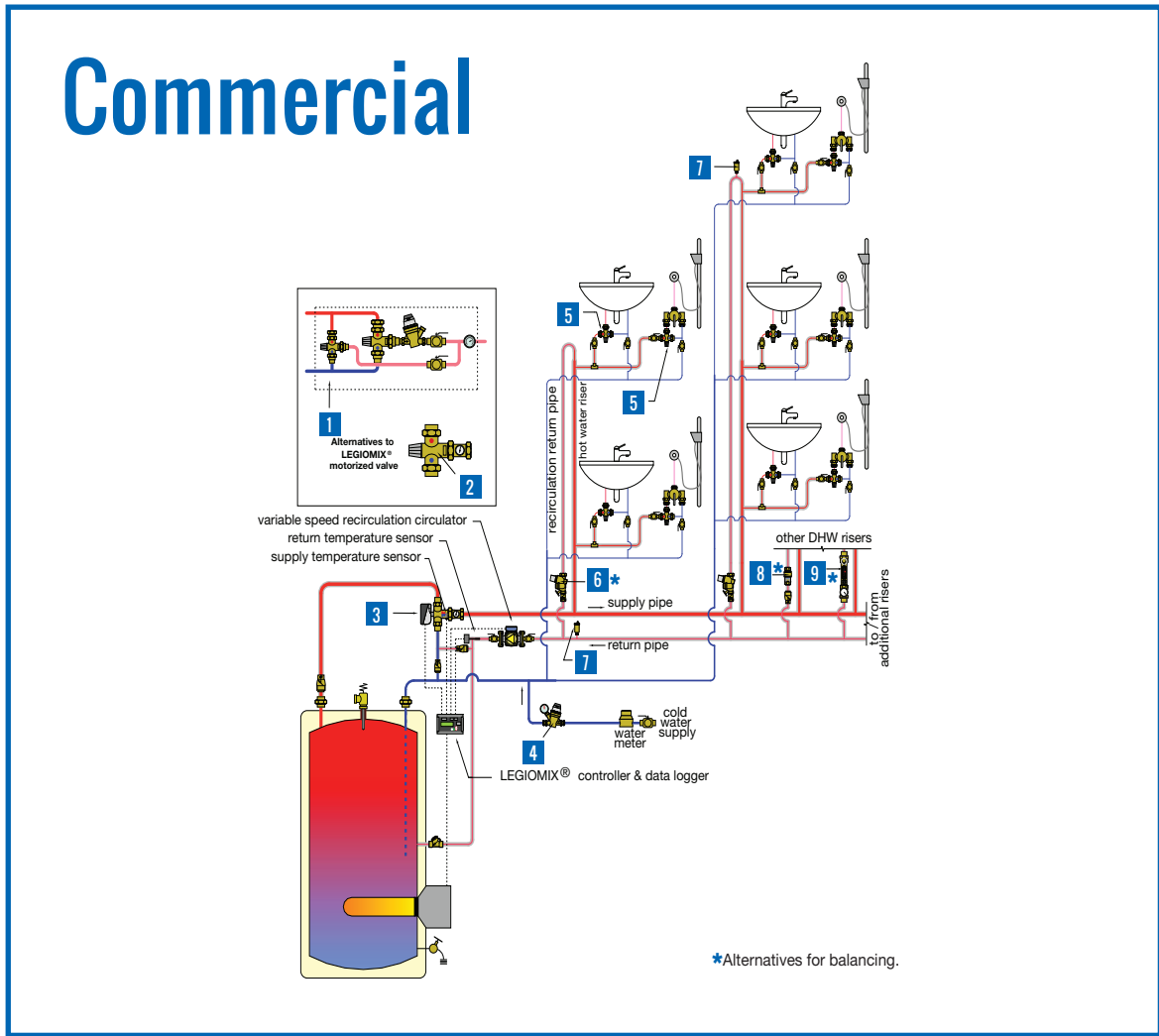
Hydronics Product Selector



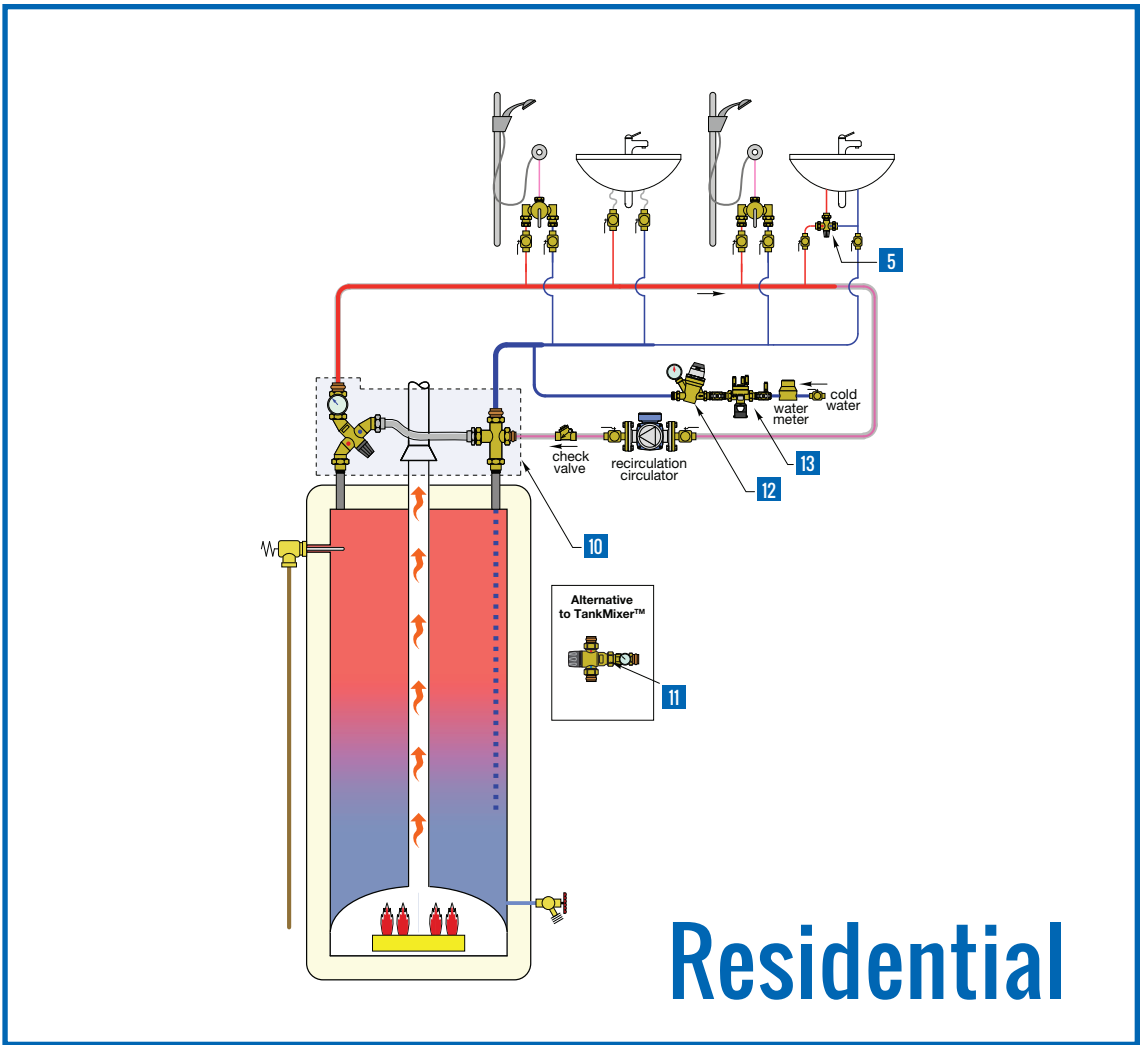
Key	Part Number	Description	Catalog Section
1	221500	Radiator valve	3
2	472000	Remote wall sensor	3
3	520510AX	TankMixer™ thermostatic mixing assembly	6A
4	NA502640A	PLUMBVENT™ low lead automatic air vent	6C
5	200000	Radiator valve control head	3
6	301040	Radiator connection valves	3
7	626600A	Paddle flow switch	8
8	508013A	Hygroscopic air vent	2
9	551706A	DISCAL® air separator, rotating collar	2
10	549506A	SEP4™ hydraulic, air, dirt, mag separator	1
11	573002A	AutoFill™ combo ASSE 1012	7
12	521619A	MixCal™ thermostatic mixing valve	6A
13	NA570924	HydroFill™ water treatment unit	7
14	574151A	AutoFill™ combo ASSE 1013	7
15	6686E5S1A	TwistFlow™ manifold	5
16	656344	TwisTop™ thermo-electric actuator	3&5
17	ZVR103	Z-one™ valve relay control	4
18	NA546306T	DIRTMAG® chemical kit	2
19	121161A	FlowCal™ automatic balancing valve	6B
20	120161A	Y-strainer	6B
21	Z55P	Z-one™ valve assembly	4
22	519600A	DP bypass valve	8
23	127361AF	FlowCal™ automatic balancing valve	6B
24	132662A	QuickSetter™ balancing valve	6B
25	6636E5A	Manifold	5
26	1725E1AHE	Manifold mixing station	5

Plumbing Product Selector

Commercial



Key	Part Number	Description	Catalog Section
1	NA52367HL	High-Low mixing valve assy ASSE 1017	6A
2	523177A	High-flow mixing valve ASSE 1017	6A
3	600074A	LEGIOMIX® electronic mixing valve ASSE 1017	6A
4	535991HA	Pressure reducing valve ASSE 1003	6C
5	521333A	Anti-scald mixing valve ASSE 1070	6A
6	116151AC	ThermoSetter™ thermal balancing valve	6B
7	NA502640A	PLUMBVENT™ low lead automatic air vent	6C



Key	Part Number	Description	Catalog Section
8	127356AF	FlowCal™ automatic balancing valve	6B
9	132537AFC	QuickSetter+™ manual balancing valve	6B
10	520516AX	TankMixer™ mixing valve assy ASSE 1017	6A
11	521616A	MixCal™ mixing valve ASSE 1017	6A
12	535360HA	Pressure reducing valve ASSE 1003	6C
13	574050A	RPZ backflow preventer ASSE 1013	6C



High performance multi-function hydraulic separator

The Caleffi SEP4™ saves on system installation and maintenance costs with four high performance functions combined into one device: hydraulic separation, micro-bubble coalescing air separation, dirt separation and magnetic separation.



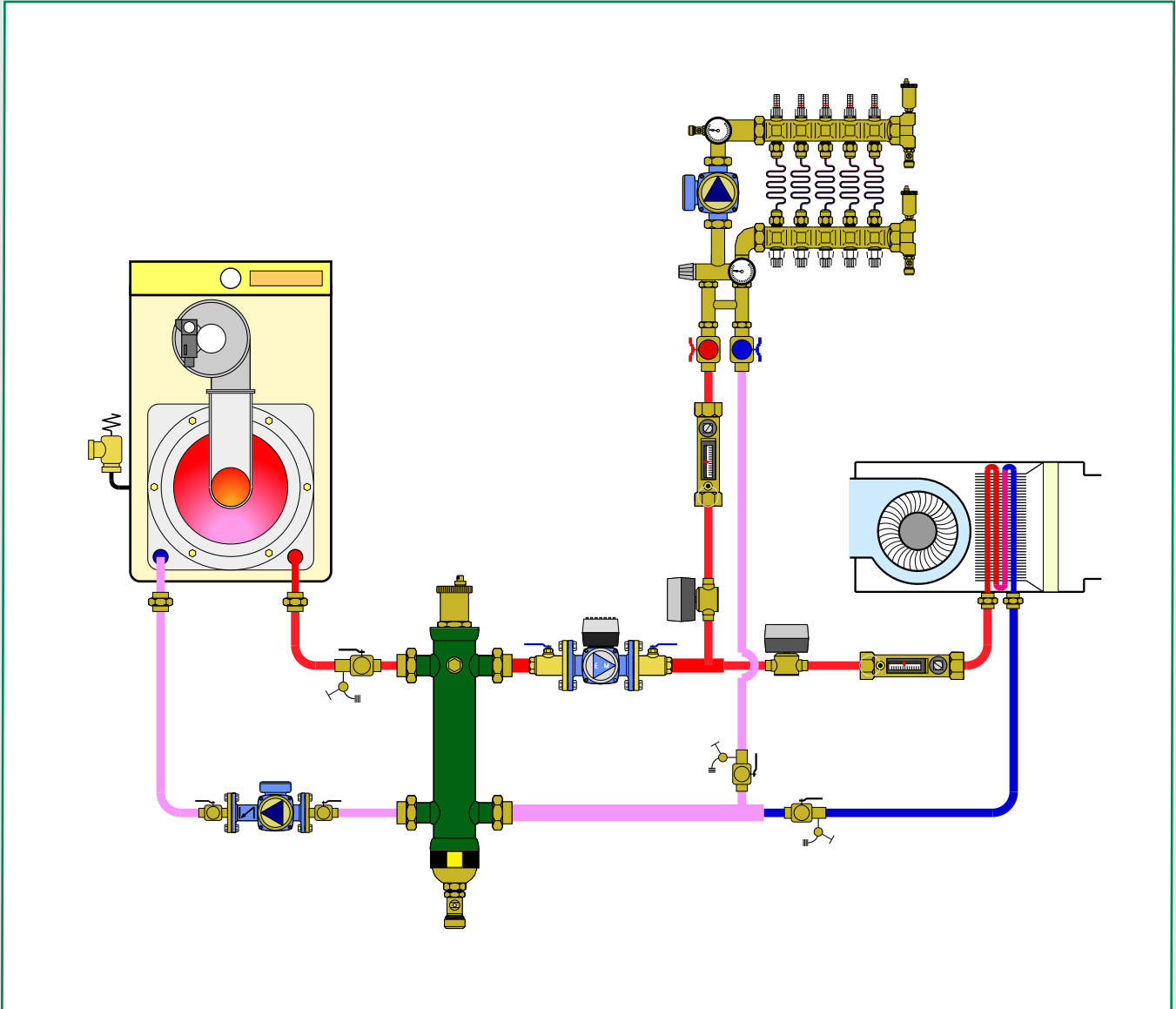
Heating & cooling

Components for today's modern hydronic systems

HYDRAULIC SEPARATORS

This diagram is for illustration purposes only

1



PRODUCTS INCLUDED IN SECTION

- 4-in-1 hydraulic separators
- Hydraulic separators
- Hydraulic separators-manifolds
- Hydraulic separator accessories

4-IN-1 HYDRAULIC SEPARATORS



5495 SEP 4™

Combination 1. air, 2. hydraulic and 3. dirt separation, plus 4. magnetic separation. Epoxy resin coated steel body. HDPE internal coalescing element, removable for cleaning. Pre-formed insulation. Thermowell tap: 1/2" straight female. Max. working pressure: 150 psi. Working temperature range: 32–210°F. Working temp. w/o insulation: 32–230°F.

Code	Description	Lbs	USD
549596A	1" sweat union	15	803.00
549506A	1" NPT female union	15	835.00
549566A	1" press union	15	878.00
549597A	1¼" sweat union	19	979.00
549507A	1¼" NPT female union	19	1,013.00
549567A	1¼" press union	19	1,113.00
549598A	1½" sweat union	27	1,278.00
549508A	1½" NPT female union	27	1,324.00
549568A	1½" press union	27	1,445.00
549599A	2" sweat union	29	1,466.00
549509A	2" NPT female union	29	1,503.00
549569A	2" press union	29	1,688.00
549506US*	1" no tailpieces	13	684.00
549507US*	1¼" no tailpieces	17	798.00
549508US*	1½" no tailpieces	25	941.00
549509US*	2" no tailpieces	27	1,141.00

*See Separator fittings in Section 8.



NA549 SEP 4™ ASME

Combination 1. air, 2. hydraulic and 3. dirt separation, plus 4. magnetic separation. Epoxy resin coated steel body. Stainless steel internal coalescing mesh. Three neodymium magnets. Complete with: automatic air vent (code 501502A). air vent shut-off valve (code NA39589). drain valve (code NA59600). ANSI 150 flange connections. Thermometer pockets (NPT): ½" inlet/outlet flanges, ¾" front center Max. working pressure: 150 psi. Vessel temperature range: 32–270°F. Particle separation capacity: to 5 µm (0.2 mil). ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered thru 12". Consult factory for 14".

Code	Description	Lbs	USD
NA549200AM	8" ANSI flange ASME & CRN	530	16,751.00
NA549250AM	10" ANSI flange ASME & CRN	740	22,695.00
NA549300AM	12" ANSI flange ASME & CRN	1,110	29,867.00
NA549350AM	14" ANSI flange ASME	1,550	35,211.00



NA549 SEP 4™

Combination 1. air, 2. hydraulic, 3. dirt separation, plus 4. magnetic separation. Epoxy resin coated steel body. Stainless steel internal coalescing mesh. Pre-formed insulation on 2" – 4" sizes. One neodymium magnet. Complete with: automatic air vent (code 501502A). air vent shut-off valve (code NA39589). 1" drain valve NA39753 (2" – 4" sizes) 1¼" drain valve NA39588 (5" – 6" sizes). ANSI 150 flange connections. Max. working pressure: 150 psi. Vessel temperature range: 32–220°F. Working temp. w/o insulation: 32–270°F. Particle separation capacity: to 5 µm (0.2 mil).

Code	Description	Lbs	USD
549552A	2" ANSI flange	76	3,570.00
549562A	2½" ANSI flange	82	3,805.00
549582A	3" ANSI flange	112	4,761.00
549510A	4" ANSI flange	120	5,332.00

Code	Description	Lbs	USD
NA549052AM	2" ANSI flange ASME & CRN	76	4,156.00
NA549062AM	2½" ANSI flange ASME & CRN	82	4,462.00
NA549082AM	3" ANSI flange ASME & CRN	112	5,523.00
NA549102AM	4" ANSI flange ASME & CRN	120	5,824.00
NA549120AM*	5" ANSI flange ASME & CRN	220	8,024.00
NA549150AM*	6" ANSI flange ASME & CRN	235	9,678.00

* without insulation

NA prefix indicates ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered.



In the SEP4™ hydraulic separators ferrous impurities are captured by a concentrated magnetic field created by a stack of neodymium magnetic rods, rare-earth magnets positioned inside a brass dry-well which is below the flow stream. Non-magnetic dirt particles are separated by colliding with an internal element in the flow stream and settling to the bottom. The deep collection chamber keeps the dirt from re-entering the flow stream. The dirt and ferrous impurities are flushed out even while the system is still running, by removing the magnets and opening the purge valve.

Size	1"	1¼"	1½"	2"
GPM	11	18	26	37
Gallons	0.5	0.7	1.3	3.5

Size	2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"
GPM	60	80	124	247	300	484	792	1330	1850	2500
Gallons	4.0	4.0	8.0	8.0	23	23	95	175	255	450

HYDRAULIC SEPARATORS



**548
Hydro Separator**

Hydraulic separator.
Epoxy resin coated steel body.
300 series stainless steel internal baffle.
Pre-formed insulation.
Thermowell tap: 1/2" straight female
Max. working pressure: 150 psi.
Working temperature range: 32–210°F.
Working temp. w/o insulation: 32–250°F.

Code	Description	Lbs	USD
548006A	1" NPT female union	13	607.00
548066A	1" press union	13	650.00
548096A	1" sweat union	13	575.00
548007A	1¼" NPT female union	17	728.00
548067A	1¼" press union	17	828.00
548097A	1¼" sweat union	17	694.00
548008A	1½" NPT female union	25	954.00
548068A	1½" press union	25	1,074.00
548098A	1½" sweat union	25	908.00
548009A	2" NPT female union	27	1,111.00
548069A	2" press union	27	1,357.00
548099A	2" sweat union	27	1,061.00
548006US*	1" no tailpieces	11	456.00
548007US*	1¼" no tailpieces	15	514.00
548008US*	1½" no tailpieces	23	570.00
548009US*	2" no tailpieces	25	628.00

*See Separator fittings in Section 8.



**NA548
Hydro Separator
ASME**

Hydraulic separator.
Epoxy resin coated steel body.
Without insulation.
Complete with:
automatic air vent (code 501502A).
shut-off valve (code NA39589).
drain valve (code NA59600).
ANSI 150 flange connections.
Thermometer pockets (NPT):
½" inlet/outlet flanges, ¾" front center
Max. working pressure: 150 psi.
Working temperature range: 32–270°F.
Baffle plates for all sizes: 304SST
ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered thru 12". Consult factory for 14".

Code	Description	Lbs	USD
NA548200A	8" ANSI flange ASME & CRN	520	11,230.00
NA548250A	10" ANSI flange ASME & CRN	730	15,853.00
NA548300A	12" ANSI flange ASME & CRN	1,100	19,187.00
NA548350A	14" ANSI flange ASME	1,540	30,600.00



**NA548
Hydro Separator**

Hydraulic separator.
Epoxy resin coated steel body.
Pre-formed insulation on 2"–4" sizes.
Complete with:
automatic air vent (code 501502A).
shut-off valve (code NA39589).
drain valve (code NA39588).
ANSI 150 flange connections.
Max. working pressure: 150 psi.
Vessel temperature range: 32–220°F.
Vessel temp. w/o insulation: 32–270°F.
Baffle plates for all sizes: 304SST

Code	Description	Lbs	USD
548052A	2" ANSI flange	75	2,359.00
548062A	2½" ANSI flange	82	2,513.00
548082A	3" ANSI flange	112	3,144.00
548102A	4" ANSI flange	117	3,519.00

Code	Description	Lbs	USD
NA548052A	2" ANSI flange ASME & CRN	75	3,103.00
NA548062A	2½" ANSI flange ASME & CRN	82	3,337.00
NA548082A	3" ANSI flange ASME & CRN	112	4,038.00
NA548102A	4" ANSI flange ASME & CRN	117	4,270.00
NA548120A*	5" ANSI flange ASME & CRN	220	5,965.00
NA548150A*	6" ANSI flange ASME & CRN	231	7,237.00

NA prefix indicates ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered.

*Without insulation



**NA549
HydroCal™
ASME**

Combination 1. air, 2. hydraulic and 3. dirt separation.
Epoxy resin coated steel body.
Stainless steel internal coalescing mesh.
Pre-formed insulation on 2"–4" sizes.
Complete with: automatic air vent, air vent shut-off valve, drain valve.
ANSI 150 flange connections.
Max. working pressure: 150 psi.
Vessel temperature range: 32–220°F.
Working temp. w/o insulation: 32–270°F.
Particle separation capacity: to 5 µm (0.2 mil).
CRN registered thru 12". Consult factory for 14".

Code	Description	Lbs	USD
NA549052A	2" ANSI flange ASME & CRN	73	4,034.00
NA549062A	2½" ANSI flange ASME & CRN	79	4,339.00
NA549082A	3" ANSI flange ASME & CRN	108	5,248.00
NA549102A	4" ANSI flange ASME & CRN	117	5,549.00
NA549120A*	5" ANSI flange ASME & CRN	190	7,750.00
NA549150A*	6" ANSI flange ASME & CRN	231	9,403.00
NA549200A*	8" ANSI flange ASME & CRN	520	15,193.00
NA549250A*	10" ANSI flange ASME & CRN	730	21,137.00
NA549300A*	12" ANSI flange ASME & CRN	1,100	28,309.00
NA549350A*	14" ANSI flange ASME	1,540	33,653.00

*Without insulation

HYDRAULIC SEPARATORS-MANIFOLDS

**5599
HydroLink™**

Hydraulic separator + distribution manifold. 2+0 with built-in mounting. Steel body with pre-formed insulation. Complete with automatic air vent (code 502043A) and drain valve (code 538402 FD).
Max. working pressure: 100 psi.
Working temperature range: 32—230°F.
Outlet center dimension: 125 mm.
Compatible with 165, 166, 167 series HydroMixer™.



Code	Description	Lbs	USD
559920A	1" FNPT primary, 1" MNPT secondary (2)	16	755.00

**5599
HydroLink™**

Hydraulic separator + distribution manifold. 2+2 with angle mounting brackets. Steel body with pre-formed insulation. Complete with automatic air vent (code 502043A) and drain valve (code 538402 FD).
Max. working pressure: 100 psi.
Working temperature range: 32—230°F.
Outlet center dimension: 125 mm.
Compatible with 165, 166, 167 series HydroMixer™.



Code	Description	Lbs	USD
559922A	1/4" FNPT primary, 1" MNPT secondary (4)	29	928.00

**5599
HydroLink™**

Hydraulic separator + distribution manifold. 2+1 with built-in mounting. Steel body with pre-formed insulation. Complete with automatic air vent (code 502043A) and drain valve (code 538402 FD).
Max. working pressure: 100 psi.
Working temperature range: 32—230°F.
Outlet center dimension: 125 mm.
Compatible with 165, 166, 167 series HydroMixer™.



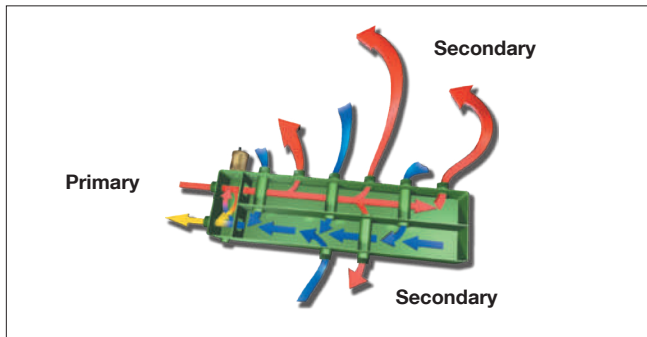
Code	Description	Lbs	USD
559921A	1" FNPT primary, 1" MNPT secondary (3)	16	777.00

**5599
HydroLink™**

Hydraulic separator + distribution manifold. 3+1 with angle mounting brackets. Steel body with pre-formed insulation. Complete with automatic air vent (code 502043A) and drain valve (code 538402 FD).
Max. working pressure: 100 psi.
Working temperature range: 32—230°F.
Outlet center dimension: 125 mm.
Compatible with 165, 166, 167 series HydroMixer™.

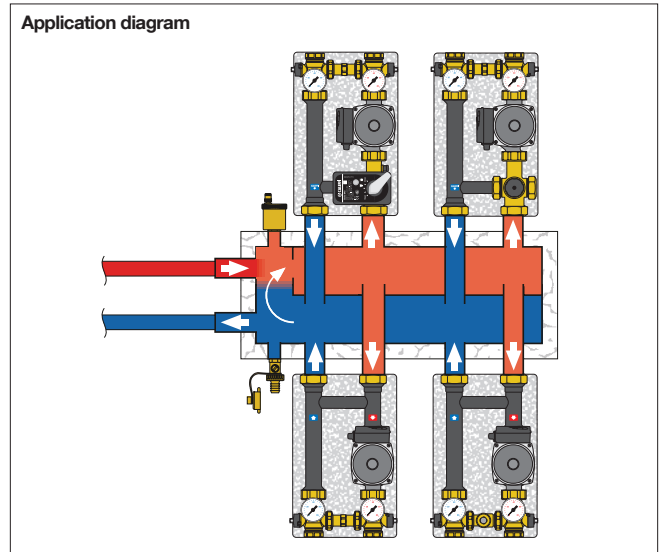


Code	Description	Lbs	USD
559931A	1/4" FNPT primary, 1" MNPT secondary (4)	39	1,115.00



Maximum recommended flow rates at connections:

Branches	Primary	Secondary Total
2+0	9 gpm	22 gpm
2+1	9 gpm	22 gpm
2+2	11 gpm	26 gpm
3+1	11 gpm	26 gpm



HYDRAULIC SEPARATOR ACCESSORIES



**501
MAXCAL™**

Replacement air vent for Hydro Separator Fits NA548 Series and NA549 Series. Brass body and cover, stainless steel internal components. Extra high discharge capacity. Max. working pressure: 230 psi. Max. discharge pressure: 90 psi. Max. working temperature: 250°F. Discharge top thread: 3/8" female.

Code	Description	Lbs	USD
501502A	3/4" FNPT	7	243.00



**5020
MINICAL™**

Replacement high capacity air vent for 5599 HydroLink™. Automatic air vents. Brass body. Hygroscopic safety air vent cap. Max. working pressure: 150 psi. Max discharge pressure: 60 psi. Max. working temperature: 250°F.

Code	Description	Lbs	USD
502043A	1/2" MNPT	0.6	19.20



**5023
VALCAL™**

Replacement high capacity air vent with service check valve fits Hydro Separator 548 series. Brass body. Max. working pressure: 150 psi. Max. discharge pressure: 60 psi. Max. working temperature: 250°F.

Code	Description	Lbs	USD
502343A	1/2" MNPT	0.5	38.90



Replacement drain valve fits Hydro Separator 548 series and HydroLink™ 559 series. Brass body. 3/4" garden hose thread with cap. Max. working pressure: 150 psi. Max. working temperature: 250°F.

Code	Description	Lbs	USD
538402 FD	1/2" NPT x 3/4" GHT	0.3	12.30



Drain ball valves fit HydroCal™, Hydro Separators, DISCAL®, DISCALDIRT® and DIRTICAL®. Brass body. Max. working pressure: 150 psi. Max. working temperature: 365°F.



Code	Description	Lbs	USD
NA39589	3/4" FNPT w/T-handle, air vent isolate	0.8	25.30
NA39753	1" FNPT w/Lever, drain	0.7	34.40
NA39588	1 1/4" FNPT w/Lever, drain	1	57.90
NA59600	2" FNPT w/Lever, drain	4	123.00



Temperature pocket well fits 1", 1 1/4", 1 1/2" & 2" 548 / 5495 Hydro Separators. 1 3/4" pocket length. Inside thread: 20 x1.0 mm.

Code	Description	Lbs	USD
694045	1/2" straight thread	0.2	15.50
F50055	Sealing washer	0.1	1.30
NA10426	Sensor holding grommet	0.1	3.50
NA10425	Kit containing above 3 items	0.4	20.80



Double male nipple.

Code	Description	Lbs	USD
41447	3/4" NPT x 3/4" NPT x 2"	0.3	22.40



Magnetic/drywell assembly for SEP4™.

Code	Description	Lbs	USD
F000435	Fits 2" and 2 1/2"	3	116.00
49684A	Fits 3" — 6"	3	262.00
F000349	Fits 8" to 14"	3	494.00



The Gold Standard For healthy hydronic system fluids

DISCAL®

- High efficiency air separator with large, low-flow zone, coalescing element and automatic air vent to minimize corrosion.

DIRTMAG®

- Magnetic technology and particle mesh, in a single dirt separator used to remove both ferrous and non-ferrous debris.
- Simple blowdown valve for fast dirt removal eliminates laborious and messy disassembly.
- Maximum protection for expensive heat exchangers and ECM circulators.

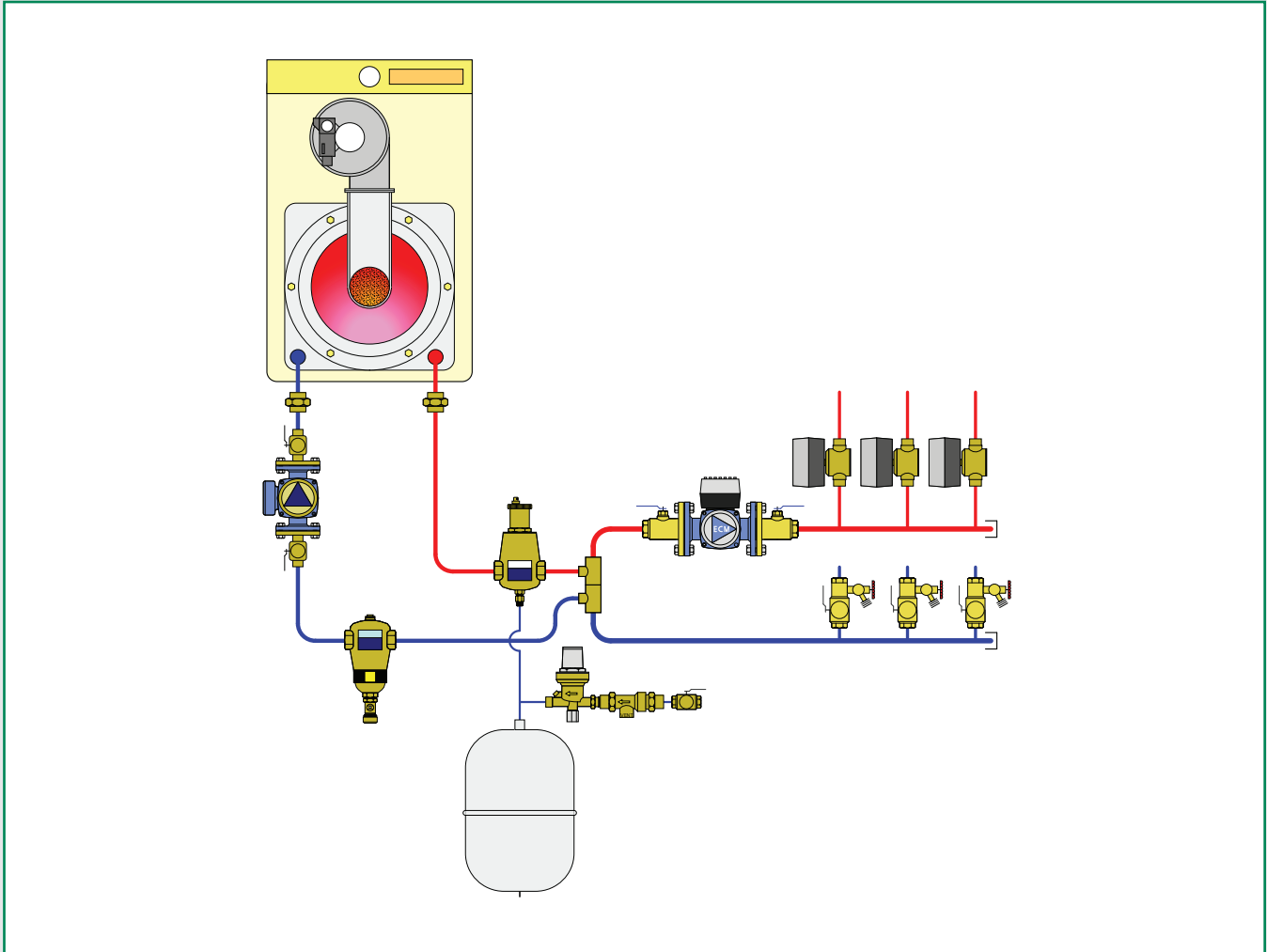


Heating & cooling

Components for today's modern hydronic systems

AIR AND DIRT SEPARATION AND AIR VENTS

This diagram is for illustration purposes only



2

PRODUCTS INCLUDED IN SECTION

- Automatic and manual air vents
- Air separators
- Dirt separators
- Air and dirt separators
- Dirt and magnetic dirt separators
- Magnetic dirt separators
- Accessories for air and dirt separators

AUTOMATIC AND MANUAL AIR VENTS

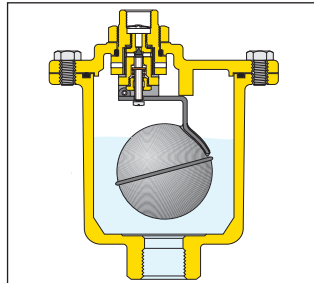
Automatic air vents are designed to remove the air that accumulates in heating and cooling systems without the need for manual intervention. This prevents harmful air that may compromise the life and the performance of the system which includes:

- corrosion due to the oxygen;
- pockets of air trapped in the heat emitters;
- cavitation in the circulation pumps;
- noise from air passing through the pipes.

The accumulation of air bubbles in the air vent body causes the float to drop and thus the vent valve to open. The air vent functions correctly, as long as the water pressure remains below the maximum discharge pressure.

MAXCAL™

Extra high capacity air vent is ideal for use in large piping systems and can also be installed in horizontal piping. The valve body and cover are made of forged brass while the filter, valve stem, float, and spring are all made of stainless steel to prevent the formation of rust.



**501
MAXCAL™**

Automatic air vent for heating and air conditioning. Brass body and cover, stainless steel internal components. Extra high discharge capacity.
 Max. working pressure: 230 psi.
 Max. discharge pressure: 90 psi.
 Max. discharge rate: 9 SCFM.
 Working temperature range: -4 – 250°F.
 Discharge top thread: 3/8" female.

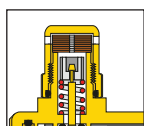
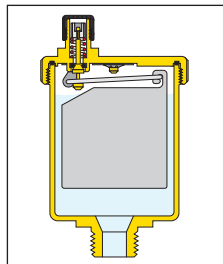
Code	Description	Lbs	USD
501502A	3/4" FNPT	7	243.00

MINICAL™ and VALCAL™

These float type automatic air vents are designed to vent released air from the water while being heated. They are used on manifolds or pipes in sealed heating systems.

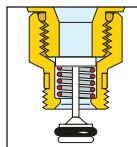
MINICAL™ is a standard size air vent that will discharge up to 1.75 SCFM.

VALCAL™ is a high capacity larger size air vent that will discharge up to 2.5 SCFM.



Some MINICAL™ and VALCAL™ models are equipped with a hygroscopic safety cap. Cellulose fiber discs serve as the redundant seal. Their volume increases by 50% wet which "causes" the discharge vent to close.

Some MINICAL™ and VALCAL™ models are equipped with a service check valve which facilitates maintenance operations by shutting off the water flow when the air vent is removed and also allows an easy replacement of the air vent without purging the system.



**5020
MINICAL™**

Automatic air vent.
 Brass body.
 Max. working pressure: 150 psi.
 Max. discharge pressure: 40 psi.
 Max. discharge rate: 1.75 SCFM.
 Max. working temperature: 250°F.

Code	Description	Lbs	USD
502015A	1/8" MNPT	0.4	13.60
502040A	1/2" MNPT	0.4	13.60



**5021
MINICAL™**

Automatic air vent with service check valve
 Brass body.
 Max. working pressure: 150 psi.
 Max. discharge pressure: 40 psi.
 Max. discharge rate: 1.75 SCFM.
 Max. working temperature: 230°F.

Code	Description	Lbs	USD
502115A	1/8" MNPT	0.4	18.30
502113A	1/8" MNPT, hygroscopic anti-drip cap	0.4	21.10



**5020
MINICAL™**

Automatic air vent.
 Brass body.
 Hygroscopic safety air vent cap.
 Max. working pressure: 150 psi.
 Max discharge pressure: 60 psi.
 Max. discharge rate: 1.75 SCFM.
 Max. working temperature: 250°F.

Code	Description	Lbs	USD
502043A	1/2" MNPT	0.6	19.20



**5022
VALCAL™**

High discharge automatic air vent.
 Brass body.
 Max. working pressure: 150 psi.
 Max. discharge pressure: 60 psi.
 Max. discharge rate: 2.5 SCFM.
 Max. working temperature: 250°F.

Code	Description	Lbs	USD
502243A	1/2" MNPT	0.5	32.90



**5023
VALCAL™**

High discharge vent with service check.
 Brass body.
 Max. working pressure: 150 psi.
 Max. discharge pressure: 60 psi.
 Max. discharge rate: 2.5 SCFM.
 Max. working temperature: 250°F.

Code	Description	Lbs	USD
502343A	1/2" MNPT	0.5	38.90

AUTOMATIC AND MANUAL AIR VENTS



5026 ROBOCAL™

Automatic air vent.
Brass body.
Max. working pressure: 150 psi.
Max. discharge pressure: 90 psi.
Max. discharge rate: 1.75 SCFM.
Max. working temperature: 240°F.

Code	Description	Lbs	USD
502610A	1/8" MNPT	0.6	12.20
502620A	1/4" MNPT	0.6	12.70
502630	3/8" straight thread	1.0	17.00
502640	1/2" straight thread	1.0	18.30



5027 ROBOCAL™

Automatic air vent with service check valve.
Brass body.
Max. working pressure: 150 psi.
Max. discharge pressure: 90 psi.
Max. discharge rate: 1.75 SCFM.
Max. working temperature: 240°F.

Code	Description	Lbs	USD
502710A	1/8" MNPT	0.6	16.90
502720A	1/4" MNPT	0.6	17.80
NA502740A	1/2" MNPT, hygroscopic anti-drip cap	0.6	23.10



Service check valve for removal of air vent or expansion tank without purging system. Fits automatic air vents 502 series.
Max. working pressure: 150 psi.
Max. working temperature: 250°F.

Code	Description	Lbs	USD
59474A	1/8" MNPT x FNPT	0.1	10.00
59804A	1/4" MNPT x FNPT	0.1	10.70
561402A	1/2" MNPT x FNPT	0.2	12.30



551 DISCALAIR®

High discharge automatic air vent.
Brass body.
Stainless steel float guide pin and linkage.
Max. working pressure: 150 psi.
Max. discharge pressure: 150 psi.
Max. discharge rate: 4.5 SCFM.
Max. working temperature: 250°F.

Code	Description	Lbs	USD
551004A	1/2" FNPT	0.8	78.80

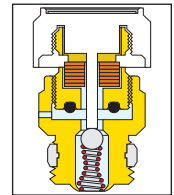


5080 HYGROCAL™

Automatic hygroscopic air vent for hydronic heating system and low pressure steam.
Manual operation by rotating knob.
Chrome plated brass body.
Max. working pressure: 150 psi.
Max. working temperature: 212°F.
Low pressure steam: 15 psi.
(Priced each, sold in package of 25 each)

Code	Description	Lbs	USD
508013A	1/8" MNPT	0.1	6.60

Automatic radiator air vent valve is designed to remove any air trapped inside the heat emitters both during the filling of the system and in normal operation. The automatic air discharge happens when the hygroscopic cellulose fiber discs are dry. As air is vented and water contacts the hygroscopic discs, they increase their volume by 50% which causes the discharge vent to close.



5081

Replacement hygroscopic cartridge fits hygroscopic air vent 5080 series.
(Priced each, sold in package of 25 each)

Code	Description	Lbs	USD
508100A	Cartridge	0.1	5.80

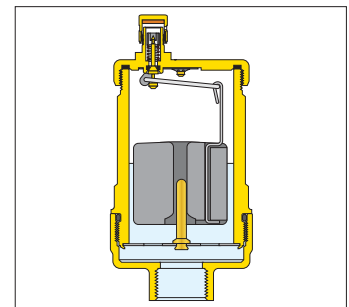


337

Manual air vent with metal seal and adjustable outlet.
Brass body.
Max. working pressure: 150 psi.
Max. working temperature: 212°F.

Code	Description	Lbs	USD
337221A	1/4" MNPT	0.1	8.20

Function
DISCALAIR® automatic air vents release air that forms in the hydraulic circuits of heating and air conditioning systems with pressures to 150 psi. The venting air discharge capacity is capable of expelling over 4 standard cubic feet per minute (SCFM). The circulation of fully de-aerated water or glycol-water mediums enables the equipment to operate under optimum conditions, free from noise, corrosion, localized overheating, or mechanical damage.



AIR SEPARATORS



551 DISCAL® Sweat

Air separator.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
½" NPT female bottom thread.
Max. working pressure: 150 psi.
Working temperature range: 32—250°F.

Code	Description	Lbs	USD
551028A	1" sweat	3.7	174.00
551035A	1¼" sweat	3.7	253.00
551041A	1½" sweat	4.9	329.00
551054A	2" sweat	5.5	403.00



551 DISCAL® Sweat

Air separator with ½" service check valve (code 561402A) to mount expansion tank on bottom thread.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
Max. working pressure: 150 psi.
Working temperature range: 32—250°F.

Code	Description	Lbs	USD
551028AC	1" sweat	3.8	180.00
551035AC	1¼" sweat	3.8	260.00
551041AC	1½" sweat	5.0	337.00
551054AC	2" sweat	5.6	409.00



551 DISCAL® NPT

Air separator.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
½" NPT female bottom thread.
Max. working pressure: 150 psi.
Working temperature range: 32—250°F.

Code	Description	Lbs	USD
551005A	¾" FNPT	3.7	169.00
551006A	1" FNPT	3.7	182.00
551007A	1¼" FNPT	4.9	266.00
551008A	1½" FNPT	4.9	346.00
551009A	2" FNPT	5.5	423.00



551 DISCAL® NPT

Air separator with automatic ½" check valve (code 561402A) to mount expansion tank on bottom thread.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
Max. working pressure: 150 psi.
Working temperature range: 32—250°F.

Code	Description	Lbs	USD
551005AC	¾" FNPT	3.8	176.00
551006AC	1" FNPT	3.8	189.00
551007AC	1¼" FNPT	5.0	272.00
551008AC	1½" FNPT	5.0	353.00
551009AC	2" FNPT	5.6	429.00



551 DISCAL® Press

Air separator.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
Max. working pressure: 150 psi.
Working temperature range: 32—250°F.

Code	Description	Lbs	USD
551066A	1" integral press	3.8	208.00
551067A	1¼" integral press	5	320.00
551068A	1½" integral press	5.1	413.00
551069A	2" integral press	5.5	504.00



551 DISCAL® Press

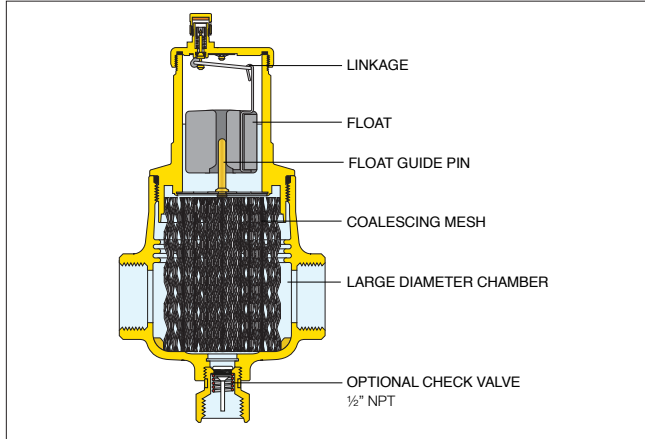
Air separator with automatic ½" check valve (code 561402A) to mount expansion tank on bottom thread.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
Max. working pressure: 150 psi.
Working temperature range: 32—250°F.

Code	Description	Lbs	USD
551066AC	1" integral press	3.9	213.00
551067AC	1¼" integral press	5.1	326.00
551068AC	1½" integral press	5.2	420.00
551069AC	2" integral press	5.6	511.00

AIR SEPARATORS

Construction details

The air separator uses the combined action of several physical principles. The active part consists of an assembly of concentric mesh surfaces. These elements create the whirling movement required to facilitate the release of microbubbles and their adhesion to these surfaces. The bubbles, fusing with each other, increase in size until the hydrostatic thrust overcomes the adhesion force to the mesh. They rise towards the top of the unit from which they are released through a float-operated automatic air vent with stainless steel float guide pin, which keeps the float from binding.



MAXIMUM FLOW RATE					
Size	3/4"	1"	1 1/4"	1 1/2"	2"
GPM	6	10	15	22	39
Cv	19	32	56	73	81

MAXIMUM FLOW RATE			
Size	3/4" compact	3/4" vertical	1" vertical
GPM	6	6	10
Cv	12	19	19

ACCESSORIES



Service check valve for easy replacement of expansion tank when connected to bottom of DISCAL®.

Code	Description	Lbs	USD
561402A	1/2" MNPT x 1/2" FNPT	0.2	12.30



Insulation shell fits DISCAL® 551 series.

Code	Description	Lbs	USD
CBN551005	Fits 3/4" and 1" 551 series	0.1	46.40
CBN551007	Fits 1 1/4" and 1 1/2" 551 series	0.1	49.80
CBN551009	Fits 2" 551 series	0.1	54.40

*Will not fit the 3/4" compact DISCAL®; codes 551003A and 551022A.

551 DISCAL® Compact



Air separator.
Brass body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
1/2" NPT bottom thread.
Max. working pressure: 150 psi.
Working temperature range: 32–250°F.

Code	Description	Lbs	USD
551003A	3/4" FNPT	2.0	113.00
551022A	3/4" sweat	2.0	109.00

551 DISCAL® Compact



Air separator with 1/2" service check valve to mount expansion tank on bottom thread.
Brass body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
Max. working pressure: 150 psi.
Working temperature range: 32–250°F.

Code	Description	Lbs	USD
551003AC	3/4" FNPT	2.1	119.00
551022AC	3/4" sweat	2.1	116.00

5517 DISCAL® Rotating collar



Air separator with rotating collar for horizontal or vertical pipes.
Brass body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
Max. working pressure: 150 psi.
Working temperature range: 32–250°F.

Code	Description	Lbs	USD
551705A	3/4" NPT male union	4.9	215.00
551765A	3/4" press union	4.9	226.00
551795A	3/4" sweat union	4.9	212.00
551706A	1" NPT male union	4.9	228.00
551766A	1" press union	4.9	253.00
551796A	1" sweat union	4.9	225.00
551716*	body only, order unions separately	4.4	196.00

*See fitting selection table in Section 8.

AIR SEPARATORS



551 DISCAL®

Air separator.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
ANSI 150 flange connections.
1" NPT male bottom drain connection.
Complete with male bottom drain valve (NA39753).
½" NPT male side drain connection.
Complete with side drain valve (538402FD).
Max. working pressure: 150 psi.
Vessel temperature range: 32–270°F.



NA551 DISCAL® ASME/CRN

Air separator.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
ANSI 150 flange connections.
1" NPT male bottom drain connection.
Complete with drain valve (NA39753).
½" NPT male side drain connection.
Complete with side drain valve (538402FD).
Max. working pressure: 150 psi.
Vessel temperature range: 32–270°F.
ASME and CRN registered.

Code	Description	Lbs	USD
551050A	2" ANSI flange	34	1,835.00
551050AT	2" MNPT	30	1,745.00
551060A	2½" ANSI flange	35	1,962.00
551060AT	2½" MNPT	31	1,872.00
551080A	3" ANSI flange	62	2,597.00
551100A	4" ANSI flange	67	2,905.00
551120A	5" ANSI flange	106	4,228.00
551150A	6" ANSI flange	117	5,448.00

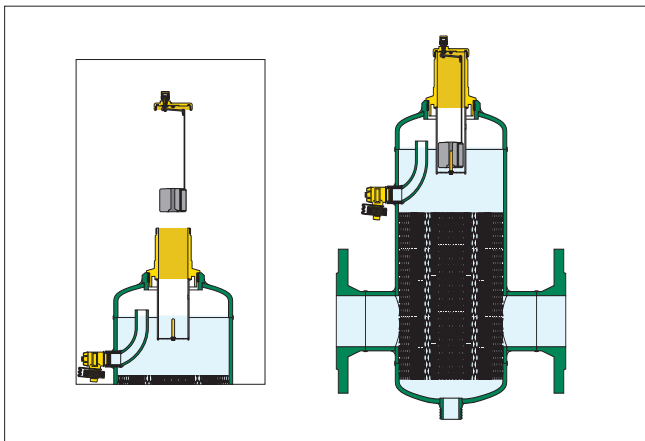
Code	Description	Lbs	USD
NA551050A	2" ANSI flange ASME & CRN	34	2,199.00
NA551060A	2½" ANSI flange ASME & CRN	35	2,351.00
NA551080A	3" ANSI flange ASME & CRN	62	3,112.00
NA551100A	4" ANSI flange ASME & CRN	67	3,482.00
NA551120A	5" ANSI flange ASME & CRN	106	5,066.00
NA551150A	6" ANSI flange ASME & CRN	117	6,528.00

NA prefix indicates ASME tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered.

Air separator construction

DISCAL® air separators are constructed to allow maintenance and cleaning operations to be carried out without having to remove the separator body from the pipe work. All DISCAL® air separator have a bottom connection drain valve. All internal air release control components are fully accessible. The automatic air release valve, located at the top of the separator, has a long chamber for the movement of the float. This feature prevents any debris present in the water from reaching the sealing seat.

Flanged models include a side drain vent to release large amounts of air when filling the system and to remove any debris present above the water level.



MAXIMUM FLOW RATE

Size	2"	2½"	3"	4"	5"	6"	8"	10"	12"
GPM	100	155	220	400	615	880	1,570	2,450	3,525
Cv	87	174	208	324	520	832	1,109	1,387	1,664

NA551 DISCAL® ASME



Air separator.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
ANSI 150 flange connections.
2" NPT male bottom drain connection.
Complete with drain valve (NA59600).
½" NPT male side drain connection.
Complete with side drain valve (538402FD).
Max. working pressure: 150 psi.
Vessel temperature range: 32–270°F.
ASME and CRN registered.

Code	Description	Lbs	USD
NA551200A	8" ANSI flange ASME & CRN	371	10,683.00
NA551250A	10" ANSI flange ASME & CRN	617	16,024.00
NA551300A	12" ANSI flange ASME & CRN	871	20,831.00

NA prefix indicates ASME tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered.



Replacement drain ball valve.
Fits DISCAL® series.
Brass body.
Lever.
Max. working pressure: 150 psi.
Max. working temperature: 365°F.

Code	Description	Lbs	USD
NA39753	1" FNPT with lever	0.7	34.40
NA59600	2" FNPT with lever	3.5	123.00

DIRT SEPARATORS

The dirt separating action performed by the DIRTCAL® is based on using the internal element with concentric diamond pattern mesh surfaces instead of a mechanical filter. The element offers little resistance to the medium flow while ensuring dirt separation. This occurs due to the particles colliding with the concentric diamond pattern mesh surfaces and then settling to the bottom, and not by filtration; which, over time, gets continuously clogged. By contrast, the DIRTCAL® low-velocity zone dirt separator efficiently removes the particles to as small as 5 µm (0.2 mil) with very low head loss. The dirt collection chamber at the bottom of the DIRTCAL® is at the optimal distance from the inlet and outlet connections to ensure that the collected dirt particles are not affected by the swirling flow through the mesh element. The dirt can then be removed through the bottom drain port even with the system running, by opening the drain valve. Low head losses and performance are maintained over time.

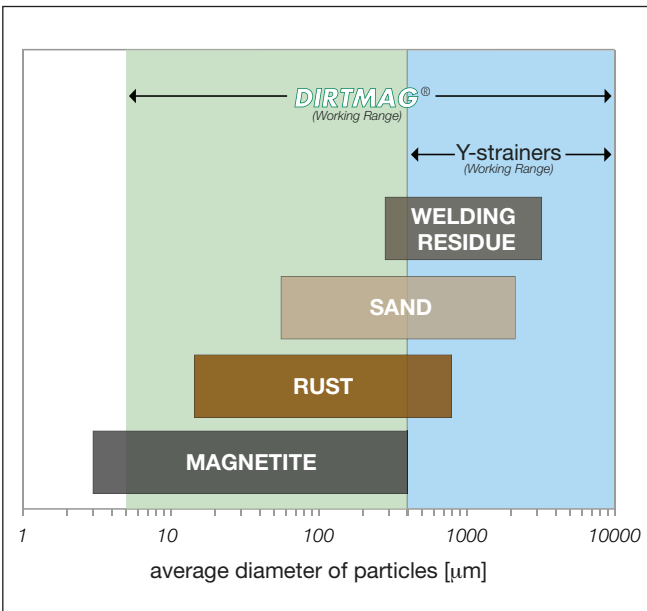


5465
DIRTCAL®

Dirt separator.
Epoxy resin coated steel body.
1" threaded NPT bottom drain connection
Complete with drain valve (code NA39753).
¾" NPT male top thread with brass cap.
ANSI 150 flange connections.
Max. working pressure: 150 psi.
Vessel temperature range: 32—270°F.
Particle separation capacity: to 5 µm (0.2 mil).

Code	Description	Lbs	USD
546550A	2" ANSI flange	29	1,177.00
546560A	2½" ANSI flange	38	1,252.00
546510A	4" ANSI flange	54	1,753.00

Dirt separation comparison



NA5465
DIRTCAL® ASME/CRN



Dirt separator.
Epoxy resin coated steel body.
1" threaded NPT bottom drain connection
Complete with drain valve (code NA39753).
¾" NPT male top thread with brass cap.
ANSI 150 flange connections.
Max. working pressure: 150 psi.
Vessel temperature range: 32—270°F.
Particle separation capacity: to 5 µm (0.2 mil).
ASME and CRN registered.

Code	Description	Lbs	USD
NA546550A	2" ANSI flange ASME & CRN	38	1,887.00
NA546560A	2½" ANSI flange ASME & CRN	38	2,007.00
NA546580A	3" ANSI flange ASME & CRN	55	2,613.00
NA546510A	4" ANSI flange ASME & CRN	55	2,860.00
NA546512A	5" ANSI flange ASME & CRN	138	4,123.00
NA546515A	6" ANSI flange ASME & CRN	148	5,289.00

ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors CRN registered.

NA5465
DIRTCAL® ASME/CRN



Dirt separator.
Epoxy resin coated steel body.
2" threaded NPT bottom drain connection.
Complete with drain valve (code NA59600).
¾" NPT male top thread with brass cap.
ANSI 150 flange connections.
Max. working pressure: 150 psi.
Vessel temperature range: 32—270°F.
Particle separation capacity: to 5 µm (0.2 mil).
ASME registered. CRN registered thru 12".
Consult factory for 14".

Code	Description	Lbs	USD
NA546520A	8" ANSI flange ASME & CRN	335	10,814.00
NA546525A	10" ANSI flange ASME & CRN	620	16,671.00
NA546530A	12" ANSI flange ASME & CRN	870	20,647.00
NA546535A	14" ANSI flange ASME	1,000	25,958.00

ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors registered. CRN registered, 8" and 10"; consult factory for 12" — 14".

MAXIMUM FLOW RATE						
Size	2"	2½"	3"	4"	5"	6"
GPM	89	150	227	355	816	904
Cv	88	176	211	328	520	842

MAXIMUM FLOW RATE				
Size	8"	10"	12"	14"
GPM	1,570	2,450	3,525	4,800
Cv	1,055	1,400	1,755	2,075

AIR AND DIRT SEPARATORS

The **DISCALDIRT®** air and dirt separator uses a coalescing element that consists of an assembly of concentric diamond pattern mesh surfaces. This element creates the whirling movement required to facilitate the release of micro-bubbles and their adhesion to these surfaces. The bubbles, fusing with each other, increase in volume until the bouyancy force overcomes the adhesion force to the surface. They rise towards the top of the unit and are released through a float-operated automatic air release valve.

The dirt separating action performed by the same element offers little resistance to the medium flow while ensuring dirt separation. The particles collide with the concentric diamond pattern mesh surfaces and then settle to the bottom, and not by filtration unlike mesh strainers; which, over time, get progressively clogged. By contrast, the DISCALDIRT®'s low-velocity zone dirt separator function efficiently removes the particles to as small as 5µm (0.2 mil) with very low head loss. The dirt can then be removed through the bottom drain port.



546 DISCALDIRT®

Air & Dirt separator.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
Max. working pressure: 150 psi.
Working temperature range: 32 – 250°F.
Particle separation capacity: to 5 µm (0.2 mil).

Code	Description	Lbs	USD
546096A	1" sweat	8.3	293.00
546016A	1" MNPT	8.3	307.00
546097A	1¼" sweat	8.3	349.00

The **DISCALDIRTMAG™** air and dirt separator with magnet uses an external magnet ring for separation of ferrous impurities. The external magnet allows greater effectiveness in the separation and collection of ferrous impurities. The impurities are retained in the body of the dirt separator by the strong magnetic field created by magnets in its external outer ring. The outer ring is removable from the body to allow the flushing of sludge, with the system still running. Since the magnetic ring is positioned outside the body of the dirt separator, it does not interfere with the flow through the device.



5461 DISCALDIRTMAG™

Air & Dirt separator with magnet.
Brass body.
Stainless steel float guide pin and linkage.
Glass reinforced nylon internal element.
Max. working pressure: 150 psi.
Working temperature range: 32 – 250°F.
Particle separation capacity: to 5 µm (0.2 mil).
Ferrous impurities separation efficiency: 100%.



Code	Description	Lbs	USD
546196A	1" sweat	8.5	360.00
546116A	1" MNPT	8.5	376.00
546197A	1¼" sweat	8.5	429.00



5461 DISCALDIRTMAG™

Air & Dirt separator with magnet.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
Complete with union connections.
Max. working pressure: 150 psi.
Working temperature range: 32 – 230°F
Particle separation capacity: to 5 µm (0.2 mil).
Ferrous impurities separation efficiency: 100%.

Code	Description	Lbs	USD
546198A	1½" sweat union	22	1,062.00
546108A	1½" NPT female union	22	1,094.00
546168A	1½" press union	22	1,213.00
546199A	2" sweat union	23	1,113.00
546109A	2" NPT female union	23	1,155.00
546169A	2" press union	23	1,353.00



Insulation shell for DISCALDIRT® & DISCALDIRTMAG™.

Code	Description	Lbs	USD
CBN546002	Fits 1", 1¼" brass 546 only	0.1	72.70
CBN546118	Fits 1½" steel 5461 only	0.1	92.00
CBN546119	Fits 2" steel 5461 only	0.1	105.00

Size	MAXIMUM FLOW RATE			
	1"	1¼"	1½"	2"
GPM	10	15	22	39
Cv	32	40	50	79

546 DISCALDIRT®

Air & Dirt separator.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
1" NPT threaded bottom drain connection.
Complete with side drain valve (538402 FD).
ANSI 150 flange connections.
Complete with drain valve (NA39753)
Max. working pressure: 150 psi.
Vessel temperature range: 32 – 270°F.
Particle separation capacity: to 5 µm (0.2 mil).



Code	Description	Lbs	USD
546050A	2" ANSI flange	40	2,330.00
546060A	2½" ANSI flange	42	2,456.00
546080A	3" ANSI flange	73	3,163.00
546100A	4" ANSI flange	78	3,468.00
546120A	5" ANSI flange	181	5,003.00
546150A	6" ANSI flange	188	6,103.00

AIR AND DIRT SEPARATORS



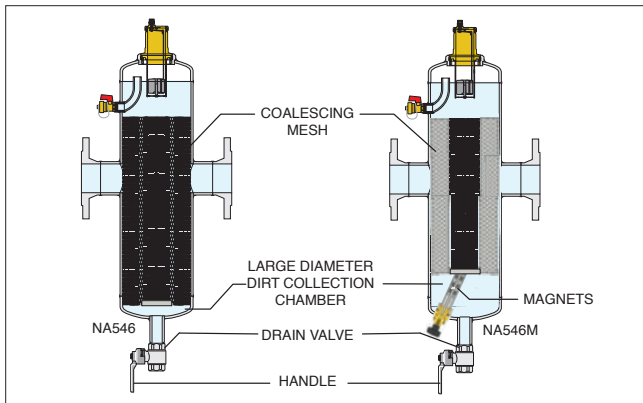
**NA546
DISCALDIRT®
ASME/CRN**

Air & Dirt separator.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
1" (2–6" sizes) and 2" (8–14" sizes)
threaded NPT bottom drain connection.
ANSI 150 flange connections.
Complete with drain valve NA39753
(2–6" sizes), NA59600 (8–14" sizes).
Max. working pressure: 150 psi.
Vessel temperature range: 32–270°F.
ASME registered. CRN registered thru 12".
Consult factory for 14".

Code	Description	Lbs	USD
NA546050T	2" Threaded ASME & CRN	28	2,231.00
NA546060A	2½" ANSI flange ASME & CRN	42	3,002.00
NA546080A	3" ANSI flange ASME & CRN	73	3,866.00
NA546100A	4" ANSI flange ASME & CRN	78	4,238.00
NA546120A	5" ANSI flange ASME & CRN	181	6,114.00
NA546150A	6" ANSI flange ASME & CRN	188	7,459.00
NA546200A	8" ANSI flange ASME & CRN	355	13,855.00
NA546250A	10" ANSI flange ASME & CRN	555	21,303.00
NA546300A	12" ANSI flange ASME & CRN	825	26,639.00
NA546350A	14" ANSI flange ASME	950	33,684.00

ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered, 2" – 12"; consult factory for 14".

Low head losses and high performance are maintained over time. The dirt separating action performed by the DISCALDIRT® air and dirt separator is based on using the internal element with concentric diamond pattern mesh surfaces instead of an ordinary filter. The element offers little resistance to the medium flow while ensuring dirt separation. This occurs due to the particles colliding with the concentric diamond pattern mesh surfaces and then settling to the bottom, and not by filtration; which, over time, gets progressively clogged. By contrast, the DISCALDIRT® low-velocity zone air and dirt separator efficiently removes the particles to as small as 5 µm (0.2 mil) with very low head loss. The dirt collection chamber at the bottom of the DISCALDIRT® is at the right distance from the inlet and outlet connections so that the collected dirt particles are not affected by the swirling flow through the bottom drain port, even with the system running, by opening the drain valve with the handle.



**NA546M
DISCALDIRTMAG™
ASME/CRN**

Air & Dirt separator with magnets.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
ANSI 150 flange connections.
1" (2–6" sizes) and 2" (8–14" sizes)
threaded NPT bottom drain connection.
Complete with drain valve NA39753
(2–6" sizes), NA59600 (8–14" sizes).
Max. working pressure: 150 psi.
Vessel temperature range: 32–270°F.
Particle separation capacity: to 5 µm (0.2 mil).
Ferrous impurities separation efficiency: up to 100%.
ASME registered. CRN registered thru 12".
Consult factory for 14".

Code	Description	Lbs	USD
NA546050TM*	2" Threaded ASME & CRN	31	2,579.00
NA546060AM*	2½" ANSI flange ASME & CRN	45	3,373.00
NA546080AM*	3" ANSI flange ASME & CRN	76	4,388.00
NA546100AM*	4" ANSI flange ASME & CRN	81	4,771.00
NA546120AM*	5" ANSI flange ASME & CRN	184	6,702.00
NA546150AM*	6" ANSI flange ASME & CRN	191	8,087.00
NA546200AM**	8" ANSI flange ASME & CRN	365	15,866.00
NA546250AM**	10" ANSI flange ASME & CRN	565	22,907.00
NA546300AM**	12" ANSI flange ASME & CRN	835	29,026.00
NA546350AM**	14" ANSI flange ASME	960	36,278.00

*with one magnet

**with three magnets

ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors. CRN registered, 2" – 12"; consult factory for 14".



In the DISCALDIRTMAG™ air and dirt separator with magnets ferrous impurities are captured by a concentrated magnetic field created by a stack of neodymium rare-earth magnets positioned inside a brass dry-well which is below the flow stream. Non-magnetic dirt particles are separated by colliding with an internal element in the flow stream and settling to the bottom. The deep collection chamber keeps the dirt from re-entering the flow stream. The dirt and ferrous impurities are flushed out while the system is operating, by removing the magnets and opening the purge valve.

Size	MAXIMUM FLOW RATE									
	2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"
GPM	100	155	220	400	615	880	1,570	2,450	3,525	4,800
Cv	87	174	208	324	520	832	1,109	1,387	1,664	1,967

DIRT & MAGNETIC DIRT SEPARATORS

The dirt separating action performed by the DIRTCAL® is based on using the internal element with concentric diamond pattern mesh surfaces instead of a mechanical filter. The element offers little resistance to the medium flow while ensuring dirt separation. This occurs due to the particles colliding with the concentric diamond pattern mesh surfaces and then settling to the bottom, and not by filtration; which, over time, gets continuously clogged. By contrast, the DIRTCAL® low-velocity zone dirt separator requires a pressure drop 25% or less than that of a comparable Y-strainer depending on mesh size and amount of filtered debris. It efficiently removes the particles to as small as 5 µm (0.2 mil) with very low head loss. The dirt collection chamber at the bottom of the DIRTCAL® is at the optimal distance from the inlet and outlet connections to ensure that the collected dirt particles are not affected by the swirling flow through the mesh element. The dirt can then be removed through the bottom drain port even with the system running by opening the drain valve. Low head losses and performance are maintained over time.



5463
DIRTMAG®

Dirt separator with magnet.
Brass body.
½" NPT top thread with plug.
Max. working pressure: 150 psi.
Working temperature range: 32—250°F.
Particle separation capacity: to 5 µm (0.2 mil).
Ferrous impurities separation efficiency: 100%.

The versatile DIRTMAG® magnetic dirt separator removes both magnetic and non-magnetic particles continuously. In addition to removing sand and rust impurities with a glass-reinforced nylon internal element in a low-velocity zone chamber, the DIRTMAG® features a powerful removable external magnet around the body below the flow line for fast and effective capture of ferrous particles. The DIRTMAG® has the magnet positioned externally to maintain low pressure loss, and removes up to 100% of the ferrous impurities that can form in a hydronic system.

The DIRTMAG® can be fitted with optional insulated covers, code CBN5462xx series purchased separately, to minimize heat loss.



Code	Description	Lbs	USD
546305A	¾" FNPT	4.2	191.00
546328A	1" sweat	4.2	195.00
546306A	1" FNPT	4.2	205.00
546366A	1" press	4.5	223.00
546335A	1¼" sweat	4.2	284.00
546307A	1¼" FNPT	5.3	299.00
546367A	1¼" press	5.6	341.00
546341A	1½" sweat	4.9	371.00
546308A	1½" FNPT	6.2	390.00
546368A	1½" press	6.5	445.00
546354A	2" sweat	5.5	453.00
546309A	2" FNPT	6.2	470.00
546369A	2" press	6.5	543.00



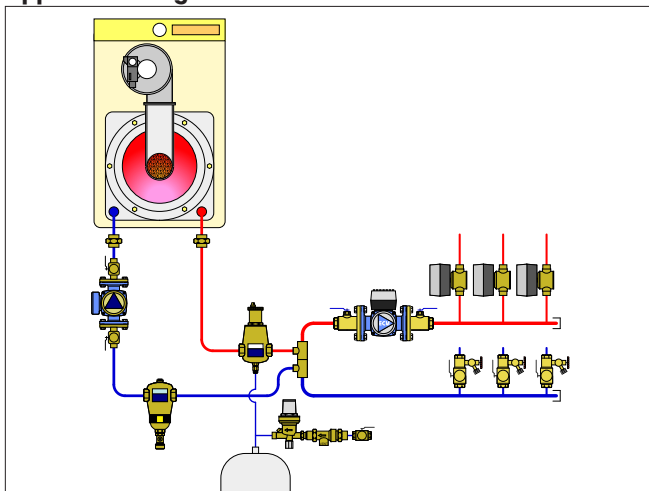
Replacement drain valve fits DIRTCAL® 5462 series, DIRTMAG® 5463 series, DISCALDIRT® 546 series and DISCALDIRTMAG™ 5461 series.
Brass body.
Max. working pressure: 150 psi.
Max. working temperature: 250°F.

Code	Description	Lbs	USD
538402 FD	½" MNPT x ¾" GHT	0.3	12.30



DIRTCAL® to DIRTMAG®
Retrofit kit for ¾" to 2" 5462 brass Dircal.

Application diagram



Code	Description	Lbs	USD
F41661A	Retrofit kit	2.0	94.80



Insulation shell fits DIRTCAL® 5462 and DIRTMAG® 5463 series.
Labels included for field installation to externally identify product use.

Code	Description	Lbs	USD
CBN546205	Fits ¾" & 1" DIRTCAL®, DIRTMAG®	0.1	46.40
CBN546207	Fits 1¼" & 1½" DIRTCAL®, DIRTMAG®	0.1	49.80
CBN546209	Fits 2" DIRTCAL®, DIRTMAG®	0.1	54.40

MAGNETIC DIRT SEPARATORS

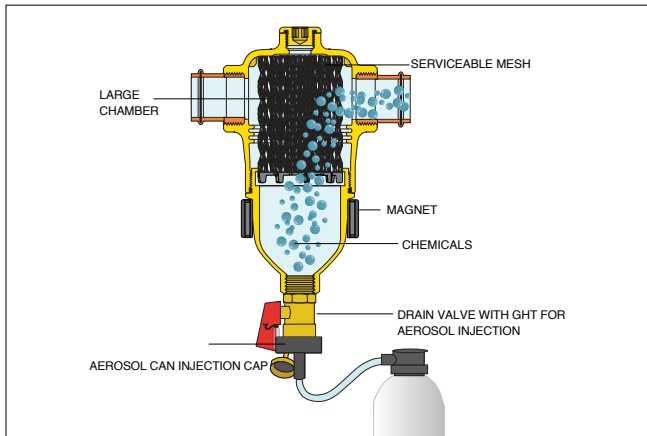
NA5463
DIRTMAG® Chemical kit



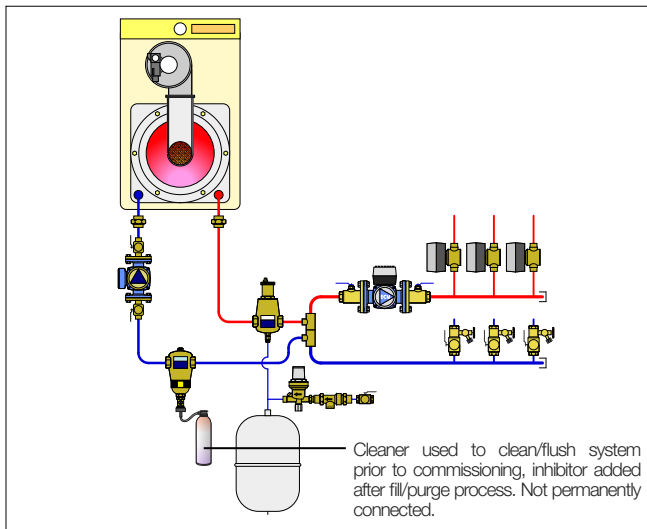
Magnetic Dirt separator plus Boiler Chemical Treatment Kit.
Brass body.
½" NPT top thread with plug.
Treats up to 30 gallons.
DIRTMAG® plus 1 can of Hydro-Solv™ cleaner and 1 can of Pro-Tek® treatment.
Aerosols are injected into the hydronic system through the GHT connection on the bottom of the DIRTMAG®.

Code	Description	Lbs	USD
NA546328T	1" sweat	6.8	308.00
NA546306T	1" FNPT	6.8	316.00
NA546366T	1" press	7.1	333.00
NA546335T	1¼" sweat	6.8	390.00
NA546307T	1¼" FNPT	6.8	403.00
NA546367T	1¼" press	7.1	441.00

Construction



Application



NA5453
DIRTMAG®

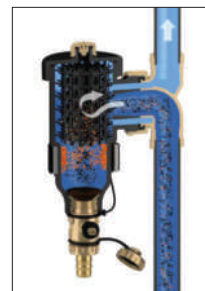


Dirt separator with magnet.
Brass mounting housing.
Composite PA66G30 body.
Max. working pressure: 45 psi.
Working temperature range: 32 – 195°F.
Particle separation capacity: to 5 µm (0.2 mil).
Ferrous impurities separation efficiency: 100%.
Drain valve with hose connection.
Top dosing point port.
Dosing capacity: 12 fluid oz.
Manual screw air vent.

Code	Description	Lbs	USD
NA545305	¾" NPT male union	4.5	168.00
NA545365	¾" press union	4.5	182.00
NA545395	¾" sweat union	4.5	167.00
NA545306	1" NPT male union	4.5	194.00
NA545366	1" press union	4.7	219.00
NA545396	1" sweat union	4.5	185.00
NA545355	¾" NPT female union, isolation valves	5.5	202.00
NA545356	1" NPT female union, isolation valves	5.5	235.00
NA545376	1" press union, isolation valves	5.5	322.00

MAXIMUM FLOW RATE

Size	¾"	1"
GPM	10	10
Cv w/ ball valve	9	9
Cv w/o ball valve	12	12



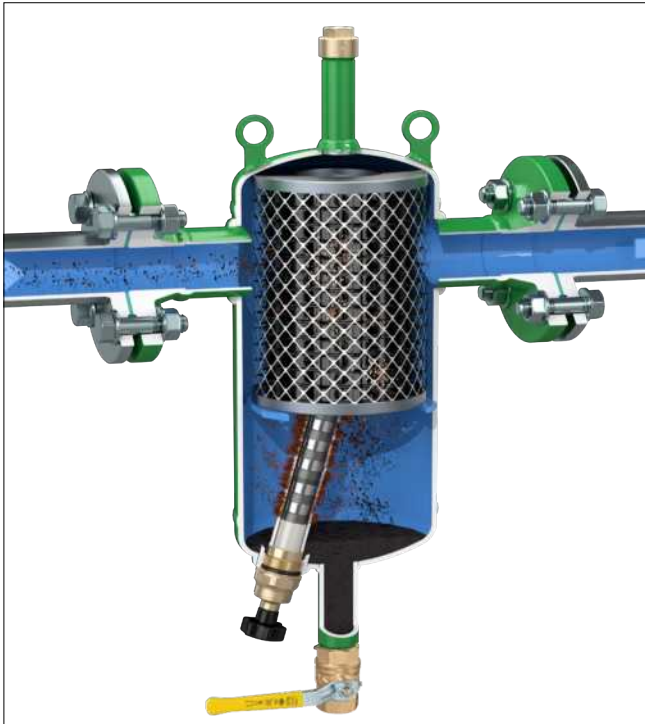
The dirt separator with magnet combines the action of the internal element and magnet. The impurities in the water strike the internal element and are separated, dropping into the bottom of the body where they are collected. Ferrous impurities are also trapped inside the dirt separator body by two strong magnets inserted into removable outer ring collar. The collected impurities are discharged by removing the external ring magnet and opening the drain valve. This procedure can be performed while the system is in operation.



The special coupling between the locking nut and the mounting base allows the DIRTMAG® dirt separator to be rotated for installation to either vertical or horizontal pipes, while maintaining the same operating performance.

MAGNETIC DIRT SEPARATORS

Ferrous and non ferrous impurities in hydronic systems can deposit onto heat exchanger surfaces and accumulate in pump cavities causing reduced thermal efficiency and premature wear. The small and often microscopic magnetic particles, called magnetite, form when iron or steel corrodes. Highly abrasive, the extremely fine particles are difficult to remove by traditional means. DIRTMAG® separators offer highly efficient separation of typical dirt as well as magnetite. The magnetite is captured by a concentrated magnetic field created by a stack of neodymium rare-earth magnets positioned inside a brass dry-well which is below the flow stream. Non-magnetic dirt particles are separated by colliding with an internal element in the flow stream, settling to the bottom. The deep collection chamber keeps the dirt from re-entering the flow stream.



To purge the debris, the flexible magnetic stack is removed from the brass dry-well and, even while the system is still running, the drain valve is opened. Aided by the system pressure, the dirt and magnetite flushes out quickly and effectively. DIRTMAG® magnetic dirt separators accomplish 2½ times the ferrous impurities removal performance of standard dirt separators, delivering up to 100% elimination efficiency.



MAXIMUM FLOW RATE						
Size	2"	2½"	3"	4"	5"	6"
GPM	89	150	227	355	816	904
Cv	88	176	211	328	520	842

MAXIMUM FLOW RATE				
Size	8"	10"	12"	14"
GPM	1,570	2,450	3,525	4,800
Cv	1,055	1,400	1,755	2,075



5465M
DIRTMAG®

Magnetic dirt separator. Epoxy resin coated steel body. Complete with drain valve (code NA39753). ¼" NPT male top thread with brass cap. ANSI 150 flange connections. Max. working pressure: 150 psi. Vessel temperature range: 32–270°F. Particle separation capacity: to 5 µm (0.2 mil). Ferrous impurities separation efficiency: 100%.

Code	Description	Lbs	USD
546550AM	2" ANSI flange	41	1,520.00
546560AM	2½" ANSI flange	41	1,636.00
546580AM	3" ANSI flange	58	2,212.00
546510AM	4" ANSI flange	58	2,446.00



NA5465M
DIRTMAG® ASME/CRN

Magnetic dirt separator with one magnet assembly. Epoxy resin coated steel body. Complete with drain valve (code NA39753). ¼" NPT male top thread with brass cap. ANSI 150 flange connections. Max. working pressure: 150 psi. Vessel temperature range: 32–270°F. Particle separation capacity: to 5 µm (0.2 mil). Ferrous impurities separation efficiency: 100%. ASME and CRN registered.

Code	Description	Lbs	USD
NA546550AM	2" ANSI flange ASME & CRN	41	2,156.00
NA546560AM	2½" ANSI flange ASME & CRN	41	2,276.00
NA546580AM	3" ANSI flange ASME & CRN	58	3,002.00
NA546510AM	4" ANSI flange ASME & CRN	58	3,249.00
NA546512AM	5" ANSI flange ASME & CRN	141	4,513.00
NA546515AM	6" ANSI flange ASME & CRN	151	5,678.00



NA5465M
DIRTMAG® ASME/CRN

Magnetic dirt separator with three magnets assembly. Epoxy resin coated steel body. Complete with drain valve (code NA59600). ¼" NPT male top thread with brass cap. ANSI 150 flange connections. Max. working pressure: 150 psi. Vessel temperature range: 32–270°F. Particle separation capacity: to 5 µm (0.2 mil). Ferrous impurities separation efficiency: 100%. ASME registered. CRN registered thru 12". Consult factory for 14".

Code	Description	Lbs	USD
NA546520AM	8" ANSI flange ASME & CRN	345	12,341.00
NA546525AM	10" ANSI flange ASME & CRN	630	18,198.00
NA546530AM	12" ANSI flange ASME & CRN	880	22,174.00
NA546535AM	14" ANSI flange ASME	1,010	27,485.00

ACCESSORIES FOR AIR AND DIRT SEPARATORS



Hygroscopic air vent cap fits DISCAL® 551, and DISCALDIRT® 546 series, and MINICAL® 502 series.

Code	Description	Lbs	USD
R59681	Vent cap	0.1	15.20



Anti-suction air vent cap fits DISCAL® 551, DISCALDIRT® 546 series and MINICAL® 502 series.

Code	Description	Lbs	USD
562100	Vent cap	0.1	16.00



Replacement air vent cap fits DISCAL® 551 and DISCALDIRT® 546 series.

Code	Description	Lbs	USD
R59119	Vent cap	0.1	10.10



Replacement plastic cap fits MINICAL® 5020 and 5021 series.

Code	Description	Lbs	USD
R56214	Vent cap	0.1	1.70



Replacement plastic air vent cap fits 5026 and 5027 series.

Code	Description	Lbs	USD
R56142	Vent cap	0.1	1.60



Magnetic/drywell assembly for DISCALDIRTMAG™ and DIRTMAG®.

Code	Description	Lbs	USD
49684A	Fit 2" and 2½"	3.0	262.00
49685A	Fit 3" to 6"	3.0	378.00
F0000349	Fit 8" to 14"	3.0	494.00



Replacement air vent assembly fits DISCAL® brass 551 series (except Compact and Rotating Collar version), brass 546, brass and steel 5461 series and SEP4™ 5495 series.

Code	Description	Lbs	USD
59829	Air Vent	2.0	98.10



Replacement air vent assembly fits steel 551, NA551 steel DISCAL® and 546 steel series DISCALDIRT® and DISCALDIRTMAG™.

Code	Description	Lbs	USD
59756	Air vent	3.0	115.00



Replacement cover and float fits DISCAL® brass 551 series and DISCALDIRT® brass 546 series. Vent cap sold separately.

Code	Description	Lbs	USD
F39807	Cover and float	0.4	47.80



Drain ball valve. Fits DIRTCAL® 5465 and NA5465 series. Fits steel separators in section 2. Brass body. Lever. Max. working pressure: 150 psi. Max. working temperature: 365°F.

Code	Description	Lbs	USD
NA39753	1" FNPT with lever	0.7	34.40
NA59600	2" FNPT with lever	3.5	123.00



Vent cap adapter fits all air separators and air vents except 5026 and 5027 series.

Code	Description	Lbs	USD
NA10204	¼" MNPT	0.1	17.30



Replacement coalescing element for brass separators (except 551 Compact and 5517 Rotating collar).

Code	Description	Lbs	USD
F0001179	For sizes ¾" to 1¼" (sweat)	0.2	16.00
F59917	For sizes 1¼" (NPT, press) to 2"	0.2	16.00



A JOURNAL OF DESIGN INNOVATION

idronics™ is a complimentary educational journal series for hydronic, plumbing and renewable energy professionals to aid them in system design, component application and selection. The popular and frequently referenced publication is written by engineers and oriented towards innovative design techniques with a commitment to continuous education of North American professionals.

Interested in receiving your own copy of our popular *idronics* journal?
Visit www.caleffi.us to be added to the mailing list or scan QR code below.

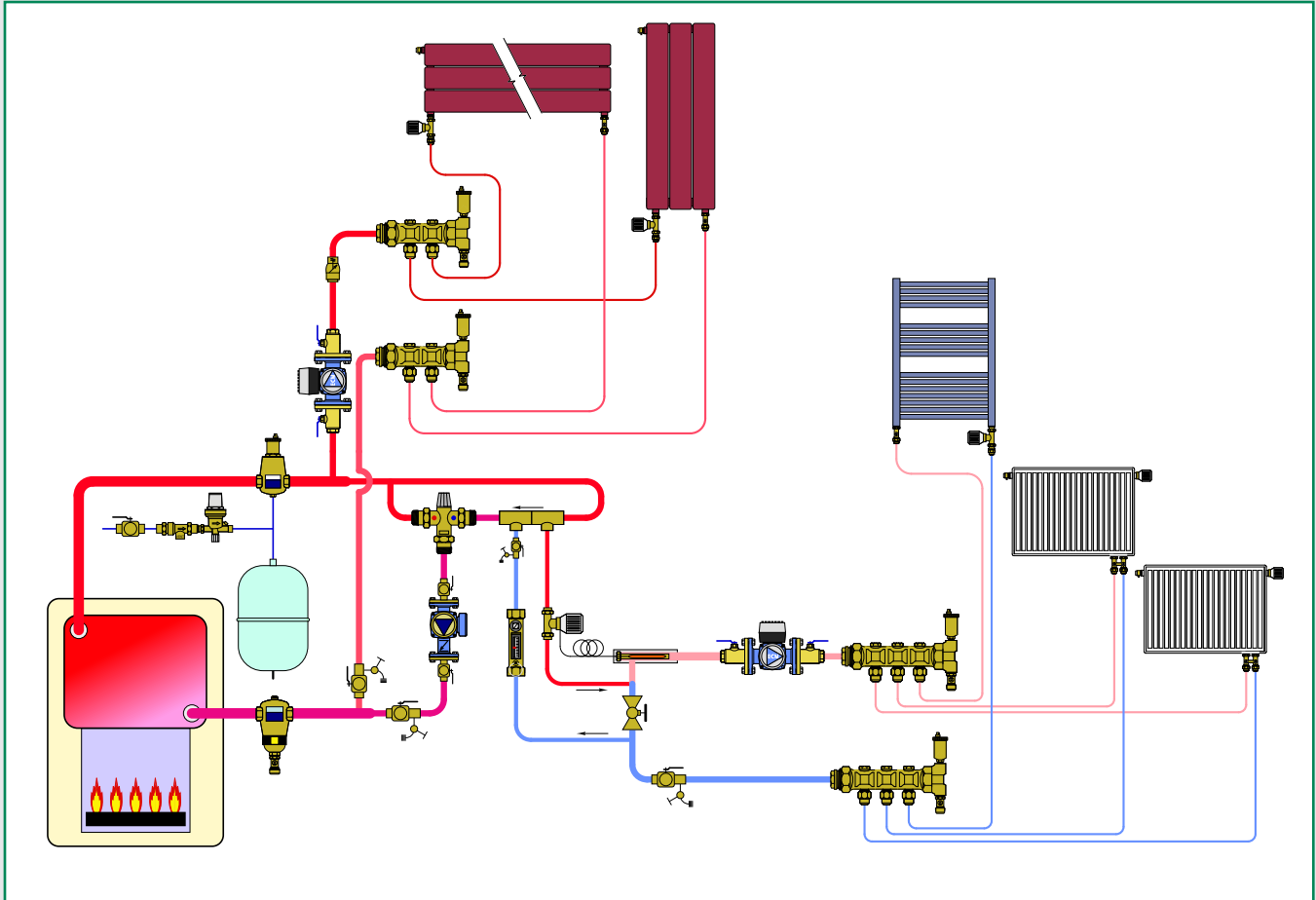


Register today



THERMOSTATIC RADIATOR VALVES

This diagram is for illustration purposes only



PRODUCTS INCLUDED IN SECTION

- Thermostatic control heads
- Accessories for thermostatic control heads
- Thermo-electric actuators
- NPT thermostatic radiator valve bodies
- European towel warmer radiator valves
- Connection valves for panel radiators
- Connection fittings

THERMOSTATIC CONTROL HEADS



200

Thermostatic control head fits radiator valves. Set point locking mechanism. Range stop adjustment. Built-in sensor with liquid-filled element. Fits valve 220, 221, 338 and 339 series. Graduated scale from * to 5 corresponding to a temperature scale adjustment range of 45–82°F (7–28°C).

Code	Description	Lbs	USD
200000	Built-in sensor	0.5	47.20



472

Thermostatic control head with remote adjusting knob, liquid-filled element. Fits valves 220, 221, 338, 339 & 676 series (direct coupling). Temperature range: 43–82°F (6–28°C). Capillary length: 78 in. (2 m).

Code	Description	Lbs	USD
472000	Remote wall sensor	1	161.00



201

Thermostatic control head fits radiator valves. With remote sensor. Fits valve 220, 221, 338 and 339 series. Graduated scale from * to 5 corresponding to a temperature scale adjustment range of 45–82°F (7–28°C). Capillary length: 78" (2 m).

Code	Description	Lbs	USD
201000	Remote sensor	1	84.30



203

Thermostatic control head fits radiator valves; with contact probe. Built-in sensor with liquid-filled element. Fits valve 220, 221, 338 and 339 series. The pre-set scale corresponds to adjustment temperature range of 68–122°F (20–50°C). Capillary length: 78" (2 m).

Code	Description	Lbs	USD
203502	Remote sensor probe	0.5	160.00

ACCESSORIES



4490

Manual knob for thermostatic radiator valves. Fits valves 220 and 221 series.

Code	Description	Lbs	USD
449010	Manual knob	0.1	9.80

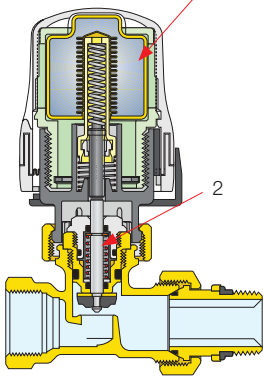
THERMO-ELECTRIC ACTUATOR



6564

Thermo-electric actuator for electric control of radiator valves. Fits valves 220, 221, 338 and 339 series. Low current draw. Power supply: 24 V AC/DC. Initial current draw: ≤ 250 mA. Power consumption: 3 W, 6 VA. 31.5" wire lead connection.

Code	Description	Lbs	USD
656404	24 V AC/DC	0.4	65.00
656414	24 V AC/DC with microswitch	0.4	82.10



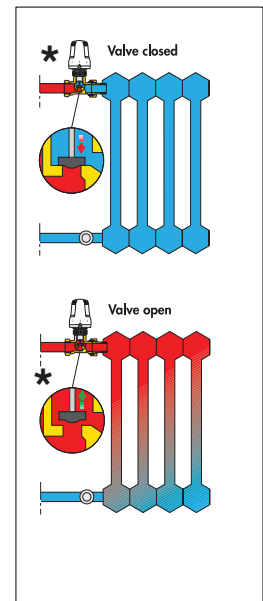
Key features

The thermostatic control head is filled with a non compressible liquid bellows (1). Plus, the radiator valve body has an extra strong valve stem compression spring (2). The non compressible liquid provides the force required to compress the strong valve stem spring. When the temperature decreases, the liquid bellows contracts, which allows the valve stem spring to lift the valve plug from valve seat after long periods of non-movement. This ensures that after a long 'off-season', when the actuator operates for the first time, the spring reliably lifts the valve plug off the seat without sticking. In addition, the 200000 control head features an easy-to-use locking mechanism that prevents unauthorized temperature set point changes and a range stop adjustment that limits the maximum temperature setting to save energy and over-heating.

Function

The control mechanism of the thermostatic radiator valve is a proportional temperature controller, composed of a liquid filled bellows. With increasing temperature the liquid expands which, in turn, causes the bellows to expand. When the temperature decreases the opposite occurs; the bellows contracts allowing the spring to return it to the original position. By connection to the valve stem, these movements adjust the heat transfer medium to the radiator.

*Head shown vertical for illustration only, it should be installed horizontally.



NPT THERMOSTATIC RADIATOR VALVE BODIES



220

Angled radiator valve body. Order thermo-electric actuators or thermostatic control heads separately for field installation.
Chrome plated.
Max. working pressure: 150 psi (10 bar).
Temperature range: 40–212°F (5–100°C).

Code	Description	Cv	Lbs	USD
220400A	1/2" FNPT in, 1/2" NPT male union out	2.7	0.3	46.30
220500A	3/4" FNPT in, 3/4" NPT male union out	3.7	0.3	50.70



221

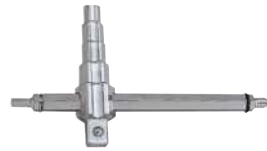
Straight radiator valve body. Order thermo-electric actuators or thermostatic control heads separately for field installation.
Chrome plated.
Max. working pressure: 150 psi (10 bar).
Temperature range: 40–212°F (5–100°C).

Code	Description	Cv	Lbs	USD
221400A	1/2" FNPT in, 1/2" NPT male union out	1.7	0.3	46.30
221500A	3/4" FNPT in, 3/4" NPT male union out	2.5	0.3	50.70



Replacement internal valve assembly fits radiator valves.

Code	Description	Lbs	USD
F36073	1/2" and 3/4"	0.1	6.50



Universal radiator tool for installing 1/2" and 3/4" tail pieces.

Code	Description	Lbs	USD
387127	Radiator tool	1.0	67.80

EUROPEAN TOWEL WARMER RADIATOR VALVES



338

Angled radiator valve body. Convertible from standard manual operation to automatic control with thermostatic control heads.
Chrome plated.
Fits copper, single and multilayer PEX pipes.
Max. working pressure: 150 psi (10 bar).
Temperature range: 40–212°F (5–100°C).

Code	Radiator Connection	Pipe Connection	Cv	Lbs	USD
338452	1/2" straight	3/4" conical	3.1	0.5	48.70



342

Angled isolation and balancing valve. Chrome plated.
Fits copper, single and multilayer PEX pipes.
Max. working pressure: 150 psi (10 bar).
Temperature range: 40–212°F (5–100°C).

Code	Radiator Connection	Pipe Connection	Cv	Lbs	USD
342452	1/2" straight	3/4" conical	4.6	0.5	32.10



339

Straight radiator valve body. Convertible from standard manual operation to automatic control with thermostatic control heads.
Chrome plated.
Fits copper, single and multilayer PEX pipes.
Max. working pressure: 150 psi (10 bar).
Temperature range: 40–212°F (5–100°C).

Code	Radiator Connection	Pipe Connection	Cv	Lbs	USD
339452	1/2" straight	3/4" conical	2.0	0.5	52.50



343

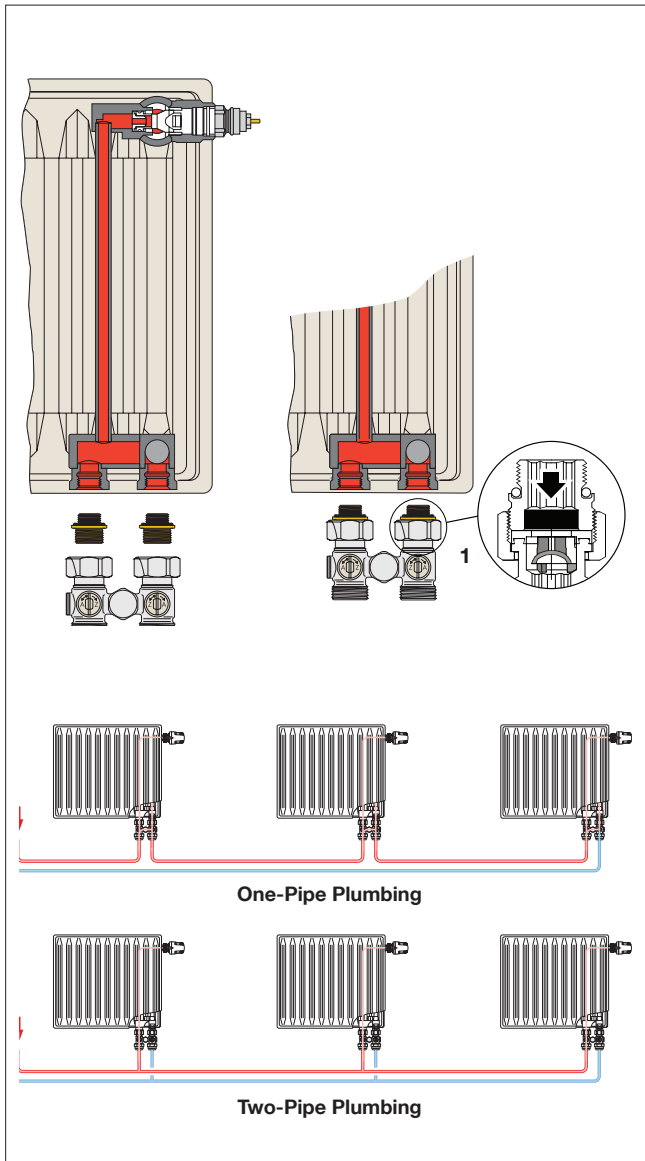
Straight isolation and balancing valve. Chrome plated.
Fits copper, single and multilayer PEX pipes.
Max. working pressure: 150 psi (10 bar).
Temperature range: 40–212°F (5–100°C).

Code	Radiator Connection	Pipe Connection	Cv	Lbs	USD
343452	1/2" straight	3/4" conical	2.5	0.5	33.60

Intended for use in metric radiators such as European towel warmers and panel radiators.

CONNECTION VALVES FOR PANEL RADIATORS

Caleffi panel radiator valves are designed to be connected to the bottom of panel radiators. They come in two versions: for two-pipe and one-pipe systems. Both are available straight (pipes exiting the floor) and angled (pipes exiting the wall). The two-pipe version is equipped with two ball shut-off valves. The one-pipe, in addition to the shut-off valves, is equipped with an adjustable by-pass from 30% to 50% of the flow rate towards the radiator, and a flow check valve device (1) prevents thermo-syphoning upward into radiator from by-passing flow.



3010

Valve for panel radiators that have built-in thermostatic valve unit.
Two-pipe straight version (floor connections) fits 1/2" female radiator connections.
Max. working pressure: 150 psi (10 bar).
Max. working temperature: 212°F (100°C).

Code	Radiator Connection	Pipe Connection	Lbs	USD
301040	1/2" straight	3/4" conical	1	39.00



3011

Valve for panel radiators that have built-in thermostatic valve unit.
Two-pipe valve angled version (wall connections) fits 1/2" female radiator connections.
Max. working pressure: 150 psi (10 bar).
Max. working temperature: 212°F (100°C).

Code	Radiator Connection	Pipe Connection	Lbs	USD
301140	1/2" straight	3/4" conical	1	39.00



3012

Valve for panel radiators that have built-in thermostatic valve unit.
One-pipe straight version (floor connections) fits 1/2" female radiator connections.
With adjustable by-pass.
Balance knob.
Max. working pressure: 150 psi (10 bar).
Max. working temperature: 212°F (100°C).

Code	Radiator Connection	Pipe Connection	Lbs	USD
301241	1/2" straight	3/4" conical	1	68.30



3013

Valve for panel radiators that have built-in thermostatic valve unit.
One-pipe angled version (wall connections) fits 1/2" female radiator connections.
With adjustable by-pass.
Balance knob.
Max. working pressure: 150 psi (10 bar).
Max. working temperature: 212°F (100°C).

Code	Radiator Connection	Pipe Connection	Lbs	USD
301341	1/2" straight	3/4" conical	1	68.30



4497

Wall-covering plate.
Fits dual panel radiator valves 301.
With wall connections.
In white ABS.
Outlet center distance: 40–50 mm.

Code	Description	Lbs	USD
449740	Plate	0.1	3.40

CONNECTION FITTINGS



**681
Universal
PEX fittings**

681 series fittings are compatible with any ASTM F876 single layer PEX.
Max. working pressure: 150 psi.
Working temperature for ASTM F876 PEX piping: 41 – 180°F.
Chrome plated nut.

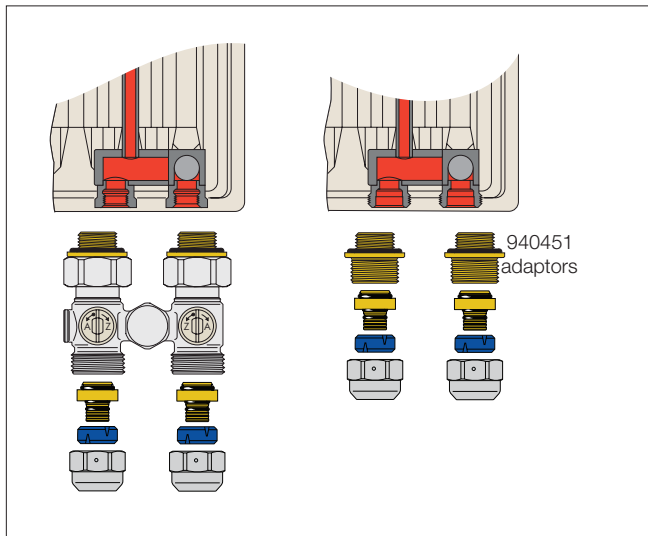
Code	Description	Lbs	USD
681503A	3/8" nominal PEX	0.2	8.30
681524	1/2" nominal PEX	0.2	8.30
681555	5/8" nominal PEX	0.2	8.30



**682
Universal
PEX-AL-PEX fittings**

682 series fittings are compatible with any ASTM F1281 multilayer PEX-AL-PEX pipe.
Max. working pressure: 150 psi.
Working temperature for ASTM F1281 PEX-AL-PEX piping: 41 – 200°F with tubing rated 200°F.

Code	Description	Lbs	USD
682540A	1/2" PEX-AL-PEX	0.2	8.10



940



Radiator adapter for directly connecting a panel radiator with PEX, PEX-AL-PEX, sweat, NPT or compression fittings.
Package of 2 each, priced per package.

Code	Description	Lbs	USD
940451	1/2" M straight x 3/4" M conical (2 ea.)	0.1	14.90



Wrench for tightening PEX fitting to TRV.

Code	Description	Lbs	USD
387100	26 mm x 30 mm	1.5	37.50



437

Compression fitting, fits 1/2" hard copper.
With o-ring seal.
Max. working pressure: 150 psi.
Working temperature range: 41 – 250°F.
Chrome plated.
For connecting copper to valve 301, 338, 339, 342 and 343 series.

Code	Description	Lbs	USD
437516	1/2" compression	0.1	6.80



NA102

Sweat connection fitting fits 1/2" copper.
Max. working pressure: 150 psi.
Working temperature range: 41 – 250°F.
Chrome plated nut.
For connecting copper to valve 301, 338, 339, 342 and 343 series.

Code	Description	Lbs	USD
NA10262	1/2" sweat	0.2	8.80



NA103

NPT connection fitting.
Max. working pressure: 150 psi.
Working temperature range: 41 – 250°F.
Chrome plated nut.
For connecting copper to valve 301, 338, 339, 342 and 343 series.

Code	Description	Lbs	USD
NA10313	1/2" NPT male	0.2	9.50

THEY GO TOGETHER LIKE NUTS AND BOLTS



GET A 5 YEAR WARRANTY WHEN INSTALLED TOGETHER

Install our Z-one™ Series zone valve together with our Z-one™ Series Relay and both qualify for our industry exclusive five year warranty. Sold separately, Z-one valves have a two year warranty and Z-one relays have a 3 year warranty.

Universal, reliable and installer-friendly zone control for hot water, chilled water, and low-pressure steam systems

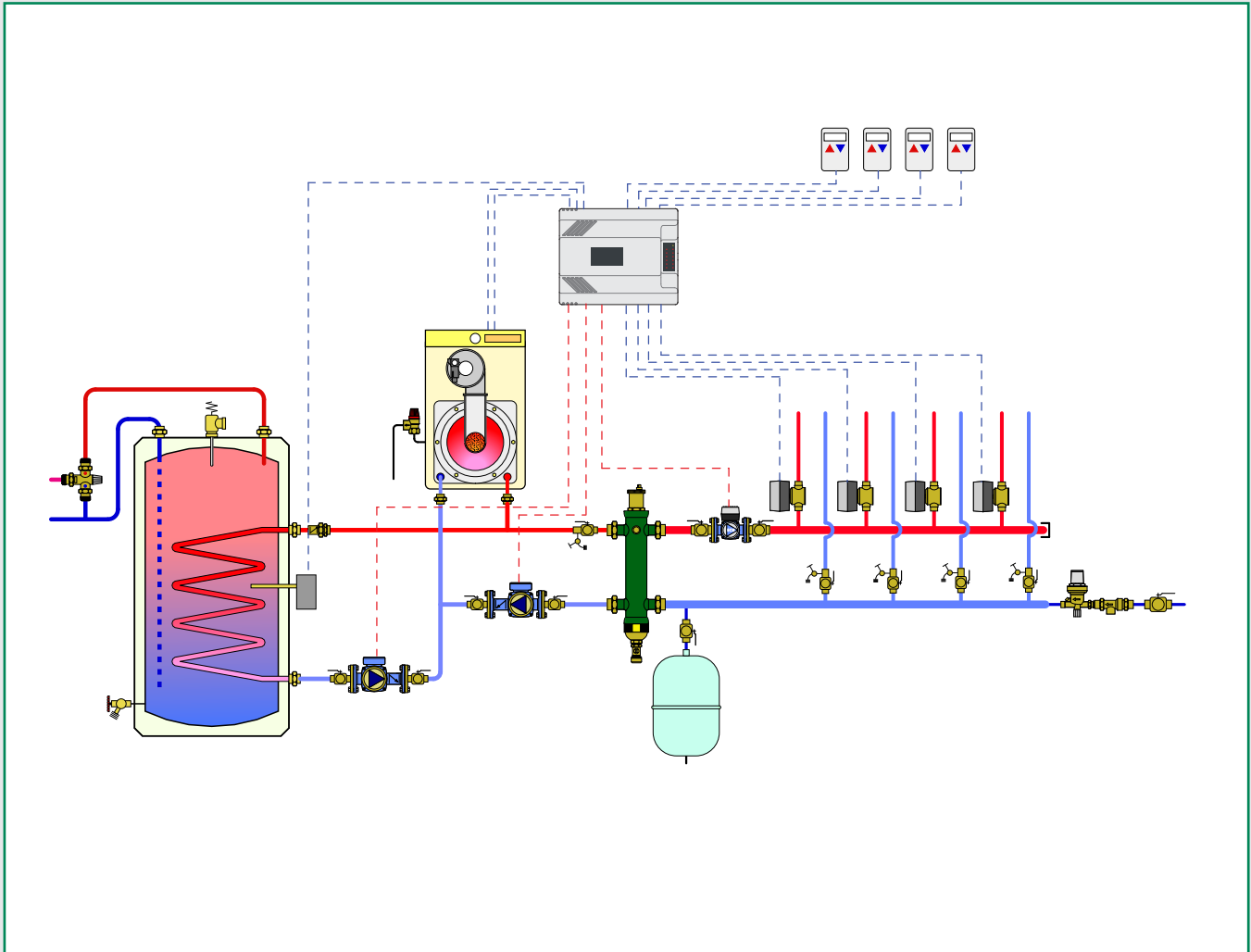


Heating & cooling

Components for today's modern hydronic systems

ZONE VALVES AND ZONE CONTROLS

This diagram is for illustration purposes only



4

PRODUCTS INCLUDED IN SECTION

- Thermo-electric zone valves
- Thermo-electric actuators
- Motorized zone valves
- Pump zone controls
- Valve zone controls
- Motorized ball zone valves, high-flow, high-close off

THERMO-ELECTRIC ZONE VALVES

6767 TwisTop+™ High Performance



Complete with 656354 actuator.
Spring return. Normally closed.
Pressure balanced body.
Brass valve body and trim.
Max. body pressure: 150 psi.
Max. Temperature: 200°F.
Power supply: 24 V AC/DC.
Initial current draw: ≤ 250 mA.
Power consumption:
holding: 3 W
inrush: 6 VA
Rating of micro-switch contacts: 5 A (24 V).
31.5" wire lead connection.

6762 TwisTop™ Zone valve



Two-way thermo-electric zone valve.
Complete with TwisTop™ (code 656354) actuator. Spring return. Normally closed.
Brass valve body and trim.
Max. body pressure: 150 psi.
Max. Temperature: 200°F.
Power supply: 24 V AC/DC.
Initial current draw: ≤ 250 mA.
Power consumption:
holding: 3 W
inrush: 6 VA
Rating of micro-switch contacts: 5 A (24 V).
31.5" wire lead connection.

Code	Description	Cv	ΔP	Lbs	USD
676756A	¾" press union	5.6	35 psi	2.2	183.00
676759A	¾" sweat union	5.6	35 psi	2.2	179.00
676758A	¾" PEX expansion union	5.6	35 psi	2.2	179.00
676766A	1" press union	5.6	35 psi	2.2	207.00
676769A	1" sweat union	5.6	35 psi	2.2	199.00
676768A	1" PEX expansion union	5.6	35 psi	2.2	199.00

Code	Description	Cv	ΔP	Lbs	USD
676256A	¾" press union	4	20 psi	1.4	161.00
676259A	¾" sweat union	4	20 psi	1.4	155.00
676258A	¾" PEX expansion union	4	20 psi	1.4	155.00
676266A	1" press union	4	20 psi	1.4	184.00
676269A	1" sweat union	4	20 psi	1.4	177.00
676268A	1" PEX expansion union	4	20 psi	1.4	177.00

6564



Thermo-electric actuator fits on 676 two-way zone valve bodies.
Low current draw.
Protection class (installed in all positions): NEMA 3 (IP54)
Power supply: 24 V AC/DC.
Initial current draw: ≤ 250 mA.
Power consumption:
holding: 3 W
inrush: 6 VA
Rating of micro-switch contacts: 5 A (24 V).
31.5" wire lead connection.

Code	Description	Lbs	USD
656404	24 V AC/DC	0.4	65.00
656414	24 V AC/DC with micro-switch	0.4	82.10

6563 TwisTop™



TwisTop™ thermo-electric actuator fits on 676 two-way valve.
Twist the top to manually open and close micro-switch.
Power supply: 24 V AC/DC.
Initial current draw: ≤ 250 mA.
Power consumption:
holding: 3 W
inrush: 6 VA
Rating of micro-switch contacts: 5 A (24 V).
31.5" wire lead connection.
US Patent 7,617,989 B2.

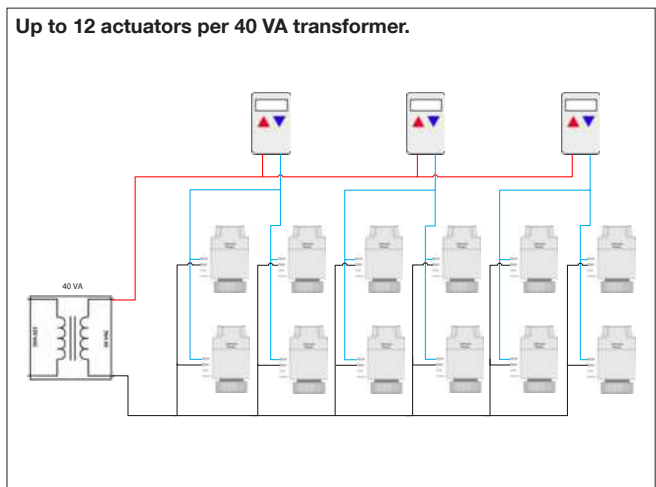
Code	Description	Lbs	USD
656344	24 V AC/DC	0.4	87.10
656354	24 V AC/DC with micro-switch	0.4	103.00

6760, 6765



Two-way zone valve body.
For field installation of thermo-electric actuators 6563 series or 6564 series.
Brass body and trim.
Max. body pressure: 150 psi.
Max. temperature: 200°F.
See fitting selection table in Section 8.
Select fittings with 1" nut.

Code	Description	Cv	Lbs	USD
676000A	body only, close-off 20 psid	4.3	0.5	22.20
676500A	body only, close-off 35 psid	5.6	1	47.20



MOTORIZED ZONE VALVES



**Z4
Zone 2-way**

Two-way zone valve. Spring return.
Normally closed actuator: Z111000.
Auxiliary micro-switch.
Max. body pressure: 300 psi.
Temperature range: 32°–240°F.
Suitable fluids: water, 50% max. glycol,
15 psi max. steam.
Power supply: 24 V AC.
Power consumption: 5 W, 7 VA.
Rating of auxiliary micro-switch contacts:
0.0 A min, 0.4 A max 24 V (24 V only).
18" wire lead connection.
UL873, cULus Listed & CE.
UL 1995 sec. 18 air plenums and ducts.
US Patent 7,048,251.



**Z5
Zone 2-way**

Two-way zone valve. Spring return.
Normally closed actuator: Z151000
Auxiliary micro-switch.
Max. body pressure: 300 psi.
Temperature range: 32°–240°F.
Suitable fluids: water, 50% max. glycol,
15 psi max. steam.
Power supply: 24 V AC.
Power consumption: 5 W, 7 VA.
Rating of auxiliary micro-switch contacts:
0.0 A min, 0.4 A max 24 V (24 V only).
Screw terminal connection.
UL873, cULus Listed & CE.
UL 1995 sec. 18 air plenums and ducts.
US Patent 7,048,251.



Code	Description	Cv	Δ P	Lbs	USD
Z40	Inverted flare	3.5	30 psi	2.2	131.00
Z40F	¾" Inv flare*	3.5	30 psi	2.2	148.00
Z42	½" SAE flare	3.5	30 psi	2.2	143.00
Z44	½" sweat	2.5	50 psi	2.1	127.00
Z45	¾" sweat	7.5	20 psi	2.2	139.00
Z46	1" sweat	7.5	20 psi	2.3	173.00
Z47	1¼" sweat	7.5	20 psi	2.3	201.00

* Two ¾" sweat fittings (NA10006) included.

Code	Description	Cv	Δ P	Lbs	USD
Z50	Inverted flare	3.5	30 psi	2.2	134.00
Z50F	¾" Inv flare*	3.5	30 psi	2.2	151.00
Z54	½" sweat	2.5	50 psi	2.1	131.00
Z55	¾" sweat	7.5	20 psi	2.2	143.00
Z56	1" sweat	7.5	20 psi	2.3	176.00
Z57	1¼" sweat	7.5	20 psi	2.3	204.00

* Two ¾" sweat fittings (NA10006) included.

Zone 2-way Press



Two-way zone valve. Spring return.
Normally closed actuator: Z111000.
Auxiliary micro-switch.
Max. body pressure: 300 psi.
Overall length: 5-5/8"
Temperature range: 32–240°F.
Suitable fluids: water, 50% max. glycol,
15 psi max. steam.
Power supply: 24 V AC.
Power consumption: 5 W, 7 VA.
Rating of auxiliary micro-switch contacts:
0.0 A min, 0.4 A max 24 V (24 V only).
UL873, cULus Listed & CE.
UL 1995 sec. 18 air plenums and ducts.
US Patent 7,048,251.



Zone 2-way Sweat



Two-way zone valve. Spring return.
Normally closed actuator: Z151000
Auxiliary micro-switch.
Max. body pressure: 300 psi.
Temperature range: 32°–240°F.
Suitable fluids: water, 50% max. glycol,
15 psi max. steam.
Power supply: 24 V AC.
Power consumption: 5 W, 7 VA.
Rating of auxiliary micro-switch contacts:
0.0 A min, 0.4 A max 24 V (24 V only).
Screw terminal connection.
UL873, cULus Listed & CE.
UL 1995 sec. 18 air plenums and ducts.
US Patent 7,048,251.



Code	Description	Cv	Δ P	Lbs	USD
Z44P	½" press*	3.5	30 psi	2.2	176.00
Z54P	½" press**	3.5	30 psi	2.2	179.00
Z45P	¾" press*	7.5	20 psi	2.2	179.00
Z55P	¾" press**	7.5	20 psi	2.2	182.00
Z45PL	¾" press*	7.5	20 psi	2.3	196.00
Z55PL	¾" press**	7.5	20 psi	2.3	199.00
Z46P	1" press*	7.5	20 psi	2.4	202.00
Z56P	1" press**	7.5	20 psi	2.4	206.00

*18" wire lead connection.
**Screw terminal connection.
PL (1) extra long press fitting for retrofit
Includes press fittings.

Code	Description	Cv	Δ P	Lbs	USD
Z55S	¾" sweat	7.5	20 psi	2.2	173.00



Inverted flare sweat adaptors fits Z40, Z50
and inverted flare valve body.

Code	Description	Lbs	USD
NA10005	½" sweat	0.3	6.80
NA10006	¾" sweat	0.3	8.50
NA10007	1" sweat	0.4	14.10
NA61241	Retrofit extension kit	0.2	6.90

MOTORIZED ZONE VALVES



**Z1
Normally Closed**

Z1 NC actuator fits on Z2 and Z3 series valve bodies with the push of a button. Two position spring return normally closed. 7/8" knockout for 1/2" conduit connector. Power: 24, 120, 208, 230 & 277 VAC. Power consumption: 5 W, 7 VA. Conduct connector size: 1/2". Rating of auxiliary switch contacts: 24 VAC: 0.0 A min, 0.4 A max (24 V). 120-277 and Z111900 VAC: 0.25 A min, 5.0 A max (230 V). UL873, cULus Listed & CE. UL 1995 sec.18 air plenums and ducts. US Patent 7,048,251.



**Z1
Normally Open**

Z1 NO actuator fits on Z2 series valve bodies with the push of a button. Two position spring return normally opened. 7/8" knockout for 1/2" conduit connector. Power: 24, 120, 208, 230 & 277 VAC. Power consumption: 5 W, 7 VA. Conduct connector size: 1/2". Rating of auxiliary switch contacts: 24 VAC: 0.0 A min, 0.4 A max (24 V). 120-277 VAC: 0.25 A min, 5.0 A max (230 V). UL873, cULus Listed & CE. UL 1995 sec. 18 air plenums and ducts. US Patent 7,048,251.



Code	Description	Lbs	USD
Z111000	24 V, micro-switch, 18" wires	1.1	90.40
Z111900	24 V, high current switch, 18" wires	1.1	90.40
Z116000	120 V, micro-switch, 6" wires	1.1	90.40
Z113000	208 V, micro-switch, 6" wires	1.1	108.00
Z114000	230 V, micro-switch, 6" wires	1.1	108.00
Z115000	277 V, micro-switch, 6" wires	1.1	108.00
Z151000	24 V, micro-switch, terminal blocks	1.1	93.70
Z161000	24 V, terminal blocks	1.1	86.00
Z121000	24 V, 18" wires	1.1	83.80
Z126000	120 V, 6" wires	1.1	83.80
Z123000	208 V, 6" wires	1.1	101.00
Z124000	230 V, 6" wires	1.1	101.00
Z125000	277 V, 6" wires	1.1	101.00

Code	Description	Lbs	USD
Z131000	24 V, micro-switch, 18" wires	1.1	98.60
Z136000	120 V, micro-switch, 6" wires	1.1	98.60
Z141000	24 V, 18" wires	1.1	92.00
Z146000	120 V, 6" wires	1.1	92.00

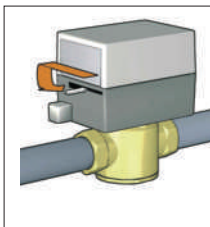
Function

The Z-one™ valve is a truly universal zone valve that can be used in a wide range of commercial and residential applications; from fan coils to baseboard, radiant to high rise, the Z-one™ is the professional's valve of choice. The Z-one™ can be used in both chilled or hot water and low pressure steam applications. With Delta P close off pressures of up to 75 PSI, the Z-one™ outperforms all other zone valves. The Z-one™ is available in sizes from 1/2" to 1 1/4" sweat or NPT connections on valve body, with removable actuator available in 24 to 277 voltages.

Some models of Z-one™ actuators contain an auxiliary micro-switch to operate other devices. The 24 V actuators use a sealed reed switch, which has been produced specifically for use with relays, boiler contacts (TT) and DDC systems. It requires no minimum current load. The 120 V - 277 V actuators for applications requiring greater than 400 mA, use a conventional micro-switch with silver contacts. The auxiliary switch is activated when the valve is 60% open or when the actuator is manually opened.

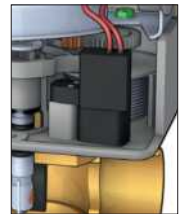
• Manual opening (Normally closed actuator only)

The valve can be opened manually by moving the lever for opening it. When the power is restored the manual control is automatically overridden. The auxiliary switch in 24 V actuators is tripped when the unit is put into manual open position. This helps during start up to check if the wiring is correct without firing the valve electrically with the thermostat.

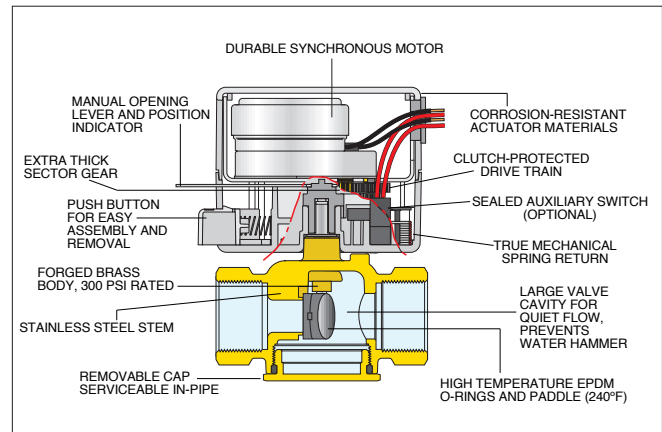


• Auxiliary micro-switch

The actuator contains an auxiliary microswitch to operate other devices. The 24 V actuators use a sealed reed switch, which has been produced specifically for use with relays, boiler contacts (TT) and DDC systems. It requires no minimum current load. The 120 V to 277 V actuators use a conventional micro-switch with silver contacts. The auxiliary micro-switch is activated when the valve is 60% open or when the actuator is manually opened.



Construction



• Easy push button

A simple push of the button makes it easy to remove it from the body of the valve for maintenance or replacement operations. Warning: the actuator can only be used with valve bodies Z2-Z3 series.

• Operation

The actuator is fitted with a special mechanism for gradual movement of the valve paddle which provides smooth and quiet constant operation. Power-on full stroke run time is 60 seconds with 6 second power-off return time eliminating the effects of water hammer.

MOTORIZED ZONE VALVES



**Z2
2-way**

Two-way on/off two position valve. Straight through flow pattern. Brass body. Stainless steel stem. EPDM rubber seals and paddle. Max. working pressure: 300 psi. Max temperature: 240°F.



**Z3
3-way**

Three-way on/off two position valve. Diverting flow pattern. Brass body. Stainless steel stem. EPDM rubber seals and paddle. Max. working pressure: 300 psi. Max temperature: 240°F.

Code	Description	Cv	Δ P	Lbs	USD
Z200041	Inverted flare	1	75 psi	1.1	40.30
Z200042	Inverted flare	2.5	50 psi	1.1	40.30
Z200043	Inverted flare	3.5	30 psi	1.1	40.30
Z200053	½" SAE Flare	3.5	30 psi	1.1	51.80
Z200411	½" FNPT	1	75 psi	1.1	40.30
Z207411	½" FNPT LL	1	75 psi	1.1	55.10
Z200412	½" FNPT	2.5	50 psi	1.1	40.30
Z200413	½" FNPT	3.5	30 psi	1.1	40.30
Z200431	½" sweat	1	75 psi	1	36.90
Z200432	½" sweat	2.5	50 psi	1	36.90
Z207433	½" sweat LL	3.5	30 psi	1	51.80
Z200512	¾" FNPT	2.5	50 psi	1.2	55.10
Z200513	¾" FNPT	3.5	30 psi	1.2	55.10
Z200515	¾" FNPT	5	25 psi	1.2	55.10
Z200517	¾" FNPT	7.5	20 psi	1.2	55.10
Z200532	¾" sweat	2.5	50 psi	1.1	48.70
Z207533*	¾" sweat LL	3.5	30 psi	1.1	63.40
Z200535	¾" sweat	5	25 psi	1.1	48.70
Z200537	¾" sweat	7.5	20 psi	1.1	48.70
Z207537*	¾" sweat LL	7.5	20 psi	1.1	63.40
Z200617	1" FNPT	7.5	20 psi	1.3	87.10
Z200635	1" sweat	5	25 psi	1.2	82.70
Z200637	1" sweat	7.5	20 psi	1.2	82.70
Z200737	1¼" sweat	7.5	20 psi	1.3	110.00

LL Low-lead brass body.



Two-way and three-way zone valve body repair kit. Includes valve stem paddle with O-rings, C clip and one bottom cap O-ring.

Code	Description	Lbs	USD
F69293	Fits all ½" & ¾" sweat Z2, Z3 valves	0.4	13.90
F69294	Fits all ¾" NPT and all 1" Z2, Z3 valves	0.4	13.90

Code	Description	Cv	Δ P	Lbs	USD
Z300053	½" SAE Flare	3.5	30 psi	1.1	64.50
Z300411	½" FNPT	1	75 psi	1.1	53.70
Z300412	½" FNPT	2.5	50 psi	1.1	53.70
Z300413	½" FNPT	3.5	30 psi	1.1	53.70
Z300431	½" sweat	1	75 psi	1	50.40
Z300432	½" sweat	2.5	50 psi	1	50.40
Z307433*	½" sweat LL	3.5	30 psi	1	65.00
Z300512	¾" FNPT	2.5	50 psi	1.2	67.20
Z300513	¾" FNPT	3.5	30 psi	1.2	67.20
Z300515	¾" FNPT	5	25 psi	1.2	67.20
Z300517	¾" FNPT	7.5	20 psi	1.2	67.20
Z300532	¾" sweat	2.5	50 psi	1.1	62.30
Z300533	¾" sweat	3.5	30 psi	1.1	62.30
Z300535	¾" sweat	5	25 psi	1.1	62.30
Z307537*	¾" sweat LL	7.5	20 psi	1.1	77.10
Z300617	1" FNPT	7.5	20 psi	1.3	101.00
Z300635	1" sweat	5	25 psi	1.2	93.70
Z300637	1" sweat	7.5	20 psi	1.2	93.70
Z300737	1¼" sweat	7.5	20 psi	1.3	114.00

***LL** Low-lead brass body.



2-way male union valve body. Select fittings in Section 8 Table.

Code	Description	Cv	Δ P	Lbs	USD
Z200683	1" male union body	3.5	30 psi	1.1	55.10
Z200687	1" male union body	7.5	20 psi	1.1	55.10



3-way male union valve body. Select fittings in Section 8 Table.

Code	Description	Cv	Δ P	Lbs	USD
Z300687	1" male union body	7.5	20 psi	1.2	70.00

PUMP ZONE CONTROLS



Certified to CSA C22-2 No.24
Conforms to UL Standard 873

ZSR
Z-one Relay

The ZSR series is multi-zone pump and boiler operating control for multiple zone hydronic heating systems. The ZSR series interfaces with low voltage thermostats, or any other low voltage controllers having a switching action. The ZSR series controls up to 3, 4, 5 or 6 heating circulator pumps, depending on model selected, a primary pump and has LED indicators to provide functional status and easy system troubleshooting. In addition, a primary pump system circulator is switched on whenever any zone calls for heat.

Power supply: 120 VAC, 50/60 Hz
Transformer voltage: 24 VAC
Maximum transformer load: 12 VA (ZSR101/103/104), 20 VA (ZSR106)
Electrical switch rating: 10A (ZSR101), 20A (ZSR103/4/6) max combined
Electrical switch rating pump output: 120 VAC, 5A each
Dry contact rating: AUX, XX, ZONE1 E/S: 120 VAC max, 2A each
Replaceable fuses: Type 2AG, 5A slow blow

Code	Description	Lbs	USD
ZSR101	Single zone relay	1.0	102.00
ZSR103	3 zone pump control	2.0	240.00
ZSR104	4 zone pump control	2.0	281.00
ZSR106	6 zone pump control	2.0	344.00

VALVE ZONE CONTROLS



Certified to CSA C22-2 No.24
Conforms to UL Standard 873

ZVR
Z-one Relay

The ZVR series is a multi-zone valve relay and boiler operating control for multiple zone hydronic heating systems. The ZVR series interfaces with low voltage thermostats, or any other low voltage controllers having a switching action. The ZVR series controls up to 3, 4, 5 or 6 zones, depending on model selected. In addition, a system circulator pump and secondary pump is turned on whenever any zone calls for heat. LED indicators provide functional status and easy system troubleshooting. The ZVR series is a perfect match with Caleffi's Z-one™ motorized zone valves.

Power supply: 120 VAC, 50/60 Hz
Transformer voltage: 24 VAC
Maximum transformer load: 40 VA (ZVR103/4), 80 VA (ZVR106)
Electrical switch rating: 20A Max Combined
Electrical switch rating pumps: 120 VAC, 5A each
Dry contact rating: AUX, XX, ZONE1 E/S:120 VAC, 2A each
Resettable Fuse: automatic
High Capacity 40 VA Transformer standard for 3 and 4 zone models- expandable to 80 VA, and 80 VA for the 6 zone model

Code	Description	Lbs	USD
ZVR103	3 zone valve control	2.0	182.00
ZVR104	4 zone valve control	2.0	217.00
ZVR106	6 zone valve control	2.0	281.00
NA10343	Expansion transformer	0.1	59.00

Z-ONE RELAY FUSES

Code	Description	Lbs	USD
NA10342	Spare fuse (package of 5)	0.1	9.80

MOTORIZED BALL ZONE VALVES HIGH-FLOW, HIGH CLOSE-OFF

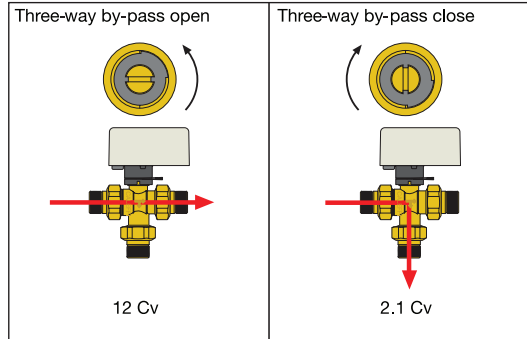
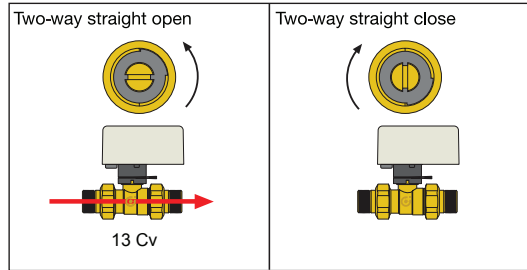


6442
2-way Straight

Two-way motorized ball zone valve. Straight.
Max. ΔP close-off pressure: 150 psi.
Temperature range: 20°–230°F.
Power supply: 24 VAC.
Power consumption: 4 VA.
Rating of micro-switch contacts: 5 A (24 V).
3-wire control.
36" wire lead connection.

Code	Description	Cv	Lbs	USD
644250A	¾" NPT male union	13	2.3	257.00
644256A	¾" press union	13	2.4	257.00
644259A	¾" sweat union	13	2.3	252.00
644260A	1" NPT male union	13	2.3	278.00
644266A	1" press union	13	2.4	280.00
644269A	1" sweat union	13	2.3	273.00
NA644200*	body, with no fittings	13	1.0	224.00

*See fitting selection table in Section 8.



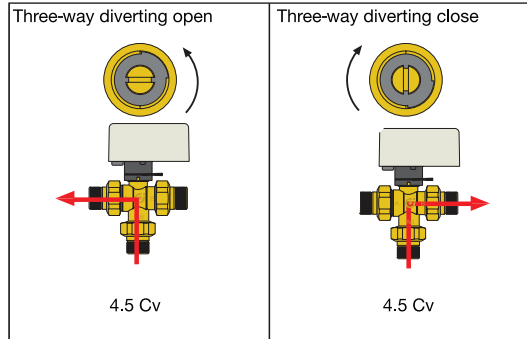
6443..3BY
3-way By-pass



Three-way motorized ball zone valve. By-pass.
Max. ΔP close-off pressure: 150 psi.
Temperature range: 20°–230°F.
Power supply: 24 VAC.
Power consumption: 4 VA.
Rating of micro-switch contacts: 5 A (24 V).
3-wire control.
2.1 Cv in by-pass mode.
36" wire lead connection.

Code	Description	Cv	Lbs	USD
644350A 3BY	¾" NPT male union	12	2.5	277.00
644356A 3BY	¾" press union	12	2.6	292.00
644359A 3BY	¾" sweat union	12	2.5	284.00
644360A 3BY	1" NPT male union	12	2.5	323.00
644366A 3BY	1" press union	12	2.6	327.00
644369A 3BY	1" sweat union	12	2.5	315.00
NA644300 3BY*	body, no fittings	12	1.2	242.00

*See fitting selection table in Section 8.



6440
24 V 3-wire control



Actuator fits 6442 and 6443 series.
Power supply: 24 VAC.
Power consumption: 4 VA.
Rating of micro-switch contacts: 5 A (24 V).
Operating time: 40 s (90° rotation).
Length of supply cable: 36".

Code	Description	Lbs	USD
644004	24 VAC	1.0	151.00

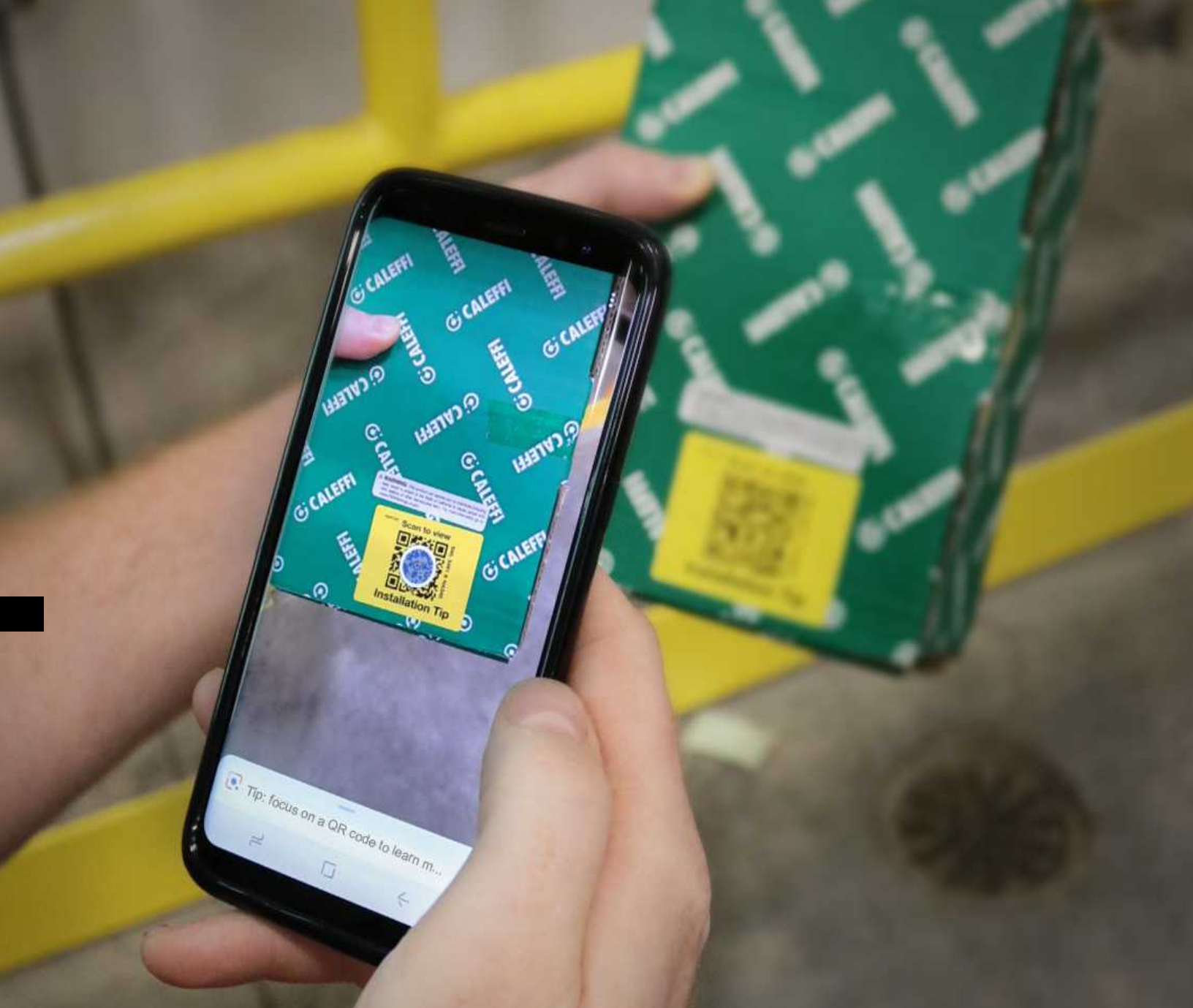
6443
3-way Diverting



Three-way motorized ball zone valve. Diverting.
Max. ΔP close-off pressure: 150 psi.
Temperature range: 20°–230°F.
Power supply: 24 VAC.
Power consumption: 4 VA.
Rating of micro-switch contacts: 5 A (24 V).
3-wire control.
36" wire lead connection.

Code	Description	Cv	Lbs	USD
644350A	¾" NPT male union	4.5	2.5	277.00
644356A	¾" press union	4.5	2.6	292.00
644359A	¾" sweat union	4.5	2.5	284.00
644360A	1" NPT male union	4.5	2.5	323.00
644366A	1" press union	4.5	2.6	327.00
644369A	1" sweat union	4.5	2.5	315.00
NA644300*	body, no fittings	4.5	1.2	242.00

*See fitting selection table in Section 8.



EASY-ACCESS INSTALLATION TIP VIDEOS

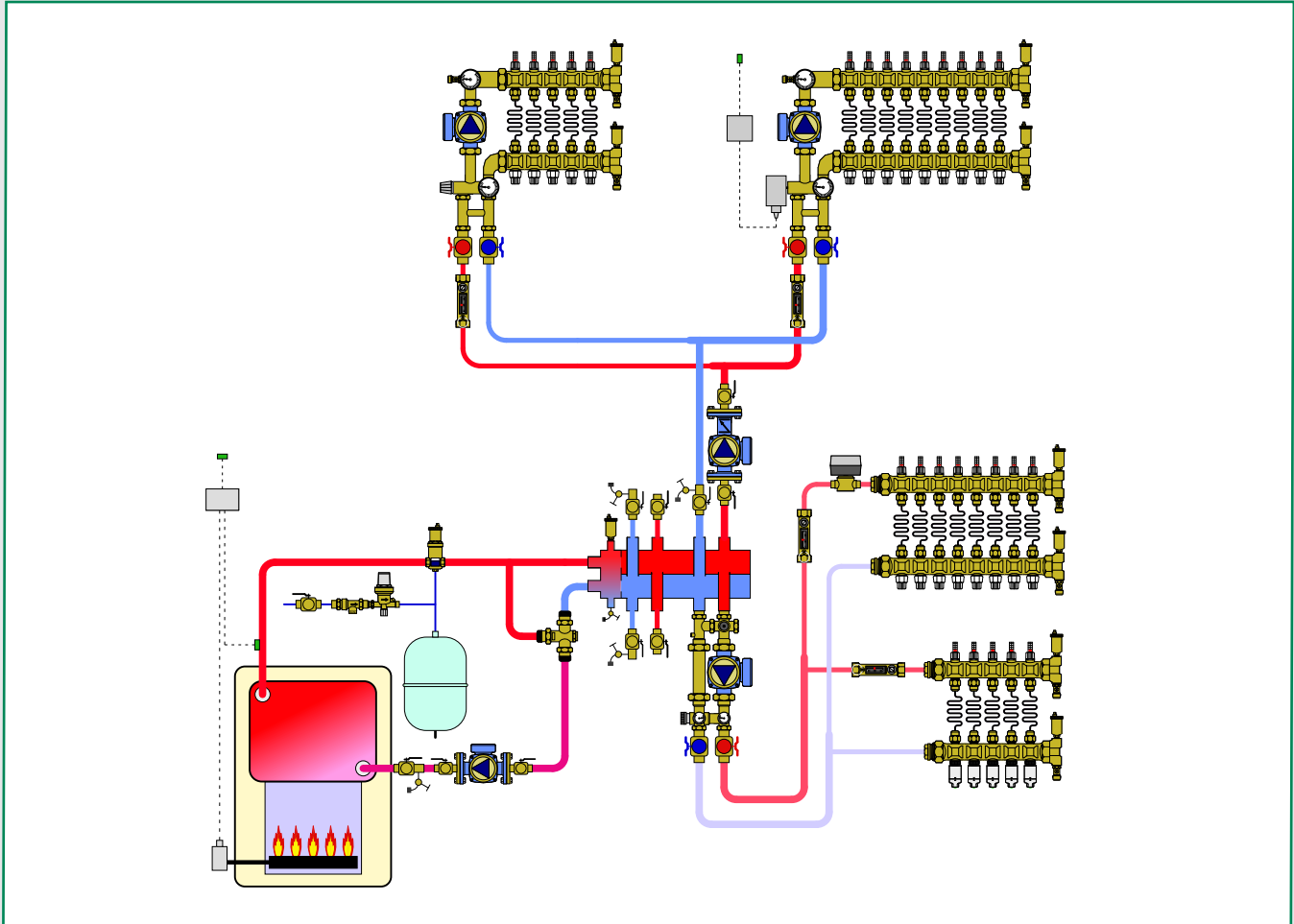
Whether you're a contractor in the mechanical room looking for installation pointers or a wholesaler explaining a component at the counter, Caleffi's Installation Tip videos just made your job easier!

Simply scan the QR Code easily identified with a bright-yellow label placed on our product boxes to access the brief YouTube videos.



DISTRIBUTION MANIFOLDS AND TEMPERATURE MIXING STATIONS

This diagram is for illustration purposes only



5

PRODUCTS INCLUDED IN SECTION

- Pump and valve temperature mixing units
- Thermostatic manifold mixing stations
- Manifold mixing stations
- Brass distribution manifolds
- Distribution manifolds
- Boxes for distribution manifolds
- Fittings for distribution manifolds and mixing stations
- Brass distribution manifold accessories
- Accessories

PUMP & VALVE TEMPERATURE MIXING UNITS

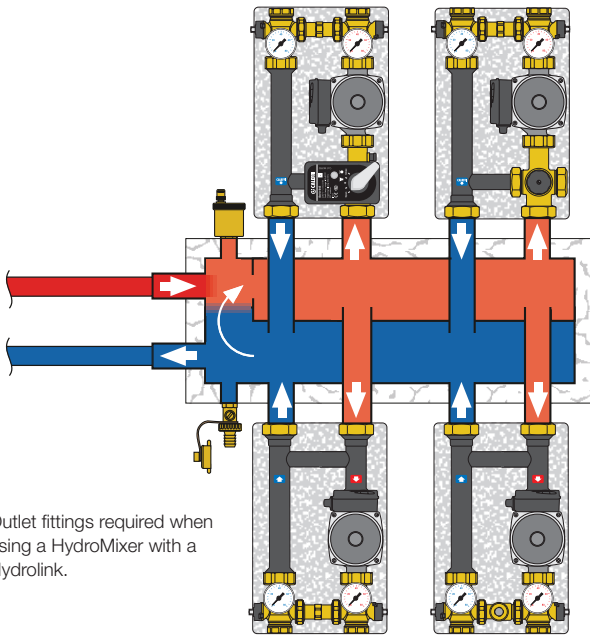


165 HydroMixer™

Injection pump mixing unit with insulation. Grundfos UPS 15-58 three speed pump.
 Grundfos Alpha 25-55U pump.
 Temperature gauges.
 Shut-off ball valves.
 Compatible with 5599 HydroLink™ series Male union connections (select top and bottom fitting sets on page 35).
 Max working pressure: 145 psi.
 Max. working temperature: 212°F.
 Power supply: 115 V 50/60 Hz.

Code	Description	Lbs	USD
165600A	Dual line with 15-58 pump on right	21	898.00
165610A	Dual line with 15-58 pump on left	21	898.00
165602A	Dual line with Alpha pump on right	21	1,096.00
165612A	Dual line with Alpha pump on left	21	1,096.00

5599 HydroLink with 165, 166, 167 HydroMixers

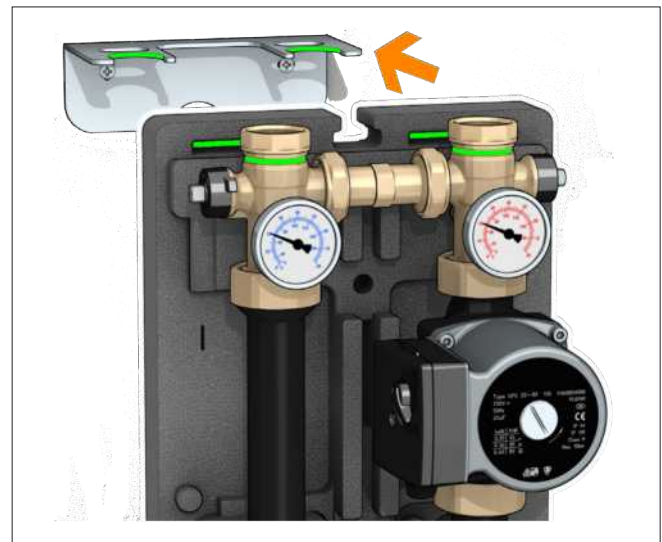


Outlet fittings required when using a HydroMixer with a Hydrolink.

Wall bracket fits 165, 166 and 167 series.



Code	Description	Lbs	USD
165001	Wall bracket	0.1	50.10



PUMP & VALVE TEMPERATURE MIXING UNITS



166 HydroMixer™

Thermostatic adjustable temperature mixing unit with insulation. Grundfos UPS 15-58 three speed pump. Grundfos Alpha 25-55U pump. Temperature gauges. Shut-off ball valves. Compatible with 5599 Hydrolink™ series Male union connections (select top and bottom fitting sets below). Max working pressure: 145 psi. Adjustable range: 80–125°F. Power supply: 115 V 50/60 Hz.



167 HydroMixer™

Motorized temperature mixing unit with insulation. Three-point floating 24 VAC actuator for use with separately-sourced outdoor reset controller. Grundfos UPS 15-58 three speed pump. Grundfos Alpha 25-55U pump. Temperature gauges. Shut-off ball valves. Compatible with 5599 Hydrolink™ series Male union connections (select top and bottom fitting sets below). Max working pressure: 145 psi. Primary inlet temperature range: 40-212°F. Power supply: 115 V 50/60 Hz. Valve actuator: 24 V AC

Code	Description	Lbs	USD
166600A	Dual line with 15-58 pump on right	22	1,096.00
166610A	Dual line with 15-58 pump on left	22	1,096.00
166602A	Dual line with Alpha pump on right	22	1,296.00
166612A	Dual line with Alpha pump on left	22	1,296.00

Code	Description	Lbs	USD
167600A	Dual line with 15-58 pump on right	23	1,296.00
167610A	Dual line with 15-58 pump on left	23	1,296.00
167602A	Dual line with Alpha pump on right	23	1,495.00
167612A	Dual line with Alpha pump on left	23	1,495.00



Optional differential pressure by-pass valve fits 165, 166 and 167 series.

Code	Description	Lbs	USD
519006	Differential pressure by-pass valve	1.0	56.20



Top outlet fitting set fits 165, 166, 167 series. Includes (2) 1 1/4" union nuts, (2) tail pieces and (2) washers. Will not fit bottom inlet thread.

Code	Description	Lbs	USD
NA16069	1" sweat union outlet fittings	1.0	51.60



Bottom Inlet fitting set fit 165, 166, 167 series. Includes (2) 1 1/2" union nuts, (2) tail pieces and (2) washers. Will not fit top outlet thread.

Code	Description	Lbs	USD
NA16169	1" sweat union inlet fittings	1.0	52.10



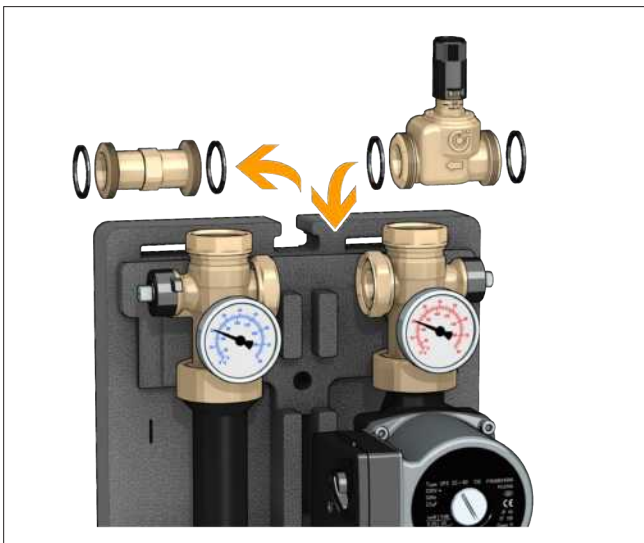
Top outlet fitting set fits 165, 166, 167 series. Includes (2) 1 1/4" union nuts, (2) tail pieces and (2) washers. Will not fit bottom inlet thread.

Code	Description	Lbs	USD
NA16060	1" NPT female union outlet fittings	1.0	58.40



Bottom Inlet fitting set fit 165, 166, 167 series. Includes (2) 1 1/2" union nuts, (2) tail pieces and (2) washers. Will not fit top outlet thread.

Code	Description	Lbs	USD
NA16160	1" NPT female union inlet fittings	1.0	59.00



THERMOSTATIC MANIFOLD MIXING STATIONS

**172
Manifold mixing station
three speed pump**

Pre-assembled thermostatic manifold mixing station consisting of a supply distribution manifold complete with built-in sight flow gauges and adjustable balancing valves. Return manifold with built-in shutoff valves is suitable for thermo-electric actuators. Complete with built-in sensor to keep flow temperature at constant set value.

Includes Grundfos UPS 15—58 three-speed pump.

¾" F NPT supply/return ball valves.

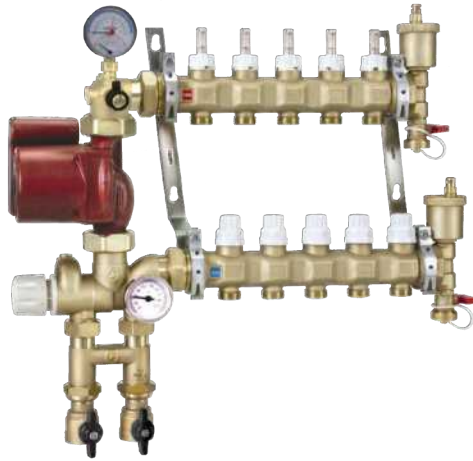
Max. working pressure: 150 psi.

Control temperature range: 80°—130°F

Primary inlet max. temperature: 195°F

Outlet center distance: 2 in.

Models with "...IN" suffix are built inverted (tubing connections going upward).



Code	Description	UPS Pump	No.	Outlets	Lbs	USD
1725C1A	¾"	15-58	3	¾" M	20	1,046.00
1725C1A IN	¾"	15-58	3	¾" M	20	1,046.00
1725D1A	¾"	15-58	4	¾" M	21	1,114.00
1725D1A IN	¾"	15-58	4	¾" M	21	1,114.00
1725E1A	¾"	15-58	5	¾" M	23	1,181.00
1725E1A IN	¾"	15-58	5	¾" M	23	1,181.00
1725F1A	¾"	15-58	6	¾" M	25	1,249.00
1725F1A IN	¾"	15-58	6	¾" M	25	1,249.00
1725G1A	¾"	15-58	7	¾" M	27	1,317.00
1725G1A IN	¾"	15-58	7	¾" M	27	1,317.00
1725H1A	¾"	15-58	8	¾" M	28	1,384.00
1725H1A IN	¾"	15-58	8	¾" M	28	1,384.00
1725I1A	¾"	15-58	9	¾" M	29	1,451.00
1725I1A IN	¾"	15-58	9	¾" M	29	1,451.00
1725L1A	¾"	15-58	10	¾" M	31	1,519.00
1725L1A IN	¾"	15-58	10	¾" M	31	1,519.00
1725M1A	¾"	15-58	11	¾" M	33	1,585.00
1725M1A IN	¾"	15-58	11	¾" M	33	1,585.00
1725N1A	¾"	15-58	12	¾" M	34	1,654.00
1725N1A IN	¾"	15-58	12	¾" M	34	1,654.00
1725O1A	¾"	15-58	13	¾" M	36	1,721.00
1725O1A IN	¾"	15-58	13	¾" M	36	1,721.00

**172
Manifold mixing station
high efficiency pump**

Pre-assembled thermostatic manifold mixing station consisting of a supply distribution manifold complete with built-in sight flow gauges and adjustable balancing valves. Return manifold with built-in shutoff valves is suitable for thermo-electric actuators. Complete with built-in sensor to keep flow temperature at constant set value.

Includes Grundfos Alpha 25-55U pump.

¾" F NPT supply/return ball valves.

Max. working pressure: 150 psi.

Control temperature range: 80°—130°F

Primary inlet max. temperature: 195°F

Outlet center distance: 2 in.

Models with "...IN" suffix are built inverted (tubing connections going upward).



Code	Description	Alpha Pump	No.	Outlets	Lbs	USD
1725C1AHE	¾"	25-55U	3	¾" M	20	1,256.00
1725C1AHE IN	¾"	25-55U	3	¾" M	20	1,256.00
1725D1AHE	¾"	25-55U	4	¾" M	21	1,323.00
1725D1AHE IN	¾"	25-55U	4	¾" M	21	1,323.00
1725E1AHE	¾"	25-55U	5	¾" M	23	1,390.00
1725E1AHE IN	¾"	25-55U	5	¾" M	23	1,390.00
1725F1AHE	¾"	25-55U	6	¾" M	25	1,457.00
1725F1AHE IN	¾"	25-55U	6	¾" M	25	1,457.00
1725G1AHE	¾"	25-55U	7	¾" M	27	1,525.00
1725G1AHE IN	¾"	25-55U	7	¾" M	27	1,525.00
1725H1AHE	¾"	25-55U	8	¾" M	28	1,592.00
1725H1AHE IN	¾"	25-55U	8	¾" M	28	1,592.00
1725I1AHE	¾"	25-55U	9	¾" M	29	1,660.00
1725I1AHE IN	¾"	25-55U	9	¾" M	29	1,660.00
1725L1AHE	¾"	25-55U	10	¾" M	31	1,728.00
1725L1AHE IN	¾"	25-55U	10	¾" M	31	1,728.00
1725M1AHE	¾"	25-55U	11	¾" M	33	1,795.00
1725M1AHE IN	¾"	25-55U	11	¾" M	33	1,795.00
1725N1AHE	¾"	25-55U	12	¾" M	34	1,863.00
1725N1AHE IN	¾"	25-55U	12	¾" M	34	1,863.00
1725O1AHE	¾"	25-55U	13	¾" M	36	1,930.00
1725O1AHE IN	¾"	25-55U	13	¾" M	36	1,930.00

THERMOSTATIC MANIFOLD MIXING STATIONS

Characteristic components / hydraulic diagram

Item	Description	Symbol
1	Circulation pump UPS 15-58 pictured	
2	Top elbow with supply temperature and pressure gauge	
3	Purge valve	
4	Supply temperature and pressure gauge	
5	Return temperature gauge	
6	Primary circuit shut-off valves	
7	Primary circuit hydraulic separator with check valve	
8	Thermostatic three-way mixing valve with built-in sensor	

Supply manifold equipped with flow meters and balancing valves.

Return manifold equipped with shut-off valves.

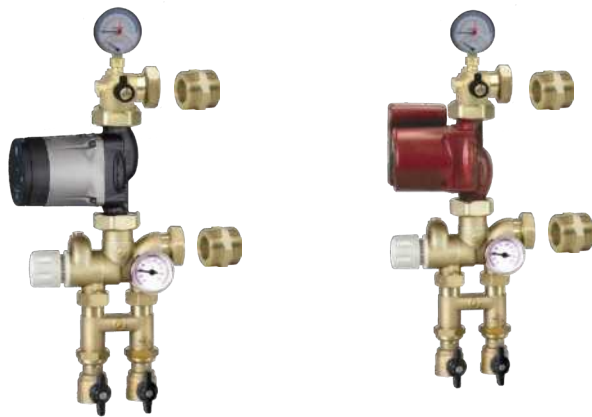
End fittings with automatic air vent with hygroscopic cap and drain cock.

Function

The 172 series manifold mixing station is designed for use in manifold-based hydronic distribution systems. The manifold mixing station incorporates a thermostatic actuator with built-in sensor which keeps the flow temperature at a constant set value for use in low temperature systems such as floor radiant panels. A removable primary circuit hydraulic separator with check valve is also supplied. The hydraulic separator is essential when there is a primary circuit circulation pump and when radiator circuits or fan coils are controlled by

thermostatic or thermo-electric valves. When connecting to a Caleffi HYDROLINK™ or hydraulic separator without a primary pump, the hydraulic separator can be removed and the manifold mixing station can be connected directly. The 172 station, like the TWISTFLOW™ Series 668S1 distribution manifolds, can be configured with 3 to 13 circuit outlets offering similar benefits with built-in sight flow meters/adjustable balancing valves and optional TWISTOP™ thermo-electric zone actuators.

MANIFOLD MIXING STATIONS

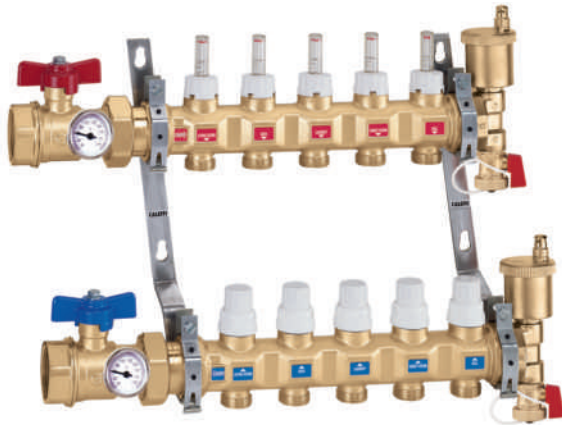


Thermostatic mixing station kit

For field assembly to a Caleffi radiant manifold assembly.
Grundfos UPS 15—58 three-speed pump or Alpha 25-55U.
1" NPT male adapters included to connect to manifold.
¾" NPT female riser connections.
Includes built-in hydraulic separator.

Code	Description	Lbs	USD
NA17256HE	Thermostatic mixing, Alpha 25-55U	4.1	969.00
NA17256	Thermostatic mixing, UPS 15-58U	4.1	760.00
NA16002	Alpha 25-55U replacement pump	2.3	416.00
NA10038	UPS 15-58U replacement pump	2.3	205.00
F19153	Replacement mixing valve	1.6	230.00

BRASS DISTRIBUTION MANIFOLDS



**668S1
TwistFlow™ Assembly**

Pre-assembled radiant manifold consisting of return distribution manifold complete with built-in shut-off valves suitable for thermo-electric actuator and supply distribution manifold complete with built-in sight flow meters and balancing valves with 2" gauges 30—210°F scale. 1" or 1¼" NPT inlet ball valves.

Temperature gauges.

Max. working pressure: 150 psi.

Max. working temperature: 180°F.

Max. peak temperature: 200°F.

Loop Cv: 1.23 (combined supply & return ports).

Flow meter scale: ¼ — 2 gpm.

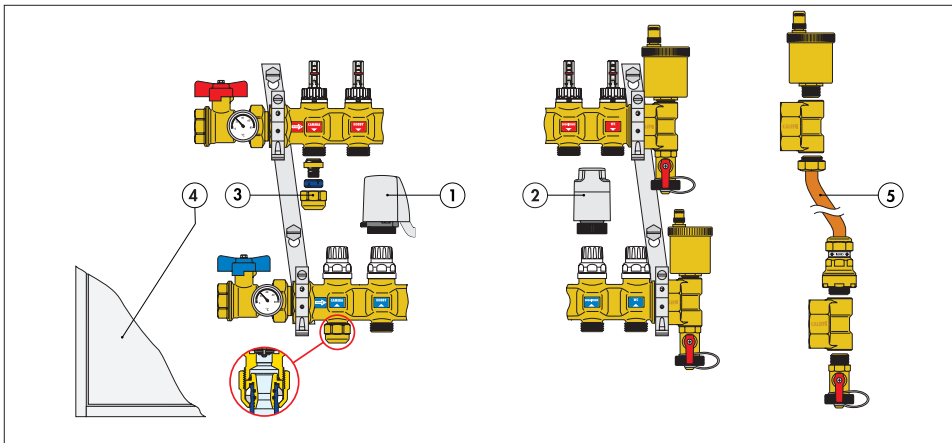
Outlet center distance: 2 in.

Models with "...IN" suffix are built inverted (tubing connections going upward).

Code	Description	No.	Outlets	Lbs	USD
6686C5S1A	1"	3	¾" M	17	483.00
6686C5S1A IN	1"	3	¾" M	17	483.00
6686D5S1A	1"	4	¾" M	18	553.00
6686D5S1A IN	1"	4	¾" M	18	553.00
6686E5S1A	1"	5	¾" M	19	623.00
6686E5S1A IN	1"	5	¾" M	19	623.00
6686F5S1A	1"	6	¾" M	21	694.00
6686F5S1A IN	1"	6	¾" M	21	694.00
6686G5S1A	1"	7	¾" M	23	763.00
6686G5S1A IN	1"	7	¾" M	23	763.00
6686H5S1A	1"	8	¾" M	24	834.00
6686H5S1A IN	1"	8	¾" M	24	834.00
6686I5S1A	1"	9	¾" M	26	904.00
6686I5S1A IN	1"	9	¾" M	26	904.00
6686L5S1A	1"	10	¾" M	28	974.00
6686L5S1A IN	1"	10	¾" M	28	974.00
6686M5S1A	1"	11	¾" M	29	1,044.00
6686M5S1A IN	1"	11	¾" M	29	1,044.00
6686N5S1A	1"	12	¾" M	31	1,114.00
6686N5S1A IN	1"	12	¾" M	31	1,114.00
6686O5S1A	1"	13	¾" M	33	1,185.00
6686O5S1A IN	1"	13	¾" M	33	1,185.00

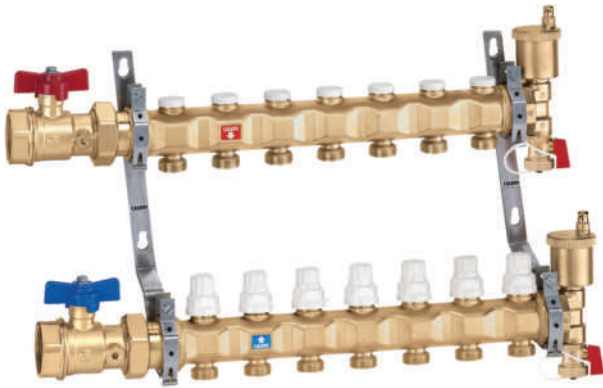
Code	Description	No.	Outlets	Lbs	USD
6687C5S1A	1¼"	3	¾" M	17	512.00
6687C5S1A IN	1¼"	3	¾" M	17	512.00
6687D5S1A	1¼"	4	¾" M	18	582.00
6687D5S1A IN	1¼"	4	¾" M	18	582.00
6687E5S1A	1¼"	5	¾" M	19	653.00
6687E5S1A IN	1¼"	5	¾" M	19	653.00
6687F5S1A	1¼"	6	¾" M	21	722.00
6687F5S1A IN	1¼"	6	¾" M	21	722.00
6687G5S1A	1¼"	7	¾" M	23	792.00
6687G5S1A IN	1¼"	7	¾" M	23	792.00
6687H5S1A	1¼"	8	¾" M	24	863.00
6687H5S1A IN	1¼"	8	¾" M	24	863.00
6687I5S1A	1¼"	9	¾" M	26	933.00
6687I5S1A IN	1¼"	9	¾" M	26	933.00
6687L5S1A	1¼"	10	¾" M	28	1,003.00
6687L5S1A IN	1¼"	10	¾" M	28	1,003.00
6687M5S1A	1¼"	11	¾" M	29	1,073.00
6687M5S1A IN	1¼"	11	¾" M	29	1,073.00
6687N5S1A	1¼"	12	¾" M	31	1,143.00
6687N5S1A IN	1¼"	12	¾" M	31	1,143.00
6687O5S1A	1¼"	13	¾" M	33	1,213.00
6687O5S1A IN	1¼"	13	¾" M	33	1,213.00

Manifolds and accessories



1. Thermo-electric actuator 6564 series.
2. Thermo-electric actuator with manual open handle, 6563 series.
3. Self-adjusting Universal PEX fitting, 680, 682 series.
4. Inspection wall box, 659 series.
5. Differential by-pass kit, code 668000.

DISTRIBUTION MANIFOLDS



**663
Pre-assembled distribution
assembly**

Pre-assembled distribution assembly consisting of return distribution manifold complete with built-in shut-off valves suitable for thermo-electric actuator and supply distribution manifold complete with manually-adjustable balancing valves.

1" or 1¼" NPT inlet ball valves.

Loop Cv: 2.3 (combined supply & return ports).

Max. working pressure: 150 psi.

Max. temperature: 210°F.

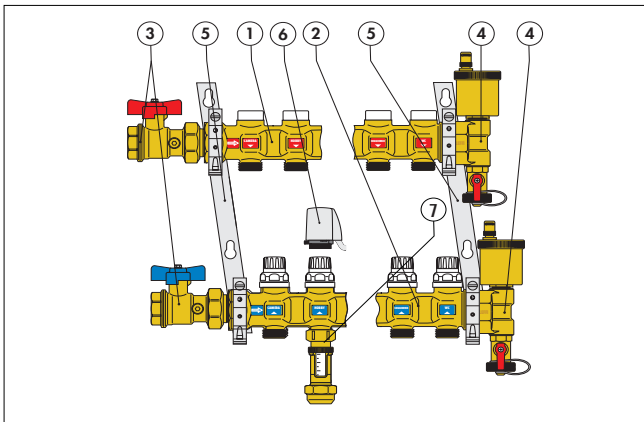
Outlet center distance: 2 in.

Models with "...IN" suffix are built inverted (tubing connections going upward).

Code	Description	No.	Outlets	Lbs	USD
6636C5A	1"	3	¾" M	17	395.00
6636C5A IN	1"	3	¾" M	17	395.00
6636D5A	1"	4	¾" M	18	457.00
6636D5A IN	1"	4	¾" M	18	457.00
6636E5A	1"	5	¾" M	19	518.00
6636E5A IN	1"	5	¾" M	19	518.00
6636F5A	1"	6	¾" M	21	579.00
6636F5A IN	1"	6	¾" M	21	579.00
6636G5A	1"	7	¾" M	23	640.00
6636G5A IN	1"	7	¾" M	23	640.00
6636H5A	1"	8	¾" M	24	702.00
6636H5A IN	1"	8	¾" M	24	702.00
6636I5A	1"	9	¾" M	26	763.00
6636I5A IN	1"	9	¾" M	26	763.00
6636L5A	1"	10	¾" M	28	825.00
6636L5A IN	1"	10	¾" M	28	825.00
6636M5A	1"	11	¾" M	29	886.00
6636M5A IN	1"	11	¾" M	29	886.00
6636N5A	1"	12	¾" M	31	947.00
6636N5A IN	1"	12	¾" M	31	947.00
6636O5A	1"	13	¾" M	33	1,009.00
6636O5A IN	1"	13	¾" M	33	1,009.00
6636P5A	1"	14	¾" M	35	1,185.00
6636P5A IN	1"	14	¾" M	35	1,185.00

Code	Description	No.	Outlets	Lbs	USD
6637C5A	1¼"	3	¾" M	17	421.00
6637C5A IN	1¼"	3	¾" M	17	421.00
6637D5A	1¼"	4	¾" M	18	482.00
6637D5A IN	1¼"	4	¾" M	18	482.00
6637E5A	1¼"	5	¾" M	19	543.00
6637E5A IN	1¼"	5	¾" M	19	543.00
6637F5A	1¼"	6	¾" M	21	605.00
6637F5A IN	1¼"	6	¾" M	21	605.00
6637G5A	1¼"	7	¾" M	23	666.00
6637G5A IN	1¼"	7	¾" M	23	666.00
6637H5A	1¼"	8	¾" M	24	728.00
6637H5A IN	1¼"	8	¾" M	24	728.00
6637I5A	1¼"	9	¾" M	26	788.00
6637I5A IN	1¼"	9	¾" M	26	788.00
6637L5A	1¼"	10	¾" M	28	850.00
6637L5A IN	1¼"	10	¾" M	28	850.00
6637M5A	1¼"	11	¾" M	29	911.00
6637M5A IN	1¼"	11	¾" M	29	911.00
6637N5A	1¼"	12	¾" M	31	974.00
6637N5A IN	1¼"	12	¾" M	31	974.00
6637O5A	1¼"	13	¾" M	33	1,035.00
6637O5A IN	1¼"	13	¾" M	33	1,035.00
6637P5A	1¼"	14	¾" M	35	1,216.00
6637P5A IN	1¼"	14	¾" M	35	1,216.00

Construction



1. Supply manifold.
2. Return manifold complete with shut-off valves that can be used with thermo-electric actuators.
3. Pair of shut-off ball valves (complete with port for optional temperature gauge only for 1 1/4" version).
4. End fittings consisting of a 3-way end fitting, automatic air vent valve and drain cock.
5. Pair of mounting brackets for use with series 659 boxes or direct wall installation.
6. Thermo-electric actuator, series 6564 or 6563.
7. Flow meter, code NA669.

BOXES FOR DISTRIBUTION MANIFOLDS



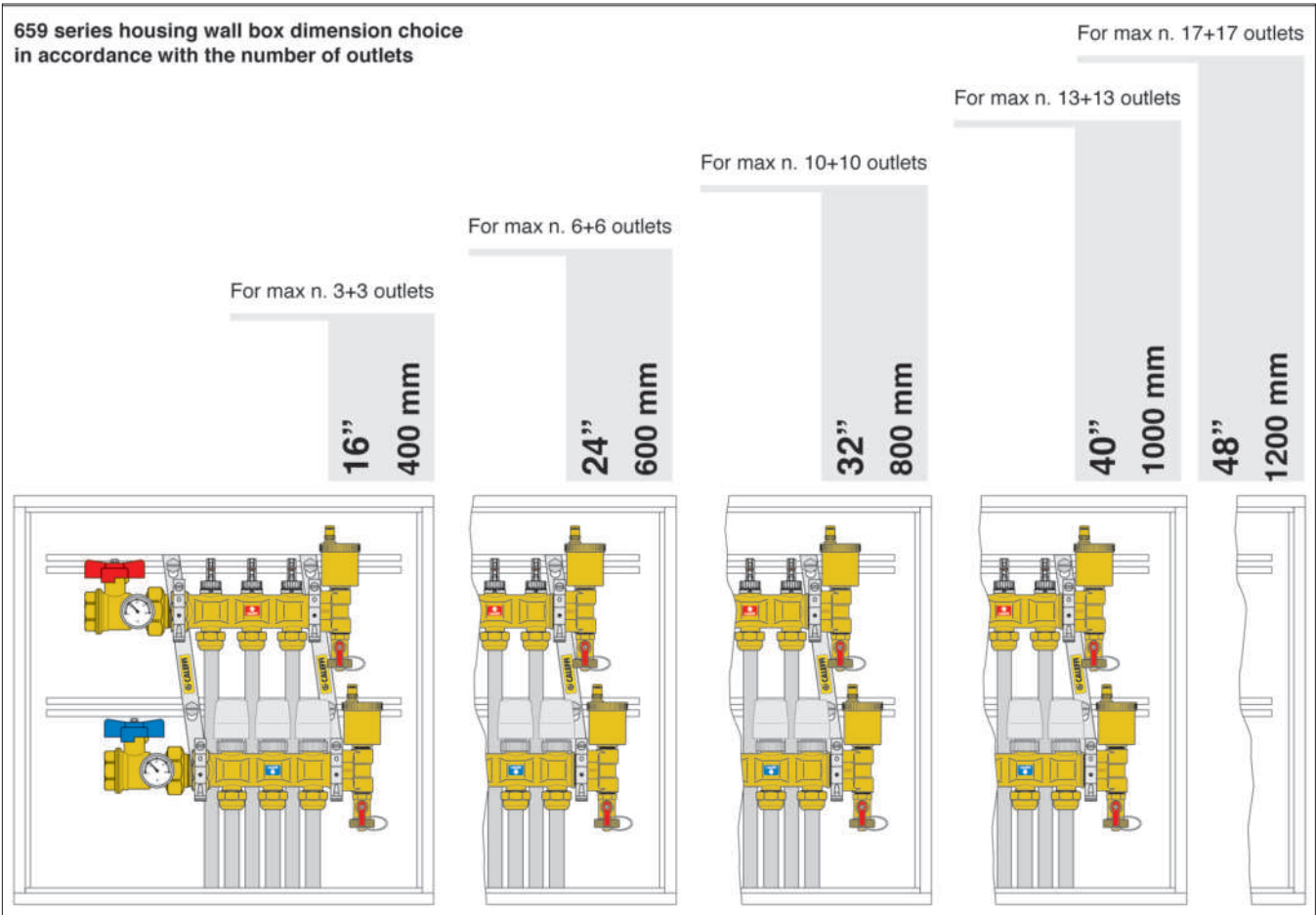
**659
Manifold cabinet**

Housing wall box fits 663 and 668S1 series manifolds.
Adjustable depth: 4³/₈" – 5¹/₂".
Powder coated painted 18 gauge sheet metal.
With push-fit clamp.

Code	Description	H	Max Outlets	Lbs	USD
659044	16" width	20"	3	17	255.00
659064	24" width	20"	6	23	278.00
659084	32" width	20"	10	30	327.00
659104	40" width	20"	13	37	376.00
659124	48" width	20"	17	44	425.00

Rough opening dimensions

659 series housing wall box dimension choice in accordance with the number of outlets



FITTINGS FOR DISTRIBUTION MANIFOLDS AND MIXING STATIONS



(680504A shown)

**680
Universal
PEX fittings**

680 series fittings are compatible with any ASTM F876 single layer PEX.
Max. working pressure: 150 psi.
Working temperature range for ASTM F876 PEX piping: 40–180°F.

Code	Description	Compression ring	Lbs	USD
680507	5/16" nominal PEX	Blue	0.2	7.90
680503A	3/8" nominal PEX	Black	0.2	7.90
680504A	1/2" nominal PEX	Blue	0.2	7.90
680555A	5/8" nominal PEX	Black	0.2	7.90
680505A	3/4" nominal PEX	Brass	0.2	7.90



(682530A shown)

**682
Universal
PEX-AL-PEX fittings**

682 series fittings are compatible with any ASTM F1281 multilayer PEX-AL-PEX pipe.
Max. working pressure: 150 psi.
Working temperature range for ASTM F1281 PEX-AL-PEX piping: 40–200°F with tubing rated 200°F.

Code	Description	Lbs	USD
682530A	3/8" nominal PEX-AL-PEX	0.2	8.10
682540A	1/2" nominal PEX-AL-PEX	0.2	8.10
682545A	5/8" nominal PEX-AL-PEX	0.2	8.70
682550A	3/4" nominal PEX-AL-PEX	0.2	15.40

Construction details

There is a large variety of PEX and PEX-AL-PEX pipes available with a wide range of permissible tolerances. This fitting is designed to adapt to several pipe diameter tolerances. This innovative solution for mechanical fittings has been constructed so that the same fitting can be used for pipes with different external diameter tolerances and differences on internal diameters tolerances while maintaining the nominal dimensions.

Resistance to pull out

This fitting offers a high degree of resistance to pull out of pipe. Its special clamping system makes it suitable for every application and ensures a leak tight fit.

Low pressure losses

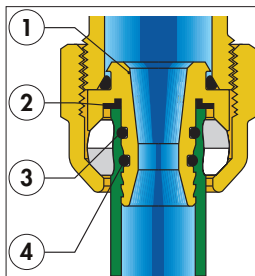
The internal profile of the adapter (1) is shaped to obtain a Venturi effect when the fluid passes through, reducing pressure losses by 20%, compared to a similar diameter.

Insulation ring

The fitting is equipped with a rubber insulation element (2) to prevent contact between the aluminium in PEX-AL-PEX pipe and the brass fitting, thus preventing galvanic corrosion generated by the two different metals.

Dual O-ring seal

The adapter is equipped with two O-ring seals (3) and (4) in EPDM to prevent leaks even when operating at high pressure.



NA102

Sweat connection fitting fits 1/2" copper.
Max. working pressure: 150 psi.
Working temperature range: 41–250°F.
Chrome plated nut.
Does not work with 668S1 and 172 series.

Code	Description	Lbs	USD
NA10262	1/2" sweat	0.2	8.80



NA103

NPT connection fitting.
Max. working pressure: 150 psi.
Working temperature range: 41–250°F.
Chrome plated nut.
Does not work with 668S1 and 172 series.

Code	Description	Lbs	USD
NA10313	1/2" NPT male	0.2	9.50



386

Cap to plug unused manifold outlets on 592, 663 and 668S1 series.

Code	Description	Lbs	USD
386500	3/4" straight thread	0.2	7.90



Double nipple for coupling PEX fittings.

Code	Description	Lbs	USD
942550	3/4" x 3/4" thread	0.1	9.80



Wrench for tightening PEX fitting to manifolds.

Code	Description	Lbs	USD
387100	26 mm x 30 mm	1.5	37.50

BRASS DISTRIBUTION MANIFOLD ACCESSORIES



668

Off-center by-pass assembly with fixed crack setting of 3.6 psi differential pressure. Max working pressure: 150 psi. Working temperature range: 15—230°F.

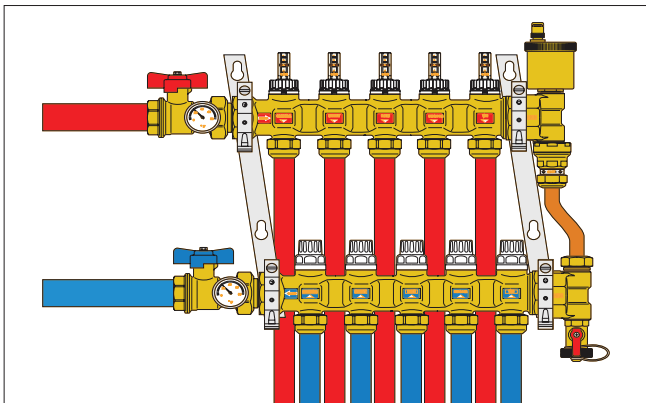
Code	Description	Lbs	USD
668000	1/2" x 1/2"	0.5	74.90



6564

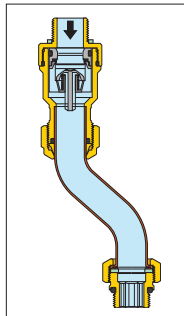
Low current draw thermo-electric actuator. Hermetically sealed for upside down installation. Pop-up feature
Power supply: 24 V AC/DC.
Initial current draw: ≤ 250 mA.
Power consumption: 3 W.
Rating of micro-switch contacts: 5 A (24 V).
31.5" wire lead connection.

Code	Description	Lbs	USD
656404	24 V AC/DC	0.4	65.00
656414	24 V AC/DC with micro-switch	0.4	82.10



The by-pass valve contains a check valve connected to a contact spring. When the fixed setting pressure is reached, the valve disk gradually opens, recirculating the flow in proportion to the closing of the thermo-electric valves and maintaining a constant differential pressure in the manifold circuit.

The differential by-pass assembly features a fixed setting that cannot be changed. The small, compact size and offset connections makes this kit particularly easy to mount after installing thermo-electric valves on the manifold. It does not require a larger or deeper zone box than those used for normal manifolds.



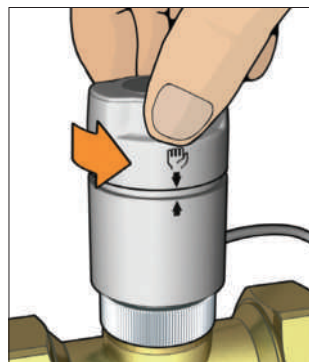
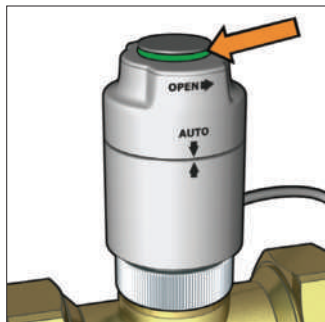
6563 TwisTop™



TwisTop™ thermo-electric actuator. Twist the top to manually open. Power supply: 24 V AC/DC. Initial current draw: ≤ 250 mA. Power consumption: 3 W. Rating of micro-switch contacts: 5 A (24 V). US Patent 7,617,989 B2.

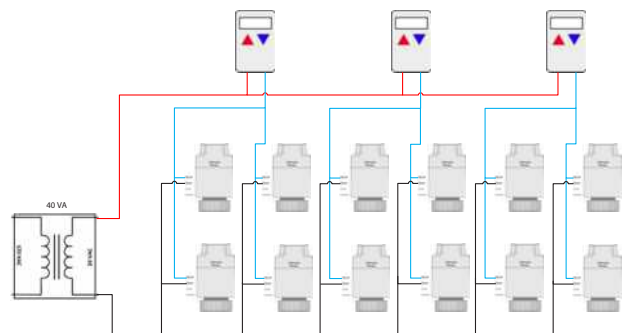
Code	Description	Lbs	USD
656344	24 V AC/DC	0.4	87.10
656354	24 V AC/DC with micro-switch	0.4	103.00
656354R	24 V AC/DC with micro-switch Rehau	0.4	113.00

Simply twist to manually open actuator (and activate micro switch on 656354). When power is applied, it returns to Auto position.



Green ring indicates valve is open.

Up to 12 actuators per 40 VA transformer.



ACCESSORIES



Replacement balance/flow meter fits 668S1 series manifold.
Flow meter scale: ¼ — 2 gpm.

Code	Description	Lbs	USD
F69600	Fits 668S1 supply manifold	0.2	22.90



Replacement shut-off valve fits 668S1 series manifold.

Code	Description	Lbs	USD
F69590	Fits 668S1 return manifold	0.3	18.30



Replacement balancing valve fits 668 series manifold.

Code	Description	Lbs	USD
F69184	Fits 668 supply manifold	0.2	16.00



Replacement shut-off valve fits 668 & 663 series manifold.

Code	Description	Lbs	USD
69122 CST	Fits 668 & 663 return manifold	0.3	10.20



Replacement balancing valve for 663 series manifold.

Code	Description	Lbs	USD
R69176	Fits 663 supply manifold	0.3	15.70



NA669

Flow meter fits manifolds.
Max: temperature: 180°F (669050).
Max: temperature: 210°F (NA669 series).
¾" straight male x ¼" straight female connections.

Code	Description	Lbs	USD
669050	1 — 4 LPM	0.4	27.10
NA669150	¼ — 1 GPM High Temp.	0.3	27.10
NA669250	½ — 2 GPM High Temp.	0.3	27.10



White replacement knob fits 663 and 668S1 series manifolds.

Code	Description	Lbs	USD
449000	Knob	0.5	7.90



5020

Replacement air vent fits radiant manifolds. Brass body.
Hygroscopic safety air vent cap.
Max. working pressure: 150 psi
Max discharge pressure: 60 psi
Max. working temperature: 250°F.

Code	Description	Lbs	USD
502043 CST	½" straight thread	0.6	19.20



Plastic replacement/test cap fits 5020 series.

Code	Description	Lbs	USD
R56214	Vent cap	0.1	1.70

675



Snap-on thermometer directly to PEX, PEX-AL-PEX and copper piping.
Box of 10 comes with 1 syringe of thermo conductive paste.



Code	Description	Lbs	USD
675900A	¾" & 5/8" PEX & ½" copper	0.2	8.50
R69413	Syringe of thermo conductive paste	0.1	6.00



688

Temperature gauge with well pocket fitting for inserting into manifold ball valves.
Working Temperature range: 30—210° F.
Face dial diameter: 2".

Code	Description	Lbs	USD
R39591	Replacement gauge	0.1	20.80
688003A	Gauge with pocket well	0.2	31.80
NA10498	Replacement pocket well, low lead	0.1	3.10
F67037	O-ring fits NA10498	0.1	0.70

Cutting-Edge Innovation in Temperature Mixing



Caleffi Mixing Valves Lead the Way

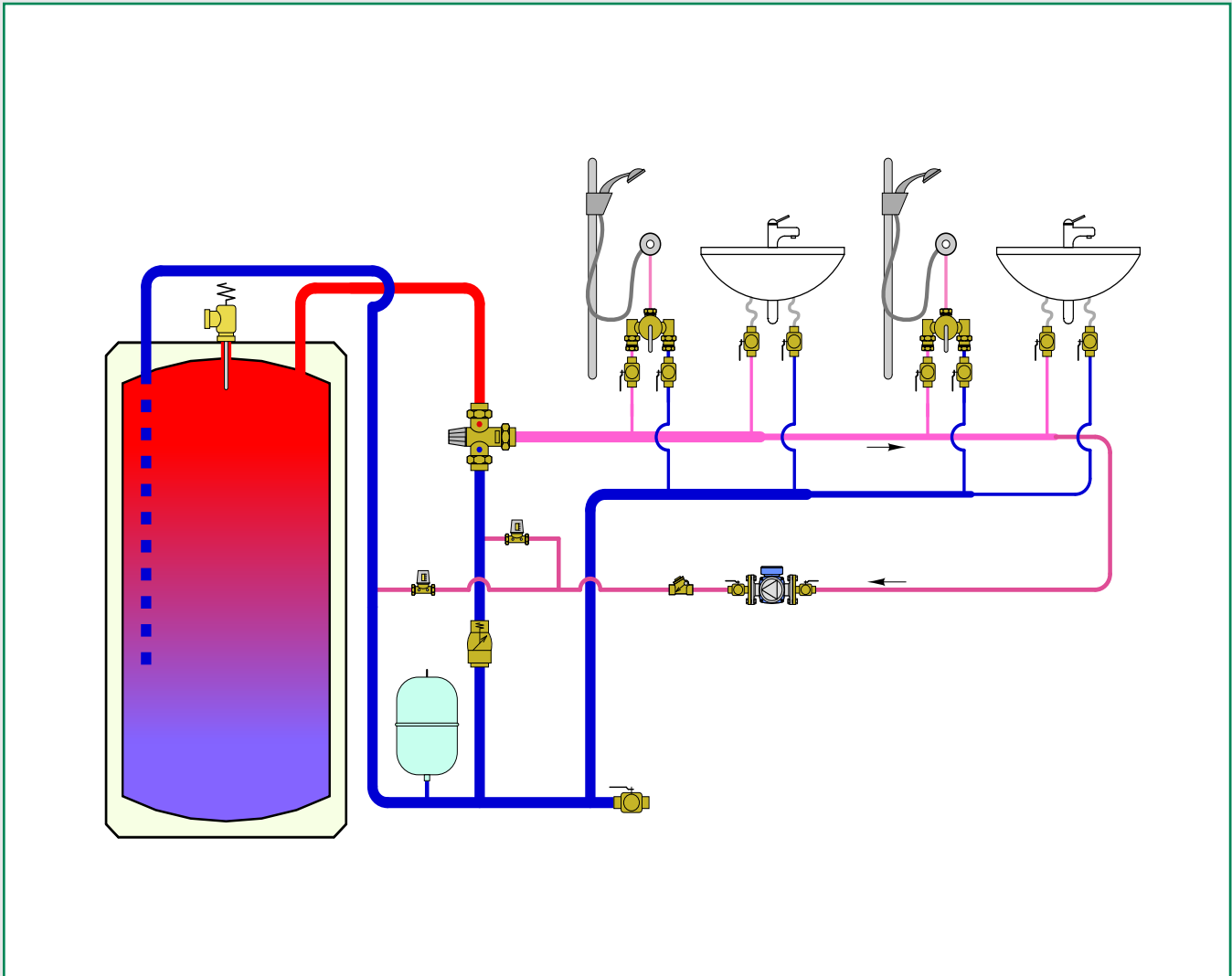
- Feature-rich portfolio of thermostatic and digital mixing solutions.
- Over 50 years of proven, reliable service worldwide.
- Broad assortment of union connections for piping flexibility.
- Compliance with ANSI/NSF 372-2011 low lead, ASSE 1017, ASSE 1070 (anti-scald), CSA B125.3, UPC, IPC, IRC, NPC for the USA and Canada.



Controlling and protecting your water

MIXING VALVES FOR PLUMBING AND HYDRONICS

This diagram is for illustration purposes only



6A

PRODUCTS INCLUDED IN SECTION

- Thermostatic mixing valves for plumbing and hydronics
- High flow thermostatic mixing valves for plumbing and hydronics
- Scald protection thermostatic mixing valves for plumbing
- Mixing valves for centralized hydronic systems
- Electronic mixing valve for plumbing
- High/low thermostatic mixing valve for plumbing
- Thermostatic mixing valve kit for domestic water heaters

THERMOSTATIC MIXING VALVES FOR PLUMBING AND HYDRONICS



**521
MixCal™**

Adjustable thermostatic mixing valve for point of distribution in domestic water systems and radiant hydronic heating systems. Low-lead brass body. Locking set point knob. Max. working pressure: 200 psi. Max. inlet temperature: 200°F. Adjustable range: 85 – 150°F. Min. flow for optimum performance: 1.0 gpm. (0 gpm with recirculation) Max flow for optimum performance 14 gpm.

ASSE 1017



**521
MixCal™ with gauge**

Adjustable thermostatic mixing valve for point of distribution in domestic water systems and radiant hydronic heating systems. Low-lead brass body. Locking set point knob. Max. working pressure: 200 psi. Max. inlet temperature: 200°F. Adjustable range: 85 – 150°F. Min. flow for optimum performance: 1.0 gpm. (0 gpm with recirculation) Max flow for optimum performance 14 gpm. Optional Gauge scale: 30 – 210°F.

ASSE 1017

Code	Description	Cv	Lbs	USD
521409A	½" sweat union	3	2.4	157.00
521409AC	½" sweat union, check valves	3	2.4	174.00
521400A	½" NPT male union	3	2.4	164.00
521400AC	½" NPT male union, check valves	3	2.4	180.00
521406A	½" Press union	3	2.4	167.00
521407A	½" PEX crimp union	3	2.4	157.00
521407AC	½" PEX crimp union, check valves	3	2.9	174.00
521408A	½" PEX expansion union	3	2.4	157.00
521408AC	½" PEX expansion union, check valves	3	2.9	174.00
521509A	¾" sweat union	3	2.4	164.00
521509AC	¾" sweat union, check valves	3	2.4	188.00
521500A	¾" NPT male union	3	2.4	172.00
521500AC	¾" NPT male union, check valves	3	2.4	195.00
521506A	¾" Press union	3	2.4	172.00
521506AC	¾" Press union, check valves	3	2.5	212.00
521507A	¾" PEX crimp union	3	2.4	164.00
521507AC	¾" PEX crimp union, check valves	3	2.9	188.00
521508A	¾" PEX expansion union	3	2.4	164.00
521508AC	¾" PEX expansion union, check valves	3	2.9	188.00
521609A	1" sweat union	3	2.4	195.00
521609AC	1" sweat union, check valves	3	2.4	219.00
521600A	1" NPT male union	3	2.4	203.00
521600AC	1" NPT male union, check valves	3	2.4	226.00
521606A	1" Press union	3	2.6	207.00
521607A	1" PEX crimp union	3	2.4	195.00
521607AC	1" PEX crimp union, check valves	3	2.9	219.00
521608A	1" PEX expansion union	3	2.4	195.00
521608AC	1" PEX expansion union, check valves	3	2.9	219.00

Code	Description	Cv	Lbs	USD
521419A	½" sweat union	3	2.9	186.00
521419AC	½" sweat union, check valves	3	2.9	202.00
521410A	½" NPT male union	3	2.9	193.00
521410AC	½" NPT male union, check valves	3	2.9	209.00
521416A	½" Press union	3	2.9	196.00
521417A	½" PEX crimp union	3	2.5	186.00
521417AC	½" PEX crimp union, checks	3	2.9	202.00
521418A	½" PEX expansion union	3	2.5	186.00
521418AC	½" PEX expansion union, checks	3	2.9	202.00
521519A	¾" sweat union	3	2.9	193.00
521519AC	¾" sweat union, check valves	3	2.9	217.00
521510A	¾" NPT male union	3	2.9	201.00
521510AC	¾" NPT male union, check valves	3	2.9	224.00
521516A	¾" Press union	3	2.9	201.00
521516AC	¾" Press union checks	3	3	241.00
521517A	¾" PEX crimp union	3	2.5	193.00
521517AC	¾" PEX crimp union, checks	3	2.9	217.00
521518A	¾" PEX expansion union	3	2.5	193.00
521518AC	¾" PEX expansion union, checks	3	2.9	217.00
521619A	1" sweat union	3	2.9	225.00
521619AC	1" sweat union, check valves	3	2.9	248.00
521610A	1" NPT male union	3	2.9	233.00
521610AC	1" NPT male union, check valves	3	2.9	256.00
521616A	1" Press union	3	3.1	237.00
521617A	1" PEX crimp union	3	2.5	225.00
521617AC	1" PEX crimp union, checks	3	2.9	248.00
521618A	1" PEX expansion union	3	2.5	225.00
521618AC	1" PEX expansion union, checks	3	2.9	248.00

Meets requirements of ANSI/NSF 372-2011. Certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

ACCESSORIES



Replacement check valves for 521 (AC models) and 5213.

Code	Description	Lbs	USD
NA10405	Repl. check for 521 PEX, press fittings	0.1	2.00
R39204	Repl. check for 521 sweat, NPT fittings	0.1	2.70
NA10479	Replacement check for 521333A	0.1	1.80



Conical inlet filter for 521 and 5213 mixing valves.

Code	Description	Lbs	USD
F52429	Conical filter	0.1	4.00

THERMOSTATIC MIXING VALVES FOR PLUMBING AND HYDRONICS



Point of distribution mixed temperature gauge adaptor fits 1" male union thread mixing valves.
Removable gauge fits into pocket well.
Gauge scale: 30–210°F.
Gauge accuracy: ± 6°F.
Gauge dial: 2" diameter.
Certified: Low-lead brass.

Code	Description	Lbs	USD
NA10328	1/2" sweat with gauge	0.4	46.60
NA10056	3/4" sweat with gauge	0.4	51.20
NA10058	1" sweat with gauge	0.4	56.20
NA10358	1" union thread with gauge	0.4	29.30
688003A	Replacement gauge with pocket well	0.5	31.80
R39591	Replacement gauge	0.1	20.80
NA10498	Pocket well, plated	0.1	3.10

Meets requirements of ANSI/NSF 372-2011. Certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.



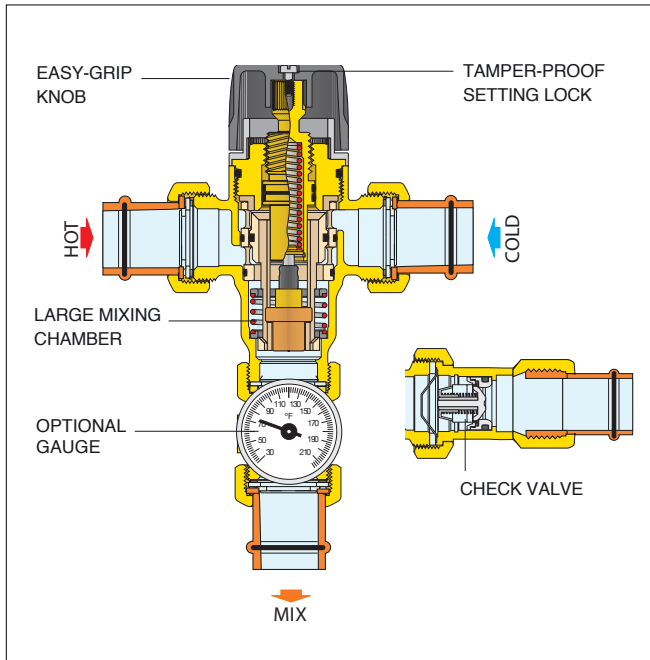
520 AngleMix™ with gauge

Adjustment temperature range: 95°F — 150°F.
Max. working pressure (static): 150 psi.
Max. working pressure (dynamic): 75 psi.
Max. inlet temperature: 195°F.
Gauge scale: 30–210°F.
Minimum flow for optimum performance: 0.5 gpm (0 gpm with recirculation).
Max flow for optimum performance 9 gpm.

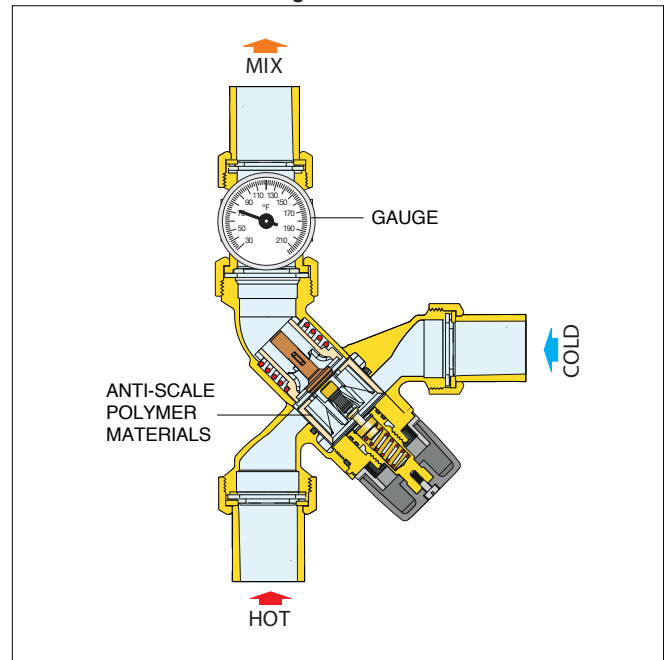
ASSE 1017

Code	Description	Cv	Lbs	USD
520516A	3/4" angle, press union	2	2.8	201.00
520516AC	3/4" angle, press union, checks	2	2.8	241.00
520519A	3/4" angle, sweat union	2	2.8	193.00
520519AC	3/4" angle, sweat union, checks	2	2.8	217.00

Construction details 521 MixCal™



Construction details 520 AngleMix™



521 MixCal™ Body

Replacement body. See fitting selection table in Section 8.

ASSE 1017

Code	Description	Cv	Lbs	USD
521101A	1" male union thread	3	1.9	121.00



520 AngleMix™ Body

Replacement body. See fitting selection table in Section 8.

ASSE 1017

Code	Description	Cv	Lbs	USD
520051A	1" male union thread	2	2.0	121.00

HIGH FLOW THERMOSTATIC MIXING VALVES FOR PLUMBING AND HYDRONICS

Model 5231 series high flow thermostatic mixing valves for centralized systems are designed to be installed at the domestic water heater (point of distribution). For safety reasons, it is advisable to limit the maximum mixed water temperature to 120°F (when anti-scald valves are not installed at point-of-use). 5231 series thermostatic mixing valves can also be used for regulating the flow temperature in radiant panel heating systems, to which it assures a constant and accurate control with ease of installation. Meets requirements of ANSI/NSF 372-2011. Certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.



5231 MixCal+™

Adjustable thermostatic mixing valve for domestic water systems and radiant hydronic systems. DZR low lead brass body. Max. working pressure: 200 psi. Max. inlet temperature: 195°F. Adjustable range: 95—150°F.

ASSE 1017

Code	Description	Min - Max Flow (gpm)	Cv	Lbs	USD
523168A	1" sweat union	4.4 to 40	7	7	887.00
523160A	1" NPT male union	4.4 to 40	7	7	896.00
523166A	1" press union	4.4 to 40	7	7	944.00
523178A	1¼" sweat union	4.4 to 40	7.6	7	927.00
523176A	1¼" press union	4.4 to 40	7.6	7	987.00
523170A	1¼" NPT male union	4.4 to 40	7.6	7	970.00
523188A	1½" sweat union	8.8 to 70	13	17	1,394.00
523186A	1½" press union	8.8 to 70	13	17	1,519.00
523180A	1½" NPT male union	8.8 to 70	13	17	1,428.00
523198A	2" sweat union	8.8 to 70	14.2	18	1,466.00
523196A	2" press union	8.8 to 70	14.2	18	1,688.00
523190A	2" NPT male union	8.8 to 70	14.2	18	1,503.00



5231 MixCal+™ Body Sweat

Replacement body includes nuts and washers. See fitting selection table in Section 8.

ASSE 1017

Code	Description	Min - Max Flow (gpm)	Cv	Lbs	USD
523179A	For 1" and 1¼" sizes	4.4 to 40	7.6	5.0	798.00
523199A	For 1½" and 2" sizes	8.8 to 70	14.2	14.2	1,141.00



5231 MixCal+™ Sweat

Adjustable thermostatic mixing valve for domestic water systems and radiant hydronic systems. DZR low lead brass body. Max. working pressure: 200 psi. Max. inlet temperature: 195°F. Adjustable range: 95—150°F. Gauge scale: 30—210°F. Gauge accuracy: ± 6°F. Gauge dial: 2" diameter.

ASSE 1017

Code	Description	Min - Max Flow (gpm)	Cv	Lbs	USD
523177A	1¼" sweat union	4.4 to 40	7.6	9.0	997.00



Point of distribution mixed temperature gauge adaptor fits High Flow 5231 series mixing valves. Removable gauge fits into pocket well. Gauge scale: 30—210°F. Gauge accuracy: ± 6°F. Gauge dial: 2" diameter. Certified: Low-lead brass.

Code	Description	Lbs	USD
NA10315	1¼" sweat	0.5	113.00
NA10476	1" and 1¼" male x female union	3.0	128.00
NA10461	1½" and 2" male x female union	4.0	223.00
688003A	Replacement gauge with pocket well	0.2	31.80
R39591	Replacement gauge	0.1	20.80



Inlet check valve assembly for installing on inlet union tail pieces of 5231 mixing valves. Stainless steel body. No Lead. Ordered separately, field installed. Assembly examples shown below.



523177A shown with (2) NA10366 523178A shown with (2) NA10366

Code	Description	Lbs	USD
NA10366	Check valve assembly 1" and 1¼"	1.0	49.80
NA10367	Check valve assembly 1½" & 2"	1.5	123.00

SCALD PROTECTION THERMOSTATIC MIXING VALVES FOR PLUMBING

NEW



5212 SinkMixer™ 4-way Scald Protection Point-of-use

Thermostatic mixing valve for under sink and under counter applications where the user must be protected from the danger of scalding caused by hot water.

Temperature adjustment range: 95 – 120°F.

Cold inlet temperature: Min. 39°F; Max. 85°F.

Hot inlet temperature: Min. 120°F; Max. 195°F.

Maximum operating differential pressure:

Static: 150 psi (10 bar).

Dynamic: 70 psi (5 bar).

Min. operating differential pressure (dynamic): 1.5 psi (0.1 bar).

Min flow for optimum performance 0.35 gpm.

Max flow for optimum performance 2.3 gpm.

ASSE 1070

Code	Description	Cv	Lbs	USD
521201A	3/8" compression union	0.52	1	100.00



5213 Scald Protection Point-of-Use

Adjustable thermostatic mixing valve for point of use where protected from scalding caused by hot water with locking set point. Complete with check valves on both hot and cold inlets.

Low-lead brass body.

Max. working pressure: 150 psi.

Max. inlet temperature: 185°F.

Adjustable range: 85 – 120°F.

Temperature control: ±3°F.

Min. flow for optimum performance: 0.5 gpm.

Max flow for optimum performance 9 gpm.

ASSE 1070

Code	Description	Cv	Lbs	USD
521333A	3/8" compression union	2	2	139.00
521347A	1/2" PEX crimp union	2	2	164.00
521348A	1/2" PEX expansion union	2	2	164.00
521342A	1/2" NPT male union	2	2	172.00
521349A	1/2" sweat union	2	2	164.00
521357A	3/4" PEX crimp union	2	2	172.00
521358A	3/4" PEX expansion union	2	2	172.00
521352A	3/4" NPT male union	2	2	179.00
521359A	3/4" sweat union	2	2	172.00
521367A	1" PEX crimp union	2	2	205.00
521368A	1" PEX expansion union	2	2	205.00
521362A	1" NPT male union	2	2	212.00
521369A	1" sweat union	2	2	205.00
521301A*	Replacement body, no fittings	2	1.5	113.00

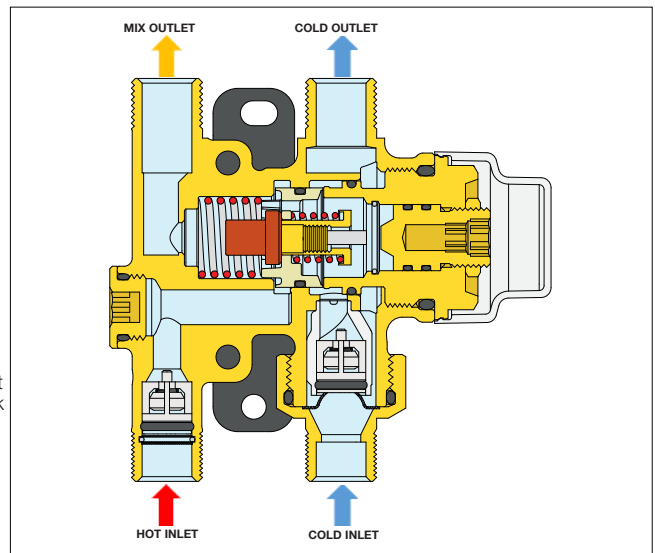
*See fitting selection table in Section 8.

Operating principle 5212 SinkMixer™

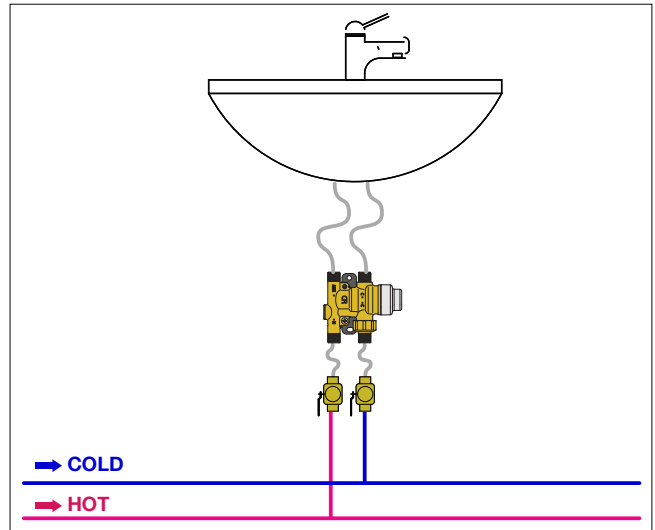
The thermostatic mixing valve mixes hot and cold water in such a way as to maintain constant set temperature of the mixed water at the outlet. A thermostatic element is fully immersed into the mixed water. This element then contracts or expands causing movement of the piston, closing either the hot or cold inlets, regulating the flow rates entering the valve. If there are variations of temperature or pressure at the inlets, the internal element automatically reacts to restore the original temperature setting. In the event of a failure of either the hot or cold supply, the piston will shut off, stopping water discharging from the mixed water outlet.

Thermal shutoff

In the event of a failure of the hot supply port, the piston closes the cold supply port. Similarly, if the cold water supply fails, the piston closes the hot supply port. The Caleffi 521201A thermostatic mixing valve requires a minimum temperature differential from hot inlet to mixed water outlet of 18°F (10°C) to ensure the correct operation of the thermal shutoff feature.



SinkMixer installation diagram



Meets requirements of ANSI/NSF 372-2011. Certified to ASSE 1070, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

ELECTRONIC MIXING VALVE FOR PLUMBING



6000 LEGIOMIX®

Electronic mixing valve with optional selectable programs for thermal disinfection of hot water recirculation system to kill Legionella bacteria.
 Code number includes:
 three-way ball valve
 3-wire floating control actuator
 controller/user interface with DIN rail mounting bracket
 mixed outlet temperature sensor/probe
 return temperature sensor/probe
 mixed outlet temperature gauge
 optional Modbus-to-BACnet gateway for BAS integration

Power: 24 VAC +/- 10% - 50/60 Hz - 6 VA.
 115/24 VAC transformer included.
 Adjustment temperature range: 70 — 185°F.
 Disinfection temperature range: 100 — 185°F.
 Max. working pressure: 230 psi.
 Max. inlet temperature: 212°F.
 Protection class: IP 54 (controller).
 Meets requirements of ANSI/NSF 372-2011 and certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

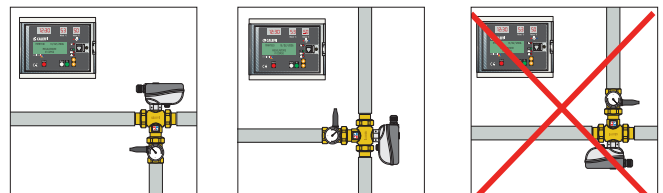
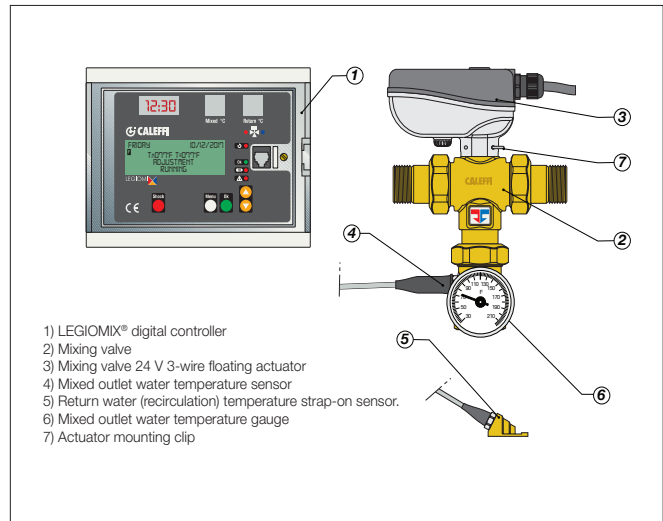
ASSE 1017

Code	Description		Cv	Lbs	USD
600054A	¾" NPT male union	NEW	9.7	5.1	2,236.00
600059A	¾" sweat union	NEW	9.7	5.1	2,214.00
600056A	¾" press union	NEW	9.7	5.1	2,332.00
600064A	1" NPT male union		21	7.3	2,459.00
600069A	1" sweat union		21	7.3	2,450.00
600066A	1" press union		21	7.3	2,509.00
600074A	1-1/4" NPT male union		24	8.2	2,535.00
600079A	1¼" sweat union		24	8.2	2,491.00
600076A	1¼" press union		24	8.2	2,553.00
600084A	1½" NPT male union		34	21	2,862.00
600089A	1½" sweat union		34	21	2,827.00
600086A	1½" press union		34	21	2,956.00
600094A	2" NPT male union		48	22	2,940.00
600099A	2" sweat union		48	22	2,900.00
600096A	2" press union		48	22	3,131.00
600060A	2½" ANSI 150 flanges	NEW	105	30	10,566.00
600080A	3" ANSI 150 flanges	NEW	120	42	11,184.00

Function

The electronic mixing valve is used in centralized systems that produce and distribute domestic hot water. It maintains the temperature of the domestic hot water delivered to the user when there are variations in the temperature and pressure of the hot and cold water at the inlet or in the draw-off flow rate. The LEGIOMIX® electronic mixing valve provides precise temperature control over very low and very high flow rate demand, minimal pressure drop with a ball valve control element, automatic self-cleaning to prevent scale formation and easy-to-use digital interface with data logging, alarming and status indication. The LEGIOMIX® electronic mixing valve is furnished with a controller with LCD user interface that provides a set of programs for circuit thermal disinfection to kill Legionella and is configurable via keypad, or local or remote computer. Depending on the type of system and habits of the user, temperature levels and operation times can be programmed as desired. In addition, it comes standard with monitoring and remote control connections.

Characteristic components



Size	Recommended Flow Rates (gpm/lpm)						
	¾"	1"	1¼"	1½"	2"	2½"	3"
Minimum flow*	2.2 / 8.3	3.1 / 11.7	4.4 / 16.6	6.6 / 25	8.8 / 33.3	17.0 / 64	22.0 / 83.3
Design flow**	27 / 102	58 / 220	66 / 250	93 / 352	131 / 495	288 / 1,090	329 / 1,245
Maximum flow	43 / 172	94 / 356	107 / 405	152 / 575	215 / 814	470 / 1,780	537 / 2,033
Cv	9.7	21	24	34	48	105	120

*to ensure stable operation and ± 3° F accuracy. Minimum flow rate is 0 gpm when recirculation flow rate is greater than or equal to the valve size minimum flow rating.
 **suggested maximum flow rate for optimum modulating control (at 7.5 psid pressure drop).

ELECTRONIC MIXING VALVE FOR PLUMBING



6000 LEGIOMIX® Station

Electronic mixing valve with optional selectable programs for thermal disinfection of hot water recirculation system to kill Legionella bacteria, in a packaged wall mount configuration.

Station assembly includes pre-piped 3-way mixing valve with union connections, serviceable check valves, a recirculation connection and isolation valves for fast and simple installation, all mounted on welded, powder-coat painted steel strut. The LEGIOMIX® controller/user interface with DIN rail mounting bracket is pre-mounted and pre-wired and includes a return water temperature sensor. Simply wall mount the assembly, hook up the hot and cold water supplies, mixed outlet, recirculation return water.

ASSE 1017

Code	Description	Cv	Lbs	USD
600066AS	1" copper wall-mount station	21	27.3	7,231.00
600076AS	1¼" copper wall-mount station	24	28.2	8,218.00
600086AS	1½" copper wall-mount station	34	41	10,400.00
600096AS	2" copper wall-mount station	48	42	11,805.00

ACCESSORIES AND REPLACEMENT

NEW



Replacement mixed temp sensor.

Code	Description	Lbs	USD
F69807	Fits 1" and 1¼" valve	1.0	52.00

NEW



Replacement mixed temp sensor.

Code	Description	Lbs	USD
F69804	Fits 1½" and 2" valve	1.0	74.00

NEW



Replacement recirculation sensor.

Code	Description	Lbs	USD
F69591	Replacement recirculation sensor	1.0	66.00



Replacement controller.

Code	Description	Lbs	USD
F000962	Replacement controller	1.5	1,483.00



Replacement actuator.

Code	Description	Lbs	USD
645114	Replacement actuator	1.0	371.00

NEW



Replacement temp gauge.

Code	Description	Lbs	USD
R19101	Replacement temp gauge	0.3	18.00



Modbus-to-BACnet gateway
Converts LEGIOMIX® controller Modbus (RS-485 serial) output communication to BACnet IP or MSTP communication.

Code	Description	Lbs	USD
755052	Modbus-to-BACnet gateway	1.2	1,654.00



Inlet check valve assembly for installing on 6000 Series valve body (if required). Stainless steel body. No Lead. Ordered separately, field installed. 2 required per valve.

Code	Description	Lbs	USD
NA10366	Check valve assembly 1" and 1¼"	1.0	49.80
NA10367	Check valve assembly 1½" & 2"	1.5	123.00



Replacement body includes gauge adapter assembly. See fitting selection table in Section 8.

ASSE 1017

Code	Description	Lbs	USD
NA10615	Body, gauge adapter (1", 1¼")	1.0	428.00
NA10616	Body, gauge adapter (1½", 2")	1.5	628.00

HIGH/LOW THERMOSTATIC MIXING VALVE FOR PLUMBING



**NA523
DELTA 2™**

Adjustable thermostatic high low mixing valve for point of distribution in domestic water systems.
 Low-lead brass valve bodies.
 Locking set point knobs on thermostatic mixing valves.
 Check valves on thermostatic mixing valve cold inlets.
 Locking set point knob on pressure reducing valve.
 Copper connecting tubing, all sweat construction.
 Double union connection on all valves for ease of service.
 Removable 1/2" NPT threaded outlet thermometer.
 Pre-mounted to strut for easy mounting.

Max. working pressure: 200 psi.
 Max. inlet temperature: 180°F.
 Adjustable range: 95 – 150°F.
 Flow range: 1 to 50 gpm.

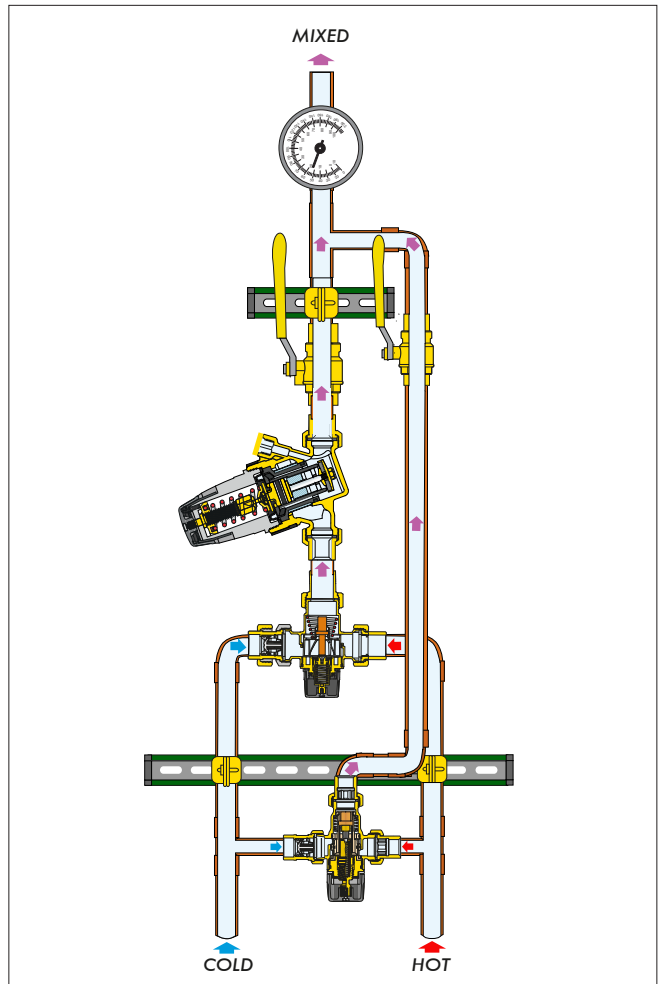
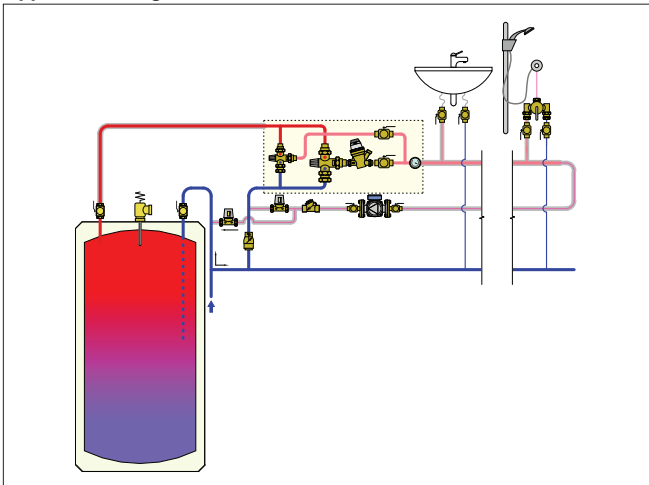
Thermostatic mixing valves meet requirements of ANSI/NSF 372-2011 and certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes. Pressure reducing valve is certified to ASSE 1003, CSA B356, NSF61, NSF 372 Low Lead Laws and listed by ICC-ES. Meets codes IPC, IRC & UPC for use in accordance with the U.S. and Canadian plumbing codes.

Code	Description	Lbs	USD
NA52367HL	1" sweat inlets, 1 1/4" sweat outlet, copper	25	2,541.00
NA10512	Ball valve stems extension kit	0.9	98.60

Function

The NA523 two-stage high low mixing valve system delivers tempered water for a wide range of flows in a single assembly, applicable for institutional and commercial applications such as hotels, nursing homes, hospitals, schools, and so on. The NA523 is furnished assembled and pressure tested with large and small mixing valves along with a pressure reducing valve, to function as one system in providing a broad flow range from 1 gpm to 50 gpm. This one-piece assembly also contains an outlet thermometer, cold water inlet check valves, and shut-off ball valves. The mixing valves are piped in parallel to the hot and cold inlet lines and the pressure reducing valve is piped on the outlet (mixed temperature) side of the larger thermostatic mixing valve. When demand is low, the small thermostatic mixing valve provides the needed water flow. When demand increases, indicated by increasing Delta P (differential pressure) in the system, the pressure reducing valve sees this fall off pressure, and opens to allow flow through the larger thermostatic mixing valve.

Application Diagram



THERMOSTATIC MIXING VALVE KIT FOR DOMESTIC WATER HEATERS



520 TankMixer™

Adjustment temperature range: 95°F - 150°F.
 Max. working pressure (static): 150 psi.
 Max. working pressure (dynamic): 75 psi.
 Max. inlet temperature: 195°F.
 Minimum flow for optimum performance: 0.5 GPM (0 GPM with recirculation).
 Tank: 3/4" NPT female union connections.
 System: 3/4" NPT M, press or sweat union connections.

ASSE 1017



520 TankMixer™ with gauge

Adjustment temperature range: 95°F - 150°F.
 Max. working pressure (static): 150 psi.
 Max. working pressure (dynamic): 75 psi.
 Max. inlet temperature: 195°F.
 Gauge scale: 30—210°F.
 Gauge accuracy: ± 6°F.
 Gauge dial: 2" diameter.
 Minimum flow for optimum performance: 0.5 GPM (0 GPM with recirculation).
 Max flow for optimum performance: 9 gpm.
 Tank: 3/4" NPT female union connections.
 System: 3/4" NPT M, press or sweat union connections.

ASSE 1017

Code	Description	Cv	Lbs	USD
520500AX	3/4" NPT male union system connections	2	2.4	225.00
520506AX	3/4" press union system connections	2	2.4	257.00
520509AX	3/4" sweat union system connections	2	2.4	218.00

Code	Description	Cv	Lbs	USD
520510AX	3/4" NPT male union system connections	2	2.9	257.00
520516AX	3/4" press union system connections	2	2.9	289.00
520519AX	3/4" sweat union system connections	2	2.9	249.00

Meets requirements of ANSI/NSF 372-2011. Certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.



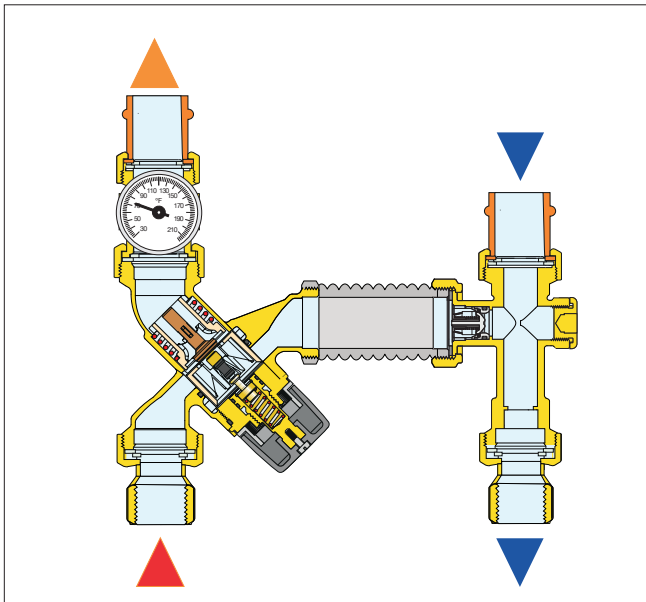
520 TankMixer™ Body

Replacement body.
 See fitting section table in Section 8.

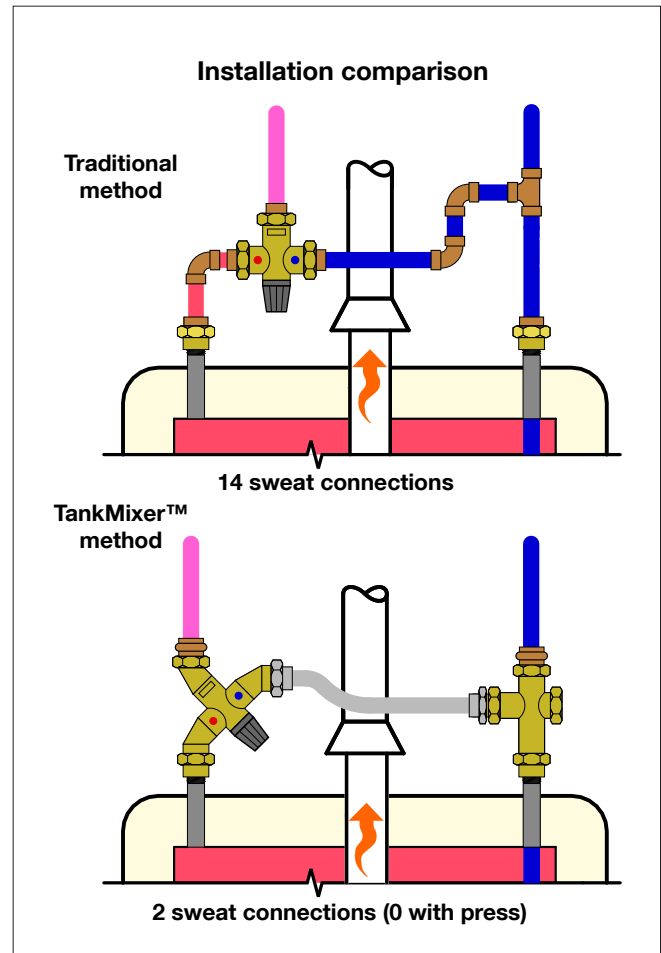
ASSE 1017

Code	Description	Cv	Lbs	USD
520051A	1" male union connection	2	2.0	121.00

Construction details



Application diagram





116 ThermoSetter™

Adjustable thermal balancing valve for domestic hot water recirculation circuits.

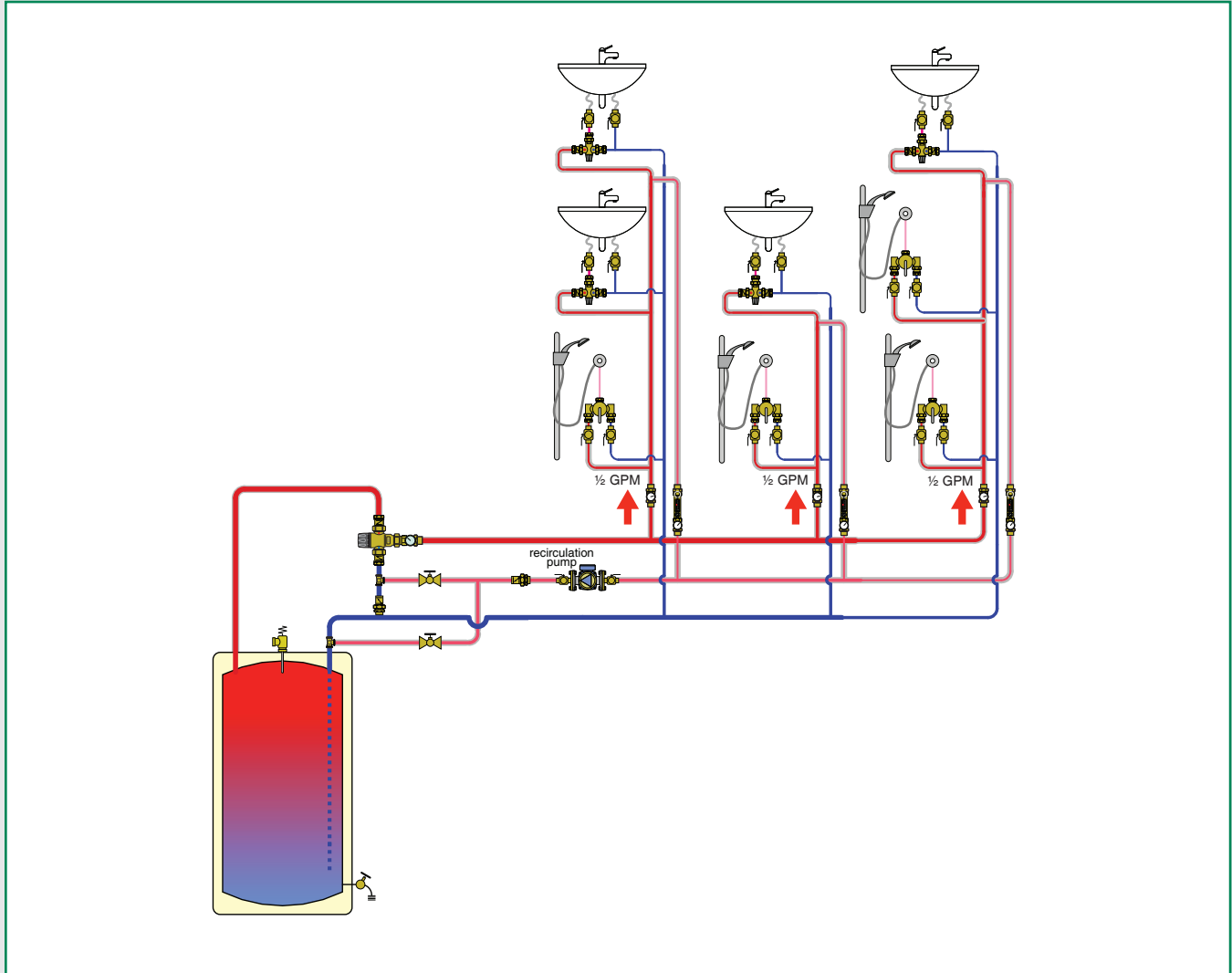
- Set it and forget it; no balancing tools required.
- Modulates flow to maintain temperature set point.
- Set point temperature scale on adjustment dial for simplicity.
- Integral drywell for local gauge or sensor bulb.
- Models with bypass feature for thermal disinfection process.



Controlling and protecting your water

BALANCING VALVES FOR PLUMBING AND HYDRONICS

This diagram is for illustration purposes only



PRODUCTS INCLUDED IN SECTION

- Static balancing valves with flowmeter for plumbing
- Static balancing valves with flowmeter for hydronics
- Dynamic balancing valves for plumbing and hydronics
- Thermal balancing valves for plumbing
- Y-strainer with ball valves for hydronics
- Static balancing valves, fixed orifice, for plumbing and hydronics
- Static balancing valves, variable orifice, for plumbing and hydronics

STATIC BALANCING VALVES WITH FLOWMETER FOR PLUMBING



132 QuickSetter+™

Balancing valve with flow meter.
 Direct reading of flow rate.
 No sight gauge clouding or scaling.
 DZR low-lead brass.
 Stainless steel flow rate adjuster.
 Inlet flow check valve.
 Graduated scale flow meter with magnetic movement flow rate indicator.
 2" diameter temperature gauge, optional.
 Gauge scale: 30 – 210°F.
 Gauge accuracy: ± 6°F.
 Meets requirements of ANSI/NSF 372-2011.
 Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

Without temperature gauge:

Code	Description	Flow scale (gpm)	Lbs	USD
132434AFC	1/2" PEX crimp union	0.5–1.75	1.8	208.00
132432AFC	1/2" PEX expansion union	0.5–1.75	1.8	208.00
132439AFC	1/2" sweat union	0.5–1.75	2.0	208.00
132534AFC	3/4" PEX crimp union	0.5–1.75	2.0	217.00
132532AFC	3/4" PEX expansion union	0.5–1.75	2.0	217.00
132536AFC	3/4" press union	0.5–1.75	1.8	230.00
132539AFC	3/4" sweat union	0.5–1.75	1.8	217.00
132634AFC	1" PEX crimp union	0.5–1.75	2.2	250.00
132632AFC	1" PEX expansion union	0.5–1.75	2.2	250.00
132639AFC	1" sweat union	0.5–1.75	2.4	239.00
132454AFC	1/2" PEX crimp union	2.0–7.0	1.8	208.00
132452AFC	1/2" PEX expansion union	2.0–7.0	1.8	208.00
132459AFC	1/2" sweat union	2.0–7.0	2.0	208.00
132554AFC	3/4" PEX crimp union	2.0–7.0	2.0	217.00
132552AFC	3/4" PEX expansion union	2.0–7.0	2.0	217.00
132556AFC	3/4" press union	2.0–7.0	1.8	230.00
132559AFC	3/4" sweat union	2.0–7.0	1.8	217.00
132654AFC	1" PEX crimp union	2.0–7.0	2.2	250.00
132652AFC	1" PEX expansion union	2.0–7.0	2.2	250.00
132659AFC	1" sweat union	2.0–7.0	2.4	239.00

Balancing made fast, easy, and accurate with QuickSetter+™

Features include:

- Three connection sizes: 1/2", 3/4" and 1" sweat unions.
- Two flow range options: 0.5–1.75 gpm scale or 2–7 gpm scale.
- Stainless steel flow adjuster.
- Memory flow indicator.
- Built-in flow check valve.
- Temperature gauge (optional).

Connection size	Flow rate (gpm)	Fully open Cv
1/2"	0.5 - 1.75	1.0
3/4"	0.5 - 1.75	1.0
1"	0.5 - 1.75	1.0
1/2"	2.0 - 7.0	6.3
3/4"	2.0 - 7.0	6.3
1"	2.0 - 7.0	6.3

With temperature gauge:

Code	Description	Flow scale (gpm)	Lbs	USD
132435AFC	1/2" PEX crimp union	0.5–1.75	2.2	238.00
132433AFC	1/2" PEX expansion union	0.5–1.75	2.2	238.00
132438AFC	1/2" sweat union	0.5–1.75	2.4	238.00
132537AFC	3/4" press union	0.5–1.75	2.2	261.00
132535AFC	3/4" PEX crimp union	0.5–1.75	2.4	247.00
132533AFC	3/4" PEX expansion union	0.5–1.75	2.4	247.00
132538AFC	3/4" sweat union	0.5–1.75	2.2	247.00
132635AFC	1" PEX crimp union	0.5–1.75	2.6	280.00
132633AFC	1" PEX expansion union	0.5–1.75	2.6	280.00
132638AFC	1" sweat union	0.5–1.75	2.8	268.00
132455AFC	1/2" PEX crimp union	2.0–7.0	2.2	238.00
132453AFC	1/2" PEX expansion union	2.0–7.0	2.2	238.00
132458AFC	1/2" sweat union	2.0–7.0	2.4	238.00
132555AFC	3/4" PEX crimp union	2.0–7.0	2.4	247.00
132553AFC	3/4" PEX expansion union	2.0–7.0	2.4	247.00
132557AFC	3/4" press union	2.0–7.0	2.2	261.00
132558AFC	3/4" sweat union	2.0–7.0	2.2	247.00
132655AFC	1" PEX crimp union	2.0–7.0	2.6	280.00
132653AFC	1" PEX expansion union	2.0–7.0	2.6	280.00
132658AFC	1" sweat union	2.0–7.0	2.8	268.00
F19346	Replacement by-pass valve stem*		0.1	33.30

*with operating ring

ACCESSORIES



Replacement body.
 See fitting section table in Section 8.

Code	Description	Lbs	USD
132637	0.5 - 1.75 GPM	1	165.00
132657	2.0 - 7.0 GPM	1	174.00



QuickSetter™ Insulation sleeve for valve and fitting on each end.

Code	Description	Lbs	USD
F0000926	For models with temperature gauge	0.1	33.20
112001	For models without temperature gauge	0.1	32.80



Replacement flow meter.

Code	Description	Lbs	USD
F0000940	0.5 to 1.75 GPM	0.2	91.50
F0000941	2.0 to 7.0 GPM	0.2	91.50

STATIC BALANCING VALVES WITH FLOWMETER FOR HYDRONICS



132 QuickSetter™

Balancing valve with flow meter.
 Direct reading of flow rate.
 No sight gauge clouding or scaling.
 Brass valve body and flow meter.
 Rotatable valve for flow rate adjustment.
 With insulation.
 Max. working pressure: 150 psi.
 Temperature range: 14–230°F.
 Max. percentage of glycol: 50%.

Code	Description	Flow scale (gpm)	Lbs	USD
132432A	½" FNPT	0.5–1.75	2.0	165.00
132552A	¾" FNPT	2.0–7.0	1.8	177.00
132662A	1" FNPT	3.0–10.0	2.4	207.00
132772A	1¼" FNPT	5.0–19.0	2.8	275.00
132882A	1½" FNPT	8.0–32.0	3.4	326.00
132992A	2" FNPT	12.0–50.0	4.4	399.00
F19346	Replacement by-pass valve stem*	0.1		33.30

*with operating ring



132 QuickSetter™

Balancing valve with flow meter.
 Direct reading of flow rate.
 ANSI 125 flanged cast iron body.
 Brass flow meter.
 Max. working pressure: 150 psi.
 Temperature range: 14–230°F.
 Max. percentage of glycol: 50%.

Code	Description	Flow scale (gpm)	Lbs	USD
132060A	2½" ANSI flange	30–105	35	985.00
132080A	3" ANSI flange	38–148	62	1,315.00
132100A	4" ANSI flange	55–210	67	2,007.00

Replacement flow meter.

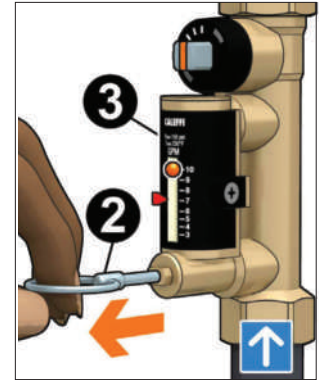
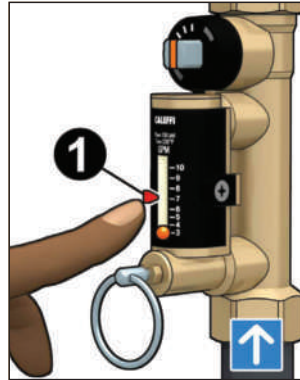


Code	Description	Lbs	USD
F0000940	0.5 to 1.75 GPM	0.2	91.50
F0000941	2.0 to 7.0 GPM	0.2	91.50
F0000942	3.0 to 10 GPM	0.2	91.50
F0000943	5.0 to 19 GPM	0.2	95.90
F0000944	8.0 to 32 GPM	0.2	95.90
F0000945	12 to 50 GPM	0.2	95.90
F0000946	30 to 105 GPM	0.2	101.00
F0000947	38 to 148 GPM	0.2	101.00
F0000948	55 to 210 GPM	0.2	101.00

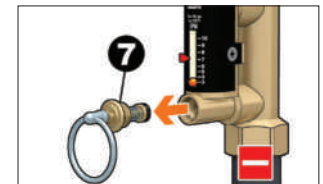
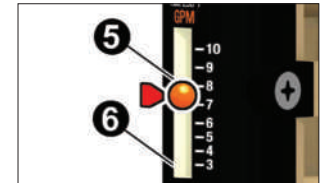
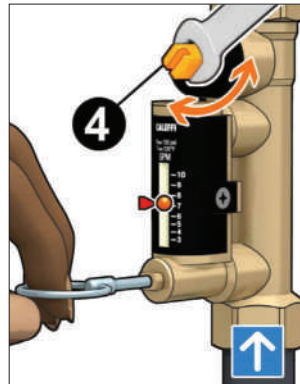
Pull, adjust, release - easy to set

The flow rate is adjusted as follows:

- A. With the aid of the flow rate indicator (1), mark the desired flow rate.
- B. Use the operating ring (2) to open the by-pass valve slowly. This allows fluid to flow through the flow meter (3). The bypass valve is automatically closed under normal operating conditions.



- C. While holding the bypass valve open, use a wrench to turn the valve control stem (4) to adjust the flow rate slowly. The resulting flow rate is indicated by the metal ball (5) that slides up and down inside a transparent channel (6) marked by a graduated scale in gpm.



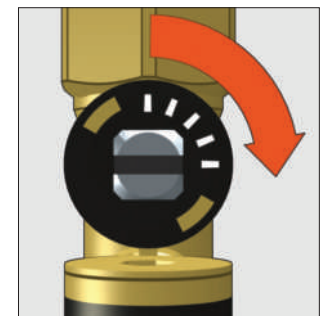
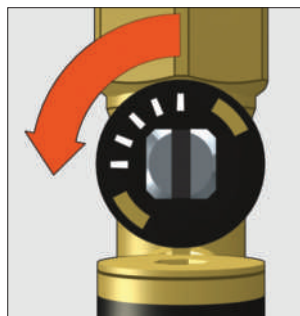
- D. Once the flow rate is properly adjusted, release the operating ring (2) of the by-pass valve. The valve will automatically return to the closed position by means of an internal spring.

- E. A replacement by-pass valve stem (7) with operating ring is available in event it is damaged and inoperable. Order code F19346.

Complete opening and closing of the valve

Full opening of the valve

Full closing of the valve



DYNAMIC BALANCING VALVES FOR PLUMBING AND HYDRONICS



127 FlowCal+™

Compact automatic recirculation balancing valves
 Patented anti-scale, low noise polymer FlowCal™ cartridge.
 Inlet flow check valve.
 Max. working pressure: 230 psi.
 Temperature range: 32—212°F.
 Max. percentage of glycol: 50%
 Flow rate range 0.35 to 10 GPM.
 Flow accuracy: ±10%.
 2" gauge diameter temperature.
 Gauge scale: 30— 210°F
 Gauge accuracy: ± 6°F

Without temperature gauge:

Code	Description	Lbs	USD
127141AFC ***	½" NPT male union	1	94.20
127146AFC ***	½" press union	1	100.00
127144AFC ***	½" PEX crimp union	1	93.10
127142AFC ***	½" PEX expansion union	1	93.10
127149AFC ***	½" sweat union	0.8	93.10
127151AFC ***	¾" NPT male union	1	100.00
127156AFC ***	¾" press union	1	116.00
127154AFC ***	¾" PEX crimp union	1	101.00
127152AFC ***	¾" PEX expansion union	1	101.00
127159AFC ***	¾" sweat union	0.8	101.00
127161AFC ***	1" NPT male union	1.2	126.00
127166AFC ***	1" press union	1.3	132.00
127164AFC ***	1" PEX crimp union	1.3	125.00
127162AFC ***	1" PEX expansion union	1.3	125.00
127169AFC ***	1" sweat union	1	125.00

With temperature gauge:

Code	Description	Lbs	USD
127140AFC ***	½" NPT male union	1.2	126.00
127147AFC ***	½" press union	1.2	132.00
127145AFC ***	½" PEX crimp union	1.2	123.00
127143AFC ***	½" PEX expansion union	1.2	123.00
127148AFC ***	½" sweat union	1	123.00
127150AFC ***	¾" NPT male union	1.2	151.00
127157AFC ***	¾" press union	1.2	147.00
127155AFC ***	¾" PEX crimp union	1.2	133.00
127153AFC ***	¾" PEX expansion union	1.2	133.00
127158AFC ***	¾" sweat union	1	133.00
127160AFC ***	1" NPT male union	1.4	157.00
127167AFC ***	1" press union	1.5	163.00
127165AFC ***	1" PEX crimp union	1.5	155.00
127163AFC ***	1" PEX expansion union	1.5	155.00
127168AFC ***	1" sweat union	1.2	155.00

Select desired flow rate to complete full part number. No restrictions.

Meets requirements of ANSI/NSF 372-2011. Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes. US Patent 7,246,635 B2.

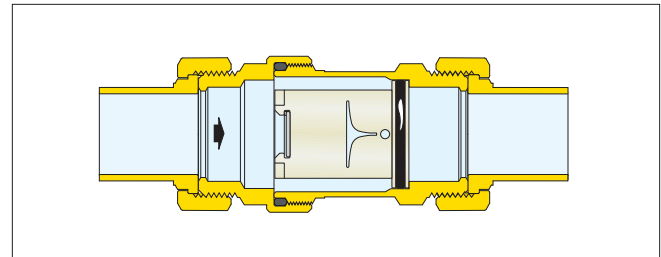


127 FlowCal™

Compact automatic recirculation balancing valves.
 Patented anti-scale, low noise polymer
 Max. working pressure: 230 psi
 Temperature range: 32—212°F.
 Max. percentage of glycol: 50%
 Flow rate range 0.35 to 10 GPM.
 Flow accuracy: ±10%.

Code	Description	Lbs	USD
127341AF ***	½" NPT male union	1	89.80
127346AF ***	½" press union	1	99.20
127342AF ***	½" PEX expansion union	1	84.90
127349AF ***	½" sweat union	0.8	84.90
127351AF ***	¾" NPT male union	1	93.70
127356AF ***	¾" press union	1	109.00
127352AF ***	¾" PEX expansion union	1	89.30
127359AF ***	¾" sweat union	0.8	89.30
127361AF ***	1" NPT male union	1.2	107.00
127366AF ***	1" press union	1.3	134.00
127362AF ***	1" PEX expansion union	1.3	103.00
127369AF ***	1" sweat union	1	103.00

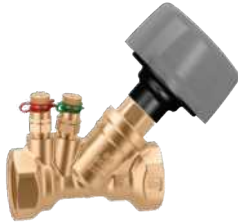
Select desired flow rate to complete full part number. No restrictions.



GPM	Last 3 digits ...	Differential Pressure Control Ranges (psid)
.35	G35	2—14
.5	G50	
.75	G75	
1	1G0	2—32
1.3	1G3	
1.5	1G5	
1.7	1G7	
2	2G0	
2.2	2G2	
2.5	2G5	
2.6	2G6	
3	3G0	
3.5	3G5	
4	4G0	4—34
4.5	4G5	
5	5G0	
6	6G0	
7	7G0	5—35
8	8G0	
9	9G0	
10	10G	

STATIC BALANCING VALVES, FIXED ORIFICE, FOR PLUMBING AND HYDRONICS

130 Flo-Set™ Fixed Orifice



Fixed orifice.
Multi-turn adjustment range.
Memory stop feature.
Max. working pressure: 232 psi.
Working temperature range: -4 to 250°F.
Number of adjustment turns: 6.
DZR Low-lead brass body.
Stainless steel valve plug.
Teflon® stem guide bearing.
Meets requirements of ANSI/NSF 372-2011.
Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.



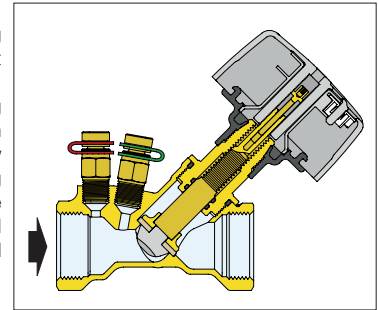
Insulation shell fits 130 series balancing valves.

Code	Description	Max Cv	Lbs	USD
130400A	½" NPT female	3.7	1.0	117.00
130500A	¾" NPT female	5.1	1.2	127.00
130600A	1" NPT female	8.8	1.5	152.00
130700A	1¼" NPT female	14.0	2.0	190.00
130800A	1½" NPT female	19.7	2.3	237.00
130900A	2" NPT female	30.5	2.5	316.00

Code	Description	Lbs	USD
CBN130400	fits ½" NPT	0.1	25.70
CBN130500	fits ¾" NPT	0.1	27.80
CBN130600	fits 1" NPT	0.1	33.40
CBN130700	fits 1¼" NPT	0.1	41.80
CBN130800	fits 1½" NPT	0.1	52.10
CBN130900	fits 2" NPT	0.1	69.40

Operating Principal

The 130 series balancing valve is a hydraulic device that controls the flow rate of a fluid. Turning the knob moves a plug within the fluid stream which varies the flow rate. The flow rate is determined according to the pressure drop value measured by a differential pressure meter connected to the pressure test ports.



STATIC BALANCING VALVES, VARIABLE ORIFICE, FOR PLUMBING AND HYDRONICS

142 Flo-Set™ Variable Orifice



Memory stop feature
Characterized plug for smooth adjustment.
Maximum working pressure: 232 psi.
Working temperature range: 14–250°F.
DZR low-lead brass body.
Meets requirements of ANSI/NSF 372-2011.
Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.



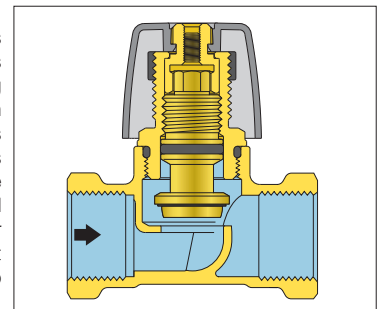
Insulation shell fits 142 series balancing valves.

Code	Description	Max Cv	Lbs	USD
142241A	½" NPT female	3.4	1.0	91.50
142251A	¾" NPT female	5.0	1.2	97.50
142261A	1" NPT female	7.5	1.5	132.00
142271A	1¼" NPT female	12.9	2.3	189.00
142281A	1½" NPT female	16.8	3.0	212.00
142291A	2" NPT female	22.0	3.5	271.00

Code	Description	Lbs	USD
CBN142241A	fits ½" NPT	0.1	23.50
CBN142251A	fits ¾" NPT	0.1	25.00
CBN142261A	fits 1" NPT	0.1	34.10
CBN142271A	fits 1¼" NPT	0.1	48.60
CBN142281A	fits 1½" NPT	0.1	54.70

Operating Principal

The 142 series balancing valve is a hydraulic device that controls the flow rate of a fluid. Turning the knob moves a plug within the fluid stream which varies the flow rate. The flow rate is determined according to the pressure drop value measured by a differential pressure meter connected to the pressure test ports and the adjustment knob position.



THERMAL BALANCING VALVES FOR PLUMBING



116 ThermoSetter™

Adjustable thermal balancing valve for domestic hot water recirculation circuits. Body has section for thermal disinfection cartridge retrofit. Drywell for temperature gauge or probe. DZR low-lead brass body. Optional check valve. Optional outlet temperature gauge. Max. working pressure: 230 psi. Adjustment temperature range: 95°F — 140°F. Cv max: 2.1; Cv min: 0.23; Cv design: 0.52. Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes. ANSI/NSF 61 to 180°F approval.

Code	Description	Lbs	USD
116140A	½" FNPT	1.6	176.00
116140AC	½" FNPT, check valve	1.8	211.00
116141A	½" FNPT, gauge	1.7	188.00
116141AC	½" FNPT, gauge, check valve	1.9	223.00
116150A	¾" FNPT	1.5	189.00
116150AC	¾" FNPT, check valve	1.7	230.00
116151A	¾" FNPT, gauge	1.6	201.00
116151AC	¾" FNPT, gauge, check valve	1.8	242.00



116 ThermoSetter™

Adjustable thermal balancing valve for domestic hot water recirculation circuits. With by-pass valve for thermal disinfection. Purchase 656 actuator separately. Drywell for temperature gauge or probe. DZR low-lead brass body. Optional outlet check valve. Max. working pressure: 230 psi. Adjustment temperature range: 95°F — 140°F. Cv max: 2.1; Cv min: 0.23. Cv disinfection: 1.2; Cv design: 0.52. Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes. ANSI/NSF 61 to 180°F approval.

Code	Description	Lbs	USD
116340A*	½" FNPT, gauge	1.8	241.00
116340AC*	½" FNPT, gauge, check valve	2.0	277.00
116350A*	¾" FNPT, gauge	1.7	254.00
116350AC*	¾" FNPT, gauge, check valve	1.9	295.00

*Requires separately ordered 656 series actuator.

Operating principle

The ThermoSetter adjustable thermal balancing valve, 116 series models, installed at the end of each branch of the domestic hot water recirculation system, automatically maintains the set temperature. It controls the water flow rate according to the inlet temperature with the internal adjustable thermostatic cartridge. The thermostatic cartridge modulates the valve opening in response to changing water temperature, and when reaching the temperature setting, closes the valve to minimum flow position. A recirculation pump distributes flow to all the branches resulting in effective automatic thermal balancing. The automatic response allows each hot water branch to deliver hot water to each fixture. The ThermoSetter works perfectly with variable speed recirculation pumps for optimal energy usage. Optional check valve are available for all models, which protect against circuit thermo-siphoning.

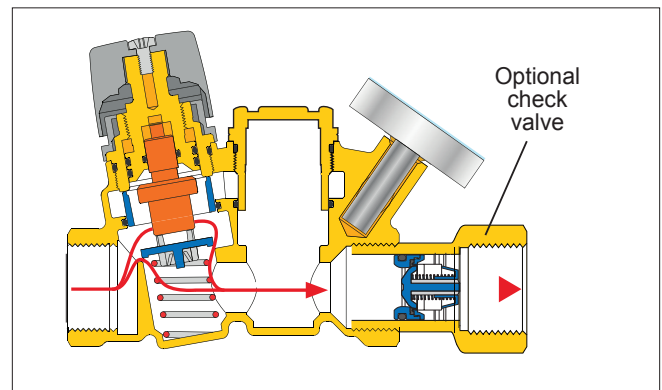


116 ThermoSetter™

Adjustable thermal balancing valve for domestic hot water recirculation circuits. With thermal by-pass cartridge for thermal disinfection. Drywell for temperature gauge or probe. DZR low-lead brass body. Optional check valve. Optional outlet temperature gauge. Max. working pressure: 230 psi. Adjustment temperature range: 95°F — 140°F. Cv max: 2.1; Cv min: 0.23. Cv disinfection: 1.2; Cv design: 0.52. Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes. ANSI/NSF 61 to 180°F approval.

Code	Description	Lbs	USD
116240A	½" FNPT, gauge	1.8	229.00
116240AC	½" FNPT, gauge, check valve	2	264.00
116250A	¾" FNPT, gauge	1.7	242.00
116250AC	¾" FNPT, gauge, check valve	1.9	283.00

116150AC cutaway



THERMAL BALANCING VALVES FOR PLUMBING

NEW



116 ThermoSetter™

Adjustable thermal balancing valve for domestic hot water recirculation circuits. Drywell for temperature gauge or probe. DZR low-lead brass body. Optional outlet check valve. Max. working pressure: 230 psi. Adjustment temperature range: 105°F — 150°F. Cv max: 2.1; Cv min: 0.35. Cv design: 0.69. Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes. ANSI/NSF 61 to 180°F approval.

Code	Description	Lbs	USD
116440A	½" FNPT	1.6	160.00
116440AC	½" FNPT, check valve	1.8	194.00
116441A	½" FNPT, gauge	1.5	170.00
116441AC	½" FNPT, gauge, check valve	1.7	206.00
116450A	¾" FNPT	1.6	172.00
116450AC	¾" FNPT, check valve	1.8	212.00
116451A	¾" FNPT, gauge	1.5	182.00
116451AC	¾" FNPT, gauge, check valve	1.7	224.00

Function

The ThermoSetter™ adjustable thermal balancing valve is used for automatic balancing of recirculation loops in domestic hot water systems, to speed hot water delivery, reduce water waste and save energy. The internal thermostatic balancing cartridge automatically modulates flow to ensure a constant temperature in the recirculation piping system. The 116 Series has an adjustment knob with temperature scale indication. An integral dry-well holds a slide-in temperature gauge for local indication, or a sensor for remote temperature sensing. The optional check valve protects against circuit thermo-syphoning.



Actuator disinfection cartridge for use with 656 actuator.

Code	Description	Lbs	USD
116000	Replacement actuator bypass cartridge	0.1	53.40

6563 TwisTop™



TwisTop™ thermo-electric actuator for use with 1163xx Series. Twist the top to manually open. Power supply: 24 V AC/DC. Initial current draw: ≤ 250 mA. Power consumption: 3 W. Rating of micro-switch contacts: 5 A (24 V). 31.5" wire lead connection. US Patent 7,617,989 B2.

Code	Description	Lbs	USD
656344	24 V AC/DC	0.4	87.10
656354	24 V AC/DC with micro-switch	0.4	103.00



Replacement thermal disinfection cartridge.

Code	Description	Lbs	USD
F000580	Replacement thermal bypass cartridge	0.1	41.50



Insulation shell fits 116 series thermal balancing valve.

Code	Description	Lbs	USD
CBN116140	Insulation shell for 1161, 1162, 1163	0.1	28.40
CBN116440	Insulation shell for 1164 NEW	0.1	28.00

6564



Thermo-electric actuator with micro-switch fits on 676 two-way zone valve bodies. Low current draw. Protection class (installed in all positions): NEMA 3 (IP54). Power supply: 24 V AC/DC. Initial current draw: ≤ 250 mA. Power consumption: holding: 3 W inrush: 6 VA. Rating of micro-switch contacts: 5 A (24 V). 31.5" wire lead connection.



Code	Description	Lbs	USD
656404	24 V AC/DC	0.4	65.00
656414	24 V AC/DC with micro-switch	0.4	82.10



Temperature gauge fits 116 series. Working temperature range: 30°F — 180°F.

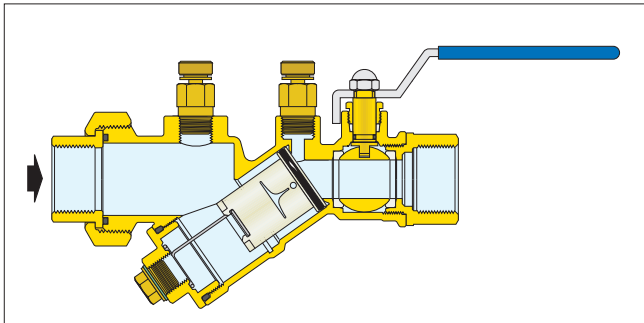
Code	Description	Lbs	USD
116010	1½" dial temp. gauge	0.1	11.80



Check valve fits 116 ThermoSetter™. DZR low-lead brass. Max. working pressure: 150 psi. Max. working temperature: 250°F.

Code	Description	Lbs	USD
NA10469	½" FNPT x MNPT inline check valve	0.1	35.60
NA10467	¾" FNPT x MNPT inline check valve	0.1	41.50

DYNAMIC BALANCING VALVES FOR HYDRONICS



**121
FlowCal™**

Automatic flow balancing valve with integral ball valve.
 Brass body.
 Patented anti-scale, low noise polymer FlowCal™ cartridge.
 Maximum working pressure: 400 psi (400 WOG).
 Working temperature range: 32—212°F (0 —100°C).
 Max. percentage of glycol: 50%.
 Differential pressure control ranges: 2—14, 2—32, 4—34, 5—35 psid.
 Flow rate: fixed flow rate settings ranging from 0.35—21 GPM.
 Flow accuracy: ±10%.
 US Patent 7,246,635 B2.

Available with optional factory-installed pressure and temperature test ports (1213xxx series).

Code	Description	Lbs	USD
121141A ●●●	½" NPT female	2.7	117.00
121149A ●●●	½" sweat	2.7	112.00
121151A ●●●	¾" NPT female	2.7	118.00
121159A ●●●	¾" sweat	2.7	113.00
121161A ●●●	1" NPT female	5.0	241.00
121169A ●●●	1" sweat	5.0	230.00
121171A ●●●	1¼" NPT female	5.0	271.00
121179A ●●●	1¼" sweat	5.0	258.00
121341A ●●●	½" NPT female with PT test ports	3.2	126.00
121349A ●●●	½" sweat with PT test ports	3.2	120.00
121351A ●●●	¾" NPT female with PT test ports	3.2	128.00
121359A ●●●	¾" sweat with PT test ports	3.2	121.00
121361A ●●●	1" NPT female with PT test ports	5.5	250.00
121369A ●●●	1" sweat with PT test ports	5.5	239.00
121371A ●●●	1¼" NPT female with PT test ports	5.5	279.00
121379A ●●●	1¼" sweat with PT test ports	5.5	266.00

Size	GPM	Last 3 digits ...	Differential Pressure Control Ranges (psid)
½", ¾"	0.35	G35	2 – 14
½", ¾"	0.5	G50	
½", ¾"	0.75	G75	
½", ¾"	1	1G0	2 – 32
½", ¾"	1.3	1G3	
½", ¾"	1.5	1G5	
½", ¾"	1.7	1G7	
½", ¾"	2	2G0	
½", ¾"	2.2	2G2	
½", ¾"	2.5	2G5	
½", ¾", 1"	2.6	2G6	
½", ¾", 1"	3	3G0	4 – 34
½", ¾", 1"	3.5	3G5	
½", ¾", 1", 1¼"	4	4G0	
½", ¾", 1", 1¼"	4.5	4G5	
½", ¾", 1", 1¼"	5	5G0	
½", ¾", 1", 1¼"	6	6G0	
½", ¾", 1", 1¼"	7	7G0	
½", ¾", 1", 1¼"	8	8G0	

Size	GPM	Last 3 digits ...	Differential Pressure Control Ranges (psid)
½", ¾", 1", 1¼"	9	9G0	5 – 35
½", ¾", 1", 1¼"	10	10G	
1", 1¼"	11	11G	3 – 32
1", 1¼"	12	12G	
1", 1¼"	13	13G	
1", 1¼"	14	14G	4 – 35
1", 1¼"	15	15G	
1", 1¼"	16	16G	
1", 1¼"	17	17G	
1", 1¼"	18	18G	
1", 1¼"	19	19G	
1", 1¼"	20	20G	
1", 1¼"	21	21G	

Size	Flow Rates
½"	.35 –10 GPM
¾"	.35 –10 GPM
1"	2.5–21 GPM
1¼"	4–21 GPM

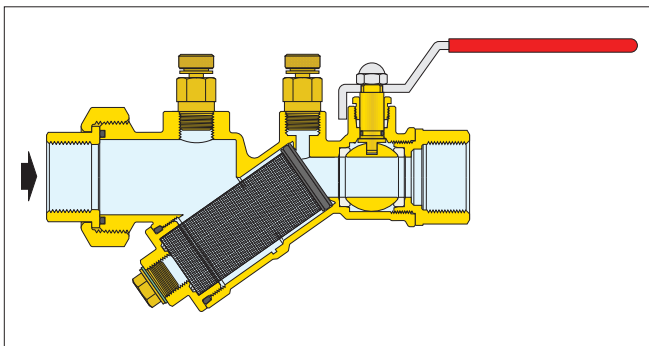
Y-STRAINER WITH BALL VALVE FOR HYDRONICS

**120
Y-strainer**

Y-strainer with integral ball valve. Brass body. Stainless steel strainer cartridge. Maximum working pressure: 400 psi (400 WOG). Working temperature range: 32–212°F. Max. percentage glycol: 50%. Strainer (20 mesh). Connections: —body: F NPT union x F NPT, sweat union x sweat. Pressure and temperature ports: ¼" NPT. Drain port connection: ¼" for ½" & ¾" or ½" for 1" & 1¼".



Code	Description	Cv	Lbs	USD
120141A 000	½" NPT female	8.0	3.0	106.00
120149A 000	½" sweat	8.0	3.0	101.00
120151A 000	¾" NPT female	8.4	3.0	107.00
120159A 000	¾" sweat	8.4	3.0	102.00
120161A 000	1" NPT female	19	6.0	212.00
120169A 000	1" sweat	19	6.0	202.00
120171A 000	1¼" NPT female	20	6.0	241.00
120179A 000	1¼" sweat	20	6.0	230.00
120341A 000	½" NPT female with PT	8.0	3.5	115.00
120349A 000	½" sweat with PT	8.0	3.5	110.00
120351A 000	¾" NPT female with PT	8.4	3.5	116.00
120359A 000	¾" sweat with PT	8.4	3.5	111.00
120361A 000	1" NPT female with PT	19	6.5	222.00
120369A 000	1" sweat with PT	19	6.5	210.00
120371A 000	1¼" NPT female with PT	20	6.5	250.00
120379A 000	1¼" sweat with PT	20	6.5	239.00



STATIC BALANCING WITH FLOW METER

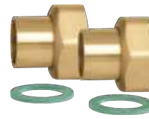
NA223

Direct in-line balancing / flow meter with brass body for hydronic applications only. Max percentage of glycol: 50%. Max working pressure: 150 psi. Temperature range: 32–250°F. Measuring accuracy: ±10%. Cv: 6.0. See fitting selection table in Section 9.



Code	Description	Lbs	USD
NA223529	2 to 8 gpm with 1" union thread	0.9	114.00

Two union nuts, washers and tail pieces. Low-lead brass.



Code	Description	Lbs	USD
NA12249	½" sweat with 1" union nuts	0.2	23.40
NA12259	¾" sweat with 1" union nuts	0.2	28.00
NA12269	1" sweat with 1" union nuts	0.3	49.00

538

Drain valves for field installation in blow-down-port connection of the 120 series Y-strainer. Brass body. With ¾" garden hose connection. Max. working pressure: 150 psi. Max: working temperature: 250°F.



Code	Description	Lbs	USD
538202 FD	¼" NPT fits ½–¾" 120 series	0.3	12.00
538402 FD	½" NPT fits 1–1¼" 120 series	0.3	12.30

**100
PT test ports**

Fast-plug pressure/temperature test ports fits FlowCal™ automatic flow balancing valves and the 120 series Y-strainer. The double-sealing core insures long and trouble free service. Low Lead brass body. Nordel Core. Connections: ¼" NPT male. Cap thread: ⅜"-24 UNF. Working temperature range: 0–275°F. Max. working pressure: 435 psi. Pair (2 ports included).



Code	Description	Lbs	USD
100001A	Standard size, 1½" length (pair)	0.5	13.20

World's Most Recognized Pressure Reducing Valve



PresCal™

Often copied but never matched

- Removable self-contained cartridge with stainless steel mesh filter.
- Easy installation and service.
- Tamper-resistant cap.
- Hot water booster system compatible: Rated to 180°F. Certified to NSF 61, ASSE 1003, CSA B356 and NSF 372.

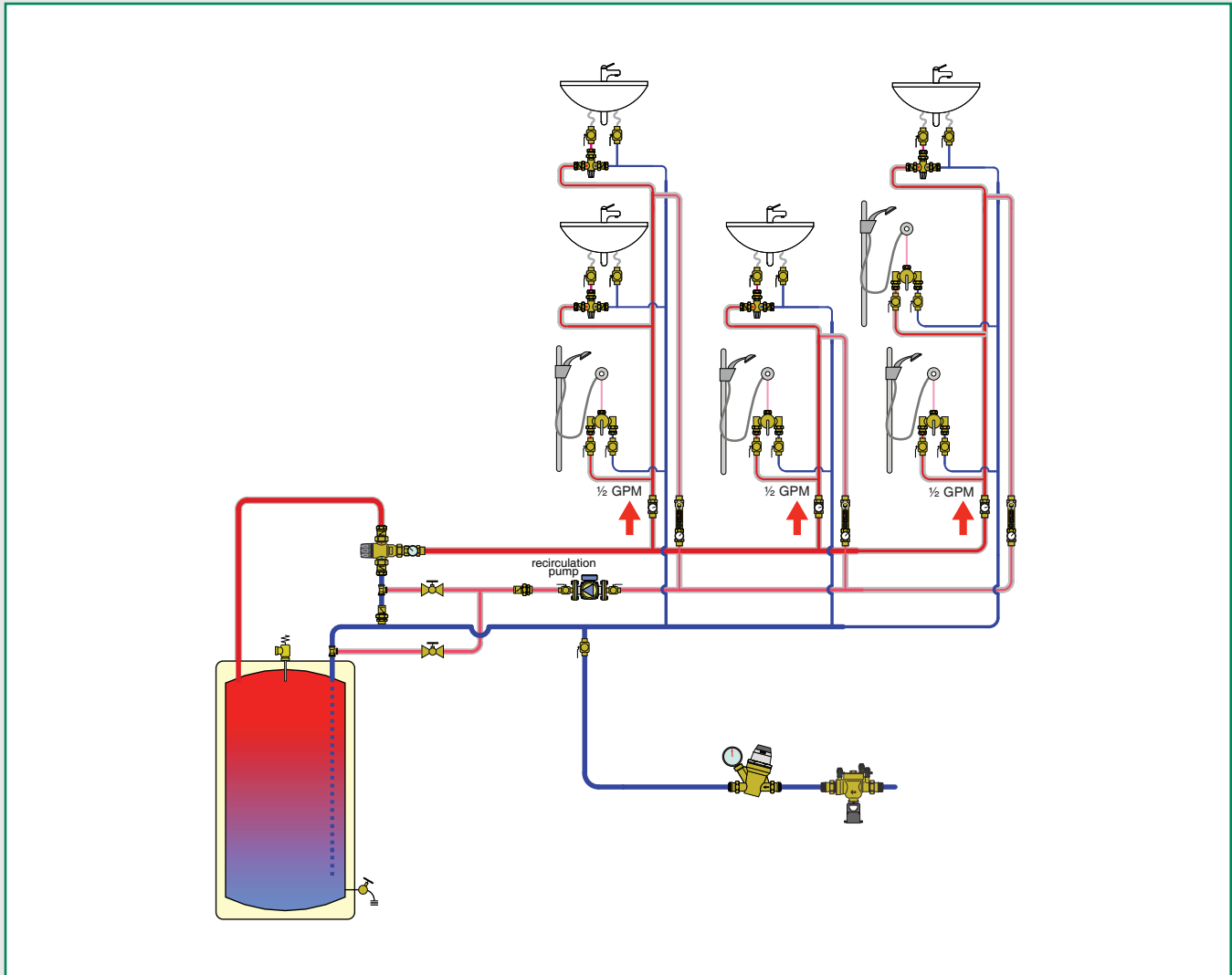


Plumbing

Controlling and protecting your water

PRVS, BACKFLOW PREVENTERS AND AIR VENTS

This diagram is for illustration purposes only



PRODUCTS INCLUDED IN SECTION

- Pressure reducing valves for plumbing
- Backflow preventers, dual check, for plumbing and hydronics
- Backflow preventers, RPZ type, for plumbing and hydronics
- Automatic air vent for plumbing

PRESSURE REDUCING VALVES FOR PLUMBING



535H PresCal™

Pressure reducing valve for residential and commercial applications. Pressure balanced cartridge. DZR low lead "Ecobross" body. Max. working pressure: 300 psi. Max. working temperature: 180°F. Pressure setting range: 15 — 90 psi. Factory setting: 45 psi. Certified to: ASSE 1003, CSA B356, NSF61, NSF 372, Low Lead Laws and listed by ICC-ES. Meets codes IPC, IRC & UPC for use in accordance with the U.S. and Canadian plumbing codes.

ASSE 1003

Code	Description	Max GPM	Lbs	USD
535940HA	1/2" sweat union	7.0	1.9	101.00
535941HA	1/2" sweat union, gauge	7.0	2.0	112.00
535340HA	1/2" NPT female union	7.0	2.0	110.00
535341HA	1/2" NPT female union, gauge	7.0	2.1	121.00
535950HA	3/4" sweat union	12.3	2.2	110.00
535951HA	3/4" sweat union, gauge	12.3	2.3	120.00
535350HA	3/4" NPT female union	12.3	2.3	118.00
535351HA	3/4" NPT female union, gauge	12.3	2.4	129.00
535650HA	3/4" press union	12.3	2.3	115.00
535651HA	3/4" press union, gauge	12.3	2.4	126.00
535750HA	3/4" PEX crimp union	12.3	2.3	110.00
535751HA	3/4" PEX crimp union, gauge	12.3	2.4	120.00
535550HA	3/4" PEX expansion union	12.3	2.3	110.00
535551HA	3/4" PEX expansion union, gauge	12.3	2.4	120.00
535960HA	1" sweat union	19.0	2.9	145.00
535961HA	1" sweat union, gauge	19.0	3.0	156.00
535360HA	1" NPT female union	19.0	3.0	154.00
535361HA	1" NPT female union, gauge	19.0	3.1	165.00
535660HA	1" press union	19.0	3.0	169.00
535661HA	1" press union, gauge	19.0	3.1	180.00
535760HA	1" PEX crimp union	19.0	3.0	145.00
535761HA	1" PEX crimp union, gauge	19.0	3.1	156.00
535970HA	1 1/4" sweat union	31.0	5.6	321.00
535971HA	1 1/4" sweat union, gauge	31.0	5.7	331.00
535370HA	1 1/4" NPT female union	31.0	5.7	329.00
535371HA	1 1/4" NPT female union, gauge	31.0	5.8	340.00
535670HA	1 1/4" press union NEW	31	5.8	469.00
535671HA	1 1/4" press union, gauge NEW	31	5.8	480.00
535980HA	1 1/2" sweat union	42.0	7.3	450.00
535981HA	1 1/2" sweat union, gauge	42.0	7.4	460.00
535380HA	1 1/2" NPT female union	42.0	7.3	474.00
535381HA	1 1/2" NPT female union, gauge	42.0	7.4	485.00
535680HA	1 1/2" press union NEW	42	7.3	673.00
535681HA	1 1/2" press union, gauge NEW	42	7.4	687.00
535990HA	2" sweat union	64.0	9.7	585.00
535991HA	2" sweat union, gauge	64.0	9.8	596.00
535390HA	2" NPT female union	64.0	9.7	582.00
535391HA	2" NPT female union, gauge	64.0	9.8	593.00
535690HA	2" press union NEW	64	9.7	829.00
535691HA	2" press union, gauge NEW	64	9.8	840.00

GPM flowrate at 6 feet per second water velocity.



533H PresCal™

Compact pressure reducing valve for residential and light commercial applications. DZR low lead "Ecobross" body with inlet union connection. Low friction anti-scale moving parts. High flow seat design. Replaceable cartridge. Integral stainless steel filter. Adjustment screw for pressure set point. Tamper-resistant cap included. Max. working pressure: 250 psi. Max. working temperature: 180°F. Pressure setting range: 15 — 90 psi. Factory setting: 45 psi. Certified to: ASSE 1003, CSA B356, NSF61, NSF 372, Low Lead Laws and listed by ICC-ES. Meets codes IPC, IRC & UPC for use in accordance with the U.S. and Canadian plumbing codes.

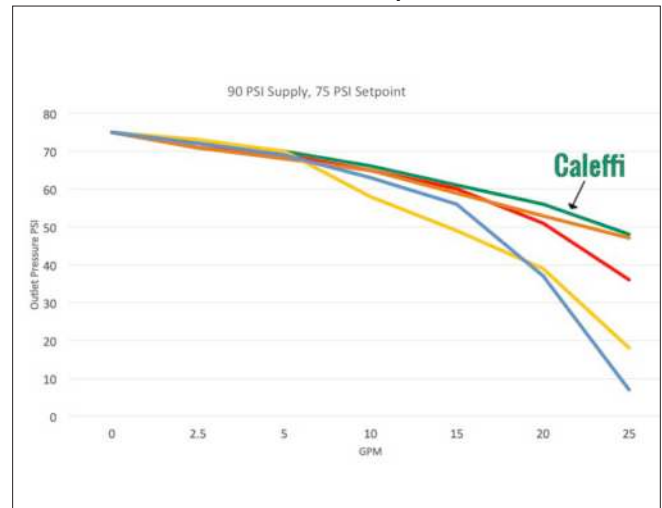
ASSE 1003

Code	Description	Max GPM	Lbs	USD
533340HA*	1/2", NPT female union in	5.5	0.9	88.20
533341HA**	1/2", NPT female union in	5.5	1.1	99.70
533940HA*	1/2", sweat union in	5.5	0.9	80.40
533941HA**	1/2", sweat union in	5.5	1.1	92.00
533350HA*	3/4", NPT female union in	10	1.1	94.80
533351HA**	3/4", NPT female union in	10	1.3	106.00
533950HA*	3/4", sweat union in	10	1.1	87.60
533951HA**	3/4", sweat union in	10	1.3	99.20
533650HA*	3/4", press union in	10	1.1	92.00
533651HA**	3/4", press union in	10	1.3	103.00
533750HA*	3/4", PEX crimp union in	10	1.1	87.60
533751HA**	3/4", PEX crimp union in	10	1.3	99.20
533850HA*	3/4", PEX expan. union in	10	1.1	87.60
533851HA**	3/4", PEX expan. union in	10	1.3	99.20

*FNPT outlet

**FNPT outlet with gauge

3/4" 535H Falloff Performance vs. competition



PRESSURE REDUCING VALVES FOR PLUMBING



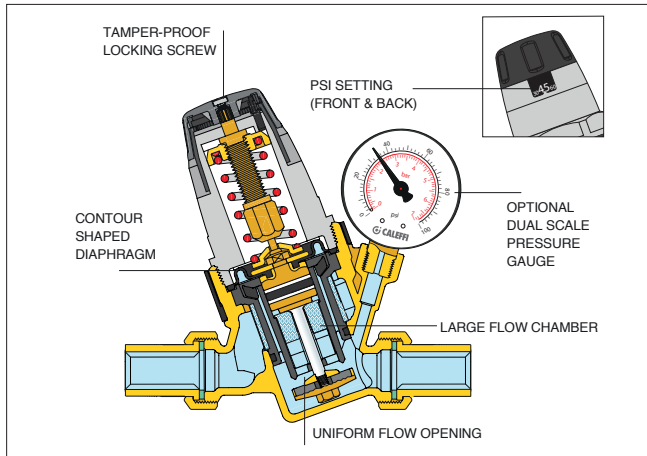
535H PresCal™ Body

Replacement valve body. DZR low lead "Ecobrass" body. Gauge port plug NA10438 included with body. See fitting selection table in Section 8.

ASSE 1003

Code	Description	Lbs	USD
NA535840HA	1/2" body	1.9	77.00
NA535850HA	3/4" body	2.2	81.00
NA535860HA	1" body	2.9	107.00
NA535870HA	1 1/4" body	6.1	234.00
NA535880HA	1 1/2" body	7.3	330.00
NA535890HA	2" body	9.7	383.00

Construction details 535H PresCal™



533H PresCal™ Body

Replacement valve body. DZR low lead "Ecobrass" body. Gauge port plug NA10438 included with body. See fitting selection table in Section 8.

ASSE 1003

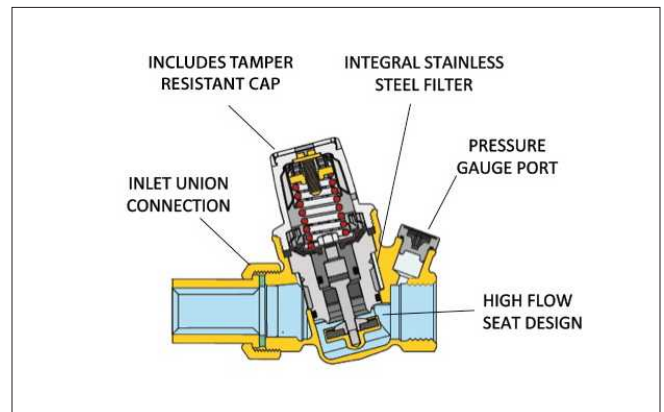
Code	Description	Lbs	USD
NA533449HA	1/2" body	0.7	68.40
NA533459HA	3/4" body	0.9	72.40



Replacement cartridge for 533H series pressure reducer.

Code	Description	Lbs	USD
533000H	Fits 533H 1/2", 3/4"	0.2	44.50

Construction details 533H PresCal™



NEW



Gauge port plug

Code	Description	Lbs	USD
NA10438	1/8" NPT	0.1	2.20



Pressure gauge fits 535H and 533H series pressure reducers. Dial size: 2". Pressure range: 0—100 psi /0-7 bar. Connection: 1/8" NPT.



PVC jumper nipple with male union thread. The length of the jumper nipple matches the 535H series valve body face-to-face dimension (B'), allowing the piping to be completed prior to the installation of valve and permitting quick change out from the jumper to the valve.

Code	Description	Lbs	USD
NA11304	Jumper nipple for 535H 1/2"	0.1	13.00
NA11305	Jumper nipple for 535H 3/4"	0.1	14.40
NA11306	Jumper nipple for 535H 1"	0.2	15.40
NA11307	Jumper nipple for 535H 1 1/4"	0.3	16.60
NA11308	Jumper nipple for 535H 1 1/2"	0.3	18.00
NA11309	Jumper nipple for 535H 2"	0.5	52.00

Code	Description	Lbs	USD
NA10273	1/8" NPT male	0.1	12.10



Replacement cartridge for 535H series pressure reducer.

Code	Description	Lbs	USD
535006HA	Fits 535H 1/2", 3/4", 1"	0.3	55.70
535009HA	Fits 535H 1 1/4", 1 1/2", 2"	0.5	171.00

BACKFLOW PREVENTERS, DUAL CHECK, FOR PLUMBING AND HYDRONICS



**573
Dual Check Backflow Preventer**

Dual check continuous pressure backflow preventer with atmospheric vent.
DZR low Lead brass body.

Max. working pressure: 175 psi.

Working temperature range: 32–250°F.

Emergency backpressure temperature: 250°F.

Certified to: ASSE 1012, CSA B64.3, NSF 372, Low Lead Laws and listed by ICC-ES. Meets codes IPC, IRC & UPC for use in accordance with the U.S. and Canadian plumbing codes.

ASSE 1012

Code	Description	Lbs	USD
573403A	1/2" NPT female unions	1.7	76.60
573406A	1/2" press unions	1.7	93.10
573409A	1/2" sweat unions	1.7	72.70
573493A	1/2" sweat union inlet, 1/2" FNPT union outlet	1.7	74.90
573503A	3/4" NPT female unions	1.7	80.40
573100A*	Replacement body w/washers	1.5	56.20

*See fitting selection table in Section 8

BACKFLOW PREVENTERS, RPZ TYPE, FOR PLUMBING AND HYDRONICS

**574
RPZ Backflow Preventer**



Testable reduced pressure zone backflow preventer.

DZR low lead brass body.

Max. working pressure: 150 psi.

Max. working temperature: 150°F.

ASSE 1013

**574
RPZ Backflow Preventer**



Testable reduced pressure zone backflow preventer.

DZR low lead brass body.

Max. working pressure: 150 psi.

Max. working temperature: 150°F.

ASSE 1013

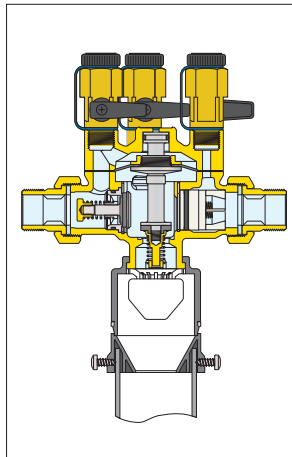
Code	Description	Lbs	USD
574004A	1/2" FNPT	5.0	296.00
574064A	1/2" press	5.1	314.00
59977	Replacement upstream check valve	0.1	18.40
59978	Replacement discharge valve assembly	0.2	32.90
59979	Replacement downstream check valve	0.1	21.30
59980	Replacement discharge air gap	0.1	8.00

Certified to: ASSE 1013, CSA B64.4, NSF372, Low Lead Laws and listed by ICC-ES. Meets codes IPC, IRC & UPC for use in accordance with the U.S. and Canadian plumbing codes.

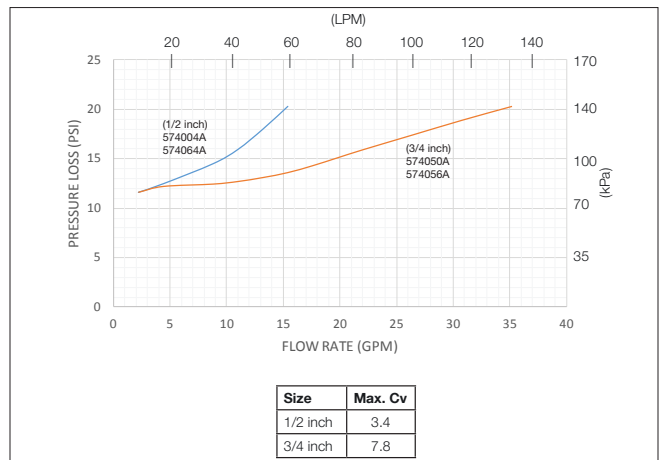
Code	Description	Lbs	USD
574050A	3/4" FNPT	9.5	356.00
574056A	3/4" press	9.6	386.00
59469	Replacement upstream check valve	0.2	47.40
59470	Replacement downstream check valve	0.2	50.30
59471	Replacement discharge valve assembly	0.3	99.70
59472	Replacement valve seat	0.1	35.50
39623	Replacement discharge air gap	0.2	11.80

Construction details

The testable reduced pressure zone backflow preventer is composed of a body with a removable cover, upstream and downstream check valves and relief valve. The two check valves create three separate pressure zones: upstream or inlet zone; intermediate, also known as the reduced pressure zone; and a downstream, or outlet zone. Each has a test port to measure pressure. A relief valve is located in the lower part of the reduced pressure zone. The valve stem of the relief valve is connected to the diaphragm, and is forced upward by the spring. The diaphragm separates the water in the upstream zone of the operation chamber from the water in the reduced pressure zone (RPZ) chamber.



Flow capacity



AUTOMATIC AIR VENT FOR PLUMBING



**NA5026
PLUMBVENT™**

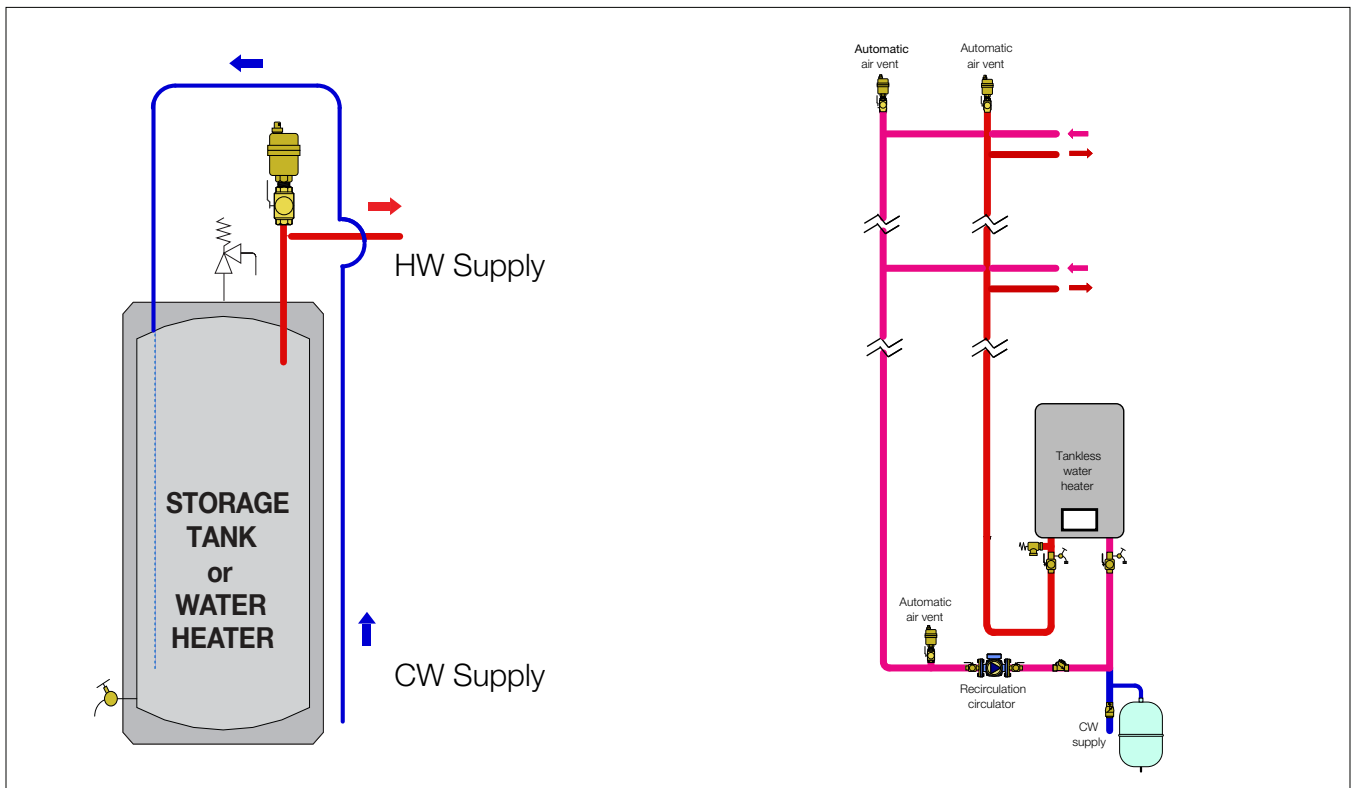
Automatic air vent.
Compatible with plumbing systems.
Hygroscopic cap (anti-drip).
Low lead brass body.
Max. working pressure: 150 psi.
Max. discharge pressure: 90 psi.
Max. discharge rate: 1.75 SCFM.
Max working temperature: 240°F.

Code	Description	Lbs	USD
NA502640A	1/2" MNPT	0.6	39.40

Function

Float type automatic air vent designed to vent air from water at high points in plumbing system piping. Example applications include risers, domestic hot water storage tanks and recirculation system pump inlets. The automatic air vent is installed in the vertical position in parts of the system where air has possibility accumulated. It is supplied complete with a safety hygroscopic cap that automatically closes the air discharge in case of contact with water.

Application Diagrams



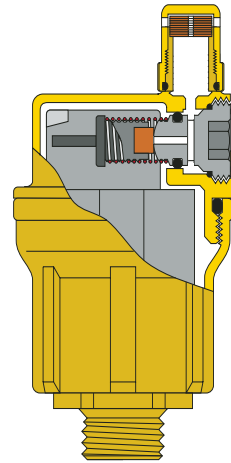
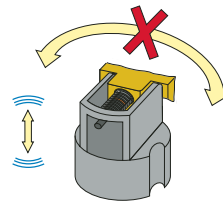
Construction Diagram

Operating mechanism

The function of this device is guaranteed by an operating mechanism specially designed to vent when system pressure is high.

Antivibration and antirotation system on the float

This guarantees that in the rest position the air relief valve will not be affected by any movement of the float.





Set It and Forget It with AutoFill™

Backflow preventer/fill valve combos

- Fast-fill and accurate pressure control for hydronic heating or cooling systems.
- Simple dial set point adjustment, factory pre-set at 15 psi.
- System-side pressure gauge for local indication.
- Choice of ASSE 1012 dual check or ASSE 1013 reduced pressure zone backflow for regional code variations.

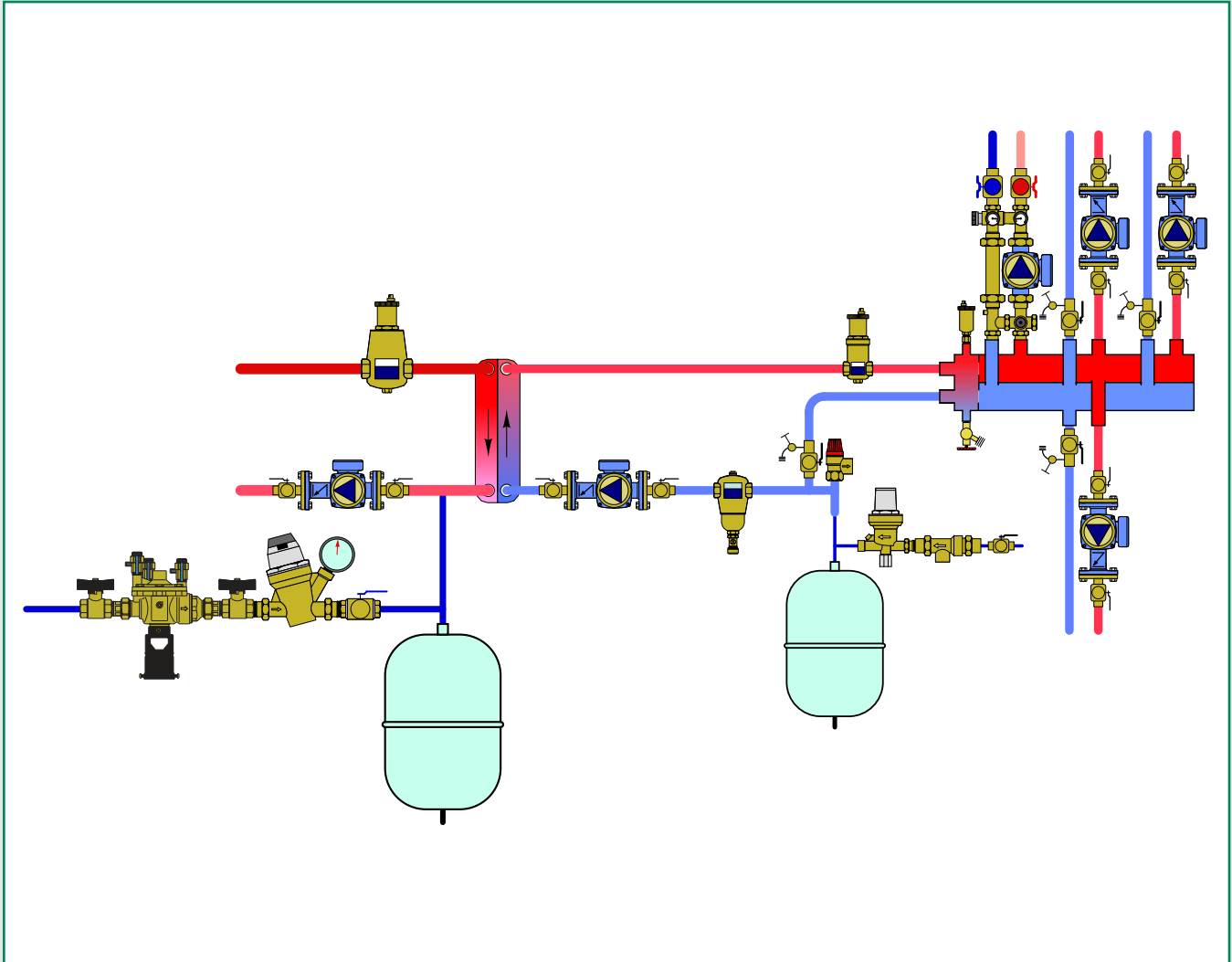


Heating & cooling

Components for today's modern hydronic systems

FILLING UNITS AND BOILER TRIM KITS

This diagram is for illustration purposes only



PRODUCTS INCLUDED IN SECTION

- Water treatment filling units
- Fill and flush cart
- Automatic filling units
- Boiler trim kits

WATER TREATMENT FILLING UNITS

**NA570
HYDROFILL™**

Portable water treatment filling unit, demineralizes site water through a mixed bed resin ion exchange with TDS indicator.

Complete including resin bags.
Composite PPHAGF50 body.
Max. inlet pressure: 120 psi.
Max. working temperature: 100°F.
Max. fill rate NA570912: 6 gpm.
Max. fill rate NA570924: 12 gpm.
TDS of water after treatment: < 30 ppm.
Connections: ¼" GHT.



Code	Description	Lbs	USD
NA570912	Two resin filter bag unit	44	1,814.00
NA570924	Four resin filter bag unit with cart	98	3,449.00

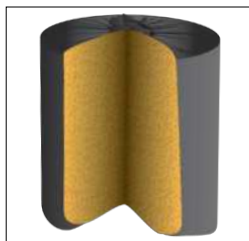
Construction details

The large yellow lever enables quick and easy opening of the tank. The lever includes a pressure release valve. In one motion as the lid is turned to the full open position, the tank depressurizes and opens to the full diameter of the tank.



Highly accurate built-in TDS meter 0 - 999 ppm with resolution of 1 ppm due to its advanced microprocessor technology. Auto-Off function conserves battery power. The unit shuts off automatically after 10 minutes of non-use. Replaceable battery with a life of approximately 1000 hours of continuous use.

Pre-packed resin bags save time and simplify resin change process. No more time-consuming, inconvenient filling up of narrow tanks and no more spilled, wasted resin. Resin change process is simple as removing the used bags and inserting new ones. Each bag is made from a water permeable material and contains a pre-proportioned amount of high capacity premium grade virgin mixed bed resin.



Innovative flow distribution screen design evenly distributes the inlet water through the entire column of resin. Produces up to 30% more treated water from a single resin refill compared to other types of demineralization tanks. Reduced operational cost through less frequent resin replacement. Less waste, less time spent on changing resin.



Replacement twist-on lid.
Includes new TDS monitor.

Code	Description	Lbs	USD
NA57094	Replacement twist-on lid	3	538.00

Replacement parts



Code	Description	Lbs	USD
NA57092	Replacement internal inlet/outlet screens	1.5	49.20
NA57093	Replacement o-ring seal kit	0.1	79.30



Resin bags for HYDROFILL™ in reusable plastic pail.

Code	Description	Lbs	USD
NA570971	Two resin bags for NA570912	22	396.00
NA570974	Four resin bags for NA570924	43	791.00

NA573

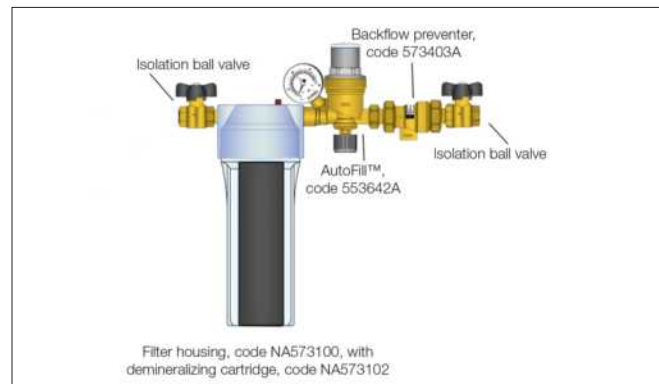


Replenishment water treatment filling unit, demineralizes site water through a color changing (indicates when to change) demineralizing cartridge.
Max. inlet pressure: 125 psi.
Max. working temperature: 100°F.
Max. flow: 1 gpm.
TDS of water after treatment: < 30 ppm.

Code	Description	Lbs	USD
NA573022*	½" FNPT	7.4	327.00
NA573100**	Replacement filter housing assembly	3.4	148.00
NA573102	Replacement color-changing filter	1.0	76.00

*Complete including back flow preventer, isolation valves, filter housing with resin cartridge and AutoFill™.
**Filter housing only. Includes color changing demineralizing cartridge.

Construction detail



FILL AND FLUSH CART

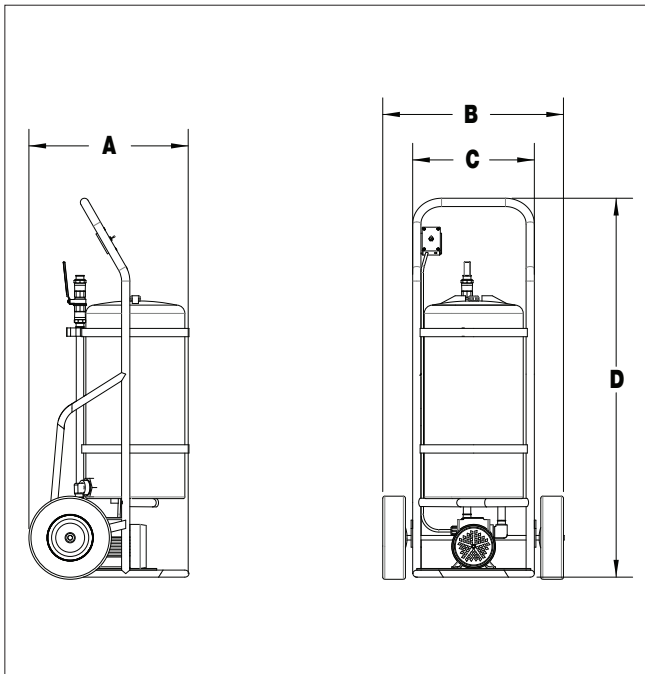
**NA255
HYDROFLUSH™**



The fill and flush pump cart is portable, leak-tested for a safe, quick and clean way to fill and flush solar, geo thermal and hydronic systems.
 Medium: water, glycol and cleaning fluids.
 Tank: 10 gallon with dirt filter.
 Max. tank medium temperature: 140°F.
 Pump delivery flow: 1–15 gpm.
 Pump feet of head: 125 psi.
 Max. pump pressure: 55 psi.
 Pump power: ½ HP (120 V AC).
 Isolating ball valves: ¾" garden hose thread.
 Transfer hoses: 8' with ¾" GHT (2 ea).
 Dimensions: 48"H x 20"W x 18"D.

Code	Description	Lbs	USD
NA25510	Clean, fill and flush cart	60	2,328.00
NA11338	Replacement hose, 3/4" ID, FxF GHT	3.0	51.00

Dimensions:



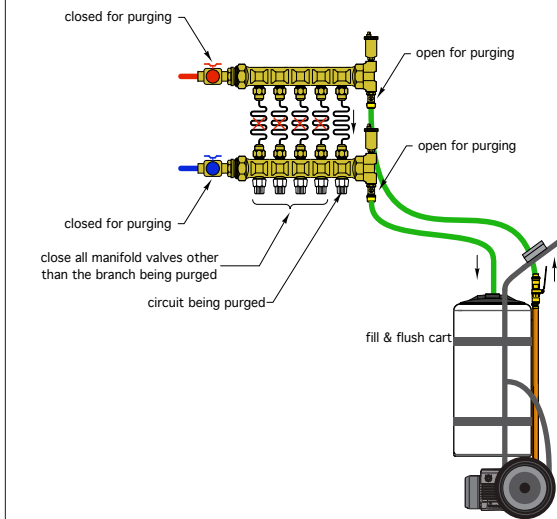
Code	A	B	C	D	Weight	Capacity
NA25510	19 ½"	20 "	14"	46 ¼"	85 lbs.	10 gallon

Function

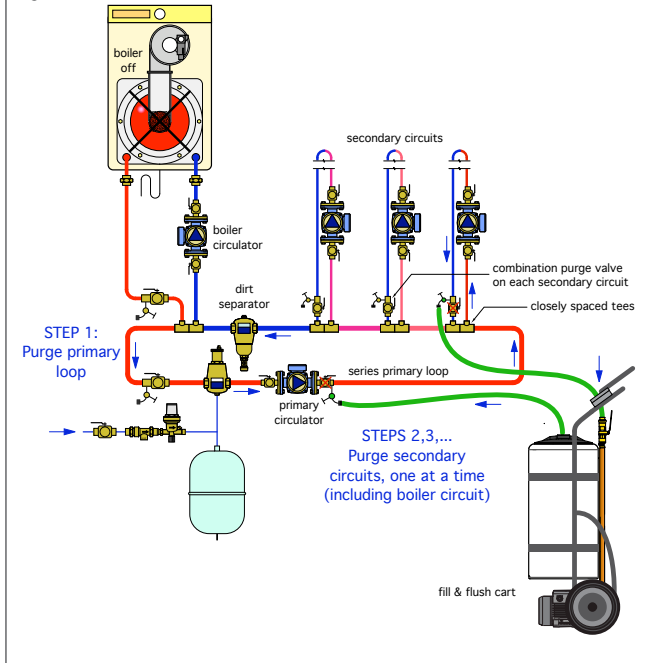
The fill and flush pump cart is portable and leak-tested for a safe, quick and clean way to fill and flush solar, geothermal and hydronic systems.

Connect the fill/purge valves to the fill and flush system, allow fluid to circulate and remove air and dirt in system.

Radiant



Hydronic



AUTOMATIC FILLING UNITS



553 AutoFill™

Pre-adjustable automatic filling valve, anti-scale, visual system pressure indicator. Complete with manual shut-off valve, strainer and check valve. Brass body.
 Max. inlet pressure: 230 psi.
 Max. working temperature: 150°F.
 Setting pressure range: 3–60 psi.
 Preset outlet pressure: 15 psi.
 Pressure gauge scale: 0–60 psi / 0–4 bar.

Code	Description	Lbs	USD
553542A	½" NPT male union in, ½" FNPT out	1.7	98.60
553549A	½" sweat union in, ½" FNPT out	1.7	93.70
553642A*	½" NPT male union in, ½" FNPT out	1.7	111.00
553649A*	½" sweat union in, ½" FNPT out	1.7	106.00

*With pressure gauge.



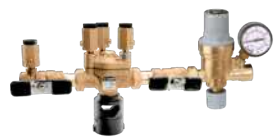
573 AutoFill™ Combo

Pre-adjustable automatic filling valve with backflow preventer. Brass body.
 Max. inlet pressure: 175 psi.
 Max. working temperature: 150°F.
 Setting pressure range: 3–60 psi.
 Preset outlet pressure: 15 psi.
 Pressure gauge scale: 0–60 psi / 0–4 bar.

ASSE 1012

Code	Description	Lbs	USD
573002A	½" NPT female union in, ½" FNPT out	5.0	168.00
573012A*	½" NPT female union in, ½" FNPT out	5.0	181.00
573006A	½" press union in, ½" press out	5.0	187.00
573016A*	½" press union in, ½" press out	5.0	202.00
573007A	½" press union in, ½" FNPT out	5.0	178.00
573017A*	½" press union in, ½" FNPT out	5.0	192.00
573009A	½" sweat union in, ½" FNPT out	5.0	161.00
573019A*	½" sweat union in, ½" FNPT out	5.0	174.00

*With pressure gauge.



574 AutoFill™ Combo

Pre-adjustable automatic filling valve with testable reduced pressure zone backflow preventer. Brass body.
 Max. working pressure: 150 psi.
 Max. working temperature: 150°F.
 Setting pressure range: 3–60 psi.
 Preset outlet pressure: 15 psi.
 Pressure gauge scale: 0–60 psi / 0–4 bar.

ASSE 1013

Code	Description	Lbs	USD
574002A	½" FNPT	9.4	389.00
574012A	½" FNPT, gauge	9.4	401.00
574006A	½" press	9.4	407.00
574016A	½" press, gauge	9.4	419.00
574007A	½" press in x FNPT out	9.4	398.00
574017A	½" press in x FNPT out, gauge	9.4	410.00



Code	Description	Lbs	USD
NA10363	0-60 psi/0-4 bar, ¼" NPT	0.1	12.70

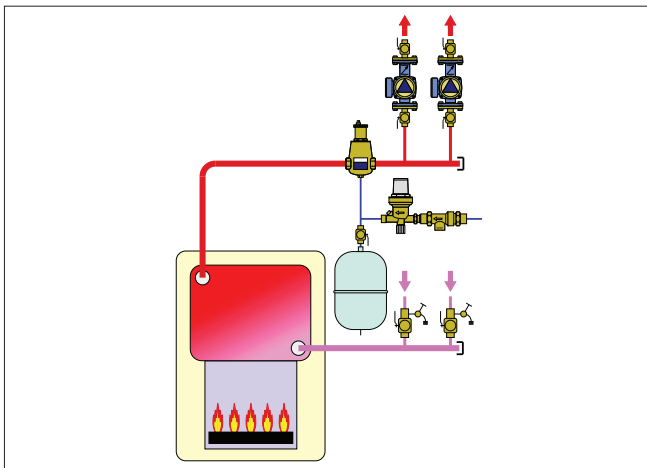


Code	Description	Lbs	USD
F59650	553 AutoFill replacement cartridge	0.2	29.10

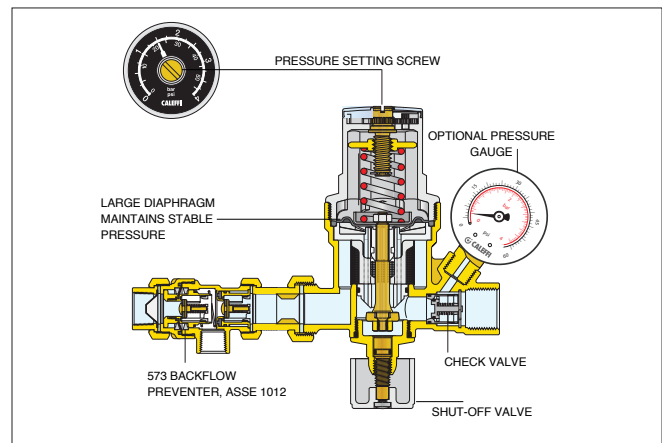


Code	Description	Lbs	USD
NA10197	AutoFill™ clear plastic disc cover	0.1	1.30

Application Diagram



Construction



COMMERCIAL AUTOMATIC FILLING UNITS



5350 AutoFill™

Automatic filling valve. Complete with integral downstream pressure gauge and pressure setting adjustment knob. Max. working pressure: 365 psi. Max. working temperature: 140°F. Pressure gauge scale: 0–100 psi /0–7 bar. Pressure setting range: 6–90 psi. Preset outlet pressure: 15 psi.

Code	Description	Lbs	USD
535051A	¾" NPT male union	2.3	128.00
535056A	¾" press union	2.3	131.00
535057A	¾" PEX crimp union	2.3	126.00
535058A	¾" PEX expansion union	2.3	126.00
535059A	¾" sweat union	2.3	126.00
535061A	1" NPT male union	2.4	135.00
535066A	1" press union	2.4	142.00
535067A	1" PEX crimp union	2.4	136.00
535068A	1" PEX expansion union	2.4	136.00
535069A	1" sweat union	2.4	134.00



5350 AutoFill™ Body

Automatic filling valve. Brass body. Complete with integral downstream pressure gauge and pressure setting adjustment knob. See fitting selection table in Section 8.

Code	Description	Lbs	USD
535950A	AutoFill™ body, no fittings	2.0	92.60



574 AutoFill™ Combo

Pre-adjustable automatic filling valve with testable reduced pressure zone backflow preventer. Max. working pressure: 150 psi. Max. working temperature: 140°F. Pressure gauge scale: 0–100 psi /0–7 bar. Pressure setting range: 6–90 psi. Preset outlet pressure: 15 psi.

ASSE 1013

Code	Description	Lbs	USD
574151A	¾" FNPT in, ¾" NPT male union out	9.4	475.00
574156A	¾" press	9.4	505.00
574157A	¾" press in, ¾" NPT male union out	9.4	490.00



NA102

Pressure gauge fits 5350 series AutoFill™. Dial size: 2". Pressure range: 0–100 psi /0–7 bar. Connection: ½" NPT.

Code	Description	Lbs	USD
NA10273	0-100 psi/0-7 bar, ½" MNPT	0.2	12.10



Replacement cartridge for 5350 series AutoFill™.

Code	Description	Lbs	USD
535004	AutoFill™ 5350 series replacement cartridge	0.2	46.40

BOILER TRIM KITS



NA553

Boiler Trim Kits. 6 configurations combining 8 boiler installation components in one box. This kit includes:

- (1) Caleffi DISCAL® air separator
- (1) Backflow preventer: ½" NPT, sweat or press union
- (1) AutoFill™
- (1) Expansion tank check valve
- (2) Brass nipples: 3"
- (1) NPT brass tee
- (1) Expansion tank

Code	Description	Tank size (gal)	Lbs	USD
NA553362	1" FNPT	4.4	15	471.00
NA553366	1" press	4.4	15	505.00
NA553369	1" sweat	4.4	15	461.00
NA553372	1¼" FNPT	4.4	16	545.00
NA553376	1¼" press	4.4	16	607.00
NA553379	1¼" sweat	4.4	16	535.00



NA553

Boiler Trim Kits. 6 configurations combining 8 boiler installation components in one box. This kit includes:

- (1) Caleffi DISCAL® air separator
- (1) RPZ backflow preventer
- (1) AutoFill™
- (1) Expansion tank check valve
- (2) Brass nipples: 3"
- (1) NPT brass tee
- (1) Expansion tank

Code	Description	Tank size (gal)	Lbs	USD
NA553362R	1" FNPT	4.4	19.4	750.00
NA553366R	1" press	4.4	19.4	785.00
NA553369R	1" sweat	4.4	19.4	741.00
NA553372R	1¼" FNPT	4.4	20.4	825.00
NA553376R	1¼" press	4.4	20.4	887.00
NA553379R	1¼" sweat	4.4	20.4	814.00



Pioneers Guiding the Industry

Providing state-of-the-art engineered solutions for today's world

- Creating innovative, superior performance products that help customers live comfortably and economically, while softening their impact on the environment.
- Continually expanding our product portfolio to meet industry needs.

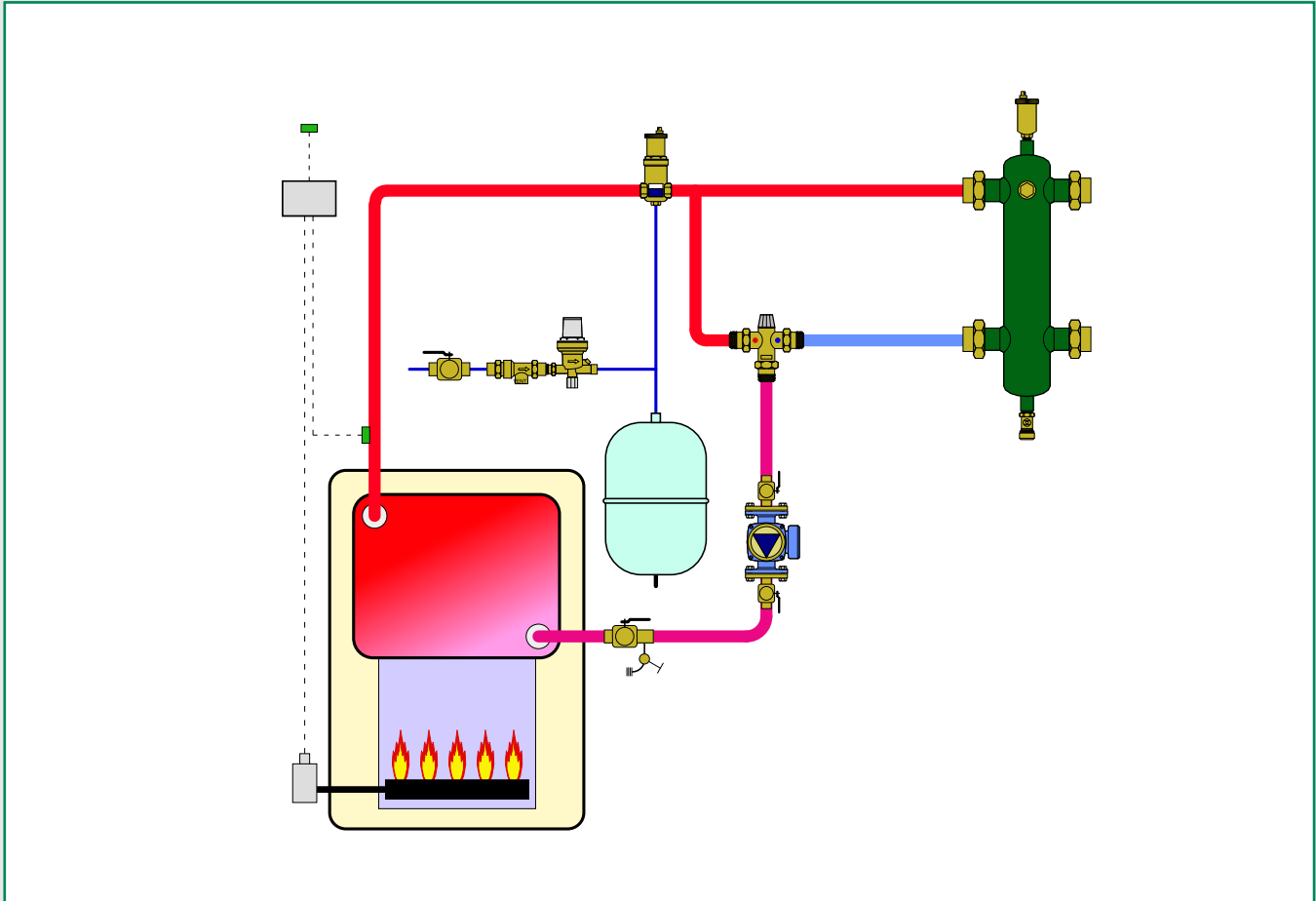


Heating & cooling

Components for today's modern hydronic systems

FITTINGS AND MISCELLANEOUS COMPONENTS

This diagram is for illustration purposes only



PRODUCTS INCLUDED IN SECTION

- Fittings configuration table
- Small mixing valves, zone valves, others with 1" union fittings
- Prescal™ pressure reducing valve fittings
- Press fitting kits
- Mixing valve fittings
- AutoFill™ and backflow preventer fittings
- Hydro separator fittings
- Fittings with threads
- Miscellaneous system components
- Uni-Switch™ Universal flow switch

FITTING CONFIGURATION TABLE

Product series	Code	Description	Nut code	Tailpiece code	Washer code	USD
535H PresCal™ (½") 533H PresCal™ (½") 553 AutoFill™	NA20543	½" FNPT, ¾" nut, washer	incl. w/tail	F49644	incl. w/tail	16.40
	NA20540	½" MNPT, ¾" nut, washer	F41186	F31868	R50058	13.50
	NA20549	½" sweat, ¾" nut, washer	F41186	NA10001	R50058	11.90
127 FlowCal™	NA20643	½" FNPT, 1" nut, washer	F0000698	NA10569	F50055	16.40
	NA20640	½" MNPT, 1" nut, washer	F61008	R31981	F50055	14.20
	NA20640C	½" MNPT, 1" nut, washer, check	F61008	59893A	F50055	22.10
	NA20649	½" sweat, 1" nut, washer	F61008	NA10002	F50055	11.70
	NA20649C	½" sweat, 1" nut, washer, check	F61008	NA10164	F50055	19.70
	NA20646	½" press, 1" nut, washer	F61008	NA10403	F50055	15.10
127 FlowCal+™	NA20647	½" PEX crimp, 1" nut, washer	F61008	F0000492	F50055	11.70
132 QuickSetter+™	NA20647C	½" PEX crimp, 1" nut, washer, check	F61008	NA10484	F50055	19.70
	NA20648	½" PEX expansion, 1" nut, washer	F61008	F0001007	F50055	11.70
520 TankMixer™	NA20648C	½" PEX expansion, 1" nut, washer, check	F61008	NA10634	F50055	19.70
520 AngleMix™	NA20653	¾" FNPT, 1" nut, washer	incl. w/tail	F49645	incl. w/tail	18.60
	NA20650	¾" MNPT, 1" nut, washer	F61008	31901A	F50055	16.40
521 MixCal™	NA20650C	¾" MNPT, 1" nut, washer, check	F61008	59840A	F50055	28.20
	NA20659	¾" sweat, 1" nut, washer	F61008	NA10003	F50055	14.10
5213 TMV (req. inlet port check)	NA20659C	¾" sweat, 1" nut, washer, check	F61008	NA10165	F50055	25.80
	NA20656	¾" press, 1" nut, washer	incl. w/tail	NA16265	F50055	16.50
5350 AutoFill™	NA20656C	¾" press, 1" nut, washer, check	incl. w/tail	NA16265LC	F50055	36.60
533H PresCal™ (¾")	NA20657	¾" PEX crimp, 1" nut, washer	F61008	F0000520	F50055	14.10
535H PresCal™ (¾")	NA20657C	¾" PEX crimp, 1" nut, washer, check	F61008	NA10485	F50055	25.80
	NA20658	¾" PEX expansion, 1" nut, washer	F61008	F0001008	F50055	14.10
644 Ball Valve	NA20658C	¾" PEX expansion, 1" nut, washer, check	F61008	NA10635	F50055	25.80
676 Zone Valve	NA20660	1" MNPT, 1" nut, washer	incl. w/tail	59817A	F50055	27.20
	NA20660C	1" MNPT, 1" nut, washer, check	incl. w/tail	59894A	F50055	38.90
Z2, Z3 Zone Valve	NA20669	1" sweat, 1" nut, washer	incl. w/tail	59834A	F50055	24.50
	NA20669C	1" sweat, 1" nut, washer, check	incl. w/tail	59906A	F50055	36.30
NA512xx	NA20666	1" press, 1" nut, washer	incl. w/tail	NA16266	F50055	28.40
V40 flow meter	NA20666C	1" press, 1" nut, washer, check	incl. w/tail	NA16266LC	F50055	56.00
	NA20667	1" PEX crimp, 1" nut, washer	F61008	F0000521	F50055	24.50
	NA20667C	1" PEX crimp, 1" nut, washer, check	F61008	NA10486	F50055	36.30
	NA20668	1" PEX expansion, 1" nut, washer	F61008	F0001009	F50055	24.50
	NA20668C	1" PEX expansion, 1" nut, washer, check	F61008	NA10636	F50055	36.30
535H PresCal™ (1")	NA20763	1" FNPT, 1¼" nut, washer	incl. w/tail	F49646	incl. w/tail	26.20
	NA20767	1" PEX crimp, 1¼" nut, washer	R31495	NA10496	R50056	25.00
	NA20766	1" press, 1¼" nut, washer	incl. w/tail	NA10497	R50056	31.50
	NA20769	1" sweat, 1¼" nut, washer	incl. w/tail	F49657	incl. w/tail	19.30
535H PresCal™ (1¼")	NA20873	1¼" FNPT, 1½" nut, washer	incl. w/tail	F49647	incl. w/tail	47.50
	NA20879	1¼" sweat, 1½" nut, washer	R31589	41787 CST	R50057	42.80
	NA20876	1¼" press, 1½" nut, washer	R11221	NA10707	R50057	62.80
535H PresCal™ (1½")	NA20983	1½" FNPT, 2" nut, washer	incl. w/tail	F0000493	R50008	72.20
	NA20989	1½" sweat, 2" nut, washer	incl. w/tail	F0000494	R50008	60.10
	NA20986	1½" press, 2" nut, washer	incl. w/tail	NA10715	R50008	130.00
535H PresCal™ (2")	NA21193	2" FNPT, 2½" nut, washer	incl. w/tail	F0000495	R50060	99.70
	NA21199	2" sweat, 2½" nut, washer	incl. w/tail	F0000496	R50060	109.00
	NA21196	2" press, 2½" nut, washer	incl. w/tail	NA10709	R50060	182.00

FITTING CONFIGURATION TABLE

Product series	Code	Description	Nut code	Tailpiece code	Washer code	USD
548, 5495 Seps (1")	NA20863	1" FNPT, 1½" nut, washer	R31589	31553 FD	R50005	29.30
	NA20869	1" sweat, 1½" nut, washer	R31589	31554 FD	R50005	29.60
	NA20866	1" press 1½" nut, washer	R31589	NA10406	R50005	48.50
548, 5495 Seps (1¼")	NA20973	1¼" FNPT, 2" nut, washer	R53003	31401 FD	R50008	62.30
	NA20979	1¼" sweat, 2" nut, washer	R53003	31403 FD	R50008	83.20
	NA20976	1¼" press 2" nut, washer	R53003	NA10407	R50008	85.40
548, 5495 Seps (1½") 5461 DISCALDIRTMAG™ (1½")	NA21083	1½" FNPT, 2¼" nut, washer	R53004	R41441	R50047	67.80
	NA21089	1½" sweat, 2¼" nut, washer	R53004	41882A	R50047	86.50
	NA21086	1½" press 2¼" nut, washer	R53004	NA10408	R50047	114.00
548, 5495 Seps (2") 5461 DISCALDIRTMAG™ (2")	NA21293	2" FNPT, 2¾" nut, washer	R53005	31426 FD	R50048	105.00
	NA21299	2" sweat, 2¾" nut, washer	R53005	31428 FD	R50048	124.00
	NA21296	2" press 2¾" nut, washer	R53005	NA10409	R50048	168.00
5231 MixCal+™ (1") 6000 LEGIOMIX® (1")	NA20860	1" MNPT 1½" nut, washer	R31589	NA10009	R50057	32.50
	NA20869	1" sweat, 1½" nut, washer	R31589	31554 FD	R50057	29.60
	NA20866	1" press, 1-1/2" nut, washer	R31589	NA10706	R50057	48.50
5231 MixCal+™ (1¼") 6000 LEGIOMIX® (1¼")	NA20870	1¼" MNPT 1½" nut, washer	R31589	R41660	R50057	57.30
	NA20879	1¼" sweat, 1½" nut, washer	R31589	41787 CST	R50057	42.80
	NA20876	1-1/4" press, 1-1/2" nut, washer	R11221	NA10707	R50057	62.80
5231 MixCal+™ (1½") 6000 LEGIOMIX® (1½")	NA21180	1½" MNPT 2½" nut, washer	R51838	41371A	R50060	95.90
	NA21189	1½" sweat 2½" nut, washer	R51838	41788 CST	R50060	84.30
	NA21186	1½" press, 2-1/2" nut, washer	R51838	NA10708	R50060	126.00
5231 MixCal+™ (2") 6000 LEGIOMIX® (2")	NA21190	2" MNPT 2½" nut, washer	R51838	41372A	R50060	121.00
	NA21199	2" sweat 2½" nut, washer	R51838	41789 CST	R50060	109.00
	NA21196	2" press, 2-1/2" nut, washer	incl. w/tail	NA10709	R50060	182.00

SMALL MIXING VALVES, ZONE VALVES, OTHERS WITH 1" UNION FITTINGS



Tail piece with check valve.
Low lead brass.

Code	Description	Lbs	USD
59893A	½" NPT male fits 1" nut	0.2	17.20
59840A	¾" NPT male fits 1" nut	0.3	23.30



Tail piece without check valve.
Low lead brass.

Code	Description	Lbs	USD
R31981	½" NPT male fits 1" nut	0.3	9.10
31901A	¾" NPT male fits 1" nut	0.4	11.50



Tail piece.
Low lead brass. Requires sealing washer
R50055, not included.

Code	Description	Lbs	USD
59817A	1" NPT male with 1" nut	0.4	25.80
59894A	1" NPT male with 1" nut w/check valve	0.5	37.50



Tail piece with check valve.
Low lead brass.

Code	Description	Lbs	USD
59904A	½" NPT male fits 1" nut	0.2	14.80
59905A	¾" NPT male fits 1" nut	0.3	20.90



Copper press tail piece with 1" brass union
nut. Low lead. Requires sealing washer, not
included.

Code	Description	Lbs	USD
NA16264	½" press with 1" union nut	0.3	13.80
NA16265	¾" press with 1" union nut	0.4	15.20
NA16266	1" press with 1" union nut	0.5	27.10



Long copper press tail piece with 1" brass
union slip nut. Low lead. Requires sealing
washer, not included.

Code	Description	Lbs	USD
NA16265L	¾" long press with 1" union slip nut	0.3	34.80
NA16265LC	¾" long press with 1" union nut/check valve	0.3	44.10
NA16266L	1" long press with 1" union slip nut	0.3	52.00
NA16266LC	1" long press with 1" union nut/check valve	0.3	54.00



Washer fits 1" union thread.

Code	Description	Lbs	USD
F50055	1" union washer	0.1	1.30



Tail piece.
Low lead brass.

Code	Description	Lbs	USD
NA10002	½" sweat fits 1" nut	0.2	6.70
NA10003	¾" sweat fits 1" nut	0.3	9.10



Tail piece.
Low lead brass. Requires sealing washer
R50055, not included.

Code	Description	Lbs	USD
59834A	1" sweat with 1" nut	0.4	23.20
59906A	1" sweat with 1" nut w/check valve	0.5	35.00



Tail piece with high temperature check valve.
Low lead brass.

Code	Description	Lbs	USD
NA10164	½" sweat fits 1" nut	0.2	20.60
NA10165	¾" sweat fits 1" nut	0.3	24.10



Tail piece with high temperature check valve.
Low lead brass. Requires sealing washer
F50055, not included.

Code	Description	Lbs	USD
NA10166	1" sweat with 1" nut w/check valve	0.4	39.50



Copper press low lead tail piece with check
valve, requires F0000698 1" slip nut.

Code	Description	Lbs	USD
NA10419C	¾" press long fits 1" slip nut w/check	0.3	35.30



Copper press low lead tail piece, requires
F0000698 1" slip nut.

Code	Description	Lbs	USD
NA10403	½" press fits 1" nut	0.1	17.90
NA10419	¾" press long fits 1" slip nut F0000698	0.3	30.20
NA10404	1" press fits 1" slip nut F0000698	0.4	27.20



Washer fits 1" union thread.
High temperature silicone rubber.
Working temperature: -40—350°F.

Code	Description	Lbs	USD
NA10302	1" union washer high temp silicone	0.1	2.00

SMALL MIXING VALVES, ZONE VALVES, OTHERS WITH 1" UNION FITTINGS



Union nut fits 1" union thread.

Code	Description	Lbs	USD
F61008	1" brass nut	0.2	3.60
F0000698	1" brass slip nut	0.2	5.00



Union nut fits 1" union thread.

Code	Description	Lbs	USD
F61008/C	1" chrome-plated nut	0.2	4.30



Compression fitting

Code	Description	Lbs	USD
F0000718	3/8" compression tailpiece for 1" nut	0.1	13.40



PEX crimp (ASTM F1807) tailpiece for 1" union nut, requires sealing washer and nut, not included.

Code	Description	Lbs	USD
F0000492	1/2" PEX for 1" union nut	0.1	6.70
F0000520	3/4" PEX for 1" union nut	0.1	9.10
F0000521	1" PEX for 1" union nut	0.1	19.50



PEX expansion (ASTM F1960) tailpiece for 1" union nut, requires sealing washer and nut, not included.

Code	Description	Lbs	USD
F0001007	1/2" PEX for 1" union nut	0.1	6.70
F0001008	3/4" PEX for 1" union nut	0.1	9.10
F0001009	1" PEX for 1" union nut	0.1	19.50



PEX crimp (ASTM F1807) tailpiece for 1" union nut with check valve, requires sealing washer and nut, not included.

Code	Description	Lbs	USD
NA10484	1/2" PEX for 1" union nut	0.1	14.80
NA10485	3/4" PEX for 1" union nut	0.1	20.90
NA10486	1" PEX for 1" union nut	0.1	31.30



PEX expansion (ASTM F1960) tailpiece for 1" union nut with check valve, requires sealing washer and nut, not included.

Code	Description	Lbs	USD
NA10634	1/2" PEX for 1" union nut	0.1	14.80
NA10635	3/4" PEX for 1" union nut	0.1	20.90
NA10636	1" PEX for 1" union nut	0.1	31.30

5231 AND 6000 SERIES MIXING VALVE FITTINGS



Tail piece
Low lead brass.

Code	Description	Lbs	USD
NA10009	1" NPT male	0.3	36.00
R41660	1 1/4" NPT male	0.3	41.20
41371A	1 1/2" NPT male	0.4	46.40
41372A	2" NPT male	0.5	60.10



Tail piece
Low lead brass.

Code	Description	Lbs	USD
31554 FD	1" sweat	0.3	28.50
41787 CST	1 1/4" sweat	0.3	28.10
41788 CST	1 1/2" sweat	0.4	44.50
41789 CST	2" sweat	0.5	57.90



Washer

Code	Description	Lbs	USD
R50057*	1 1/2" union washer	0.1	2.80
R50060**	2 1/2" union washer	0.1	13.30

*fits 1" and 1-1/4" valves
** fits 1-1/2" and 2" valves



Large press tail piece
Low lead brass.

Code	Description	Lbs	USD
NA10706	1" press tailpiece assy	0.4	36.00
NA10707	1 1/4" press tailpiece assy	0.4	66.00
NA10708	1 1/2" press tailpiece assy	0.5	94.00
NA10709	2" press tailpiece assy	0.5	168.00



Union nut

Code	Description	Lbs	USD
R31589*	1 1/2" union nut	0.2	12.30
R11221	1 1/2" slip union nut for 1 1/4" press	0.2	12.00
R51838**	2 1/2" union nut	0.3	29.90

* fits 1" and 1 1/4" valves
**fits 1 1/2" and 2" valves

PRESCAL™ PRESSURE REDUCING VALVE FITTINGS

NEW



NPT female tailpieces with union nut and washer

Code	Description	Lbs	USD
F49644	1/2" NPT female tailpiece with 3/4" union nut	0.4	16.00
F49645	3/4" NPT female tailpiece with 1" union nut	0.5	18.00
F49646	1" NPT female tailpiece with 1 1/4" union nut	0.6	24.00
F49647	1 1/4" NPT female tailpiece with 1 1/2" union nut	0.7	40.00
F0000493	1 1/2" NPT female tailpiece with 2" union nut	0.9	72.00
F0000495	2" NPT female tailpiece with 2 1/2" union nut	1.0	86.00

NEW



NPT male tailpieces for union nut

Code	Description	Lbs	USD
F31868	1/2" NPT male tailpiece for 3/4" union nut	0.1	9.50
31901A	3/4" NPT male tailpiece for 1" union nut	0.1	11.50

NEW



Sweat tailpieces

Code	Description	Lbs	USD
NA10001	1/2" sweat tailpiece for 3/4" union nut	0.1	7.90
NA10003	3/4" sweat tailpiece for 1" union nut	0.2	9.10
F49657*	1" sweat tailpiece with 1 1/4" nut	0.4	16.00
41787 CST	1 1/4" sweat tailpiece for 1 1/2" union nut	0.3	28.10
F0000494*	1 1/2" sweat tailpiece with 2" union nut	0.7	54.00
F0000496*	2" sweat tailpiece with 2 1/2" union nut	0.8	74.00

*with washer

NEW



Press tailpieces

Code	Description	Lbs	USD
NA16265	3/4" press tailpiece with 1" nut	0.2	15.20
NA10497	1" press tailpiece with 1 1/4" union nut	0.4	30.00
NA10707	1 1/4" press tailpiece for 1 1/2" union nut	0.6	66.00
NA10715	1 1/2" press tailpiece with 2" union nut	0.8	130.00
NA10709	2" press tailpiece with 2 1/2" union nut	0.9	168.00

NEW



PEX expansion tailpieces (ASTM F1960) for union nut

Code	Description	Lbs	USD
F0001008	3/4" PEX expansion tailpiece for 1" union nut	0.1	9.10
NA10556	1" PEX expansion tailpiece for 1 1/4" union nut	0.2	12.00

NEW



PEX crimp tailpieces (ASTM F1807) for union nut

Code	Description	Lbs	USD
F0000520	3/4" PEX crimp tailpiece for 1" union nut	0.1	9.10
NA10496	1" PEX crimp tailpiece for 1 1/4" union nut	0.2	22.00

NEW



Union nut

Code	Description	Lbs	USD
F41186	3/4" union nut	0.1	2.90
F61008	1" union nut	0.2	3.60
R31495	1 1/4" union nut	0.3	6.00
R31589	1 1/2" union nut	0.4	12.30
R53003	2" union nut	0.4	24.40
R51838	2 1/2" union nut	0.5	29.90

NEW



Union washers

Code	Description	Lbs	USD
R50058	3/4" union washer	0.1	1.20
F50055	1" union washer	0.1	1.30
R50056	1 1/4" union washer	0.1	2.00
R50057	1 1/2" union washer	0.1	2.80
R50008	2" union washer	0.1	5.70
R50060	2 1/2" union washer	0.1	13.30

AUTOFILL™ FITTINGS



AutoFill™ union nut.

Code	Description	Lbs	USD
F41186	¾" union nut	0.1	2.90



AutoFill™ tail piece.

Code	Description	Lbs	USD
NA10001	½" sweat	0.3	7.90



AutoFill™ tail piece.

Code	Description	Lbs	USD
F31868	½" NPT male	0.1	9.50



AutoFill™ washer.

Code	Description	Lbs	USD
R50058	¾" union washer	0.1	1.20

BACKFLOW PREVENTER FITTINGS



Tail piece with screen fits 573 backflow preventer.

Code	Description	Lbs	USD
R0000892	½" NPT female	0.1	12.00



Tail piece with screen fits 573 backflow preventer.

Code	Description	Lbs	USD
41380A	½" sweat	0.1	11.40



Washer union fits 573 backflow preventer.

Code	Description	Lbs	USD
R50065	Union washer	0.1	2.80

SEPARATOR FITTINGS



Tail piece for steel 548, 5495, 5461.

Code	Description	Lbs	USD
31553 FD	1" NPT female, fits 54...6A	0.3	14.30
31401 FD	1¼" NPT female, fits 54...7A	0.3	32.20
R41441	1½" NPT female, fits 54...8A	0.3	31.10
31426 FD	2" NPT female, fits 54...9A	0.4	63.40



Tail piece for steel 548, 5495, 5461.

Code	Description	Lbs	USD
31554 FD	1" sweat, fits 54...6A	0.3	28.50
31403 FD	1¼" sweat, fits 54...7A	0.3	53.20
41882A	1½" sweat, fits 54...8A	0.3	50.30
31428 FD	2" sweat, fits 54...9A	0.4	82.70



Press tail piece for steel 548, 5495, 5461.

Code	Description	Lbs	USD
NA10406	1" press, fits 54...6A	0.6	36.90
NA10407	1¼" press, fits 54...7A	0.7	55.10
NA10408	1½" press, fits 54...8A	0.9	77.70
NA10409	2" press, fits 54...9A	1.0	127.00



Union nut for steel 548, 5495, 5461.

Code	Description	Lbs	USD
R31589	fits 54...6A	0.4	12.30
R53003	fits 54...7A	0.4	24.40
R53004	fits 54...8A	0.4	24.40
R53005	fits 54...9A	0.4	27.90



Union washer for steel 548, 5495, 5461.

Code	Description	Lbs	USD
R50005	fits 54...6A	0.2	2.80
R50008	fits 54...7A	0.2	5.70
R50047	fits 54...8A	0.2	11.40
R50048	fits 54...9A	0.2	13.80

FITTINGS WITH 3/4" THREADS



Double nipple.

Code	Description	Lbs	USD
NA12172	3/4" NPT x 3/4" NPT	0.3	17.30



Union nut.

Code	Description	Lbs	USD
F41186	3/4" union nut	0.1	2.90

FITTINGS WITH 1" THREADS



Double nipple.

Code	Description	Lbs	USD
NA12173	1" NPT x 1" NPT	0.4	21.50



Bushing.

Code	Description	Lbs	USD
NA10060	3/4" NPT female w/ 1" male thread	0.3	17.30



Sweat adapter.

Code	Description	Lbs	USD
NA10061	3/4" sweat adaptor w/ 1 " male thread	0.2	18.00



Sweat adapter.

Code	Description	Lbs	USD
NA10062	1" sweat adaptor w/ 1" male thd.	0.1	18.60



Union nut fits 1" union thread.

Code	Description	Lbs	USD
F61008	1" brass nut	0.2	3.60
F000698	1" brass slip nut	0.2	5.00

FITTINGS WITH 1" THREADS



Nipple.

Code	Description	Lbs	USD
NA12162	3/4" male w/ O-ring x 1" male thread	0.2	19.90



Bushing.

Code	Description	Lbs	USD
NA10089	3/4" female thread x 1" male thread	0.1	14.40



Disk.

Code	Description	Lbs	USD
NA10104	1" female disk	0.1	2.90



High temperature silicone flat 1" washer.

Code	Description	Lbs	USD
NA10302	1" flat silicone gasket	0.1	2.00



Nipple.

Code	Description	Lbs	USD
NA10064	1" NPT w/ 1" male thread	0.2	19.40

FITTINGS WITH 1 1/4" THREADS



Sweat adapter.

Code	Description	Lbs	USD
NA10119	1" sweat adapter x 1 1/4" union thread	0.4	23.70



Bushing.

Code	Description	Lbs	USD
NA10087	1" female x 1 1/4" male thread bushing	0.4	17.40



Bushing.

Code	Description	Lbs	USD
61215A	1" NPT F x 1 1/4" M thread bushing	0.8	17.30



Nipple.

Code	Description	Lbs	USD
R31706	1" male x 1 1/4" male nipple	0.3	21.50



union nut.

Code	Description	Lbs	USD
R31495	1 1/4" union nut	0.1	6.00



Washer.

Code	Description	Lbs	USD
R50056	1 1/4" washer	0.1	2.00



Disk.

Code	Description	Lbs	USD
R11059	1 1/4" female disk	0.1	3.60

MISCELLANEOUS SYSTEM COMPONENTS



519

Differential pressure by-pass valve. Adjustable from 2 to 10 psid. Brass body. Max. working pressure: 150 psi. Working temperature range: 32 – 230°F. ¾" flow up to 9 gpm. 1" flow up to 40 gpm. 1¼" flow up to 45 gpm.

Code	Description	Lbs	USD
519502A	¾" NPT female union	1.0	106.00
519566A	¾" press union	1.0	120.00
519599A	¾" sweat union	1.0	105.00
519600A	1" FNPT in, 1" NPT male union out	1.4	165.00
519609A	1" FNPT in, 1" sweat union out	1.4	165.00
519700A	1¼" FNPT in, 1¼" NPT male union out	1.5	198.00
519709A	1¼" FNPT in, 1¼" sweat union out	1.5	198.00



538

Drain valve. Brass body. ¾" garden hose thread with cap. Max. working pressure: 150 psi. Max. working temperature: 250°F.

Code	Description	Lbs	USD
538202 FD	¼" NPT male x ¾" GHT	0.3	12.00
538402 FD	½" NPT male x ¾" GHT	0.3	12.30



NA503

Tridicator dual pressure / temperature gauge for boilers. Dial size: 3 1/8". Pressure range: 0–75 PSI. Temperature range: 60–320 F. ¼" NPT rear probe. For direct fluid stream submersion.

Code	Description	Lbs	USD
NA503040	¼" NPT male center back	0.2	29.90

UNIVERSAL FLOW SWITCH



626 Uni-Switch™

Universal flow switch. Suitable for 1" to 8" pipe size. Working pressure: 150 psi. Working temperature range: -20 – 250°F. Minimum flow: 5.7 gpm. Switch contacts: NO or NC. Switch rating: 15 A. CE, cUL, NEMA Type 5, IP 54.



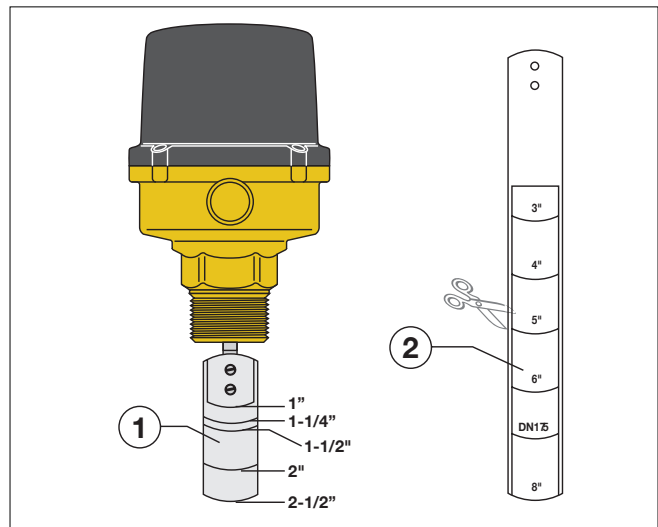
Code	Description	Lbs	USD
626600A	1" NPT male thread	2.3	206.00
626009	Replacement paddle assembly*	0.1	19.30

* stainless steel

Installation

The unit is equipped with a set of paddles (blades) (1), to be used for different pipe diameters, particularly sized to allow easy installation and minimal head losses.

For diameters equal to or greater than 3" (DN 80), it is necessary to add to the preassembled blades in increasing order on the long blade (2) (supplied in the package), just by cutting it to the size corresponding to the desired diameter. Replacement paddle or blade assemblies are available, order part number 626009.



SERVICEABLE LOW LEAD CHECK VALVES

NEW

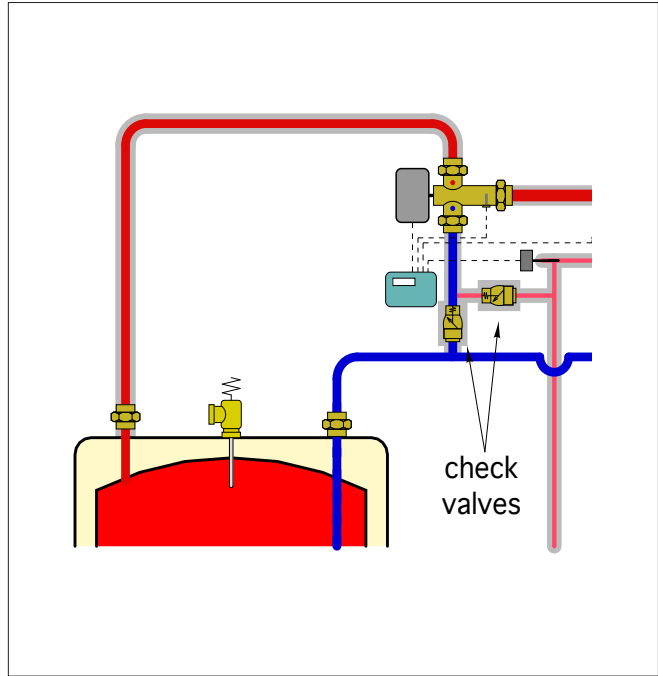


NA51

Serviceable low lead check valves.
 Max. working pressure: 150 psi (10 bar).
 Operating temperature range: 32 to 150°F (0 to 65°C).
 Max. temperature: for one hour: 190°F (88°C).
 Opening pressure differential: 0.25 psi (½" through 1¼"); 0.50 psi (1½", 2").

Code	Description	Cv	Lbs	USD
NA51200	Body, small, w/o fittings	17	0.2	44.00
NA51240	½" MNPT	17	0.4	74.00
NA51243	½" FNPT	17	0.4	84.00
NA51246	½" press	17	0.4	90.00
NA51247	½" PEX crimp	17	0.4	68.00
NA51248	½" PEX expansion	17	0.4	68.00
NA51249	½" sweat	17	0.4	62.00
NA51250	¾" MNPT	17	0.6	78.00
NA51253	¾" FNPT	17	0.6	90.00
NA51256	¾" press	17	0.6	96.00
NA51257	¾" PEX crimp	17	0.6	74.00
NA51258	¾" PEX expansion	17	0.6	74.00
NA51259	¾" sweat	17	0.4	68.00
NA51300	Body, medium, w/o fittings	30	0.5	56.00
NA51360	1" MNPT	30	1.1	102.00
NA51363	1" FNPT	30	1.1	108.00
NA51366	1" press	30	1.1	140.00
NA51369	1" sweat	30	0.9	96.00
NA51370	1¼" MNPT	30	1.3	112.00
NA51373	1-1/4" FNPT	30	1.3	118.00
NA51376	1-1/4" press	30	1.3	164.00
NA51379	1¼" sweat	30	1.1	108.00
NA51400	Body, large, w/o fittings	75	1.8	146.00
NA51480	1½" MNPT	75	2.6	286.00
NA51486	1½" press	75	2.6	354.00
NA51489	1½" sweat	75	2.4	270.00
NA51490	2" MNPT	75	2.6	304.00
NA51493	2" FNPT	75	2.6	316.00
NA51496	2" press	75	2.6	388.00
NA51499	2" sweat	75	2.4	286.00

Application diagram



NEW



Replacement checks.

Code	Description	Cv	Lbs	USD
NA10117	Fits ½", ¾" (small body)	17	0.1	8.00
NA10370	Fits 1", 1¼" (medium body)	30	0.1	8.00
NA10371	Fits 1½", 2" (large body)	75	0.2	14.00

MISCELLANEOUS COMPONENTS



NA101

Ball valve. Brass body.
 Max. working pressure: 600 psi.
 Max. working temperature: 365°F.

Code	Description	Lbs	USD
NA10167	½" sweat x ½" sweat	0.5	8.00



NA510

Dual unions.
 Stainless body, low lead brass tailpieces
 NBR, POM check valve.
 Max. percentage of glycol: 50%.
 Max. working pressure: 150 psi.
 Temperature range: 32-150°F (190°F for max. 1 hour).
 Opening pressure differential: 0.25 psi (½" through 1¼"); 0.50 psi (1½", 2").

Code	Description	Cv	Lbs	USD
NA51059	¾" sweat union	12	0.7	47.10
NA51069	1" sweat union	17	1.0	60.10



TIME TO GRAB A COFFEE AND LEARN

You are invited to join us for our monthly webinar series, Coffee with Caleffi™. The complimentary technical training webinars are intended for contractors, designers and wholesalers. A *Certificate of Attendance* is emailed to attendees following the webinar for continuing education consideration.

Register by scanning the QR code below. Missed a webinar? No problem! Our webinars are available 24/7 on YouTube for your convenience.

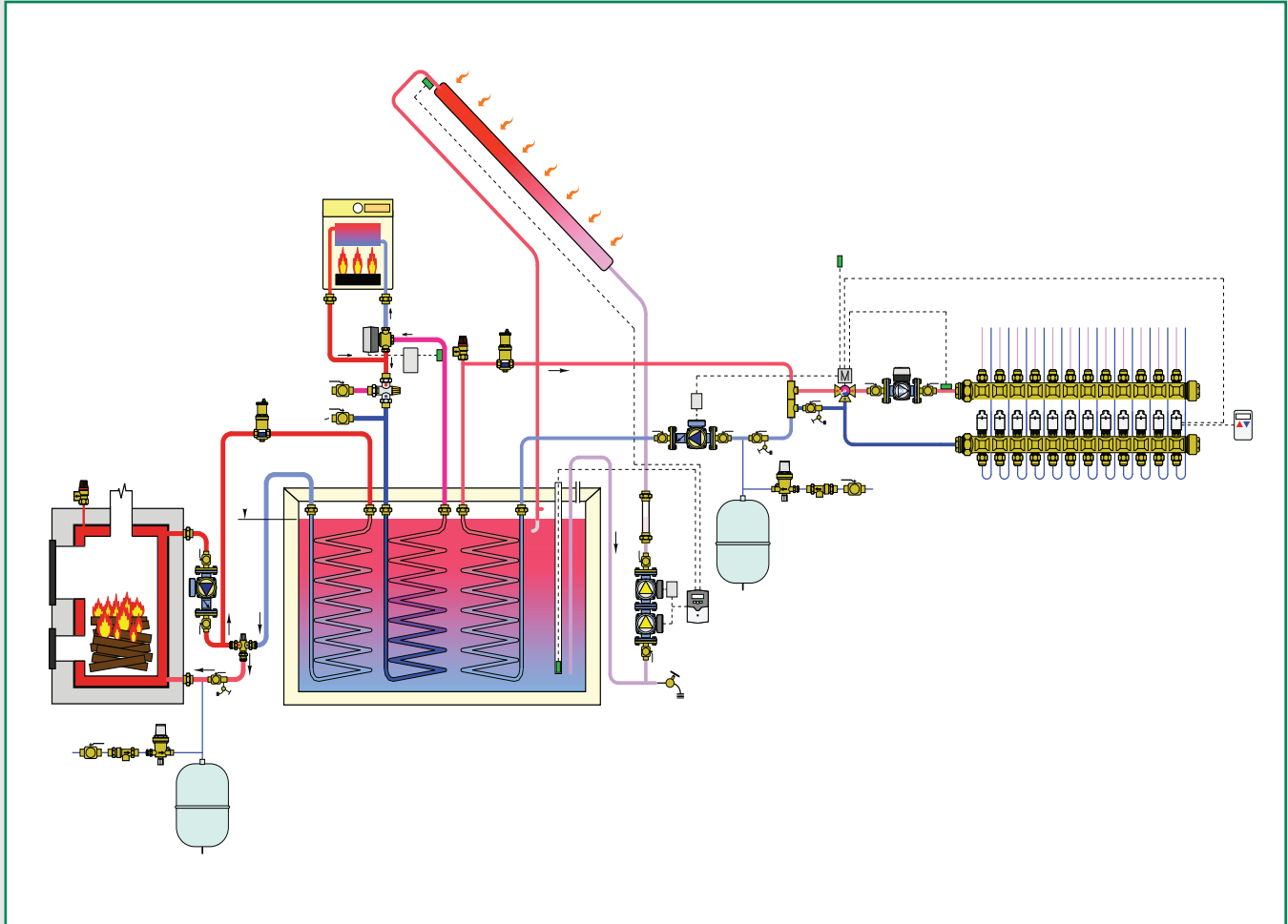


Visit
www.caleffi.com
to View Upcoming Schedule



RENEWABLES, SOLAR, GEOTHERMAL AND BIOMASS DEVICES

This diagram is for illustration purposes only



PRODUCTS INCLUDED IN SECTION

- Storage tanks and accessories
- Pump stations and fittings
- Air vents, air separator, and safety relief valves
- Mixing valves
- Geothermal manifolds and fittings
- Geothermal accessories
- PE pipe connection
- Boiler protection high-flow thermostatic mixing valve
- Boiler protection recirculation and distribution unit
- Boiler protection valve accessories

STORAGE TANKS



NAS200 ThermoCon™

ThermoCon™ thermal buffering tanks have a porcelain glass coated steel lining and powder coated steel external cover. Drain port/valve. Anode rods required when used in potable water applications. Max. working pressure: 150 psi. Working temperature: 35—180°F. Recommended max. delivery water temperature: 120°F. Testing pressure: 300 psi. Tank insulation: 2" non-CFC foam. Insulation thermal conductivity: R16. Connections (all FNPT): 25 gal. top; two 1-1/2", one 3/4". sides; four 1-1/2", one 3/4". 50, 80, 119 gal. top; three 3/4", sides; seven 2".

Code	Description	Lbs	USD
NAS20025	ThermoCon™ 25 gal.	100	2,013.00
NAS20050	ThermoCon™ 50 gal.	200	2,406.00
NAS20080	ThermoCon™ 80 gal.	250	2,844.00
NAS20120	ThermoCon™ 119 gal.	350	3,763.00

EXPANSION TANK



259

Solar system expansion tanks with 3/4" straight thread. System temp. range: 15—250°F. Maximum diaphragm temp: 160°F. Maximum working pressure: 150 psi. Pre-charge pressure: 35 psi. Maximum percentage of glycol: 50%.

Code	Description	Lbs	USD
259012	3 gallon, 3/4" male straight thread	14	109.00
259018	5 gallon, 3/4" male straight thread	17	135.00
259025	7 gallon, 3/4" male straight thread	21	175.00
259033	9 gallon, 3/4" male straight thread	24	298.00
259050	13 gallon, 3/4" male straight thread	28	376.00

STORAGE TANK ACCESSORIES



Reducer bushing fits tanks without HX for installing temperature probe. Low lead brass 1 5/8" hex head.

Code	Description	Lbs	USD
NA10234	2" NPT male x 3/4" NPT female	0.4	50.50



Sensor well, 1/4" Ø I.D. Insertion length: 1 3/4".

Code	Description	Lbs	USD
NA15029	Sensor well, 3/4" NPT male thread	0.5	35.30



Cap for plugging tank connection on pump station while leak testing. Requires R50058 washer.

Code	Description	Lbs	USD
R21180	3/4" female cap	0.1	4.00



255

Expansion tank connection kit. Includes 3/4" connection, wall bracket, hardware and double check valve.

Code	Description	Lbs	USD
255007	S.S. flexible tank connection kit	3.0	127.00



Expansion tank fitting connections. 3/4" union nut connects to the expansion tank.

Code	Description	Lbs	USD
NA25540	1/2" NPT union connection set	0.1	18.60
NA25549	1/2" sweat union connection set	0.1	17.20



Pipe nipple for attaching air vent to top of storage tank with reducing bushing.

Code	Description	Lbs	USD
NA10160	1/2" NPT male x 1/2" male NPT x 3"	0.1	8.20

COMMERCIAL SOLAR PUMP STATION

NA255



The Solar pump station is a pre-assembled and leak-tested unit without fittings for transferring heat from the collector to the storage tank. The pump station contains the following:
 Ball valves in flow and return in combination with flow check valves.
 Foam insulation shell.
 Ports for filling and flushing.
 Manual air vents.
 Balance/flow meter.
 Temperature gauges in flow and return.
 Pressure gauge.
 Safety relief valve: 90 psi.
 Pump: Star S 30 U25 three-speed.
 Connection: 1" male straight thread.
 Max. working pressure: 150 psi.
 Max. working temp: 360°F.
 Adjustable flow: ½ to 10 gpm.
 Agency approval: cULus.

(Select fittings to the right)

Code	Description	Lbs	USD
NA255160	1" male union thread	25	1,379.00



Replacement pump fits solar pump station NA255. 120 VAC / 1.3 A.
 30 feet head / 30 gpm. 1½" male union thread.

(install in-line with NA122 union fittings on page 94)

Code	Description	Lbs	USD
NA12169	Wilo Star S 30 replacement pump	6.0	342.00



Replacement solar pump station pressure gauge.
 Pressure range: 0—90 psi.
 Dial size: 1½".

Code	Description	Lbs	USD
NA12156	¼" male center back mount	0.1	30.90

SOLAR GLYCOL



NA101 SolarHD™

Pre-mixed 50% high temperature non toxic glycol, FDA reference: 21 CFR 182.1666, Gosselin TOXICITY INDEX 1, Generally recognized as safe for use as direct food additives. NSF listed, Category Code: HT1, HT2, NSF Registration No. 144912. Compatible with other propylene glycols.



Code	Description	Lbs	USD
NA10103	5 gallon bucket	45	175.00

PUMP STATION FITTINGS

NA155

NA255160 Solar pump stations fitting kits. (mix & match for top & bottom)



Code	Description	Lbs	USD
NA15550	¾" NPT male union kit	1.0	110.00

NA255160 Solar pump stations fitting kits. (mix & match for top & bottom)



Code	Description	Lbs	USD
NA15559	¾" sweat union kit	1.0	88.70

NA255160 Solar pump stations fitting kits. (mix & match for top & bottom)



Code	Description	Lbs	USD
NA15560	1" NPT male union kit	1.1	110.00

NA255160 Solar pump stations fitting kits. (mix & match for top & bottom)



Code	Description	Lbs	USD
NA15569	1" sweat union kit	1.1	90.40

NA255160 Solar pump stations fitting kits. (mix & match for top & bottom)



Code	Description	Lbs	USD
NA15570	1¼" male, 1" SolarFlex™	0.9	37.40

FILL AND FLUSH CART

NA255 HYDROFLUSH™

The fill and flush pump cart is portable, leak-tested for a safe, quick and clean way to fill and flush solar, geo thermal and hydronic systems.
 Medium: water, glycol and cleaning fluids.
 Tank: 10 gallon with dirt filter.
 Max. tank medium temperature: 140°F.
 Pump delivery flow: 1—15 gpm.
 Pump feet of head: 125.
 Max. pump pressure: 55 psi.
 Pump power: ½ HP (120 V AC).
 Isolating ball valves: ¾" garden hose thread.
 Transfer hoses: 8' with ¾" GHT (2 ea).
 Dimensions: 48"H × 20"W × 18"D.



Code	Description	Lbs	USD
NA25510	Wash, fill and flush cart	60	2,328.00

SOLAR PUMP STATIONS

278 & 279



Solar pump stations are pre-assembled and leak-tested. Safety relief valve. Ball valves with built-in flow checks in return (and flow for dual-line models). Temperature gauges in return (and flow for dual-line models). Pressure gauge. Manual air vent (dual-line models only). Expansion tank connection. Connections for flushing and filling. Foam insulation. Balance/flow meter: 1 – 8 gpm scale. Pump: three speed. Pump performance: 19 ft head/8 gpm. Safety relief valve: 90 psi. Max. working pressure: 145 psi. Max. working temp: 350°F. Connections: 3/4" female thread.

(Select adaptors to the right)

Code	Description	Lbs	USD
279051A	Dual-line solar pump station	17	830.00
279051	Dual-line solar station w/o pump	12	664.00
278751A	Single-line solar pump station	14	724.00
278751	Single-line solar station w/o pump	10	558.00
278011	Controller housing	0.5	40.40



Replacement pumps fit current solar pump stations 278 & 279, plus discontinued 255 & 256 stations. 3 speed 115 V. 1" male union thread. Agency approval: cULus.

(install in-line with NA122 union fittings on page 84)

Code	Description	Lbs	USD
NA10481	Grundfos 15-58U, 21' head / 18 gpm	5	214.00

PUMP STATION FITTINGS



3/4" SolarFlex™ directly to top or bottom. 2 each.

Code	Description	Lbs	USD
NA26650	3/4" male thread x 1" male thread	0.6	39.90



3/4" SolarFlex™ directly to top and bottom. 4 each.

Code	Description	Lbs	USD
NA26750	3/4" male thread x 1" male thread	1.0	79.90



1" SolarFlex™ directly to top or bottom. 2 each.

Code	Description	Lbs	USD
NA26660	3/4" male thread x 1 1/4" male thread	0.6	77.10



1" SolarFlex™ directly to top and bottom. 4 each.

Code	Description	Lbs	USD
NA26760	3/4" male thread x 1 1/4" male thread	1.0	154.00

PUMP STATION FITTINGS



3/4" sweat fittings to top or bottom.
2 each.

Code	Description	Lbs	USD
NA26659	3/4" male thread x 3/4" sweat fitting	0.6	68.30



3/4" sweat fittings to top and bottom. 4 each.

Code	Description	Lbs	USD
NA26759	3/4" male thread x 3/4" sweat fitting	1.0	136.00



1" sweat fittings to top or bottom.
2 each.

Code	Description	Lbs	USD
NA26669	3/4" male thread x 1" sweat fitting	0.6	74.90



1" sweat fittings to top and bottom. 4 each.

Code	Description	Lbs	USD
NA26769	3/4" male thread x 1" sweat fitting	1.0	149.00

DRAINBACK PUMP STATION

278



Drainback solar pump station designed with a high head and steep pump curve which are pre-assembled and leak-tested. Safety relief valve, ball valve, temperature gauge, pressure gauge, air fill valve. Connections for flushing and filling with foam insulation. Balance/flow meter: 2—8 gpm scale. Pump: Grundfos UP15-100. Performance: 36 feet head / 8 gpm. Safety relief valve: 90 psi. Max. working pressure: 145 psi. Max. working temp: 350°F. Connections: 3/4" female thread. (Select adaptors to the left)

Code	Description	Lbs	USD
278951A	Drainback solar pump station	14	773.00

NA121



Replacement single speed 120 V, 1" male union thread. Flow 36 feet head / 8 gpm. Agency approval: cULus. (install in-line with NA122 union fittings on page 94)

Code	Description	Lbs	USD
NA12171	Grundfos Solar 15-100	6.0	266.00

DC SOLAR PUMP

NA267



8 to 34 VDC, DC Strong solar pump for mounting in solar stations. 15 feet head / 7 gpm at 24 VDC. 8 feet head / 4 gpm at 12 VDC. Power consumption: 30—45 W. Max. working pressure: 150 psi. Max. temperature: -10—230°F.

(install in-line with NA122 union fittings on page 94)



Shown mounted in 279051 or can be mounted inside 278751.

Code	Description	Lbs	USD
NA26711	1" male union thread	3.0	460.00

LOW LEAD MIXING VALVES



2521

Adjustable thermostatic three-way mixing valve for solar systems with built-in inlet check valves.
 Setting range: 80—150°F.
 Max. working pressure: 200 psi.
 Max. inlet temperature: 210°F.
 Connection: ½", ¾", 1" sweat.
 Certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

ASSE 1017

Code	Description	Lbs	USD
252149A	½" sweat unions	1.2	160.00
252158A	¾" sweat unions with gauge	1.2	207.00
252159A	¾" sweat unions	1.2	168.00
252168A	1" sweat unions with gauge	1.2	235.00
252169A	1" sweat unions	1.2	195.00

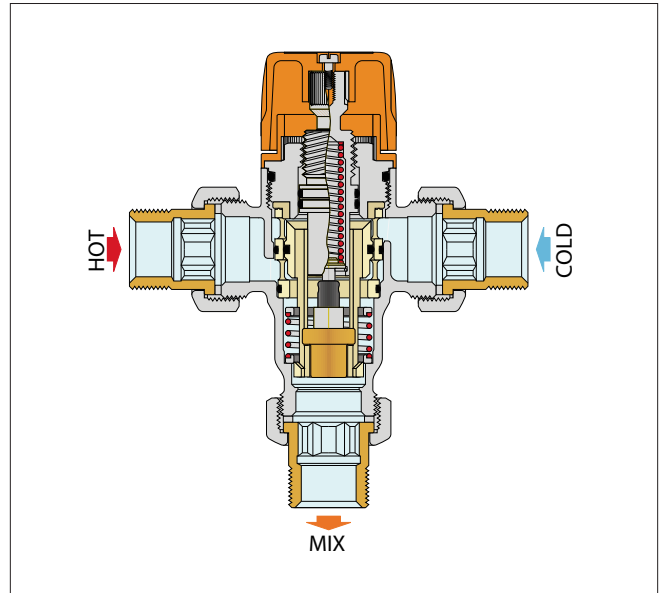


Check valve for use in 2521 mixing valve.
 Max. inlet temperature: 210°F.

Code	Description	Lbs	USD
R29326	Check valve insert	0.1	6.00

Operating principle

The controlling element of the solar thermostatic mixing valve is a temperature sensor that is fully immersed in the mixed water outlet passage. As it expands or contracts, the sensor continuously establishes the correct proportion of hot and cold water entering the valve. The flow is regulated by a piston sliding in a cylinder between the hot and cold water passages. Even when there are pressure drops due to the drawing off of hot or cold water for other uses or variations in the incoming temperature, the mixer automatically regulates the water flow to obtain the required temperature.



AIR SEPARATOR AND SAFETY RELIEF VALVES



251 DISCAL®

Air separator for solar heating systems.
 Working temperature range: -20—320°F.
 Max. working pressure: 150 psi.
 Max. discharge pressure: 150 psi.
 Connections: Main, ¾" NPT, female.
 Bottom, ½" NPT, female.

Code	Description	Lbs	USD
251003A	¾" NPT female	2.0	147.00



253

Safety relief valves for solar systems.
 Working temperature range: -20—360°F.
 Normal pressure: 150 psi.
 Opening over pressure: 10%.
 Closing differential: 20%.
 Discharge capacity: 171,000 Btu.
 Connections: Inlet, ½" female.
 Discharge, ¾" female.
 TÜV certified to TRD-721-SV100 7.7.
 Meets ANSI Z21.22 standard.
 TÜV Rheinland is an approved U.S. Nationally Recognized Testing Laboratory (NRTL) Certification Body for Pressure Equipment. Meets ANSI Z21.22 "Relief Valves for Hot Water Supply Systems."



Code	Description	Lbs	USD
253042	Factory set to 35 psi	0.3	49.50
253043	Factory set to 45 psi	0.3	49.50
253044	Factory set to 60 psi	0.3	49.50
253046	Factory set to 90 psi	0.3	49.50
253048	Factory set to 120 psi	0.3	49.50
253040	Factory set to 150 psi	0.3	49.50

AUTOMATIC AIR VENTS



250

Automatic air vent for solar systems.
Working temperature range: -20—360°F.
Max. working pressure: 150 psi.
Max. discharge pressure: 75 psi.



251 DISCALAIR®

High-performance automatic air vent for solar heating systems.
Working temperature range: -20—320°F.
Max. working pressure: 150 psi.
Max. discharge pressure: 150 psi.

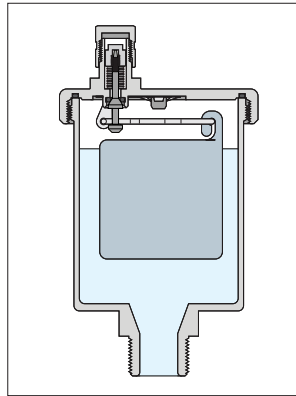
Code	Description	Lbs	USD
250041A	½" MNPT	0.3	52.20

Code	Description	Lbs	USD
251004A	½" FNPT	0.8	110.80

Function

Automatic air vents are used in the closed circuits of solar heating systems. They allow air contained in the fluid to be released automatically during the filling process, through a valve operated by a float in contact with fluid in the system.

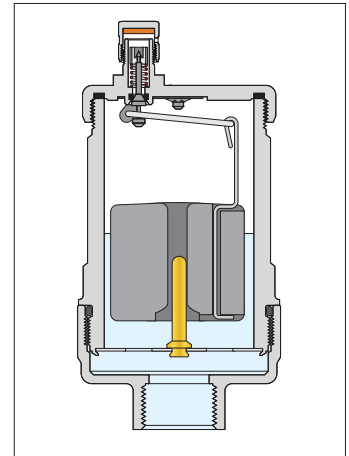
The shut-off valves are used in combination with the automatic air vents to isolate them after filling the circuit of solar heating systems. These series of products have been specially made to work at high temperatures with a glycol medium.



Function

DISCALAIR® solar devices are used in hydronic systems or in the filling and start-up phase of solar heating systems to discharge evenly discharge large quantities of air that have formed in the circuits. This function is performed even when there is considerable pressure due to the special geometry of the discharge mechanism, which is identical to the mechanism on DISCAL® Solar 251 series air separators.

This particular series of automatic air vent valves have been specifically designed to work at high temperature with a glycol medium, which is typical of solar heating systems.



NA292



Shut-off fits automatic air vent.
Working temperature range: -20—360°F.
Max. working pressure: 150 psi.

Code	Description	Lbs	USD
NA29284	½" FNPT x ½" MNPT	0.2	40.50

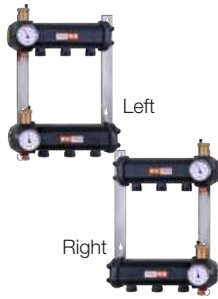


NA102

Vent cap adapter to connect discharge tube. Fits all air vents and air separators except 5026 and 5027 series.

Code	Description	Lbs	USD
NA10204	¼" MNPT	0.1	17.30

MANIFOLDS



110
GeoCal™

GeoCal™ left or right hand distribution manifold assemblies with temperature gauges, air vents and drain valves. 1¼" F NPT brass inlet/outlet ports. Max. working pressure: 90 psi. Max. system test pressure: 150 psi. Working temperature range for: water, glycol & saline solutions: 15–140°F. Ethanol & methanol solutions: 15–90°F. Ambient temp. range: -5–140°F. Max. flow rate: 24 gpm total all circuits.

Code	Description	Lbs	USD
1107B5LA	Left side connections, 2 circuits	16	762.00
1107B5RA	Right side connections, 2 circuits	16	762.00
1107C5LA	Left side connections, 3 circuits	18	841.00
1107C5RA	Right side connections, 3 circuits	18	841.00
1107D5LA	Left side connections, 4 circuits	20	926.00
1107D5RA	Right side connections, 4 circuits	20	926.00
1107E5LA	Left side connections, 5 circuits	22	1,004.00
1107E5RA	Right side connections, 5 circuits	22	1,004.00
1107F5LA	Left side connections, 6 circuits	23	1,083.00
1107F5RA	Right side connections, 6 circuits	23	1,083.00
1107G5LA	Left side connections, 7 circuits	25	1,180.00
1107G5RA	Right side connections, 7 circuits	25	1,180.00
1107H5LA	Left side connections, 8 circuits	26	1,258.00
1107H5RA	Right side connections, 8 circuits	26	1,258.00



NA102

GeoGrip™ manifold outlet connector for joining manifold to polyethylene pipe. (Includes union nut and gasket)

Code	Description	Lbs	USD
NA10246	¾" PE pipe compression	0.8	32.70
NA10247	1" PE pipe compression	1.0	40.50

FITTINGS



110

GeoCal™ manifold outlet fitting, includes union nut and gasket.

Code	Description	Lbs	USD
110050A	¾" male NPT tail piece	0.4	24.80
110060A	1" male NPT tail piece	0.6	27.20



861

GeoGrip™ polyethylene pipe fittings. For joining polyethylene pipe to 132 series QuickSetter™.

Code	Description	Lbs	USD
861527A CST	¾" M NPT x ¾" PE pipe compression	0.2	15.10
861634A CST	1" M NPT x 1" PE pipe compression	0.6	24.20
NA10288	¾" M NPT x 1" PE pipe compression	0.2	33.70

GEOTHERMAL ACCESSORIES



132

QuickSetter™ balancing valve with flow meter. Direct reading of flow rate. Brass valve body and flow meter. Graduated scale flow meter with magnetic movement flow rate indicator. Max. working pressure: 150 psi. Temperature range: 14–230°F. Max. percentage of glycol: 50%.

Code	Description	Flow scale (gpm)	Lbs	USD
132552A	¾" FNPT	2.0–7.0	1.8	177.00
132662A	1" FNPT	3.0–10.0	2.4	207.00
132772A	1¼" FNPT	5.0–19.0	2.8	275.00
132882A	1½" FNPT	8.0–32.0	3.4	326.00
132992A	2" FNPT	12.0–50.0	4.4	399.00
F19346	Replacement by-pass valve stem*		0.1	33.30

* With operating ring

BOILER PROTECTION ACCESSORIES



F296

Replacement thermostatic sensor cartridges. Sensor cartridge accuracy: ±4°F. By-pass from boiler complete closing temperature: Tset +18°F (130°F+18°F=148°F).

Fits 280 and 281 series boiler protection valves. Easy replacement to change the 280 valve set temperature without removing the valve body from the piping.

Code	Description	Lbs	USD
F29633	115°F Tset	0.2	25.30
F29634	130°F Tset	0.2	25.30
F29635	140°F Tset	0.2	25.30
F29636	160°F Tset	0.2	25.30

Selection note: thermostatic sensor cartridge will completely close at Tset value +18°F. Example: (130°F Tset +18°F=148°F completely closed) ±4°F.



F295

Dual scale temperature gauge 280 and 281 series boiler protection valves.

Code	Description	Lbs	USD
F29571	32–250°F	0.2	21.40

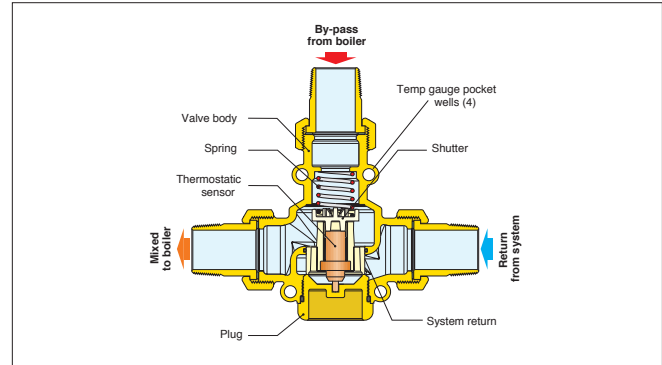
BOILER PROTECTION HIGH-FLOW THERMOSTATIC MIXING VALVES



**280
ThermoProtec™**

Boiler protection high-flow thermostatic mixing valve.
 Changeable thermostatic sensor cartridge.
 Brass body and lower plug.
 Max. working pressure: 150 psi.
 Working temperature range: 40–212°F.
 Thermostatic sensor cartridge:
 130°F & 140°F Tset standard selections, see below.
 115°F, 160°F Tset optional (field replaceable).
 Sensor cartridge accuracy: ±4°F.
 By-pass from boiler complete closing
 temperature: Tset +18°F (ex. 130°+18°=148°F).

Construction



Code	Description	Lbs	USD
280965A	1" sweat unions 130°F Tset	11	250.00
280165A	1" NPT female unions 130°F Tset	11	267.00
280966A	1" sweat unions 140°F Tset	11	250.00
280166A	1" NPT female unions 140°F Tset	11	267.00
280975A	1¼" sweat unions 130°F Tset	11	294.00
280175A	1¼" NPT female unions 130°F Tset	11	307.00
280976A	1¼" sweat unions 140°F Tset	11	294.00
280176A	1¼" NPT female unions 140°F Tset	11	307.00

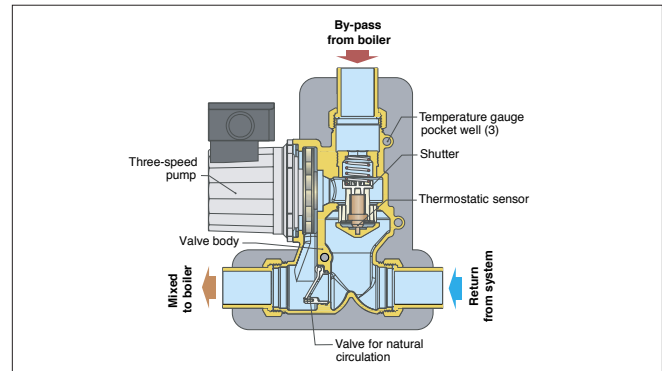
BOILER PROTECTION RECIRCULATION AND DISTRIBUTION UNITS



**281
ThermoBloc™**

ThermoBloc™ boiler protection recirculation and distribution unit.
 Suitable fluids: water, up to 50% glycol solutions.
 Max. working pressure: 150 psi.
 Working temperature range: 40–210°F.
 Maximum pumping capacity: 10 gpm.
 Temperature gauge scale: 30–250°F.
 Thermostatic sensor:
 130°F & 140°F Tset standard selections, see below.
 115°F, 160°F Tset optional models*.
 Sensor cartridge accuracy: ±4°F.
 By-pass from boiler complete closing
 temperature: Tset +18°F (ex. 130°+18°=148°F).
 * Consult factory

Construction



Code	Description	Lbs	USD
281965A	1" sweat unions 130°F Tset	11	768.00
281165A	1" NPT female unions 130°F Tset	11	822.00
281966A	1" sweat unions 140°F Tset	11	768.00
281166A	1" NPT female unions 140°F Tset	11	822.00
281975A	1¼" sweat unions 130°F Tset	11	904.00
281175A	1¼" NPT female unions 130°F Tset	11	945.00
281976A	1¼" sweat unions 140°F Tset	11	904.00
281176A	1¼" NPT female unions 140°F Tset	11	945.00
F19379	Replacement Pump	5	326.00



CONTECA™ Heat Energy Meter

- Displays and logs instantaneous and totalized energy and flow for both heating and cooling.
- Two pulse inputs for domestic cold and hot water meters, two universal pulse inputs for gas or electric measurement.
- Complies with new ASTM E3137/E3137M – 17 Standard Specification for Heat Meter Instrumentation.
- Daily and monthly log data accessible via local user interface or remotely.
- Integral RS485 2-wire communication for remote access and configuration.
- Network up to 250 units on one Datalogger; Modbus and BACnet communication.

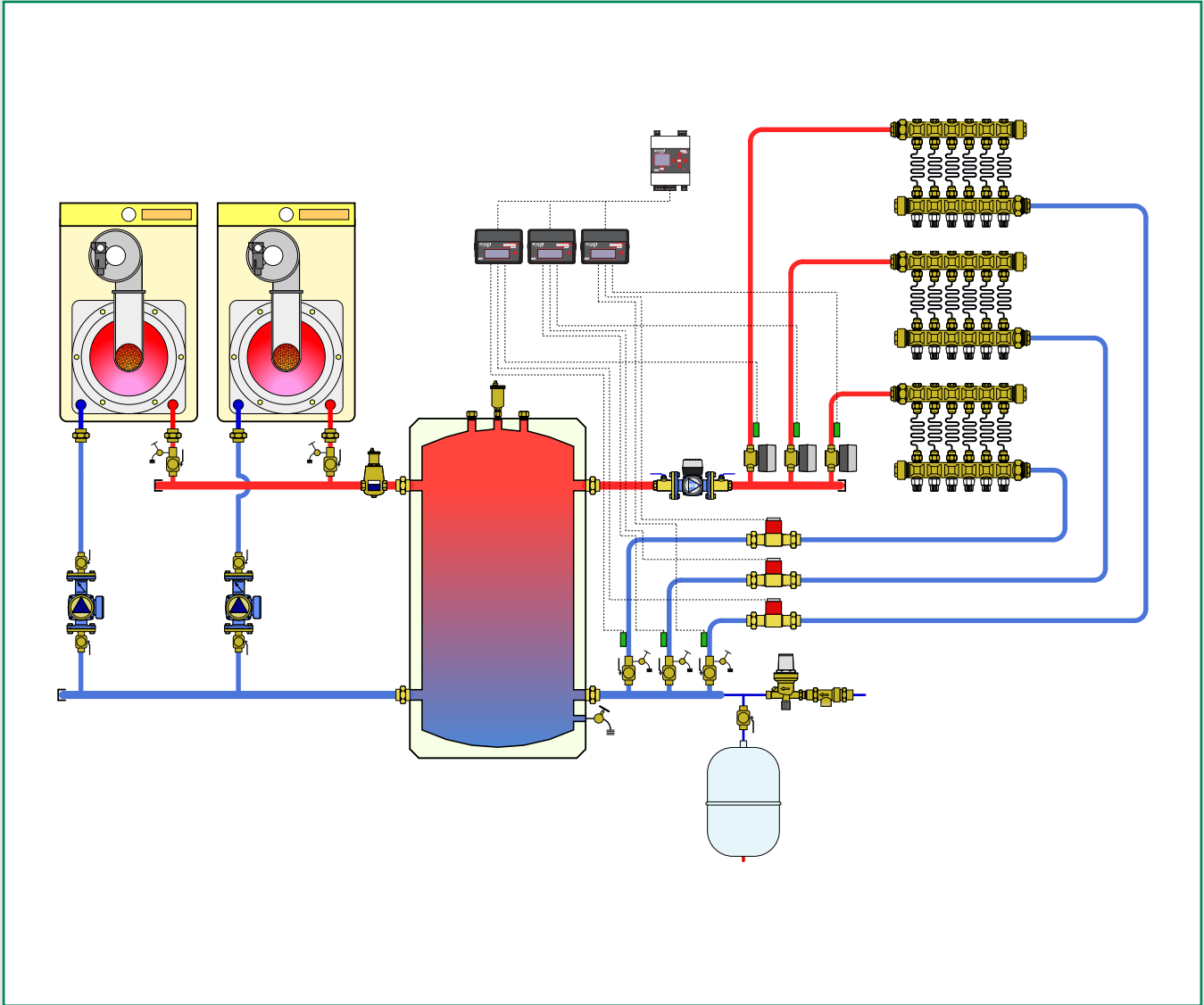


Heat metering

Correct measurement for correct management

HEAT METERS

This diagram is for illustration purposes only



PRODUCTS INCLUDED IN SECTION

- Heat meters
- Heat meters accessories

HEAT METERS



7504
CONTECA™ Heat meter

CONTECA™ is a direct heat meter designed to measure instantaneous and recorded history of thermal energy usage in residential and commercial buildings.

Micro processor:

Power supply: 24 VAC, 50/60 Hz, 1W.

Data transmission: 2-wire RS485; selectable Modbus or M-bus (for use with Datalogger).

Ambient temperature: 40 – 113°F (4 – 45°C).

Environmental rating: NEMA 3S (IP 54).

Pulse inputs: Class 1B per EN 1434-2.

Temperature sensors:

Cable length: 26¼ feet (8 m).

Sensor type: 100 kohm NTC matched.

Temperature sensitivity: < 0.1°F.

Flow meters:

Body material: Brass.

Body threads: ISO 228 male straight.

Piping connections: Dual unions, tailpieces NPT, sweat, press.

Max. working pressure: 150 psi (10 bar)

Code	Description	Lbs	USD
750449A	Heat Meter, 0.25 to 10 GPM, ½" sweat	6.2	901.00
750440A	Heat Meter, 0.25 to 10 GPM, ½" MNPT	6.2	935.00
750446A	Heat Meter, 0.25 to 10 GPM, ½" press	6.2	981.00
750459A	Heat Meter, 0.25 to 10 GPM, ¾" sweat	7.1	912.00
750450A	Heat Meter, 0.25 to 10 GPM, ¾" MNPT	7.1	947.00
750456A	Heat Meter, 0.25 to 10 GPM, ¾" press	7.1	992.00
750469A	Heat Meter, 0.25 to 10 GPM, 1" sweat	7.9	958.00
750460A	Heat Meter, 0.25 to 10 GPM, 1" MNPT	7.9	992.00
750466A	Heat Meter, 0.25 to 10 GPM, 1" press	7.9	1,038.00
750463A	Heat Meter, 0.3 to 15 GPM, 1" FNPT	11.5	1,335.00
750473A	Heat Meter, 0.5 to 25 GPM, 1¼" FNPT	12.1	1,426.00
750483A	Heat Meter, 1 to 45 GPM, 1½" FNPT	18.7	1,654.00
750410A	Heat Meter 11 - 110 GPM, 2½" flanges NEW	27	2,518.00
750411A	Heat Meter 14 - 140 GPM, 3" flanges NEW	29	3,176.00
750412A	Heat Meter 22 - 220 GPM, 4" flanges NEW	44	4,170.00
750413A	Heat Meter 35 - 350 GPM, 5" flanges NEW	51	4,760.00
750414A	Heat Meter 88 - 880 GPM, 6" flanges NEW	88	5,666.00
750415A	Heat Meter 100 - 1000 GPM, 8" flanges NEW	110	6,346.00



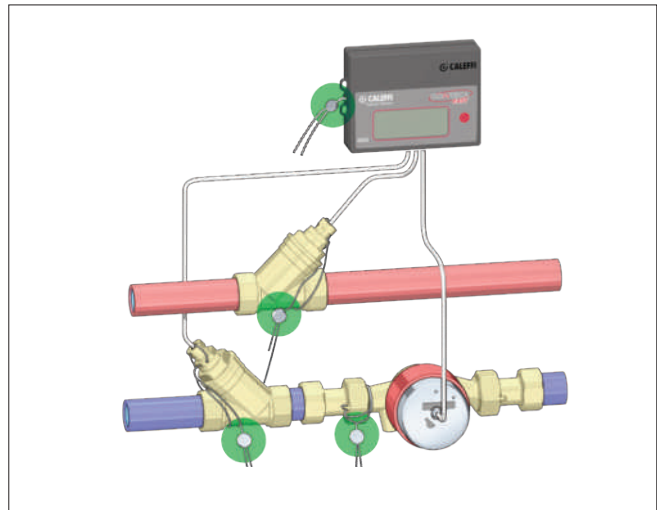
Function

The CONTECA™ meter features an 8-digit liquid crystal display that enables easy reading of BTU consumed as well as a range of technical data indicating equipment operating status and data logging.

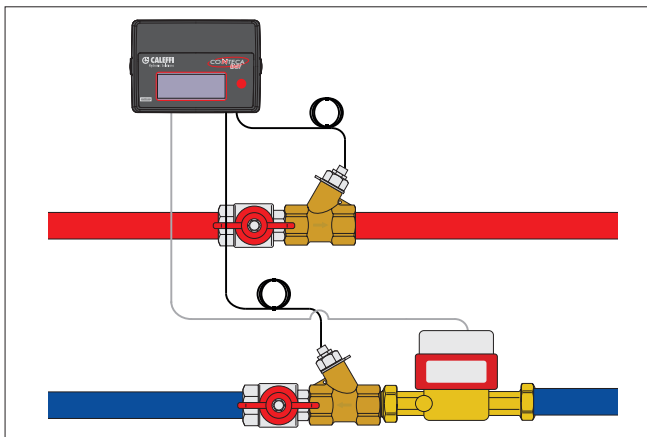
Each CONTECA™ includes an electronic calculator/user interface, two temperature sensors, fittings included. The flow meter comes with the CONTECA™ meter kit. In addition to the two temperature inputs and flow meter input, 4 additional pulse inputs, for optional equipment monitoring and data logging. The CONTECA™ is easy to install and commission, and complies with ASTM E3137 specification for heat metering instrumentation and European directive 2014/32/UE EN 1434 (MI 004).

The meter has integral RS485 Modbus protocol 2-wire communication (default) for remote access and configuration when BAS is Modbus. The RS485 protocol must be changed to M-bus when using the Datalogger. Up to 250 CONTECA™ meters can connect to one CONTECA® data logger.

Lead seals (included with each kit) to prevent tampering



Standard installation



HEAT METERS

7504 CONTECA™ Datalogger



Power supply: 24 V (dc) ±10%, 24 V (ac) - 3 W.
 2 Ethernet ports: ETH1 (PoE), ETH2.
 Ambient temperature range: 32—122°F.
 Mounting: on a 35 mm DIN rail (EN 60715).
 Daily data logging: 10 years.
 Reports: In XLS or CSV format.



Code	Description	Lbs	USD
750450	Conteca Datalogger	2.0	2,007.00

Modbus-to-BACnet gateway.
 Converts CONTECA™ controller Modbus (RS-485 serial) output communication to BACnet IP or MSTP communication.



Code	Description	Lbs	USD
750552	Modbus-to-BACnet gateway	1.0	1,654.00

Wall transformer.
 Input voltage: 120 V AC.
 Output voltage: 24 V AC.
 Power output: 40 VA.
 Agency approval: cULus.



Code	Description	Lbs	USD
NA605010	24 V AC wall transformer	1.0	29.50

V40 Replacement



Replacement flow meter (body only)
 Single jet rotary pulse flow meter measures liquid flow for energy heat metering production or consumption. Accurate to International Standards OIML R75, EN1434 and MID.
 Brass body.
 Sweat connections included.
 Working temperature range: -40—210°F.
 Max. fluid temperature: 265°F.
 Max. working pressure: 235 psi.
 Maximum glycol: 50%.

Code	Description	Lbs	USD
R79701	0.25 to 10 GPM	3.0	394.00

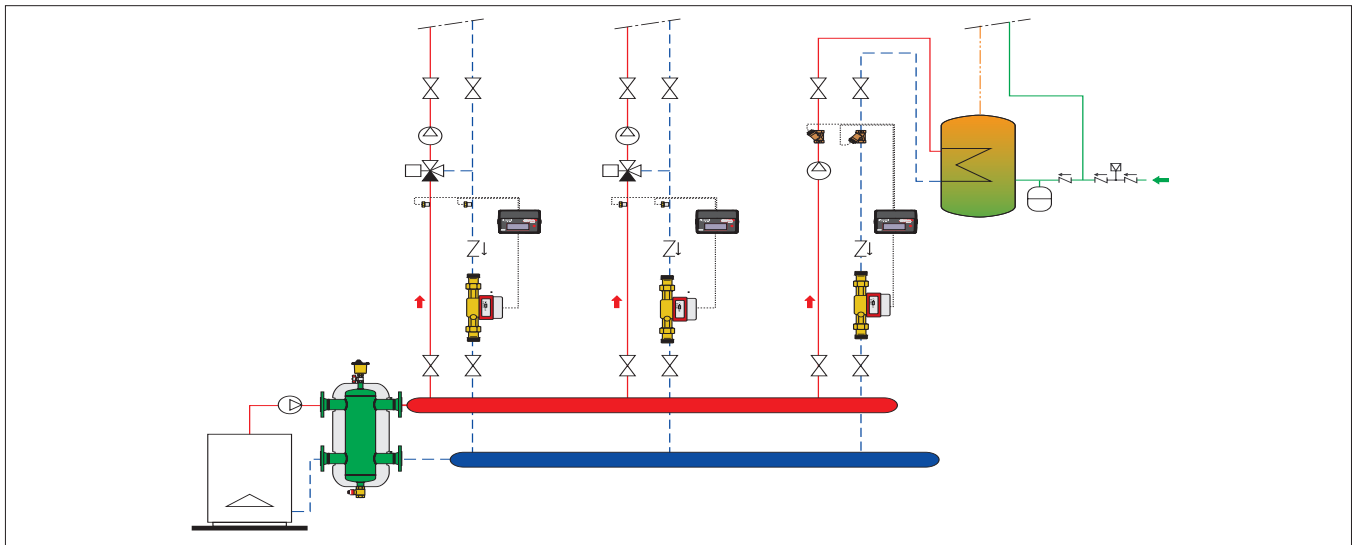
V40 Replacement



Replacement flow meter (body only)
 Multi-jet rotary pulse flow meter measures liquid flow for energy heat metering production or consumption. Accurate to International Standards OIML R75, EN1434 and MID.
 Brass body.
 Sweat connections included.
 Working temperature range: -40—210°F.
 Max. fluid temperature: 265°F.
 Max. working pressure: 235 psi.
 Maximum glycol: 50%.

Code	Description	Lbs	USD
R79702	0.3 to 15 GPM	5.0	702.00
R79703	0.5 to 25 GPM	8.0	830.00
R79704	1 to 45 GPM	14	986.00

Diagram





INNOVATIVE HYDRONIC AND PLUMBING COMPONENTS

Caleffi Hydronic Solutions, a leader in state-of-the-art engineered solutions, manufactures and supplies high-quality components for hydronic heating and cooling, plumbing, heat metering and renewable energy systems, for domestic, commercial and industrial buildings. Caleffi, an Italian based company, is a name recognized around the world for innovative solutions and superior performing products that help customers live comfortably and economically, while softening their impact on the environment.



Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
100001A	13.20	73	127140AFC	126.00	68	132555AFC	247.00	66	1725M1AHE	1,795.00	46
110050A	24.80	106	127141AFC	94.20	68	132556AFC	230.00	66	1725M1AHE IN	1,795.00	46
110060A	27.20	106	127142AFC	93.10	68	132557AFC	261.00	66	1725N1A	1,654.00	46
1107B5LA	762.00	106	127143AFC	123.00	68	132558AFC	247.00	66	1725N1A IN	1,654.00	46
1107B5RA	762.00	106	127144AFC	93.10	68	132559AFC	217.00	66	1725N1AHE	1,863.00	46
1107C5LA	841.00	106	127145AFC	123.00	68	132637	165.00	66	1725N1AHE IN	1,863.00	46
1107C5RA	841.00	106	127146AFC	100.00	68	132657	174.00	66	1725O1A	1,721.00	46
1107D5LA	926.00	106	127147AFC	132.00	68	132632AFC	250.00	66	1725O1A IN	1,721.00	46
1107D5RA	926.00	106	127148AFC	123.00	68	132633AFC	280.00	66	1725O1AHE	1,930.00	46
1107E5LA	1,004.00	106	127149AFC	93.10	68	132634AFC	250.00	66	1725O1AHE IN	1,930.00	46
1107E5RA	1,004.00	106	127150AFC	151.00	68	132635AFC	280.00	66	200000	47.20	30
1107F5LA	1,083.00	106	127151AFC	100.00	68	132638AFC	268.00	66	201000	84.30	30
1107F5RA	1,083.00	106	127152AFC	101.00	68	132639AFC	239.00	66	203502	160.00	30
1107G5LA	1,180.00	106	127153AFC	133.00	68	132652AFC	250.00	66	220400A	46.30	31
1107G5RA	1,180.00	106	127154AFC	101.00	68	132653AFC	280.00	66	220500A	50.70	31
1107H5LA	1,258.00	106	127155AFC	133.00	68	132654AFC	250.00	66	221400A	46.30	31
1107H5RA	1,258.00	106	127156AFC	116.00	68	132655AFC	280.00	66	221500A	50.70	31
112001	32.80	66	127157AFC	147.00	68	132658AFC	268.00	66	250041A	52.20	105
116000	53.40	71	127158AFC	133.00	68	132659AFC	239.00	66	251003A	147.00	104
116010	11.80	71	127159AFC	101.00	68	132662A	207.00	67, 106	251004A	110.80	105
116140A	176.00	70	127160AFC	157.00	68	132772A	275.00	67, 106	252149A	160.00	104
116140AC	211.00	70	127161AFC	126.00	68	132882A	326.00	67, 106	252158A	207.00	104
116141A	188.00	70	127162AFC	125.00	68	132992A	399.00	67, 106	252159A	168.00	104
116141AC	223.00	70	127163AFC	155.00	68	142241A	91.50	69	252168A	235.00	104
116150A	189.00	70	127164AFC	125.00	68	142251A	97.50	69	252169A	195.00	104
116150AC	230.00	70	127165AFC	155.00	68	142261A	132.00	69	253040	49.50	104
116151A	201.00	70	127166AFC	132.00	68	142271A	189.00	69	253042	49.50	104
116151AC	242.00	70	127167AFC	163.00	68	142281A	212.00	69	253043	49.50	104
116240A	229.00	70	127168AFC	155.00	68	142291A	271.00	69	253044	49.50	104
116240AC	264.00	70	127169AFC	125.00	68	165001	50.10	44	253046	49.50	104
116250A	242.00	70	127341AF	89.80	68	165600A	898.00	44	253048	49.50	104
116250AC	283.00	70	127342AF	84.90	68	165602A	1,096.00	44	255007	127.00	100
116340A	241.00	70	127346AF	99.20	68	165610A	898.00	44	259012	109.00	100
116340AC	277.00	70	127349AF	84.90	68	165612A	1,096.00	44	259018	135.00	100
116350A	254.00	70	127351AF	93.70	68	166600A	1,096.00	45	259025	175.00	100
116350AC	295.00	70	127352AF	89.30	68	166602A	1,296.00	45	259033	298.00	100
116440A	160.00	71	127356AF	109.00	68	166610A	1,096.00	45	259050	376.00	100
116440AC	194.00	71	127359AF	89.30	68	166612A	1,296.00	45	278011	40.40	102
116441A	170.00	71	127361AF	107.00	68	167600A	1,296.00	45	278751	558.00	102
116441AC	206.00	71	127362AF	103.00	68	167602A	1,495.00	45	278751A	724.00	102
116450A	172.00	71	127366AF	134.00	68	167610A	1,296.00	45	278951A	773.00	103
116450AC	212.00	71	127369AF	103.00	68	167612A	1,495.00	45	279051	664.00	102
116451A	182.00	71	130400A	117.00	69	1725C1A	1,046.00	46	279051A	830.00	102
116451AC	224.00	71	130500A	127.00	69	1725C1A IN	1,046.00	46	280165A	267.00	107
120141A 000	106.00	73	130600A	152.00	69	1725C1AHE	1,256.00	46	280166A	267.00	107
120149A 000	101.00	73	130700A	190.00	69	1725C1AHE IN	1,256.00	46	280175A	307.00	107
120151A 000	107.00	73	130800A	237.00	69	1725D1A	1,114.00	46	280176A	307.00	107
120159A 000	102.00	73	130900A	316.00	69	1725D1A IN	1,114.00	46	280965A	250.00	107
120161A 000	212.00	73	132060A	985.00	67	1725D1AHE	1,323.00	46	280966A	250.00	107
120169A 000	202.00	73	132080A	1,315.00	67	1725D1AHE IN	1,323.00	46	280975A	294.00	107
120171A 000	241.00	73	132100A	2,007.00	67	1725E1A	1,181.00	46	280976A	294.00	107
120179A 000	230.00	73	132432A	165.00	67	1725E1A IN	1,181.00	46	281165A	822.00	107
120341A 000	115.00	73	132432AFC	208.00	66	1725E1AHE	1,390.00	46	281166A	822.00	107
120349A 000	110.00	73	132433AFC	238.00	66	1725E1AHE IN	1,390.00	46	281175A	945.00	107
120351A 000	116.00	73	132434AFC	208.00	66	1725F1A	1,249.00	46	281176A	945.00	107
120359A 000	111.00	73	132435AFC	238.00	66	1725F1A IN	1,249.00	46	281965A	768.00	107
120361A 000	222.00	73	132438AFC	238.00	66	1725F1AHE	1,457.00	46	281966A	768.00	107
120369A 000	210.00	73	132439AFC	208.00	66	1725F1AHE IN	1,457.00	46	281975A	904.00	107
120371A 000	250.00	73	132452AFC	208.00	66	1725G1A	1,317.00	46	281976A	904.00	107
120379A 000	239.00	73	132453AFC	238.00	66	1725G1A IN	1,317.00	46	301040	39.00	32
121141A	117.00	72	132454AFC	208.00	66	1725G1AHE	1,525.00	46	301140	39.00	32
121149A	112.00	72	132455AFC	238.00	66	1725G1AHE IN	1,525.00	46	301241	68.30	32
121151A	118.00	72	132458AFC	238.00	66	1725H1A	1,384.00	46	301341	68.30	32
121159A	113.00	72	132459AFC	208.00	66	1725H1A IN	1,384.00	46	31401 FD	32.20	93
121161A	241.00	72	132532AFC	217.00	66	1725H1AHE	1,592.00	46	31403 FD	53.20	93
121169A	230.00	72	132533AFC	247.00	66	1725H1AHE IN	1,592.00	46	31426 FD	63.40	93
121171A	271.00	72	132534AFC	217.00	66	1725I1A	1,451.00	46	31428 FD	82.70	93
121179A	258.00	72	132535AFC	247.00	66	1725I1A IN	1,451.00	46	31553 FD	14.30	93
121341A	126.00	72	132536AFC	230.00	66	1725I1AHE	1,660.00	46	31554 FD	28.50	91, 93
121349A	120.00	72	132537AFC	261.00	66	1725I1AHE IN	1,660.00	46	31901A	11.50	90, 92
121351A	128.00	72	132538AFC	247.00	66	1725L1A	1,519.00	46	337221A	8.20	17
121359A	121.00	72	132539AFC	217.00	66	1725L1A IN	1,519.00	46	338452	48.70	31
121361A	250.00	72	132552A	177.00	67, 106	1725L1AHE	1,728.00	46	339452	52.50	31
121369A	239.00	72	132552AFC	217.00	66	1725L1AHE IN	1,728.00	46	342452	32.10	31
121371A	279.00	72	132553AFC	247.00	66	1725M1A	1,585.00	46	343452	33.60	31
121379A	266.00	72	132554AFC	217.00	66	1725M1A IN	1,585.00	46	386500	7.90	51

Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
387100	37.50	33, 51	521408AC	174.00	56	533940HA	80.40	76	546198A	1,062.00	22
387127	67.80	31	521409A	157.00	56	533941HA	92.00	76	546199A	1,113.00	22
39623	11.80	78	521409AC	174.00	56	533950HA	87.60	76	546305A	191.00	24
41371A	46.40	91	521410A	193.00	56	533951HA	99.20	76	546306A	205.00	24
41372A	60.10	91	521410AC	209.00	56	535004	46.40	85	546307A	299.00	24
41380A	11.40	93	521416A	196.00	56	535006HA	55.70	77	546308A	390.00	24
41447	22.40	13	521417A	186.00	56	535009HA	171.00	77	546309A	470.00	24
41787 CST	28.10	91, 92	521417AC	202.00	56	535051A	128.00	85	546328A	195.00	24
41788 CST	44.50	91	521418A	186.00	56	535056A	131.00	85	546335A	284.00	24
41789 CST	57.90	91	521418AC	202.00	56	535057A	126.00	85	546341A	371.00	24
41882A	50.30	93	521419A	186.00	56	535058A	126.00	85	546354A	453.00	24
437516	6.80	33	521419AC	202.00	56	535059A	126.00	85	546366A	223.00	24
449000	7.90	53	521500A	172.00	56	535061A	135.00	85	546367A	341.00	24
449010	9.80	30	521500AC	195.00	56	535066A	142.00	85	546368A	445.00	24
449740	3.40	32	521506A	172.00	56	535067A	136.00	85	546369A	543.00	24
472000	161.00	30	521506AC	212.00	56	535068A	136.00	85	546510A	1,753.00	21
49684A	262.00	13, 27	521507A	164.00	56	535069A	134.00	85	546510AM	2,446.00	26
49685A	378.00	27	521507AC	188.00	56	535340HA	110.00	76	546550A	1,177.00	21
501502A	243.00	13, 16	521508A	164.00	56	535341HA	121.00	76	546550AM	1,520.00	26
502015A	13.60	16	521508AC	188.00	56	535350HA	118.00	76	546560A	1,252.00	21
502040A	13.60	16	521509A	164.00	56	535351HA	129.00	76	546560AM	1,636.00	26
502043 CST	19.20	53	521509AC	188.00	56	535360HA	154.00	76	546580AM	2,212.00	26
502043A	19.20	13, 16	521510A	201.00	56	535361HA	165.00	76	548006A	607.00	11
502113A	21.10	16	521510AC	224.00	56	535370HA	329.00	76	548006US	456.00	11
502115A	18.30	16	521516A	201.00	56	535371HA	340.00	76	548007A	728.00	11
502243A	32.90	16	521516AC	241.00	56	535380HA	474.00	76	548007US	514.00	11
502343A	38.90	13, 16	521517A	193.00	56	535381HA	485.00	76	548008A	954.00	11
502630	17.00	17	521517AC	217.00	56	535390HA	582.00	76	548008US	570.00	11
502640	18.30	17	521518A	193.00	56	535391HA	593.00	76	548009A	1,111.00	11
502610A	12.20	17	521518AC	217.00	56	535550HA	110.00	76	548009US	628.00	11
502620A	12.70	17	521519A	193.00	56	535551HA	120.00	76	548052A	2,359.00	11
502710A	16.90	17	521519AC	217.00	56	535650HA	115.00	76	548062A	2,513.00	11
502720A	17.80	17	521600A	203.00	56	535651HA	126.00	76	548066A	650.00	11
508013A	6.60	17	521600AC	226.00	56	535660HA	169.00	76	548067A	828.00	11
508100A	5.80	17	521606A	207.00	56	535661HA	180.00	76	548068A	1,074.00	11
519006	56.20	45	521607A	195.00	56	535670HA	469.00	76	548069A	1,357.00	11
519502A	106.00	96	521607AC	219.00	56	535671HA	480.00	76	548082A	3,144.00	11
519566A	120.00	96	521608A	195.00	56	535680HA	673.00	76	548096A	575.00	11
519599A	105.00	96	521608AC	219.00	56	535681HA	687.00	76	548097A	694.00	11
519600A	165.00	96	521609A	195.00	56	535690HA	829.00	76	548098A	908.00	11
519609A	165.00	96	521609AC	219.00	56	535691HA	840.00	76	548099A	1,061.00	11
519700A	198.00	96	521610A	233.00	56	535750HA	110.00	76	548102A	3,519.00	11
519709A	198.00	96	521610AC	256.00	56	535751HA	120.00	76	549506A	835.00	10
520051A	121.00	57, 63	521616A	237.00	56	535760HA	145.00	76	549506US	684.00	10
520500AX	225.00	63	521617A	225.00	56	535761HA	156.00	76	549507A	1,013.00	10
520506AX	257.00	63	521617AC	248.00	56	535940HA	101.00	76	549507US	798.00	10
520509AX	218.00	63	521618A	225.00	56	535941HA	112.00	76	549508A	1,324.00	10
520510AX	257.00	63	521618AC	248.00	56	535950A	92.60	85	549508US	941.00	10
520516A	201.00	57	521619A	225.00	56	535950HA	110.00	76	549509A	1,503.00	10
520516AC	241.00	57	521619AC	248.00	56	535951HA	120.00	76	549509US	1,141.00	10
520516AX	289.00	63	523160A	896.00	58	535960HA	145.00	76	549510A	5,332.00	10
520519A	193.00	57	523166A	944.00	58	535961HA	156.00	76	549552A	3,570.00	10
520519AC	217.00	57	523168A	887.00	58	535970HA	321.00	76	549562A	3,805.00	10
520519AX	249.00	63	523170A	970.00	58	535971HA	331.00	76	549566A	878.00	10
521101A	121.00	57	523176A	987.00	58	535980HA	450.00	76	549567A	1,113.00	10
521201A	100.00	59	523177A	997.00	58	535981HA	460.00	76	549568A	1,445.00	10
521301A	113.00	59	523178A	927.00	58	535990HA	585.00	76	549569A	1,688.00	10
521333A	139.00	59	523179A	798.00	58	535991HA	596.00	76	549582A	4,761.00	10
521342A	172.00	59	523180A	1,428.00	58	538202 FD	12.00	73, 96	549596A	803.00	10
521347A	164.00	59	523186A	1,519.00	58	538402 FD	12.30	13, 24, 73, 96	549597A	979.00	10
521348A	164.00	59	523188A	1,394.00	58	546016A	307.00	22	549598A	1,278.00	10
521349A	164.00	59	523190A	1,503.00	58	546050A	2,330.00	22	549599A	1,466.00	10
521352A	179.00	59	523196A	1,688.00	58	546060A	2,456.00	22	551003A	113.00	19
521357A	172.00	59	523198A	1,466.00	58	546080A	3,163.00	22	551003AC	119.00	19
521358A	172.00	59	523199A	1,141.00	58	546096A	293.00	22	551004A	78.80	17
521359A	172.00	59	533000H	44.50	77	546097A	349.00	22	551005A	169.00	18
521362A	212.00	59	533340HA	88.20	76	546100A	3,468.00	22	551005AC	176.00	18
521367A	205.00	59	533341HA	99.70	76	546108A	1,094.00	22	551006A	182.00	18
521368A	205.00	59	533350HA	94.80	76	546109A	1,155.00	22	551006AC	189.00	18
521369A	205.00	59	533351HA	106.00	76	546116A	376.00	22	551007A	266.00	18
521400A	164.00	56	533650HA	92.00	76	546120A	5,003.00	22	551007AC	272.00	18
521400AC	180.00	56	533651HA	103.00	76	546150A	6,103.00	22	551008A	346.00	18
521406A	167.00	56	533750HA	87.60	76	546168A	1,213.00	22	551008AC	353.00	18
521407A	157.00	56	533751HA	99.20	76	546169A	1,353.00	22	551009A	423.00	18
521407AC	174.00	56	533850HA	87.60	76	546196A	360.00	22	551009AC	429.00	18
521408A	157.00	56	533851HA	99.20	76	546197A	429.00	22	551022A	109.00	19

Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
551022AC	116.00	19	59817A	25.80	90	6636G5A IN	640.00	49	6687M5S1A	1,073.00	48
551028A	174.00	18	59829	98.10	27	6636H5A	702.00	49	6687M5S1A IN	1,073.00	48
551028AC	180.00	18	59834A	23.20	90	6636H5A IN	702.00	49	6687N5S1A	1,143.00	48
551035A	253.00	18	59840A	23.30	90	6636I5A	763.00	49	6687N5S1A IN	1,143.00	48
551035AC	260.00	18	59893A	17.20	90	6636I5A IN	763.00	49	6687O5S1A	1,213.00	48
551041A	329.00	18	59894A	37.50	90	6636L5A	825.00	49	6687O5S1A IN	1,213.00	48
551041AC	337.00	18	59904A	14.80	90	6636L5A IN	825.00	49	669050	27.10	53
551050A	1,835.00	20	59905A	20.90	90	6636M5A	886.00	49	675900A	8.50	53
551050AT	1,745.00	20	59906A	35.00	90	6636M5A IN	886.00	49	676000A	22.20	36
551054A	403.00	18	59977	18.40	78	6636N5A	947.00	49	676256A	161.00	36
551054AC	409.00	18	59978	32.90	78	6636N5A IN	947.00	49	676258A	155.00	36
551060A	1,962.00	20	59979	21.30	78	6636O5A	1,009.00	49	676259A	155.00	36
551060AT	1,872.00	20	59980	8.00	78	6636O5A IN	1,009.00	49	676266A	184.00	36
551066A	208.00	18	600054A	2,236.00	60	6637P5A	1,216.00	49	676268A	177.00	36
551066AC	213.00	18	600056A	2,332.00	60	6637P5A IN	1,216.00	49	676269A	177.00	36
551067A	320.00	18	600059A	2,214.00	60	6637C5A	421.00	49	676500A	47.20	36
551067AC	326.00	18	600060A	10,566.00	60	6637C5A IN	421.00	49	676756A	183.00	36
551068A	413.00	18	600064A	2,459.00	60	6637D5A	482.00	49	676758A	179.00	36
551068AC	420.00	18	600066A	2,509.00	60	6637D5A IN	482.00	49	676759A	179.00	36
551069A	504.00	18	600066AS	7,231.00	61	6637E5A	543.00	49	676766A	207.00	36
551069AC	511.00	18	600069A	2,450.00	60	6637E5A IN	543.00	49	676768A	199.00	36
551080A	2,597.00	20	600074A	2,535.00	60	6637F5A	605.00	49	676769A	199.00	36
551100A	2,905.00	20	600076A	2,553.00	60	6637F5A IN	605.00	49	680507	7.90	51
551120A	4,228.00	20	600076AS	8,218.00	61	6637G5A	666.00	49	680503A	7.90	51
551150A	5,448.00	20	600079A	2,491.00	60	6637G5A IN	666.00	49	680504A	7.90	51
551716	196.00	19	600080A	11,184.00	60	6637H5A	728.00	49	680505A	7.90	51
551705A	215.00	19	600084A	2,862.00	60	6637H5A IN	728.00	49	680555A	7.90	51
551706A	228.00	19	600086A	2,956.00	60	6637I5A	788.00	49	681524	8.30	33
551765A	226.00	19	600086AS	10,400.00	61	6637I5A IN	788.00	49	681555	8.30	33
551766A	253.00	19	600089A	2,827.00	60	6637L5A	850.00	49	681503A	8.30	33
551795A	212.00	19	600094A	2,940.00	60	6637L5A IN	850.00	49	682530A	8.10	51
551796A	225.00	19	600096A	3,131.00	60	6637M5A	911.00	49	682540A	8.10	33, 51
553542A	98.60	84	600096AS	11,805.00	61	6637M5A IN	911.00	49	682545A	8.70	51
553549A	93.70	84	600099A	2,900.00	60	6637N5A	974.00	49	682550A	15.40	51
553642A	111.00	84	61215A	17.30	95	6637N5A IN	974.00	49	688003A	31.80	53, 57, 58
553649A	106.00	84	626009	19.30	96	6637O5A	1,035.00	49	69122 CST	10.20	53
559920A	755.00	12	626600A	206.00	96	6637O5A IN	1,035.00	49	694045	15.50	13
559921A	777.00	12	644004	151.00	41	668000	74.90	52	750450	2,007.00	111
559922A	928.00	12	644250A	257.00	41	6686C5S1A	483.00	48	750410A	2,518.00	110
559931A	1,115.00	12	644256A	257.00	41	6686C5S1A IN	483.00	48	750411A	3,176.00	110
561402A	12.30	17, 19	644259A	252.00	41	6686D5S1A	553.00	48	750412A	4,170.00	110
562100	16.00	27	644260A	278.00	41	6686D5S1A IN	553.00	48	750413A	4,760.00	110
573002A	168.00	84	644266A	280.00	41	6686E5S1A	623.00	48	750414A	5,666.00	110
573006A	187.00	84	644269A	273.00	41	6686E5S1A IN	623.00	48	750415A	6,346.00	110
573007A	178.00	84	644350A	277.00	41	6686F5S1A	694.00	48	750440A	935.00	110
573009A	161.00	84	644350A 3BY	277.00	41	6686F5S1A IN	694.00	48	750446A	981.00	110
573012A	181.00	84	644356A	292.00	41	6686G5S1A	763.00	48	750449A	901.00	110
573016A	202.00	84	644356A 3BY	292.00	41	6686G5S1A IN	763.00	48	750450A	947.00	110
573017A	192.00	84	644359A	284.00	41	6686H5S1A	834.00	48	750456A	992.00	110
573019A	174.00	84	644359A 3BY	284.00	41	6686H5S1A IN	834.00	48	750459A	912.00	110
573100A	56.20	78	644360A	323.00	41	6686I5S1A	904.00	48	750460A	992.00	110
573403A	76.60	78	644360A 3BY	323.00	41	6686I5S1A IN	904.00	48	750463A	1,335.00	110
573406A	93.10	78	644366A	327.00	41	6686L5S1A	974.00	48	750466A	1,038.00	110
573409A	72.70	78	644366A 3BY	327.00	41	6686L5S1A IN	974.00	48	750469A	958.00	110
573493A	74.90	78	644369A	315.00	41	6686M5S1A	1,044.00	48	750473A	1,426.00	110
573503A	80.40	78	644369A 3BY	315.00	41	6686M5S1A IN	1,044.00	48	750483A	1,654.00	110
574002A	389.00	84	645114	371.00	61	6686N5S1A	1,114.00	48	755052	1,654.00	61, 111
574004A	296.00	78	656344	87.10	36, 52, 71	6686N5S1A IN	1,114.00	48	861527A CST	15.10	106
574006A	407.00	84	656354	103.00	36, 52, 71	6686O5S1A	1,185.00	48	861634A CST	24.20	106
574007A	398.00	84	656354R	113.00	52	6686O5S1A IN	1,185.00	48	940451	14.90	33
574012A	401.00	84	656404	65.00	30, 36, 52, 71	6687C5S1A	512.00	48	942550	9.80	51
574016A	419.00	84	656414	82.10	30, 36, 52, 71	6687C5S1A IN	512.00	48	CBN116140	28.40	71
574017A	410.00	84	659044	255.00	50	6687D5S1A	582.00	48	CBN116440	28.00	71
574050A	356.00	78	659064	278.00	50	6687D5S1A IN	582.00	48	CBN130400	25.70	69
574056A	386.00	78	659084	327.00	50	6687E5S1A	653.00	48	CBN130500	27.80	69
574064A	314.00	78	659104	376.00	50	6687E5S1A IN	653.00	48	CBN130600	33.40	69
574151A	475.00	85	659124	425.00	50	6687F5S1A	722.00	48	CBN130700	41.80	69
574156A	505.00	85	6636C5A	395.00	49	6687F5S1A IN	722.00	48	CBN130800	52.10	69
574157A	490.00	85	6636C5A IN	395.00	49	6687G5S1A	792.00	48	CBN130900	69.40	69
59469	47.40	78	6636D5A	457.00	49	6687G5S1A IN	792.00	48	CBN142241A	23.50	69
59470	50.30	78	6636D5A IN	457.00	49	6687H5S1A	863.00	48	CBN142251A	25.00	69
59471	99.70	78	6636E5A	518.00	49	6687H5S1A IN	863.00	48	CBN142261A	34.10	69
59472	35.50	78	6636E5A IN	518.00	49	6687I5S1A	933.00	48	CBN142271A	48.60	69
59474A	10.00	17	6636F5A	579.00	49	6687I5S1A IN	933.00	48	CBN142281A	54.70	69
59756	115.00	27	6636F5A IN	579.00	49	6687L5S1A	1,003.00	48	CBN546002	72.70	22
59804A	10.70	17	6636G5A	640.00	49	6687L5S1A IN	1,003.00	48	CBN546118	92.00	22

Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
CBN546119	105.00	22	NA10058	56.20	57	NA11308	18.00	77	NA20876	62.80	88, 89
CBN546205	46.40	24	NA10060	17.30	94	NA11309	52.00	77	NA20879	42.80	88, 89
CBN546207	49.80	24	NA10061	18.00	94	NA11338	51.00	83	NA20973	62.30	89
CBN546209	54.40	24	NA10062	18.60	94	NA12156	30.90	101	NA20976	85.40	89
CBN551005	46.40	19	NA10064	19.40	95	NA12162	19.90	95	NA20979	83.20	89
CBN551007	49.80	19	NA10087	17.40	95	NA12169	342.00	101	NA20983	72.20	88
CBN551009	54.40	19	NA10089	14.40	95	NA12171	266.00	103	NA20986	130.00	88
F0000349	494.00	13, 27	NA10103	175.00	101	NA12172	17.30	94	NA20989	60.10	88
F0000435	116.00	13	NA10117	8.00	97	NA12173	21.50	94	NA21083	67.80	89
F0000492	6.70	91	NA10119	23.70	95	NA12249	23.40	73	NA21086	114.00	89
F0000493	72.00	92	NA10160	8.20	100	NA12259	28.00	73	NA21089	86.50	89
F0000494	54.00	92	NA10164	20.60	90	NA12269	49.00	73	NA21180	95.90	89
F0000495	86.00	92	NA10165	24.10	90	NA15029	35.30	100	NA21186	126.00	89
F0000496	74.00	92	NA10166	39.50	90	NA15550	110.00	101	NA21189	84.30	89
F0000520	9.10	91, 92	NA10167	8.00	97	NA15559	88.70	101	NA21190	121.00	89
F0000521	19.50	91	NA10197	1.30	84	NA15560	110.00	101	NA21193	99.70	88
F0000580	41.50	71	NA10204	17.30	27, 105	NA15569	90.40	101	NA21196	182.00	88, 89
F0000698	5.00	91, 94	NA10234	50.50	100	NA15570	37.40	101	NA21199	109.00	88, 89
F0000718	13.40	91	NA10262	8.80	33, 51	NA16002	416.00	47	NA21293	105.00	89
F0000926	33.20	66	NA10273	12.10	77, 85	NA16060	58.40	45	NA21296	168.00	89
F0000940	91.50	66, 67	NA10288	33.70	106	NA16069	51.60	45	NA21299	124.00	89
F0000941	91.50	66, 67	NA10302	2.00	90, 95	NA16160	59.00	45	NA223529	114.00	73
F0000942	91.50	67	NA10313	9.50	33, 51	NA16169	52.10	45	NA25510	2,328.00	83, 101
F0000943	95.90	67	NA10315	113.00	58	NA16264	13.80	90	NA255160	1,379.00	101
F0000944	95.90	67	NA10328	46.60	57	NA16265	15.20	90, 92	NA25540	18.60	100
F0000945	95.90	67	NA10342	9.80	40	NA16265L	34.80	90	NA25549	17.20	100
F0000946	101.00	67	NA10343	59.00	40	NA16265LC	44.10	90	NA26650	39.90	102
F0000947	101.00	67	NA10358	29.30	57	NA16266	27.10	90	NA26659	68.30	103
F0000948	101.00	67	NA10363	12.70	84	NA16266L	52.00	90	NA26660	77.10	102
F0000962	1,483.00	61	NA10366	49.80	58, 61	NA16266LC	54.00	90	NA26669	74.90	103
F0001007	6.70	91	NA10367	123.00	58, 61	NA17256	760.00	47	NA26711	460.00	103
F0001008	9.10	91, 92	NA10370	8.00	97	NA17256HE	969.00	47	NA26750	79.90	102
F0001009	19.50	91	NA10371	14.00	97	NA20540	13.50	88	NA26759	136.00	103
F0001179	16.00	27	NA10403	17.90	90	NA20543	16.40	88	NA26760	154.00	102
F19153	230.00	47	NA10404	27.20	90	NA20549	11.90	88	NA26769	149.00	103
F19346	33.30	66, 67, 106	NA10405	2.00	56	NA20640	14.20	88	NA29284	40.50	105
F19379	326.00	107	NA10406	36.90	93	NA20640C	22.10	88	NA39588	57.90	13
F29571	21.40	106	NA10407	55.10	93	NA20643	16.40	88	NA39589	25.30	13
F29633	25.30	106	NA10408	77.70	93	NA20646	15.10	88	NA39753	34.40	13, 20, 27
F29634	25.30	106	NA10409	127.00	93	NA20647	11.70	88	NA502640A	39.40	79
F29635	25.30	106	NA10419	30.20	90	NA20647C	19.70	88	NA502740A	23.10	17
F29636	25.30	106	NA10419C	35.30	90	NA20648	11.70	88	NA503040	29.90	96
F31868	9.50	93, 92	NA10425	20.80	13	NA20648C	19.70	88	NA51059	47.10	97
F36073	6.50	31	NA10426	3.50	13	NA20649	11.70	88	NA51069	60.10	97
F39807	47.80	27	NA10438	2.20	77	NA20649C	19.70	88	NA51200	44.00	97
F41186	2.90	93, 92, 94	NA10461	223.00	58	NA20650	16.40	88	NA51240	74.00	97
F41661A	94.80	24	NA10467	41.50	71	NA20650C	28.20	88	NA51243	84.00	97
F49644	16.00	92	NA10469	35.60	71	NA20653	18.60	88	NA51246	90.00	97
F49645	18.00	92	NA10476	128.00	58	NA20656	16.50	88	NA51247	68.00	97
F49646	24.00	92	NA10479	1.80	56	NA20656C	36.60	88	NA51248	68.00	97
F49647	40.00	92	NA10481	214.00	102	NA20657	14.10	88	NA51249	62.00	97
F49657	16.00	92	NA10484	14.80	91	NA20657C	25.80	88	NA51250	78.00	97
F50055	1.30	13, 90, 92	NA10485	20.90	91	NA20658	14.10	88	NA51253	90.00	97
F52429	4.00	56	NA10486	31.30	91	NA20658C	25.80	88	NA51256	96.00	97
F59650	29.10	84	NA10496	22.00	92	NA20659	14.10	88	NA51257	74.00	97
F59917	16.00	27	NA10497	30.00	92	NA20659C	25.80	88	NA51258	74.00	97
F61008	3.60	91, 92, 94	NA10498	3.10	53, 57	NA20660	27.20	88	NA51259	68.00	97
F61008/C	4.30	91	NA10512	98.60	62	NA20660C	38.90	88	NA51300	56.00	97
F67037	0.70	53	NA10556	12.00	92	NA20666	28.40	88	NA51360	102.00	97
F69184	16.00	53	NA10615	428.00	61	NA20666C	56.00	88	NA51363	108.00	97
F69293	13.90	39	NA10616	628.00	61	NA20667	24.50	88	NA51366	140.00	97
F69294	13.90	39	NA10634	14.80	91	NA20667C	36.30	88	NA51369	96.00	97
F69590	18.30	53	NA10635	20.90	91	NA20668	24.50	88	NA51370	112.00	97
F69591	66.00	61	NA10636	31.30	91	NA20668C	36.30	88	NA51373	118.00	97
F69600	22.90	53	NA10706	36.00	91	NA20669	24.50	88	NA51376	164.00	97
F69804	74.00	61	NA10707	66.00	91, 92	NA20669C	36.30	88	NA51379	108.00	97
F69807	52.00	61	NA10708	94.00	91	NA20763	26.20	88	NA51400	146.00	97
NA10001	7.90	93, 92	NA10709	168.00	91, 92	NA20766	31.50	88	NA51480	286.00	97
NA10002	6.70	90	NA10715	130.00	92	NA20767	25.00	88	NA51486	354.00	97
NA10003	9.10	90, 92	NA10104	2.90	95	NA20769	19.30	88	NA51489	270.00	97
NA10005	6.80	37	NA10246	32.70	106	NA20860	32.50	89	NA51490	304.00	97
NA10006	8.50	37	NA10247	40.50	106	NA20863	29.30	89	NA51493	316.00	97
NA10007	14.10	37	NA11304	13.00	77	NA20866	48.50	89	NA51496	388.00	97
NA10009	36.00	91	NA11305	14.40	77	NA20869	29.60	89	NA51499	286.00	97
NA10038	205.00	47	NA11306	15.40	77	NA20870	57.30	89	NA52367HL	2,541.00	62
NA10056	51.20	57	NA11307	16.60	77	NA20873	47.50	88	NA533449HA	68.40	77

Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
NA533459HA	72.40	77	NA548120A	5,965.00	11	NAS20050	2,406.00	100	Z200512	55.10	39
NA535840HA	77.00	77	NA548150A	7,237.00	11	NAS20080	2,844.00	100	Z200513	55.10	39
NA535850HA	81.00	77	NA548200A	11,230.00	11	NAS20120	3,763.00	100	Z200515	55.10	39
NA535860HA	107.00	77	NA548250A	15,853.00	11	R0000892	12.00	93	Z200517	55.10	39
NA535870HA	234.00	77	NA548300A	19,187.00	11	R11059	3.60	95	Z200532	48.70	39
NA535880HA	330.00	77	NA548350A	30,600.00	11	R11221	12.00	91	Z200535	48.70	39
NA535890HA	383.00	77	NA549052A	4,034.00	11	R19101	18.00	61	Z200537	48.70	39
NA545305	168.00	25	NA549052AM	4,156.00	10	R21180	4.00	100	Z200617	87.10	39
NA545306	194.00	25	NA549062A	4,339.00	11	R29326	6.00	104	Z200635	82.70	39
NA545355	202.00	25	NA549062AM	4,462.00	10	R31495	6.00	92, 95	Z200637	82.70	39
NA545356	235.00	25	NA549082A	5,248.00	11	R31589	12.30	91, 92, 93	Z200683	55.10	39
NA545365	182.00	25	NA549082AM	5,523.00	10	R31706	21.50	95	Z200687	55.10	39
NA545366	219.00	25	NA549102A	5,549.00	11	R31981	9.10	90	Z200737	110.00	39
NA545376	322.00	25	NA549102AM	5,824.00	10	R39204	2.70	56	Z207411	55.10	39
NA545395	167.00	25	NA549120A	7,750.00	11	R39591	20.80	53, 57, 58	Z207433	51.80	39
NA545396	185.00	25	NA549120AM	8,024.00	10	R41441	31.10	93	Z207533	63.40	39
NA546050T	2,231.00	23	NA549150A	9,403.00	11	R41660	41.20	91	Z207537	63.40	39
NA546050TM	2,579.00	23	NA549150AM	9,678.00	10	R50005	2.80	93	Z300053	64.50	39
NA546060A	3,002.00	23	NA549200A	15,193.00	11	R50008	5.70	93, 92	Z300411	53.70	39
NA546060AM	3,373.00	23	NA549200AM	16,751.00	10	R50047	11.40	93	Z300412	53.70	39
NA546080A	3,866.00	23	NA549250A	21,137.00	11	R50048	13.80	93	Z300413	53.70	39
NA546080AM	4,388.00	23	NA549250AM	22,695.00	10	R50056	2.00	92, 95	Z300431	50.40	39
NA546100A	4,238.00	23	NA549300A	28,309.00	11	R50057	2.80	91, 92	Z300432	50.40	39
NA546100AM	4,771.00	23	NA549300AM	29,867.00	10	R50058	1.20	92, 93	Z300512	67.20	39
NA546120A	6,114.00	23	NA549350A	33,653.00	11	R50060	13.30	91, 92	Z300513	67.20	39
NA546120AM	6,702.00	23	NA549350AM	35,211.00	10	R50065	2.80	93	Z300515	67.20	39
NA546150A	7,459.00	23	NA551050A	2,199.00	20	R51838	29.90	91, 92	Z300517	67.20	39
NA546150AM	8,087.00	23	NA551060A	2,351.00	20	R53003	24.40	92, 93	Z300532	62.30	39
NA546200A	13,855.00	23	NA551080A	3,112.00	20	R53004	24.40	93	Z300533	62.30	39
NA546200AM	15,866.00	23	NA551100A	3,482.00	20	R53005	27.90	93	Z300535	62.30	39
NA546250A	21,303.00	23	NA551120A	5,066.00	20	R56142	1.60	27	Z300617	101.00	39
NA546250AM	22,907.00	23	NA551150A	6,528.00	20	R56214	1.70	27, 53	Z300635	93.70	39
NA546300A	26,639.00	23	NA551200A	10,683.00	20	R59119	10.10	27	Z300637	93.70	39
NA546300AM	29,026.00	23	NA551250A	16,024.00	20	R59681	15.20	27	Z300687	70.00	39
NA546306T	316.00	25	NA551300A	20,831.00	20	R69176	15.70	53	Z300737	114.00	39
NA546307T	403.00	25	NA553362	471.00	85	R69413	6.00	53	Z307433	65.00	39
NA546328T	308.00	25	NA553362R	750.00	85	R79701	394.00	111	Z307537	77.10	39
NA546335T	390.00	25	NA553366	505.00	85	R79702	702.00	111	Z40	131.00	37
NA546350A	33,684.00	23	NA553366R	785.00	85	R79703	830.00	111	Z40F	148.00	37
NA546350AM	36,278.00	23	NA553369	461.00	85	R79704	986.00	111	Z42	143.00	37
NA546366T	333.00	25	NA553369R	741.00	85	Z111000	90.40	38	Z44	127.00	37
NA546367T	441.00	25	NA553372	545.00	85	Z111900	90.40	38	Z44P	176.00	37
NA546510A	2,860.00	21	NA553372R	825.00	85	Z113000	108.00	38	Z45	139.00	37
NA546510AM	3,249.00	26	NA553376	607.00	85	Z114000	108.00	38	Z45P	179.00	37
NA546512A	4,123.00	21	NA553376R	887.00	85	Z115000	108.00	38	Z45PL	196.00	37
NA546512AM	4,513.00	26	NA553379	535.00	85	Z116000	90.40	38	Z46	173.00	37
NA546515A	5,289.00	21	NA553379R	814.00	85	Z121000	83.80	38	Z46P	202.00	37
NA546515AM	5,678.00	26	NA570912	1,814.00	82	Z123000	101.00	38	Z47	201.00	37
NA546520A	10,814.00	21	NA57092	49.20	82	Z124000	101.00	38	Z50	134.00	37
NA546520AM	12,341.00	26	NA570924	3,449.00	82	Z125000	101.00	38	Z50F	151.00	37
NA546525A	16,671.00	21	NA57093	79.30	82	Z126000	83.80	38	Z54	131.00	37
NA546525AM	18,198.00	26	NA57094	538.00	82	Z131000	98.60	38	Z54P	179.00	37
NA546530A	20,647.00	21	NA570971	396.00	82	Z136000	98.60	38	Z55	143.00	37
NA546530AM	22,174.00	26	NA570974	791.00	82	Z141000	92.00	38	Z55P	182.00	37
NA546535A	25,958.00	21	NA573022	327.00	82	Z146000	92.00	38	Z55PL	199.00	37
NA546535AM	27,485.00	26	NA573100	148.00	82	Z151000	93.70	38	Z55S	173.00	37
NA546550A	1,887.00	21	NA573102	76.00	82	Z161000	86.00	38	Z56	176.00	37
NA546550AM	2,156.00	26	NA59600	123.00	13, 20, 27	Z200041	40.30	39	Z56P	206.00	37
NA546560A	2,007.00	21	NA605010	29.50	111	Z200042	40.30	39	Z57	204.00	37
NA546560AM	2,276.00	26	NA61241	6.90	37	Z200043	40.30	39	ZSR101	102.00	40
NA546580A	2,613.00	21	NA644200	224.00	41	Z200053	51.80	39	ZSR103	240.00	40
NA546580AM	3,002.00	26	NA644300	242.00	41	Z200411	40.30	39	ZSR104	281.00	40
NA548052A	3,103.00	11	NA644300 3BY	242.00	41	Z200412	40.30	39	ZSR106	344.00	40
NA548062A	3,337.00	11	NA669150	27.10	53	Z200413	40.30	39	ZVR103	182.00	40
NA548082A	4,038.00	11	NA669250	27.10	53	Z200431	36.90	39	ZVR104	217.00	40
NA548102A	4,270.00	11	NAS20025	2,013.00	100	Z200432	36.90	39	ZVR106	281.00	40

LIMITED WARRANTY

COVERAGE: Caleffi North America Inc. ("WARRANTOR") warrants that each Caleffi PRODUCT will be free from defects in material and workmanship for a period of two years* from the date of shipment/delivery of the PRODUCT (that can be identified by the "Caleffi" trademark, trade name, or logo affixed to them). The Limited Warranty is referred to herein as "the Limited warranty." The PURCHASER's sole and exclusive remedy under this Limited Warranty for defects in the PRODUCT shall be the repair, replacement or refund of the purchase price, in WARRANTOR's sole discretion, of the defective PRODUCT, or components thereof.

***PRODUCT warranty exceptions:**

Switching Zone Relays	3 years
Switching zone relays + valves (Z-one valves and Z-one relays installed together)	5 years
Storage Tank	6 years

NOT COVERED: This Limited Warranty also does not apply to, and WARRANTOR shall have no liability or responsibility in respect of, damages or expenses relating to:

- The failure to properly store, transport, install or use the PRODUCT as, for example, specified in any manuals or other literature supplied by WARRANTOR, on WARRANTOR's website, or in accordance with any applicable laws, codes, regulators or standards;
- Any PRODUCT purchased from any entity other than WARRANTOR;
- Alteration, change or modification of the PRODUCT, including its subcomponents, parts or assemblies;
- WARRANTOR also makes no warranty that a PRODUCT manufactured does not infringe the intellectual property or other proprietary rights of any third party;
- Accidents, misuse, abuse, abnormal use, improper use, negligent use, wilful misconduct, or use exceeding the recommended and permitted limits of the PRODUCT, and/or normal wear or deterioration;
- Any defect or non-conformity that has not been timely and promptly communicated in writing to WARRANTOR as set forth herein.
- Any damage, cost or expense caused by Act of God; or
- Loss of time, loss of use, inconvenience, loss of profits, lost business, lost business opportunities, damage to reputation, goodwill and any incidental or consequential damages arising out of or relating to the PRODUCT, or other matters not specifically covered hereunder.

PROCEDURE: Upon delivery, PURCHASER shall, within one (3) business day, inspect the PRODUCT for conformity and visible defects. PURCHASER shall give WARRANTOR immediate written, specific and detailed notice of any non-conformities or defects regarding the PRODUCT. Upon receipt of the written notice of claim, WARRANTOR shall have the right to inspect the PRODUCT. In the event of a defect covered by this Limited Warranty, WARRANTOR will, at WARRANTOR's discretion, repair or replace the PRODUCT or any component of the PRODUCT or refund the purchase price for that particular PRODUCT. In the event that PURCHASER submits a warranty claim that, in the sole reasonable discretion of the WARRANTOR, is unfounded, the PURCHASER shall reimburse the WARRANTOR all reasonable costs incurred by the WARRANTOR in evaluating the warranty claim (i.e. travel, lodging, expert evaluations, etc.). WARRANTOR must approve, in advance and in writing, all repairs or replacements covered under or performed pursuant to this Limited Warranty. Any warranty repairs or service must be performed exclusively by WARRANTOR or other authorized representative of WARRANTOR or by another servicing facility pre-approved in writing by WARRANTOR. Acceptance of any Limited Warranty claim is not an admission that any PRODUCT or any of its component parts are defective. The PURCHASER forfeits any rights it may have under this Limited Warranty if the PURCHASER does not follow the procedure described herein.

All requests and notices under this Limited Warranty shall be directed to:

Caleffi North America Inc.
 3883 West Milwaukee Road
 Milwaukee, WI 53208
 E-Mail: returns.us@caleffi.com
 Phone (414) 238-2360
 Fax: (414) 238-2366

LIMITATION OF DAMAGES: Except as expressly provided by this Limited Warranty, **WARRANTOR SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ASSOCIATED WITH THE USE OR NON-USE OF THE PRODUCT OR A CLAIM UNDER THIS LIMITED WARRANTY, WHETHER THE CLAIM IS BASED ON CONTRACT, TORT OR OTHERWISE.** The foregoing statements of warranty are exclusive and in lieu of all other remedies or damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so only in this case this limitation or exclusion may not apply to you. This Limited Warranty shall be the sole and exclusive remedy available to the PURCHASER with respect to this PRODUCT. In the event of any alleged breach of any warranty or any legal action brought by the PURCHASER, based on breach of warranty, alleged negligence or other tortious conduct by WARRANTOR, the PURCHASER's sole and exclusive remedy will be the repair or replacement of any defective PRODUCT as stated herein. In no event shall the liability of the WARRANTOR exceed the purchase price of the PRODUCT.

DISCLAIMER: ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL IMPLIED WARRANTIES ARISING FROM A COURSE OF DEALING, USAGE OF TRADE, BY STATUTE OR OTHERWISE, IS HEREBY STRICTLY LIMITED TO THE TERM OF THIS WRITTEN WARRANTY. This Limited Warranty shall be the sole and exclusive remedy available to the PURCHASER with respect to this PRODUCT. In the event of any alleged breach of any warranty or any legal action brought by the PURCHASER based on alleged negligence or other tortious conduct by WARRANTOR, the PURCHASER'S sole and exclusive remedy will be repair or replacement of defective materials or refund of the purchase price, as stated herein.

TRANSFER OF LIMITED WARRANTY: This warranty is made by WARRANTOR with only first PURCHASER of the PRODUCT and does not extend to any subsequent PURCHASER or any third parties. The unexpired portion of this Limited Warranty may not be transferred to any entity.

APPLICABLE LAW: The parties expressly acknowledge and irrevocably agree that any and all claims or disputes arising out of or otherwise relating to this Limited Warranty shall be decided by a binding arbitration administered by the American Arbitration Association pursuant to Commercial Industry Rules in effect as of the date of this Limited Warranty, to the exclusion of any courts of any place, except as necessary for the enforcement of arbitration rights. The place for any such arbitration shall be The State of Wisconsin. PURCHASER expressly waives any provision of law in the jurisdiction in which PURCHASER is located or any other potentially applicable law which conflicts with any provision of this Limited Warranty at any time.

OTHER RIGHTS: Your acceptance of delivery of The PRODUCT constitutes your acceptance of the terms of this Limited Warranty. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from state to state. If any term or provision of this Limited Warranty is invalid or unenforceable under any local, state, or federal law, statute, judicial decision, regulation, ordinance, executive order or other rule of law, such term shall be deemed reformed or deleted, but only to the extent necessary to comply with such statute, regulation, ordinance, order or rule and the remaining provisions of this Limited Warranty shall remain in full force and effect.

ENTIRE AGREEMENT: This document alone contains the entire Limited Warranty given by WARRANTOR in respect of the PRODUCT. Nothing in WARRANTOR's product literature, marketing materials, advertisements and technical specifications expand or enlarge the scope of this Limited Warranty. There are no terms, promises, conditions or warranties regarding the PRODUCT other than those expressly contained herein. WARRANTOR specifically does not authorize any person, including but not limited to any dealer or other agent or employee of WARRANTOR, to extend the time, scope, terms or conditions of this Limited Warranty or to create or assume for WARRANTOR any other obligation or liability with respect to the PRODUCT or other products designed, manufactured or sold by WARRANTOR. All terms of this Limited Warranty are contractual and not mere recitals, and constitute material terms of this Limited Warranty. It is agreed and acknowledged that the provisions of this Limited Warranty allocate the risks between WARRANTOR and PURCHASER, that WARRANTOR's pricing reflects this allocation of risk, and but for this allocation and limitation of liability, WARRANTOR would not have entered into this Limited Warranty. The agents, employees, and dealers of Caleffi Products are not authorized to make modifications to this limited warranty or make additional warranties binding on Caleffi.

THIS DOCUMENT AND ALL PROVISIONS CONTAINED HAS BEEN SPECIFICALLY AGREED BETWEEN THE PARTIES.

Suggested List Price
Effective February 1, 2020
Canceling All Prior Issues
specifications and prices are subject to change without notice

Caleffi North America, Inc.
3883 W. Milwaukee Road • Milwaukee, WI 53208
Tel: 414.238.2360 • Fax: 414.238.2366
sales@caleffi.com • www.caleffi.com

SKU: 20-001