

LIST PRICE CATALOG MARCH 2017

INSTALLATION TIP VIDEOS



Courtesy of Auer Steel & Heating Supply Co., Milwaukee, WI

- To view a short installation video, scan the QR code found on the outside of the product box.
- Quick scan from any mobile smart device with internet connection
- Decrease your installation time with these quick installation tip videos.



LIMITED WARRANTY

Limited Warranty:

Caleffi North America (Caleffi) warrants that all its products sold in accordance with these warranty provisions shall be free from defects in material and workmanship, or other malfunction or failure to perform, under normal use and services. This warranty extends only to persons or organizations that purchase Caleffi products for resale. This warranty is valid for the time listed below from the date of manufacture by product classification listed below:

Standard Components:	2 years
Switching Zone Relays:	3 years
Switching Relay & Valve:	5 years (Z-one™ ZVR series relay and Z-one™ zone valve installed together)
Storage Tank and SolarFlex™:	6 years
Solar Collectors:	10 years

Caleffi's sole obligation hereunder shall be, at its option, to issue credit, repair or replace any component which is proved to be defective. This limited warranty does not cover the cost of transportation or labor charges, including installation and removal, unless such charges are authorized in writing in advance by Caleffi. The solar heat transfer fluid, and maintenance schedule, must be per Caleffi specification. Specifically excluded from this warranty are glass breakage and the effects of frost or acts of God (force majeure) responsible for system or component malfunction.

Caleffi is not responsible for malfunction resulting from any unauthorized alterations made to any Caleffi system components. Caleffi assumes no responsibility for damage to any system component caused by neglect, abuse, faulty installation, misuse, handling or cause not in Caleffi control or not an inherent defect. Caleffi is not liable for consequential damage or expenses, the total liability shall be limited to replacement and repair as stated above.

Disclaimer of Warranties:

CALEFFI NORTH AMERICA (CALEFFI) DISCLAIMS ANY WARRANTY NOT PROVIDED HEREIN INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IT IS EXPRESSLY UNDERSTOOD THAT CALEFFI IS NOT RESPONSIBLE FOR ANY CONSEQUENTIAL OR OTHER DAMAGES THAT MAY ARISE FROM USING CALEFFI SYSTEM COMPONENTS. DAMAGE RESULTING FROM WATER FREEZING IN THE TUBING DOES NOT CONSTITUTE A DEFECT IN MATERIAL OR WORKMANSHIP, AND SHALL NOT BE COVERED BY THIS WARRANTY.

CALEFFI DISCLAIMS ANY STATUTORY OR IMPLIED WARRANTY OF HABITABILITY. CALEFFI FURTHER DISCLAIMS ANY RESPONSIBILITY FOR LOSSES, EXPENSES, INCONVENIENCES, SPECIAL, INDIRECT, SECONDARY, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THE ARTICLES SOLD HEREUNDER. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE HEREOF.

Low Lead Notice:

Products identified as "Low Lead" comply with the "Reduction of Lead in Drinking Water Act" a amendment to the "Safe Drinking Water Act" (SDWA) Section 1417. These products can be used in potable water services such as drinking water, hand washing, food service and dish washing.

Products not specifically identified as "Low Lead" are intended for hydronic heating and cooling applications and do not comply with SDWA Section 1417; they cannot be installed in new potable water services.

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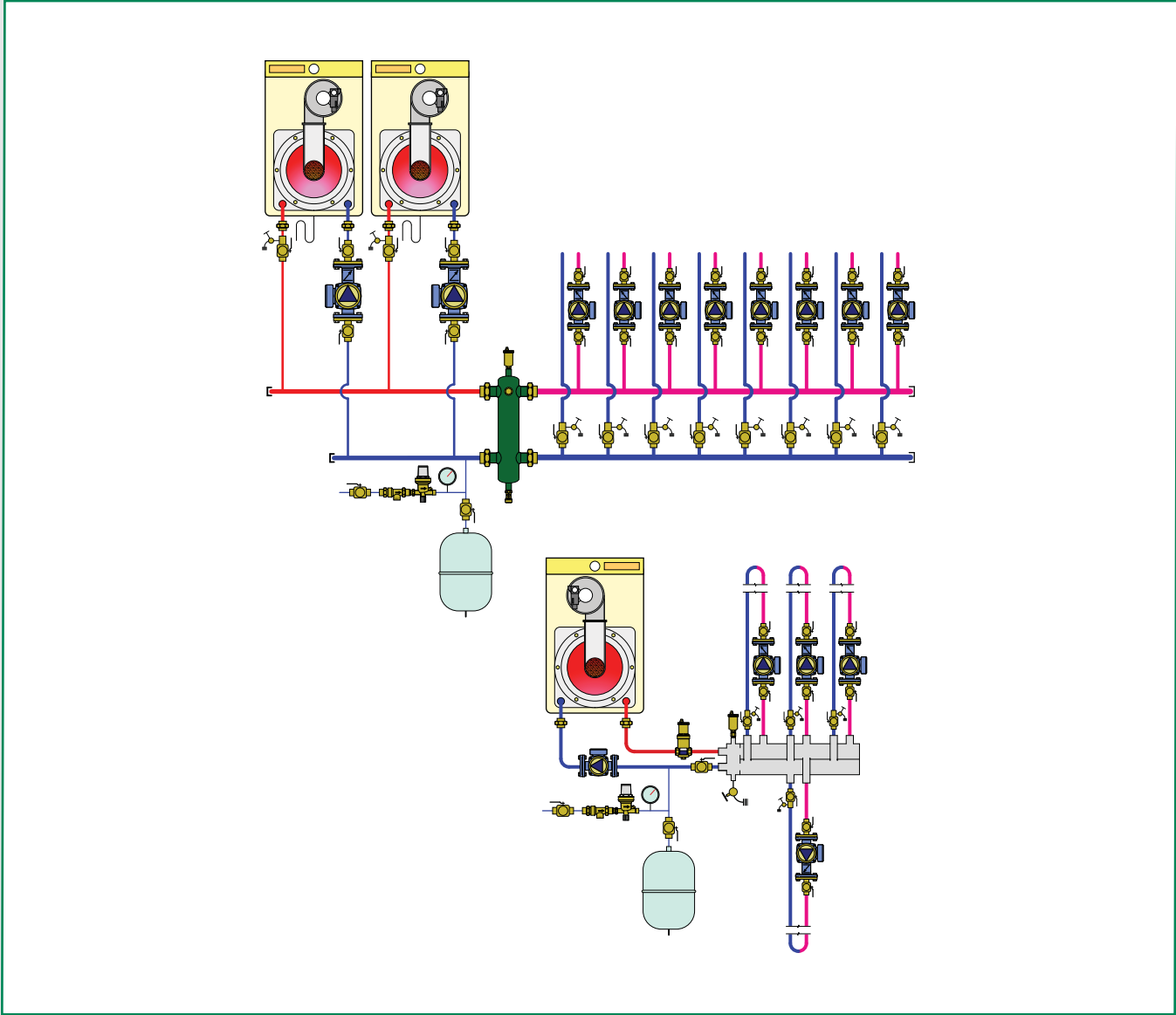
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HYDRAULIC SEPARATION

This diagram is an example



- SEP4™ 4-in-1 hydraulic separators
- Hydraulic separators
- Hydraulic separators + manifolds
- Hydraulic separator accessories
- Miscellaneous system components

4-IN-1 HYDRAULIC SEPARATORS



5495
SEP4™

tech. broch. 01249

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. Particle separation capacity: to 5 µm (0.2 mil). Ferrous impurities separation efficiency: 100%. Air separation efficiency: 100% to microbubble level. Complete with union connections. 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.

NEW



549
SEP4™

tech. broch. 01249

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).
drain valve (code NA39588).
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
549596A	1" sweat union	15	1,315.00
549506A	1" NPT F union	15	1,375.00
549566A	1" Press F union	15	1,455.00
549597A	1 ¼" sweat union	19	1,585.00
549507A	1 ¼" NPT F union	19	1,665.00
549567A	1 ¼" Press F union	19	1,833.00
549598A	1 ½" sweat union	27	2,080.00
549508A	1 ½" NPT F union	27	2,185.00
549568A	1 ½" Press F union	27	2,385.00
549599A	2" sweat union	29	2,425.00
549509A	2" NPT F union	29	2,545.00
549569A	2" Press F union	29	2,965.00

Code	Description	Lbs	USD
549552A	2" ANSI flange	76	5,846.00
549562A	2½" ANSI flange	82	6,229.00
549582A	3" ANSI flange	112	7,795.00
549510A	4" ANSI flange	120	8,730.00

Code	Description	Lbs	USD
NA549052AM	2" ANSI flange ASME & CRN	76	6,805.00
NA549062AM	2½" ANSI flange ASME & CRN	82	7,305.00
NA549082AM	3" ANSI flange ASME & CRN	112	9,042.00
NA549102AM	4" ANSI flange ASME & CRN	120	9,535.00
NA549120AM*	5" ANSI flange ASME & CRN	220	13,138.00
NA549150AM*	6" ANSI flange ASME & CRN	235	15,845.00

* without insulation
NA prefix indicates ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered.

NEW



549
SEP4™
ASME

tech. broch. 01249

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 consult factory.



In the SEP4™ hydraulic separators 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.

Code	Description	Lbs	USD
NA549200AM	8" ANSI flange ASME	530	27,425.00
NA549250AM	10" ANSI flange ASME	740	37,158.00
NA549300AM	12" ANSI flange ASME	1,110	48,900.00
NA549350AM	14" ANSI flange ASME	1,550	57,650.00

FLOW RATE - UNION CONNECTIONS				
Size	1"	1¼"	1½"	2"
GPM	11	18	26	37
Gallons	0.5	0.7	1.3	3.5

FLOW RATE - FLANGED CONNECTIONS										
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

tech. broch. 01076

Hydraulic separator.
Epoxy resin coated steel body.
300 series stainless steel internal baffle.
Pre-formed insulation.
Complete with:
automatic air vent valve (code 502343A).
service check valve (code 561402A).
drain valve (code 538402 FD).
Union connections.
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 F union	13	1,010.00
548066A	1" Press F union	13	1,090.00
548096A	1" sweat union	13	961.00
548007A	1 ¼" NPT F union	17	1,217.00
548067A	1 ¼" Press F union	17	1,385.00
548097A	1 ¼" sweat union	17	1,160.00
548008A	1 ½" NPT F union	25	1,594.00
548068A	1 ½" Press F union	25	1,794.00
548098A	1 ½" sweat union	25	1,518.00
548009A	2" NPT F union	27	1,860.00
548069A	2" Press F union	27	2,280.00
548099A	2" sweat union	27	1,772.00



548 Hydro Separator ASME

tech. broch. 01076

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 consult factory.

Code	Description	Lbs	USD
NA548200A	8" ANSI flange ASME	520	18,386.00
NA548250A	10" ANSI flange ASME	730	25,956.00
NA548300A	12" ANSI flange ASME	1,100	31,415.00
NA548350A	14" ANSI flange ASME	1,540	50,100.00



548 Hydro Separator

tech. broch. 01076

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	3,862.00
548062A	2½" ANSI flange	82	4,115.00
548082A	3" ANSI flange	112	5,147.00
548102A	4" ANSI flange	117	5,761.00

Code	Description	Lbs	USD
NA548052A	2" ANSI flange ASME & CRN	75	5,081.00
NA548062A	2½" ANSI flange ASME & CRN	82	5,464.00
NA548082A	3" ANSI flange ASME & CRN	112	6,611.00
NA548102A	4" ANSI flange ASME & CRN	117	6,990.00
NA548120A*	5" ANSI flange ASME & CRN	220	9,766.00
NA548150A*	6" ANSI flange ASME & CRN	231	11,850.00

NA prefix indicates ASME U-stamp tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors; CRN registered.
*Without insulation



549 HydroCal™

tech. broch. 01178

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).

Limited quantities, call for factory availability.

Code	Description	Lbs	USD
549052A	2" ANSI flange	73	4,872.00
549082A	3" ANSI flange	108	6,496.00
549102A	4" ANSI flange	117	7,275.00
NA549052A	2" ANSI flange ASME & CRN	73	6,605.00
NA549062A	2½" ANSI flange ASME & CRN	79	7,105.00
NA549082A	3" ANSI flange ASME & CRN	108	8,592.00
NA549102A	4" ANSI flange ASME & CRN	117	9,085.00
NA549150A*	6" ANSI flange ASME & CRN	231	15,395.00
NA549200A*	8" ANSI flange ASME & CRN	520	24,875.00
NA549250A*	10" ANSI flange ASME & CRN	730	34,608.00
NA549300A*	12" ANSI flange ASME & CRN	1,100	46,350.00

HYDRAULIC SEPARATORS-MANIFOLDS

5599 HydroLink™

 tech. broch. 01084

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" NPT female + 1" NPT male branches	16	1,249.00

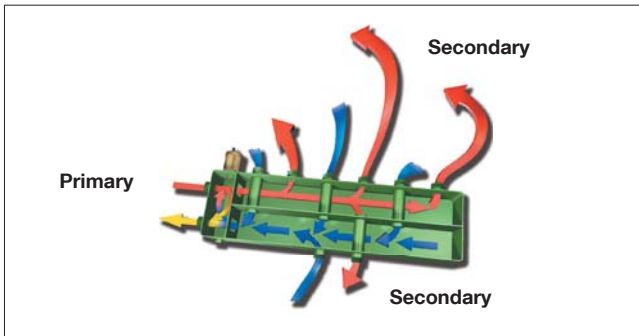
5599 HydroLink™

 tech. broch. 01084

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" NPT female + 1" NPT male branches	16	1,284.00



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

5599 HydroLink™

 tech. broch. 01084

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	1¼" NPT female + 1" NPT male branches	29	1,534.00

5599 HydroLink™

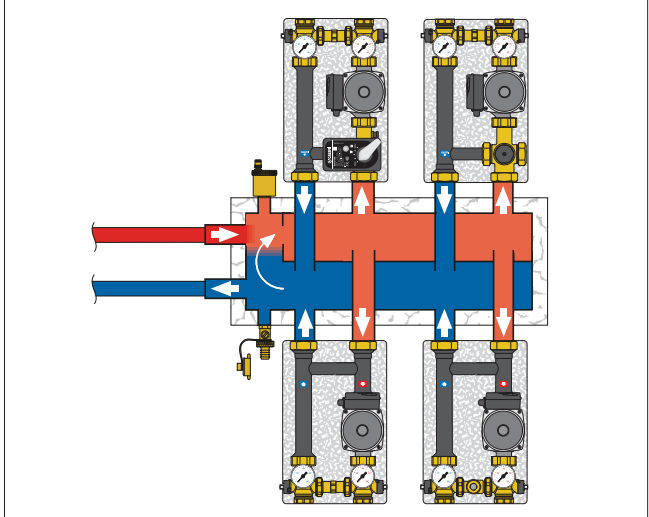
 tech. broch. 01084

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	1¼" NPT female + 1" NPT male branches	39	1,844.00

Application diagram



HYDRAULIC SEPARATOR ACCESSORIES



**501
MAXCAL®**

tech. broch. 01090

Replacement air vent for Hydro Separator 548 and NA548 series and fits HydroCal™ 549 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" NPT female inlet	7	422.50



**5020
MINICAL®**

tech. broch. 01054

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" NPT male	0.6	33.30



**5023
VALCAL®**

tech. broch. 01090

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" NPT male	0.5	67.60



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	20.30



tech. broch. 01076

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



Code	Description	Lbs	USD
NA39589	3/4" NPT female w/T-handle	0.8	41.80
NA39753	1" NPT female w/Lever	0.7	57.00
NA39588	1 1/4" NPT female w/Lever	1.0	94.90
NA59600	2" NPT female w/Lever	4.0	204.30



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	25.70
F50055	Sealing washer NEW	0.1	2.20
NA10426	Sensor holding grommet NEW	0.1	5.90
NA10425	Kit containing above 3 items	0.4	34.40



Double male nipple.

Code	Description	Lbs	USD
R41447	3/4" NPT x 3/4" NPT x 2	0.3	37.10

NEW




Magnetic/drywell assembly for SEP4™.

Code	Description	Lbs	USD
F000435	Fits 2" and 2 1/2"	0.3	200.00
49684A	Fits 3"-6"	0.3	450.00
F000349	Fits 8" to 14"	0.3	850.00

MISCELLANEOUS SYSTEM COMPONENTS




626  tech. broch. 01052
 Universal flow switch for heating and air conditioning systems.
 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	340.00
626009	Replacement paddle assembly	0.1	31.90

* stainless steel



519  tech. broch. 01007
 Differential pressure by-pass valve.
 Adjustable from 2 to 10 psi.
 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 inlet x ¾" NPT outlet	1.0	175.90
519566A	¾" press x ¾" NPT press	1.0	198.90
519599A	¾" sweat inlet x ¾" sweat outlet	1.0	173.50
519600A	1" NPT inlet x 1" NPT outlet	1.4	272.80
519609A	1" NPT inlet x 1" sweat outlet	1.4	272.80
519700A	1¼" NPT inlet x 1¼" NPT outlet	1.5	327.50
519709A	1¼" NPT inlet x 1¼" sweat outlet	1.5	327.50



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	¾" NPT male x ¾" GHT	0.3	19.90
538402 FD	½" NPT male x ¾" GHT	0.3	20.30



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	0.2	46.60



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
688003A	Gauge with pocket well	0.2	52.60
F11344	Replacement pocket well, low-lead	0.1	5.20
F67037	O-ring fits F11344	0.1	1.20



NA102
 Union with temperature gauge.
 Brass body and fittings.
 Max. working pressure: 150 psi.
 Face dial diameter: 2".
 Dial scale: 30-210° F.

Code	Description	Lbs	USD
NA10295	½" sweat union	2.2	114.40
NA10296	1" sweat union	2.2	123.80



NA103
 In-line PT port
 Low Lead brass body.
 Max. working pressure: 150 psi.
 Temperature range: 32-250°F.

Code	Description	Lbs	USD
NA10354	½" sweat with PT port	0.2	71.70
NA10355	¾" sweat with PT port	0.2	86.30



NA510
 In-line union flow check valve.
 Brass body and fittings.
 Max. percentage of glycol: 50%.
 Max. working pressure: 150 psi.
 Temperature range: 32-250°F.
 Open pressure: 0.29 psi

Code	Description	Cv	Lbs	USD
NA51059	¾" sweat union	12	0.7	77.70
NA51069	1" sweat union	17	1.0	99.30



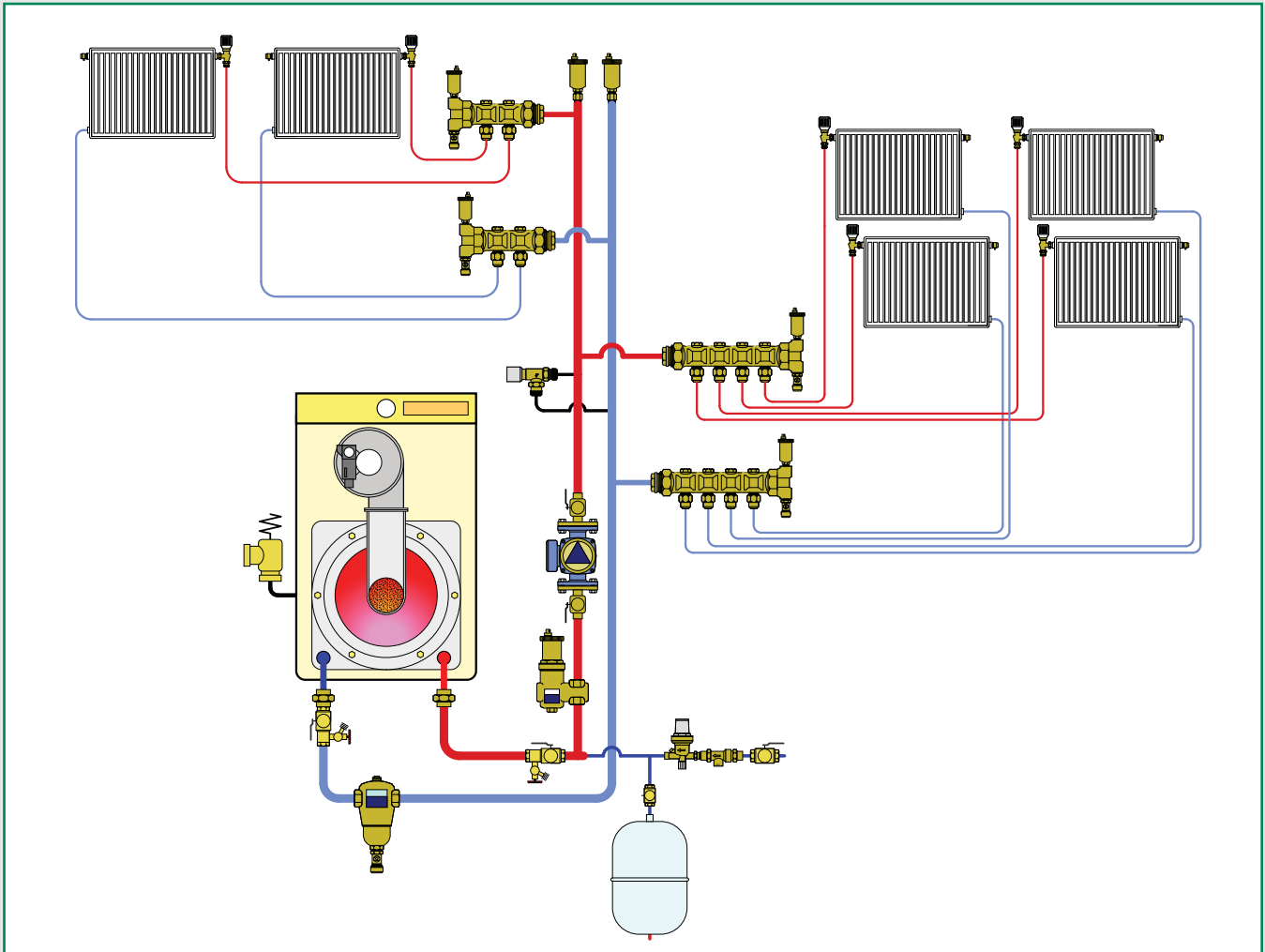
NA121
 Sweat union with union thread nut.
 Max. working pressure: 150 psi.
 Max. working temperature: 250°F.

Code	Description	Lbs	USD
NA12153	¾" sweat union, 1" union thread nut	0.7	53.00
NA12154	1" sweat union, 1" union thread nut	0.9	58.30
NA12155	1" sweat union, 1¼" union thread nut	1.0	83.00

AIR AND DIRT SEPARATION AND VENTING DEVICES

This diagram is an example

2



Automatic air vents, MINICAL®

Manual air vents

Dirt separators, brass, DIRTCAL®

Magnetic dirt separators, DIRTMAG®

Dirt separators flanged, DIRTCAL®

High discharge automatic air vent, DISCALAIR®

Air separators, brass, DISCAL®

Air separators flanged, DISCAL®

Air and dirt separators, DISCALDIRT®

Air and magnetic dirt separators, DISCALDIRTMAG®

Accessories for air and dirt separators

AUTOMATIC AND MANUAL AIR VENTS

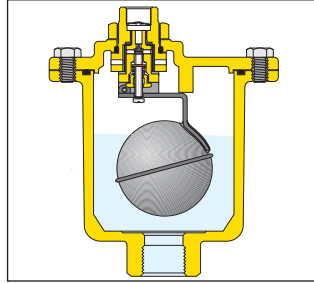
Automatic air vents are designed to remove the air that accumulates in heating and cooling systems without the need for manual intervention. This prevents harmful air that may compromise the life and the performance of the system which includes:

- corrosion due to the oxygen;
- pockets of air trapped in the heating 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®

[tech. broch. 01090](#)

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.

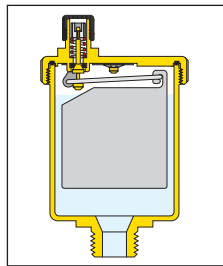
Code	Description	Lbs	USD
501502A	3/4" NPT female	7	422.50

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.

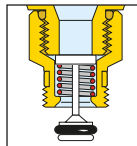
MINICAL® is a standard size air vent that will discharge up to 1.75 SCFM.

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 fibre discs serve as the redundant vent seal which their volume increases by 50% when they become wet which cause 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 air vent without purging the system.



5020 MINICAL®

[tech. broch. 01054](#)

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" NPT male	0.4	23.60
502040A	1/2" NPT male	0.4	23.60



5021 MINICAL®

[tech. broch. 01054](#)

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" NPT male	0.4	31.90



5020 MINICAL®

[tech. broch. 01054](#)

Automatic air vents. 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" NPT male	0.6	33.30



5022 VALCAL®

[tech. broch. 01090](#)

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" NPT male	0.5	57.30



5023 VALCAL®

[tech. broch. 01090](#)

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" NPT male	0.5	67.60

AUTOMATIC AND MANUAL AIR VENTS

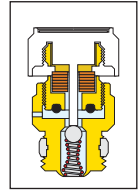


5026

[tech. broch. 01090](#)

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.

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 fibre discs are dry. As air is vented and water contacts the hygroscopic discs, they increase their volume by 50% which cause the discharge vent to close.



Code	Description	Lbs	USD
502610A	1/8" NPT male	0.6	21.20
502620A	1/4" NPT male	0.6	22.20
502630	3/8" straight thread	1.0	29.50
502640	1/2" straight thread	1.0	31.90



5027

[tech. broch. 01090](#)

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.



5080

[tech. broch. 01090](#)

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" NPT male	0.1	11.60

Code	Description	Lbs	USD
502710A	1/8" NPT male	0.6	29.40
502720A	1/4" NPT male	0.6	31.00



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.



5081

[tech. broch. 01090](#)

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	10.00

Code	Description	Lbs	USD
59474A	1/8" NPT male	0.1	16.50
59804A	1/4" NPT male	0.1	17.70
561402A	1/2" NPT male	0.2	20.40



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" NPT male	0.1	14.30



551 DISCALAIR®

[tech. broch. 01124](#)

High discharge automatic air vent.
 Brass body.
 Stainless steel float guide pin and linkage.
 Max. working pressure: 150 psi.
 Max. discharge pressure: 90 psi.
 Max. discharge rate: 4.5 SCFM.
 Max. working temperature: 250°F.

Code	Description	Lbs	USD
551004A	1/2" NPT female	0.8	130.20

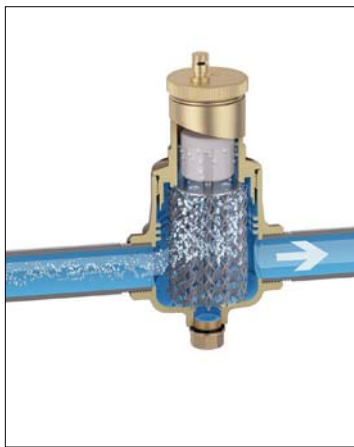
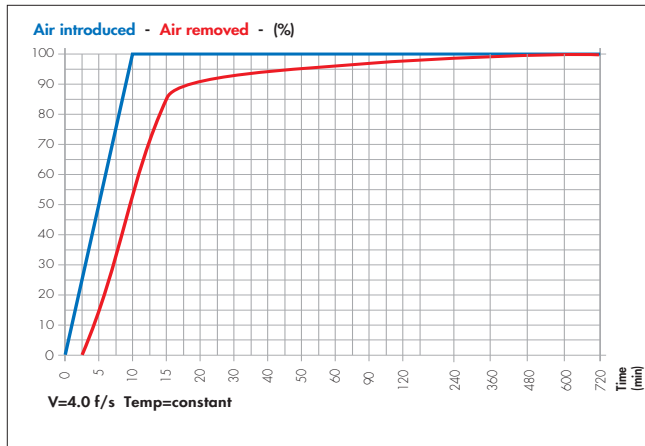
AIR SEPARATORS

The DISCAL® air separator is used to continuously remove the air contained in hydronic circuits of heating and cooling systems. The air discharge capacity is very high. They automatically remove all the air present in the system down to micro-bubble level with low head loss due to the special internal shape of the separator body. Flow direction of the DISCAL® air separator is bidirectional; flow in either direction is permitted.

Air separation efficiency

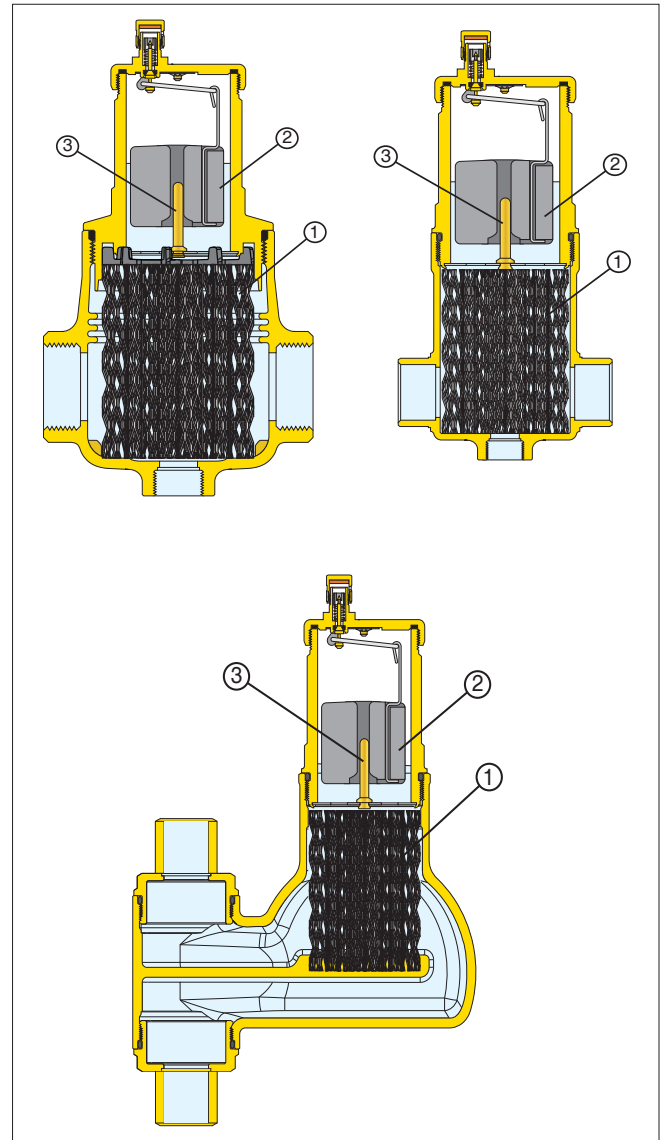
DISCAL® air separators continuously remove entrained air in hydronic systems with very high separation efficiency. The amount of air removed from a system varies depending on fluid velocity and temperature. As illustrated on the graph below, at the 4.0 feet per second fluid velocity, all the air artificially introduced into the circuit is eliminated by the DISCAL® air separator.

Any small amount which remains is then gradually eliminated during normal system operation. In conditions where the fluid velocity is slower or the temperature of the fluid is higher, the amount of air separated is even greater.



Construction details

The air separator uses the combined action of several physical principles. The active part consists of an assembly of concentric mesh surfaces (1). 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 (3) which keeps the float (2) from binding.



	MAXIMUM FLOW RATE				
Size	¾"	1"	1¼"	1½"	2"
GPM	6	10	15	22	39
Cv	19	32	56	73	81

AIR SEPARATORS



551 DISCAL® Sweat tech. broch. 01060

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	287.10
551035A	1¼" sweat	3.7	419.00
551041A	1½" sweat	4.9	545.50
551054A	2" sweat	5.5	665.70



551 DISCAL® NPT tech. broch. 01060

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" NPT female	3.7	272.70
551006A	1" NPT female	3.7	301.30
551007A	1¼" NPT female	4.9	440.00
551008A	1½" NPT female	4.9	572.70
551009A	2" NPT female	5.5	699.10



551 DISCAL® Sweat tech. broch. 01060

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	297.30
551035AC	1¼" sweat	3.8	429.30
551041AC	1½" sweat	5.0	555.70
551054AC	2" sweat	5.6	675.90



551 DISCAL® NPT tech. broch. 01060

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" NPT female	3.8	283.00
551006AC	1" NPT female	3.8	311.50
551007AC	1¼" NPT female	5.0	450.30
551008AC	1½" NPT female	5.0	582.90
551009AC	2" NPT female	5.6	709.30



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

Code	Description	Lbs	USD
561402A	½" NPT male x ½" NPT female	0.2	20.40



Insulation shell fits DISCAL® 551 series.

Code	Description	Lbs	USD
CBN551005	Fits ¾" and 1" 551 series	0.1	76.80
CBN551007	Fits 1¼" and 1½" 551 series	0.1	82.30
CBN551009	Fits 2" 551 series	0.1	90.00

*Will not fit the ¾" compact DISCAL® codes 551003A and 551022A.



551 DISCAL® Press tech. broch. 01060

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	343.10
551066AC	1" integral press with check valve	3.9	353.30
551067A	1¼" integral press	5.0	527.80
551067AC	1¼" integral press with check valve	5.1	538.10

AIR SEPARATORS



551 DISCAL® Compact  tech. broch. 01060

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

Code	Description	Lbs	USD
551003A	¾" NPT female	2.0	165.00
551022A	¾" sweat	2.0	159.30



551 DISCAL® Compact  tech. broch. 01060

Air separator with ½" 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	¾" NPT female	2.1	175.20
551022AC	¾" sweat	2.1	169.50

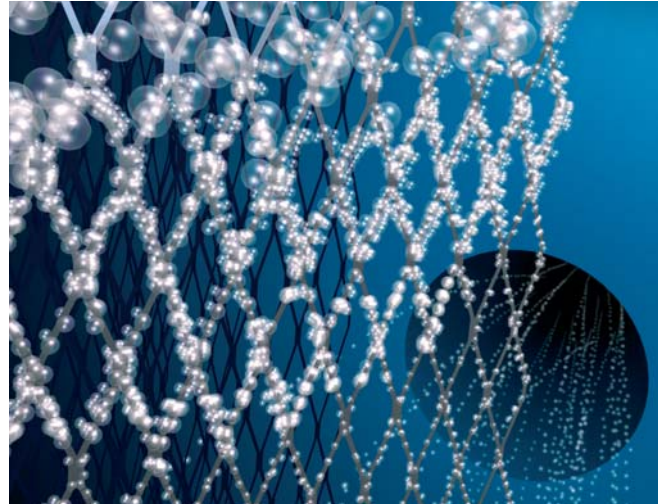


551 DISCAL® Vertical  tech. broch. 01060

Air separator for 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.

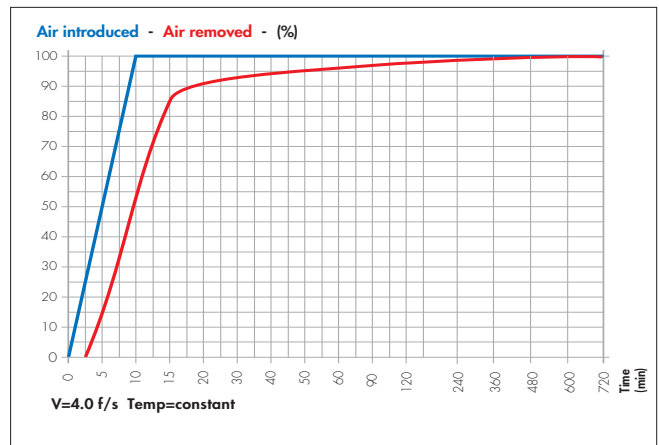
Code	Description	Lbs	USD
NA551995	¾" sweat	4.5	352.50
NA551996	1" sweat	4.5	389.40

The DISCAL® air separator uses a coalescing element that consists of an element 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 buoyancy force overcomes the adhesion force to the surface. They rise to the top of the unit from where they are released through a float-operated automatic air release valve.



Air separation efficiency

DISCAL® air separators continuously remove entrained air in hydronic systems with very high separation efficiency. The amount of air removed from a system varies depending on fluid velocity and temperature. As illustrated on the graph, at the 4.0 feet per second fluid velocity, all the air artificially introduced into the system is gradually eliminated during normal system operation by the DISCAL® air separator. In conditions where the fluid velocity is slower or the temperature of the fluid is higher, the amount of air separated is even faster.



	MAXIMUM FLOW RATE		
Size	¾" compact	¾" vertical	1" vertical
GPM	6	6	10
Cv	12	19	19

AIR SEPARATORS



551 DISCAL®

tech. broch. 01060

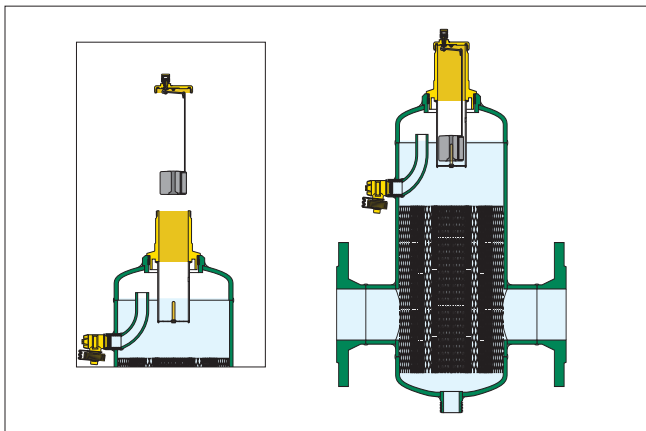
Air separator.
Epoxy resin coated steel body.
Stainless steel float guide pin and linkage.
Stainless steel mesh internal element.
ANSI 150 flange connections.
1" NPT male drain thread.
Complete with drain valve (NA39753).
½" NPT male side drain connection.
Complete with side drain valve (538402A).
Max.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

Code	Description	Lbs	USD
551050A	2" ANSI flange	34	3,004.00
551060A	2½" ANSI flange	35	3,212.00
551080A	3" ANSI flange	62	4,252.00
551100A	4" ANSI flange	67	4,757.00
551120A	5" ANSI flange	106	6,923.00
551150A	6" ANSI flange	117	8,920.00

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 for installing a 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.



Size	MAXIMUM FLOW RATE									
	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/CRN

tech. broch. 01060

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.
Max. working pressure: 150 psi.
Vessel temperature range: 32–270°F.
ASME and CRN registered.
Complete with drain valve (NA39753).
½" NPT male side drain connection.
Complete with side drain valve (538402FD).

Code	Description	Lbs	USD
NA551050A	2" ANSI flange ASME & CRN	34	3,672.00
NA551050T	2" ANSI NPT ASME & CRN	35	3,367.90
NA551060A	2½" ANSI flange ASME & CRN	35	3,926.00
NA551060T	2½" ANSI NPT ASME & CRN	35	3,689.00
NA551080A	3" ANSI flange ASME & CRN	62	5,197.00
NA551100A	4" ANSI flange ASME & CRN	67	5,814.00
NA551120A	5" ANSI flange ASME & CRN	106	8,461.00
NA551150A	6" ANSI flange ASME & CRN	117	10,902.00

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

NA551 DISCAL® ASME

tech. broch. 01287



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 registered.
CRN consult factory.

Code	Description	Lbs	USD
NA551200A	8" ANSI flange ASME	371	18,779.00
NA551250A	10" ANSI flange ASME	617	28,169.00
NA551300A	12" ANSI flange ASME	871	36,619.00

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



Optional 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" NPT female with lever	0.7	57.00
NA59600	2" NPT female with lever	3.5	204.30

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 buoyancy 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 which 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®  tech. broch. 01123

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	483.80
546016A	1" NPT male	8.3	507.90
546097A	1¼" sweat	8.3	576.80

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®  tech. broch. 01287

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%.

PCT
INTERNATIONAL
APPLICATOR
PENDING

Code	Description	Lbs	USD
546195A	¾" sweat	8.5	508.40
546196A	1" sweat	8.5	578.90
546116A	1" NPT male	8.5	604.00
546197A	1¼" sweat	8.5	688.70





5461 DISCALDIRTMAG®  tech. broch. 01287

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	1,706.00
546108A	1½" NPT female union	22	1,756.00
546168A	1½" Press union	22	1,860.00
546199A	2" sweat union	23	1,788.00
546109A	2" NPT female union	23	1,855.00
546169A	2" Press union	23	2,074.00



Insulation shell for DISCALDIRT® & DISCALDIRTMAG®.

Code	Description	Lbs	USD
CBN546002	Fits ¾", 1", 1¼" brass 546 only	0.1	120.70
CBN546118	Fits 1½" steel 5461 only 	0.1	151.90
CBN546119	Fits 2" steel 5461 only 	0.1	174.00

MAXIMUM FLOW RATE					
Size	¾"	1"	1¼"	1½"	2"
GPM	6	10	15	22	39
Cv	19	32	40	50	79



546 DISCALDIRT®  tech. broch. 01123

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	3,815.00
546060A	2½" ANSI flange	42	4,021.00
546080A	3" ANSI flange	73	5,179.00
546100A	4" ANSI flange	78	5,677.00
546120A	5" ANSI flange	181	8,190.00
546150A	6" ANSI flange	188	9,992.00

AIR AND DIRT SEPARATORS



NA546  tech. broch. 01123
DISCALDIRT®
ASME/CRN

Air & Dirt separator.
 Epoxy resin coated steel body.
 Stainless steel float guide pin and linkage.
 Stainless steel mesh internal element.
 2" threaded NPT bottom drain connection.
 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).
 ASME and CRN registered.

Code	Description	Lbs	USD
NA546050T	2" Threaded ASME & CRN	28	3,653.00
NA546060A	2½" ANSI flange ASME & CRN	42	4,915.00
NA546080A	3" ANSI flange ASME & CRN	73	6,330.00
NA546100A	4" ANSI flange ASME & CRN	78	6,939.00
NA546120A	5" ANSI flange ASME & CRN	181	10,010.00
NA546150A	6" ANSI flange ASME & CRN	188	12,213.00

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



NA546  tech. broch. 01123
DISCALDIRT®
ASME

Air & Dirt separator.
 Epoxy resin coated steel body.
 Stainless steel float guide pin and linkage.
 Stainless steel mesh internal element.
 ANSI 150 flange connections.
 2" threaded NPT bottom drain connection.
 Complete with drain valve (NA59600)
 Max. working pressure: 150 psi.
 Vessel temperature range: 32–270°F.
 Particle separation capacity: to 5 µm (0.2 mil).
 ASME registered. For CRN consult factory.

Code	Description	Lbs	USD
NA546200A	8" ANSI flange ASME	355	22,684.00
NA546250A	10" ANSI flange ASME	555	33,882.00
NA546300A	12" ANSI flange ASME	825	43,615.00
NA546350A	14" ANSI flange ASME	950	55,150.00

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

MAXIMUM FLOW RATE										
Size	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



NA546  tech. broch. 01287
DISCALDIRTMAG®
ASME/CRN

Air & Dirt separator with one magnet.
 Epoxy resin coated steel body.
 Stainless steel float guide pin and linkage.
 Stainless steel mesh internal element.
 ANSI 150 flange connections.
 2" threaded NPT bottom drain connection.
 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).
 Ferrous impurities separation efficiency: 100%.
 ASME and CRN registered.



Code	Description	Lbs	USD
NA546050TM	2" Threaded ASME & CRN	31	4,103.00
NA546060AM	2½" ANSI flange ASME & CRN	45	5,365.00
NA546080AM	3" ANSI flange ASME & CRN	76	6,980.00
NA546100AM	4" ANSI flange ASME & CRN	81	7,589.00
NA546120AM	5" ANSI flange ASME & CRN	184	10,660.00
NA546150AM	6" ANSI flange ASME & CRN	191	12,863.00

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



NA546  tech. broch. 01287
DISCALDIRTMAG®
ASME

Air & Dirt separator with three magnets.
 Epoxy resin coated steel body.
 Stainless steel float guide pin and linkage.
 Stainless steel mesh internal element.
 ANSI 150 flange connections.
 2" threaded NPT bottom drain connection
 Complete with drain valve (NA59600)
 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. For CRN consult factory.



Code	Description	Lbs	USD
NA546200AM	8" ANSI flange ASME	365	25,234.00
NA546250AM	10" ANSI flange ASME	565	36,432.00
NA546300AM	12" ANSI flange ASME	835	46,165.00
NA546350AM	14" ANSI flange ASME	960	57,700.00

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

DIRT & MAGNETIC DIRT SEPARATORS

The dirt separating action performed by the DIRTAL[®] 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 DIRTAL[®] low-velocity-zone dirt separator requiring a pressure drop 25% or less that of a comparable Y-strainer depending on mesh size and amount of filtered debris and 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 DIRTAL[®] is at the optimal distance from the inlet and outlet connections 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.

5462
DIRTAL[®]

 tech. broch. 01137



Dirt separator.
Brass body.
½" NPT top thread with plug for optional air vent, code 502243A.
Max. working pressure: 150 psi.
Working temperature range: 32–250°F.
Particle separation capacity: to 5 µm (0.2 mil).

Code	Description	Lbs	USD
546205A	¾" NPT female	4.2	254.50
546228A	1" sweat	4.2	267.90
546206A	1" NPT female	4.2	281.30
546266A	1" integral press	4.5	323.10
546235A	1¼" sweat	4.2	390.30
546207A	1¼" NPT female	5.3	409.80
546267A	1¼" integral press	5.6	497.60
546241A	1½" sweat	4.9	505.40
546208A	1½" NPT female	6.2	530.90
546254A	2" sweat	5.5	621.80
546209A	2" NPT female	6.2	652.10



Replacement drain valve fits DIRTAL[®] 5462 series and DIRTMAG[®] 5463 series.
Brass body.
Max. working pressure: 150 psi.
Max. working temperature: 250°F.

Code	Description	Lbs	USD
538402 FD	½" NPT male x ¾" GHT	0.3	20.30

NEW



DIRTAL[®] to DIRTMAG[®] Retrofit kit.

Code	Description	Lbs	USD
F41661A	Retrofit kit	2.0	156.80

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.



5463
DIRTMAG[®]

 tech. broch. 01137



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%.

PCT
INTERNATIONAL
APPLICATION
PENDING

Code	Description	Lbs	USD
546328A	1" sweat	4.2	322.50
546306A	1" NPT female	4.2	338.60
546366A	1" integral press	4.5	367.30
546335A	1¼" sweat	4.2	470.90
546307A	1¼" NPT female	5.3	494.40
546367A	1¼" integral press	5.6	563.20
546341A	1½" sweat	4.9	613.40
546308A	1½" NPT female	6.2	643.70
546354A	2" sweat	5.5	748.20
546309A	2" NPT female	6.2	776.40



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

Code	Description	Lbs	USD
CBN546205	Fits ¾" & 1" DIRTAL [®] , DIRTMAG [®]	0.1	76.80
CBN546207	Fits 1¼" & 1½" DIRTAL [®] , DIRTMAG [®]	0.1	82.30
CBN546209	Fits 2" DIRTAL [®] , DIRTMAG [®]	0.1	90.00

MAXIMUM FLOW RATE					
Size	¾"	1"	1¼"	1½"	2"
GPM	6	10	15	22	39
Cv	19	32	56	73	81


MAGNETIC DIRT SEPARATORS

NA5453  tech. broch. 01240
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%.
Union isolation ball valves.
Drain valve with hose connection.
Top dosing point port.
Dosing capacity: 12 fluid oz.
Manual screw air vent.

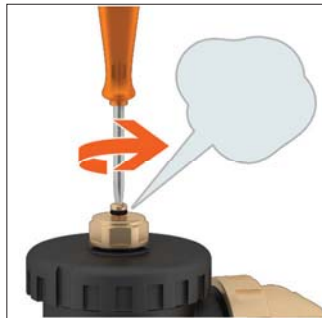
PCT
INTERNATIONAL
APPLICATION
PENDING

Code	Description	Lbs	USD
NA545355	¾" union NPT with isolation valves	5.5	333.10
NA545356	1" union NPT with isolation valves	5.5	389.60
NA545376	1" union press with isolation valves 	5.5	532.80

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

This multifunction device can also be used as a dosing point to inject chemical additives into the circuit.

Use a screwdriver to undo the screw on the top plug in order to purge any air that has collected at the top of the body.



NA5453  tech. broch. 01240
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.

PCT
INTERNATIONAL
APPLICATION
PENDING

Code	Description	Lbs	USD
NA545305	¾" union NPT	4.5	278.80
NA545365	¾" union press	4.5	301.60
NA545395	¾" union sweat	4.5	276.50
NA545306	1" union NPT	4.5	320.70
NA545366	1" union press	4.7	362.50
NA545396	1" union sweat	4.5	305.50



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 even 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.

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 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®** tech. broch. 01137

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	38	2,031.00
546560A	2½" ANSI flange	38	2,185.00
546580A	3" ANSI flange	55	2,955.00
546510A	4" ANSI flange	55	3,269.00



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

Code	Description	Cv	Lbs	USD
NA39753	1" NPT female with lever	50	0.7	57.00

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



NA5465 tech. broch. 01137
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	3,150.00
NA546560A	2½" ANSI flange ASME & CRN	38	3,351.00
NA546580A	3" ANSI flange ASME & CRN	55	4,364.00
NA546510A	4" ANSI flange ASME & CRN	55	4,776.00
NA546512A	5" ANSI flange ASME & CRN	138	6,886.00
NA546515A	6" ANSI flange ASME & CRN	148	8,832.00

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



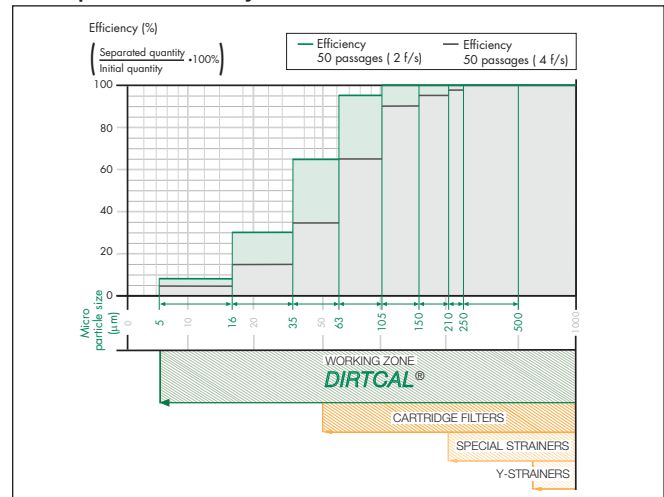
NA5465 tech. broch. 01137
DIRTCAL® ASME

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 registered. For CRN consult factory.

Code	Description	Lbs	USD
NA546520A	8" ANSI flange ASME	335	18,060.00
NA546525A	10" ANSI flange ASME	620	27,840.00
NA546530A	12" ANSI flange ASME	870	34,480.00
NA546535A	14" ANSI flange ASME	1,000	43,350.00

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

Dirt separation efficiency



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 and 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



5465

tech. broch. 01137

DIRTMAG®

Dirt magnetic 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	2,539.00
546560AM	2½" ANSI flange	41	2,732.00
546580AM	3" ANSI flange	58	3,694.00
546510AM	4" ANSI flange	58	4,086.00



NA5465

tech. broch. 01137

DIRTMAG®

Dirt magnetic separator with one magnet. 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 registered. CRN registered.



Code	Description	Lbs	USD
NA546550AM	2" ANSI flange ASME & CRN	41	3,600.00
NA546560AM	2½" ANSI flange ASME & CRN	41	3,801.00
NA546580AM	3" ANSI flange ASME & CRN	58	5,014.00
NA546510AM	4" ANSI flange ASME & CRN	58	5,426.00
NA546512AM	5" ANSI flange ASME & CRN	141	7,536.00
NA546515AM	6" ANSI flange ASME & CRN	151	9,482.00

NEW



NA5465

tech. broch. 01137

DIRTMAG®

Dirt magnetic separator with three magnets. 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 registered. For CRN consult factory.



Code	Description	Lbs	USD
NA546520AM	8" ANSI flange ASME	345	20,610.00
NA546525AM	10" ANSI flange ASME	630	30,390.00
NA546530AM	12" ANSI flange ASME	880	37,030.00
NA546535AM	14" ANSI flange ASME	1,010	45,900.00

ACCESSORIES FOR AIR AND DIRT SEPARATORS



[tech. broch. 01054](#)

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

Code	Description	Lbs	USD
R59681	Vent cap	0.1	25.10



[tech. broch. 01054](#)

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

Code	Description	Lbs	USD
562100	Vent cap	0.1	26.50



[tech. broch. 01060](#)

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

Code	Description	Lbs	USD
R59119	Vent cap	0.1	16.70



Replacement plastic cap fits MINICAL® 5020 and 5021 series.

Code	Description	Lbs	USD
R56214	Vent cap	0.1	2.70



Replacement plastic air vent cap fits 5026 and 5027 series.

Code	Description	Lbs	USD
R56142	Vent cap	0.1	2.60

NEW



Magnetic/drywell assembly for DISCALDIRTMAG® and DIRTMAG®

Code	Description	Lbs	USD
49684A	Fit 2" and 2½"	3.0	450.00
49685A	Fit 3" to 6"	3.0	650.00
F0000349	Fit 8" to 14"	3.0	850.00



[tech. broch. 01060](#)

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

Code	Description	Lbs	USD
59829	Air Vent	2.0	161.50



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

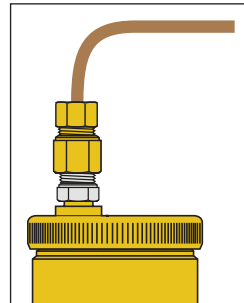
Code	Description	Lbs	USD
F39807	Cover and float	0.4	79.00



[tech. broch. 01133](#)

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

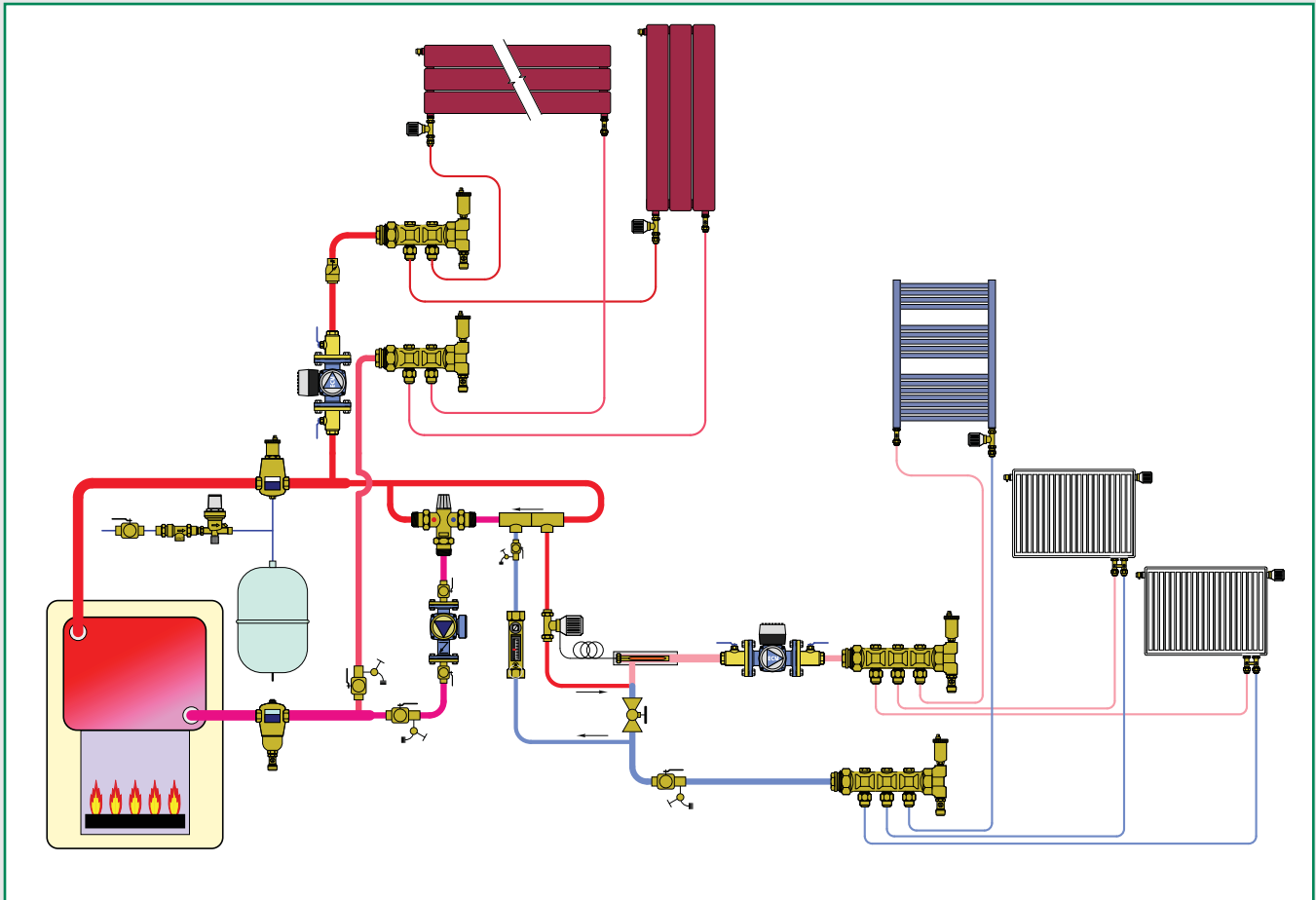
Code	Description	Lbs	USD
NA10204	¼" NPT male	0.1	28.50



Vent cap adapter NA10204 replaces the air vent cap which provides a ¼" male NPT thread which can be used to connect a discharge tube with separate fittings.

THERMOSTATIC RADIATOR VALVES AND ACCESSORIES

This diagram is an example



Thermostatic control heads

Accessories for thermostatic control heads

Thermostatic radiator valve bodies


Towel warmer radiator valves

Connection valves for panel style radiators

Connection fittings

THERMOSTATIC CONTROL HEADS




200  [tech. broch. 01034](#)

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	79.60




472  [tech. broch. 01034](#)

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	271.90




201  [tech. broch. 01034](#)

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	142.60




203  [tech. broch. 01034](#)

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	269.90

ACCESSORIES



209  [tech. broch. 01034](#)

Tamper-proof cap for public installations. Fits thermostatic control head 200 and 201 series. To be used with special hex key code 209001.

Code	Description	Lbs	USD
209000	Tamper proof cap	0.1	27.50



 [tech. broch. 01034](#)

Special hex key fits tamper-proof cap. To be used with tamper-proof caps 209 series.

Code	Description	Lbs	USD
209001	Hex key	0.1	11.00




NA475

Pocket well fits 203502. Length: 7 3/8" (187 mm).

Code	Description	Lbs	USD
NA475002	3/4" NPT male	0.2	47.20

THERMO-ELECTRIC ACTUATOR



6564  [tech. broch. 01198](#)

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	107.90
656414	24 V AC/DC with microswitch	0.4	135.00



4490

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

Code	Description	Lbs	USD
449010	Manual knob	0.1	16.50

NPT THERMOSTATIC RADIATOR VALVE BODIES



220

tech. broch. 01034

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	½" NPT	2.7	0.3	78.00
220500A	¾" NPT	3.7	0.3	85.60



221

tech. broch. 01034

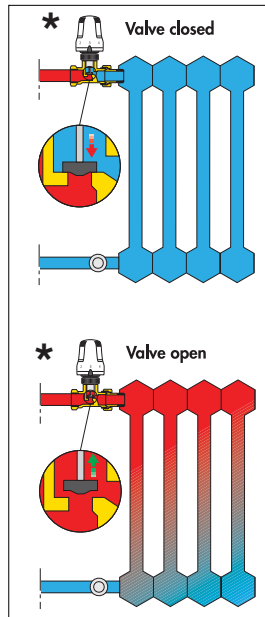
Straight radiator valve body. Order thermo-electric actuators or thermostatic control heads separately for field installation.
Chrome plated.
Max. working pressure: 150 psi (10 bar).
Temperature range: 40–212°F (5–100°C).



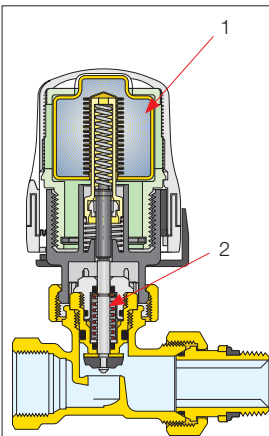
Code	Description	Cv	Lbs	USD
221400A	½" NPT	1.7	0.3	78.00
221500A	¾" NPT	2.5	0.3	85.60

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.



Key features

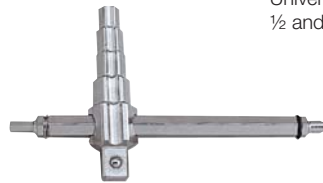
The thermostatic control head is filled with a non compressible liquid bellows (1). Plus, the radiator valve body has extra strong valve stem compression spring (2). The non compressible liquid provides the force required to compress the strong valve stem spring. When the temperature decreases, the liquid 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.

Replacement internal valve assembly fits radiator valves.



Code	Description	Lbs	USD
F36073	½" and ¾"	0.1	11.00

Universal radiator tool for installing ½ and ¾" tail pieces.



Code	Description	Lbs	USD
387127	Radiator tool	1.0	115.00

TELL
Thermostatic Efficiency Label

Manufacturer: **Caleffi S.p.A**
Model: **200000**
Registration number: **10428-2011527**

A **A**

B

C

D

E

F

Basis: EN 215
Information: www.tellonline.eu

A Label of EUnited Valves
European Valve Manufacturers

The Caleffi thermostatic control heads 200000 and 201000, and the radiator valve bodies 220 and 221 series in combination with control heads are approved to EN 215 (KEYMARK) and Thermostatic Efficiency Label (TELL): Level A, Reg. 10428/9-20110527. Under EN 215 these devices are certified to meet manufacturer quality assurance requirements with reference to temperature setting and adjustment, nominal flow rate, hysteresis, and leak tightness of the body assembly and stem seal. The European TELL certification promotes responsible energy usage and provides information to customers when selecting products. The control heads 200000 and 201000 are "A" rated for efficiency. Additional information available on request.



EUROPEAN TOWEL WARMER RADIATOR VALVES



338

tech. broch. 01009

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	82.00



342

tech. broch. 01009

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	54.00



339

tech. broch. 01009

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	88.40



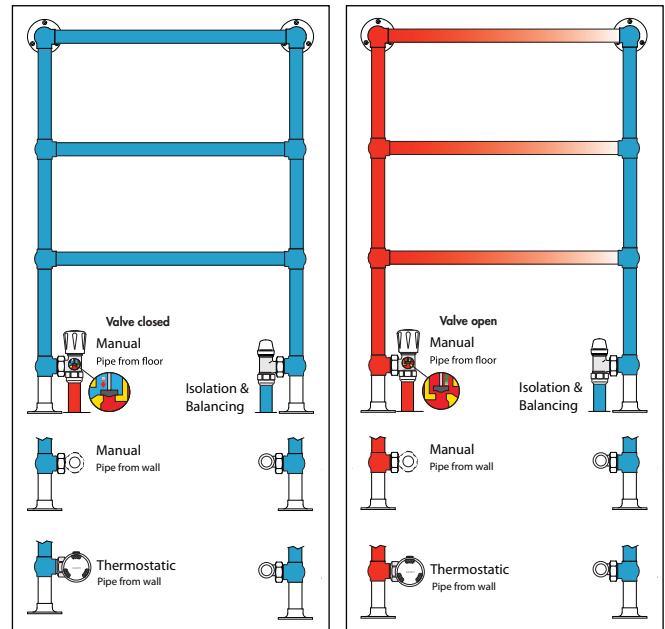
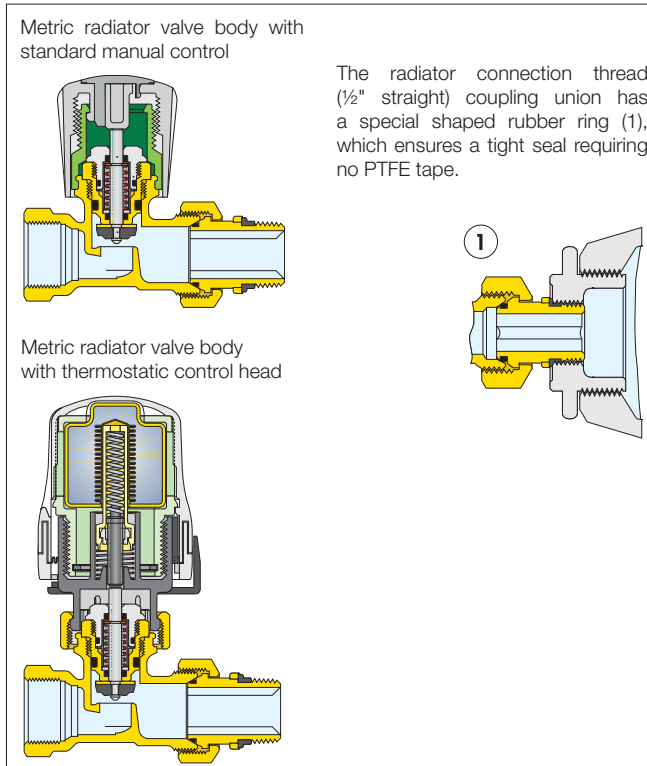
343

tech. broch. 01009

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).

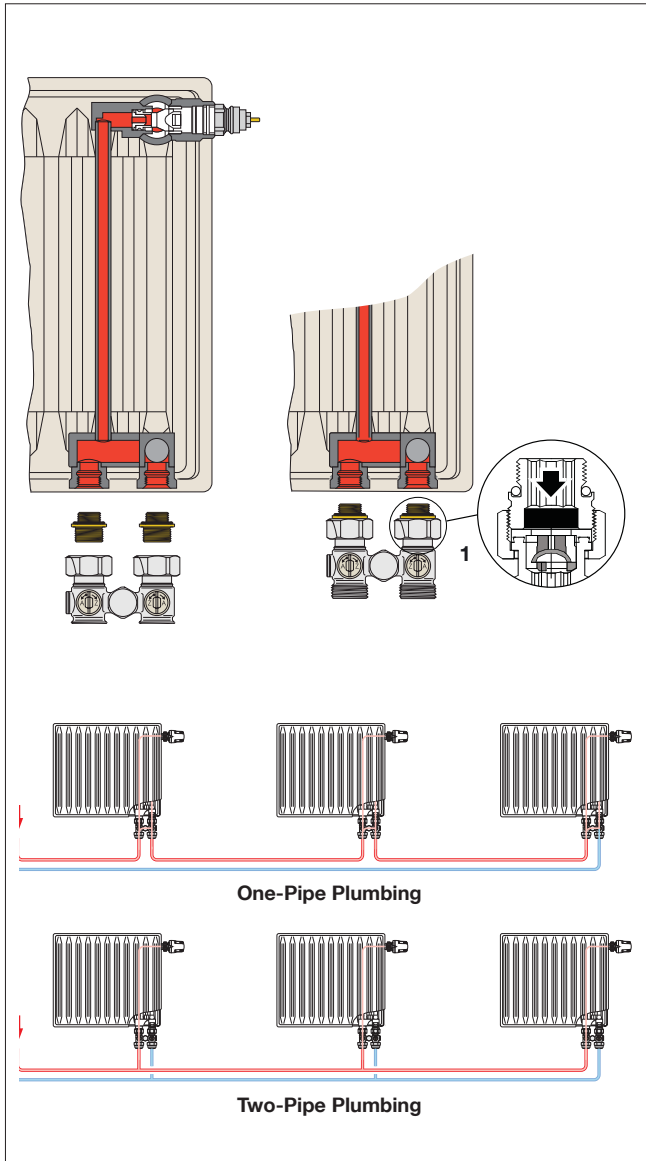
Code	Radiator Connection	Pipe Connection	Cv	Lbs	USD
343452	1/2" straight	3/4" conical	2.5	0.5	56.60

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 installed 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

[tech. broch. 01036](#)

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	65.80



3011

[tech. broch. 01036](#)

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	65.80



3012

[tech. broch. 01036](#)

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	115.30



3013

[tech. broch. 01036](#)

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	115.30



4497

[tech. broch. 01036](#)

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	5.70

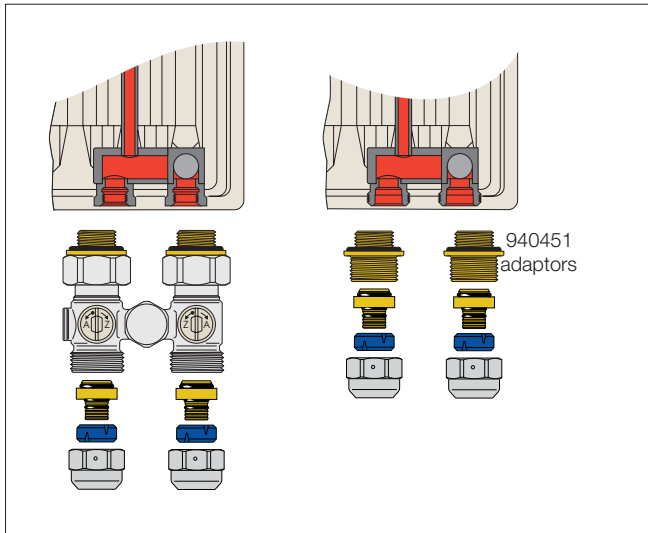
CONNECTION FITTINGS



**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	13.60
681524	1/2" nominal PEX	0.2	13.60
681555	5/8" nominal PEX	0.2	13.60



940

tech. broch. 01036



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	24.70



Wrench for tightening PEX fitting to TRV.

Code	Description	Lbs	USD
387100	26 mm x 30 mm	1.5	62.10



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

tech. broch. 01170

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	13.40



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	11.20



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	14.50



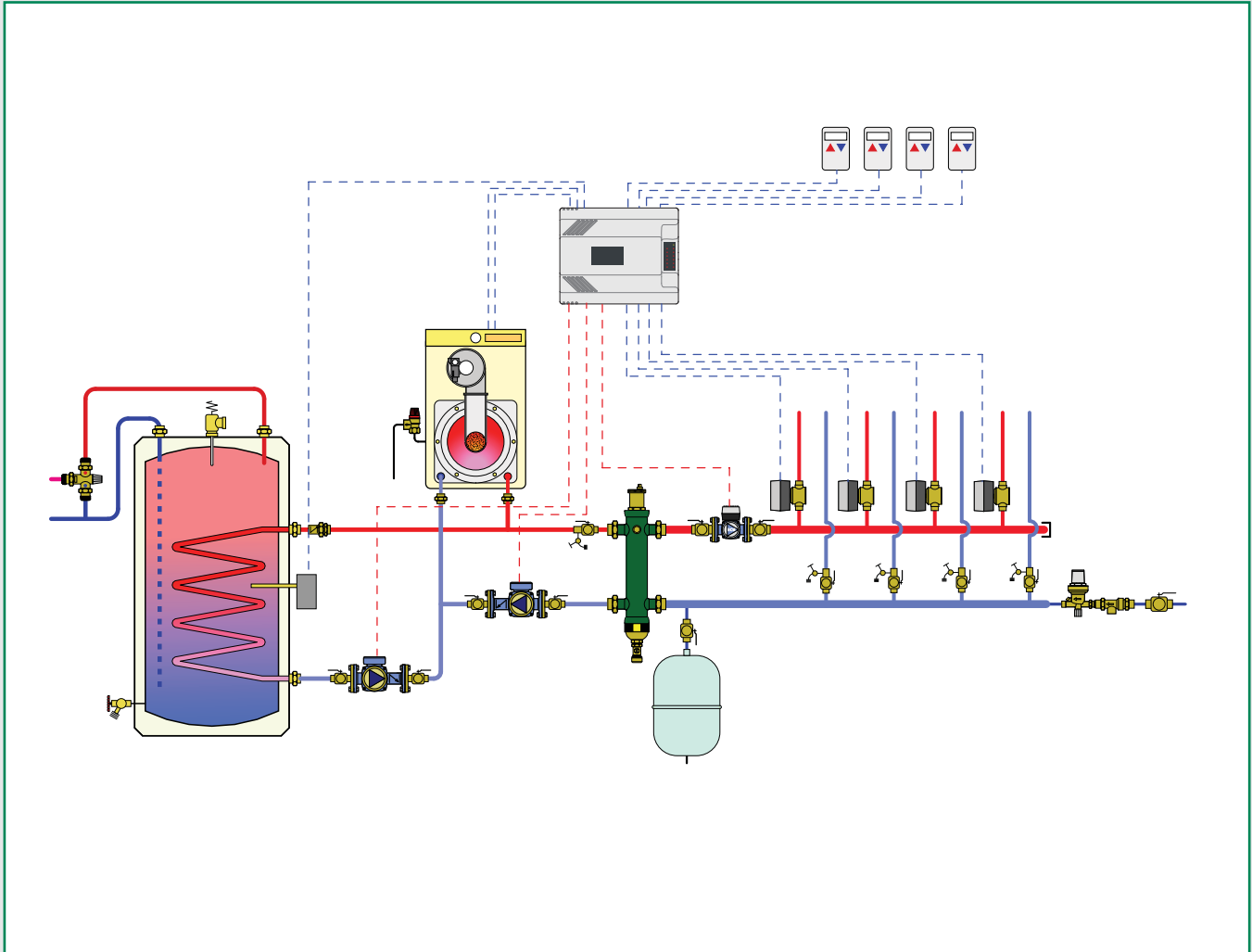
NA103

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	15.70

ZONE VALVES AND ZONE CONTROLS

This diagram is an example



Thermo-electric zone valves

Thermo-electric actuators, including TwisTop™

Motorized zone valves, Z-one™

Pump zone controls, Z-one™ Relay

Valve zone controls, Z-one™ Relay

Motorized ball zone valves, high-flow, high-close off

THERMO-ELECTRIC ZONE VALVES



6763

tech. broch. 01072

Two-way thermo-electric zone valve. Complete with 656414 actuator. Spring return. Normally closed. Brass valve body and trim. Max. body pressure: 150 psi. Max. Temperature: 200°F. Max: ΔP close-off pressure: 20 psi. 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	Lbs	USD
676346A	½" press	4.0	1.4	225.00
676349A	½" sweat union	4.0	1.4	213.60
676356A	¾" press	4.0	1.4	229.80
676359A	¾" sweat union	4.0	1.4	221.40
676366A	1" press	4.0	1.4	269.00
676369A	1" sweat union	4.0	1.4	256.00



6762

tech. broch. 01072

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. Max: ΔP close-off pressure: 20 psi. 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	Lbs	USD
676246A	½" press	4.0	1.4	260.80
676249A	½" sweat union	4.0	1.4	249.40
676256A	¾" press	4.0	1.4	265.60
676259A	¾" sweat union	4.0	1.4	257.20
676266A	1" press	4.0	1.4	304.80
676269A	1" sweat union	4.0	1.4	291.80



6564

tech. broch. 01198

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	107.90
656414	24 V AC/DC with micro-switch	0.4	135.00



6563 TwisTop™

tech. broch. 01072

TwisTop™ thermo-electric actuator with micro-switch 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	143.90
656354	24 V AC/DC with micro-switch	0.4	170.80



6760

tech. broch. 01072

Two-way zone valve body. For field installation of thermo-electric actuators 656314 or 656414. Brass body and trim. Max. body pressure: 150 psi. Max. temperature: 200°F.

Code	Description	Cv	Lbs	USD
676000A	no fittings	4.0	1.0	36.60
676046A	½" press	4.0	1.0	79.60
676049A	½" sweat union	4.0	1.0	60.80
676056A	¾" press	4.0	1.0	88.30
676059A	¾" sweat union	4.0	1.0	75.60
676066A	1" press	4.0	1.0	136.50
676069A	1" sweat union	4.0	1.0	90.20



NA605

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 VAC wall transformer	1.0	48.70

MOTORIZED ZONE VALVES



Z4
Zone 2-way

tech. broch. 01115

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

tech. broch. 01115

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	215.80
Z40F	¾" Inv flare*	3.5	30 psi	2.2	244.00
Z42	½" SAE flare	3.5	30 psi	2.2	234.90
Z44	½" sweat	2.5	50 psi	2.1	210.20
Z45	¾" sweat	7.5	20 psi	2.2	229.60
Z46	1" sweat	7.5	20 psi	2.3	285.10
Z47	1¼" sweat	7.5	20 psi	2.3	332.00

* Two ¾" sweat fittings (NA10006) included.

Code	Description	Cv	Δ P	Lbs	USD
Z50	Inverted flare	3.5	30 psi	2.2	221.50
Z50F	¾" Inv flare*	3.5	30 psi	2.2	249.70
Z54	½" sweat	2.5	50 psi	2.1	215.90
Z55	¾" sweat	7.5	20 psi	2.2	235.30
Z56	1" sweat	7.5	20 psi	2.3	290.80
Z57	1¼" sweat	7.5	20 psi	2.3	337.70

* Two ¾" sweat fittings (NA10006) included.



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

Code	Description	Lbs	USD
NA10005	½" sweat	0.3	11.30
NA10006	¾" sweat	0.3	14.10
NA10007	1" sweat	0.4	23.20
NA61241	Retrofit extension kit	0.2	11.40



Presscon™ copper press tail pieces with 1" brass union nuts and washers for use with 2-way 1" male union valve body (Z200687).

Code	Description	Lbs	USD
NA20646	½" press with 1" union nut	0.2	25.00
NA20656	¾" press with 1" union nut	0.2	27.40
NA20666	1" press with 1" union slip nut	0.4	47.00



Presscon™ 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	57.50

Zone 2-way

tech. broch. 01115



Two-way zone valve. Spring return.
Normally closed actuator.
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.



Code	Description	Cv	Δ P	Lbs	USD
Z44P	½" press*	3.5	30 psi	2.2	290.50
Z54P	½" press**	3.5	30 psi	2.2	296.20
Z45P	¾" press*	7.5	20 psi	2.2	295.30
Z55P	¾" press**	7.5	20 psi	2.2	301.00
Z45PL	¾" press*	7.5	20 psi	2.3	323.40
Z55PL	¾" press**	7.5	20 psi	2.3	329.10
Z46P	1" press*	7.5	20 psi	2.4	334.50
Z56P	1" press**	7.5	20 psi	2.4	340.20

*18" wire lead connection.

**Screw terminal connection.

PL (1) extra long press fitting for retrofit
Includes press fittings.

MOTORIZED ZONE VALVES



Z1 Normally Closed  tech. broch. 01115


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 Z11900 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  tech. broch. 01115

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	24V with micro-switch 18" wire	1.1	149.20
Z111900	24V with m/s <i>high current</i> 18" wire 	1.1	139.40
Z116000	120V with micro-switch 6" wire	1.1	149.20
Z113000	208V with micro-switch 6" wire	1.1	178.80
Z114000	230V with micro-switch 6" wire	1.1	178.80
Z115000	277V with micro-switch 6" wire	1.1	178.80
Z151000	24V with micro-switch terminal block	1.1	154.90
Z161000	24V without micro-switch terminal block	1.1	142.50
Z121000	24V without micro-switch 18" wire	1.1	138.30
Z126000	120V without micro-switch 6" wire	1.1	138.30
Z123000	208V without micro-switch 6" wire	1.1	167.80
Z124000	230V without micro-switch 6" wire	1.1	167.80
Z125000	277V without micro-switch 6" wire	1.1	167.80

Code	Description	Lbs	USD
Z131000	24V with micro-switch 18" wire	1.1	163.20
Z136000	120V with micro-switch 6" wire	1.1	163.20
Z133000	208V with micro-switch 6" wire	1.1	192.50
Z134000	230V with micro-switch 6" wire	1.1	192.50
Z135000	277V with micro-switch 6" wire	1.1	192.50
Z141000	24V without micro-switch 18" wire	1.1	152.20
Z146000	120V without micro-switch 6" wire	1.1	152.20
Z143000	208V without micro-switch 6" wire	1.1	181.50
Z144000	230V without micro-switch 6" wire	1.1	181.50
Z145000	277V without micro-switch 6" wire	1.1	181.50

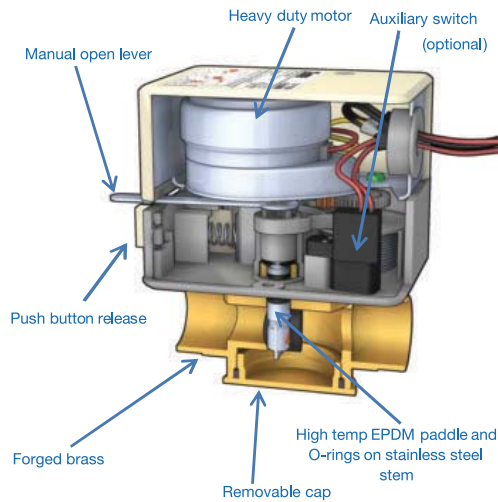
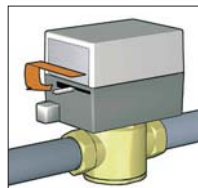
Function

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.



• **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**

tech. broch. 01115

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**

tech. broch. 01115

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	1.0	75 psi	1.1	66.60
Z200042	Inverted flare	2.5	50 psi	1.1	66.60
Z200043	Inverted flare	3.5	30 psi	1.1	66.60
Z200053	½" SAE Flare	3.5	30 psi	1.1	85.70
Z200411	½" NPT	1.0	75 psi	1.1	66.60
Z207411	½" NPT LF	1.0	75 psi	1.1	91.20
Z200412	½" NPT	2.5	50 psi	1.1	66.60
Z200413	½" NPT	3.5	30 psi	1.1	66.60
Z200431	½" sweat	1.0	75 psi	1.0	61.00
Z200432	½" sweat	2.5	50 psi	1.0	61.00
Z207433	½" sweat LF	3.5	30 psi	1.0	85.70
Z200512	¾" NPT	2.5	50 psi	1.2	91.30
Z200513	¾" NPT	3.5	30 psi	1.2	91.30
Z200515	¾" NPT	5.0	25 psi	1.2	91.30
Z200517	¾" NPT	7.5	20 psi	1.2	91.30
Z200532	¾" sweat	2.5	50 psi	1.1	80.40
Z207533*	¾" sweat LF	3.5	30 psi	1.1	105.00
Z200535	¾" sweat	5.0	25 psi	1.1	80.40
Z200537	¾" sweat	7.5	20 psi	1.1	80.40
Z207537*	¾" sweat LF	7.5	20 psi	1.1	105.00
Z200617	1" NPT	7.5	20 psi	1.3	144.10
Z200635	1" sweat	5.0	25 psi	1.2	135.90
Z200637	1" sweat	7.5	20 psi	1.2	135.90
Z200737	1¼" sweat	7.5	20 psi	1.3	182.80
Z200683	1" male union	3.5	30 psi	1.1	91.30
Z200687	1" male union	7.5	20 psi	1.1	91.30

LF 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	22.90
F69294	Fits all ¾" NPT and all 1" Z2, Z3 valves	0.4	22.90

Code	Description	Cv	Δ P	Lbs	USD
Z300041	Inverted flare	1.0	75 psi	1.1	88.70
Z300042	Inverted flare	2.5	50 psi	1.1	88.70
Z300043	Inverted flare	3.5	30 psi	1.1	88.70
Z300053	½" SAE Flare	3.5	30 psi	1.1	106.60
Z300411	½" NPT	1.0	75 psi	1.1	88.70
Z300412	½" NPT	2.5	50 psi	1.1	88.70
Z300413	½" NPT	3.5	30 psi	1.1	88.70
Z300431	½" sweat	1.0	75 psi	1.0	83.20
Z300432	½" sweat	2.5	50 psi	1.0	83.20
Z307433	½" sweat LF	3.5	30 psi	1.0	107.90
Z300512	¾" NPT	2.5	50 psi	1.2	110.90
Z300513	¾" NPT	3.5	30 psi	1.2	110.90
Z300515	¾" NPT	5.0	25 psi	1.2	110.90
Z300517	¾" NPT	7.5	20 psi	1.2	110.90
Z300532	¾" sweat	2.5	50 psi	1.1	102.80
Z300533	¾" sweat	3.5	30 psi	1.1	102.80
Z300535	¾" sweat	5.0	25 psi	1.1	102.80
Z307537*	¾" sweat LF	7.5	20 psi	1.1	127.40
Z300617	1" NPT	7.5	20 psi	1.3	166.40
Z300635	1" sweat	5.0	25 psi	1.2	155.10
Z300637	1" sweat	7.5	20 psi	1.2	155.10
Z300737	1¼" sweat	7.5	20 psi	1.3	188.30
Z300687	1" male union	7.5	20 psi	1.2	116.00

***LF** Low-lead brass body.



NA605

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 VAC wall transformer	1.0	48.70

PUMP ZONE CONTROLS



ETL US
 Certified to CSA C22-2 No.24
 Intertek
 4009064
 Conforms to UL Standard 873

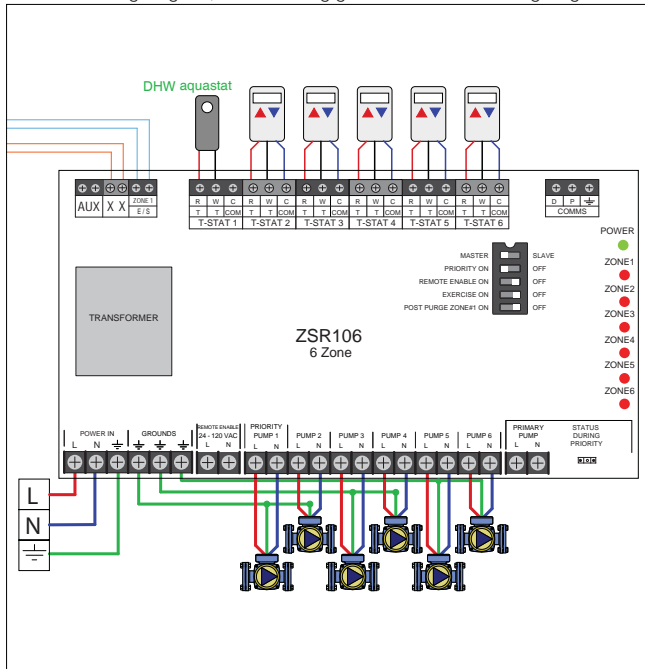
ZSR
Z-one Relay

tech. broch. 01284

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 (ZSR103/4), 20 VA (ZSR106)
 Electrical switch rating: 20A 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

Illustrative wiring diagram, consult wiring guide for additional wiring diagrams.



Code	Description	Lbs	USD
ZSR103	3 zone pump control	2.0	384.40
ZSR104	4 zone pump control	2.0	451.00
ZSR106	6 zone pump control	2.0	553.50

ZSR101 tech. broch. 01285
Z-one Relay



The ZSR101 single zone switching relay is operated by low voltage thermostats. The ZSR101 single zone switching relay incorporates Power In, Relay 1 and Relay 2 connection terminals.

Power Supply: 120 VAC, 50/60 Hz
 Transformer Voltage: 24 VAC
 Maximum transformer load: 12 VA
 Switch Rating: 10A Max Combined
 Replaceable Fuses: Type 2AG, 5A

ETL US
 Certified to CSA C22-2 No.24
 Intertek
 4009064
 Conforms to UL Standard 873

Z-ONE RELAY FUSES

Code	Description	Lbs	USD
NA10342	Spare fuse (package of 5)	0.1	15.70

Code	Description	Lbs	USD
ZSR101	Single zone relay	1.0	164.00

VALVE ZONE CONTROLS



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

tech. broch. 01286

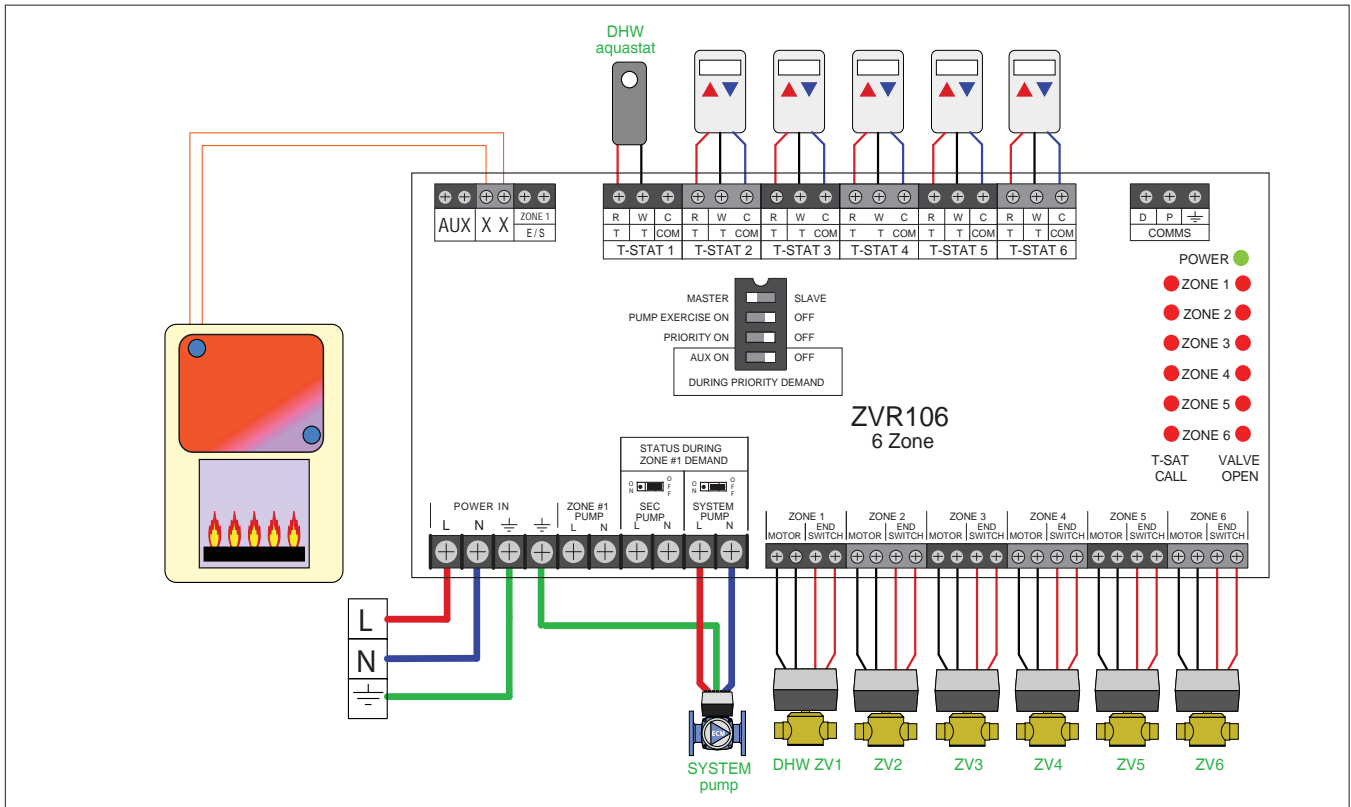
ZVR
Z-one Relay

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, AUX, XX, ZONE1 E/S: 120 VAC, 2A each
Electrical switch rating pumps: 120 VAC, 5A 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 pump control	2.0	292.10
ZVR104	4 zone pump control	2.0	348.50
ZVR106	6 zone pump control	2.0	451.00
NA10343	Expansion transformer	0.1	94.10

Illustrative wiring diagram, consult wiring guide for additional wiring diagrams.



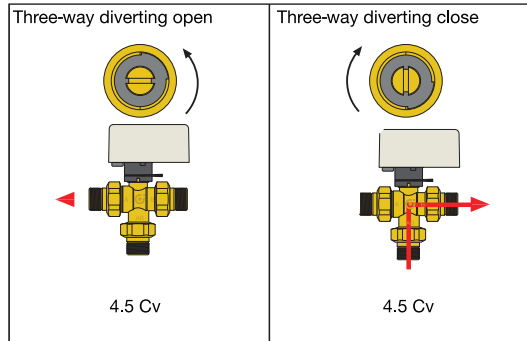
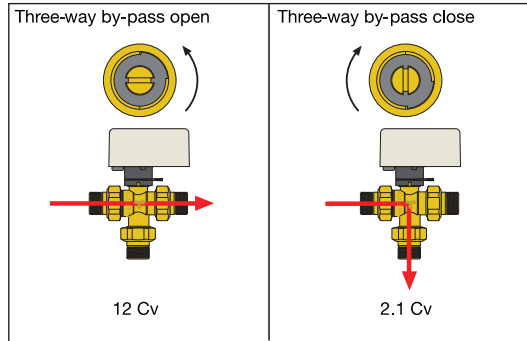
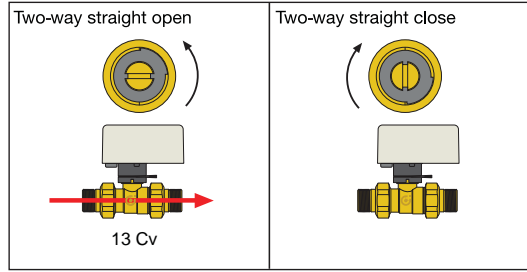
MOTORIZED BALL ZONE VALVES HIGH-FLOW, HIGH CLOSE-OFF



6442  [tech. broch. 01131](#)
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
644240A	½" NPT	13	2.3	416.60
644246A	½" press	13	2.4	420.00
644249A	½" sweat	13	2.3	408.60
644250A	¾" NPT	13	2.3	424.40
644256A	¾" press	13	2.4	424.80
644259A	¾" sweat	13	2.3	416.40
644260A	1" NPT	13	2.3	459.80
644266A	1" press	13	2.4	464.00
644269A	1" sweat	13	2.3	451.00
NA644200	body with no fittings	13	2.3	370.00



6443..3BY  [tech. broch. 01131](#)
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
644340A 3BY	½" NPT	12	2.5	469.90
644346A 3BY	½" press	12	2.6	475.00
644349A 3BY	½" sweat	12	2.5	457.90
644350A 3BY	¾" NPT	12	2.5	457.90
644356A 3BY	¾" press	12	2.6	482.20
644359A 3BY	¾" sweat	12	2.5	469.60
644360A 3BY	1" NPT	12	2.5	534.70
644366A 3BY	1" press	12	2.6	541.00
644369A 3BY	1" sweat	12	2.5	521.50
NA644300 3BY	body, no fittings	12	2.5	400.00



6443  [tech. broch. 01131](#)
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
644340A	½" NPT	4.5	2.5	469.90
644346A	½" press	4.5	2.6	475.00
644349A	½" sweat	4.5	2.5	457.90
644350A	¾" NPT	4.5	2.5	457.90
644356A	¾" press	4.5	2.6	482.20
644359A	¾" sweat	4.5	2.5	469.60
644360A	1" NPT	4.5	2.5	534.70
644366A	1" press	4.5	2.6	541.00
644369A	1" sweat	4.5	2.5	521.50
NA644300	body, no fittings	4.5	2.5	400.00

6440  [tech. broch. 01131](#)
24 V 3-wire control

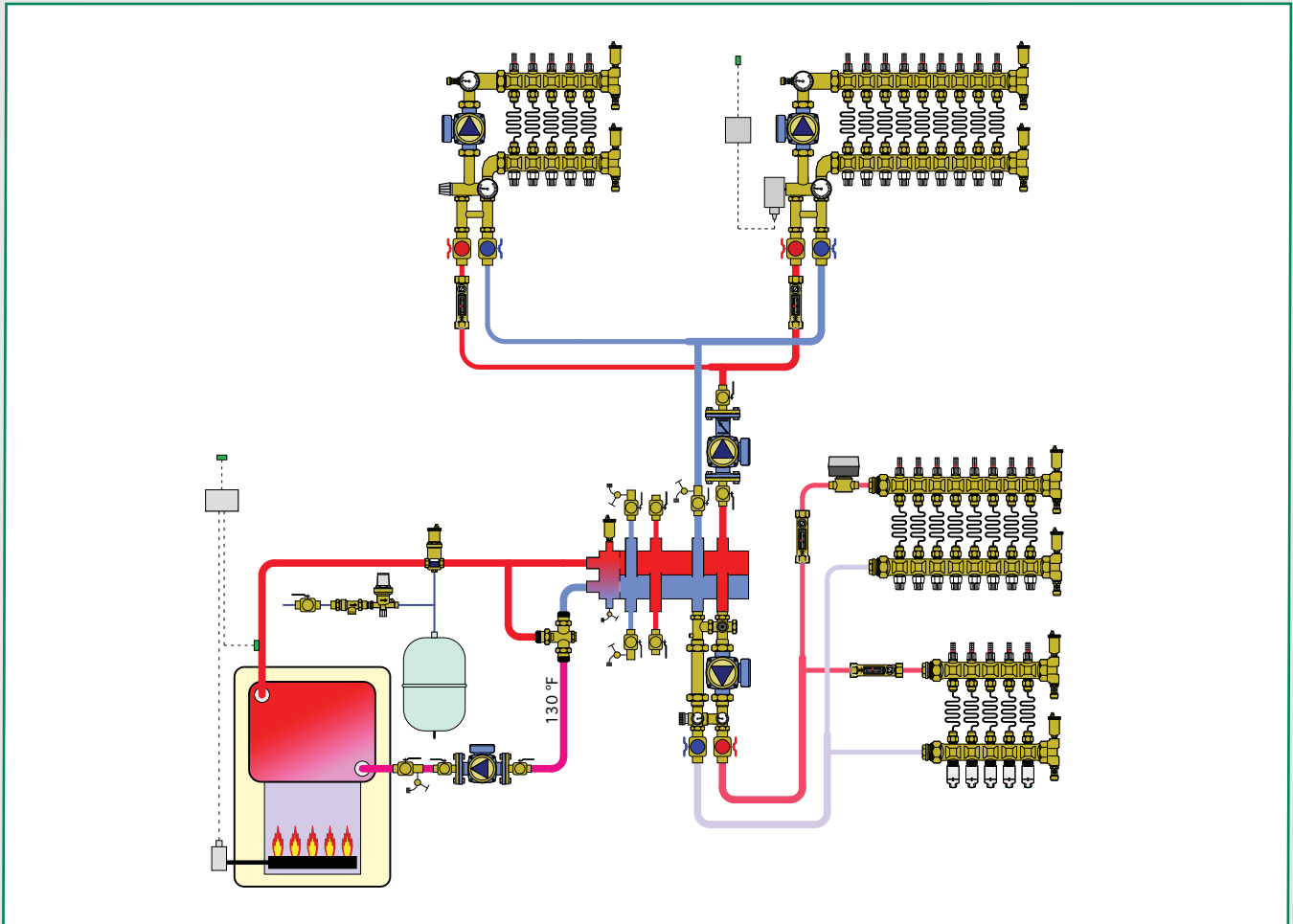
Actuator fits 6442 and 6443 series.
 Power supply: 24 VAC.
 Power consumption: 4 VA.
 Rating of micro-switch contacts: 5 A (24 V).
 Operating time: 40 s (90° rotation).
 Length of supply cable: 36".



Code	Description	Lbs	USD
644004	24 VAC	1.0	250.00

TEMPERATURE MIXING STATIONS AND DISTRIBUTION MANIFOLDS

This diagram is an example



5

Thermostatic fixed point mixing unit for HydroLink™, HydroMixer™

Motorized temperature mixing unit for HydroLink™, HydroMixer™

Thermostatic mixing stations

Brass distribution manifolds, TwistFlow™

Distribution manifolds

Manifold mixing stations

Boxes for distribution manifolds

Fittings for distribution manifolds and mixing stations

Accessories

Fill and flush cart, HYDROFLUSH™

PUMP & VALVE TEMPERATURE MIXING UNITS



163 HydroMixer™  tech. broch. 01121

Thermostatic fixed temperature mixing unit with insulation. Includes Grundfos UPS 15-58 three speed pump. Differential pressure by-pass valve adjustable from 1.5 to 8.5 psi. Temperature gauges. Shut-off ball valves. 1" NPT female union inlet fittings. Max working pressure: 145 psi. Adjustable range: 80–130°F. Power supply: 115 V 50/60 Hz.

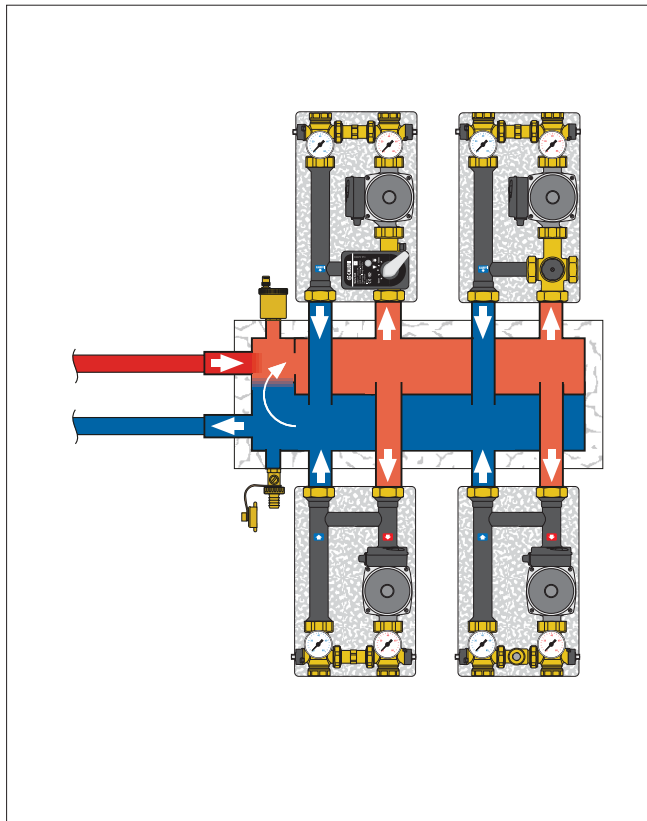


165 HydroMixer™  tech. broch. 01237

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
163600A	1" NPT outlet for right side flow	21	1,975.00
163610A	1" NPT outlet for left side flow	21	1,975.00

Code	Description	Lbs	USD
165600A	Dual line with 15-58 pump on right	21	1,484.00
165610A	Dual line with 15-58 pump on left	21	1,484.00
165602A	Dual line with Alpha pump on right	21	1,813.00
165612A	Dual line with Alpha pump on left	21	1,813.00



Wall bracket fits 165, 166 and 167 series.



Code	Description	Lbs	USD
165001	Wall bracket	0.1	82.80



PUMP & VALVE TEMPERATURE MIXING UNITS



166 HydroMixer™  tech. broch. 01238

Thermostatic fixed 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™  tech. broch. 01239

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	1,813.00
166610A	Dual line with 15-58 pump on left	22	1,813.00
166602A	Dual line with Alpha pump on right	22	2,142.00
166612A	Dual line with Alpha pump on left	22	2,142.00

Code	Description	Lbs	USD
167600A	Dual line with 15-58 pump on right	23	2,142.00
167610A	Dual line with 15-58 pump on left	23	2,142.00
167602A	Dual line with Alpha pump on right	23	2,471.00
167612A	Dual line with Alpha pump on left	23	2,471.00



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

Code	Description	Lbs	USD
519006	Differential pressure by-pass valve	1.0	93.30



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 outlet union fittings	1.0	85.20



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 outlet union fittings	1.0	86.20



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
NA16060	1" NPT M outlet union fittings	1.0	96.10



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 F inlet union fittings	1.0	97.20



THERMOSTATIC MANIFOLD MIXING STATIONS

172
Manifold mixing station
three speed pump

tech. broch. 01155

Pre-assembled thermostatic manifold mixing station consisting of a supply distribution manifold complete with built-in sight flow gauges, 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.

Consult factory to request inverted assembly.



Code	Description	UPS Pump	No.	Outlets	Lbs	USD
1725C1A	¾"	15-58	3	¾" M	20	1,729.00
1725D1A	¾"	15-58	4	¾" M	21	1,841.00
1725E1A	¾"	15-58	5	¾" M	23	1,952.00
1725F1A	¾"	15-58	6	¾" M	25	2,064.00
1725G1A	¾"	15-58	7	¾" M	27	2,176.00
1725H1A	¾"	15-58	8	¾" M	28	2,287.00
1725I1A	¾"	15-58	9	¾" M	29	2,399.00
1725L1A	¾"	15-58	10	¾" M	31	2,511.00
1725M1A	¾"	15-58	11	¾" M	33	2,621.00
1725N1A	¾"	15-58	12	¾" M	34	2,733.00
1725O1A	¾"	15-58	13	¾" M	36	2,844.00

172
Manifold mixing station
high efficiency pump

tech. broch. 01155

Pre-assembled thermostatic manifold mixing station consisting of a supply distribution manifold complete with built-in sight flow gauges, 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

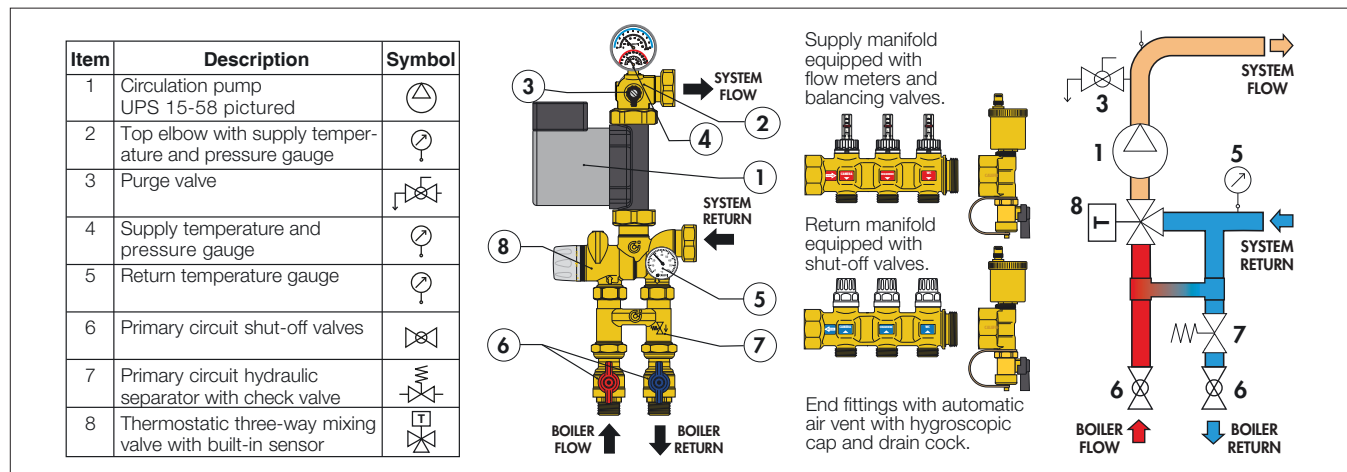
Primary inlet max. temperature: 195°F

Outlet center distance: 2 in.

Consult factory to request inverted assembly.



Code	Description	Alpha Pump	No.	Outlets	Lbs	USD
1725C1AHE	¾"	25-55U	3	¾" M	20	2,075.00
1725D1AHE	¾"	25-55U	4	¾" M	21	2,187.00
1725E1AHE	¾"	25-55U	5	¾" M	23	2,298.00
1725F1AHE	¾"	25-55U	6	¾" M	25	2,410.00
1725G1AHE	¾"	25-55U	7	¾" M	27	2,521.00
1725H1AHE	¾"	25-55U	8	¾" M	28	2,632.00
1725I1AHE	¾"	25-55U	9	¾" M	29	2,744.00
1725L1AHE	¾"	25-55U	10	¾" M	31	2,856.00
1725M1AHE	¾"	25-55U	11	¾" M	33	2,967.00
1725N1AHE	¾"	25-55U	12	¾" M	34	3,079.00
1725O1AHE	¾"	25-55U	13	¾" M	36	3,190.00



MANIFOLDS MIXING STATIONS



Thermostatic mixing station kit

tech. broch. 01155

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. 3/4" NPT female riser connections. Includes built-in hydraulic separator.

Code	Description	Lbs	USD
NA17256HE	Thermostatic mixing, Alpha 25-55U	4.1	1,602.00
NA17256	Thermostatic mixing, UPS 15-58U	4.1	1,256.00
NA16002	Alpha 25-55U replacement pump	2.3	687.00
NA10038	UPS 15-58U replacement pump	2.3	338.00

MIXING VALVE FOR CENTRALIZED SYSTEMS



**NA164
3-way - 24 V AC
motorized 3-wire
control temperature
mixing valve**

Motorized mixing valve for hydronic systems or in radiant panel heating systems. Operates on a control signal from a separately-sourced outdoor reset controller. High flow rate. No swings due to sudden changes in thermal load. Installation flexibility with reversible cold inlet port and straight through flow direction from hot inlet to mixed outlet. Brass body. Max. working pressure: 200 psi. Temperature range: 40–210°F. Power supply: 24 V AC. Power consumption: 8 W. Rating of micro-switch contacts: 5 A (24 V).



**NA163
3-way fixed
temperature mixing
valve**


Adjustable thermostatic mixing valve for boiler protection and low temperature mixing. Installation flexibility with reversible cold inlet port and straight through flow direction from hot inlet to mixed outlet. Brass body. Max. working pressure: 200 psi. Max. inlet temperature: 185°F. Adjustable range: 80–130°F.

Code	Description	Cv	Lbs	USD
NA16469	1" sweat unions, floating	7.7	5.8	1,087.00
F19149	Replacement actuator 3-wire floating	1.8		438.90

Code	Description	Cv	Lbs	USD
NA16369	1" sweat unions	3.9	4.8	856.90

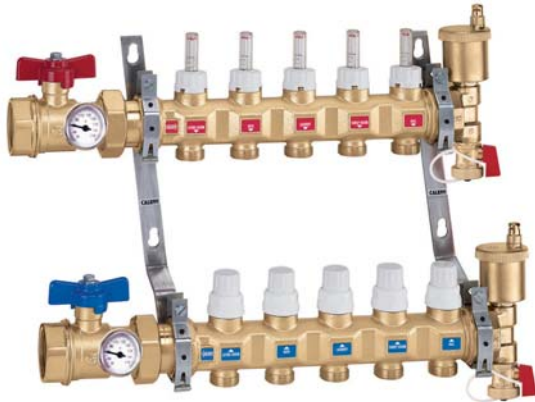
BRASS DISTRIBUTION MANIFOLDS

**668S1
TwistFlow™ Assembly**

 tech. broch. 01170

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.

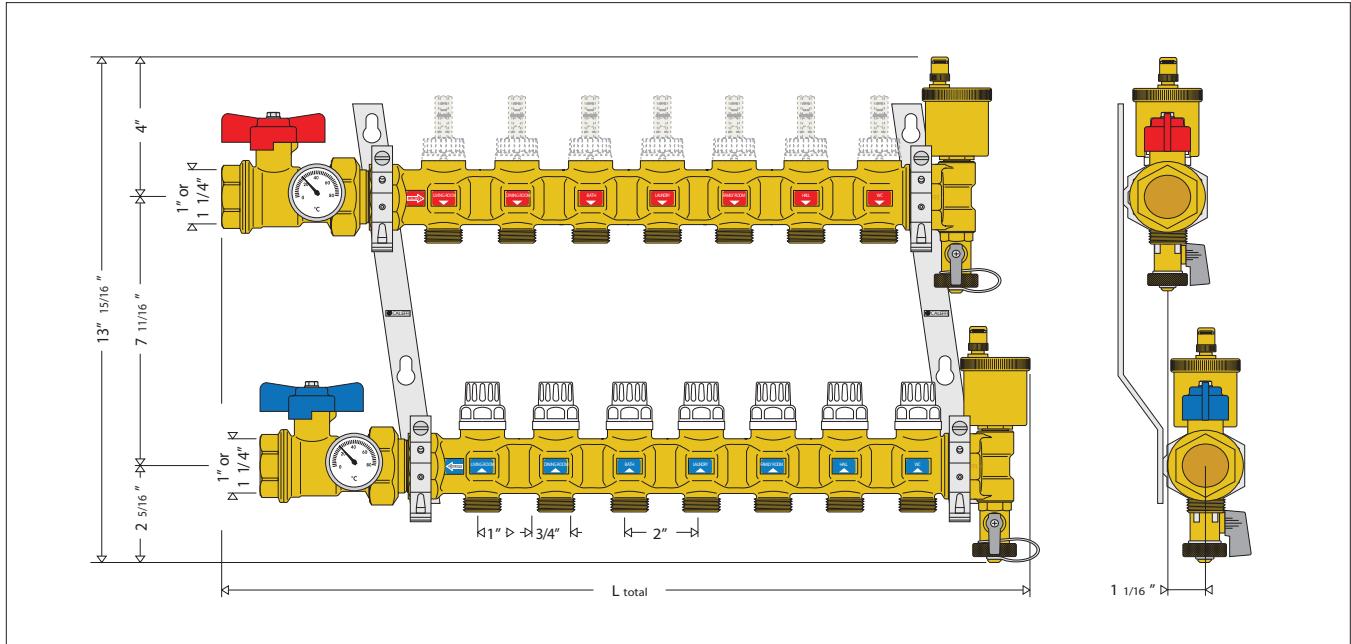
- 1" or 1 1/4" NPT inlet ball valves.
- Temperature gauges.
- Max. working pressure: 150 psi.
- Max. working temperature: 180°F.
- Max. peak temperature: 200°F.
- Loop Cv: 1.23 (combined supply & return ports).
- Flow meter scale: 1/4 - 2 gpm.
- Outlet center distance: 2 in.



Code	Description	No.	Outlets	Lbs	USD
6686C5S1A	1"	3	3/4" M	17	798.40
6686D5S1A	1"	4	3/4" M	18	914.40
6686E5S1A	1"	5	3/4" M	19	1,030.00
6686F5S1A	1"	6	3/4" M	21	1,146.00
6686G5S1A	1"	7	3/4" M	23	1,262.00
6686H5S1A	1"	8	3/4" M	24	1,378.00
6686I5S1A	1"	9	3/4" M	26	1,494.00
6686L5S1A	1"	10	3/4" M	28	1,610.00
6686M5S1A	1"	11	3/4" M	29	1,726.00
6686N5S1A	1"	12	3/4" M	31	1,842.00
6686O5S1A	1"	13	3/4" M	33	1,959.00

6687C5S1A	1 1/4"	3	3/4" M	17	846.50
6687D5S1A	1 1/4"	4	3/4" M	18	962.40
6687E5S1A	1 1/4"	5	3/4" M	19	1,079.00
6687F5S1A	1 1/4"	6	3/4" M	21	1,193.00
6687G5S1A	1 1/4"	7	3/4" M	23	1,310.00
6687H5S1A	1 1/4"	8	3/4" M	24	1,426.00
6687I5S1A	1 1/4"	9	3/4" M	26	1,542.00
6687L5S1A	1 1/4"	10	3/4" M	28	1,658.00
6687M5S1A	1 1/4"	11	3/4" M	29	1,774.00
6687N5S1A	1 1/4"	12	3/4" M	31	1,890.00
6687O5S1A	1 1/4"	13	3/4" M	33	2,006.00

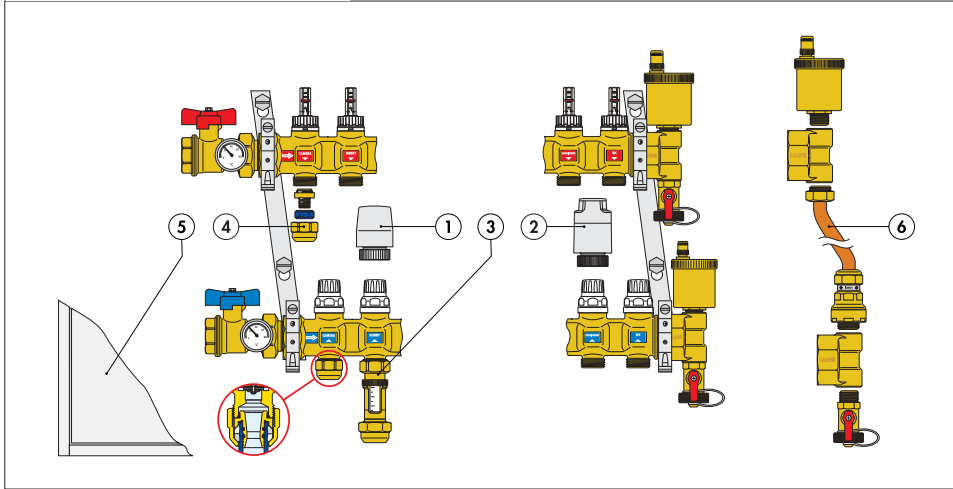
Consult factory for inverted assembly options.



Code (1")	6686C5S1A	6686D5S1A	6686E5S1A	6686F5S1A	6686G5S1A	6686H5S1A	6686I5S1A	6686L5S1A	6686M5S1A	6686N5S1A	6686O5S1A
Code (1 1/4")	6687C5S1A	6687D5S1A	6687E5S1A	6687F5S1A	6687G5S1A	6687H5S1A	6687I5S1A	6687L5S1A	6687M5S1A	6687N5S1A	6687O5S1A
No. outlets	3	4	5	6	7	8	9	10	11	12	13
Total length	15 3/16"	17 1/8"	19"	21"	23"	25"	28 1/8"	30 1/8"	32 1/16"	34 1/16"	36"

BRASS DISTRIBUTION MANIFOLDS

Manifolds and accessories



1. Thermo-electric actuator 6564 series
2. Thermo-electric actuator with manual open handle, 6563 series
3. Flow meter, code NA669
4. Self-adjusting Universal PEX fitting, 680, 682 series
5. Inspection wall box, 659 series
6. Differential by-pass kit, code 668000

DISTRIBUTION MANIFOLDS

663

tech. broch. 01170

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.



Code	Description	No.	Outlets	Lbs	USD
6636C5A	1"	3	¾" M	17	653.10
6636D5A	1"	4	¾" M	18	754.50
6636E5A	1"	5	¾" M	19	855.90
6636F5A	1"	6	¾" M	21	957.20
6636G5A	1"	7	¾" M	23	1,059.00
6636H5A	1"	8	¾" M	24	1,161.00
6636I5A	1"	9	¾" M	26	1,262.00
6636L5A	1"	10	¾" M	28	1,364.00
6636M5A	1"	11	¾" M	29	1,465.00
6636N5A	1"	12	¾" M	31	1,566.00
6636O5A	1"	13	¾" M	33	1,668.00
6636P5A	1"	14	¾" M	35	1,959.00

Consult factory for inverted assembly options.

Code	Description	No.	Outlets	Lbs	USD
6637C5A	1¼"	3	¾" M	17	696.00
6637D5A	1¼"	4	¾" M	18	796.30
6637E5A	1¼"	5	¾" M	19	897.70
6637F5A	1¼"	6	¾" M	21	1,000.00
6637G5A	1¼"	7	¾" M	23	1,101.00
6637H5A	1¼"	8	¾" M	24	1,203.00
6637I5A	1¼"	9	¾" M	26	1,304.00
6637L5A	1¼"	10	¾" M	28	1,406.00
6637M5A	1¼"	11	¾" M	29	1,507.00
6637N5A	1¼"	12	¾" M	31	1,609.00
6637O5A	1¼"	13	¾" M	33	1,711.00
6636P5A	1¼"	14	¾" M	35	2,010.00

Consult factory for inverted assembly options.

BOXES FOR DISTRIBUTION MANIFOLDS



**659
Manifold cabinet**

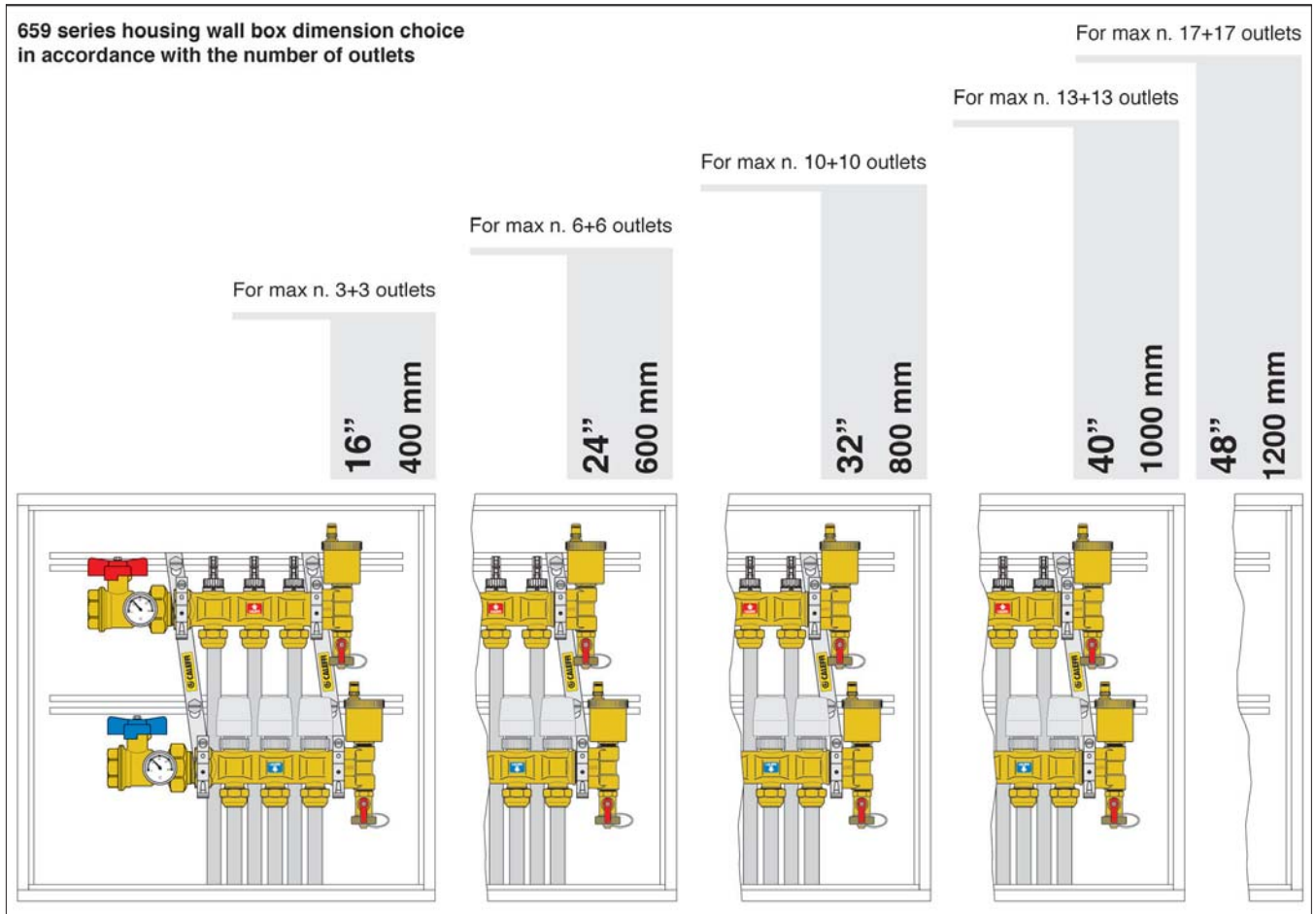
tech. broch. 01170

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

Code	Description	H	Max Outlets	Lbs	USD
659044	16" width	20"	3	17	421.40
659064	24" width	20"	6	23	458.50
659084	32" width	20"	10	30	540.30
659104	40" width	20"	13	37	621.80
659124	48" width"	20"	17	44	702.20

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**

tech. broch. 01170

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	13.00
680503A	3/8" nominal PEX	Black	0.2	13.00
680504A	1/2" nominal PEX	Blue	0.2	13.00
680555A	5/8" nominal PEX	Black	0.2	13.00
680505A	3/4" nominal PEX	Brass	0.2	13.00



(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	13.40
682540A	1/2" nominal PEX-AL-PEX	0.2	13.40
682545A	5/8" nominal PEX-AL-PEX	0.2	14.40
682550A	3/4" nominal PEX-AL-PEX	0.2	25.50

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 diameters tolerances. The innovative solution for mechanical fittings has been constructed so that the same fitting can be used for pipes with difference external diameters 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

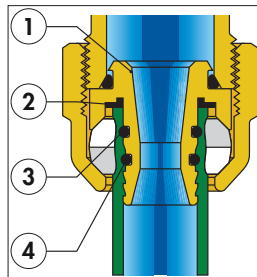
The internal profile of the adapter (1) is shaped to obtain a Venturi effect when the fluid passes through, reducing pressure losses by 20% compared to a similar diameter.

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	14.50



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	15.70



386

tech. broch.01170

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

Code	Description	Lbs	USD
386500	3/4" straight thread	0.2	13.00



Double nipple for coupling PEX fittings.

Code	Description	Lbs	USD
942550	3/4" x 3/4" thread	0.1	16.20



Wrench for tightening PEX fitting to manifolds.

Code	Description	Lbs	USD
387100	26 mm x 30 mm	1.5	62.10

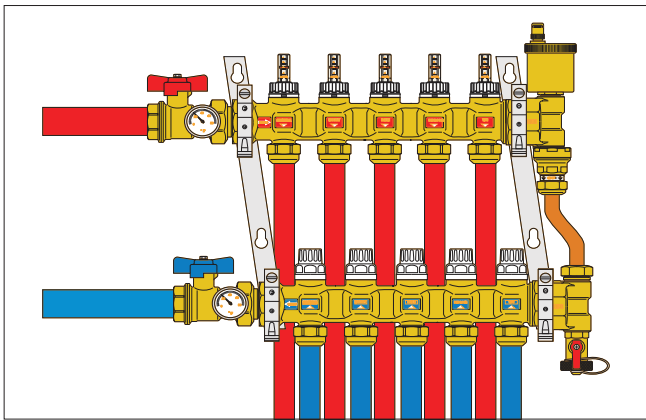


668

tech. broch. 01170

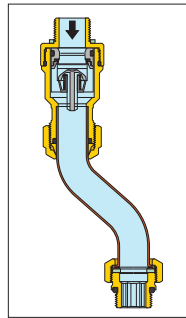
Off-center by-pass assembly with fixed crack setting of 3.6 psi differential pressure. Max working pressure: 150 psi. Working temperature range: 15–230°F.

Code	Description	Lbs	USD
668000	1/2" x 1/2"	0.5	123.10

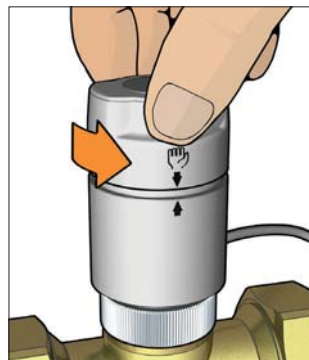
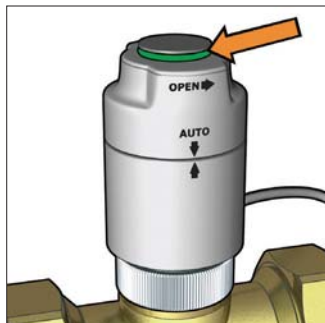


The by-pass valve contains a check valve connected to a contact spring. When the fixed setting pressure is reached, the valve disk gradually opens, recirculating the flow in proportion to the closing of the thermo-electric valves and maintaining a constant differential pressure in the manifold circuit.

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.



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.



6564

tech. broch. 01198

Low current draw thermo-electric actuator for use with 663 and 668S1 series distribution manifolds. 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	107.90
656414	24 V AC/DC with micro-switch	0.4	135.00

NEW



6563 TwisTop™

tech. broch. 01170

TwisTop™ thermo-electric actuator for use with return manifolds. 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	143.90
656354	24 V AC/DC with micro-switch	0.4	170.80
656354R	24 V AC/DC with micro-switch Rehau	0.4	186.10



CE

6563 TwisTop™

tech. broch. 01072

TwisTop™ thermo-electric actuator fits on 676 two-way valve. Power supply: 24 V AC/DC. Initial current draw: 800 mA. Power consumption: holding: 3 W, inrush: 19 VA. 31.5" wire lead connection. US Patent 7,617,989 B2.

Code	Description	Lbs	USD
656304	24 V AC/DC	0.4	143.90

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	37.90



Replacement shut-off valve fits 668 S1 series manifold.

Code	Description	Lbs	USD
F69590	Fits 668S1 return manifold	0.3	30.30



Replacement balancing valve fits 668 series manifold.

Code	Description	Lbs	USD
F69184	Fits 668 supply manifold	0.2	26.40



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

Code	Description	Lbs	USD
69122 CST	Fits 668 & 663 return manifold	0.3	16.90



Replacement balancing valve for 663 series manifold.

Code	Description	Lbs	USD
R69176	Fits 663 supply manifold	0.3	25.90



669 [tech. broch. 01170](#)

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

Code	Description	Lbs	USD
669050	1 — 4 LPM	0.4	44.70
NA669150	¼ — 1 GPM High Temp.	0.3	44.70
NA669250	½ — 2 GPM High Temp.	0.3	44.70
NA669450	1 — 4 GPM High Temp.	0.3	42.60



White replacement knob fits 663 and 668S1 series manifolds.

Code	Description	Lbs	USD
449000	Knob	0.5	13.10



5020 [tech. broch. 01090](#)

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	33.30



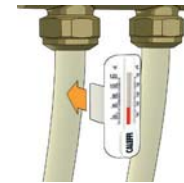
Plastic replacement/test cap fits 5020 series.

Code	Description	Lbs	USD
R56214	Vent cap	0.1	2.70



675 [tech. broch.01170](#)

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



Code	Description	Lbs	USD
675900A	¾" & 5/8" PEX & ½" copper	0.2	14.10
R69413	Syringe of thermo conductive paste	0.1	9.90



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
688003A	Gauge with pocket well	0.2	52.60
F11344	Replacement pocket well, low lead	0.1	5.20
F67037	O-ring fits F11344	0.1	1.20

FILL AND FLUSH CART

NA25510  tech. broch. 01280
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: 1–13 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 x 20"W x 18"D.

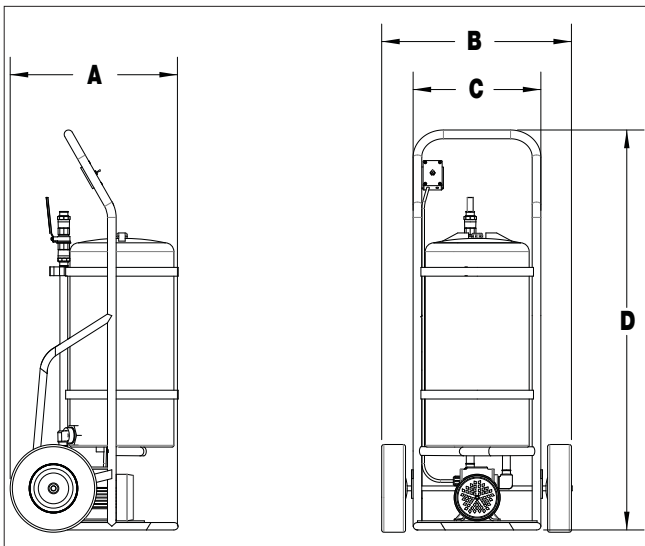
Code	Description	Lbs	USD
NA25510	Fill and flush cart	60	3,188.00

Operating principles

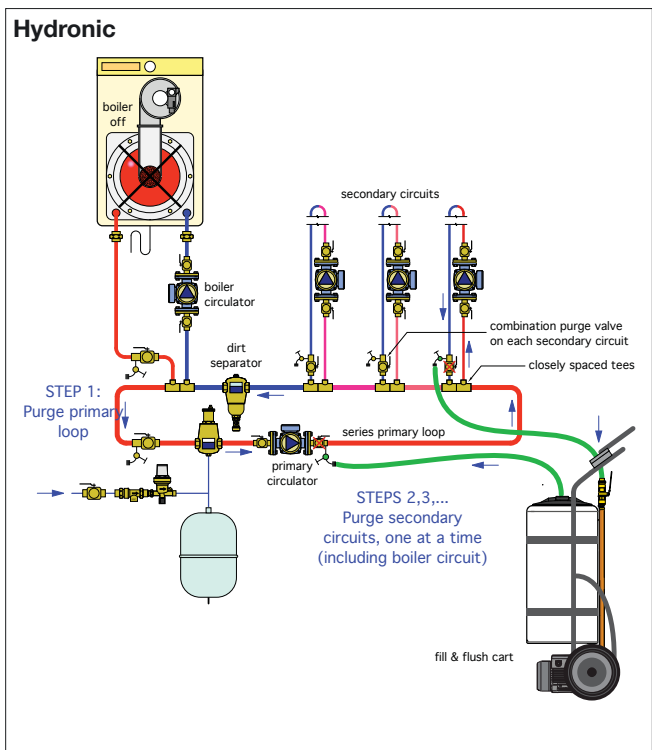
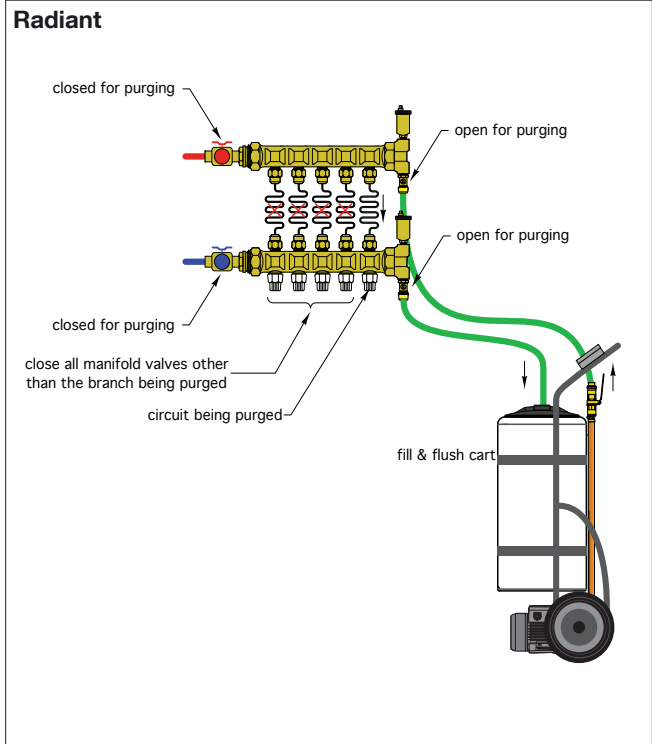
The fill and flush pump cart is portable and leak-tested for a safe, quick and clean way to fill and flush solar, geothermal and hydronic systems. HYDROFLUSH™ with a leak test pressure gauge, the Fill and Flush cart makes it easy to test a system.

Connect the fill/purge valves to the fill and flush system, allow fluid to circulate and remove air and dirt in system. Pump system to desired pressure, use the liquid pressure gauge to observe system pressure. If the system holds its pressure, the system is leak free.

Dimensions:

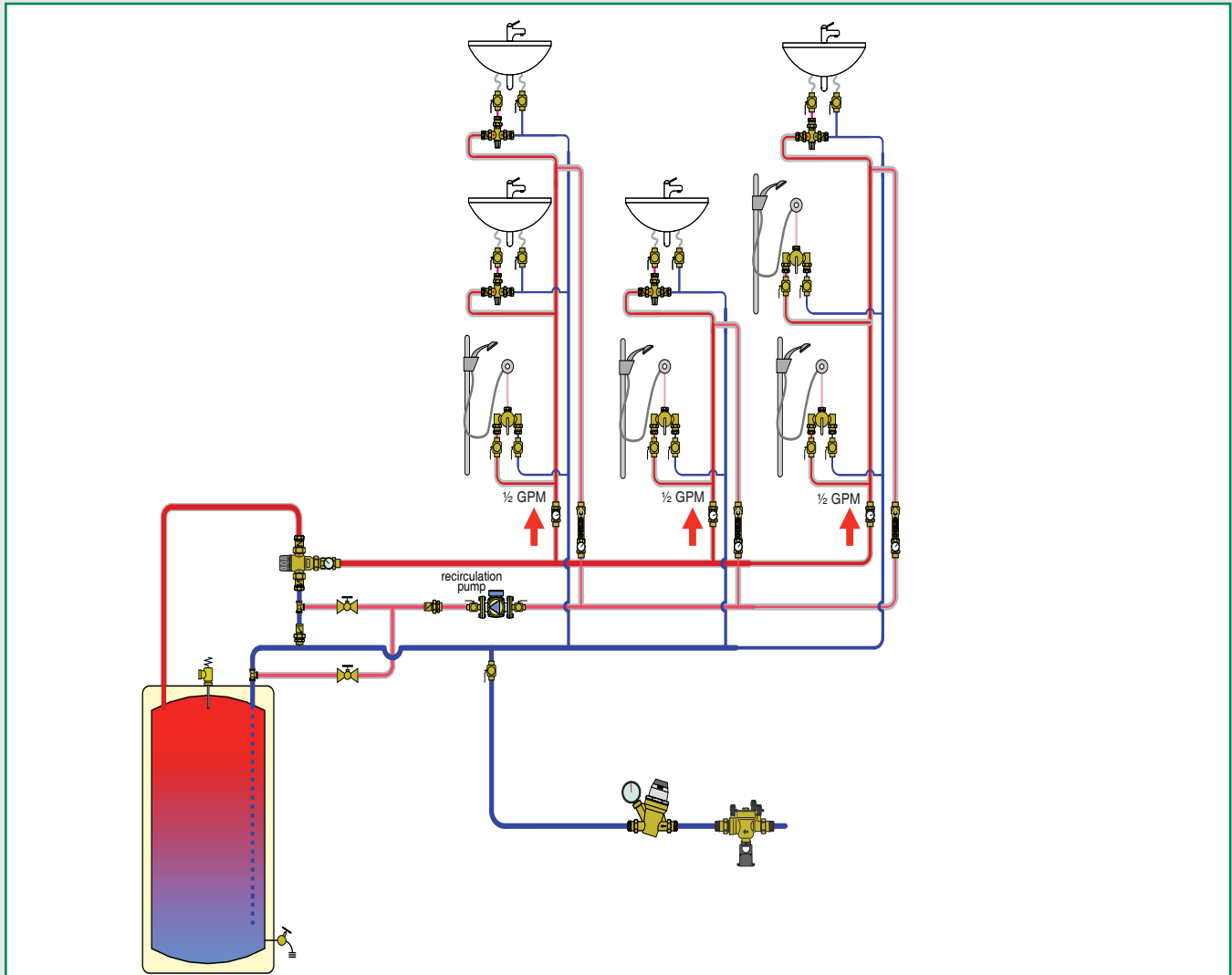


Code	A	B	C	D	Weight	Capacity
NA25510	19 ½"	20 "	14"	46 ¼"	85 lbs.	10 gallon



LOW LEAD VALVES FOR DOMESTIC WATER SYSTEMS

This diagram is an example



Thermostatic mixing valves, MixCal™

Scald protection thermostatic mixing valves

Water heater tank mixing valve, TankMixer™

Two-stage thermostatic mixing valve, Delta2™

Pre-adjustable pressure reducing valves

Recirculation automatic balancing valve, Flowcal+™

Recirculation balancing valve with flow meter, QuickSetter+™

Recirculation thermal balancing valve, ThermoSetter™

Testable reduced pressure zone backflow preventers

LOW LEAD THERMOSTATIC MIXING VALVES



521 MixCal™ Sweat  tech. broch. 01050

Adjustable thermostatic and pressure balanced mixing valve for point of distribution in domestic water systems and radiant hydronic heating systems. Low-lead brass body and fittings. Locking set point knob. Max. working pressure: 200 psi. Max. inlet temperature: 200°F. Adjustable range: 85–150°F. Min. flow for optimum performance: 1.3 gpm.

ASSE 1017



521 MixCal™ Sweat  tech. broch. 01050

Adjustable thermostatic and pressure balanced 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: 1.3 gpm. Gauge scale: 30–210°F. Gauge accuracy: ± 6°F. Gauge dial: 2" diameter.

ASSE 1017

Code	Description	Cv	Lbs	USD
521409A	½" sweat	3	2.4	259.30
521409AC	½" sweat inlet check valves	3	2.4	285.90
521509A	¾" sweat	3	2.4	271.00
521509AC	¾" sweat inlet check valves	3	2.4	310.00
521609A	1" sweat	3	2.4	322.90
521609AC	1" sweat inlet check valves	3	2.4	361.90

Code	Description	Cv	Lbs	USD
521419A	½" sweat	3	2.9	307.60
521419AC	½" sweat inlet check valves	3	2.9	334.20
521519A	¾" sweat	3	2.9	319.30
521519AC	¾" sweat inlet check valves	3	2.9	358.30
521619A	1" sweat	3	2.9	371.20
521619AC	1" sweat inlet check valves	3	2.9	410.20



521 MixCal™ NPT  tech. broch. 01050

Adjustable thermostatic and pressure balanced mixing valve for point of distribution in domestic water systems and radiant hydronic heating systems. Locking set point knob. Max. working pressure: 200 psi. Max. inlet temperature: 200°F. Adjustable range: 85–150°F. Min. flow for optimum performance: 1.3 gpm.

ASSE 1017



521 MixCal™ NPT  tech. broch. 01050

Adjustable thermostatic and pressure balanced 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: 1.3 gpm. Gauge scale: 30–210°F. Gauge accuracy: ± 6°F. Gauge dial: 2" diameter.

ASSE 1017

Code	Description	Cv	Lbs	USD
521400A	½" NPT male	3.2	2.4	271.30
521400AC	½" NPT male inlet check valves	3.2	2.4	297.70
521500A	¾" NPT male	3.2	2.4	283.00
521500AC	¾" NPT male inlet check valves	3.2	2.4	321.80
521600A	1" NPT male	3.2	2.4	336.10
521600AC	1" NPT male inlet check valves	3.2	2.4	374.90

Code	Description	Cv	Lbs	USD
521410A	½" NPT male	3	2.9	319.60
521410AC	½" NPT male inlet check valves	3	2.9	346.00
521510A	¾" NPT male	3	2.9	331.30
521510AC	¾" NPT male inlet check valves	3	2.9	370.10
521610A	1" NPT male	3	2.9	384.40
521610AC	1" NPT male inlet check valves	3	2.9	423.20

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.

LOW LEAD THERMOSTATIC MIXING VALVES



521 MixCal™ Press  tech. broch. 01050

Adjustable thermostatic and pressure balanced 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: 1.3 gpm. Gauge scale: 30–210°F. Gauge accuracy: ± 6°F. Gauge dial: 2" diameter.

ASSE 1017

Code	Description	Cv	Lbs	USD
521406A	½" Press	3	2.4	276.40
521416A	½" Press with gauge	3	2.9	324.70
521506A	¾" Press	3	2.4	283.60
521516A	¾" Press with gauge	3	2.9	331.90
521506AC	¾" Press inlet check valves	3	2.5	349.80
521516AC	¾" Press w/gauge/inlet checks	3	3.0	398.10
521606A	1" Press	3	2.6	342.40
521616A	1" Press with gauge	3	3.1	390.70

NEW



521 MixCal™ PEX  tech. broch. 01050

Adjustable thermostatic and pressure balanced 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: 1.3 gpm. Gauge scale: 30–210°F. Gauge accuracy: ± 6°F. Gauge dial: 2" diameter.

ASSE 1017

Code	Description	Cv	Lbs	USD
521407A	½" PEX barb	3	2.4	259.30
521417A	½" PEX barb with gauge	3	2.5	307.60
521407AC	½" PEX barb inlet check valves	3	2.9	285.90
521417AC	½" PEX w/gauge/inlet checks	3	2.9	334.20
521507A	¾" PEX barb	3	2.4	271.00
521517A	¾" PEX barb with gauge	3	2.5	319.30
521507AC	¾" PEX barb inlet check valves	3	2.9	310.00
521517AC	¾" PEX w/gauge/inlet checks	3	2.9	358.30
521607A	1" PEX barb	3	2.4	322.90
521617A	1" PEX barb with gauge	3	2.5	371.20
521607AC	1" PEX barb inlet check valves	3	2.9	361.90
521617AC	1" PEX w/gauge/inlet checks	3	2.9	410.20

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.



521 MixCal™ Body  tech. broch. 01050

Replacement body. See fitting selection table in Section 9.

ASSE 1017

Code	Description	Cv	Lbs	USD
521101A	1" male union thread	3	1.9	201.40



Check valve fits only Presscon™ and PEX fittings

Code	Description	Lbs	USD
NA10405	Check valve insert	0.1	3.10



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	½" sweat with gauge	0.4	77.10
NA10056	¾" sweat with gauge	0.4	84.70
NA10058	1" sweat with gauge	0.4	93.00
NA10358	1" union thread with gauge	0.4	48.30
688003A	Replacement gauge with pocket well	0.5	52.60



Check valve for 521 and 5213 mixing valves. Fits sweat and NPT.

Code	Description	Lbs	USD
R39204	Check valve insert	0.1	4.40



Conical inlet filter for 521 and 5213 mixing valves.

Code	Description	Lbs	USD
F52429	Conical filter	0.1	5.20

LOW LEAD HIGH FLOW THERMOSTATIC MIXING VALVES

ASSE 1017 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. Series 5231 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 High Flow Sweat

[tech. broch. 01256](#)

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 Flow (gpm)	Cv	Lbs	USD
523168A	1" sweat	4.4	7.0	7.0	1,333.00
523178A	1¼" sweat	4.4	7.6	7.0	1,562.00
523188A	1½" sweat	8.8	13.0	17.0	2,197.00
523198A	2" sweat	8.8	14.2	18.0	2,525.00



5231 High Flow Sweat

[tech. broch. 01256](#)

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 Flow (gpm)	Cv	Lbs	USD
523177A	1¼" sweat	4.4	7.6	9.0	1,654.00



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	187.00
NA10476	1" and 1¼" male x female union	3.0	212.10
NA10461	1½" and 2" male x female union	4.0	368.90
688003A	Replacement gauge with pocket well	0.2	52.60



5231 High Flow NPT

[tech. broch. 01256](#)

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 Flow (gpm)	Cv	Lbs	USD
523160A	1" NPT M	4.4	7.0	7.0	1,434.00
523170A	1¼" NPT M	4.4	7.6	7.0	1,641.00
523180A	1½" NPT M	8.8	13.0	17.0	2,275.00
523190A	2" NPT M	8.8	14.2	18.0	2,604.00



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



5231 High Flow Body

[tech. broch. 01256](#)

Replacement body.
See fitting selection table in Section 9

ASSE 1017

Code	Description	Min Flow (gpm)	Cv	Lbs	USD
523179A	1½" union thread	4.4	7.6	5.0	1,323.00
523199A	2½" union thread	8.8	14.2	14.2	2,023.00



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

Code	Description	Lbs	USD
NA10366	Check valve assembly 1" and 1¼"	1.0	82.30
NA10367	Check valve assembly 1½" & 2"	1.5	203.00

TWO-STAGE HIGH LOW MIXING VALVE

NEW



 tech. broch. 01092

**NA523
DELTA 2™**

Adjustable thermostatic two-stage 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.

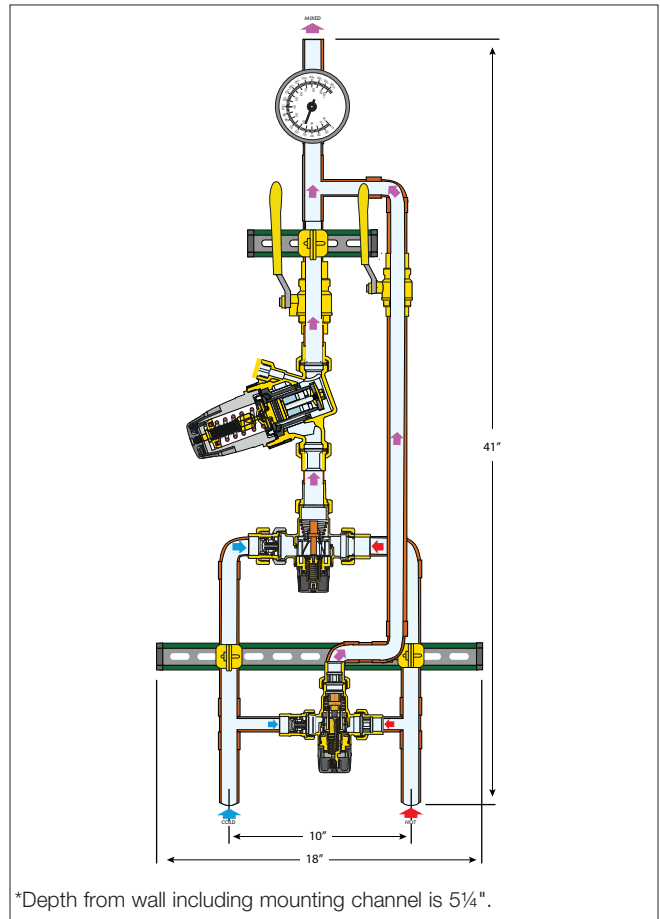
Thermostatic mixing valves meet requirements of ANSI/NSF 372-2011 and certified to ASSE 1017, CSA B125.3, UPC, IPC, Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes. Pressure reducing valve is certified to ASSE 1003, CSA B356, NSF61, NSF 372 Low Lead 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" inlets, 1 1/4" outlet, copper	25	4,200.00

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.

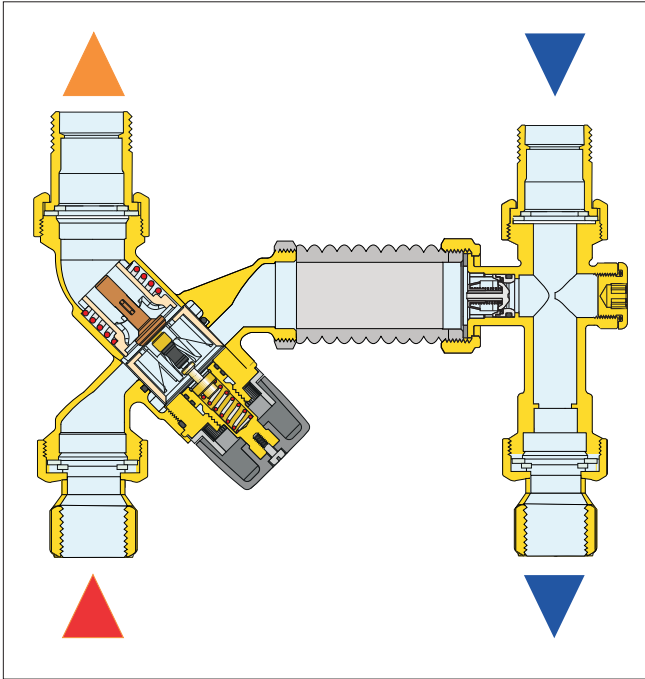
The NA523 is furnished assembled and pressure tested with large and small thermostatic mixing valves; codes 521509A and 523178A, along with a pressure reducing valve code 535970HA, to function as one system in providing a broad flow range from 1 gpm to 50 gpm. This one-piece assembly also contains an 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.



WATER HEATER TANK MIXING VALVE

Construction details



The thermostatic mixing valve mixes the hot and cold water at the inlets to maintain constant mixed water at the desired set temperature. The TankMixer™ 520 series, point of distribution mixing valve, is an angled configuration combined with a flexible hose and cold water cross for easy installation to most water heaters for direct mounting to the universal 3/4" male NPT threaded top pipe connections with a variety of outlet connection styles. This provides increased usable hot water capacity on existing or new high efficiency water heaters by allowing water to be stored at a higher temperature and safely delivered at lower adjustable temperatures to all fixtures. In addition, it can be used to reduce legionella growth by allowing the water heater thermostat to be set at 140°F. The flexible hose length allows mounting to all water heater tank sizes. The TankMixer™ comes standard with a plugged recirculation port that can be used for connecting to a hot water recirculation loop.

Non-sticking materials

The materials used the mixing valve are designed to minimize limescale formation. All functional parts are made with a special anti-scale material with low adherence coefficient, which ensures long term performance.

Thermal shut-off

In the event of accidental cold water supply failure, the shutter seals off the hot water passage, thus preventing the delivery of mixed temperature water. This is only guaranteed when there is a minimum temperature difference between the inlet hot water and the mixed temperature water delivery of 30°F.

Check valves

In systems with thermostatic mixing valves, check valves must be installed to prevent undesired backflow. The TankMixer™ 520 series mixing valves are supplied complete with a check valve on the cold water inlet.

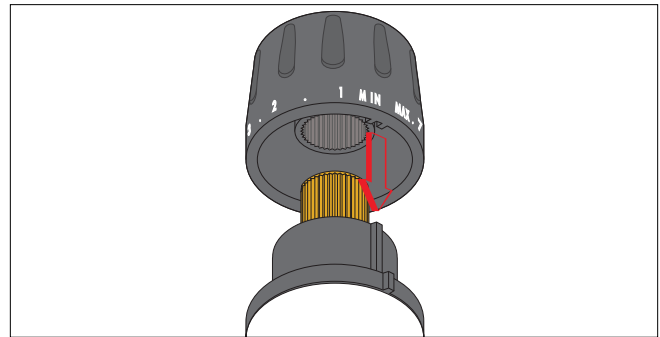
Temperature adjustment

The temperature is set at the desired value using the control knob with the graduated scale on the valve.

Pos.	Min.	1	2	3	4	5	6	7	Max.
T (°F)	95	105	115	120	125	132	140	145	150
T (°C)	35	40	45	48	52	56	60	63	65

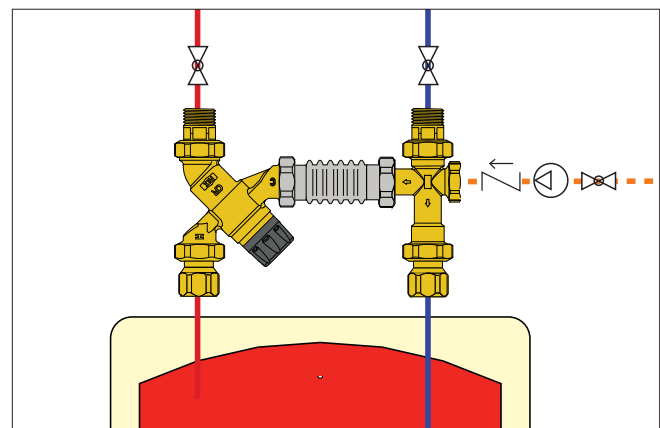
Locking the setting

Position the handle to the number required with respect to the index point. Unscrew the head screw, pull off the handle and reposition it so that the handle fits into the internal slot of the knob. Tighten the head screw.



Body shape

The "L" pattern, angle body configuration has improved fluid dynamics for better performance, and reduces installation labor and materials because the hot inlet port is in line with the mixed outlet port, eliminating a piping elbow as required for standard mixing valves. The cold inlet comes in the side.



WATER HEATER TANK MIXING VALVE

NEW



520 TankMixer™

tech. broch. 01267

Adjustment temperature range: 95°F - 150°F.
 Max. working pressure (static): 145 psi.
 Max. working pressure (dynamic): 75 psi.
 Max. inlet temperature: 195°F.
 Minimum flow for optimum performance: 0.5 gpm.
 Inlet: 3/4" NPT female union connections.
 Outlets: 3/4" NPT M, press or sweat union connections.

ASSE 1017

Code	Description	Cv	Lbs	USD
520500AX	3/4" NPT M outlet to system	3	2.4	372.00
520506AX	3/4" press outlet to system	3	2.4	425.30
520509AX	3/4" sweat outlet to system	3	2.9	359.50

NEW



520 TankMixer™

tech. broch. 01267

Adjustment temperature range: 95°F - 150°F.
 Max. working pressure (static): 145 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.
 Inlet: 3/4" NPT female union connections.
 Outlets: 3/4" NPT M, press or sweat union connections.

ASSE 1017

Code	Description	Cv	Lbs	USD
520510AX	3/4" NPT M outlet to system	3	2.9	425.30
520516AX	3/4" press outlet to system	3	2.9	477.30
520519AX	3/4" sweat outlet to system	3	2.9	411.70

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.

NEW



520 TankMixer™ Body

tech. broch. 01267

Replacement body.
 Adjustment temperature range: 95°F - 150°F.
 Max. working pressure (static): 145 psi.
 Max. working pressure (dynamic): 75 psi.
 Max. inlet temperature: 195°F.
 Minimum flow for optimum performance: 0.5 gpm.

See fitting section table in Section 9

ASSE 1017

Code	Description	Cv	Lbs	USD
520051A	1" male union connection	3	2.4	172.40

LOW LEAD SCALD PROTECTION THERMOSTATIC MIXING VALVES



5213 Sweat  tech. broch. 01092
Scald Protection Point-of-Use

Adjustable thermostatic and pressure balanced 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.
 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.

ASSE 1070

Code	Description	Cv	Lbs	USD
521349A	½" sweat	2	2.0	270.90
521359A	¾" sweat	2	2.0	283.20
521369A	1" sweat	2	2.0	338.40



5213 NPT  tech. broch. 01092
Scald Protection Point-of-Use

Adjustable thermostatic and pressure balanced 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.
 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.

ASSE 1070

Code	Description	Cv	Lbs	USD
521342A	½" NPT male	2	2.0	283.20
521352A	¾" NPT male	2	2.0	295.50
521362A	1" NPT male	2	2.0	350.90

NEW



5213 PEX  tech. broch. 01092
Scald Protection Point-of-Use


Adjustable thermostatic and pressure balanced 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.
 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.

ASSE 1070

Code	Description	Cv	Lbs	USD
521347A	½" pex barb	2	2.0	270.90
521357A	¾" pex barb	2	2.0	283.20
521367A	1" pex barb	2	2.0	338.40

LOW LEAD PRE-ADJUSTABLE PRESSURE REDUCING VALVES

535H














 tech. broch. 01265



Pre-adjustable pressure reducing valve for residential and commercial applications. DZR low lead "Ecobrass" body. Unique noise reducing pressure balanced cartridge. Low friction anti-scale moving parts. High flow seat design. Dial indicator with direct readout. Replaceable cartridge. Integral stainless steel filter. Adjustment locking screw.

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	GPM	Lbs	USD
535940HA	½" sweat	7.3	1.9	167.00
535941HA	½" sweat gauge	7.3	2.0	185.00
535340HA	½" NPT female	7.3	2.0	182.00
535341HA	½" NPT female gauge	7.3	2.1	200.00
535950HA	¾" sweat	12.5	2.2	181.00
535951HA	¾" sweat gauge	12.5	2.3	199.00
535350HA	¾" NPT female	12.5	2.3	196.00
535351HA	¾" NPT female gauge	12.5	2.4	214.00
535650HA	¾" Press	12.5	2.3	189.40
535651HA	¾" Press gauge	12.5	2.4	207.40
535750HA	¾" PEX barb 	12.5	2.3	181.00
535751HA	¾" PEX barb gauge 	12.5	2.4	199.00
535960HA	1" sweat	19.0	2.9	240.00
535961HA	1" sweat gauge	19.0	3.0	258.00
535360HA	1" NPT female	19.0	3.0	256.00
535361HA	1" NPT female gauge	19.0	3.1	274.00
535660HA	1" Press	19.0	3.0	279.00
535661HA	1" Press gauge	19.0	3.1	298.00
535760HA	1" PEX barb 	19.0	3.0	240.00
535761HA	1" PEX barb gauge 	19.0	3.1	258.00
535970HA	1¼" sweat	34.0	5.6	530.00
535971HA	1¼" sweat gauge	34.0	5.7	548.00
535370HA	1¼" NPT female	34.0	5.7	544.00
535371HA	1¼" NPT female gauge 	34.0	5.8	562.00
535980HA	1½" sweat 	40.0	7.3	743.00
535981HA	1½" sweat gauge 	40.0	7.4	761.00
535380HA	1½" NPT female 	40.0	7.3	784.00
535381HA	1½" NPT female gauge 	40.0	7.4	802.00
535990HA	2" sweat 	61.6	9.7	967.00
535991HA	2" sweat gauge 	61.6	9.8	985.00
535390HA	2" NPT female 	61.6	9.7	963.00
535391HA	2" NPT female gauge 	61.6	9.8	981.00

GPM flowrate at 6 feet per second water velocity.

535H Body  tech. broch. 01265





Pressure reducer replacement valve body. 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. See fitting selection table in Section 9.

ASSE 1003

Code	Description	Lbs	USD
535840HA	½" body	1.9	127.60
535850HA	¾" body	2.2	134.60
535860HA	1" body	2.9	176.20
535870HA	1¼" body	6.1	387.00
535880HA	1½" body	7.3	544.80
535890HA	2" body	9.7	633.20





Replacement cartridge for 535H series pressure reducer.

Code	Description	Lbs	USD
535006HA	Fits 535HA ½", ¾", 1"	0.3	92.00
535009HA	Fits 535HA 1¼", 1½", 2"	0.5	282.00





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

Code	Description	Lbs	USD
NA10273	1/8" NPT	0.1	20.00



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 ½"	0.1	21.50
NA11305	Jumper nipple for 535H ¾"	0.1	23.70
NA11306	Jumper nipple for 535H 1"	0.2	25.50
NA11307	Jumper nipple for 535H 1¼"	0.3	27.50
NA11308	Jumper nipple for 535H 1½" 	0.3	29.70
NA11309	Jumper nipple for 535H 2" 	0.5	60.00

HOT WATER RECIRCULATION STATIC BALANCING VALVE

132 QuickSetter+™

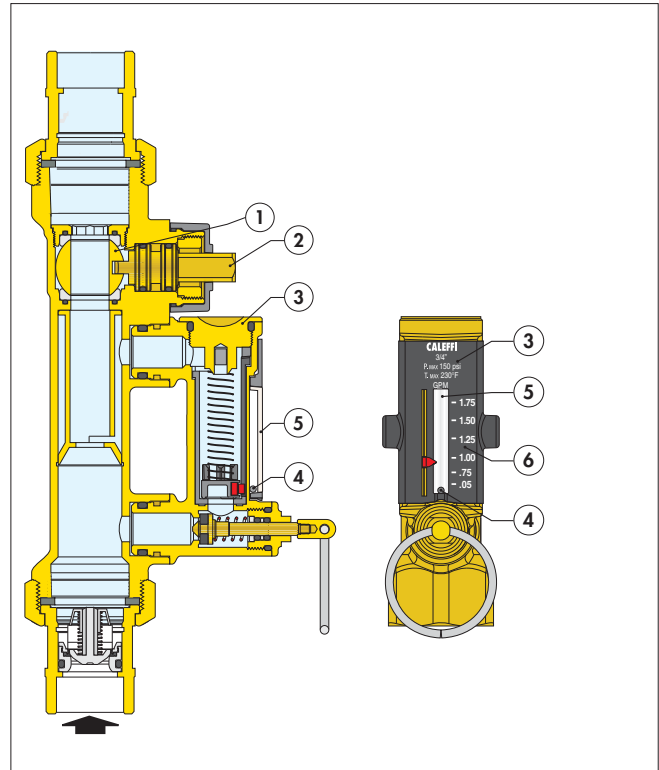
tech. broch. 01283



Balancing valve with flow meter.
 Direct reading of flow rate.
 No sight gauge clouding or scaling.
 DZR low-lead brass.
 Rotatable 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: + or - 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.

Operating principle

The control mechanism is a stainless ball stem valve (1), operated by a control stem (2). The flow rate is manually and properly set by use of the convenient onboard flow meter (3) housed in a bypass circuit on the valve body. This circuit is automatically shut off during normal operation. The flow rate is indicated by a metal ball (4) sliding inside a transparent channel (5) with an integral graduated scale (6).



Code	Description	Flow scale (gpm)	Lbs	USD
132434AFC	1/2" PEX barb NEW	0.5—1.75	1.8	333.90
132439AFC	1/2" sweat	0.5—1.75	2.0	333.90
132534AFC	3/4" PEX barb NEW	0.5—1.75	2.0	347.90
132536AFC	3/4" Press	0.5—1.75	1.8	369.90
132539AFC	3/4" Sweat	0.5—1.75	1.8	347.90
132634AFC	1" PEX barb NEW	0.5—1.75	2.2	402.00
132639AFC	1" Sweat	0.5—1.75	2.4	382.50
132454AFC	1/2" PEX barb NEW	2.0—7.0	1.8	333.90
132459AFC	1/2" Sweat	2.0—7.0	2.0	333.90
132554AFC	3/4" PEX barb NEW	2.0—7.0	2.0	347.90
132556AFC	3/4" Press	2.0—7.0	1.8	369.90
132559AFC	3/4" Sweat	2.0—7.0	1.8	347.90
132654AFC	1" PEX barb NEW	2.0—7.0	2.2	402.00
132659AFC	1" Sweat	2.0—7.0	2.4	382.50

With temperature gauge:

Code	Description	Flow scale (gpm)	Lbs	USD
132435AFC	1/2" PEX barb NEW	0.5—1.75	2.2	382.00
132537AFC	3/4" Press	0.5—1.75	2.2	418.20
132438AFC	1/2" sweat	0.5—1.75	2.4	382.20
132535AFC	3/4" PEX barb NEW	0.5—1.75	2.4	396.20
132538AFC	3/4" Sweat	0.5—1.75	2.2	396.20
132635AFC	1" PEX barb NEW	0.5—1.75	2.6	450.30
132638AFC	1" Sweat	0.5—1.75	2.8	430.80
132455AFC	1/2" PEX barb NEW	2.0—7.0	2.2	382.20
132458AFC	1/2" Sweat	2.0—7.0	2.4	382.20
132555AFC	3/4" PEX barb NEW	2.0—7.0	2.4	396.20
132557AFC	3/4" Press	2.0—7.0	2.2	418.20
132558AFC	3/4" Sweat	2.0—7.0	2.2	396.20
132655AFC	1" PEX barb NEW	2.0—7.0	2.6	450.30
132658AFC	1" Sweat	2.0—7.0	2.8	430.80
F19346	Replacement by-pass valve stem*		0.1	53.50

*with operating ring

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

Features include:

- Three connection sizes: 1/2", 3/4" and 1" sweat union
- Two flow range options: .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

HOT WATER RECIRCULATION DYNAMIC BALANCING VALVE

NEW



127 FlowCal+™

tech. broch. 01289

Compact automatic flow balancing valve. DZR low-lead brass body. 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%. Differential pressure control ranges: 2–14, 2–32, 4–34, 5–35 psid. Flow rate: 16 fixed flow rate settings ranging from 0.5–10 GPM. Flow accuracy: ±10%. 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.

NEW



127 FlowCal+™

tech. broch. 01289

Compact automatic flow balancing valve. DZR low-lead brass body. 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%. Differential pressure control ranges: 2–14, 2–32, 4–34, 5–35 psid. Flow rate: 16 fixed flow rate settings ranging from 0.5–10 GPM. Flow accuracy: ±10%. 2" gauge diameter temperature. Gauge scale: 30-210°F. Gauge accuracy: + or - 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. US Patent 7,246,635 B2.

Code	Description	Flow rate (gpm)	Lbs	USD
127144AFC G50	½" PEX barb	.50	1.0	145.10
127144AFC G75	½" PEX barb	.75	1.0	145.10
127144AFC 1G0	½" PEX barb	1.0	1.0	145.10
127144AFC 1G5	½" PEX barb	1.5	1.0	145.10
127144AFC 2G0	½" PEX barb	2.0	1.0	145.10
127149AFC G50	½" sweat	.50	1.0	145.10
127149AFC G75	½" sweat	.75	1.0	145.10
127149AFC 1G0	½" sweat	1.0	1.0	145.10
127149AFC 1G5	½" sweat	1.5	1.0	145.10
127149AFC 2G0	½" sweat	2.0	1.0	145.10
127154AFC G50	¾" PEX barb	.50	1.1	159.10
127154AFC G75	¾" PEX barb	.75	1.1	159.10
127154AFC 1G0	¾" PEX barb	1.0	1.1	159.10
127154AFC 1G5	¾" PEX barb	1.5	1.1	159.10
127154AFC 2G0	¾" PEX barb	2.0	1.1	159.10
127156AFC G50	¾" Press	.50	1.1	181.10
127156AFC G75	¾" Press	.75	1.1	181.10
127156AFC 1G0	¾" Press	1.0	1.1	181.10
127156AFC 1G5	¾" Press	1.5	1.1	181.10
127156AFC 2G0	¾" Press	2.0	1.1	181.10
127159AFC G50	¾" sweat	.50	1.1	159.10
127159AFC G75	¾" sweat	.75	1.1	159.10
127159AFC 1G0	¾" sweat	1.0	1.1	159.10
127159AFC 1G5	¾" sweat	1.5	1.1	159.10
127159AFC 2G0	¾" sweat	2.0	1.1	159.10
127164AFC G50	1" PEX barb	.50	1.3	193.70
127164AFC G75	1" PEX barb	.75	1.3	193.70
127164AFC 1G0	1" PEX barb	1.0	1.3	193.70
127164AFC 1G5	1" PEX barb	1.5	1.3	193.70
127164AFC 2G0	1" PEX barb	2.0	1.3	193.70
127169AFC G50	1" sweat	.50	1.3	193.70
127169AFC G75	1" sweat	.75	1.3	193.70
127169AFC 1G0	1" sweat	1.0	1.3	193.70
127169AFC 1G5	1" sweat	1.5	1.3	193.70
127169AFC 2G0	1" sweat	2.0	1.3	193.70

Code	Description	Flow rate (gpm)	Lbs	USD
127145AFC G50	½" PEX barb	.50	1.4	193.40
127145AFC G75	½" PEX barb	.75	1.4	193.40
127145AFC 1G0	½" PEX barb	1.0	1.4	193.40
127145AFC 1G5	½" PEX barb	1.5	1.4	193.40
127145AFC 2G0	½" PEX barb	2.0	1.4	193.40
127148AFC G50	½" sweat	.50	1.4	193.40
127148AFC G75	½" sweat	.75	1.4	193.40
127148AFC 1G0	½" sweat	1.0	1.4	193.40
127148AFC 1G5	½" sweat	1.5	1.4	193.40
127148AFC 2G0	½" sweat	2.0	1.4	193.40
127155AFC G50	¾" PEX barb	.50	1.5	207.40
127155AFC G75	¾" PEX barb	.75	1.5	207.40
127155AFC 1G0	¾" PEX barb	1.0	1.5	207.40
127155AFC 1G5	¾" PEX barb	1.5	1.5	207.40
127155AFC 2G0	¾" PEX barb	2.0	1.5	207.40
127157AFC G50	¾" Press	.50	1.5	229.40
127157AFC G75	¾" Press	.75	1.5	229.40
127157AFC 1G0	¾" Press	1.0	1.5	229.40
127157AFC 1G5	¾" Press	1.5	1.5	229.40
127157AFC 2G0	¾" Press	2.0	1.5	229.40
127158AFC G50	¾" sweat	.50	1.5	207.40
127158AFC G75	¾" sweat	.75	1.5	207.40
127158AFC 1G0	¾" sweat	1.0	1.5	207.40
127158AFC 1G5	¾" sweat	1.5	1.5	207.40
127158AFC 2G0	¾" sweat	2.0	1.5	207.40
127165AFC G50	1" PEX barb	.50	1.7	242.00
127165AFC G75	1" PEX barb	.75	1.7	242.00
127165AFC 1G0	1" PEX barb	1.0	1.7	242.00
127165AFC 1G5	1" PEX barb	1.5	1.7	242.00
127165AFC 2G0	1" PEX barb	2.0	1.7	242.00
127168AFC G50	1" sweat	.50	1.7	242.00
127168AFC G75	1" sweat	.75	1.7	242.00
127168AFC 1G0	1" sweat	1.0	1.7	242.00
127168AFC 1G5	1" sweat	1.5	1.7	242.00
127168AFC 2G0	1" sweat	2.0	1.7	242.00

HOT WATER RECIRCULATION THERMAL BALANCING VALVE

NEW

116 ThermoSetter™

tech. broch. 01325



Adjustable thermal balancing valve for domestic hot water recirculation circuits. Drywell for temperature gauge or probe. DZR low-lead brass body. Optional inlet 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 Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

Code	Description	Lbs	USD
116140A	½" NPT female	1.6	296.00
116140AC	½" NPT female, inlet check valve	1.8	356.00
116141A	½" NPT female, gauge	1.7	316.00
116141AC	½" NPT female, gauge, inlet check valve	1.9	376.00
116150A	¾" NPT female	1.5	318.00
116150AC	¾" NPT female, inlet check valve	1.7	388.00
116151A	¾" NPT female, gauge	1.6	338.00
116151AC	¾" NPT female, gauge, inlet check valve	1.8	408.00

NEW

116 ThermoSetter™

tech. broch. 01325



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 inlet check valve. Optional outlet temperature gauge. Max. working pressure: 230 psi Adjustment temperature range: 95°F - 140°F Cv disinfection: 1.2 Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

Code	Description	Lbs	USD
116240A	½" NPT female, gauge	1.8	386.00
116240AC	½" NPT female, gauge, inlet check valve	2.0	446.00
116250A	¾" NPT female, gauge	1.7	408.00
116250AC	¾" NPT female, gauge, inlet check valve	1.9	478.00

NEW



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" NPT M x F inline check valve	0.1	60.00
NA10467	¾" NPT M x F inline check valve	0.1	70.00

NEW

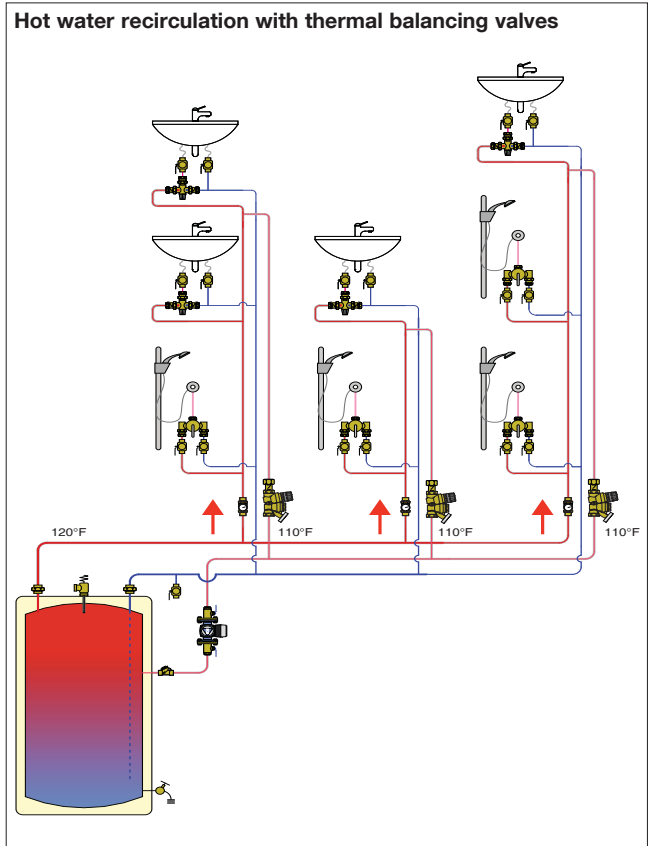
116 ThermoSetter™

tech. broch. 01325



Adjustable thermal balancing valve for domestic hot water recirculation circuits. With by-pass valve for thermal disinfection with optional 656 actuator. Drywell for temperature gauge. DZR low-lead brass body. Max. working pressure: 230 psi Adjustment temperature range: 95°F - 140°F Cv disinfection: 1.2 Cv max: 2.1; Cv min: 0.23 Certified to Low Lead Laws and listed by ICC-ES for use in accordance with the U.S. and Canadian plumbing codes.

Code	Description	Lbs	USD
116340A	½" NPT female, gauge	1.8	406.00
116340AC	½" NPT female, gauge, inlet check valve	2.0	466.00
116350A	¾" NPT female, gauge	1.7	428.00
116350AC	¾" NPT female, gauge, inlet check valve	1.9	498.00



HOT WATER RECIRCULATION THERMAL BALANCING VALVE

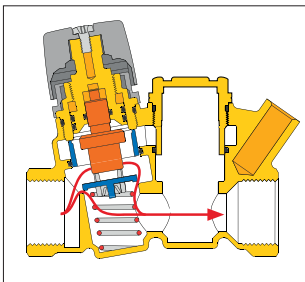
Function

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 pumping 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 95°F to 140°F (35°C to 60°C) 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.

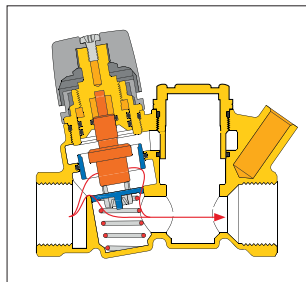
Operating mode A - Temperature control (1161xx series)

At the set temperature, the valve plug, controlled by the thermostatic balancing cartridge, gradually closes the outlet. The outlet is never fully closed, always allowing a minimum flow for temperature sensing and to prevent recirculation pump dead-heading. If the temperature decreases, the outlet flow increases, causing flow and thus temperature to increase back to the set temperature. If temperature exceeds the set-point, the plug stays in the minimum closed position.

Thermostatic balancing control



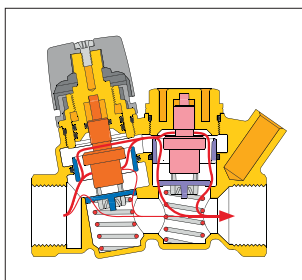
Minimum flow rate



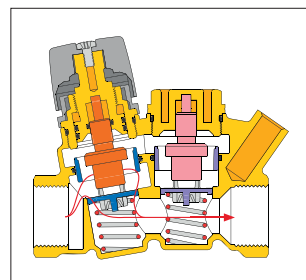
Operating mode B - Automatic thermostatic disinfection (1162xx series)

When a temperature higher than about 155°F (68°C) is reached, a by-pass passage begins to open to activate the second thermostatic cartridge which controls the thermal disinfection process, allowing flow independent of the operation of the thermostatic balancing cartridge. This allows water flow through a special by-pass port, opening the flow path up until the temperature of 160°F (70°C). If the temperature continues rising beyond this point, the flow is reduced through the by-pass port to allow thermal balancing even during the disinfection process. When temperature reaches about 170°F (75°C), the cartridge closes the disinfection by-pass port to protect the system fixtures from the effects of excessive temperatures.

Thermostatic disinfection by-pass



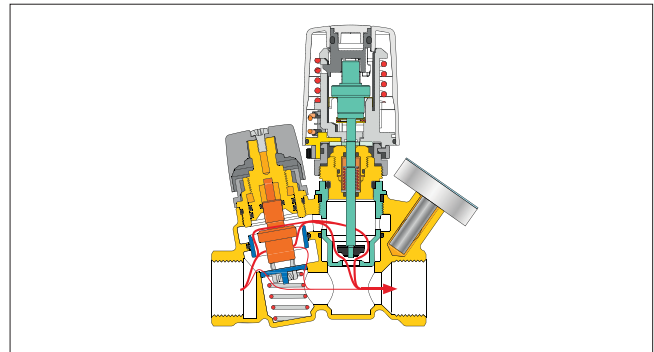
Thermal shut-off



Operating mode C - Actuator-controlled disinfection (1163xx series)

When the disinfection operating temperature setting of the electronic disinfection system is reached, the thermo-electric actuator 656 series (which is controlled by a dedicated electronic control system), is energized to operate the by-pass valve to control the disinfection process, allowing flow independent of the operation of the thermostatic balancing cartridge. In this case, the minimum head loss is produced during this thermal disinfection process.

Electric controlled disinfection by-pass



NEW



Replacement actuator thermal disinfection cartridge.

Code	Description	Lbs	USD
116000	Replacement actuator cartridge	0.1	90.00

NEW



Replacement thermal disinfection cartridge.

Code	Description	Lbs	USD
F000580	Replacement thermal cartridge	0.1	70.00

NEW



Insulation shell fits 116 series thermal balancing valve.

Code	Description	Lbs	USD
CBN116140	Insulation shell	0.1	38.60

NEW



Temperature gauge fit 116 series. Working temperature range: 30°F - 180°F


Code	Description	Lbs	USD
116010	1½" dial temp. gauge	0.1	20.00

BACKFLOW PREVENTER

Function

The backflow preventer prevents contaminated water from back-shiphoning into the the potable water supply system. This may occur when the pressure in the potable water supply system changes causing water flow reversal. The backflow preventer is installed between the potable water supply system and the internal domestic water supply system, creating a safety zone which prevents the water in the two systems from coming into contact.

573 Backflow Preventer

 [tech. broch. 01061](#)




Dual check continuous pressure backflow preventer with atmospheric vent.
 DZR low Lead brass body.
 Max. working pressure: 175 psi.
 Working temperature range: 32—210°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	½" NPT female inlet/outlet	1.7	126.80
573406A	½" press inlet/outlet	1.7	153.60
573409A	½" sweat inlet/outlet	1.7	120.80
573493A	½" sweat inlet x ½" F NPT outlet	1.7	123.90
573503A	¾" NPT female inlet/outlet	1.7	133.10

574 Backflow Preventer

 [tech. broch. 01022](#)



Testable reduced pressure zone backflow preventer.
 DZR low lead brass body.
 Max. working pressure: 150 psi.
 Max. working temperature: 150°F.
 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.

ASSE 1013

Code	Description	Lbs	USD
574004A	½" F NPT	5.0	500.00

574 Backflow Preventer

 [tech. broch. 01022](#)



Testable reduced pressure zone backflow preventer.
 DZR low lead brass body.
 Max. working pressure: 150 psi.
 Max. working temperature: 150°F.
 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.

ASSE 1013

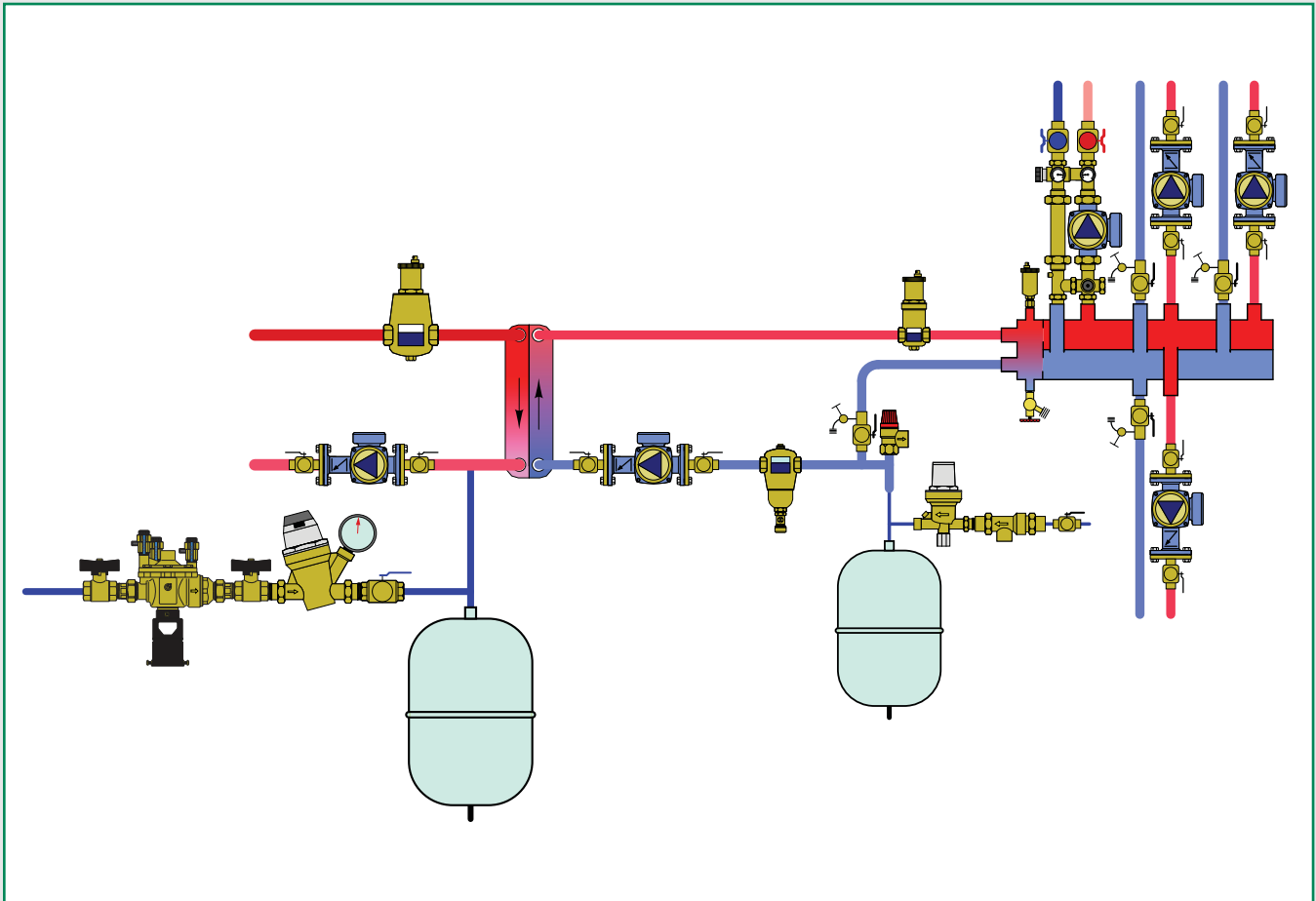
Code	Description	Lbs	USD
574050A	¾" F NPT	5.0	600.00

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 in the operation chamber from the water in the reduced pressure zone (RPZ) chamber

AUTOMATIC FILLING UNITS AND BACKFLOW PREVENTERS

This diagram is an example



Water treatment filling units, HYDROFILL™

Fill and flush cart, HYDROFLUSH™

Automatic filling units, AutoFill™

Backflow preventers

Boiler trim kits

WATER TREATMENT FILLING UNITS

Function

HYDROFILL™ is a water treatment filling unit that produces from site sourced water, demineralized water of an ideal grade for use in closed hydronic heating and cooling systems. Salts and other soluble minerals are almost entirely eliminated so as to prevent premature equipment malfunction including reduced efficiency or component failure due to lime scale formation, a common affliction of heat exchangers. The treated water results in low electrical conductivity to minimize corrosion due to galvanic attack. Also, by eliminating the variability of site produced water having different mineral content values from location to location, using treated water makes for more reliable dosing when chemical additives are used – such as glycol.



1. Water IN connection
2. Water OUT connection
3. Quick opening lever to release pressure and open
4. TDS-Meter
5. Handles to carry and open
6. Tank
7. Resin Bags
8. Stainless steel cart (NA570924 only)

Site water flows up through a column of mixed bed resin beads which are charged with negative and positive ions. The effectiveness of removing minerals from site water through exchange depends on the TDS of input site water and the time the water has in contact with the resin beads. The column height of resin and the water flow rate will determine the effectiveness of the ion exchange, the slower the flow rate the higher the efficiency.

Water treatment capacity

Water classification	Hardness (ppm)	NA570912 (gallons)	NA570924 (gallons)
Slightly hard	< 60	1,750	3,500
Moderately hard	61 - 120	1,375	2,750
Hard	121 - 180	1,000	2,000
Very hard	181 - 250	475	950
Extremely Hard	> 250	250	500

Capacities based on treating water containing 180 ppm (10.5 gpg) total dissolved solids (expressed as calcium carbonate), consisting of 25% sodium, 50% alkalinity, 77°F (25°C), at a flow rate of 6 gpm, delivering 30 ppm of treated water

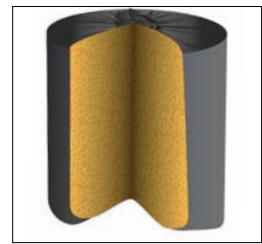
Construction details

Large yellow lever enables quick and easy opening of the tank. 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.



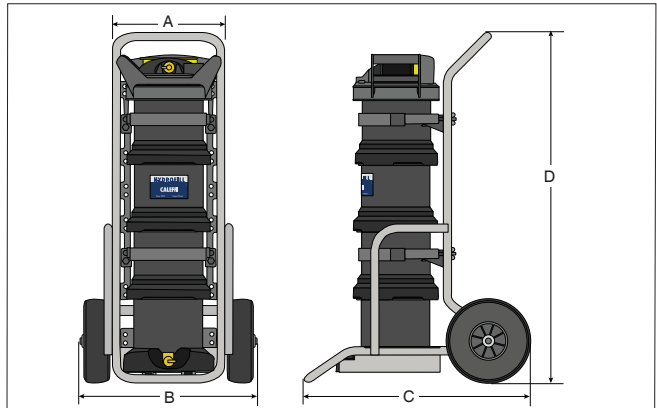
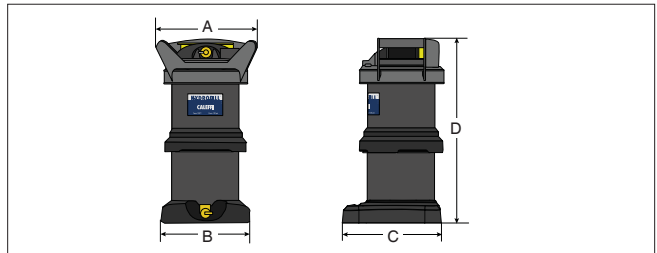
Highly accurate built-in TDS meter 0 - 999 ppm with resolution of 1 ppm due to its advanced microprocessor technology. Auto-Off function conserves battery power. The unit shuts off automatically after 10 minutes of non-use. Replaceable battery with a life of approximately 1000 hours of continuous use.

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.

Dimensions



Code	A	B	C	D	Wgt. Lbs.
NA570912	13"	11"	12"	22"	44
NA570924	13½"	21"	27"	42½"	98

WATER TREATMENT FILLING UNITS

**NA570
HYDROFILL™**

 tech. broch. 01247

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 NA579024: 12 gpm.
 TDS of water after treatment: < 30 ppm
 Connections: ¾" GHT




Code	Description	Lbs	USD
NA570912	Two resin filter bag unit	44	3,000.00
NA570924	Four resin filter bag unit with cart	98	5,700.00

Recyclable resin bags for HYDROFILL™ in reusable plastic pail.



Code	Description	Lbs	USD
NA570971	Two resin bags for NA570912	22	618.00
NA570974	Four resin bags for NA570924filter	43	1,235.00

NA575

 tech. broch. 01247

Multi-parameter TDS, pH & temperature tester kit complete with carrying case plus pH and conductivity calibration packets.
 Range TDS: 0 — 999.9 ppm.
 Range pH: 0 — 14.
 Range temp: 32 — 122°F.



Code	Description	Lbs	USD
NA575002	TDS, pH & temperature tester kit	3.0	745.00

NA573

 tech. broch. 01268

Replenishment water treatment filling unit, demineralizes site water through a color changing (indicates when to change) demineralizing cartridge.
 Complete including back flow preventer, isolation valves, filter housing with resin cartridge and AutoFill™.
 Max. inlet pressure: 125 psi.
 Max. working temperature: 100°F.
 Max. flow: 1 gpm.
 TDS of water after treatment: < 30 ppm
 Connections: ½" NPT



Code	Description	Lbs	USD
NA573022	½" F NPT inlet x ½" F NPT outlet	7.4	540.00
NA573102	10" color changing demineralizing filter	1.0	125.00

NA573

 tech. broch. 01268

Filter housing complete including color changing resin (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
 Connections: ½" NPT



Code	Description	Lbs	USD
NA573100	½" F NPT inlet x ½" F NPT outlet	3.4	245.00
NA573102	10" color changing demineralizing filter	1.0	125.00

NA256

Dual fill and flush valve.

(Select union fitting on page 90 or in Section 9)



Code	Description	Lbs	USD
NA256011	1" male union thread x ¾" GHT	0.8	219.50

**NA255
HYDROFLUSH™**

 tech. broch. 01280

HYDROFLUSH pump cart is portable, leak-tested unit for a easy, quick and clean way to wash, flush and fill hydronic systems.
 Medium: water, glycol and cleaning fluids.
 Tank: 13 gallon with dirt filter.
 Max. tank medium temperature: 150°F.
 Pump delivery flow: 1 — 13 gpm
 Pump feet of head: 220
 Max. pump pressure: 100 psi.
 Pump power: ½ HP (120 V AC).
 Isolating ball valves: ¾" garden hose thread.
 Transfer hoses: 6' with ¾" GHT (2 ea).
 Pressure gauge: 2" dial, 0 — 100 psi.
 Dimensions: 48"H x 20"W x 18"D.



Code	Description	Lbs	USD
NA25510	Wash, flush and fill cart	60	3,188.00

AUTOMATIC FILLING UNITS

553 AutoFill™

 [tech. broch. 01061](#)



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	1/2" M NPT inlet x 1/2" F NPT outlet	1.7	162.50
553549A	1/2" sweat inlet x 1/2" F NPT outlet	1.7	154.90
553642A	1/2" M NPT inlet x 1/2" F NPT outlet / gauge	1.7	183.40
553649A	1/2" sweat inlet x 1/2" F NPT outlet / gauge	1.7	175.80

573 AutoFill™ Combo

 [tech. broch. 01061](#)



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	1/2" F NPT inlet x 1/2" F NPT outlet	5.0	278.90
573006A	1/2" press inlet x 1/2" press outlet	5.0	309.30
573007A	1/2" press inlet x 1/2" F NPT outlet	5.0	294.10
573009A	1/2" sweat inlet x 1/2" F NPT outlet	5.0	265.60
573012A	1/2" F NPT inlet x 1/2" F NPT outlet / gauge	5.0	299.80
573016A	1/2" press inlet x 1/2" press outlet / gauge	5.0	333.40
573017A	1/2" press inlet x 1/2" F NPT outlet / gauge	5.0	316.60
573019A	1/2" sweat inlet x 1/2" F NPT outlet / gauge	5.0	286.50

BACKFLOW PREVENTERS

573 Backflow Preventer

 [tech. broch. 01061](#)



Dual check continuous pressure backflow preventer with atmospheric vent. DZR low lead brass body. Max. working pressure: 175 psi. Working temperature range: 32–210°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 inlet/outlet	1.7	126.80
573406A	1/2" press inlet/outlet	1.7	153.60
573409A	1/2" sweat inlet/outlet	1.7	120.80
573493A	1/2" sweat inlet x 1/2" F NPT outlet	1.7	123.90
573503A	3/4" NPT female inlet/outlet	1.7	133.10



Code	Description	Lbs	USD
NA10363	Gauge 0-60 psi/0-4 bar, 1/4" NPT	0.1	20.0




Code	Description	Lbs	USD
F59650	553 replacement cartridge	0.2	48.00



Code	Description	Lbs	USD
NA10197	AutoFill™ clear plastic disc cover	0.1	2.20

2nd QTR

574 Backflow Preventer

 [tech. broch. 01022](#)



Testable reduced pressure zone backflow preventer. DZR low lead brass body. Max. working pressure: 150 psi. Max. working temperature: 150°F. 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.

ASSE 1013

Code	Description	Lbs	USD
574004A	1/2" F NPT	5.0	500.00

2nd QTR

574 AutoFill™ Combo

 [tech. broch. 01022](#)



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	1/2" F NPT inlet x 1/2" F NPT outlet	9.4	655.50
574012A	1/2" F NPT inlet x 1/2" F NPT outlet, gauge	9.4	675.50

COMMERCIAL AUTOMATIC FILLING UNITS



5350 AutoFill™

tech. broch. 01085

Automatic filling valve.
Brass body.
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	210.40
535056A	¾" press	2.3	216.30
535057A	¾" pex barb	2.3	208.00
535059A	¾" sweat union	2.3	208.00
535066A	1" press	2.4	234.60
535067A	1" pex barb	2.4	225.60



574 AutoFill™ Combo

tech. broch. 01022

Pre-adjustable automatic filling valve with testable reduced pressure zone backflow preventer.
Brass body.
Max. working pressure: 140 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" F NPT inlet x ¾" F NPT outlet, gauge	9.4	801.30



NA102

Pressure gauge fits 5350 series AutoFill™.
Dial size: 2".
Pressure range: 0—100 psi /0-7 bar.
Connection: 1/8" NPT.

Code	Description	Lbs	USD
NA10273	1/8" NPT	20.1	20.00



574 Backflow Preventer

tech. broch. 01022

Testable reduced pressure zone backflow preventer.
DZR low lead brass body.
Max. working pressure: 150 psi.
Max. working temperature: 150°F.
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.

ASSE 1013

Code	Description	Lbs	USD
574050A	¾" F NPT	9.4	600.00



Replacement cartridge for 5350 series AutoFill™.

Code	Description	Lbs	USD
535004	AutoFill™ 5350 series replacement cartridge	0.1	76.80

BOILER TRIM KITS



NA553

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

- 1 Caleffi DISCAL® Air Separator
- 1 Backflow Preventer: ½" NPT or sweat union
- 1 AutoFill™
- 1 Expansion Tank Check Valve
- 2 Brass Nipples: 3"
- 1 NPT Brass Tee
- 1 Expansion Tank

NPT connections

Code	Description	Tank size (gal)	Lbs	USD
NA553252	¾" NPT	2.2	13	636.40
NA553362	1" NPT	4.4	15	778.50
NA553662	1" NPT	7.6	20	903.90
NA553372	1¼"NPT	4.4	16	900.80
NA553672	1¼"NPT	7.6	21	1,028.00

Sweat connections

Code	Description	Tank size (gal)	Lbs	USD
NA553259	¾" sweat	2.2	13	624.30
NA553369	1" sweat	4.4	15	762.90
NA553669	1" sweat	7.6	20	886.20
NA553379	1¼" sweat	4.4	16	884.10
NA553679	1¼" sweat	7.6	21	1,008.00

Press connections

Code	Description	Tank size (gal)	Lbs	USD
NA553366	1" press	4.4	15	835.50
NA553666	1" press	7.6	20	960.90
NA553376	1¼" press	4.4	16	1,003.80
NA553676	1¼" press	7.6	21	1,131.00

Sweat connections® (without backflow preventer)

Code	Description	Tank size (gal)	Lbs	USD
NA553259-B	¾" sweat	2.2	12	481.80
NA553369-B	1" sweat	4.4	13	618.60
NA553669-B	1" sweat	7.6	18	744.00
NA553379-B	1¼" sweat	4.4	15	742.00
NA553679-B	1¼" sweat	7.6	20	864.20

NA553

Boiler Trim Kits.
Boiler installation components in one box.
This kit includes:

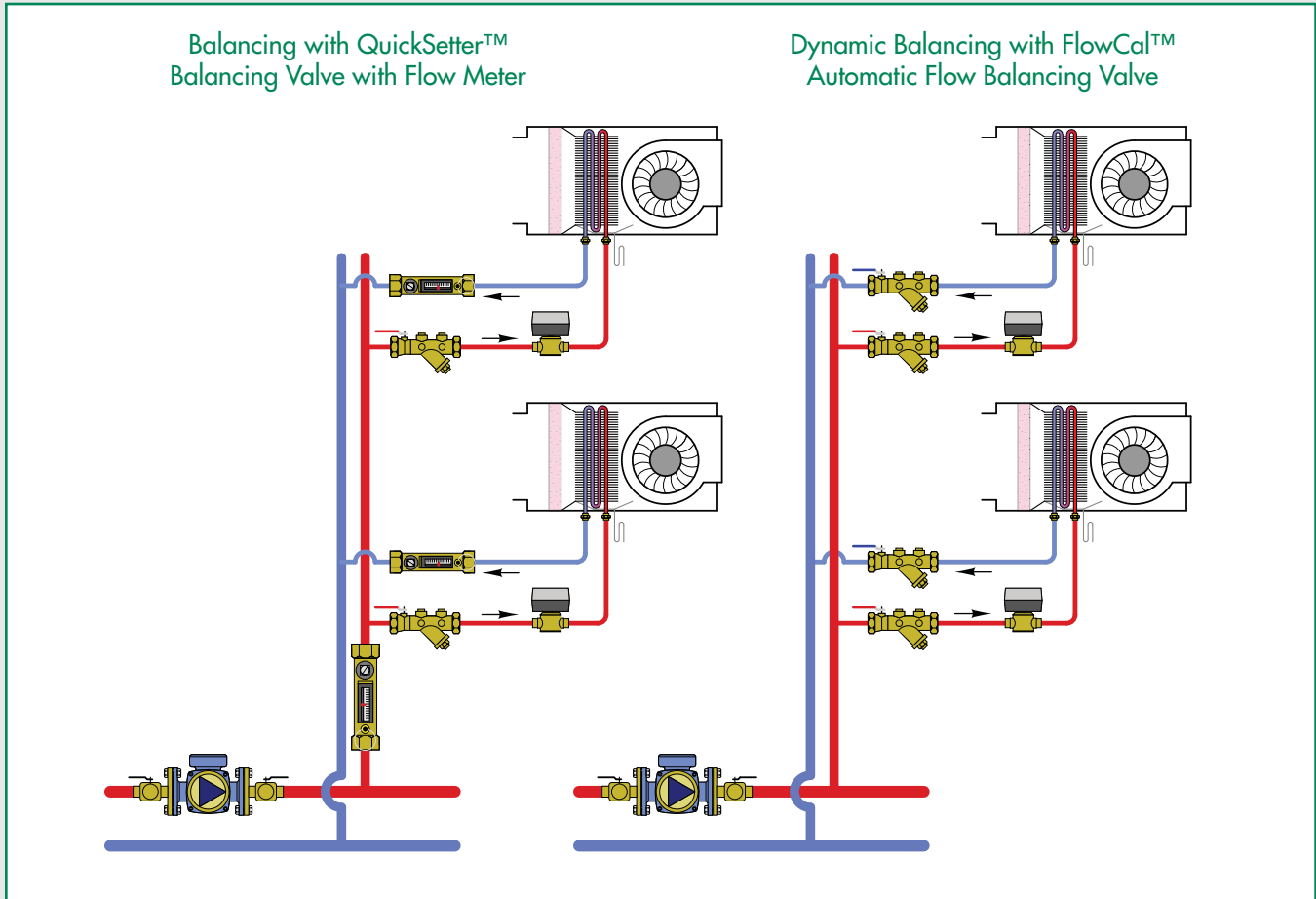
- 1 Air purger
- 1 MiniCal® air vent with service check
- 1 Backflow preventer: ½" sweat
- 1 AutoFill™
- 1 Expansion tank check valve
- 2 3" Brass nipples
- 1 Brass tee
- 1 Expansion tank



Code	Description	Tank size (gal)	Lbs	USD
NA553362P	1" female NPT	4.4	15	508.60
NA553372P	1¼" female NPT	4.4	16	508.60

BALANCING DEVICES

This diagram is an example



Low lead compact dynamic balancing valve, FlowCal™

Dynamic balancing valve, FlowCal™

Low lead fixed orifice static balancing valves

Low lead variable orifice static balancing valves

Static balancing valve with flow meter, QuickSetter™

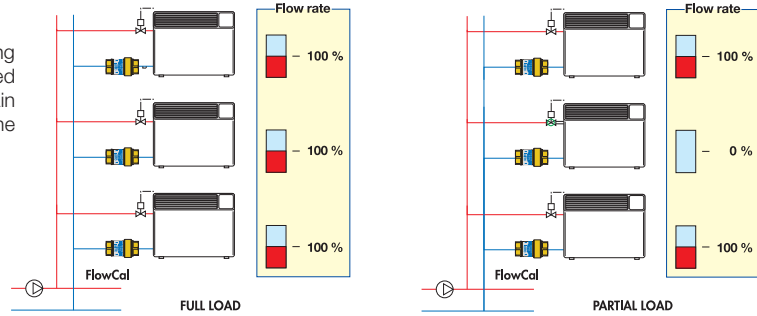
In-line flow meter / balancing valves

Y-Strainer

DYNAMIC BALANCING—FlowCal™ DEVICES

Circuits balanced with FlowCal™

FlowCal™ balances the hydraulic circuit by automatically controlling the design flow rate to each emitter. Even with some circuits closed by the control valves, the flow rates in the open circuits remain constant at the nominal value. The system always provides the greatest comfort and the highest energy savings.



LOW LEAD COMPACT DYNAMIC BALANCING VALVE



**127
FlowCal™**

tech. broch. 01166

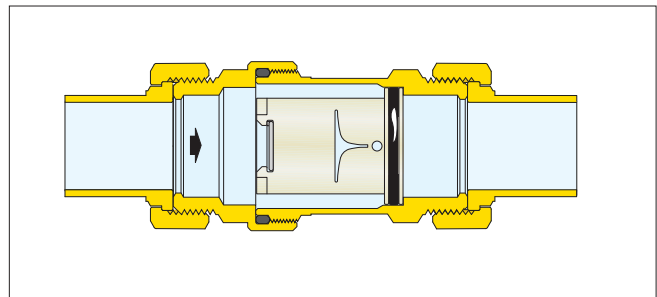
Compact automatic flow balancing valve.
 DZR low-lead brass body.
 Patented anti-scale, low noise polymer FlowCal™ cartridge.
 Max. working pressure: 232 psi (16 bar).
 Temperature range: 32–212°F (0–100°C).
 Max. percentage of glycol: 50%
 Differential pressure control ranges: 2–14, 2–32, 4–34, 5–35 psid.
 Flow rate: 16 fixed flow rate settings ranging from 0.5–10 GPM.
 Flow accuracy: ±10%.
 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.

Code	Description	Lbs	USD
127341AF ...	½" NPT male	1.0	139.80
127346AF ...	½" Press	1.0	154.70
127347AF	½" PEX barb NEW	1.0	131.80
127349AF ...	½" sweat	0.8	133.10
127351AF ...	¾" NPT male	1.0	146.20
127356AF ...	¾" Press	1.0	169.20
127357AF	¾" PEX barb NEW	1.0	139.60
127359AF ...	¾" sweat	0.8	139.10
127361AF ...	1" NPT male	1.2	167.60
127366AF ...	1" Press	1.3	209.40
127367AF	1" PEX barb NEW	1.3	174.20
127369AF ...	1" sweat	1.0	159.70

Select desired flow rate to complete full part number.

No restrictions.

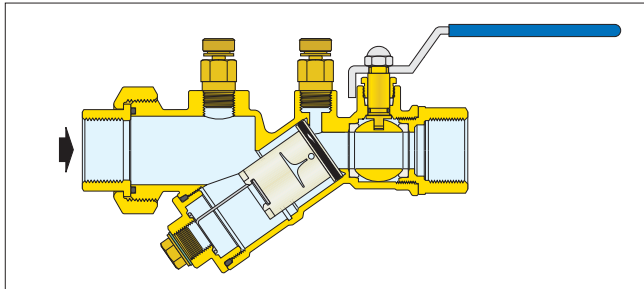
GPM	Last 3 digits ...	Differential Pressure Control Ranges (psid)
½	G50	2–14
¾	G75	
1	1G0	2–32
1½	1G5	
2	2G0	
2½	2G5	
3	3G0	
3½	3G5	



GPM	Last 3 digits ...	Differential Pressure Control Ranges (psid)
4	4G0	2–32
4½	4G5	
5	5G0	
6	6G0	4–34
7	7G0	
8	8G0	
9	9G0	5–35
10	10G	

Replacement flow cartridge kits are available. Consult factory.

DYNAMIC BALANCING VALVE



121 FlowCal™

tech. broch. 01141

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: 27 fixed flow rate settings ranging from 0.5–21 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	193.50
121149A ●●●	½" sweat	2.7	184.30
121151A ●●●	¾" NPT female	2.7	195.80
121159A ●●●	¾" sweat	2.7	186.50
121161A ●●●	1" NPT female	5.0	399.20
121169A ●●●	1" sweat	5.0	380.20
121171A ●●●	1¼" NPT female	5.0	447.70
121179A ●●●	1¼" sweat	5.0	426.30
121341A ●●●	½" NPT female with PT test ports	3.2	207.40
121349A ●●●	½" sweat with PT test ports	3.2	198.10
121351A ●●●	¾" NPT female with PT test ports	3.2	210.40
121359A ●●●	¾" sweat with PT test ports	3.2	200.30
121361A ●●●	1" NPT female with PT test ports	5.5	413.70
121369A ●●●	1" sweat with PT test ports	5.5	394.10
121371A ●●●	1¼" NPT female with PT test ports	5.5	462.20
121379A ●●●	1¼" sweat with PT test ports	5.5	440.20

Select desired flow rate to complete full part number.

Size	GPM	Last 3 digits ...	Differential Pressure Control Ranges (psid)
½", ¾"	½	G50	2 – 14
½", ¾"	¾	G75	
½", ¾"	1	1G0	
½", ¾"	1½	1G5	2 – 32
½", ¾"	2	2G0	
½", ¾", 1"	2½	2G5	
½", ¾", 1"	3	3G0	
½", ¾", 1"	3½	3G5	
½", ¾", 1", 1¼"	4	4G0	
½", ¾", 1", 1¼"	4½	4G5	4 – 34
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	
1", 1¼"	15	15G	4 – 35
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"	½–10 GPM
¾"	½–10 GPM
1"	2½–21 GPM
1¼"	4–21 GPM

Replacement flow cartridge kits are available. Consult factory.

LOW LEAD FIXED ORIFICE STATIC BALANCING VALVES

130 Fixed Orifice Balancing Valve

 tech. broch. 01251



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.

Code	Description	Max. valve Cv	Lbs	USD
130400A	½" NPT	3.7	1.0	193.30
130500A	¾" NPT	5.1	1.2	209.00
130600A	1" NPT	8.8	1.5	250.80
130700A	1¼" NPT	14.0	2.0	313.50
130800A	1½" NPT	19.7	2.3	391.90
130900A	2" NPT	30.5	2.5	522.50

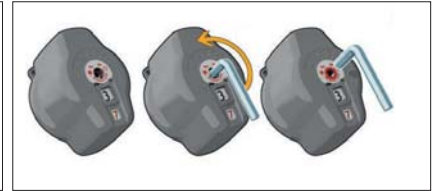
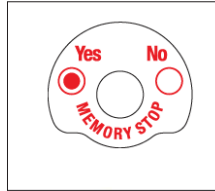
Venturi flow rate measurement device

The 130 series valves are equipped with a flow rate measurement device based on the Venturi effect. The device is incorporated in the body of the valve upstream of the valve plug.



Insulation shell fits 130 series balancing valves.

Code	Description	Lbs	USD
CBN130400	fits ½" NPT	0.1	42.50
CBN130500	fits ¾" NPT	0.1	46.00
CBN130600	fits 1" NPT	0.1	55.20
CBN130700	fits 1¼" NPT	0.1	69.00
CBN130800	fits 1½" NPT	0.1	86.20
CBN130900	fits 2" NPT	0.1	115.00



Memory Stop

The 130 series balancing valve features a memory stop that allows the valve to be reopened to the initial position if it has been closed for any reason such as isolating components in the balanced circuit. Locking the position to be memorized requires the use of a 2.5 mm hex key.

LOW LEAD VARIABLE ORIFICE STATIC BALANCING VALVE

142 Variable Orifice Balancing Valve

 tech. broch. 01250



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.

Code	Description	Cv	Lbs	USD
142241A	½" NPT	3.4	1.0	162.00
142251A	¾" NPT	5.0	1.2	172.40
142261A	1" NPT	7.5	1.5	235.10
142271A	1¼" NPT	12.9	2.3	334.40
142281A	1½" NPT	16.8	3.0	376.20
142291A	2" NPT	22.0	3.5	480.70



Insulation shell fits 142 series balancing valves.

Code	Description	Lbs	USD
CBN142241A	fits ½" NPT	0.1	38.90
CBN142251A	fits ¾" NPT	0.1	41.40
CBN142261A	fits 1" NPT	0.1	56.40
CBN142271A	fits 1¼" NPT	0.1	80.30
CBN142281A	fits 1½" NPT	0.1	90.30



STATIC BALANCING VALVE WITH FLOW METER



132 QuickSetter™  tech. broch. 01149

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.
Graduated scale flow meter with magnetic movement flow rate indicator.

With insulation.
Max. working pressure: 150 psi.
Temperature range: 14–230°F.
Max. percentage of glycol: 50%.



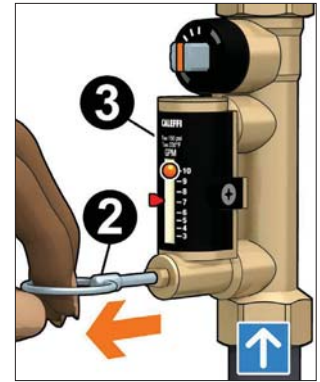
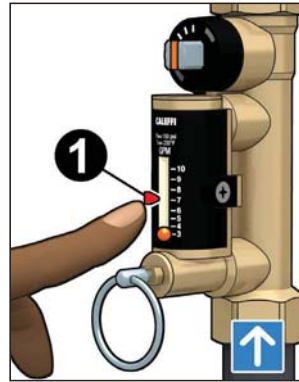
Code	Description	Flow scale (gpm)	Lbs	USD
132432A	½" NPT	0.5–1.75	2.0	272.40
132552A	¾" NPT	2.0–7.0	1.8	293.40
132662A	1" NPT	3.0–10.0	2.4	342.10
132772A	1¼" NPT	5.0–19.0	2.8	453.90
132882A	1½" NPT	8.0–32.0	3.4	537.80
132992A	2" NPT	12.0–50.0	4.4	659.80
F19346	Replacement by-pass valve stem*	0.1		53.50

*with operating ring

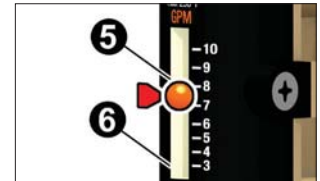
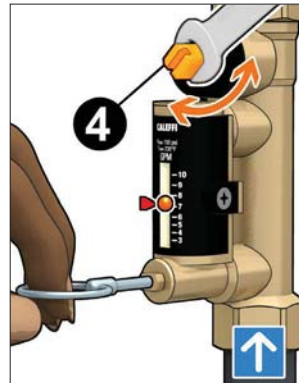
Flow rate adjustment

The flow rate is adjusted as follows:

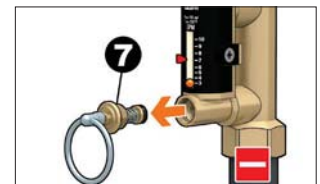
- A. With the aid of the flow rate indicator (1), mark the desired flow rate.
- B. Use the operating ring (2) to open the by-pass valve slowly. This allows fluid to flow through the flow meter (3). The bypass valve is automatically closed under normal operating conditions.



- 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.



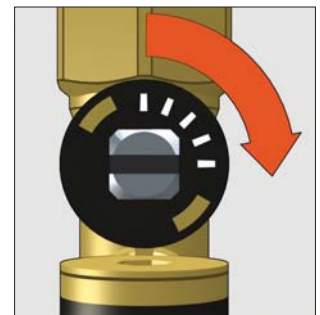
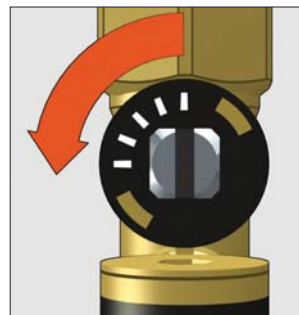
- D. Once the flow rate is properly adjusted, release the operating ring (2) of the by-pass valve. The valve will automatically return to the closed position by means of an internal spring.
- E. A replacement by-pass valve stem (7) with operating ring is available in event it is damaged and inoperable. Order code F19346.



Complete opening and closing of the valve

Full opening of the valve

Full closing of the valve



132 QuickSetter™  tech. broch. 01149

Balancing valve with flow meter.
Direct reading of flow rate.
Cast iron body.
Brass flow meter.
Characterized rotating valve for smoother flow rate adjustment.
Graduated scale flow meter with magnetic movement flow rate indicator.
ANSI 150 flange connections.

With insulation.
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	20–105	35	1,662.00
132080A	3" ANSI flange	35–140	62	2,216.00
132100A	4" ANSI flange	55–210	67	3,384.40

Y-STRAINER WITH BALL VALVE

**120
Y-strainer**

 tech. broch. 01141

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	175.50
120149A 000	½" sweat	8.0	3.0	167.10
120151A 000	¾" NPT female	8.4	3.0	177.80
120159A 000	¾" sweat	8.4	3.0	169.30
120161A 000	1" NPT female	19	6.0	350.90
120169A 000	1" sweat	19	6.0	334.10
120171A 000	1¼" NPT female	20	6.0	399.20
120179A 000	1¼" sweat	20	6.0	380.20
120341A 000	½" NPT female with PT	8.0	3.5	190.00
120349A 000	½" sweat with PT	8.0	3.5	180.90
120351A 000	¾" NPT female with PT	8.4	3.5	192.30
120359A 000	¾" sweat with PT	8.4	3.5	183.10
120361A 000	1" NPT female with PT	19	6.5	365.40
120369A 000	1" sweat with PT	19	6.5	348.10
120371A 000	1¼" NPT female with PT	20	6.5	413.80
120379A 000	1¼" sweat with PT	20	6.5	394.10

STATIC BALANCING WITH FLOW METER

NA223



Direct in-line balancing / flow meter with brass body.
 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	188.10



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

Code	Description	Lbs	USD
NA12249	½" sweat with 1" union nuts	0.2	38.60
NA12259	¾" sweat with 1" union nuts	0.2	46.40
NA12269	1" sweat with 1" union nuts	0.3	81.00

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	19.90
538402 FD	½" NPT fits 1—1¼" 120 series	0.3	20.30

**100
PT test ports**

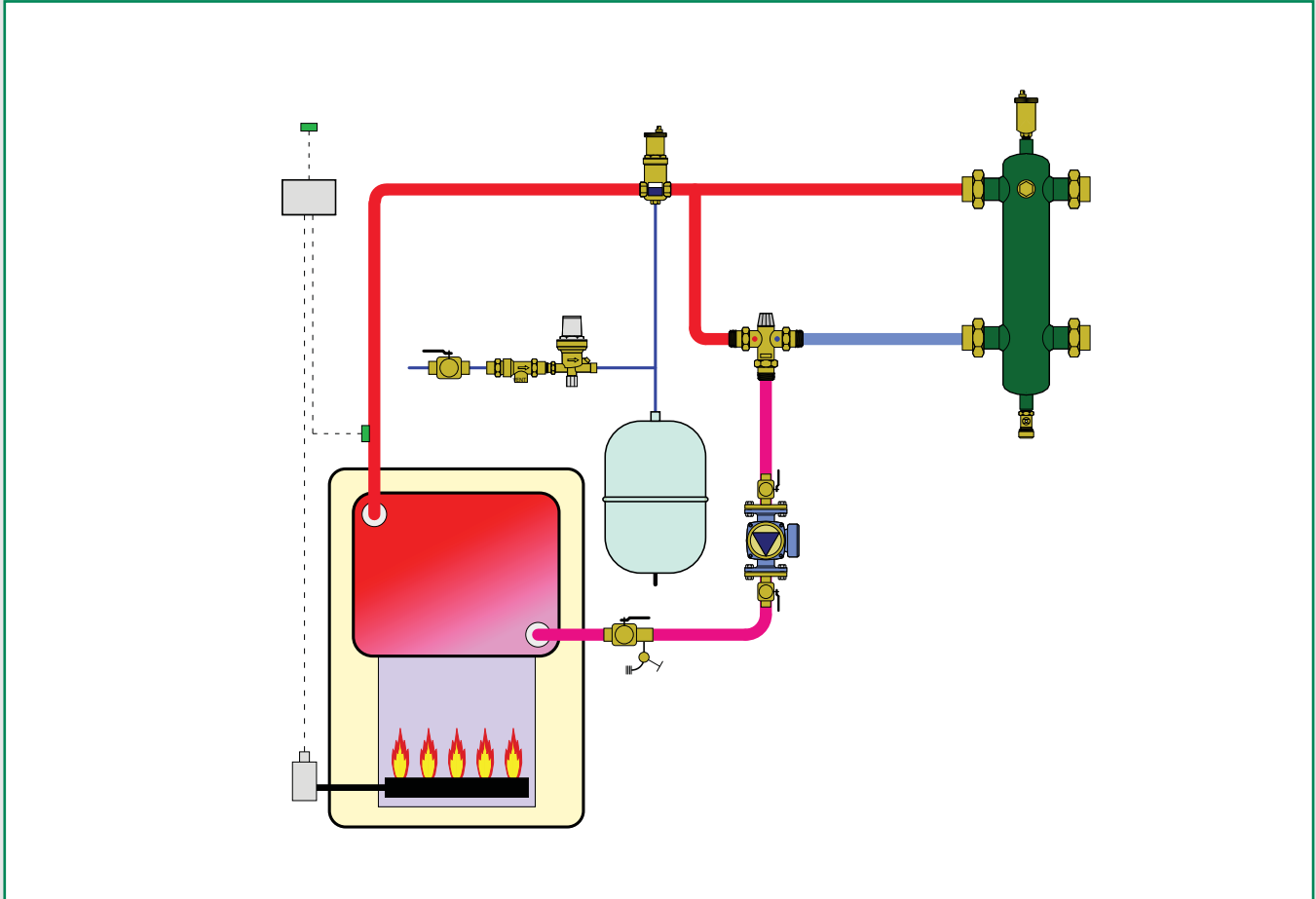


Fast-plug pressure/temperature test ports fits FlowCal™ automatic flow balancing valves and the 120 series Y-strainer. The double-sealing core insures long and trouble free service.
 Low Lead brass body.
 Nordel Core.
 Connections: ¼" NPT male.
 Cap thread: ⅜"-24 UNF
 Working temperature range: 0—275°F.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

Code	Description	Lbs	USD
100001A	Standard size, 1½" length (pair)	0.5	21.90

FITTINGS

This diagram is an example



Presscon™ fitting kits

Sweat union sets

In-line check valves

Mixing valve fittings

Zone valve fittings

AutoFill™ and backflow preventer fittings

Hydro separator fittings

Elbows, Tees and Crosses

Fittings configuration table

SMALL MIXING VALVE AND ZONE VALVE FITTINGS



Tail piece with check valve.
Low lead brass.

Code	Description	Lbs	USD
59893A	½" NPT male fits 1" nut	0.2	28.30
59840A	¾" NPT male for 1" nut	0.3	38.40



Tail piece without check valve.
Low lead brass.

Code	Description	Lbs	USD
R31981	½" NPT male fits 1" nut	0.4	15.10
31901A	¾" NPT male for 1" nut	0.4	19.00



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

Code	Description	Lbs	USD
59817A	1" NPT male with 1" nut	0.2	42.70
59894A	1" NPT male with 1" nut w/check valve	0.4	62.10



Tail piece with check valve.
Low lead brass.

Code	Description	Lbs	USD
59904A	½" NPT male fits 1" nut	0.2	24.40
59905A	¾" NPT male for 1" nut	0.3	34.50



Presscon™ 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	0.1	22.80
NA16265	¾" press with 1" union nut	0.1	25.20
NA16266	1" press with 1" union nut	0.1	44.80



Presscon™ 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	57.50
NA16265LC	¾" long press with 1" union nut/check valve	0.3	72.90



Presscon™ copper press low lead tail piece, requires R11217 1" slip nut.

Code	Description	Lbs	USD
NA10403	½" press fits 1" nut	0.1	29.50
NA10419	¾" press long fits 1" slip nut R11217	0.3	50.00
NA10404	1" press fits 1" slip nut R11217	0.4	45.00



Tail piece.
Low lead brass.

Code	Description	Lbs	USD
NA10002	½" sweat fits 1" nut	0.3	11.10
NA10003	¾" sweat fits 1" nut	0.4	15.00



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

Code	Description	Lbs	USD
59834A	1" sweat with 1" nut	0.4	38.30
59906A	1" sweat with 1" nut w/check valve	0.5	57.80



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

Code	Description	Lbs	USD
NA10164	½" sweat fits 1" nut	0.2	33.90
NA10165	¾" sweat fits 1" nut	0.3	39.90



Tail piece with high temperature check valve.
Low lead brass. Requires sealing washer R50055, not included.

Code	Description	Lbs	USD
NA10166	1" sweat with 1" nut w/check valve	0.4	65.30



Presscon™ copper press low lead tail piece with check valve, requires R11217 1" slip nut.

Code	Description	Lbs	USD
NA10419C	¾" press long fits 1" slip nut w/check	0.3	58.20



PEX barb tailpiece for 1" union nut, requires sealing washer and nut, not included.

Code	Description	Lbs	USD
F000492	½" PEX barb tailpiece for 1" union nut	0.1	11.10
F000520	¾" PEX barb tailpiece for 1" union nut	0.1	15.00
F000521	1" PEX barb tailpiece for 1" union nut	0.1	32.30



PEX barb tailpiece for 1" union nut with check valve, requires sealing washer and nut, not included.

Code	Description	Lbs	USD
NA10484	½" PEX barb tailpiece for 1" union nut	0.3	24.40
NA10485	¾" PEX barb tailpiece for 1" union nut	0.3	34.50
NA10486	1" PEX barb tailpiece for 1" union nut	0.3	51.80

SMALL MIXING AND ZONE VALVE FITTINGS



Union nut fits 1" union thread.

Code	Description	Lbs	USD
F61008	1" brass nut	0.2	6.00
F61008/C	1" chrome-plated nut	0.2	7.10
R11217	1" brass slip nut	0.2	8.30



Washer fits 1" union thread.

Code	Description	Lbs	USD
F50055	1" union washer	0.1	2.20



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	3.30



Two union nuts, washers and tail pieces fits 1" union thread. Low-lead brass.

Code	Description	Lbs	USD
NA12249	1/2" sweat with 1" union nuts	0.2	38.60
NA12259	3/4" sweat with 1" union nuts	0.2	46.40
NA12269	1" sweat with 1" union nuts	0.3	81.00

PRESSURE REDUCER VALVE FITTINGS

NEW



Tail piece and union nut

Code	Description	Lbs	USD
F49644	1/2" FNPT tailpiece for 3/4" union nut	0.1	25.30
F49645	3/4" FNPT tailpiece for 1" union nut	0.1	28.50
F49646	1" FNPT tailpiece for 1 1/4" union nut	0.1	39.90

NEW



Tail piece and union nut

Code	Description	Lbs	USD
F000494	1 1/2" sweat tailpiece for 2" union nut	0.1	89.70
F000496	2" sweat tailpiece for 2 1/2" union nut	0.1	144.90

NEW



Tail piece and union nut

Code	Description	Lbs	USD
F000493	1 1/2" FNPT tailpiece for 2" union nut	0.1	110.20
F000495	2" FNPT tailpiece for 2 1/2" union nut	0.1	142.90

5231 SERIES MIXING VALVE FITTINGS



Tail piece
Low lead brass.

Code	Description	Lbs	USD
31554 FD	1" sweat, fits 523168A	0.3	47.20
41787 CST	1 1/4" sweat, fits 523177 & 523178A	0.3	46.50
41788 CST	1 1/2" sweat, fits 523188A	0.3	73.60
41789 CST	2" sweat, fits 523198A	0.5	95.50



Tail piece
Low lead brass.

Code	Description	Lbs	USD
NA10009	1" NPT male, fits 523160A	0.2	59.60
R41660	1 1/4" NPT male, fits 523170A	0.3	68.10
41371A	1 1/2" NPT male, fits 523180A	0.2	76.80
41372A	2" NPT male, fits 523190A	0.2	98.80



Washer

Code	Description	Lbs	USD
R50057*	1 1/2" union washer	0.1	4.60
R50060**	2 1/2" union washer	0.1	22.00

*fits 523160A, 68A, 70A, 77A, 78A.

**fits 523180A, 88A, 90A, 98A.



Union nut

Code	Description	Lbs	USD
R31589*	1 1/2" union nut	0.4	20.40
R51838**	2 1/2" union nut	0.5	49.40

*fits 523160A, 68A, 70A, 77A, 78A.

**fits 523180A, 88A, 90A, 98A.

AUTOFILL™ FITTINGS



AutoFill™ union nut.

Code	Description	Lbs	USD
F41186	¾" union nut	0.1	4.70



AutoFill™ tail piece.

Code	Description	Lbs	USD
NA10001	½" sweat	0.3	13.10



AutoFill™ tail piece.

Code	Description	Lbs	USD
F31868	½" NPT M	0.1	15.80



AutoFill™ washer.

Code	Description	Lbs	USD
R50058	¾" union washer	0.1	1.90

BACKFLOW PREVENTER FITTINGS



Tail piece with screen fits 573 backflow preventer.

Code	Description	Lbs	USD
31970A	½" NPT female	0.1	18.80



Tail piece with screen fits 573 backflow preventer.

Code	Description	Lbs	USD
41380A	½" sweat female	0.1	18.80



Washer union fits 573 backflow preventer.

Code	Description	Lbs	USD
R50065	Union washer	0.1	4.50

HYDRO SEPARATOR FITTINGS



Tail piece.

Code	Description	Lbs	USD
31553 FD	1" NPT female, fits 548006A, 549506A	0.3	23.50
31401 FD	1¼" NPT female, fits 548007A, 549507A	0.3	53.20
R41441	1½" NPT female, fits 548008A, 549508A	0.3	51.40
31426 FD	2" NPT female, fits 548009A, 549509A	0.4	105.10



Tail piece.

Code	Description	Lbs	USD
31554 FD	1" sweat, fits 548096A, 549596A	0.3	47.20
31403 FD	1¼" sweat, fits 548097A, 549597A	0.3	87.80
41882A	1½" sweat, fits 54898A, 549598A	0.3	83.00
31428 FD	2" sweat, fits 548099A, 549599A	0.4	136.00



Presscon™ press tail piece.

Code	Description	Lbs	USD
NA10406	1" press, fits 548066A, 549566A	0.6	60.90
NA10407	1¼" press, fits 548067A, 549567A	0.7	91.40
NA10408	1½" press, fits 548068A, 549568A	0.9	128.50
NA10409	2" press, fits 548069A, 549569A	1.0	209.00



Union nut.

Code	Description	Lbs	USD
R31589	Fits 548006A and 548096A, 5495x6A	0.4	20.40
R53003	Fits 548007A and 548097A, 5495x7A	0.4	40.30
R53004	Fits 548008A and 548098A, 5495x8A	0.4	40.30
R53005	Fits 548009A and 548099A, 5495x9A	0.4	46.10



Union washer.

Code	Description	Lbs	USD
R50005	Fits 1" 548006A and 549096A, 5495x6A	0.2	4.50
R50008	Fits 1¼" 548007A and 548097A, 5495x7A	0.2	9.40
R50047	Fits 1½" 548008A and 548098A, 5495x8A	0.2	18.70
R50048	Fits 2" 548009A and 548099A, 5495x9A	0.2	22.80

FITTINGS WITH 3/4" THREADS



Double nipple.

Code	Description	Lbs	USD
NA12122	3/4" x 3/4" male	0.3	28.50



Double nipple.

Code	Description	Lbs	USD
NA12172	3/4" NPT x 3/4" NPT	0.3	28.50



Union nut.

Code	Description	Lbs	USD
F41186	3/4" union nut	0.1	4.70



Sweat adapter.

Code	Description	Lbs	USD
NA10118	3/4" sweat x 3/4" male thread	0.3	28.50



Nipple.

Code	Description	Lbs	USD
NA12152	3/4" male w/ O-ring x 3/4" male thread	0.3	30.50

FITTINGS WITH 1" THREADS



Double nipple.

Code	Description	Lbs	USD
NA12123	1" x 1" male thread	0.4	35.60



Double nipple.

Code	Description	Lbs	USD
NA12173	1" NPT x 1" NPT	0.4	35.60



Bushing.

Code	Description	Lbs	USD
NA10060	3/4" NPT female w/ 1" male thread	0.3	28.50



Sweat adapter.

Code	Description	Lbs	USD
NA10061	3/4" sweat adaptor w/ 1" male thd.	0.2	29.80



Sweat adapter.

Code	Description	Lbs	USD
NA10062	1" sweat adaptor w/ 1" male thd.	0.1	30.80



Double union connector high temperature silicone O-ring pre-installed inside union.

Code	Description	Lbs	USD
NA10272	1" female thread union	0.5	54.90



High temperature silicone O-ring, replacement for NA10272.

Code	Description	Lbs	USD
NA10271	Red silicone o-ring	0.1	4.40

FITTINGS WITH 1" THREADS

Nipple.



Code	Description	Lbs	USD
NA10064	1" NPT w/ 1" male thread	0.2	32.10

Nipple.



Code	Description	Lbs	USD
NA12162	3/4" male w/ O-ring x 1" male thread	0.2	33.00

Bushing.



Code	Description	Lbs	USD
NA10089	3/4" female thread x 1" male thread	0.1	23.70

Plug.



Code	Description	Lbs	USD
NA10083	1" male threaded plug	0.2	17.80

Disk.



Code	Description	Lbs	USD
NA10104	1" disk	0.1	4.70

Cap.



Code	Description	Lbs	USD
586600	1" female thread cap	0.2	16.10

High temperature silicone flat 1" washer.



Code	Description	Lbs	USD
NA10302	1" flat silicone gasket	0.1	3.30

FITTINGS WITH 1 1/4" THREADS

Double nipple.



Code	Description	Lbs	USD
NA12124	1 1/4" x 1 1/4" thread	0.4	57.10

Sweat adapter.



Code	Description	Lbs	USD
NA10119	1" sweat adapter x 1 1/4" union thread	0.4	39.20

Bushing.



Code	Description	Lbs	USD
NA10087	1" female x 1 1/4" male thd. bushing	0.4	28.70

Bushing.



Code	Description	Lbs	USD
61215A	1" NPT F x 1 1/4" M thd. bushing	0.8	28.50

Nipple.



Code	Description	Lbs	USD
R31706	1" male x 1 1/4" male nipple	0.3	35.60

Plug.



Code	Description	Lbs	USD
NA10236	1 1/4" male threaded plug	0.1	22.40

Disk.



Code	Description	Lbs	USD
R11059	1 1/4" female disk	0.1	6.00

FITTINGS



(NAL6263 shown)

Brass fittings, elbows.
Male (M) straight thread.
Female (F) straight thread.
Female (F) union nut.
22mm female compression.



(NAC6TT26341 shown)

Brass fittings, cross.
Male (M) straight thread (thd).
Female (F) straight thread (thd).
Female (F) union nut.
NPT (F) Female.
22mm female compression.
Sweat (F).

Code	Description	Lbs	USD
NAL5263	3/4" M thread x 1" F union nut	0.4	72.90
NAL5736	3/4" F thread x 22mm comp.	0.4	55.40
NAL6262	1" M thread x 1" M thread	0.4	41.30
NAL6263	1" M thread x 1" F union nut	0.4	54.00
NAL6273	1" M thread x 1 1/4" F union nut	0.4	88.10
NAL6363	1" F union nut x 1" F union nut	0.4	66.70
NAL7262	1 1/4" M thread x 1" M thread	0.4	70.00
NAL7263	1 1/4" M thread x 1" F union nut	0.4	82.80
NAL7273	1 1/4" M thread x 1 1/4" F union nut	0.4	116.80

Code	Description	Lbs	USD
NAC41TT5454	1/2" NPT F x T. well x 3/4" Sweat x 3/4" Swt	2.0	184.40
NAC623641TT	1" M x 22mm x 1/2" NPT F x T. well	2.0	172.60
NAC6262TT41	1" M x 1" M x T. well x 1/2" NPT F	2.0	148.90
NAC6263TT41	1" M x 1" F nut x T. well x 1/2" NPT F	2.0	161.70
NAC62TT6241	1" M x T. well 1" M x 1/2" NPT F	2.0	148.90
NAC62TT6341	1" M x T. well x 1" F nut x 1/2" NPT F	2.0	161.70
NAC72TT6241	1 1/4" M x T. well x 1" M x 1/2" NPT F	2.0	177.70
NAC72TT7241	1 1/4" M x T. well x 1 1/4" M x 1/2" NPT F	2.0	206.40

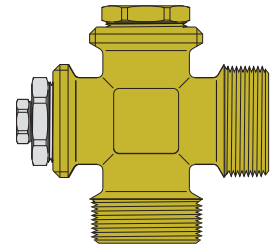
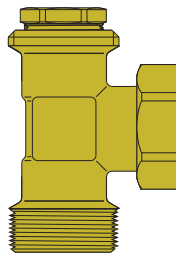
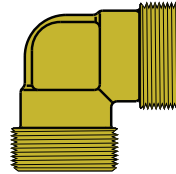


(NAT634162 shown)

Brass fittings, Tees.
Male (M) straight thread (thd).
Female (F) straight thread (thd).
Female (F) union nut.
NPT (F) Female.
22mm female compression.
Sweat (F)

Code	Description	Lbs	USD
NAT417272	1/2" NPT F x 1 1/4" M thd x 1 1/4" M thd	0.6	116.20
NAT523641	3/4" M thd x 22mm comp. x 1/2" NPT F	0.6	94.60
NAT524136	3/4" M thd x 1/2" NPT F x 22mm comp.	0.6	94.60
NAT545641	3/4" Sweat x 3/4" comp. x 1/2" NPT F	0.6	80.50
NAT574136	3/4" F thd x 1/2" NPT F x 22mm comp.	0.6	64.10
NAT623641	1" M thd x 22mm comp. x 1/2" NPT F	0.6	73.70
NAT624136	1" M thd x 1/2" NPT F x 22mm comp.	0.6	73.70
NAT624162	1" M thd x 1/2" NPT F x 1" M thd	0.6	50.00
NAT626241	1" M thd x 1" M thd x 1/2" NPT F	0.6	50.00
NAT626262	1" M thd x 1" M thd x 1" M thd	0.6	51.10
NAT626341	1" M thd x 1" F union nut x 1/2" NPT F	0.6	62.70
NAT626362	1" M thd x 1" F union nut x 1" M thd	0.6	63.80
NAT6263TT	1" M thd x 1" F union nut x Temp well	0.6	104.30
NAT62TT63	1" M thd x Temp well x 1" F union nut	0.6	104.30
NAT634162	1" F union nut x 1/2" NPT F x 1" M thd	0.6	62.70
NAT636262	1" F union nut x 1" M thd x 1" M thd	0.6	63.80
NAT6362TT	1" F union nut x 1" M thd x Temp well	0.6	104.30
NAT724162	1 1/4" M thd x 1/2" NPT F x 1" M thd	0.6	78.70

SPECIAL CONFIGURED FITTINGS



Brass fittings are configured by starting at 12:00 position and moving clockwise to 3:00 position followed by clockwise to 6:00 position ending with 9:00 position on cross. Special order any configuration of fitting by specifying connections type and size plus clock position.

Code	Description	Lbs	USD
NALXXXX	Special configured elbow	0.4	CF*
NATXXXXXX	Special configured tee	0.6	CF*
NACXXXXXXXX	Special configured cross	2.0	CF*

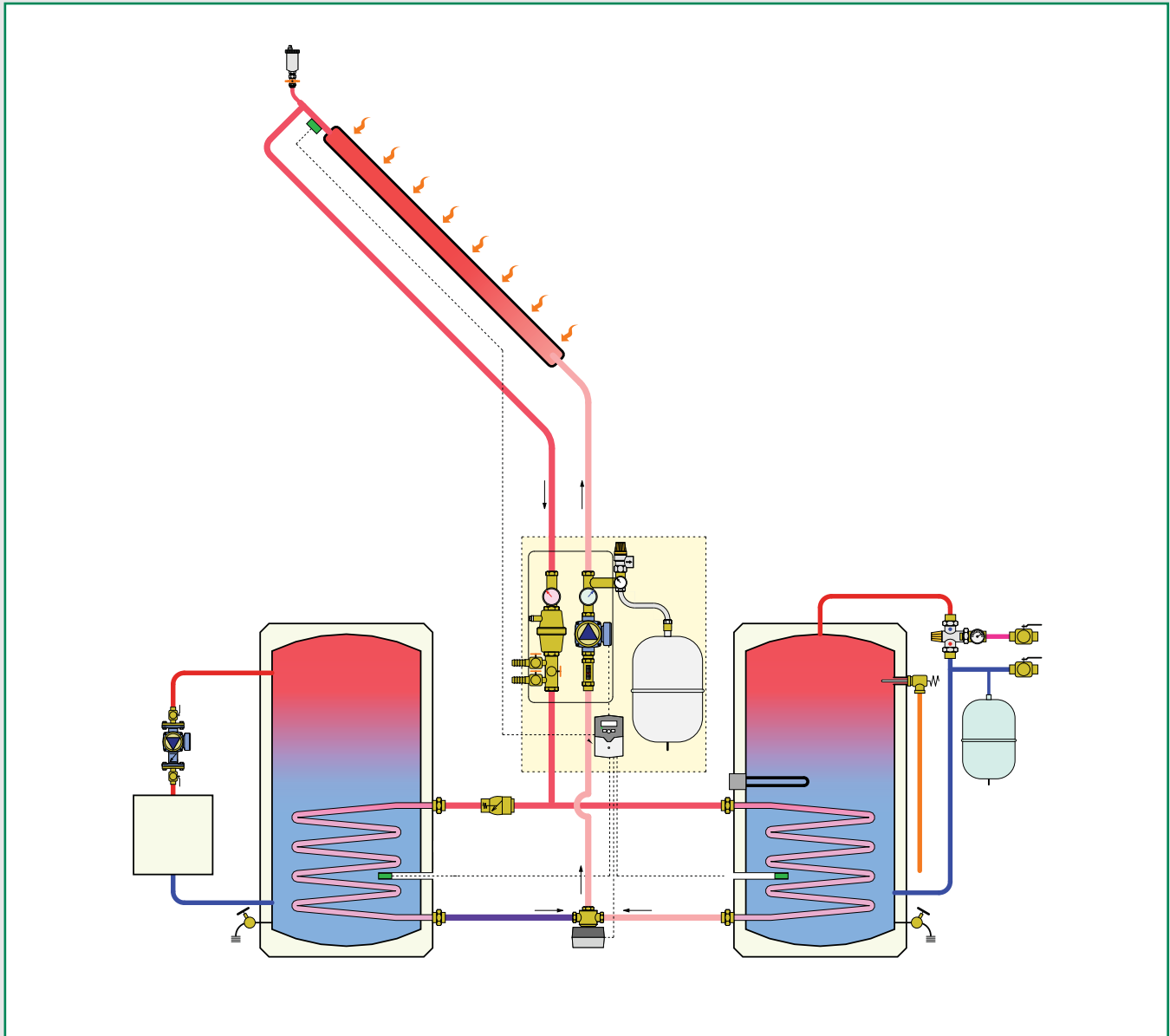
*Consult factory.

FITTING CONFIGURATION TABLE

Product series	Code	Description	Nut code	Tailpiece code	Washer code	USD
535H PRV (1/2")	NA20543	1/2" FNPT, 3/4" nut, washer	incl. w/tail	F49644	R50058	27.20
	NA20540	1/2" MNPT, 3/4" nut, washer	F41186	F31868	R50058	22.40
553 AutoFill	NA20549	1/2" sweat, 3/4" nut, washer	F41186	NA10001	R50058	19.70
127 FlowCal	NA20640	1/2" MNPT, 1" nut, washer	F61008	R31981	F50055	23.30
	NA20640C	1/2" MNPT, 1" nut, washer, check	F61008	59893A	F50055	36.50
	NA20649	1/2" sweat, 1" nut, washer	F61008	NA10002	F50055	19.30
	NA20649C	1/2" sweat, 1" nut, washer, check	F61008	59904A	F50055	32.60
	NA20646	1/2" press, 1" nut, washer	incl. w/tail	NA16264	F50055	25.00
127 FlowCal+	NA20647	1/2" PEX barb, 1" nut, washer	F61008	F0000492	F50055	19.30
	NA20647C	1/2" PEX barb, 1" nut, washer, check	F61008	NA10484	F50055	32.60
132 QuickSetter+	NA20653	3/4" FNPT, 1" nut, washer	incl. w/tail	F49645	F50055	30.70
	NA20650	3/4" MNPT, 1" nut, washer	F61008	31901A	F50055	27.20
520 TankMixer	NA20650C	3/4" MNPT, 1" nut, washer, check	F61008	59840A	F50055	46.60
	NA20659	3/4" sweat, 1" nut, washer	F61008	NA10003	F50055	23.20
521 MixCal	NA20659C	3/4" sweat, 1" nut, washer, check	F61008	59905A	F50055	42.70
	NA20656	3/4" press, 1" nut, washer	incl. w/tail	NA16265	F50055	27.40
535H PRV (3/4")	NA20656C	3/4" press, 1" nut, washer, check	R11217	NA10419	F50055	60.50
	NA20657	3/4" PEX barb, 1" nut, washer	F61008	F0000520	F50055	23.20
644 Ball Valve	NA20657C	3/4" PEX barb, 1" nut, washer, check	F61008	NA10485	F50055	42.70
	NA20660	1" MNPT, 1" nut, washer	incl. w/tail	59817A	F50055	44.90
676 Zone Valve	NA20660C	1" MNPT, 1" nut, washer, check	incl. w/tail	59894A	F50055	64.30
	NA20669	1" sweat, 1" nut, washer	incl. w/tail	59834A	F50055	40.50
Z2, Z3 Zone Valve	NA20669C	1" sweat, 1" nut, washer, check	incl. w/tail	59906A	F50055	60.00
	NA20666	1" press, 1" nut, washer	incl. w/tail	NA16266	F50055	47.00
	NA20667	1" PEX barb, 1" nut, washer	F61008	F0000521	F50055	40.50
	NA20667C	1" PEX barb, 1" nut, washer, check	F61008	NA10486	F50055	60.00
535H PRV (1")	NA20763	1" FNPT, 1 1/4" nut, washer	incl. w/tail	F49646	R50056	43.30
	NA20767	1" PEX barb, 1 1/4" nut, washer	R31495	NA10496	R50056	41.30
	NA20766	1" press, 1 1/4" nut, washer	incl. w/tail	NA10497	R50056	52.10
535H PRV (1 1/4")	NA20769	1" sweat, 1 1/4" nut, washer	incl. w/tail	F49657	R50056	31.90
	NA20873	1 1/4" FNPT, 1 1/2" nut, washer	incl. w/tail	F49647	R50057	78.50
535H PRV (1 1/2")	NA20879	1 1/4" sweat, 1 1/2" nut, washer	R31589	41787 CST	R50057	71.50
	NA20983	1 1/2" FNPT, 2" nut, washer	incl. w/tail	F0000493	R50008	119.60
535H PRV (2")	NA20989	1 1/2" sweat, 2" nut, washer	incl. w/tail	F0000494	R50008	99.10
	NA21193	2" FNPT, 2 1/2" nut, washer	incl. w/tail	F0000495	R50060	164.90
	NA21199	2" sweat, 2 1/2" nut, washer	incl. w/tail	F0000496	R50060	166.90
548, 5495 Union (1" - 2" Hydro Seps)	NA20863	1" FNPT, 1 1/2" nut, washer	R31589	31553 FD	R50005	48.40
	NA20869	1" sweat, 1 1/2" nut, washer	R31589	31554 FD	R50005	72.20
	NA20866	1" press 1 1/2" nut, washer	R31589	NA10406	R50005	85.80
	NA20973	1 1/4" FNPT, 2" nut, washer	R53003	31401 FD	R50008	102.90
	NA20979	1 1/4" sweat, 2" nut, washer	R53003	31403 FD	R50008	137.50
	NA20976	1 1/4" press 2" nut, washer	R53003	NA10407	R50008	141.10
	NA21083	1 1/2" FNPT, 2 1/4" nut, washer	R53004	R41441	R50047	111.50
5461 Union (1 1/2", 2") DiscalDirtMag	NA21089	1 1/2" sweat, 2 1/4" nut, washer	R53004	41882A	R50047	143.10
	NA21086	1 1/2" press 2 1/4" nut, washer	R53004	NA10408	R50047	188.60
	NA21293	2" FNPT, 2 3/4" nut, washer	R53005	31426 FD	R50048	174.00
	NA21299	2" sweat, 2 3/4" nut, washer	R53005	31428 FD	R50048	204.90
	NA21296	2" press 2 3/4" nut, washer	R53005	NA10409	R50048	277.90
1", 1 1/4" 5231 MixCal	NA20860	1" MNPT 1 1/2" nut, washer	R31589	NA10009	R50057	84.60
	NA20869	1" sweat, 1 1/2" nut, washer	R31589	31554 FD	R50057	72.20
	NA20870	1 1/4" MNPT 1 1/2" nut, washer	R31589	R41660	R50057	93.10
	NA20879	1 1/4" sweat, 1 1/2" nut, washer	R31589	41787 CST	R50057	71.50
1 1/2", 2" 5231 MixCal	NA21180	1 1/2" MNPT 2 1/2" nut, washer	R51838	41371A	R50060	148.20
	NA21189	1 1/2" sweat 2 1/2" nut, washer	R51838	41788 CST	R50060	145.00
	NA21190	2" MNPT 2 1/2" nut, washer	R51838	41372A	R50060	170.20
	NA21199	2" sweat 2 1/2" nut, washer	R51838	41789 CST	R50060	166.90

SOLAR COMPONENTS

This diagram is an example



Solar collectors, StarMax 4™
Complete solar water heaters
Storage tanks, SolarCon™
Expansion tanks
Solar pump stations
Drainback pump station
DC solar pump
In-line flow meter / balancing valves

In-line check valves
High temperature glycol
Solar air vents and air separators
Low lead mixing valves
SolarFlex™ piping
iSolar™ differential temp. controllers
Flow meters
iSolar™ data loggers

SOLAR COLLECTORS



**NAS144
StarMax 4™**

tech. broch. 01173

Star Max 4™ flat plate collectors heat fluid from solar energy for solar water heater and space heating systems.

Fluids: water, glycol solutions.

Maximum percentage of glycol: 60%.

Working pressure: 90 psi.

Max. test pressure: 150 psi.

Working temperature: -40—350°F.

Typical transfer flow rate: 0.5—1.8 gpm.

Wind load rating: 180 mph.

Connection: 1¼" male union thread

SRCC Category C: 40 kBtu/day.

Approvals: SRCC OG-100.



Flat plate collector mounting brackets and wide strut mount.

Code	Description	Lbs	USD
NAS10001	Universal foot mount, 4 each	5.0	293.00
NAS10004	Wide strut mount, 4 each	1.0	175.60



Aluminum 6005-T5 square tube extension for tilting flat plate collectors. Connects with tilt mounting U brackets.

Code	Description	Lbs	USD
NAS10002	1" square tube x 6'	2.0	147.00
NAS10005	1" square tube x 12'	4.0	263.30



Flashing kit with 3/8" stud for attaching U mounts and other brackets using the supplied 3/8" stainless steel nut & washer. Black painted aluminum 6061 T6 flashing 14 3/4" L x 9 1/2" W x 0.6" H, galvanized steel base plate with six mounting holes and double stud.

Code	Description	Lbs	USD
NAS10030	Flashing kit	1.5	82.30



Galvanized steel base plate with 3/8"-16 center thread and six mounting holes, can be used under a truss or rafter.

Code	Description	Lbs	USD
NAS10032	Steel base plate	0.5	30.00

Code	Description	Lbs	USD
NAS14406	4' x 6.5', Category C 25 kBtu/day	90	2,736.00
NA10100	Crating charge for NAS14406 (1—10)	net	110.00
NAS14408	4' x 8', Category C 32 kBtu/day	113	3,231.00
NAS14410	4' x 10', Category C 40 kBtu/day	153	3,599.00
NA10126	Crating for NAS14408 / NAS14410 (1—6)	net	110.00



The 1/4" male union threads on the StarMax 4 collector have a flat sealing surface. The NAS10478 double union allows the collectors to be joined close together, but still allows for a collector to be removed from an array without moving the adjoining collectors. The double union has pre-installed high temperature silicone O-rings which seal against the coupling flat surface and will not fallout during coupling. This provides fast torch free connections.



Double union nut coupler high temperature silicone O-ring pre-installed inside union.

Code	Description	Lbs	USD
NA10478	1¼" double union nut coupler	0.4	98.90

Components required to cap unused 1¼" male union outlets on StarMax 4 collector. 1¼" brass nut (1), 1¼" brass disk (1) and 1¼" silicon sealing washer (1).



Code	Description	Lbs	USD
R31495	1¼" union nut	0.2	9.50
R11059	1¼" brass disk	0.1	6.00
R67032	1¼" high temp silicon washer	0.1	2.90

COMPLETE SOLAR WATER HEATER SYSTEMS

NAS300



The prepackaged, specially engineered solar water heating system includes all of the components needed for a standard installation — from the solar collectors, to the pump station and controller, to pre-insulated piping, to the storage tank, and all of the necessary hardware and components.
 System collector code numbers:
 4' x 8' flat plate (NAS14408)
 4' x 10' flat plate (NAS14410).
 Approvals: SRCC OG-300 certified.



50 gal. single coil with electric element (NAS20053)

Code	Description	Collector	Lbs	USD
NAS30020-P	no collector		490	8,983.00
NAS30020P8	4' x 8' collector	1	615	13,261.00
NAS300201P8	4' x 8' collector	2	730	16,702.00
NAS30020P10	4' x 10' collector	1	655	13,718.00
NAS300201P10	4' x 10' collector	2	810	17,616.00

80 gal. single coil with electric element (NAS20083)

Code	Description	Collector	Lbs	USD
NAS30040-P	no collector		660	10,353.00
NAS30040P8	4' x 8' collector	2	785	18,127.00
NAS300401P8	4' x 8' collector	3	900	21,642.00
NAS30040P10	4' x 10' collector	2	825	19,040.00
NAS300401P10	4' x 10' collector	3	980	23,011.00

80 gal. dual coil without electric element (NAS20082)

Code	Description	Collector	Lbs	USD
NAS30042-P	no collector		610	10,923.00
NAS30042P8	4' x 8' collector	2	835	18,697.00
NAS300421P8	4' x 8' collector	3	950	22,213.00
NAS30042P10	4' x 10' collector	2	875	19,610.00
NAS300421P10	4' x 10' collector	3	980	23,581.00

120 gal. single coil with electric element (NAS20123)

Code	Description	Collector	Lbs	USD
NAS30060-P	no collector		670	11,265.00
NAS30060P8	4' x 8' collector	3	995	22,554.00
NAS300601P8	4' x 8' collector	4	1110	26,170.00
NAS30060P10	4' x 10' collector	3	1035	23,924.00
NAS300601P10	4' x 10' collector	4	1190	28,230.00

120 gal. dual coil without electric element (NAS20122)

Code	Description	Collector	Lbs	USD
NAS30062-P	no collector		700	11,836.00
NAS30062P8	4' x 8' collector	3	1025	23,125.00
NAS300621P8	4' x 8' collector	4	1140	26,741.00
NAS30062P10	4' x 10' collector	3	1065	24,495.00
NAS300621P10	4' x 10' collector	4	1220	28,800.00



Key	Code	Description
1	255060A	Dual-line solar pump station with 3/4" SolarFlex™ fittings
2	255007	Expansion tank mounting kit with double-check valve
3*	259012	3 gallon
	259018	5 gallon
	259025	7 gallon
	259033	9 gallon
		Tank size is system dependent
4	NA267003	Bracket to mount solar pump station to storage tank
5	257260A	iSolar™ Plus differential temperature controller
6	NA15006	Lightning protector
7	NA10092	18" SJ round cord connects pump to controller
8	NA3540-15	SolarFlex™ 3/4" x 50 ft. coil piping with fittings
9	NA12133	Hangers fits 3/4" SolarFlex™ (4 pcs)
10	NA3140-02	Two 3/4" flex pipes with insulation, 6' long
11	NA10093	Two 90-degree brass elbows 1" male union half
12	250041A	Automatic solar air vent, 1/2" NPT male
13	NA29284	Solar air vent shut-off valve, 1/2" NPT MxF
14	NAT624162	Tee 1" M union x 1/2" NPT F x 1" union nut
15	NA35001	EPDM insulation black tape, 1/8" x 2" x 25' roll
16	NA35002	UV-resistant black film tape, 2" x 30' roll
17*	NA10478	Double union nut coupler 1 1/4"
	R31495	Union nut 1 1/4"
	R11059	Disk 1 1/4"
	R67032	Sealing washer 1 1/4"
18*	NAS10001	Universal foot mounts fits solar collectors
19*	NA10103	5-15 gallons glycol. NSF listed (amount model specific)

*these items are not provided in the "-P" kits (kit without collectors)

STORAGE TANKS



NAS200 SolarCon™

tech. broch. 01175

Storage tanks can serve as either a domestic hot water tank or a thermal buffering tank with porcelain glass coated steel lining. Powder-coated steel external cover. Drain port/valve.

Max. working pressure: 150 psi.

Working temperature: -40—190°F.

Recommended max. delivery water temperature: 120°F.

Testing pressure: 300 psi.

Tank insulation: 2" non-CFC foam.

Insulation thermal conductivity: R16.

Temperature & pressure relief valve: 210°F/150 psi. (HX models)

Electric element: 4.5 Kw. UL listed.

Connections: 25 gal. no HX (6) 1½" NPT F top & side, (2) ¾" NPT F top & side.

Non HX (7) 2" NPT female side, (3) ¾" NPT female top.

50 gal. HX (2) 1" NPT male side, (2) ¾" NPT male on top.

80-119 gal. (1) HX (3) 1" NPT male side, (1) 1" NPT male top.

80-119 gal. (2) HX (5) 1" NPT male side, (1) 1" NPT male top.

*Reduction of Lead in Drinking Water Act Compliant: 0.25% max. weighted average lead content. Certified through Underwriters Laboratory (UL) in accordance with NSF/ANSI 372. Meets CSA C309.

Function

No HX:

Typical applications include where system design requires use of an external heat exchanger, an open solar thermal system, or when buffering storage capacity is required.

One HX:

A coil type solar loop HX is located in the lower portion of the tank. An electrical heating element provides boost heat for a one tank system, or is unused for a two tank pre-heat system.

Two HX:

Coil type HX's are located in the lower and upper portions of the tank. Common applications include using the upper HX for boost heat when connected to a back-up heat source, using the top HX for supplemental space heat, or connecting both HX's to the solar loop for layer loading.

Two HX with electrical element:

Typical application is for a one tank domestic hot water system with electric element boost, and utilizing upper HX for supplemental space heat.

Code	Description	Lbs	USD
NAS20025	25 gal. no HX	100	2,777.00
NAS20050	50 gal. no HX	200	3,319.00
NAS20053	50 gal. no HX, electric element	231	4,225.00
NAS20080	80 gal. no HX	250	3,923.00
NAS20083	80 gal. 1 HX, electric element	297	5,733.00
NAS20082	80 gal. 2 HX	327	6,337.00
NAS20120	119 gal. no HX	350	5,191.00
NAS20123	119 gal. 1 HX, electric element	397	6,820.00
NAS20122	119 gal. 2 HX	427	7,483.00
NAS20124	119 gal. 1 HX, electric element	429	7,725.00

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 ¾" NPT female	0.4	83.40



Male plug 1 1/4" square head.

Code	Description	Lbs	USD
NA10339	2" NPT male x ¾" NPT female	0.2	45.40



Brass reducing bushing. 1 1/8" hex head.

Code	Description	Lbs	USD
NA10082	¾" NPT male x ½" NPT female	0.3	8.40



Magnesium anode rod.

Code	Description	Lbs	USD
NA10229	¾" NPT x 36" anode rod fits 50 gal.	8.0	67.00
NA10230	¾" NPT x 40" anode fits 80 & 100 gal.	9.0	93.40



90° brass elbow to connect ¾" SolarFlex™ to heat exchanger in SolarCon tank.

Code	Description	Lbs	USD
NA10093	1" NPT female x 1" male	0.5	67.50



Insulated 6' SolarFlex™ for connecting solar pump station to SolarCon™ HX.

Code	Description	Lbs	USD
NA3140-02	¾" SolarFlex with 1" union nuts	1.0	203.00

EXPANSION TANK



259

[tech. broch. 01246](#)

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	179.60
259018	5 gallon, 3/4" male straight thread	17	223.10
259025	7 gallon, 3/4" male straight thread	21	288.80
259033	9 gallon, 3/4" male straight thread	24	493.10
259050	13 gallon, 3/4" male straight thread	28	621.80

ACCESSORIES



255

[tech. broch. 01246](#)

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	209.00



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	30.80
NA25549	1/2" sweat union connection set	0.1	28.40



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	6.60

ACCESSORIES



NA255

6' flexible stainless steel extension for connecting expansion tank to pumping station.

Code	Description	Lbs	USD
NA255002	3/4" union nuts	1.0	115.30



NA267

Kit for mounting solar pumping station onto storage tank and connecting expansion tank to pumping station. Includes bracket, hardware and 6' extension for expansion tank.

Code	Description	Lbs	USD
NA267002	3/4" union nuts	2.0	137.20



NA267

Kit for mounting solar pumping station onto storage tank. Includes bracket and hardware.

Code	Description	Lbs	USD
NA267003	Kit to mount solar station	2.0	25.30



255

Hand pump attaches to solar pump station for pressurizing system.

Code	Description	Lbs	USD
255010A	Manual hand pump	3.0	351.10



NA256

Two solar station connection kits.

Code	Description	Lbs	USD
NA256012	3/4" F x 3/4" M thread and cap	1.0	329.20

SOLAR PUMP STATIONS

278 & 279  tech. broch. 01264



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	1,372.00
279051	Dual-line solar station w/o pump	12	1,097.00
278751A	Single-line solar pump station	14	1,197.00
278751	Single-line solar station w/o pump	10	921.70
278011	Controller housing	0.5	66.90



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 union fitting on page 90)

Code	Description	Lbs	USD
NA121168	Wilco Star S-21, 19' head / 8 gpm	5.0	355.30



Temperature gauges fit 278 & 279 solar stations.

Code	Description	Lbs	USD
F29759	1 1/2" red dial temp. gauge	0.1	52.80
F29758	1 1/2" blue dial temp. gauge	0.1	52.80

PUMP STATION FITTINGS

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



Code	Description	Lbs	USD
NA26640	3/4" male thread x 3/4" male thread	0.6	61.00

1/2" SolarFlex™ directly to top and bottom.
 4 each.



Code	Description	Lbs	USD
NA26740	3/4" male thread x 3/4" male thread	1.0	122.10

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	66.00

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	132.10

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	127.90

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	255.90

PUMP STATION FITTINGS



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

Code	Description	Lbs	USD
NA26649	3/4" male thread x 1/2" sweat fitting	0.6	100.30



1/2" sweat fittings to top and bottom. 4 each.

Code	Description	Lbs	USD
NA26749	3/4" male thread x 1/2" sweat fitting	1.0	200.50



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	112.50



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	225.20



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

Code	Description	Lbs	USD
NA26669	3/4" male thread x 1" sweat fitting	0.6	123.10



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

Code	Description	Lbs	USD
NA26769	3/4" male thread x 1" sweat fitting	1.0	246.20

DRAINBACK PUMP STATION

278

tech. broch.01264



Drainback solar pump stations 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	1,278.00

NA121



Replacement single speed 120 V, 1" male union thread. Flow 36 feet head / 8 gpm. Agency approval: cULus. (Install in-line with union fitting on page 90)

Code	Description	Lbs	USD
NA12171	Grundfos Solar 15-100	6.0	438.90

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.



Shown mounted in 279051 or can be mounted inside 278751.

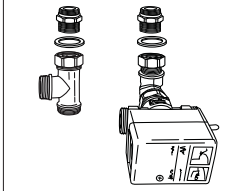
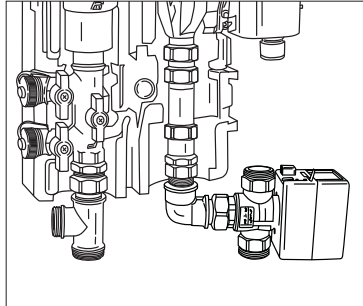
(Install in-line with union fitting on page 90)

Code	Description	Lbs	USD
NA26711	1" male union thread	3.0	715.80

DIVERTING VALVE KIT

NA267

Diverting three-way valve for solar pump station mounting kit. Used for diverting solar fluid to another storage tank, swimming pool heat exchanger or heat dissipating device. (Select fittings below)



Kit Contents

Code	Description	Quantity
Z126000	Actuator 120 VAC	1
Z300687	Three-way valve with 1" male union threads	1
NAL6363	Elbow with 1" union threads	1
NAT636262	Tee with 1" union threads	1
NA10092	Power cord	1

Code	Description	Lbs	USD
NA26710	Diverting three-way valve kit	6.0	351.10

Select two fitting sets below, mix and match sets for a total of four union fittings.

FILL & FLUSH VALVE

NA256

Dual fill and flush valve.

(Select fitting to the right or in Section 9)



Code	Description	Lbs	USD
NA256011	1" male union thread x 3/4" GHT	0.8	219.50

IN-LINE CHECK VALVE

NA510

In-line union sweat solar flow check valve.
 Open pressure: 0.29 psi.
 Max percentage of glycol: 50%.
 Max working pressure: 150 psi.
 Temperature range: 32–250°F.
 Open pressure: 0.29 psi



Code	Description	Cv	Lbs	USD
NA51059	3/4" sweat union	12	0.7	77.70

NA510

In-line union sweat solar flow check valve.
 Open pressure: 0.29 psi.
 Max percentage of glycol: 50%.
 Max working pressure: 150 psi.
 Temperature range: 32–250°F.
 Open pressure: 0.29 psi



Code	Description	Cv	Lbs	USD
NA51069	1" sweat union	17	1.0	99.30

BALANCING / FLOW METER

NA223

Direct in-line balancing / flow meter with brass body.
 Max percentage of glycol: 50%.
 Max working pressure: 150 psi.
 Temperature range: 32–250°F.
 Measuring accuracy: ±10%.
 Cv: 6.
 Select fittings below or in Section 9.



Code	Description	Lbs	USD
NA223529	2 to 8 gpm with 1" union thread	0.9	188.10

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



Code	Description	Lbs	USD
NA12249	1/2" sweat with 1" union nuts	0.2	38.60
NA12259	3/4" sweat with 1" union nuts	0.2	46.40
NA12269	1" sweat with 1" union nuts	0.3	81.00

COMMERCIAL SOLAR PUMP STATION

NA255



The Solar pump station is 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	2,278.00



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 union fitting on page 90)

Code	Description	Lbs	USD
NA12169	Wilo Star S 30	6.0	564.30



Replacement solar pump station pressure gauge.
 Pressure range: 0—90 psi.
 Dial size: 1 ½"

Code	Description	Lbs	USD
NA12156	¼" male rear connection thread	0.1	51.00

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	181.50

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



Code	Description	Lbs	USD
NA15559	¾" sweat union kit	1.0	147.20

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



Code	Description	Lbs	USD
NA15560	1" NPT male union kit	1.1	181.50

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



Code	Description	Lbs	USD
NA15569	1" sweat union kit	1.1	149.40

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



Code	Description	Lbs	USD
NA15570	1¼" male, 1" SolarFlex™	0.9	61.90

SOLAR GLYCOL



NA101  **SolarHD™** tech. broch. 01282

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	264.20

FILL AND FLUSH CART



NA255  **HYDROFLUSH™** tech. broch. 01280

The fill and flush pump cart is portable, leak-tested for a safe, quick and clean way to fill and flush solar and hydronic systems. Medium: water, glycol and cleaning fluids. Tank: 13 gallon with dirt filter. Max. tank medium temperature: 150°F. Pump delivery flow: 1–13 gpm. Pump feet of head: 220. Max. pump pressure: 100 psi. Pump power: ½ HP (120 V AC). Isolating ball valves: ¾" garden hose thread. Transfer hoses: 6' with ¾" GHT (2 ea). Pressure gauge: 2" dial, 0–100 psi. Dimensions: 48"H x 20"W x 18"D.

Code	Description	Lbs	USD
NA25510	Wash, fill and flush cart	60	3,188.00

AUTOMATIC AIR VENT



250  tech. broch. 01133

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

Code	Description	Lbs	USD
250041A	½" NPT male	0.3	82.30



NA292  tech. broch. 01133

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

Code	Description	Lbs	USD
NA29284	½" NPT female x ½" NPT male	0.2	67.00

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" NPT male	0.1	28.50

251  **DISCALAIR®** tech. broch. 01135

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
251004A	½" NPT female	0.8	164.40

AIR SEPARATOR



251 DISCAL™

tech. broch. 01134

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	218.20

253

tech. broch. 01089



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	82.00
253043	Factory set to 45 psi	0.3	82.00
253044	Factory set to 60 psi	0.3	82.00
253046	Factory set to 90 psi	0.3	82.00
253048	Factory set to 120 psi	0.3	82.00
253040	Factory set to 150 psi	0.3	82.00

LOW LEAD MIXING VALVES



2521

tech. broch. 01127

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 with inlet check valves	1.2	264.30
252159A	¾" sweat with inlet check valves	1.2	278.50
252169A	1" sweat with inlet check valves	1.2	322.60

2521

tech. broch. 01127



Adjustable thermostatic three-way mixing valve with temperature gauge 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: 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
252158A	¾" sweat with inlet check valves	1.2	342.10
252168A	1" sweat with inlet check valves	1.2	389.30



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

Code	Description	Lbs	USD
R29326	Check valve insert	0.1	9.80

STAINLESS STEEL PIPING

NA35 SolarFlex™  [tech. broch. 01172](#)



SolarFlex™ stainless steel piping with EPDM insulation. Used to connect solar collector with storage tank. Integrated sensor cable saves time and reduces cost. Packaged in a 50 foot continuous coil ensures a leak-free installation. Max. working pressure: 150 psi. Max. fluid temperature: 350°F. Min. surface temperature: -60°F. Min. bend radius: 5". Flammability: Class VO. Flame spread/smoke density: 25/50. Agency approvals: ASTM D 635 ASTM C 177

Includes fitting kit.



Code	Description	Lbs	USD
NA3520-15	½" Pipe, 50' coil	28	1,646.00
NA3540-15	¾" Pipe, 50' coil	33	1,865.00
NA3560-15	1" Pipe, 50' coil	40	2,524.00
NA3540-50	¾" Pipe, 165' spool*	115	5,165.00


* without fitting kit, order NA12103 below.



NA121  [tech. broch. 01172](#)
SolarFlex™ extra connection kits.

Code	Description	Lbs	USD
NA12102	½" SolarFlex™, ¾" nuts and washers	1.0	41.70
NA12103	¾" SolarFlex™, 1" nuts and washers	1.1	56.20
NA12104	1" SolarFlex™, 1¼" nuts and washers	1.3	90.00



NA121  [tech. broch. 01172](#)
SolarFlex™ pipe hangers with hardware. (4 per pack)

Code	Description	Lbs	USD
NA12132	½" SolarFlex™ hangers	1.2	50.40
NA12133	¾" SolarFlex™ hangers	1.3	53.00
NA12134	1" SolarFlex™ hangers	1.0	59.70

NA350  [tech. broch. 01172](#)



EPDM foam UV resistant insulating tape to wrap fitting connections.

Code	Description	Lbs	USD
NA35001	2" x 1/8" x 25' roll	1.3	97.30



Black film UV resistant film tape to wrap foam tape.

Code	Description	Lbs	USD
NA35002	2" x 30' roll	0.5	20.70



4' lengths black braid sleeve (UV & vermin resistant) (2) to protect outdoors piping with black film tape.

Code	Description	Lbs	USD
NA35007	4' Sleeve with 2" x 30' film tape	1.0	82.50

NA350  [tech. broch. 01172](#)



SolarFlex™ sliding piston flattening tool. Three sizes of jaws to match SolarFlex™ pipe sizes.

Code	Description	Lbs	USD
NA35003	Sliding piston tool	5.0	329.20
NA35004	½" Fixed jaw	3.0	619.70
NA35005	¾" Fixed jaw	3.0	619.70
NA35006	1" Fixed jaw	3.0	619.70

1/2" FLEX FITTINGS WITH 3/4" THREADS



Double nipple.

Code	Description	Lbs	USD
NA12122	3/4" male x 3/4" male	0.3	28.50



Double nipple.

Code	Description	Lbs	USD
NA12172	3/4" NPT x 3/4" NPT	0.3	28.50



Union nut.

Code	Description	Lbs	USD
R41298/C	3/4" union nut	0.1	4.80



C-clip.
(Priced each, sold in package of 10 each)

Code	Description	Lbs	USD
NA12112	1/2" flex "C" clip	0.1	3.90



Union washer

Code	Description	Lbs	USD
R50058	3/4" union washer	0.1	1.90



Sweat tail piece.

Code	Description	Lbs	USD
NA10001	1/2" sweat fits 3/4" union nut	0.3	13.10



Sweat adapter.

Code	Description	Lbs	USD
NA10118	3/4" sweat x 3/4" male thread	0.3	28.50



Double nipple with O-ring.

Code	Description	Lbs	USD
NA12152	3/4" male w/ O-ring x 3/4" male thread	0.3	30.50



NPT tail piece.

Code	Description	Lbs	USD
F31868	1/2" NPT fits 3/4" union nut	0.1	15.80



Compression adaptor.

Code	Description	Lbs	USD
254452	22mm comp. w/ 3/4" male thread	0.2	33.20

3/4" FLEX FITTINGS WITH 1" THREADS



Double nipple.

Code	Description	Lbs	USD
NA12123	1" x 1" male thread	0.4	35.60



Double nipple.

Code	Description	Lbs	USD
NA12173	1" NPT x 1" NPT	0.4	35.60



Union nut. Low-lead brass.

Code	Description	Lbs	USD
F61008	1" brass nut	0.2	6.00
F61008/C	1" chrome-plated nut	0.2	7.10



C-clip.
(Priced each, sold in package of 10 each)

Code	Description	Lbs	USD
NA12113	3/4" flex "C" clip	0.1	6.00



Union washer.

Code	Description	Lbs	USD
F50055	1" union washer	0.1	2.20

3/4" FLEX FITTINGS WITH 1" THREADS



Union washer.
High temperature silicone rubber.
Working temperature: -40—350°F.

Code	Description	Lbs	USD
NA10302	1" union washer high temp silicone	0.1	3.30



Sweat adaptor.

Code	Description	Lbs	USD
NA10062	1" sweat adaptor w/ 1" male thd.	0.2	30.80



Sweat tail piece.
Low lead brass.

Code	Description	Lbs	USD
NA10002	1/2" sweat fits 1" union nut	0.3	11.10



Nipple adaptor.

Code	Description	Lbs	USD
NA10064	1" NPT w/ 1" male thread	0.2	32.10



Sweat tail piece.
Low lead brass.

Code	Description	Lbs	USD
NA10003	3/4" sweat fits 1" union nut	0.4	15.00



Nipple adaptor with O-ring.

Code	Description	Lbs	USD
NA12162	3/4" male w/ O -ring x 1" male thread	0.2	33.00



NPT tail piece.
Low lead brass.

Code	Description	Lbs	USD
31901A	3/4" NPT fits 1" union nut	0.4	19.00



Bushing.

Code	Description	Lbs	USD
NA10089	3/4" female thread x 1" male thread	0.1	23.70



Sweat tail piece with nut.
Low lead brass.

Code	Description	Lbs	USD
59834A	1" sweat w/ 1" union nut	0.5	38.30



Smooth pipe adaptor.

Code	Description	Lbs	USD
NA10085	22mm pipe w/ 1" male thread	0.2	27.30



Bushing adaptor.

Code	Description	Lbs	USD
NA10060	3/4" NPT female w/ 1" male thread	0.3	28.50



Sweat adaptor.

Code	Description	Lbs	USD
NA10061	3/4" sweat adaptor w/ 1" male thread	0.2	29.80

1" FLEX FITTINGS WITH 1¼" THREADS



Double nipple.

Code	Description	Lbs	USD
NA12124	1¼" x 1¼" thread	0.4	57.10



Sweat tail piece.

Code	Description	Lbs	USD
NA10042	1" sweat fits 1¼" union nut	0.3	30.80



Union nut.

Code	Description	Lbs	USD
R31495	1¼" union nut	0.2	9.50



NPT tail piece.

Code	Description	Lbs	USD
NA10116	1" NPT male fits 1¼" union nut	0.3	46.80



C-clip.
(Priced each, sold in package of 5 each)

Code	Description	Lbs	USD
NA12114	1" flex "C" clip	0.1	9.50



Sweat adaptor.

Code	Description	Lbs	USD
NA10119	1" sweat adapter x 1¼" union thread	0.4	39.20



Union washer.

Code	Description	Lbs	USD
R50056	1¼" union washer	0.1	3.40



Bushing.

Code	Description	Lbs	USD
NA10087	1" female x 1¼" male bushing	0.4	28.70



Gasket- black.

Code	Description	Lbs	USD
R67032	1¼" high temp silicon	0.1	2.90



Bushing.

Code	Description	Lbs	USD
61215A	1" NPT female x 1¼" male bushing	0.8	28.50



Sweat tail piece.
Low lead brass.

Code	Description	Lbs	USD
NA10114	¾" sweat fits 1¼" union nut	0.2	30.20



Nipple adaptor.

Code	Description	Lbs	USD
R31706	1" male x 1¼" male nipple	0.3	35.60

DIFFERENTIAL TEMPERATURE CONTROLLERS



Code	Description	Lbs	USD
257220A	iSolar™ 2, 1 relay	2.0	522.50
257260A	iSolar™ Plus, 2 relays	2.0	794.20

Model Comparison	iSolar 2	iSolar Plus	iSolar BX	iSolar MX-LTE
Pre configured arrangements	1	10	26	20
Speed control triac output (30–100%)	1	2	3	4
Standard relay output	0	0	1	0
Dry contact relay	0	0	0	1
Sensor inputs (temperature)	4	4	5	8
Pt-1000 temp. sensors included	3	4	4	5
Max. solar collector arrays	1	2	2	2
Max. solar storage tanks	1	2	2	4
Two tank priority logic		•	•	•
Second delta T-function		•	•	•
Drain-back pump speed control	•	•	•	•
Drain-back booster pump		•	•	•
Time controlled thermostat function		•	•	•
Backup heat function		•	•	•
Heat dump function		•	•	•
Real time clock (timer function)		•	•	•
Collector freeze protection	•	•	•	•
Evacuated tube collector function		•	•	•
Min. collector temperature	•	•	•	•
Collector cooling functions	•	•	•	•
Tank (night time) cooling	•	•	•	•
Emergency shutdown functions	•	•	•	•
Pump operating hours counter	•	•	•	•
Energy metering - flow calculated	•			
Energy metering - flow meter input		•	•	•
Vbus data communication	•	•	•	•
Onboard data logging			•	•

257
iSolar™

tech. broch. 01174

The iSolar™ 257 series are multi-functional temperature differential controllers that provide complete control of the solar thermal system.

Inputs: (4) Pt1000 temperature sensors
 Triac relays capacities: 1A / 100–240 V AC.
 Standard relay capacity: 1A / 100–240 V AC.
 Power supply: 100–240 V AC- 50/60 Hz.
 Data interface: V-Bus.

ΔT adjustment range: 2–40°F Δ.
 Min. temperature differential 2°F Δ.
 Hysteresis: 2°FΔ, ± 1°FΔ.
 Max. tank temperature range: 35–205°F.
 Max. collector temperature range: 210–375°F.
 Emergency shut down of the collector: 230–395°F.
 Min. collector temperature range: 50–195°F.
 Antifreeze temperature option: 15–50°F.
 kWh (BTU) calculation flow input: 0–5 gpm.

Function

The iSolar™ series are multi-functional temperature differential controllers that provide complete control of the solar thermal system for safe and long-lasting operation. The microprocessor based controller monitors and controls thermal solar systems by means of a collector sensor and a storage tank sensor. The controllers also perform important system monitoring and safety functions. The system parameters and measured values can be changed and viewed on the large LCD display. The controller is equipped for up to four temperature sensor inputs and one or two 120 VAC outputs (some models) for activating the solar circuit pump and second 120 VAC output for activating a valve or second pump. The controller is additionally equipped with VBus® for two-way communication between modules, PC's or data loggers.



Replacement fuse T4A.
(priced per package of 10).

Code	Description	Lbs	USD
257208	Fuses	0.1	32.90

NA101



Steel electrical mounting box with cover for iSolar™ controllers.
UL listed



Code	Description	Lbs	USD
NA10120	1 5/8" D x 8 5/8" H x 4 1/2" W	3.0	76.80

VBUS DATA INTERFACE

SD3



Smart display SD3 connected to VBus data interface is used for displaying data from *iSolar*TM controller; collector temperature, storage temperature and total energy heat produced. An additional power supply is not required. Bright LED displays. Power supply: via VBus. Mounting: wall.

Code	Description	Lbs	USD
NA15008	Smart display	2.0	787.90



SP10

The lightning protector SP10 device is used to protect the collector temperature sensor and controller against external over-voltages such as those caused by lightning strikes.

Code	Description	Lbs	USD
NA15006	Lightning protector	0.2	84.50



WALL

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	48.70

USB



USB to VBus data interface to connect *iSolar*TM controller to PC for transmission of system data for processing, visualizing and archiving. Full version of Service Center software included on CD-ROM. USB 2.0 full speed with mini-USB port and cable. Power supply: via VBus.

Code	Description	Lbs	USD
NA15020	USB to VBus data interface	0.3	277.70

PWM



PWM or 0–10 V DC to VBus data interface is used for speed control of a pump. Information from the *iSolar*TM controller is converted into a PWM or 0–10 V DC output control signal which is connected to input control signal of a pump. Display: LED display. Wall power: 100-240 V AC / 50-60 Hz. Adapter input voltage: 12 V DC.

Code	Description	Lbs	USD
NA15021	PWM or 0–10 V DC to VBus interface	0.3	371.00

LAN



LAN socket to VBus data interface to connect controller to PC network or router for transmission of system data for processing, visualizing and archiving over a local network. Full version of Service Center software included. Wall power: 100-240 V AC / 50-60 Hz. Adapter input voltage: 12 V DC.

Code	Description	Lbs	USD
NA15022	LAN socket to VBus data interface	0.3	460.80

DIFFERENTIAL TEMPERATURE CONTROLLERS



Function

The *iSolar™* BX is a multi-functional temperature differential controller with add-on system functions for use in a wide variety of solar thermal heating applications. *iSolar™* BX is equipped with four relay outputs; three triac pump speed control relays and one standard relay. The controller is equipped with five Pt1000 sensor inputs, two analog Grundfos sensor inputs, and one impulse flow meter input. Twenty six system configuration options are predefined for control of a standard solar water heating system, drainback systems, supplemental space heating, multiple storage tanks, heat dump and storage tank booster heating. Unique features include built-in SD memory card slot, built-in clock and calendar, integrated energy heat measurement inputs, parallel relay operation and drain back control.

NA150



Cable for connecting Grundfos VFS & RPS with molded plug to BX controller with molded plug.

Code	Description	Lbs	USD
NA15028	VFS & RPS molded plug cable, 10'	0.2	27.50

NA150



Steel electrical mounting box with cover fits *iSolar™* BX controller.



Code	Description	Lbs	USD
NA15027	Electrical box	5.0	87.80

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iSolar™ BX**

tech. broch. 01273

Inputs: (5) Pt1000 temperature sensors, 2 analog Grundfos Direct Sensors™, impulse flow meter
 Outputs: (3) triac and (1) standard relays.
 Triac relays capacities: 1A / 115 V.
 Standard relay capacity: 2A / 115 V.
 Power supply: 100–240 V - 50/60 Hz.
 Data interface: V-Bus, SD card slot
 ΔT adjustment range: 2–40°FΔ.
 Min. temperature differential 2°FΔ.
 Hysteresis: 2°FΔ, ± 1°FΔ.
 Max. tank temperature range: 35–205°F.
 Max. collector temperature range: 210–375°F.
 Emergency shut down of the collector: 230–395°F.
 Min. collector temperature range: 50–195°F.
 Antifreeze temperature option: 15–50°F.
 kWh (BTU) flow input: 0–26 gpm.



Tested and Approved by TÜV Rheinland as an approved U.S. Nationally Recognized Testing Laboratory (NRTL) Exceeds or is equivalent to: UL 60730-1A CAN/CSA E60730-1

Code	Description	Lbs	USD
257270A	<i>iSolar™</i> BX	3.0	1,071.00

NA100



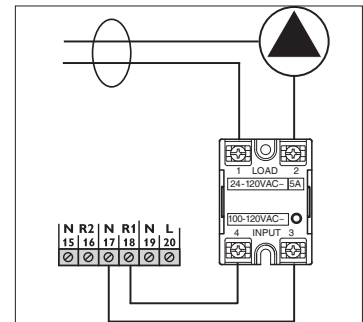
18" SJ round cord, stripped and pre-tinned for connecting pump or valve to *iSolar* controller.

Code	Description	Lbs	USD
NA10092	18" SJ round cord	0.3	9.90

NA150



SSRs (Solid State Relays) is an isolation speed control relay which will speed control up to a 5 Amp solar pump based on the output speed control voltage of the *iSolar* solar controllers.



Code	Description	Lbs	USD
NA15012	120 VAC / 5A	0.1	175.60

FLOW METERS



RPS Grundfos analog pressure/ temperature sensor. Requires NA15028 cable.
 Pressure measuring range: 0—150 psi.
 Temperature measurement range: 32—210°F.
 Max. fluid temperature: 250°F
 Maximum glycol: 50%.
 Connection: ½" male NPT.

Code	Description	Lbs	USD
NA15010	RPS 0—10, 0—150 psi	0.3	207.40



VFS Grundfos analog flow / temperature sensor. Requires NA15028 cable.
 Temperature measurement range: 32—210°F.
 Max. fluid temperature: 250°F
 Flow measurement accuracy: 1.5%
 Flow response time: < 1 sec.
 Brass or stainless in-line body.
 Maximum glycol: 50%.
 Connection: 1" male union thread.
 Select union fittings on the right.
 Flow measurement accuracy: 1.5%
 Flow response time: <1 sec.
 Select fittings below or in Section 9.

Code	Description	Lbs	USD
NA15015	VFS 1-12, ¼—3 gpm	0.6	349.60
NA15016	VFS 2-40, ½—10 gpm	0.6	385.20
NA15017	VFS 5-100, 1½—15 gpm	1.6	669.80



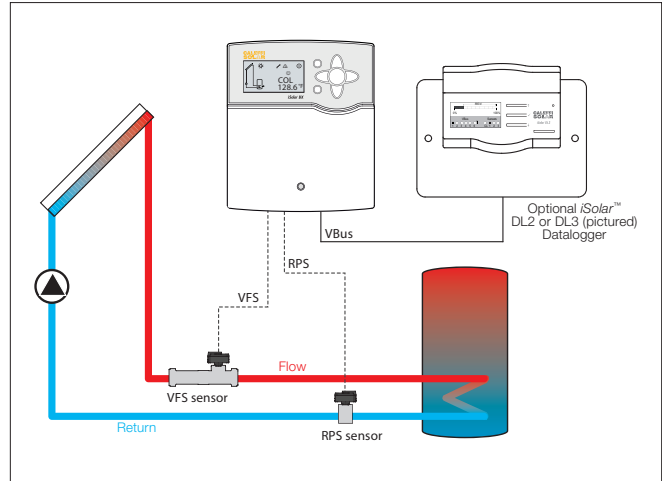
Two union nuts, washers and tail pieces.
 Low-lead brass.

Code	Description	Lbs	USD
NA12249	½" sweat with 1" union nuts	0.2	38.60
NA12259	¾" sweat with 1" union nuts	0.2	46.40
NA12269	1" sweat with 1" union nuts	0.3	81.00



VFS Grundfos analog flow / temperature sensor. Requires NA15028 cable.
 Temperature measurement range: 32—210°F.
 Max. fluid temperature: 250°F
 Flow measurement accuracy: 1.5%
 Flow response time: < 1 sec.
 Composite in—line body.
 Sweat unions included.
 Maximum glycol: 50%.
 Flow measurement accuracy: 1.5%
 Flow response time: <1 sec.

Code	Description	Lbs	USD
NA15018	VFS 10-200, 2½—20 gpm, 1" sweat	1.7	947.80
NA15019	VFS 20-400, 2½—50 gpm, 1¼" sweat	1.9	1,422.00



Cable for connecting Grundfos VFS & RPS with molded plug to BX controller with molded plug.

Code	Description	Lbs	USD
NA15028	VFS & RPS cable, 10' length	0.2	27.50

DIFFERENTIAL TEMPERATURE CONTROLLERS



Code	Description	Lbs	USD
257280A LTE	iSolar™ MX LTE	3.0	1,317.00

257
iSolar™ MX LTE

tech. broch. 01274

Inputs: (8) Pt1000 temperature sensors.
 (1) V40 rotary impulse meter.
 (1) CS10 irradiation sensor.

Outputs: (4) triac relays, (1) dry contact relay and (1) PWM / 0-10 V DC.
 Triac relays capacities: 1A / 120 V.
 Dry contact relay capacity: 2A / 24 V.
 Power supply: 100—240 V - 50/60 Hz.
 Data interface: V-Bus, SD card slot.
 ΔT adjustment range: 2—40°FΔ.
 Min. temperature differential 2°FΔ.
 Hysteresis: 2°FΔ, ± 1°FΔ.
 Max. tank temperature range: 35—205°F.
 Max. collector temperature range: 210—375°F.
 Emergency shut down of the collector: 230—395°F.
 Min. collector temperature range: 50—195°F.
 Antifreeze temperature option: 15—50°F.
 kWh (BTU) flow input: 0—99 gpm.
 Note: Do not attach Grundfos analog sensors

Function

The iSolar™ MX LTE is a multi-functional temperature differential controller with add-on system functions for use in a wide variety of solar thermal heating applications. iSolar™ MX LTE is equipped with four triac pump speed control relays and one dry contact relay. The controller is equipped with eight Pt1000 sensor inputs, one V40 impulse flow meter input and one CS10 irradiation sensor input. Several system configuration options are predefined for control of a standard solar water heating system, drainback systems, supplemental space heating, multiple storage tanks, heat dump and storage tank booster heating. Unique features include built-in SD memory card slot, built-in clock and calendar, integrated energy heat measurement inputs, parallel relay operation and drain back control.

NA150



Steel electrical mounting box with cover fits iSolar™ MX LTE controller.



Code	Description	Lbs	USD
NA15027	Electrical box	5.0	87.80

FAP13



The FAP13 is used for measuring the outdoor temperature with a PT1000 (platinum measuring element), 1000 Ohm. The FAP13 is placed in a weather resistant housing designed for mounting outdoors.

Code	Description	Lbs	USD
NA15023	Outdoor air temperature sensor	0.3	164.60

CS10



The solar cell is used for measuring the irradiation intensity. The short-circuit current rises with increasing irradiation intensity. Depending on the controller, the sensor can also be used for additional indirect or direct control. The connecting two wire cable can be extended to 300 ft.

Code	Description	Lbs	USD
NA257102	Solar irradiation sensor	0.1	274.30

NA100




18" SJ round cord, stripped and pre-tinned for connecting pump or valve to iSolar controller.

Code	Description	Lbs	USD
NA10092	18" SJ round cord	0.3	9.90

FLOW METERS

V40


 [tech. broch. 01275](#)



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
NA79701	¼—10 gpm, ¾" sweat	3.0	715.80

V40

 [tech. broch. 01275](#)



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
NA79702	½—15 gpm, 1" sweat	5.0	1,264.00
NA79703	½—25 gpm, 1¼" sweat	8.0	1,484.00
NA79704	1—45 gpm, 1½" sweat	14	1,813.00
NA79705	1½—65 gpm, 2" sweat	17	2,613.00

NEW



RPD Grundfos digital pressure/ temperature sensor for use with iSolar™ MX LTE controller. Requires NA15028 cable.
 Pressure measuring range: 0—150 psi.
 Temperature measurement range: 32—210°F.
 Max. fluid temperature: 250°F
 Maximum glycol: 50%.
 Connection: ½" male NPT.

Code	Description	Lbs	USD
NA15010D	RPD 0—10, 0—150 psi	0.3	209.00

NEW



VFD Grundfos digital flow / temperature sensor for use with iSolar™ MX LTE controller. Requires NA15028 cable.
 Temperature measurement range: 32—210°F.
 Max. fluid temperature: 250°F
 Flow measurement accuracy: 1.5%
 Flow response time: < 1 sec.
 Brass or stainless in-line body.
 Maximum glycol: 50%.
 Connection: 1" male union thread.
 Select union fittings on the right.
 Flow measurement accuracy: 1.5%
 Flow response time: <1 sec.
 Select fitting below or in Section 9.

Code	Description	Lbs	USD
NA15015D	VFD 1-12, ¼—3 gpm	0.6	397.10
NA15016D	VFD 2-40, ½—10 gpm	0.6	418.00
NA15017D	VFD 5-100, 1½—15 gpm	1.6	736.80



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

Code	Description	Lbs	USD
NA12249	½" sweat with 1" union nuts	0.2	38.60
NA12259	¾" sweat with 1" union nuts	0.2	46.40
NA12269	1" sweat with 1" union nuts	0.3	81.00

REPLACEMENT TEMPERATURE SENSORS FOR ISOLAR™



FKP6 collector Pt1000 sensor with 5' black UV cable, Platinum RTD type, 1000 Ohm, -58—355°F, ¼" Ø O.D.

Code	Description	Lbs	USD
257205	Black collector sensor	0.2	64.80



FKP9 collector screw mount Pt1000 sensor with 5' black cable, Platinum RTD type, 1000 Ohm, -58—355°F, ¼" Ø O.D.

Code	Description	Lbs	USD
257207	Black collector sensor	0.2	97.70



FRP6 storage tank Pt1000 sensor with 8' gray cable, Platinum RTD type, 1000 Ohm, 15—200°F, ¼" Ø O.D.

Code	Description	Lbs	USD
257206	Gray storage sensor	0.2	64.40



Sensor well, ¼" Ø I.D. fits Pt1000 temperature sensors 257205 and 257206. Insertion length: 1¾".

Code	Description	Lbs	USD
NA10090	Sensor well, ½" NPT male thread	0.5	38.00
NA15029	Sensor well, ¾" NPT male thread	0.5	58.20

DATA LOGGERS

**257
iSolar™ DL2**



iSolar™ DL2 intelligent web enabled datalogger connects to VBus data terminals on one iSolar™ controller. VBus input terminals: 1. Ethernet connection: RJ45 socket. Integrated SD slot: 1. Ambient temperature: 32–100°F. Input voltage: 5 VDC ±5%. Power voltage adapter: 100–240 V. Max. current: 350 mA.

**257
iSolar™ DL3**



iSolar™ DL3 intelligent web enabled datalogger / BACnet IP gateway connects to VBus data terminals on six iSolar™ controllers. VBus input terminals: 6. Pt1000 sensor inputs: 3. Current loop input: 4–20 mA. Ambient temperature: 32–100°F. Input voltage: 12 VDC ±5%. Power voltage adapter: 100–240 V. Max. current: 1 A. Ethernet connection: RJ45 socket. USB connection: 1. Integrated SD card: 1 slot.

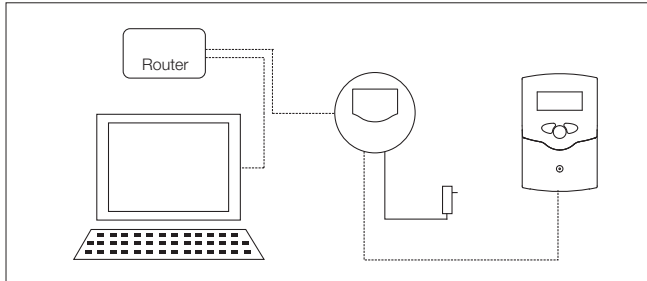
Code	Description	Lbs	USD
257201A	Datalogger	2.0	1,104.00

Code	Description	Lbs	USD
257204A	Datalogger with BACnet IP	2.0	1,975.00

Function

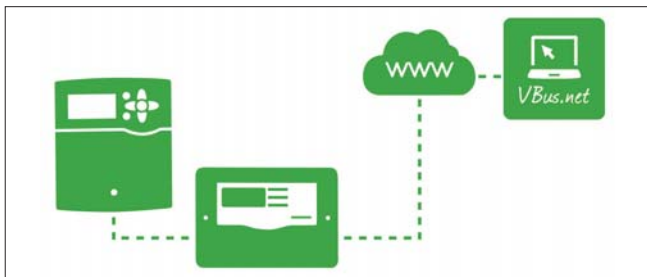
The DL2 datalogger enables the acquisition and storage of large amounts of data such as energy heat metering and recorded values of the solar system over a long period of time when connected to an iSolar™ series controller. The datalogger, when connected to a network through the integrated Ethernet socket, can be configured and viewed with any standard internet browser via its integrated web interface, without additional software. Download data through the web interface or an SD memory card for further data processing in spreadsheet programs.

System layout



VBus.net

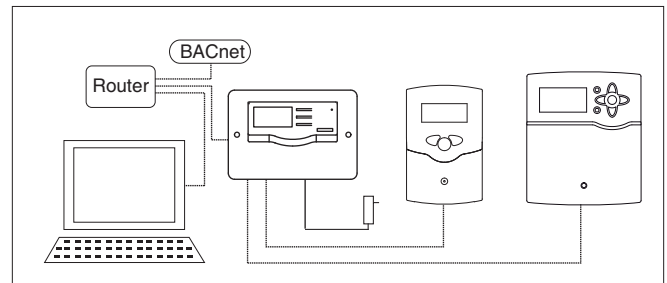
VBus.net is a service portal that offers access to solar thermal system data from all over the world. No DNS router configuration is required. To use VBus.net service, the system must be equipped with a Caleffi iSolar™DL2 or DL3 Data Logger. After signing on at www.VBus.net, the Data Logger can be registered with the system. VBus.net enables users to access their solar thermal system data from all over the world, just by using a regular web browser. No additional software or app is required, only a registered account for the VBus.net service, a web browser and internet connection. Many mobile devices are supported as well.



Function

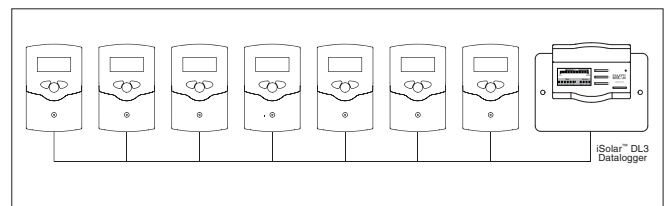
The DL3 datalogger / BACnet/IP gateway provides communication translation between iSolar™ controllers and DDC system which are capable of BACnet/IP communications. Conforms with BACnet PICS, Up to six iSolar™ controllers can be connected to DL3 with two conductor wire (bell wire) at least 20 AWG up to a distance of 150 feet. The DL3 has three additional inputs for Pt1000 temperature sensors and one 4–20 mA Current Loop analog input. A configurable IP address and password protection allows for access from any PC with an internet connection. Download data through the web interface, an SD memory card or USB cable for further data processing in spreadsheet programs.

System layout



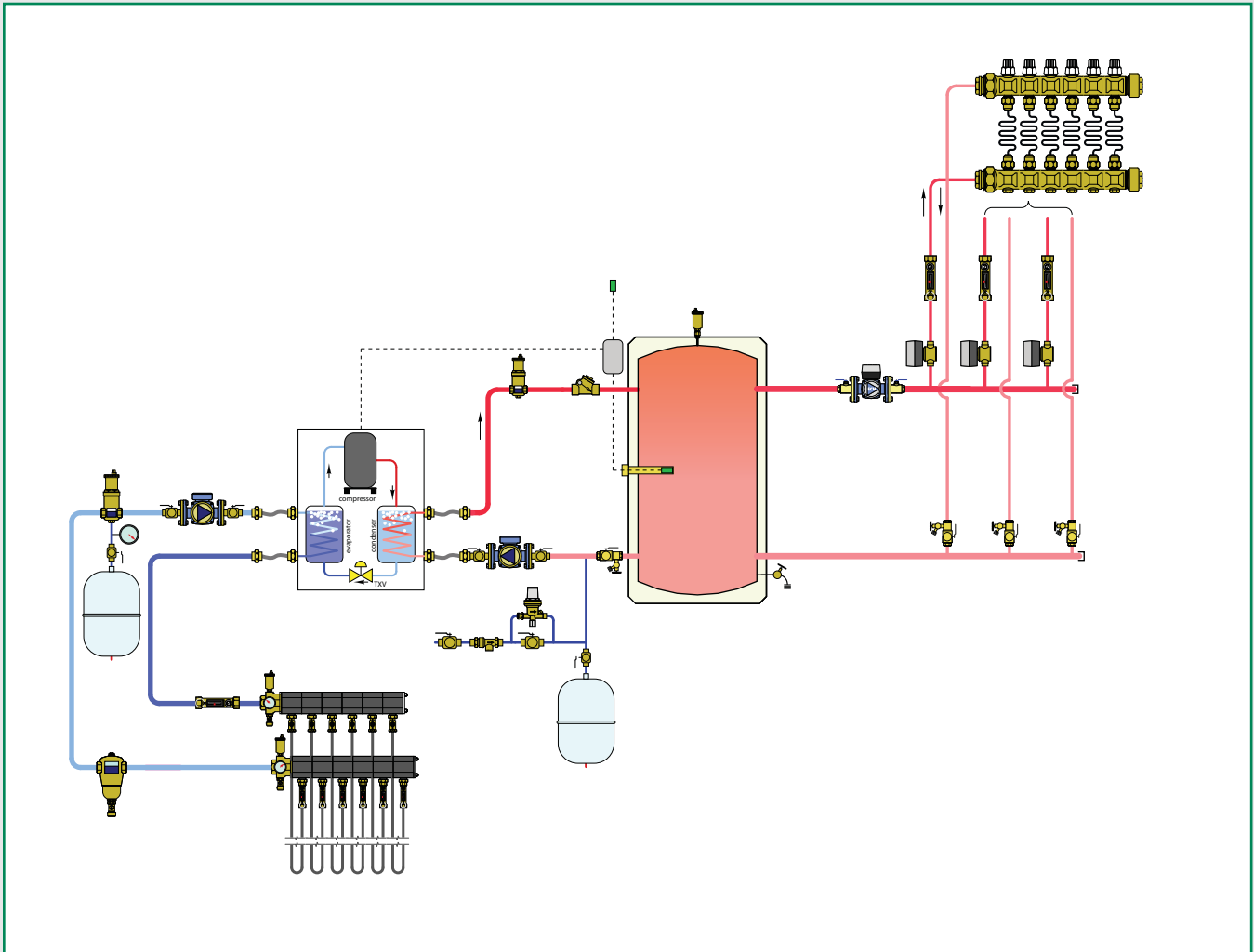
Multinode network

Multiple WMZ or WMZ-G1 energy heat meters can be cascaded together on the VBus connection. One WMZ is configured as the master and additional WMZ meters are configured as slaves. Up to 16 meters can be cascaded together with two conductor wire (bell wire) at least 20 AWG and up to 150 feet for transmission of data values to a connected PC, DL2 or DL3 Datalogger. The connection sequence is arbitrary, up to 16 can be cascaded together.



GEOTHERMAL COMPONENTS

This diagram is an example



- Geothermal manifolds, GeoCal™
- Pipe connections, GeoGrip™
- Balancing valves, QuickSetter™
- Storage tanks, ThermoCon™
- Wall penetration seals, GeoSeal™
- Automatic air vents, DISCALAIR®

MANIFOLDS

110
GeoCal™

 tech. broch. 03175



GeoCal™ left 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	1,260.00
1107C5LA	Left side connections, 3 circuits	18	1,390.00
1107D5LA	Left side connections, 4 circuits	20	1,530.00
1107E5LA	Left side connections, 5 circuits	22	1,660.00
1107F5LA	Left side connections, 6 circuits	23	1,790.00
1107G5LA	Left side connections, 7 circuits	25	1,950.00
1107H5LA	Left side connections, 8 circuits	26	2,080.00



GeoCal™ 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
1107B5RA	Right side connections, 2 circuits	17	1,260.00
1107C5RA	Right side connections, 3 circuits	18	1,390.00
1107D5RA	Right side connections, 4 circuits	20	1,530.00
1107E5RA	Right side connections, 5 circuits	22	1,660.00
1107F5RA	Right side connections, 6 circuits	23	1,790.00
1107G5RA	Right side connections, 7 circuits	25	1,950.00
1107H5RA	Right side connections, 8 circuits	26	2,080.00

FITTINGS

110



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

Code	Description	Lbs	USD
110050A	¾" male NPT tail piece	0.4	41.00
110060A	1" male NPT tail piece	0.6	45.00

861



GeoGrip™ polyethylene pipe fittings. For joining polyethylene pipe to 132 series QuickSetter™ or NA139 ball valves.

Code	Description	Lbs	USD
861527A CST	¾" M NPT x ¾" PE pipe compression	0.2	25.00
861634A CST	1" M NPT x 1" PE pipe compression	0.6	40.00
NA10288	¾" M NPT x 1" PE pipe compression	0.2	55.70

NA39



Brass ball valves
 Brass body.
 Max. working pressure: 150 psi.
 Max. working temperature: 365°F.



Code	Description	Cv	Lbs	USD
NA39589	¾" NPT female w/T-handle	35	0.6	41.80
NA39753	1" NPT female w/Lever	50	0.7	57.00
NA39588	1¼" NPT female w/Lever	104	1.0	94.90

111



Insulation sleeve for item valve and fitting on each end.

Code	Description	Lbs	USD
111001	Insulation sleeve fits NA39589	0.1	51.20

BALANCING VALVE



132

tech. broch. 01149

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" NPT	2.0—7.0	1.8	293.40
132662A	1" NPT	3.0—10.0	2.4	342.10
132772A	1¼" NPT	5.0—19.0	2.8	453.90
132882A	1½" NPT	8.0—32.0	3.4	537.80
132992A	2" NPT	12.0—50.0	4.4	659.80
F19346	Replacement by-pass valve stem*		0.1	53.50

* With operating ring



112

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

Code	Description	Lbs	USD
112001	Insulation sleeve fits 132552A	0.1	54.30
112003	Insulation sleeve fits 132662A	0.1	56.40



NA102

Double Nipple fits 1 ¼" QuickSetter™ or Ball Valve for GeoCal™ main inlet. Connecting 110 Series Manifold to 132772A valve or NA39588 ball valve.

Code	Description	Lbs	USD
NA10263	1¼" NPT x 1¼" NPT, brass	0.4	28.20

WALL SEALS



NA102

GeoSeal™ wall penetration seals. EPDM w/316 stainless steel hardware. (Priced per pair)

Code	Description	Lbs	USD
NA10248	¾", PE pipe thru 2.5" ID hole	0.5	100.00
NA10249	1", PE pipe thru 2.5" ID hole	0.4	70.00
NA10265	1¼", PE pipe thru 3" ID hole	0.7	147.00

PE PIPE CONNECTIONS



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	54.00
NA10247	1" PE pipe compression	1.0	67.00



863

GeoGrip™ brass sleeve coupling for joining two polyethylene pipes.

Code	Description	Lbs	USD
863027	¾" x ¾" PE pipe compression	0.8	30.00
863034	1" PE pipe compression	1.0	44.00



NA102

Vent cap adapter to connect discharge tube. (Ethanol and methanol systems). Fits onto air vent.

Code	Description	Lbs	USD
NA10204	¼" NPT male x female	0.1	28.50

REPLACEMENT PARTS



5020

Automatic air vents fits 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" male thread	0.5	33.30



687

Manifold temperature gauge with drywell. -20—120°F.

Code	Description	Lbs	USD
687000	2½" diameter	0.2	27.70



Replacement drain valve fits GeoCal™ 110 series manifolds. Brass body. ¾" garden hose thread with cap. Max. working pressure: 150 psi. Max. working temperature: 250°F.

Code	Description	Lbs	USD
538402 FD	½" NPT x ¾" GHT	0.3	20.30

STORAGE TANKS

NAS200 ThermoCon™

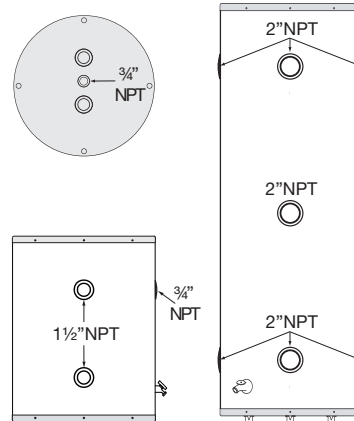
tech. broch. 01179



Storage tanks can serve as a thermal buffering tank with porcelain glass coated steel lining. Powder-coated steel external cover. Drain port/valve. Max. working pressure: 150 psi. Working temperature: -40—190°F. Recommended max. delivery water temperature: 120°F. Testing pressure: 300 psi. Tank insulation: 2" non-CFC foam. Insulation thermal conductivity: R16. Connections: 25 gal. side: (4) 1½" & (1) ¾" NPT female
25 gal. top: (2) 1½" & (1) ¾" NPT female
50, 80, 120 gal. side: (7) 2" NPT female
50, 80, 120 gal. top: (3) ¾" NPT female

Code	Description	Lbs	USD
NAS20025	25 gal. tank, no HX	100	2,777.00
NAS20050	50 gal. tank, no HX	200	3,319.00
NAS20080	80 gal. tank, no HX	250	3,923.00
NAS20120	119 gal. tank, no HX	350	5,191.00

Reduction of Lead in Drinking Water Act Compliant: 0.25% max. weighted average lead content. Reduction of Lead in Drinking Water Act certified through Underwriters Laboratory (UL) in accordance with NSF/ANSI 372.



STORAGE TANK ACCESSORIES



551 DISCALAIR®

tech. broch. 01124

High discharge automatic air vent. Brass body. Max. working pressure: 150 psi. Working temperature range: 32—250°F.

Code	Description	Lbs	USD
551004A	½" NPT female	8.2	130.20



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

Code	Description	Lbs	USD
NA10160	½" NPT male x ½" male NPT x 3"	0.1	13.50



Reducer bushing for inserting into top of storage tank to attach pipe nipple to air vent. 1⅝" hex head.

Code	Description	Lbs	USD
NA10082	¾" M NPT x ½" F NPT, brass	0.3	8.40



Magnesium anode rod.

Code	Description	Lbs	USD
NA10229	¾" NPT x 36" anode rod fits 50 gal.	8.0	67.00
NA10230	¾" NPT x 40" anode fits 80 & 120 gal.	9.0	93.40



Reducer bushing for installing into 2" NPT female connection in storage tank providing an ¾" NPT female thread. 1⅝" hex head.

Code	Description	Lbs	USD
NA10234	2" M NPT x ¾" F NPT, low lead brass	0.2	83.40



Male plug 1¼" square head.

Code	Description	Lbs	USD
NA10339	2" NPT male plug, stainless steel	0.2	45.40

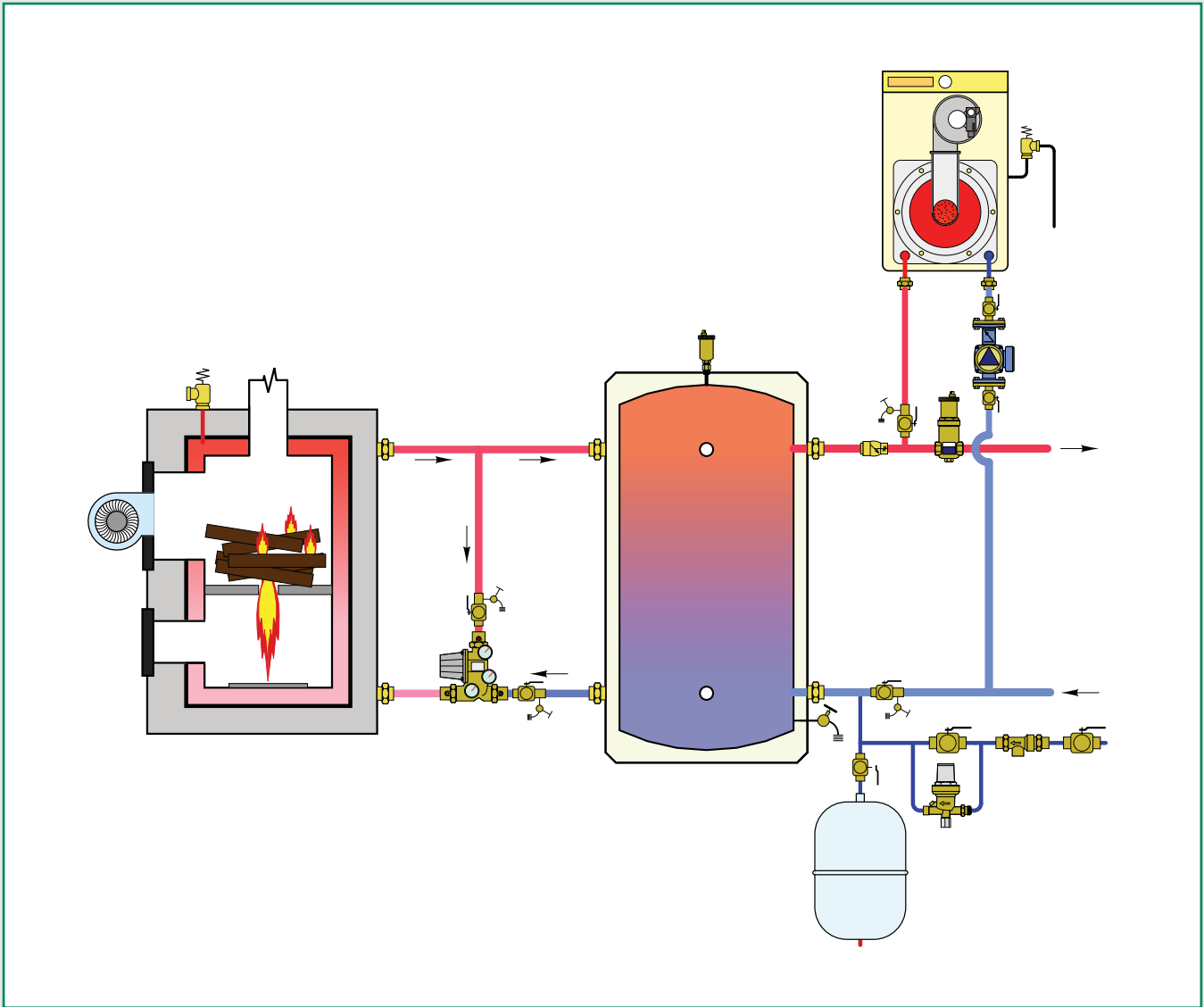


Sensor well, ¼" Ø I.D. Insertion length: 1¼".

Code	Description	Lbs	USD
NA15029	Sensor well, ¾" NPT male thread	0.5	58.20

BIOMASS COMPONENTS

This diagram is an example



Boiler protection valves, ThermoProtec™

Boiler protection recirculation and distribution unit, ThermoBloc™

BOILER PROTECTION HIGH-FLOW THERMOSTATIC MIXING VALVE



280 ThermoProtec™ NPT

tech. broch. 01223

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).



Code	Description	Cv	Lbs	USD
280165A	1" NPT 130°F Tset	10	3.6	441.00
280166A	1" NPT 140°F Tset	10	3.6	441.00
280175A	1¼" NPT 130°F Tset	14	4.5	506.80
280176A	1¼" NPT 140°F Tset	14	4.5	506.80



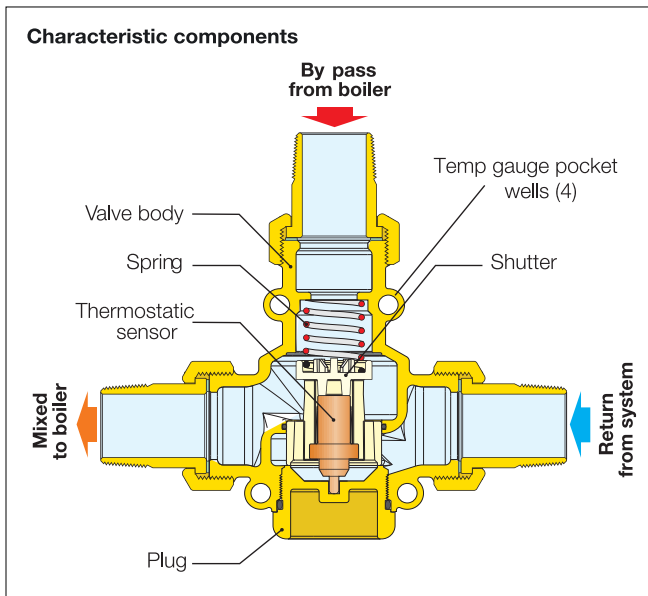
280 ThermoProtec™ Sweat

tech. broch. 01223

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).



Code	Description	Cv	Lbs	USD
280965A	1" sweat 130°F Tset	10	3.6	412.80
280966A	1" sweat 140°F Tset	10	3.6	412.80
280975A	1¼" sweat 130°F Tset	14	4.5	485.90
280976A	1¼" sweat 140°F Tset	14	4.5	485.90



FUNCTION

The ThermoProtec™ boiler protection high-flow thermostatic mixing valve is used in hydronic heating systems with non-condensing boilers, including solid fuel, biomass, gas, LP or oil-fired. It can be installed with steel, cast iron and copper tube style boilers, automatically controlling the return water temperature, preventing condensation of the water vapor contained in the flue gas.

The 280 series ThermoProtec™ valve mixes by-pass flow from the boiler with return flow from the system, sending a fixed temperature flow to the boiler which protects against corrosion from condensation occurring when a minimum flue gas temperature is not otherwise maintained.

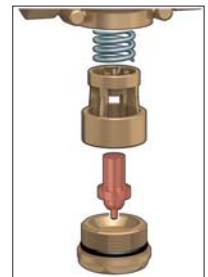
Changeable thermostatic sensor cartridges modifies valve temperature setting. The thermostatic sensor cartridge can easily be removed for maintenance or to change the valve set temperature, with out removing the valve body from the piping.

Thermostatic sensor replacement to modify setting

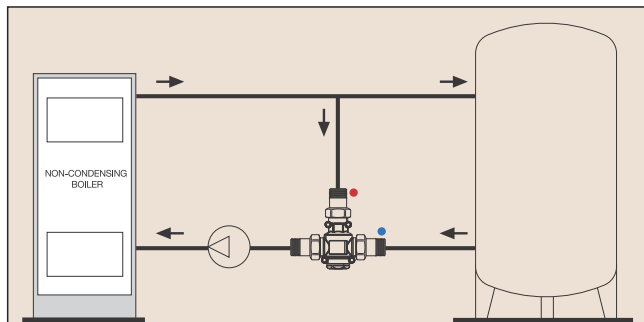
The thermostatic sensor can easily be removed for maintenance or to change the setting, with no need to remove the valve body from the piping.

Installation

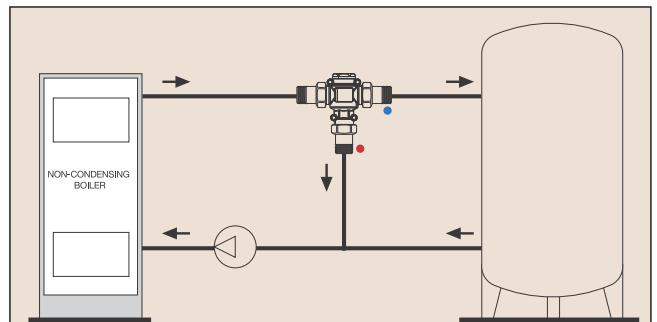
The valve can be installed on both sides of the boiler in any position, vertical or horizontal. Installation is recommended on the return to the boiler in mixing mode; it can also be installed on the flow from the boiler in diverting mode.



Installation in mixing mode (boiler protection)



Installation in diverter mode (system control)



BOILER PROTECTION RECIRCULATION AND DISTRIBUTION UNIT



281 ThermoBloc™ NPT tech. broch. 01224

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

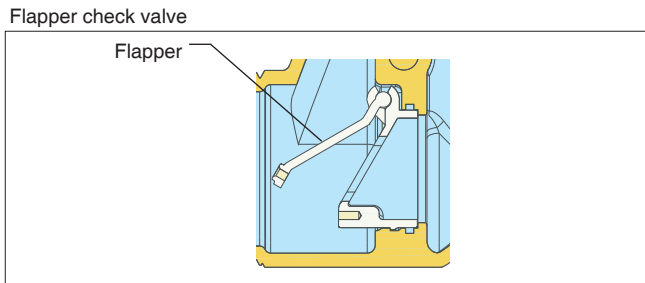
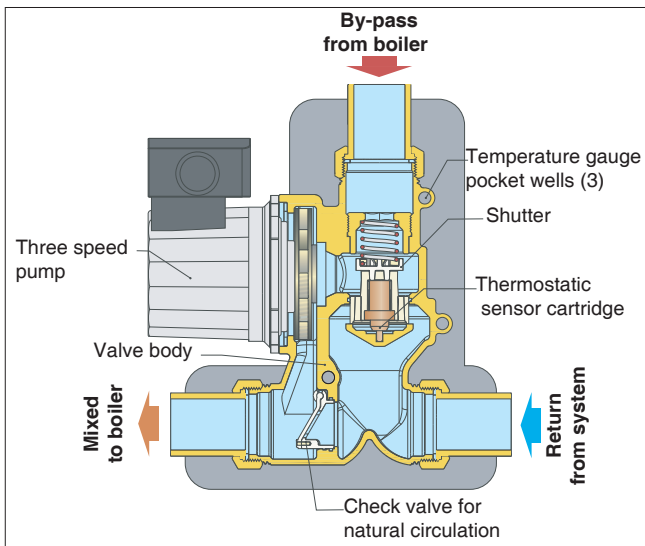
Code	Description	Lbs	USD
281165A	1" NPT 130°F Tset	11	1,359.00
281166A	1" NPT 140°F Tset	11	1,359.00
281175A	1¼" NPT 130°F Tset	11	1,562.00
281176A	1¼" NPT 140°F Tset	11	1,562.00



281 ThermoBloc™ Sweet tech. broch. 01224

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

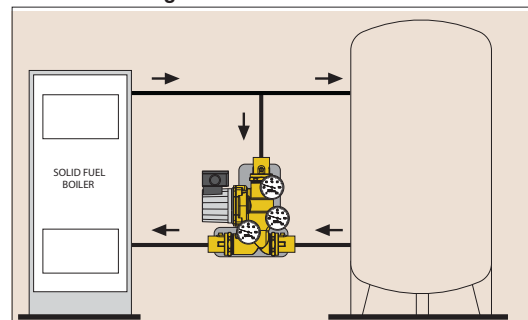
Code	Description	Lbs	USD
281965A	1" sweat 130°F Tset	11	1,270.00
281966A	1" sweat 140°F Tset	11	1,270.00
281975A	1¼" sweat 130°F Tset	11	1,494.00
281976A	1¼" sweat 140°F Tset	11	1,494.00
F19379	Replacement Pump	5	538.20



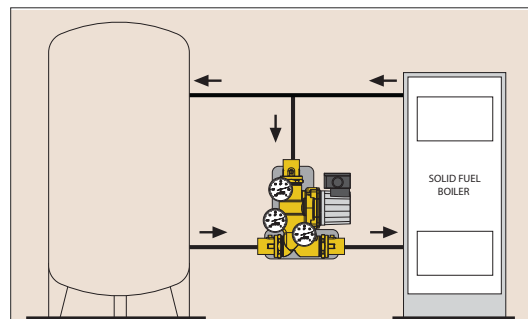
Function
 The flapper check valve allows the natural thermosyphon circulation of the system heat transfer fluid when the pump stops running due to power failure. When the pump is running under normal conditions the thrust of the flowing medium keeps the flapper closed, forcing flow past the thermostatic sensor. When the pump stops running and the fluid in the boiler is at high temperature, natural circulation begins, by-passing the thermostatic sensor, preventing over heating in the boiler.

Function
 The ThermoBloc™ boiler protection recirculation and distribution unit is used in hydronic heating systems with non-condensing boilers, including solid fuel, biomass, gas LP or oil-fired. It can be installed with steel, cast iron and copper tube style boilers, automatically controlling the return water temperature, protection against corrosion from condensation occurring when a minimum flue gas temperature is not otherwise maintained. The ThermoBloc™ unit is compact for easy installation, reducing required space and fittings. It combines the functionality of a boiler protection valve with a circulation pump and a unique flapper check valve allowing for thermosyphon flow between the boiler and distribution system during a power outage. The ThermoBloc™ includes three temperature gauges and is encased in an insulation shell.

Installation on right side of boiler



Installation on left side of boiler





F296

Replacement thermostatic sensor cartridges.
 Sensor cartridge accuracy: $\pm 4^{\circ}\text{F}$.
 By-pass from boiler complete closing temperature: $\text{Tset} + 18^{\circ}\text{F}$ ($130^{\circ} + 18^{\circ} = 148^{\circ}\text{F}$).
 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	41.80
F29634	130°F Tset	0.2	41.80
F29635	140°F Tset	0.2	41.80
F29636	160°F Tset	0.2	41.80

Selection note: thermostatic sensor cartridge will completely close at Tset value $+18^{\circ}\text{F}$. Example: (130°F Tset $+18^{\circ}\text{F} = 148^{\circ}\text{F}$ completely closed) $\pm 4^{\circ}\text{F}$.



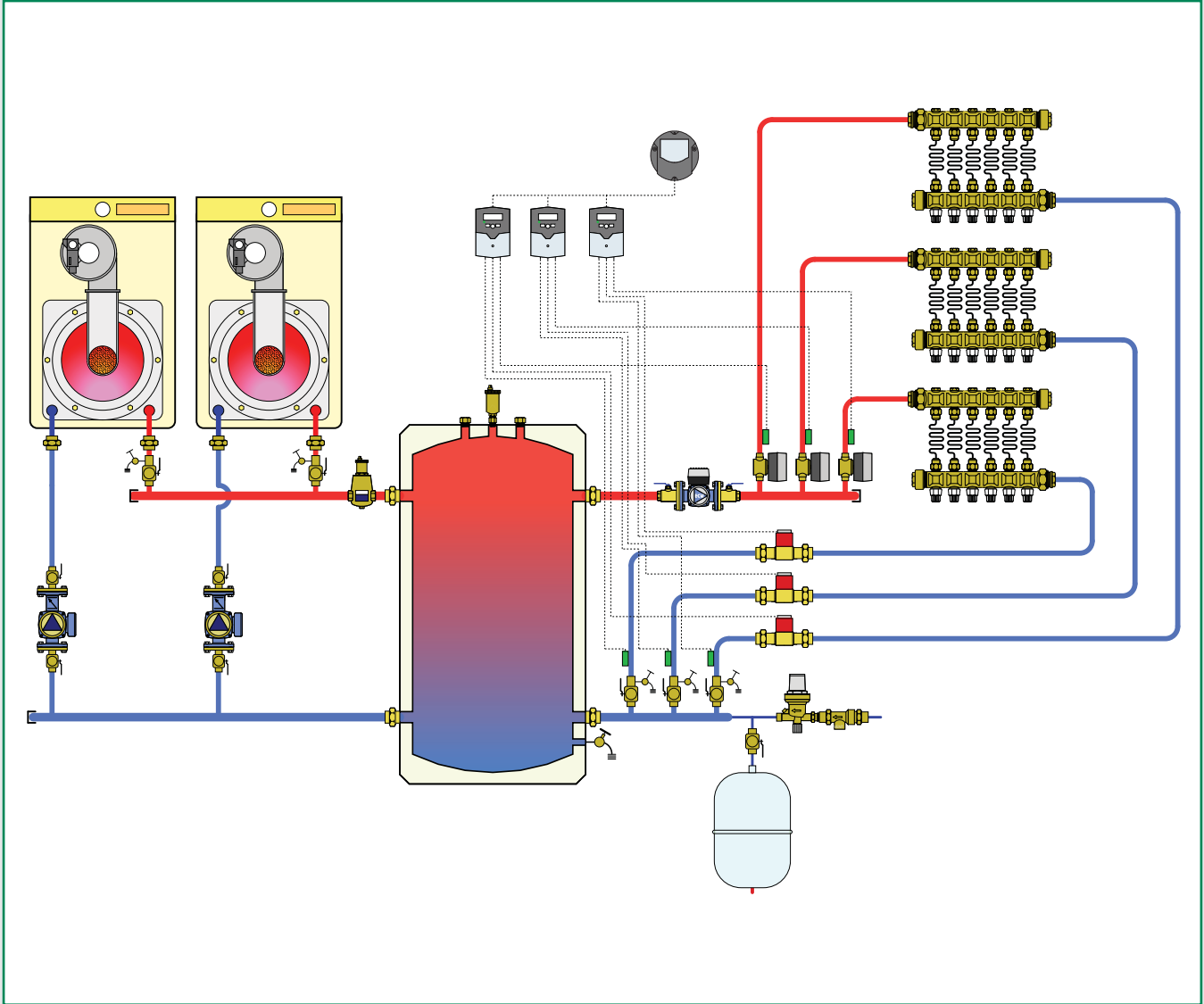
F295

Dual scale temperature gauge 280 and 281 series boiler protection valves.

Code	Description	Lbs	USD
F29571	32 — 250°F	0.2	35.50

HEAT METERS

This diagram is an example



WMZ heat meters

HEAT METERS

**257
WMZ**

 tech. broch. 01275

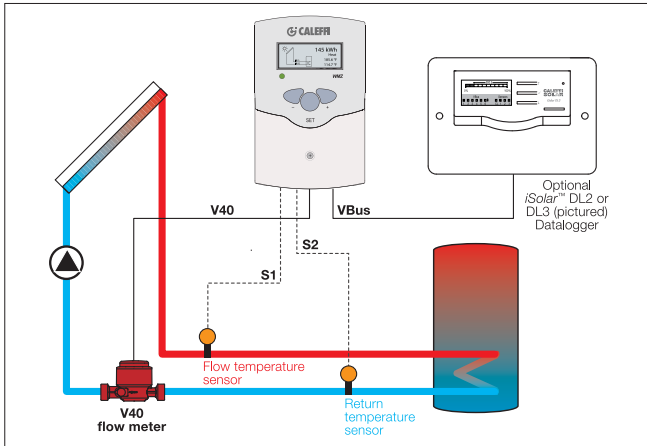


WMZ intelligent kWh energy heat meter with data connection.
 Inputs: rotary pulse flow meter and two Pt1000 supply and return temperature sensors purchased separately.
 Temp. measurement range: -20°—300°F.
 Adj. temp. sensor offset: ± 0.9°F (0.5°K).
 Measuring precision: ± 0.5°F (0.3°K).
 Volume concentration of glycol: 0—70%.
 Pulse rate volumetric flow rate: 1—99 l/imp.
 Interface: VBus.
 Power supply: 24 V AC/DC

Code	Description	Lbs	USD
257202A	Energy heat meter	2.0	719.00

Function

The WMZ is a heat meter for solar thermal systems and conventional heating (or cooling) systems. The WMZ calculates heat by integrating flow rate from a rotary pulse flow meter and temperature difference in the supply and return piping using two Pt1000 temperature sensors for convenient metering of energy generated or consumed. The calculated heat energy value is displayed in kWh (kilowatt hours) and stored. Memory protection guarantees that the adjusted system settings and the calculated heat energy quantity are maintained in the case of power loss.



Multi node network

Additional WMZ energy meters can be cascaded together on the VBus connection. One WMZ is configured as the master and additional WMZ meters are configured as slaves. Up to 16 meters can be cascaded together with two conductor wire (bell wire) at least 20 AWG and up to 150 feet for transmission of data values to a connected PC or DL datalogger.



Sensor well, 1/4" Ø I.D. fits Pt1000 temperature sensors 257205 and 257206
 Insertion length 1 3/4".

Code	Description	Lbs	USD
NA10090	Sensor well, 1/2" NPT male thread	0.5	38.00
NA15029	Sensor well, 3/4" NPT male thread	0.5	58.20

V40

 tech. broch. 01275



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
NA79701	1/4—10 gpm, 3/4" sweat	3.0	715.80

V40

 tech. broch. 01275



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
NA79702	1/2—15 gpm, 1" sweat	5.0	1,264.00
NA79703	1/2—25 gpm, 1 1/4" sweat	8.0	1,484.00
NA79704	1—45 gpm, 1 1/2" sweat	14	1,813.00
NA79705	1 1/2—65 gpm, 2" sweat	17	2,613.00



FKP6 collector Pt1000 sensor with 5' black UV cable, Platinum RTD type, 1000 Ohm, -58—355°F, 1/4" Ø O.D.

Code	Description	Lbs	USD
257205	Black collector sensor	0.2	64.80



FRP6 storage tank Pt1000 sensor with 8' gray cable, Platinum RTD type, 1000 Ohm, 15—200°F, 1/4" Ø O.D.

Code	Description	Lbs	USD
257206	Gray storage sensor	0.2	60.40



FKP9 collector screw mount Pt1000 sensor with 5' black cable, Platinum RTD type, 1000 Ohm, -58—355°F, 1/4" Ø O.D.

Code	Description	Lbs	USD
257207	Black collector sensor	0.2	97.70

HEAT METERS

**257
WMZ-G1**

 tech. broch. 01272

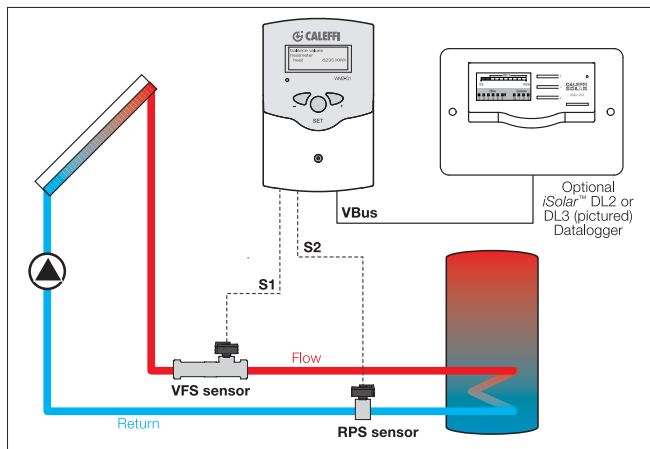


WMZ-G1 intelligent kWh energy heat meter with VBus data connection. Requires VFS and RPS sensors purchased separately. Temperature measurement range: 32–210°F. Pressure measuring range: 0–150 psi. Inputs: 2 Grundfos Direct analog sensors. Alarm relay capacities: 1 A 24 V AC/DC Interface: VBus data connection. Power supply: 24 V AC/DC.

Code	Description	Lbs	USD
257202A G1	Energy heat meter	2.0	719.00

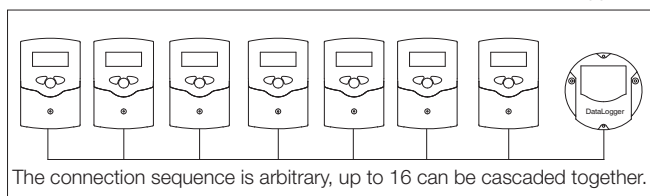
Function

The WMZ-G1 is a energy heat meter for solar thermal systems and conventional heating or cooling systems. The WMZ-G1 calculates heat by integrating flow rate from a Grundfos Vortex Flow Sensor (VFS) and temperature difference in the supply and return piping using either Grundfos Relative Pressure Sensor (RPS) or VFS sensors. The calculated heat energy value is displayed in kWh (kilowatt hours) and stored. Memory protection guarantees that the adjusted system settings and the calculated heat energy quantity are maintained in the case of power loss.



Multi node network

Additional WMZ-G1 energy meters can be cascaded together on the VBus connection. One WMZ-G1 is configured as the master and additional WMZ-G1 meters are configured as slaves. Up to 16 meters can be cascaded together with two conductor wire (bell wire) at least 20 AWG and up to 150 feet for transmission of data values to a connected PC or DL datalogger.



Cable for connecting Grundfos VFS & RPS (molded plug) to WMZ-G1 terminal block (4 wire pins).

Code	Description	Lbs	USD
NA15030	VFS & RPS cable, 10' length	0.1	27.50



RPS Grundfos analog pressure/ temperature sensor. Requires NA15030 cable. Pressure measuring range: 0–150 psi. Temperature measurement range: 32–210°F. Max. fluid temperature: 250°F. Maximum Glycol: 50%. Connection: 1/2" male NPT.

Code	Description	Lbs	USD
NA15010	RPS 0–10, 0–150 psi	0.3	207.40



VFS Grundfos analog flow / temperature sensor. Requires NA15030 cable. Temperature measurement range: 32–210°F. Max. fluid temperature: 250°F. Flow measurement accuracy: 1.5%. Flow response time: < 1 sec. Brass or stainless in-line body. Maximum glycol: 50%. Connection: 1" male union thread. Flow measurement accuracy: 1.5%. Flow response time: <1 sec. Select fittings below or in Section 9.

Code	Description	Lbs	USD
NA15015	VFS 1-12, 1/4–3 gpm	0.6	349.60
NA15016	VFS 2-40, 1/2–10 gpm	0.6	385.20
NA15017	VFS 5-100, 1 1/2–15 gpm	1.6	669.80



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

Code	Description	Lbs	USD
NA12249	1/2" sweat with 1" union nuts	0.2	38.60
NA12259	3/4" sweat with 1" union nuts	0.2	46.40
NA12269	1" sweat with 1" union nuts	0.3	81.00



VFS Grundfos analog flow / temperature sensor. Requires NA15030 cable. Temperature measurement range: 32–210°F. Max. fluid temperature: 250°F. Flow measurement accuracy: 1.5%. Flow response time: < 1 sec. Composite in-line body. Sweat unions included. Maximum glycol: 50%. Flow measurement accuracy: 1.5%. Flow response time: <1 sec.



Code	Description	Lbs	USD
NA15018	VFS 10-200, 2 1/2–20 gpm, 1" sweat	1.7	947.80
NA15019	VFS 20-400, 2 1/2–50 gpm, 1 1/4" sweat	1.9	1,422.00



Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
100001A	21.90	74	127156AFC	181.10	59	166600A	1,813.00	39	278951A	1,278.00	89
110050A	41.00	106	127157AFC	229.40	59	166602A	2,142.00	39	279051	1,097.00	88
110060A	45.00	106	127158AFC	207.40	59	166610A	1,813.00	39	279051A	1,372.00	88
1107B5LA	1,260.00	106	127159AFC	159.10	59	166612A	2,142.00	39	280165A	441.00	110
1107B5RA	1,260.00	106	127164AFC	193.70	59	167600A	2,142.00	39	280166A	441.00	110
1107C5LA	1,390.00	106	127165AFC	242.00	59	167602A	2,471.00	39	280175A	506.80	110
1107C5RA	1,390.00	106	127168AFC	242.00	59	167610A	2,142.00	39	280176A	506.80	110
1107D5LA	1,530.00	106	127169AFC	193.70	59	167612A	2,471.00	39	280965A	412.80	110
1107D5RA	1,530.00	106	127341AF	139.80	70	1725C1A	1,729.00	40	280966A	412.80	110
1107E5LA	1,660.00	106	127346AF	154.70	70	1725C1AHE	2,075.00	40	280975A	485.90	110
1107E5RA	1,660.00	106	127347AF	131.80	70	1725D1A	1,841.00	40	280976A	485.90	110
1107F5LA	1,790.00	106	127349AF	133.10	70	1725D1AHE	2,187.00	40	281165A	1,359.00	111
1107F5RA	1,790.00	106	127351AF	146.20	70	1725E1A	1,952.00	40	281166A	1,359.00	111
1107G5LA	1,950.00	106	127356AF	169.20	70	1725E1AHE	2,298.00	40	281175A	1,562.00	111
1107G5RA	1,950.00	106	127357AF	139.60	70	1725F1A	2,064.00	40	281176A	1,562.00	111
1107H5LA	2,080.00	106	127359AF	139.10	70	1725F1AHE	2,410.00	40	281965A	1,270.00	111
1107H5RA	2,080.00	106	127361AF	167.60	70	1725G1A	2,176.00	40	281966A	1,270.00	111
111001	51.20	106	127366AF	209.40	70	1725G1AHE	2,521.00	40	281975A	1,494.00	111
112001	54.30	107	127367AF	174.20	70	1725H1A	2,287.00	40	281976A	1,494.00	111
112003	56.40	107	127369AF	159.70	70	1725H1AHE	2,632.00	40	301040	65.80	27
116000	90.00	61	130400A	193.30	72	1725I1A	2,399.00	40	301140	65.80	27
116010	20.00	61	130500A	209.00	72	1725I1AHE	2,744.00	40	301241	115.30	27
116140A	296.00	60	130600A	250.80	72	1725L1A	2,511.00	40	301341	115.30	27
116140AC	356.00	60	130700A	313.50	72	1725L1AHE	2,856.00	40	31401 FD	53.20	78
116141A	316.00	60	130800A	391.90	72	1725M1A	2,621.00	40	31403 FD	87.80	78
116141AC	376.00	60	130900A	522.50	72	1725M1AHE	2,967.00	40	31426 FD	105.10	78
116150A	318.00	60	132060A	1,662.00	73	1725N1A	2,733.00	40	31428 FD	136.00	78
116150AC	388.00	60	132080A	2,216.00	73	1725N1AHE	3,079.00	40	31553 FD	23.50	78
116151A	338.00	60	132100A	3,384.00	73	1725O1A	2,844.00	40	31554 FD	47.20	77,78
116151AC	408.00	60	132432A	272.40	73	1725O1AHE	3,190.00	40	31901A	19.00	76,96
116240A	386.00	60	132434AFC	333.90	58	200000	79.60	24	31970A	18.80	78
116240AC	446.00	60	132435AFC	382.20	58	201000	142.60	24	337221A	14.30	11
116250A	408.00	60	132438AFC	382.20	58	203502	269.90	24	338452	82.00	26
116250AC	478.00	60	132439AFC	333.90	58	209000	27.50	24	339452	88.40	26
116340A	406.00	60	132454AFC	333.90	58	209001	11.00	24	342452	54.00	26
116340AC	466.00	60	132455AFC	382.20	58	220400A	78.00	25	343452	56.60	26
116350A	428.00	60	132458AFC	382.20	58	220500A	85.60	25	386500	13.00	45
116350AC	498.00	60	132459AFC	333.90	58	221400A	78.00	25	387100	62.10	28,45
120141A 000	175.50	74	132534AFC	347.90	58	221500A	85.60	25	387127	115.00	25
120149A 000	167.10	74	132535AFC	396.20	58	250041A	82.30	92	41371A	76.80	77
120151A 000	177.80	74	132536AFC	369.90	58	251003A	218.20	93	41372A	98.80	77
120159A 000	169.30	74	132537AFC	418.20	58	251004A	164.40	92	41380A	18.80	78
120161A 000	350.90	74	132538AFC	396.20	58	252149A	264.30	93	41787 CST	46.50	77
120169A 000	334.10	74	132539AFC	347.90	58	252158A	342.10	93	41788 CST	73.60	77
120171A 000	399.20	74	132552A	293.40	73,107	252159A	278.50	93	41789 CST	95.50	77
120179A 000	380.20	74	132554AFC	347.90	58	252168A	389.30	93	41882A	83.00	78
120341A 000	190.00	74	132555AFC	396.20	58	252169A	322.60	93	437516	11.20	28
120349A 000	180.90	74	132556AFC	369.90	58	253040	82.00	93	449000	13.10	47
120351A 000	192.30	74	132557AFC	418.20	58	253042	82.00	93	449010	16.50	24
120359A 000	183.10	74	132558AFC	396.20	58	253043	82.00	93	449740	5.70	27
120361A 000	365.40	74	132559AFC	347.90	58	253044	82.00	93	472000	271.90	24
120369A 000	348.00	74	132634AFC	402.00	58	253046	82.00	93	49684A	450.00	7,22
120371A 000	413.80	74	132635AFC	450.30	58	253048	82.00	93	49685A	650.00	22
120379A 000	394.10	74	132638AFC	430.80	58	254452	33.20	95	501502A	422.50	7,10
121141A	193.50	71	132639AFC	382.50	58	255007	209.00	87	502015A	23.60	10
121149A	184.30	71	132654AFC	402.00	58	255010A	351.10	87	502040A	23.60	10
121151A	195.80	71	132655AFC	450.30	58	257201A	1,104.00	104	502043 CST	33.30	47,107
121159A	186.50	71	132658AFC	430.80	58	257202A	719.00	114	502043A	33.30	7,10
121161A	399.20	71	132659AFC	382.50	58	257202A G1	719.00	115	502115A	31.90	10
121169A	380.20	71	132662A	342.10	73,107	257204A	1,975.00	104	502243A	57.30	10
121171A	447.70	71	132772A	453.90	73,107	257205	64.80	103,114	502343A	67.60	7,10
121179A	426.30	71	132882A	537.80	73,107	257206	60.40	103,114	502610A	21.20	11
121341A	207.40	71	132992A	659.80	73,107	257207	97.70	103,114	502620A	22.20	11
121349A	198.10	71	142241A	162.00	72	257208	32.90	98	502630	29.50	11
121351A	210.40	71	142251A	172.40	72	257220A	522.50	98	502640	31.90	11
121359A	200.30	71	142261A	235.10	72	257260A	794.20	98	502710A	29.40	11
121361A	413.70	71	142271A	334.40	72	257270A	1,071.00	100	502720A	31.00	11
121369A	394.10	71	142281A	376.20	72	257280A LTE	1,317.00	102	508013A	11.60	11
121371A	462.20	71	142291A	480.70	72	259012	179.60	87	508100A	10.00	11
121379A	440.20	71	163600A	1,975.00	38	259018	223.10	87	519006	93.30	39
127144AFC	145.10	59	163610A	1,975.00	38	259025	288.80	87	519502A	175.90	8
127145AFC	193.40	59	165001	82.80	38	259033	493.10	87	519566A	198.90	8
127148AFC	193.40	59	165600A	1,484.00	38	259050	621.80	87	519599A	173.50	8
127149AFC	145.10	59	165602A	1,813.00	38	278011	66.90	88	519600A	272.80	8
127154AFC	159.10	59	165610A	1,484.00	38	278751	921.70	88	519609A	272.80	8
127155AFC	207.40	59	165612A	1,813.00	38	278751A	1,197.00	88	519700A	327.50	8

Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
519709A	327.50	8	535051A	210.40	67	546306A	338.60	18	551054AC	675.90	13
520051A	172.40	55	535056A	216.30	67	546307A	494.40	18	551060A	3,212.00	15
520500AX	372.00	55	535057A	208.00	67	546308A	643.70	18	551066A	343.10	13
520506AX	425.30	55	535059A	208.00	67	546309A	776.40	18	551066AC	353.30	13
520509AX	359.50	55	535066A	234.60	67	546328A	322.50	18	551067A	527.80	13
520510AX	425.30	55	535067A	225.60	67	546335A	470.90	18	551067AC	538.10	13
520516AX	477.60	55	535340HA	182.00	57	546341A	613.40	18	551080A	4,252.00	15
520519AX	411.70	55	535341HA	200.00	57	546354A	748.20	18	551100A	4,757.00	15
521101A	201.40	51	535350HA	196.00	57	546366A	367.30	18	551120A	6,923.00	15
521342A	283.20	56	535351HA	214.00	57	546367A	563.20	18	551150A	8,920.00	15
521347A	270.90	56	535360HA	256.00	57	546510A	3,269.00	20	553542A	162.50	66
521349A	270.90	56	535361HA	274.00	57	546510AM	4,086.00	21	553549A	154.90	66
521352A	295.50	56	535370HA	544.00	57	546550A	2,031.00	20	553642A	183.40	66
521357A	283.20	56	535371HA	562.00	57	546550AM	2,539.00	21	553649A	175.80	66
521359A	283.20	56	535380HA	784.00	57	546560A	2,185.00	20	559920A	1,249.00	6
521362A	350.90	56	535381HA	802.00	57	546560AM	2,732.00	21	559921A	1,284.00	6
521367A	338.40	56	535390HA	963.00	57	546580A	2,955.00	20	559922A	1,534.00	6
521369A	338.40	56	535391HA	981.00	57	546580AM	3,694.00	21	559931A	1,844.00	6
521400A	271.30	50	535650HA	189.40	57	548006A	1,010.00	5	561402A	20.40	11,13
521400AC	297.70	50	535651HA	207.40	57	548007A	1,217.00	5	562100	26.50	22
521406A	276.40	51	535660HA	279.00	57	548008A	1,594.00	5	573002A	278.90	66
521407A	259.30	51	535661HA	298.00	57	548009A	1,860.00	5	573006A	309.30	66
521407AC	285.90	51	535750HA	181.00	57	548052A	3,862.00	5	573007A	294.10	66
521409A	259.30	50	535751HA	199.00	57	548062A	4,115.00	5	573009A	265.60	66
521409AC	285.90	50	535760HA	240.00	57	548066A	1,090.00	5	573012A	299.80	66
521410A	319.60	50	535761HA	258.00	57	548067A	1,385.00	5	573016A	333.40	66
521410AC	346.00	50	535840HA	127.60	57	548068A	1,794.00	5	573017A	316.60	66
521416A	324.70	51	535850HA	134.60	57	548069A	2,280.00	5	573019A	286.50	66
521417A	307.60	51	535860HA	176.20	57	548082A	5,147.00	5	573403A	126.80	62,66
521417AC	334.20	51	535870HA	387.00	57	548096A	961.00	5	573406A	153.60	62,66
521419A	307.60	50	535880HA	544.80	57	548097A	1,160.00	5	573409A	120.80	62,66
521419AC	334.20	50	535890HA	633.20	57	548098A	1,518.00	5	573493A	123.90	62,66
521500A	283.00	50	535940HA	167.00	57	548099A	1,772.00	5	573503A	133.10	62,66
521500AC	321.80	50	535941HA	185.00	57	548102A	5,761.00	5	574002A	655.50	66
521506A	283.60	51	535950HA	181.00	57	549052A	4,872.00	5	574004A	500.00	62,66
521506AC	349.80	51	535951HA	199.00	57	549082A	6,496.00	5	574050A	600.00	62,67
521507A	271.00	51	535960HA	240.00	57	549102A	7,275.00	5	574012A	675.50	66
521507AC	310.00	51	535961HA	258.00	57	549506A	1,375.00	4	574151A	801.30	67
521509A	271.00	50	535970HA	530.00	57	549507A	1,665.00	4	586600	16.10	80
521509AC	310.00	50	535971HA	548.00	57	549508A	2,185.00	4	59474A	16.50	11
521510A	331.30	50	535980HA	743.00	57	549509A	2,545.00	4	59804A	17.70	11
521510AC	370.10	50	535981HA	761.00	57	549510A	8,730.00	4	59817A	42.70	76
521516A	331.90	51	535990HA	967.00	57	549552A	5,846.00	4	59829	161.50	22
521516AC	398.10	51	535991HA	985.00	57	549562A	6,229.00	4	59834A	38.30	76,96
521517A	319.30	51	538202 FD	19.90	8,74	549566A	1,455.00	4	59840A	38.40	76
521517AC	358.30	51	538402 FD	20.30	8,18,74,107	549567A	1,833.00	4	59893A	28.30	76
521519A	319.30	50	546016A	507.90	16	549568A	2,385.00	4	59894A	62.10	76
521519AC	358.30	50	546050A	3,815.00	16	549569A	2,965.00	4	59904A	24.40	76
521600A	336.10	50	546060A	4,021.00	16	549582A	7,795.00	4	59905A	34.50	76
521600AC	374.90	50	546080A	5,179.00	16	549596A	1,315.00	4	59906A	57.80	76
521606A	342.40	51	546096A	483.80	16	549597A	1,585.00	4	61215A	28.50	80,97
521607A	322.90	51	546097A	578.80	16	549598A	2,080.00	4	626009	31.90	8
521607AC	361.90	51	546100A	5,677.00	16	549599A	2,425.00	4	626600A	340.00	8
521609A	322.90	50	546108A	1,756.00	16	551003A	165.00	14	644004	250.00	36
521609AC	361.90	50	546109A	1,855.00	16	551003AC	175.20	14	644240A	416.60	36
521610A	384.40	50	546116A	604.00	16	551004A	130.20	11,108	644246A	420.00	36
521610AC	423.20	50	546120A	8,190.00	16	551005A	272.70	13	644249A	408.60	36
521616A	390.70	51	546150A	9,992.00	16	551005AC	283.00	13	644250A	424.40	36
521617A	371.20	51	546168A	1,860.00	16	551006A	301.30	13	644256A	424.80	36
521617AC	410.20	51	546169A	2,074.00	16	551006AC	311.50	13	644259A	416.40	36
521619A	371.20	50	546195A	508.40	16	551007A	440.00	13	644260A	459.80	36
521619AC	410.20	50	546196A	578.90	16	551007AC	450.30	13	644266A	464.00	36
523160A	1,434.00	52	546197A	688.70	16	551008A	572.70	13	644269A	451.00	36
523168A	1,333.00	52	546198A	1,706.00	16	551008AC	582.90	13	644340A	469.90	36
523170A	1,641.00	52	546199A	1,788.00	16	551009A	699.10	13	644340A 3BY	469.90	36
523177A	1,654.00	52	546205A	254.50	18	551009AC	709.30	13	644346A	475.00	36
523178A	1,562.00	52	546206A	281.30	18	551022A	159.30	14	644346A 3BY	475.00	36
523179A	1,323.00	52	546207A	409.80	18	551022AC	169.50	14	644349A	457.90	36
523180A	2,275.00	52	546208A	530.90	18	551028A	287.10	13	644349A 3BY	457.90	36
523188A	2,197.00	52	546209A	652.10	18	551028AC	297.30	13	644350A	457.90	36
523190A	2,604.00	52	546228A	267.90	18	551035A	419.00	13	644350A 3BY	457.90	36
523198A	2,525.00	52	546235A	390.30	18	551035AC	429.30	13	644356A	482.20	36
523199A	2,023.00	52	546241A	505.40	18	551041A	545.50	13	644356A 3BY	482.20	36
535004	76.80	67	546254A	621.80	18	551041AC	555.70	13	644359A	469.60	36
535006HA	92.00	57	546266A	323.10	18	551050A	3,004.00	15	644359A 3BY	469.60	36
535009HA	282.00	57	546267A	497.60	18	551054A	665.70	13	644360A	534.70	36

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644360A 3BY	534.70	36	676266A	304.80	30	F41661A	156.80	18	NA10343	94.10	35
644366A	541.00	36	676269A	291.80	30	F49644	25.30	77	NA10354	71.70	8
644366A 3BY	541.00	36	676346A	225.00	30	F49645	28.50	77	NA10355	86.30	8
644369A	521.50	36	676349A	213.60	30	F49646	39.90	77	NA10358	48.30	51
644369A 3BY	521.50	36	676356A	229.80	30	F50055	2.20	7,77,95	NA10363	20.90	66
656304	143.90	46	676359A	221.40	30	F52429	5.20	51	NA10366	82.30	52
656344	143.90	30,46	676366A	269.00	30	F59650	48.00	66	NA10367	203.00	52
656354	170.80	30,46	676369A	256.00	30	F61008	6.00	77,95	NA10403	29.50	76
656354R	186.10	30,46	680503A	13.00	45	F61008/C	7.10	77,95	NA10404	45.00	76
656404	107.90	24,30,46	680504A	13.00	45	F67037	1.20	8,47	NA10405	3.10	51
656414	135.00	24,30,46	680505A	13.00	45	F69184	26.40	47	NA10406	60.90	78
659044	421.40	44	680507	13.00	45	F69293	22.90	33	NA10407	91.40	78
659064	458.50	44	680555A	13.00	45	F69294	22.90	33	NA10408	128.50	78
659084	540.30	44	681503A	13.60	28	F69590	30.30	47	NA10409	209.00	78
659104	621.80	44	681524	13.60	28	F69600	37.90	47	NA10419	50.00	76
659124	702.20	44	681555	13.60	28	NA10001	13.10	78,95	NA10419C	58.20	76
6636C5A	653.10	43	682530A	13.40	45	NA10002	11.10	76,96	NA10425	34.40	7
6636D5A	754.50	43	682540A	13.40	28,45	NA10003	15.00	76,96	NA10426	5.90	7
6636E5A	855.90	43	682545A	14.40	45	NA10005	11.30	31	NA10461	368.90	52
6636F5A	957.20	43	682550A	25.50	45	NA10006	14.10	31	NA10467	70.00	60
6636G5A	1,059.00	43	687000	27.70	107	NA10007	23.20	31	NA10469	60.00	60
6636H5A	1,161.00	43	688003A	52.60	8,47,51,52	NA10009	59.60	77	NA10476	212.10	52
6636I5A	1,262.00	43	69122 CST	16.90	47	NA10038	338.00	41	NA10478	98.90	84
6636L5A	1,364.00	43	694045	25.70	7	NA10042	30.80	97	NA10484	24.40	76
6636M5A	1,465.00	43	861527A CST	25.00	106	NA10056	84.70	51	NA10485	34.50	76
6636N5A	1,566.00	43	861634A CST	40.00	106	NA10058	93.00	51	NA10486	51.80	76
6636O5A	1,668.00	43	863027	30.00	107	NA10060	28.50	79,96	NA11304	21.50	57
6636P5A	1,959.00	43	863034	44.00	107	NA10061	29.80	79,96	NA11305	23.70	57
6637C5A	696.00	43	940451	24.70	28	NA10062	30.80	79,96	NA11306	25.50	57
6637D5A	796.30	43	942550	16.20	45	NA10064	32.10	80,96	NA11307	27.50	57
6637E5A	897.70	43	CBN116140	38.60	61	NA10082	8.40	86,108	NA11308	29.50	57
6637F5A	1,000.00	43	CBN130400	42.50	72	NA10083	17.80	80	NA11309	60.00	57
6637G5A	1,101.00	43	CBN130500	46.00	72	NA10085	27.30	96	NA12102	41.70	94
6637H5A	1,203.00	43	CBN130600	55.20	72	NA10087	28.70	80,97	NA12103	56.20	94
6637I5A	1,304.00	43	CBN130700	69.00	72	NA10089	23.70	80,96	NA12104	90.00	94
6637L5A	1,406.00	43	CBN130800	86.20	72	NA10090	38.00	103,114	NA12112	3.90	95
6637M5A	1,507.00	43	CBN130900	115.00	72	NA10092	9.90	100,102	NA12113	6.00	95
6637N5A	1,609.00	43	CBN142241A	38.90	72	NA10093	67.50	86	NA12114	9.50	97
6637O5A	1,711.00	43	CBN142251A	41.40	72	NA10100	110.00	84	NA12122	28.50	79,95
6637P5A	2,010.00	43	CBN142261A	56.40	72	NA10103	264.20	92	NA12123	35.60	79,95
668000	123.10	46	CBN142271A	80.30	72	NA10104	4.70	80	NA12124	57.10	80,97
6686C5S1A	798.40	42	CBN142281A	90.30	72	NA10114	30.20	97	NA12132	50.40	94
6686D5S1A	914.40	42	CBN546002	120.70	16	NA10116	46.80	97	NA12133	53.00	94
6686E5S1A	1,030.00	42	CBN546205	76.80	18	NA10118	28.50	79,95	NA12134	59.70	94
6686F5S1A	1,146.00	42	CBN546207	82.30	18	NA10119	39.20	80,97	NA12152	30.50	79,95
6686G5S1A	1,262.00	42	CBN546209	90.00	18	NA10120	76.80	98	NA12153	53.00	8
6686H5S1A	1,378.00	42	CBN546118	151.90	16	NA10126	110.00	84	NA12154	58.30	8
6686I5S1A	1,494.00	42	CBN546119	174.00	16	NA10160	13.50	108	NA12155	83.00	8
6686L5S1A	1,610.00	42	CBN551005	76.80	13	NA10164	33.90	76	NA12156	51.00	91
6686M5S1A	1,726.00	42	CBN551007	82.30	13	NA10165	39.90	76	NA12162	33.00	80,96
6686N5S1A	1,842.00	42	CBN551009	90.00	13	NA10166	65.30	76	NA12168	355.30	88
6686O5S1A	1,959.00	42	F0000349	850.00	7,22	NA10197	2.20	66	NA12169	564.30	91
6687C5S1A	846.50	42	F0000435	200.00	7	NA10204	28.50	22,92,107	NA12171	438.90	89
6687D5S1A	962.40	42	F0000580	70.00	61	NA10229	67.00	86,108	NA12172	28.50	79,95
6687E5S1A	1,079.00	42	F0000492	11.10	76	NA10230	93.40	86,108	NA12173	35.60	79,95
6687F5S1A	1,193.00	42	F0000493	110.20	77	NA10234	83.40	86,108	NA12249	38.60	74,77,90,101
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6687O5S1A	2,006.00	42	F19149	438.90	41	NA10263	28.20	107	NA15012	175.60	100
669050	44.70	47	F19346	53.50	58,73,107	NA10265	147.00	107	NA15015	349.60	101,115
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676000A	36.60	30	F29571	35.50	112	NA10272	54.90	79	NA15016	385.20	101,115
676046A	79.60	30	F29633	41.80	112	NA10273	20.00	57,67	NA15016D	418.00	103
676049A	60.80	30	F29634	41.80	112	NA10288	55.70	106	NA15017	669.80	101,115
676056A	88.30	30	F29635	41.80	112	NA10295	114.40	8	NA15017D	736.80	103
676059A	75.60	30	F29636	41.80	112	NA10296	123.80	8	NA15018	947.80	101,115
676066A	136.50	30	F29758	52.80	88	NA10302	3.30	77,80,96	NA15019	1,422.00	101,115
676069A	90.20	30	F29759	52.80	88	NA10313	15.70	28,45	NA15020	277.70	99
676246A	260.80	30	F31868	15.80	78,95	NA10315	187.00	52	NA15021	371.00	99
676249A	249.40	30	F36073	11.00	25	NA10328	77.10	51	NA15022	460.80	99
676256A	265.60	30	F39807	79.00	22	NA10339	45.40	86,108	NA15023	164.60	102
676259A	257.20	30	F41186	4.70	78,79	NA10342	15.70	34	NA15027	87.80	100,102

Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)	Code	USD	Page(s)
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NA15550	181.50	91	NA25540	30.80	87	NA546515AM	9,482.00	21	NA553679	1,008.00	68
NA15559	147.20	91	NA25549	28.40	87	NA546520A	18,060.00	20	NA553679-B	864.20	68
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NA15569	149.40	91	NA256012	329.20	87	NA546525A	27,840.00	20	NA570924	5,700.00	65
NA15570	61.90	91	NA257102	274.30	102	NA546525AM	30,390.00	21	NA570971	618.00	65
NA16002	687.00	41	NA26640	61.00	88	NA546530A	34,480.00	20	NA570974	1,235.00	65
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NA16160	97.20	39	NA26659	112.50	89	NA546535AM	45,900.00	21	NA573102	125.00	65
NA16169	86.20	39	NA26660	127.90	88	NA546550A	3,150.00	20	NA575002	745.00	65
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NA17256	1,256.00	41	NA26750	132.10	88	NA548082A	6,611.00	5	NA669250	44.70	47
NA17256HE	1,602.00	41	NA26759	225.20	89	NA548102A	6,990.00	5	NA669450	42.60	47
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NA20656	27.40	31,82	NA3540-50	5,165.00	94	NA549102AM	9,535.00	4	NAL5263	72.90	81
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NA20657	23.20	82	NA39588	94.90	7,106	NA549150A	15,395.00	5	NAL6262	41.30	81
NA20657C	42.70	82	NA39589	41.80	7,106	NA549150AM	15,845.00	4	NAL6263	54.00	81
NA20659	23.20	82	NA39753	57.00	7,15,20,106	NA549200A	24,875.00	5	NAL6273	88.10	81
NA20659C	42.70	82	NA475002	47.20	24	NA549200AM	27,425.00	4	NAL6363	66.70	81
NA20660	44.90	82	NA503040	46.60	8	NA549250A	34,608.00	5	NAL7262	70.00	81
NA20660C	64.30	82	NA51059	77.70	8,90	NA549250AM	37,158.00	4	NAL7263	82.80	81
NA20666	47.00	31,82	NA51069	99.30	8,90	NA549300A	46,350.00	5	NAL7273	116.80	81
NA20667	40.50	82	NA52367HL	4,200.00	53	NA549300AM	48,900.00	4	NAS10001	293.00	84
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NA20669	40.50	82	NA545306	320.70	19	NA549350AM	57,650.00	4	NAS10004	175.60	84
NA20669C	60.00	82	NA545355	333.10	19	NA551050A	3,672.00	15	NAS10005	263.30	84
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NA20766	52.10	82	NA545365	301.60	19	NA551060A	3,926.00	15	NAS10032	30.70	84
NA20767	41.30	82	NA545366	362.50	19	NA551060T	3,689.00	15	NAS14406	2,736.00	84
NA20769	31.90	82	NA545376	532.80	19	NA551080A	5,197.00	15	NAS14408	3,231.00	84
NA20860	84.60	82	NA545395	276.50	19	NA551100A	5,814.00	15	NAS14410	3,599.00	84
NA20863	48.40	82	NA545396	305.50	19	NA551120A	8,461.00	15	NAS20025	2,777.00	86,108
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NA20869	72.20	82	NA546050TM	4,103.00	17	NA551995	352.50	14	NAS20053	4,225.00	86
NA20870	93.10	82	NA546060A	4,915.00	17	NA551996	389.40	14	NAS20080	3,923.00	86,108
NA20873	78.50	82	NA546060AM	5,365.00	17	NA551200A	18,779.00	15	NAS20082	6,337.00	86
NA20879	71.50	82	NA546080A	6,330.00	17	NA551250A	28,169.00	15	NAS20083	5,733.00	86
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NA20976	141.10	82	NA546100A	6,939.00	17	NA553252	636.40	68	NAS20122	7,483.00	86
NA20979	137.50	82	NA546100AM	7,589.00	17	NA553259	624.30	68	NAS20123	6,820.00	86
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NA20989	99.10	82	NA546120AM	10,660.00	17	NA553362	778.50	68	NAS30020-P	8,983.00	85
NA21083	111.50	82	NA546150A	12,213.00	17	NA553362P	508.60	68	NAS300201P10	17,616.00	85
NA21086	188.60	82	NA546150AM	12,863.00	17	NA553366	835.50	68	NAS300201P8	16,702.00	85
NA21089	143.10	82	NA546200A	22,684.00	17	NA553369	762.90	68	NAS30020P10	13,718.00	85
NA21180	148.20	82	NA546200AM	25,234.00	17	NA553369-B	618.60	68	NAS30020P8	13,261.00	85
NA21189	145.00	82	NA546250A	33,882.00	17	NA553372	900.80	68	NAS30040-P	10,353.00	85
NA21190	170.20	82	NA546250AM	36,432.00	17	NA553372P	508.60	68	NAS300401P10	23,011.00	85
NA21193	164.90	82	NA546300A	43,615.00	17	NA553376	1,003.80	68	NAS300401P8	21,642.00	85
NA21199	166.90	82	NA546300AM	46,165.00	17	NA553379	884.10	68	NAS30040P10	19,040.00	85
NA21293	174.00	82	NA546350A	55,150.00	17	NA553379-B	742.00	68	NAS30040P8	18,127.00	85
NA21296	277.90	82	NA546350AM	57,700.00	17	NA553662	903.90	68	NAS30042-P	10,923.00	85
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NAS30062P8	23,125.00	85	R51838	49.40	77	Z200431	61.00	33	Z307537	127.40	33
NAT417272	116.20	81	R53003	40.30	78	Z200432	61.00	33	Z40	215.80	31
NAT523641	94.60	81	R53004	40.30	78	Z200512	91.30	33	Z40F	244.00	31
NAT524136	94.60	81	R53005	46.10	78	Z200513	91.30	33	Z42	234.90	31
NAT545641	80.50	81	R56142	2.60	22	Z200515	91.30	33	Z44	210.20	31
NAT574136	64.10	81	R56214	2.70	22,47	Z200517	91.30	33	Z44P	290.50	31
NAT623641	73.70	81	R59119	16.70	22	Z200532	80.40	33	Z45	229.60	31
NAT624136	73.70	81	R59681	25.10	22	Z200535	80.40	33	Z45P	295.30	31
NAT624162	50.00	81	R67032	2.90	84,97	Z200537	80.40	33	Z45PL	323.40	31
NAT626241	50.00	81	R69176	25.90	47	Z200617	144.10	33	Z46	285.10	31
NAT626262	51.10	81	R69413	9.90	47	Z200635	135.90	33	Z46P	334.50	31
NAT626341	62.70	81	Z111000	149.20	32	Z200637	135.90	33	Z47	332.00	31
NAT626362	63.80	81	Z111900	139.40	32	Z200683	91.30	33	Z50	221.50	31
NAT6263TT	104.30	81	Z113000	178.70	32	Z200687	91.30	33	Z50F	249.70	31
NAT62TT63	104.30	81	Z114000	178.70	32	Z200737	182.80	33	Z54	215.90	31
NAT634162	62.70	81	Z115000	178.70	32	Z207411	91.20	33	Z54P	296.20	31
NAT636262	63.80	81	Z116000	149.20	32	Z207433	85.70	33	Z55	235.30	31
NAT6362TT	104.30	81	Z121000	138.30	32	Z207533	105.00	33	Z55P	301.00	31
NAT724162	78.70	81	Z123000	167.80	32	Z207537	105.00	33	Z55PL	329.10	31
R11059	6.00	80,84	Z124000	167.80	32	Z300041	88.70	33	Z56	290.80	31
R11217	8.00	77	Z125000	167.80	32	Z300042	88.70	33	Z56P	340.20	31
R21180	6.60	87	Z126000	138.30	32	Z300043	88.70	33	Z57	337.70	31
R29326	9.80	93	Z131000	163.20	32	Z300053	106.60	33	ZSR101	164.00	34
R31495	9.50	84,97	Z133000	192.50	32	Z300411	88.70	33	ZSR103	384.40	34
R31589	20.40	77,78	Z134000	192.50	32	Z300412	88.70	33	ZSR104	451.00	34
R31706	35.60	80,97	Z135000	192.50	32	Z300413	88.70	33	ZSR106	553.50	34
R31981	15.10	76	Z136000	163.20	32	Z300431	83.20	33	ZVR103	292.10	35
R39204	4.40	51	Z141000	152.20	32	Z300432	83.20	33	ZVR104	348.50	35
R41298/C	4.80	95	Z143000	181.50	32	Z300512	110.90	33	ZVR106	451.00	35
R41441	51.40	78	Z144000	181.50	32	Z300513	110.90	33			

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Suggested List Price
Effective March 1, 2017
Canceling All Prior Issues
specifications and prices are subject to change without notice

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