

TankMixer™ and TankMixer™ Compact thermostatic mixing valve kit

520 series



01267/25 NA

Replaces 01267/24 NA



ASSE 1017
NSF/ANSI/CAN 372



Function

The Caleffi TankMixer™ maintains the desired output temperature of the mixed water supplied at a constant setpoint compensating for both temperature and pressure fluctuations of the incoming hot and colder water. The TankMixer allows the water heater thermostat to be set higher than the mixing valve setting, increasing the effective capacity of the heater.

The TankMixer series combines the high-performing AngleMix three-way point of distribution thermostatic mixing valve with a cold water supply cross, which contains an integral check valve for the flow to the mixing valve and ½" NPT female threaded recirculation tap, that can be plugged if not used. The AngleMix angle style mixing valve body design offers improved fluid dynamics for better performance and reduces installation labor and materials, eliminating a piping elbow in typical installations. The AngleMix also features a thermal shut-off function that operates in the event of a cold water supply failure at the inlet.

The TankMixer features a flexible pipe for easy installation directly on a typical gas-fired water heater and other water heaters that have a flue or fan-powered exhaust in between the cold inlet and hot outlet pipe nipples.

The TankMixer Compact provides two pivoting brass connectors for easy installation directly on typical electric water heaters and heat pump water heaters. It has unique ¾" pivot connectors that adapt to heater nipples spaced from 3" to 8" on-center.

The TankMixer thermostatic mixing valve kits have been certified to ASSE 1017, CSA B125.3 and US and Canadian plumbing codes. The products also meet NSF/ANSI/CAN 372 for low lead and lead free materials requirements for products in drinking water systems. Certified and listed by ICC-ES.

Product range

TankMixer

- 52050_AX series kit: Adjustable 3-way thermostatic mixing valve kit, with flexible pipe....union system connections ¾" sweat, press, and NPT male
- 52051_AX series kit: 52050_AX series kit with mixed outlet temperature gauge.

TankMixer Compact

- 52051_AP series kit: Adjustable 3-way thermostatic mixing valve kit, with pivot connectors.....
union system connections ¾" sweat, press, and NPT male

All kits contain angle mixing valve body with cold water cross and ¾" NPT female connection to water heater.

Technical specifications

Materials

Valve body:	DZR low-lead* brass
Cold water cross body:	DZR low-lead* brass
Shutter, seats and slide guides:	PSU
Springs:	stainless steel
Seals:	peroxide-cured EPDM
Adjustment knob	ABS
Large ID flexible pipe:	stainless steel
Recirculation port plug:	low-lead* brass

* Meets the "lead free" requirement of Section 1417 of the Safe Drinking Water Act (SDWA).
This product has a weighted average lead content of less than 0.25% for its wetted surfaces contacted with consumable water.

Performance

Suitable fluids:	water
Setting range:	95 – 150 °F (35 – 65 °C)
Tolerance:	±3 °F (±2 °C)
Max. working pressure (static):	150 psi (10 bar)
Max. working pressure (dynamic):	75 psi (5 bar)
Max. hot water inlet temperature:	195 °F (90 °C)
Max. inlet pressure ratio (H/C or C/H) for optimal performance:	2:1

Minimum temperature difference between hot water inlet and mixed water outlet for stable operation with balanced supply pressure conditions: 9 °F (5 °C)
Recommended minimum temperature difference between hot water inlet and mixed water outlet for optimal performance: 18 °F (10 °C)

Dimensions,TankMixer Kit

Required minimum temperature difference between hot water inlet and mixed water outlet for thermal shut-off function: 18 °F (10 °C)
Minimum flow rate for stable operation with balanced supply pressure conditions: 0.5 gpm (2 l/min)

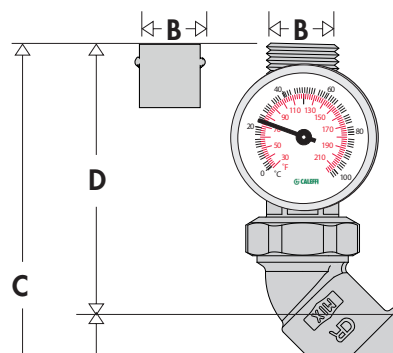
Outlet temperature gauge (optional): 2" diameter
Dual-scale 30 °F - 210 °F (0 °C -100 °C)

Certifications

- 1. ASSE 1017, CSA B125.3, UPC, IPC, IRC and NPC for use in accordance with U.S. and Canadian plumbing codes. Certified and listed by ICC-ES, File PMG 1357.
- 2. NSF/ANSI/CAN 372, US and Canadian Low-Lead and Lead-Free materials contents laws for drinking water system components. Certified by ICC-ES, PMG File 1360.

Connections

- To water heater:
- NPT female union: ¾"
- To mix temperature outlet and cold water inlet:
- sweat union: ¾"
 - press union: ¾"
 - NPT male union: ¾"
- Recirculation inlet port in cross:
- NPT female (plug included) ½"



No temperature gauge.

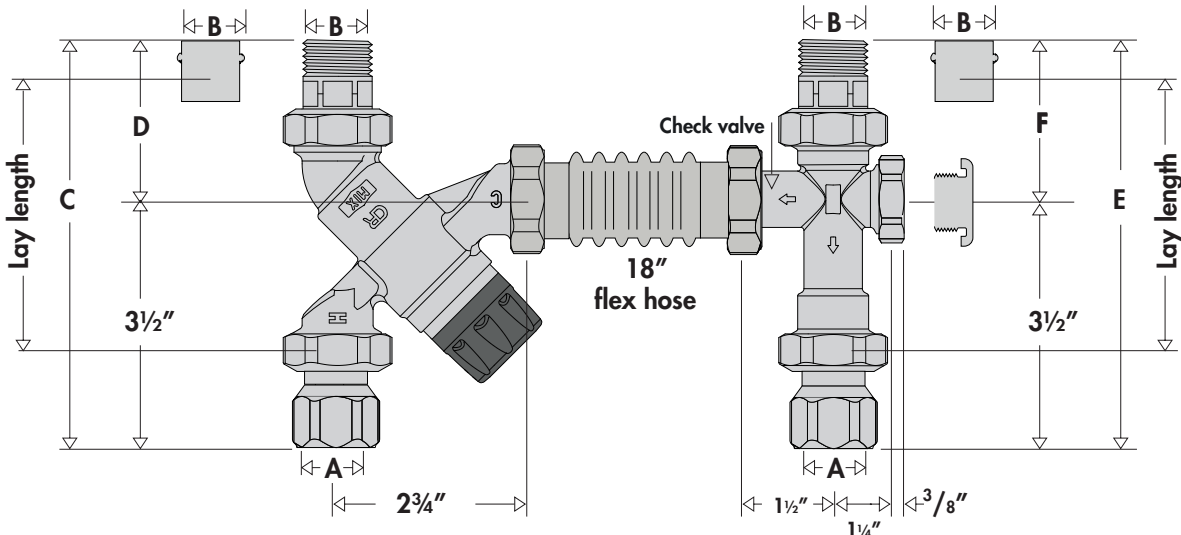
Code	A	B	C	D	E	F	Wt. (lb.)
520500AX	¾" NPTF	¾" NPTM	5 9/16"	2 ¼"	5 5/8"	2 ¼"	2.4
520506AX	¾" NPTF	¾" PRESS	5 13/16"	2 9/16"	5 7/8"	2 9/16"	2.4
520509AX	¾" NPTF	¾" SWT	5 ½"	2 3/16"	5 ½"	2 3/16"	2.4

Lay length (hot inlet to mix outlet) for press: 3 3/8"; for sweat: 3 3/8".

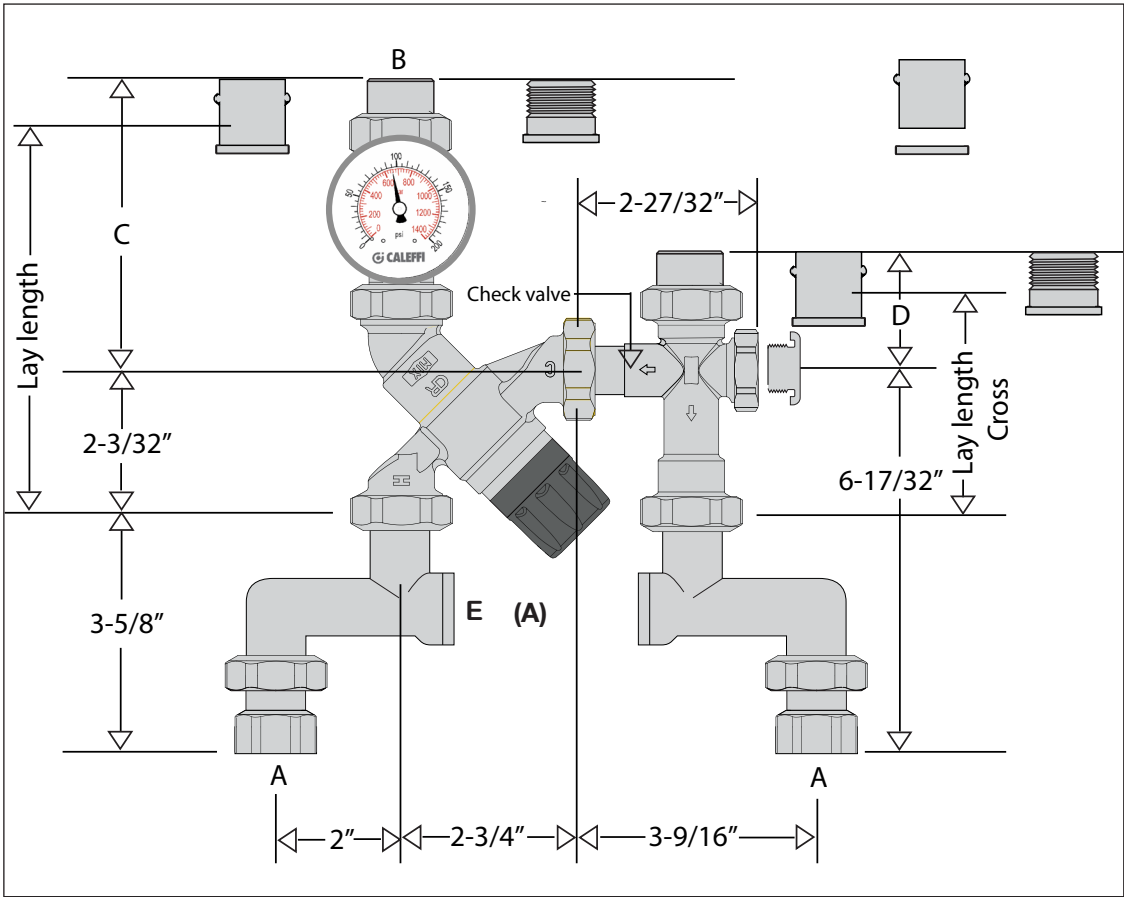
With temperature gauge.

Code	A	B	C	D	E	F	Wt. (lb.)
520510AX	¾" NPTF	¾" NPTM	7 7/8"	4 ¼"	5 5/8"	2 ¼"	2.9
520516AX	¾" NPTF	¾" PRESS	8"	4 9/16"	5 7/8"	2 9/16"	2.9
520519AX	¾" NPTF	¾" SWT	7 ¾"	4 3/16"	5 ½"	2 3/16"	2.9

Lay length (hot inlet to mix outlet) for press: 5 5/16"; for sweat: 5 5/16".



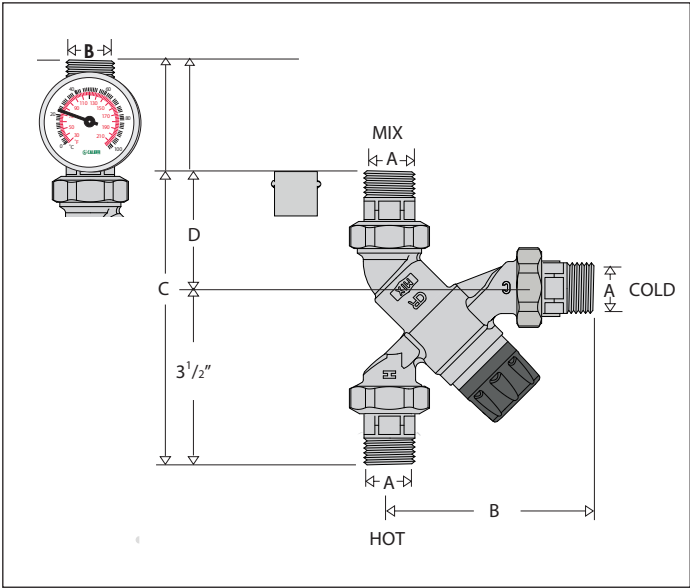
Dimensions,TankMixer Compact Kit



(A) This kit provides one pivot connector with a 3/4" FNPT port (E), which can be used for applications where there is no pressure relief valve on the tank. Install that pivot connector on the hot side to add a pressure relief valve. For applications where a pressure relief valve is present on the tank, install the pivot connector with the FNPT port on the cold side for incorporating an expansion tank.

Code	A	B	C	D	E	Wt. (lb.)
520510AP		3/4" NPTM	4 3/16"	2"		4.5
520516AP	3/4" NPTF	3/4" PRESS	4 17/32"	2 13/32"	3/4" NPTF	4.4
520519AP		3/4" SWT	3 5/16"	1 15/16"		4.1

Lay length (hot inlet to mix outlet) for press: 5 11/16"; for sweat: 4 11/16".
Lay length (Cross) for press: 3 9/32"; for sweat: 3 17/32".



Code	Fitting code	A	B	C	D	Wt. (lb.)
520051A*	NA20650**	3/4" NPTM	4"	5 1/4"	2 1/4"	2.8
	NA20653**	3/4" NPTF	4 1/4"	5 3/4"	2 1/4"	2.8
	NA20656**	3/4" PRESS	4"	5 3/4"	2 9/16"	2.8
	NA20659**	3/4" SWEAT	4"	5 1/4"	2 3/16"	2.8

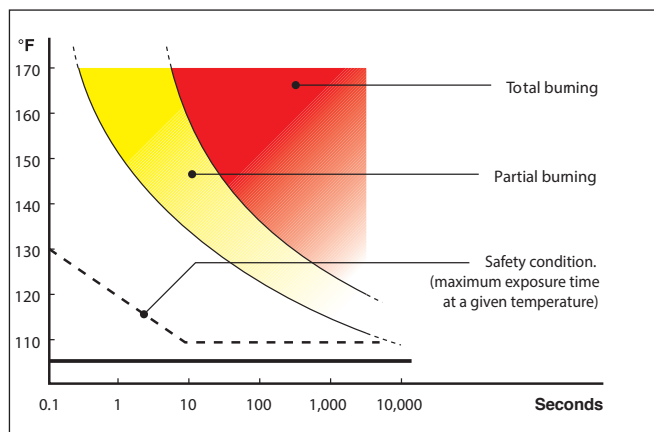
Add 2 1/4 inch to dimension D and C for temperature gauge adapter on mix outlet, code NA10358 (1" union thread with gauge).

*1" male union connection.

**3 required for all ports, weight includes fittings.

Lay length from Hot Inlet to Mix Outlet for 3/4" press and sweat connections: 3 3/4"

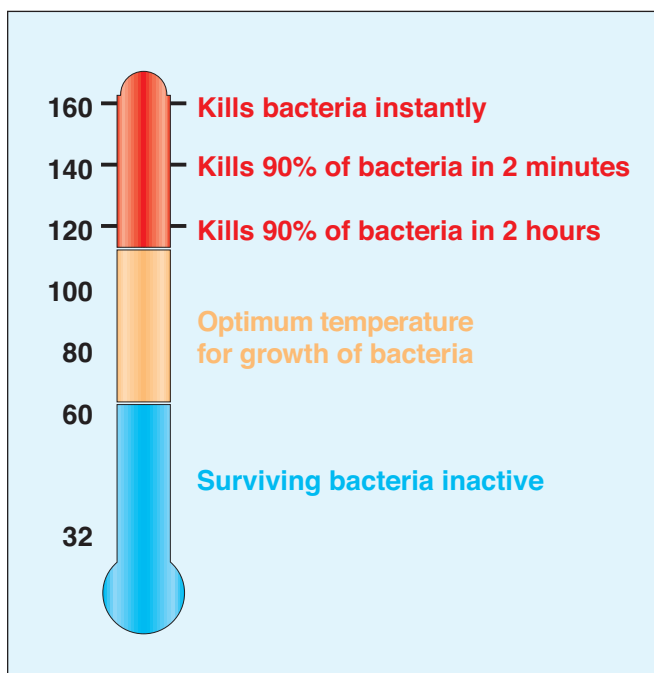
Temperature — exposure time



Thermal disinfection

The diagram shows the behavior of the bacteria Legionella Pneumophila when the temperature conditions of the water in which it is contained vary.

In order to ensure proper thermal “disinfection”, the values must not be below 140 °F.



Legionella-scalding risk

In systems producing domestic hot water with storage, in order to avoid the dangerous infection known as Legionella, the hot water must be stored at a temperature of at least 140 °F. At this temperature it is certain that the growth of the bacteria causing this infection will be totally eliminated. At this temperature, however, the water cannot be used directly.

As shown on the diagram opposite, temperatures of more than 120 °F can cause burning very quickly. For example, at 130 °F partial burning will occur in approximately 30 seconds, while at 140 °F partial burning will occur in approximately 5 seconds. The time may be reduced by 50 percent or more for children and elderly people.

In view of the above, it is necessary to install a thermostatic mixing valve which can:

- reduce the temperature at the point of use to a value lower than that of storage and suitable for sanitary users. For safety reasons, it is advisable to limit the mixed water temperature to 120 °F when point-of-use anti-scalding thermostatic mixing valves are not present at all fixtures.
- maintain the temperature constant when the incoming pressure and temperature conditions vary.

Construction details

Anti-scale materials

The material used in the construction of the Caleffi TankMixer 520 series thermostatic mixing valve reduces jamming caused by lime deposits. All the working parts such as shutter, seats and slide guides are made of a special anti-scale polymer material, with a low friction coefficient, assuring long term performance.

Temperature setting and locking

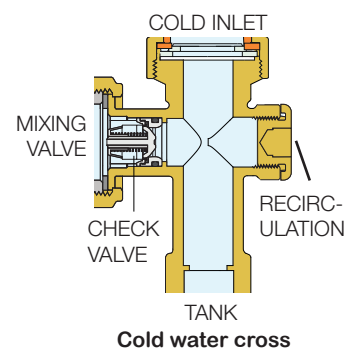
The control knob permits temperature setting between minimum and maximum in one turn (360°). It also has a tamper-proof system to lock the temperature at the set value.

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 18 °F. Additionally, the tight closing hot inlet port prevents temperature creep in recirculation applications.

Check valve

In systems with thermostatic mixing valves, check valves should be installed to prevent undesired backflow. The TankMixer and TankMixer Compact thermostatic mixing valve kits are supplied complete with a check valve on the cold water cross outlet port to the mixing valve. As a convenience for easier installations, the TankMixer 520051A body only can be field-installed with separately purchased union tailpieces for ½", ¾" or 1" npt female or male, press, PEX barb or sweat with or without check valves (for the hot and cold inlet ports).

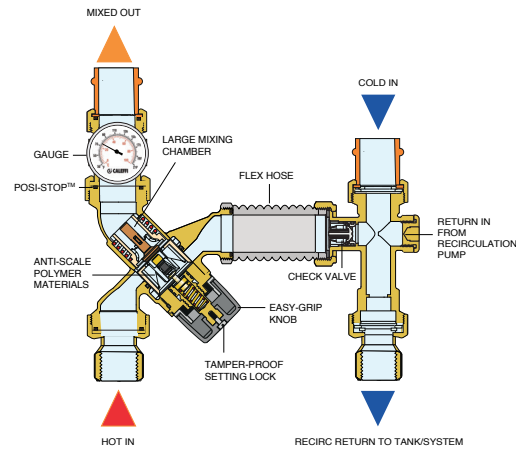


Operating principle

The point of distribution 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_AX and 520_AP series comes standard with a recirculation port that can be plugged or used for connecting to a hot water recirculation loop.

TankMixer

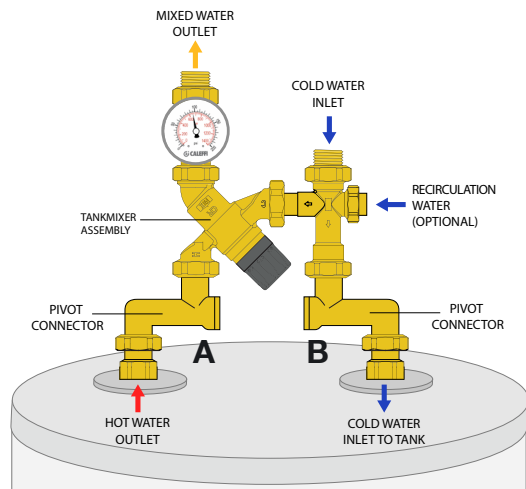
The TankMixer has an angled configuration combined with a flexible hose and cold water cross with check valve. The flexible hose length allows mounting to all water heater tank sizes that have a flue or fan-powered exhaust. It connects to the heater's 3/4" male nipples and is available with a variety of mixed water outlet and cold water inlet pipe connection types.



TankMixer Compact

The TankMixer Compact also includes a cold water cross, with check valve, but has pivot connectors for easy installation to most electric and heat pump water heaters. It also connects to the heater's 3/4" male nipples and is available with a variety of mixed water outlet and cold water inlet pipe connection types. The unique 3/4" pivot connectors adapt to heater nipples spaced from 3" to 8" on-center.

This kit provides one pivot connector with a 3/4" FNPT port, which can be used for applications where there is no pressure relief valve on the tank. Install that pivot connector on the hot side (A) to add a pressure relief valve. For applications where a pressure relief valve is present on the tank, install the pivot connector with the FNPT port on the cold side (B) for incorporating an expansion tank.

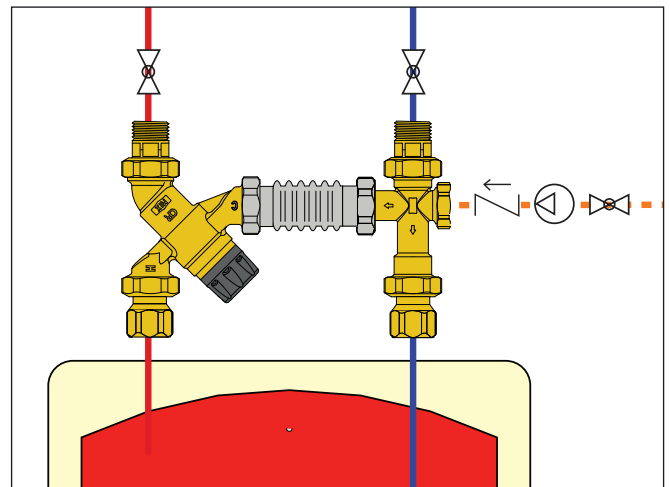


Water heater

As a result of the NAECA, many water heaters now have more insulation making them physically larger, for the same water capacity, than the older models. So units with less capacity are installed requiring higher temperature settings to provide the capacity users were previously accustomed, requiring mixing valves to temper the water to safe levels.

Caleffi TankMixer thermostatic mixing valves with cold water cross assembly and flexible connector will conveniently fit a typical gas-fired water heater and a wide variety of other water heaters.

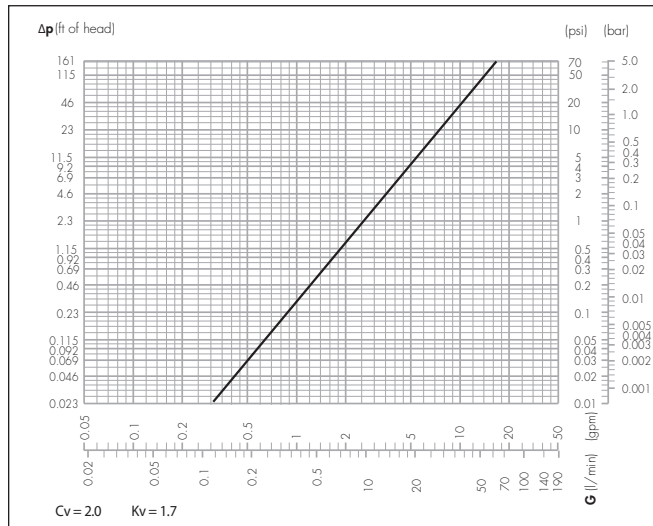
The Caleffi TankMixer Compact provides, instead of the flexible pipe, pivot connectors that will conveniently fit a typical electric water heater and heat pump water heater.



Body shape

The 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.

Hydraulic Characteristics



Flow should never exceed standards for pipe size and materials.

Use and installation

The Caleffi TankMixer and TankMixer Compact thermostatic mixing valve kits are intended for installation directly to the water heater at the point of distribution. These products are not designed to provide scald or thermal shock protection. Due to minimal flow requirements these products are not suitable for tempering water temperature at individual fixtures and should not be used as point-of-use valves. For safety, it is recommended to limit the maximum mixed water temperature to 120 °F and install scald protection devices at each fixture.

Before installing a Caleffi TankMixer or TankMixer Compact thermostatic mixing valve kit, the system must be inspected to ensure that its operating conditions are within the range of the mixing valve, checking, for example, the supply temperature, supply pressure, etc.

Systems where these thermostatic mixing valves will be installed must be drained and cleaned out to remove any dirt or debris which may have accumulated during installation.

The installation of appropriately sized filters at the inlet from the main water supply is always advisable.

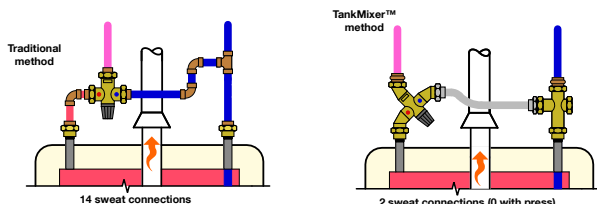
Caleffi TankMixer or TankMixer Compact thermostatic mixing valves must be installed by qualified personnel in accordance with the diagrams in this brochure, taking into account all current applicable standards.

These thermostatic mixing valves can be installed in any position, either vertical or horizontal, or upside down.

The following are shown on the thermostatic mixing valve body:

- Hot water inlet, marked "H".
- Cold water inlet, marked "C".
- Mixed water outlet, marked "MIX".

The TankMixer and TankMixer Compact comes packaged in a kit with everything needed for fast installation including union fittings and press connections.



Commissioning

The Caleffi TankMixer and TankMixer Compact thermostatic mixing valve kits must be commissioned in accordance with current standards by qualified personnel using temperature measuring equipment. Caleffi TankMixer 52051_AX series, and TankMixer Compact 52051_AP series with outlet port temperature gauge provide a time-saving temperature setting process to get close to the desired temperature. Use of a digital thermometer is recommended for confirming the final setting of the mixed water temperature.

Note: For models purchased without the outlet temperature gauge, the temperature gauge adapter with temperature gauge can be separately purchased and field installed, code NA10056 for 3/4" models.

After installation, the valve kit must be tested and commissioned in accordance with instructions given in the instruction sheet NA10482, taking into account applicable standards.

Temperature adjustment

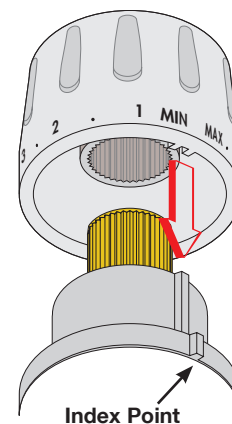
The control knob permits temperature setting between minimum and maximum in one turn (360°). It also has a tamper-proof system to lock the temperature at the set value. The temperature is set to the required value by means of the knob with the graduated scale, on the top of the valve.

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

with: $T_{HOT} = 158 \text{ °F (70 °C)}$, with: $T_{cold} = 59 \text{ °F (15 °C)}$, $P = 43 \text{ psi (3 bar)}$

Locking the temperature setting knob with the tamper-proof system

1. Align the index point to the desired temperature setting by rotating the control knob.
2. Unscrew the head screw and remove the control knob.
3. Position the knob so that the boss, indicated by red arrow in figure, fits into the internal slot of the control knob.
4. Tighten the head screw and the control knob will no longer be able to rotate to adjust the mixing setting.



Replacement parts



Replacement body.
Meets requirements of NSF/ANSI 372-2011. Certified to: ASSE 1017/CSA B125.3, Low lead, by ICC-ES file PMG-1360.
End connection flexibility: 1/2", 3/4" or 1" npt female or male, press, PEX barb or sweat with or without check valves, separately sourced for field installation. See Caleffi List Price catalog for fitting selection.



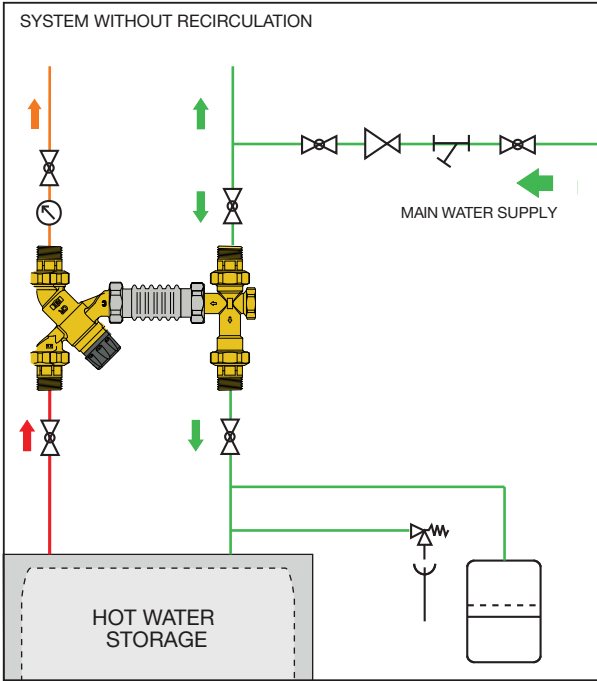
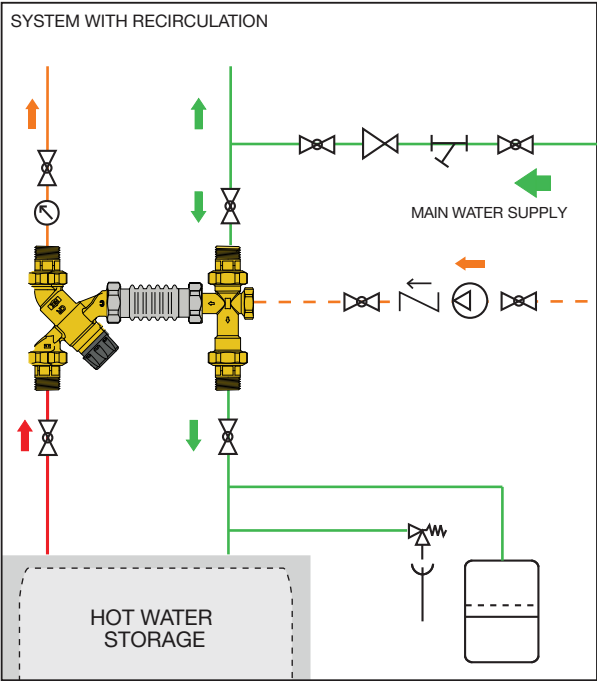
Point of distribution mixed temperature gauge adaptor fits 1" male union thread mixing valves. Removable gauge fits into temperature well. Gauge dial is 2" diameter and dual-scale from 30–210 °F (0–100 °C). Low-lead brass body. Meets requirements of NSF/ANSI/CAN 372. Certified to: ASSE 1017, CSA B125.3, Low lead, by ICC-ES file PMG-1360.

520015A.....1" male union thread, Cv=2.0 (Kv=1.7)

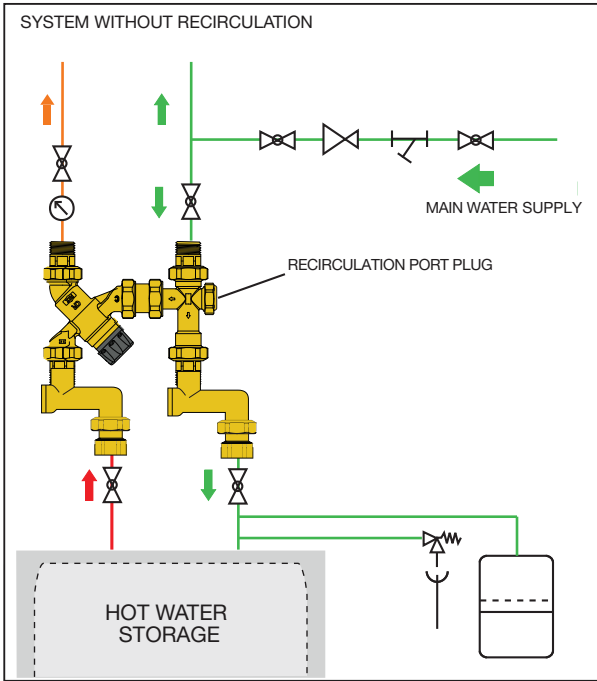
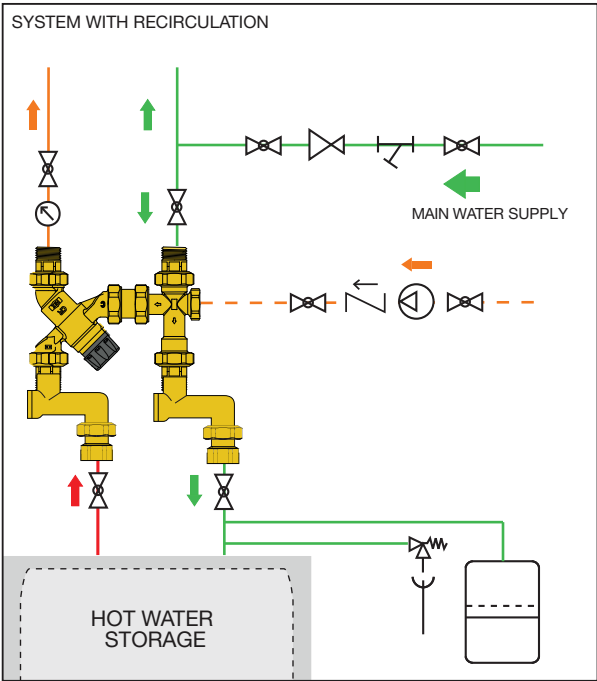
NA10056.....3/4" sweat with gauge
NA10358.....1" union thread with gauge
688003A.....Replacement gauge

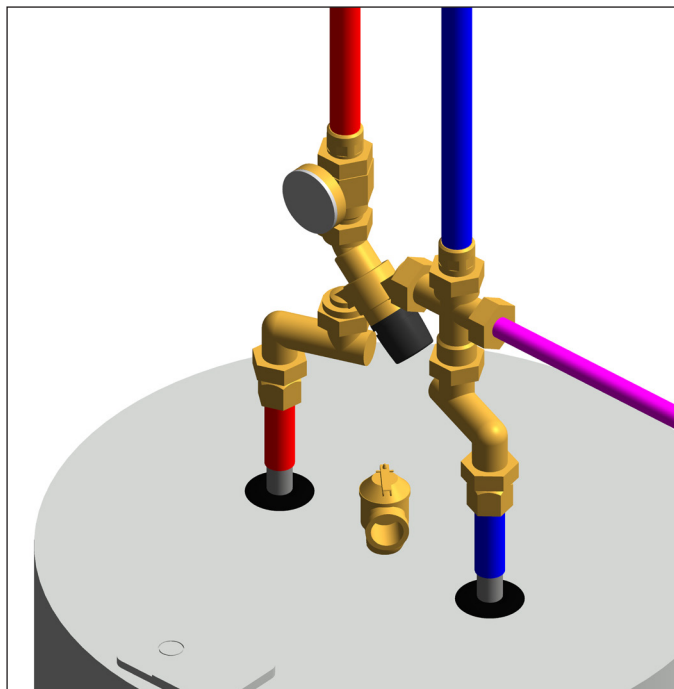
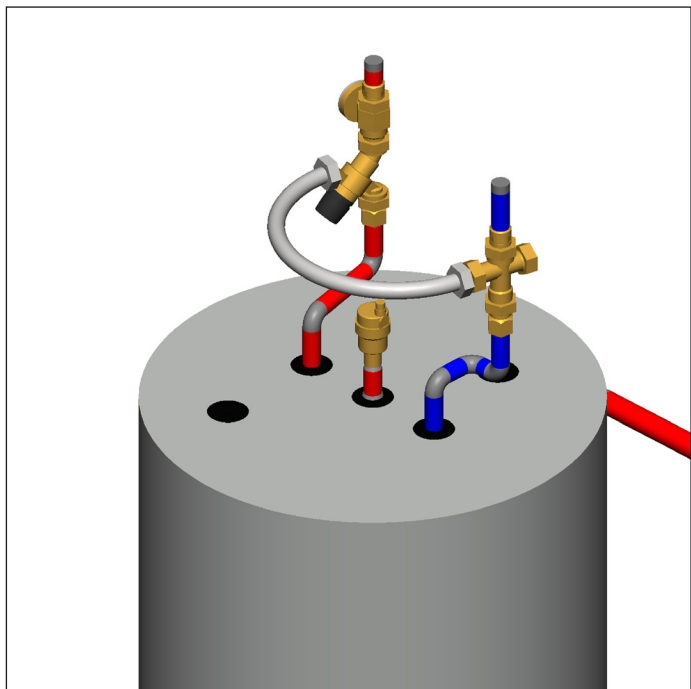
Application diagrams

TankMixer



TankMixer Compact





Find us in

MasterSpec®

a product of The American Institute of Architects

<https://get.caleffi.info/specpoint>



find BIM Revit files and system templates at
<https://bim.caleffi.com/en-us>

SPECIFICATION SUMMARIES

TankMixer™ 5205_AX series - thermostatic mixing valve with flexible pipe and cold water cross

Adjustable thermostatic and pressure balanced mixing valve, certified by ICC-ES to ASSE 1017 and CSA B125.3, UPC, IPC, IRC, and NPC, approved for point of distribution domestic water systems. Connections 3/4" NPT male, 3/4" sweat or 3/4" press with union tailpieces. DZR low-lead* brass valve body and cold water cross (<0.25% Lead content) certified by ICC-ES file 1360. Meets requirements of NSF/ANSI/CAN 372. Shutter, regulating seats and sliding surfaces in anti-scale plastic, PSU. Seals peroxide-cured EPDM. Stainless steel spring. Large ID stainless steel flexible pipe, 18" length. Maximum working temperature 195 degrees F (90 degrees C). Setting range 95 degrees F to 150 degrees F (35 degrees C to 65 degrees C). Maximum working pressure 150 psi (10 bar). Maximum operating differential pressure 75 psi (5 bar). Tolerance ±3 degrees F (±2 degrees C). Flow rating: Cv 2.0 (Kv 1.7). Provided with tamper-proof setting lock. Provided with cold water port check valve in cold water cross outlet. Provide with optional mixed outlet temperature gauge, 30 to 210 degrees F scale, 2 inch diameter. Provided with recirculation return port, 1/2" NPT female, low-lead brass plug included.

TankMixer™ Compact 52051_AP series - thermostatic mixing valve with pivot connectors and cold water cross

Adjustable thermostatic and pressure balanced mixing valve, certified by ICC-ES to ASSE 1017 and CSA B125.3, UPC, IPC, IRC, and NPC, approved for point of distribution domestic water systems. Connections 3/4" NPT male, 3/4" sweat or 3/4" press with union tailpieces. DZR low-lead* brass valve body, pivot connectors and cold water cross (<0.25% Lead content) certified by ICC-ES file 1360. Meets requirements of NSF/ANSI/CAN 372. Shutter, regulating seats and sliding surfaces in anti-scale plastic, PSU. Seals peroxide-cured EPDM. Stainless steel spring. Maximum working temperature 195 degrees F (90 degrees C). Setting range 95 degrees F to 150 degrees F (35 degrees C to 65 degrees C). Maximum working pressure 150 psi (10 bar). Maximum operating differential pressure 75 psi (5 bar). Tolerance ±3 degrees F (±2 degrees C). Flow rating: Cv 2.0 (Kv 1.7). Provided with tamper-proof setting lock. Provided with cold water port check valve in cold water cross outlet. Provided with mixed outlet temperature gauge, 32 to 210 degrees F scale, 2 inch diameter. Provided with recirculation return port, 1/2" NPT female, low-lead brass plug included.

* Meets the "lead free" requirement of Section 1417 of the Safe Drinking Water Act (SDWA). This product has a weighted average lead content of less than 0.25% for its wetted surfaces contacted with consumable water.

We reserve the right to make changes and improvements to the products and related data in this publication, at any time and without prior notice. The technical brochure on www.caleffi.com always has the most up-to-date version of the document, which should be used for technical verification.



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