

TankMixer™ Combi and TankMixer™ Compact Combi thermostatic mixing valve kit

520 series



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. In addition, it can be used to reduce legionella growth by allowing the water heater thermostat to be set at 140 °F.

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™ Combi features a flexible pipe for easy installation directly on a typical wall-hung gas or electric fired water heater or combi boiler. In addition, hot and cold water isolation and service 3-way ball valves are included offering convenient servicing and flushing ports, and integral pressure relief valve.

The TankMixer™ Compact Combi provides a pivoting brass connector for easy installation directly on typical combi boilers. It has unique ¾" pivot connectors that adapt to heater nipples spaced from 3" to 8" on-center. It also provides service ball valves with flushing ports and integral pressure relief valve.

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. Service valves in the kit are certified to section 1417(d) of the Safe Drinking Water Act, The lead content requirements of Section 116875 of the California Health & Safety Code and NSF/ANSI/CAN 372 . Listed by IAPMO R&T.

Product range

TankMixer Combi

KIT52051_AX series kit:

Adjustable 3-way thermostatic mixing valve kit, with flexible pipe.....union system connections ¾" sweat, press, and NPT male

TankMixer Compact Combi

KIT52051_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 and pivot connectors:	DZR low-lead* brass
Shutter, seats and slide guides:	PSU
Springs:	stainless steel
Seals:	peroxide-cured EPDM
Adjustment knob	ABS
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)

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: 2" diameter
Dual-scale 30 °F - 210 °F (0 °C –100 °C)

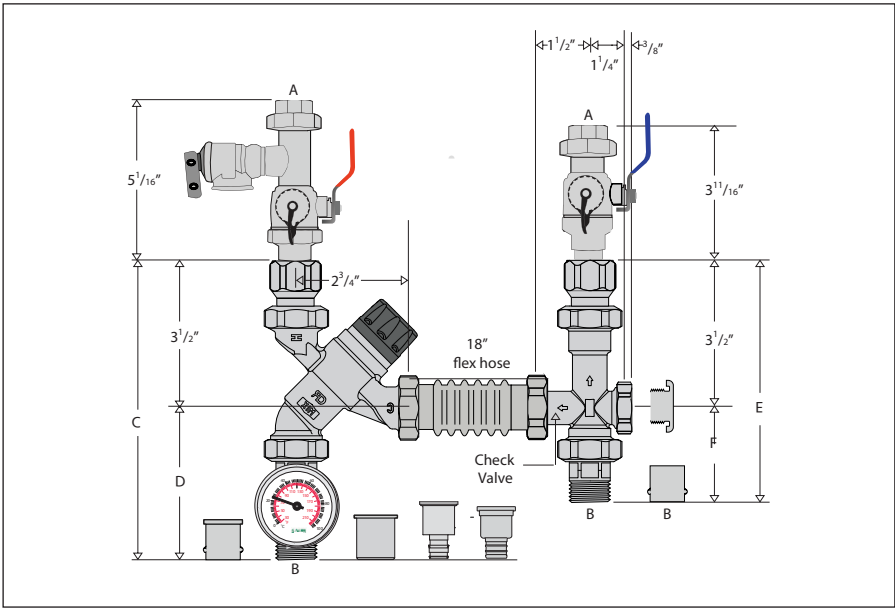
Certifications

- 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.
- 3. Service valves listed and certified by IAPMO R&T, File number K-14799.

Connections

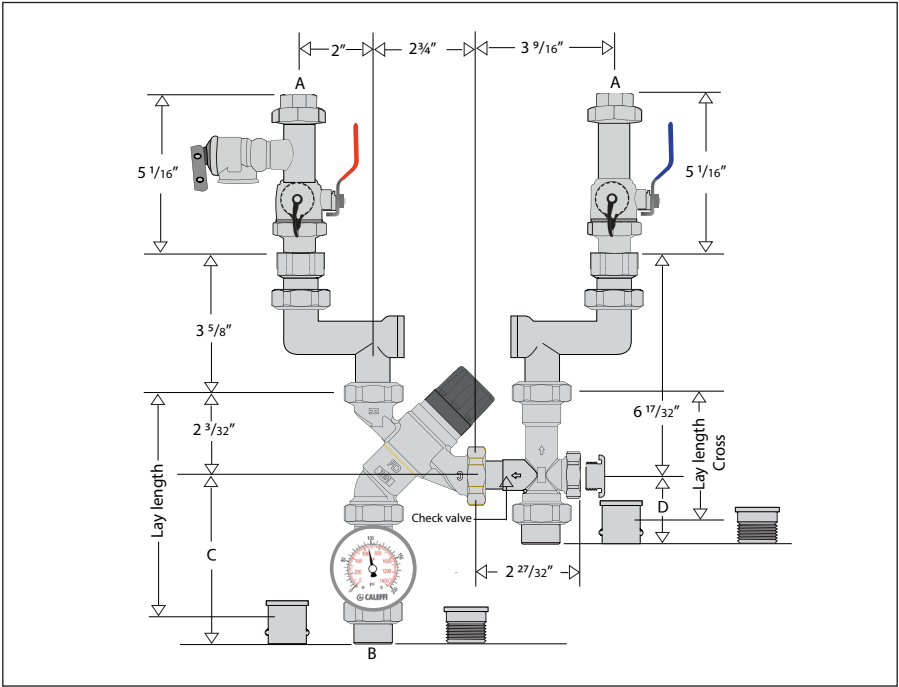
- To water heater:
- NPT female union: 3/4"
- To mix temperature outlet and cold water inlet:
- sweat union: 3/4"
 - press union: 3/4"
 - NPT male union: 3/4"
- Recirculation inlet port in cross:
- NPT female (plug included) 1/2"

Dimensions, TankMixer Combi Kit



Code	A	B	C	D	E	F	Wt. (lb.)
KIT520510AX	3/4" NPTF	3/4" NPTM	7 7/8"	4 1/4"	5 5/8"	2 1/4"	5.0
KIT520516AX	3/4" NPTF	3/4" PRESS	8"	4 9/16"	5 7/8"	2 9/16"	5.0
KIT520519AX	3/4" NPTF	3/4" SWT	7 3/4"	4 3/16"	5 1/2"	2 3/16"	5.0
KIT520517AX	3/4" NPTF	3/4" PEX Crimp	8 1/4"	4 7/8"	6 1/4"	5 7/8"	5.0
KIT520518AX	3/4" NPTF	3/4" PEX Expansion	8 7/16"	4 13/16"	6 3/16"	2 13/16"	5.0

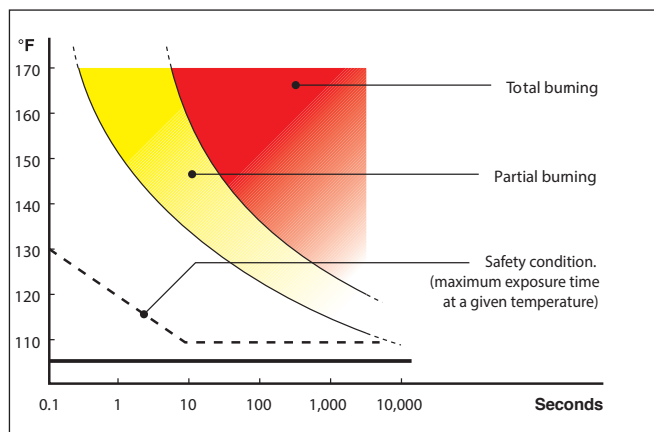
Dimensions, TankMixer Compact Combi Kit



Code	A	B	C	D	Wt. (lb.)
KIT520510AP	3/4" NPTF	3/4" NPTM	4 3/16"	2"	4.5
KIT520516AP	3/4" NPTF	3/4" PRESS	4 17/32"	2 13/32"	4.4
KIT520519AP	3/4" NPTF	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".

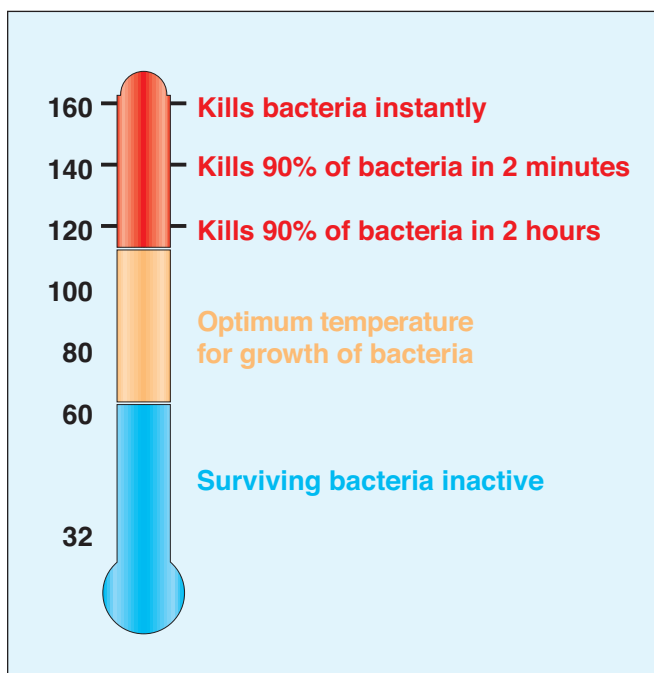
Temperature — exposure time



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

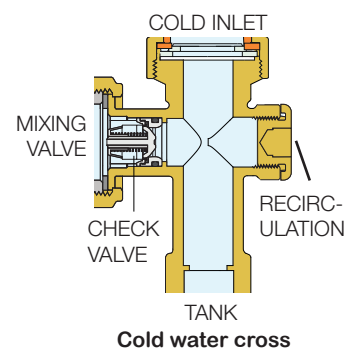
The control knob permits temperature setting between minimum and maximum in one turn (360°). It also has a tamper-proof system to lock the temperature at the set value.

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 Combi and TankMixer Compact Combi thermostatic mixing valve kits are supplied complete with a check valve on the cold water cross outlet port to the mixing valve.



Operating principle

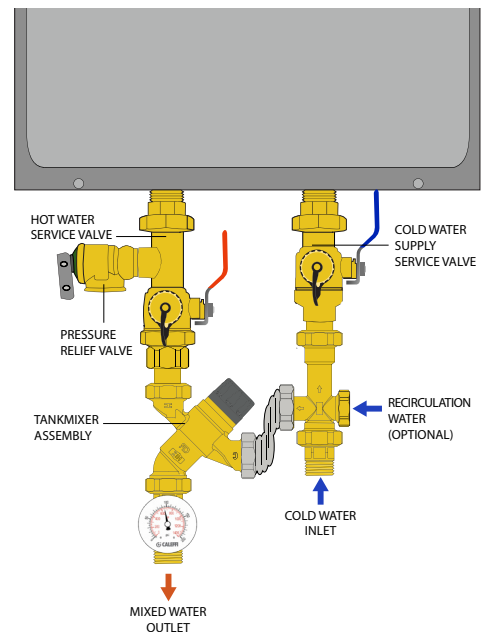
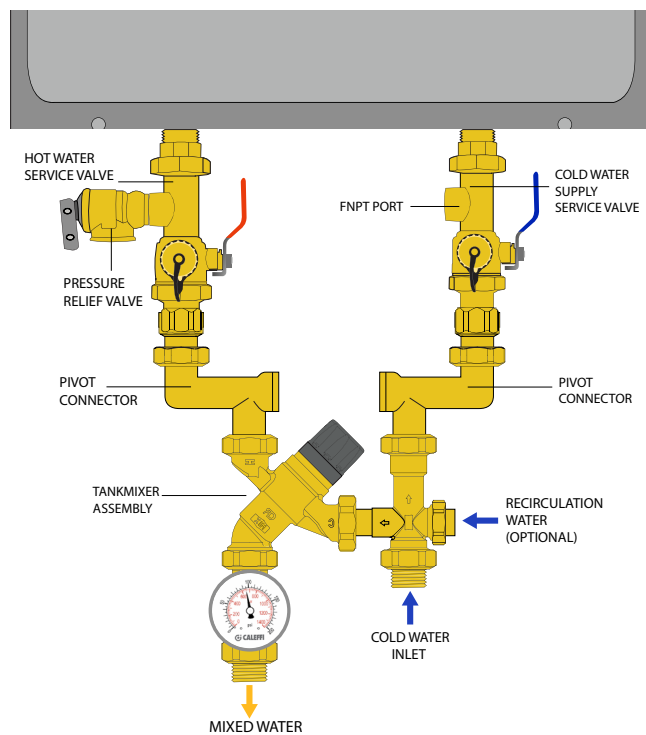
The point of distribution thermostatic mixing valve mixes the hot and cold water at the inlets to maintain constant mixed water at the desired set temperature. The TankMixer Combi and Compact Combi KIT52051_AX and KIT52051_AP series come standard with a cold water supply cross, with check valve and recirculation port that can be plugged or used for connecting to a hot water recirculation loop, 3-way ball valves for servicing and flushing and pressure relief valve.

TankMixer Combi

The TankMixer Combi is an angled configuration combined with a flexible hose. The flexible hose length allows for easy installation directly on a typical wall-hung gas or electric fired water heater or combi boiler. 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 Combi

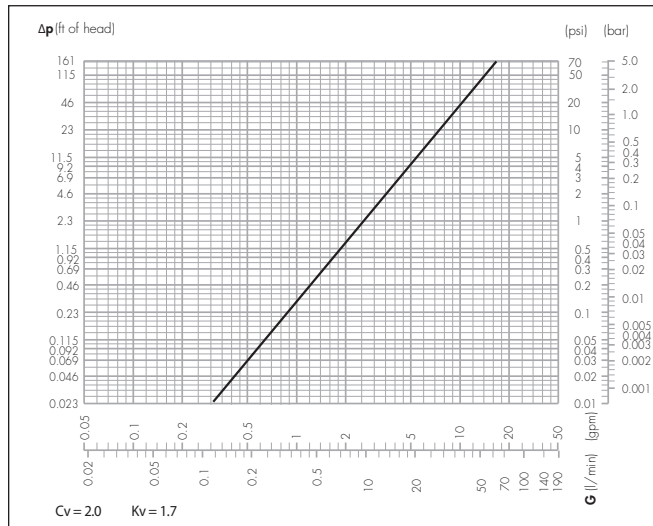
The TankMixer Compact Combi has pivot connectors for easy installation directly on typical combi boilers. It also connects to the heater's 3/4" male nipples and is available with a variety of mixed water outlet and cold water inlet pipe connection types. The unique 3/4" pivot connectors adapt to heater nipples spaced from 3" to 8" on-center.



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



Use and installation

Caleffi TankMixer Combi and Compact Combi thermostatic mixing valve assemblies are designed to be installed at the water heater. They cannot be used for tempering water temperature at fixtures as a point-of-use valve. They are not designed to provide scald protection. For safety reasons, it is advisable to limit the maximum mixed water temperature to 120 °F when anti-scald devices are not used at each fixture.

Before installing a Caleffi TankMixer Combi or Compact Combi thermostatic mixing valve assembly, 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 valve assemblies 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 Combi and Compact Combi thermostatic mixing valve assemblies must be installed by qualified personnel in accordance with the diagrams in this brochure, taking into account all current applicable standards.

These thermostatic mixing valve assemblies can be installed in any position, either vertical, 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".

Commissioning

The Caleffi TankMixer Combi and Compact Combi thermostatic mixing valve assembly must be commissioned in accordance with current standards by qualified personnel using temperature measuring equipment. The mixed outlet temperature gauge reduces commissioning time, saving time to approach the desired temperature efficiently. It's advisable to utilize a digital thermometer to verify the final setting of the mixed water temperature.

After installation, the valve must be tested and commissioned in accordance with instructions given in the instruction sheet NA11357, taking into account current applicable standards.

Mixed temperature control knob setting

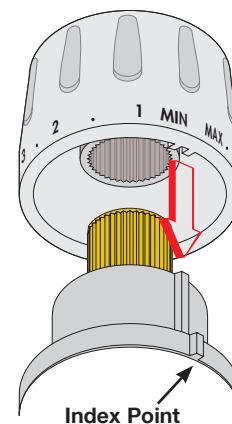
The control knob permits temperature setting between minimum and maximum in one turn (360 °). It also has a tamper-proof system to lock the temperature at application required set value. The temperature is set to the required value by means of the knob with the graduated scale, on the top of the valve.

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

- Align the index point to the desired temperature setting by rotating the control knob.
- Unscrew the head screw and remove the control knob.
- Position the knob so that the boss, indicated by red arrow in figure, fits into the internal slot of the control knob.
- 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.

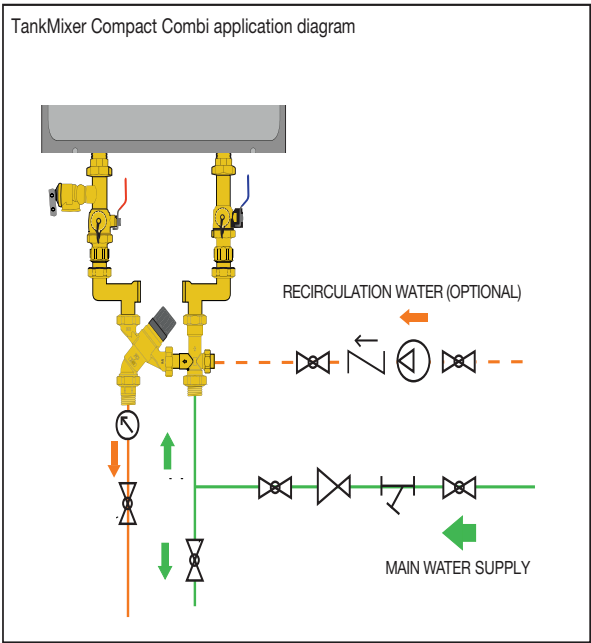
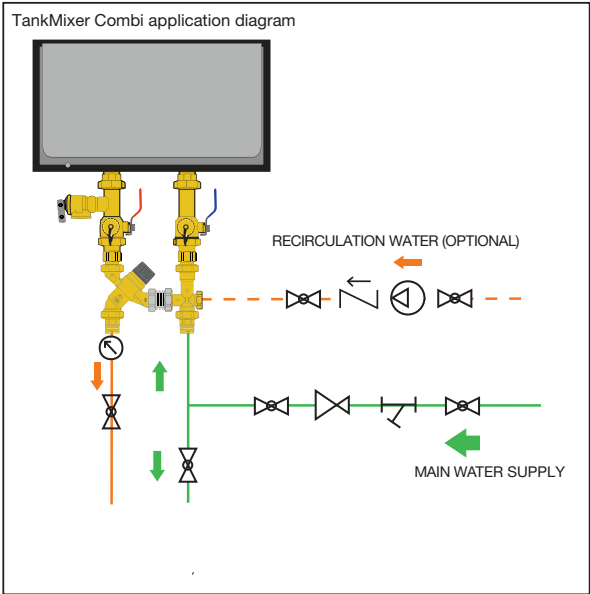
520015A.....1" male union thread, Cv=2.0 (Kv=1.7)

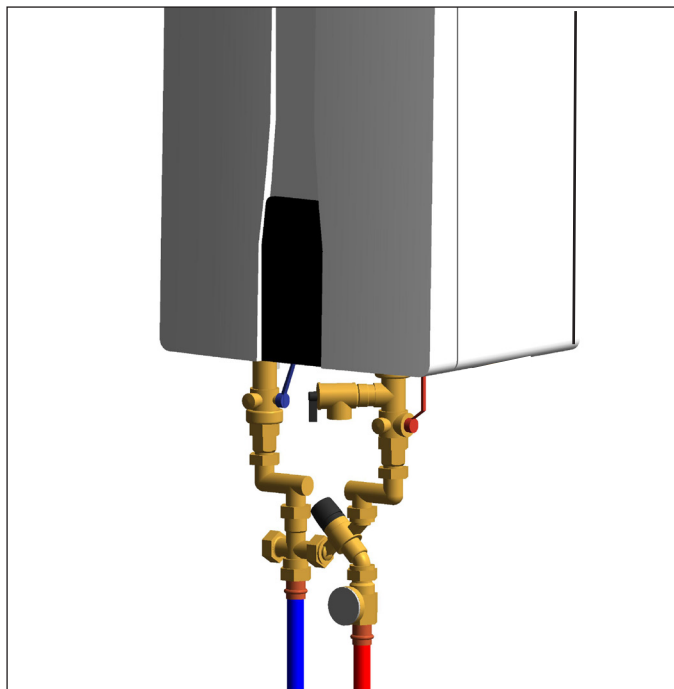
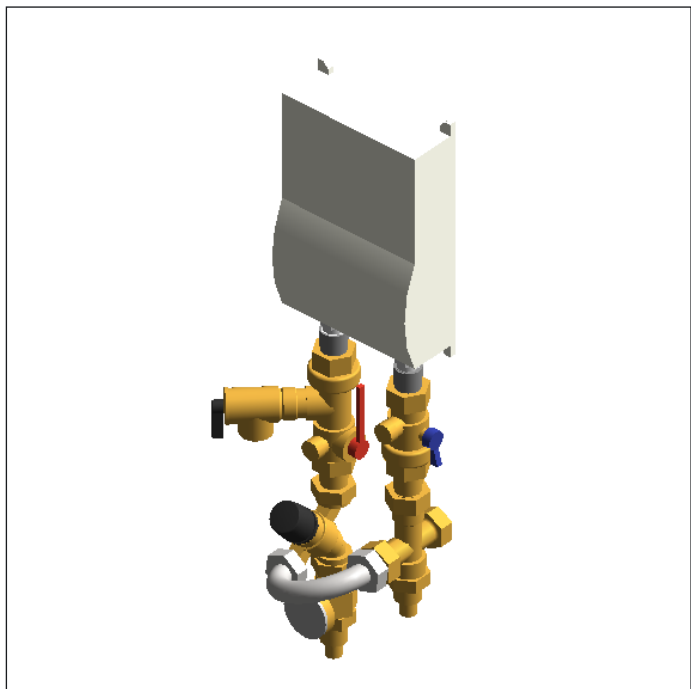


Point of distribution mixed temperature gauge adaptor fits 1" male union thread mixing valves. Removable gauge fits into temperature well. Gauge dial is 2" diameter and dual-scale from 30—210 °F (0—100 °C). Low-lead brass body. Meets requirements of NSF/ANSI/CAN 372. Certified to: ASSE 1017, CSA B125.3,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

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

Application diagrams





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™ Combi KIT52051_AX series - thermostatic mixing valve kit with flexible pipe, cold water cross and service valves

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 low lead* brass hot and cold water isolation and service valves listed and certified by IAPMO R&T, file number K-14799. Provided with cold water port check valve in cold water cross outlet. Provided with 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.

* 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.

TankMixer™ Compact Combi KIT52051_AP series - thermostatic mixing valve with pivot connectors, cold water cross and service valves

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 low lead* brass hot and cold water isolation and service valves listed and certified by IAPMO R&T, file number K-14799. 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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