ThermoSetter™
Recirculation Thermal Balancing Valve

1164 Series

Installation, commissioning and servicing instructions

NSF/ANSI/CAN 61
NSF/ANSI/CAN 372

Function

The ThermoSetter™ 1164 series adjustable thermal balancing valve is used for automatic balancing of recirculation loops in domestic hot water systems, to speed hot water delivery, reduce water waste and save energy. The internal thermostatic balancing cartridge automatically modulates flow to ensure a constant temperature in the recirculation piping system. The 1164 Series has an adjustment knob with 105 °F to 150 °F (40 °C to 65 °C) temperature scale indication. The adjustment knob is lockable for tamper-proofing. An integral dry-well holds a slide-in temperature gauge for local indication, or a sensor for remote temperature communication to a building automation system. The standard integral check valve protects against circuit thermo-syphoning.

The ThermoSetter 1164 series is also available pre-assembled with the Caleffi 290030 low-lead brass full-port ball valve for isolation. This can be ordered by adding a 3-digit suffix to the order code number per the tables on page 6 and 7.

The ThermoSetter complies with standards NSF/ANSI/CAN 61 (180 °F/82 °C Commercial Hot), NSF/ANSI/CAN 372 and codes IPC, IRC, UPC and NPC certified by ICC-ES.

Product range

1164 series — ThermoSetter, models w/ check valve, w/ and w/o temperature gauge, w/ and w/o isolation valves.....connections ½" and ¾" union NPT female, sweat, press, PEX expansion, or PEX crimp

Technical specifications

Materials

Body: DZR low-lead* brass EN 12165 CW724R	
Adjustable cartridge:	PSU
Springs:	Stainless steel EN 10270-3 (AISI 302)
Hydraulic seals:	peroxide-cured EPDM
Check valve:	EPDM, POM color black
Adjustment knob:	ABS

* 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 fluid:	water
Max. working pressure:	230 psi (16 bar)
Max. differential pressure:	15 psi (1 bar)
Adjustable temperature range:	105 – 150 °F (40 – 65 °C)
Factory setting:	135 °F (58 °C)
Max. inlet temperature:	195 °F (90 °C)

Cv (Kv) max:	2.1 (1.8)
Cv (Kv) min:	0.35 (0.3)
Cv (Kv) design:	0.69 (0.6)

Certifications

1. Complies with standards NSF/ANSI/CAN 61 (180 °F/82 °C Commercial Hot), NSF ANSI/CAN 372 and codes IPC, IRC, UPC and NPC certified by ICC-ES.
2. PEX crimp fittings certified to ASTM F 1807.
3. PEX expansion fittings certified to ASTM F 1960.

Connections

Main connnections:
½" & ¾" with NPT female, sweat, press, PEX expansion, PEX crimp union connections

Temperature gauge/probe pocket:
Ø 10 mm metric

Temperature gauge code 116010

Scale:	32 – 180 °F (0 – 80 °C)
Diameter:	1½" (40 mm)
Stem diameter:	0.35" (9 mm)

SAFETY INSTRUCTION

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.**

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.

CAUTION: Over-tightening and breakage can occur with the use of Teflon® pipe joint compounds. Teflon® provides lubricity so that care must be exercised not to over-tighten joints. Failure to follow these instructions could result in property damage and /or personal injury.

WARNING: System fluids are under pressure or temperature can be hazardous. Be sure the pressure has been reduced to zero and the system temperature is below 100 °F (38 °C). Failure to follow these instructions could result in property damage and/or personal injury.

CAUTION: If the series ThermoSetter balancing valve is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.

WARNING: The outer surface of the device, especially in polymer type components, must not come into contact with any chemical substance, either on purpose or accidentally. The system fluid and any chemical additives used within the water piping system – whether for washing or as protection – must be compatible with the materials used to make the device and with the function it performs.

CAUTION: Make sure that all the connecting pipework is water tight.

Caleffi shall not be liable for damages resulting from stress corrosion, misapplication or misuse of it products.

LEAVE THIS MANUAL FOR THE USER.

CONSIGNE DE SÉCURITÉ

Ce symbole d'avertissement servira dans ce manuel à attirer l'attention sur la sécurité concernant instructions. Lorsqu'il est utilisé, ce symbole signifie. **ATTENTION! DEVENEZ ALERTE ! VOTRE SÉCURITÉ EST EN JEU ! NE PAS SUIVRE CES INSTRUCTIONS PEUT PROVOQUER UN**

AVERTISSEMENT: Ce produit peut vous exposer à des produits chimiques comme le plomb, qui est connu dans l'État de Californie pour causer le cancer, dommages à la naissance ou autre. Pour plus d'informations rendez-vous www.P65Warnings.ca.gov.

ATTENTION: Tous les travaux doivent être effectués par du personnel qualifié formé à la bonne application, installation et maintenance des systèmes conformément aux codes et règlements locaux.

ATTENTION: Un serrage excessif et la rupture peut se produire avec l'utilisation de composés à joint de tuyau en Téflon®. Pouvoir lubrifiant Teflon® permet de sorte qu'il faut prendre soin de ne pas trop serrer les articulations. Le non-respect de ces instructions peut entraîner des dommages matériels et/ou des blessures.

AVERTISSEMENT: Les liquides du système sont sous pression ou de la température peuvent être dangereux. Être sûr que la pression a été réduite à zéro et la température du système est inférieure à 100 °F (38 °C). Le non-respect de ces instructions peut entraîner des dommages matériels et/ou des blessures.Le non-respect de ces instructions peut entraîner des dommages matériels et/ou des blessures.

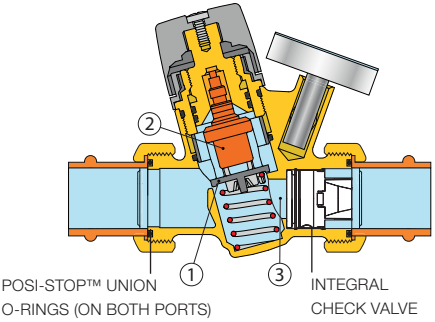
ATTENTION: Si le vanne d'équilibrage, Série ThermoSetter, n'est pas installé, mis en service et entretenu correctement, selon les instructions contenues dans ce manuel, il peut ne pas fonctionner correctement et peut mettre en danger l'utilisateur.

AVERTISSEMENT: La surface extérieure de l'appareil, en particulier les composants de type polymère, ne doit pas entrer en contact avec des substances chimiques, que ce soit volontairement ou accidentellement. Le produit et les additifs chimiques utilisés dans les canalisations d'eau - que ce soit pour le lavage ou la protection - doivent être compatibles avec les matériaux utilisés pour la fabrication de l'appareil et avec la fonction qu'il remplit.

ATTENTION: S'assurer que tous les raccordements sont étanches.

Caleffi ne pourra être tenue responsable des dommages résultant de la corrosion, d'une mauvaise utilisation ou une mauvaise utilisation des produits.

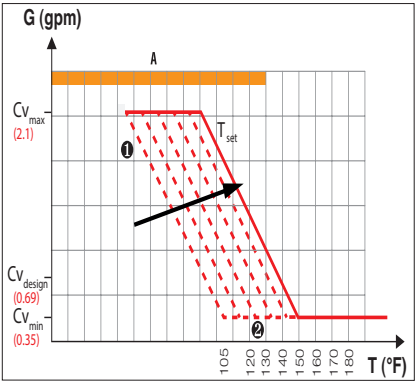
LAISSEZ CE MANUEL AVEC L'UTILISATEUR



Thermostatic control, 1164xxAC series

Function

At the set temperature, the valve plug (1), controlled by the thermostatic balancing cartridge (2), gradually closes the outlet to the minimum flow (3). The outlet never fully closes to always allow a minimum flow for temperature sensing and to prevent recirculation pump dead-heading. If the temperature decreases, the outlet increases, causing flow and thus temperature to increase back to the set temperature as shown in curve 1. If temperature exceeds the set-point, the plug stays in the minimum closed position as shown in curve 2.



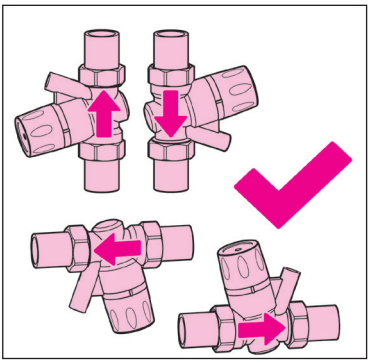
Installation

Before installing the ThermoSetter, flush the pipes to make sure that impurities in system will not interfere with valve performance. Strainers of sufficient capacity at the inlet from the water main are highly recommended. The ThermoSetter can be installed in any position, vertical or horizontal, following the flow direction indicated by the arrow on the valve body. The ThermoSetter must be installed according to the diagrams given in this manual. It must be installed to allow free access for checking operation and performing maintenance procedures.

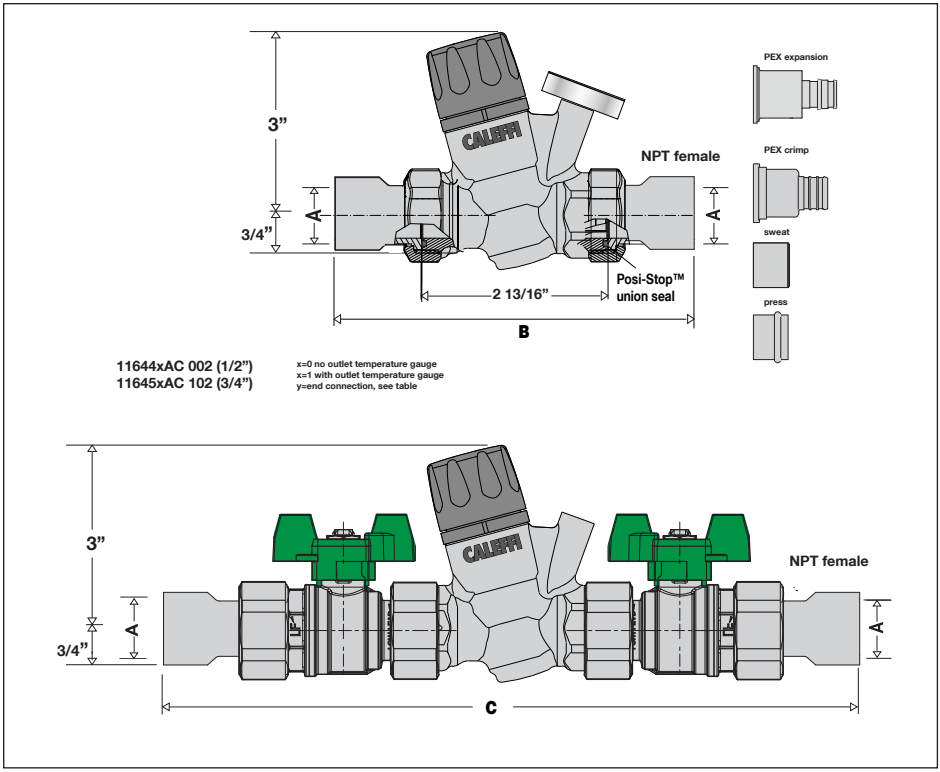
Scan to view

116 ThermoSetter™

Installation Tip



Dimensions



ThermoSetter 1164 series

Code	A	B	C	Wt w/o ball valves lb (kg)	Wt with ball valves lb (kg)
116440AC 002	½" NPT F	5"	---	3.0 (1.3)	---
116441AC 002*	½" NPT F	5”	---	3.0 (1.3)	---
116440AC 102	½" NPT F	---	10”	---	5.0 (2.2)
116441AC 102*	½" NPT F	---	10"	---	5.0 (2.2)
116450AC 002	¾" NPT F	5½"	---	3.0 (1.3)	---
116451AC 002*	¾" NPT F	5½”	---	3.0 (1.3)	---
116450AC 102	¾" NPT F	---	11”	---	5.0 (2.2)
116451AC 102*	¾" NPT F	---	11"	---	5.0 (2.2)

All codes in this table DO include a check valve.
*with integral outlet temperature gauge.

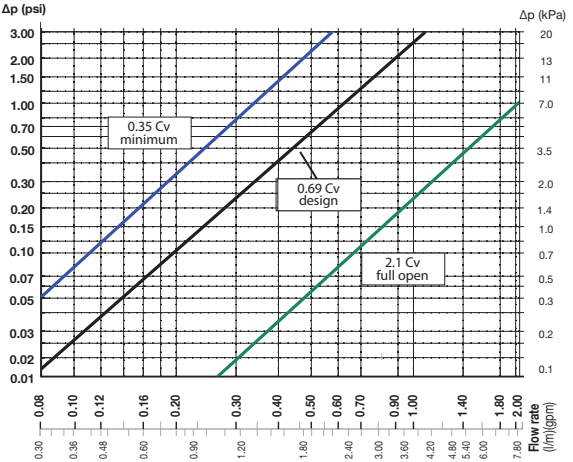
Code	A	B	C	Wt w/o ball valves lb (kg)	Wt with ball valves lb (kg)
116440AC 009	½" sweat	4 5/16"	---	2.4 (1.1)	---
116441AC 009*	½" sweat	4 5/16"	---	2.5 (1.1)	---
116440AC 109	½" sweat	---	9 13/16"	---	4.4 (2.0)
116441AC 109*	½" sweat	---	9 13/16"	---	4.5 (2.0)
116450AC 009	¾" sweat	4 13/16"	---	2.6 (1.1)	---
116451AC 009*	¾" sweat	4 13/16"	---	2.7 (1.2)	---
116450AC 109	¾" sweat	---	10 5/16"	---	4.6 (2.1)
116451AC 109*	¾" sweat	---	10 5/16"	---	4.7 (2.1)
116440AC 006	½" press**	5"	---	2.2 (1.0)	---
116441AC 006*	½" press**	5"	---	2.3 (1.0)	---
116440AC 106	½" press**	---	10 ½"	---	4.2 (1.9)
116441AC 106*	½" press**	---	10 ½"	---	4.3 (1.9)
116450AC 006	¾" press**	5"	---	2.2 (1.0)	---
116451AC 006*	¾" press**	5"	---	2.3 (1.0)	---
116450AC 106	¾" press**	---	10 ½"	---	4.2 (1.9)
116451AC 106*	¾" press**	---	10 ½"	---	4.3 (1.9)
116440AC 008	½" PEX exp	4 ¼"	---	2.2 (1.0)	---
116441AC 008*	½" PEX exp	4 ¼"	---	2.3 (1.0)	---
116440AC 108	½" PEX exp	---	9 ¾"	---	4.2 (1.9)
116441AC 108*	½" PEX exp	---	9 ¾"	---	4.3 (1.9)
116450AC 008	¾" PEX exp	7 3/16"	---	2.4 (1.1)	---
116451AC 008*	¾" PEX exp	7 3/16"	---	2.4 (1.1)	---
116450AC 108	¾" PEX exp	---	12 11/16"	---	4.4 (2.0)
116451AC 108*	¾" PEX exp	---	12 11/16"	---	4.4 (2.0)
116440AC 007	½" PEX crimp	4 3/16"	---	2.2 (1.0)	---
116441AC 007*	½" PEX crimp	4 3/16"	---	2.3 (1.0)	---
116440AC 107	½" PEX crimp	---	9 11/16"	---	4.2 (1.9)
116441AC 107*	½" PEX crimp	---	9 11/16"	---	4.3 (1.9)
116450AC 007	¾" PEX crimp	6 3/16"	---	2.4 (1.1)	---
116451AC 007*	¾" PEX crimp	6 3/16"	---	2.4 (1.1)	---
116450AC 107	¾" PEX crimp	---	11 13/16"	---	4.4 (2.0)
116451AC 107*	¾" PEX crimp	---	11 13/16"	---	4.4 (2.0)

All codes in this table DO include a check valve.
*with integral outlet temperature gauge.
**Lay Length: size 1/2": 3 ¼"; size 3/4": 2 7/16".

Flow characteristics

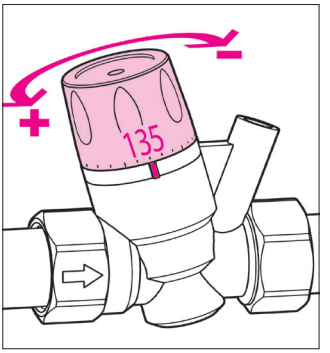
The ThermoSetter thermostatic balancing valve is designed to balance individual branches of domestic hot water recirculation systems, based on the temperature at the valve. It automatically modulates flow to maintain hot water availability to all fixtures in the branch circuit. The valve is at minimum flow (Cv = 0.35) when the incoming water temperature is equal to the set-point position of the adjustment dial. The valve opens as incoming water temperature drops.

For pressure loss calculations in the recirculation system, follow traditional pipe sizing and head loss practices. For pressure loss calculations across the ThermoSetter valve, use the design curve shown in the graph. This line represents a typical valve position under normal working conditions (ΔT= 10 °F). Determine the pressure drop across the valve by selecting the branch design GPM on the graph X-axis, draw a vertical line up to the "design" curve, then go across to the Y-axis to find the design pressure drop. Include that pressure drop in your head loss calculations for the circuit.



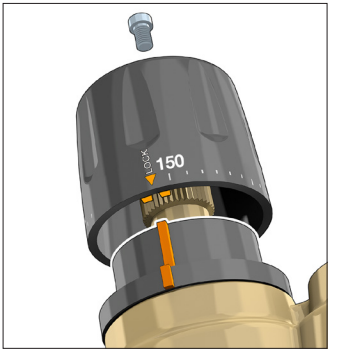
Temperature adjustment

Set the desired recirculation system temperature by turning the adjustment knob. The graduated scale shows the temperatures at which the indicator can be set.



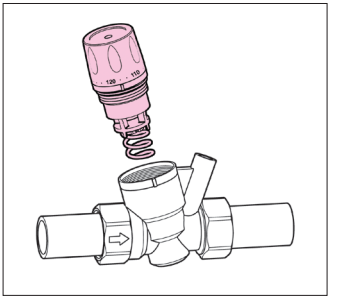
Adjustment locking

After adjusting the temperature, the setting can be locked at the desired value using the adjustment knob. Unscrew the locking screw at the top of the adjustment knob, remove the knob and then put it back on so that the internal groove couples with the protrusion on the knob holder nut. When this block is used, the reference of the indication of the temperature values on the knob is lost. To restore it, completely unscrew the locking screw. Reposition the knob on MAX value. Tighten the locking screw.



Maintenance

The balancing adjustment cartridge can be removed from the valve body for periodic inspection, cleaning or replacement (with the system cold or empty).

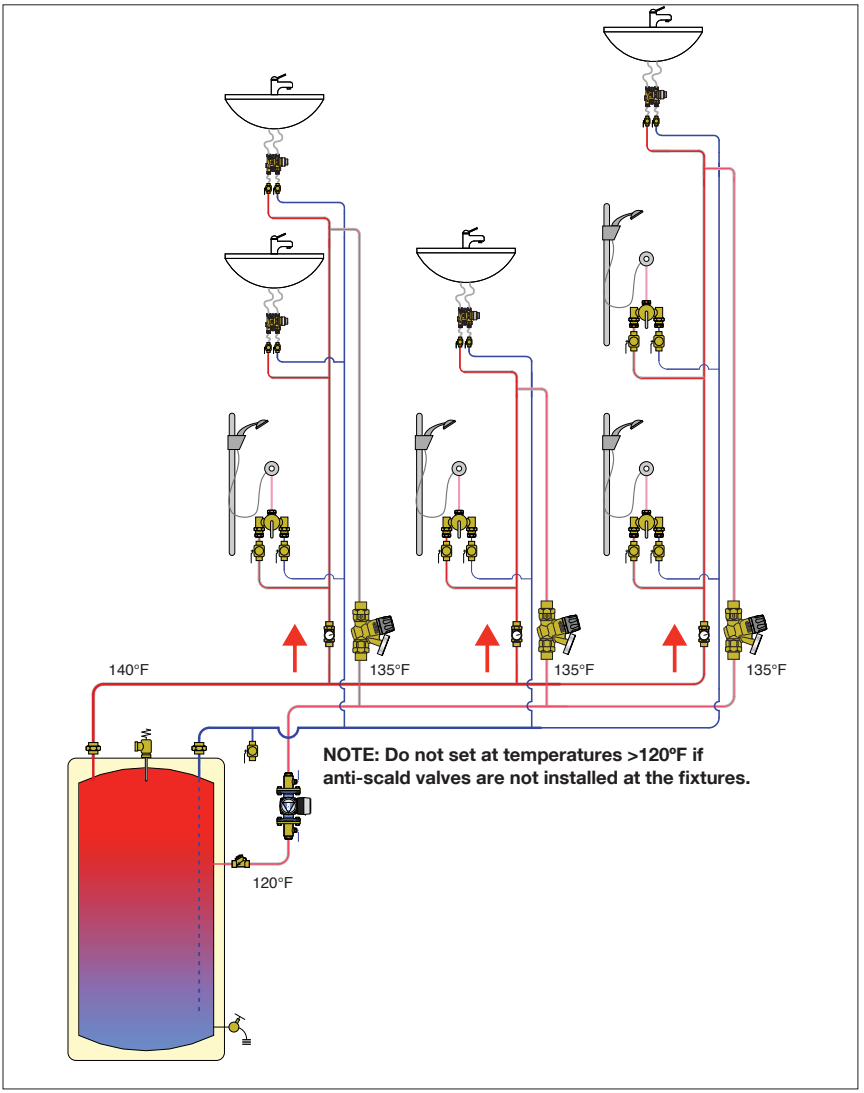


Insulation shell

The ThermoSetter 1164 series insulation shell, code CBN116440 can be purchased separately to minimize heat loss.

Application diagram

Hot water recirculation with thermal balancing valves



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NOTES

LEAVE THIS MANUAL WITH THE USER.

Laissez ce manuel à la disposition de l'utilisateur.

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