

# ThermoSetter™ Recirculation thermal balancing valve



116A Series 1/2" and 3/4"

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## Application

The ThermoSetter™ adjustable thermal balancing valve is used for automatic balancing of recirculation loops in domestic hot water systems, to speed hot water delivery, reduce water waste and save energy. The internal thermostatic balancing cartridge automatically modulates flow to ensure a constant temperature in the recirculation piping system. The 116A Series has an adjustment knob with 95 °F to 140 °F (35 °C to 60 °C), for sizes 1/2", 3/4". An integral check valve to prevent circuit thermo-syphoning is standard on sizes 1/2" and 3/4".

The 1162xx and 1166xx Series is available with a "disinfection" by-pass cartridge, for use in systems which are designed to perform thermal disinfection for prevention of Legionella. When the disinfection cartridge senses 160 °F (70 °C) -1162xx, or 140 °F (60 °C) -1166xx, water (2 available temperature options), indicating disinfection control mode, it automatically opens a by-pass flow path to allow sufficient flow for disinfection to occur. When the temperature drops back to normal range, the disinfection by-pass cartridge closes to return flow control to the balancing cartridge.

The 1163xx Series is also available with a "disinfection" valve that is controlled by a 24V spring return thermo-electric actuator, rather than thermostatically, thus allowing thermal disinfection mode to be controlled remotely by an automation system.

The 116A series ThermoSetter is available pre-assembled with Caleffi low-lead brass full-port ball valve for isolation. Fitting sizes 1/2" and 3/4" are pre-assembled with the Caleffi 290030 series low lead ball valve. Product codes for 116A ThermoSetters pre-assembled with isolation valves can be found on page 2.

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



## Typical Specification

Furnish and install on the plans and describing herein, a Caleffi recirculation thermal balancing valve, as manufactured by Caleffi. Each balancing valve must be designed with a DZR low-lead brass body that complies with NSF/ANSI 372, as certified by ICC-ES, file PMG-1360. Complies with NSF/ANSI/CAN 61 (180 °F/82 °C Commercial Hot) as certified by ICC-ES, file PMG-1512. Stainless steel & copper adjustable cartridge, peroxide-cured EPDM seals, ABS adjustment knob. The balancing valve must include 1/2" or 3/4" union connections. Each valve has 230 psi (16 bar) maximum working pressure and 95-140 °F (35-60 °C) adjustable temperature range. Provide with optional outlet temperature gauge with 32-180 °F (0-80 °C) temperature scale, and optional pre-formed insulation shell. Provide with optional inlet and outlet low-lead brass full-port ball valves, for isolation, factory-assembled, or separately-sourced, Code 290030 series Each valve shall be Caleffi model 1161 or approved equal; model 1162 or 1166 with thermostatic by-pass valve for thermal disinfection function (disinfection temperature 160 °F (70 °C) for 1162 series, 140 °F (60 °C) for 1166 series); or model 1163 with by-pass valve for thermal disinfection function with optional code 656 series thermo-electric actuator (disinfection temperature 160 °F (70 °C)). (See product instructions for specific installation information.)

## Technical specifications of 290030 ball valve

### Materials

Body and male end cap: DZR low-lead brass EN 12165 CW510L  
Female unplated nut: DZR low-lead brass EN CW617N EN 12165  
Chrome-plated ball and unplated stem: DZR low-lead brass EN 12164 CW510L  
Seats (2): PTFE  
O-ring stem seals (2) and Gasket: EPDM  
Green T-handle (RAL6001): Cast Aluminum EN AC-46100 EN 1676

## Technical specifications

### Materials

Body: DZR\* low-lead brass  
Adjustable cartridge: stainless steel & copper  
Springs: stainless steel AISI 302 (EN 10270-3)  
Hydraulic seals: peroxide-cured EPDM  
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)  
Max. inlet temperature: 195 °F (90 °C)  
Adjustment temperature range: 95-140 °F (35-60 °C)  
Flow Cv (Kv) max: 2.1 (1.8)  
Flow Cv (Kv) min: 0.23 (0.2)  
Flow Cv (Kv) design: 0.52 (0.45)

### Connections:

Main connections: 1/2" & 3/4" with NPT female, sweat, press, PEX crimp and PEX expansion union connections  
Temperature gauge/sensor dry-well: Ø 10 mm metric

### Temperature gauge code 116010

Scale: 32 - 180 °F (0 - 80 °C)  
Diameter: 1 1/2" (40 mm)  
Stem diameter: 0.35" (9 mm)

### Technical specifications of insulation, code CBN116140

Materials: closed cell expanded PE-X  
Thickness: 1/2 inch (13 mm)  
Density: -internal part: 1.9 lb/ft³ (30 kg/m³)  
-external part: 5.0 lb/ft³ (80 kg/m³)  
Thermal conductivity (DIN52612):  
- at 32 °F (0 °C): 0.82 BTU · in/hr · ft² · °F (0.0345 W/(m · K))  
- at 105 °F (40 °C): 0.94 BTU · in/hr · ft² · °F (0.0398 W/(m · K))  
Coefficient of resistance to the diffusion of vapor: > 1,300  
Working temperature range: 32-212 °F (0-100 °C)  
Flammability (ASTM D 635): Class VO

### Certifications:

- Complies with codes IPC and UPC and standard NSF/ANSI/CAN 61(180 °F/82 °C Commercial Hot), as certified by ICC-ES, file PMG 1512.
- Complies with NSF/ANSI 372, low lead, as certified by ICC-ES, file PMG-1360.
- PEX crimp fittings certified to ASTM F 1807.
- PEX expansion fittings certified to ASTM F 1960.

## Technical specifications of 290030 ball valve (continued)

### Performance

Suitable Fluids: water, glycol solutions  
Max. percentage of glycol: 50%  
Max. working pressure: 230 psi (16 bar)  
Working temperature range: -40 - 300 °F (-40 - 150 °C)  
Flow coefficient, fully open: Cv 5.8 (Kvs 5.0)

### Connections:

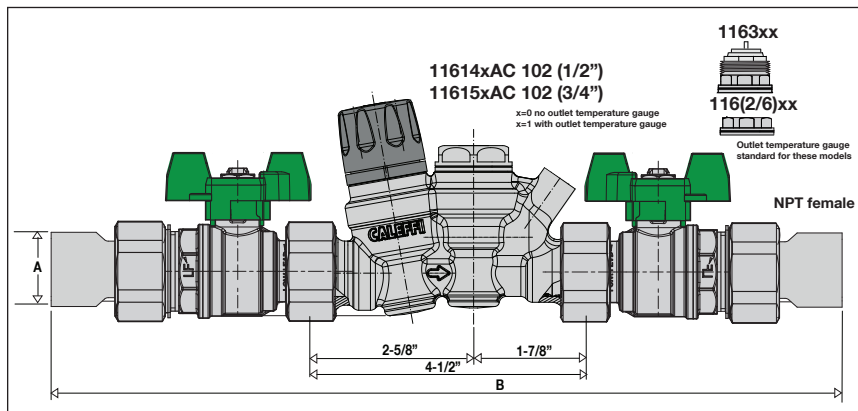
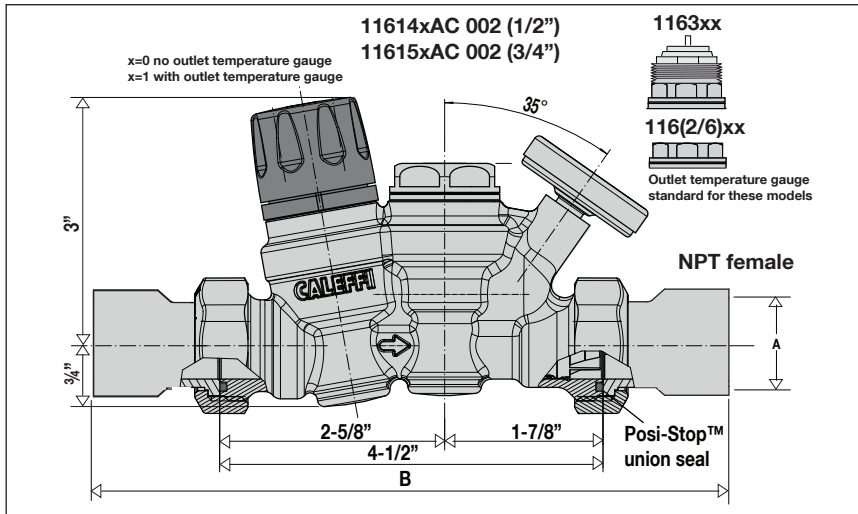
Main connections: 1" Metric "G" thread Male x Female, ISO 228/1

### Certifications:

Complies with NSF/ANSI/CAN 61 & 372.

# Dimensions

ThermoSetter 116 series 1/2" & 3/4" union connections with standard outlet check valve



Base Code	A	B					Weight w/o ball valves w/ ball valves (lb/kg) (NPT;SwT;Prs;exp;crmp)
		NPTF 002 102	Sweat 009 109	Press** 006 106	PEX expansion 008 108	PEX crimp 007 107	
116n40AC XXX with ball valves	1/2"	6 11/16" 12 1/4"	6 1/32" 11 9/16"	6 11/16" 12 3/16"	5 15/16" 11 7/16"	5 7/8" 11 3/8"	3.0;2.6;2.4;2.4;2.4 5.0;4.6;4.4;4.4;4.4
*116n41AC XXX with ball valves		6 11/16" 12 1/4"	6 1/32" 11 9/16"	6 11/16" 12 3/16"	5 15/16" 11 7/16"	5 7/8" 11 3/8"	3.0;2.6;2.4;2.4;2.4 5.0;4.6;4.4;4.4;4.4
116n50AC XXX with ball valves	3/4"	7 7/32" 12 11/16"	6 1/2" 12"	6 3/4" 12 1/4"	8 7/8" 14 3/8"	7 7/8" 13 7/16"	3.0;2.8;2.4;2.4;2.4 5.0;4.8;4.4;4.4;4.4
*116n51AC XXX with ball valves		7 7/32" 12 11/16"	6 1/2" 12"	6 3/4" 12 1/4"	8 7/8" 14 3/8"	7 7/8" 13 7/16"	3.0;2.8;2.4;2.4;2.4 5.0;4.8;4.4;4.4;4.4

\*with integral outlet temperature gauge (digits 5 and 6=41 and 51 only for 1161 models, and not used for A=2,6,3)

\*\*Lay Length: size 1/2": 5"; size 3/4": 4-3/16".

n: =1 for models without disinfection function, integral outlet temperature gauge optional.

=2 for models with 160 °F (70 °C) disinfection temperature, includes integral outlet temperature gauge.

=3 for models with 140 °F (60 °C) disinfection temperature, includes integral outlet temperature gauge.

=3 for models with actuator disinfection function, includes integral outlet temperature gauge.

XXX: suffix identifies end connection style with and without isolation ball valves on inlet and outlet.

All 1/2" and 3/4" models have outlet check valve pressed into outlet before installing tailpiece and union nut, standard.

We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice. Contractors should request production drawings if prefabricating the system

Job name	_____	Size	_____
Job location	_____	Quantity	_____
Engineer	_____	Approval	_____
Mechanical contractor	_____	Service	_____
Contractor's P. O. No.	_____	Tag No.	_____
Representative	_____	Notes	_____