ThermoMix™ boiler protection high-flow thermostatic mixing valve

series 280

Function

The ThermoMix™ 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 ThermoMix valve mixes bypass 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.

Changable 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.

Product range

Code 280xxxA Boiler protection high-flow thermostatic mixing valve with 140ºF cartridge, threaded and sweat connections ..... sizes 1", 1-1/4"
Code F29633 Themostatic sensor cartridge ..... 115º F
Code F29634 Themostatic sensor cartridge ..... 130º F
Code F29635 Themostatic sensor cartridge ..... 140º F
Code F29636 Themostatic sensor cartridge ..... 160º F

Technical specifications

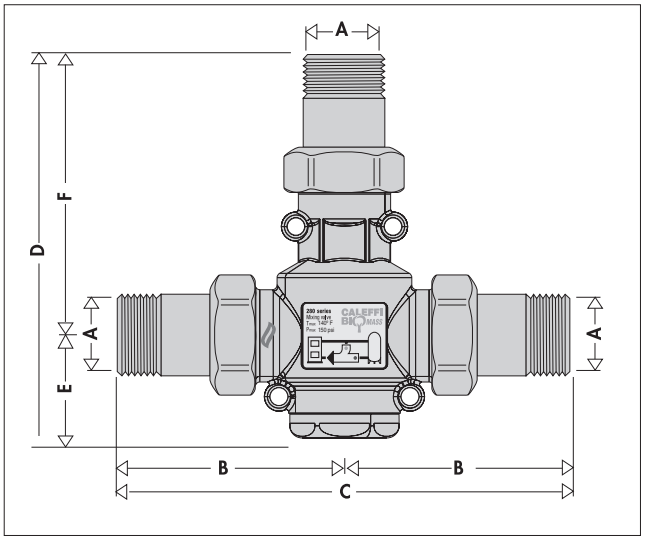
Materials

Body and lower body plug:	brass
Shutter:	polysulfone
Spring:	stainless steel
Seal:	EPDM
Union seals:	non-asbestos fiber
Thermostatic sensor:	wax

Performance

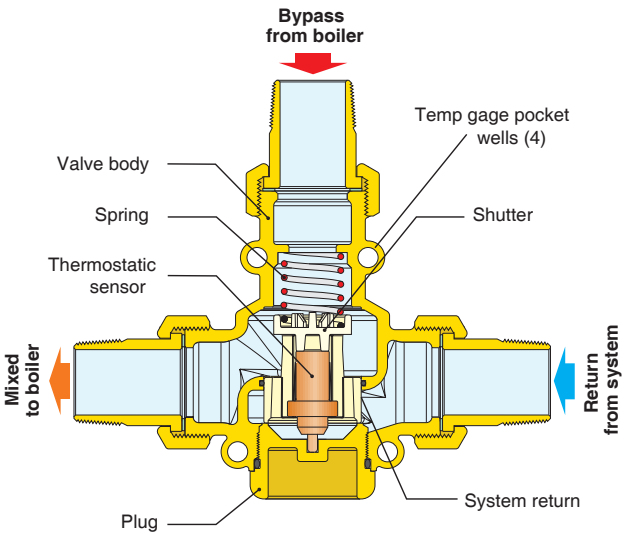
Suitable fluids:	water, up to 50% glycol solutions
Max working pressure:	150 psi (10 bar)
Working temperature range:	40-212°F (5-100°C)
Thermostatic sensor cartridge:	140°F (60°C) standard
	115°F (45°C), 130°F (55°C), 160°F (70°C) optional cartridges
Sensor cartridge accuracy:	±3.6°F (±2°C)
By-pass from boiler complete closing temperature:	Tset +18°F (10°C)
Cv:	size 1"... 10Cv
	size 1-1/4" ... 14Cv
Connections: - NPT male union	1" and 1¼"
- sweat union	1" and 1¼"

Dimensions



Code	A	B	C	D	E	F
280166A	1" NPT	3 1/2"	7"	6"	1 5/8"	4 3/8"
280966A	1" SWT	3 1/2"	7"	6"	1 5/8"	4 3/8"
280176A	1 1/4" NPT	3 13/16"	7 5/8"	6 3/16"	1 9/16"	4 3/8"
280976A	1 1/4" SWT	3 13/16"	7 5/8"	6 3/16"	1 9/16"	4 3/8"

Characteristic components



Operating principle

The thermostatic sensor, completely immersed in the medium, controls the movement of a shutter that regulates the bypass flow from the boiler and toward the system. At boiler startup, the boiler protection thermostatic mixing valve recirculates the bypass flow from the boiler to bring the boiler up to temperature as quickly as possible (fig. 1). When the bypass flow from the boiler Tf exceeds the setting of the boiler protection mixing valve Tset, the valve's return from the system port starts opening to produce the water mixing Tmix: in this phase the system loading begins (fig. 2).

When the mixed flow to the boiler temperature Tmix is greater than the set point of the boiler protection mixing valve by approximately 18°F (10°C), the bypass flow from the boiler port closes and water returns to the boiler at the same temperature as the return flow from the system.

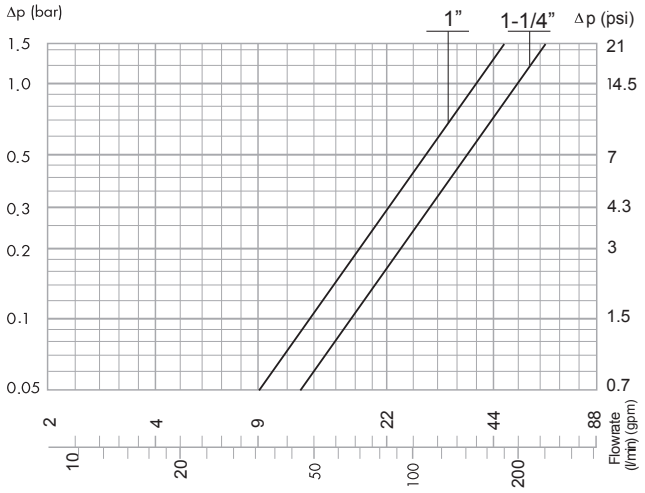
Construction details

The brass body prevents the formation of ferrous residues in the system, prolonging boiler operating life.

The thermostatic sensor can be easily replaced for maintenance or set point change.

The boiler protection mixing valve body features temperature gage pocket wells on front and rear sides, allowing installation of a temperature gage (code F29571) for monitoring the working temperatures: bypass from boiler, return from system, and mixed to boiler.

Flow curve

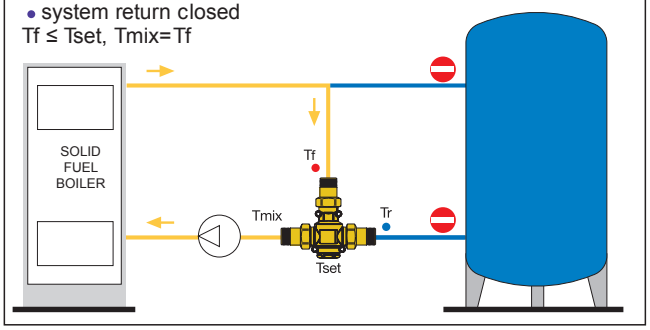


Cv: size 1"... 10
size 1-1/4" ... 14

Tf ≤ Tset SYSTEM START UP 1

- by-pass open
- system return closed

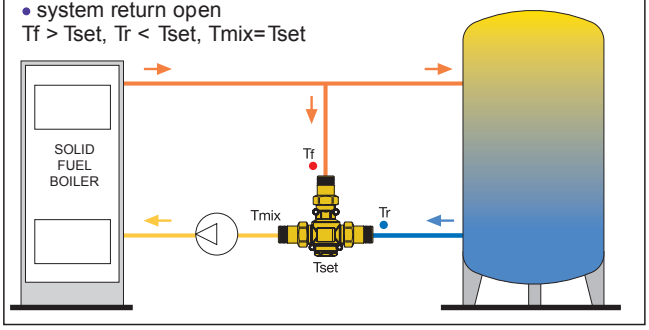
Tf ≤ Tset, Tmix=Tf



Tf > Tset START OF SYSTEM LOADING 2

- by-pass open
- system return open

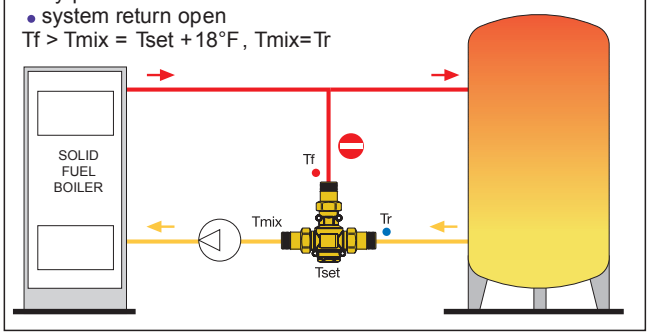
Tf > Tset, Tr < Tset, Tmix=Tset



Tmix = Tset + 18°F BY-PASS CLOSING 3

- by-pass closed
- system return open

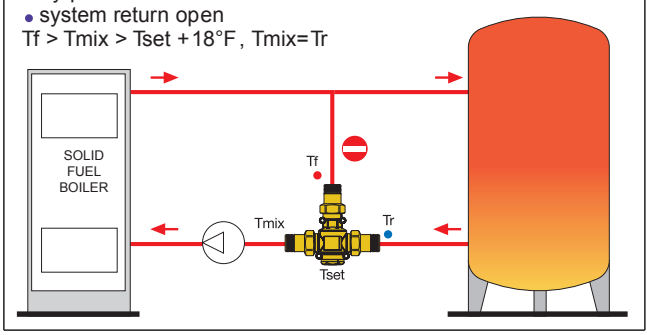
Tf > Tmix = Tset +18°F, Tmix=Tr



Tmix > Tset + 18°F SYSTEM LOADED 4

- by-pass closed
- system return open

Tf > Tmix > Tset +18°F, Tmix=Tr



Tf=Bypass flow from boiler
Tset=Boiler protection valve set point temperature
Tmix=Mixed flow to boiler temperature
Tr=Return from system temperature