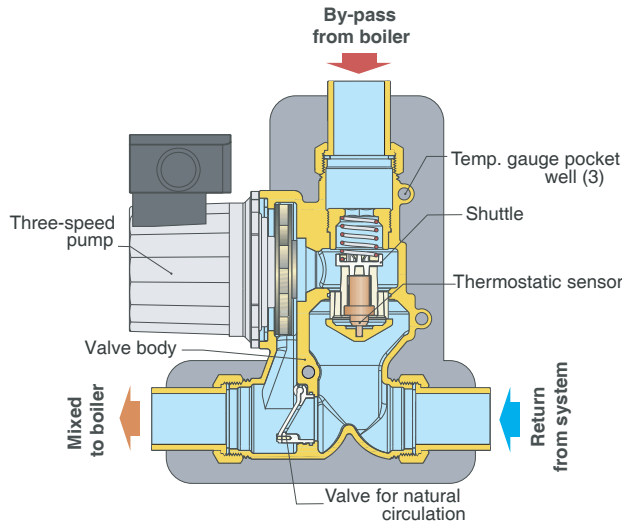


Characteristic components



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 recirculation and distribution unit 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 T_f exceeds the setting of the fixed thermostatic sensor T_{set} , the unit's return from the system port starts opening to produce the water mixing T_{mix} : in this phase the system loading begins (fig. 2).

When the mixed flow to the boiler temperature T_{mix} is greater than the set point of the boiler protection recirculation and distribution unit 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 (fig. 3).

When power is out and the circulation pump stops running, the flapper check valve, which is closed during normal operation, opens with a slight pressure differential resulting from the effects of heated water in the boiler and cooler water in the distribution system, a natural thermosyphon flow. This prevents an excessive heat buildup which eventually would cause the pressure relief valve to open (fig. 4).

The compact brass body casting houses the pump and all functioning components, offering easy installation, either on the right or left side of the boiler. The temperature gages can be easily removed and re-inserted on the back side of the unit.

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

The unit features a thermostatic sensor to control the temperature of water returning to the boiler to prevent condensation. The sensor can be easily replaced for maintenance or set point change.

The flapper check valve allows the natural thermosyphon circulation of the system heat transfer fluid when the pump stops running due to power failure. When the pump is running under normal conditions the thrust of the flowing medium keeps the flapper closed, forcing flow past the thermostatic sensor. When the pump stops running and the fluid in the boiler is at high temperature, natural circulation begins, bypassing the thermostatic sensor, preventing overheating in the boiler.

