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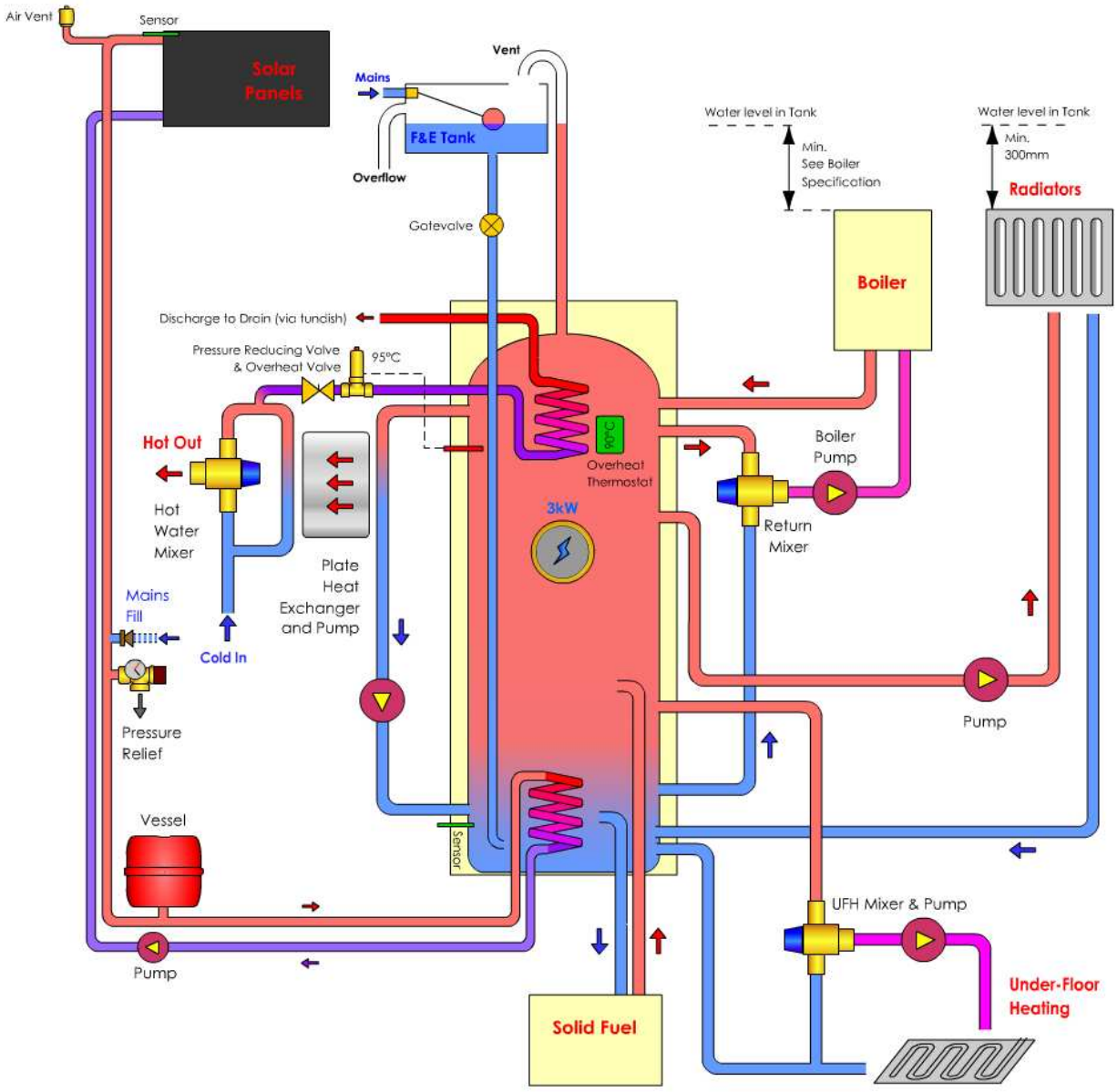
Summary of Overheat Protections for Wood Burners connected to Heat Banks

The schematic below shows an example of a multi-fuel Heat Bank System, combining a Solid Fuel Wood Burner, Gas Boiler, Solar Panels and Electric Backup, along with Mains Pressure Hot Water, Radiators and Underfloor Heating.

The system allows any heat source to be stored and used with any load (hot water or heating) as desired. The method of connection to each heat source is tailored to maximise the efficiency of that source. Low temperature sources (solar and heat pumps) are fed into the lower half of the storage, and low temperature loads, such as underfloor heating, are taken out from this section. High temperature sources are fed into the upper half of the storage, and are used to drive loads such as radiators and mains hot water to taps.



When using wood burners in a domestic system there are certain safety criteria that must be met:

- **The wood burner must be installed into a vented (unpressurised) system.** Xcel Heat Banks (as shown below) are all open vented and provide the wood burner with a direct route to atmosphere via the standard vent pipe.

- **The water in the wood burner must not be used to feed domestic taps or outlets.** This is to prevent the wood burner from scaling up, and to prevent contamination from the wood burner from reaching domestic outlets. The water in the Heat Bank that circulates through the wood burner is NOT the same water that comes out of taps - it never changes and is protected by the addition of a few litres of corrosion inhibitor (as al standard primary systems should be). The water that feeds taps comes directly from the cold mains supply, is under high pressure, and never comes into contact with the storage system or heat sources. The mains water is heated up using the stainless steel plate heat exchanger fitted on al Heat Banks.

- **Heat generated within the wood burner must be removed from the wood burner, even under no-power conditions**, to prevent boiling of water within the burner. Usually this is accomplished by the use of dump radiators fitted higher than the wood burner in such a way that heat will rise naturally from the wood burner into the radiators.

  The design shown here does not use natural convection to circulate water to radiators. Instead it has a fitted cylinder thermostat that turns on the central heating pump to radiators and/or underfloor heating when the store temperature reaches 90°C. This method is capable of removing more heat from the system than by natural convection as it can feed radiators downstairs, but will not run under power-cut conditions or a pump failure.

  To provide a power-free level of protection, the system shown is also fitted with a mains discharge coil that acts like opening a hot tap to extract excess heat from the store. A Honeywell TS boiler overheat valve (mechanical) is fitted onto the mains feed to the coil and is normally closed. When the store temperature reaches 95°C (detected via an armored capillary sensor) the valve opens and allows cold mains water to flow through the coil and out to a discharge, cooling the store down. A pressure reducing valve is fitted to limit the mains pressure to the valve and the discharge flow rate. This method of protection can discharge over 20kW without power and without relying on natural convection to radiators.

  IMPORTANT: This method of protection must be approved by the manufacturer of the wood burning equipment if it is to replace conventional dump radiators.

  The only disadvantage of using this form of overheat discharge protection in place of dump radiators is that it is not possible to run the upstairs central heating system using gravity alone. If this function is still required then both gravity fed radiators and a discharge can be used together if a backup form of protection is preferred.

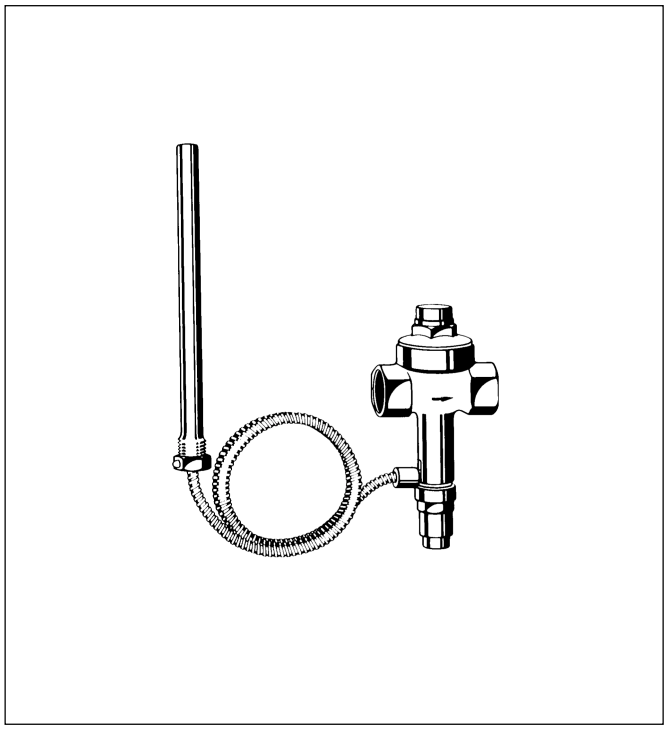
For further information on all Heat Bank systems, or methods of integrating different heat sources, please contact Dedicated Pressure Systems Ltd. on 0845 2411441, or visit our website at **www.heatweb.com**

We offer a free design consultancy service and provide many online tools that assist in the design of systems, including a schematic designer - used to generate the schematic shown here - and a Heat Bank designer, that can be used to build a finished pre-fabricated system to match requirements.

Honeywell

TS130
Temperature Relief Valve
WITH TEST FACILITY AND DOUBLE SENSOR

PRODUCT DATA



Application

The TS130 Temperature Relief Valve for heating systems to DIN 4751, Sheet 2 is a self-acting valve which is activated by the flow temperature of the heat generator. It opens and discharges water from the heat generator or condensing coil at a flow temperature of 95°C (203°F) and thereby prevents a significant temperature rise in the heat generator.

Features

- **Construction tested to DIN 3440**
- **Immersion pocket with double heat sensors**
- **With test facility**
- **Capillary tube protected against kinking by steel sheath**
- **Immersion pocket with external thread**

Range of Application

Multi-fuel boilers with integral water heating or condensing coils in closed solid-fuel fired heating systems to DIN 4751, Sheet 2.

Specifications

Heating system capacity	max. 93 kW (80 000 kcal/h)
Operating temperature	95°C (203°F)
Flow capacity	2000 kg /h water at a minimum flow pressure of 1,0 bar (14,5 P.S.I.)
Connection size	Rp 3/4" (DIN 2999)

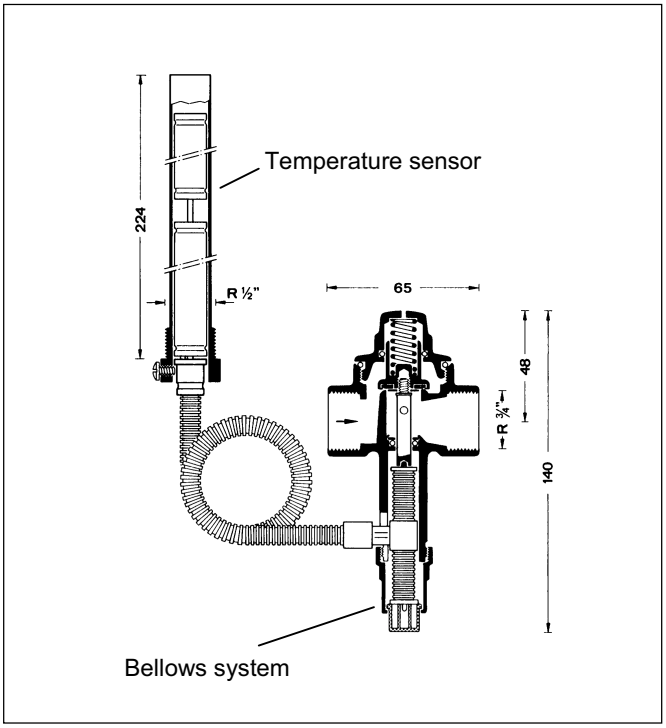
Design

The Temperature Relief Valve comprises:

- Housing with internal thread
- Bonnet
- Valve piston with seal disc
- Spring
- Immersion pocket
- Remote double temperature sensor with capillary tube
- Immersion sensor G 1/2” (ISO 228)

Materials

- Brass housing, bonnet and immersion pocket
- Copper temperature sensor
- Copper capillary tube
- Brass valve piston
- Hot-water-resistant elastomer seals



Function

The temperature relief valve is actuated by the flow temperature of the heat generator. It comprises a spring-loaded valve and a bellows operated temperature sensor. When a boiler flow temperature of 95ºC is reached the force exerted by the bellows system becomes greater than the force of the spring and the valve opens. Heated potable water then flows out and this is replaced by cold water from the supply network. This absorbs excess heat from the heat generator and prevents overheating.

Versions

TS130 - 3/4 A = Opening temperature 95°C (203°F), capillary tube with protection sheath 1300 m, with approved construction

TS130 - 3/4 B = Opening temperature 95°C (203°F), capillary tube with protection sheath 4000 m

TS130 - 3/4 Z = Special versions on request

Accessories

Complete piston guide for TS130

TS130 KF-3/4 A

Honeywell

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