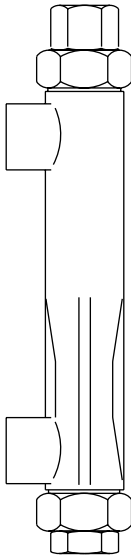

Thermocirc
Installation and Maintenance Instructions



- 1. *General safety information*
- 2. *General product information*
- 3. *Installation*
- 4. *Commissioning*
- 5. *Operation*
- 6. *Maintenance*
- 7. *Spare parts*

— 1. *General safety information* —

Safe operation of the unit can only be guaranteed if it is properly installed, commissioned and maintained by a qualified person (see Section 11 of the attached Supplementary Safety Information) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

Isolation

Consider whether closing isolating valves will put any other part of the system or personnel at risk. Dangers might include; isolation of vents and protective devices or alarms. Ensure isolation valves are turned off in a gradual way to avoid system shocks.

Pressure

Before attempting any maintenance consider what is or may have been in the pipeline. Ensure that any pressure is isolated and safely vented to atmospheric pressure before attempting to maintain the product, this is easily achieved by fitting Spirax Sarco depressurisation valves type DV (see separate literature for details). Do not assume that the system is depressurised even when a pressure gauge indicates zero.

Temperature

Allow time for temperature to normalise after isolation to avoid the danger of burns and consider whether protective clothing (including safety glasses) is required.

Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

2. General product information

2.1 Description

The thermocirc utilises liquid expansion technology as a mixing valve. The fixed temperature, liquid expansion, oil filled element is factory set but does allow for minor adjustment.

By combining the functions of temperature control and steam injection, the Thermocirc produces hot water by the direct mixing of steam and cold water.

Note: For additional information see Technical Information Sheet TI-P157-19.

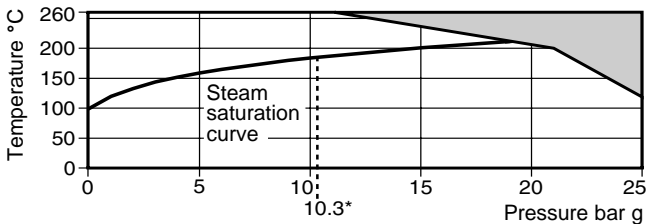
2.2 Sizes and pipe connections


½" screwed BSP or NPT.

2.3 Limiting conditions

Body design conditions	PN25	
PMA - Maximum allowable pressure	25 bar g	(363 psi g)
TMA - Maximum allowable temperature	260°C	(500°F)
PMO - Maximum operating pressure	10.3 bar g	(150 psi g)
TMO - Maximum operating temperature	260°C	(500°F)
Temperature range	49°C to 82°C (120°F to 180°F)	
Designed for a maximum cold hydraulic test pressure of	38 bar g	(551 psi g)

2.4 Operating range



 The product must not be used in this region.

*PMO Maximum operating pressure recommended for saturated steam is 10.3 bar g (150 psi g).

3. Installation

Note: Before actioning any installation observe the 'Safety Information' in Section 1.

Two typical installations are shown in Figures 1 and 2.

For hot water tanks the most efficient operation is obtained by fitting the thermocirc vertically on the side of the tank (see Figure 1).

The most rapid response will be obtained if the cold water make-up is discharged close to the recirculation circuit inlet of the thermocirc at the bottom of the tank. The hot water draw-off should be taken from as high up as is practicable.

Note: A strainer and check valve should always be fitted in the steam inlet pipework prior to entry into the thermocirc as shown below. The pipeline strainer is fitted to protect the valve from scale, etc. The check valve prevents water draining from the tank or jacket when the steam is off.

Caution: The thermocirc is not suitable for controlling at temperatures above 82°C (180°F).

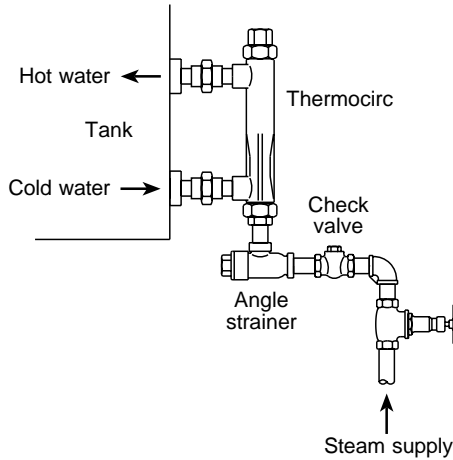


Fig. 1 Typical installation (Thermocirc fitted directly to a small hot water tank)

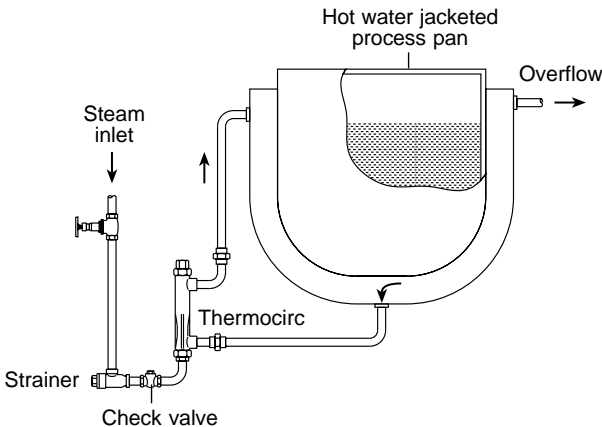


Fig. 2 Spirax Sarco Thermocirc applied to a water-jacketed vessel

4. Commissioning

After installation or maintenance ensure that the system is fully functioning. Carry out tests on any alarms or protective devices.

5. Operation

The Spirax Sarco thermocirc is a device for obtaining hot water at a higher temperature by the direct mixture of steam and cold water.

Steam enters at point (C) and passes through the stainless steel nozzle (3) into the body (the mixing chamber) of the device. The velocity of steam through (3) induces a flow of cool water, from the storage tank or other vessel, into the mixing chamber via the cold water inlet (A). The steam condenses in the water and so warms it, the warm water passes back into the storage vessel. Inside the mixing chamber there is a liquid-filled thermostat (8) which is adjustable by turning the adjustment nut (13) so that it closes the stainless steel valve (2) against the steam inlet nozzle (3) when a predetermined temperature is reached in the mixing chamber. Once set, the thermostat, without further attention will continue to operate the valve according to the required temperature. Adjustment is between 49°C and 82°C.

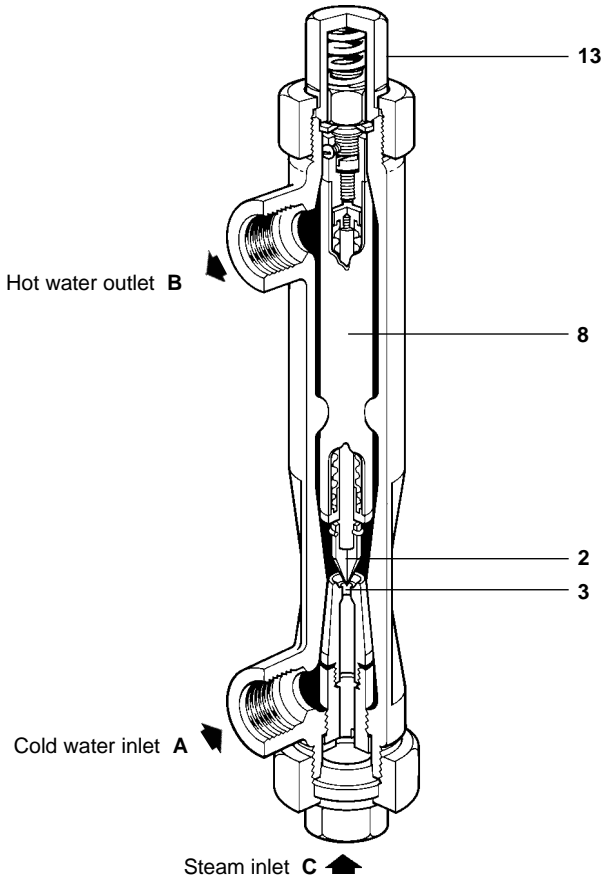


Fig. 3

Steam inlet C 

6. Maintenance

Note: Before actioning any maintenance programme observe the 'Safety Information' in Section 1.

Adjustment:



- Isolate the thermocirc from the supply, return and steam lines and allow the unit to safely normalise to atmospheric pressure.
- The thermocirc should be allowed to cool to ambient temperature before proceeding.
- The control is calibrated in the factory, but may require initial adjustments to match it to your conditions.
- Loosen the lock-nut (**14**) $\frac{1}{2}$ of a turn anticlockwise.
- Turn the adjustment nut (**13**) as indicated by the arrow - 'open', in order to increase the temperature. Turn the adjustment nut as indicated by the arrow - 'closed', in order to decrease the temperature.
- Hold the adjustment nut (**13**) with one spanner and tighten the lock-nut (**14**) with another. Refer to Table 1 for the recommended tightening torques.

Note: Adjustment nut (**13**) should not be moved more than $\frac{1}{4}$ turn at a time; wait for the effect of each adjustment on the temperature of the stored water before making further adjustments.

Replacement of element:

- Isolate the thermocirc from the supply, return and steam lines and allow the unit to safely normalise to atmospheric pressure.
- The thermocirc should be allowed to cool to ambient temperature before proceeding.
- Remove the lock-nuts (**10** and **14**) at both ends of the unit.
- Remove the element (**8**) and spring (**11**) and unscrew the stainless steel valve seat ring (**3**).
- Ensure all gasket contact areas are clean.
- Reassemble the new valve seat ring (**3**) and new element (**8**) ensuring the spring (**11**) is correctly located.
- Replace the lock-nuts/adjustment nuts (**10** and **14**) and tighten to the recommended torque (see Table 1).

Table 1 Recommend tightening torques

Item	Part	 or 	N m	(lbf ft)
3	Valve seat ring		30 - 35	(22 - 26)
10	Lock-nut	$1\frac{15}{32}$ " A/F	80 - 85	(59 - 63)
14	Lock-nut	$1\frac{15}{32}$ " A/F	80 - 85	(59 - 63)

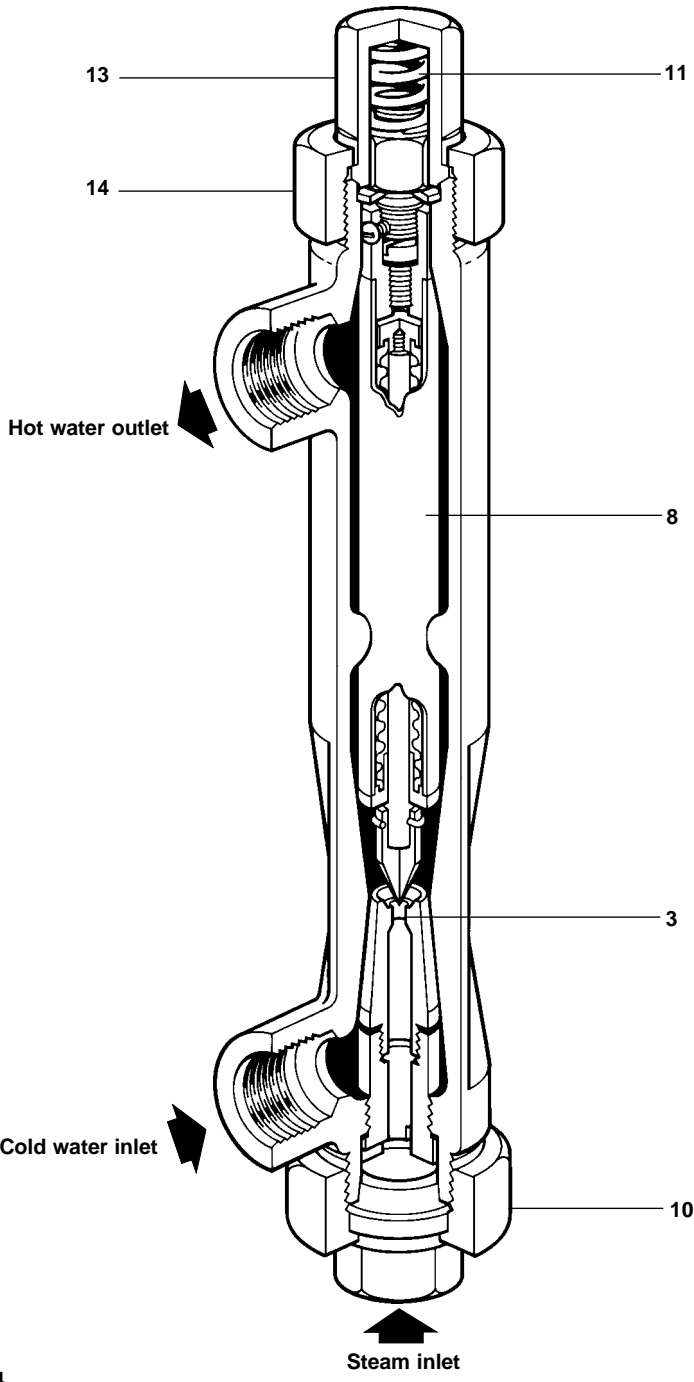


Fig. 4

7. Spare parts

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Available spare

Element set

3, 4, 5, 6, 8, 11, 12

How to order spares

Always order spares by using the description given in the column headed 'Available spare' and state the size and type of control.

Example: 1 - Element set for a 1/2" Spirax Sarco thermocirc.

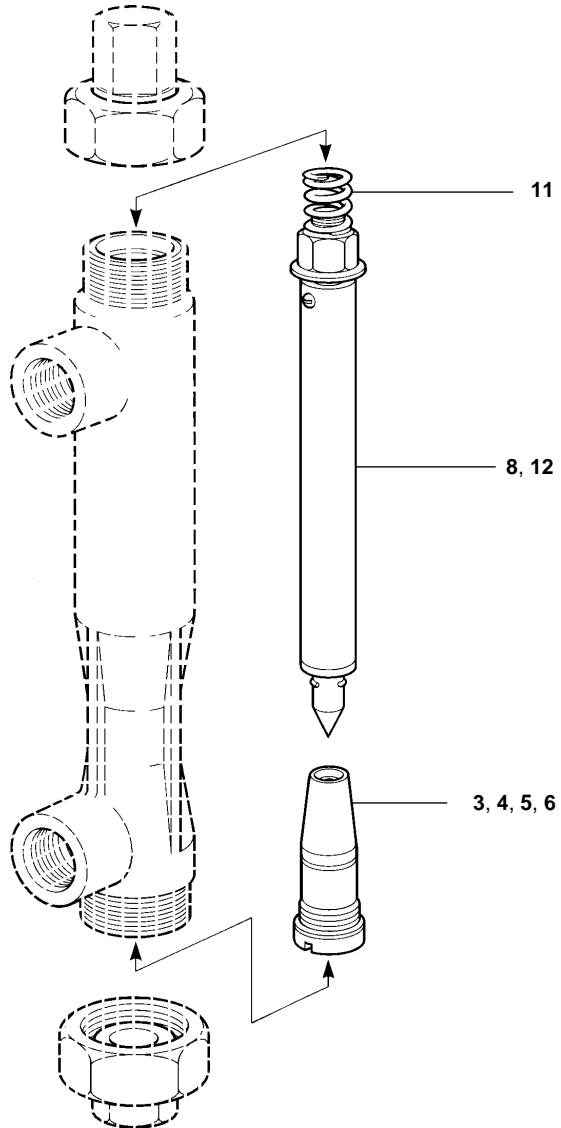


Fig. 5