spirax sarco

TI-P157-08
ST Issue 10

Steam/Water Mixing Valve - MkII

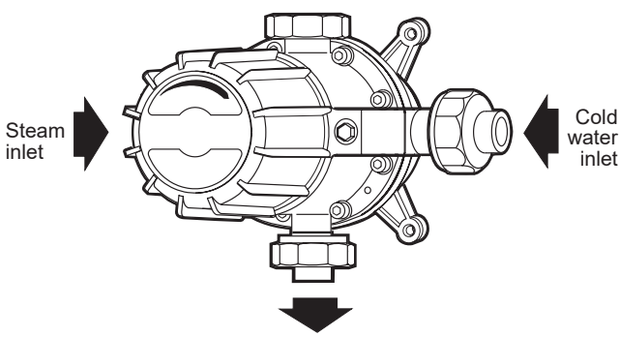
Description

Design

The MkII Spirax Sarco steam/water mixing valve is designed to provide hot water economically by blending steam and cold water quickly to the required user temperature. The temperature can be changed by turning the adjustment knob. As the valve is not thermostatically controlled in order to maintain a fixed hot water temperature the cold water pressure and flowrate must be constant. The installer must ensure that the Local Water Board Regulations are adhered to, with regard to direct use of mains water supply. MkII valves were supplied from 2002 onwards.

Operation

The mixing valve employs a piston to lift and open the steam valve. The piston is lifted by the cold water supply. If the cold water supply stops the piston will fall, closing the steam valve. To sustain this design integrity the piston must move freely. Scale build-up will prevent movement and regular maintenance must be carried out to ensure the valves safe operation.



Range

The ½" and ¾" valves are primarily intended for use in hosedown stations, washing down plant e.g. The food and beverage industries.
See TI-P157-06 on steam/water mixing stations and TI-P157-05 for the hosedown gun, hose and hose rack.
High capacity 1" and 1½" valves are intended for fixed installation i.e. Periodic filling of tanks, therefore no hoses or guns are available.

Temperature/pressure ranges

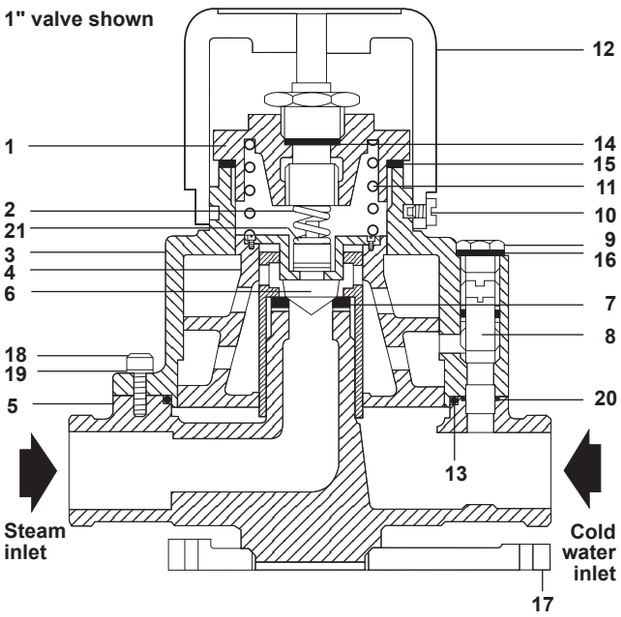
All sizes will supply a mixed water temperature in the range of 40° to 90°C. For sizing, see TI-P157-06. The valves are supplied with three fixed loading springs which allows the valve to operate over a wide range of steam pressures. The intermediate spring is fitted as standard.

Sizes and pipe connections

½", ¾", **1**" and 1½" screwed BSP (inlet and outlet)

Limiting conditions

Body design condition	PN16
Maximum pressure and temperature of inlet steam	10.3 bar g @ 184°C
Designed for a maximum cold hydraulic test pressure of 24 bar g	

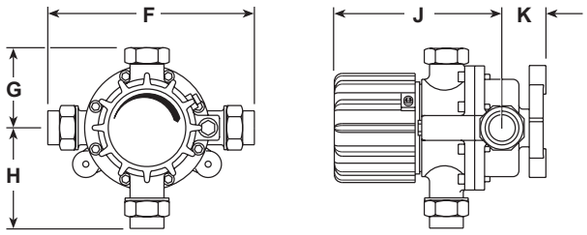


Materials

No.	Part		Material
1	Upper head		Bronze
2	Steam valve spring		Stainless steel
3	Upper body		Bronze
4	Piston		Bronze
5	Lower body		Bronze
6	Steam valve plug		Stainless steel
7	Steam valve seat		PTFE
8	Bypass valve		Stainless steel
9	Screw		Brass
10	Knob retaining screw		Stainless steel
11	Fixed loading spring		Stainless steel
12	Temperature adjustment knob	DN15 - 25	Glass filled polymer
		DN40	Plastic coated aluminium
13	Body 'O' ring		Viton
14	'O' ring packing washer		Graphite
15	Top gasket		Klingersil
16	Bypass valve washer		PTFE
17	Wall bracket	½" - 1"	Polypropylene
		1½"	Bronze
18	Cap screw		Stainless steel
19	Washer		Stainless steel
20	Bypass 'O' ring		Viton
21	Spigoted spring guide (1" + 1½" only)		

Dimensions / weights (approximate) in mm and kg

Size	F	G	H	J	K	Weight
½"	208	85	158	157	41	6.2
¾"	212	87	158	165	45	7.1
1"	261	108	158	179	58	11.1
1½"	396	128	200	226	60	23.8



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P157-03) supplied with the product.

General information

Cleaning should only be carried out by suitably qualified persons. Regular cleaning of the mixing valve and handgun is required to prevent scale build-up and continued safe working operation. This is especially important in hard water areas.

Note: Pressure gauges are installed in the steam and cold water supply lines of all Spirax Sarco steam/water mixing valve stations. These are installed for fault finding purposes.

Disposal

See IM-P157-03 which is supplied with the product for full details. The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken. However if the recycling process involves a temperature approaching 260°C caution is advised regarding decomposition of the PTFE and/or Viton components.

How to order

Example: 1 off 1½" Spirax Sarco MkII steam / water mixing valve.

Spare parts

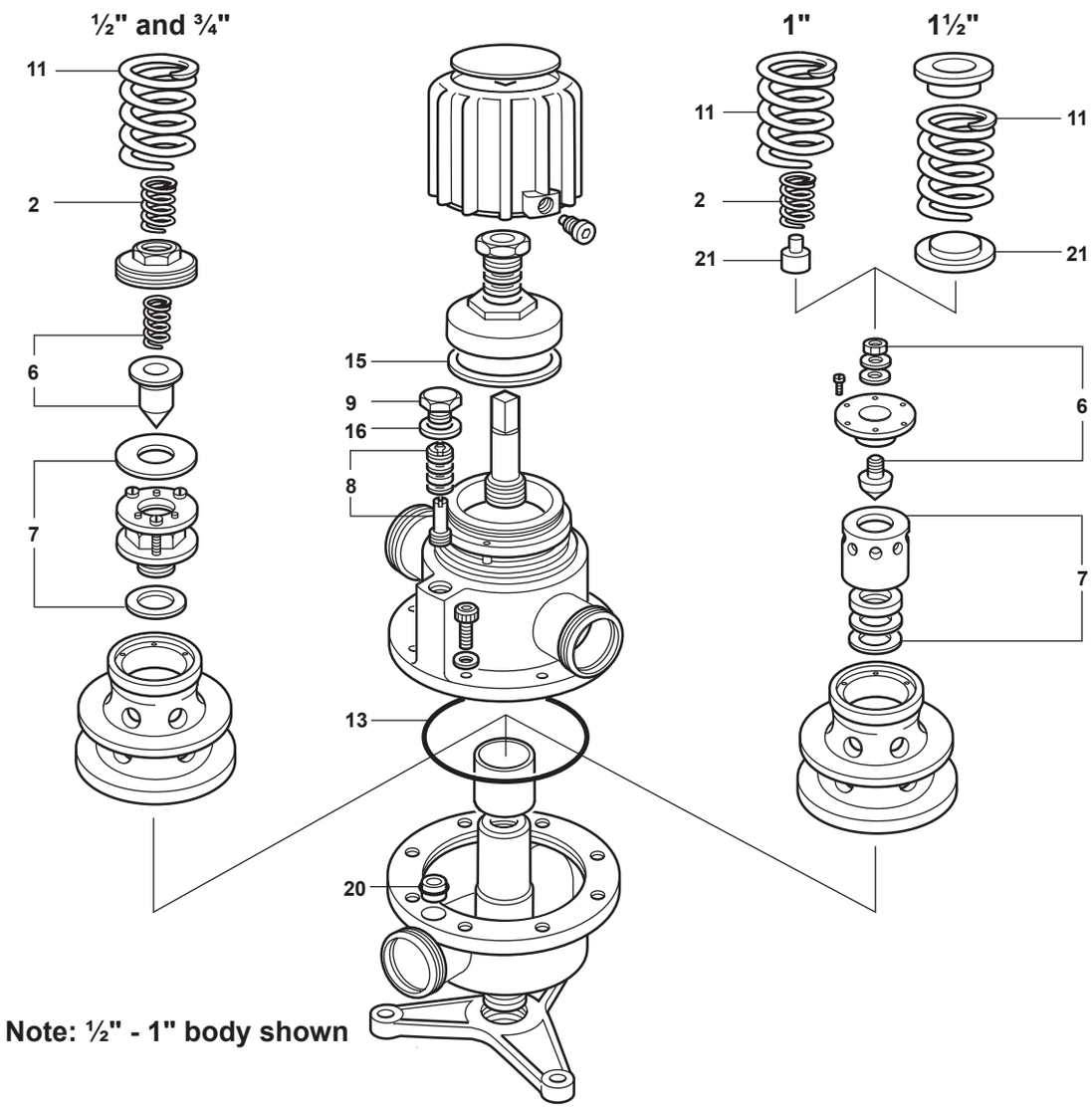
Spare parts are available as indicated. No other parts are supplied as spares.

Available spares

Maintenance set	**2, 6, 7, 8, 9, 13, 15, 16, 20**
Gasket set	**8, 13, 15, 16, 20**
Fixed loading spring	**11, 15**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size of the valve.
Example: 1 off Gasket set for a 1½" Spirax Sarco MkII steam / water mixing valve.



Note: ½" - 1" body shown

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TI-P157-06
ST Issue 9

Steam/Water Mixing Stations - MkII Valve

Description

The MkII Spirax Sarco steam/water mixing station is designed to provide hot water economically by blending steam and cold water quickly to the required user temperature. The temperature can be changed by turning the adjustment knob. As the valve is not thermostatically controlled, in order to maintain a fixed hot water temperature the cold water pressure and flowrate must be constant. The installer must ensure that the Local Water Board Regulations are adhered to, with regard to direct use of mains water supply. MkII valves are supplied from 2002 onwards.

Operation

The mixing valve employs a piston to lift and open the steam valve. The piston is lifted by the cold water supply. If the cold water supply stops the piston will fall, closing the steam valve. To sustain this design integrity the piston must move freely. Scale build-up will prevent movement and regular maintenance must be carried out to ensure the valves safe operation.
The TCO1 temperature cut-out valve activates at a temperature of 95°C to limit the discharge of steam in the event of a system fault.

Range

Each steam/water mixing station is supplied with isolation valves, pressure gauges, syphons and cocks, steam traps, check valves, union joints, strainers, thermometer and TCO1 temperature cut-out valve.
½" and ¾" stations can be supplied with an optional high quality hose, hose rack and gun for hosedown purposes, see TI-P157-05 and TI-P157-22. High capacity 1" and 1½" stations are intended for fixed installation such as periodic filling of tanks and therefore no hoses or guns are available.

Optional equipment

Hosedown gun, hose and hose rack (for ½" and ¾" valves only) refer to TI-P157-05.
Hose reel (for ½" and ¾" valves only) refer to TI-P157-22.

Sizes and pipe connections

½", ¾", 1" and 1½" screwed BSP (inlet and outlet)

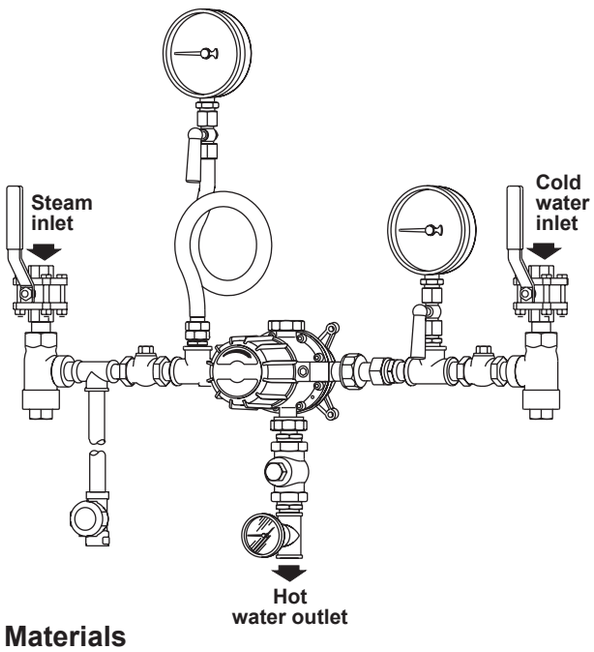
Available types

Size	Range °C Hot water outlet	Flow l/min Minimum to Maximum
½"	40 to 90	2.2 to 108
¾"	40 to 90	6.8 to 200
1"	40 to 90	27.3 to 375
1½"	40 to 90	54.4 to 550

Technical data Mixing valve pressure/spring ranges

Size	Spring	Steam inlet Pressure bar g	Minimum cold waterflow l/min to open steam valve
½"	Yellow	7.00 to 10.3	4.5
	Green	3.50 to 7.0	2.7
	Black	0.35 to 3.5	2.2
¾"	Red	7.00 to 10.3	8.1
	Blue	3.50 to 7.0	6.8
	White	0.35 to 3.5	6.8
1"	Red	7.00 to 10.3	36.3
	Blue	3.50 to 7.0	31.8
	White	0.35 to 3.5	27.2
1½"	Red	7.00 to 10.3	54.4
	Blue	3.50 to 7.0	54.4
	White	0.35 to 3.5	54.4

Note: Valves are supplied with the intermediate pressure range spring fitted.



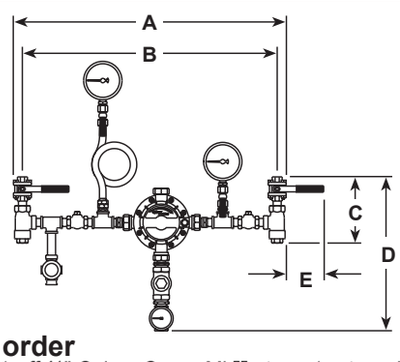
Materials

Mixing valve See TI-P157-08	Check valve	Bronze	See TI-P029-01
	Ball valve	Carbon steel	See TI-P133-06
	Strainer	Brass	See TI-P164-01
Pipeline fittings	Dial thermometer	Stainless steel/Brass	
	Pipe fittings	Brass/Bronze	
	Temperature cut-out valve	Bronze	See TI-P157-18
	Pressure gauge	Mild steel	See TI-P027-01
	Steam trap	Brass	See TI-P122-01

Typical dimensions / weights - as installed

(approximate) in mm and kg

Size	A	B	C	D	E	Weight
½"	655	613	120	295	96	13.7
¾"	713	671	130	440	94	15.9
1"	932	867	190	530	125	23.8
1½"	1 214	1 154	400	800	148	45.5



How to order

Example: 1 off ½" Spirax Sarco MkII steam/water mixing station.

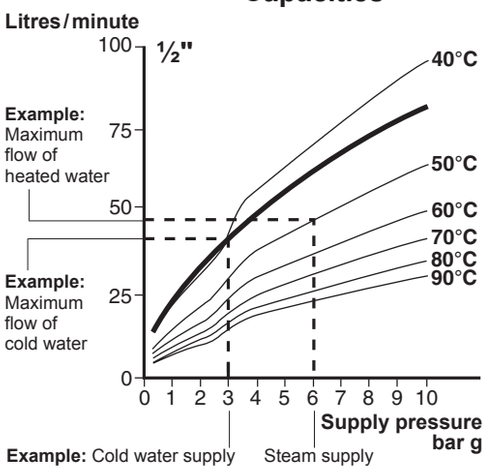
Steam consumption

Steam usage is shown in kg/h with the maximum water flow. If the water flow reduces then the steam usage will also decrease.

Steam flow kg/h (with maximum water flow)

	Valve type			
Pressure bar	½"	¾"	1"	1½"
0.5	45	100	180	185
1	60	125	300	245
2	90	175	380	440
3	135	270	450	565
4	160	310	520	715
5	175	335	580	820
6	180	380	600	950
7	210	445	665	1 070
8	225	515	735	1 165
9	245	550	830	1 240
10	260	570	905	1 290

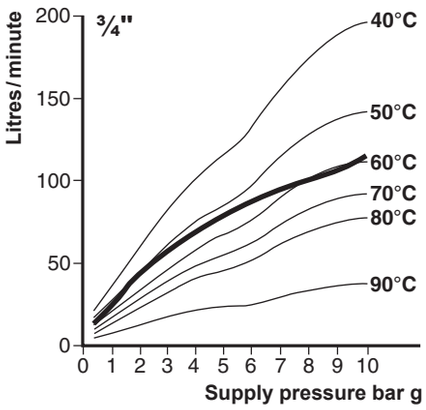
Capacities



Sizes and capacities

The graphs indicate the maximum flow of hot water at various temperatures for a given steam supply pressure. The bold lines show the maximum cold water flow for a given water supply pressure. When sizing the valve, ascertain the hot water temperature and quantity required, and the cold water and steam pressures available.
Plot the cold water supply pressure and read off from the bold line the maximum flow of cold water. Plot the steam supply pressure against the hot water temperature required and read off the maximum flow of heated water. For sizing purposes always select the lowest of the two values because depending on the supply pressures, there can be an imbalance in the amount of either water or steam heat available. The effect of selecting different supply pressures or different sizes of valve can easily be compared.

Example
For a cold water supply pressure of 3 bar g the maximum flow of cold water is 40 l/min. For a steam supply pressure of 6 bar g the maximum flow of hot water at 50°C is 46 l/min.

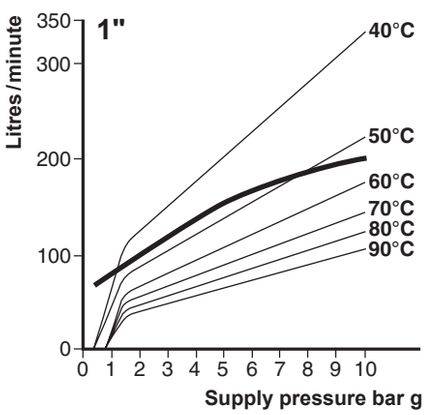


Safety information

Pressure
Before attempting any maintenance of any component of the steam/water mixing station 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 any component e.g. mixing valve, hose etc. This is easily achieved by fitting Spirax Sarco depressurisation valves type DV (see separate literature for details). Discharge content of hose and station by pulling the gun trigger and eliminate the pressure until the water flow stops. Do not assume that the system is depressurised even when the pressure gauges indicate zero.

Temperature
Allow time for temperature to normalise after isolation to avoid the danger of burns. For personal protection wear protective clothing, especially heavy duty gloves and safety glasses.

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



Maintenance

See the Installation and Maintenance Instructions (IM-P157-03) supplied with each system before commencing with any maintenance.

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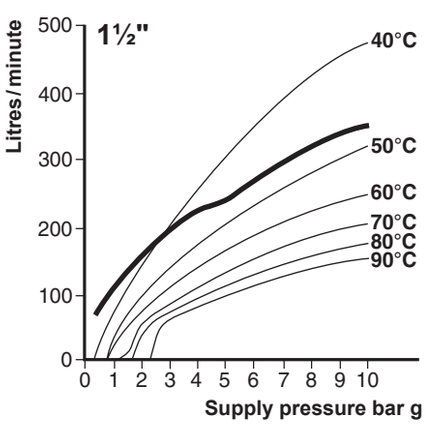
Installation

Full details are given in the Installation and Maintenance Instructions (IM-P157-03) supplied with each system. A typical installation is shown below.
Supply pipework should be sized according to standard practice.The steam inlet should be sized on the steam flowrate (from the steam consumption chart) at the supply pressure and a steam velocity of between 15 to 25 m/s.
Cold water pipework should take into account pressure, length of pipe and acceptable pressure drop.

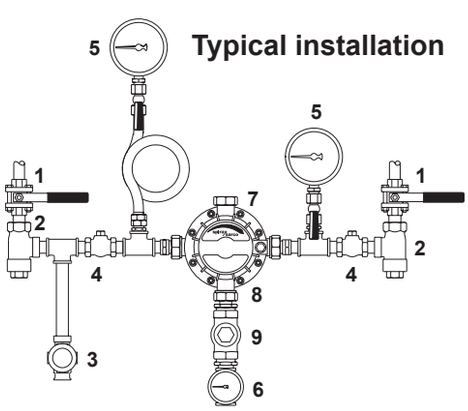


Spares

See Installation and Maintenance Instructions IM-P157-03 for details.

1	Ball valve
2	Strainer
3	Steam trap
4	Check valve
5	Pressure gauge, syphon and cock
6	Temperature gauge
7	Mixing valve
8	Mixed water outlet
9	TCO1 temperature cut-out valve

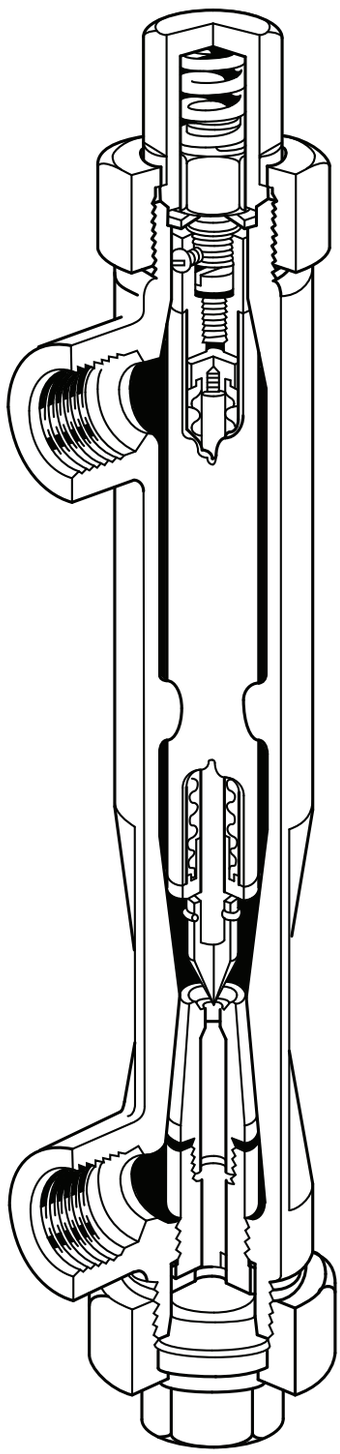
Typical installation



TI-P157-19
CMGT Issue 6

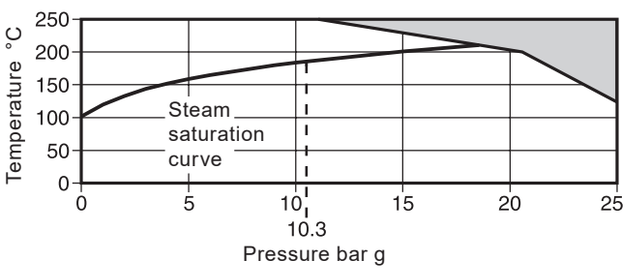
Thermocirc
Steam/Water Mixing Valve

Description
The thermocirc steam/water mixing valve provides hot water by blending steam and cold water. The temperature is controlled by a thermostatic element. The set temperature can be set by turning the adjustment nut.



Sizes and pipe connections
½" screwed BSP to (BS 21) or NPT.

Pressure/temperature limits



The product **must not** be used in this region.

* PMO Maximum operating pressure when used for steam service.

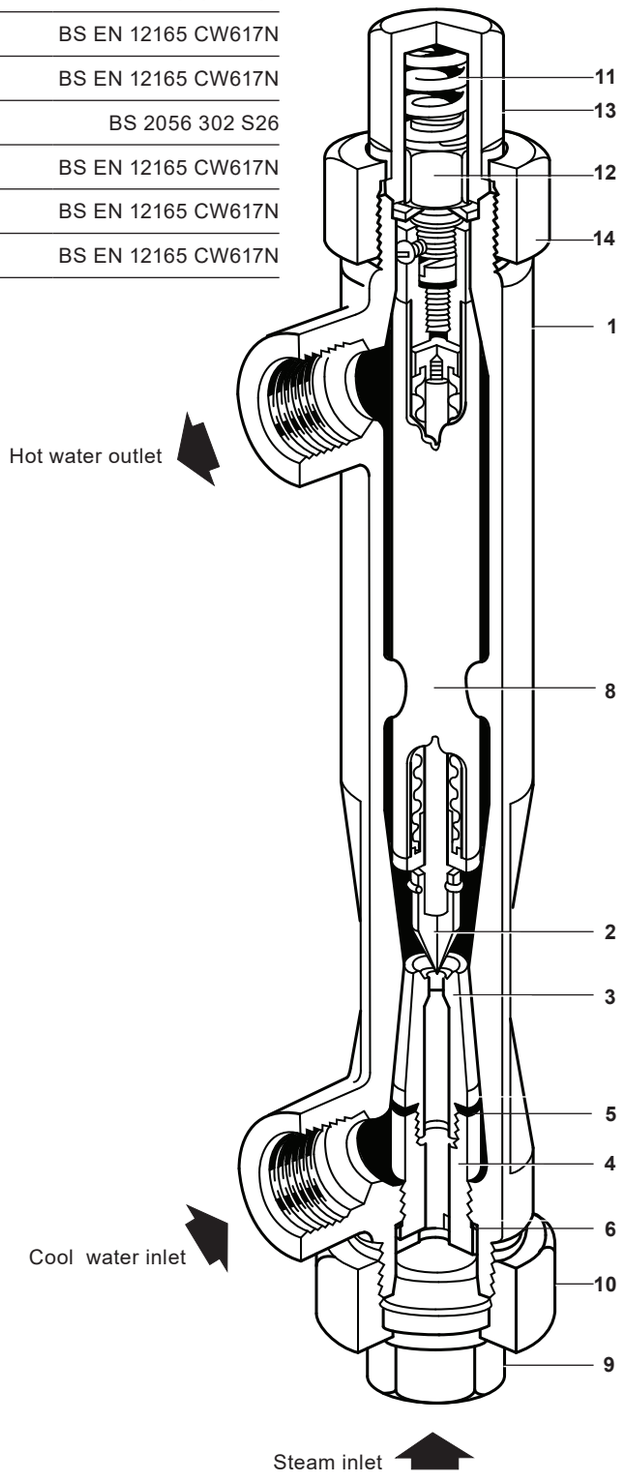
Body design conditions		PN25
PMA	Maximum allowable pressure	25 bar g
TMA	Maximum allowable temperature	260 °C
PMO	Maximum operating pressure	10.3 bar g
TMO	Maximum operating temperature	250 °C
Temperature range		49 °C to 82 °C
Designed for a maximum cold hydraulic test pressure of:		38 bar g

Certification
The product is available with certification to EN 10204 2.2 for the body and nut.
Note: All certification/inspection requirements must be stated at the time of order placement.

Pipeline ancillaries
Hosedown stations

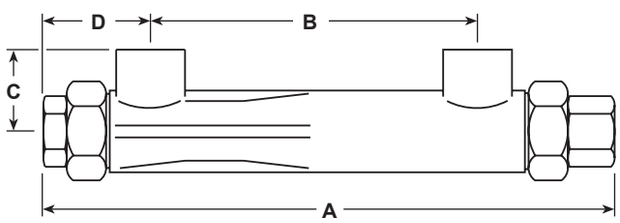
Materials

No.	Part	Material	
1	Body	Copper alloy (LG2)	BS EN 1982 CC491K
2	Valve closure member	Stainless steel	BS 970 431 S29
3	Valve seat ring	Stainless steel	BS 970 431 S29
4	Seat holder	Brass	BS 2874 CZ121
5	Seat gasket	Copper	BS 2870 C102
6	Seat holder gasket	Copper	BS 2870 C102
8	Element	Brass and phosphor bronze	BS 2870 CZ108 BS 2870 PB102
9	Nipple	Brass	BS EN 12165 CW617N
10	Nut	Brass	BS EN 12165 CW617N
11	Spring	Stainless steel	BS 2056 302 S26
12	Element nut	Brass	BS EN 12165 CW617N
13	Adjustment nut	Brass	BS EN 12165 CW617N
14	Lock-nut	Brass	BS EN 12165 CW617N

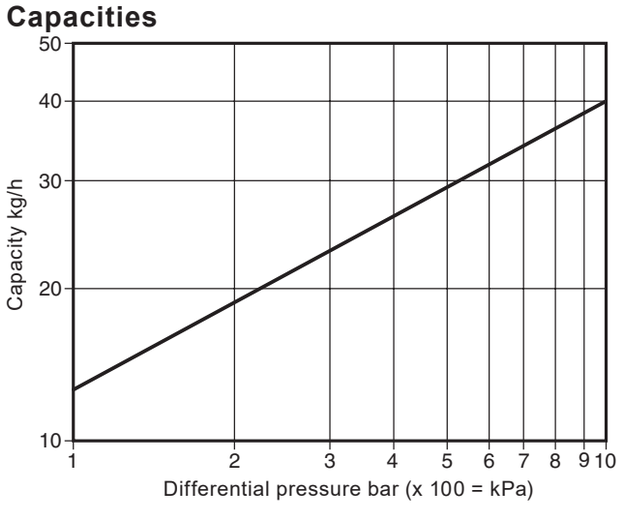


Dimensions/weight (approximate) in mm and kg

Size	A	B	C	D	Weight
½"	270	152	40	50	1.5

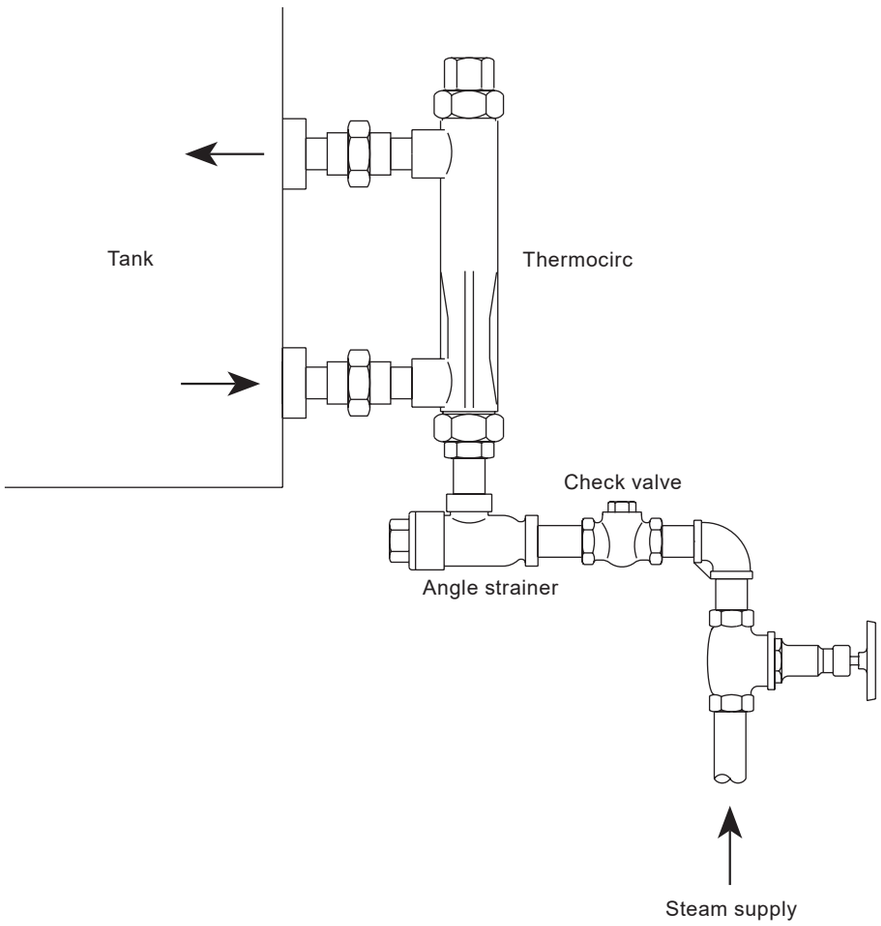


Capacities



Safety information, installation and maintenace

For full details see the Installation and Maintenance Instructions (IM-P157-36) supplied with the product.
Note: A strainer and check valve should always be fitted in the steam inlet pipework prior to entry into the thermocirc as shown below.



Typical installation showing a thermocirc fitted directly to a small hot water tank.

Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken, with exception to the element (8) which should be disposed of separately as it contains a parafin fill.

How to order

Example: 1 off ½" Spirax Sarco thermocirc with copper alloy (LG2) body and screwed BSP connections.

Spare parts

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

Available spare

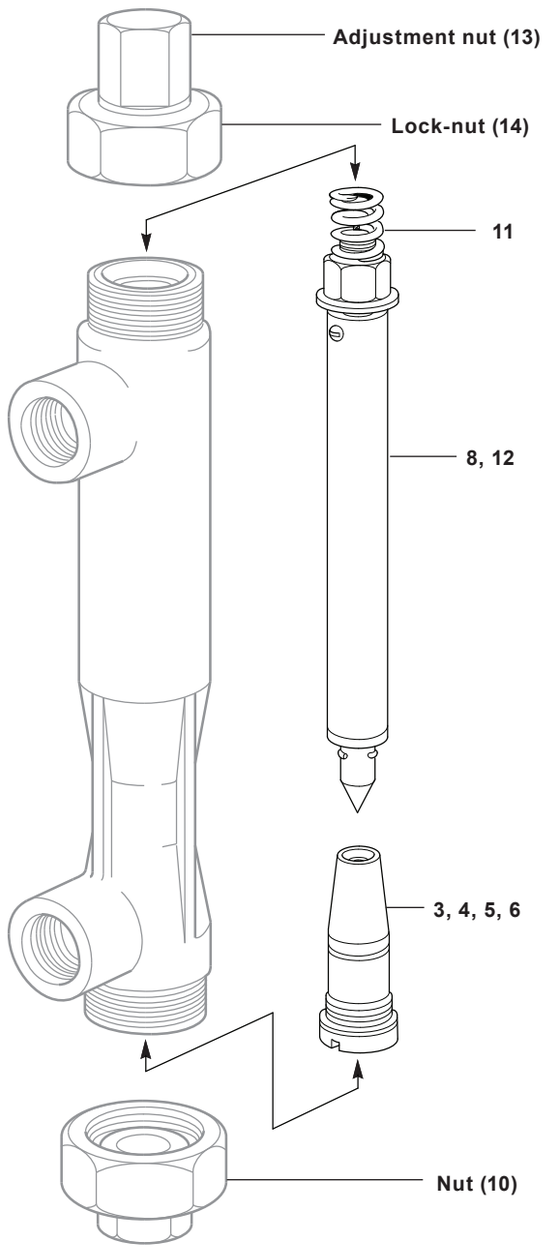
Element set	**3, 4, 5, 6, 8, 11, 12**

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 ½" Spirax Sarco thermocirc.

How to fit spares

See the Installation and Maintenance Instructions (IM-P157-36) supplied with each thermocirc.



Recommended tightening torques

Item	or mm		N m
3			30 - 35
10	1 15/32" A/F		80 - 85
14	1 15/32" A/F		80 - 85