

# spirax sarco

## USM21

# Sealed Bimetallic Steam Trap for use with Pipeline Connectors

### Description

The USM21 is a pre-set and maintenance free sealed bimetallic steam trap manufactured in stainless steel. It is designed for steam pressures up to 21 bar (305 psi) and applications such as steam tracing and mains drips. When installed in any position with a suitable pipeline connector the USM21 can easily and simply be removed without breaking into the pipeline, thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available with screwed, socket weld and flanged connections.

### Standards

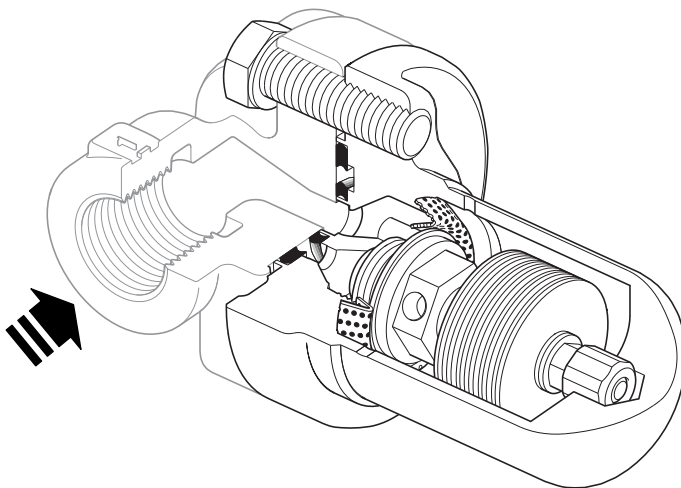
This product fully complies with the requirements of the Pressure Equipment Directive (PED) and carries the **CE** mark when so required.

**Note:** The body/cover weld joint complies with ASME section IX.

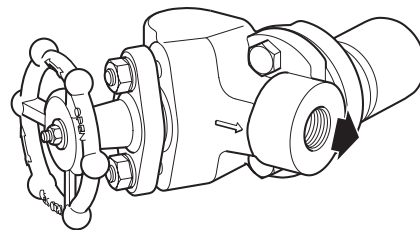
### Certification

This product is available with certification to EN 10204 3.1.

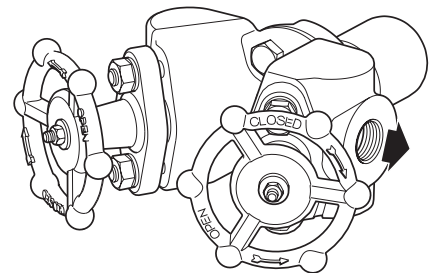
**Note:** All certification/inspection requirements must be stated at the time of order placement.



**USM21 fitted to a PC10HP connector**



**USM21 fitted to a PC3\_ connector**



**USM21 fitted to a PC4\_ connector**

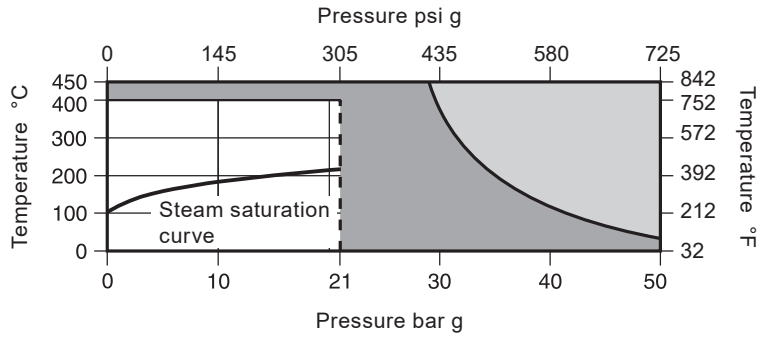
### Pipeline connector options


The USM can be fitted to a variety of pipeline connectors including:


<b>PC10HP</b>	Straight connector	ASME 600	(TI-P128-10)
<b>PC20</b>	+ 'Y' type strainer	ASME 300	(TI-P128-15)
<b>IPC2_</b>	+ 'Y' type strainer and Spiratec sensor		(TI-P128-17)
<b>PC3_</b>	+ 1 piston isolation valve	ASME 600	(TI-P128-02)
<b>PC4_</b>	+ 2 piston isolation valves	ASME 600	(TI-P128-03)

See the relevant Technical Information sheet as listed opposite for details of the connections available for each pipeline connector.

## Pressure/temperature limits (ISO 6552)



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

 The product should not be used in this region or beyond its operating range as damage to the internals may occur.

**Note:** The model of pipeline connector and connections selected will dictate the maximum operating pressure and temperature of the complete assembly. Consult the specified Technical Information sheet as listed in 'Sizes and pipe connections' for relevant data.

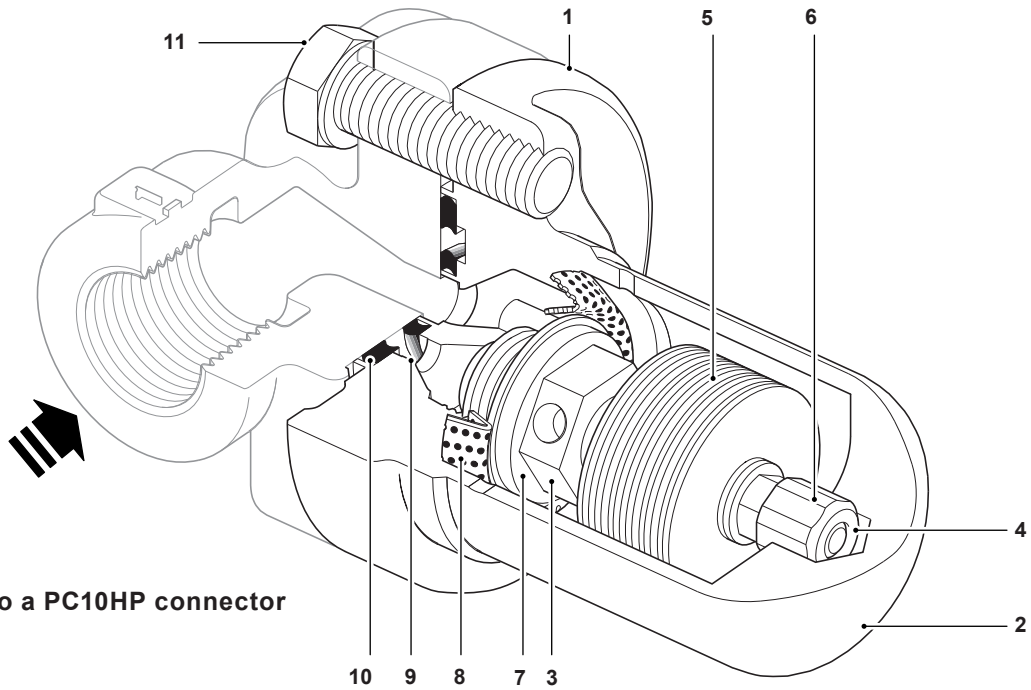
Body design conditions		ASME 300	
PMA	Maximum allowable pressure	50 bar g @ 40 °C	725 psi g @ 104 °F
TMA	Maximum allowable temperature	450 °C @ 29 bar g	842 °F @ 421 psi g
Minimum allowable temperature		-29 °C	-20.2 °F
PMO	Maximum operating pressure for saturated steam service	21 bar g	305 psi g
TMO	Maximum operating temperature	400 °C @ 21 bar g	752 °F @ 305 psi g
Minimum operating temperature *		0 °C	32 °F
ΔPMX	Maximum differential pressure	21 bar	305 psi
Designed for a maximum cold hydraulic test pressure of		75 bar g	1088 psi

\* Traps are available in a range of subcooled temperature settings.

Except for start-up and shutdown, they must operate above the minimum differential pressure values shown in the table below:

Nominal subcooled temperature		External identification	Threshold differential pressure	
-10 °C	-14 °F	'-1'	5 bar	73 psi
-30 °C	-22 °F	'-3'	2 bar	29 psi
-50 °C	-58 °F	'-5'	0.5 bar	7.25 psi
-70 °C	-94 °F	'-7'	0.1 bar	1.45 psi

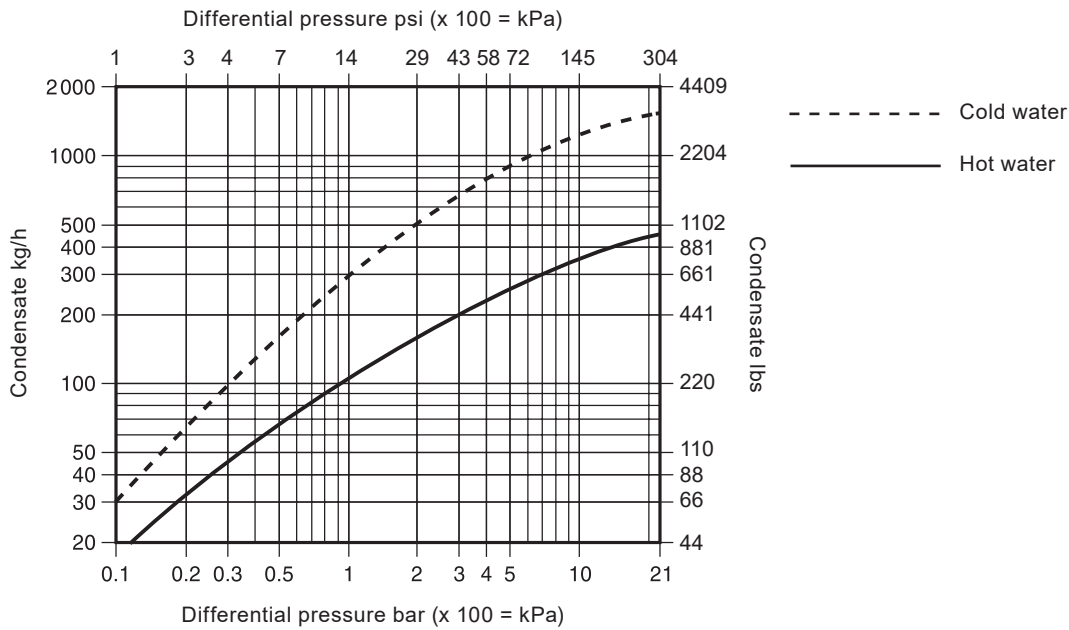
## Materials



USM21 fitted to a PC10HP connector

No.	Part	Material	
1	Body	Stainless steel	ASTM A351 CF8M
2	Cover	Stainless steel	AISI 316L
3	Seat	Stainless steel	AISI 316L
4	Stem	Stainless steel	AISI 410
5	Bimetal	Nickel alloy	G. Rau H46
6	Lock-nuts	Stainless steel	AISI 304L
7	Body/seat gasket	Stainless steel	AISI 316L
8	Screen	Stainless steel	AISI 304L
9	Inner gasket	Stainless steel / Graphite filler	Spirally wound AISI 304 strip
10	Outer gasket	Stainless steel / Graphite filler	Spirally wound AISI 304 strip
11	Connector screws	Carbon steel	ASTM A193 B7

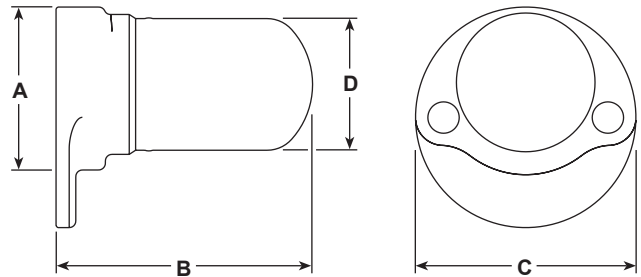
## Capacities (in accordance with ISO 7842)



## Dimensions/weights

(approximate) in mm (inches) and kg (lbs)

Model	A	B	C	D	Weight (Trap only)
USM21	35 (1.38)	78 (3.07)	68 (2.68)	40 (1.57)	0.6 (1.32)



## How to specify

Steam traps shall be of the sealed bimetal thermostatic USM21 type manufactured in stainless steel and be suitable for operating pressures up to 21 bar 305 psi. Traps to be zero maintenance and to be connected to separate pipeline connectors by two screws for quick and simple installation/replacement.

The thermostatic element is to nominally operate at 10 °C, 30 °C, 50 °C or 70 °C (50 °F, 86 °F, 122 °F or 158 °F) below steam temperature. Traps can be installed in any plane.

## How to order

The USM21 is supplied in two parts:-

1. The swivel pipeline connector	PC10HP	Standard connection
	PC20	+ 'Y' type strainer
	IPC2_	+ 'Y' type strainer and Spiratec sensor
	PC3_	+ 1 integral ISO valve
	PC4_	+ 2 integral ISO valves
2. The USM21 trap complete with inner and outer gaskets and two connector screws.		

### Notes:

1. State the nominal subcooling temperature required.
2. Any optional extras need to be specified at the time of order placement.

## How to order example:

1 off ½" PC10HP swivel connector having screwed NPT connections for use with a USM21 sealed bimetallic steam trap.

1 off Spirax Sarco USM21 sealed bimetallic steam trap, set to operate nominally at 30 °C (86 °F) below steam temperature.

## Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P625-03) supplied with the product. The USM21 can be installed on any Spirax Sarco pipeline connector. See separate Installation and Maintenance Instructions for Spirax Sarco pipeline connectors (IM-P128-06, IM-P128-11 and IM-P128-13).

## Disposal

The USM21 trap unit is manufactured from stainless steel and is therefore totally recyclable. No ecological hazard is anticipated with the disposal of this product provided due care is taken.

## Spare parts

The USM21 is a sealed non-maintainable trap unit. No internal spares are available. The spares which are available are shown in heavy outline. Parts shown in a grey line are not available as spares.

## Available spares

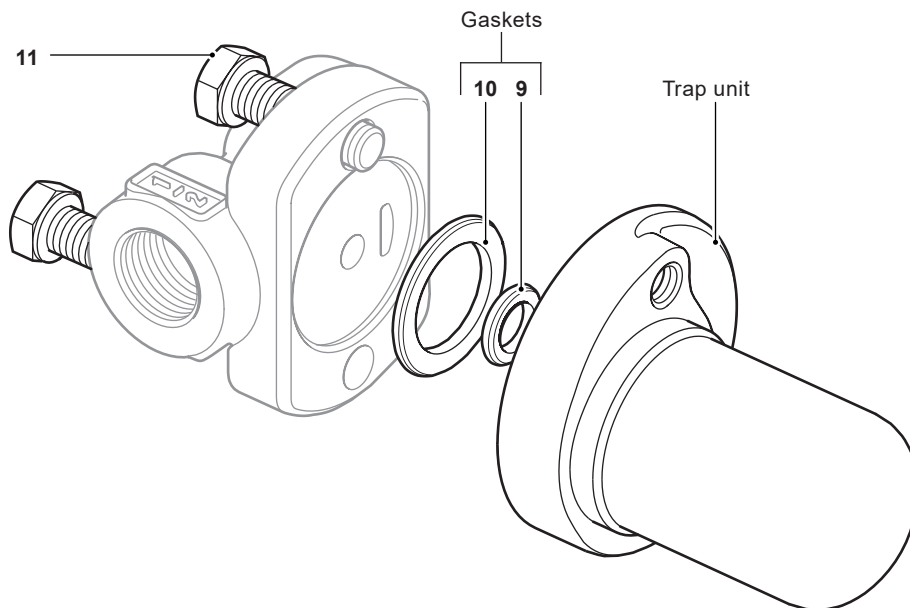
Connector screws (2 off)	<b>11</b>
Complete USM21 trap unit inclusive of gaskets (9 and 10) and connector screws (11)	

**Note:** The gaskets contain sharp metal reinforcement, please handle with care.



## How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state if ordering a complete trap the nominal operating temperature of the steam trap.

**Example:** 2 off Connector screws for a USM21 sealed bimetallic steam trap.



## Recommended tightening torques

Item	Part	 or mm 	N m
11	Connector screws	3/16"	33