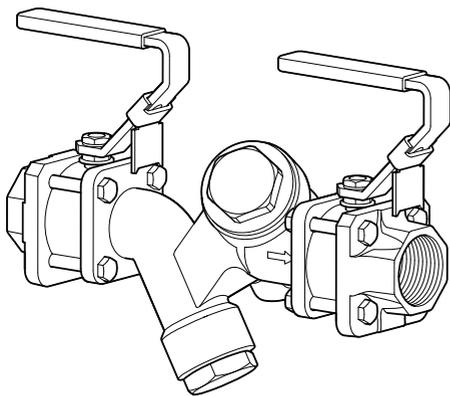


STS17.2

Stainless Steel

Compact Pipeline Connector Steam Trapping Station

Installation and Maintenance Instructions



1. Safety information
2. General product information
3. Installation
4. Commissioning
5. Maintenance
6. Spare parts

1. Safety information

Safe operation of these products can only be guaranteed if they are properly installed, commissioned, used and maintained by qualified personnel (see Section 1.11) 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.

1.1 Intended use

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application.

The products listed below comply with the requirements of the EU Pressure Equipment Directive/

UK Pressure Equipment (Safety) Regulations and carry the  /  mark when so required.

The products fall within the following Pressure Equipment Directive categories:

Product	Group 1 Gases	Group 2 Gases	Group 1 Liquids	Group 2 Liquids
STS17.2 DN15 - DN25	-	SEP	-	SEP

- i) The STS17.2 has been specifically designed for use on steam and condensate that is in Group 2 of the above mentioned pressure equipment directive.
For use on other fluids contact Spirax Sarco to confirm suitability of the product for the application being considered.
- ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.
- iii) Determine the correct installation situation and direction of fluid flow.
- iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.
- v) Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?

Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure.

Consider double isolation, Double Block and Bleeds (DBB) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.8 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns.

Valves which are fitted with PTFE seats must not be subjected to temperatures above 260 °C (500 °F). Above these temperatures toxic fumes may be given off.

Avoid inhalation of fumes or skin contact.

1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

1.10 Protective clothing

Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high/low temperature, radiation, noise, falling objects, and dangers to eyes and face.

1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person.

Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions.

Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety.

Post 'warning notices' if necessary.

1.12 Handling

Manual handling of large and/or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures of 230 °C (446 °F).

Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.15 Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken. However, the product is fitted with PTFE seats, special care must be taken to avoid potential health hazards associated with decomposition/burning of these seats.

Please visit the Spirax Sarco product compliance web pages:

<https://www.spiraxsarco.com/product-compliance>

for up to date information on any substances of concern that may be contained within this product. Where no additional information is provided on the Spirax Sarco product compliance web page, this product may be safely recycled and/or disposed providing due care is taken.

Always check your local recycling and disposal regulations.'

PTFE:

- Can only be disposed of by approved methods, not incineration.
- Keep PTFE waste in a separate container, do not mix it with other rubbish, and consign it to a landfill site.

1.16 Returning products

Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residue's or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

2. General product information

2.1 Description

The STS17.2 compact pipeline connector steam trapping station has been designed to provide a convenient ready to install trapping solution, which includes: upstream and downstream isolation valves (2), body incorporating quickfit connector + strainer (1) and check valve (16).

Available types

The STS17.2 is available in Single, Double or Double Block and Bleed variations.

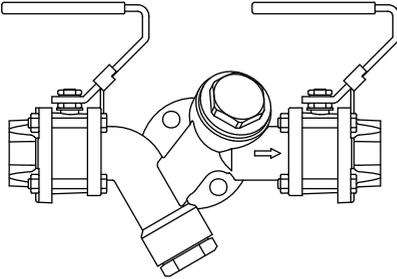


Fig. 1 Single Isolation (SB)

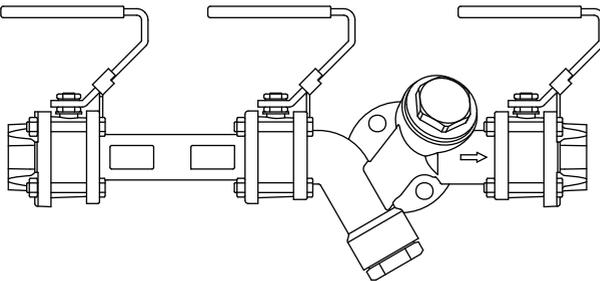


Fig. 2 Double Isolation Upstream (DB US)

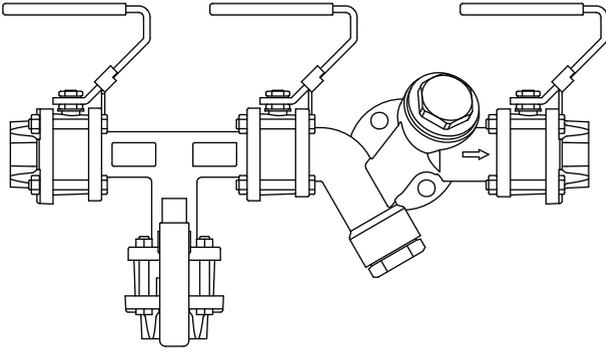


Fig. 3 Double Block and Bleed Upstream Horizontal (DBB USH)

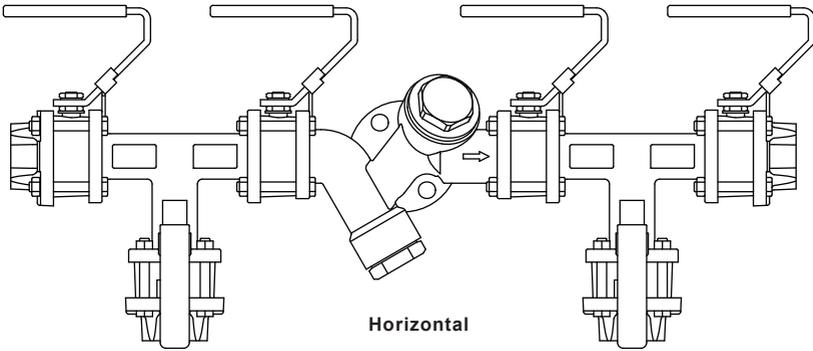


Fig. 4 Double Block and Bleed Upstream Horizontal Downstream Horizontal (DBB USH DSH)

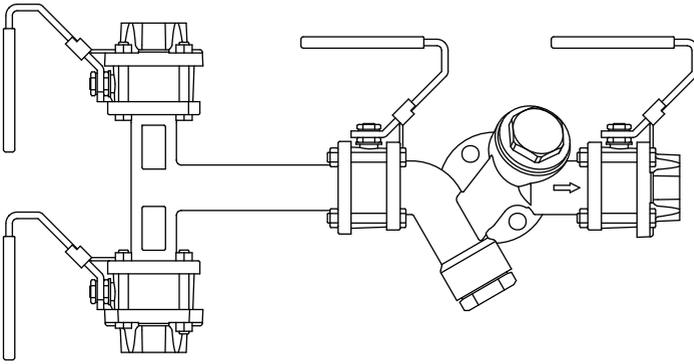


Fig. 5 Double Block and Bleed Upstream Vertical (DBB USV)

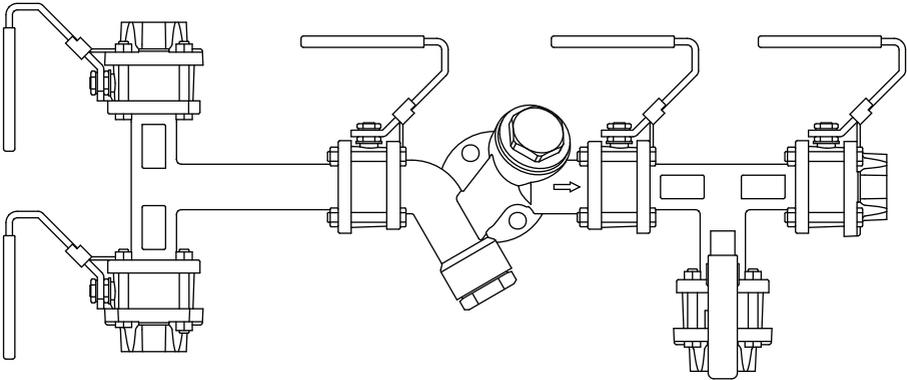


Fig. 6 Double Block and Bleed Upstream Vertical Downstream Horizontal (DBB USV DSH)

The DBB (Double Block and Bleed) variation provides enhanced safety and possibility to drain the steam trapped between the isolation valves by adding a T shaped connection.

The STS17.2 trapping solution incorporates Spirax Sarco quickfit technology, which allows speedy trap maintenance. The following swivel connector steam traps (sold separately) can be used with this pipeline connector enabling it to be tailored to suit any application:

- **UTD26** and **UTD52** thermodynamic steam traps.
- **UBP32** balanced pressure steam trap.
- **USM** bimetallic steam trap.
- **UFT32** ball float steam trap.
- **UIB30** and **UIB30H** inverted bucket steam traps.

Standards

These products fully comply with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations.

Certification

These products are available with certification to EN 10204 3.1.

Note: All certification/ inspection requirements must be stated at the time of order placement. For other certification contact Spirax Sarco.

Note: For additional product information see Technical Information Sheet TI-P128-22.

Optional extras

Integral sensor type SSL1 (steam only) or **WLSL1** (for waterlogging) for use with R1C or **WLSL1 with DIODE** for use with RI6C are available as optional extras, to enable operational monitoring of the steam trap. **Please note that the optional Spiratec SSL1 and WLSL1 sensors must not be fitted when the STS17.2 is installed in a vertical application.**

BDV1 blowdown valve is also available for cleaning the strainer during operation. Care should be taken when using the BDV1 blowdown valve as the discharge may be hot. Please note that a BDV1 cannot be used when a Spiratec sensor has been chosen to be part of the unit.

Retrofit double isolation valve and spool piece to convert a single upstream isolation version to double isolation.

Insulation jacket is available to reduce heat loss and energy wastage. See separate literature.

Retrofit Double Block and Bleed to convert a single Isolation version to Double Block and Bleed (DBB).

Different connections and sizes upon request (e.g. ½" Upstream BSP and 1" Downstream ASME 150).

2.2 Sizes and pipe connections

1/2", 3/4" and 1" screwed BSP, NPT or socket weld.

1/2", 3/4" and 1" ASME 150 and ASME 300.

DN15, DN20 and DN25 flanged EN 1092 PN40.

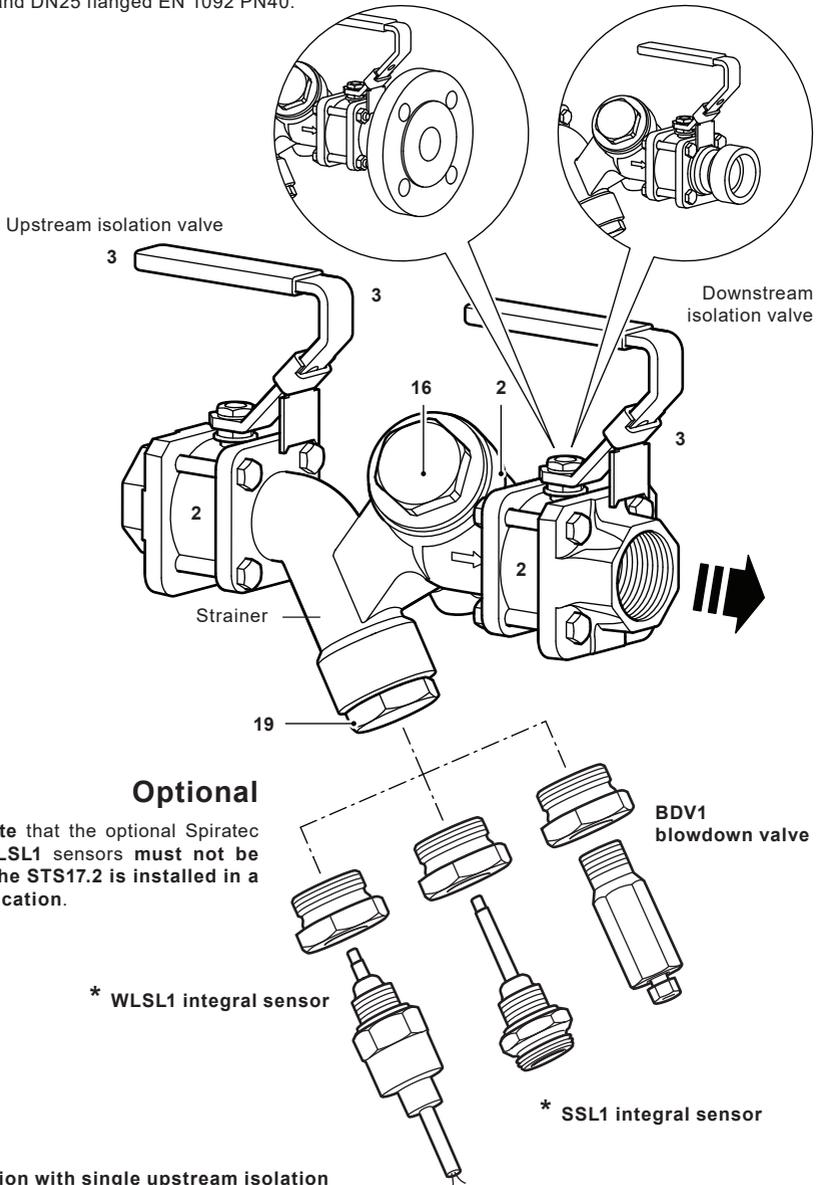
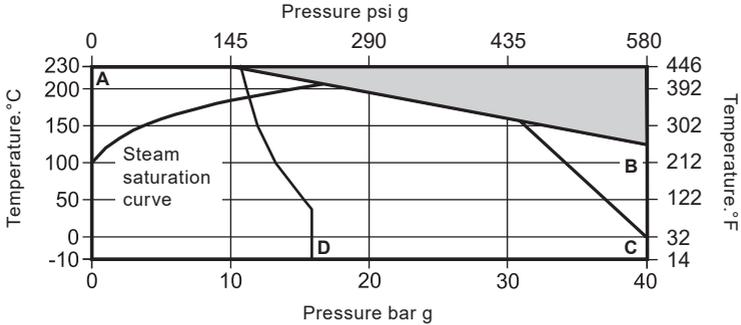


Fig. 7
STS17.2 version with single upstream isolation

2.3 Pressure/temperature limits



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

- A - B Flanged ASME Class 300, screwed and socket weld.
- A - C Flanged EN 1092 PN40.
- A - D Flanged ASME Class 150.

System design conditions		PN40	
PMA	Maximum allowable pressure	40 bar g @ 120 °C	(580 psi g @ 248 °F)
TMA	Maximum allowable temperature	230 °C @ 10 bar g	(446 °F @ 145 psi g)
	Minimum allowable temperature	-10 °C	(14 °F)
PMO	Maximum operating pressure for saturated steam service	ASME 150	11.3 bar g (163.8 psi g)
		All other connections	17.5 bar g (294 psi g)
TMO	Maximum operating temperature	230 °C @ 10 bar g	(446 °F @ 145 psi g)
	Minimum operating temperature	-10 °C	(14 °F)
Designed for a maximum cold hydraulic test pressure of:		60 bar g	(870 psi g)

3. Installation

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

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation:

- 3.1** Check materials, pressure and temperature and their maximum values. If the maximum operating limit of the product is lower than that of the system in which it is being fitted, ensure that a safety device is included in the system to prevent overpressurisation.
- 3.2** Ensure that the directional arrows on the steam trapping station are pointing in the same direction as the fluid flow within the pipeline.
- 3.3** Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.
- 3.4** Make sure that there will be sufficient access for a steam trap to be fitted to the connector, once the trapping station is installed within the pipeline.
- 3.5** Although the steam trapping station has great structural integrity, severe misalignment and/or the pulling effect of incorrect pipe length will have a detrimental effect on the unit and must be avoided. Particular attention should be paid to correct pipe alignment such that the inlet pipework and valve are all on the same axis.
- 3.6** Care must be taken to ensure any dirt in the connecting pipework is removed before installation, maintain cleanliness during installation since the introduction of dirt can result in damage to the seats within the isolation valves.
- 3.7** To install socket welded versions the following procedure should be followed:
 - Dismantle the end caps from the body.
 - Remove the PTFE seats.
 - Weld each end cap to the pipeline.
 - Replace the PTFE seats.
 - Reassemble.
- 3.8** Select a quickfit connector steam trap suitable for the application and fit it to the steam trap station using the guidance provided within the Installation and Maintenance Instructions provided with the chosen product.

3.9

The STS17.2 can be installed in a horizontal line, or in a vertical line with flow downwards - See below.

The STS17.2 **MUST NOT** be fitted in a vertical line with the flow upwards - See below.

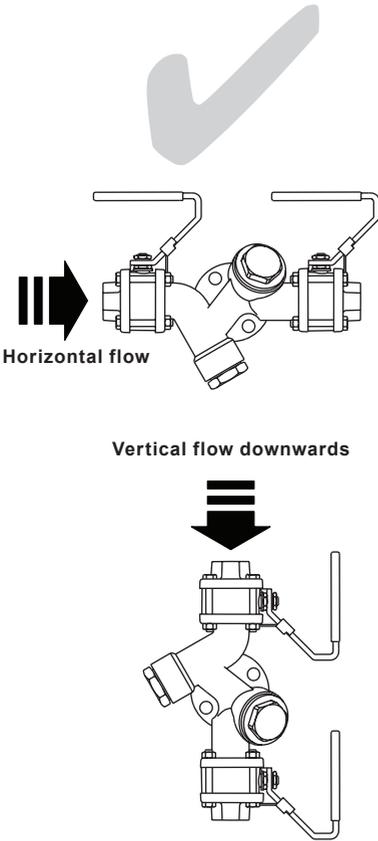


Fig. 8

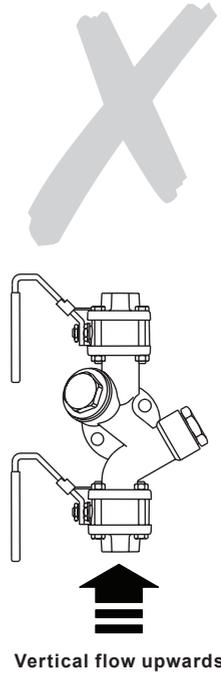


Fig. 9

Please note that the optional Spiratec **SSL1** and **WLSL1** sensors must not be fitted when the STS17.2 is installed in a vertical application.

3.10 Welding into pipeline of socket weld variants

A universal weld procedure covering the requirements of different National and International Standards and practices is difficult to provide - specifically regarding the welding procedure, welding conditions (run number, consumable size, current, voltage, polarity), storage of consumables and make/type of consumables due to the abundance of appropriate consumable suppliers.

Therefore, the information given in Section 3.10.1, is only advice based on British Standards to be used for guidance on the essential requirements of welding socket weld STS17.2 trap stations into the pipeline.

This will allow a user to select an appropriate weld procedure from those available to that user.

This advice is not intended to be a substitute for a weld procedure: it is for guidance only.

3.10.1 Welding of an STS17.2 steam trap station

The welding of an STS17.2 steam trap station ½", ¾" and 1" socket weld to a 15 mm, 20 mm or 25 mm Schedule 40 pipe

Parent material(s)

Description

Austenitic stainless steel with minimum tensile strength up to and including 485 N/mm²

Specification(s)

ASTM A182 F316L (STS17.2)
ASTM A106 Gr. B (Pipe)

Material group(s)

R
A1

Joint type

Socket joint to BS 3799 Class 3000 lb

Parent material(s) dimensions

	Thickness (mm)	O/D (mm)
½"	STS17.2	5.15
	Pipe	2.76
¾"	STS17.2	5.00
	Pipe	2.87
1"	STS17.2	5.60
	Pipe	3.38

Pipe is to be BS 1600 Schedule 40

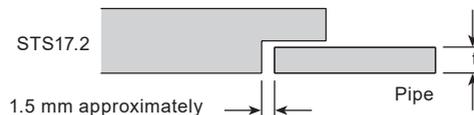
Welding process

Manual Metal Arc (MMA)

Welding positions(s)

All: Site welded

Weld preparation: Dimensioned sketch



Diametrical clearance 1.0 mm maximum

Reference - BS 2633: 1987: Section 3.1 and Fig. 9

Welding consumables

Filler material:

Composition -.Low C: 23% Cr: 12 % Ni:
Specification - BS 2926: 1984: 23-12 L BR

Shielding gas/flux:

Not applicable

Method of preparation and cleaning

Socket: As supplied and wire brushed

Pipe: Mechanically cut and wire brushed

Additional information

1. See Section 3.7.
 2. Fit-up using tack welds.
-

Parent material temperature

Preheat temperature

Only required when ambient is below 5 °C (41 °F), then "warm to touch"

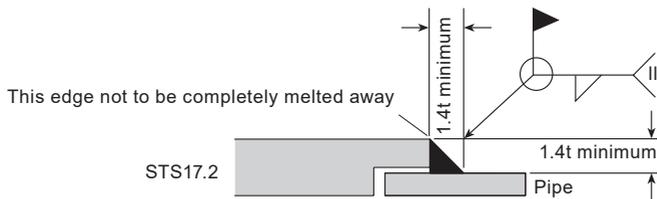
Interpass temperature

Not applicable

Post-weld heat treatment

None required

Run sequence and completed weld dimensions: sketch



Reference.- BS 806: 1990: Section 4: Clause 4.7.3

3.10.2

Select a quickfit connector steam trap suitable for the application and fit to the STS17.2 using the guidance provided within the Installation and Maintenance Instructions provided with the steam trap.

4. Commissioning

After installation ensure that the system is fully functioning. Carry out tests on any alarms or protective devices. Open isolating valves slowly and ensure that there are no leaks.

5. Maintenance

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

5.1 Introduction

All work must be carried out by a suitably competent person. Before starting work ensure that suitable tools are available. Use only Spirax Sarco replacement parts.

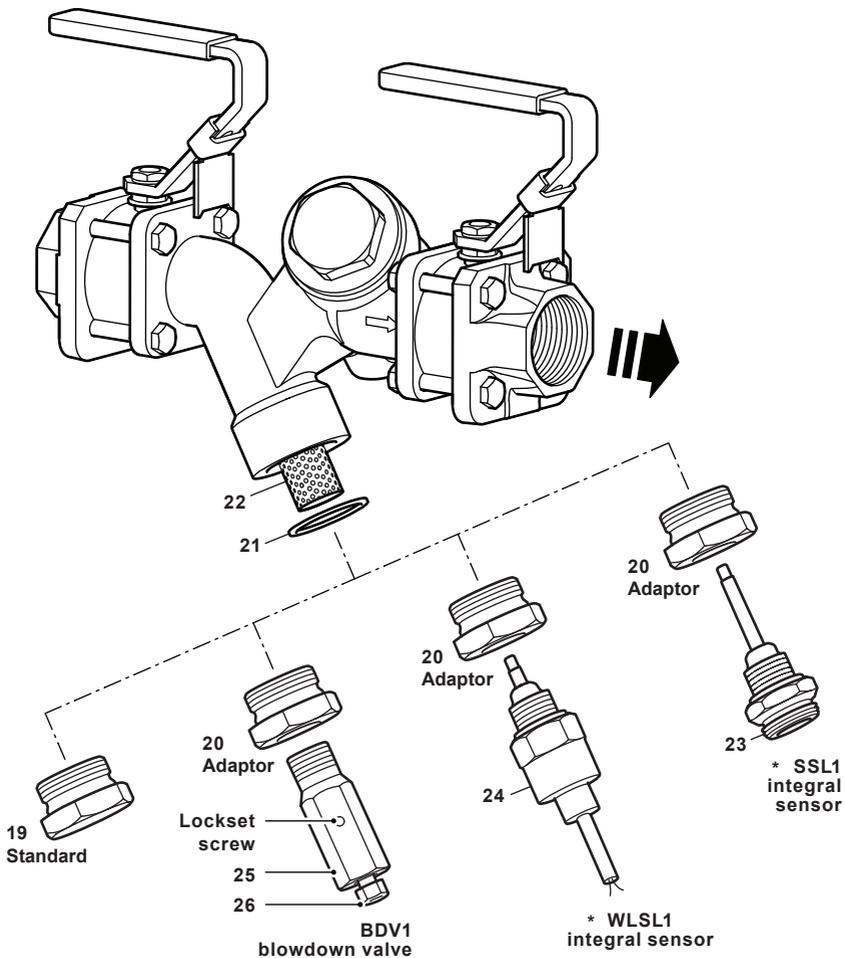
5.2 Maintenance

Some maintenance can be completed with the steam trap station in the pipeline, once the safety procedures have been observed. It is recommended that new gaskets and spares are used whenever maintenance is undertaken. Ensure that the correct tools and necessary protective equipment are used at all times. When maintenance is complete open isolation valves slowly and check for leaks.

Table 1 Recommended tightening torques

Item		or mm		Torque	
				N m	lbf ft
19	32 A/F		M28 x ISP	170 - 190	126 - 140
20 Adaptor	32 A/F		M28 x ISP	170 - 190	126 - 140
23	19 A/F			50 - 55	37 - 40
24	24 A/F			50 - 55	37 - 40
25	24 A/F			Not applicable	Not applicable
26	17 A/F			22 - 25	16 - 18

STS17.2 version with single isolation



* Please note that the optional Spiratec **SSL1** and **WLSL1** sensors (items 20 + 23 or 24) must not be fitted when the STS17.2 is installed in a vertical application.

Fig. 10

5.3 How to replace the strainer screen:

- Before starting any maintenance work make sure that the steam trap station is isolated from the mains pressure (both steam and condensate) and that any residual pressure is vented to atmosphere. Allow to cool before commencing work.
- Remove the strainer cap (19) with sensor (23 and 24 if fitted) ensuring cables are not damaged (WLSL1) or optional blowdown valve (25 and 26) and separate it from the strainer screen (22).
- Once the strainer screen (22) has been cleaned or replaced, place it in the recess of the strainer cap (19 or 20).
- Using a new cap gasket (21) replace the strainer screen and cap into the body of the STS17.2 and loosely tighten to ensure the screen and gasket locate correctly.
- Tighten to the recommended torque (see Table 1).
- Ensure sensor cables are not twisted and are secure.
- Recommission and ensure that there are no leaks.

5.4 How to blowdown the strainer screen:

(models fitted with blowdown valve only)

- Periodic blowdown will remove most debris within the strainer screen. Larger debris may require the whole screen to be removed as detailed in Section 5.3.
- The BDV1 blowdown valve fitted to the STS17.2 has an integral valve screw (26), which can be unscrewed with a 17 mm A/F spanner to blowdown the strainer screen. A lockset screw will prevent the integral valve screw from disengaging from the valve body (25). A torque of 22 - 25 N m (16 - 17 lbf ft) is recommended for resealing the integral valve screw.

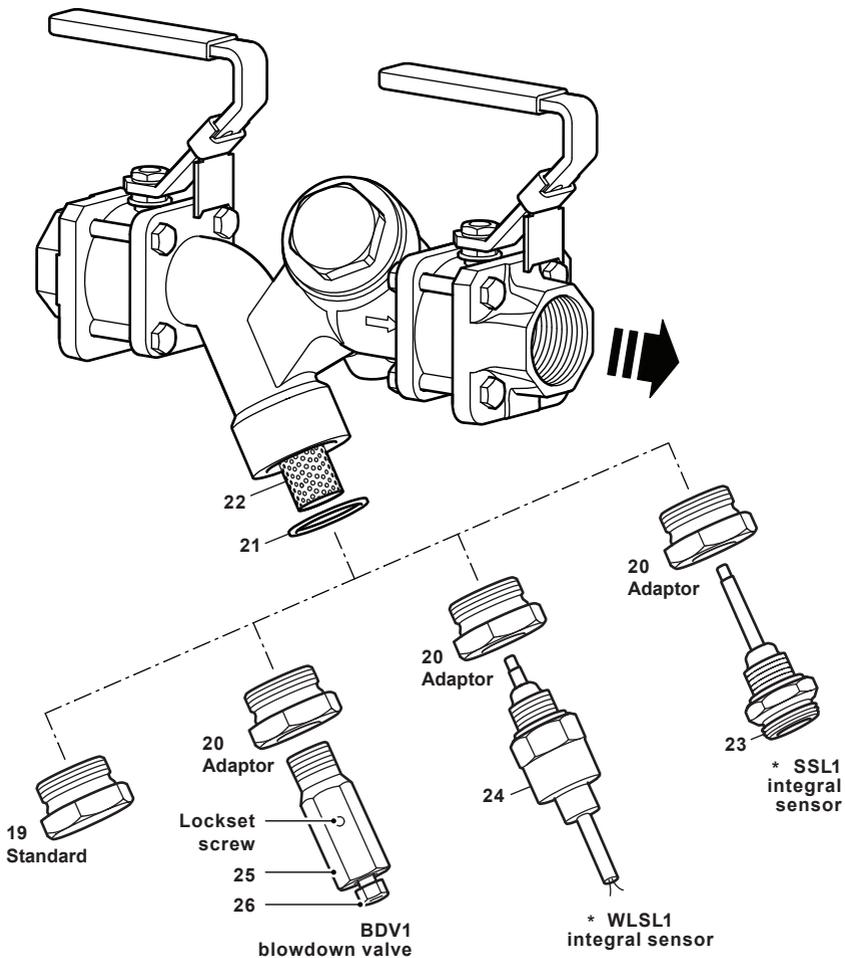
Warning: Ensure that adequate safety precautions have been taken when opening the blowdown valve to atmosphere.

For full technical details of the BDV1 see IM-P600-02.

Table 1 Recommended tightening torques

Item	 or 	mm	Torque	
			N m	lbf ft
19	32 A/F	M28 x ISP	170 - 190	126 - 140
20 Adaptor	32 A/F	M28 x ISP	170 - 190	126 - 140
23	19 A/F		50 - 55	37 - 40
24	24 A/F		50 - 55	37 - 40
25	24 A/F		Not applicable	Not applicable
26	17 A/F		22 - 25	16 - 18

STS17.2 version with single isolation



* Please note that the optional Spiratec **SSL1** and **WLSL1** sensors (items 20 + 23 or 24) must not be fitted when the STS17.2 is installed in a vertical application.

Fig. 11

5.5 How to replace or clean the sensor:

- Before starting any maintenance work make sure that the steam trap station is isolated from the mains pressure (both steam and condensate) and that any residual pressure is vented to atmosphere. Allow to cool before commencing work.
- If a waterlogging sensor is fitted (WLSL1), it will be necessary to disconnect the wiring at the terminal block. Remove the sensor (**23** or **24**) from the adaptor (**20**). (This can be done in line so long as the adaptor is securely held in place).
- Clean the sensor insulation. If pitting of the insulation has occurred, a new sensor should be fitted.
- Clean or replace the strainer screen (**22**) (whichever action is appropriate for the condition of the screen).
- Replace the new or cleaned sensor (**23** or **24**) and screw it into the adaptor (**20**), ensuring that the gasket (**21**) and strainer screen (**22**) are centralised.
- Tighten to the recommended torque, see Table 2.
- Reconnect the waterlogging sensor as described in IM-P087-34.
- **Please note** that the optional Spiratec **SSL1** and **WLSL1** sensors (items **20 + 23** or **24**) **must not be fitted when the STS17.2 is installed in a vertical application.**

5.6 How to replace the check valve

Using a 32 mm A/F spanner, unscrew and remove the check valve blanking plug (**16**). You can now see the check valve assembly (**17**) inside the body. A long 20 mm A/F socket is required to unscrew the check valve (**17**) from the body.

Replace with a new check valve assembly (**17**) and tighten to the recommended torque: 110 - 120 N m (81 - 88 lbf ft).

Using a new gasket (**18**), replace the check valve blanking plug (**16**) and tighten to the recommended torque, see Table 2.

Table 2 Recommended tightening torques

Item	 or mm		Torque	
			N m	lbf ft
5 and 11	½" and ¾"	13	5.4 - 8.1	4 - 6
	1"	14	10.8 - 13.5	8 - 10
12, 14 and 13, 15		M6	15 - 17	11 - 12
¼" studs/nuts are used when the STS17.2 is flanged.		M6	15 - 17	11 - 12
16	32 A/F	M35 x 1.5	190 - 200	140 - 147
20 Adaptor	32 A/F	M28 x ISP	170 - 190	126 - 140
23	19 A/F		50 - 55	37 - 40
24	24 A/F		50 - 55	37 - 40
25	24 A/F		Not applicable	Not applicable
26	17 A/F		22 - 25	16 - 18

5.7 How to replace the ball valve spares (reference Figure 12):

Maintenance work can be carried out without removing the complete ball valve from the pipeline. Remove the two upper bolts and nuts (12 + 13) and then loosen the lower two (14 + 15). The complete body assembly (2) can then be removed and any new parts fitted.

Renewal of seats:

1. Remove the body as described above.
2. With body removed, remove the seats (8).
3. Fit new seats, pushing them into the body recesses.

Renewal of the stem seals

1. Remove body as described above.
2. Remove nuts (5 and 11) and the belleville washers (10).
3. Replace stem seals (9).

Reassembly

Reassemble in reverse order to instructions given above. The ball valve bolts and nuts (12 + 13 and 14 + 15) should be tightened to the recommended torques shown in Table 2.

STS17.2 version with single isolation

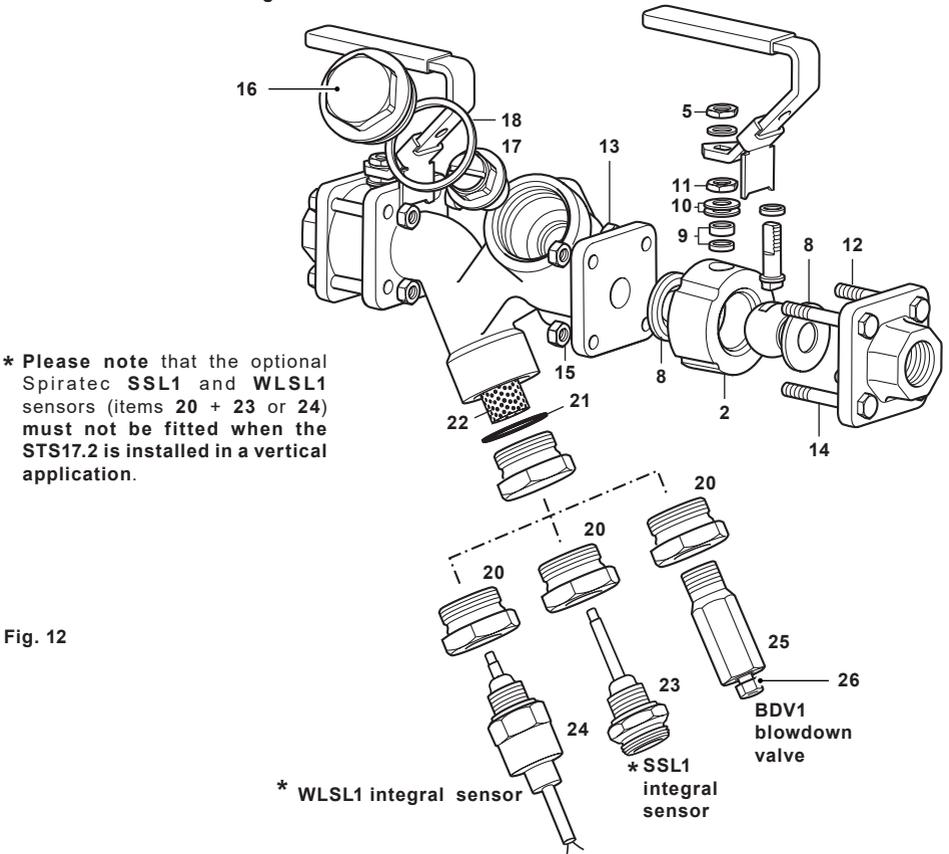


Fig. 12

5.8 How to fit a conversion kit (see Figures 13 and 14)

- A retrofit kit is available to convert a standard single isolation STS17.2 to a Double Isolation or Double Block and Bleed (DBB) version. The conversion kits include a spool piece (straight or T shaped) and additional ball valve parts.
- Remove the bolts/studs and nuts (12 + 13) and remove the end cap (6).
- Attach the spool piece (27 or 28) using the new bolts/studs supplied with the conversion kit in combination with the existing nuts (12 + 13 and 14 + 15) and tighten to the recommended torque (see Table 3).
- Loosely assemble the existing end cap (6) to the other end of the spool piece (27 or 28) using the new nuts supplied with the conversion kit in combination with the existing bolts/studs (12 + 13 and 14 + 15), allowing enough gap to slide in the new ball valve and body assembly (2).
- Slide in the new ball valve and body assembly (2) between the spool piece (27) and end cap (6) and tighten the bolts/studs and nuts (12 + 13 and 14 + 15) to the recommended torque (see Table 3).
- For the Double Block and Bleed conversion repeat the above 2 steps for the T shaped end using the supplied end cap in combination with supplied bolts/studs.
- Fit the new handle(s) (3) onto the spindle of the new ball valve(s) assembly (2), ensuring it is in the correct orientation and secure in place by fitting the washer and nut (4 + 5) and tighten firmly.

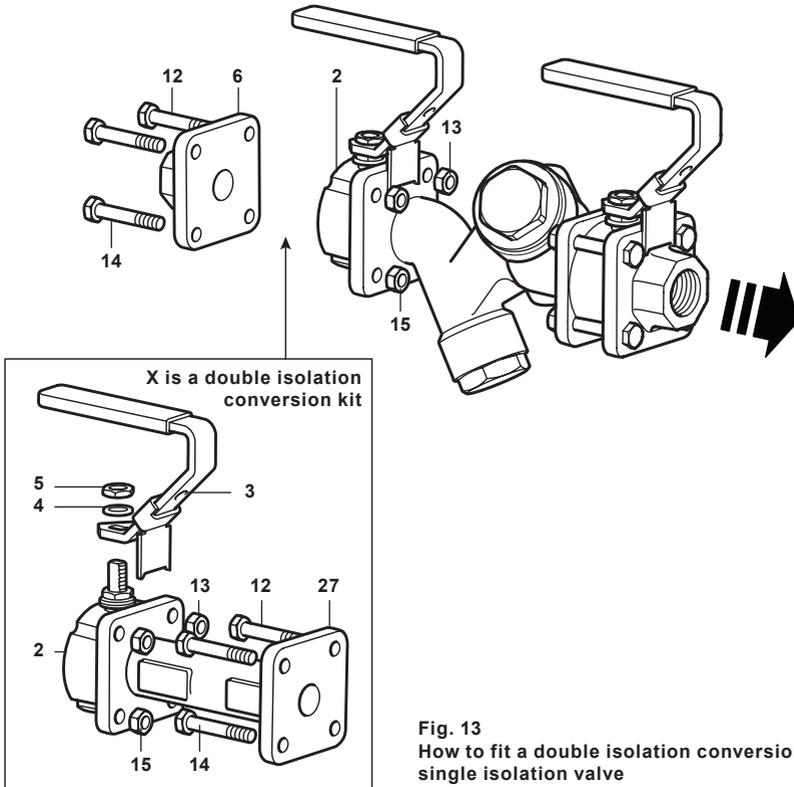


Fig. 13
How to fit a double isolation conversion kit to a single isolation valve

Table 3 Recommended tightening torques

Item	 or mm		Torque	
			N m	lbf ft
5	½" and ¾"	13	5.4 - 8.1	4 - 6
	1"	14	10.8 - 13.5	8 - 10
12, 14 and 13, 15			M6	15 - 17
¼" studs/nuts are used when the STS17.2 is flanged.			M6	

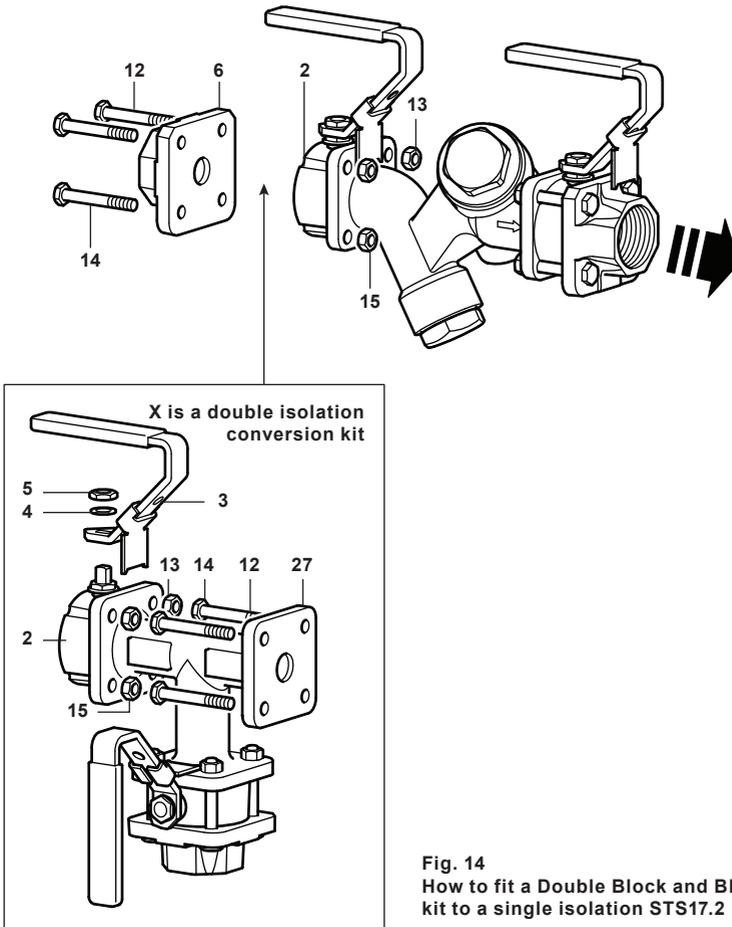


Fig. 14
How to fit a Double Block and Bleed conversion kit to a single isolation STS17.2

6. Spare parts

Spare parts

The spare parts are available as indicated below. No other parts are supplied as spares.

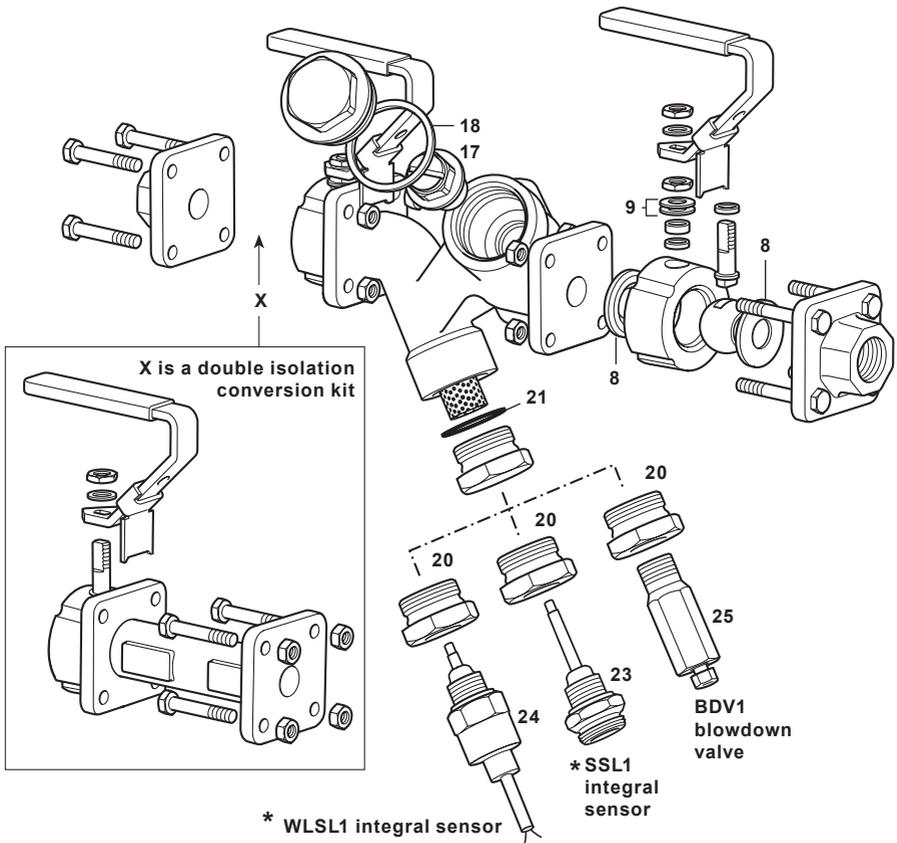
Available spares

Isolation ball valve seat and stem seals		8, 9
Strainer screen and gasket		21, 22
Spare sensor and sensor gasket	SSL1 Spiratec sensor	23
	WLSL1 diode waterlogging sensor	24
Spiratec retrofit kit	Note: State whether an SSL1 or WLSL1 sensor is required.	20, 21 + 23 or 24
Check valve assembly		17, 18
Double isolation conversion kit (includes spool piece and additional isolation valve)		X
Double Block and Bleed conversion kit (includes spool piece, connectors additional isolation valves and their bolts/studs/nuts)		
BDV1 blowdown valve retrofit kit		20, 21 + 25

How to order spares

Always order spares using the description given in the column headed 'Available spares' and state the size and model number.

Example: 1 off Spare Spiratec sensor and sensor gasket with WLSL1 diode waterlogging sensor for a ½" STS17.2 compact pipeline connector steam trapping station.



* Please note that the optional Spiratec SSL1 and WLSL1 sensors (items 20 + 23 or 24) must not be fitted when the STS17.2 is installed in a vertical application.

Fig. 15

