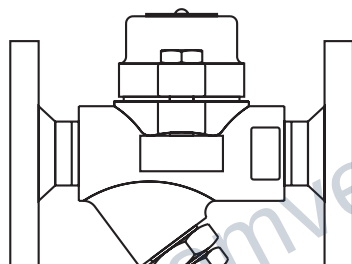
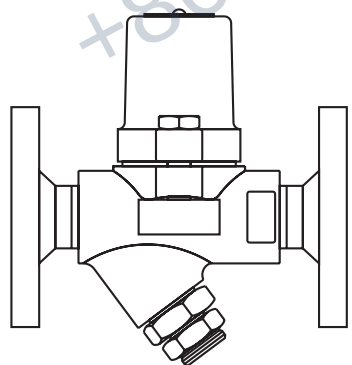


IBPC32, IBPS32 and ISMC32 Steam Traps with Integral Spiratec Sensors

Installation and Maintenance Instructions



IBPC32
IBPS32



ISMC32

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

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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 European Pressure Equipment Directive 2014/68/EU and carry the  mark when so required.

The products fall within the following Pressure Equipment Directive categories:

Product	Group 2 Gases	Group 2 Liquids
IBPC32, IBPS32 and ISMC32	SEP	SEP

- i) The products have been specifically designed for use on steam, air or water/condensate which are in Group 2 of the above mentioned Pressure Equipment Directive. The products' use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the 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 before installation.

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 bleed) 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.

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 in excess of 500 °C (932 °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 Safety information

See the relevant Sections of the attached Installation and Maintenance Instructions for specific details relating to these products.

1.16 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.

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.

1.17 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 residues 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 IBPC32, IBPS32 and ISMC32 range of steam traps with integral sensors have been designed for installation into the steam line without the need for an extra sensor chamber.

They can be supplied with an integral sensor to detect waterlogging and steam leakage (WLS1) or for steam leakage only (SS1). All trap types can be simply integrated into all existing Spiratrac monitoring systems. Please refer to the relevant Installation and Maintenance Instructions when connecting to R1C (IM-P087-33) or R16C (IM-P087-21 and IM-P087-22) automatic monitors.

All pressure bearing components are produced by TÜV approved suppliers in accordance with AD-Merkblatt WO/TRD100.

These traps are unaffected by waterhammer and are available as follows:-

IBPC32	Carbon steel balanced pressure thermostatic steam trap with integral Spiratrac sensor.
IBPC32CV	Carbon steel balanced pressure thermostatic steam trap with check valve and integral Spiratrac sensor.
IBPS32	Stainless steel balanced pressure thermostatic steam trap with integral Spiratrac sensor.
IBPS32CV	Stainless steel balanced pressure thermostatic steam trap with check valve and integral Spiratrac sensor.
ISMC32	Carbon steel bimetallic steam trap with integral Spiratrac sensor.

Note: When placing an order for the IBPC32, IBPC32CV, IBPS32 or IBPS32CV always state capsule fill.

Capsule fill and operation:

Standard capsule - Is marked with 'STD' for operation at approximately 12 °C (21.6 °F) below steam saturation temperature.

Optionally - The capsule can be supplied for sub-cooled 'SUB' operation at approximately 24 °C (43.2 °F) below steam saturation temperature or near-to-steam 'NTS' operation at approximately 6 °C (10.8 °F) below steam temperature.

Standards

These products fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU.

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.

Note: For additional information see the following Technical Information Sheets:

IBPC32 and IBPC32CV TI-P005-06, IBPS32 and IBPS32CV TI-P005-05, ISMC32 TI-P076-11

2.2 Sizes and pipe connections

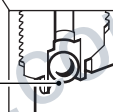
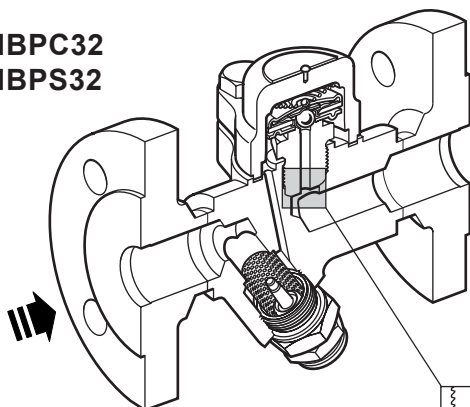
½", ¾", and 1" screwed BSP T Rp (ISO 7-1) or NPT.

½", ¾", and 1" socket weld ends to BS 3799.

½", ¾", and 1" butt weld ends to EN 12 627.

DN15, DN20 and DN25 standard flange to EN 1092 PN40, ANSI B 16.5 Class 150 and 300, JIS /KS 10K and JIS /KS 20K.

IBPC32
IBPS32



IBPC32CV
IBPS32CV

Check valve

Fig. 1

ISMC32

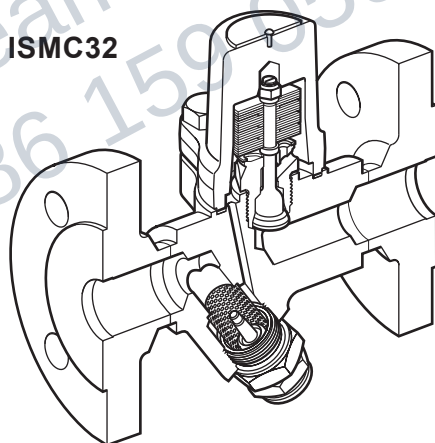
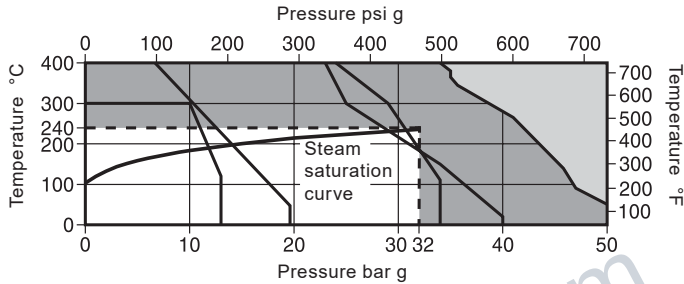


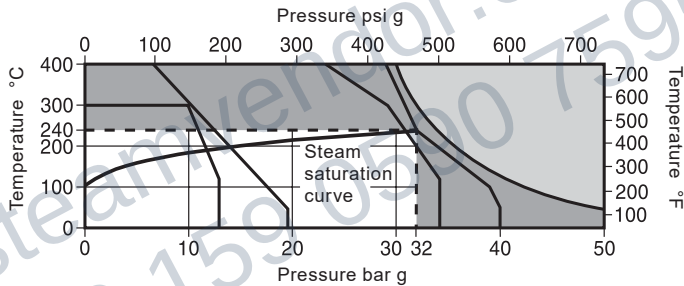
Fig. 2

2.3 Pressure/temperature limits

IBPC32, IBPC32CV and ISMC32



IBPS32 and IBPS32CV



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.

- A - B Screwed, socket weld, butt weld and flanged ANSI 300.
- A - C Flanged EN 1092 PN40.
- A - D Flanged JIS/KS 20K.
- A - E Flanged ANSI 150.
- F - G Flanged JIS/KS 10K.

Body design conditions		PN40	
PMA	Maximum allowable pressure	50 bar g @ 50 °C	(725 psi g @ 122 °F)
TMA	Maximum allowable temperature	IBPC32, IBPC32CV and ISMC32	400 °C @ 35 bar g (752 °F @ 507 psi g)
		IBPS32 and IBPS32CV	400 °C @ 30 bar g (752 °F @ 435 psi g)
Minimum allowable temperature		IBPC32, IBPC32CV, ISMC32	-60 °C (-76 °F)
		IBPS32, IBPS32CV	-200 °C (-328 °F)
PMO	Maximum operating pressure for saturated steam service	32 bar g	(464 psi g)
TMO	Maximum operating temperature	240 °C @ 32 bar g	(464 °F @ 464 psi g)
Minimum operating temperature		0 °C	(32 °F)
Note: For lower operating temperatures consult Spirax Sarco.			
Designed for a maximum cold hydraulic test pressure of:		75 bar g	(1088 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** Determine the correct installation situation and the direction of fluid flow.
- 3.3** Remove protective covers from all connections.
- 3.4** These traps must be installed in horizontal pipework, preferably with a drop leg immediately preceding the trap - typically 150 mm (6") see Figure 3.
Caution: If no drop leg is allowed then it may be possible (under low load conditions) for steam to flow over the condensate in the bottom of the pipe and reach the trap.
- 3.5** Always fit a non-return (check) valve downstream of any steam traps which discharge into condensate return lines where backpressure is experienced. This is most commonly caused by a rising condensate line. The check valve will prevent the steam space flooding when the inlet pressure is reduced or the steam is shut off. Use a suitable valve such as the Spirax Sarco DCV41, see Figure 3.
- 3.6** When the trap is discharging to atmosphere, it is strongly recommended to install a diffuser on the outlet side of the trap. This reduces any problem of noise and erosion by cushioning high velocity discharge. See TI-P155-02 for further information.
- 3.7** Isolation valves must be installed to allow for safe maintenance and trap replacement.
- 3.8** Open isolation valves slowly until normal operating conditions are achieved.
- 3.9** Check for leaks and correct operation.
- 3.10** Ensure adequate space is left to remove the cover from the body for maintenance. Minimum withdrawal distance for the cover is 37 mm (1½") for the IBPC32, IBPC32CV, IBPS32, IBPS32CV and 51 mm (2") for the ISMC32, minimum withdrawal distance for the strainer screen and sensor is 28 mm (1¼").
- 3.11** Welding into the pipeline - There is no need to remove the operating capsule or element from the product providing the welding is performed using the electric arc method. For specific weld procedures consult the relevant National and International welding standards.

Note: If the trap is to discharge to atmosphere ensure it is to a safe place as the discharging fluid may be at a temperature of 100 °C (212 °F).

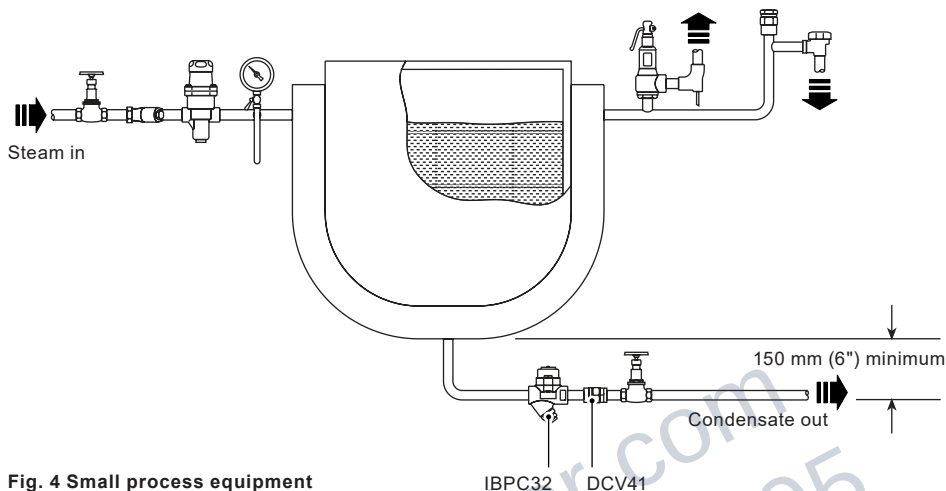


Fig. 4 Small process equipment

Fig. 3 Small process equipment

4. Commissioning

Note: The trap is supplied with a plug in the sensor adapter. It is recommended that the trap be operated under normal conditions for 24 hours before the plug is removed.

This will allow any pipeline debris to be removed from the strainer prior to the sensor being installed. Failure to complete this commissioning process may affect the operation of the sensor. Before fitting the sensor, the trap must be isolated from both supply line and return line, and any pressure allowed to safely normalise to atmosphere. The trap should then be allowed to cool. Remove the plug from the adapter ensuring the trap is securely held and replace with the sensor. Screw into the adapter ensuring the gasket is centralised. Tighten to the recommended tightening torque (see Table 1). If a waterlogging sensor is to be fitted it will be necessary to carry out the installation procedure in IM-P087-34 which accompanies the sensor.

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

5. Operation

5.1 IBPC32, IBPC32CV, IBPS32 and IBPS32CV

The operating element is a capsule containing a small quantity of a special liquid with a boiling point below that of water. In the cold conditions that exist at start-up, the capsule is relaxed. The valve is off its seat and is wide open, allowing unrestricted removal of air. This is a feature of all balanced pressure traps and explains why they are well suited to air venting.

As condensate passes through the balanced pressure steam trap, heat is transferred to the liquid in the capsule. The fill liquid boils before steam reaches the trap. The vapour pressure within the capsule causes it to expand and the trap shuts. Heat loss from the trap then cools the water surrounding the capsule, the fill condenses and the capsule contracts, opening the valve and releasing condensate until steam temperature approaches again at which the cycle is repeated.

These traps are supplied with an integral sensor to detect waterlogging and steam leakage (WLS1) or for steam leakage only (SS1).

5.2 ISMC32

The ISMC32 bimetallic steam trap operates on the basis of two opposing forces acting on the valve - an opening force created by the system pressure, and a closing force resulting from the condensate temperature acting on the bimetallic elements. The ISMC32 operates with no loss of steam and automatically and quickly drains air, non-condensable gases and large amounts of cold water on start-up.

This trap is supplied with an integral sensor to detect waterlogging and steam leakage (WLS1) or for steam leakage only (SS1).

6. Maintenance

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

Warning

The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

6.1 General information

Before undertaking any maintenance on the trap it must be isolated from both the supply line and return line and any pressure allowed to safely normalise to atmosphere. The trap should then be allowed to cool. When reassembling, ensure that all joint faces are clean.

Maintenance can be completed with the trap 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.

Note: The sensor should be removed periodically to inspect and clean the insulation as a build-up of pipeline residue may affect the function of the sensor. Frequency of inspection will be dictated by condensate quality. If pitting of the insulation occurs, a new sensor should be fitted.

More precise service information is given in the following Sections:

IBPC32, IBPC32CV, IBPS32, and IBPS32CV	See Sections 6.2, 6.4 and 6.5
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ISMC32	See Sections 6.3, 6.4 and 6.5
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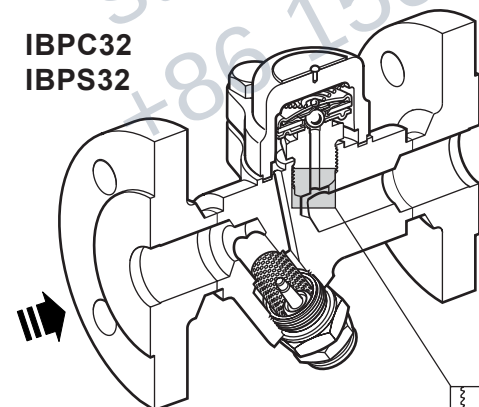
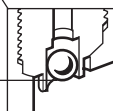


Fig. 4

Check valve



**IBPC32CV
IBPS32CV**

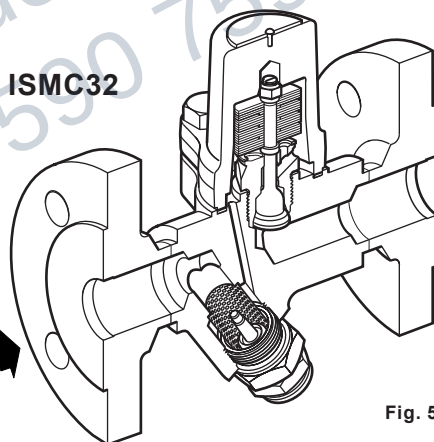


Fig. 5

6.2 How to fit a new capsule and seat -

IBPC32, IBPC32CV, IBPS32 and IBPS32CV

- Remove the cover (1) and spring (17) from the body (8) by unscrewing the two cover bolts (9).
- Remove the capsule (2) and spacer plate (18).
- Unscrew the valve seat (3) from the body (8).
- Replace the valve seat (3) and tighten to the recommended torque (see Table 1).
- It is recommended to fit a new cover gasket (7) reassemble the spacer plate (18) ensuring that it is located centrally on the valve seat (3).
- Reassemble the capsule (2), spring (17) and cover (1).

Note: Care must be taken to ensure the cover bolts (9) are progressively tightened to the recommended torque (see Table 1).

6.3 How to fit a new element set -

ISMC32

Warning: Do not dismantle the element set by removing the locking nut (4) or the setting of the trap will be affected.

- Remove the cover (1) from the body (8) by unscrewing the two cover bolts (9).
- Remove the complete element set by unscrewing the valve seat (3).
- Replace the element set and tighten the valve seat (3) to the recommended torque (see Table 1).
- It is recommended to fit a new cover gasket (7) and then replace the cover (1).

Note: Care must be taken to ensure the cover bolts (9) are progressively tightened to the recommended torque (see Table 1).

Table 1 Recommended tightening torques

Item	Part	 or 		N m	(lbf ft)
		mm			
3	Valve seat	24 A/F		115 - 125	(82 - 89)
9	Cover bolts	16 A/F	M10 x 30	23 - 27	(16 - 19)
12	Sensor adaptor	27 A/F		120 - 135	(88 - 99)
14	Sensor	24 A/F		50 - 56	(36 - 40)

ISM C32

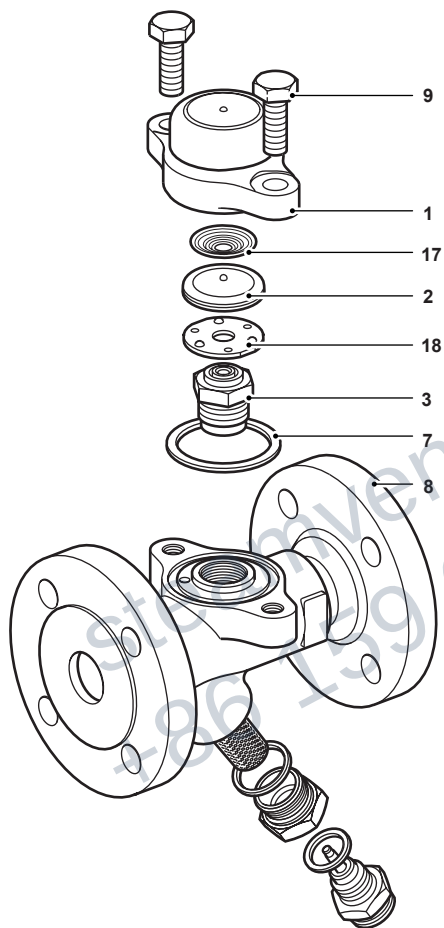


Fig. 6a

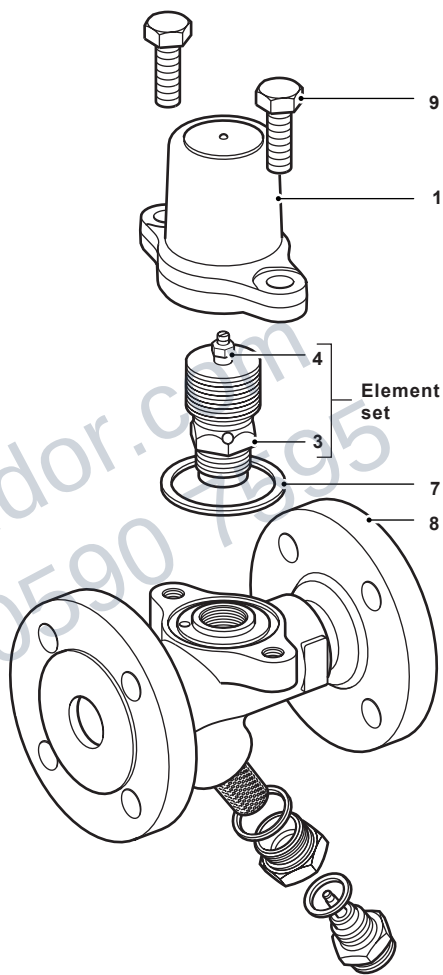


Fig. 7a

6.4 How to replace or clean the Y-type strainer screen

Note: If a waterlogging sensor is fitted, it will be necessary to disconnect the wiring at the terminal block.

- Undo and remove the sensor adaptor (12). Note: the sensor (14) does not have to be removed from the adaptor.
- Clean or replace the screen (5) as required.
- Replace the screen (5) and sensor assembly, ensuring that the screen is located centrally, and a new gasket (16) is fitted, but ensure that the joint faces are clean. A fine smear of Molybdenum Disulphide grease should be applied to the first few threads.
- Tighten the sensor adaptor (12) to the recommended tightening torque (see Table 1).
- Reconnect the waterlogging sensor as described in IM-P087-34.

6.5 How to replace or clean the sensor

Note: If a waterlogging sensor is fitted, it will be necessary to disconnect the wiring at the terminal block.

- Remove the sensor (14) from the adaptor (12). This can be done in line so long as the adaptor (12) is securely held in place.
- Clean the sensor insulation. If pitting of the insulation occurs, a new sensor should be fitted.
- Replace new sensor (14) and screw into the adaptor (12), ensuring the gasket (13) is centralised.
- Tighten the sensor (14) to the recommended tightening torque (see Table 1).
- Reconnect the waterlogging sensor as described in IM-P087-34.

Table 1 Recommended tightening torques

Item	Part	 or mm		N m	(lbf ft)
3	Valve seat	24 A/F		115 - 125	(82 - 89)
9	Cover bolts	16 A/F	M10 x 30	23 - 27	(16 - 19)
12	Sensor adaptor	27 A/F		120 - 135	(88 - 99)
14	Sensor	24 A/F		50 - 56	(36 - 40)

**IBPC32, IBPC32CV,
IBPS32 and IBPS32CV**

ISM32

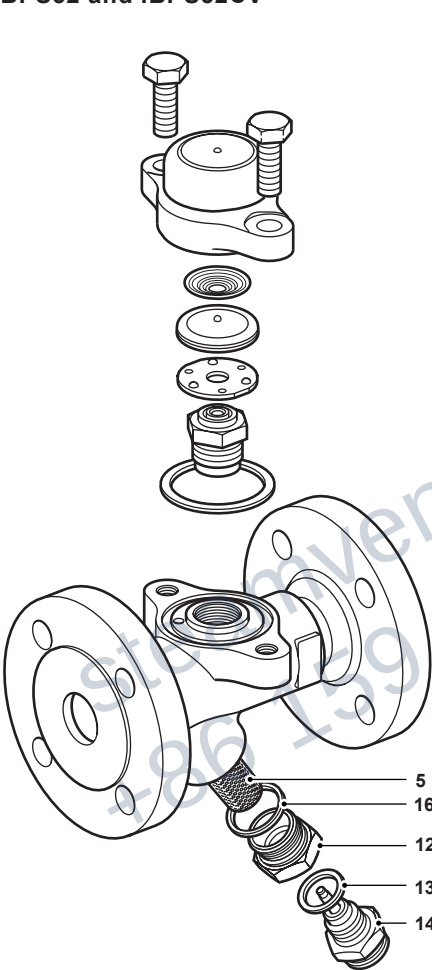


Fig. 6b

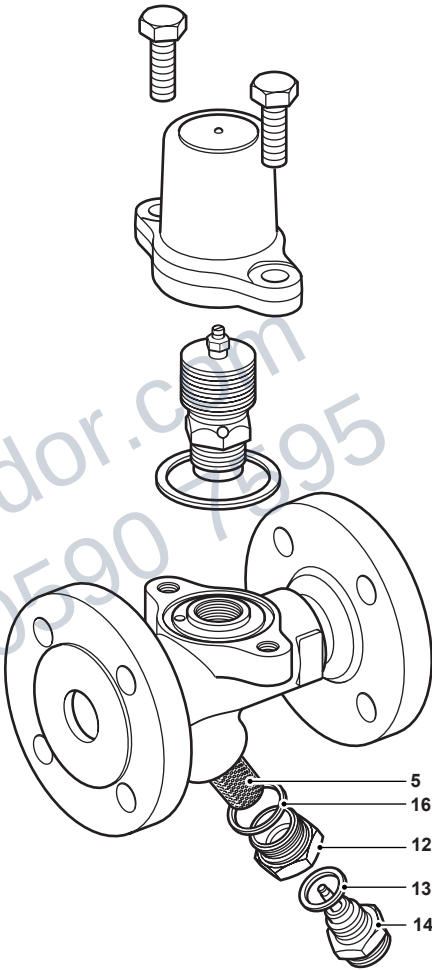


Fig. 7b

7. Spare parts

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

Available spares

Capsule and seat assembly set - IBPC32, IBPC32CV, IBPS32 and IBPS32CV	2, 3, 17, 18
Element set - ISMC32	2, 3, 4, 6
Warning: Do not dismantle the element set by removing the locking nut (4) or the setting of the trap will be affected.	
Strainer screen Y-type cylindrical and gasket (1 off each)	5, 16
Set of cover gaskets (packet of 3)	7
Sensor and sensor gasket	13, 14
Adaptor gasket (packet of 3)	16

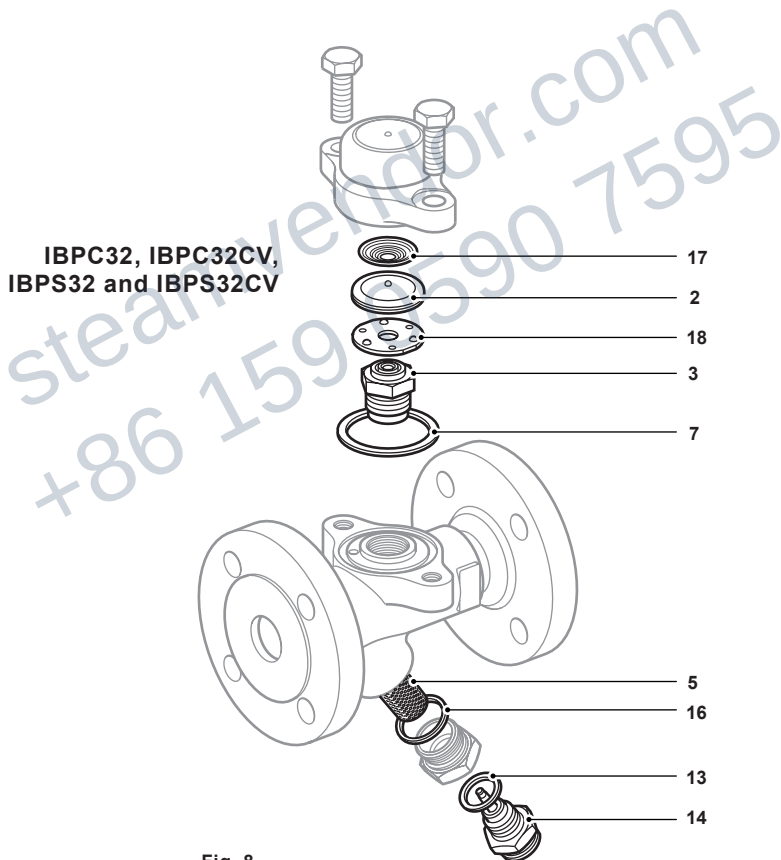


Fig. 8

How to order spares

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

Example 1: 1 - Capsule and seat assembly set for a Spirax Sarco DN25 IBPC32 having an 'STD' fill capsule for operation at 12°C below steam saturation temperature with integral Spiratrec sensor.

Example 2: 1 - Element set for a Spirax Sarco DN25 ISMC32 bimetallic steam trap with integral Spiratrec sensor.

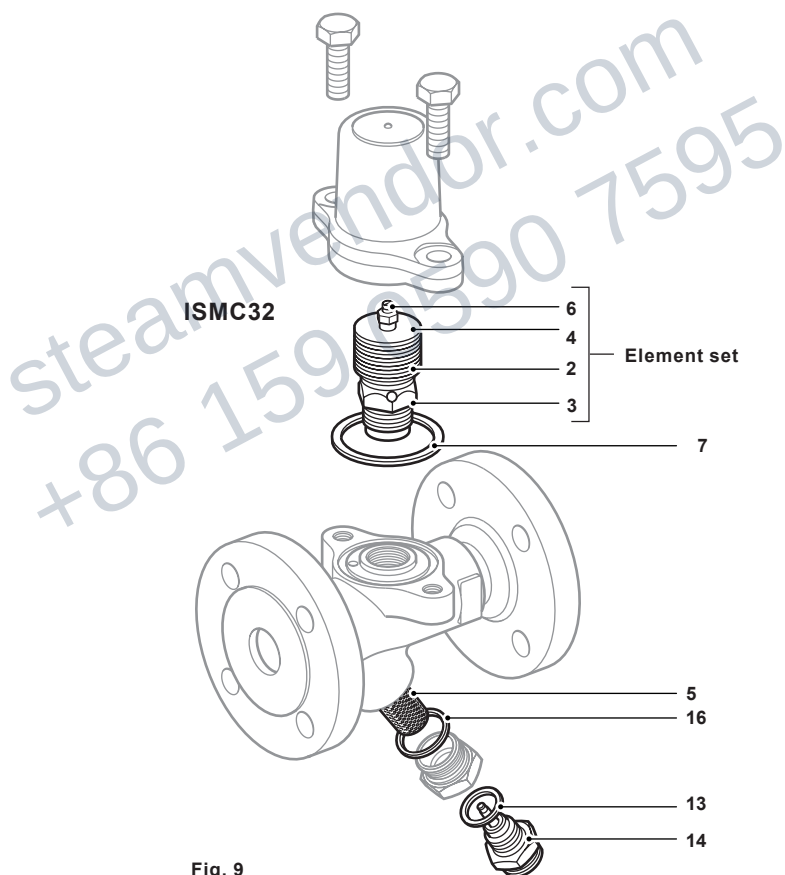


Fig. 9

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