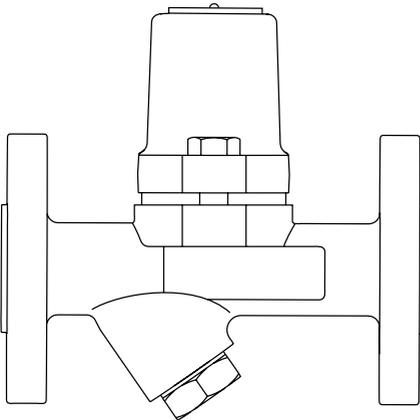

SMC32, SMC32F, SMC32Y and SMC32YF
Carbon Steel Bimetallic Steam Traps
Installation and Maintenance Instructions



1. Safety information
2. General product information
3. Installation
4. Commissioning
5. Operation
6. Maintenance
7. 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 European Pressure Equipment Directive 97/23/EC and carry the $\text{C}\epsilon$ 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
SMC32	-	SEP	-	SEP
SMC32F	-	SEP	-	SEP
SMC32Y	-	SEP	-	SEP
SMC32YF	-	SEP	-	SEP

- i) These 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 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 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 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 the products may reach temperatures in excess of 400°C (752°F).

The product is 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

These products are recyclable - No ecological hazard is anticipated with disposal providing due care is taken.

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 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 SMC32, SMC32F, SMC32Y and SMC32YF are carbon steel maintainable bimetallic steam traps with straight connections. The SMC32 and SMC32F have an integral flat strainer screen and the SMC32Y and SMC32YF have an integral Y-type cylindrical strainer. The SMC32F has flanges integral to the body and straight connections. The letter 'F' in the product name denotes this version. All pressure bearing components are produced by TÜV approved suppliers in accordance with AD-Merkblatt WO/TRD100.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC.

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:

SMC32 and SMC32Y	TI-P076-10
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SMC32F and SMC32YF	TI-P076-17
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2.2 Sizes and pipe connections

½", ¾", and 1" screwed BSP 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,

ASME B 16.5 Class 150, ASME B 16.5 Class 300, JIS/KS 10K and JIS/KS 20K.

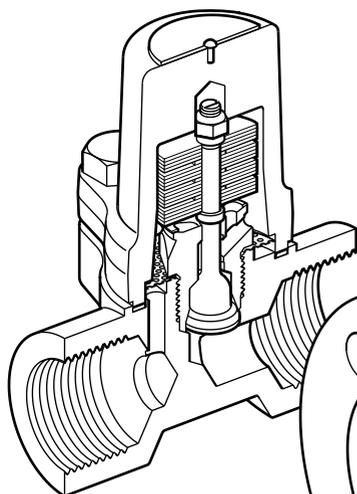


Fig. 1 SMC32

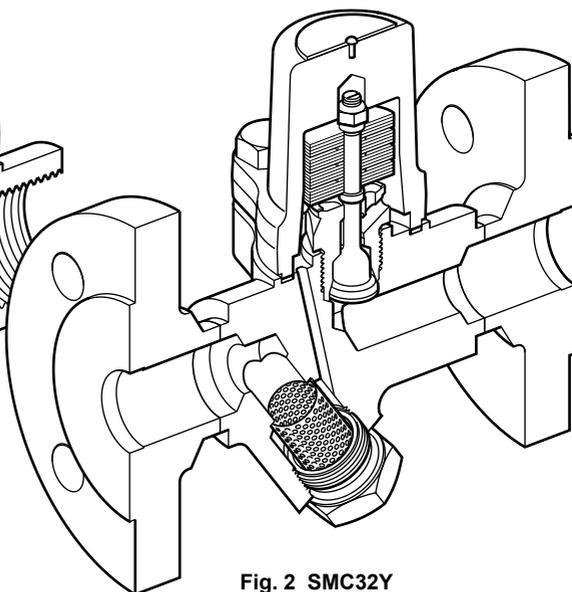
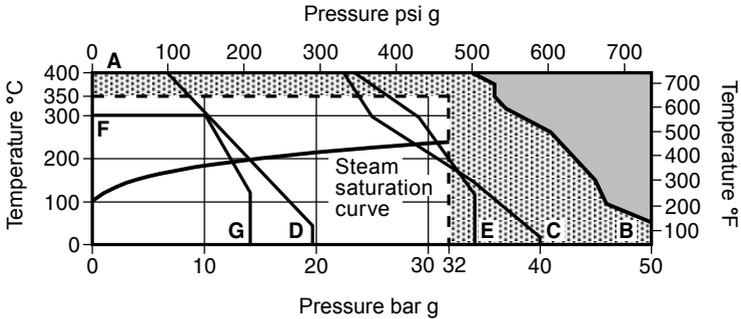


Fig. 2 SMC32Y

2.3 SMC32 and SMC32Y - 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.

A - B Screwed, socket weld, butt weld and flanged ASME 300.

A - C Flanged EN 1092 PN40.

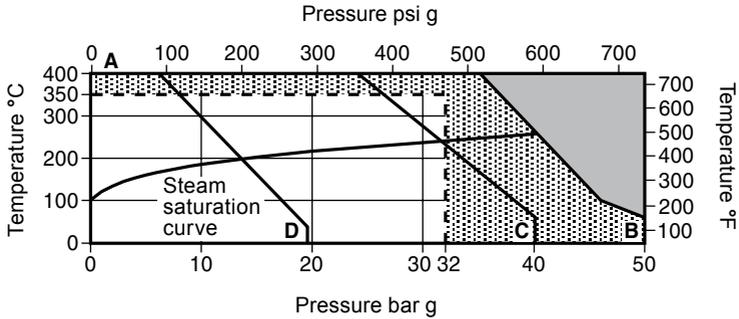
A - D Flanged ASME 150.

A - E Flanged JIS/KS 20K.

F - G Flanged JIS/KS 10K.

Body design condition		PN40	
PMA	Maximum allowable pressure	50 bar g @ 50°C	(725 psi g @ 122°F)
TMA	Maximum allowable temperature	400°C @ 35 bar g	(752°F @ 507 psi g)
Minimum allowable temperature		-60°C	(-76°F)
PMO	Maximum operating pressure for saturated steam service	32 bar g	(464 psi g)
TMO	Maximum operating temperature	350°C @ 32 bar g	(662°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)

2.4 SMC32F and SMC32YF - 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.

A - B Flanged ASME 300.

A - C Flanged EN 1092 PN40.

A - D Flanged ASME 150.

Body design condition		ASME 300	
PMA	Maximum allowable pressure	50 bar g @ 50°C	(725 psi g @ 122°F)
TMA	Maximum allowable temperature	400°C @ 35 bar g	(752°F @ 507 psi g)
Minimum allowable temperature		-60°C	(-76°F)
PMO	Maximum operating pressure for saturated steam service	32 bar g	(464 psi g)
TMO	Maximum operating temperature	350°C @ 32 bar g	(662°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 and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.
- 3.4** The trap is designed for installation in any position, horizontal or vertical, 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.
Bimetallic steam traps are recommended for applications where sub-cooling of condensate prior to discharge is acceptable. Therefore, if prompt removal of condensate is required, a suitable unlagged cooling leg of pipework must be installed immediately upstream of the trap. The cooling leg should be at least 1 - 2 m (3 - 6 ft) long.
- 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** Open isolated valves slowly until normal operating conditions are achieved.
- 3.7** Check for leaks and correct operation.
- 3.8** Ensure adequate space is left to remove the cover and strainer screen from the body for maintenance. The minimum withdrawal distance for the cover is 51 mm (2"), and the minimum withdrawal distance for the strainer screen (SMC32Y and SMC32YF) is 28 mm (1¹/₈").
- 3.9** The temperature of the discharge condensate will be reduced if the trap is discharging in return lines where backpressure is experienced. For further information consult Spirax Sarco.
- 3.10 Welding into the pipeline** - There is no need to remove the 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).

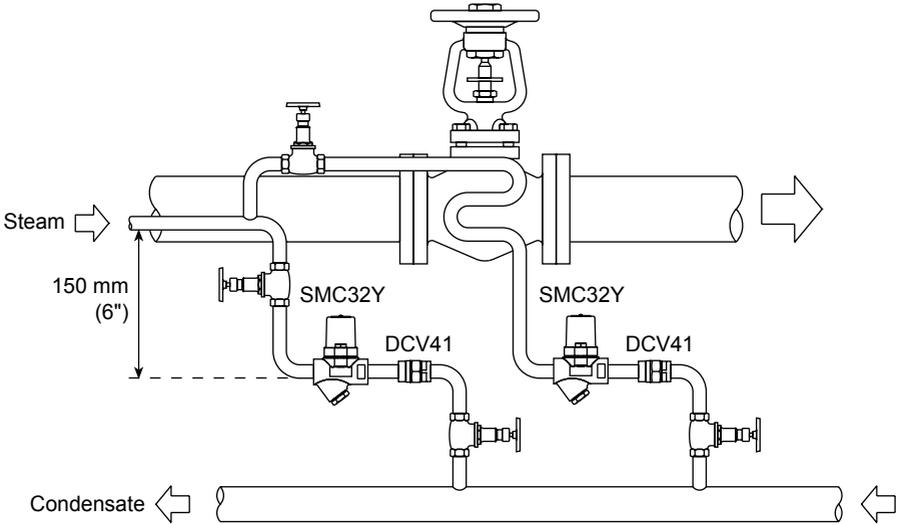


Fig. 3 Non-critical tracing

4. Commissioning

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

5. Operation

The SMC 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 SMC operates with no loss of steam and automatically and quickly drains air, non-condensable gases and large amounts of cold water on start-up.

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.

6.2 How to fit a new element set:

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).
- Clean or replace the strainer screen (5, SMC32 and SMC32F only).
- 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), replace cover (1).

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

6.3 How to clean or replace the 'Y' type strainer screen - SMC32Y and SMC32YF:

- Undo the strainer cap (10) and remove the strainer screen (5).
- Clean or replace as required and reassemble the strainer cap (10) into the body, (8) ensuring that the strainer screen (5) is located centrally and a new strainer cap gasket (11) is recommended.
- Using a little anti-seize compound on the threads tighten to the recommended torque (see Table 1).

6.4 How to clean or replace the strainer screen - SMC32 and SMC32F:

- 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).
- Clean or replace the strainer screen (5) as required.
- 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 replace the cover (1).

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

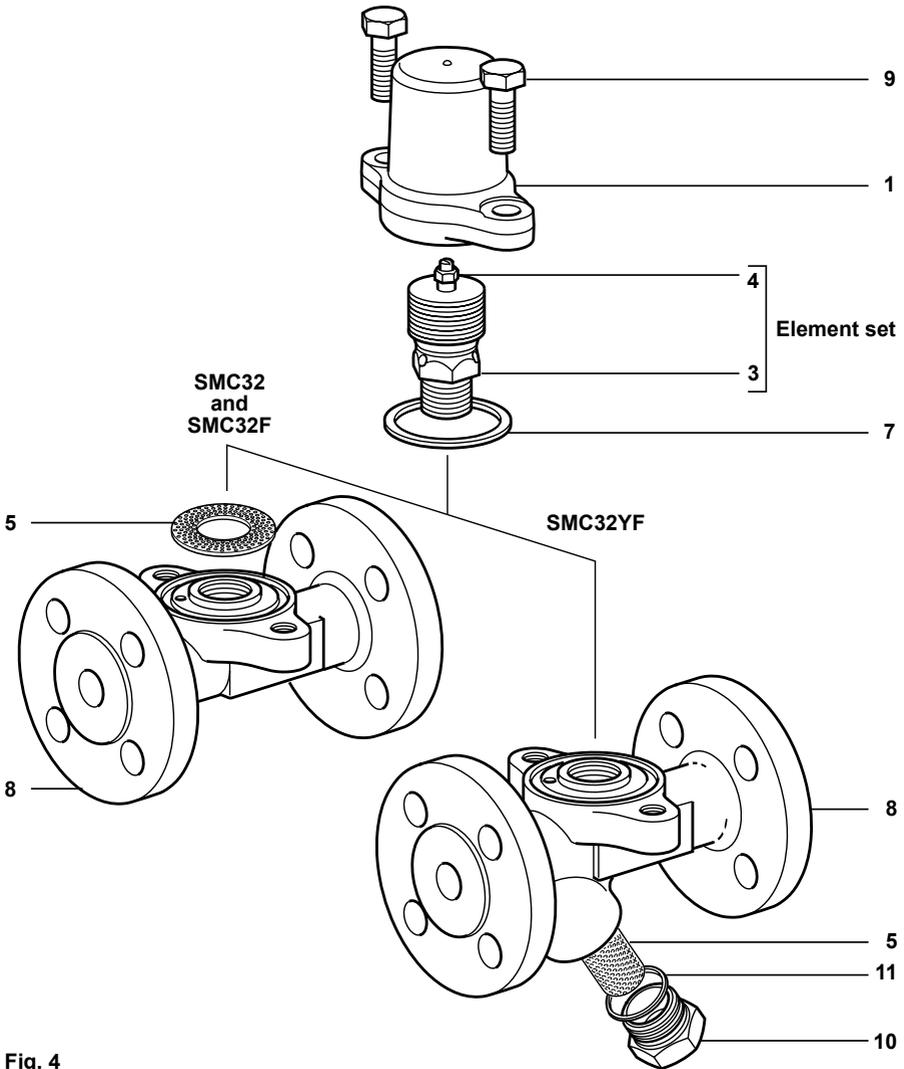


Fig. 4

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)
10	Strainer cap	27 A/F		120 - 135	(86 - 96)

7. Spare parts

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

Available spares

Element set			2, 3, 4, 6
Strainer screen	SMC32 and SMC32F	(3 off)	5
Strainer screen and gasket	SMC32Y and SMC32YF	(1 off each)	5, 11
Set of cover gaskets		(packet of 3)	7
Strainer cap gasket		(packet of 3)	11

How to order spares

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

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

Example: 1 - Element set for a Spirax Sarco 1/2" SMC32 bimetallic steam trap.

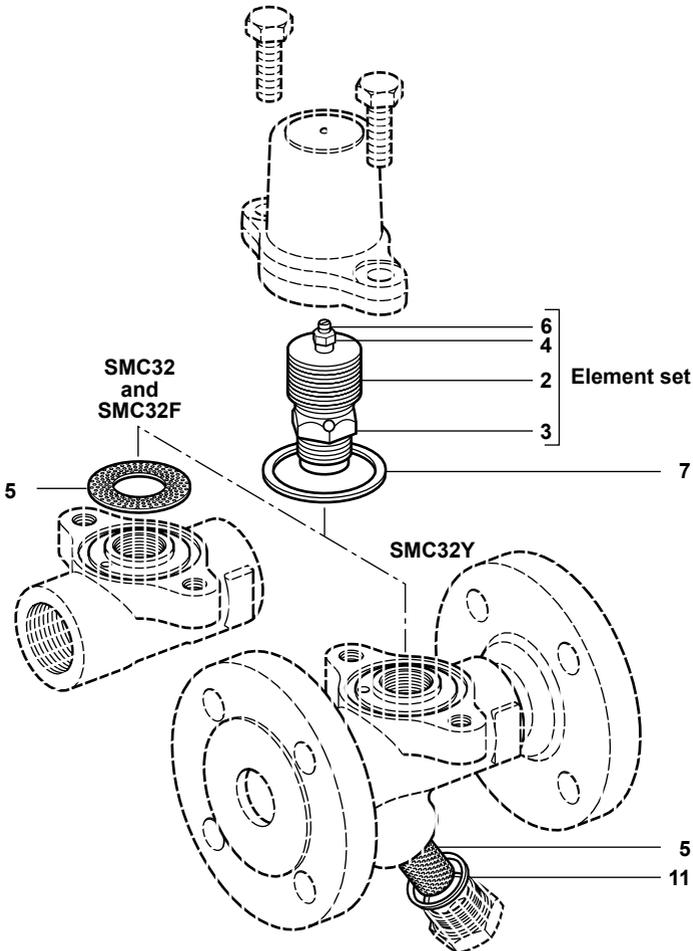


Fig. 5