

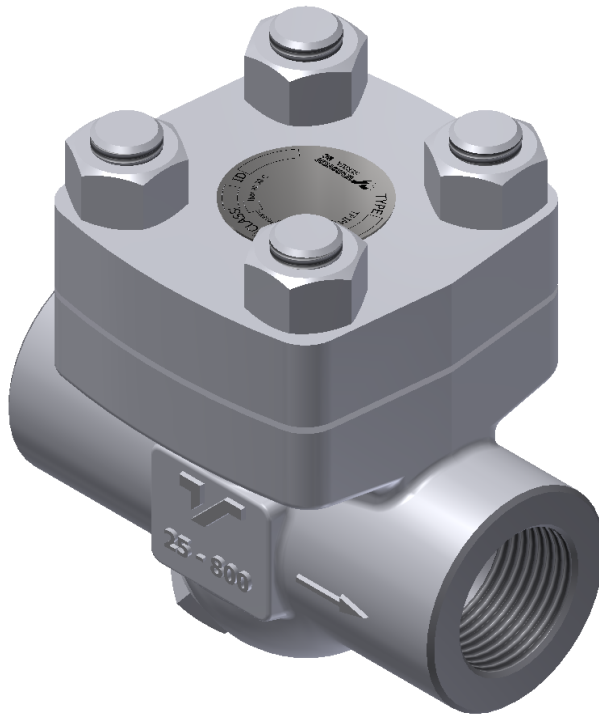
# INSTRUCTIONS

## FOR INSTALLATION, OPERATION AND MAINTENANCE OF

---

### Thermodynamic steam trap [TST]

---



## Table of Contents

<b>1. General safety information's</b>	<b>3</b>
<b>2. Product description</b>	<b>3</b>
<b>3. Transport and storage</b>	<b>6</b>
<b>4. Installation and start-up</b>	<b>7</b>
<b>5. Usage and maintenance</b>	<b>8</b>
<b>6. Service and repair</b>	<b>9</b>
<b>7. Possible malfunctions and solutions</b>	<b>10</b>
<b>8. Guarantee</b>	<b>12</b>



## 1. General safety information's

Instructions for installation, start-up and maintenance during the period of exploitation of Thermodynamic Steam Traps manufactured in the "Termovent SC" should be used as a manual intended for all personnel directly or indirectly involved in dealing with the aforementioned goods.

These instructions are only related to Thermodynamic steam trap.

Operators in charge of installation, operation and maintenance of thermodynamic steam trap during the period of use, should be fully trained for the correct / optimal performance of these tasks.

Because thermodynamic steam trap in working conditions have hot parts (body and cover) and may cause burns, the operator has an obligation to undertake all necessary precautions to avoid such by using protective facilities.

Before the service or reinstallation of the thermodynamic steam trap, the plant or installation should be taken out of operation (pressure 0 bar, temperature of Thermodynamic Steam Traps should be the same temperature as the environment).

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

## 2. Product description

Thermodynamic Steam Traps are intended for separation of Steam out of steam line with variable amount of Steam.

In the case of appearance of eventual ambiguities at the moment of installation, start-up or during exploitation, but not determined in the scope of this Instructions, the departments of the "Termovent SC" should be contacted directly in order to obtain adequate support.

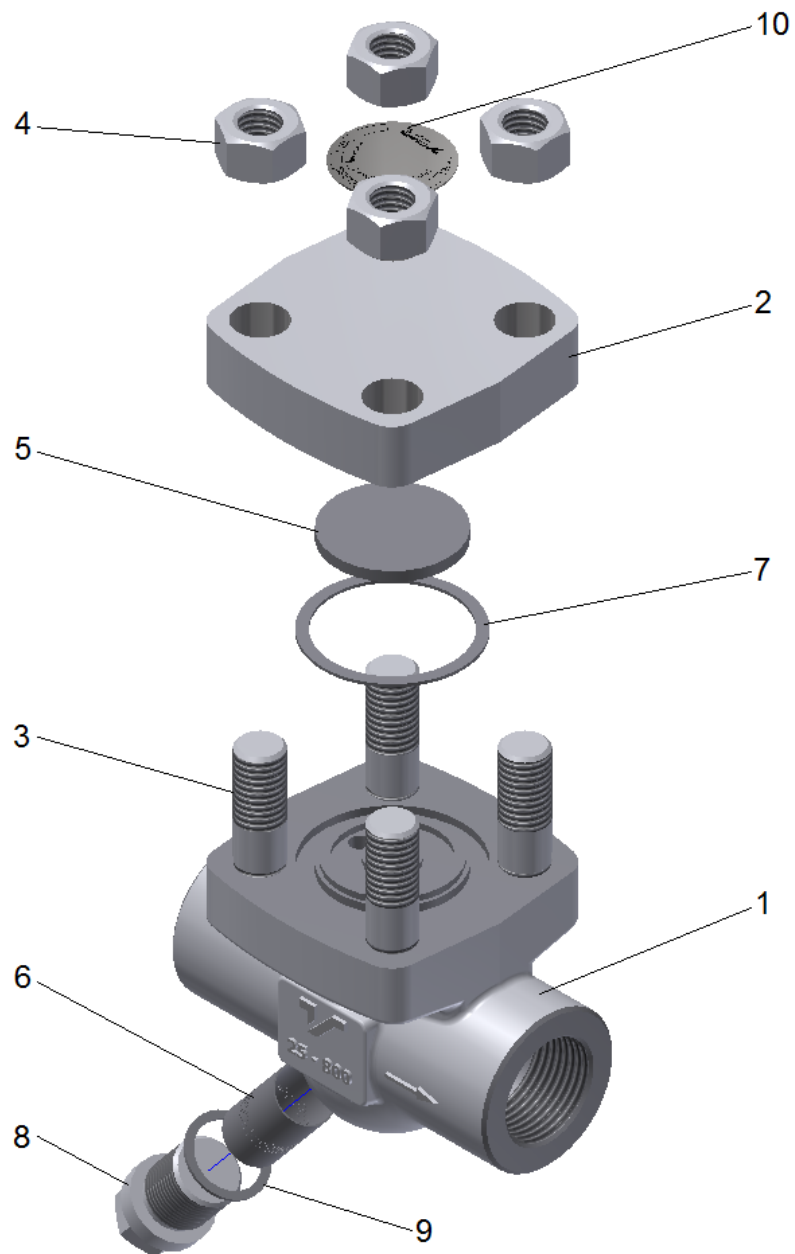
All Valves manufactured in "Termovent SC" are marked with following marks:

- Identification of manufacturer ("Termovent SC" logo);
- Nominal diameter of Valve (DN);
- Nominal pressure (PN) or Class (#);
- Material designation of body and cover;
- Body and cover melt identification/heat number;
- Trim identification- material grade for net;



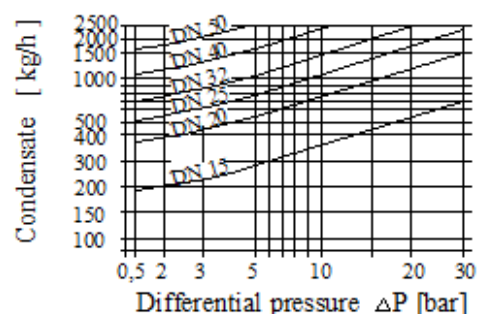
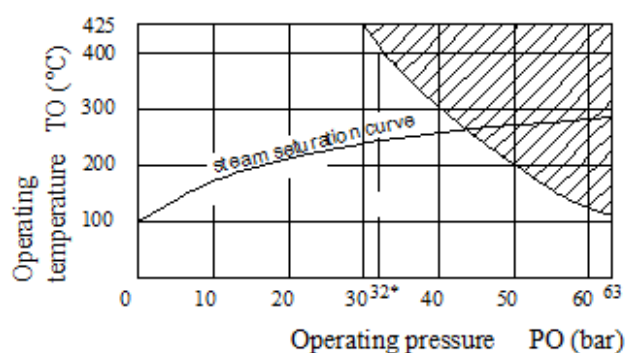
- Unique serial number;
- Arrow mark for allowable direction of flow;
- Date of manufacture (month and year) ;
- Maximum allowable pressure at maximal temperature according to EN 12516;
- Other marks in accordance with customer request according to valid standards.



**Fig. 1 Parts names****Table 1-1**

Pos.	Part Name	Quantity	Spare Parts
1	Body	1	
2	Cover	1	
3	Stud bolts	4	

4	Nuts	4	
5	Disc	1	
6	Net	1	
7	Cover gasket	1	Yes
8	Plug	1	
9	Plug gasket	1	Yes
10	Nameplate	1	



Boundary conditions (by ISO 6552):

Nominal pressure	PN 63
PMA - Maximum allowable pressure	63 bar
TMA - Maximum allowable temperature	425°C
PMO – Maximum operating pressure by TMA	
TMO - Maximum allowable operating temperature 425°C (up to PMO)	
Δ PMN – Minimum differential pressure	0,5 bar

### 3. Transport and storage

Transport and storage of Thermodynamic Steam Traps should be performed at a temperature between -20°C to +60°C and should be protected against outer and atmospheric influences, as well as protecting painted surfaces against damage. The purpose of painted surfaces is to protect Thermodynamic Steam Traps against corrosion during transport and storage.

The basic version of Thermodynamic Steam Traps are protected with particular/special paints applied to the outer parts and protective preservatives inside. As such, any corrosion is prevented for a period of



6 months. Protection for special conditions is applied only with prior agreement.

It is recommended to store the Thermodynamic Steam Traps in closed, dry and ventilated storage facilities and to protect Thermodynamic Steam Traps against any atmospheric influence. In order to avoid the appearance of corrosion before the expiry of protection it is necessary to store the Thermodynamic Steam Traps on a pallet/crate or other appropriate place.

### **WARNING !!!**

- You must not lift Thermodynamic Steam Traps using the connection flange holes
- You must not remove the protection covers from the Thermodynamic Steam Trap connection ends

## **4. Installation and start-up**

After the removal of the protection covers it is necessary to thoroughly clean inside the Thermodynamic Steam Trap with compressed air.

When installing Thermodynamic Steam Traps with flanged ends it is necessary to take into consideration the selection of adequate bolt material and the appropriate type of gasket depending on the type of working fluid, pressure, temperature, and the type of flange facing. It is necessary to install gaskets strictly in accordance with instructions given from the manufacturer of the gaskets.

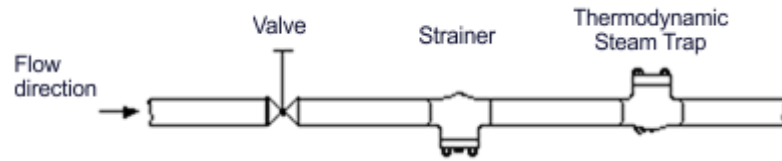
Thermodynamic Steam Traps with welding ends should be welded onto the pipeline by an expert and with appropriate WPS. After welding, if necessary, local normalization should be performed and the inside of the pipeline should be cleaned to remove possible welding remains.

At the moment of installation the influence of the load of the pipeline on the Thermodynamic Steam Trap should be reduced. The same also applies for temperature oscillation, hydraulic impact and similar. The Thermodynamic Steam Trap should not be used as a support for a pipeline.

It is important to take care about the flow direction at the time of installation. The flow direction is indicated with the arrow mark casted or imprinted on the body of the Thermodynamic Steam Trap.

Delivered Thermodynamic Steam Trap is ready for use. After removing protective caps from connection ends it is necessary thoroughly clean inside with compressed air. Thermodynamic Steam Trap should be installed horizontally with identification plate on the top (Fig. 2).



**Fig. 2****WARNING !!!**

- You must not lift the Thermodynamic Steam Trap using the connection flange holes at the moment of the installation on the pipeline – you should use lifting straps.
- Before installation the impurities should be removed from the pipeline or from the appliance;
- Remove protecting covers from the Thermodynamic Steam Trap ends, degrease and clean the inside of the Thermodynamic Steam Trap, and in case of a flanged connection, carefully clean the sealing surfaces;
- Confirm that the marks on the Thermodynamic Steam Traps correspond to the projected parameters of the plant (e.g. size, pressure, material etc.) and installation is according to allowable flow direction;
- Confirm that the velocity of the fluid at the place of the installation is in range of the recommended velocity;
- At the moment of testing of a pipeline or an installed appliance Thermodynamic Steam Trap; take care about the predicted maximal differential pressure.

## 5. Usage and maintenance

It is convention during usage of the Thermodynamic Steam Trap that all minor defects, if operating conditions allow, should be repaired on the spot. If not, the Thermodynamic Steam Trap should be dismantled from the site in order to perform a full repair. If the Thermodynamic Steam Trap is severely damaged it should be replaced with a new one. Such repairs protect Thermodynamic Steam Trap against further deterioration, being permanently out of work and being the cause of severe accidents in the plant.

In case of leakage through gaskets between Thermodynamic Steam Trap connection flanges or between the cover and body, it is necessary





to make replacements of the gaskets as soon as possible to prevent damage of the sealing surfaces due to erosion.

### **WARNING !!!**

- If, when a Thermodynamic Steam Trap is overhauled, a decrease of wall thickness of more than 30% is detected at any of the ports (due to erosion) the Thermodynamic Steam Trap should stop being used;
- Any time when a Thermodynamic Steam Trap is dismantled or reinstalled the gaskets should be replaced with new ones with the appropriate quality;
- Thermodynamic Steam Trap maintenance and manipulation during use should be done only by experts and persons well trained for such purpose;
- At the moment of installation of the plant sudden and extreme change of pressure and temperature should be avoided;

## **6. Service and repair**

Only authorized persons should perform service and repair with appropriate tools and, if it is possible, using original spare parts. Personal protection should be applied in accordance with valid regulations and legalizations.

Attention should always be paid to the reliability of the Thermodynamic Steam Traps and parameters of the working implementation / plant, and only materials which can successfully replace those originally installed should be used.

For highly reliable Thermodynamic Steam Traps (Thermodynamic Steam Traps which work with high temperatures, high pressures or with dangerous fluids) any service, repair or replacement should be done professionally and responsibly in accordance with valid regulations for safe working conditions at the plant.

Before the service or reinstallation of the Thermodynamic Steam Traps, the plant or installation should be taken out of operation (pressure 0 bar, temperature of Thermodynamic Steam Traps should be the same temperature as the environment).

Every Thermodynamic Steam Trap serviced or repaired should be subject to all necessary tests usually performed for a newly produced Thermodynamic Steam Trap.



Bolts for connection between body and cover should be tightened evenly and crosswise applying appropriate torque.

Bearing in mind the responsibility of the equipment in the eventual replacement of materials / parts, installed materials must be at least the same or better quality than to the originally.

Possible torques for tightening are listed in Table 2 and the selection of torque depends on the material grade of bolts and nuts used, as well as the quality of the gasket.

**Table 2**

Nut	M8	M10	M12	M14	M16	M20	M24	M27	M30	M33	M36
Torque (Nm)	8÷20	15÷40	26÷65	42÷100	64÷150	125÷300	210÷500	305÷730	410÷1000	550÷1350	710÷1720

**WARNING !!!**

- Gaskets between the body and cover should be manipulated with high precautions because they could contain stainless steel wire which can cause severe injuries.

## 7. Possible malfunctions and solutions

During the period of usage of the installed valve malfunctions may occur. Only experts in the premises of the user should undertake repairs. The most common cause of malfunctions and how to overcome such situations is listed in Table 3.

**Table 3.**

Failure	Possible cause	Troubleshooting
Fail to trap steam	Protective caps are not removed.	Remove protective caps off connection ends.
	Pipeline is completely covered with deposits.	Check and clean pipeline, remove deposits
	Greasy or dirty pipeline relatively covered with deposits on sealing surfaces of body or plate.	Check and clean pipeline, remove deposits.



Irregularities at trap of steam	Appearance of damages on sealing surfaces of the body (Pos.1) or disc (Pos. 5).	After dismantling of cover (Pos.2) undertake grinding and lapping sealing surfaces of the body (Pos.1) and plate (Pos.5). In the case of significant damages replace product with another one.
Leakage on cover gasket.	Bolted connections between and cover (Pos. 2) of the Thermodynamic Steam Trap are loosen.	Fasten with torque wrench nuts (Pos.4) of bolted connections between body (Pos.1) and cover (Pos.2).
	Cover gasket (Pos.7) is damaged	Disassemble cover (Pos.2) and replace cover gasket (Pos.7) with new one
Leakage on connection ends.	Bolted connection between body (Pos.1) of Thermodynamic Steam Trap and pipeline.	Fasten with torque wrench nuts (Pos.4) of bolted connections between Thermodynamic Steam Trap and pipeline.
	Insufficient fastened threated connection between body of Thermodynamic Steam Trap and pipeline.	Fasten threated connection between body of Thermodynamic Steam Trap and pipeline using appropriate tools for fastening.
	Fault in welded connection between body of Thermodynamic Steam Trap and pipeline.	Depending on type and value of the fault undertake reparation in accordance with verified WPS or replace Thermodynamic Steam Trap with another one.
Leakage on plug gasket	Plug (Pos.8) are not tightened	Tighten plug (Pos.8)
	Plug gasket (Pos.9) is damaged	Disassemble plug (Pos. 8) and replace plug gasket (Pos.9) with new one



## 8. Guarantee

The Guarantee issued by “Termovent SC” confirms the safe working of its products under conditions when these products are properly installed in accordance with the instructions in the documentation given to the customer, and usage is in accordance with approved technical conditions and working parameters.

The Guarantee is void if inappropriate parts from other manufacturers are implemented, if the user changes construction, or if there is any decline in function or malfunction due to natural wear and tear.

### **Guarantee conditions:**

The Guarantee is valid for defective parts or defective products, when any such defect is confirmed by an expert engaged by the customer and approved by experts from our company. In such a situation “Termovent SC” will replace the defective part(s) or defective product(s).

Replacement of defective part(s) or defective product(s) with new one(s) should be done only by an expert engaged by the customer upon approval or by instruction of our experts and in accordance with the instructions for installation.

The Guarantee period is not valid if installation and manipulation of the Thermodynamic Steam Trap isn't in accordance with these instructions. The Guarantee period for all replaced parts or product(s) starts from the moment the replacement(s) is/are done.

### **Guarantee is valid only for following storage and maintenance conditions:**

Crate and pallets with Thermodynamic Steam Trap should be stored indoors in a building with access limited to authorized personnel only. In the case of an inappropriate storage place crates (or pallets) should be stored under an awning and should be protected against rain and moisture with an appropriate waterproof cover, again with access limited to authorized personnel only.

Thermodynamic Steam Trap should only be taken out of a crate or removed from the covering of a pallet just before installation and only quantity to be installed should be taken out / removed. After the Thermodynamic Steam Trap for installation are taken out of a crate (or pallet) the crate/pallet should be closed/covered again.

Do not remove the protector covers from Thermodynamic Steam Trap until installation.



Thermodynamic Steam Trap prepared for installation should be manipulated and transported in a careful manner to prevent possible mechanical damage.

**WARNING !!!**

- After detection of mistakes “Termovent SC” should be informed immediately.
- Claims must be made in writing.

