



GESTRA Steam Systems

TRS 5-8



Installation Instructions 810709-02

Temperature Switch
TRS 5-8

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Important Notes

Usage for the intended purpose

Use temperature switch TRS 5-8 only in conjunction with resistance thermometers TRG 5-53, TRG 5-54, TRG 5-55 and TRG 5-57 for signalling limit temperature.

Safety note

The equipment must only be installed and commissioned by qualified and competent staff. Retrofitting and maintenance work must only be performed by qualified staff who – through adequate training – have achieved a recognised level of competence.



Danger

The terminal strip of the equipment is live during operation. This presents the danger of electric shock. Cut off power supply before mounting or removing the terminal strips and the housing cover.



Attention

The name plate specifies the technical features of the equipment. Note that any piece of equipment without its specific name plate must neither be commissioned nor operated.

PED (Pressure Equipment Directive)

The equipment fulfills the requirements of the Pressure Equipment Directive PED 97/23/EC. For applications with fluids of group 1 and 2. With CE marking (apart from equipment according to section 3.3 that is excluded from the scope of this directive).

ATEX (Atmosphère Explosible)

The equipment constitutes a simple item of electrical equipment as defined in DIN EN 50020 section 5.4. According to the European Directive 94/9/EC the equipment must be equipped with approved Zener barriers if used in potentially explosive areas. Applicable in Ex-zones 1, 2 (1999/92EC). The equipment does not bear an Ex-marking. The suitability of the Zener barriers is certified in a separate document.

Explanatory Notes

Scope of supply

TRS 5-8

- 1 Temperature switch TRS 5-8
- 1 Installation manual

Explanatory Notes - continued -

Description

Temperature switch designed for use with resistance thermometers type TRG 5-53, TRG 5-54, TRG 5-55 or TRG 5-57.

The equipment works as temperature monitor. An alarm is given as soon as the temperature exceeds a preset limit. Application in steam boilers and pressurized hot-water plants operating without constant supervision (TRD 604) as well as any other kind of heat generating units.

Function

The temperature switch TRS 5-8 is a two-channel temperature monitoring system used in conjunction with a standardized platinum resistance thermometer Pt 100 to IEC 751. A power source fitted with a variable resistor supplies the resistance thermometer Pt 100 with a constant current.

The desired cut-off temperatures are adjusted by means of an eight-pole code switch. To ensure a fail-safe alarm signal as soon as the temperature exceeds the max. limit the output contact relays of the TRS 5-8 are of the normally closed type. In the event of a power supply failure the temperature switch will raise an alarm.

The temperature switch can signal the following two operating conditions:

- Normal operation (temperatures within permissible range)
- Alarm (temperatures above/below limit)

A green LED indicates mains supply ON. Two red LEDs are illuminated if the temperature exceeds or falls below the limit.

System components

TRG 5-53

Temperature sensor with threaded connection piece ½", PN 40

TRG 5-54

Temperature sensor with threaded connection piece ½", PN 40

TRG 5-55

Temperature sensor with weld-in protection Ø 18 mm, PN 160

TRG 5-57

Temperature sensor with weld-in protection Ø 18 mm, PN 160

Design

TRS 5-8

Plug-in unit in plastic case for installation in control cabinets. The terminals in the case are accessible after loosening two screws and unplugging the unit from its base. Thanks to the code plug the equipment cannot be connected inadvertently to wrong GESTRA equipment. The equipment may be clipped onto a 35 mm supporting rail or screwed into position on a mounting panel.

Technical Data

TRS 5-8

Type approval

DIN TW 106807

Input

Connection for resistance thermometer (Pt 100):

TRG 5-5..., PN 40-160, T_{\max} 400 °C – 540 °C.

Output

2 volt-free relay contacts. Max. contact rating with switching voltages of 24 V, 115 V and 230 V AC: 4 A resistive, 0.75 A inductive at $\cos \varphi$ 0.5.

Max. contact rating with a switching voltage of 24 V DC: 4 A.

Contact material: silver, hard-gold plated.

Temperature limit range

30 °C to 540 °C, adjustable via code switch in steps of 2 °C.

Switching hysteresis

At MAX limit –5 °C,

At MIN limit 5 °C.

Indicators and adjustors

Two LEDs "Alarm", one LED "Power",

one code switch for "MIN temperature", one code switch for "MAX temperature".

Mains supply

230 V +/- 10 %, 50/60 Hz.

Special voltages 115 V +/- 10 %, 50/60 Hz or 24 V +/- 10 %, 50/60 Hz.

Power consumption

5 VA

Protection

TRS 5-8 b:

IP 20 to DIN EN 60529

Admissible ambient temperature

0 °C to 55 °C

Body materials

TRS 5-8 b:

Base ABS, black. Cover: Polystyrol, highly shock resistant, stone grey.

Front panel: Aluminium.

Weight

Approx. 0.6 kg

Technical Data - continued -

Corrosion resistance

If the unit is used for the intended purpose, its safety is not impaired by corrosion.

Name plate/ marking







 			
<p>Vor Öffnen des Gehäuses Gerät freischalten Before opening the equipment cut off power supply. Avant d'ouvrir l'appareil couper l'alimentation secteur.</p>			
TRS 5-8b		Equipment designation	
<p>Temperaturschalter Temperature switch Commutateur de température</p>			
<p>24V <input type="checkbox"/> 115V <input type="checkbox"/> 230V <input checked="" type="checkbox"/></p>		Mains supply	
50 / 60 Hz	5VA	IP 20	Protection
Tamb = 55°C (131°F)			
 250 V ~ T 2,5 A		External fuse	
Wirkweise Typ 2B			
<p>GESTRA AG Münchener Str. 77 D-28215 Bremen</p>			

Fig. 1

Dimensions

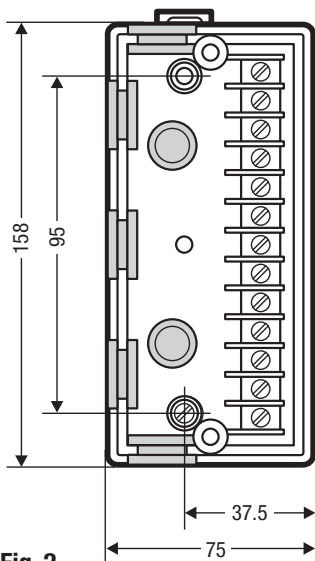


Fig. 2

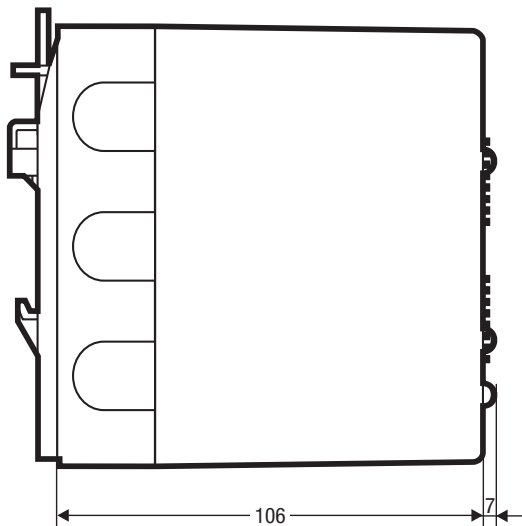


Fig. 3

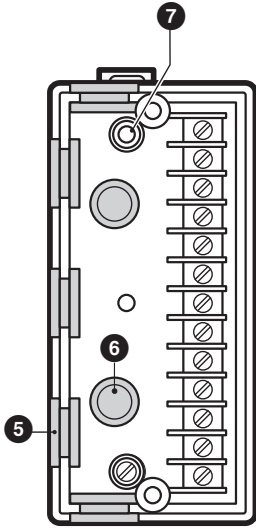


Fig. 4

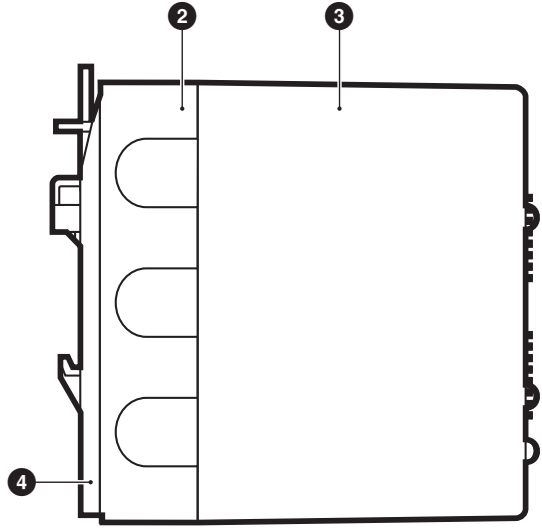


Fig. 5

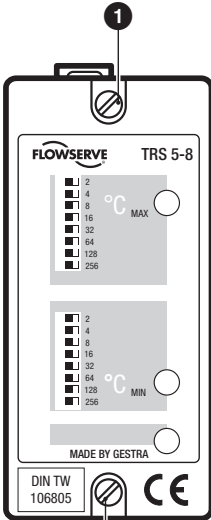


Fig. 6

Functional Elements

TRS 5-8

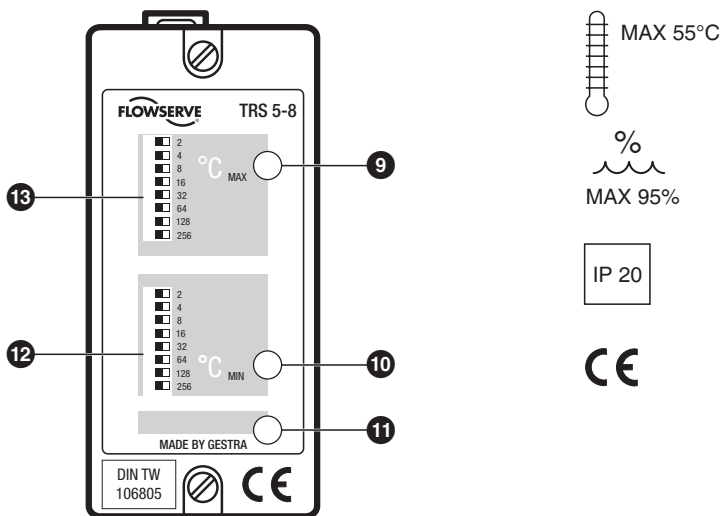


Fig. 7

Design/Functional Elements

Key

- ① Cover screws
- ② Base
- ③ Upper part of the housing
- ④ Mounting clip
- ⑤ Cable entry (flexible)
- ⑥ Cable entry (housing)
- ⑦ Fixing holes $d = 4.3 \text{ mm}$
- ⑧ Supporting rail TS 35 x 15 DIN EN 50022
- ⑨ LED "MAX temperature alarm"
- ⑩ LED "MIN temperature alarm"
- ⑫ LED "Power"
- ⑫ Code switch for MIN temperature setting
- ⑬ Code switch for MAX temperature setting

Installation

TRS 5-8

On supporting rail

1. Clip temperature switch onto supporting rail.
2. Loosen cover screws ❶ and detach cover ❸ from its base ❷.
3. Select cable entry ❺ and remove corresponding seal.

On mounting panel

1. Loosen cover screws ❶ and detach cover ❸ from its base ❷.
2. Unscrew mounting clip ❹.
3. Drill hole ❷ marked in the base to \varnothing 4.3 mm.
4. Select cable entry ❺ / ❻ and remove corresponding seal.
5. Fix base with two M4 screws onto mounting panel.



Attention

- To provide sufficient ventilation, ensure a minimum spacing of 20 mm between adjacent units.

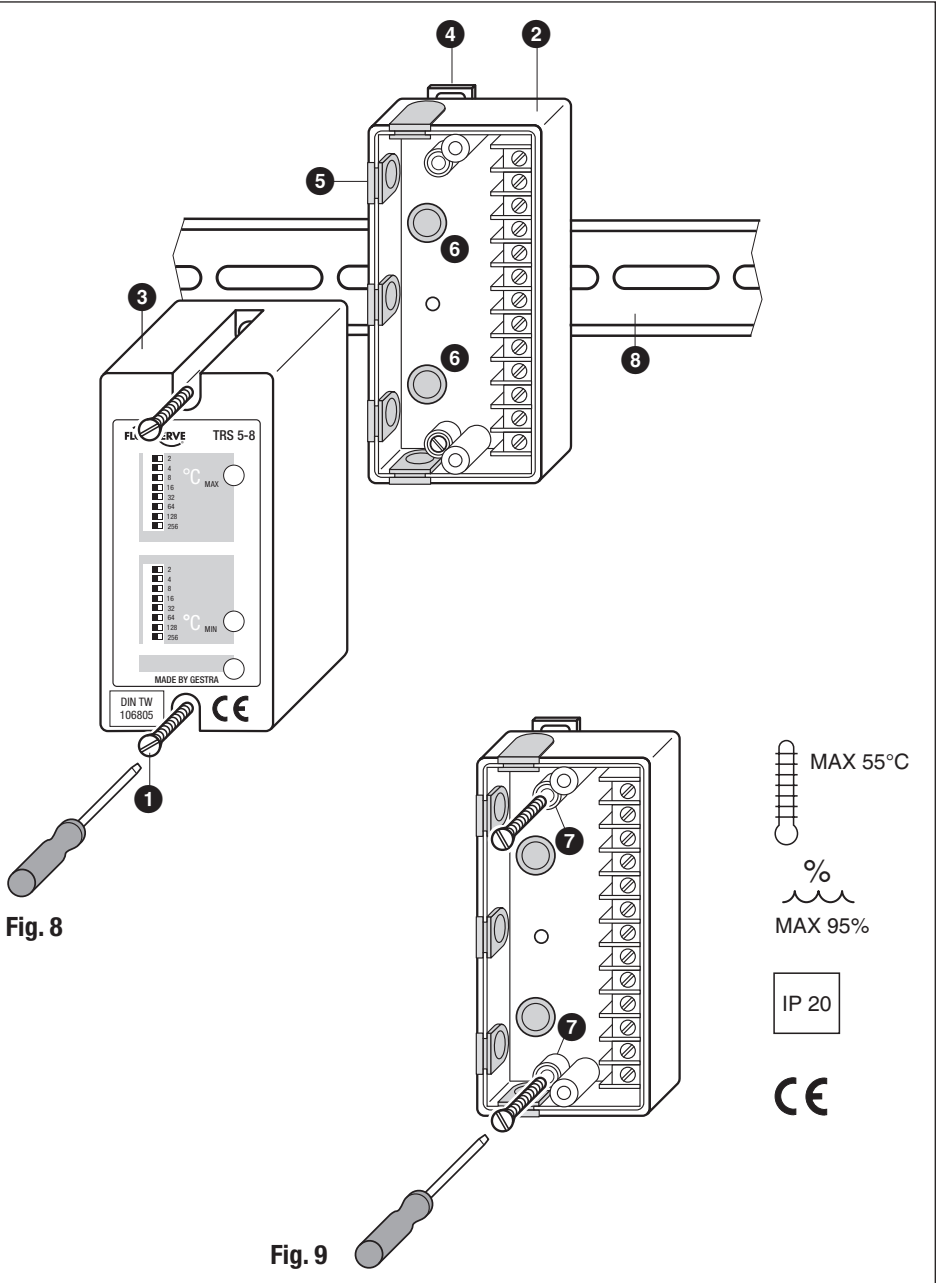
Tools

- Screwdriver (5.5/100)

Key

- ❶ Cover screws
- ❷ Base
- ❸ Upper part of the housing
- ❹ Mounting clip
- ❺ Cable entry (flexible)
- ❻ Cable entry (housing)
- ❼ Fixing holes $d = 4.3$ mm
- ❽ Supporting rail TS 35 x 15 DIN EN 50022

Examples of Installation



Wiring

TRS 5-8

Note that screened four-core cable, e. g. I-ly(St)Y 2 x 2 x 0.8 or LIYCY 4 x 0.5 mm² is required.



Attention

- To protect the switching contacts fuse circuit with T 2.5 A or according to TRD-regulations (1A for 72h operation).
- The screen must not make any other electrical contact



Note

- Connect screen only to terminal 10 of the temperature switch.
- The loop resistance must be below 10 Ω.
- The rated voltage is indicated on the name plate.
- When switching off inductive loads, voltage spikes are produced that may impair the operation of control and measuring systems. Inductive loads should be provided with commercial arc suppressor RC-combinations, e.g. 0.1 μF/100 Ω.

Tools

- Screwdriver for slotted screws, size 2.5 completely insulated according to DIN VDE 0680-01

Key

- 14 Switching relay for MAX temperature
- 15 Mains
- 16 Switching relay for MIN temperature
- 17 Terminal, red
- 18 Terminal, red
- 19 Terminal, black
- 20 Terminal, black
- 21 Terminal, red
- 22 Terminal, red
- 23 Terminal, yellow

Wiring diagram

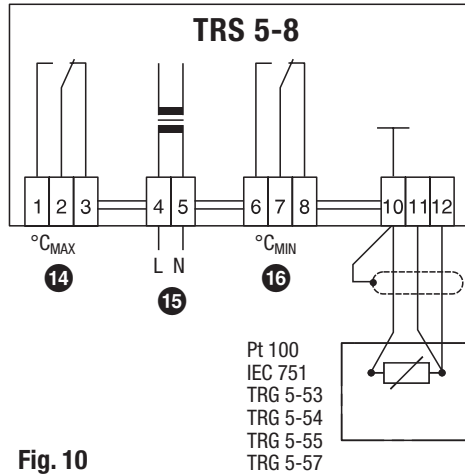


Fig. 10

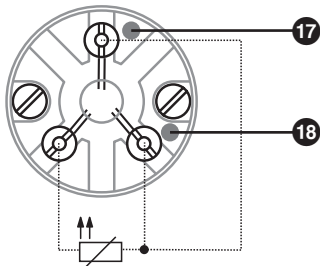


Fig. 11
TRG 5-53, TRG 5-54

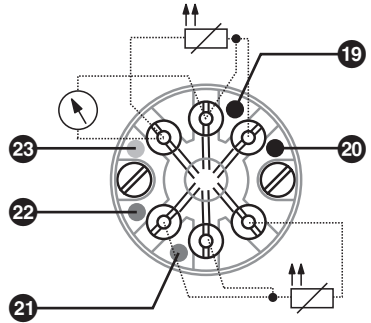


Fig. 12
TRG 5-55, TRG 5-57

Basic Settings

Adjusting temperature limit

To set the temperature use the 8-pole code switch on the front panel of the TRS 5-8. Use code switch 12 to set the min. temperature limit and code switch 16 to set the max. temperature limit.

Example 1

A temperature limit is to be set at $T_{\max} = 176 \text{ }^{\circ}\text{C}$.

The code switch indicates eight values from 2 to 256. The basic temperature is $30 \text{ }^{\circ}\text{C}$.

Set the switches 2, 16 and 128 to the left by using a small screwdriver. The sum of the values gives a temperature of $146 \text{ }^{\circ}\text{C}$.

Plus $30 \text{ }^{\circ}\text{C}$ basic temperature makes the requested limit temperature $T_{\max} = 176 \text{ }^{\circ}\text{C}$. **Fig. 13**

Example 2

A temperature limit is to be set at $T_{\max} = 446 \text{ }^{\circ}\text{C}$.

Set the switches 32, 128 and 256 to the left by using a small screwdriver. The sum of the values gives a temperature of $416 \text{ }^{\circ}\text{C}$.

Plus $30 \text{ }^{\circ}\text{C}$ basic temperature makes the requested limit temperature $T_{\max} = 446 \text{ }^{\circ}\text{C}$.

Example 3

A temperature limit is to be set at $T_{\max} = 79 \text{ }^{\circ}\text{C}$.

Set the switches 16 and 32 to the left by using a small screwdriver.

The values add up to a temperature of $48 \text{ }^{\circ}\text{C}$.

Plus $30 \text{ }^{\circ}\text{C}$ basic temperature makes the requested limit temperature $T_{\max} = 78 \text{ }^{\circ}\text{C}$. Note that temperatures can only be adjusted in steps of $2 \text{ }^{\circ}\text{C}$. **Fig. 14**

Tools

- Screwdriver for slotted screws, size 2.5, completely insulated according to VDE 0680

Code switch settings



30		°C	176
S1	ON	2	
S2	OFF	4	
S3	OFF	8	
S4	ON	16	
S5	OFF	32	
S6	OFF	64	
S7	ON	128	
S8	OFF	256	

Fig. 13 (Example 1)



30		°C	78
S1	OFF	2	
S2	OFF	4	
S3	OFF	8	
S4	ON	16	
S5	ON	32	
S6	OFF	64	
S7	OFF	128	
S8	OFF	256	

Fig. 14 (Example 3)

Commissioning

Check wiring

Make sure that the TRS 5-8 is wired to its associated temperature sensor as indicated in the wiring diagram. **Fig. 10, Fig. 11, Fig. 12**

Apply mains voltage

Apply mains voltage to temperature switch TRS 5-8.

Performance test

TRS 5-8

1. When switching on the mains voltage the green LED **11** must be permanently illuminated.
2. Raise the temperature in the heat generator until the max. temperature limit is exceeded.
The red LED **9** of the temperature switch must light up.
3. After lowering the temperature the red LED **9** must extinguish.
4. Lower the temperature until it falls below the min. limit.
The red LED **10** of the temperature switch must light up.
5. After raising the temperature the red LED **10** must extinguish.

Operation

Temperature controller

Operation only in conjunction with temperature sensors TRG 5-53, TRG 5-54, TRG 5-55 or TRG 5-57 in (pressurized) hot-water and steam plants to TRD 401, TRD 602, TRD 604, EN 12952, EN 12953.



Note

- To analyse and remedy malfunctions occurring during the commissioning procedure refer to section **Operational Malfunctions**.

Operation Malfunctions



Danger

The terminal strip of the equipment is live during operation. This presents the risk of severe cases of electric shock! Cut off power supply before mounting or removing the terminal strips and the housing cover.

Fault-finding list for troubleshooting

Normal operation – Temperature switch triggers an alarm

- Fault:** The temperature switch triggers an alarm during normal operation.
- Remedy:** Make sure that the green LED is illuminated. If this is not the case check whether the equipment is supplied with mains voltage.
- Remedy:** Check whether the cable leading to the resistance thermometer is damaged.
- Remedy:** Check whether the resistance thermometer gives correct readings (basic values of measuring resistor to DIN EN 60751 for Pt 100).

If faults occur that are not listed above or cannot be corrected, please contact our service centre or authorized agency in your country.

Decommissioning



Danger

The terminal strip of the equipment is live during operation. This presents the risk of severe cases of electric shock! Cut off power supply before mounting or removing the terminal strips and the housing cover.

Disposal

Dismantle the equipment and separate the waste materials, using the material specification as a reference.

Electronic component parts such as the circuit board must be disposed of separately! For the disposal of the equipment observe the pertinent legal regulations concerning waste disposal.

Annex

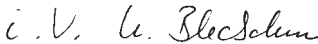
Declaration of Conformity **CE**

We hereby declare that the equipment **TRS 5-8** conforms to the following European guidelines:

- Low voltage directive 73/23/EC version 93/68/EC
- Low voltage directive 89/336/EC version 93/68/EC
- Low voltage standard EN 50178
- EMC-standard EN 50081-2, EN 50082-2
- Applied conformity assessment procedure: Annex III, Module B and D, verified by the Notified Body 0525

This declaration is no longer valid if modifications are made to the equipment without consultation with us.

Bremen, 3rd January 2005
GESTRA AG



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For your notes

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