# GESTRA Steam Systems

Product Range B1

Temperature Switch
**TRS 5-6**

**TRS 5-6**

## Description

Self-monitoring temperature switch with periodic self-checking feature to be used in conjunction with a resistance thermometer type TRG 5-53, TRG 5-54, TRG 5-55 or TRG 5-57. The equipment operates as a safety temperature controller, or in conjunction with an external lock-out in accordance with VDE 0116 as a safety temperature limiter. An alarm is given as soon as the temperature exceeds a preset limit value.

Application in steam boilers, pressurized hot-water plants, as well as any other type of heat generator. The equipment meets the German regulations for use in steam-boiler plants operating without constant supervision (TRD 604, sheet 1/2).

## Design

**TRS 5-6b**

Plug-in unit in plastic case for installation in contol 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 plug-in units may be clipped onto a 35 mm supporting rail or screwed into position on a mounting panel. Field enclosures for several plug-in units are available on request.

## Function

The temperature switch type TRS 5-6 is a two channel unit provided with an automatic periodic self-checking logic unit, in accordance with DIN 3440/VDE 0116 (regulations on protection circuits for firing equipment of furnaces). The two channels are designed to monitor the operation of each other. If one channel fails, an alarm signal is initiated, simultaneously switching the output contacts to shut off the heat supply. The periodic self-checking logic unit checks the two channel circuits for malfunction. The integrity of the resistance thermometer is continuously monitored by the TRS 5-6. This is done automatically every 40 seconds by the triggering of a test alarm pulse through the circuit. Unless it finds a fault, this internal test does not interfere with the output contacts of the temperature switch and therefore the plant operation is not interrupted.

In addition, there is a secondary checking device to monitor the operation of the periodic self-checking logic unit. If no test pulse alarm is triggered, the secondary checking device will initiate an alarm signal and switch the output contacts to shut off the heat supply.

A manual test push button is also provided. When the push button “Test I” is pressed, it simulates a fault in the resistance thermometer. There is also a toggle switch “Test II/Inspection” for checking the function of the self-checking circuitry.

The output contact relays of the temperature switch are of the normally close type and will therefore signal alarm condition in the event of a mains failure.

The temperature switch can signal the following three operating conditions:

- Normal operation (temperature within permissible range)
- Alarm (limit temperature exceeded)
- Alarm (fault in temperature switch or resistance thermometer)

A green LED indicates mains supply ON. Exceeding of limit temperature or malfunction of the system is indicated by two red LEDs. The failure of one channel (loss of redundancy) is signalled by the lighting-up of one red LED.

The combination of resistance thermometer TRG 5-... and temperature switch TRS 5-6 provides fail-safe protection against a first fault, i.e. the system will still continue to provide the safety function even after the occurrence of a first fault.

## Technical Data

**Type-approval No.**
DIN · STW (STB) · 985 07S

**Input**
Three terminals for the connection of one resistance thermometer (Pt 100), type TRG 5-5..., PN 40 –160, $T_{max}$ 400 °C – 540 °C

**Output**
Two volt-free relay contacts.
Max. contact rating with switching voltages of 24 V, 115 V and 230 V a.c.: 4 A resistive, 0.75 A inductive, cos φ 0.5.
Max. contact rating with a switching voltage of 24 V d.c.: 4 A.
Contact material silver, hard-gold plated.

**Temperature range**
Switching temperature adjustable in steps of 2 °C within a range of 30 °C to 540 °C by a code switch.

**Switching hysteresis**
–3 °C

**Indicators and adjustors**
2 red LEDs “Alarm”
1 green LED “Mains supply on”
1 button “Test I”
1 toggle switch “Test II/Inspection”
8 red LEDs “Set-point indication”
1 eight-pole code switch for setting the limit temperature

**Mains supply**
230 V ±10 %, 50/60 Hz
Special voltage: 115 V ± 10 %, 50/60 Hz or 24 V ±10 %, 50/60 Hz

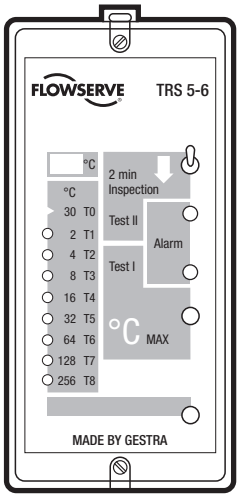
**Power consumption**
Approx. 5 VA

**Protection**
TRS 5-6b: IP 20 to DIN EN 60529

**Permissible ambient temperature**
TRS 5-6b: 0 °C to 55 °C

**Case materials**
TRS 5-6b
Base: ABS plastic, black.
Cover: Polystyrene (highly shock-resistant)
Front plate: Aluminium

**Weight**
TRS 5-6b: approx. 1.0 kg




*TRS 5-6b*

Temperature Switch
# TRS 5-6

## Important Notes

Cable required for wiring to the resistance thermometer: Four-core overall screened cable, e.g. I-Y(St)Y 2 x 2 x 0.8 or LIYCY 4 x 0.5 $^2$. Minimum conductor size 0.5 mm $^2$.

Max. cable length 100 m.

When mounting the resistance thermometer into steam or pressurized hot-water boilers the relevant regulations must be considered.

The protection circuit should be fused with 2.5 A (anti-surge fuse) or in accordance with the pertinent TRD regulations (e.g. 1.0 A for 72 hrs.).

The temperature switch does **not** have its own lock-out circuit. Lock-out and manual reset facilities are to be provided externally by a secondary circuit (safety chain) in the control cabinet.

## Order and Enquiry Specifications

GESTRA temperature switch with periodic self-checking feature in accordance with TRD 602, TRD 604, EN 12952 and EN 12953:

- Temperature switch type TRS 5-6b, in a plastic case for installation in control cabinets.

Mains supply ..... V ..... Hz

## Associated Equipment

Resistance thermometer type TRG 5-53, TRG 5-54, TRG 5-55, TRG 5-57.

## 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.

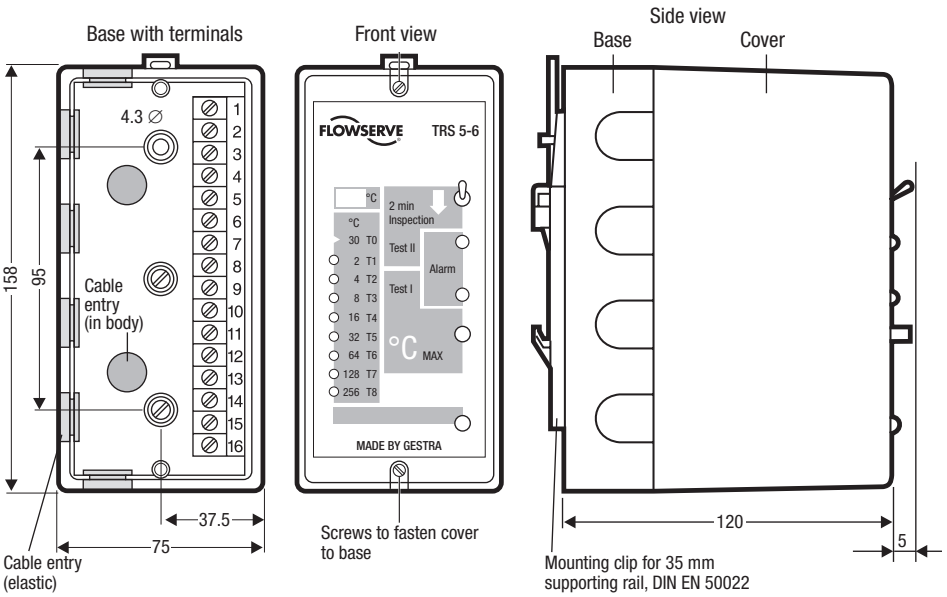
With CE marking (apart from equipment according to section 3.3 that is excluded from the scope of this directive).

## ATEX (Atmosphère Explosible)

According to the European Directive ATEX 94/9/EC the equipment must **not** be used in potentially explosive areas.

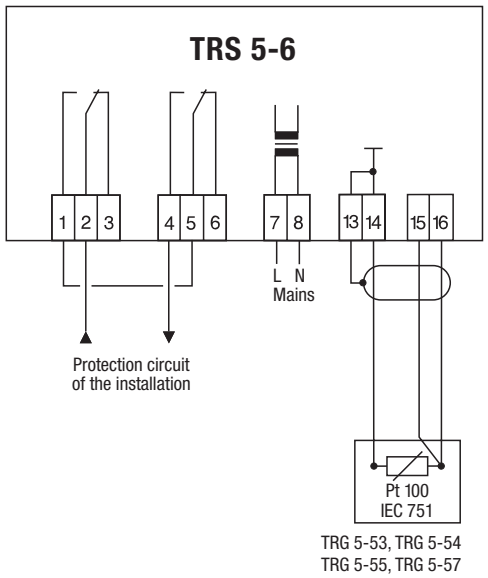
Supply in accordance with our general terms of business.

## Dimensions




*TRS 5-6b*

## Wiring Diagram




TRG 5-53, TRG 5-54
TRG 5-55, TRG 5-57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