

EX HS STB

Top-hat rail safety temperature limiter



Characteristics

- Certified STB (SIL2)
- Easy installation on the top-hat rail
- Illumed display
- Parameterization easy to understand
- 1 x PT 100 sensor input
- Analog output
- Remote off

The Ex HS STB is certified as control unit and limiter for the Ex zones I and II according to 94/9/EG. The limiter is furthermore also certified as safety temperature limiter according to guideline EN 61508:2001(functional safety) with SIL 2.

The limiter complies with the EMC requirements (electromagnetic compatibility) according to EN 61326-1 and EN 61326-3-1.

The limiter offers the user a maximum safety and reliability during the monitoring of thermal processes.

The control unit has a Pt-100 sensor input at its disposal and is fully configurable on-site.

The complete overview of the operating condition and all functions are immediately visible on the three lined backlit display.

The control unit is designed as single channel limiter and records the temperature via a PT 100 sensor, which is directly connected to the device, in three-wire technology. Depending on the temperature at the sensor and the value set as setpoint value, the relais switches the output of the limiter redundant.

We supply suitable certified Pt100 sensors in two basic versions:

Type Ex TF Pt100L as contact sensor with minimum dimensions of 7,4 cm x 2,1 cm x 2,1 cm. Fully encapsulated in an aluminium enclosure with a measuring temperature of up to 200°C.

Type Ex TF Pt100KS with a sensor tip 5 mm and a length of 23 cm. Fully encapsulated in an aluminium enclosure, a stainless steel sensor tip and a measuring temperature of up to 400°C.

The sensors are particularly safe against interference voltage. Further details can be found in the product literature Pt-100Ks or Pt-100L.

Monitoring

In the event of power failure the limiter relais drops down or rather in rest position. (open condition)
Bypass of measuring circuit and sensor break are detected.


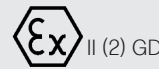
Construction of heating circuit

If you want to build a heating circuit for the Ex area in top-hat rail assembly, we can recommend our controllers or voltage adjusters. A functional schematic can be found under point 9.1. Control units are not necessary for the safe operation of devices or protective systems, do not contribute to them or are included in the view according to EG 94/9, as the guideline only covers the associated equipment, see article 1 (2) of the guideline 94/9/EG.

TECHNICAL DATA LIMITER SIL 2

Measuring range	-50...500°C
Setting ranges/ scales	0...500°C
Setpoint value adjustment	10 gear trimmer behind the front panel
Limiter resetting	Pushbutton behind the front panel
ESD protection	According to DIN EN 61340-5-1
Measuring accuracy	0,2°C bzw. 1 digit
Switching point accuracy	1 °C
Switching hysteresis	< 2 K
Ambient temperature influence	≤ 0,02 % per K
Supply line measurement error	1 K for 3 x 1,5 mm ² cable, length 1,0 km
Tripping time	30 ms
Fault tolerance time	30 ms
Measuring circuit monitoring	
Shortcircuit	≥ 300 Ω
Open-circuit	-50°C = 80 Ω

TECHNICAL DATA

Setting range	0 °C to + 500 °C	
Temperature measuring range	-50 °C to + 500 °C	
Ambient temperature	0 °C to + 40 °C	
Nominal voltage	230 V / alternatively 24 V/ 48V	
Degree of protection	IP 20 / EN 60529	
Dimensions		
Length	71,5 mm	
Width	42,5 mm	
Height	68 mm	
Construction		
Plastic casing for top-hat rail TS 35	4 TE	3 lined LCD display
Electrical connection	Terminal block in grid 5,08	
	Conductor cross-section up to 2,5 mm ²	
Certificates		
Level functional safety	SIL 2	
EC-type examination certificate	TÜV13ATEX124201	
Identification		

Supply circuit	
Nominal voltage	230 V ± 15%, 48-62 Hz
Nominal current	20 mA
Fuse	80 mA (1A bei switching power supply version)
Protection class	II

PT-100 input	
1 PT 100 input	Three wire technology
max. current	4,6 mA
max. voltage	5 V
max. capacity	5,7 mW
Measuring current	1 mA

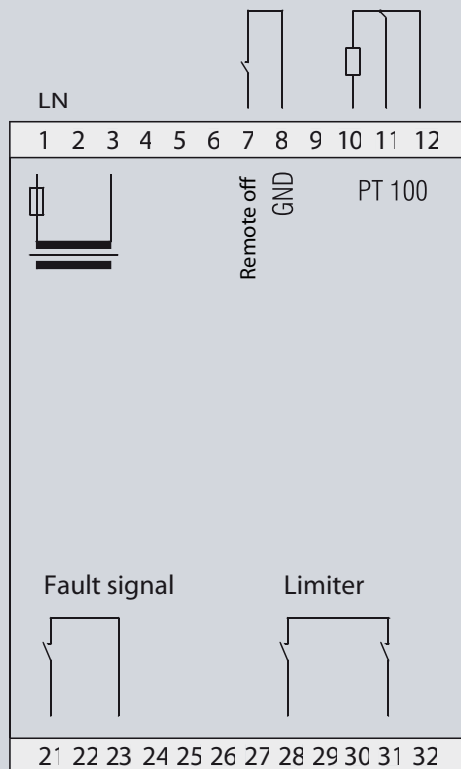
Limiter relais	
1 potential-free make contact	
Nominal voltage	230 V
max. current	10 A

Fault signal relay	
1 potential-free make contact	
Nominal voltage	230 V
max. current	3 A

Safety integrity level limiter SIL 2 (Test cycle 3 years)	
Parameters	
PFH	4,35 E-07
PFD	5,08 E-03

Safety integrity level limiter SIL 2 (Test cycle 1 year)	
Parameter	
PFH	3,37E-07
PFD	1,41E-03

CONNECTION PLAN CONTROLLER + LIMITER



TYPECODE

EX HS STB

1	2	3
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1	-	Standard
	FA	Remote off (remote switch)

2	Voltage	
	-	230 V AC (Standard version with transformer)
	S 230V	230 V (version switching power supply)
	S 24V	24 V DC (version switching power supply)
	S 48V	48 V DC (version switching power supply)

3	Display	
	-	backlit display Colour: amber (standard)
	D	No display illumination - highly reflective display - minimum self-heating (optimal in combination with switching power supply)

Versions with switching power supply should be preferred for disadvantageous installation situations.

Example:

Standard limiter with remote off monitoring

EX HS STB

FA
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INSTALLATION

Pt100 connection

The PT100 must be connected in 3-wire technology to achieve the indicated security including the tolerance. Tolerances (also see technical data limiter)

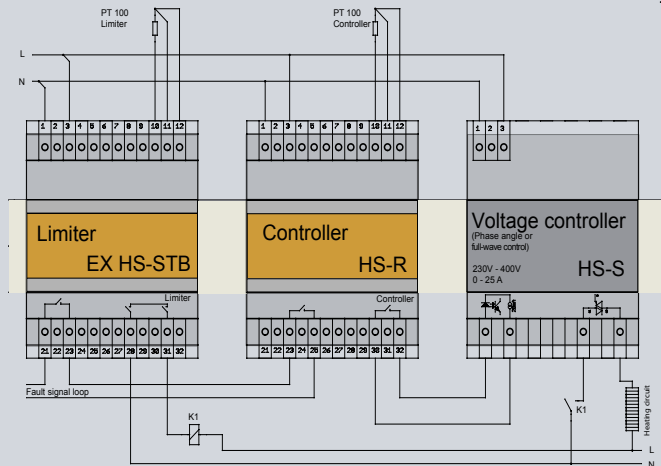
Heat accumulation

Attention should be paid to heat accumulation problems during the installation of the top-hat rail devices. The ambient temperature range of max. 40°C must be considered. See installation example: For a reduction of the lost heat difficulty the versions with switching power supply are recommendable. At this the self-heating is reduced to approx. 15 K above the ambient temperature.

Vibration

The equipment is determined for the intended use according to the guideline 94/9/EG and to the harmonized standards referring to this. Fluctuation stress must not be assumed, vibrations from the equipment itself are not generated.

APPLICATION EXAMPLE



Please take further data from the operating manual. Download on www.erich-ott.de