

TRB - PaxS

Temperature-Controller-Limiter - Fault reporting unit



Characteristics

- 2 intrinsically safe measuring sensor inputs [Ex ib] IIC
- Certified STL (SIL1)
- Precise control
- Clear Display
- Parameterization easily understandable
- Easy installation
- Remote switch connection for intrinsically safe circuits [Ex ib] IIC
- Analog output for intrinsically safe circuits [Ex ib] IIC
- Standstill monitoring

The TRB-PaxS makes two intrinsically safe Pt100 inputs in 3-wire system available, on which appropriate temperature sensors in the hazardous area can be operated. The measuring sensor inputs are separately designed for controller and limiter and independent. We supply appropriate, certified Pt100 measuring 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 cabinet with a measuring temperature of up to 200°C.

Typ Ex TF Pt100Ks with a measuring sensor tip 5 mm and a length 23 cm. Fully encapsulated in an aluminium cabinet, a stainless steel measuring sensor tip and a measuring temperature of up to 400°C.

Both measuring sensors are particularly safe of interfering voltage. For more information see the product literature Pt-100Ks or Pt-100L.

The unit is fully configurable on site. The complete overview of the operating condition and all functions can be read directly on the front panel. The TRB-PaxS consists of a temperature controller and an according to the regulation 2014/34/EU certified safety temperature limiter (STL) with assessment of the functional safety to SIL 1. It provides the user when monitoring thermal processes with a maximum of safety and reliability.

Controlling

The control unit is designed as temperature controller with On/Off switching behaviour and records the temperature via an intrinsically safe PT- 100- sensor in 3- wire system, which is directly connected to the

rack (optionally) of the TRB-PaxS. Depending on the temperature at the measuring sensor and the value set as target value, the (intrinsically safe) relay switches at the output of the controller. The target value is set analogue by means of a push button on the front side on a scale and secured with a lock against unintentional adjustment. The true value is shown on a 3 1/2 – digit LED- Display.

Monitoring

A variety of parameters is monitored, such as temperature and temperature underflow, limiter alarm, sensor break/short circuit, power failure and heating resistor break (optionally). To ensure the operating safety, the TRB-PaxS has three special functions:

Periodically shut off heating circuits are checked regularly (standstill monitoring)
With the infinitely variable under temperature- monitoring a lapse of the process temperature under the predetermined setpoint can be recorded so early, that the interference possibly can be corrected before the occurrence of a damage.
Overtemperature control with inevitable shutdown of the heating and manual reclosing of the limiter.

Overtemperature – restriction (SIL)

The registration of the limit temperature takes place via an intrinsically safe Pt-100 sensor in 3-wire system, which is connected to the rack (optionally) of the equipment.

To ensure that the temperature is measured at the warmest point, the sensor must be installed at the correct reference point. If the admissible temperature limit is exceeded or an error occurs (sensor break, -short circuit) within the admissible temperature range, the built-in relay switches the system without delay in a reliable condition. The shutdown will remain active until a manual release is effected by the reset button on the front page of the TRB-PaxS.

At a power failure, without triggering the alarm contact, an automatic release occurs when power returns.



The analog setpoint adjuster for the overtemperature limit is placed on the front. An unintentional or unauthorized adjustment of the limit value is prevented by a sealable transparent cover.

Voltage regulator SRS

The TRB-PaxS can optionally be supplemented by a voltage regulator for the performance or length adaption of heat tracings.

The planning, construction and subsequent expansion of heater circuits is considerably simplified. The voltage regulator is designed as standard – 19" – card. Optionally a mounting cabinet is available. The product literature for the SRS includes further details.

TECHNICAL DATA

Ambient temperature	0 °C to +40 °C	
Dimensions	19"-Euroboard 100x160 mm according to DIN 41494	
Type of construction Front panel (Aluminium) (1 TE = 5,08 mm)	Width 12 TE	ca. 61 mm without digital display
	Width 14 TE	ca. 71 mm with digital display
	Height 3 HE	129 mm
	Length	176 mm (with front panel and plug board)
Electrical connection	32-pole plug board according to DIN 41612, construction type F	
	Pin assignment d+z (Standard, plug board 1)	
	32-pole plug board according to DIN 41612, pin assignment d+z (optionally, plug board 2)	
Cabinet type	Alu-mounting cabinet with terminal strips (210 x 190 mm, T x H), IP20 (optionally)	
	19"-subrack according to DIN 41494	
Cabinet protection degree	IP20 / EN 60529 (when ordering the mounting cabinet)	
EU-type examination certificate	PTZ 16 ATEX 0027	
Ignition protection type (Gas)	II 2G [Ex ib] IIC	
Ignition protection type (Dust)	II 2D [Ex ib] IIIC	
Identification	 0344	 II (2) G [Ex ib] IIC II D [Ex ib] IIIC

CONTROL CIRCUIT

Measuring range	-40...200°C -40...300°C -40...400°C
Setting ranges / Scales	0...100°C 0...200°C 0...300°C 0...400°C
Setpoint adjustment	Precision potentiometer lockable, angle of rotation 300°
Lightning protection	1500 W/ms
Switching point accuracy	≤ 1 %
Switching hysteresis	≤ 1 % of the full scale value
Ambient temperature influence	≤ 0,02 % pro K
Linearization error	≤ 0,1 %
Connection lead measurement error	1 K in line 3 x 1,5 mm ² , length 1,0 km
Measuring circuit monitoring	
Conductor break	≥ 200 Ω (depends on the measuring range*)
Line terminal	≤ 50 Ω

* For measuring ranges above 200°C the conductor break is 10 % over the end of the measuring range

LIMITER CIRCUIT

Setting ranges / Scales	0...200°C 0...300°C 0...400°C 0...500°C
Setpoint adjustment	Precision potentiometer lockable, angle of rotation 300°
Lightning protection	1500 W/ms
Switching point accuracy	≤ 1 %, reproducible 0,2 %
Switching hysteresis	≤ 2 % of the full scale value
Ambient temperature influence	≤ 0,02 % per K
Linearization error	≤ 0,1 %
Connection lead measurement error	1 K in line 3 x 1,5 mm ² , length 1,0 km
Measuring circuit monitoring	
Conductor break	≥ 200 Ω (depends on the measuring range*)
Line terminal	≤ 50 Ω
Keyboard	b2 behind the front panel

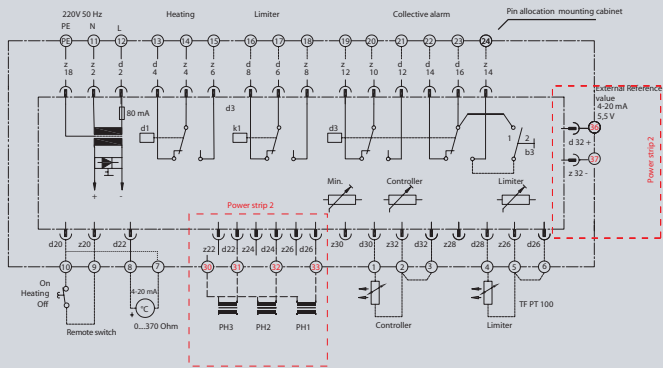
* For measuring ranges above 300°C the conductor break is 10 % over the end of the measuring range

OVERVIEW OF ALL AVAILABLE DEVICES

	Availability	Ex Safety	SIL certification	PT 100 3-wire with conductor break/closure	Actual value output controller 4-20 mA	ext. setpoint control controller 4-20 mA	Current monitoring 1/3 phase	Display	Allocation plug board 1	2nd plug board	Allocation plug board 2
TRB - P	X	nicht Ex		X	X			X	b/z		
TRB - PO	X	nicht Ex		X	X				b/z		
TRB - P S	X	Ex II 2 GD	X	X	X			X	b/z		
TRB - PO S	X	Ex II 2 GD	X	X	X				b/z		
TRB - Ple S	X	Ex II 2 GD	X	X	X	X	X	X	b/z	X	d/z
TRB - POie S	X	Ex II 2 GD	X	X	X	X	X		b/z	X	d/z
TRB - P axS	X	Ex II 2 GD [Ex ib] IIC	X	X	X			X	d/z		
TRB - PO axS	X	Ex II 2 GD [Ex ib] IIC	X	X	X				d/z		
TRB - PleaxS	X	Ex II 2 GD [Ex ib] IIC	X	X	X	X	X	X	d/z	X	d/z
TRB-POieaxS	X	Ex II 2 GD [Ex ib] IIC	X	X	X	X	X		d/z	X	d/z
TRB-Pax	Ersatz	EEx ib IIC		X	X			X	d/z		
TRB-POax	Ersatz	EEx ib IIC		X	X				d/z		
TRB-Piax	Ersatz	EEx ib IIC		X	X		X	X	d/z	X	d/z
TRB-POiax	Ersatz	EEx ib IIC		X	X		X		d/z	X	d/z

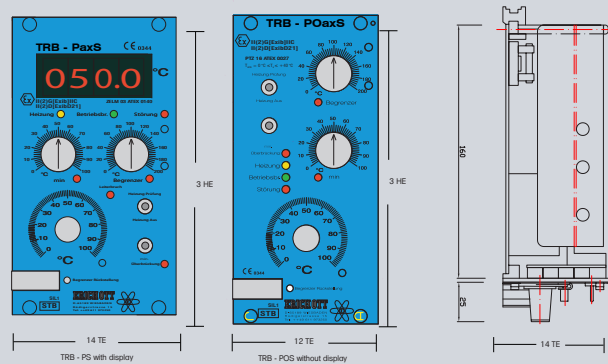
CONNECTION DIAGRAM

According to the type of device the plug board 2 is available. The clamps on the mounting cabinet are mounted corresponding to the type of device. See price list for scope of delivery.



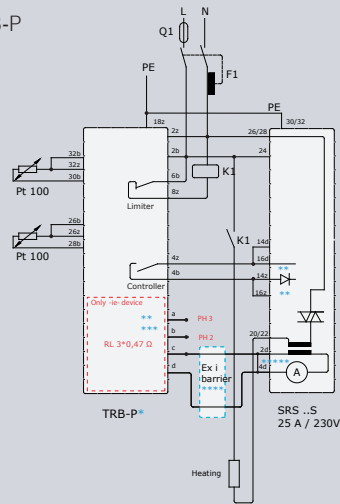
DIMENSIONS

Dimensions (nominal), measures in mm



APPLICATION EXAMPLE

SRS... with TRB-P



* bei Ex- design ...d instead of ...b

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Pin allocation of the current transformer input			
Plug board 2		Plug board 1	
STB (SIL)	STB (SIL) + [Ex ib] IIC	Old units*** [Ex ib] IIC	not Ex***
BVS 07 ATEX F001	ZELM 03 ATEX 0140	Zelm 03 ATEX 0140	
a	22b	22d	8d
b	24b	24d	10d
c	26b	26d	12d
d	22z, 24z, 26z	22z, 24z, 26z	8d, 10d, 12d

*** for 1-phase-operation bridge a-c (Only for TRB - P, VDE)

**** only for Ex i devices (TRB-P.ax.)

***** only for devices without current monitoring

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