



Electronic Temperature Controller ETRA 2 Ex-ib Type 1047

Installation- and operating instructions

Before installation and use read this manual!

General safety advice

This unit must be installed and used by qualified personal. Safety regulations and this wiring and operating instructions must be strictly observed.

The regulations of DIN VDE 0100 must be obeyed.

It must be ensured that personal or other persons are not endangered.

For the intended use it must be assured, that the intended range of the unit is not exceeded (e.g. voltage, load current, ambient temperature).

The producer is not liable for damages by external forces or other damages through external factors!

Use only units from original packings and free of damage.

Manipulation of the unit is prohibited and excludes warranty. The unit may be repaired solely by the producer.



Specification

Electronic Temperature Controllers ETRA 2 Ex-ib Type 1047 are used with thermistors Pt100 for temperature limiting of equipment which is used in flame proof areas.

The device is flame proof according to RL94/9/EG, EN 60 079-0:2012, EN 60 079-11:2012 EMV- Test NAMUR NE21

Characteristics

- use in flame proof areas II 2 G/D [Ex ib] IIC and [Ex ib] IIB
- working range 0...450°C
- connection to resistance temperature sensor Pt100 (optional Ni100) in 3- or 2-wire configuration
- adjustment of switch point with tool only (screwdriver)
- measured temperature and temperature sensor alarm (shortage or breakage) shown by 7-segment LED display
- both switch points are independently adjustable
- indication of relays switching position by LED`s
- extended range power supply 24 - 265V AC/DC
- strong makrolon housing IP20 for snap mounting on standard rail or screw mounting

Function

ETRA 2 Ex-ib type 1047 are installed in a non flame proof area as part of an electrical control.

The temperature sensor is installed in the flame proof area; the current loop is intrinsically safe.

Data processing and display is controlled by a microprocessor.

Adjusting the temperature set point by adjustment potentiometers **P1**.

When the actual temperature exceeds limit temperature, the relay output switches from terminal 7 - 8 to 7 - 6.

Adjusting the temperature alarm set point by adjustment potentiometers **P2**.

At underrun of the limit value, the relay output switches from terminal 4 - 5 to 4 - 3.

If a sensor alarm or power failure takes place, the relay output connects terminal 3 to 4 and 6 to 7.

The potentiometer **Wire compens.** is used with a 100Ω resistor to adjust to 0°C, which is useful with 2-wire configuration.



Temperature sensor monitoring

The ETRA 2 Ex-ib type 1047 permanently monitors the temperature sensor, displays faults and records faults. Temporarily occurring faults are displayed as "F2" to "F4" until a reset is made with button T2.

The Device displays faults as:

<i>Short circuit of sensor i.e. $T < -100^{\circ}\text{C}$</i>	<i>signal internal signal external</i>	<i>- LED-display switching with "---" - fault messages with opening of: relay contacts 4 and 5, heating is shut down relay contacts 7 and 8, low alarm</i>
<i>breakage i.e. $T > 532^{\circ}\text{C}$</i>	<i>signal internal signal external</i>	<i>- LED-display switching with "UUU" - fault messages with opening of: relay contacts 4 and 5, heating is shut down relay contacts 7 and 8, low alarm</i>
<i>breakage (sense-wire)</i>	<i>signal internal signal external</i>	<i>- LED-display switching with "UU" - fault messages with opening of: relay contacts 4 and 5, heating is shut down relay contacts 7 and 8, low alarm</i>
<i>sensor wiring > 22 Ohm</i>	<i>signal internal signal external</i>	<i>- LED-display switching displaying temperature - fault messages with opening of: relay contacts 4 and 5, heating is shut down relay contacts 7 and 8, low alarm</i>
<i>LED-display "F2"</i>	<i>Controller had sense wire short circuit Reset with button T2</i>	
<i>LED-display "F3"</i>	<i>Limitter had temperature sensor wire interruption Reset with button T2</i>	
<i>LED-display "F4"</i>	<i>Controller had temperature sensor wire > 22Ω Reset with button T2</i>	

Approvals

- flame proof
 - EC-Type Examination Certificate TÜV 08 ATEX 555822 benannte Stelle 0044
 - intrinsically safe EN 60 079-11
 - designation [Ex ib] IIC and [Ex ib] IIB according to EN 60 079-0
- EMI
 - EMI - approved
 - Namur NE 21 criterion A
- additional tests
 - each device checked after thermal treatment according to certified BÖHM confidential instruction BV 300801a



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Technical Data

Supply voltage	24V..265V AC(50/60Hz)/DC
Power consumption	app. 3VA
Sensor loop intrinsically safe	[Ex ib] IIC U ₀ = 2,6V, I ₀ = 6.8mA, max. external capacity 6.7μF [Ex ib] IIB U ₀ = 2,6V, I ₀ = 6,8mA, max. external inductance 50mH max. external capacity 36μF max. external inductance 50mH
Temperature sensor	The ETBA 1 Ex-ib may be used with all common Pt100 sensors
Relays out limiter	1 NC 5 A, 250 V~ cosφ ≥ 0,7 or 6 A, 24 V DC fuse 5A internal, must be changed <u>only</u> by manufacturer.
working range	heater: 0°C...450°C low alarm: -30°C...430°C
displayed range	actual value: -99...460°C low alarm: -32...432°C
Accuracy of switching	< 1K
Hysteresis	2K
Ambient temperature	-20...+50°C
Storage temperature	-20...+70°C
Housing	Polycarbonate, rail mounting on rail according to EN 50022
Protection	EN 60529 IP20. The device must be mounted according to IP30 (i.e. Inside a cabinet)
Terminals	for leads 0,5...4mm ²
Size	(55 x 75 x 110)mm
Mounting	any
Weight	app. 550 g

Accessories:

Temperature sensor 2/15, type 1048, T _{max} 450°C, Pt100	Order no.: 1048001
Temperature sensor 3/10, type 1049, T _{max} 450°C, Pt100	Order no.: 1049001

Connections

Terminals 1, 2:	power supply 24V..265 V AC(50/60Hz)/DC
Terminals 3, 4, 5:	relay output, 4 – 5 opens at low alarm
Terminals 6, 7, 8:	relay output, 7 – 8 heater is switched on
Terminals 8, 9, 10:	temperature sensor Pt 100 (3-wire with intrinsically safe Ex-i-current loop)



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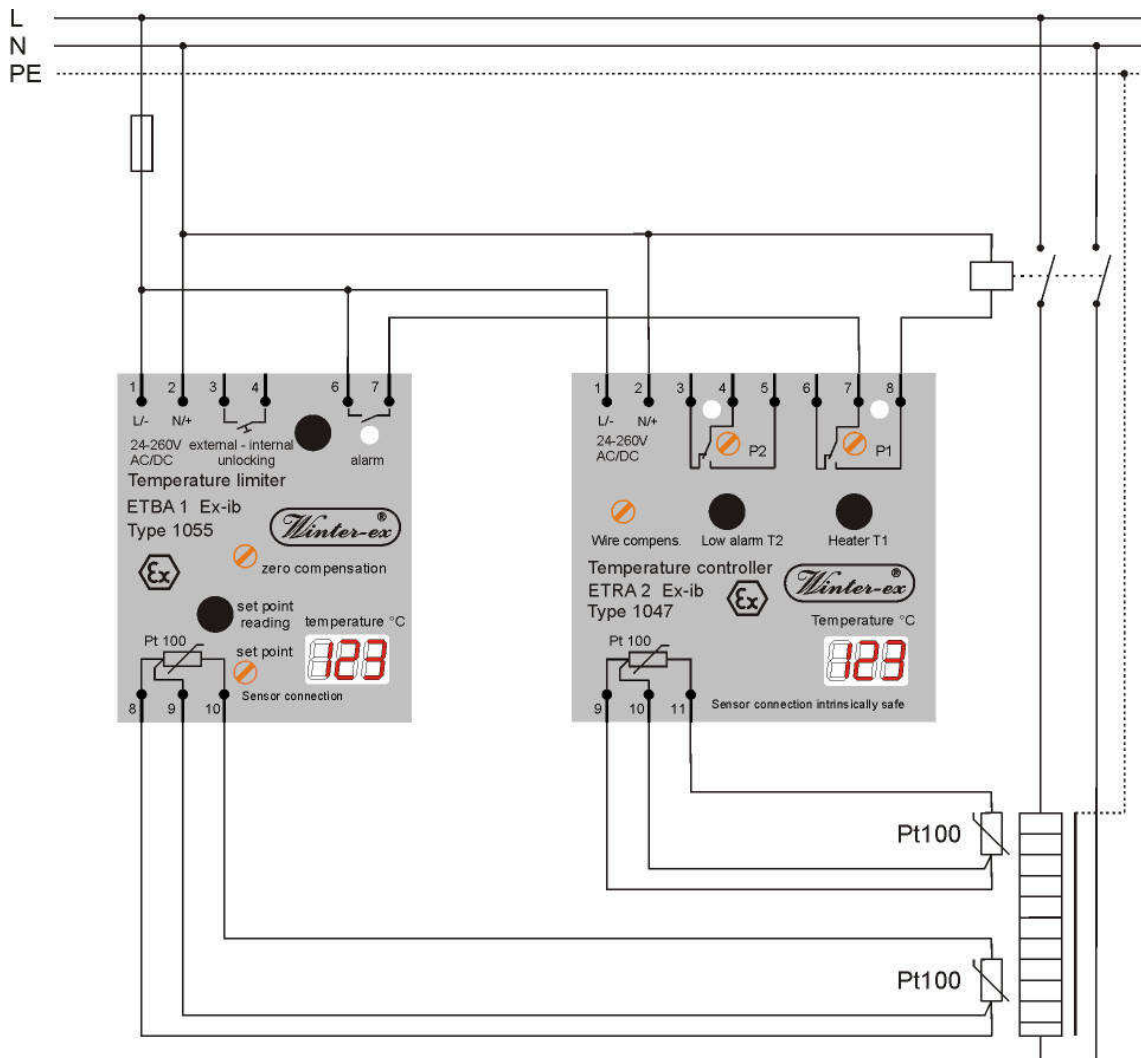
Installation- and operating instructions

Initial power up

1. Connect temperature sensor Pt100 at terminals 9, 10, 11.
2. Connect power supply to terminals 1, 2.
3. **ETBA 1:** Press button **set point** and adjust limit temperature with screwdriver at trimmer **set point**. Press button **unlocking**; relay contact indicator LED switches off, ETBA 1 Ex-ib is ready to operate.
4. **ETRA 2:** Press button **Heater T1** and adjust heater temperature with screwdriver at trimmer **P1**. Press button **low alarm T2** and adjust limit temperature with screwdriver at trimmer **P2**.

If 2-wire connection is used, terminals 9 + 10 must be connected. Temperature sensor must be connected to terminal 10 + 11.

The circuit diagram shows the ETRA 2 Ex-ib type 1047 in a heating control.



Technical data are subject to change

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The circuit diagram shows the ETRA 2 Ex-ib type 1047 in a heating control with SM 1 type 1055 to control SSR.

The SM1 supplies a control voltage of 10V.

