



## Electronic Temperature Limiter ETBA 1 Ex-ib Type 1055

# Wiring 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 Limiters ETBA 1 Ex-ib Type 1055 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**

### Features

- use in flame proof areas [Ex ib] IIC and [Ex ib] IIB
- range 0...450°C
- connection to resistance temperature sensor Pt100 or Ni100 in 3- or 2-wire configuration
- adjustment of switch point with tool only (screwdriver)
- limiter alarm shown by LED
- temperature and temperature sensor alarm (shortage or breakage) shown by 7-segment LED display
- unlock at device or remote
- no unlock necessary after breakdown of power supply
- extended range power supply 24 - 265V AC/DC
- strong makrolon housing IP20 for snap mounting on standard rail or screw mounting

### Function

ETBA 1 Ex-ib Type 1055 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.

The limit is adjusted by potentiometer „**set point**“.

Whenever the measured temperature is higher than the adjusted switching temperature, the main circuit will be opened and locked. Unlock is possible with the unlock switch at the ETBA or remote controlled.

If the temperature sensor is not connected or the connection is broken, the main circuit will be opened and locked. Failure of supply voltage will open the main circuit but not lock the ETBA. After a failure of supply voltage the ETBA switches into the same condition as before the supply voltage failure.

The potentiometer „**zero compensation**“ is used with a 100Ω resistor to adjust to 0°C, which is useful with 2-wire configuration.



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### Temperature sensor monitoring

The ETBA 1Ex-ib type 1055 permanently monitors the temperature sensor, displays faults and records faults. Temporarily occurring faults are displayed as F1 to F5 when fault free operation continues. The display of previous faults is reset with the button „**internal unlocking**“.

The ETBA 1Ex-ib type 1055 displays faults as:

<i>Short circuit of sensor i.e. <math>T &lt; -100^{\circ}\text{C}</math></i>	<i>signal internal signal external</i>	<i>- LED-display switching with „---“ - opens main circuit, temperature limiter locks</i>
<i>breakage i.e. <math>T &gt; 532^{\circ}\text{C}</math></i>	<i>signal internal signal external</i>	<i>- LED-display switching with „UUU“ - opens main circuit, temperature limiter locks</i>
<i>breakage (sense-wire ) i.e. <math>T &gt; 532^{\circ}\text{C}</math></i>	<i>signal internal signal external</i>	<i>- LED-display slowly switching with „UU“ - opens main circuit with locking</i>
<i>sensor wiring &gt; 22 Ohm</i>	<i>signal internal signal external</i>	<i>- LED-display switching displaying temperature - opens main circuit with locking</i>

<i>LED-display „F1 “</i>	<i>Limiter exceeded temperature limit Reset with button „<b>unlocking</b>“</i>
<i>LED-display „F2 “</i>	<i>Limiter had sense wire short circuit Reset with button „<b>unlocking</b>“</i>
<i>LED-display „F3 “</i>	<i>Limiter had temperature sensor wire interruption Reset with button „<b>unlocking</b>“</i>
<i>LED-display „F4 “</i>	<i>Limiter had sense wire interruption Reset with button „<b>unlocking</b>“</i>
<i>LED-display „F5 “</i>	<i>Limiter had temperature sensor wire &gt; 22Ω Reset with button „<b>unlocking</b>“</i>

### Approvals

- flame proof
  - EC Baumusterprüfbescheinigung TÜV 08 ATEX 554381 ben. 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

### Technical Data

Supply voltage	24V..265V AC(50/60Hz)/DC
Power consumption	app. 3VA



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Sensor loop intrinsically safe	[Ex ib] IIC $U_0 = 2,6V$ , $I_0 = 6.8mA$ , max. external capacity <b>6.7<math>\mu</math>F</b>
	[Ex ib] IIB $U_0 = 2.6V$ , $I_0 = 6.8mA$ , max. external capacity <b>36<math>\mu</math>F</b>
	max. external inductance <b>50mH</b>
	max. external inductance <b>50mH</b>
Temperature sensor	The ETBA 1 Ex-ib may be used with all common Pt100 sensors
Relais out limiter	1 N.C. 6 A, 250 V~ $\cos \varphi \geq 0,7$ or 6 A, 24 V DC fuse 5A internal, must be changed <u>only</u> by manufacturer.
Accuracy of switching	< 1°C
Additional safety	range < 100 °C: switch point 2°C from adjusted temperature range > 100 °C: switch point 2% from adjusted temperature
displayed range	actual value : -99...460 °C, set point : -4...460 °C
Remote unlock	switch shortens contact 3 and 4; switch must be capable of 230 V~, 0,1A <b>Attention!</b> Contact 3 and 4 carry 230V~
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 <sup>2</sup>
Size	45 x 75 x 110mm
Mounting	any
Weight	app. 200 g

### Accessories:

Temperature sensor 2/15, type 1048, $T_{max}$ 450°C, Pt100	Order Nr.: 1048001
Temperature sensor 3/10, type 1049, $T_{max}$ 450°C, Pt100	Order Nr.: 1049001

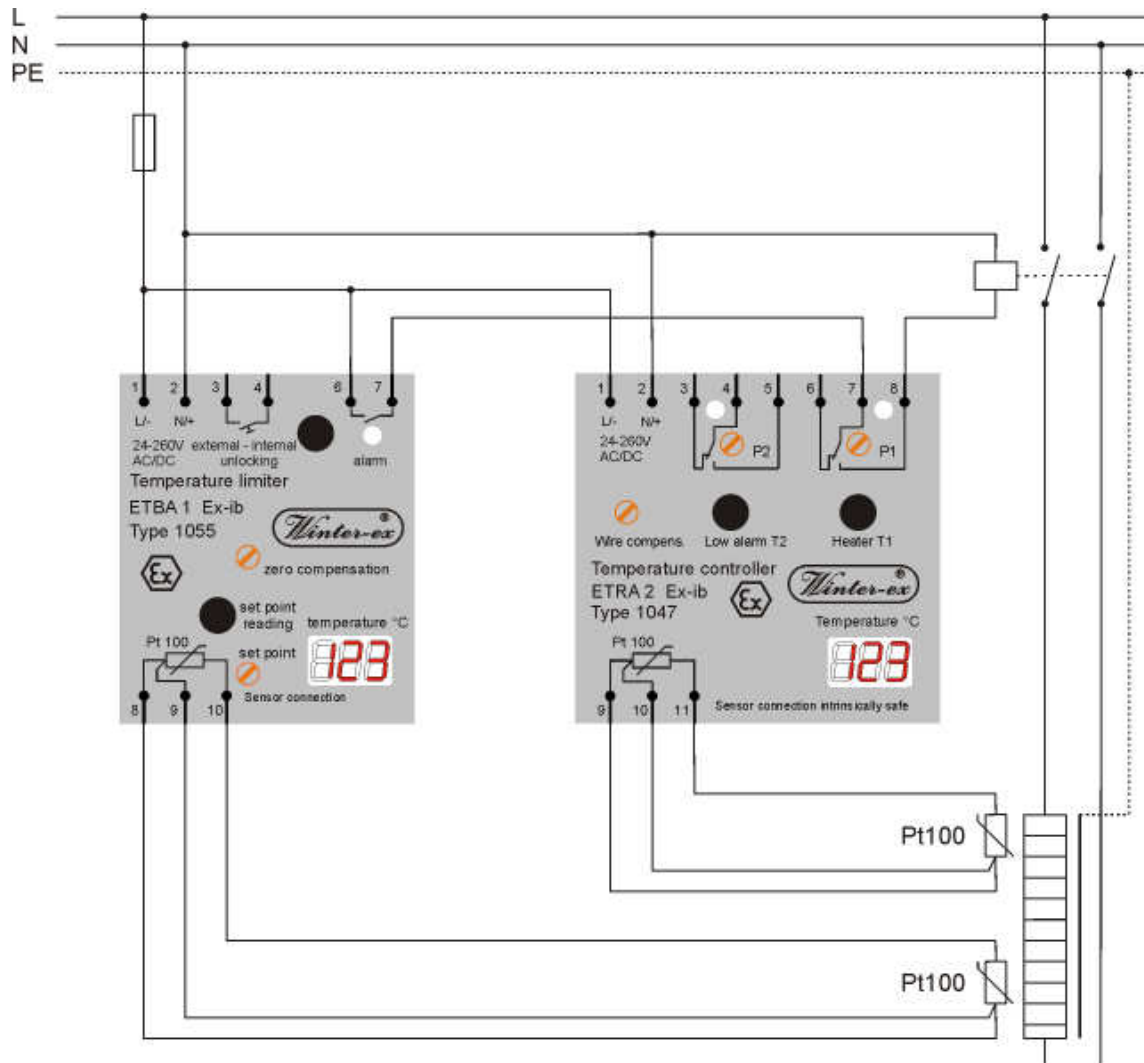
### Connections

Terminal 1, 2:	power supply 24V..265 V AC(50/60Hz)/DC
Terminal 3, 4:	remote unlock
Terminal 6, 7:	relay out, N.C., opens and locks if adjusted temperature limit is exceeded
Terminal 8, 9, 10:	temperature sensor Pt 100 (3-wire with intrinsically safe Ex-i-current loop)



## Wiring and Operating Instructions

The circuit diagram shows the ETBA 1 Ex-ib type 1055 in a heating control



### Initial power up

1. Connect temperature sensor (Pt100 or Ni100) at terminals 8, 9, 10
2. Connect power supply to terminals 1, 2
3. Press switch „set point reading“ and adjust limit temperature with screwdriver at trimmer „setpoint „
4. Press „unlocking“; relay contact indicator LED switches off, ETBA 1 Ex-ib is ready to operate

If 2-wire connection is used, terminals 8 + 9 must be connected. Temperature sensor must be connected to terminal 9 + 10