



# Ex – heating controller FTSR-1 type 1130/1131

## Installation- and operating instructions

Before installation and use read this manual!

### General safety advice

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

The regulations of IEC 60364-1 must be observed.

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).

For damage caused by external forces or other external factors, the manufacturer is not responsible!

Use only units from original packings and free of damage.

Manipulation of the unit is prohibited and excludes warranty. Repairs are only allowed by the manufacturer.

### Description

Ex – heating controller FTSR-1 type 1130/1131 are used with resistance temperature sensors (PT100 DIN) for the temperature control of devices in flame proof areas.

The device operates as a two-position controller with relay output load.

Flame proof according to RL94/9/EG, EN 60079-0, IEC 60079-0, EN 60079-7, IEC 60079-7, EN 60079-11, IEC 60079-11, EN 60079-18, IEC 60079-18, EN 60079-30-1, IEC 60079-30-1, EN 60079-31, IEC 60079-31 and EMI-shielding NAMUR NE21

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Am Schlörbach 14, D-38723 Seesen

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Beheizungssteuerung FTSR-1 Baureihe 1130  
Heating Controller FTSR-1 Type 1130

Baujahr/Year of manufacture : 2012  
Fertigungs-Nr./Serial-No. : <sernr>

U Nenn/U nom : 60...253V, 50...60Hz  
I Nenn/I nom : 25A/16A  
externe Absicherung/  
ext. circuit breaker : 25A/16A Si-Automat

Abschaltvermögen  
Breaking capacity : 6kA, cosφ > 0.7

Arbeitsbereich/  
Measuring range : 0...+450°C

T Umg./T amb. : -20...40°C < 25A  
-20...55°C < 16A

Schutzgrad/Protection : IP66

CE 0044 II 2 G Ex e ib mb IIC T4 Gb  
II 2 D Ex tb IIIC T90°C Db

ZELM 12 ATEX 0497 X  
IECEX ZLM 13.0001 X

Meßkreis eigensicher:  
measuring circuit intrinsically safe:  
U<sub>0</sub>= 5.9V, I<sub>0</sub>= 14mA, P<sub>0</sub>= 21mW  
für/for Ex ib IIC: max. C<sub>0</sub>= 42µF, max. L<sub>0</sub>= 89mH  
für/for Ex ib IIB: max. C<sub>0</sub>= 1000µF, max. L<sub>0</sub>= 725mH

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Beheizungssteuerung FTSR-1 Baureihe 1131  
Heating Controller FTSR-1 Type 1131

Baujahr/Year of manufacture : 2012  
Fertigungs-Nr./Serial-No. : <sernr>

U Nenn/U nom : 60...253V, 50...60Hz  
I Nenn/I nom : 25A/16A  
externe Absicherung/  
ext. circuit breaker : 25A/16A Si-Automat

Abschaltvermögen  
Breaking capacity : 6kA, cosφ > 0.7

Arbeitsbereich/  
Measuring range : 0...+450°C

T Umg./T amb. : -55...40°C < 25A  
-55...55°C < 16A

Schutzgrad/Protection : IP66

CE 0044 II 2 G Ex e ib mb IIC T4 Gb  
II 2 D Ex tb IIIC T90°C Db

ZELM 12 ATEX 0497 X  
IECEX ZLM 13.0001 X

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Technical data are subject to change.

03/15

Böhm Feinmechanik und Elektrotechnik, Am Schlörbach 14, 38723 Seesen-Rhüden  
Tel. 05384/216, Fax 05384/296, e-mail: info@winter-ex.de, www.winter-ex.de



## Ex – heating controller FTSR-1 type 1130/1131

### Installation- and operating instructions

#### General Mounting Instructions

- IEC 60079-14 has to be observed
- National regulations must be observed, device must be fixed with all 4 fixing points to the support frame
- Any kind of device manipulation is impermissible
- Connect the PE terminal to the enclosure cover
- The terminal cover also serves as protection against contact and must be mounted during operation
- The cable glands connections must match the cables/lines
- Cables and lines must be firmly routed

#### Characteristics

- Application area II 2 G Ex e ib mb IIC T4 Gb und II 2 D Ex tb IIIC T90°C Db
- Measuring range 0...450°C
- Intrinsically safe and galvanic isolation connection of the Pt100 DIN EN 60751 (IEC 60751) resistance thermometer in 3- or 2-wire circuit
- Green-LED-indication of the main contactors switching position
- Red-LED-indication of the alarm switching position
- Measured temperature value displayed with 7-segment-LED's
- Signalling of sensor break and sensor short-circuit
- Power supply 60V...253V~ 50/60 Hz
- Solid aluminium standard enclosure IP66 for mounting on base plate
- Fuse for the control circuit is internally accessible via terminal
- Lower Ambient temperature to -55°C for type 1131



# Ex – heating controller FTSR-1 type 1130/1131

## Installation- and operating instructions

### Function

FTSR-1 type 1130 are main part of an electrical heating control witch is typically installed in flame proof areas. Temperature sensors work in an intrinsically safe electric circuit. Measured values are processed in micro controllers.

#### 1. Temperature Controller

All functions are implemented using a mechanical rotary encoder with push button function. With a short press the 7-segment display changes cyclically between the three types: actual temperature, Set-1 (heating) and Set-2 (low alarm). Above Setpoint 1 (heating) Setpoint 2 operates as a high alarm. Two yellow LEDs indicate the respective mode. If none of these LEDs lit, the device is in actual temperature display mode. An extended (3s) push (both LEDs light up briefly) guides to the settings menu. Here the value to be set by the blinking LED is signaled. A short press changes the setting of the setpoint-1 (heating) to the desired value-2 (low level alarm) or back. A long (3s) push exits from the setup menu (both LEDs light up briefly). The sum alarm is supplied to the floating terminals 3, 4 (opens in error) and the main circuit is opened. An error condition is indicated by the red LED.

#### 2. power output

The power part consists of a single-phase high-performance relay output, the switching state is indicated by the green LED. It can switch nominal loads up to 25A. The increased starting current of self-limiting heating cables has to be obeyed particularly at low temperatures. Load circuits with self-limiting heating cable and 20A rated current can be operated. The heating circuit is externally protected with a 16/25A circuit breaker. The internal control circuit fuse can be replaced by an appropriate certified fuse on the terminal strip. (eg type GS5 Series 1080, available at Böhm).

### Measuring Circuit Monitoring

The temperature sensor system is monitored:

<i>Short-circuit of the sensor line or <math>T &lt; -100^{\circ}\text{C}</math></i>	<i>Internal signal</i>	<i>- LED display flashes with “---” value</i>
	<i>External signal</i>	<i>- Opens load- and alarm circuit</i>
<i>Line break of the sensor line or <math>T &gt; 450^{\circ}\text{C}</math></i>	<i>Internal signal</i>	<i>- LED display flashes with the “UUU” value</i>
	<i>External signal</i>	<i>- Opens load- and alarm circuit</i>
<i>Sensor line <math>&gt; 22\ \text{Ohm}</math></i>	<i>Internal signal</i>	<i>- LED display flashes with the “===” value</i>
	<i>External signal</i>	<i>- Opens load- and alarm circuit</i>

### Tests

- Explosion protection: - EG Examination certificate ZELM 12 ATEX 0497 X, IECEx ZLM 13.0001 X  
- Ex-proof general EN 60079-0:2009, IEC 60079-0 Ed. 6  
- Ex-proof intrinsic safety EN 60079-11:2007, IEC 60079-11 Ed. 6  
- Ex-proof increased safety EN 60079-7:2003, IEC 60079-7 Ed. 4  
- Ex-proof encapsulation EN 60079-18:2010, IEC 60079-18 Ed. 3  
- Ex proof electrical trace heating EN 60079-30-1, IEC 60079-30-1 Ed. 1  
- Ex-proof dust EN 60079-31:2009, IEC 60079-31 Ed. 1
- EMI shielding: - EMI-tested  
- Namur NE 21 Prüfkriterium A
- Additional test: each device checked after thermal treatment according to BÖHM BV 010403a

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### Installation- and operating instructions

#### Technical Data

Supply voltage:	60 – 253V~ / 50-60Hz
External protection:	25A circuit-breaker (16A at +55°C)
Power consumption:	≤ 5VA (no load)
Mounting position:	Wall-mounting
Intrinsically safe measuring Circuit:	Ex ib IIC U <sub>o</sub> = 5,9 V, I <sub>o</sub> = 14 mA, P <sub>o</sub> = 21mW max. C <sub>o</sub> = 42 µF, max. L <sub>o</sub> = 99 mH Ex ib IIB U <sub>o</sub> = 5,9 V, I <sub>o</sub> = 14 mA, P <sub>o</sub> = 21mW max. C <sub>o</sub> = 1000 µF, max. L <sub>o</sub> = 725 mH
Temperature sensor:	Resistance thermometer in industrial version Pt100 DIN in 3- or 2-wire circuit See Electrical Data at CoC resp. EC-type examination certificate.
Relay output alarm:	1 CO contact 5A, 250 V~, 100VA or 5A, 24 V DC, 100W
Setting range controller T1:	0...450°C
Setting range alarm T2:	-30...450°C (low alarm: below T1, high alarm: above T1)
display range:	actual temperature: -99...450°C
Switching point accuracy:	< 1K
Controller hysteresis:	2K
Ambient temperature:	type 1130 -20...40°C < 25A, ...55°C < 16A type 1131 -55...40°C < 25A, ...55°C < 16A
Storage temperature:	-55°C...70°C
Enclosure:	aluminium, mounting on base plate
Degree of protection:	EN 60529 (IEC 60529) IP66
Terminals: (Conductor cross-section)	Infeed 0.5...6 mm <sup>2</sup> (to 4 mm <sup>2</sup> with end sleeve) Load output 0.5...6 mm <sup>2</sup> (to 4 mm <sup>2</sup> with end sleeve) Sensors 0.2...4 mm <sup>2</sup> (to 2,5 mm <sup>2</sup> with end sleeve) Reset/rel. Output 0.2...4 mm <sup>2</sup> (to 2,5 mm <sup>2</sup> with end sleeve)
Dimensions:	(160 x 160 x 105)mm
Weight:	app. 2,5 kg



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#### Electrical Connection / Device Connections

Terminals F1:	fuse GS5, rated value: T125mA (use only if original fuse is blown)
Terminals L1, N, PE:	power supply, bonding (or on the outside of PE)
Terminals 1, 2:	load circuit
Terminals 3, 4:	output group fault
Terminals 5, 6, 7:	thermistor Pt 100, 3-wire connection, intrinsically-safe (when 2-wire connection, terminal 5 and 6 connect)

#### Cable glands for Type 1130

- 1x M25 power supply (11,5 – 15,5mm)
- 1x M25 heating cable (2 x 4,5 - 7mm)
- 1x M16 alarm output (7,0 - 10,5mm)
- 1x M16 temperature sensor cable (3 - 6mm)

#### Cable glands for Type 1131 (-55°C)

- 1x M25 power supply (11,5 – 15,5mm)
- 1x M25 heating cable (11,5 - 15,5mm)
- 1x M16 alarm output (6,0 - 12mm)
- 1x M16 temperature sensor cable (2 - 6mm)



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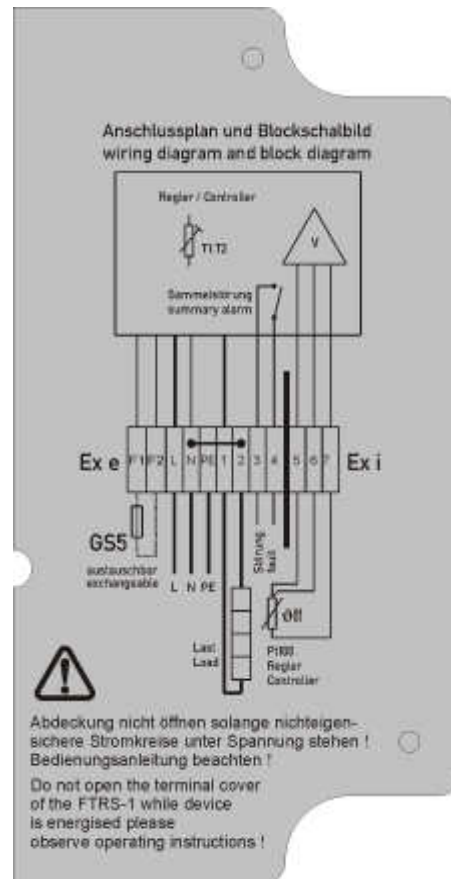


Fig. 1 Terminal cover

### Start up of temperature controller

#### Connections:

1. Connect temperature sensors (Pt100) at terminals 5 to 7.
2. If needed connect output group fault.
3. Connect supply voltage and load circuit.

#### Set switchpoint Maintain temperature:

Press encoder button for 3 second.  
Heating LED flashes, set value by turning button.  
Acceptance of the value by pressing the encoder button.

#### Set switchpoint Alarmtemperature:

Low alarm LED flashes, set value by turning button.  
Set and exit from the menu by pressing the encoder button 3 seconds.



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Fig. 2 Front panel



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Fig. 3. Cable gland



Fig. 4. Dimensions

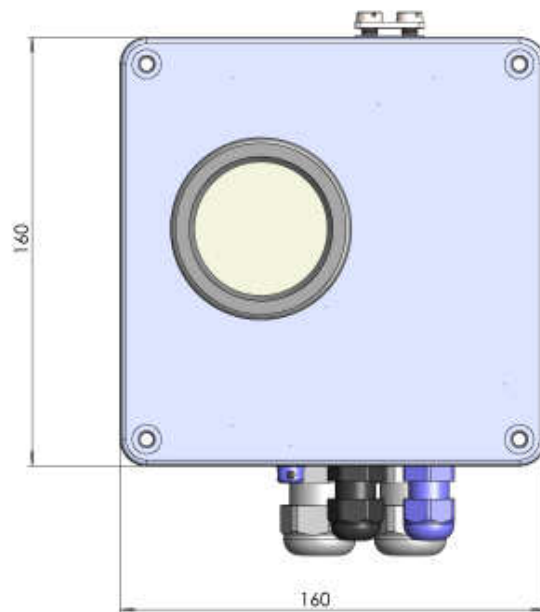
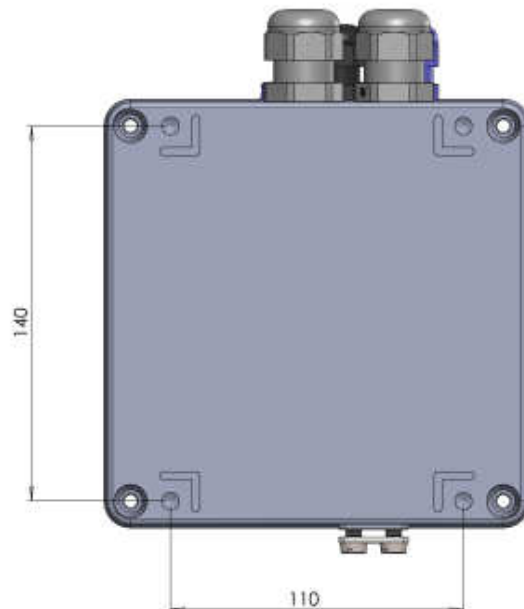


Fig. 5. Fixing



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