



## Ex Heating Controller FRBL-1 type 1081

# Installation- and operating instructions

Before installation and use read this manual!

### General safety advice

This device 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 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).

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.

### Description

The FRBL-1 type 1081 is to be used with resistance temperature sensors (PT100 DIN) for the temperature control and limitation of devices in ATEX areas.

The device also comprises the power section in form of a full-wave control.

ATEX according to RL94/9/EG, EN 60079-0, EN 60079-7, EN 60079-11, EN 60079-18 EN 60079-31 and EMI-shielding NAMUR NE21



Böhm Feinmechanik & Elektrotechnik  
Am Schlörbach 14, D-38723 Seesen

Beheizungssteuerung FRBL-1 Baureihe 1081

Heating Controller FRBL-1 Type 1081

Baujahr/Year of manufacture : 2014

Fertigungs-Nr./Serial-No. : <Sernr>

U Nenn/U nom : 230V, -15%/+10%, 50...60Hz

I Nenn/I nom : 25A

externe Absicherung/  
ext. circuit breaker : 25A Si-Automat. s. Bedienungsanleitung  
note operation manual

Abschaltvermögen

Breaking capacity : 6kA,  $\cos\phi > 0.7$

Arbeitsbereich/  
Measuring range :

0...+450°C

Schutzgrad/Protection : IP64



0044



II 2 G Ex e ib [ib Gb] mb IIC T4 Gb  
TÜV 03 ATEX 2078 II 2 D Ex tb IIIC IP 6X T90 °C Db

Meßkreis eigensicher / measuring circuit intrinsically safe:  $U_0=6.3V$ ,  $I_0=22mA$ ,  $P_0=35mW$

für Ex ib IIC gilt: max.  $C_0=1.5\mu F$ , max.  $L_0=10mH$

für Ex ib IIB gilt: max.  $C_0=8.2\mu F$ , max.  $L_0=10mH$

**Nicht in explosionsfähiger Staubatmosphäre öffnen!**

**Not open in a location with explosive dust atmosphere!**

### General Mounting Instructions

- Device according to protection class I
- EN 60079-14 has to be observed
- DIN VDE 0100 has to 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

Technical data are subject to change.

09/14

Böhm Feinmechanik und Elektrotechnik, Am Schlörbach 14, 38723 Seesen-Rhüden  
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## Ex Heating Controller FRBL-1 type 1081

# Installation- and operating instructions

### Characteristics

- Application area II 2 G Ex e ib [ib Gb] mb IIC T4 Gb and II D Ex tb IIIC IP 6X T90 °C Db
- Measuring range of temperature controller and temperature limiter 0...450°C
- Intrinsically safe and galvanic isolation connection of the Pt100 DIN EN 60751 resistance thermometer in 3- or 2-wire circuit
- Setting of the switching point by means of a screwdriver
- Measured value processing via a micro controller
- Greener-LED-indication of the main contactors switching position
- Measured value display via 7-segment-LED-display for controller and limiter
- Signalling of sensor break and sensor short-circuit
- Reset of the limiter at the device or externally
- After power failure no reset required
- Power supply 230V~ 50/60 Hz (optional 254V)
- No disadvantage effect to the power supply because of full wave control with SSR (solid-state relay)
- Solid aluminium standard enclosure IP64 for mounting on base plate

### Function

FRBL-1 type 1081 is an electrical heating controller which is typically installed in ATEX areas.

Temperature sensors work in an intrinsically safe electric circuit.

Measured values are processed in separate micro controllers for temperature controller and temperature limiter.

#### 1. Temperature Limiter

The indicated limit value is adjusted with the potentiometer **Set Point** to the desired value while the pushbutton **Set Point** is pressed.

As soon as the sensor temperature exceeds the set limit value, the load circuit is opened and interlocked (red LED on). The interlocking can be reset by an internal reset button.

In case of a line break, short circuit or if no sensor (Pt100) has been connected, the load circuit is opened and interlocked.

If the supply voltage fails, the power supply of the circuit to be limited is also interrupted. After the supply voltage has been restored, the device returns to the condition it was in before the supply voltage failure.

#### 2. Temperature Controller

Upon operation of the pushbuttons **T1** or **T2**, the corresponding set point is displayed.

The potentiometers **T1 Maintain temperature** and **T2 Alarmtemperature** allow for a separate setting of switching points.

heating switching point: set point T1; Maintain temperature

temperature alarm: set point T2; Alarmtemperature      Terminals 3, 4, 5 (changeover)

In case of a line break or a short-circuit of the temperature sensor, the main circuit is opened and the fault is displayed.

#### 3. Power control

The power control unit consists of a main relay and full wave control with zero crossing switching.

The output power may be adjusted in 10% steps from 10% to 100%

Adaptation to different trace heating cables and length is possible.

External protection of the Heating circuit by a 25A circuit breaker.

The cable connection must be stationary.

The device is equipped with an internal self resetting temperature switch, which triggers at 90°C.

The operator himself can replace the control circuit fuse GS5 type 1080.



## Ex Heating Controller FRBL-1 type 1081

# Installation- and operating instructions

### Measuring Circuit Monitoring

With the FRBL-1, the temperature sensor systems of the controller and the limiter are both monitored in the same way:

<i>Short-circuit of the sensor line or <math>T &lt; -100^{\circ}\text{C}</math></i>	<i>Internal signal - LED display flashes with “---” value External signal - Opens load circuit (limiter with interlocking)</i>
<i>Line break of the sensor line or <math>T &gt; 532^{\circ}\text{C}</math></i>	<i>Internal signal - LED display flashes with the “UUU” value External signal - Opens load circuit (limiter with interlocking)</i>
<i>Line break of the sensor line with 3-wire connection</i>	<i>Internal signal - LED display flashes with the “UU” value External signal - Opens load circuit (limiter with interlocking)</i>
<i>Sensor line <math>&gt; 22\ \Omega</math></i>	<i>Internal signal - LED display flashes with measured value External signal - Opens load circuit (limiter with interlocking)</i>

### Tests

- Explosion protection:
  - EC-Type Examination Certificate TÜV 03 ATEX 2078 ben. Stelle 0044
  - Ex-proof general EN 60079-0:2009
  - Ex-proof intrinsic safety EN 60079-11:2007
  - Ex-proof increased safety t EN 60079-7:2003
  - Ex-proof encapsulation EN 60079-18:2004
  - Ex-proof equipment dust EN 60079-31:2009
- EMI shielding:
  - EMI-tested
  - Namur NE 21 Prüfkriterium A
- Additional test: each device checked after thermal treatment according to BÖHM confidential instruction BV 010403a

### Technical Data

Supply voltage:	195,5 – 253V~ 50-60Hz
External protection:	25A circuit-breaker, type A, B, C (Siemens), or Z, B, C (ABB)
Power consumption:	$\leq 11\text{VA}$ (without load)
Mounting position:	Wall-mounting
Intrinsically safe measuring circuit:	[Ex ib] IIC $U_0 = 6,3\text{ V}$ , $I_0 = 22\text{ mA}$ , max. $C_0 = 1,5\ \mu\text{F}$ , max. $L_0 = 10\text{ mH}$ [Ex ib] IIB $U_0 = 6,3\text{ V}$ , $I_0 = 22\text{ mA}$ , max. $C_0 = 8,2\ \mu\text{F}$ , max. $L_0 = 10\text{ mH}$
Temperature sensor:	Resistance thermometer in industrial version Pt100 DIN
Relay output alarm:	1 NC contact 5A, 250 V~, 100VA or 5A, 24 V DC, 100W
Limiter switching point shift related to the set point:	tripping value $2^{\circ}\text{C}$ <b>below</b> the defined set point
Setting range limiter/controller T1:	0...450°C
controller low alarm T2:	-30...+430°C
indicating range:	actual value: -99...460°C
Switching point accuracy:	$< 1\text{K}$
Controller hysteresis:	2K
Ambient temperature:	-20...+40°C

Technical data are subject to change.

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## Ex Heating Controller FRBL-1 type 1081

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Degree of protection:	EN 60529 IP64		
Terminals: (Conductor cross-section)	Infeed 0.5...6 mm <sup>2</sup> Load output 0.5...6 mm <sup>2</sup>	Reset/rel. Output Sensors	0.2...4 mm <sup>2</sup> 0.2...4 mm <sup>2</sup>
Enclosure:	aluminium, mounting on base plate, cover screw torque 3,0-3,5 Nm		
Dimensions:	260 x 160 x 135mm		
Weight:	app. 6,0 kg		

### Electrical Connection / Device Connections

Terminals F1, F2 :	fuse GS5 (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, 5 :	output group fault
Terminals 6, 7 :	remote unlocking
Terminals 8, 9, 10 :	resistance thermometer Pt 100 controller, 3-wire connection, intrinsically-safe
Terminals 11, 12, 13 :	resistance thermometer Pt 100 limiter, 3-wire-connection, intrinsically-safe

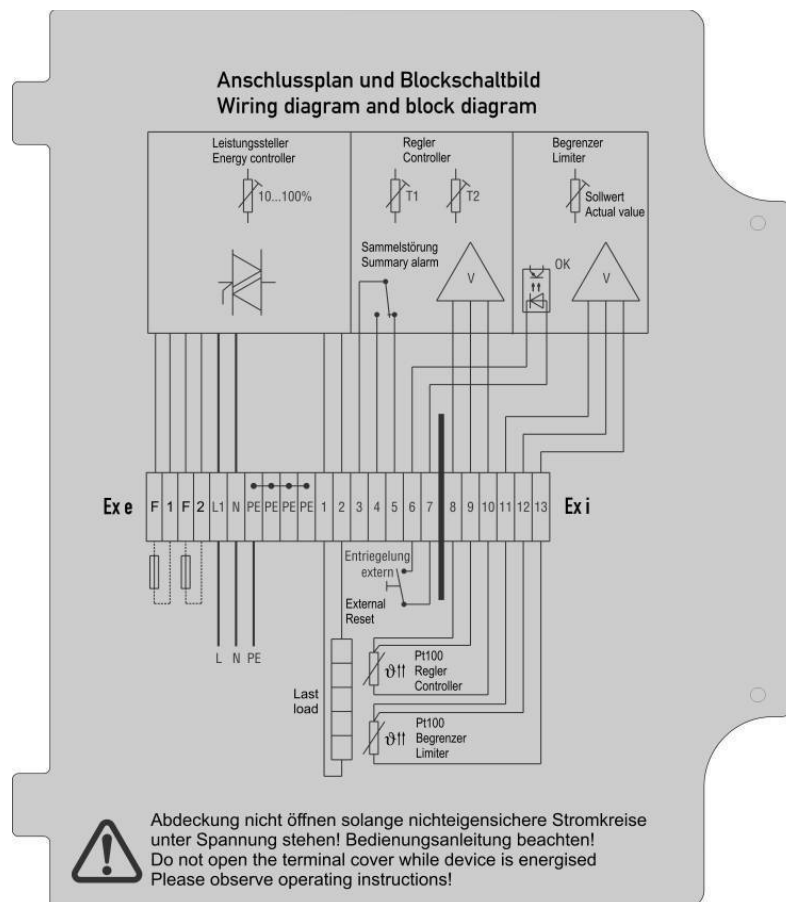


Fig. 1: Terminal cover

Technical data are subject to change.

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## Ex Heating Controller FRBL-1 type 1081

# Installation- and operating instructions

### Start up of temperature controller/limiter

#### Connections:

1. Connect temperature sensors (Pt100) at terminals 8 to 13.
2. If needed connect output group fault and external reset.
3. Connect supply voltage and load circuit.

#### Limiter:

Press button **Setpoint** and set limit with screwdriver at potentiometer **Setpoint**.  
Limiter is interlocked, then press reset.  
Red LED **Alarm** turns off, limiter closes load circuit.

#### Temperature controller:

Set switchpoint Maintain temperature:

Press button **T1** and set switchpoint with screwdriver at potentiometer **T1 Maintain temperature**, if temperature < switchpoint green LED turns on (heating is working).

Set switchpoint Alarmtemperature:

Press button **T2** and set switchpoint with screwdriver at potentiometer **T2 Alarmtemperature**, switchpoint has to be < temperature, otherwise output group fault will be active.

When using the Pt100 two-wire circuit, a line compensation is required.  
A respective manual is available from Böhm.

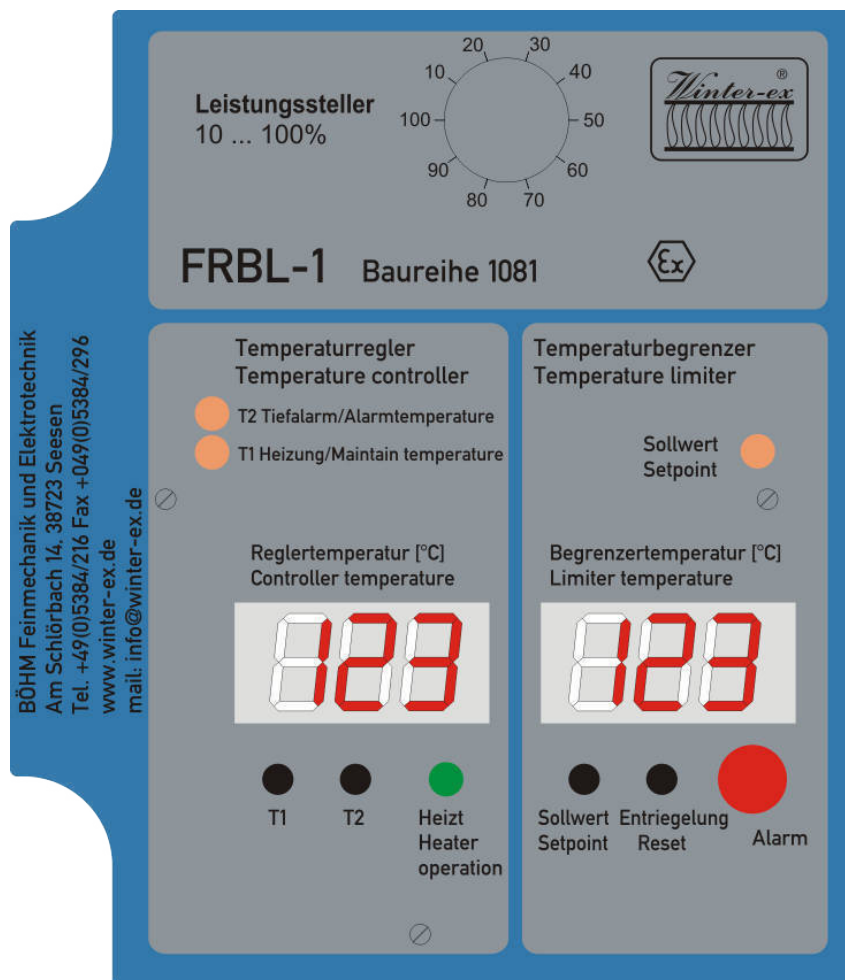


Fig.2: Front-Panel

Technical data are subject to change.

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## Ex Heating Controller FRBL-1 type 1081

### Installation- and operating instructions

Fig. 3: Cable gland

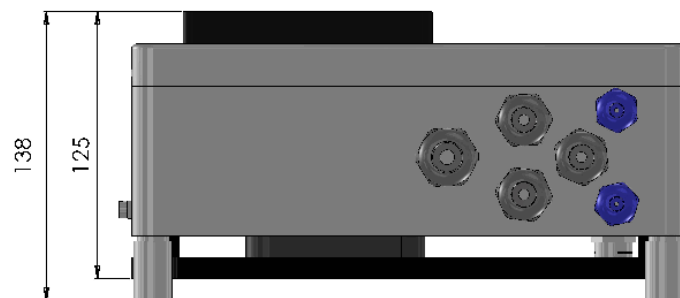


Fig. 4: Dimensions

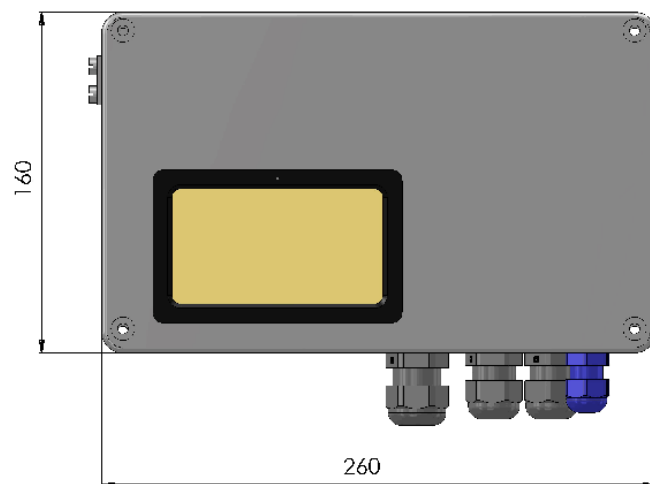
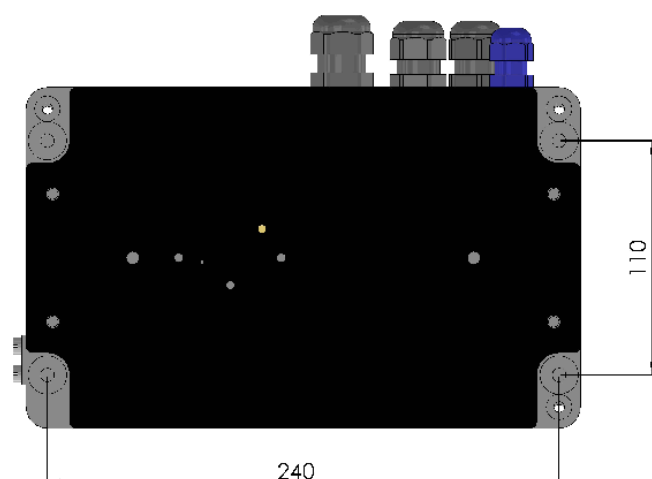


Fig. 5: Fixing



Technical data are subject to change.

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Translation

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - **Directive 94/9/EC**



(3) EC-Type Examination Certificate Number

**TÜV 03 ATEX 2078**

(4) Equipment: Ex heating control type FRBL-1, series 1057/1058

(5) Manufacturer: Böhm Feinmechanik und Elektrotechnik Betriebs – GmbH

(6) Address: Am Schlörbach 14  
D-38723 Seesen-Rhüden

(7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH & Co. KG, TÜV CERT-Certification Body, notified body number N° 0032 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report N° 03 YEX 550258.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN 50014:1997+A1+A2    EN 50019:2000    EN 50 020:2002    EN 50 028:1987**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

 II 2 G EEx m e Ib [Ib] IIC T4

TÜV NORD CERT GmbH & Co. KG  
TÜV CERT-Certification Body  
Am TÜV 1  
D-30519 Hannover  
Tel.: 0511 986-1470  
Fax: 0511 986-2555

Hanover, 2005-03-07



**TÜV NORD CERT**

Head of the   
Certification Body



(13)

## SCHEDULE

### (14) EC-TYPE EXAMINATION CERTIFICATE N° TÜV 03 ATEX 2078

#### (15) Description of equipment

The Ex heating control type FRBL-1, series 1057/1058 in conjunction with a PTC resistance thermometer is used for the control and limitation of the temperature of equipment in hazardous explosive areas which require apparatus of category 2.

#### Electrical Data

Supply voltage ..... (Connection L1, N, PE)	Un = 230 V, -15%/+10%, 50 ... 60 Hz
Load circuit ..... (Connection 1 and 2)	for the connection of the heating facility
External unlocking ..... (Connection 6 and 7)	connected with the supply circuit; only to connect a key switch (250 V AC, 0,1 A)
Output temperature alarm..... (connection 3, 4 and 5)	1 change over contact; permissible values: 250 V AC, 5A, 100 VA or 24 V DC, 5A, 100 W
Measurement circuit ..... (connection 8, 9, 10 [control unit] and 11, 12, 13 [limiter] )	in type of protection Intrinsic Safety EEx ib IIC/IIB  Maximum value per circuit: U <sub>o</sub> = 6,3 V I <sub>o</sub> = 22 mA P <sub>o</sub> = 35 mW characteristic line: linear only for the connection of Pt100-resistance thermometer.

EEx ib	IIC	IIB
maximum outer inductance	50 mH	200 mH
maximum outer capacitance	31 µF	720 µF

The intrinsically safe measurement circuits are safely galvanically separated from all other non-intrinsically safe circuits up to a surely electrically isolated up to a maximum value of 375 V from the not-intrinsically safe electric circuits. The intrinsically safe measure circuits are surely separate from the earth potential.

special conditions for safe use:

The resistance thermometer PT 100, that is connected on the intrinsic safety circuit is an simple electrical system and has to be rate by the EN 50020 article 5.4.





(16) Test documents are listed in the test report No.: 03YEX550258.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones



**1. SUPPLEMENT**  
to  
**Statement of Conformity No. TÜV 03 ATEX 2078**

Of the company: Böhm Feinmechanik und Elektrotechnik Betriebs - GmbH  
Am Schlörbach 14  
D-38723 Seesen-Rhüden

The explosion-protected heating controls, type FRBL-1, series 1057/1058, may in future also be manufactured and operated in accordance with the documentation listed below.  
The modifications concern the connection area and the fuses and resistors for the transformers.

The electrical data and all other specifications remain unchanged for this 1. Supplement.

The individual testing steps are documented in the confidential test report 03YEX550655a.

TÜV NORD CERT GmbH & Co. KG  
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Tel.: 0511 986-1470  
Fax: 0511 986-2555

Hannover, 2005-03-07

A handwritten signature in black ink, appearing to read 'Stüwe'.

Der Leiter



**2. SUPPLEMENT**  
to  
**Statement of Conformity No. TÜV 03 ATEX 2078**

Of the company: Böhm Feinmechanik und Elektrotechnik Betriebs - GmbH  
Am Schlörbach 14  
D-38723 Seesen-Rhüden

The explosion-protected heating controls, type FRBL-1, series 1057/1058, may in future also be manufactured and operated in accordance with the documentation listed below.

The modifications concern the heating current circuit.

The electronic load relay has been omitted; the heating current circuit is wired to the main fuse. The type designation for this modified version is FRBL-1, series 1059/1060.

The electrical data and all other specifications remain unchanged for this 2. Supplement.

The individual testing steps are documented in the confidential test report 03YEX550655b.

TÜV NORD CERT GmbH & Co. KG  
TÜV CERT-Zertifizierungsstelle  
Am TÜV 1  
D-30519 Hannover  
Tel.: 0511 986-1470  
Fax: 0511 986-2555

Hannover, 2005-03-07

  
Der Leiter

Translation

## 4. SUPPLEMENT

<b>to Certificate No.</b>	<b>TÜV 03 ATEX 2078</b>
<b>Equipment:</b>	Ex heating control type FRBL-2, series 1061 and 1062
<b>Manufacturer:</b>	Böhm Feinmechanik und Elektrotechnik Betriebs GmbH
<b>Address:</b>	Am Schlörbach 14 D-38723 Seesen-Rhüden
<b>Order number:</b>	8000553073
<b>Date of issue:</b>	2009-07-02
<b>German original certificate issued on</b>	2006-06-07

In the future, the Ex heating control type FRBL-1 may also be manufactured according to the documents listed in the test report.

The type designation of the Ex heating control reads

type FRBL-2 series 1061\* for the execution with 230V nominal voltage,  
type FRBL-2 series 1062\* for the execution with 115V nominal voltage and  
type FRBL-2 series 1063\* for the execution with 254V nominal voltage.

The following changes were realised:

- The Ex heating control is extended by a device for indication of the rms-value of the heating current by means of additional evaluation electronics and a belonging measurement instrument. (Marking with „Stromanzeige Typ FRBL2“). The internal construction of the Ex heating control is changed accordingly.
- In the future, the permissible ambient temperature range is  $-40^{\circ}\text{C} \dots +40^{\circ}\text{C}$ .
- At a reduced load current of 16A, the Ex heating control is allowed to be operated also at an ambient temperature of  $\leq 50^{\circ}\text{C}$ .
- With connected supply voltage, the Ex heating control is allowed to be operated at  $-40^{\circ}\text{C}$ ; a decrease of the ambient temperature to  $-50^{\circ}\text{C}$  with the apparatus in operation is permissible.
- The installation of certified components according to directive 94/9/EG by the manufacturer is permissible if the safety relevant hints in the regarding certificates are observed.

### Electrical data

#### **Type FRBL-2 series 1061\***

Supply voltage .....  $U_n = 230 \text{ V}, -15\%/+10\%, 50 \dots 60 \text{ Hz}$   
(Connections L1, N, PE)

#### **Type FRBL-2 series 1062\***

Supply voltage .....  $U_n = 115 \text{ V}, -15\%/+10\%, 50 \dots 60 \text{ Hz}$   
(Connections L1, N, PE)

#### **Type FRBL-2 series 1063\***

Supply voltage .....  $U_n = 254 \text{ V}, +4\%/-10\%, 50 \dots 60 \text{ Hz}$   
(Connections L1, N, PE)

4. Supplement to Certificate No. TÜV 03 ATEX 2078

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All other details remain unchanged for this supplement.

The equipment incl. of this supplement meets the requirements of these standards:

**EN 50014:1997+A1+A2    EN 50019:2000    EN 50 020:2002    EN 50 028:1987**

(16) The test documents are listed in the test report No. 06 YEX 553073.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body

A handwritten signature in black ink, appearing to read "i. V. Schwedt".

Schwedt

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Translation

**5. SUPPLEMENT**

**to Certificate No.** TÜV 03 ATEX 2078  
**Equipment:** Ex heating control  
 type FRBL-4, series 1081, 1082, 1087  
 type FRBL-5, series 1064, 1065  
**Manufacturer:** Böhm Feinmechanik und Elektrotechnik Betriebs GmbH  
**Address:** Am Schlörbach 14  
 38723 Seesen-Rhüden  
 Germany  
**Order number:** 8000554521  
**Date of issue:** 2009-07-02  
**German original certificate issued on** 2008-12-11

In the future, the EC-Type Examination Certificate TÜV 03 ATEX 2078 is valid for the Ex heating controls according to the following table:

Type	Supply voltage	Permissible temperature range	Remark
FRBL-1 series 1081	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C	--
FRBL-1 series 1082	254 V, -10%/+4% 50 ... 60 Hz	-20°C ... + 40°C	--
FRBL-1 series 1087	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C	without electr. load relay (SSR)
FRBL-2 series 1064	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C or -40°C ... +40°C (+50 °C) *	with current indicator type FRBL2
FRBL-2 series 1065	115 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C or -40°C ... +40°C (+50°C) *	with current indicator type FRBL2

\* At a reduced load current of 16A, the Ex heating control may also be operated at an ambient temperature of ≤ 50°C.

An operation of the Ex heating control according to the table mentioned above at an ambient temperature of -50°C is not permissible any more.

The installation of certified components according to directive 94/9/EG and according to the test documents of the manufacturer is permissible.

Electrical data

Supply voltage ..... see table  
 (Connections L1, N, PE)

Internal fuses ..... only for connection to fuses according to  
 (Connections F1 and F2) EC-Type Examination Certificate TÜV 07 ATEX 553973 U  
 by the manufacturer

Load output ..... for connection to heating devices  
 (Connections 1 and 2)

External release ..... connected with the supply voltage;  
 (Connections 6 and 7) only for connection to a pushbutton (250 V a. c.; 0.1 A)

5. Supplement to Certificate No. TÜV 03 ATEX 2078

Output temperature alarm ..... 1 change-over contact; permissible values:  
 (Connections 3, 4, 5) 250V a. c., 5A, 100VA resp. 24V d. c., 5A, 100W

Measuring circuits ..... in type of protection Intrinsic Safety Ex ib IIC/IIB  
 (Connections 8, 9, 10 [closed loop control] and 11, 12, 13 [limiter] )

Maximum values per circuit:

$U_o = 6.3 \text{ V}$

$I_o = 22 \text{ mA}$

$P_o = 35 \text{ mW}$

Characteristic line: linear

Only for connection to Pt100 resistance thermometers

Ex ib	IIC	IIB
max. permissible external inductance	10 mH	10 mH
max. permissible external capacitance	1.5 $\mu\text{F}$	8.2 $\mu\text{F}$

Hints for erection:

The maximum values of the tables are also allowed to be used up to the permissible values by concentrated capacitances and inductances.

The Pt 100 sensors connected to the intrinsically safe circuits are simple electrical apparatus and have to be assessed according to section 5.7 of EN 60079-11.

The intrinsically safe measuring circuits are safely galvanically separated from the non-intrinsically safe circuits up to a peak crest value of the voltage of 375 V.

The intrinsically safe measuring circuits are safely separated from the earth potential.

The equipment according to this supplement meets the requirements of these standards:

EN 60079-0:2006

EN 60079-7:2003

EN 60079-11:2007

EN 60079-18:2004

(16) The test documents are listed in the test report No. 08 204 554521.

(17) Special conditions for safe use


none

(18) Essential Health and Safety Requirements

no additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body

  
 Schwedt

Translation

## 6. SUPPLEMENT

<b>to Certificate No.</b>	<b>TÜV 03 ATEX 2078</b>
<b>Equipment:</b>	Ex heating control type FRBL-x, series 10xx
<b>Manufacturer:</b>	Böhm Feinmechanik und Elektrotechnik Betriebs GmbH
<b>Address:</b>	Am Schlörbach 14 38723 Seesen-Rhüden Germany
<b>Order number:</b>	8000556050
<b>Date of issue:</b>	2010-09-14

In the future, the Ex heating control type FRBL-x, series 10xx may be manufactured according to the documents listed in the test report.

The changes refer to the suitability of the Ex heating control for operation in potentially explosive dust atmospheres with conductive dust as well as the mechanical construction (execution of the vision panel) and the marking.

In the future, the marking reads as follows:

II 2 G Ex e ib [ib Gb] mb IIC T4 Gb  
and  
II 2 D Ex tb IIIC IP 6X T90 °C Db

Table of technical data:

No.	Type	Supply voltage	Permissible temperature range	Remark
1	FRBL-1 series 1081	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C	--
2	FRBL-1 series 1082	254 V, -10%/+4% 50 ... 60 Hz	-20°C ... + 40°C	--
3	FRBL-1 series 1087	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C	without electr. load relay (SSR)
4	FRBL-2 series 1064	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C or -40°C ... +40°C (+50 °C) *	with current indicator type FRBL2
5	FRBL-2 series 1065	115 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C or -40°C ... +40°C (+50°C) *	with current indicator type FRBL2
6	All mentioned types; marking with II 2 D	according to no. 1 ... 6	-20 °C ... +40 °C	for operation in explosive dust atmospheres

\* At a reduced load current of 16A, the Ex heating control may also be operated at an ambient temperature of ≤ 50°C.

The installation of certified components according to directive 94/9/EG and according to the test documents of the manufacturer is permissible.



**Electrical data**

- Supply voltage ..... see table of technical data  
(Connections L1, N, PE)
- Internal fuses ..... only for connection to fuses according to  
(Connections F1 and F2) EC-Type Examination Certificate TÜV 07 ATEX 553973 U  
by the manufacturer
- Load output ..... for connection to heating devices  
(Connections 1 and 2)
- External release ..... connected with the supply voltage;  
(Connections 6 and 7) only for connection to a pushbutton (250 V a. c.; 0.1 A)
- Output temperature alarm ..... 1 change-over contact; permissible values:  
(Connections 3, 4, 5) 250V a. c., 5A, 100VA resp. 24V d. c., 5A, 100W
- Measuring circuits ..... in type of protection Intrinsic Safety Ex ib IIC/IIB  
(Connections  
8, 9, 10 [closed loop control] and  
11, 12, 13 [limiter] )

Maximum values per circuit:

$U_o = 6.3 \text{ V}$   
 $I_o = 22 \text{ mA}$   
 $P_o = 35 \text{ mW}$

Characteristic line: linear

Only for connection to Pt100 resistance thermometers

Ex ib	IIC	IIB
max. permissible external inductance	10 mH	10 mH
max. permissible external capacitance	1.5 $\mu\text{F}$	8.2 $\mu\text{F}$

The values for IIB and for IIC are also permissible for explosive dust atmospheres.

**Hints for erection and operation:**

- At dangers by explosive dust atmospheres, the housing must not be opened; in particular, this is valid for connecting the current indicator.
- The circuit „Load input“ has to be fused externally with max. 25 A.
- The Ex control for electrical resistance trace heating has to be erected in such a way, that only a low risk of mechanical danger exists for the cable entries.
- All connection cables have to be installed fixed.
- The Pt 100 sensors connected to the intrinsically safe circuits are simple electrical apparatus and have to be assessed according to section 5.7 of EN 60079-11.
- The maximum values of the tables are also allowed to be used up to the permissible values by concentrated capacitances and inductances.
- The intrinsically safe measuring circuits are safely galvanically separated from the non-intrinsically safe circuits up to a peak crest value of the voltage of 375 V.

The intrinsically safe measuring circuits are safely separated from the earth potential.

These hints are content of the manufacturer's manual.

6. Supplement to Certificate No. TÜV 03 ATEX 2078

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The equipment according to this supplement meets the requirements of these standards:

EN 60079-0:2009  
EN 60079-18:2004

EN 60079-7:2003  
EN 60079-31:2009

EN 60079-11:2007

(16) The test documents are listed in the test report no. 10 203 556050.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body

A handwritten signature in black ink, appearing to read "Schwedt".

Schwedt

Hanover office, Am TÜV 1, 30519 Hanover, Tel.: +49 (0) 511 986-1455, Fax: +49 (0) 511 986-1590

Translation  
**7. SUPPLEMENT**

**to Certificate No.** TÜV 03 ATEX 2078

**Equipment:** Ex heating controls

FRBL-1 series 2081
FRBL-1 series 2082
FRB-1 series 2087
FRBL-2 series 2064
FRBL-2 series 2065

**Manufacturer:** Böhm Feinmechanik und Elektrotechnik Betriebsges. m.b.H.

**Address:** Am Schlörbach 14  
 38723 Seesen-Rhüden, Germany

**Order number:** 8000402752

**Date of issue:** 2012-08-30

In the future, the Ex heating control type FRBL-x, series 10xx may be manufactured according to the documents listed in the test report.

The changes refer to the installation of separately certified plug-in connectors in metal execution.

The type designation of the devices with installed plug-in connectors reads as follows:

**Ex heating controls**

FRBL-1 series 2081
FRBL-1 series 2082
FRB-1 series 2087
FRBL-2 series 2064
FRBL-2 series 2065

**Table of technical data:**

No.	Type	Supply voltage	Permissible temperature range	Remark
1	FRBL-1 series 2081	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C	--
2	FRB-1 series 2082	254 V, -10%/+4% 50 ... 60 Hz	-20°C ... + 40°C	--
3	FRBL-1 series 2087	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C	without electr. load relay (SSR)
4	FRBL-2 series 2064	230 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C or -40°C ... +40°C (+50 °C) *	with current indicator type FRBL2
5	FRBL-2 series 2065	115 V, -15%/+10%, 50 ... 60 Hz	-20°C ... + 40°C or -40°C ... +40°C (+50°C) *	with current indicator type FRBL2
6	All mentioned types; marking with II 2 D	according to no. 1 ... 5	-20 °C ... +40 °C	for operation in explosive dust atmospheres

\* At a reduced load current of 16A, the Ex heating control may also be operated at an ambient temperature of ≤ 50°C.

The reduction down to 16 A is necessary at use of the plug-in connectors.

### Electrical data

Supply voltage ..... see table of technical data;  
 (Connections L1, N, PE ..... max. 16 A a. c. (for load disconnection max. 10 A  
 or optionally at use of a  
 panel plug-in connector 3:  
 Pins 1 [L], 2 [N] and 7 [PE] )

Flange socket 1  
 Load output ..... for connection to heating devices  
 (Pins 1, 2 and 7 [PE] )

Output temperature alarm ..... 1 change-over contact; permissible values:  
 (Pins 3, 4, 5) ..... 250V a. c., 5A, 100VA resp. 24V d. c., 5A, 100W

Flange socket 2  
 Measuring circuits ..... in type of protection Intrinsic Safety Ex ib IIC/IIB  
 (Pins 1, 2, 3 [closed loop control] ..... Maximum values per circuit:  
 and 4, 5, 6 [limiter] )  
 $U_o = 6.3 \text{ V}$   
 $I_o = 22 \text{ mA}$   
 $P_o = 35 \text{ mW}$   
 Characteristic line: linear

Only for connection to Pt100 resistance thermometers

Ex ib	IIC	IIB
max. permissible external inductance	10 mH	10 mH
max. permissible external capacitance	1.5 $\mu$ F	8.2 $\mu$ F

The values for IIB and for IIC are also permissible for explosive dust atmospheres.

### Hints for erection and operation:

1. At dangers by explosive dust atmospheres, the housing must not be opened; in particular, this is valid for connecting the current indicator.
2. The circuit „Load input“ has to be fused externally with max. 25 A.  
 Apparatus with separately certified plug-in connectors in metal execution: Externally fusing with max. 16 A
3. The Ex control for electrical resistance trace heating has to be erected in such a way, that only a low risk of mechanical danger exists for the cable entries.
4. All connection cables have to be installed fixed.
5. The Pt 100 sensors connected to the intrinsically safe circuits are simple electrical apparatus and have to be assessed according to section 5.7 of EN 60079-11.
6. The maximum values of the tables are also allowed to be used up to the permissible values by concentrated capacitances and inductances.

7. Supplement to Certificate No. TÜV 03 ATEX 2078

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7. The intrinsically safe measuring circuits are safely galvanically separated from the non-intrinsically safe circuits up to a peak crest value of the voltage of 375 V.

The intrinsically safe measuring circuits are safely separated from the earth potential.

8. Apparatus with installed separately certified plug-in connectors in metal execution: For load disconnection, a reduced current in the plug-in connectors of 10 A is permissible.

These hints are content of the manufacturer's manual.

The equipment according to this supplement meets the requirements of these standards:

EN 60079-0:2009

EN 60079-7:2007

EN 60079-11:2007

EN 60079-18:2004

EN 60079-31:2009

All other details remain unchanged.

(16) The test documents are listed in the test report no. 12 203 093475.

(17) Special conditions for safe use

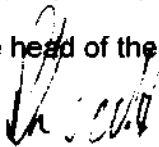
none

(18) Essential Health and Safety Requirements

no additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body



Schwedt

Hanover office, Am TÜV 1, 30519 Hanover, Tel.: +49 (0) 511 986-1455, Fax: +49 (0) 511 986-1590

# BOHM



## EG-Konformitätserklärung EC-Declaration of conformity

Der Hersteller / Inverkehrbringer  
The manufacturer

**Böhm Feinmechanik und Elektrotechnik Betriebsges. m.b.H.**  
**Am Schlörbach 14**  
**D 38723 Seesen-Rhüden**

erklärt hiermit, dass das nachstehende Produkt:  
declares hereby, that the following product:

**Elektronische Beheizungssteuerung FRBL-1 Baureihe 1081/1087/2081/2087**  
**Electronic Heating Controller FRBL-1 Type 1081/1087/2081/2087**

den geltenden Bestimmungen folgender EG-Richtlinien entspricht:  
is according to the following EC-regulations:

**EG-Richtlinie 94/9/EG**  
**EMV - Richtlinie 2004 / 108 / EG**

Angewendete Normen und technische Spezifikationen:  
Applied standards and technical specifications:

<b>IEC 60127-3/III</b>	/	<b>EN 60 079-0: 2009</b>
	/	<b>EN 60 079-7: 2007</b>
	/	<b>EN 60 079-11: 2007</b>
	/	<b>EN 60 079-18: 2004</b>
	/	<b>EN 60 079-31: 2009</b>
	/	<b>EN 61 000-6-2: 2001</b>
	/	<b>EN 61 000-6-4: 2001</b>

**NAMUR NE 21**

Benannte Stelle / Certification body:

**TUV NORD CERT GmbH Geschäftsstelle Hannover, Ident. Nr. 0044**

Bescheinigungsnummer / Certificate Number: **TÜV 03 ATEX 2078**

Seesen-Rhüden, den 06.06.2014

A handwritten signature in blue ink that reads 'Manfred Böhm'.

Manfred Böhm

Geschäftsführer / managing director