Operating Manual

Barksdale Hazardous Temperature Controller and Limiter
KELVIN

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Specifications are subject to changes without notice!

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1 General Notes

☞ NOTE

Read this manual before working with the product. The contents must be thoroughly read and understood before installing, using or maintaining this product.

These operating instructions serve for safe and efficient handling of the device. It must be accessible to all persons involved in installation and commissioning and must be read and understood before the any work is started. All safety notes and instructions given are a prerequisite of safe working and must be adhered to. Illustrations in this manual are intended to provide basic understanding and may differ from the actual design.

2 Intended Applications

The Barksdale Hazardous Temperature Controller and Limiter is an electronic device for temperature measurement / monitoring and control developed for electric trace heating systems. It is certified to ATEX Zone 1, IECEx Zone 1. The Barksdale Hazardous Temperature Controller with Limiter function is certified to ATEX Zone 2, IECEx Zone 2.

3 Safety Instructions

The warnings are intended to protect against dangerous situations and / or property damage.
In the operating instructions, the severity of potential hazards is indicated by the following hazard words:

3.1 Explanation of the symbols used

⚠ DANGER

Indication of an imminent danger to the life and health of humans.
Nonobservance will result in serious injury and death.

⚠ WARNING

Indication of a possible danger to the life and health of humans.
Nonobservance may result in serious injury or death.

⚠ CAUTION

Indication of a possible hazard.
May result in injury if ignored.

NOTICE

Indication of a possible hazard.
Nonobservance may result in damage to the unit.

☞ NOTE

Reference to important information that should be especially pointed out.

Disposal

Disposal of the device must be carried out professionally in accordance with the country-specific regulations for electrical and electronic equipment.

The device must not be disposed of with household waste!

3.2 Data, Pictures, Changes

Despite the greatest possible care, no liability can be assumed for accuracy, completeness and up-to-datedness. Changes are reserved.

3.3 Trademark and Copyright

All hardware names and brand names used in this documentation are protected under trademark law. The operating instructions are protected by copyright. The authorized user has got a simple right of use within the scope of the contract purpose.

3.4 Warnings

⚠ WARNING

Serious injuries due to misuse

Improper use of the product may result in explosion, serious injury or death.

- The warnings and instructions must be read and understood.

☞ NOTE

The Barksdale Hazardous Temperature Controller and Limiter are listed for use in Hazardous Location (Classified).

☞ NOTE

Observe also the applicable national safety instructions for assembly, commissioning and operation of the switch.

4 Approvals

The approvals depend on the device function and are following the below standards:
EN IEC 60079-0 : 2018; EN 60079-7 : 2015 +A1 : 2018; EN 60079-11 : 2012;
EN 60079-18 : 2015 + A1 : 2017; EN 60079-30-1 : 2017; IEC 60079-0:2017;
IEC 60079-11:2011; IEC 60079-18:2017; IEC 60079-7:2017; IEC/IEEE 60079-30-1:2015

4.1 BHTC/BHTL

IECEx DEK 19.0014U

Ex eb mb [ib] [60079-30-1] IIC Gb

[Ex ib 60079-30-1 Db] IIIC

DEKRA 19ATEX0028 U

II 2 G Ex eb mb [ib] [60079-30-1] IIC Gb

II (2) D [Ex ib 60079-30-1 Db] IIIC

Made in Germany with quality compliance by TUV 0044

4.2 BHTLC

IECEx DEK 19.0014U

Ex eb mb [ib] [60079-30-1] IIC Gc

[Ex ib 60079-30-1 Dc] IIIC

DEKRA 19ATEX0028 U

II 3 G Ex eb mb [ib] [60079-30-1] IIC Gc

II (3) D [Ex ib 60079-30-1 Dc] IIIC

5 Warranty / Guaranty

Our scope of delivery and services is governed by the statutory warranties and warranty periods.

5.1 Terms of guaranty

For the Barksdale Hazardous Temperature Controller and Limiter, we grant a guarantee according to the legal regulations for the intended use under the specified operating and maintenance conditions.

5.2 Loss of guaranty

The agreed guaranty period will expire in case of:

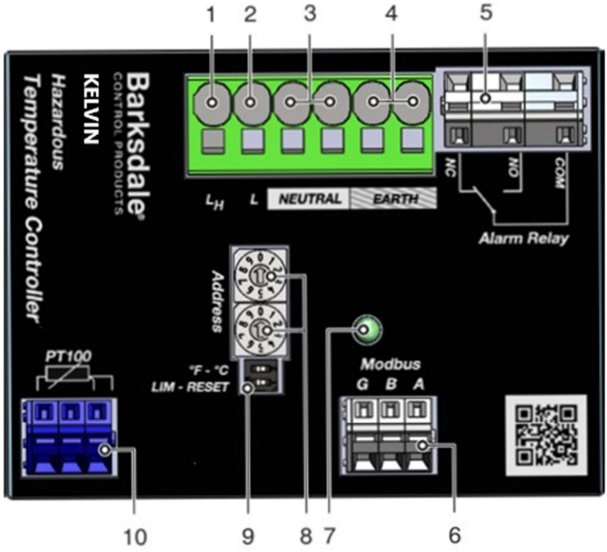
- improper use,
- incorrect installation or
- incorrect handling or operation contrary to the provisions of these operating instructions.

No liability is assumed for any damage resulting therefrom, or any consequential damage.

6 Transport

The Barksdale Hazardous Temperature Controller and Limiter has sensitive boards that are sensitive to shocks. Carefully transport and protect from moisture.

7 Technical Structure

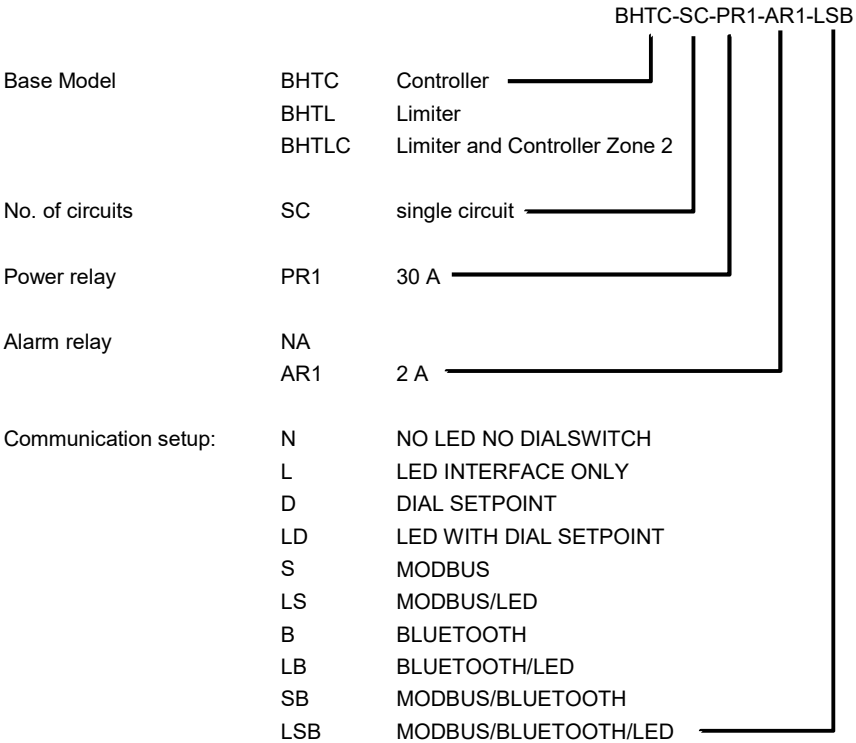


No.	Definition	Description
1	Heater supply	Connect heater supply to L_H
2	Power supply	Connect power supply for thermostat to L
3	Neutral connection	Left: heater supply to L_H Right: supply for thermostat to L
4	Earth connection	Grounding
5	Alarm relay*	NC NO COM
6	Modbus connection*	Connect Modbus to A, B, G (ground)
7	LED indicator*	Used for warnings and errors. The blink code is described in the chapter 11.1
8	Rotary encoders*	Used to set the temperature set point or Modbus address*
9	Dip switches °F - °C LIM-RESET*	Two dip switches • to select the unit, °F or °C. • to reset the limiter – the procedure is described in chapter 10.3 Temperature Limiter
10	RTD/ PT100 input	Two/ three wire RTD sensor input is given through this terminal

*depending on product configuration

8 Order Code

The following code describes the product configuration:



9 Installation

⚠ **DANGER**

Danger of electrocution

When working on the power lines and connections, there is a risk of electrocution.

- Always de-energize all lines and secure against accidental re-closing.
- Make sure that only qualified persons install the device.

⚠ **DANGER**

Danger of electric shock

Incorrect or improper connection may result in serious injury and death.

- All installations must be effectively grounded in accordance with the National Electrical Code.
- Avoid contact with the exposed leads and terminals.
- Properly connect the electrical and process connections before operating the device.

- When device is mounted, make sure the potting is not broken and cable clamps are not loose.

Turn off power before removing the junction box cover all the times.

NOTICE

Improper maintenance or other interventions that are not in accordance with the intended use will result in the destruction of the device and the loss of all warranty claims.

- Remember, this product does not have any field replaceable parts.
- Turn off power before removing the junction box cover all the times.

  Substitution of any component may impair the suitability for class 1 division 2.

9.1 Tools required

- ► The Wire cutters
- ► Screwdriver of 2.5mm size
- ► Wire stripper

9.2 Mounting

The device can be panel mounted with M4 screws (hole distance 34mm) or with DIN-Rail clip as accessory.

9.3 Installation limitations and requirements

⚠ **DANGER**

Danger of electrocution

When working on the power lines and connections, there is a risk of electrocution.

- Always de-energize all lines and secure against accidental re-closing.
- Make sure that only qualified persons work on the device.

NOTICE

Damage due to incorrect installation

Failure to follow the installation conditions below may result in damage to the unit.

- Observe all subsequent installation conditions exactly.

⚠ **WARNING**

The following restrictions shall be considered by the ExCB resp. Notified Body (as applicable) that provides the equipment certification:

- The Barksdale Hazardous Temperature Controller and Limiter shall be mounted in an enclosure in accordance with installation drawing in the Annex, which provides a degree of protection of at least IP65 in accordance with EN 60079-0 and EN 60529. Mounting shall be in such a way that the Barksdale Hazardous Temperature Controller and Limiter is not susceptible to UV light.
- The intrinsically safe terminals and (if applicable) integrated wiring shall be separated from all non-intrinsically safe conductors including earth/frame, per EN 60079-11.
- Variants where type designation contains 'L' (LED interface) have a highest component surface temperature of up to 150 °C when considering a local service temperature as well as the application of faults per EN 60079-11.
- The user of the limiter function of the Barksdale Hazardous Temperature Controller and Limiter, shall demonstrate his ability to predict the offset (ΔT_{offset})

between the trace heating sheath temperature and the temperature control device's set point in accordance with clause 4.5.3.1 of EN 60079-30-1: 2017.

- The enclosure has to provide a lock against unauthorized access.

9.4 Safety instructions for wiring and connections

- Power to Barksdale Hazardous Temperature Controller and Limiter – A nominal AC Voltage of 85-277 VAC should be applied between the line (L), neutral (N) and grounded with earth (PE) terminal to operate the device.

Heater should be applied between the line (L), neutral (N) and grounded with earth (PE) terminal.

- For power and heater cable follow the following instructions.
  - Use one wire per clamp
  - Use wire size from 2,5…6mm^2 (14…10 AWG) for solid, flexible or ferrule without insulation or 2,5…4mm^2 (14…12 AWG) for ferrule with insulation
  - Strip off 13±1mm of insulation
  - Open cage clamp with screwdriver and insert wire fully up to the bottom stopper of clamp.
  - Verify by pulling on the wires.
- For RTD use two/three wire PT100 with a maximum cable resistance of 14 ohm and according to table in chapter 9.5.
- For alarm relay select wire according to maximum load current; cables should comply with increased safety standard (IEC60079-7).
- MODBUS cable should comply with increased safety standard (IEC60079-7).
- For Modbus use one wire with size from 0.8…2.5mm² (18…12AWG) or two wires with a maximum size of each 1mm² combined in one ferrule with size of 0.8mm²…2.5mm²
- For RTD and alarm relay use one wire per clamp
- For RTD, MODBUS and alarm relay follow the following instructions:
  - Use wire size from 0.8…2.5mm^2 (18…12 AWG) for solid, flexible or ferrule without insulation.
  - Strip off 4 to 5mm of insulation.
  - Open cage clamp with screwdriver and insert wire fully up to the bottom stopper of clamp.
  - Verify by pulling on the wires.

9.5 Safety electrical data for terminals (circuits)

Power and load terminal L-N in type of protection Ex eb	
Rated voltage U supply	80 - 277 VAC for Limiter and Controller 80 - 250 VAC for Controller with Limiter function
U_m	305 VAC
Rated power without load	4.5 W
For use with trace heating (load)	see table *Current Limits for Trace Heating*
Maximum breaker size	An external breaker is required and shall be dimensioned to ensure not to exceed limits in table *Current Limits for Trace Heating,* but not greater than 32A.

Current Limits for Trace Heating		
Maximum Ambient Temperature [°C]	**T6 [A]**	**T5 [A]**
15	30.0 (22.0)*	30.0 (22.0)*
20	29.1 (22.0)*	30.0 (22.0)*
25	27.8 (22.0)*	30.0 (22.0)*
30	26.4 (22.0)*	30.0 (22.0)*
35	24.9 (22.0)*	29.1 (22.0)*
40	23.4 (22.0)*	27.8 (22.0)*
45	16.3	26.4 (22.0)*
50		24.9 (22.0)*
55		23.4 (22.0)*
60		21.7
65		19.9
70		12.5

☞ NOTE

Maximum ambient temperature in above table is temperature around the device, inside the required enclosure. Ambient temperature outside the enclosure has to be lower to keep above limits. Temperature limitation outside the enclosure depends on enclosure type and size.

*Maximum current in above table is reduced to 22A in case of Temperature Controller with Limiter function (Configuration BHTLC) in compliance with IEC/IEEE 60079-30-1 for trace heating installed in Zone 2.

Alarm relay, potential free contacts in type of protection Ex eb	
Rated voltage	277 VAC or 36 VDC
U_m	305 VAC
Rated switched current (Load)	2 A

Modbus (terminals A, B, and G) in type of protection Ex eb	
U_m	250 VAC
Rated voltage	5 VDC

RTD terminal in type of protection Ex ib	
U_0	6.6 V
I_0	827 mA
P_0	1.28 W
C_0	6.7 µF
L_0	32 µH

☞ **NOTE**

The Ex ib sensor circuit is infallibly galvanically separated from the alarm relay circuit.

The Ex ib sensor circuit is not infallibly galvanically separated from all other non-intrinsically safe circuits.

Therefore, the earth connection of the equipment shall be connected to the potential equalizing (P.E.) system in accordance with the applicable installation standard.

10 Modes of Operation and Configuration

☞ **NOTE**

The Barksdale Hazardous Temperature Controller and Limiter controls the heater load by simple ON/OFF operation of relay.

The device is shipped as a Temperature Controller, Limiter or Limiter and Controller for Zone 2, depending on product configuration.

10.1 Setup switches

Dip switch is provided to choose the unit of temperature in °C or °F (after every change, unit resets to factory default).

Rotatory switches are provided to set the temperature set point or Modbus address in hexadecimal format, depending on product configuration.

The MODBUS address used to address a particular thermostat in a network should be unique.

10.2 Temperature Controller

Mode to control the temperature within a specified temperature range. Heater is powered when measured temperature is lower than set temperature. Heater turns off when measured temperature is higher than set temperature + hysteresis. Heater is powered again when measured temperature is lower than set temperature.

In Case of Sensor or device malfunction, the heater will be de-energized.

10.3 Temperature Limiter in compliance with IEC/IEEE 60079-30-1 for trace heating installed in Zone 1 and Zone 2.

Safety Mode that switches power off before the maximum specified surface temperature is reached. Each device has its own power supply and therefore operates independently either as a temperature controller or as a limiter.

A 3-Wire RTD should be connected to support all relevant sensor monitoring functions to de-energize heater in case of malfunction.

Heater is powered when measured temperature is lower than set temperature. Heater will be de-energized when measured temperature is higher than set temperature. A manual reset is required to repower the heater. The LED will shine constantly red, when Limiter needs to be reset. Depending on device option, limiter status is also indicated over Bluetooth, Modbus and/or alarm Relay.

To perform manual reset power OFF the system, then toggle reset switch and repower the system. The enclosure has to provide a lock against unauthorized access to temperature setup and reset.

To change set temperature, hysteresis or reset limiter over Modbus, password is required. See chapter 11.4 Modbus for details.

To change set temperature, hysteresis or reset limiter over Bluetooth, user authentication is required.

☞ **NOTE**

The user of the limiter function, shall demonstrate his ability to predict the offset (ΔToffset) between the trace heating sheath temperature and the temperature control device's set point in accordance with clause 4.5.3.1 of EN 60079-30-1: 2017.

Measured temperature must be at least set temperature minus hysteresis. If measured temperature is above, limiter locks again heater.

10.4 Temperature Controller with Limiter function in compliance with IEC/IEEE 60079-30-1 for trace heating installed in Zone 2.

Device is also intended to use as a Temperature Controller with Limiter function in Zone 2. Behaviour will be identical to both Controller and Limiter as described in chapters before.

Maximum load current is reduced to 22A for this operation.

☞ **NOTE**

The user of the limiter function of the Thermostat shall demonstrate his ability to predict the offset (ΔToffset) between the trace heating sheath temperature and the temperature control device's set point in accordance with clause 4.5.3.1 of EN 60079-30-1: 2017.

11 Advance Function

Advance Function enables detailed monitoring of device status and condition. Indication of status and condition is via LED codes, Modbus and Bluetooth app.

11.1 LED status codes

All the LED status with flashing sequence in pulses is shown in the table below.

Number of Pulses	OK Green	Warning Yellow	Alarm Red
Constant	Relay ON	Process temperature out of defined warning limits	Limiter Trip
1 pulse	Device powered	Device temperature out of defined warning limits	Sensor short or open
2 pulses		Relay lifetime over 80%	Sensor cable resistance too High
3 pulses		Warning: Sensor cable (rise > 3°C/s)	Relay lifetime over
4 pulses			Device temperature too high (> 90°C)

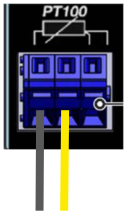
11.2 Thermostat PC Software (BarksdaleDeviceManager)

Download BarksdaleDeviceManager from Barksdale Website to update, parametrize or monitor the device.

Install Software first than connect USB-Interface to PC.

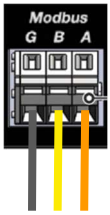
Connect Thermostat with Barksdale One-Wire-Interface for devices without Modbus and Barksdale RS485-Interface for devices with Modbus option like described below.

One-Wire-Interface



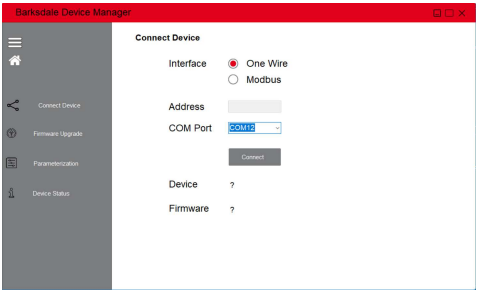
Black / Yellow

RS485-Interface



Black / Yellow / Orange

Start BarksdaleDeviceManager, select Interface and connect device.



Further features are available to parametrize device or to monitor detailed device status.

11.3 Thermostat app

Depending on product configuration controllers can also be accessed via an app. You can find the app with the QR Code on your device. Access to device require user authentication.

11.4 Modbus

Interface parameter: RTU / 9600-8-N-1.

	Discrete input contacts (bit, read only)	
0	Heater relay status	0: Relay off 1: Relay on
1	Unit	0: °C 1: °F
2	Mode of operation	0: Controller 1: Limiter
3	Limiter Trip	0: Normal operation 1: Limiter Trip (based on temperature or Error)
4	Warning device temperature	0: Normal operation 1: Internal temperature out of defined limits
5	Warning process temperature	0: Normal operation 1: Measured temperature out of defined limits
6	Warning internal	0: Normal operation 1: Internal warning (replace device)
7	Reserved	
8	Error sensor limit	0: Normal operation 1: Shortcut or disconnection of sensor
9	Error sensor cable resistance too high	0: Normal operation 1: Sensor cable resistance over 14 Ohm
10	Warning sensor signal unstable	0: Normal operation 1: Temperature rise faster than 5°C/s or 9°F/s
12	Warning life lime ≥80%	0: Device live time <80% 1: Device live time ≥80% (prepare for replacement)
13	Error life time 100%	0: Device live time <100% 1: Device live time 100% (replace device)
14	Error device over temperature	0: Normal operation 1: Internal temperature ≥90°C/194°F
15	Reserved	

	Analog input registers (integer, read only)	
0…15	Device Software & Hardware	Oder Code. E.g. 1.00;BHTC-PR1-NA-LD
16...21	Device serial number	Serial number. E.g. KR12345.0001
22	Discrete input contacts	Same content as table above
23	Process temperature	Temperature in PT100
24	Device temperature	Internal temperature of Thermostat
25	Device life time	Life time of device in percent. Factor 10 (23 → 2.3%)
26	Sensor cable resistance	Cable resistance of sensor cable. Factor 10 (2 → 0.2Ohm)
27	Minimal device temperature	Minimum device temperature. Cannot be reset.
28	Maximum device temperature	Maximum device temperature. Cannot be reset.
29	Minimal process temperature	Minimum process temperature. Cannot be reset.
30	Maximum process temperature	Maximum process temperature. Cannot be reset.
31	Counter device over temperature	Count how often device was in over temperature scenario. Cannot be reset.
32	Counter Warning Internal	Count how often device has internal warning. Cannot be reset.

	Analog output holding registers (integer, read and write)	
0	Set Temperature	Set temperature for controller operation
1	Hysteresis	Hysteresis for controller operation
2	Limiter Temperature**	Limiter Temperature
3	Limiter Hysteresis**	Hysteresis for limiter operation
4	Reserved	
5	High warning level for device temperature	High warning level for device temperature. Effect Status bits, LED and alarm relay.
6	Low warning level for device temperature	Low warning level for device temperature. Effect Status bits, LED and alarm relay.
7	High warning level for process temperature	High warning level for process temperature. Effect Status bits, LED and alarm relay.
8	Low warning level for process temperature	Low warning level for process temperature. Effect Status bits, LED and alarm relay.
9	Minimal device temperature	Minimum device temperature. Can be reset by user.
7	Maximum device temperature	Maximum device temperature. Can be reset by user.
8	Minimal process temperature	Minimum process temperature. Can be reset by user.
9	Maximum process temperature	Maximum process temperature. Can be reset by user.
10	Counter Warning sensor signal unstable	Counter for Temperature rises faster than 5°C/s or 9°F/s. Can be reset by user.
11	Counter device over temperature	Count how often device was in over temperature scenario. Can be reset by user.

15	Command Register**	Send command: • Limiter Reset (0x7f4e): Reset the limiter • Set to Default (0x6d5d): Reset all parameters to Default • Reset Min Max Values (0x0233): Reset Min and Max Values for process and device temperature • Reset Event counter (0x0234): Reset counter for device over temperature and unstable sensor signal
16	Password	Password for protected register in limiter operation

**Password protected in limiter operation.

☞ **NOTE**

In Limiter operation some Modbus registers are password protected. To change protected registers write first password “61440” to password register and change value in second write operation. This two write operations are always required for protected registers.

12 Commissioning

Check before commissioning

- Is the device properly installed?
- Have all cable connections been checked?
- Have all temperature settings been made?

Otherwise, no further measures are required.

13 Maintenance / Cleaning

The following inspections should be carried out at least once a year after installation and commissioning.

☞ **NOTE**

Electrical connection must only be carried out by qualified personnel according to state-of-the-art standards.

⚠ **DANGER**

Danger to life due to electric shock!

Before servicing power lines, make sure the device is turned off and secured against accidental reconnection.

13.1 Wiring and connectors

⚠ **DANGER**

Short circuit on lines

Overheating and fraying of cables can cause irreparable damage to the device.

- Check the cables for wear, fraying and signs of overheating.
- In case of major line damage, it is essential to replace the cables.

⚠ **DANGER**

Loose electrical and mechanical connections

Loose electrical and mechanical connections in the unit can cause damage.

- Check the device regularly for loose and mechanical connections.

13.2 Cleaning

This product does not require cleaning.

☞ **NOTE**

Prohibition of user maintenance

In case the user does any maintenance work or repair on field, that unit will not be replaced by **Barksdale GmbH**.

14 Decommissioning

14.1 Malfunction

☞ **NOTE**

In the event of a malfunction, breakage or spark, the Barksdale Hazardous Temperature Controller and Limiter should be switched off and the cables disconnected.

It should be removed from the DIN rail mount and stored in a clean place according to the storage temperature range.

14.2 Recommissioning

For recommissioning, the information in the chapter Commissioning counts, if there are no deviations.

14.3 Disassembly

⚠ **DANGER**

Electric shock and / or explosion!

In the event of malfunctions or damage to the electronic thermostat, electric shocks can occur that cause serious injuries or death.

- Before disassembling the device, switch off all lines and secure against accidental reconnection.
- Make sure that only qualified persons work on the device.

14.4 Product recycling/ disposal

NOTICE

Environmental

Some materials of the device may not be environmentally friendly.

- After expiry of the period of use or in the event of damage, the device must be disposed of properly for disposal in accordance with the local legal regulations.

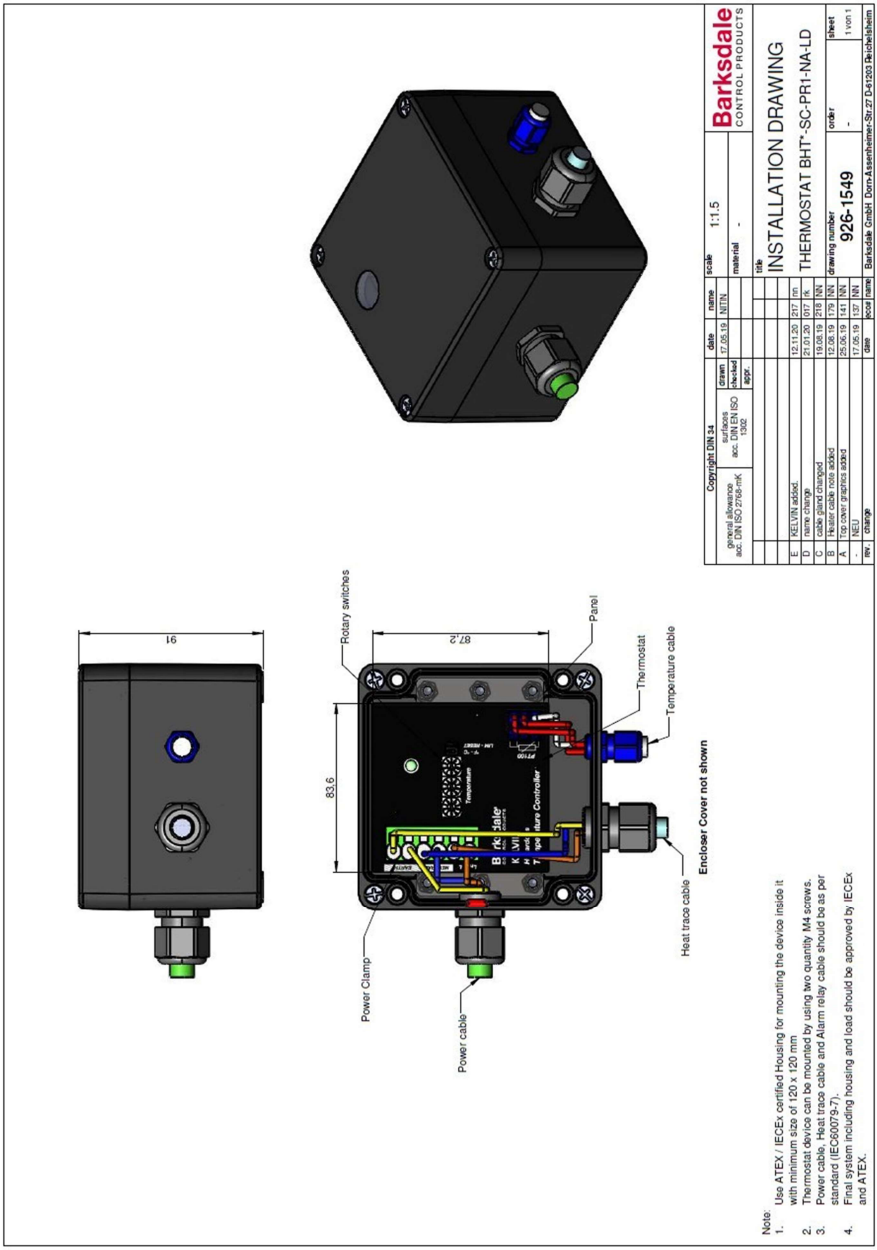
15 Technical Data

The Barksdale Hazardous Temperature Controller and Limiter has the following operating specifications:

Parameters	Values
Nominal operating/control voltage	85 - 277 VAC (50 / 60 Hz)
U_m for input power	305 VAC
U_m value for alarm relay	305 VAC
U_m value for Modbus circuit	250 VAC

Minimum ambient storage temp.	-58°F (-50°C)
Control capacity	One heat tracing circuit
Temperature inputs	One 2 or 3 wire 100 Ohm @ 32°F (0°C) Platinum RTD's per heat trace circuit, intrinsically safe input circuitry (14 ohm max cable resistance)
Temperature units	°F / °C
Temperature control range	32°F to 932°F (0°C to 500°C)
Temperature measurement range	-76°F to 932°F (-60°C to 500°C)
Communication options	Modbus RTU 9600 Baud / Bluetooth
Mounting	DIN rail clip / panel
Measurement accuracy	±0.5 % FS
Control method	Two point
Control relay switch rating	see table *9.5 Current Limits for Trace Heating*
Set temperature	Rotary switches, Modbus, Bluetooth
Hysteresis	Default 5K (9°F)
ATEX/IECEx protection classes	
Certification	Barksdale Hazardous Temperature Controller and Limiteris certified for zone 1 and 2 hazardous locations, ATEX zone 1, IECEx zone 1 and designed for North America (Class I, Div. 2)
Surface temperature class	see table *9.5 Current Limits for Trace Heating*

16 Annex


91
83,6
87,2
Rotary switches
Panel
Thermostat
Temperature cable
Power Clamp
Power cable
Heat trace cable
Encloser Cover not shown
Note:
1. Use ATEX / IECEx certified Housing for mounting the device inside it with minimum size of 120 x 120 mm
2. Thermostat device can be mounted by using two quantity M4 screws.
3. Power cable, Heat trace cable and Alarm relay cable should be as per standard (IEC60079-7)
4. Final system including housing and load should be approved by IECEx and ATEX.
Copyright DIN 34
general allowance acc. DIN ISO 2768-mK
surfaces acc. DIN EN ISO 1302
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NN
A
Top cover graphics added
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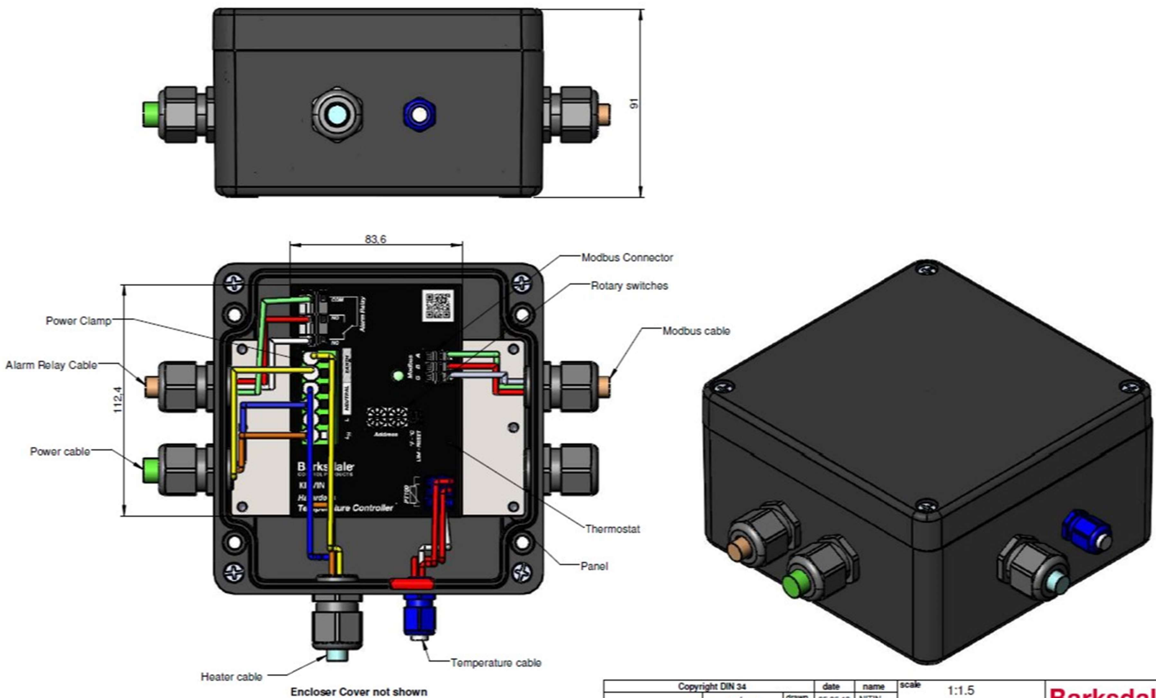
141
NN
-
NEU
17.05.19
137
NN



Note:

1. Use ATEX / IECEx certified Housing for mounting the device inside it with minimum size of 160 x 160 mm
2. Thermostat device can be mounted by using two quantity M4 screws.
3. Power cable, Heat trace cable and Alarm relay cable should be as per standard (IEC60079-7).
4. Final system including housing and load should be approved by IECEx and ATEX.

Copyright DIN 34			date	name	scale 1:1.5	Barksdale CONTROL PRODUCTS
general allowance acc. DIN ISO 2768-mK	surfaces acc. DIN EN ISO 1302	drawn	05.06.19	NITIN	material -	
		checked				
		appr.				

rev.	change	date	eco#	name
E	KELVIN added.	11.11.20	217	nn
D	name change	21.01.20	017	rk
C	Cable gland changed & modified dimension	19.08.19	218	NN
B	Heater cable note added & modified dimensions	12.08.19	179	NN
A	Top cover graphics added	25.06.19	141	NN
-	NEU	05.06.19	137	NN

title
INSTALLATION DRAWING
THERMOSTAT BHT*-SC-PR1-AR1-LSB

drawing number	order	sheet
926-1550	-	1 von 1

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