

**Operation manual
Heating Circuit DE**



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RESERVATION:

Technical data subject to change without notice. Changes, errors, and misprints may not be used as a basis for any claim for damages.

MANUFACTURER

DIRAC INDUSTRIES S.R.O.
K AUTOMOBILCE 585
28002, KOLÍN - SENDRAŽICE

TEL.: +420 323 040 700
EMAIL: INFO@DIRACINDUSTRIES.COM
INTERNET: WWW.DIRACINDUSTRIES.COM

NOTES FOR MANUAL

Working in hazardous areas safety of personnel and material depends on the adherence of all relevant safety rules. Persons who are responsible for installation and maintenance have got a special responsibility. Precondition is an exact knowledge of all actual rules and regulations. This manual summarizes all important safety rules and has to be read by all persons working with this product to be familiar with the handling. The manual must be kept over the complete life span of the product.

MARKING

Important sections in this manual are marked with a symbol.



DANGER

DANGER signs a risk which can result in death or severe injury if not avoided.



WARNING

WARNING signs a risk which can result in death or severe injury if not avoided.



CAUTION

CAUTION signs a risk which can result in injury if not avoided.



ATTENTION / NOTE

ATTENTION / NOTE signs an action to prevent material damage.

EX TERMINATION SYSTEMS FOR THE FOLLOWING HEATING CABLE TYPES:

DLT...2CT; DMT...2CT; DHT...2CT; DUT...2NT



APPLICATION

The heating circuit DE... is for electrical heating of pipes, vessels, protection-enclosures, electrical-motors, etc., for protecting temperature sensitive products from frost or for temperature maintenance of these products or to avoid condensation. The heating circuit DE... can be factory ready-made or assembled on site.

AVAILABLE TYPES

Clamping Range	Heating Cable: 4.7 x 10.0 – 6.5 x 13.0mm ² Supply Cable: 7.0 – 10.5mm ²
ETK8..-Ex	Set, contains power and end sleeve.
ETK8P-Ex	Power sleeve only
ETK8R-Ex	End sleeve only
ETK8I-Ex	Connection heating tape – heating tape (splice)
ETK8T-Ex	T-branch
ETK8TT-Ex	Power sleeve with integrated ambient thermostat (110°C max.)

CERTIFICATION & LABELLING

Manufacturer: DIRAC Industries s.r.o.
Type: DE****_**/**_*_*_*_*_***/*****
Certifications: EPS 23 ATEX 1 228 X
Marking:  II 2G Ex eb IIC T6/T5/T4/T3/T2 Gb
 II 2D Ex tb IIIC T135°C Db IP65



CE: 1026

Heating circuits assembled by Dirac Industries:
 will be labelled and delivered by Dirac Industries with all specific data for the corresponding heating circuit.

Heating circuits which are assembled by the installer
 must be labelled clearly by the installer using the enclosed UV-resistant marker (Staedtler Lumocolor) according to the following example.

The heating circuit label must be mounted clearly visible on the connection sleeve.

Complete the heating circuit label similar to the following example

Heating circuit consisting of 5m self-limiting heating tape type DHT5-2CT (55W/m, 230V AC), supply cable type FEP 3 G2,5mm², with ETK8..- Ex power and end seal.

DIRAC Industries s.r.o

K Automobilce 585


280 02 Kolín


Czech Republic

Dirac Industries Heating Circuit Ex

Type: DE****_**/**_*_*_*_*_***/*****

EPS 23 ATEX 1 228 X

 II 2G Ex eb IIC T6/T5/T4/T3/T2 Gb

 II 2G Ex tb IIIC T135°C Db IP65

Circuit Length: __, __m-60°C ≤ Ta ≤ + __°C

Rated Voltage: __V

Rated Power Output: __W/m

SN: _Number Year: 2023



Only the use of one of the following supply lines is permissible for the production of a heating circuit approved for the Ex area:

- Heating cables with low and medium temperatures Radox125-3G1.5 and Radox125-3G2.5 or alternative
- Heating cables with high temperatures FEP insulation or alternative

TECHNICAL DATA

Rated voltage:

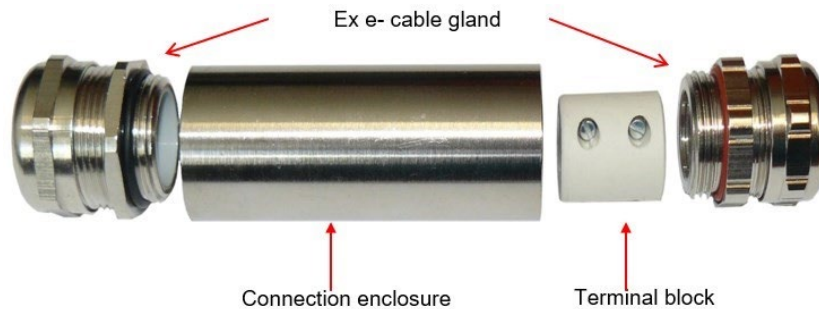
without integrated thermostat: U_{max} 277 V AC
with integrated thermostat: U_{max} 250 V AC

Rated output:

When using DIRAC Industries heating tapes up to 60 W/m max. (according to the corresponding EC-Type Examination Certificate)

Ambient-/work piece temperature range:

see tables on the following page



AMBIENT-/WORK PIECE TEMPERATURE RANGE:

ETK8...EX(**without** integrated thermostat)

Ambient temperatures	T-Class	Heating tapes
-60°C...+85°C	T6	DLT...CT 9W/m up to and including 31W/m
-60°C...+180°C	T3	DHT...CT and DUT...NT up to and including 60W/m
-60°C...+190°C	T2*/T3/T4/ T5/T6	Limit value in relation to the connection sleeve when using heating tapes from other manufacturers. Any temperature limitations of the heating tape used must be observed!

ETK8TT-EX (**with** integrated thermostat)

Ambient temperatures	T-Class	Heating tapes
-60°C...+40°C	T6	DLT...CT 9W/m up to and including 31W/m
-60°C...+110°C	T3	DHT...CT and DUT...NT up to and including 60W/m
-60°C...+110°C	T2*/T3/T4/ T5/T6	Limit value in relation to the connection sleeve when using heating tapes from other manufacturers. Any temperature limitations of the heating tape used must be observed!

It is important to ensure that the specified max. permissible ambient temperatures (see table above) are in accordance with the thermally resistant connecting cable being used, which is suitable for these continuous temperatures.

* For applications in T2 the permissible workpiece temperature must be observed!
 (e.g.: mounting outside the insulation)

When using constant wattage heating cables from other manufacturers, any possibly resulting temperature limitations because of their limit value of the heating cable used must be observed. (Limit value of the connection sleeve see above)

MAX. HEATING CIRCUIT LENGTH:	according to current heating cable data sheets
RATED CURRENT:	without integrated thermostat: up to max. 20A AC with integrated thermostat: up to max. 16A AC
CLAMPING RANGES:	see point 1 ("Available Types")
CROSS SECTION:	up to 2,5mm ²
PROTECTION CLASS:	IP65

PLEASE REFER TO CERTIFICATE & DATASHEETS FOR TECHNICAL DATA AND FURTHER INFORMATION.

SAFETY INSTRUCTIONS



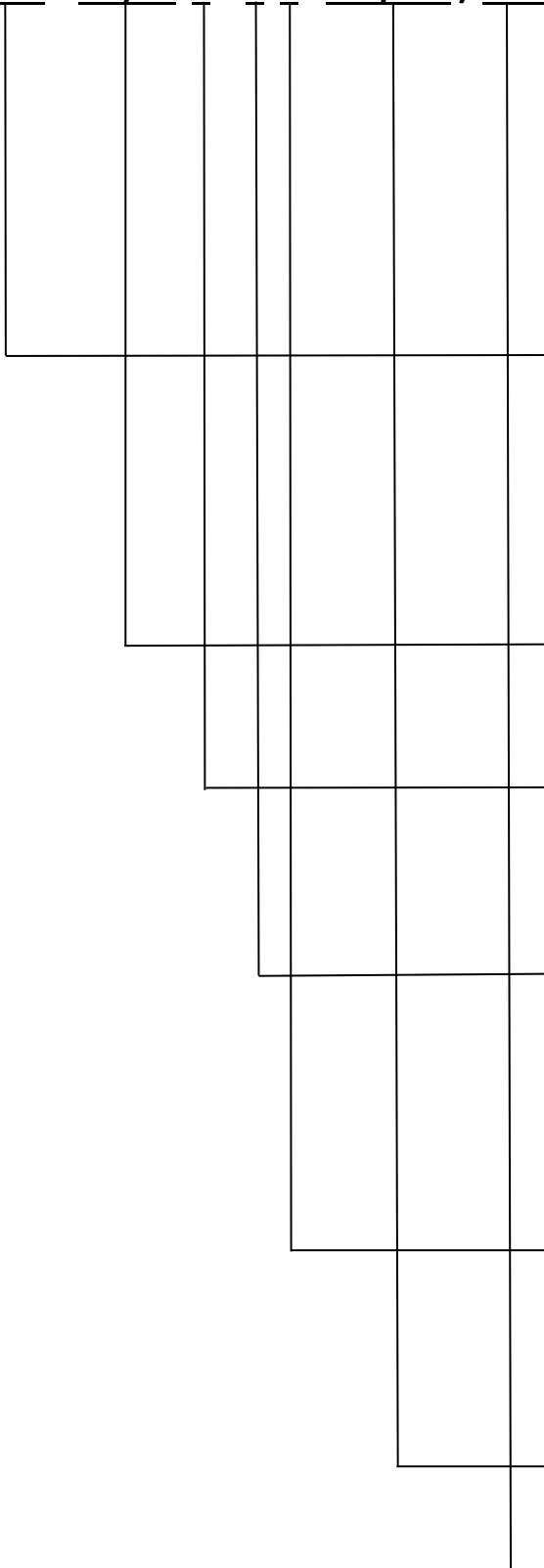
Only use the heating circuits for the approved purpose.
Explosion protection for heating circuits is only guaranteed in the original condition.
The electrical heating circuits must only be operated in an undamaged condition.
Do not open the ETK8..EX components while energized!

EXPLOSION PROTECTION IS NOT OR NO LONGER GUARANTEED IF THE:

- insulation of the heating cable or the connection cable is torn or cut open.
- connection sleeve or the end termination of the heating circuit is mechanically damaged.
- connection/end termination has not been assembled correctly according to the installation instructions.
- dimensions of the heating cable used are not within the permitted clamping range.

TYPE CODE

D ** - ** / ** * - * * - *** / *** / *******



P = Power in W/m (at nominal temperature):
 E.g. 55 = 55 W/m 00 = not existing
 / = W/m when connected

Rated voltage:
 0 = not existing 2 = 115V 4 = 400V 6 = 60V
 1 = 24V 3 = 230V 5 = 300V 8 = 12V
 9 = in plain text (on the nameplate)

Connection line:
 0 = not existing
 1 = 3G1.5mm² Radox or equivalent
 2 = 3G2.5mm² Radox or equivalent
 3 = 3G1.5mm² FEP or equivalent
 4 = 3G2.5mm² FEP or equivalent
 5 = Ex e certified single core cold lead
 7 = Hose line max. 3-core
 8 = Hose line max. 5-core

Heating cable end termination:
 0 = not existing (single core heating cable)
 1 = Dual shrink tube 4 = End termination Stripfree
 2 = Polyolefin end cap 5 = Ex e end termination metal (ETK8EX...)
 3 = Silicone boot 6 = Ex e end termination metal wide (ETK8wEX...)

Termination LBCON / POWERCON:
 A = Terminal block 3-pole D = PCB terminals with cage clamp technology
 B = Terminal block 5-pole, Ø 22 mm E = Splice connector
 C = Terminal block 5-pole, Ø 25 mm F = Ex e cage clamp technology

Heating circuit length in m: E.g. 000 = not existing
 005 = 5m DM1 = 0,1m ***/** = m for connection
 010 = 10m DM5 = 0,5m
 200 = 200m DM9 = 0,9m

Marking without influence on explosion protection, E.g.
 Heating circuit number or AB number

INSTRUCTIONS FOR INSTALLATION & OPERATION



The following Dirac Industries installation instructions must be observed for the professional assembly of the heating circuits: "ETK8..Ex.." A test report must be prepared for each heating circuit and attached to the heating circuit documentation.

The minimum and maximum ambient temperatures of the connection technology must be observed.

For the type ...SC it must be ensured that the thermostat can detect the ambient temperature unhindered.

The ETK8..Ex connection sleeve must be fixed to the object to be heated (e.g. with cable ties, tension band, etc.), ideally under the thermal insulation.

Furthermore, the heating cables must be fixed after approx. 50mm on both sides of the connection, e.g. with tensioning tape, adhesive tape.



DO NOT SQUEEZE THE HEATING CABLE!

When using constant wattage parallel heating cables

A cold lead length of min 100mm must be maintained. Thus the heated zone ends min. 100mm both in front & behind the connection sleeve.

When using heating cable type IPH...NF

The contact node point of IPH...NF must be determined by means of a resistance measurement. Please refer to separate document: „Montageanleitung ETK8EX_set“

When using a constant wattage parallel heating cable from another manufacturer

The relevant instructions for assembly, installation and operation of the manufacturer must be observed & followed directly. However, the cold lead of 100mm, as above must be ensured at all times.

SERVICE & MAINTENANCE

The operator of an electrical system in a potentially explosive atmosphere must keep the equipment in proper condition, operate it properly, monitor it and carry out maintenance and repair work (see IEC/EN 60079-17).

Maintenance and repair work on the product may only be carried out by trained and qualified personnel. Before maintenance and/or servicing, the specified safety regulations must be observed. Only original parts from the manufacturer must be used for maintenance and servicing.

A regular check of the proper condition must be carried out (see IEC/EN 60079-17). Damaged heating circuits must always be repaired or replaced immediately.

The approved ambient/workpiece temperature range (see chapter 4: "Technical data") must always be observed.

Potential equalisation

Equipotential bonding is an electrical connection that interconnects all conductive equipment. The equipotential bonding cable used must be at least 4.0mm² in the colour green/yellow. This is connected using the closed ring cable lug and the associated screw supplied. The potential equalisation is to be carried out as shown.



SPECIAL CONDITIONS

The ambient temperature range of the respective heating tape or heating cable used must be observed. A maximum limit temperature of $T = 190\text{ °C}$ must not be exceeded at the connection points of the heating tapes.

When using the cylindrical terminal compartment in conjunction with the 8-pole Ex-e cage clamp terminal technology (see type code number F), the maximum voltage is limited to $U_{\text{max}} = 60\text{ V}$.

The metallic terminal compartment must be permanently grounded by the operator during installation.

Ambient temperature with Ex-e cage clamp technology: $-55\text{ °C} \leq T_{\text{amb}} \leq +105\text{ °C}$.

TEST REPORT

HEATING CIRCUIT TEST REPORT

General information

	Customer	Constructor	Project no.:
Adress			

Order no.:	Heating Circuit Batch: _____
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Ex- design	Zone:	Temperature class: T ____
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Technical data and testing

Circuit number:	①	②	③
Heating tape group:	<input type="checkbox"/> Self limiting		<input type="checkbox"/> Constant wattage
Total sum of heating circuit:	_____ pcs.		
Part no. Of heating cable			
Length of teating circuit	_____ m	_____ m	_____ m
Nominal output total	_____ W	_____ W	_____ W
Type of termination			
Type of supply cable			
Adjustment / Controller / Limiter	controller ____°C limiter ____°C	controller ____°C limiter ____°C	controller ____°C limiter ____°C
Supply voltage	<input type="checkbox"/> 12/24V <input type="checkbox"/> 230V AC <input type="checkbox"/> 400V AC <input type="checkbox"/> ____V	<input type="checkbox"/> 12/24V <input type="checkbox"/> 230V AC <input type="checkbox"/> 400V AC <input type="checkbox"/> ____V	<input type="checkbox"/> 12/24V <input type="checkbox"/> 230V AC <input type="checkbox"/> 400V AC <input type="checkbox"/> ____V
Visual Inspection	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Function test	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
High voltage test:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Insulation measurement	_____ kv ≥ _____MΩ (min. 50MΩ)		
Testing date			
Signature examiner			

To be completed by customer or constructor

Fusing	_____ A(C-Characteristic)
RCD Residual current device	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ mA
Place / Date	
Signature Constructor	
Signature Customer	

DIRAC Industries NW/SA
J.B. Bosmansstraat 2
B-1600 Sint-Pieters-Leeuw
+32 (0)2 376 51 29
+ 32 (0)2 376 16 95

DIRAC Industries s.r.o
Prumyslova zona Kolín-Ovčary
K.Automobilce 585,
280 02 Kolín, Czech Republic
+ 420 323 040 700

DIRAC Industries Kft.
Bogoly utca 12. 2120 Dunakeszi
Hungary
+ 36 30 422 2035

DIRAC Industries Pvt Ltd.
509, Goodwill Infinity, Plot E/3A
Sector 12, Kharghar, Navi Mumbai
Maharashtra, India - 410210
+ 91 83907 44712

DECLARATION OF CONFORMITY

DIRAC INDUSTRIES S.R.O., K AUTOMOBILCE 585, 28002, KOLÍN - SENDRAŽICE

DECLARATION OF CONFORMITY

THIS DECLARATION OF CONFORMITY IS ISSUED BY THE MANUFACTURER:

Bussines name: DIRAC Industries s.r.o.
 Seat: K Automobilce 585, 28002, Kolín – Sendražice
 CIN: 27956628
 VATIN: CZ27956628

FOR THE PRODUCTS:
 Self-Limiting Parallel Heating Tapes

Notified body: Bureau Veritas

TYPE DESIGNATION:
 DE**** - **/** * - * * - ***/ *****

THE PRODUCT CORRESPONDS TO:

EN 60079-0:2018	EN 60079-31:2014
EN 60079-7:2015	EPS 23 ATEX 1 228 X
FTZU 23 ATEX Q 001	

IT COMPLIES WITH THE FOLLOWING GUIDELINES:

Directive 2014/34/EU
 Directive 2014/35/EU
 Directive 2011/30/EU

PLACE OF ISSUE:


DIRAC Industries s.r.o.
 K Automobilce 585
 280 02 Kolín – Sendražice

MANUFACTURER'S REPRESENTATIVE:

Martin Šimůnek
 Quality manager

STAMP, DATE, SIGNATURE

DIRAC Industries s.r.o.
 Průmyslová zóna Kolín - Ovčáry
 K Automobilce 585, 280 02 Kolín - Sendražice
 Tel.: +420 323 040 700, Fax: +420 323 040 799
 DIČ: CZ27956628

31.08.2023 



DIRAC INDUSTRIES NV/SA

J.B. Bosmansstraat 2
B-1600 Sint-Pieters-Leeuw
+32 (0)2 376 51 29
+ 32 (0)2 376 16 95

DIRAC INDUSTRIES S.R.O

Prumyslova zona Kolin-Ovcary
K Automobilce 585,
280 02 Kolin, Czech Republic
+ 420 323 040 700

DIRAC INDUSTRIES KFT.

Bagoly utca 12. 2120 Dunakeszi
Hungary
+ 36 30 422 2035

DIRAC INDUSTRIES PVT LTD.

509, Goodwill Infinity, Plot E/3A
Sector 12, Kharghar, Navi Mumbai
Maharashtra, India - 410210
+ 91 83907 44712