



Operating Manual

Drum/Container Heater

Series  -PERT

Diese Betriebsanleitung ist auf
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BA/FH_IBCH-EX/0.5/0120/EN

Translation of the German original

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1. Introduction

Summary In this chapter you will find the following sections:

- Structure and use of the manual
 - Manufacturer details
-

1.1 Structure and use of the manual

Validity This manual applies to the following device:

Identification: Flexible Drum/Container Heater, Series -PERT
Type FH/IBCH-EX-xx-xT

Application: Frost protection, process temperature maintenance, heating up of a drum or IBC container in potentially explosive atmospheres (Ex)

Date of Issue January 2020

1.2 Distributor details

Distributor Kuhlmann Electro-Heat A/S

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DENMARK

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2. Description of the Drum/Container Heater

Summary In this chapter you will find the following sections:

- Overview
 - Technical specifications
 - Intended use
 - EC Declaration of Conformity
-

2.1 Overview

Application Drum/Container Heaters serve for frost protection, for the heating up and/or for the maintenance of process temperatures

Customized Manufacturing Being handcrafted our Drum/Container Heaters are precisely tailored to the respective object to be heated.

Materials The jacket body is made of high quality and heat resistant fiber glass materials. The inner and outer fabric features a liquid-tight PTFE*-coating which also provides for resistance to acids and solvents . Being designated for application in potentially explosive atmospheres, the surface is antistatically equipped. An integrated insulation with elastomer mats provide a superior energy efficiency.

Heating System The heating is carried out by means of a fully integrated heating system comprising a self-limiting parallel heating cable and the corresponding connection system. The heating cable is uniformly fixed in loops to the inner side of the jacket body.

Engineering The heating power as well as the insulation thickness are configured with respect to the designated application, operating conditions and specific customer demands.

*) Poly-Tetra-Fluor-Ethylene (trade name: Teflon®)

2.2 Technical specifications

Electrical Components

Heating element:	Self-limiting parallel heating cable
Temperature sensor :	PT100 Ex nA 2-, 3- or 4 wire
Power supply:	H07BQ-F, 3G1,5 PUR coated, orange according VDE 0282 part 10 / HD 22.10

Heater Body

Fabric:	PTFE coated E-glass, antistatic, surface resistance $< 3 \cdot 10^5 \Omega/m^2$ max. temperature resistance $+260^\circ\text{C}$
Yarn:	PTFE (heater inner side) max. temperature resistance $+260^\circ\text{C}$ Polyester / Kevlar (heater outer side) max. temperature resistance $+150^\circ\text{C}$
Insulation (integrated):	Elastomer max. temperature resistance $+85^\circ\text{C}$ (MT) / $+150^\circ\text{C}$ (ST) thermal conductivity $k=0,045 \text{ W/mK}$
Belts:	PP belts max. temperature resistance $+100^\circ\text{C}$
Closing:	PA bukles max. temperature resistance $+100^\circ\text{C}$
Colour:	Black

Specification	Nominal voltage:	230 V		
	Frequency:	50...60 Hz		
	Power consumption:	see type plate ¹		
	Protection grade:	IP 65		
	Permissible ambient temperature:	-15°C...+35°C		
	Max. surface temperature heating element:	+95°C (type MT) (T5) +200°C (type ST) (T3)		
	Max. allowed media temperature:	+65°C (type MT) +110°C (type ST)		
	- cut-off (cumulative 1000 h):	+85°C (type MT) +130°C (type ST)		
	Max. allowed vessel temperature:	plastic drums and IBC container:	+90°C ²	
		steel drums:	+120°C ²	

¹⁾ The specific power consumption stated on the type plate corresponds to an ambient temperature of 0°C respectively to the operating temperature of the corresponding heating cable. For other ambient temperatures please refer to the heat output diagram included in the data sheet of the heating cable.

²⁾ The max. allowed vessel temperatures may be lower. This applies for plastic drums and IBC containers especially. Adhere to manufacturer's documentation respectively to the media specific data.

2.3 Intended use

Definition
“Authorized Person”

A person is considered an authorized person, if he or she is assigned as directed to perform specific tasks on or with the Drum/Container Heater.

Intended Use

The Drum/Container Heater is deemed to be used as intended only if attention is paid to the following points:

- The device may only be employed for the application as agreed in the contract.
 - The safety and operating instructions of this manual must be adhered to.
 - The directives of the operating company must be obeyed.
 - The legal regulations for the prevention of industrial accidents must be satisfied.
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Unintended Use

Considered as an unintended use in terms of a foreseeable misuse are:

- the heating of objects, the Drum/Container Heater has not been particularly designed for
 - the operation under conditions other than assumed in this manual
 - the operation of the Drum/Container Heater by un instructed or unauthorized personnel.
-


2.4 EC Declaration of Conformity

pursuant to ATEX Directive 2014/34/EU

The distributor

Kuhlmann Electro-Heat A/S
Tarupvej 51
5210 Odense NV
Denmark

hereby declares, that the below-mentioned device

Flexible Drum/Container Heater, series -PERT
type FH/IBCH-EX-xx-xT



complies with the regulations of the following directives:



- ATEX Directive 2014/34/EU

Adopted standards and specifications:

- DIN EN 60079-0: 2012 + A11: 2013
DIN EN 60079-7: 2007
DIN EN 60079-30: 2007
Explosive atmospheres
part 0: Equipment - General requirements
part 7: Equipment protection by increased safety "e"
part 30: Electrical resistance trace heating - General and testing requirements
Application guide for design, installation and maintenance
- DIN EN ISO 80079-36:2016
Non-electrical equipment for use in potentially explosive atmospheres
part 1: Basic method and requirements

Marking:

type MT:  II 3G Ex e IIc T5 Gb (without integrated PT100 EX temperature sensor)
 II 3G Ex e nA IIc T4 Gc (with integrated PT100 EX temperature sensor)

type ST:  II 3G Ex e IIc T3 Gb (without integrated PT100 EX temperature sensor)
 II 3G Ex e nA IIc T3 Gc (with integrated PT100 EX temperature sensor)

Odense, Denmark, 28.01.2020

Place, Date



Signature
Lars Jensen, Managing Director

3. Essential safety instructions

Summary In this chapter you will find the following sections:

- Safety symbols used
 - Primary hazards
 - Operator's duty of care
 - Requirements on the personnel
 - Use in hazardous area
-

Preface The following essential safety instructions are to be regarded supplementary to already nationally applicable rules and legal regulations for the prevention of industrial accidents. According to this, you must always obey applicable rules and legal regulations for the prevention of industrial accidents in addition to these essential safety instructions.

3.1 Safety symbols used



This symbol indicates an electrical hazard arising from exposure to electrical voltages.



This symbol identifies a burning hazard arising from exposure to hot surfaces.

DANGER OF DEATH!

Possible lethal hazards are indicated separately by the expression "DANGER OF DEATH!".

3.2 Primary hazards

Summary Here you will find information on the essential safety instructions that allow for a safe handling of the Drum/Container Heater.



DANGER OF DEATH!

The Drum/Container Heater utilizes voltages of 230 V with correspondingly high amperages. Since amperages as of 40 mA can be lethal, appropriate precautions are to be taken.

Preventive measures:

- Do not touch any current-conducting parts.
 - Immediately report damaged cables or parts to the person responsible for the Drum/Container Heater.
 - Being housed in a designated pocket on the outer side of the heater body, the connection system has to be kept plugged / screwed together and must not be removed from this pocket during operation.
 - Installation work may only be carried out by qualified personnel.
-



The surface of the heating cable can reach temperatures of more than +43°C. Touching the heating cable, either intended or unintended, may lead to serious skin burns.

Preventive measures:

- Do not touch the heating cable or the heated object during operation.
 - Ensure that the heating cable has completely cooled down before opening the Drum/Container Heater.
-

3.3 Operator's duty of care

Access to the Manual	This manual must always be accessible for personnel working with the Drum/Container Heater or being responsible for it.
Prevention	It is the operator's duty to thoroughly inform the operating personnel about all sources of hazard and to keep up the awareness of these.
Malfunctions and Defects	Immediately notify the manufacturer about malfunctions or defects. Keep the Drum/Container Heater turned off until the manufacturer has fixed the problem and has again approved its operation.

3.4 Requirements on the personnel

Responsibility	The responsibilities of the personnel regarding operation, installation and maintenance / service must be clearly defined by the operator.
Initial Operation	Personnel entrusted with the initial operation of the Drum/Container Heater must be qualified for this task by virtue of their training.
Repair Work	Repair work on the Drum/Container Heater may only be carried out by the manufacturer's service technicians.

3.5 Use in hazardous area

Scope of ATEX-Conformity



use in zone 2

The electrical components being integrated in the Drum/Container Heater (heater cable and connections system) are each individually approved as system components for the use in hazardous area according to EC-Directive 2014/34/EU (ATEX) (see certificates in the appendix).

The correct installation and the orderly operation of the electrical components included in the Drum/Container Heater corresponds to the manufacturer's operating instructions. Even the non electrical components such as the fabric and the insulation corresponds with the ATEX directive. Therefore the Drum/Container Heater (as a sum of all single components) is a category 3 equipment according to the EC-Directive 2014/34/EU (ATEX) and marked accordingly. As long as the operating instruction of the present manual are adhered the Drum/Container Heater is applicable in zone 2 without restrictions.

Applicable Norms and Directives

Regarding electrical equipment for use in potentially explosive atmospheres the relevant legal mounting and operating regulations & directives must always be considered (e.g. RL 1999/92/EU, RL 2014/34/EU, EN 60079-14 and DIN VDE 0100 series).

The requirements according to EN 60519-1 and EN 60519-2 must be complied with.

The operator of electrical equipment in potentially explosive atmospheres is obliged to keep the equipment in good order, to use it as intended, to supervise it and to regularly perform service and maintenance work (EN 60079-14, EN 60079-17 and EN 60079-19).

4. Installation

4.1 Attaching the Drum/Container Heater

Depending on the individual size and the weight of the Drum/Container Heater 1 or 2 persons are required for attaching the Drum/Container Heater to the object.

Put the Drum/Container Heater around the object to be heated. If the Drum/Container Heater features cut-outs (e.g. for supplyments or closings), make sure to have them positioned correctly.

Finally, close the Drum/Container Heater using the designated fasteners. Assure yourself that the Drum/Container Heater fits tightly to allow for full contact of the inner side with the surface of the object.

Never apply force when attaching the Drum/Container Heater.

5. Putting into operation / Electrical connection

Competence The electrical connection of the Drum/Container Heater may only be carried out by “authorized personnel”.

The manufacturer assumes no liability for installation work performed by the operator and for thereby resulting damages or injuries.

Power Supply If possible, the power supply as well as the safeguarding should preferably be located in a non-Ex area. Otherwise, the power supply and the safeguarding must be carried out utilizing only explosion protected devices and in accordance to EC-Directive 2014/34/EU (ATEX). The following wiring diagram assumes a power supply and safeguarding in non-Ex area.

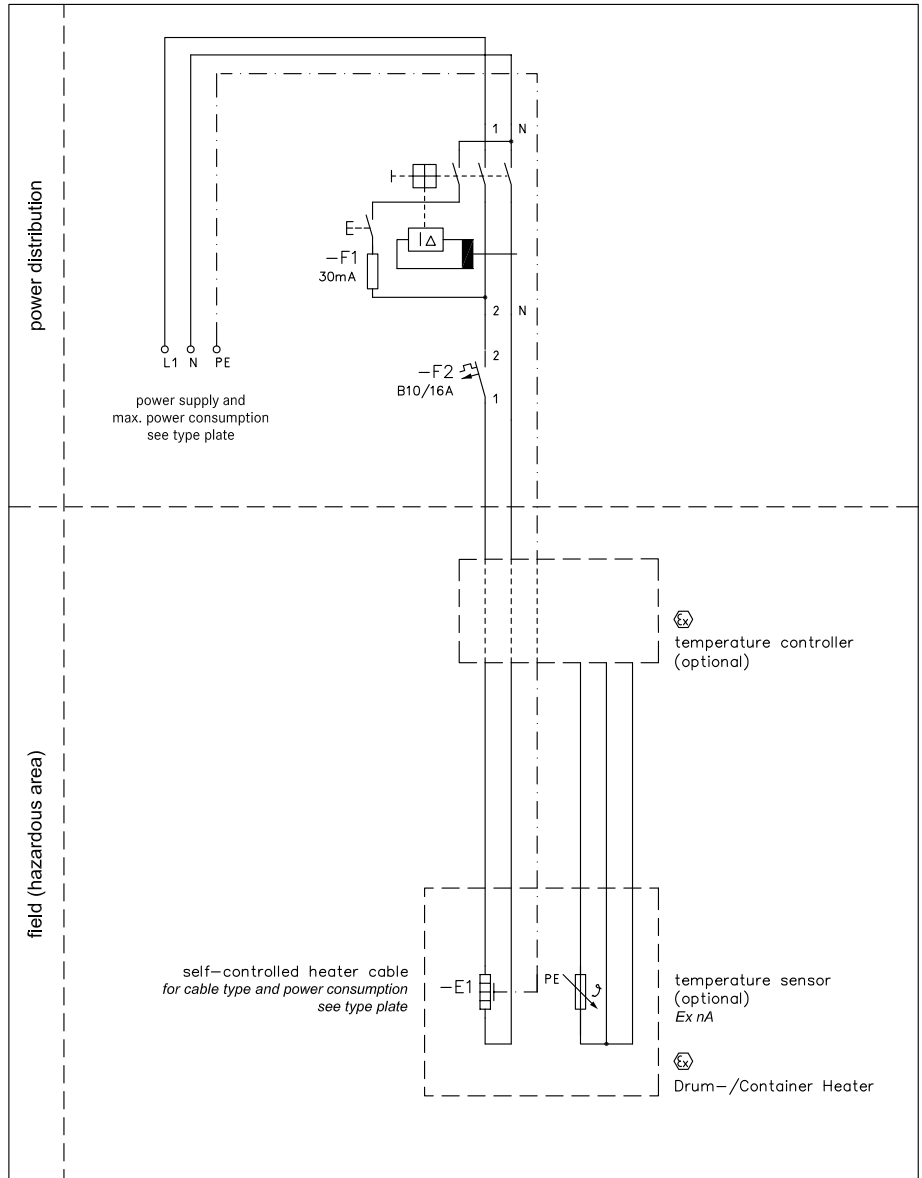
Safeguarding The power supply of the Drum/Container Heater must be safeguarded by means of a residual-current circuit breaker (RCB) together with an overcurrent circuit breaker (OCB). Alternatively, a combined residual current operated circuit-breaker with overcurrent protection (RCBO) can be employed.

Temperature Control and Limit According to the application the Drum/Container Heater must be temperature controlled and/or temperature limited. If so the Drum/Container Heater is equipped with two or one temperature sensors. The electrical connection of the controller and the limiter must be executed considering the corresponding operating manual.

Protective Earth Conductor

For protection in case of indirect contact, other current conducting parts are to be incorporated into the protective measure..

Wiring Diagram





DANGER OF DEATH!

The Drum/Container Heater utilizes voltages of 230 V with correspondingly high amperages. Since amperages as of 40 mA can be lethal, appropriate precautions are to be taken.

Preventive measures:

- Do not touch any current-conducting parts.
 - Immediately report damaged cables or parts to the person responsible for the Drum/Container Heater.
 - Being housed in a designated pocket on the outer side of the heater body, the connection system has to be kept plugged / screwed together and must not be removed from this pocket during operation.
 - Installation work may only be carried out by qualified personnel.
-

6. Operating instructions

Contact Surface of the Heated Object	The drum or IBC container to be heated must not exhibit sharp parts or edges (e.g. burr) on its contact surface to the Drum/Container Heater. Otherwise, these sections are to be eliminated or are to be covered with suitable materials in order to prevent damage to the Drum/Container Heater.
Operation only permitted on Object	The Drum/Container Heater may only be turned on if it has been properly attached to the designated object. Moreover, the Drum/Container Heater must not be opened or moved together with the object during operation.
Operating Temperatures	The Drum/Container Heater may only be operated within the specified temperature ranges (see section 2.2 → Technical specifications).
Media Temperature	Ensure the max. allowed media temperature is never exceeded. Adhere to manufacturer's documentation respectively to the media specific data. The media temperature has to be measured inside the media using e.g. a hand-held thermometer. Depending to the media the heating is not equal, i.e. the media is heating up faster at the vessel wall. Ensure the max. allowed media temperature is not exceeded even not at the vessel wall. To get a homogene media temperature the media has to be mixed by stirring.
Vessel Pressure	Ensure the drum or container pressure does not exceeds a critical value due to the heating. Open a closing (e.g. the bung hole) during the heating, if necessary.
Initial Operation	During initial operation, minor off-gassing of the glass fiber materials in the heater body may occur. Therefore, make sure to ventilate the premises for at least 1 hour.
Deformation	Avoid any deformation of the Drum/Container Heater, especially bending, compression or folding.
Mechanical Stress	Avoid exposure of the Drum/Container Heater to mechanical stress, especially caused by friction on the ground or by contact to moving or vibrating parts.
Sharp Objects	Keep sharp objects away from the Drum/Container Heater.
Cleaning	Inside hazardous area the Drum/Container Heater may only be cleaned with a damp cloth to avoid static charges. Only use gentle detergents which are approved for the use in hazardous area. Disconnect the Drum/Container Heater and wait until it has completely cooled down before performing cleaning work.

Storage Always store the Drum/Container Heater dry and frost-free. Again, please avoid any deformation of the Drum/Container Heater.

**Damages,
Malfunctions and
Defects**

Immediately report damages, malfunctions or defects to our service team:

Kuhlmann Electro-Heat A/S
Tarupvej 51
5210 Odense NV
DENMARK

Phone: +45 6612 2325

Email: kuhlmann@kuhlmann.dk

Web: <http://www.kuhlmann.dk>

7. Appendix

Overview Here you will find the technical documentations of the following, single components of the Drum/Container Heater:

- Heating Cable: Data sheet, operating manual and ATEX-certificate
 - Connection System: Data sheet, operating manual and ATEX-certificate
 - Temperature sensor: Data sheet, operating manual and ATEX-certificate
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