

ISOHEAT®

ISOHEAT-MI-FHC



manual

1.0 –06/2020



In your own interest:

Please read this manual and store it.
Note and follow the safety instructions.

manufacturer

Isoheat GmbH
D-76698 Ubstadt-Weiher

contact

Isoheat GmbH
Großer Sand 4
D-76698 Ubstadt-Weiher

Tel.: +49 (0)7251-93247-0
Fax: +49 (0)7251-93247-29
E-Mail: info@isoheat.de
Web: www.isoheat.de

content

1 general informations 4

 1.1 *product: ISOHEAT-MI-FHC* 4

 1.2 *proper operation* 5

 1.3 *delivery volume* 5

2 safety instructions 6

 2.1 *safety instructions for start up* 7

 2.2 *failure and extraordinary burdens* 8

3 Mounting and connect 9

4 start up 12

5 function and operate 13

6 technical data 14

1 general informations

This manual is for all information about installation, setting to work, function and operation of the ISOHEAT-MI-FHC. Also you get safety instruction and help cancel failures.

1.1 product: ISOHEAT-MI-FHC

Heating cable from this series are mineral insulated, waterproof, electrical heating cables with an outside sheath in stainless steel 1.4541 and 2.4816. They are used for heat up and for hold temperature constant at pipes, apparatuses, container and similar applications.

The reachable operating temperature are achieved in addition to the performance of the heating cable depends on the following operating conditions and can influence:

- thermal conductivity of the heating material,
- thermal conductivity of the heating medium,
- type and thickness of insulation and the technical data.

ISOHEAT-MI-FHC are for the construction of electrical heating and heating systems in the industrial area **Ex-proof** industrial area and provided to the following standards.

Heating cable in this series are for controlled operation up to 650°C at the heating element.

Chemical resist :

The out sheath of stainless steel can be used in many cases, however, is occurring chemical in liquids and gases only limited use. Before putting the heating cable use this condition should be checked by operator.

1.2 proper operation

ISOHEAT-MI-FHC only guilty as proper operation, if follow points will be considered:

- Heating cable is suitable for heating liquid and gaseous media.
- Heating cable should be operate only in the narrow range of performance.
- Heating cable should be operate only in the narrow range of temperature.
- Heating cable should be operate only by properly trained staff.
- The safety and operating instructions in this manual must be adhered to.
- Heating cable may only in operation with installed safety equipment
- Operating instructions of the operator must be observed.
- Statutory accident prevention regulations must be adhered too.

The documentation of the heating systems have to be store for each heating circuit separate, as long as the system was in use.

Nonproper operation:

- operation from unauthorized persons,
- operation in violation of safety regulations,
- operation with modification, damage or deactivate safety equipment.

1.3 delivery volume

Check, if the delivery is complete and intact.

Contact immediately your supplier, if parts are lost or damage.

- 1 heating cable ISOHEAT-MI-FHC
- 2 PTFE-sealing
- 1 manual
- 1 EU-examination certificate

2 safety instructions

This product is construct for heat industrial machinery and equipment. Planning, building, check and maintenance follow these requirements:

- this manual,
- IEC 60079-0 explosive area - part 0: resources – general requirements
- IEC 60079-7 explosive area - part 7:
Equipment protection by increased safety "e" 
- IEC 60079-30-1 explosive area - part 30-1:
Electrical resistance trace heating - General and testing requirements
- IEC 60079-31 explosive area - part 31:
Device dust explosion protection through housing "t" 
- directive 2014/34/EU (ATEX)
- relevant parts of VDE 0100,

as well as additional standards, regulations (those imposed by the employer`s liability insurance associations) and rules have to be observed.

The protective measures against dangerous body currents have to followed according to VDE 0100 part 410 and part 540 (grounding and earthing system) in addition to the above standards.

The design of electrical resistance trace heating systems is to be monitored by persons with specialist knowledge of trace heating systems who adhere to the design methodology specified by the manufacturer for explosive atmospheres.

2.1 safety instructions for start up



WARNING !

This heating cable is electrical equipment.

It must therefore be operated only by properly trained staff.

We advise you to run the heating cable on leakage circuit breaker (RCD). In this case we recommend use circuit breaker (RCD) with a tripping current of 0,3 A or 0,5 A, since at high temperatures and large heating cable lengths significant leakage can occur.

Maintenance connection and repair have to be performed by trained specialized and qualified staff.



WARNING !

Heating cables can reach temperatures in operation, which can cause burns if touched.

Appropriate activities are provided for personal protection.

Heating cables should not be touch if power is on!
[contact protection operation]



WARNING !

Heating cables are only for use in earthed networks (for example: TT- or TN-network)

They are not allowed in isolated networks (for example: IT-network).

2.2 failure and extraordinary burdens

It has been assumed that safe operations is no longer possible, the installation must be permanently shut down and secure against being in advertently put back into operation!

This is case, if

- heating cable shows visible signs of damages,
- heating cable is not operating according to specification,
- heating cable is not operating (no visible indication of reason),
- after excessive strain of any kind, exceeded the visible limits (e.g. storage, transportation, operating temperature, set up).

3 Mounting and connect

Switch off all circuits before installation. To switch off, all external conductors, including the neutral conductor, should be disconnected from the power supply. The marking on the heating cable must be observed. Earth-fault device protection is required for each circuit.

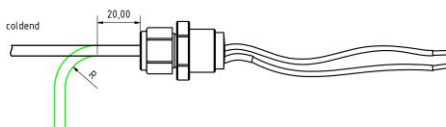
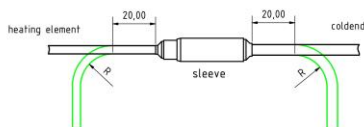
Heating cable can mount length, parallel, wounded, meanderform or spiralforn on heated object. In the installation is to ensure good surface contact and heat transfer.

The product must not be above the other, crossing over or overlapping mounted. The laying on sharp edges, corners or burrs should be avoided.

When laying meandering, the minimum bending radius, relative to the cross sections of the coil heater, must be observed.

resist [Ω / m]	diameter heating cable	min. bending radius
10,0	3,2mm	16 mm
6,30	3,2mm	16 mm
4,00	3,2mm	16 mm
2,50	3,6mm	18 mm
1,60	3,8mm	20 mm
1,00	4,1mm	21 mm
0,63	4,5mm	23 mm
0,40	5,0mm	25 mm
0,25	5,6mm	28 mm
0,16	6,5mm	33 mm

It must be between the heating cable and bending the cold end, a minimum distance of 20mm is required before the bend.



Also on the cold end side the follow minimum bending radius have to accept:

Cross-section	diameter cold end			minimum bending radius (R)	
2,5mm ²	Ø	4,9	mm	25	mm
6,0mm ²	Ø	6,1	mm	30	mm

When the installation is to ensure good surface contact and heat transfer. For bridges in critical areas (edges or corners) can be thermally conductive material can be used. Prior to the heating pipe insulation should be covered with aluminium foil or stainless foil. This serves once for better heat distribution on the object and the other part as a protection against the ingress of insulating material between the heating cable and the object to be heated. Insulation between heating part and object lead to elevate temperatures in this area and can damage the heating cable. The proper and professional cover is checked by the user.

Metallic components that come into contact with the heating cable must be included in the protective measures of protection class I (protective earthing). Explains the details to VDE 0100.

The cold leads are provided for the permanent connection and via a screw connection with flexible leads. When connected, the requirements under 2. "safety instructions" list of standards and regulations. The max. permissible temperature in the connection area is 90°C.

Operation of the heating cable may only be regulated. With proper temperature control equipment to ensure that the heating element temperature is exceeded at any point the maximum operating temperature of 650°C.

Decisive factor is the position of the temperature sensor.

Permissible operating temperature of the heating cable is located at 650°C!

In case of bad heat transfer to the object to be heated, the figure may be significantly lower.

Temperature control must be designed so, that both, the medium to be heated and the object to exceed the max. allowable temperature is excluded. In case of an error can occur (due to failure of temperature control) hazardous. There must be a safety device for limiting the temperature must be used.

The cold leads are intended for fixed connection and are screwed into one with flexible connecting wires

EN 60079-30-1 „e“



EN 60079-30-1 „t“



approved terminal box connected. The metal outer jacket is grounded via the integrated protective conductor connection.

The screw connections are either screwed into the terminal box via a suitable threaded hole or fastened with a lock nut through a through hole.

When connecting, the requirements of “2. Safety instructions” listed standards and regulations. The permissible temperature range in the connection range is -55°C to +70°C.

The minimum temperature of installation is -55°C.

Maximum permissible bore diameter for the execution of the screw connections in the terminal box:

Max. Ø20.5mm screw connections M20

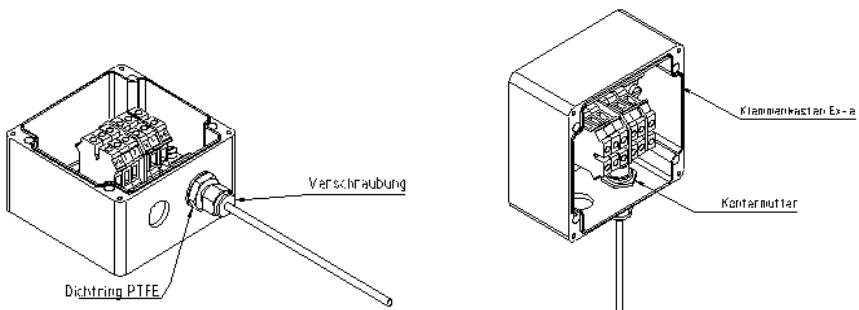
Max. Ø25.5mm screw connections M25

Torques for tightening the screw connection and the sealing ring.

Torque sealing rings PTFE M20 and M25: 20Nm

Torque screw connection M20: 30Nm

Torque screw connection M25: 35Nm



After installation, the insulation resistance of the heating cable must be measured and recorded and must not be less than 20MΩ.

4 start up

According to point 2. „safety instructions“ mentioned norms and regulations the required tests have to perform and document after the completion of the electrical heating system or equipment.

nominal voltage:

Before connecting the heating cable to the power supply, make sure that the main voltage and the voltage of the heating cable (see identification plate) are the same.

heating medias:

Heating cables from series ISOHEAT-MI-FHC are suitable for heat up media, which are bounded in the range of permissible operating temperature are controlled and operated.



WARNING!

The object provided with heat tracing (workpiece, the system part) is to be clearly identified as such after installing the thermal insulation by attaching warning notices or markings at suitable points and / or at regular intervals along the heating circuit.

5 function and operate

Service and maintenance are carried out according to the "2. Safety instructions" mentioned standards and conditions, as well as the regulations of the professional associations that apply depending on the application and other conditions that apply to the application. A functional test of the heating device and the control should be carried out at least once a year.

The documentation of the accompanying heating system must be consulted before any maintenance, repair or changes.

After each maintenance, repair or change, the function of the earth fault protection device of each circuit involved must be checked.

In the event of an earth fault or an overcurrent being interrupted, the device must not be reset until the cause of the trip has been examined by a qualified person.

At the end of maintenance, repair or changes, the insulation resistance of the trace heating must be measured and recorded and must not be less than 20MΩ

6 technical data

EU examination certificate:	BVS 12 ATEX E 041 U
IEC-Ex certificate no.:	IECEX BVS 12.0031 U
marking:	⊕ II 2G Ex 60079-30-1 IIC Gb ⊕ II 2D Ex 60079-30-1 IIIC Db

type	:	ISOHEAT-MI-FHC
nominal voltage	:	see identification plate
nominal power	:	see identification plate
nominal currency	:	see identification plate
nominal frequency	:	see identification plate
safety class	:	I
protection type	:	IP 65
heating cable temperature	:	max. 650 °C
length	:	see identification plate
part no.	:	see identification plate
serial no.	:	see identification plate
min. installation temperature	:	see identification plate