Operating and Installation Instructions for Cylinder / Ring Heating Elements:

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1. General

Cylinder / ring heaters, hereinafter referred to as heating elements, are primarily used to heat metallic cylinders in the industrial sector, especially in injection moulding machines, blow heads, extrusion cylinders.

Different possible uses require mutual agreement and should be approved and released by the manufacturer. Otherwise neither guarantee nor liability will be accepted. Specified load limits must not be exceeded. Compliance with the operating, maintenance and servicing conditions specified by the manufacturer is also part of the intended use.

In addition to these instructions, the binding accident prevention regulations in force in the country of use and at the place of use, as well as the recognized technical rules for safe and professional work, must be observed.

VDE regulations:

The product is manufactured in accordance with the following standards, where applicable:

- DIN-EN 60335-1
- VDE 0700-1

The production of the heating elements is certified according to the current DIN-EN ISO - standards certified by TÜV Thüringen.

This product is electrical equipment. Read these instructions carefully before installation and commissioning. Faultless functioning and operational safety can only be guaranteed if the general safety regulations for electrical installations and the special safety and installation instructions in this manual are observed during installation.

The heating element may only be used in accordance with the following instructions. Gebr. Bach GmbH accepts no liability for damage caused by failure to observe the instructions.

2. Technical Data

Depending on the application, we distinguish between three types:

Type	Operating Temperature max. in °C	Thermal Load max. in W/cm²
RHK (Micanite) -also available as mandrel heater-	300	3.5
RHKS (Micanite) -also available as mandrel heater-	400	6
HRHK (Ceramic) -also available as mandrel heater-	450	7

In principle, individual customer requirements in terms of material, dimensions and electrical parameters can be realized after consultation and clarification of all technical details.

3. Liability

Incorrect installation and incorrect selection of the temperature control can lead to defects and accidents. Any other or deviating conditions of use require the written approval of the manufacturer, otherwise neither warranty nor liability will be accepted for these and for any resulting damage. The same applies to unauthorized modifications to the product.

Our liability is limited to damage that has occurred during intended use. We are not liable for safety defects that are not yet recognizable according to the current state of the art. The contractually agreed time applies as the warranty / guarantee period.

4. Safety instructions

The heating element is not intended for use in Ex systems. When handling electrical equipment, please observe the following:

The relevant fire protection precautions must be observed. No critical conditions may occur both at the heating element and in the material to be heated (such as fire, explosion, smoke and gas development, etc.). Installation, maintenance and servicing of the heating element are the responsibility of a qualified electrician.

The heating elements may only be operated with a suitable temperature control that prevents the maximum permissible operating temperature from being exceeded. In the event of power supply malfunctions and/or damage to the electrical equipment, the heating element must be switched off immediately. Safety devices must not be bypassed, dismantled, altered in their function or bypassed in any other way.

For all work on the heating element, the heating element must be disconnected from the power supply and secured against being switched on again. The specified operating temperature of the heating elements does not apply to the connecting cable. If necessary, the connecting cable must be adapted to the application.

Remark: **The contact protection for the electrical connection is to be ensured by the user.**

The accident prevention regulations in the user's company must be observed.

5. Installation and commissioning

The heating element may only be handled by instructed and authorized persons. The heating element may only be used in a technically perfect condition and in accordance with its intended use and in a safety-conscious and hazard-conscious manner.

During assembly, avoid deformation and excessive spreading of the heating element. Difficult mounting conditions should be taken into account at the design stage. The heating elements may only be operated with a suitable temperature control.

The following points should be noted (RHK, RHKS):

- The heating element must be form-fitting clamped onto the cylinder to be heated in such a way that the heater and the surface to be heated are firmly connected to each other.

- Holes, grooves or similar under the heating element should be avoided. **If necessary, the use of a heat conducting plate is recommended**.
- If the connection is not form-fitting, the heating element will be destroyed by overheating.
- When using disc springs, a torque of up to 8.5 Nm should be maintained.
- During the initial heating phase, the heating element must be retensioned. Pretension heating elements with compression springs only to the extent that sufficient working travel is available.

The following points should be noted (HRHK):

- The heating element must be form-fitting clamped onto the cylinder to be heated.
- Care must be taken to avoid damaging or even destroying the ceramic elements inside the heating element. A torque is recommended which ensures that the ceramic stones of the heating element are in optimum contact with the cylinder.
- A visual inspection should confirm this. If compression springs are used, the spring must be pretensioned (approx. 2/3 of the spring tension) so that it can work in both directions. The torque should be between 3 and 3.5 Nm.

For all three types applies:

- In principle, however, care should be taken to ensure that no mechanical damage can occur to the metal parts or the wiring.

Electrical installation:

- The electrical connection may only be carried out by an authorized electrician or by appropriately instructed specialist personnel.
- The grounding of the heating element must be ensured by an appropriate installation, if the heating element was ordered without ground connection.
- Make sure that the operating voltage is the same as the supply voltage. All connections must be made with heat-resistant cables. These must be laid in such a way that they do not come into contact with sharp-edged metal parts or heat-radiating surfaces.

The heating element may only be put into operation after complete assembly. During the initial start-up until the operating temperature is reached, the tight fit of the heating element must be checked at several intervals. If necessary, the tensioning screws must be retightened with 3 to 3.5 Nm for HRHK models and up to 8.5 Nm for RHK/RHKS models.

6. Maintenance

Regular testing by a qualified electrician is mandatory. The period depends on the operational conditions and is to be determined and carried out by the user on his own responsibility.

7. Repairs - Spare Parts

Repairs may only be carried out by our service staff or qualified electricians. You can get spare parts on request from Gebr. Bach GmbH. Any liability on the part of Gebr. Bach GmbH is excluded for damage caused by the use of spare parts, accessories, lubricants and cleaning agents not supplied and approved by Gebr. Bach GmbH.

8. Dismantling

If the heating element is to be used again later, deformation of the heating element must be avoided. To allow easy disassembly, the clamping screws should be treated with a heat-resistant lubricant.

9. Storage

The heating element must be stored in a dry and dust-free place. If stored too moist, the insulating material used can absorb moisture and there is a risk of a short circuit.

10. Disposal

During disposal, the legal regulations in force in the country of operation and at the place of use at the time of disposal must be complied with.

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