Heating Elements for the Die-Casting Industry

hotset solves Heating Problems

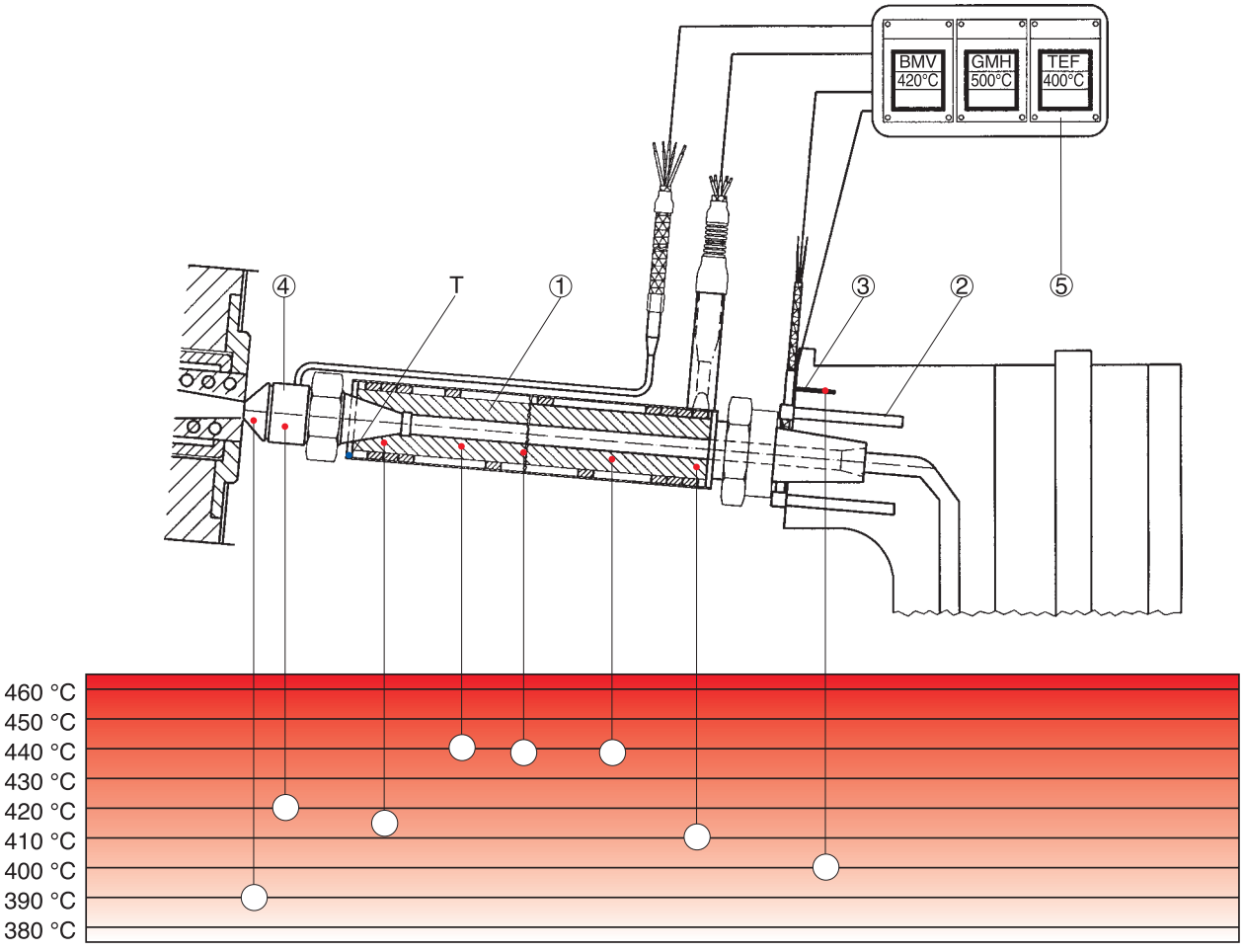
For more than 25 years, **hotset** develops and manufactures industrial heating elements from the idea up to an application-oriented usage.

For example in hot chamber die-casting: **hotset** offers electrical heating possibilities for different levels of demand. Starting with the High Watt Density Cartridge Heaters, then the Open Ended Heater and the Sealed Heater, up to the Heating System - completely ready for installation - which guarantees a process secure and economical die-casting production at a high quality level.

hotset — a good feeling !

Summary

Construction Principal for the Heating System of a Hot Chamber Die-Casting Machine

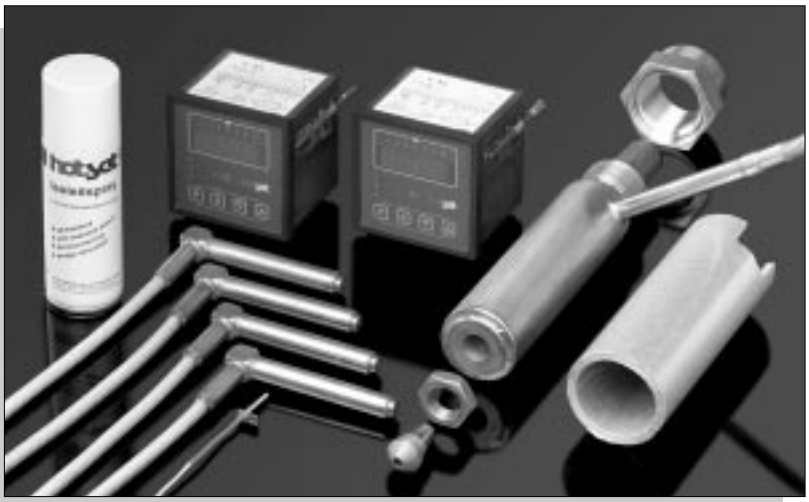


Heating System for Hot Chamber Die-Casting Machines

Heating System — the complete solution for electrical heating of hot chamber die-casting machines:

Round the Sealded Heater, type GMH, the Heating System of **hotset** offers all necessary components for the electrical heating of hot chamber die-casting machines with up to date technology.

With this complete package, the user will get a technical and economical optimized heating, which is also process secure and pollution free. The energy is used efficiently and the quality level increases remarkably.



Standard:

A "ready for installation"-system with the following components:

- Sealed Heater type GMH ① with insulation tube, nozzle tip and nuts
- 4 High Watt Density Cartridge Heaters type HHP/G ② for the heating of the gooseneck
- Thermocouple ③ type TEF 2L (NiCr-Ni / type K or Fe-CuNi / type J)
- 2 Temperature Controllers type RR 231
- all necessary leads, cables and connectors

Construction principal:

The optimal construction and the corresponding adjustment temperatures of the Heating System are as follows (see page 2):

① GMH: adjustment temperature of the integral thermocouple (measuring point T) 500 °C (932 °F), ca. 420 °C (788 °F) in the flow channel

② heating of the gooseneck with HHP/G, adjustment temperature of the separated Thermocouple TEF (③) 400 °C (752 °F), same as rated temperature

④ adjustment temperature of the Heated Nozzle Tip BMV 420 °C (788 °F), same as rated temperature

⑤ 3 temperature controllers for control of the above mentioned adjustment temperatures of the GMH 500 °C (932 °F), TEF at the gooseneck 400 °C (752 °F) and BMV 420 °C (788 °F)

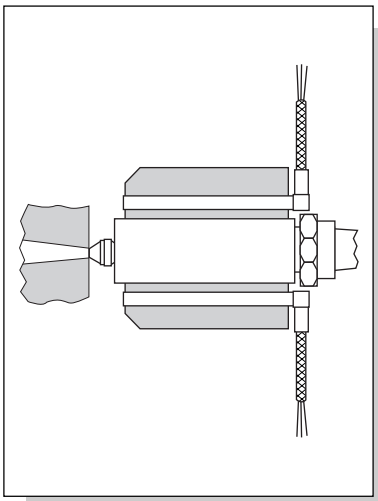
Options

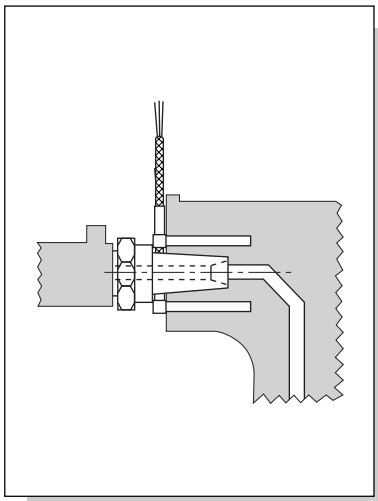
- treatment of the surface of the flow channel for flow speeds > 50 m/sec (164 ft/sec)
- Heated Nozzle Tip type BMV ④ to prevent chilling of material at the mould cavity (see page 10)
- 3 Temperature Controllers type RR 231 ⑤
- care by hotset-technicians if required

Instruction of use:

- If the connection of the GMH is not sealed, it has to be protected against the ingress of liquids etc.

HHP/G — High Watt Density Cartridge Heaters





High Watt Density Cartridge Heaters HHP/G — electrical heating of the nozzle in semi-forms (middle):

The heating of the nozzles with High Watt Density Cartridge Heaters is the most cost-effective way to start with electrical heating. The nozzle is heated from all sides without differentiated wattage distribution.

High Watt Density Cartridge Heaters HHP/G — constant temperature heating of a gooseneck (right):

With the electrical heating of a gooseneck you can temper the casting material optimal before ingress in the nozzle. You will get an uniform temperature level, a gentle handling of the material and save energy.

Standard

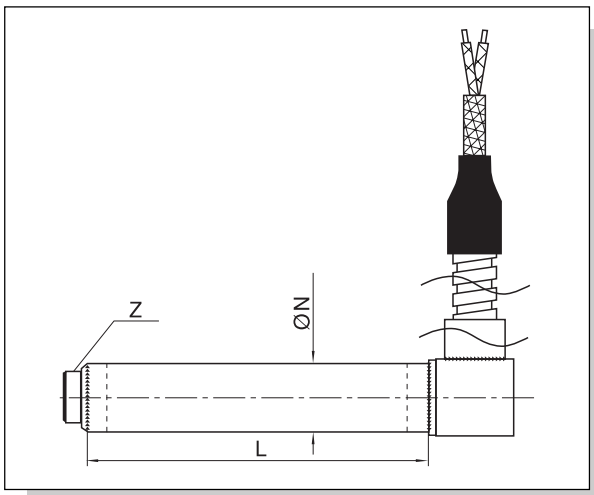
- with knockout tab, welded angular block and piece of tubing
- full mechanical protection even in a rough environment
- easy exchange due to knockout tab (Z) at heater bottom
- 1500 mm (60") glass silk insulated connection leads with flexible metal sleeving

Standard Range
(see table below)

- nominal diameter (ØN)
- length (L)

Options

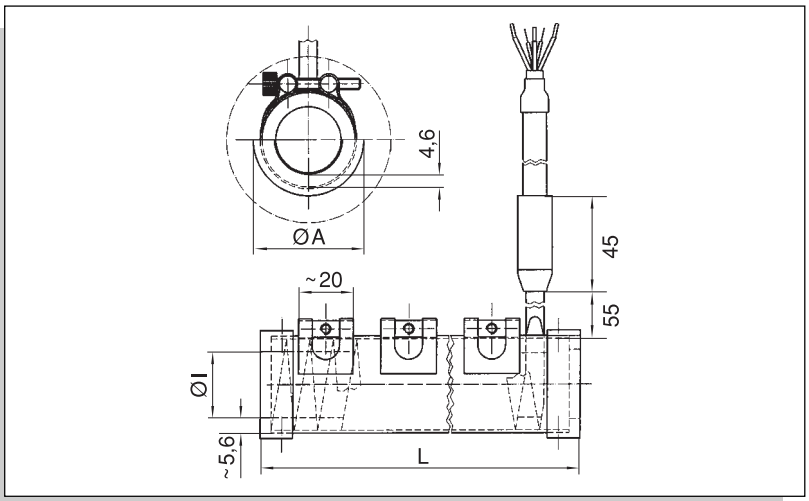
- other dimensions on request
- integral thermocouple NiCr-Ni (type K)
- different connection length
- various connection options
- with stainless steel conduit sleeving for the protection against lubricant
- with high temperature resistant leads



Standard Range HHP/G:

Art.-No.	Nom.-Ø in mm	Length in mm	Wattage in W
9906100	10,0	80	250
9906101	12,5	60	200
9906102	12,5	80	250
9906104	12,5	90	350
9906103	16,0	80	315
9906106	16,0	100	500
9906105	16,0	160	630
9906107	16,0	180	800
9906108	16,0	200	800
9906109	16,0	250	1000
9906110	20,0	100	630
9906111	20,0	160	800

OMH — Open Ended Heater



OMH — economical heating of existing nozzles:

The OMH is an external sheathed, flat lying coil heater which will be slipped onto the nozzle. The mass, which has to be heated, will be reduced to a minimum, thereby less wattage will be needed and energy will be saved. A clamping band as well as ring seals at both ends result in a tight fit of the heater and this prevents the penetration of splashed material.

OMH — high product quality through a uniform temperature level:

Due to the proper wattage distribution of the coil heater, a uniform temperature level along the total length of the nozzle is achieved. This gentle material handling results in a higher product quality and reduces the rate of the components rejected.

Standard

- Coil Heater type WRP / Maxi / 4,6 x 8,6 with special clamping band and ring seals at both ends for a tight fit and as protection against the ingress of material
- application-oriented wattage distribution for a uniform heat transfer and heat distribution to the flow channel
- with integral thermocouple NiCr-Ni (type K)
- 1500 mm (60") glass silk insulated connection leads with earth and flexible metal sleeving

Standard Range
(see table below)

- inside-diameter (ØI)
- outside-diameter (ØA)
- length (L)

Options

- other dimensions on request
- different connection length
- various connection options

Instruction of use:

- Connections which are not sealed must be protected against the ingress of liquids etc.

Standard Range OMH:

Art.-No.	Type OMH	Inside-Ø in mm	Outside-Ø in mm	Length in mm	Wattage in W	Voltage in V
5730130	5	31,5	49,2	78	500	230
5730139	20	31,5	49,2	105	700	230
5740165	50	42,0	59,7	172	1300	230
5730153	80	42,0	59,7	190	1400	230
5750258	125	50,0	67,7	235	1700	230
5760270	200	64,0	81,7	295	2400	400

GMH-Kit — GMH as a Turn Key Set

GMH-Kit — Sealed Heater GMH as kit:

The components of the GMH-Kit can be changed easily and quickly. Flexibility, short downtimes and a secure production are the results.

In operation, the GMH-Kit as a completely sealed system has the same advantages as the GMH: high production security, short sprue bushing, uniform temperature distribution to the flow channel, high product quality and a low rate of rejection.

Standard

GMH-Kit 50, Art.-No. 5940154
GMH-Kit 80, Art.-No. 5940165
consisting of:

- nozzle piece
- heating element:
  Coil Heater type WRP / Maxi / 4,6 x 8,6 completely protected, with wattage distribution
- surface thermocouple NiCr-Ni (type K)
- connection with removable sleeve connection
- insulation tube with stainless steel sheath

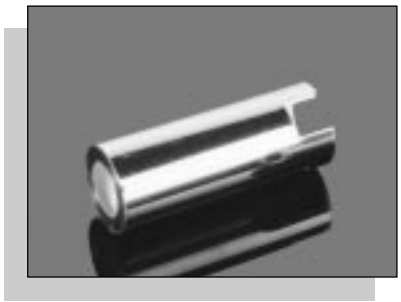
Options

- all accessories are available as single parts (see page 7)
- surface thermocouple FeCu-Ni (type J)
- treatment of the surface of the flow channel for flow speeds > 50 m/sec (164 ft/sec)
- different nozzle tips included nuts (see page 10)
- BMV — Heated Nozzle Tip prevents chilling of material at the mould cavity (see page 10)
- nuts (see page 10)

GMH-Kit — Components

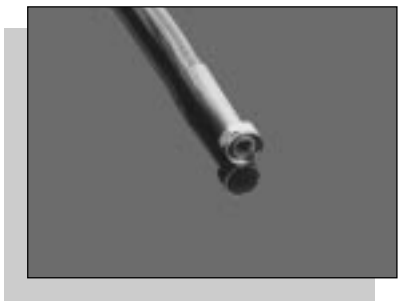
Insulation tube
with stainless steel sheath

- for GMH-Kit 50
  Art.-No. 36211/242139
- for GMH-Kit 80
  Art.-No. 36211/242140



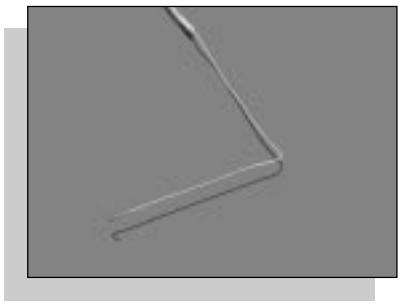
Connection
with removable sleeve connection

- for GMH-Kit 50
  Art.-No. 310082
- for GMH-Kit 80
  Art.-No. 310082



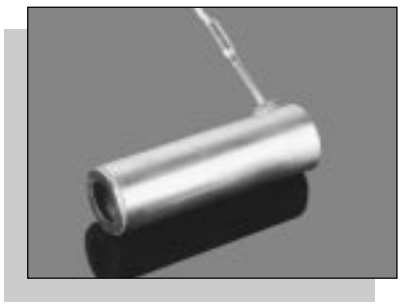
Surface thermocouple
NiCr-Ni (type K)

- for GMH-Kit 50
  Art.-No. 327004
- for GMH-Kit 80
  Art.-No. 327004



Heating element
Coil Heater type WRP / Maxi / 4,6 x 8,6
completely protected, with wattage distribution

- for GMH-Kit 50
  Art.-No. 5730000
- for GMH-Kit 80
  Art.-No. 5730001



Nozzle piece

- for GMH-Kit 50
  Art.-No. 250001
- for GMH-Kit 80
  Art.-No. 250002

GMH — Sealed Heater

GMH — a completely sealed system with a high production security:

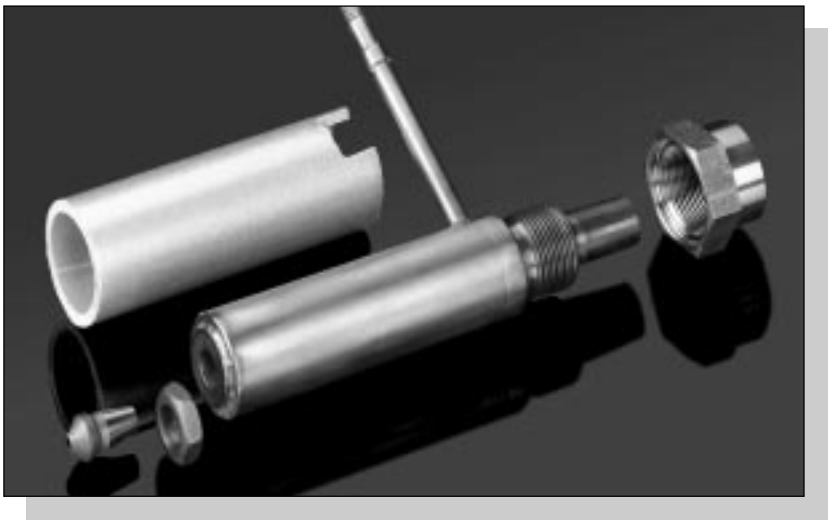
The heating element of the GMH is welded to the nozzle piece with a closely applied stainless steel sheath and end rings. This guarantees the best possible protection and therefore leads to a higher production security. Due to this, it is no exception using the GMH for one, two or three years.

GMH — a compact construction with exceptional length for a short sprue bushing:

The compact construction of the GMH with a low outside-diameter and exceptional length (type GMH / T) allows a deep immersion into the mould cavity. The sprue bushing can be shortened: material savings as well as a reduction of the cycle time are the economical advantages.

GMH — uniform heat distribution to the flow channel:

A uniform heat distribution to the flow channel of the nozzle will be achieved by the application-oriented wattage distribution of the integral heating element. Overheating or chilling of the material will be avoided. This gentle handling of the material leads to a high quality level of the die-casting parts, the rate of rejection is noticeably reduced.



Standard

- Coil Heater type WRP / Maxi / 4,6 x 8,6 with outer tube and end rings welded to the nozzle piece
- completely sealed system for absolute protection against the ingress of any material
- application-oriented wattage distribution for a uniform heat transfer and heat distribution to the flow channel
- low outside-diameter for a deep immersion into the tool
- with integral thermocouple NiCr-Ni (type K)
- 1500 mm (60") glass silk insulated connection leads with earth and stainless steel conduit sleeving

Options

- treatment of the surface of the flow channel for flow speeds > 50 m/sec (164 ft/sec)
- various nozzle tips included nuts (see page 10)
- BMV — Heated Nozzle Tip prevents chilling of material at the mould cavity (see page 10)
- insulation tube (see page 10)
- different connection length (standard 1500 mm / 60")
- various connection options
- nuts (see page 10)

Instruction of use:

- Connections which are not sealed must be protected against the ingress of liquids etc.

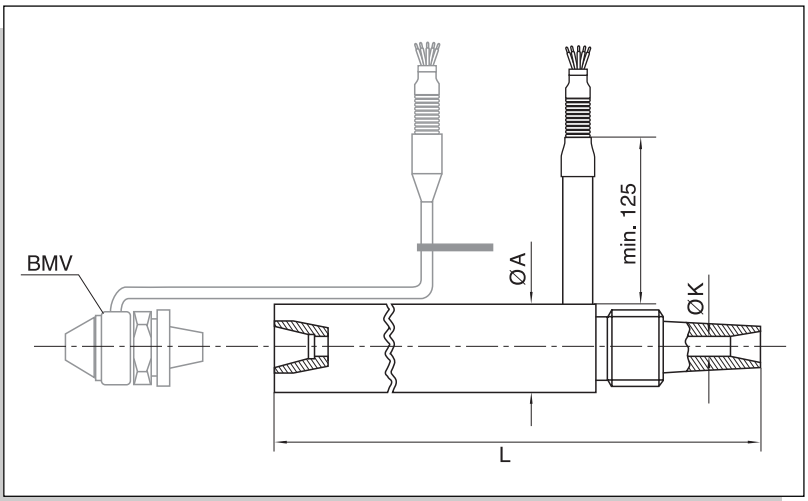
GMH — Sealed Heater

Standard Range
(see tables below)

- inside-bore (ØK)
- outside-diameter (ØA)
- length (L)

Options

- other dimensions on request
- BMV — Heated Nozzle Tip prevents chilling of material at the mould cavity (see page 10)



Standard Range GMH:

Art.-No.	Type GMH	Inside-bore Ø in mm	Outside-Ø in mm	Length in mm	Heat. Length in mm	Wattage in W*
5630133	5	7,0	42,0	149	81	550
5630139	20	9,5	42,0	178	110	700
5630165	50	11	55,2	257	167	1300
5640154	80	11	55,2	286	196	1500
5650258	125	18	62,2	330	240	1800
5650365	200	18	77,2	422	302	2600

*at 230 V, GMH 200 at 400 V

Standard Range GMH / T:

Art.-No.	Type GMH	Inside-bore Ø in mm	Outside-Ø in mm	Length in mm	Heat. Length in mm	Wattage in W*
5630156	5-T	7,0	42,0	169	101	750
5630144	20-T	9,5	42,0	208	140	900
5630254	80-T	11	55,2	316	316	1600
5630256	125-T	18	62,2	370	370	1900

*at 230 V

Accessories for the Die-Casting Industry

Nozzle Tips

Nozzle tip for GMH (left)

- Art.-No. 253002 (for GMH 5)
  Art.-No. 253003 (for GMH 20)
  Art.-No. 253004 (for GMH 50)
  Art.-No. 253005 (for GMH 80)
  Art.-No. 253011 (for GMH 125)
  Art.-No. 253012 (for GMH 200)

Option:

BMV — Heated Nozzle Tip for GMH (right)

- compensates the temperature decrease from the nozzle piece to the mould cavity and prevents chilling of material at the mould contact surface

Nuts

for standard-nozzle tips (left)

- Art.-No. 177014 (for GMH 5 - 80)
  SW 20, M24 x 1.5

  Art.-No. 177015 (for GMH 125 - 200)
  SW 35, M39 x 1.5

for nozzle tips (right)

- Art.-No. 252000 (for GMH 5 - 20)
  SW 55, M36 x 3

  Art.-No. 252001 (for GMH 50 - 120)
  SW 65, M48 x 3

  Art.-Nr. 252002 (for GMH 200)
  SW 100, M72 x 4

Insulation Tubes

In the past, a high heat radiation to the tool and machine parts as well as to the production surrounding had to be accepted when heating nozzle pieces.

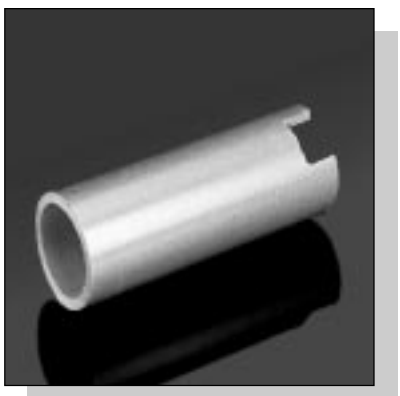
With the insulation tubes which are applied on the Sealed Heater, it is possible to reduce this heat radiation by nearly 60%. The warming up time can be shortened, flow characteristics and temperature distribution will be improved remarkably.

An insulation tubes enlarges the outside-diameter of the heater by approximately 11 mm.

Instruction of use:

An insulation of the nozzle piece has to be made only to the total length of the GMH, on no account only to small sections of the nozzle. The measuring point of the thermocouple should not be in the insulated area (especially at dive nozzles).

- Art.-No. 36216 (for GMH 5 - 20)
- Art.-No. 36217 (for GMH 50 - 80)
- Art.-No. 36218 (for GMH 125)
- Art.-No. 36219 (for GMH 200)
- other on request



Accessory for the Die-Casting Industry

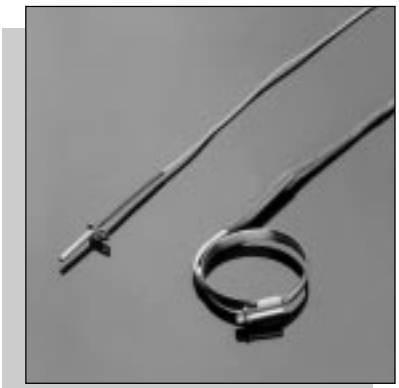
RR 231 / G

Technical data

- supply voltage: 230 V AC
- output voltage: > 5 V DC for semi-conductor relay control or mechanical relay 3 A / 230 V
- with semi-conductor relay; power output: 3300 W / 16 A
- control action: On/Off, P, PI, PD, PID with self-optimation
- dimensions
  96 (B) x 96 (H) x 86 (T) mm

Standard

- PID-control action with self-optimation (auto-tune)
- thermocouple Fe-CuNi (type J), NiCr-Ni (type K), PT 100
- reverse thermocouple indicator
- T/C break alarm with adjustable condition
- alarm functions can be programmed by user
- real value correction, limitation of set value, digital real value display, control deviation display
- start with set value range
- switchable power controller function



TEF 2 L

Cylindrical sensor

- sensor tube Ø 3.5 mm ± 0.05 mm
- length 30 or 40 mm (without screwing)
- sheath made of stainless steel (material.-no. 1.4301)
- compensation line glass silk insulated, 2 x 0.5 mm², approx. 3 mm Ø (without braided protection), 2000 mm long (standard), longer connections on request
- with GLS-protective sleeving, approx. 45 mm long
- Fe-CuNi (type J), NiCr-Ni (type K), PT 100
- with fixing plate, material.-no. 1.4301

TEF Sp Fe-CuNi

Clamping band sensor

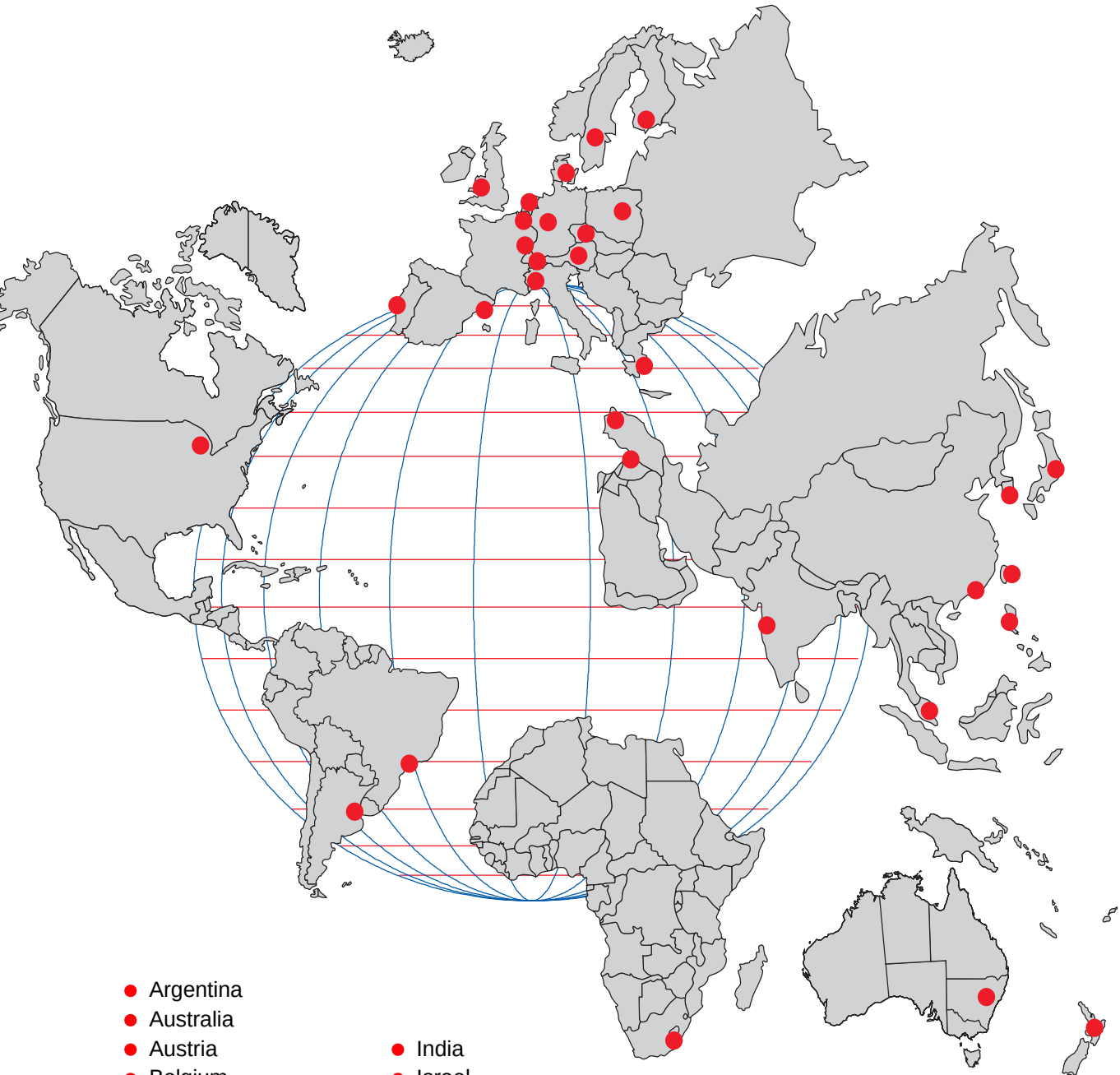
- band width 9 mm
- sensor is fixed onto the cylinder, which has to measured, like a wide clip
- compensation line 2 x 1.0 mm², 2000 mm long
- art.-no. 8609940 (for GMH 5)
  art.-no. 8609940 (for GMH 20)
  art.-no. 8609950 (for GMH 50)
  art.-no. 8609950 (for GMH 80)
  art.-no. 8609950 (for GMH 125)
  art.-no. 8609970 (for GMH 200)

"Isoleitspray"

high temperature lubricant

- heat conductive
- not electrically conductive
- corrosion protection
- less abrasion
- very good separation against metal, glass and slag melts as well as plastics
- temperature resistant up to 900 °C if exposed to air, up to 2000 °C in non-oxidizing atmosphere
- tin contains ~ 200 ml
- art.-no. 9400001

hotset — in Germany and 30 other countries all over the world:



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