FAG

HEATER10, HEATER20

Induction Heating Devices
User manual

SCHAEFFLER

Foreword

The induction heating devices HEATER 10 and HEATER 20 are compact and give rapid, clean operation. Their high efficiency level allows energy-efficient heating and shorter heating times.
This reduces the operating costs. The uniform, controlled heating allows consistently good quality of mounting.

Operation is simple and user-friendly, in addition to which the fitter does not need to remove his gloves. The touch keyboard is oil-resistant, dustproof and waterproof.

When heating by induction is used, there is no need at all to use oil – this gives particularly good environmental compatibility.
The scope of application is very extensive. They can be used to heat the loose inner rings of cylindrical or needle roller bearings as well as sealed and greased bearings. Compared with previous models, they show further improvements in performance capacity and safety.

In order to ensure durability in demanding industrial operation, the devices are extremely robust and reliable. This is also the reason that the warranty of 3 years can be extended to 5 years – free of charge!

Contents

About the user manual

This user manual is part of the device and contains important information.

Symbols

The warning and hazard symbols are defined in accordance with ANSI Z535.6-2006.

DANGER If they are not observed, death or serious injury will occur. ◁

WARNING In case of non-compliance, death or serious injury may occur. ◁

CAUTION In case of non-compliance, minor or slight injury will occur. ◁

NOTICE In case of non-compliance, damage or malfunctions in the product or the adjacent construction will occur. ◁

Signs

The warning, prohibition and instruction signs are defined in accordance with DIN 4884-2 and DIN EN ISO 7010.

Warning, prohibition and instruction signs

Signs and descriptions	
	Warning of magnetic field
	Warning of non-ionising, electromagnetic radiation
	Warning of hot surface
	Prohibited for persons with heart pacemaker
	Prohibited for persons with metallic implants
	Carrying of metallic parts or watches prohibited
	Wear safety gloves
	Wear safety shoes

Availability

This user manual is supplied with each device and can also be ordered retrospectively.

WARNING If the user manual is missing, incomplete or illegible, the user may make errors.

Serious injury or death may occur because important information for safe working is missing.

As the safety coordinator, you must ensure that this user manual is always complete and legible and that any persons using the device have the user manual available. ◁

Legal guidelines

The information in this manual corresponded to the most recent status at the close of editing. The illustrations and descriptions cannot be used as grounds for any claims relating to heating devices that have already been delivered. Schaeffler Technologies AG & Co. KG accepts no liability for any damage or malfunctions if the device or accessories have been modified or used in an incorrect manner.

Original user manual

The original user manual is taken to be a user manual in the German language. A user manual in another language is to be taken as a translation of the original user manual.

General safety guidelines

It describes how the device may be used, who may use the device and what must be observed when using the device.

Correct usage

Correct usage of the induction heating device is defined as the industrial heating of rolling bearings and other rotationally symmetrical, ferromagnetic workpieces. Sealed and greased rolling bearings can also be heated.

Incorrect usage

The heating device may not be used for the heating of parts that are not ferromagnetic or not rotationally symmetrical. Do not operate the heating device in an environment with an explosion risk.

Incorrect usage can lead to the injury or death of persons or damage to the device.

Qualified personnel

For safety reasons, the heating device may only be operated by qualified personnel.

A person defined as qualified personnel:

- has all the necessary knowledge
- is aware of all the hazards and safety guidelines
- is authorised to use the heating device by the safety co-ordinator
- has fully read and understood this user manual.

Working on electrical and electronic equipment

Work on electrical and electronic devices may only be carried out by an electrically skilled person. An electrically skilled person is in a position, on the basis of his technical training, knowledge and experience as well as his knowledge of the appropriate regulations, to carry out work on electrical and electronic devices correctly and recognise possible hazards.

Hazards

During operation, the heating device generates an electromagnetic field that can be fatally dangerous to persons with a heart pacemaker or implant made from ferromagnetic material.

The electromagnetic field heats ferromagnetic parts and can be disrupt or destroy electronic components. Examples include watches, clocks, mobile telephones, credit cards and other data carriers as well as electronic circuits.

Safety equipment

In order to protect the user and the heating device, the following safety equipment is present:

- The temperatures of the cooling element, coil and housing are continuously monitored. The thermal protection system will switch off the heating device before any component is overheated. Once the thermal protection system has been triggered, the heating device can be put back into operation once the error has been eliminated and the device has been checked.
- The heating of the rolling bearing is continuously monitored. If the specified increase in temperature is not achieved within a certain period, the heating device is switched off by the software.

In order that the user can protect himself from the negative effects of the electromagnetic field, the following measures have been taken:

- The user can set the device so that the heating operation does not start until a few seconds after the START/STOP key is pressed. With the standard setting of 5 s, he can move out of the hazard area before the electromagnetic field is generated.

Protective equipment

Personal protective equipment is intended to protect operating personnel against health hazards.

The personal protective equipment comprises:

- heat-resistant gloves
- safety shoes.

Heat-resistant gloves give protection against burns to the hands when touching the hot rolling bearing. Safety shoes give protection against foot injuries due to a falling rolling bearing or support ledge.

Safety specifications

The following safety specifications must be observed when working with the device. Further guidelines on hazards and specific operating procedures can be found, for example, in the section *Commissioning* and the section *Operation*.

Transport

The hot heating device must not be moved directly after the heating process.

Storage

The heating device must always be stored under the ambient conditions described.

These ambient conditions are as follows:

- humidity max. 90%, non-condensing
- protected against sunlight and UV radiation
- no explosion risk in the environment
- no aggressive chemicals in the environment
- temperature from –15 °C to +40 °C.

Unsuitable ambient conditions can have consequences such as damage to the electronic unit, corrosion of the ground contact surfaces and deformation of the plastic housing.

Commissioning

The heating device must not be modified.

The heating device may only be commissioned if it fulfils the regulations to be adhered to at the place of use.

Only original accessories and replacement parts may be used.

The heating device may only be used in well ventilated rooms.

Do not feed the mains connection cable through the U-shaped core.

Operation

The heating device may only be used under the ambient conditions described.

These ambient conditions are as follows:

- closed room
- subsurface flat and capable of supporting loads
- humidity min. 5%, max. 90%, non-condensing
- no explosion risk in the environment
- no aggressive chemicals in the environment
- temperature from 0 °C to +40 °C.

Unsuitable ambient conditions can have consequences such as damage to the electronic unit, corrosion of the ground contact surfaces and deformation of the plastic housing.

The heating device may only be used at the correct supply voltage.

Rolling bearings must not be heated under the cover.

A rolling bearing must not be heated if it is suspended from a metal cable.

During the heating process, the user must maintain a distance of at least 1 m from the heating device.

Objects made from ferromagnetic material must be kept at a distance of at least 1 m from the heating device.

Correct seating of the ledges on the U-shaped core must be ensured, in order to prevent severe vibrations.

The heating device may only be switched on if the support ledge is correctly positioned.

The support ledge must never be removed during the heating process.

Any smoke or vapour occurring during the heating process must not be inhaled.

The heating device must be switched off using the main switch if it is not in use.

Maintenance

The heating device must be switched off before maintenance is carried out.

Disposal

Locally applicable regulations must be observed.

Conversion

The heating device must not be converted.

Scope of delivery

The scope of delivery comprises the heating device, standard accessories and user manual, see *table* and *Figure 1* as well as *table*, page 10 and *Figure 2*, page 10.

Scope of delivery
Heating device HEATER10

Component	Designation	d[1] mm
Heating device	**HEATER10**	–
Support ledge	**HEATER10.LEDGE-15**	15
	HEATER10.LEDGE-30	30
	HEATER10.LEDGE-45	45
Temperature sensor	**HEATER.SENSOR-400MM**	–
Grease, Arcanol Multi3, 250 g	**ARCANOL-MULTI3-250G**	–
Insulating gloves, heat-resistant up to +200 °C	**GLOVE-PRO-TEMP**	–
Cover	**HEATER10.COVER**	–
User manual	–	–

1) Minimum inside diameter of rolling bearing.

① Heating device
② Support ledge HEATER10.LEDGE-45
③ Temperature sensor, magnetic
④ Support ledge HEATER10.LEDGE-30
⑤ Support ledge HEATER10.LEDGE-15
⑥ Grease
⑦ Gloves
⑧ Cover
⑨ User manual

Figure 1
Scope of delivery
Heating device HEATER10

Scope of delivery Heating device HEATER20

Component	Designation	d[1] mm
Heating device	**HEATER20**	–
Support ledge	**HEATER20.LEDGE-20**	20
	HEATER20.LEDGE-35	35
	HEATER20.LEDGE-60	60
Temperature sensor	**HEATER.SENSOR-400MM**	–
Grease, Arcanol Multi3, 250 g	**ARCANOL-MULTI3-250G**	–
Insulating gloves, heat-resistant up to +200 °C	**GLOVE-PRO-TEMP**	–
Cover	**HEATER20.COVER**	–
User manual	–	–

[1] Minimum inside diameter of rolling bearing.

① Heating device
② Support ledge HEATER20.LEDGE-60
③ Temperature sensor, magnetic
④ Support ledge HEATER20.LEDGE-20
⑤ Support ledge HEATER20.LEDGE-35
⑥ Grease
⑦ Gloves
⑧ Cover
⑨ User manual

Figure 2
Scope of delivery
Heating device HEATER20

Accessories

The heating device is supplied with standard accessories.

Special accessories such as support ledges in other sizes are available, see section *Technical data and accessories*, page 40.

Damage during transit

Any damage during transit must be reported as a complaint to the carrier:

- ▶ Check the heating device and accessories immediately upon delivery for damage during transit.
- ▶ Report any damage during transit promptly as a complaint.

Defects

Any defects must be reported promptly as a complaint:

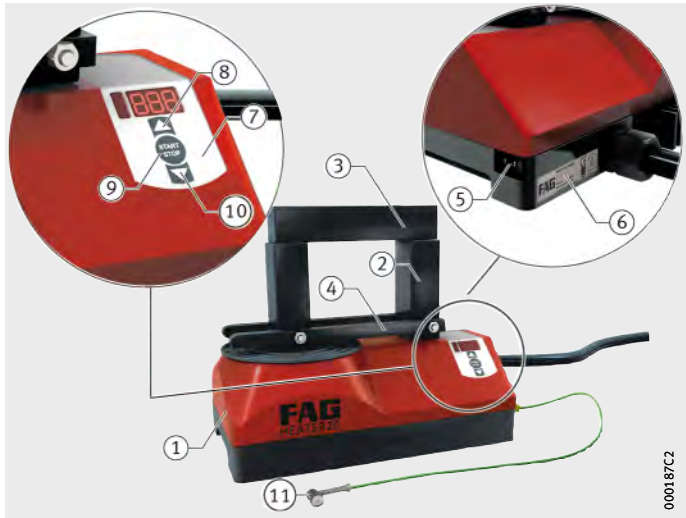
- ▶ Check the heating device and accessories immediately upon delivery for defects.
- ▶ Report any defects promptly as a complaint to Schaeffler Technologies AG & Co. KG.

Description

The heating device can be easily transported and used.

Overview

The components are made from the most suitable material for the particular function, *Figure 3*.



① Housing
② U-shaped core
③ Support ledge
④ Support rail
⑤ Main switch
⑥ Nameplate
⑦ Control panel
⑧ UP key
⑨ START/STOP key
⑩ DOWN key
⑪ Temperature sensor

Figure 3
Overview
Heating device

Housing

It is made from polyurethane and encloses the electronic unit, parts of the U-shaped core and the primary coil.

U-shaped core

This is made from steel and protrudes partially from the housing. In the housing, the primary coil is axially arranged symmetrically around the U-shaped core, *Figure 4*, page 13.

Support ledge

This consists of the same material as the U-shaped core and is placed on the U-shaped core.

Support rails

These consist of heat-resistant plastic and prevent the workpiece to be heated from coming into contact with the housing.

Main switch

This is used to switch the heating device on and off.

Control panel

The heating device is adjusted, started and stopped by means of the control panel integrated in the housing. The control panel has three keys. The display is located above the keys.

Temperature sensor

This is magnetic, interchangeable and transmits the measured value to the temperature measuring unit located in the housing unit.

Function

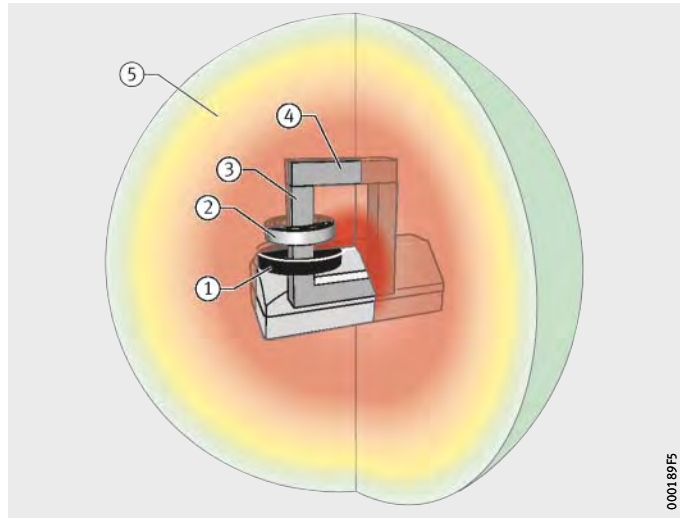
An induction heating device generates a strong electromagnetic field and can thus be used to heat a ferromagnetic workpiece. Due to heating, the workpiece expands, which makes mounting easier. A typical application is the heating of a rolling bearing. This manual therefore considers the heating of a rolling bearing.

Functional principle

The primary coil generates an electromagnetic alternating field. This electromagnetic field is transmitted via the iron core to the secondary coil, for example a rolling bearing. In the secondary coil, a high induction current at low voltage is induced.

The induction current causes rapid heating of the rolling bearing. Any parts that are not ferromagnetic, as well as the heating device itself, remain cold.

When the heating device is switched on, an electromagnetic field is generated. The electromagnetic field is very strong directly at the heating device. The electromagnetic field becomes weaker with increasing distance from the heating device, *Figure 4*.



① Primary coil
② Secondary coil
③ U-shaped iron core
④ Support ledge
⑤ Electromagnetic field

Figure 4
Function

Type of operation

Heating devices always operate on the basis of temperature control.

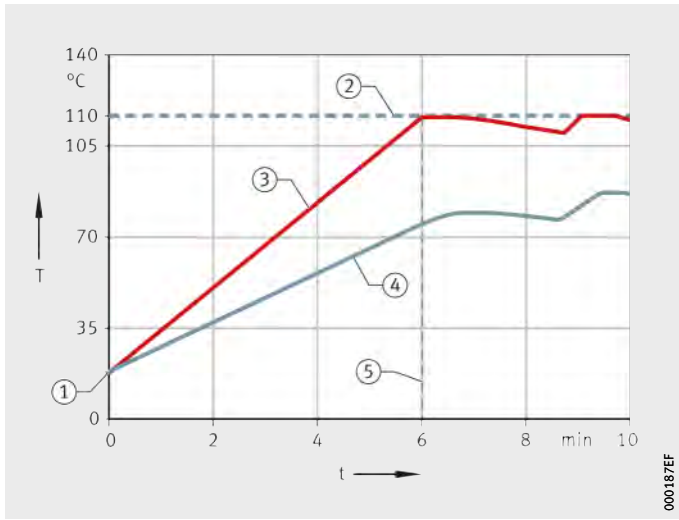
Temperature control

In the case of temperature control, the heating temperature is set. The heating operation is then started.

The heating device indicates when the heating temperature is reached. The heating device then maintains the rolling bearing at the preselected heating temperature.

Once the heating operation is complete, the heating device automatically starts the demagnetisation of the rolling bearing. The heating device indicates when demagnetisation is complete.

With this heating method, the inner ring is heated from the initial temperature to the heating temperature, *Figure 5*.



① Initial temperature
② Heating temperature
③ Temperature of inner ring
④ Temperature of outer ring
⑤ Heating time

Figure 5
Temperature control

Heating time

The heating time is the time taken until the heating temperature us reached. The heating time depends on the size of the rolling bearing and the cross-section of the support ledge.

Transport and storage

Transport

The heating device can be carried. A carry case is available as an accessory.

WARNING

Trip hazard when carrying the device due to hanging down of fixed mains connection cable.

Falling injury due to trip hazard.

Ensure that the mains connection cable is secured against hanging down for transport. ◁

Storage

The heating device should be protected against dust and UV radiation using the cover supplied or should be stored packed in the carry case.

NOTICE

Fire on cover or melting of the carry case due to contact with a hot heating device.

Damage to or destruction of the cover or carry case due to a hot heating device.

Cover the heating device with the cover or pack the heating in the carry case only when the temperature of the heating device is lower than +50 °C. ◁

Commissioning

The heating device can be commissioned at the fitting area.

Hazard area

The hazard area of the heating device can represent a danger of death.

DANGER

Danger of death due to strong electromagnetic field.

Danger of heart stoppage in persons fitted with a pacemaker.

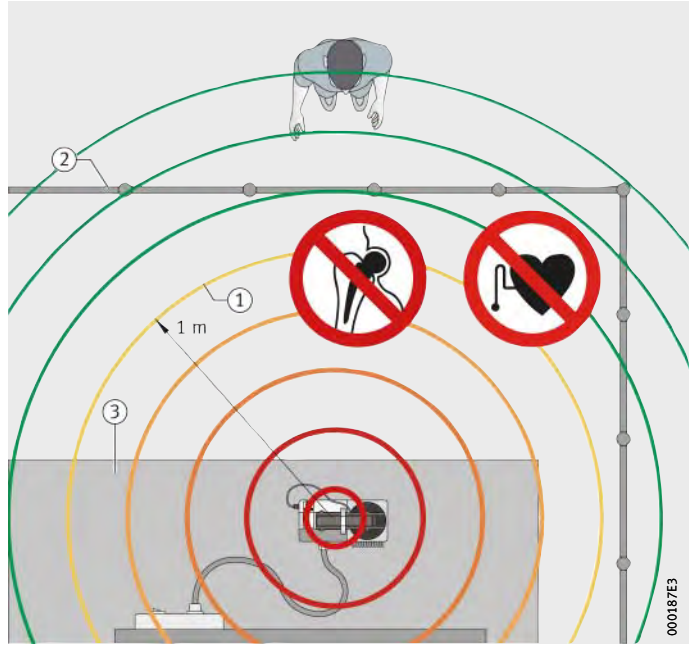
Ensure that persons with a heart pacemaker remain outside the hazard area of the heating device. If necessary, put clearly visible signs or barriers in place, *Figure 6*.◁

WARNING

Danger of burns due to strong electromagnetic field.

Danger of burns due to heating of implants in persons with ferromagnetic implants.

Ensure that persons with ferromagnetic implants remain outside the hazard area of the heating device. If necessary, put clearly visible signs or barriers in place, *Figure 6*.◁



① Hazard area, 1 m
② Barrier
③ Flat work surface capable of supporting load

Figure 6
Hazard area

Fitting area

A suitable fitting area has the following characteristics:

- flat and horizontal
- distance from ferromagnetic parts at least 1 m
- capable of supporting the total mass of the heating device and rolling device
- ergonomic working height for the fitter.

Mains connection

The mains connection cable must be laid safely.

WARNING

Exposed wires carrying current due to melting of the cable sheathing since the cable was laid through the U-shaped core.

Electric shock due to contact with wires carrying current.

Feed the mains connection cable around the U-shaped core. ◁

Carrying out commissioning

Carry out commissioning as follows:

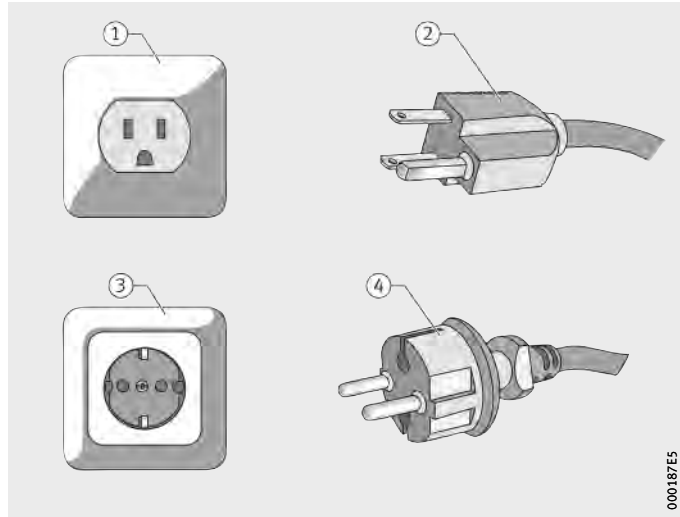
- ▶ Remove the packaging.
- ▶ Check the scope of delivery of the heating device.
- ▶ Position the heating device in a suitable fitting area.
- ▶ Check the heating device and the mains connection cable for visible damage.

⚠WARNING

Exposed cables carrying current. Electric shock! Feed the mains connection cable around the U-shaped core. ◁

- ▶ Connect the heating device to the voltage supply, *Figure 7*. The specifications for the voltage supply can be found on the nameplate, *Figure 3*, page 12, and in the section *Technical data and accessories*, page 40.
- ▶ Connect the temperature sensor to the heating device, see page 33.
- ▶ Start the configuration procedure if necessary in order to set the values for the heating operation, see section *Configuration*, page 19.

The parameters for the heating operation are set and the heating device is ready for use.



① Socket, 110 V
② Three pin NEMA plug, type B, 110 V
③ Socket, 230 V
④ Safety contact plug, 230 V

Figure 7
Voltage supply

Configuration

The heating device is supplied in a default configuration. The user can configure the heating device at any time. During configuration, the heating device is set to user mode, see *table*.

Overview of parameters

Parameter	Explanation
U00	Set to default setting
U01	Change the default setting for the heating temperature
U02	Change the temperature differential
U03	Switch the buzzer on or off
U04	Change the temperature unit
U05	Change the countdown time
U06	[1]
U07	[1]
U08	[1]
U09	Calibrate the heating device
U10	Exit user mode

[1] The parameter is displayed but should not be changed.

Setting to default setting

The heating device is supplied with default settings for the parameters. The heating device can be restored to the default settings at any time.

U00 Default setting:

- Sets all parameters to the default settings.

You can set all parameter values to their default setting as follows:

▶ Switch off the heating device using the main switch.

▶ Press the UP and DOWN keys simultaneously, hold the keys down and switch on the heating device using the main switch.

▷ The heating device is in user mode and the display will show U00.

▶ Press the START/STOP key.

▷ The display will show NO.

▶ Press the UP key as often as necessary until YES is displayed.

▶ Press the START/STOP key.

▷ The new value will be stored and the display will show U00.

▶ Press the UP key as often as necessary until U10 is displayed.

▶ Press the START/STOP key.

All the parameter values will have the same setting as at the time of delivery.

Changing the default setting for the heating temperature

The heating temperature is the temperature to which the rolling bearing will be heated. This is shown in the display when the heating device is switched on.

U01 Heating temperature:

- +40 °C, 104 °F Minimum value
- +110 °C, 230 °F Default setting
- +240 °C, 464 °F Maximum value
- 1 Step size.

You can change the heating temperature as follows:

▶ Switch off the heating device using the main switch.

▶ Press the UP and DOWN keys simultaneously, hold the keys down and switch on the heating device using the main switch.

▷ The heating device is in user mode and the display will show U00.

▶ Press the UP key as often as necessary until U01 is displayed.

▶ Press the START/STOP key.

▷ The display will read the value for the parameter U01.

▶ Change the value using the UP or DOWN key.

▶ Press the START/STOP key.

▷ The new value will be saved and the display will show U01.

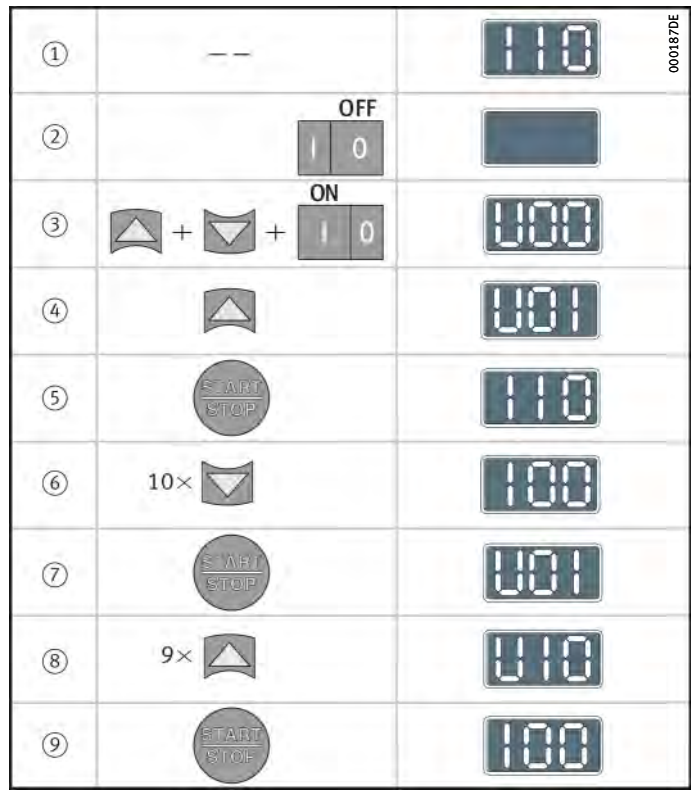
▶ Press the UP key as often as necessary until U10 is displayed.

▶ Press the START/STOP key.

The heating temperature has been changed.

Example

When the heating device is delivered, it is set to a heating temperature of +110 °C. If a different heating temperature will always be required for the heating operation, you can change the default setting for the heating temperature, *Figure 8*.



① Device in standby mode
② Switch off the heating device
③ Switch on the heating device, user mode
④ Default setting for heating temperature
⑤ Activate setting
⑥ Change heating temperature to +100 °C
⑦ Store +100 °C
⑧ Exit user mode
⑨ Switch heating device to standby mode

Figure 8
Changing the default setting for the heating temperature

Changing the temperature differential

The temperature differential is the difference in temperature relative to the heating temperature at which the device restarts heating.

U02

Temperature differential:

- 0 °C, 32 °F Minimum value
- +5 °C, 41 °F Default setting
- +50 °C, 122 °F Maximum value
- 1 Step size.

You can change the temperature differential as follows:

▶ Switch off the heating device using the main switch.

▶ Press the UP and DOWN keys simultaneously, hold the keys down and switch on the heating device using the main switch.

▷ The heating device is in user mode and the display will show U00.

▶ Press the UP key as often as necessary until U02 is displayed.

▶ Press the START/STOP key.

▷ The display will show the value for the parameter U02.

▶ Change the value using the UP or DOWN key.

▶ Press the START/STOP key.

▷ The new value will be stored and the display will show U02.

▶ Press the UP key as often as necessary until U10 is displayed.

▶ Press the START/STOP key.

The temperature differential has been changed.

Switching the buzzer on or off

If the buzzer is switched on, a buzzer tone will sound when the heating temperature is reached.

U03 Buzzer:

- 0 Switched off
- 1 Switched on, default setting.

You can switch the buzzer on or off as follows:

▶ Switch off the heating device using the main switch.

▶ Press the UP and DOWN keys simultaneously, hold the keys down and switch on the heating device using the main switch.

▷ The heating device is in user mode and the display will show U00.

▶ Press the UP key as often as necessary until U01 is displayed.

▶ Press the START/STOP key.

▷ The display will show the value for the parameter U03.

▶ Change the value using the UP or DOWN key.

▶ Press the START/STOP key.

▷ The new value will be stored and the display will show U03.

▶ Press the UP key as often as necessary until U10 is displayed.

▶ Press the START/STOP key.

The buzzer has been switched on or off.

Changing the temperature

The measured temperature is shown in the selected temperature unit in the display of the heating device.

U04

Temperature unit:

- 0 Display in °C, default setting
- 1 Display in °F.

You can change the temperature unit as follows:

▶ Switch off the heating device using the main switch.

▶ Press the UP and DOWN keys simultaneously, hold the keys down and switch on the heating device using the main switch.

▷ The heating device is in user mode and the display will show U00.

▶ Press the UP key as often as necessary until U04 is displayed.

▶ Press the START/STOP key.

▷ The display will read the value for the parameter U04.

▶ Change the value using the UP or DOWN key.

▶ Press the START/STOP key.

▷ The new value will be stored and the display will show U04.

▶ Press the UP key as often as necessary until U10 is displayed.

▶ Press the START/STOP key.

The temperature unit has been changed.

Changing the countdown time

The heating device does not start the heating operation immediately after the START/STOP key is pressed. The countdown time is the time that elapses between pressing the START/STOP key and the generation of the electromagnetic field.

U05 Countdown time:

- 0 s Minimum value
- 5 s Default setting
- 99 s Maximum value
- 1 Step size.

You can change the countdown time as follows:

▶ Switch off the heating device using the main switch.

▶ Press the UP and DOWN keys simultaneously, hold the keys down and switch on the heating device using the main switch.

▷ The heating device is in user mode and the display will show U00.

▶ Press the UP key as often as necessary until U05 is displayed.

▶ Press the START/STOP key.

▷ The display will show the value for the parameter U05.

▶ Change the value using the UP or DOWN key.

▶ Press the START/STOP key.

▷ The new value will be stored and the display will show U05.

▶ Press the UP key as often as necessary until U10 is displayed.

▶ Press the START/STOP key.

The countdown time has been changed.

Inactive parameters

In this heating device, some parameters are inactive.
When cycling through the parameters before exiting the setting mode, these parameters are displayed but must not be changed.

U06 Ramp control:
- This parameter is not active in the case of these heating devices.

U07 Ramp angle:
- This parameter is not active in the case of these heating devices.

U08 Remote control:
- This parameter is not active in the case of these heating devices.

Calibrating the heating device

The heating device can be calibrated at any time.
If the temperature sensor is changed, the heating device must then be calibrated. The heating device should be calibrated annually.

U09

Calibrating the heating device:

- The temperature measuring unit is set, the heating device then displays the exact temperature.

You can calibrate the heating device as follows:

▶ Heat a rolling bearing by means of temperature control to +120 °C.

▶ Switch off the heating device using the main switch.

▶ Press the UP and DOWN keys simultaneously, hold the keys down and switch on the heating device using the main switch.

▷ The heating device is in user mode and the display will show U00.

▶ Press the UP key as often as necessary until U09 is displayed.

▶ Press the START/STOP key.

▷ The temperature measured by the temperature sensor will be shown in the display.

▶ Measure the temperature of the rolling bearing directly next to the temperature sensor using a calibrated temperature gauge.

▶ Press the UP or DOWN key until the temperature displayed on the calibrated temperature gauge is also shown in the display of the heating device.

▶ Press the START/STOP key.

▷ The new value will be stored and the display will show U09.

▶ Press the UP key as often as necessary until U10 is displayed.

▶ Press the START/STOP key.

The heating device has been calibrated.

Exiting user mode

At the end of the configuration process, the user mode is exited by selecting this menu item.

U10

Exiting user mode:

- The heating device is switched to standby mode.

Operation

Once the rolling bearing has been positioned on the heating device while switched off, the heating device is switched on. The heating operation is then started.

DANGER

Danger of death due to strong electromagnetic field.

Danger of heart stoppage in persons fitted with a pacemaker.

Stay out of the hazard area of the heating device if you have a pacemaker, see section *Hazard area*, page 16.◁

WARNING

Danger of burns due to strong electromagnetic field.

Danger of burns due to heating of implants in persons with ferromagnetic implants.

Stay out of the hazard area of the heating device if you have a ferromagnetic implant, see section *Hazard area*, page 16.◁

Homogeneous heating

If heating is carried out rapidly, the inner ring is heated significantly more than the outer ring. In homogeneous heating with the suitable support ledge, the rolling bearing is heated slowly and the temperature differential between the inner ring and outer ring is smaller than in the case of rapid heating.

NOTICE

Damage to the rolling bearing due to excessively rapid heating of the inner ring in rolling bearings with very small radial internal clearance.

Danger of raceway damage, resulting in destruction of the bearing during operation.

Determine the appropriate support ledge for homogeneous heating by means of tests.◁

Rolling bearings with reduced radial internal clearance should be heated using a support ledge with a smaller cross-section, *Figure 9*.

① Homogeneous heating
② Rapid heating

Figure 9
Homogeneous heating

Heating operation

It is recommended that only one rolling bearing should ever be heated at one time.

WARNING

Danger of injury due to falling parts.

Danger of foot injuries due to falling rolling bearing or falling support ledge.

Always wear safety shoes when working with the heating device. ◁

WARNING

Danger of burns due to hot surfaces.

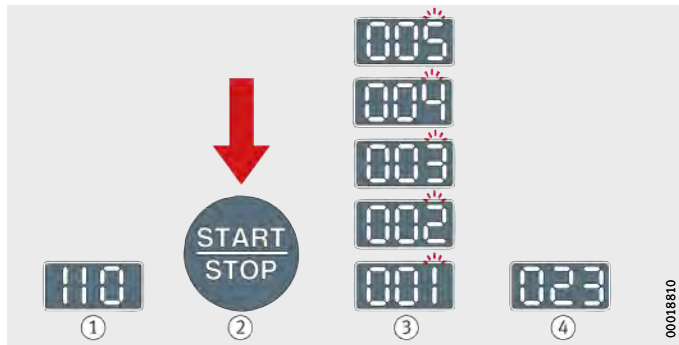
Serious burns may be suffered due to touching the hot rolling bearing with unprotected hands.

Wear insulating gloves when touching the hot rolling bearing. ◁

Countdown time

When the heating operation is started, the device may not begin heating immediately.

Depending on the settings for the countdown time, the heating device will count down the time to zero and will only then start the heating operation, *Figure 10*.



① Display of heating temperature
② START/STOP key
③ Display of countdown time
④ Display of initial temperature

Figure 10
Starting the heating operation

The temperature measured by the temperature sensor will be shown after the countdown.

Temperature holding mode

When the heating temperature is reached, an acoustic signal will sound and the display will flash. Once the heating temperature is reached, the heating device switches to temperature holding mode. If the temperature falls by a certain value, the heating device will heat the rolling bearing up to the heating temperature. During this time, the display will flash and the temperature of the rolling bearing will be shown.

After the fifth heating cycle, the temperature holding mode will be stopped and the rolling bearing will cool down.

Temperature holding mode can be stopped at any time by pressing the START/STOP key.

Heating a rolling bearing

You can heat a rolling bearing as follows:

▶ Check whether the rolling bearing can be heated, see section *Suitable rolling bearings*, page 31.

⚠WARNING

Falling parts. Foot injuries. Wear safety shoes.◁

▶ Switch off the heating device using the main switch.

▶ Position the rolling bearing on the heating device so that it is not in direct contact with the housing of the heating device, see section *Positioning the rolling bearing*, page 31.

▶ Attach the temperature sensor in the vicinity of the inside diameter, in the case of rolling bearings to the end face of the inner ring that is free from grease and oil, see page 33.

▶ Switch on the heating device using the main switch.

▷ A short acoustic signal will sound and the preset heating temperature will be shown in the display.

▶ Adjust the required heating temperature using the UP or DOWN keys.

▶ Press the START/STOP key.

▶ Move out of the hazard area of the heating device and observe the safe distance while the heating device is heating the rolling bearing.

▶ Press the START/STOP key to exit the temperature holding mode and demagnetise the rolling bearing.

▷ During demagnetisation, the measured temperature is displayed. As soon as demagnetisation is completed, a longer acoustic signal will sound and the temperature set will be shown in the display.

⚠WARNING

Hot surfaces. Serious burns. Wear insulating gloves.◁

▶ Detach the temperature sensor, see page 33.

▶ Remove the support ledge and the rolling bearing from the heating device, see section *Removing the rolling bearing*, page 35.

▶ Place the support ledge and the rolling bearing on the work surface.

The heated rolling bearing can now be mounted.

Suitable rolling bearings

Not all rolling bearings are suitable for these heating devices.
The mass and dimensions must fulfil certain values, see *tables*.

Rolling bearing suspended

Designation	HEATER10	HEATER20
Mass, maximum	10 kg	20 kg
Inside diameter, minimum	15 mm[1)]	20 mm[1)]

[1)] 10 mm when using a support ledge from the range of accessories.

Rolling bearing lying flat

Designation	HEATER10	HEATER20
Mass, maximum	10 kg	20 kg
Inside diameter, minimum	45 mm	65 mm
Outside diameter, maximum	165 mm	290 mm

Positioning the rolling bearing

The rolling bearing can be positioned either suspended or lying flat.

WARNING

Danger of injury due to falling parts.

Danger of foot injuries due to falling rolling bearing or falling support ledge.

Always wear safety shoes when working with the heating device. ◁

Positioning the rolling bearing suspended

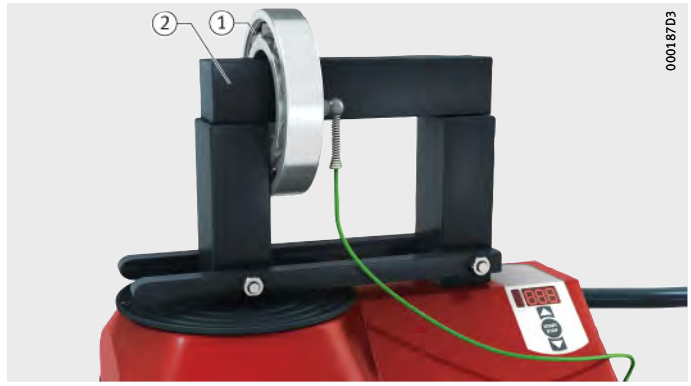
You can position the rolling bearing suspended as follows, *Figure 11*:

WARNING

Falling parts. Foot injuries. Wear safety shoes. ◁

- ▶ Select a suitable support ledge.
- ▶ Slide the rolling bearing onto the support ledge.
- ▶ Place the support ledge with the rolling bearing on the U-shaped core.

The rolling bearing is positioned suspended.



① Rolling bearing
② Support ledge

Figure 11
Rolling bearing suspended

Positioning the rolling bearing lying flat

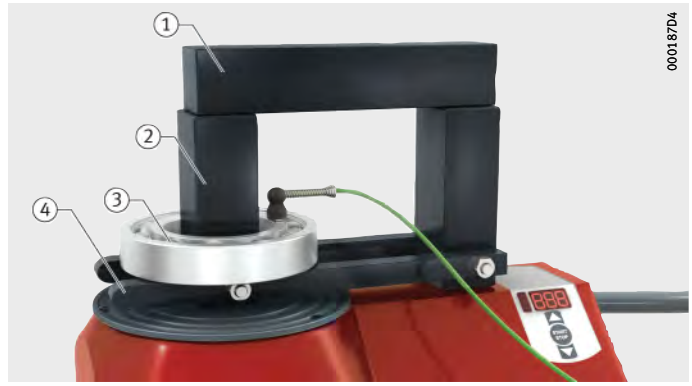
You can position the rolling bearing lying flat as follows, *Figure 12*:

⚠WARNING

Falling parts. Foot injuries. Wear safety shoes.◁

- ▶ Remove the support ledge from the U-shaped core.
- ▶ Place the rolling bearing on the support rails.
- ▶ Place the support ledge on the U-shaped core.

The rolling bearing is positioned lying flat.



① Support ledge
② U-shaped core
③ Rolling bearing
④ Support rails

Figure 12
Rolling bearing lying flat

Temperature sensor

The temperature sensor must be attached before any heating operation. The heating device will indicate an error if the temperature sensor is not detected.

NOTICE

Danger of physical damage due to strong magnetic field.

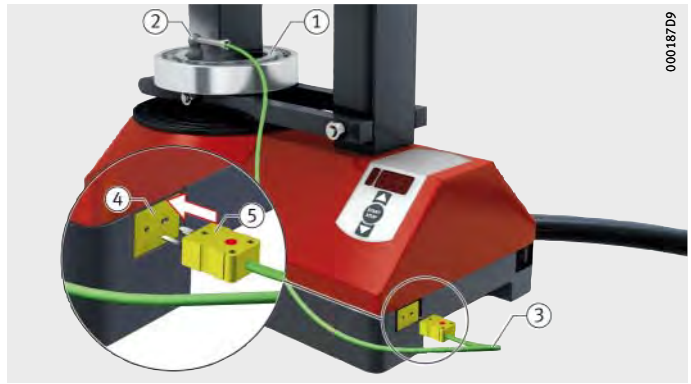
Destruction of temperature sensor through heating of cable, resulting in melting of cable sheathing.

Feed the cable for the temperature sensor around the U-shaped core.◁

Connecting the temperature sensor

You can connect the temperature sensor as follows, *Figure 13*:

▶ Insert the plug of the temperature sensor with the red mark facing upwards in the yellow socket.



① Inner ring of rolling bearing
② Temperature sensor
③ Cable of temperature sensor
④ Socket for temperature sensor
⑤ Plug of temperature sensor

Figure 13
Connecting and attaching the temperature sensor

Attaching the temperature sensor

You can attach the temperature sensor as follows, *Figure 13*:

NOTICE

Strong magnetic field. Destruction of the temperature sensor.
Feed the cable for the temperature sensor around the U-shaped core.◁

▶ Place the magnetic temperature sensor on the end face of the inner ring that is free from grease and oil.

The temperature sensor is attached and the temperature can be measured.

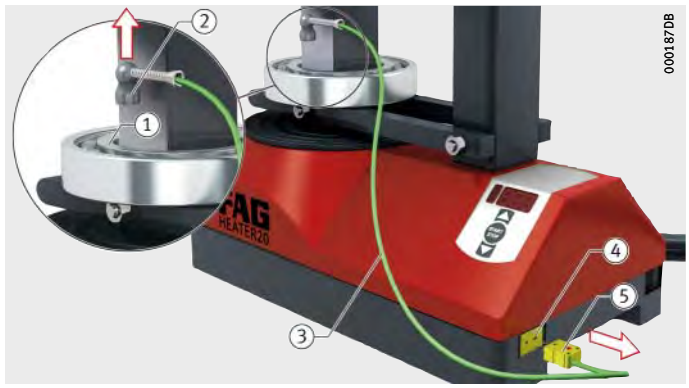
Detaching the temperature sensor

You can detach the temperature sensor as follows, *Figure 14*:

⚠WARNING

Hot surfaces. Serious burns. Wear insulating gloves.◁

- ▶ Grip the temperature sensor by its black sheathing.
- ▶ Detach the temperature sensor.
- ▶ Withdraw the plug of the temperature sensor from the yellow socket as necessary.



① Inner ring of rolling bearing
② Temperature sensor
③ Cable of temperature sensor
④ Socket for temperature sensor
⑤ Plug of temperature sensor

Figure 14
Detaching the temperature sensor

Removing the rolling bearing

Once the temperature sensor has been detached, the rolling bearing can be removed.

WARNING

Danger of injury due to falling parts.

Danger of foot injuries due to falling rolling bearing or falling support ledge.

Always wear safety shoes when working with the heating device. ◁

WARNING

Danger of burns due to hot surfaces.

Serious burns may be suffered due to touching the hot rolling bearing with unprotected hands.

Wear insulating gloves when touching the hot rolling bearing. ◁

Removing the suspended rolling bearing

You can remove the suspended rolling bearing as follows, *Figure 15*:

WARNING

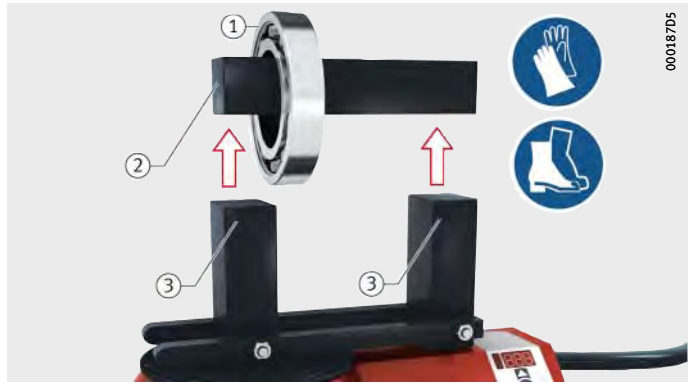
Falling parts. Foot injuries. Wear safety shoes. ◁

WARNING

Hot surfaces. Serious burns. Wear insulating gloves. ◁

- ▶ Lift the rolling bearing and supporting ledge together.
- ▶ Withdraw the support ledge from the rolling bearing and lie both down separately.

The rolling bearing can now be mounted.



① Rolling bearing
② Support ledge
③ U-shaped core

Figure 15
Removing the suspended rolling bearing

Removing the rolling bearing lying flat

You can remove the rolling bearing lying flat as follows, *Figure 16*:

⚠WARNING

Falling parts. Foot injuries. Wear safety shoes.◁

⚠WARNING

Hot surfaces. Serious burns. Wear insulating gloves.◁

▶ Remove the support ledge.

▶ Remove the rolling bearing.

The rolling bearing can now be mounted.

① Rolling bearing
② Support rail
③ U-shaped core

Figure 16
Removing the rolling bearing lying flat

Troubleshooting

Malfunctions are indicated by a flashing error number in the display. Once the malfunction has been eliminated, the heating device is ready for use again.

Eliminating the malfunction

If a malfunction occurs, the heating device will switch itself off. Before the heating device is switched on again, the cause of the malfunction must first be identified and eliminated.

You can eliminate a malfunction as follows:

- ▶ Read off the error number in the display.
- ▶ Determine the cause of the malfunction, see *table*.
- ▶ Eliminate the malfunction where you have authorisation to do so.
- ▶ Press the START/STOP key to cancel the error message.

The heating device can now be put back into operation.

Error messages

Display	Error	Possible cause	Remedy
E01	The heating device does not detect the temperature sensor	The temperature sensor is not connected	Connect the temperature sensor
		The temperature sensor is incorrectly connected	Connect the temperature sensor correctly, **the red dot must face upwards**
		The temperature sensor has a broken cable	Use a new temperature sensor
E02	The specified temperature was not achieved in the specified time	The temperature sensor is incorrectly positioned	Attach the temperature sensor over its full surface to a flat surface of the inner ring
		The rolling bearing is too heavy	Contact Customer Service
			Use a more powerful heating device
E04	The temperature of the coil or housing is too high	The temperature monitoring system has triggered. The heating device has been switched off	Allow the heating device to cool down for 30 min.
			Use a more powerful heating device
E06	No zero-cross	The terminal connections to the circuit board are defective or the circuit board itself has a defect	Arrange for an electrically skilled person to change the electronic unit

If the defect cannot be eliminated, please contact Customer Service at Schaeffler Technologies AG & Co. KG.

Maintenance

Before every use, a visual and functional inspection must be carried out. If necessary, maintenance must be carried out on the device.

Maintenance plan

The maintenance items are stated in the maintenance plan, see *tables*.

Before every use

Subassembly	Activity
Heating device	Visual inspection: ☐ Check the housing for damage ☐ Check the plug and cable for damage to the insulation ☐ Check that the support rails and support ledge are present and free from damage
	☐ Check the function of the display

As necessary

Subassembly	Activity
Heating device	☐ Clean with a soft, dry cloth
Contact surfaces on the U-shaped core	☐ Cleaning of contact surfaces ☐ For optimum contact and to prevent corrosion, regularly grease with an acid-free grease, see label “Grease contact surfaces”

Decommissioning

If the heating device will no longer be used regularly, it should be decommissioned.

Temperature

When decommissioning the heating device, its temperature must be observed.

NOTICE

Fire on cover or melting of the carry case due to contact with a hot heating device.

Damage to or destruction of the cover or carry case due to a hot heating device.

Cover the heating device with the cover or pack the heating in the carry case only when the temperature of the heating device is lower than +50 °C.◁

You can decommission the heating device as follows:

- ▶ Switch off the heating device using the main switch.
- ▶ Disconnect the heating device from the voltage supply.
- ▶ Cover the heating device with the cover or pack the heating device and accessories in the carry case.

Disposal

The device can be returned to Schaeffler for disposal.

The heating device can be dismantled in order to dispose of the subassemblies separately.

The heating device may only be dismantled by an electrically skilled person.

WARNING

Electric shock due to charged capacitors.

Internal burns, heart and nerve damage due to sudden discharging of capacitors.

Wait at least 24 h after disconnecting the voltage supply before you dismantle the heating device. ◁

WARNING

Danger of cuts due to sharp-edged components.

Cutting injuries to the hands when working on sharp-edged components located in the interior of the heating device.

Wear cut-resistant safety gloves when dismantling the heating device. ◁

WARNING

Danger of injury due to falling component.

Danger of foot injuries due to falling of sharp-edged or heavy component.

Always wear safety shoes when dismantling the heating device. ◁

Regulations

Disposal must be carried out in accordance with locally applicable regulations.

Technical data and accessories

Technical data, standard accessories and special accessories: see *tables*.

Technical data HEATER10 and HEATER10-115V-60Hz

Designation	HEATER10	HEATER10-115V-60Hz
Dimensions	240×200×255 mm	
Mass	7 kg	
Voltage supply	AC 230 V	AC 115 V
Frequency	50 Hz	60 Hz
Power consumption	2,3 kVA	1,15 kVA
Rated current	10 A	10 A
Residual magnetism, maximum	2 A/cm	
IP protection class	54	
Mains connection cable	3 pin, length 1,5 m, rigidly connected to heating device	
Mains connection plug	Safety contact plug to CEE-7	Three pin NEMA plug, type B

Standard accessories HEATER10 and HEATER10-115V-60Hz

Component	Designation	Dimensions mm	d[1)] mm	Mass kg
Support ledge	**HEATER10.LEDGE-15**	10×10×125	15	0,08
	HEATER10.LEDGE-30	20×20×125	30	0,32
	HEATER10.LEDGE-45	30×30×125	45	0,72
Temperature sensor	**HEATER.SENSO-400MM**	–	–	0,05
Grease	**ARCANOL-MULTI3-250G**	–	–	0,25
Gloves	**GLOVE-PRO-TEMP**	–	–	0,15
Cover	**HEATER10.COVER**	–	–	–

1) Suitable for rolling bearings with minimum inside diameter as stated.

Special accessories HEATER10 and HEATER10-115V-60Hz

Component	Designation	Dimensions mm	d[1)] mm	Mass kg
Support ledge	**HEATER10.LEDGE-10**	7×7×125	10	0,04

1) Suitable for rolling bearings with minimum inside diameter as stated.

Technical data HEATER20 and HEATER20-115V-60Hz

Designation	HEATER20	HEATER20-115V-60Hz
Dimensions	345×205×230 mm	
Mass	14 kg	
Voltage supply	AC 230 V	AC 115 V
Frequency	50 Hz	60 Hz
Power consumption	3 kVA	1,5 kVA
Rated current	13 A	13 A
Residual magnetism, maximum	2 A/cm	
IP protection class	54	
Mains connection cable	3 pin, length 1,5 m, rigidly connected to heating device	
Mains connection plug	Safety contact plug to CEE-7	Three pin NEMA plug, type B

Standard accessories HEATER20 and HEATER20-115V-60Hz

Component	Designation	Dimensions mm	d[1] mm	Mass kg
Support ledge	**HEATER20.LEDGE-20**	14×14×200	20	0,30
	HEATER20.LEDGE-35	25×25×200	35	0,90
	HEATER20.LEDGE-60	40×40×200	60	2,50
Temperature sensor	**HEATER.SENSO-400MM**	–	–	0,05
Grease	**ARCANOL-MULTI3-250G**	–	–	0,25
Gloves	**GLOVE-PRO-TEMP**	–	–	0,15
Cover	**HEATER20.COVER**	–	–	–

1) Suitable for rolling bearings with minimum inside diameter as stated.

Special accessories HEATER20 and HEATER20-115V-60Hz

Component	Designation	Dimensions mm	d[1] mm	Mass kg
Support ledge	**HEATER20.LEDGE-10**	7× 7×200	10	0,08
	HEATER20.LEDGE-15	10×10×200	15	0,15
	HEATER20.LEDGE-45	30×30×200	45	1,3
Extended support rails	**HEATER20.BLADE-XL**	15×20×320	–	0,35
Carry case	**HEATER20.CASE**	–	–	0,28

1) Suitable for rolling bearings with minimum inside diameter as stated.

Original accessories

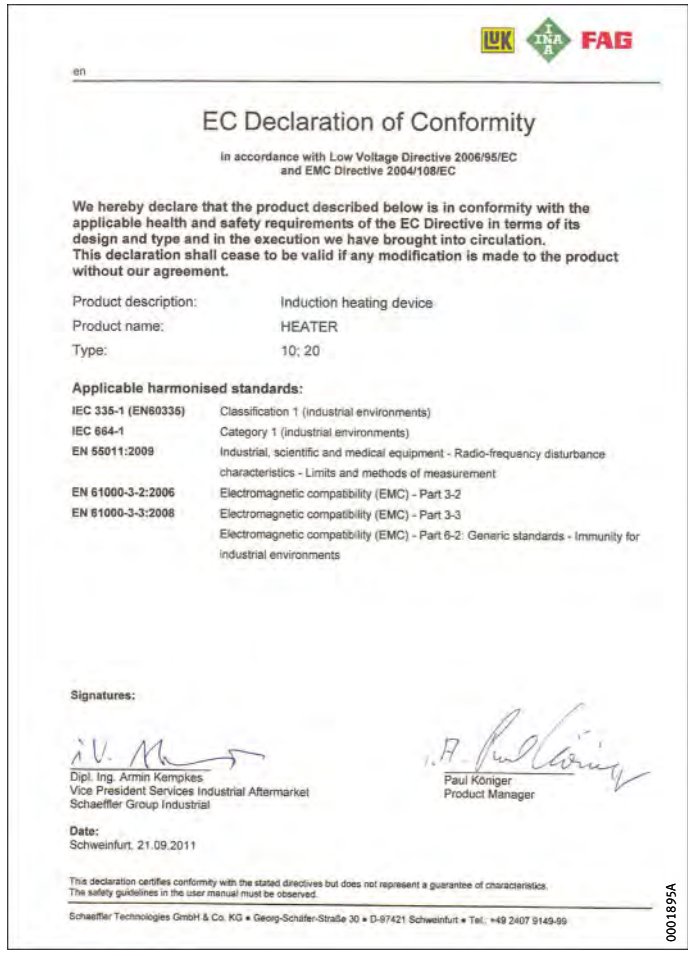
Only use FAG original accessories.

Appendix

This appendix contains the Declaration of Conformity for heating devices HEATER10 and HEATER20.

EC Declaration of Conformity

Declaration of Conformity for heating devices HEATER10 and HEATER20, *Figure 17*.



en

EC Declaration of Conformity

in accordance with Low Voltage Directive 2006/95/EC
and EMC Directive 2004/108/EC

We hereby declare that the product described below is in conformity with the applicable health and safety requirements of the EC Directive in terms of its design and type and in the execution we have brought into circulation. This declaration shall cease to be valid if any modification is made to the product without our agreement.

Product description:	Induction heating device
Product name:	HEATER
Type:	10; 20

Applicable harmonised standards:

IEC 335-1 (EN60335)	Classification 1 (industrial environments)
IEC 664-1	Category 1 (industrial environments)
EN 55011:2009	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
EN 61000-3-2:2006	Electromagnetic compatibility (EMC) - Part 3-2
EN 61000-3-3:2008	Electromagnetic compatibility (EMC) - Part 3-3
	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

Signatures:

i.V.
Dipl. Ing. Armin Kempkes
Vice President Services Industrial Aftermarket
Schaeffler Group Industrial

i.A.
Paul Königer
Product Manager

Date:
Schweinfurt, 21.09.2011

This declaration certifies conformity with the stated directives but does not represent a guarantee of characteristics.
The safety guidelines in the user manual must be observed.

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0001895A

Figure 17
Declaration of Conformity

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