Induction heating devices

Heater SMART

User Manual

We pioneer motion

SCHAEFFLER

Contents

1 About the manual

This manual is part of the product and contains important information. Read the manual thoroughly prior to use and follow the instructions precisely.

The original language of the manual is German. All other languages are translations from the original language.

1.1 Symbols

The warning and hazard symbols are defined in accordance with ANSI Z535.6-2011.

1 Warning and hazard symbols

Signs and descriptions	
⚠ DANGER	In case of non-compliance, 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 moderate injury may occur.
NOTICE	In case of non-compliance, damage or malfunctions in the product or the adjacent construction may occur.

1.2 Signs

The warning, prohibition and mandatory signs are defined in accordance with DIN EN ISO 7010 or DIN 4844-2.

2 Warning, prohibition and mandatory signs

Signs and descriptions	
	General warning
	Electrical voltage warning
	Warning of magnetic field
	Warning of non-ionising radiation (e.g. electromagnetic waves)
	Warning of hot surface
	Heavy load warning
	Floor-level obstacle warning
	Prohibited for persons with pacemakers or implanted defibrillators
	Prohibited for persons with metallic implants
	Carrying of metallic parts or watches prohibited
	Carrying of magnetic or electronic data carriers prohibited
	Observe the manual

Signs and descriptions	
	Wear safety gloves
	Wear safety shoes
	General mandatory sign

1.3 Availability

A current version of this manual can be found at:
https://www.schaeffler.de/std/1FB2

Ensure that this manual is always complete and legible and is available to all persons engaged in transporting, fitting, dismantling, commissioning, operating or maintaining the product.

Keep the manual in a safe place for immediate reference.

1.4 Legal guidelines

The information in this manual reflects the status at the time of publication.

Unauthorised modifications to or improper use of the product are not permitted. Schaeffler accepts no liability in these cases.

1.5 Images

The images in this manual may be schematic representations and may differ from the delivered device.

1.6 Further information

The selection wizard in medias can assist in the selection of a suitable heating device: https://www.schaeffler.de/std/1FEA.

Address any questions on fitting to your local contact at Schaeffler.

2 General safety regulations

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

2.1 Usage for the intended purpose

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 may also be heated. In this case, the maximum permissible heating temperatures for the seal and grease must be observed.

2.2 Improper use

Do not operate the heating device in a potentially explosive environment.

Do not operate the heating device outside of closed rooms. Do not operate the heating device without the yoke. Do not remove the yoke during operation.

2.3 Qualified personnel

Obligations of the operator:

- Ensure that only qualified and authorised personnel perform the activities described in this manual.
- Ensure that personal protective equipment is used.

Qualified personnel must:

- Ensure adequate product knowledge, e.g. through training on proper handling and use of the product
- be fully familiar with the contents of this manual, particularly all safety instructions
- be aware of any relevant country-specific regulations

2.4 Hazards

2.4.1 Electric voltage

Heating devices are electrical devices. Both on the mains side and internally, voltages are generated which can result in death or serious injury.

The device must be connected to a suitable power supply that complies with the specifications on the identification plate. The power cable must be checked for damage prior to every use. The device must always be safely disconnected from the mains before undergoing maintenance or repair work. This is achieved by removing the mains plug from the socket.

2.4.2 Electromagnetic field

The heating device generates an electromagnetic field. During operation, persons must maintain a distance of at least 1 m from the device.

DANGER

Strong electromagnetic field

Persons fitted with a pacemaker are at risk of death from cardiac arrest.

- ▸ Avoid remaining in the hazard area.

DANGER

Strong electromagnetic field

Danger of death due to heated metallic implant.

Risk of burns from carrying metallic parts.

- ▸ Avoid remaining in the hazard area.

Wearers of active physical aids are prohibited from remaining in the immediate vicinity of the device when it is in operation. The electromagnetic field generated may prevent such physical aids from functioning correctly.

2.4.2.1 Implants

Persons with implants must clarify with a doctor whether the implants are ferromagnetic before working with an induction heating device. Electromagnetic fields can be harmful to wearers of passive physical aids such as joint prostheses. Wearers of passive implants are therefore advised against remaining in the immediate vicinity of the induction heating device when it is in operation.

The following list is not exhaustive but is intended to give the user an initial overview of the types of implants that may be hazardous:

- artificial heart valve
- implantable defibrillator (ICD)
- stent
- hip implant
- knee implant
- metal plate
- metal screw
- dental implant and dentures
- cochlear implant
- neurostimulator
- insulin pump
- hand prosthesis
- subcutaneous piercing

2.4.2.2 Metallic objects

Persons with a metallic object must clarify whether it is ferromagnetic before working with an induction heating device. Metallic objects can become hot and lead to burns.

The following list is not exhaustive but is intended to give the user an initial overview of the types of metallic objects that may be hazardous:

- prosthesis
- spectacles
- hearing aid
- earring
- piercing
- brace
- chain
- ring
- armband
- keys
- timepiece
- coin
- ballpoint pen, fountain pen
- belt
- shoes with metal caps or metal springs in the sole

2.4.3 High temperature

The workpiece becomes warm to very hot during heating. Parts of the device may become hot due to contact with the workpiece or as a result of heat radiated by the workpiece.

Always wear heat-resistant protective gloves when handling workpieces in order to avoid injury due to burns.

2.4.4 Trip hazard

Scattered parts and the mains cable can pose a trip hazard to users and cause injury. In order to minimise the risk of trip-related injuries, it must be ensured that the work area is kept tidy at all times. Remove all loose, superfluous objects from the immediate vicinity of the device. Lay the mains connection cable in such a way as to minimise the trip hazard.

2.4.5 Lifting

Some heating devices weigh more than 23 kg and should not be lifted by just one person.

2.4.6 Falling objects

Users must wear safety shoes to prevent foot injuries caused by falling workpieces or machine parts.

2.5 Safety equipment

The following safety arrangements are in place to protect the user and the heating device:

- The device will shut down if the ambient temperature reaches in excess of +70 °C.
- The coil temperature is continuously monitored. The thermal protection system will stop the heating operation before the coil overheats.
- If, when using a temperature mode, a temperature increase of 1 °C is not achieved within a time period specified by the manufacturer, the heating device will switch off. The following error message will appear on the display: [No temperature increase measured].
- Models with a swivel arm are equipped with a positioning cam as a safety device.

2.6 Protective equipment

For certain work on the product, suitable protective equipment must be worn. Personal protective equipment consists of:

3 Required personal protective equipment

Personal protective equipment	Mandatory signs in accordance with DIN EN ISO 7010
Protective gloves, heat-resistant to +250 °C (+482 °F)	
Safety shoes	

2.7 Safety regulations

The following safety regulations must be observed when working with the heating device. Further guidelines on hazards and specific operating procedures can be found, for example, in the sections Commissioning ➤44|6 and Operation ➤46|7.

2.7.1 Observe the manual

This manual must be observed at all times.

2.7.2 Transport

The heating device must not be moved directly after heating.

2.7.3 Storage

The heating device must be stored under the following ambient conditions:

- humidity min. 5 %, max. 90 %, non-condensing
- protected against sunlight and UV radiation
- no explosion risk in the environment
- no aggressive chemicals in the environment
- temperature from 0 °C (+32 °F) to +50 °C (+122 °F)

If the heating device is stored under unsuitable ambient conditions, probable consequences will include damage to the electronic unit, corrosion on the contact surfaces of the yokes and on the contact surfaces (poles) of the U-shaped core, and deformation of the plastic housing.

2.7.4 Commissioning

The heating device must not be modified.

Only original accessories and original replacement parts may be used.

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

Once in place, apply the brake to mobile heater designs to prevent any further movement.

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

The device may only be operated at the correct supply voltage, see identification plate.

2.7.5 Operation

The heating device may only be operated under the following ambient conditions:

- 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 (+32 °F) to +50 °C (+122 °F)

A workpiece must not be heated if it exceeds the maximum permissible mass.

A workpiece must not be heated if it falls short of the minimum permissible dimensions or exceeds the maximum permissible dimensions ➤73|13.

A workpiece weighing more than 23 kg must be transported by 2 people or with a suitable lifting tool.

A workpiece weighing more than 46 kg must be transported with a suitable lifting tool.

A workpiece must not be suspended from ropes or chains made from ferromagnetic materials while it is being heated.

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

The U-shaped core and the yoke must not come into contact with metal parts. Objects made from ferromagnetic material must be kept at a distance of at least 1 m from the heating device.

Support, slewing and vertical yokes must not be produced or machined independently.

The heating device may only be switched on if the support, slewing or vertical yoke is correctly positioned.

The support, slewing or vertical yoke must never be removed during the heating process.

The heating device must not be switched off using the main switch while the device is heating a component.

Any smoke or vapour occurring during the heating process must not be inhaled. A suitable extraction system must be installed if smoke or vapour is produced during the heating process.

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

2.7.6 Maintenance

The heating device must be disconnected from the power supply before maintenance is carried out. The device is disconnected from the power supply by removing the mains plug.

2.7.7 Disposal

Locally applicable regulations must be observed.

2.7.8 Conversion

The heating device must not be converted.

2.8 Work on electrical devices

Only an electrician 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 devices correctly and recognise possible hazards.

3 Scope of delivery

The heating device is supplied with the following standard accessories.

- heating device
- 1 yoke or several yokes, depending on the size of the heating device
- 2 temperature sensors
- protective gloves, heat-resistant to +250 °C (+482 °F)
- petrolatum
- test certificate
- user manual

3.1 Check for transport damage

1. Check the product immediately upon delivery for transport damage.
2. Report any transport damage promptly to the carrier.

3.2 Check for defects

1. Check the product immediately upon delivery for any visible defects.
2. Report any defects promptly to the distributor of the product.
3. Do not put damaged products into operation.

4 Product description

A component can be mounted on a shaft with a tight fit. This is achieved by heating the component and sliding it onto the shaft. Once cooled, the component is mounted. A heating device can be used to heat solid ferromagnetic parts which are of a closed design. Examples include gears, bushings and rolling bearings.

4.1 Function

The induction heating device generates a strong electromagnetic field and can thus be used to heat a ferromagnetic workpiece. A typical application is the heating of a rolling bearing. This manual therefore considers the heating of a rolling bearing.

4.1.1 Functional principle

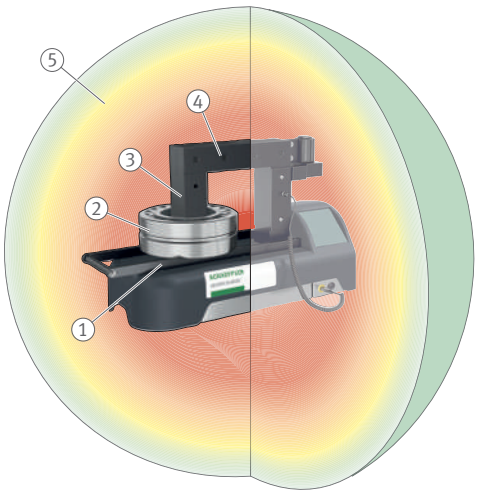
A yoke connects the two poles of the U-shaped core, with the U-shaped core and yoke forming a magnetic circuit. This magnetic circuit basically acts as the primary coil. The primary coil generates an electromagnetic alternating field. This electromagnetic field is transmitted via the iron core to the secondary coil, for example a rolling bearing, inducing a high induction current at low voltage in the second coil.

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

After the heating operation is stopped, the electromagnetic field is reduced to zero in order to demagnetise the workpiece.

The electromagnetic field is very strong directly at the heating device. The electromagnetic field becomes weaker with increasing distance from the heating device. The electromagnetic field decreases within a distance of 1 m to such an extent that it is below the applicable standard value of 0,5 mT.

1 Function



001A366C

1	Primary coil	2	Secondary coil, in this case a rolling bearing
3	U-shaped iron core	4	Yoke
5	Electromagnetic field		

4.2 Temperature sensors

The magnetic temperature sensors are included in the scope of delivery and are available to reorder ➤87|14.

For non-ferromagnetic workpieces, Schaeffler can provide quotes for special clamping sensors on request.

Design

- The temperature sensor is equipped with a magnetic clamp for easy attachment to the workpiece.
- The design of cable used with the temperature sensor is dependent on the heating device.

4 Temperature sensors

Ordering designation	Suitable for heating device	Design	Length	T_{max}		Ordering number
			mm	°C	°F	
HEATER.MPROBE-20-200	HEATER20 ... HEATER200	Spiral cable, black	2000, fully extended	240	464	097406554-0000-10
HEATER.MPROBE-400-800	HEATER400 ... HEATER800	Smooth cable, green	1100	350	662	097406562-0000-10
HEATER.MPROBE-1600	HEATER1600	Smooth cable, green	2000	350	662	097406716-0000-10

T_{max} °C or °F Max. temperature

2 Temperature sensors

1	HEATER.MPROBE-20-200	2	HEATER.MPROBE-400-800
3	HEATER.MPROBE-1600		

3 Temperature sensor

1	Plug	2	Sensor head
3	Cables		

Use

- The temperature sensors are used with a temperature mode during heating.
- The temperature sensors may be used in time mode to assist with temperature control during heating.
- The temperature sensors are connected to the heating device via temperature connections T1 and T2.
- Temperature sensor 1 at sensor connection T1 is the main sensor that controls the heating process.
- Temperature sensor 2 at sensor connection T2 is also used for the following cases:
  - activated Delta T function [Enable ΔT]: monitoring a temperature difference ΔT between 2 points on the workpiece
  - additional control

5 Operating conditions for temperature sensors

Designation	Value
Operating temperature	0 °C ... +240 °C At temperatures > +240 °C, the connection between the magnet and the temperature sensor is broken. The heating device will switch off if the temperature sensor does not detect an increase in temperature.

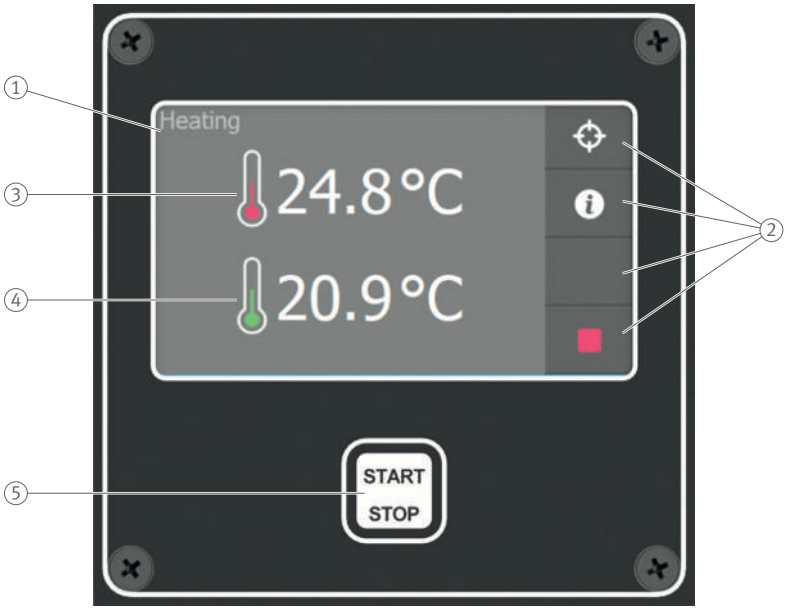
Appearance of measurement values on the display:

- measured value at T1: red
- measured value at T2: green

When removing the temperature sensor, do not pull it by the cable. Pull on the plug and sensor head only.

4.3 Control panel and connections

4 Control panel with touchscreen



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1	Touchscreen	2	Buttons
3	Temperature T1, displayed in red: measurement of temperature sensor 1	4	Temperature T2, displayed in green: measurement of temperature sensor 2
5	Starts and stops the heating process		

5 Connections

001B249D

1	Sensor connection T1 for temperature sensor 1 (main sensor)	2	Sensor connection T2 for temperature sensor 2
3	USB connection for logging heating data		

4.4 Touchscreen

During operation, various screens are displayed on the touchscreen complete with different buttons, setting options and operating functions.

6 Explanation of the buttons

Button	Description of the function	
	[Start]	Starts the heating process.
	[Stop]	Stops the heating process.
	[System settings]	Switches to the system settings menu.
	[Admin settings]	Switches to administrator settings and factory settings. Not accessible to the end user.
	[Back]	Goes back a step in the setting process or switches to the previous page.
	[Next page]	Switches to the next settings page.
	[Previous page]	Goes back to the previous screen.
	[Default mode]	Resets the device to default settings.
	[Additional information]	Retrieves additional heating information.
	[Adjust Heating Target]	Enables temperature adjustments during the heating process.
	[Log summary]	Access to logged data from the heating process.
 	[On/Off selector switch]	Activates or deactivates the associated option.
	[Selector switch not available]	The associated option cannot be activated or deactivated as other settings are being performed.

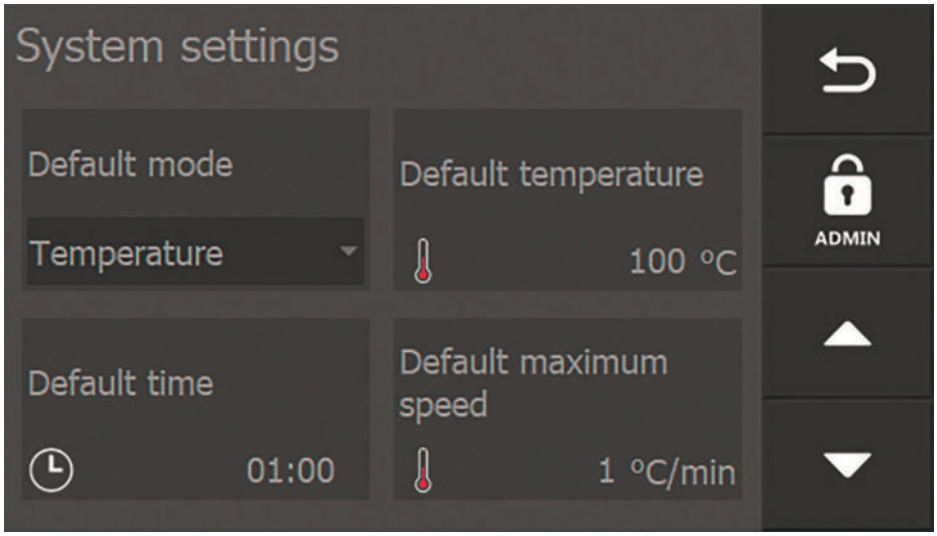
Variables can be set to a desired value at the touch of a button.

4.5 System settings

The generator allows parameters to be set and adjusted according to the requirements of the heating process.

- ▸ Tap [System settings] to access the settings.
- » The [System settings] window opens.

6 [System settings], start window



Use the [Next page], [Previous page] and [Back] buttons to navigate through the various settings pages. Select an element to change the respective setting.

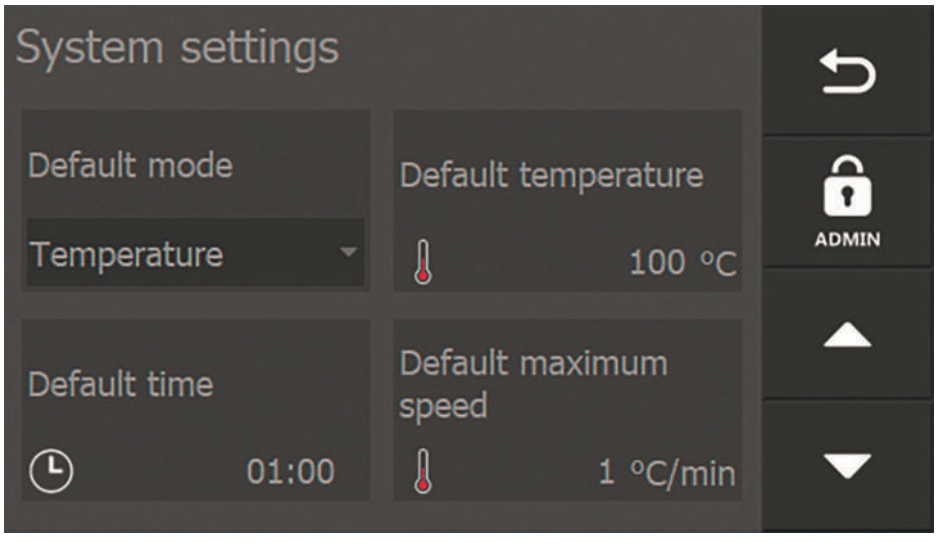
Administrator settings

The [Admin settings] button is located in the [System settings] window:

- The manufacturer uses this facility to perform essential settings for the specific type of heating device.
- The settings are protected by a password.
- The settings are not available at user level and, as a result, are not accessible to the user.

4.5.1 System settings, window 1

7 [System settings], screen 1

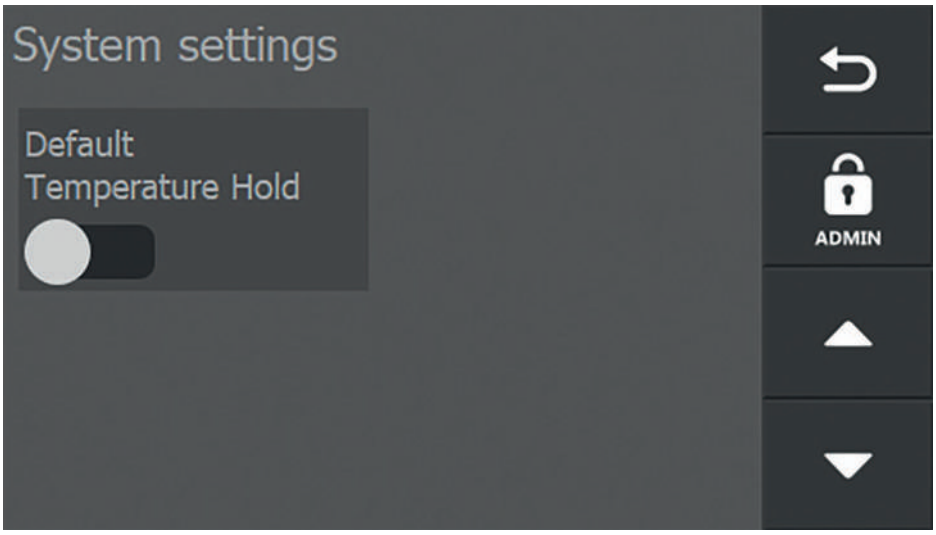


7 Setting options

Field	Setting option
[Default mode]	Heating function that the heating device is set to and in which the device will start for the first time or return to if [Default mode] is pressed.
[Default temperature]	Temperature setpoint at which the heating device will start or to which the device will return if [Default mode] is pressed.
[Default time]	Time setpoint at which the heating device will start or to which the device will return if [Default mode] is pressed.
[Default maximum speed]	Setpoint for maximum heating speed in temperature mode and speed mode. The heating device does not always reach this speed. The achievable speed is determined by the geometry of the workpiece, the type of yoke used and other factors.

4.5.2 System settings, window 2

8 [System settings], window 2

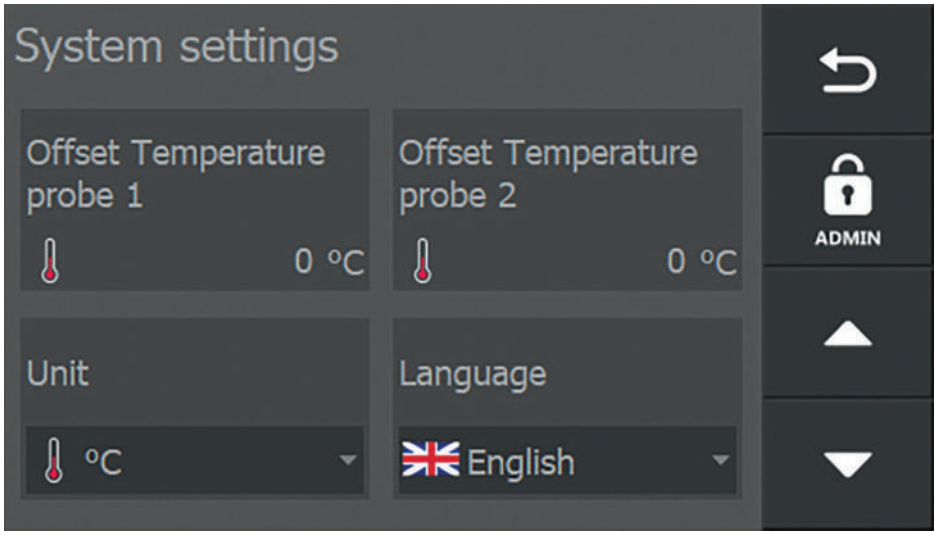


8 Setting options

Field	Setting option
[Default Temperature Hold]	Activate or deactivate to maintain the standard temperature.

4.5.3 System settings, window 3

9 [System settings], window 3

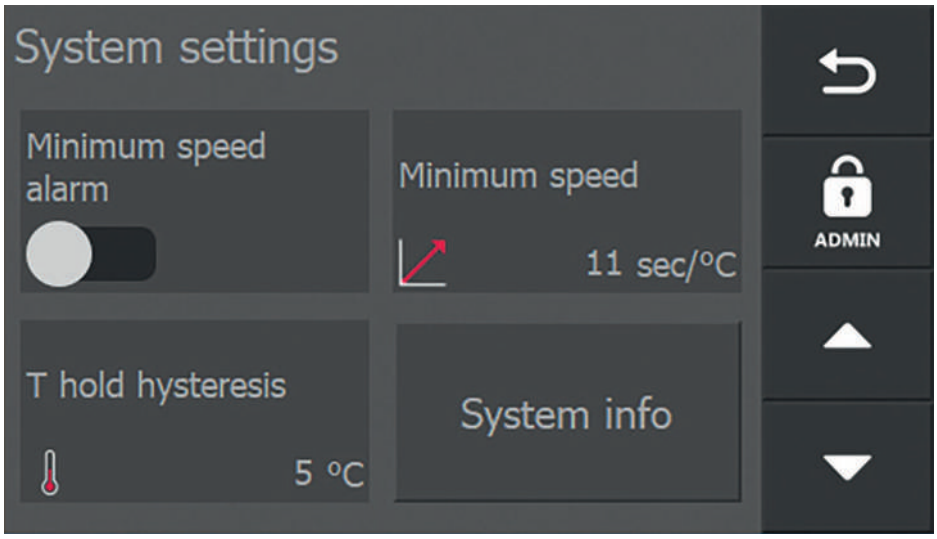


9 Setting options

Field	Setting option
[Offset Temperature probe 1]	Calibrate or adjust display for temperature sensor 1.
[Offset Temperature probe 2]	Calibrate or adjust display for temperature sensor 2.
[Unit]	Set unit for temperature measurement value: °C or °F.
[Language]	Set display language. • English • German • French • Italian • Dutch • Spanish

4.5.4 System settings, window 4

10 [System settings], window 4

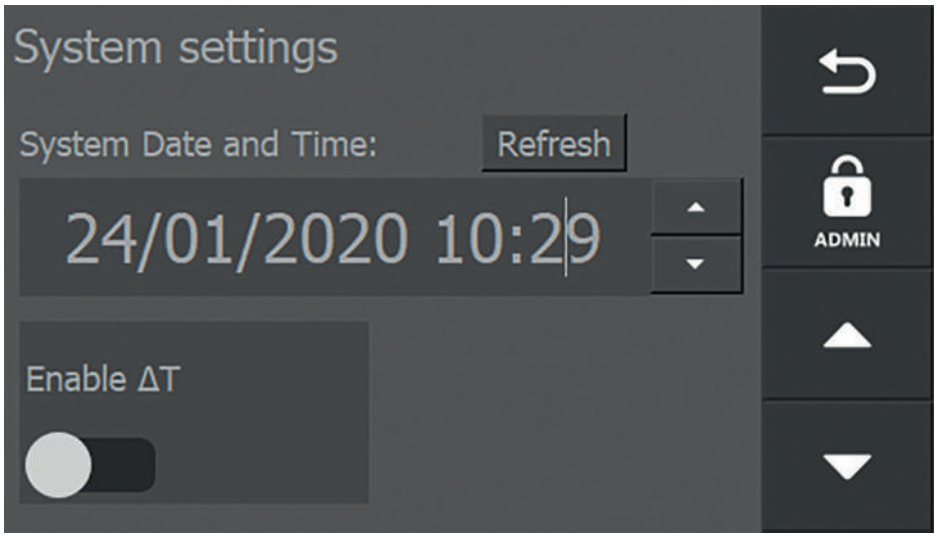


10 Setting options

Field	Setting option
[Minimum speed alarm]	Alarm triggered when an insufficient increase in temperature is measured according to the [Minimum speed] setting.
[Minimum speed]	Minimum required rate for increase in temperature.
[T hold hysteresis]	Temperature difference by which the workpiece temperature can drop before the heating process automatically restarts. The [T hold hysteresis] can be found under [Temp. Hold] in the heating setup screen.
[System info]	Information on firmware versions.

4.5.5 System settings, window 5

11 [System settings], window 5

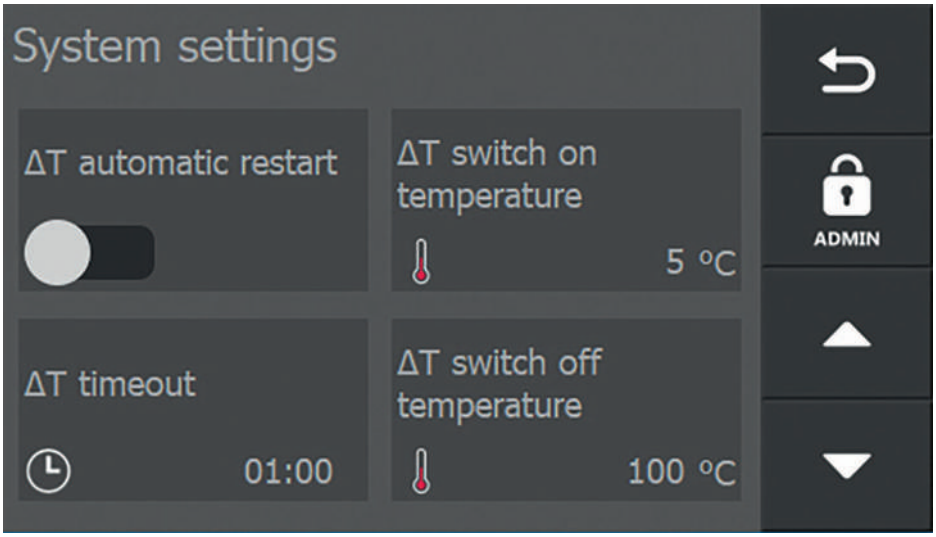


11 Setting options

Field	Setting option
[System Date and Time]	Set system date and system time.
[Enable ΔT]	Activate Delta T function, if required.

4.5.6 System settings, window 6

12 [System settings], window 6



Window 6 is only displayed if the [Enable ΔT] selector switch has been activated in window 5.

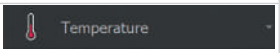
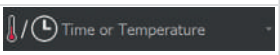
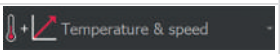
12 Setting options

Field	Setting option
[ΔT automatic restart]	Activate or deactivate to automatically restart heating when ΔT has returned to the permissible range under [ΔT switch on temperature].
[ΔT switch on temperature]	The temperature difference between two measurement points on a workpiece at which reactivation of heating is permitted following prior deactivation due to the limit value for ΔT being exceeded.
[ΔT timeout]	Time (min:s) within which a restart is possible after ΔT has been exceeded.
[ΔT switch off temperature]	Temperature difference between two measurement points on a workpiece at which heating is stopped.

4.6 Heating methods

The device offers various heating methods to suit every application.

13 Overview of heating methods

[Heating mode]	Field	Function
Temperature mode		Controlled heating to the required temperature. The temperature hold function is available for use.
Time mode		Suitable for volume production: Heat in time mode if the time required to reach a certain temperature is known. Workaround if the temperature sensor is defective: Heat in time mode and monitor the temperature using an external thermometer.
Temperature mode or time mode		Controlled heating to the required temperature or over a required time period. The heating device switches off as soon as one of the two values is reached.
Temperature mode and speed mode		Controlled heating to the required temperature. The maximum rate at which the temperature increases per unit of time can be entered so that the workpiece is heated along a specified curve. The temperature hold function is available for use.

4.6.1 Temperature mode

- Setting of the required heating temperature
- Heating of the workpiece to the set temperature
- Heating takes place as quickly as possible.
- Monitoring of the workpiece temperature throughout the entire process
- Choice of simple measurement and Delta T measurement under [System settings]
- Requires the use of 1 or more temperature sensors, which are attached to the workpiece. T1 (temperature sensor 1) is the main sensor and controls the heating process.
- The temperature hold function can be activated under [Temp. Hold]. If the workpiece temperature drops below the heating temperature, the workpiece is heated again. The limit for the permissible drop in temperature can be set in [T hold hysteresis] under [System settings]. The temperature hold function keeps the workpiece at the required heating temperature until the time set under [Hold time] has elapsed.
- After the heating process, the workpiece is demagnetised.

4.6.2 Time mode

- Setting of the required heating time
- Heating of the workpiece over the defined time period
- Operating mode available for use if the time required to heat a specific workpiece to a specific temperature is already known
- No temperature sensor required as the temperature is not monitored
- If 1 or more temperature sensors are connected, the workpiece temperature is displayed but not monitored.
- After the heating process, the workpiece is demagnetised.

In order to determine the heating time for a workpiece, the workpiece is heated to the required temperature in temperature mode. The time required is noted as the heating time.

The advantage of time mode over temperature mode is that the temperature sensor is not necessary. Time mode is therefore particularly suitable in the following situations:

- Batch mounting:
  It must be ensured that the initial temperature present when determining the heating time is also maintained in batch mounting.
- If the temperature sensor is defective:
  In this case, continually check the current temperature using a temperature gauge.
- For workpieces that are too large:
  If the mass exceeds the maximum permissible mass for horizontal workpieces, heat the workpiece while it is in a freely suspended position. This prevents mechanical overloading of the heating device. Since the thermal load is borderline, errors would be reported in temperature mode as the temperature increase is insufficient.

Once the set heating time has elapsed, the heating device automatically starts the process of demagnetising the workpiece. A continuous beep will sound once demagnetisation is complete.

4.6.3 Temperature mode or time mode

- Setting of the required workpiece temperature and the required heating period. The heating device will switch off automatically once the set temperature is reached or the set time has elapsed.
- Setting of the required heating temperature
- Heating of the workpiece to the set temperature
- Heating takes place as quickly as possible.
- Monitoring of the workpiece temperature throughout the entire process
- Choice of simple measurement and Delta T measurement under [System settings]
- Requires the use of 1 or more temperature sensors, which are attached to the workpiece. T1 (temperature sensor 1) is the main sensor and controls the heating process.
- After the heating process, the workpiece is demagnetised.

4.6.4 Temperature mode and speed mode

- Setting of the rate of permissible temperature increase during the heating process
  Example: Workpiece is heated to +120 °C at a rate of increase of 5 °C/min
- Heating of the workpiece to the set temperature
- Monitoring of the workpiece temperature throughout the entire process
- Choice of simple measurement and Delta T measurement under [System settings]

- Requires the use of 1 or more temperature sensors, which are attached to the workpiece. T1 (temperature sensor 1) is the main sensor and controls the heating process.
- The temperature hold function can be activated under [Temp. Hold]. If the workpiece temperature drops below the heating temperature, the workpiece is heated again. The limit for the permissible drop in temperature can be set in [T hold hysteresis] under [System settings]. The temperature hold function keeps the workpiece at the required heating temperature until the time set under [Hold time] has elapsed.
- After the heating process, the workpiece is demagnetised.

After activating the process, the heating device controls the power output so that the heating curve for the workpiece runs parallel to the set rate of increase. A white dashed line is displayed in the graphic representation, along which the heating process should ideally run. The actual curve will sit just above this line, as the controller initially seeks to achieve a balance between increase in temperature and corresponding power output.

Temperature mode and speed mode will only be executed correctly if the rate of increase is set at a realistic value. Additionally, the rate of increase must be proportional to the maximum power the heating device can deliver and transfer to the workpiece.

4.7 Log function

- To record and export the logs, insert an empty USB data storage device in FAT32 format into the USB port.

A USB data storage device is not included in the delivery.

4.7.1 Logging

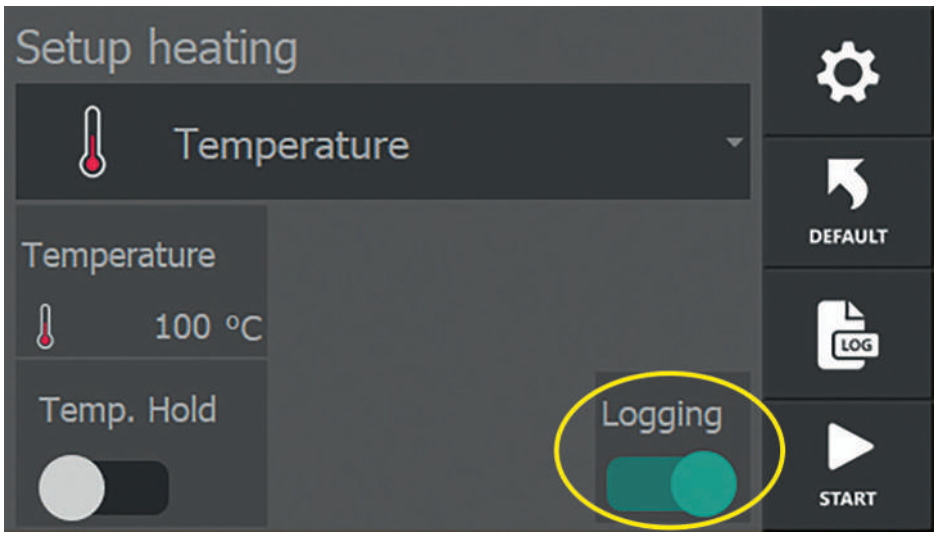
The menu for the individual heating methods includes the [Logging] selector switch, which can be used to activate or deactivate the log function.

The settings for the log are requested prior to the heating process starting.

The log contains the following information:

- temperature
- time
- output of the heating device
- operator
- workpiece designation
- date
- time

13 Activating the log function

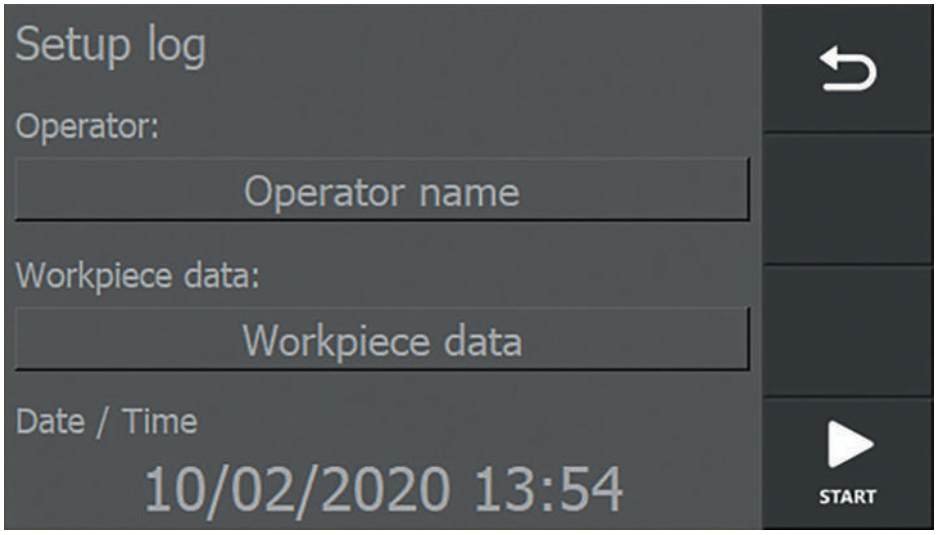


1. Press the [Logging] selector switch to activate the log function.
2. Press [Start].

› An input window opens for entering the log information.

3. Heating cannot start until all information has been entered.
4. Enter the operator name [Operator name] and the name of the workpiece [Workpiece data].

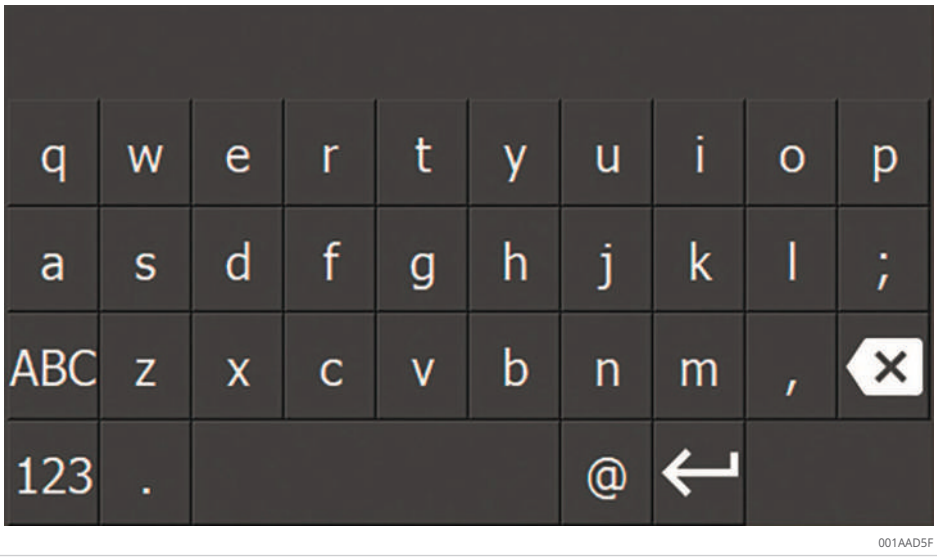
14 Entering the log information



5. Tap the field that needs to be changed.

› An input keyboard will appear.

15 Entering information for the log

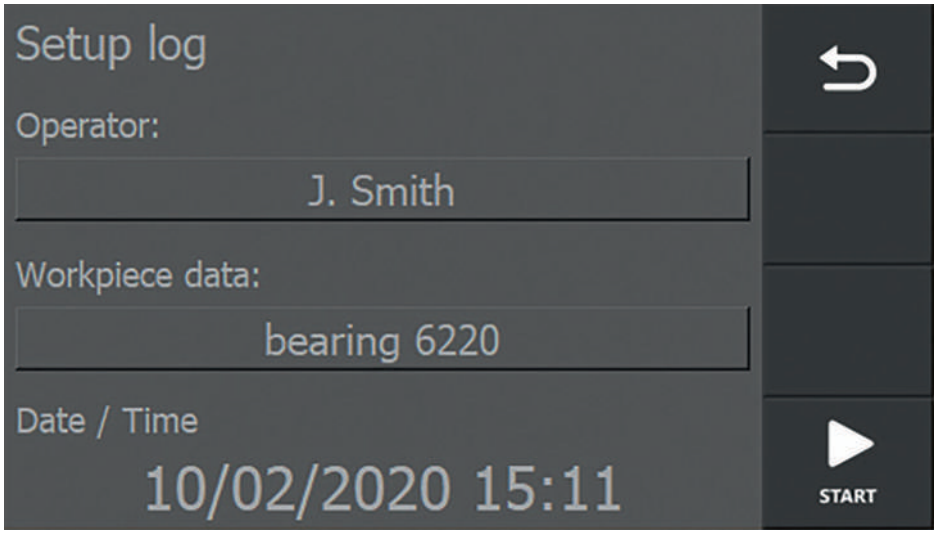


6. Enter the required information.
7. Press [Enter] to complete the entry.

› The keyboard is hidden.

› The inputted data is transferred to the corresponding field.

16 Completed log information

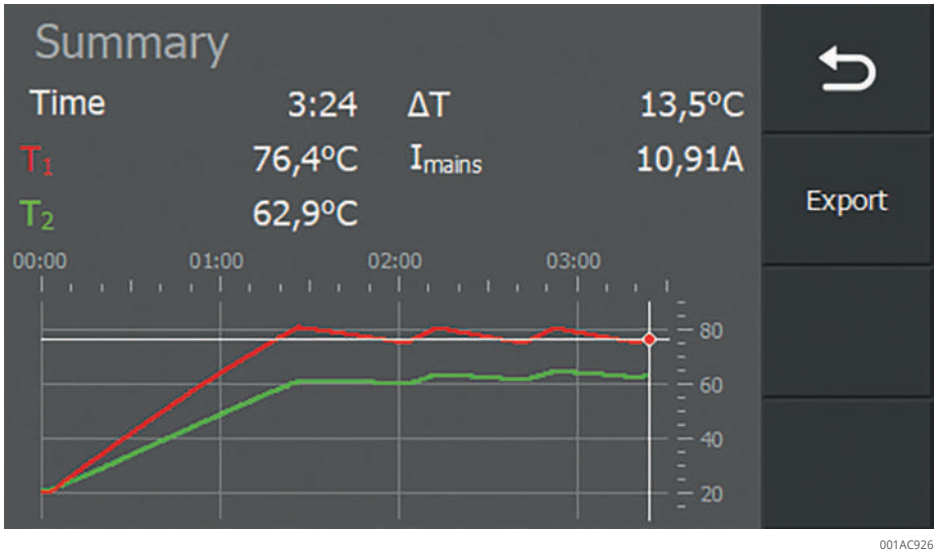


8. Heating can start once all input fields have been completed.
9. Press [Start] to start the heating operation.

› The heating process runs.

» Once the heating process has finished, an overview of the heating data is displayed.

17 Overview of the heating data



✓ If a USB storage device is inserted, the heating data can be exported as a PDF diagram and CSV file.

10. Press [EXPORT].

› A message appears confirming that the export has been successful.

11. Press [OK] to close the message.

» The log is stored as a PDF diagram and CSV file on the USB storage device.

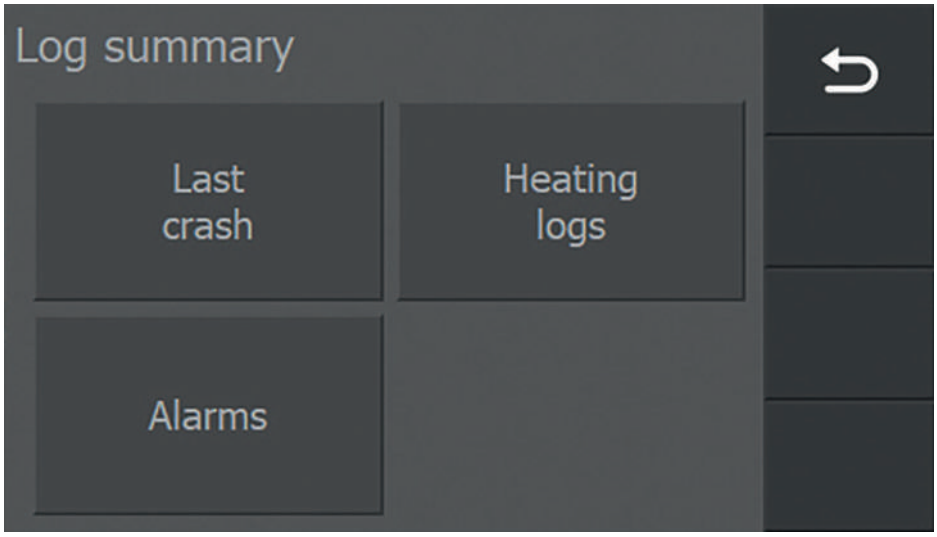
It is not necessary to export the log file immediately after each heating cycle. The information is stored in the generator and can be exported at a later date.

4.7.2 Accessing log files

1. Press the [Heating logs] button to display stored logs.

› An overview window opens.

18 Overview of logs



2. Press the button corresponding to the log type that you wish to view.

The heating device automatically saves the following data during the heating process:

14 Automatically saved log files

Log type	Description
[Last crash]	Data obtained from the process shortly before the heating device suffered a failure (“crash”).
[Heating logs]	Data from the stored heating processes.
[Alarms]	Alarms triggered

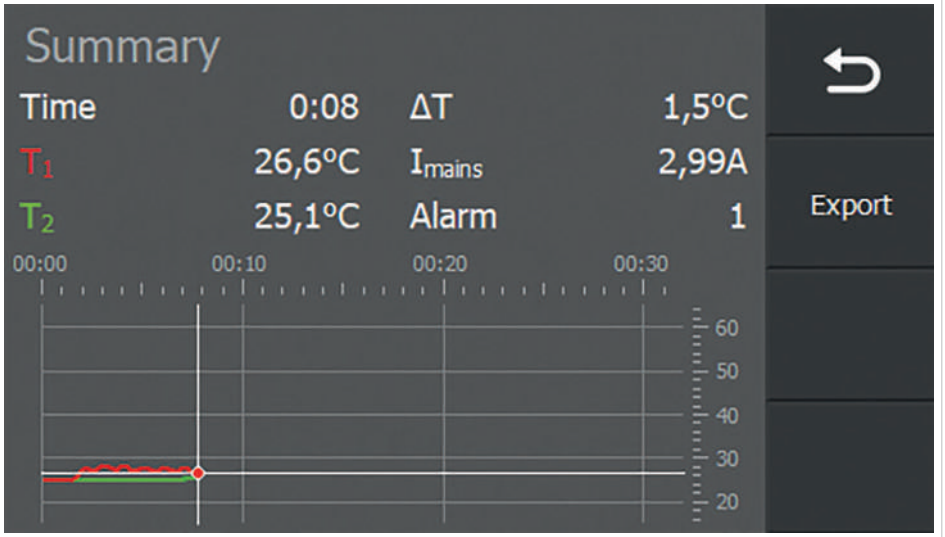
4.7.3 [Last crash]

The heating data that were valid just before the heating device suffered a crash or failure are displayed under [Last crash].

1. Press [Last crash]in the log overview window.

› This displays the heating data that were valid just before the device crashed.

19 Example of data [Last crash]



✓ If a USB storage device is inserted, the heating data can be exported as a PDF diagram and CSV file.

2. Press [EXPORT].

› A message appears confirming that the export has been successful.

3. Press [OK] to close the message.

» The log is stored as a PDF diagram and CSV file on the USB storage device.

4. Press [Back] to return to the previous menu.

4.7.4 [Heating logs]

[Heating logs] displays a list of saved heating logs.

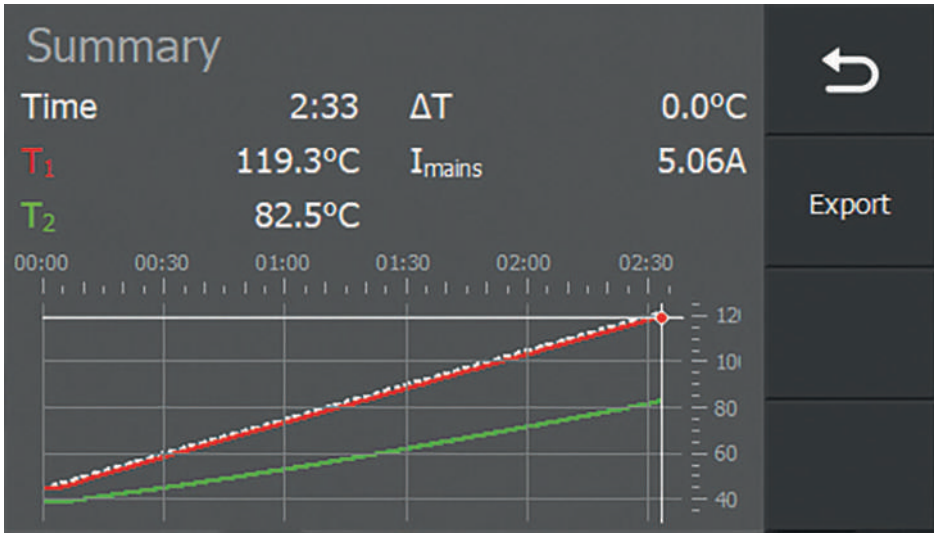
1. Use the arrow keys to scroll through the overview.
2. To select a log, press the corresponding line.
3. Decide whether you wish to view or delete the selected log.

4.7.4.1 [VIEW]

1. Open the selected log by pressing [VIEW].

› The chosen log is displayed.

20 Example of a heating log



✓ If a USB storage device is inserted, the heating data can be exported as a PDF diagram and CSV file.

2. Press [EXPORT].

› A message appears confirming that the export has been successful.

3. Press [OK] to close the message.

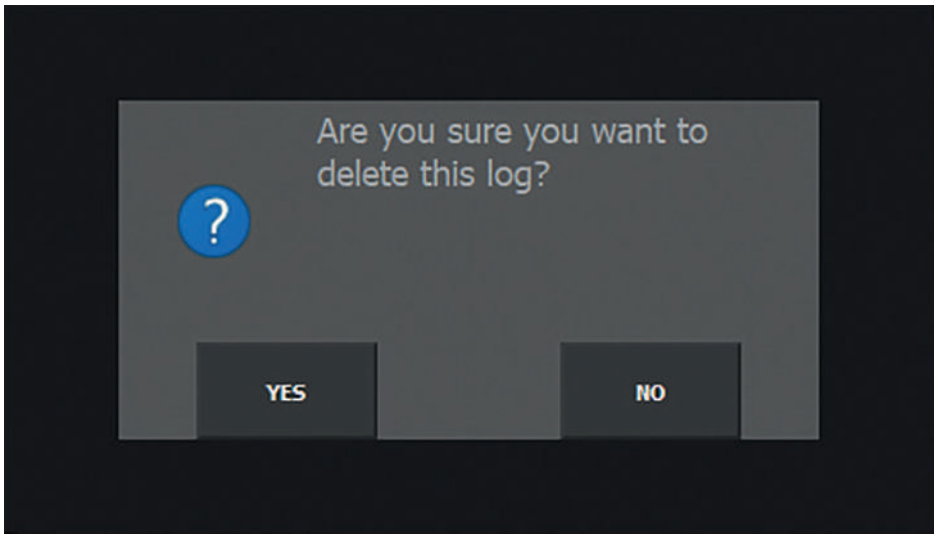
» The log is stored as a PDF diagram and CSV file on the USB storage device.

4. Press [Back] to return to the previous menu.

4.7.4.2 [CLEAR]

1. Delete the selected log by pressing [CLEAR].

21 Deleting the log file

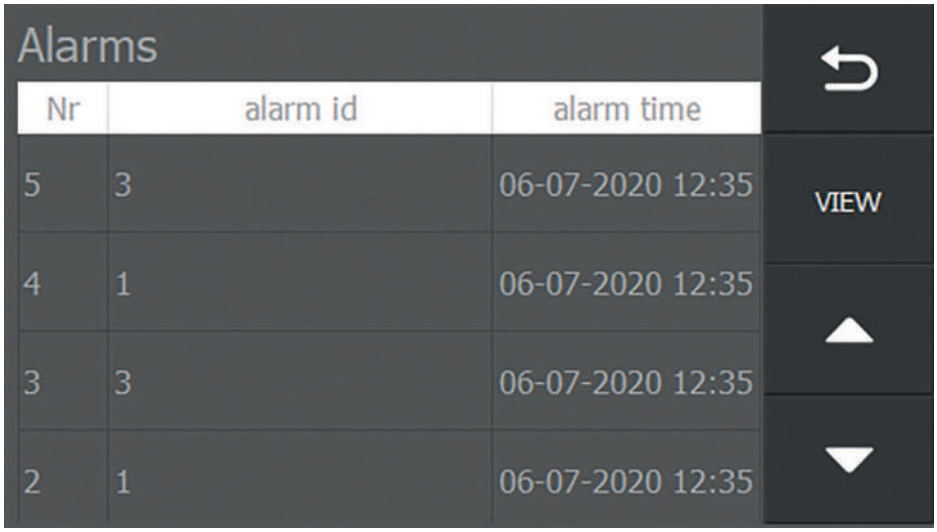


2. Press [No] if you do not wish to delete the log file.
› You will be automatically returned to the overview list of log files.
3. Press [Yes] if you do wish to delete the log file.
› A message appears confirming that the file has been successfully deleted.
4. Press [OK] to close the message.
» The log file has been deleted.
5. Press [Back] to return to the previous menu.

4.7.5 [Alarms]

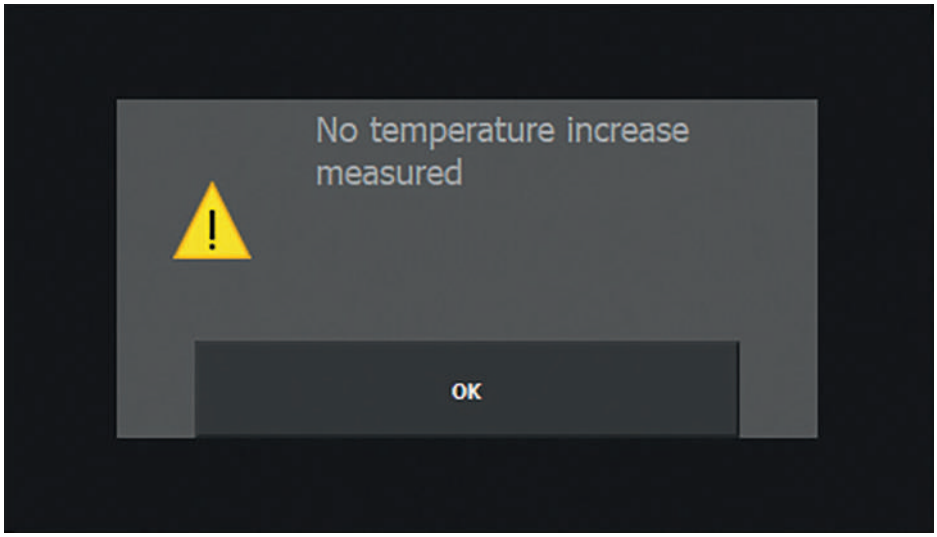
An overview of triggered alarm messages is displayed under [Alarms].

22 Example list [Alarms]



1. Use the arrow keys to scroll through the overview.
2. To select an alarm, press the corresponding line.
3. Open the required alarm by pressing [VIEW].
› The selected alarm message is displayed.

23 Example of an alarm message



4. Press [OK] to close the message.
5. Press [Back] to return to the previous menu.

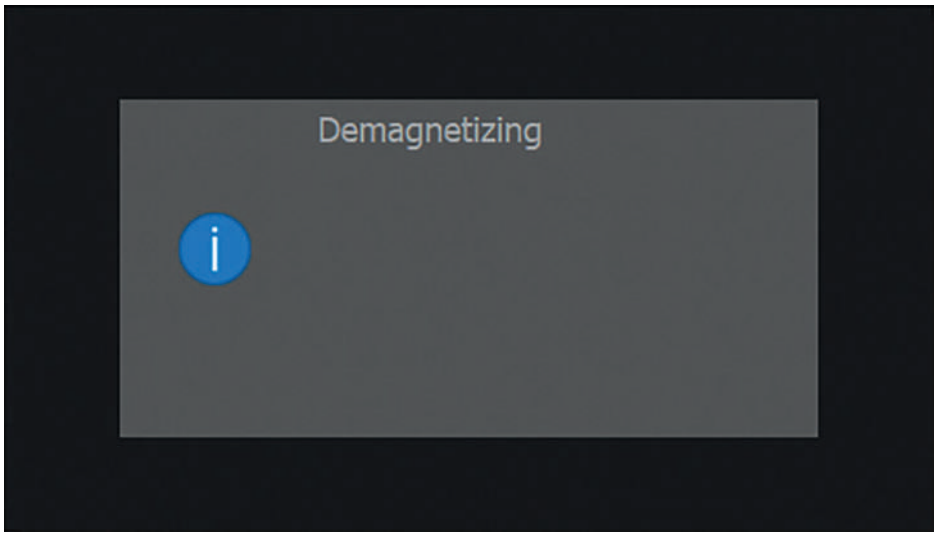
4.8 Further functions

The heating device has additional functions for controlling the heating process.

4.8.1 Demagnetisation

If a heating process stops or is stopped manually, the workpiece is demagnetised. The following message briefly appears on the display: [Demagnetizing].

24 Demagnetisation of the workpiece

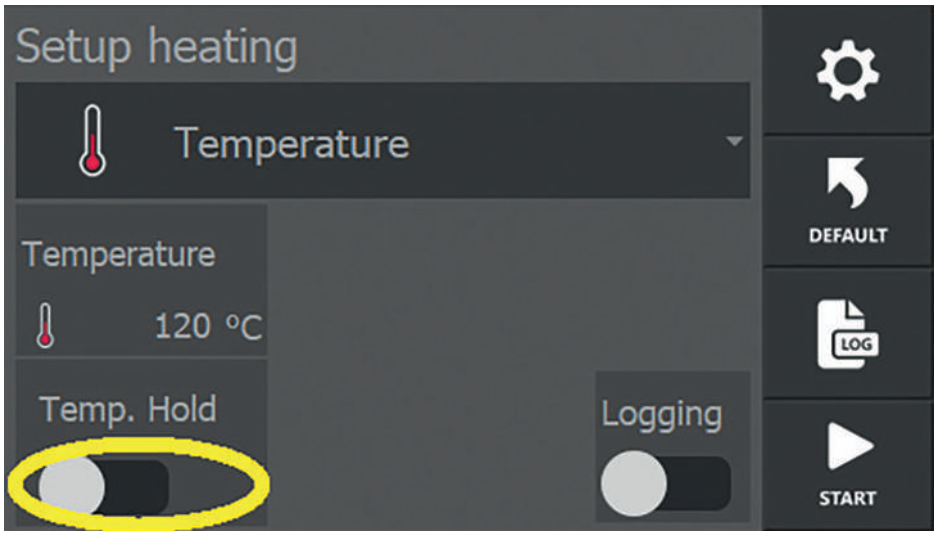


4.8.2 Temperature hold function

This function is used to hold the workpiece at a specific temperature once the set target temperature has been reached.

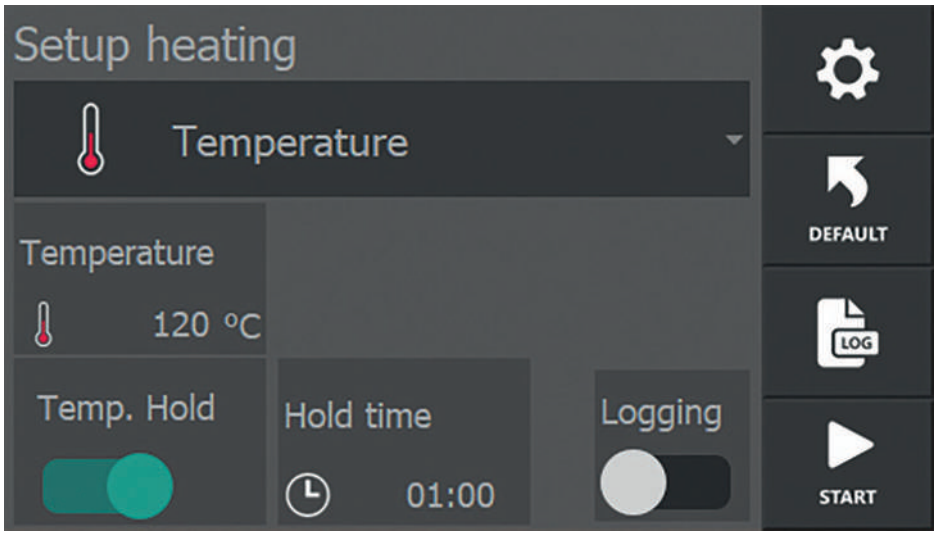
The temperature hold function is available in temperature mode as well as in temperature mode and speed mode, and is activated and deactivated using the [Temp. Hold] selector switch.

25 [Temp. Hold] selector switch



The temperature is held at a specific temperature with a switching hysteresis, which is set in the system settings. The temperature to which a workpiece can fall before the heater is automatically reactivated is set in the system settings.

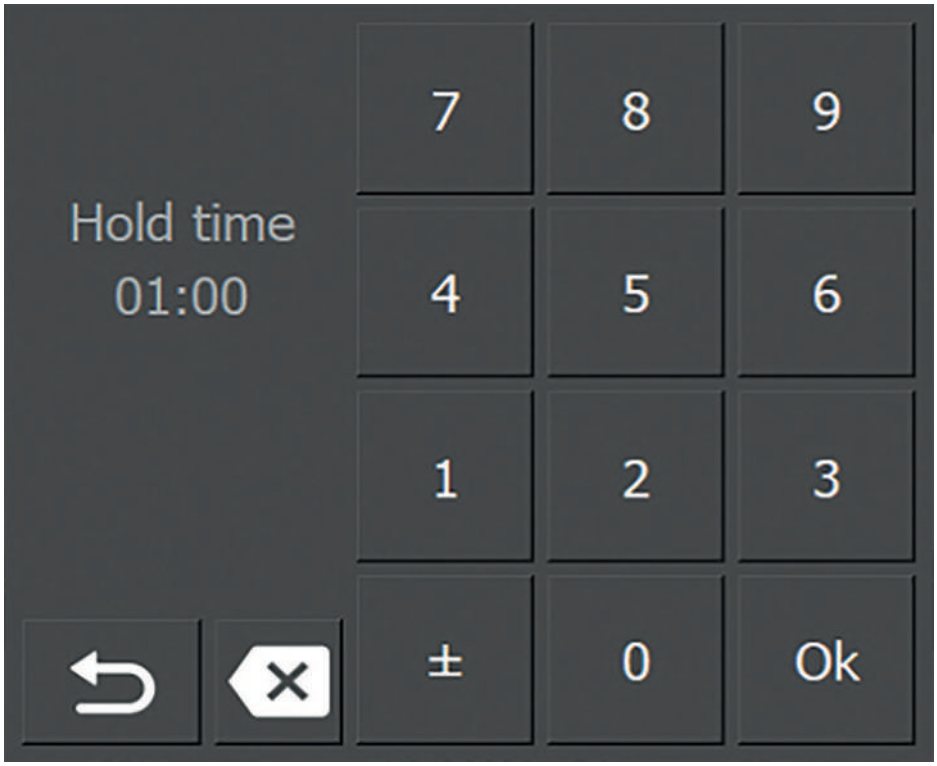
26 [Temp. Hold] selector switch active



✓ When the [Temp. Hold] selector switch is active, the selector switch turns green and the menu shows how long the workpiece will be held at the specific temperature.

1. The length of time that a workpiece should be held at a specific temperature can be set by tapping [Hold time]. The time is set in mm:ss and can be between 00:01 and 99:00.

27 Entering the time for the temperature hold function

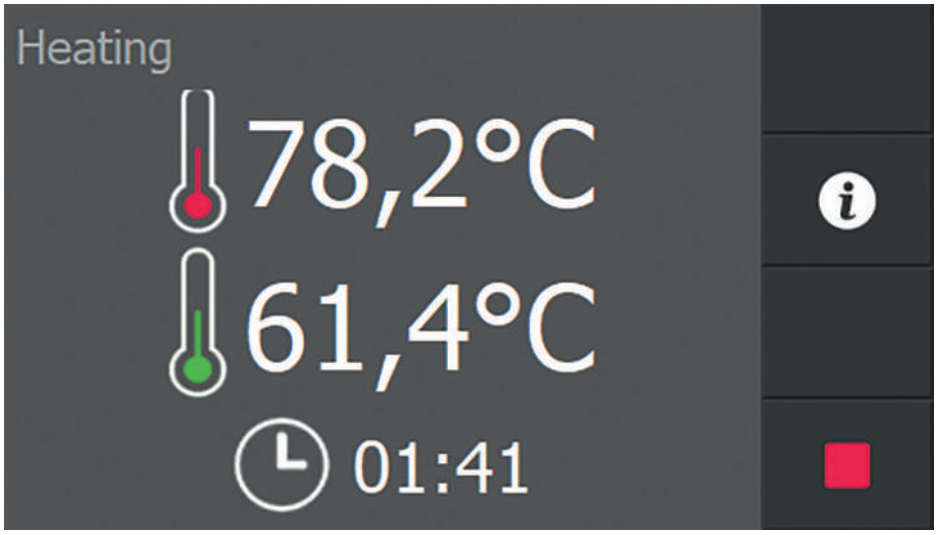


001AC026

2. Tap [Back] to return.

› Once the target temperature has been reached during the heating process, the remaining temperature maintenance time is displayed on a timer.

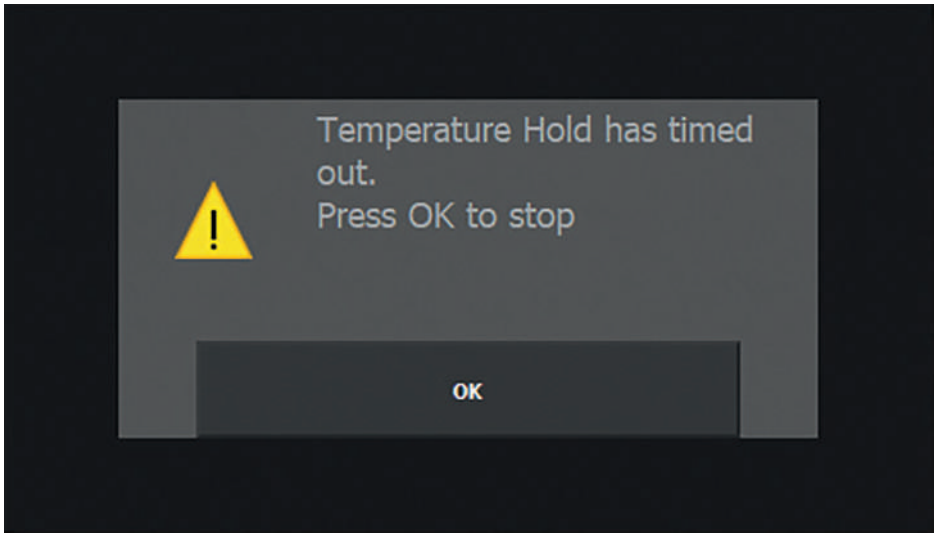
28 Remaining temperature maintenance time



001AC066

3. Once the set time has elapsed, a message will appear on the display.

29 Message confirming elapsed temperature hold function period

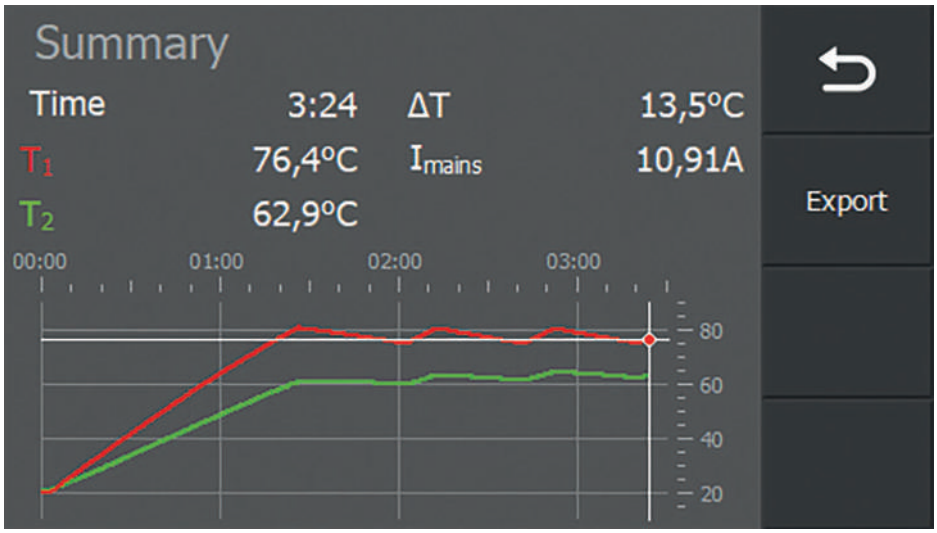


001AC046

4. Press [OK] to close the message.

› The temperature curve over time is displayed.

30 Example of temperature curve for temperature hold function



001AC926

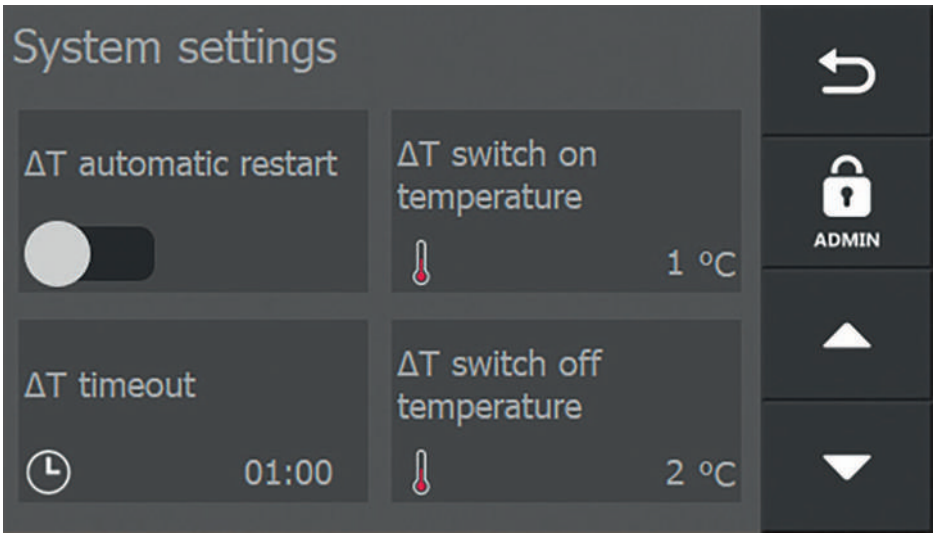
4.8.3 Delta T function

This function is used when the temperatures in a material must be kept from deviating beyond a certain point in order to avoid stresses in the material. Check with the supplier of the workpiece to establish the extent of the permitted temperature difference.

The ΔT control system is used when heating bearings where a significant difference in the temperatures of the inner and outer ring is not permitted.

During heating, temperatures T1 and T2 are measured. The difference between these two temperatures is calculated on an ongoing basis.

31 Settings for the Delta T function



✓ Both temperature sensors are connected.

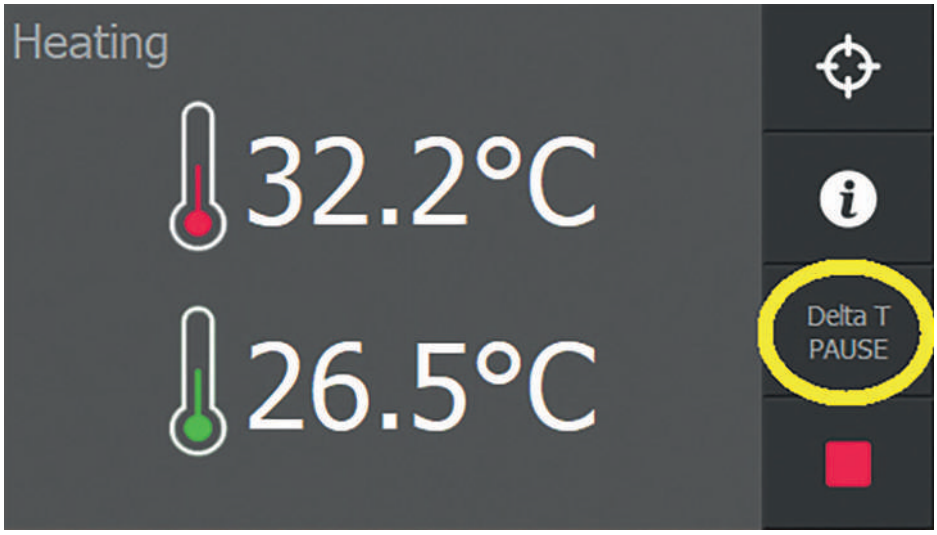
1. Activate the Delta T function in the [System settings] ➤23|4.5.5.
2. Activate [ΔT automatic restart] to allow heating to restart automatically.

› If T2 exceeds the set [ΔT switch off temperature], heating is switched off or paused. If the process is paused, [Delta T PAUSE] is shown on the display.

3. If [ΔT automatic restart] is not activated, heating must be restarted manually.

› If T1 falls below the set [ΔT switch on temperature] within the time set for [ΔT timeout], heating is started automatically.

32 Delta T function paused

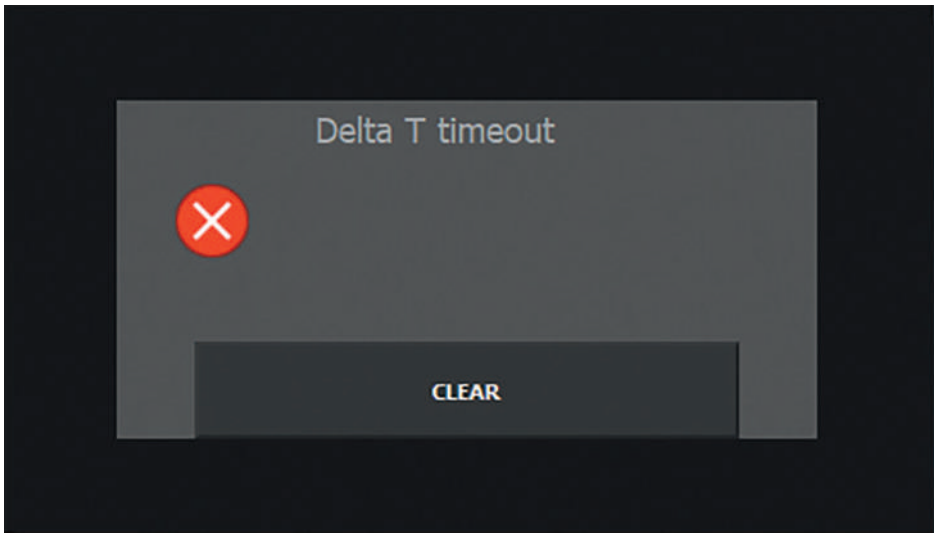


001AC534

15 Description of [ΔT automatic restart]

[ΔT automatic restart]	Description
Deactivated	Heating will not resume automatically.
	Heating must be restarted manually.
Activated	Heating will resume automatically if the temperature difference is smaller than the temperature set under [ΔT switch on temperature].
	The temperature difference must be reached within [ΔT timeout]. If the time limit is exceeded, the error message [Delta T timeout] is displayed. 4. Press [CLEAR] to close the message.

33 Error message for exceeded time limit



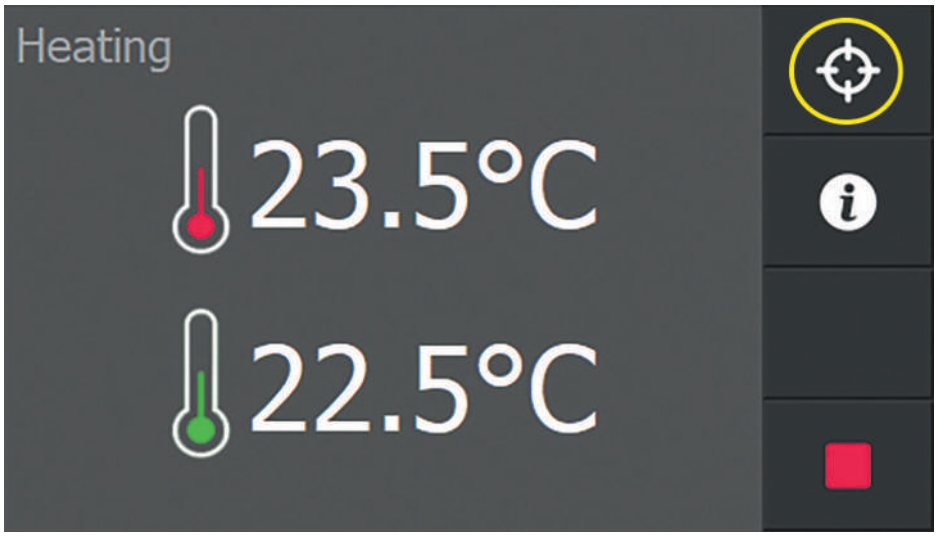
001AC554

4.8.4 Adjusting the heating target

The [Adjust Heating Target] button is displayed for all heating methods throughout the heating operation. The target (target temperature or target time) can be changed without interrupting the heating process.

An example based on a heating device in temperature mode is used below.

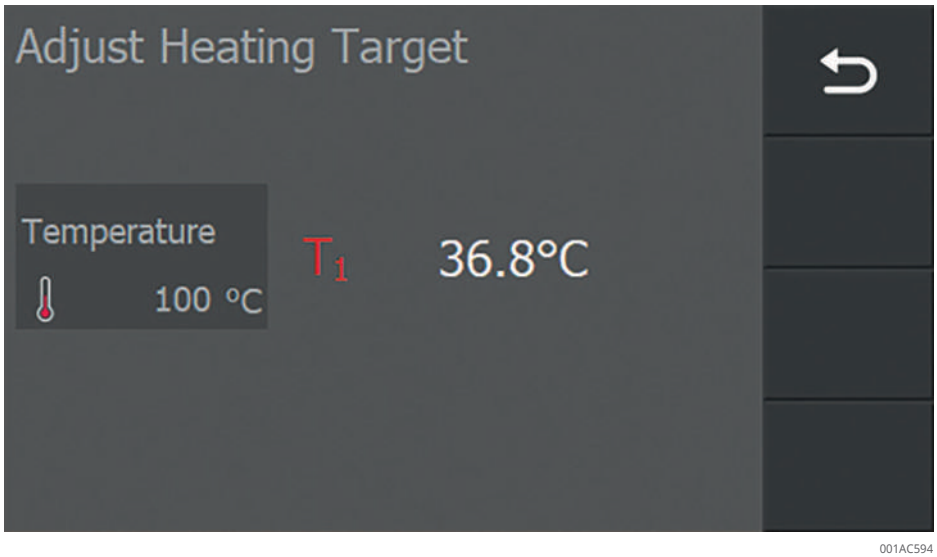
34 Example of temperature mode



1. Select the [Adjust Heating Target] button.

› A menu containing the current settings and actual values will open.

35 Example of a heating target

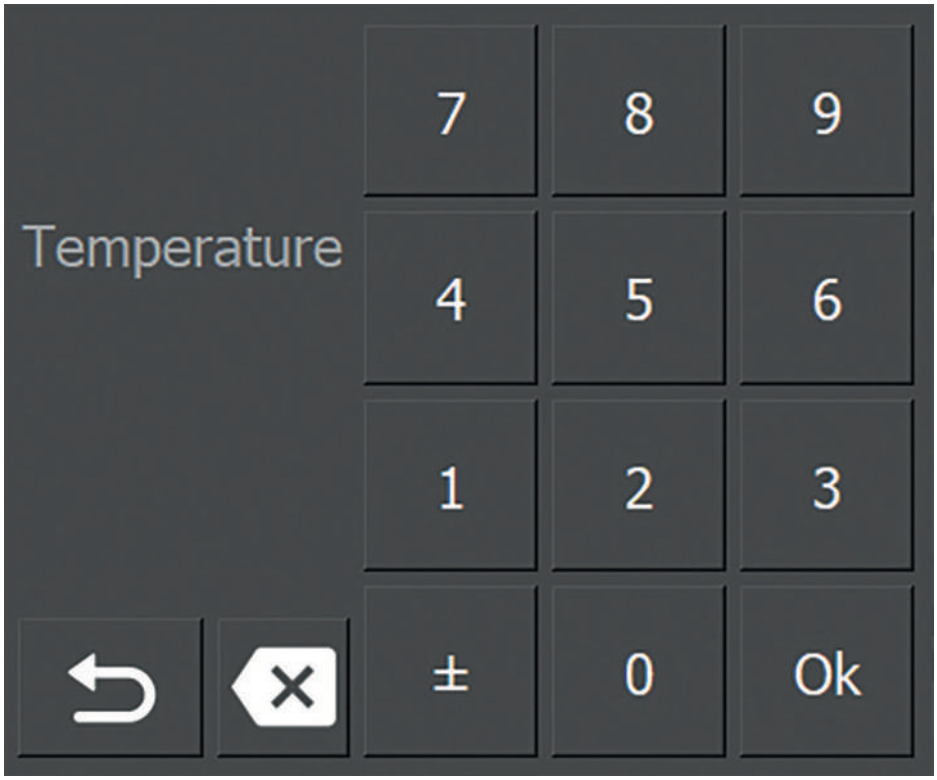


2. Press on the value to be changed.

› An input keyboard will appear.

3. Enter the new value.

36 Input keyboard



4. Press [OK] to complete the entry.

› The display will return to the heating menu.

» The target value for the current heating operation has been changed.

5 Transport and storage

5.1 Transport

The safety regulations for transport must be observed.

⚠ WARNING

Heavy product

Risk of herniated disc or back injury.

- Only lift products that weigh less than 23 kg.

Light products weighing up to 23 kg may be carried by 1 person, slightly heavier products weighing up to 46 kg must be carried by 2 people if necessary. For very heavy products weighing in excess of 46 kg, a device with a sufficiently high load-carrying capacity must be used.

16 Transporting the device

Device	1 person	2 people	Device
HEATER50	✓	✓	✓
HEATER100		✓	✓
HEATER150			✓
HEATER200			✓
HEATER400			✓
HEATER600			✓
HEATER800			✓
HEATER1600			✓

✓ possible

5.2 Storage

The safety regulations for storage must be observed.

Some heating devices are delivered in transport packaging. Wherever possible, the heating devices should be stored in the transport packaging in which they were delivered.

6 Commissioning

The heating device is commissioned at the fitting area.

6.1 Hazard area

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

DANGER

Strong electromagnetic field

Persons fitted with a pacemaker are at risk of death from cardiac arrest.

- Erect a barrier.
- Attach clearly visible warning signs to alert persons fitted with pacemakers to the hazard area.

DANGER

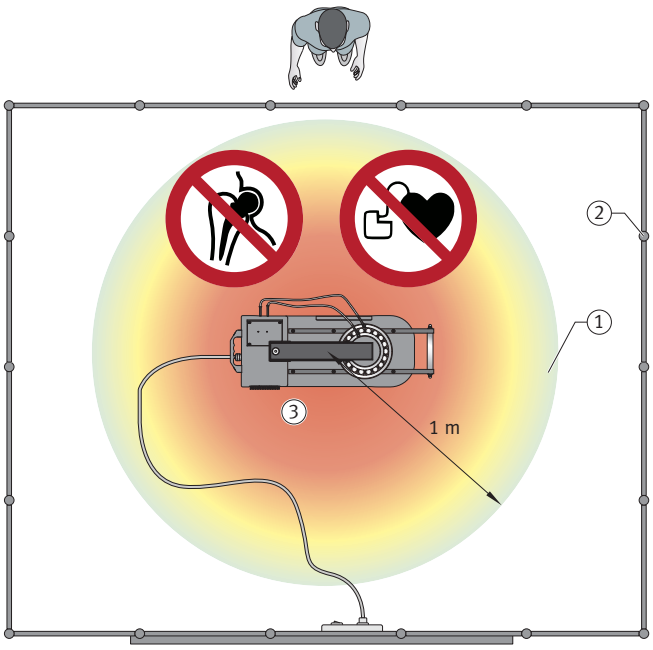
Strong electromagnetic field

Danger of death due to heated metallic implant.

Risk of burns from carrying metallic parts.

- Erect a barrier.
- Attach clearly visible warning signs to alert persons fitted with implants to the hazard area.
- Attach clearly visible warning signs to alert persons carrying metal parts to the hazard area.

37 Hazard area



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

6.2 Initial stages

The first stages in commissioning are as follows:

1. Where necessary, remove the heating device from the transport packaging.
2. Check the housing for damage.
3. Check the yoke or yokes for damage.
4. Place the heating device in a suitable mounting area.

A suitable mounting area has the following characteristics:

- flat, horizontal and non-ferromagnetic
- distance from ferromagnetic parts at least 1 m
- capable of supporting the total mass of the heating device and workpiece
- a barrier is installed at a distance of 1 m around the heating device.

6.3 Connecting the power supply

✓ The mains connection cable and mains connection plug must not show any signs of damage.

✓ The power supply must correspond to the technical data.

1. Lay the mains connection cable in such a way as to prevent a trip hazard.

⚠ DANGER

Damaged cable sheathing

Danger of death from fatal electric shock. A strong electric field can lead to exposed wires as a result of melted cable sheathing.

▸ Avoid contact between the mains connection cable and the component to be heated.

2. Lay the connection cable in such a way that it is set apart from the subsequent workpiece position.
3. Insert the mains connection plug into a suitable socket.

7 Operation

7.1 General requirements

Only start a heating operation if there is a workpiece in the inductor. The workpiece must not be removed from the inductor during the heating process.

A rolling bearing may be heated to a maximum of +120 °C (+248 °F). A precision bearing may be heated to a maximum of +70 °C (+158 °F). Higher temperatures can have a negative effect on the metallurgical structure and lubrication, leading to instability and failure.

The maximum permissible temperatures may be different for lubricated bearings with seals.

Depending on the design, the maximum temperature of the connected inductor must not exceed +180 °C or +300 °C. It is essential to observe the maximum operating time of the connected inductor.

Do not suspend a workpiece from ropes or chains made from ferromagnetic materials while it is being heated. Suspend the workpiece from a sling that does not contain metal and is temperature-resistant.

7.2 Carrying out protective measures

The following protective measures must be carried out prior to operation:

1. Mark and secure the hazard area in accordance with the general safety regulations ➤8|2.
2. Clean the workpiece to be heated to avoid smoke formation.
3. Any smoke or vapour occurring during the heating process must not be inhaled. A suitable extraction system must be installed if smoke or vapour is produced during the heating process.
4. Wear heat-resistant protective gloves effective up to +250 °C.
5. Wear safety shoes.

7.3 Selecting the support yoke, slewing yoke or vertical yoke

If a workpiece has an inside diameter that is smaller than the pole cross-section, a yoke with a smaller cross-section is used.

When using a yoke with a cross-section that is smaller than the pole cross-section of the U-shaped core, the heating device cannot carry out heating at full power. Always select a yoke that fills the inside diameter of the bearing to the greatest possible extent. There is also the option to place 2 support yokes on top of each other ➤51|41. This allows the heating device to heat up more quickly and evenly.

NOTICE

Drops or impacts

Damage to the support yoke, slewing yoke or vertical yoke

- Place the yoke or yokes into storage immediately after use.

7.4 Positioning the workpiece

Depending on the heating device used, the workpiece can be laid flat, suspended or freely suspended.

17 Positioning the workpiece

Device	Freely suspended	Suspended	Lying flat
HEATER50	✓	✓	✓
HEATER100	✓	✓	✓
HEATER150	✓	✓	✓
HEATER200	✓	✓	✓
HEATER400	✓	✓	✓
HEATER600	✓	✓	✓
HEATER800	✓		✓
HEATER1600	✓		✓

✓ possible

38 Positioning options: HEATER50 to HEATER600

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1	Rolling bearing freely suspended	2	Rolling bearing suspended
3	Rolling bearing lying flat		

39 Positioning options: HEATER800 and HEATER1600

1	Rolling bearing lying flat	2	Rolling bearing freely suspended
3	Rolling bearing suspended, not permissible		

⚠ WARNING

Impermissible mass or dimensions of the workpiece

Risk of injury due to tilting of heating device and falling workpiece.

- Ensure that the permissible masses and dimensions are observed.

⚠ WARNING

Workpiece will not lie flat due to damaged carrier

Risk of injury due to tilting of heating device and falling workpiece.

- Avoid damaging the carriers.

NOTICE

Slewing yoke will not lie flat on the U-shaped core because the slewing yoke or hinge is damaged.

Damage to the heating device due to strong vibrations or overloading of the electronics

- Avoid damaging the slewing yoke and hinge.

Large workpieces can be thermally insulated by wrapping them in insulation material (such as a welding blanket). This keeps the heat in the workpiece and prevents it from cooling as quickly.

7.4.1 Workpiece in a freely suspended position

With all tabletop devices, there is the option to heat the workpiece in a freely suspended position. In such cases, the workpiece is suspended from a temperature-resistant, non-metallic sling. As a result, the heating device is not subjected to the weight of the workpiece.

⚠ CAUTION

Rope or chain subjected to extensive heating

Risk of burns

- Suspend the workpiece from a sling that does not contain metal and is temperature-resistant.

7.4.2 Workpiece lying flat

With all heating devices, there is the option to heat the workpiece while it is lying flat.

✓ A workpiece can only be laid flat if the inside diameter of the workpiece is larger than the diagonal of the U-shaped core.

1. For models HEATER800 and HEATER1600, pull and secure the support strips.

⚠ WARNING

Slipping support strips due to the absence of fitted split pins

Risk of injury due to tilting of heating device and falling workpiece.

- Secure the retractable support strips using split pins.

2. Position the workpiece as centrally as possible to the U-shaped core.
3. Ensure that the workpiece does not come into contact with the plastic housing of the heating device.

⚠ WARNING

Workpiece protruding beyond the support strips

Risk of injury due to tilting of heating device and falling workpiece.

- Ensure that the workpiece does not protrude beyond the support strips.

40 Workpiece must not protrude

4. Close the magnetic circuit using the largest yoke available.
5. Lubricate the contact surfaces on the yoke and the contact surfaces (poles) of the U-shaped core sufficiently with petrolatum to ensure optimum contact and avoid vibrations.

7.4.3 Workpiece in a suspended position

With all tabletop devices, there is the option to heat the workpiece while it is suspended from a support yoke or slewing yoke.

⚠ WARNING

Heavy workpiece not positioned centrally on the support yoke

Risk of injury due to tilting of heating device and falling workpiece.

- In the case of heavy workpieces, use a suitable carrying sling.
- In the case of heavy workpieces, use a suitable lifting device.
- Position the workpiece centrally on the slewing yoke.

NOTICE

Overloading of the open slewing yoke

Damage to the heating device

- Subject the open slewing yoke to light load only.
- Support the workpiece.

NOTICE

Overloading of the support yoke or slewing yoke

Damage to the heating device

- Observe the maximum permissible mass of the workpiece.

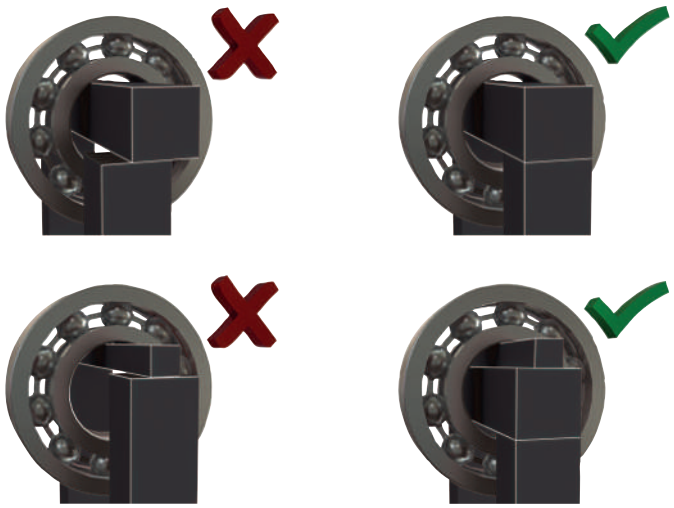
18 Maximum mass of the workpiece, limited by the load carrying capacity of the yoke

Heating device	Support yoke, slewing yoke	Workpiece
		Maximum mass
	mm	kg
HEATER50	7×7×200	1
	10×10×200	2
	14×14×200	3
	20×20×200	5
	40×40×200	10
	40×50×200	15
HEATER100	10×10×280	2
	14×14×280	3
	20×20×280	5
	30×30×280	10
	40×40×280	15
	50×50×280	20
	60×60×280	45
HEATER150, HEATER200	10×10×350	2
	14×14×350	3
	20×20×350	10
	30×30×350	15
	40×40×350	25
	50×50×350	40
	60×60×350	45
	70×70×350	50
	70×80×350	60
HEATER400	20×20×500	10
	30×30×500	15
	40×40×500	25
	60×60×500	60
	80×80×500	80
HEATER600	40×40×600	25
	60×60×600	60
	80×80×600	80
	90×90×600	80

✓ When using a support yoke:

1. Position the workpiece centrally on the support yoke.
2. Place the support yoke centrally on the U-shaped core.

41 Suspended from the support yoke or slewing yoke



001A3F4C

✓ When using a slewing yoke:

3. Swivel the slewing yoke open (towards you) until it locks into the positioning cam.
4. Slide the workpiece over the slewing yoke until the workpiece is in the middle.

42 Suspended from the slewing yoke

001A3F1C

5. Swivel the slewing yoke back to the U-shaped core.
6. Ensure that the workpiece does not come into contact with the plastic housing of the heating device.

7.5 Connecting the temperature sensor

NOTICE

Hot workpiece

Significant heating of the cable leading to melting of the cable sheathing and thus to the destruction of the temperature sensor

▸ Keep the temperature sensor cable away from the hot workpiece.

✓ Only temperature sensors that meet manufacturer specifications may be used.

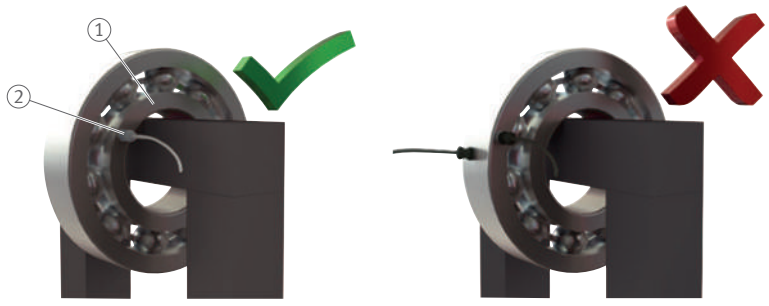
✓ The temperature sensors must not show any signs of damage.

✓ The magnetic surface of the temperature sensors must be contaminant-free.

✓ The workpiece surface must be free of contaminants.

1. Connect the plug of temperature sensor T1 to sensor connection T1. "–" and "+" must match on the plug and sensor connection.
2. Attach the sensor head of temperature sensor T1 to the workpiece at the point where the heat is transferred into the workpiece. Place the sensor on a flat part of the workpiece's end face, as close as possible to the inside diameter.
   In the case of a rolling bearing, for example, this will be on the end face of the inner ring, close to the inside diameter.

43 Attaching temperature sensor T1



001A2692

1	Inner ring	2	Sensor head of the temperature sensor

The following should also be observed for heating methods involving a dual temperature measurement or for monitoring by means of the Delta T function:

3. Connect the plug of temperature sensor T2 to sensor connection T2. "–" and "+" must match on the plug and sensor connection.
4. Place the sensor head of temperature sensor T2 at the point where the temperature in the workpiece is expected to be at its lowest.
   In the case of a rolling bearing, for example, this will be on the outer ring.

» The temperature sensors are ready for operation.

After use, attach the temperature sensor to the U-shaped core, as close as possible to the control panel.

7.6 Switching on the heating device

- ✓ The workpiece is in position.
- ✓ The required temperature sensors are connected. For a single measurement: T1, for Delta T measurement: T1 and T2.
- ✓ The power supply is connected.
- ▸ Switch on the heating device using the main switch.
- › The heating device will commence the startup operation.
- › The startup operation takes some time to complete, ~20 s.
- › A loading screen is displayed whilst the startup operation is in progress.

44 Loading screen

7.7 Selecting the heating method

1. Tap the [Setup heating] field.
2. Select the required heating method from the operating modes.

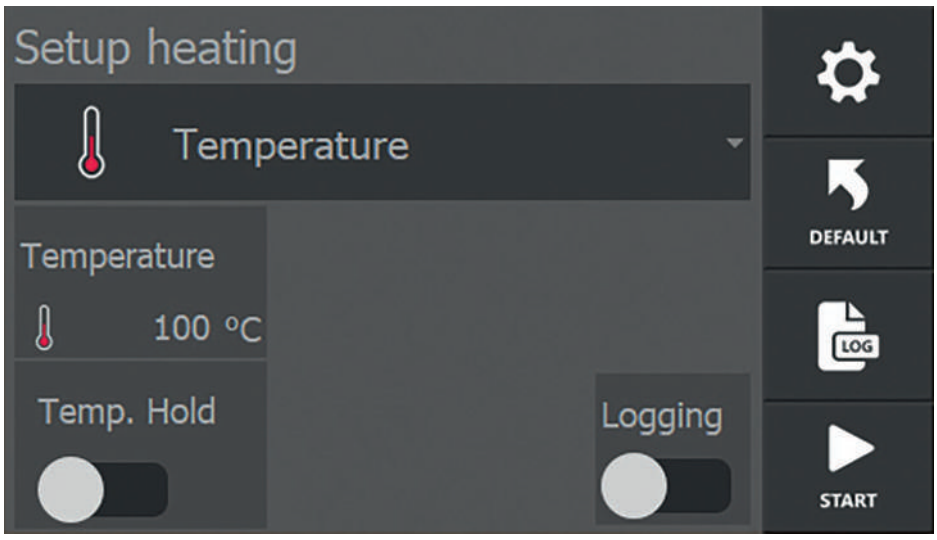
› The selection is applied as [Heating mode].

› The selection menu is then hidden again.

› The setting parameters are displayed in the window according to the selection made.

3. Press [Default mode], if required, to reset the displayed settings to the default settings activated in the settings menu ➤20|4.5.1.

45 Example display for [Setup heating]



19 Overview of heating methods

[Heating mode]	Field	Function
Temperature mode	Temperature	Controlled heating to the required temperature. The temperature hold function is available for use.
Time mode	Time	Suitable for volume production: Heat in time mode if the time required to reach a certain temperature is known. Workaround if the temperature sensor is defective: Heat in time mode and monitor the temperature using an external thermometer.
Temperature mode or time mode	Time or Temperature	Controlled heating to the required temperature or over a required time period. The heating device switches off as soon as one of the two values is reached.
Temperature mode and speed mode	Temperature & speed	Controlled heating to the required temperature. The maximum rate at which the temperature increases per unit of time can be entered so that the workpiece is heated along a specified curve. The temperature hold function is available for use.

7.8 Heating the workpiece

- Ensure that all protective measures have been carried out.

DANGER

Strong electromagnetic field

Persons fitted with a pacemaker are at risk of death from cardiac arrest.

- Erect a barrier.
- Attach clearly visible warning signs to alert persons fitted with pacemakers to the hazard area.

DANGER

Strong electromagnetic field

Danger of death due to heated metallic implant.

Risk of burns from carrying metallic parts.

- Erect a barrier.
- Attach clearly visible warning signs to alert persons fitted with implants to the hazard area.
- Attach clearly visible warning signs to alert persons carrying metal parts to the hazard area.

WARNING

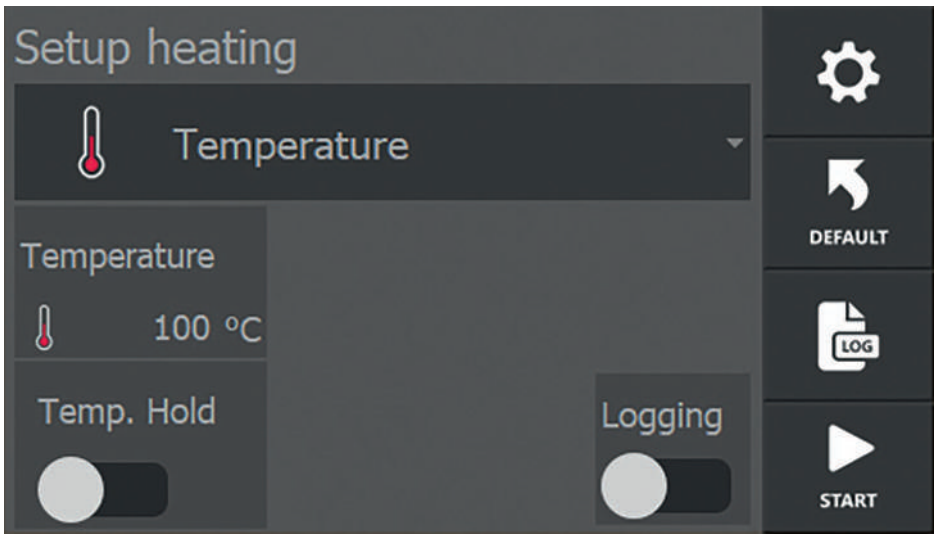
Strong electromagnetic field

Risk of cardiac arrhythmias and tissue damage from spending longer periods in a strong electromagnetic field.

- Minimise the amount of time spent in the electromagnetic field.
- Exit the hazard area immediately after switching on the device.

7.8.1 Heating in temperature mode

46 Heating in temperature mode



✓ The workpiece is in position.

✓ The required temperature sensors are connected. For a single measurement: T1, for Delta T measurement: T1 and T2.

1. Select [Temperature] as the [Heating mode].
2. Touch [Temperature] and set the target temperature for the heating operation.
3. Activate the [Temp. Hold] selector switch and set the desired hold time if the temperature hold function is required.
4. Activate the [Logging] selector switch if logging of the heating operation is required.

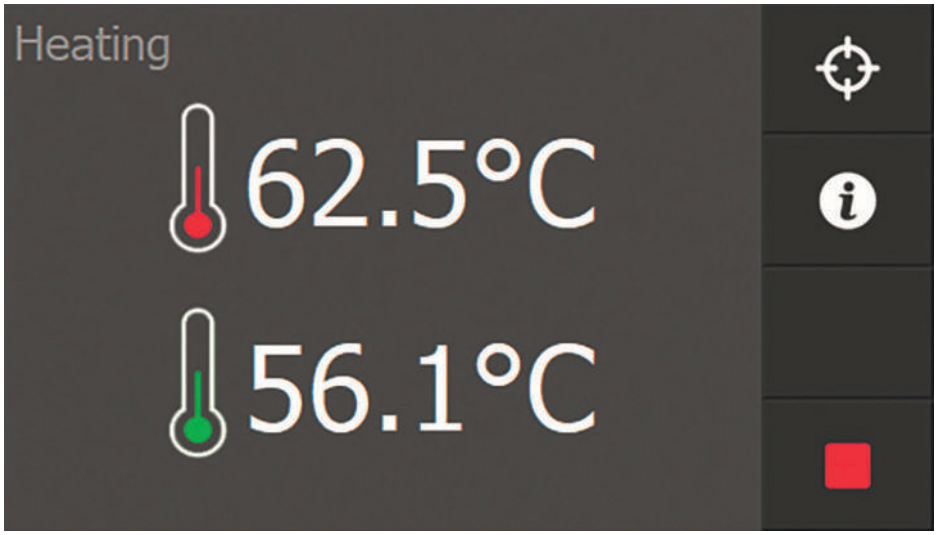
5. Press [Start] to start the heating operation.

› The heating operation will commence.

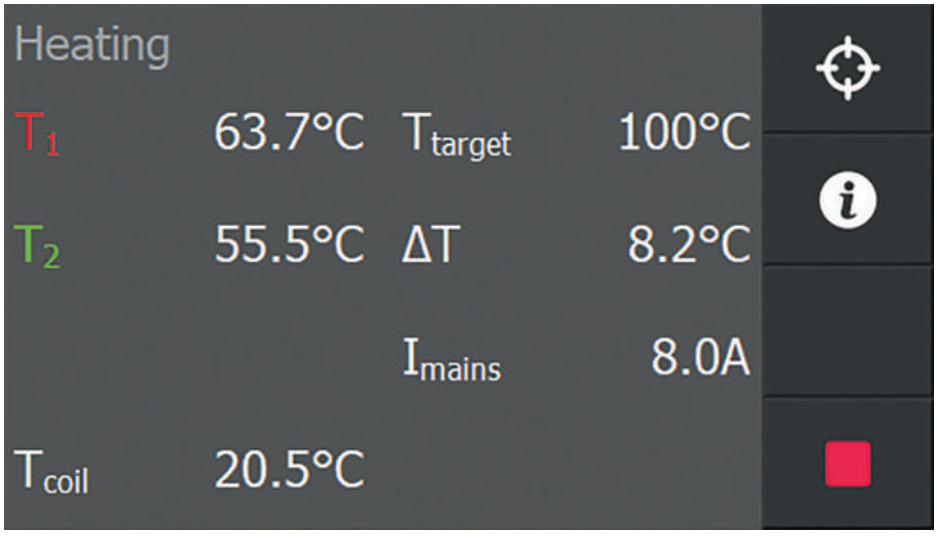
› The display shows the current workpiece temperature at temperature sensor T1.

› If a second temperature sensor T2 is attached, its temperature will also be shown on the display.

47 Display of the workpiece temperatures



48 Expanded data overview



6. Press [Additional information] to toggle between a graphic representation and an expanded data overview.

» Once the workpiece has reached the target temperature, a loud beep will sound.

20 Deviations with or without temperature hold function

[Temp. Hold]	Target temperature reached
Deactivated	Heating finishes automatically.
Activated	Heating finishes automatically.
	Heating recommences automatically if the temperature falls below the value of [T hold hysteresis].
	The time remaining in the temperature hold function is indicated by a clock on the screen.
	A message will appear and a loud continuous beep will sound once the set time has elapsed.

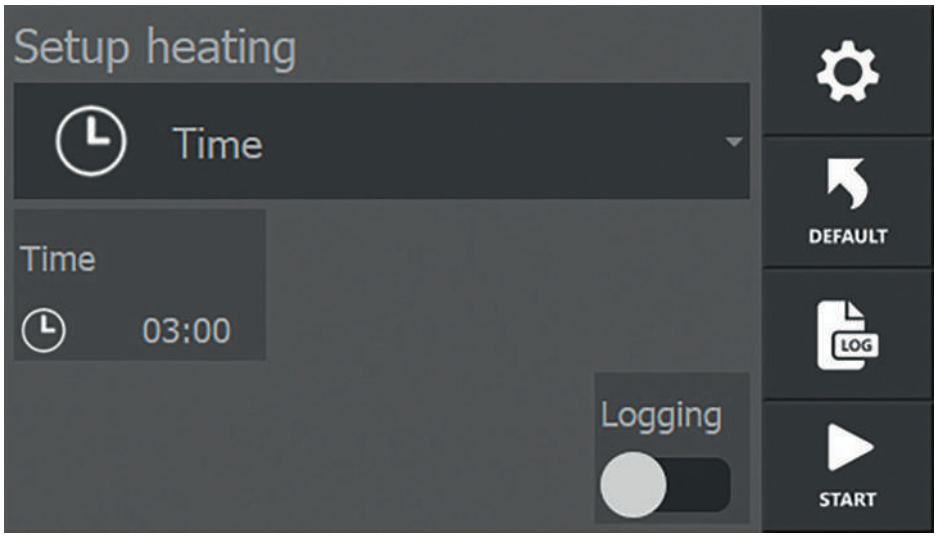
7. To cancel the beep, press [Stop].

» The heating process has finished. The workpiece is demagnetised.

The heating operation can be terminated at any time by pressing [Stop].

7.8.2 Heating in time mode

49 Heating in time mode



✓ The workpiece is in position.

1. Select [Time] as the [Heating mode].
2. Touch [Time] and set the duration of the heating operation.
3. Activate the [Logging] selector switch if logging of the heating operation is required.
4. Press [Start] to start the heating operation.

› The heating operation will commence.

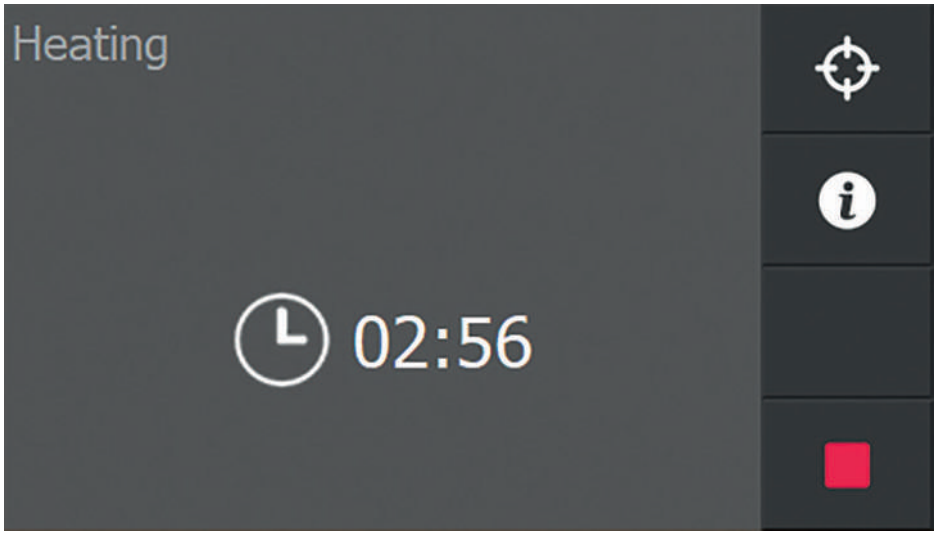
› The display shows the time remaining for the process.

› If a temperature sensor is attached, its temperature will be shown on the display.

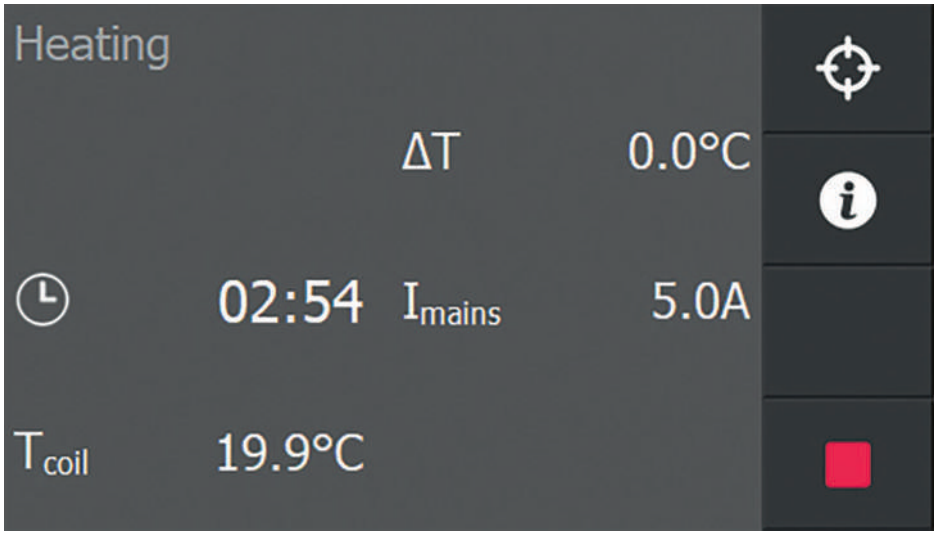
› If a second temperature sensor T2 is attached, its temperature will also be shown on the display.

In time mode, the measured temperatures have no effect on the process.

50 Display of the heating process in time mode



51 Expanded data overview



5. Press [Additional information] to toggle between a graphic representation and an expanded data overview.

» The heating device will switch off automatically once the set time has elapsed. A loud beep will sound.

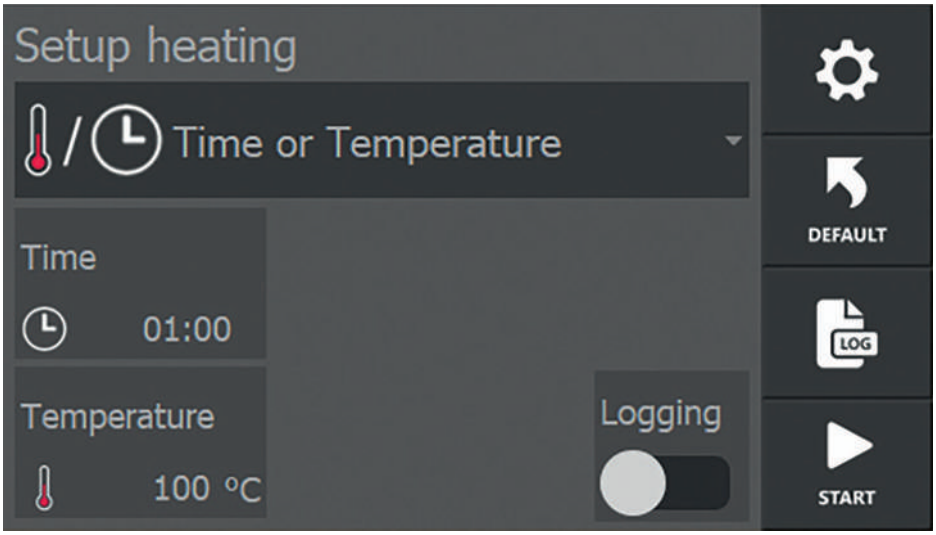
6. To cancel the beep, press [Stop].

» The heating process has finished. The workpiece is demagnetised.

The heating operation can be terminated at any time by pressing [Stop].

7.8.3 Heating in temperature mode or time mode

52 Heating in temperature mode or time mode



✓ The workpiece is in position.

✓ The required temperature sensors are connected. For a single measurement: T1, for Delta T measurement: T1 and T2.

1. Select [Time or Temperature] as the [Heating mode].
2. Touch [Time] and set the duration of the heating operation.
3. Touch [Temperature] and set the target temperature for the heating operation.
4. Activate the [Logging] selector switch if logging of the heating operation is required.
5. Press [Start] to start the heating operation.

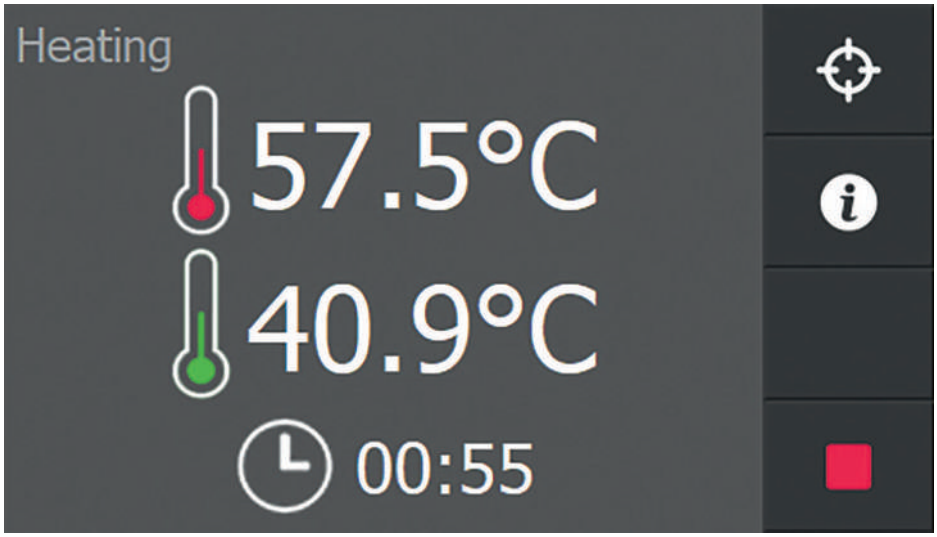
› The heating operation will commence.

› The display shows the time remaining for the process.

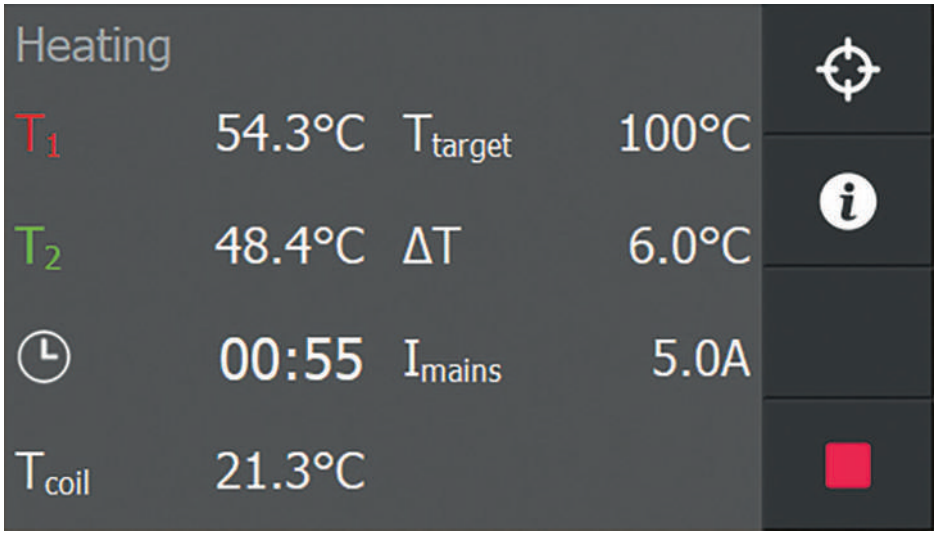
› The display shows the current workpiece temperature at temperature sensor T1.

› If a second temperature sensor T2 is attached, its temperature will also be shown on the display.

53 Display of the heating process in temperature mode or time mode



54 Expanded data overview



6. Press [Additional information] to toggle between a graphic representation and an expanded data overview.

» The heating device will switch off automatically once the set time has elapsed or the target temperature has been reached. A loud beep will sound.

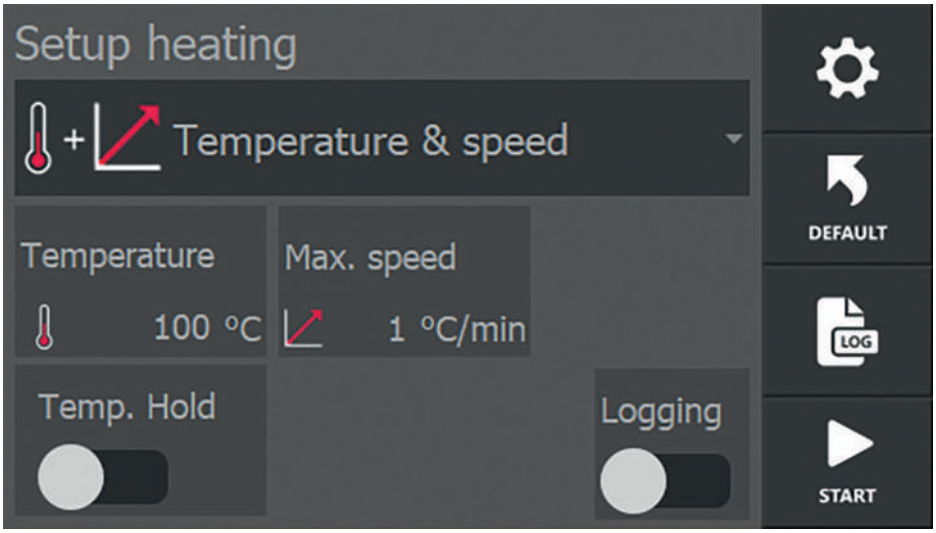
7. To cancel the beep, press [Stop].

» The heating process has finished. The workpiece is demagnetised.

The heating operation can be terminated at any time by pressing [Stop].

7.8.4 Heating in temperature mode and speed mode

55 Heating in temperature mode and speed mode



✓ The workpiece is in position.

✓ The required temperature sensors are connected. For a single measurement: T1, for Delta T measurement: T1 and T2.

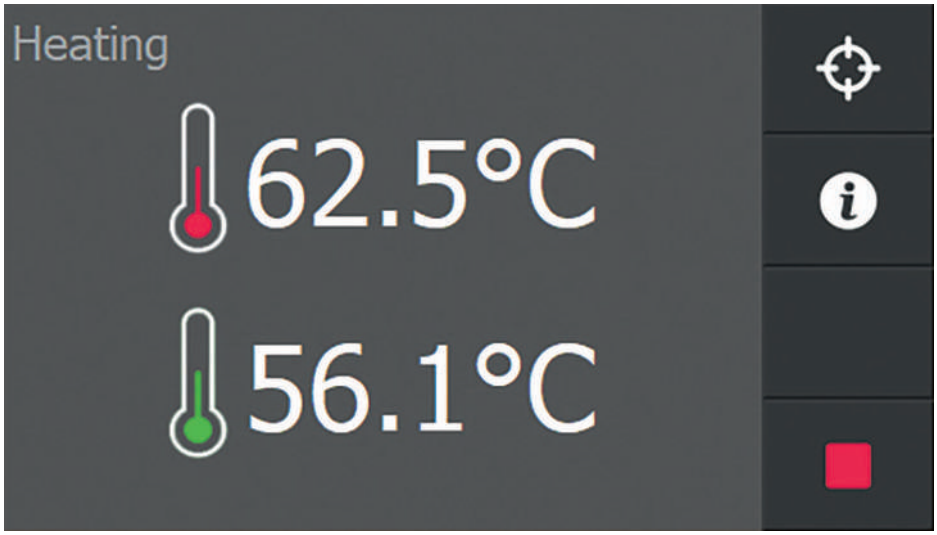
1. Select [Temperature & speed] as the [Heating mode].
2. Touch [Temperature] and set the target temperature for the heating operation.
3. Touch [Max. speed] and set the maximum rate of increase for the heating operation.
4. Activate the [Temp. Hold] selector switch and set the desired hold time if the temperature hold function is required.
5. Activate the [Logging] selector switch if logging of the heating operation is required.
6. Press [Start] to start the heating operation.

› The heating operation will commence.

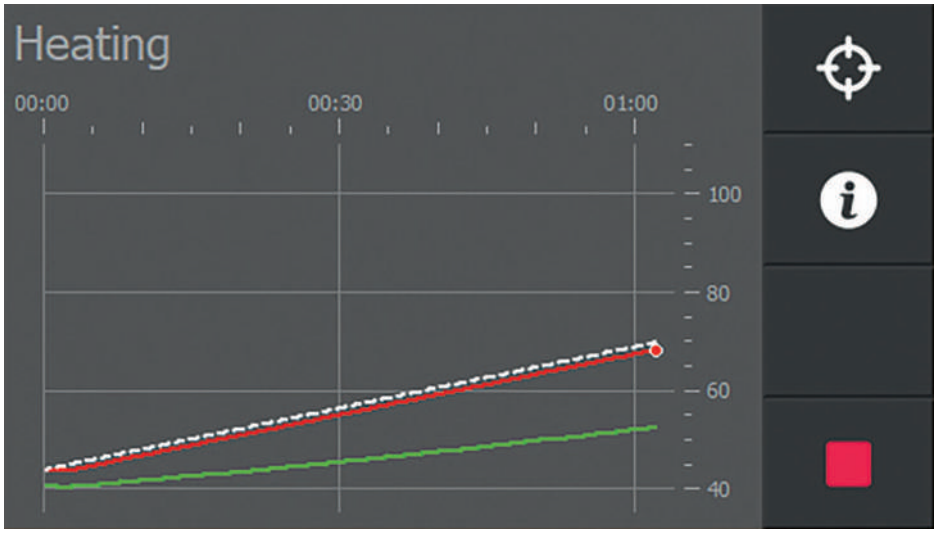
› The display shows the current workpiece temperature at temperature sensor T1.

› If a second temperature sensor T2 is attached, its temperature will also be shown on the display.

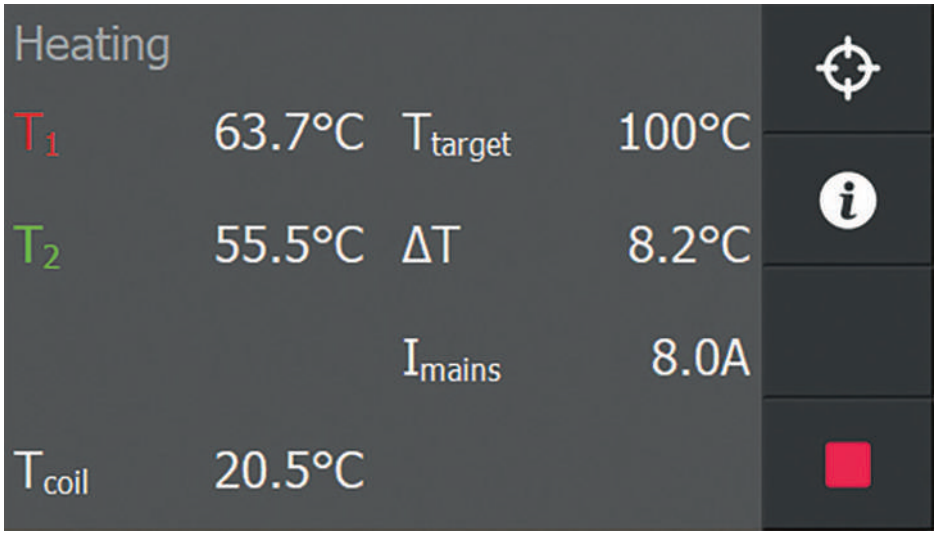
56 Display of the heating process in temperature mode and speed mode



57 Graphic representation



58 Expanded data overview



7. Press [Additional information] to toggle between a graphic representation and an expanded data overview.

» The dashed white line in the graphical representation shows the specified rate of increase.

» Once the workpiece has reached the target temperature, a loud beep will sound.

21 Deviations with or without temperature hold function

[Temp. Hold]	Target temperature reached
Deactivated	Heating finishes automatically.
Activated	Heating finishes automatically.
	Heating recommences automatically if the temperature falls below the value of [T hold hysteresis].
	The time remaining in the temperature hold function is indicated by a clock on the screen. A message will appear and a loud continuous beep will sound once the set time has elapsed.

8. To cancel the beep, press [Stop].

» The heating process has finished. The workpiece is demagnetised.

The heating operation can be terminated at any time by pressing [Stop].

7.9 Mounting the workpiece

⚠ WARNING

Hot surface

Danger of burns due to contact with hot surfaces.

During induction heating, the workpiece to be heated, the device and other components may be heated by direct or indirect means.

- Wear heat-resistant safety gloves.

1. If a temperature sensor has been used: Remove the temperature sensor from the workpiece and place it on the side of the U-shaped core.
2. When using a support yoke: Lift the support yoke together with the workpiece suspended from it and place on a clean subsurface.
   When using a slewing yoke: Open the slewing yoke up to the positioning cam and slide the workpiece off the slewing yoke.
   When using a vertical yoke: Pull the vertical yoke upwards.
3. Mount the workpiece immediately to prevent it from cooling down.

8 Troubleshooting

⚠ WARNING

Strong electromagnetic field

Risk of cardiac arrhythmias and tissue damage from spending longer periods in a strong electromagnetic field.

- Minimise the amount of time spent in the electromagnetic field.
- Exit the hazard area immediately after switching on the device.

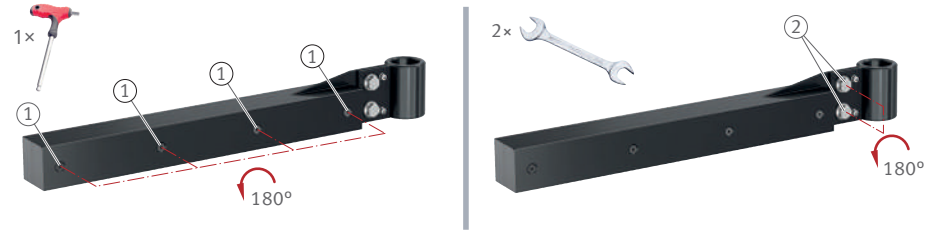
22 Troubleshooting

Fault	Possible cause	Remedy
During heating, the heating device emits strong vibrations	Contact surfaces between the U-shaped core and yoke are contaminated or are not sufficiently lubricated with petrolatum	Terminate the heating cycle, clean the contact surfaces of the yoke and the pole surfaces and lubricate with petrolatum
The heating device emits strong vibrations during heating, even though the contact surfaces have been cleaned and lubricated with petrolatum	Contact surfaces between the U-shaped core and yoke are not flat	Terminate the heating cycle and adjust the slewing yoke

8.1 Adjusting the slewing yoke

1. Remove dirt, burrs, etc. from the slewing yoke and the U-shaped core.
2. Apply a thin layer of petrolatum to all contact surfaces.
3. Fit the slewing yoke.
4. Position the slewing yoke centrally on the U-shaped core.
5. Loosen the hexagon socket screws by half a turn.
6. Loosen the pins by half a turn.

59 Loosening the hexagon socket screws and pins



1	Hexagon socket screw	2	Pin

7. Switch on the device.
8. Press [Start].

› The slewing yoke will now adjust itself.

9. If necessary, tap the slewing yoke gently with a plastic hammer.

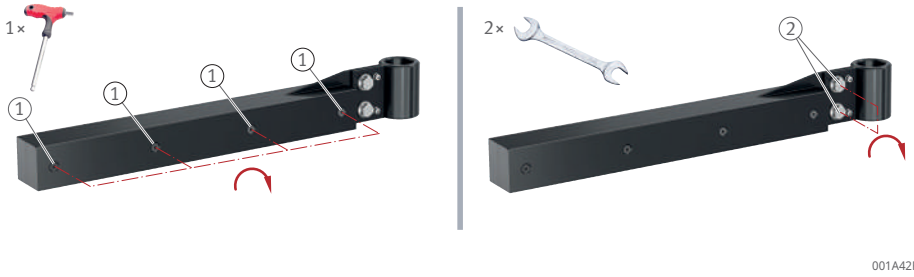
60 Adjustment with the aid of a plastic hammer

1	Plastic hammer		

✓ Once the noise has abated:

10. Tighten all hexagon socket screws and pins by half a turn.

61 Adjusting the slewing yoke



1	Hexagon socket screw	2	Pin

11. Switch off the device.

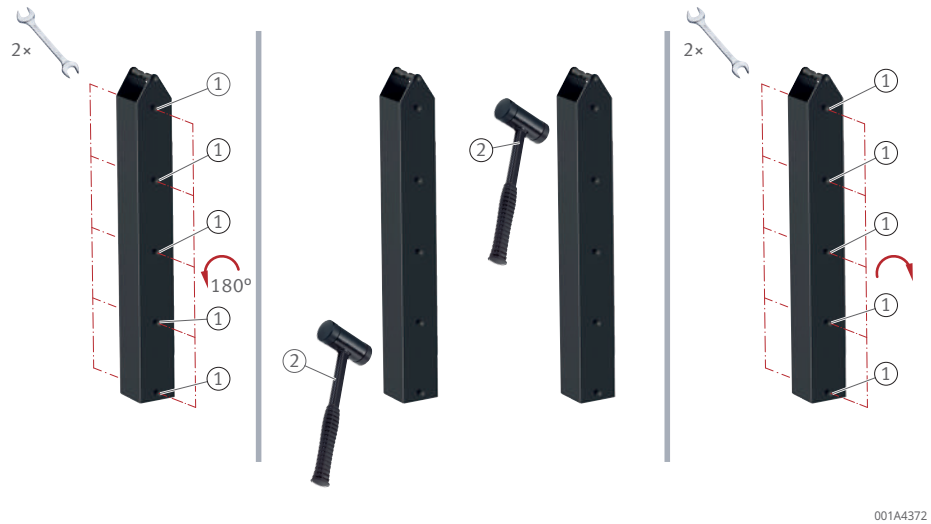
8.2 Adjusting the vertical yoke

1. Remove dirt, burrs, etc. from the vertical yoke and the U-shaped core.
2. Apply a thin layer of petrolatum to all contact surfaces.
3. Position the vertical yoke in front of the U-shaped core.
4. Loosen the screws by half a turn.
5. Switch on the device.
6. Press [Start].

› The vertical yoke will now adjust itself.

7. If necessary, tap the vertical yoke gently with a rubber hammer.
8. Tighten all screws.
9. Switch off the device.

62 Adjusting the vertical yoke



1	Screws	2	Rubber hammer

8.3 Error messages

The heating device continuously monitors process parameters and other factors that are key to the heating process running as smoothly as possible. In the event of a malfunction, the heating process usually stops and a pop-up window complete with error message is displayed.

23 Error messages

Error message	Possible cause	Remedy
[No temperature increase measured]	Insufficient temperature increase within the set time	1. Change the function setting or deactivate the function. If the error still occurs, it may be advisable to opt for a more powerful heating device.
[An internal communication error occured]	Software problem that could not be remedied automatically	2. Switch off the device using the main switch. 3. Wait a few seconds and switch the device back on.
[Temperature sensor 1 disconnected]	Temperature sensor 1 not connected or defective	4. Connect a temperature sensor. 5. Connect a different temperature sensor.
[Temperature sensor 2 disconnected]	Temperature sensor 2 not connected or defective	6. Connect a temperature sensor. 7. Connect a different temperature sensor.
[Delta T timeout]	The temperature difference between the two temperature sensors did not fall below the set limit value within the pause time set for ΔT.	8. Extend the pause time for ΔT.
[The mains voltage has dropped below the lower limit]	The supply voltage is below 80 V.	9. Check the mains voltage.
[The mains voltage has exceeded the operating limit]	The supply voltage is above 280 V.	10. Check the mains voltage.
[The mains frequency is too low]	The alternating current frequency is below 45 Hz.	11. Check the mains frequency.
[The mains frequency is too high]	The alternating current frequency is above 65 Hz.	12. Check the mains frequency.
[The environment temperature is too low]	The ambient temperature is below −10 °C (+14 °F).	13. Switch off the device using the main switch. 14. Wait until the ambient temperature has risen above −10 °C (+14 °F). 15. If the temperature is within the limit value and the error still occurs, contact Schaeffler.

Error message	Possible cause	Remedy
[The environment temperature is too high]	The ambient temperature is above +70 °C (+158 °F).	16. Switch off the device using the main switch. 17. Wait until the ambient temperature has fallen below +70 °C (+158 °F). 18. If the temperature is within the limit value and the error still occurs, contact Schaeffler.
[The coil temperature is too low]	The coil temperature is below −10 °C (+14 °F).	19. Switch off the device using the main switch. 20. Wait until the ambient temperature has risen above −10 °C (+14 °F). 21. If the temperature is within the limit value and the error still occurs, contact Schaeffler.
[The coil temperature is too high]	The coil temperature is above +120 °C (+248 °F).	22. Switch off the device using the main switch. 23. Wait until the ambient temperature has fallen below +120 °C (+248 °F). 24. If the temperature is within the limit value and the error still occurs, contact Schaeffler.
[The internal system temperature is too low]	Cooling profile temperature is too low	25. Switch off the device using the main switch. 26. Wait until the ambient temperature has risen above −10 °C (+14 °F).
[An unknown alarm has occurred]	Unknown error	27. Switch off the device using the main switch. 28. Wait a few seconds and switch the device back on. 29. If the error continues to occur, contact Schaeffler.
[The mains frequency is too unstable for operation, Attention: the yoke has not been demagnetized!]	The alternating current frequency is unstable.	30. Switch off the device using the main switch. 31. Check the mains frequency. 32. Switch the device on again.
[The mains current has exceeded its limit, Attention: the yoke has not been demagnetized!]	A root mean square current from the mains supply is too high.	33. Switch off the device using the main switch. 34. Check the mains current. 35. Switch the device on again. 36. If the problem continues, contact Schaeffler.
[The coil current has exceeded its limit, Attention: the yoke has not been demagnetized!]	A root mean square current through the coil is too high.	37. Switch off the device using the main switch and switch the device on again. 38. Try again. 39. If the problem continues, contact Schaeffler.
[The capacitor current has exceeded its limit, Attention: the yoke has not been demagnetized!]	A root mean square current through the condensor is too high.	40. Switch off the device using the main switch and switch the device on again. 41. Try again. 42. If the problem continues, contact Schaeffler.
[A coil current peak was detected, Attention: the yoke has not been demagnetized!]	A peak current has been detected.	43. Switch off the device using the main switch. 44. Wait a few seconds and switch the device back on.
[A coil voltage peak was detected, Attention: the yoke has not been demagnetized!]	A peak voltage over 500 V has been detected.	45. Switch off the device using the main switch. 46. Wait a few seconds and switch the device back on.

9 Maintenance

The device may need to undergo maintenance work.

Carrying out protective measures

The following protective measures must be carried out prior to maintenance:

- ✓ The device must be switched off and disconnected from the mains voltage.
- ✓ Ensured that the device cannot be switched on again without authorisation or unintentionally.

1. Wear heat-resistant protective gloves effective up to +250 °C.
2. Wear safety shoes.

24 Maintenance

Assembly	Activity
Heating device	Clean the heating device with a dry cloth. Never use water to clean the heating device.
Contact surfaces (poles) on the U-shaped core	Keep the contact surfaces clean. Lubricate the contact surfaces regularly with petrolatum to improve contact between the U-shaped core and yoke and to prevent corrosion.
Stud	Lubricate the stud regularly with petrolatum.
Yoke (support yoke, slewing yoke or vertical yoke)	Adjust the yoke if strong vibrations occur ➤65|8.1.

10 Repair

A repair is essential if the device shows visible signs of damage. If a fault other than strong vibrations occurs, a repair will usually be necessary.

1. Switch off the device
2. Disconnect the device from the power supply
3. Prevent the device from being used further
4. Contact the manufacturer

11 Decommissioning

The heating device should be decommissioned if it will no longer be used regularly.

Decommissioning:

1. Switch off the heating device using the main switch.
2. Disconnect the heating device from the power supply.
3. Cover the heating device.

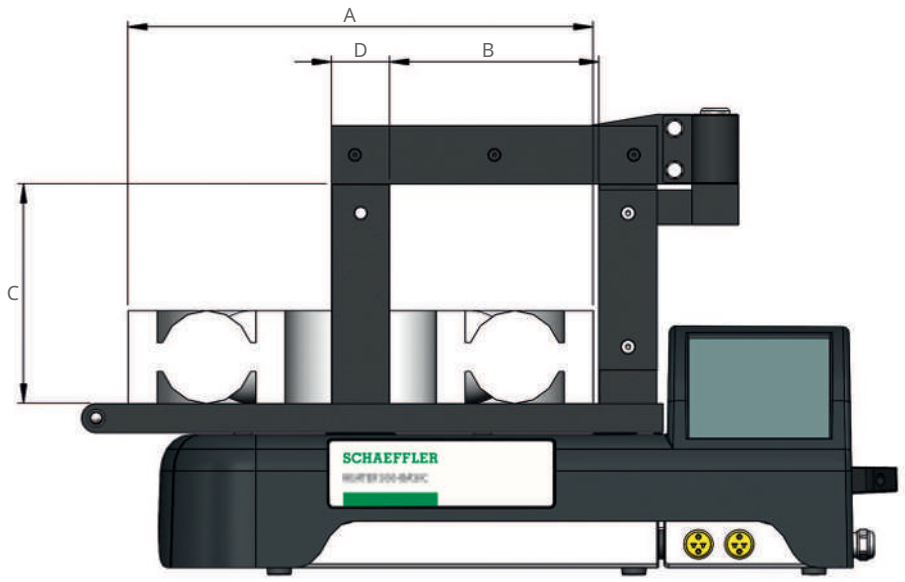
12 Disposal

Observe the locally applicable regulations for disposal.

13 Technical data

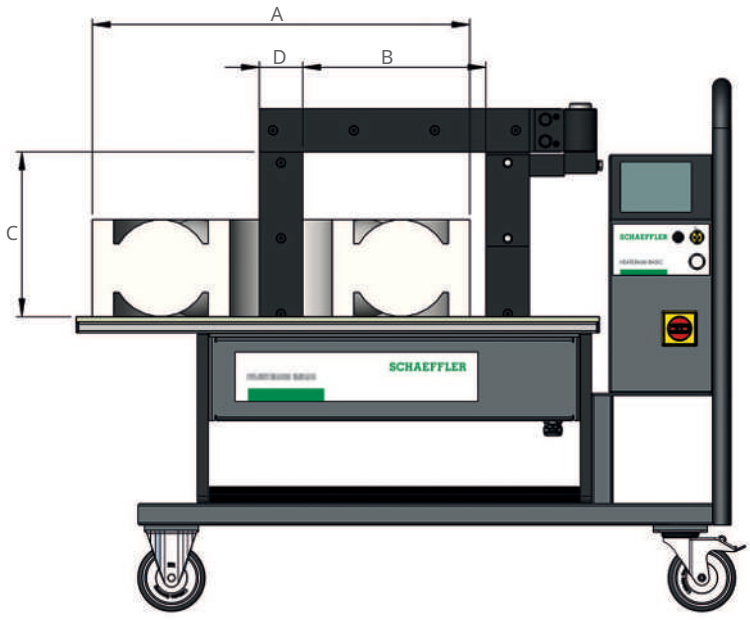
Standard accessories are included in the scope of delivery, special accessories can be ordered separately. Dimension-related terms are used in the tables. These terms are explained in the images.

63 Dimensions HEATER50 to HEATER200



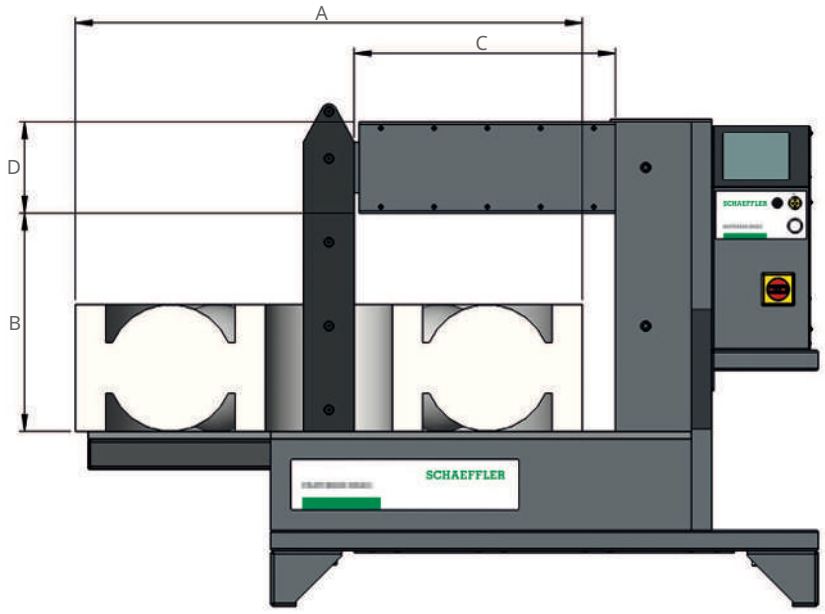
A	Maximum outside diameter of the workpiece	B	Pole distance
C	Pole length	D	Pole cross-section

64 Dimensions HEATER400 and HEATER600



A	Maximum outside diameter of the workpiece	B	Pole distance
C	Pole length	D	Pole cross-section

65 Dimensions HEATER800 and HEATER1600



001A4624

A	Maximum outside diameter of the workpiece	B	Pole distance
C	Pole length	D	Pole cross-section

13

13.1 Maximum mass of the workpiece

The maximum mass of the workpiece refers to the heating of workpieces to +100 °C at the specified voltage supply. In the event of a higher temperature or different voltage supply, please consult your contact at Schaeffler.

25 Maximum mass and necessary power supply for a heating temperature of +100 °C

Heating device	Power supply AC	Workpiece
		Maximum mass
	V	kg
HEATER50	230	50
HEATER100	230	100
HEATER150	230	150
HEATER200	400	200
HEATER400	400	400
HEATER600	400	600
HEATER800	400	800
HEATER1600	400	1600

13.2 Energy input and heating time

The heating time is determined by the maximum possible energy input into the workpiece and is dependent on the following factors:

- mass of the workpiece
- geometry of the workpiece
- power supply

The energy input into the workpiece decreases with increasing distance from the yoke or U-shaped core. For workpieces with very large bore diameters, heating may take a very long time, or the desired target temperature may not be reached.

For physical reasons, heating devices with a power supply of AC 120 V have less power than devices with AC 230 V. The energy input is significantly lower and the heating time is extended.

Please direct any questions to your contact at Schaeffler.

13.3 HEATER50-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

▦26 Heating device

Designation		Value
Dimensions	L×W×H	600 mm×226 mm×272 mm
U-shaped core	Pole distance (B)	120 mm
	Pole length (C)	130 mm
	Pole cross-section (D)	40 mm×50 mm
Mass		21 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

▦27 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER50-SMART-230V	230	13	3	CE
HEATER50-SMART-230V-UK	230	13	3	UKCA
HEATER50-SMART-120V-US	120	13	1,5	QPS
HEATER50-SMART-240V-US	240	13	3,1	QPS

Devices with the suffix "US": QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

▦28 Workpiece

Designation		Value
Mass	max.	50 kg
Outside diameter (A)	max.	400 mm

▦29 Support yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER50.YOKE-10	7×7×200	0,08	10	✓
HEATER50.YOKE-15	10×10×200	0,15	15	o
HEATER50.YOKE-20	14×14×200	0,32	20	✓
HEATER50.YOKE-30	20×20×200	0,61	30	o
HEATER50.YOKE-60	40×40×200	2,42	60	o
HEATER50.YOKE-65	40×50×200	3,02	65	✓

✓ included in delivery
o available as an option

13.4 HEATER100-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

▦30 Heating device

Designation		Value
Dimensions	L×W×H	702 mm×256 mm×392 mm
U-shaped core	Pole distance (B)	180 mm
	Pole length (C)	185 mm
	Pole cross-section (D)	50 mm×50 mm
Mass		31 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

▦31 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER100-SMART-230V	230	16	3,7	CE
HEATER100-SMART-230V-UK	230	13	2,9	UKCA
HEATER100-SMART-120V-US	120	15	1,8	QPS
HEATER100-SMART-240V-US	240	16	3,8	QPS

Devices with the suffix “US”: QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

▦32 Workpiece

Designation		Value
Mass	max.	100 kg
Outside diameter (A)	max.	500 mm

▦33 Support yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER100.YOKE-15	10×10×280	0,21	15	o
HEATER100.YOKE-20	14×14×280	0,4	20	o
HEATER100.YOKE-30	20×20×280	0,84	30	✓

✓ included in delivery
o available as an option

▦34 Slewing yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER100.YOKE-45	30×30×280	2,4	45	o
HEATER100.YOKE-60	40×40×280	3,87	60	o
HEATER100.YOKE-72	50×50×280	5,78	72	✓
HEATER100.YOKE-85	60×60×280	8,09	85	o

✓ included in delivery
o available as an option

13.5 HEATER150-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

35 Heating device

Designation		Value
Dimensions	L×W×H	788 mm×315 mm×456 mm
U-shaped core	Pole distance (B)	210 mm
	Pole length (C)	205 mm
	Pole cross-section (D)	70 mm×80 mm
Mass		52 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

36 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER150-SMART-230V	230	16	3,7	CE
HEATER150-SMART-230V-UK	230	13	2,9	UKCA
HEATER150-SMART-240V-US	240	16	3,8	QPS

Devices with the suffix “US”: QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

37 Workpiece

Designation		Value
Mass	max.	150 kg
Outside diameter (A)	max.	600 mm

38 Support yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER200.YOKE-15	10×10×350	0,27	15	o
HEATER200.YOKE-20	14×14×350	0,51	20	o
HEATER200.YOKE-30	20×20×350	1,06	30	o

✓ included in delivery
o available as an option

39 Slewing yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER200.YOKE-45	30×30×350	3,67	45	✓
HEATER200.YOKE-60	40×40×350	5,51	60	o
HEATER200.YOKE-72	50×50×350	7,79	72	o
HEATER200.YOKE-85	60×60×350	10,69	85	o
HEATER200.YOKE-100	70×70×350	14,0	100	o
HEATER200.YOKE-110	70×80×350	15,90	110	✓

✓ included in delivery
o available as an option

13.6 HEATER200-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

40 Heating device

Designation		Value
Dimensions	L×W×H	788 mm×315 mm×456 mm
U-shaped core	Pole distance (B)	210 mm
	Pole length (C)	205 mm
	Pole cross-section (D)	70 mm×80 mm
Mass		56 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

41 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER200-SMART-400V	400	20	8	CE, UKCA
HEATER200-SMART-450V	450	16	7,2	CE, UKCA
HEATER200-SMART-500V	500	16	8	CE, UKCA
HEATER200-SMART-480V-US	480	16	7,7	QPS
HEATER200-SMART-600V-US	600	14	8,4	QPS

Devices with the suffix “US”: QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

42 Workpiece

Designation		Value
Mass	max.	200 kg
Outside diameter (A)	max.	600 mm

43 Support yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER200.YOKE-15	10×10×350	0,27	15	o
HEATER200.YOKE-20	14×14×350	0,51	20	o
HEATER200.YOKE-30	20×20×350	1,06	30	o

✓ included in delivery
o available as an option

44 Slewing yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER200.YOKE-45	30×30×350	3,67	45	✓
HEATER200.YOKE-60	40×40×350	5,51	60	o
HEATER200.YOKE-72	50×50×350	7,79	72	o
HEATER200.YOKE-85	60×60×350	10,69	85	o
HEATER200.YOKE-100	70×70×350	14,0	100	o
HEATER200.YOKE-110	70×80×350	15,90	110	✓

✓ included in delivery
o available as an option

13.7 HEATER400-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

45 Heating device

Designation		Value
Dimensions	L×W×H	1214 mm×560 mm×990 mm
U-shaped core	Pole distance (B)	320 mm
	Pole length (C)	305 mm
	Pole cross-section (D)	80 mm×100 mm
Mass		150 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

46 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER400-SMART-400V	400	30	12	CE, UKCA
HEATER400-SMART-450V	450	25	12	CE, UKCA
HEATER400-SMART-500V	500	24	12	CE, UKCA
HEATER400-SMART-480V-US	480	24	12	QPS
HEATER400-SMART-600V-US	600	20	12	QPS

Devices with the suffix “US”: QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

47 Workpiece

Designation		Value
Mass	max.	400 kg
Outside diameter (A)	max.	850 mm

48 Slewing yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER400.YOKE-30	20×20×500	3,12	30	o
HEATER400.YOKE-45	30×30×500	4,95	45	o
HEATER400.YOKE-60	40×40×500	7,55	60	o
HEATER400.YOKE-85	60×60×500	14,83	85	o
HEATER400.YOKE-115	80×80×500	25,40	115	✓

✓ included in delivery
o available as an option

13.8 HEATER600-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

49 Heating device

Designation		Value
Dimensions	L×W×H	1344 mm×560 mm×990 mm
U-shaped core	Pole distance (B)	400 mm
	Pole length (C)	315 mm
	Pole cross-section (D)	90 mm×110 mm
Mass		170 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

50 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER600-SMART-400V	400	45	18	CE, UKCA
HEATER600-SMART-450V	450	40	18	CE, UKCA
HEATER600-SMART-500V	500	36	18	CE, UKCA
HEATER600-SMART-480V-US	480	36	18	QPS
HEATER600-SMART-600V-US	600	30	18	QPS

Devices with the suffix “US”: QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

51 Workpiece

Designation		Value
Mass	max.	600 kg
Outside diameter (A)	max.	1050 mm

52 Slewing yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER600.YOKE-60	40×40×600	8,57	60	o
HEATER600.YOKE-85	60×60×600	17,43	85	o
HEATER600.YOKE-115	80×80×600	29,10	115	o
HEATER600.YOKE-130	90×90×600	37,90	130	✓

✓ included in delivery
o available as an option

13.9 HEATER800-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

53 Heating device

Designation		Value
Dimensions	L×W×H	1080 mm×650 mm×955 mm
	L×W×H [1)]	1080 mm×650 mm×1025 mm
U-shaped core	Pole distance (B)	430 mm
	Pole length (C)	515 mm
	Pole cross-section (D)	180 mm×180 mm
Mass		250 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

1) Height including wheels (available as an option)

54 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER800-SMART-400V	400	60	24	CE, UKCA
HEATER800-SMART-450V	450	50	24	CE, UKCA
HEATER800-SMART-500V	500	48	24	CE, UKCA
HEATER800-SMART-480V-US	480	48	24	QPS
HEATER800-SMART-600V-US	600	40	24	QPS

Devices with the suffix “US”: QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

55 Workpiece

Designation		Value
Mass	max.	800 kg
Outside diameter (A)	max.	1150 mm

56 Vertical yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER800.YOKE-60	40×40×725	9	60	o
HEATER800.YOKE-72	50×50×725	14,5	72	o
HEATER800.YOKE-85	60×60×725	20,3	85	o
HEATER800.YOKE-115	80×80×725	36,10	115	o
HEATER800.YOKE-145	100×100×725	56,4	145	✓

✓ included in delivery
o available as an option

13.10 HEATER1600-SMART

The devices are designed for continuous operation. The heating time is only restricted at maximum heating temperature.

57 Heating device

Designation		Value
Dimensions	L×W×H	1520 mm×750 mm×1415 mm
	L×W×H [1)]	1520 mm×750 mm×1485 mm
U-shaped core	Pole distance (B)	710 mm
	Pole length (C)	780 mm
	Pole cross-section (D)	230 mm×230 mm
Mass		720 kg
Heating temperature	max.	+240 °C (+464 °F)
Heating time at max. heating temperature	max.	0,5 h

1) Height including wheels (available as an option)

58 Model

Ordering designation	Power supply AC	Current rating	Output power	Certificate
	V	A	kW	
HEATER1600-SMART-400V	400	100	40	CE, UKCA
HEATER1600-SMART-450V	450	80	40	CE, UKCA
HEATER1600-SMART-500V	500	80	40	CE, UKCA
HEATER1600-SMART-480V-US	480	80	40	QPS
HEATER1600-SMART-600V-US	600	65	40	QPS

Devices with the suffix “US”: QPS-certified versions for the USA and Canada in accordance with CSA C22.2 NO. 88:19 and UL 499, 14th Ed. (November 7, 2014)

59 Workpiece

Designation		Value
Mass	max.	1600 kg
Outside diameter (A)	max.	1700 mm

60 Vertical yokes

Ordering designation	Dimensions	Mass	Min. bore diameter	Scope of delivery
	mm	kg	mm	
HEATER1600.YOKE-85	60×60×1140	32,5	85	o
HEATER1600.YOKE-115	80×80×1140	56,76	115	o
HEATER1600.YOKE-145	100×100×1140	88,69	145	o
HEATER1600.YOKE-215	150×150×1140	199,56	215	✓

✓ included in delivery
o available as an option

13.11 Cable colours

The connection cables used are determined by the model.

13.11.1 HEATER50 to HEATER150

61 1-phase heating device 120 V/230 V

Colour		Assignment
	Brown	Phase
	Blue	Zero
	Green/yellow	Earth

62 1-phase heating device 120 V/240 V

Colour		Assignment
	Black	Phase
	White	Zero
	Green	Earth

13.11.2 HEATER200 to HEATER1600

63 2-phase heating device 400 V/450 V/500 V

Colour		Assignment
	Brown	Phase
	Black	Phase
	Green/yellow	Earth

64 2-phase heating device 480 V/600 V

Colour		Assignment
	Black	Phase
	Black	Phase
	Green	Earth

13.12 Declaration of Conformity

CE Declaration of Conformity

Manufacturer's name:	Schaeffler Smart Maintenance Tools BV
Manufacturer's address:	Schorsweg 15, 8171 ME Vaassen, NL www.schaeffler-smart-maintenance-tools.com

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Brand: Schaeffler

Product description: Inductive heater

Product name/type:

- HEATER50-SMART-230V
- HEATER100-SMART-230V
- HEATER150-SMART-230V
- HEATER200-SMART-400V
- HEATER200-SMART-450V
- HEATER200-SMART-500V
- HEATER400-SMART-400V
- HEATER400-SMART-450V
- HEATER400-SMART-500V
- HEATER600-SMART-400V
- HEATER600-SMART-450V
- HEATER600-SMART-500V
- HEATER800-SMART-400V
- HEATER800-SMART-450V
- HEATER800-SMART-500V
- HEATER1600-SMART-400V
- HEATER1600-SMART-450V
- HEATER1600-SMART-500V

Comply with the requirements of:

- EMC Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- RoHS / RoHS 2 / RoHS 3 Directive 2011/65/EU, annex II amended by directive 2015/863/EU

Applicable harmonized standards:

Electric Safety
- EN 60335-1:2020

EMC Emission (HEATER50 - HEATER200)
- EN 55011:2016
- EN 61000-3-2:2019 + A1:2021 + A2:2024
- EN 61000-3-3:2013 + A1:2019 + A2:2021

EMC Emission (HEATER400 - HEATER1600)
- EN 55011:2016
- EN 61000-3-11:2019
- EN 61000-3-12:2011 + A1:2021

EMC Immunity
- EN 61000-6-1:2019

H. van Essen
Managing Director
Schaeffler Smart Maintenance Tools BV

Place, Date:
Vaassen, 10-11-2025

CE

UKCA Declaration of Conformity

Manufacturer's name:	Schaeffler Smart Maintenance Tools BV
Manufacturer's address:	Schorsweg 15, 8171 ME Vaassen, NL www.schaeffler-smart-maintenance-tools.com

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Brand: Schaeffler

Product description: Inductive heater

Product name/type:

- HEATER50-SMART-230V-UK
- HEATER100-SMART-230V-UK
- HEATER150-SMART-230V-UK
- HEATER200-SMART-400V
- HEATER200-SMART-450V
- HEATER200-SMART-500V
- HEATER400-SMART-400V
- HEATER400-SMART-450V
- HEATER400-SMART-500V
- HEATER600-SMART-400V
- HEATER600-SMART-450V
- HEATER600-SMART-500V
- HEATER800-SMART-400V
- HEATER800-SMART-450V
- HEATER800-SMART-500V
- HEATER1600-SMART-400V
- HEATER1600-SMART-450V
- HEATER1600-SMART-500V

13

Comply with the requirements of:

- Electrical Equipment (Safety) Regulations 2016 S.I. 2016:1101
- Electromagnetic Compatibility Regulations 2016 S.I. 2016:1091
- The Restriction of the use of certain Hazardous Substances Regulations 2012 (SI 2012/3032)

Applicable harmonized standards:

Electric Safety
- EN 60335-1:2020

EMC Emission (HEATER50 - HEATER200)
- EN 55011:2016
- EN 61000-3-2:2019 + A1:2021 + A2:2024
- EN 61000-3-3:2013 + A1:2019 + A2:2021

EMC Emission (HEATER400 - HEATER1600)
- EN 55011:2016
- EN 61000-3-11:2019
- EN 61000-3-12:2011 + A1:2021

EMC Immunity
- EN 61000-6-2:2019

H. van Essen
Managing Director
Schaeffler Smart Maintenance Tools BV

Place, Date:
Vaassen, 10-11-2025

UK CA

14 Accessories

Standard accessories are available to reorder.

Additional accessories are available for the heating devices, e.g.:

- optional wheels
- lifting equipment for vertical yokes

Information on ordering accessories and further information on the heating devices can be found in the following publication:

TPI 282 | Induction heating devices |
https://www.schaeffler.de/std/1FE4

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