



# Induction heating devices

MF-GENERATOR3.0-3.5KW

User Manual



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# 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.

### 1.1.1 Warning and hazard symbols

#### Signs and descriptions

 <b>DANGER</b>	In case of non-compliance, death or serious injury will occur.
 <b>WARNING</b>	In case of non-compliance, death or serious injury may occur.
 <b>CAUTION</b>	In case of non-compliance, minor or moderate injury may occur.

## 1.2 Signs

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

### 1.2.1 Warning, prohibition and mandatory signs

#### Signs and descriptions

	General warning
	Electrical voltage warning
	Warning of magnetic field
	Warning of hot surface
	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
	Wear safety gloves
	Wear safety shoes
	Wear eye protection
	General mandatory sign

## 1.3 Availability



A current version of this manual can be found at:

<https://www.schaeffler.de/std/1FB7>

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

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

## 2 General safety regulations

### 2.1 Intended use

The generator MF-GENERATOR may only be used with inductors that are offered by Schaeffler for operation with this generator. An induction unit comprises a generator and an inductor.

The induction system may only be used for the heating of ferromagnetic workpieces.

### 2.2 Improper use

Do not operate the device in a potentially explosive environment.

Do not operate the generator with multiple inductors connected in series.

### 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 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	
Safety shoes	
Eye protection	

## 2.5 Safety equipment

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

- The generator only runs when the inductor is fully connected.
- The generator output is automatically reduced if the generator becomes too hot.
- The generator output is automatically reduced if the inductor's power output is too high.
- The generator switches off automatically if there has been no increase in workpiece temperature within a predefined time period.
- The generator switches off automatically as soon as the ambient temperature rises above +70 °C.

## 2.6 Hazards

In the operation of induction units, the principle used means that hazards can occur as a result of electromagnetic fields, electrical voltage and hot components.

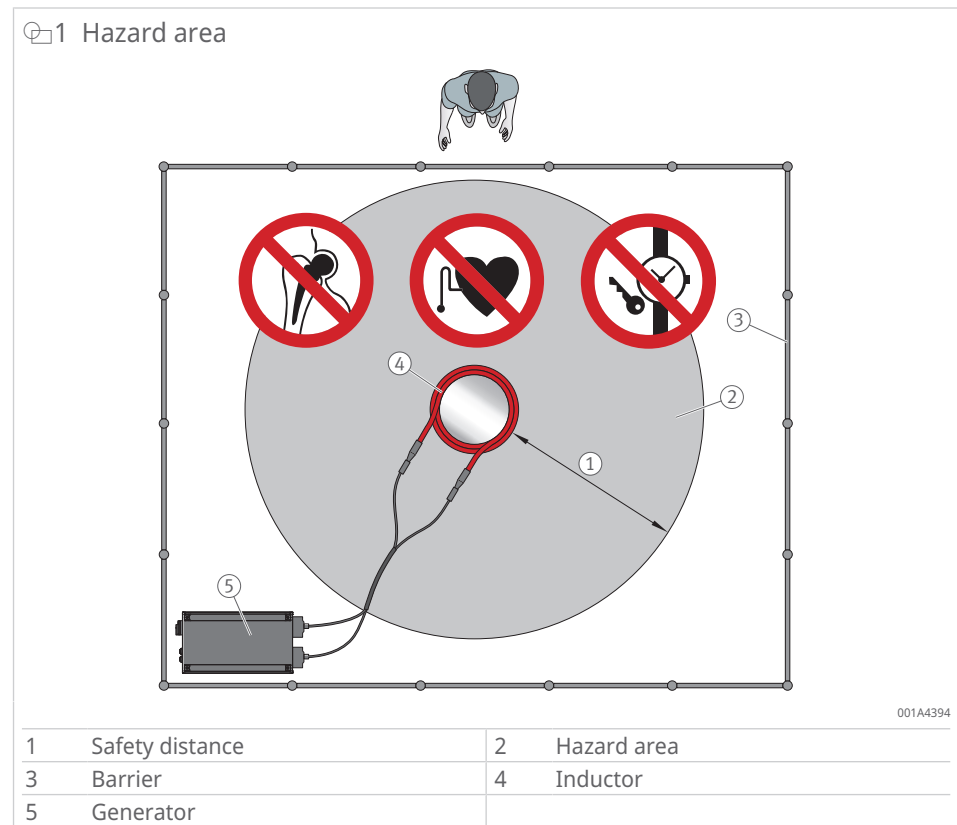
### 2.6.1 Danger of death

#### Danger of death due to electromagnetic field

##### Persons fitted with a pacemaker are at risk of cardiac arrest

Persons fitted with a pacemaker are not permitted to work with induction systems.

1. Secure the hazard area by setting a safety distance of 1 m around the inductor.
2. Mark the hazard area.
3. Avoid remaining in the hazard area during operation.



### 2.6.2 Risk of injury

#### Risk of injury due to electromagnetic field

##### Risk of cardiac arrhythmias and tissue damage from remaining in the hazard area for long periods

1. Minimise time spent in the electromagnetic field.
2. Exit the hazard area immediately after switching on the generator.

##### Wearers of ferromagnetic objects are at risk of burns

1. Wearers of ferromagnetic objects must not remain in the hazard area.
2. Wearers of ferromagnetic implants must not remain in the hazard area.
3. Mark the hazard area.

### Risk of injury from directly or indirectly heated workpieces

#### Risk of burns

4. Wear heat-resistant protective gloves effective up to +250 °C during operation.

### Risk of injury due to electric current

#### Risk of nerve irritation from touching the inductor during operation

5. Wear heat-resistant protective gloves effective up to +250 °C during operation.
6. Avoid contact with the inductor during the heating process.

### Risk of injury from heating contaminated workpieces

#### Danger from splashes, smoke and vapour formation

1. Clean contaminated workpieces prior to heating.
2. Wear eye protection.
3. Avoid inhaling smoke and vapours. Where necessary, use a suitable extraction system.

## 2.6.3 Material damage

### Material damage caused by electromagnetic field

#### Risk of damage to electronic items

1. Keep electronic items away from the hazard area.

#### Risk of damage to magnetic and electronic data carriers

1. Keep magnetic and electronic data carriers away from the hazard area.

## 2.7 Safety regulations

This section summarises the most important safety regulations relating to working with the generator. Further guidelines on hazards and specific operating procedures can be found in the individual chapters of this user manual.

Since the generator is always operated in conjunction with an inductor, there are also some regulations covering work with the inductor. The operating instructions for the inductor used need to be observed.

### 2.7.1 Transport and storage

In transport, the relevant safety and accident prevention regulations must be observed.

- The generator is fitted with side handles.
- Use the handles when transporting the generator.
- Use both hands when transporting the generator.
- Wear safety shoes.
- Secure the product to prevent it from shifting position, tipping over or falling.

The ambient conditions specified for storage must be observed.

### 2.7.2 Operation

In order to prevent death or injury, persons with active medical aids such as pacemakers and persons with metallic implants must not remain in the hazard area of the inductor. This also applies to persons with metallic objects in contact with the body. The hazard area must be secured by suitable measures such as barriers, signal devices and warning signs.

Electrical and electronic components must not be present in the hazard area of the electromagnetic field, otherwise they may be disrupted or damaged.

National regulations relating to work with electromagnetic fields must be observed.

The generator may only be used with inductors offered by Schaeffler for operation with these generators.

The generator may only be operated if the specifications stated in this manual concerning the installation site as well as the ambient temperature and humidity are observed.

The generator may only be operated if the generator and the connected inductor are in a defect-free condition. If damage is detected, operation must be stopped immediately and the damage must be reported to the safety coordinator.

The workplace must be kept clean and organised during the entire operation.

The generator must not be switched off at the main switch during the heating phase.

Main connection cables, inductors and inductor feed cables must be laid or secured in such a way as to prevent trip hazards.

Heat cleaned workpieces only. Any smoke or vapour occurring during the heating of uncleaned workpieces must not be inhaled. Where necessary, a suitable extraction system should be used.

Provide the workpiece to be heated with earthing by means of a fixed connection. If this is not possible, make sure at the time of installation that the workpiece cannot be touched by anyone.

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.

In order to prevent burns occurring through contact with hot components, heat-resistant protective gloves must be worn at all times. In addition to the workpiece to be heated, other components in the operating area as well as the inductor itself may undergo heating.

Do not touch the inductor during operation to avoid nerve irritation.

Before changing the inductor, switch off the generator and disconnect it from the mains.

The power connection between an inductor and generator must not be disconnected under any circumstances during a heating operation.

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.

Do not place inductors on or around ferromagnetic objects that are not to be heated.

Fit the inductor uniformly around the workpiece to be heated.

The maximum temperature of the connected inductor must not exceed +180 °C. The connected inductor may be operated at the maximum temperature for a maximum of 15 min.

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.

### 2.7.3 Maintenance and repair

The activities described in the maintenance plan are fundamental for the preservation of operational security and must be carried out as stated in the maintenance plan.

Maintenance work and repairs may only be carried out by qualified personnel.

For all maintenance and repair work, the generator must be switched off and disconnected from the mains voltage. It must be ensured that it cannot be switched on again without authorisation or unintentionally, for example by persons who have not been informed of the maintenance work.

### 2.7.4 Disposal

Observe the locally applicable regulations for disposal.

### 2.7.5 Conversion

For safety reasons, unauthorised modifications and conversions to the generator are not permitted in any form.

## 3 Scope of delivery

The device is supplied as a complete set containing the following:

- Generator MF-GENERATOR (1×)
- Mains connection cable, 1,8 m (1×)
- Temperature sensor MF-GENERATOR.MPROBE-GREEN (1×)
- Temperature sensor MF-GENERATOR.MPROBE-RED (1×)
- Protective gloves, heat-resistant up to +250 °C (1 pair)
- User manual

Inductors are not included in the scope of delivery but can be ordered as accessories ►66 | 14.

### 3.1 Check for transport damage

1. Check the product immediately upon delivery for any damage during transit.
2. Report any damage during transit promptly as a complaint 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.

The induction system, comprising a generator and inductor, is designed for the induction heating of ferromagnetic workpieces. Inductors may only be connected to the generator that are specifically offered by Schaeffler for this purpose.

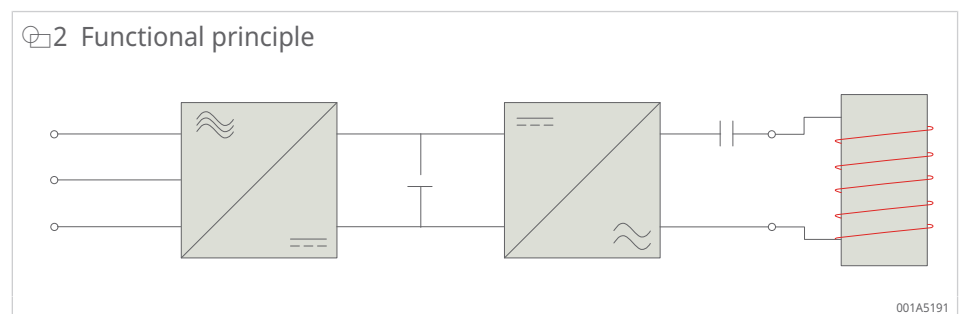
The maximum power transferred to the workpiece is 3,5 kW

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### 4.1 Functional principle

The generator supplies the connected inductor with an alternating voltage. As a result, an alternating electromagnetic field is created around the inductor. If the ferromagnetic workpiece to be heated is present in this field, an eddy current is induced in the workpiece. Heating of the workpiece is caused by the eddy current and hysteresis losses.

The mains voltage is rectified and smoothed. The direct voltage is converted into an alternating voltage with a frequency of between 10 kHz and 50 kHz by an inverter. The power is transmitted magnetically to the workpiece to be heated by a resonance capacitor via an inductor (coil).



As a result of the high frequency, the penetration depth of the magnetic field into the workpiece to be heated is small, leading to heating of the outer layer of the workpiece.

At the end of the heating operation, the residual magnetism in the workpiece is automatically reduced to the level that was present before induction heating.

### 4.2 Flexible inductors

The inductor is the induction coil that is used to transfer the energy to the workpiece to be heated. Flexible inductors are made from a special cable and have a wide variety of uses. Depending on the application, they are positioned in the bore or on the outside diameter of the workpiece.

The flexible inductor designs differ in terms of their dimensions, permissible temperature range and the resulting technical data.

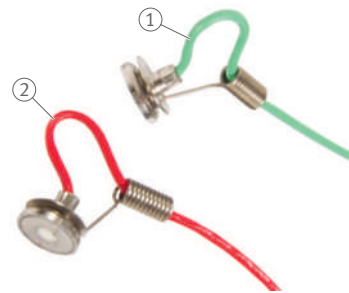
#### Further information

BA 86 | Flexible inductors |  
<https://www.schaeffler.de/std/1FD6>

## 4.3 Temperature sensors

Temperature sensors are available to reorder as replacement parts ►66 | 14.2.

3 Temperature sensors



001A5304

1	MF-GENERATOR.MPROBE-GREEN	2	MF-GENERATOR.MPROBE-RED
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4 Temperature sensors

Temperature sensor	Information
T1	Red This temperature sensor controls the heating process as the main sensor.
T2	Green This temperature sensor controls the lower temperature threshold.

Use:

- The temperature sensor is equipped with a magnetic clamp for easy attachment to the workpiece.
- The temperature sensors are used during heating in temperature mode.
- The temperature sensors may be used in time mode to assist with temperature control during heating.
- The temperature sensors are connected to the generator via sensor 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 ... +350 °C At temperatures > +350 °C, the connection between the magnet and the temperature sensor is interrupted.

Appearance of measurement values on the display:

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

## 4.4 Connections

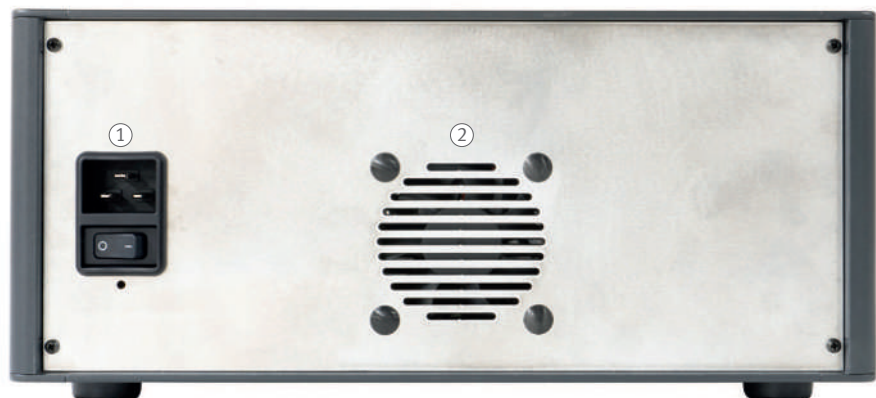
### 4 Generator controls



001A5808

1	Touchscreen	2	USB port
3	Ports for temperature sensors T1 and T2	4	LED indicator [Heating activated]
5	Starts and stops the heating process	6	Inductor connection sockets

### 5 Back of the generator
















001A5284

1	Mains cable connection with main switch	2	Ventilation opening
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## 4.5 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.

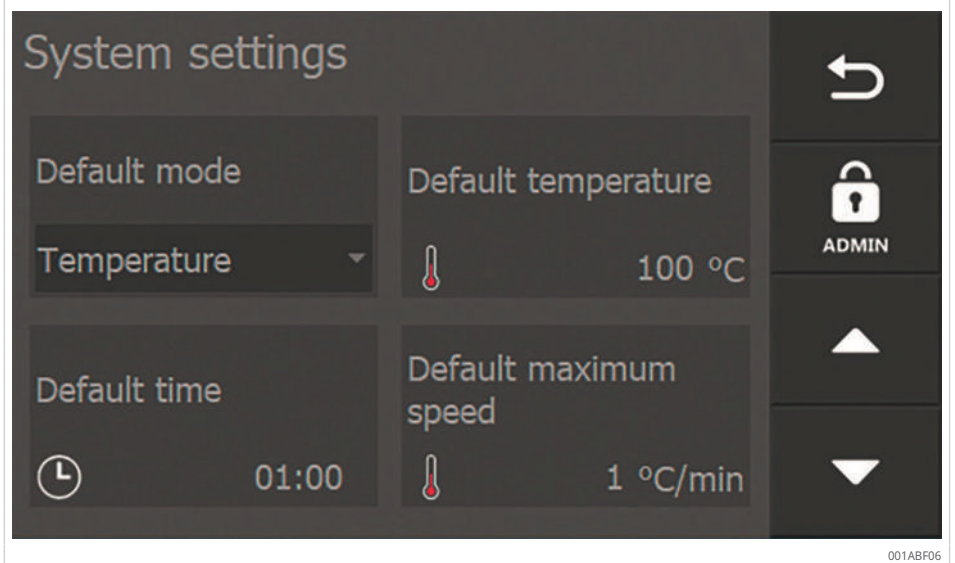
Variables can be set to a desired value at the touch of a button.

## 4.6 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.

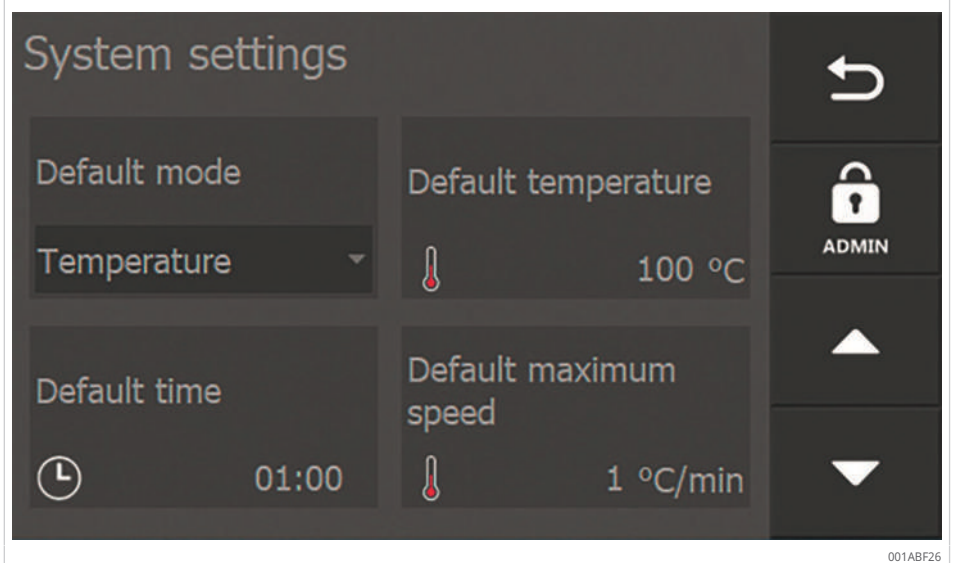
### Administrator settings

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.

#### 4.6.1 System settings, window 1

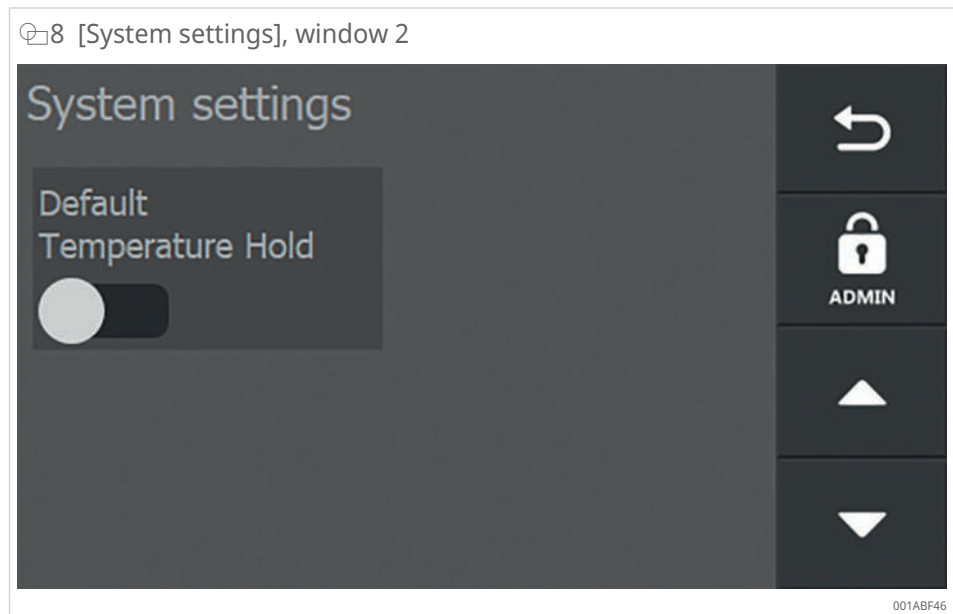
7 [System settings], screen 1



### 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 inductor used and other factors.

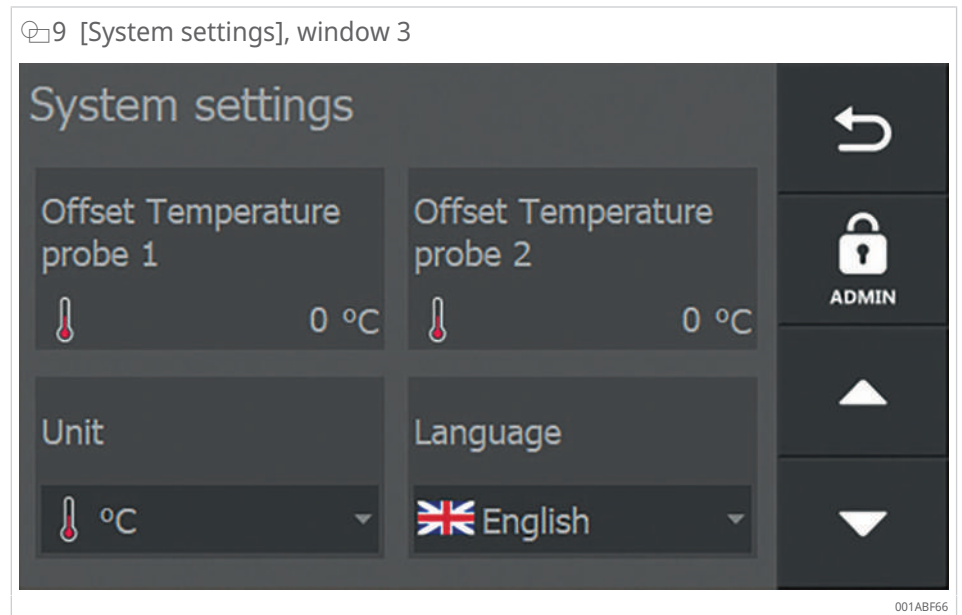
## 4.6.2 System settings, window 2



### 8 Setting options

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

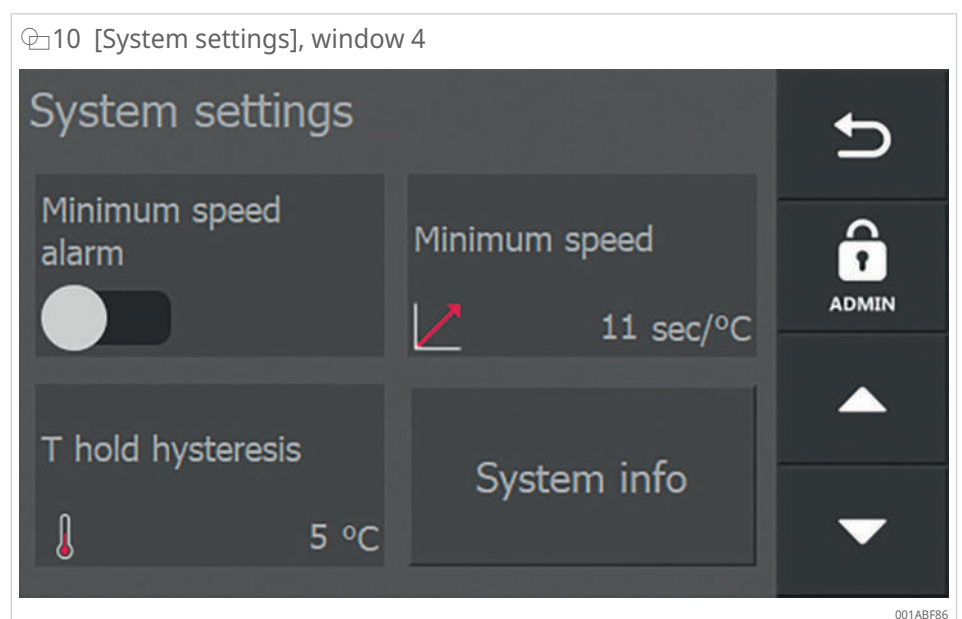
## 4.6.3 System settings, window 3



## 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. <ul style="list-style-type: none"> <li>• English</li> <li>• German</li> <li>• French</li> <li>• Italian</li> <li>• Dutch</li> <li>• Spanish</li> </ul>

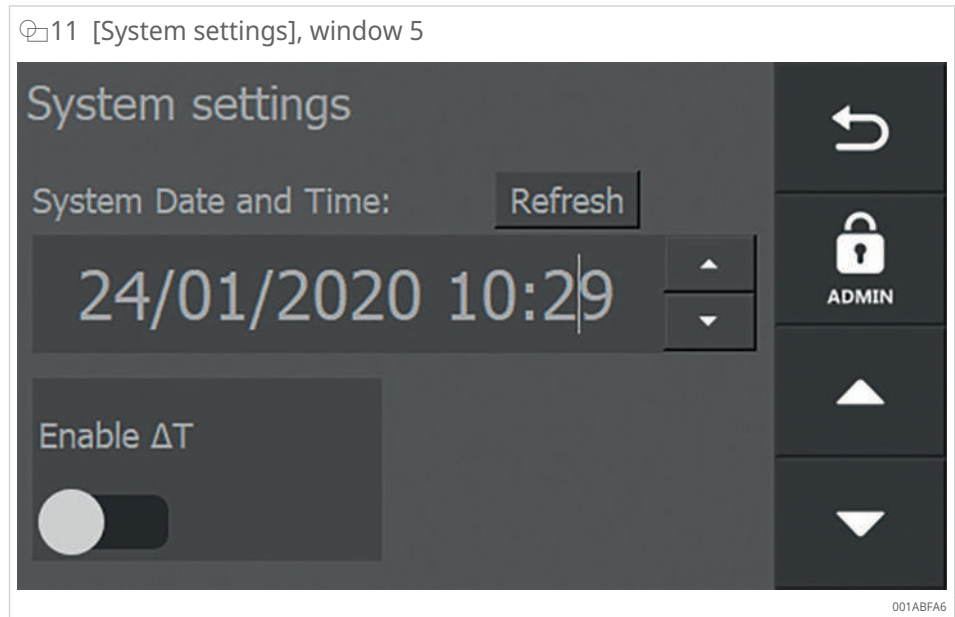
## 4.6.4 System settings, window 4



☰ 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.

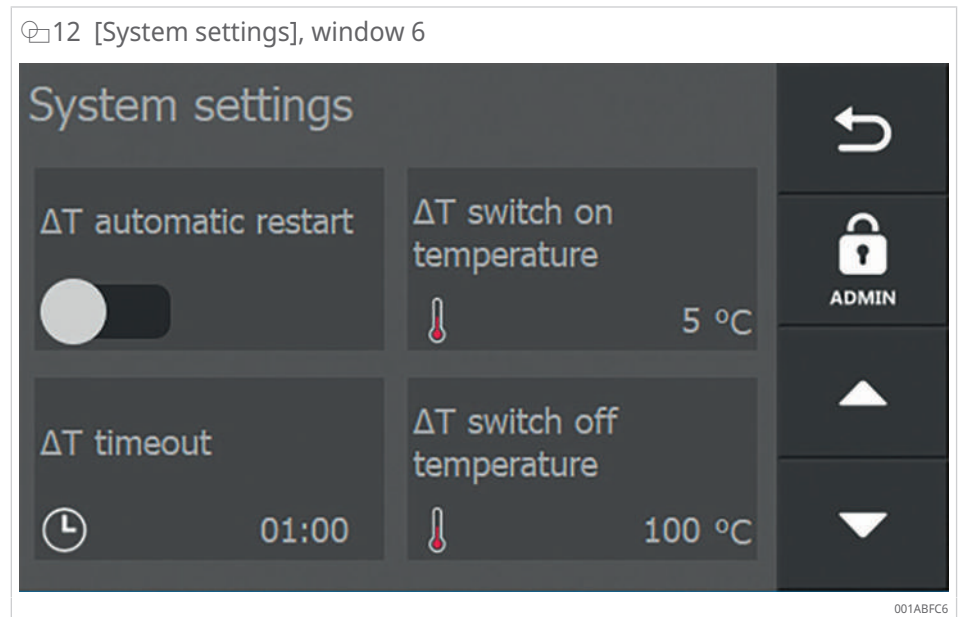
4.6.5 System settings, window 5



☰ 11 Setting options

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

## 4.6.6 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.

## 4.7 Heating methods

The device offers various heating methods to suit every application.

13 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.

### 4.7.1 Temperature mode

- Setting of the required heating temperature
- 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.

### 4.7.2 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.

### 4.7.3 Temperature mode or time mode

- Setting of the required workpiece temperature and the required heating period. The device switches 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
- 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.

### 4.7.4 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 process is activated, the 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 during heating, along which the heating process should ideally proceed. 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 device can deliver and transfer to the workpiece.

## 4.8 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.

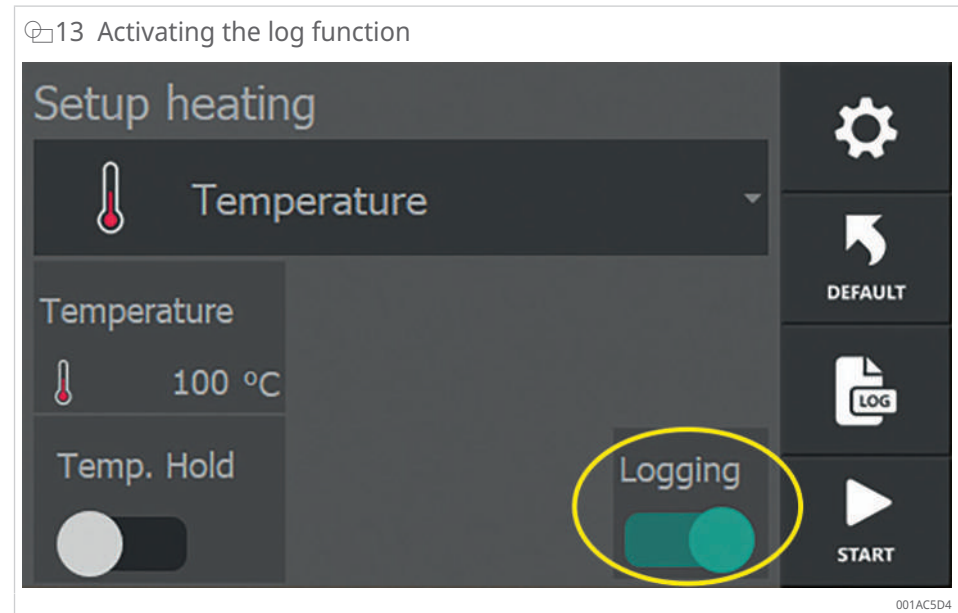
### 4.8.1 Logging

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

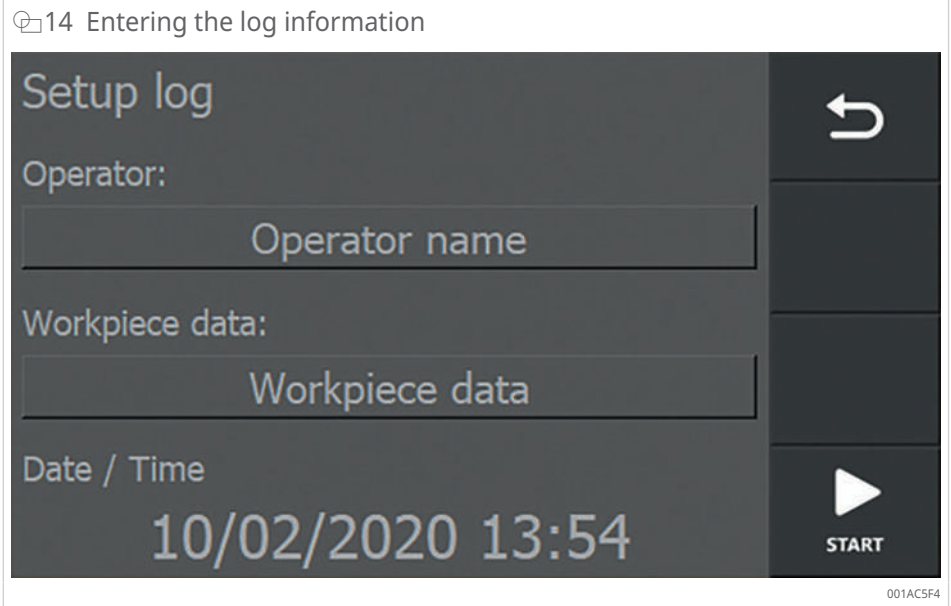
The settings for the log are requested prior to the heating process starting.

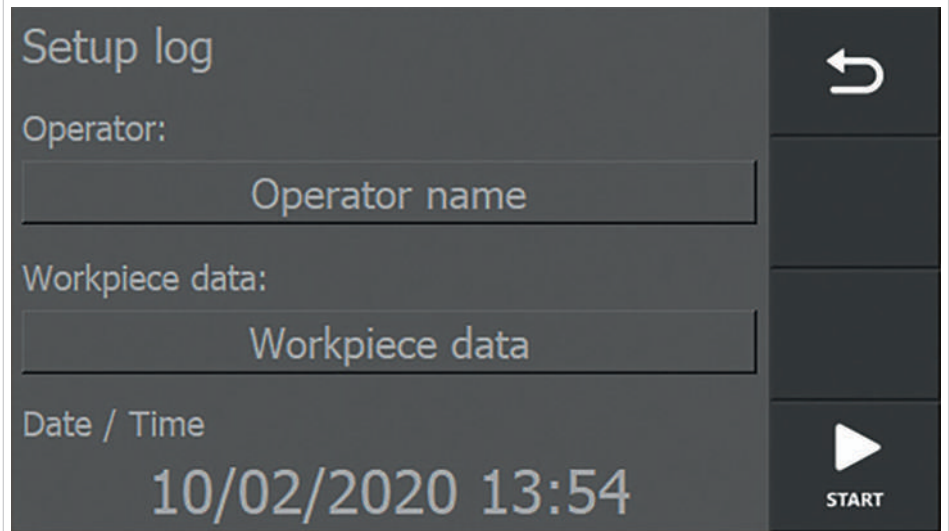
The log contains the following information:

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



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



Setup log

Operator:

Operator name

Workpiece data:

Workpiece data

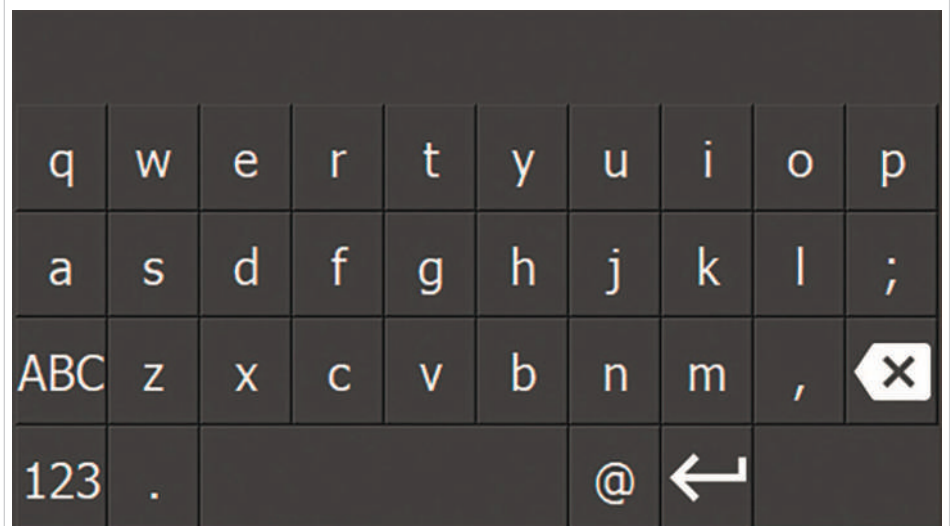
Date / Time

10/02/2020 13:54

START

001AC5F4

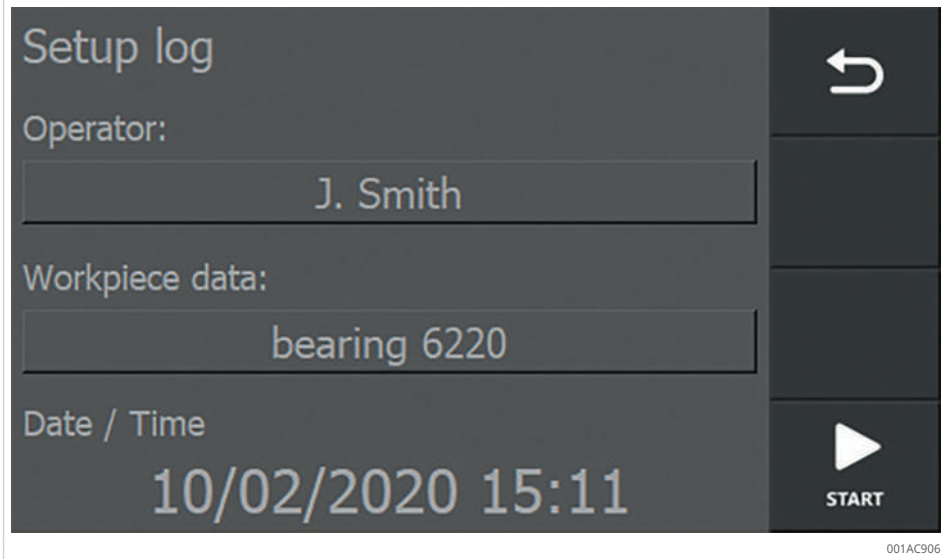
5. Tap the field that needs to be changed.
  - › An input keyboard will appear.


 15 Entering information for the log


001AAD5F

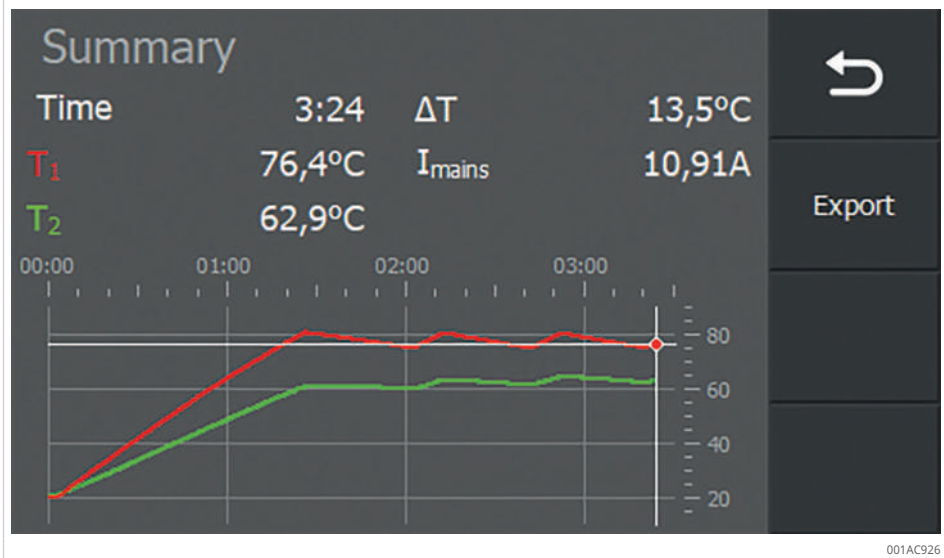
6. Enter the required information.
7. Press [Enter] to complete the entry.
  - › The keyboard is hidden.
  - › The inputted data is transferred to the corresponding field.

#### 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.

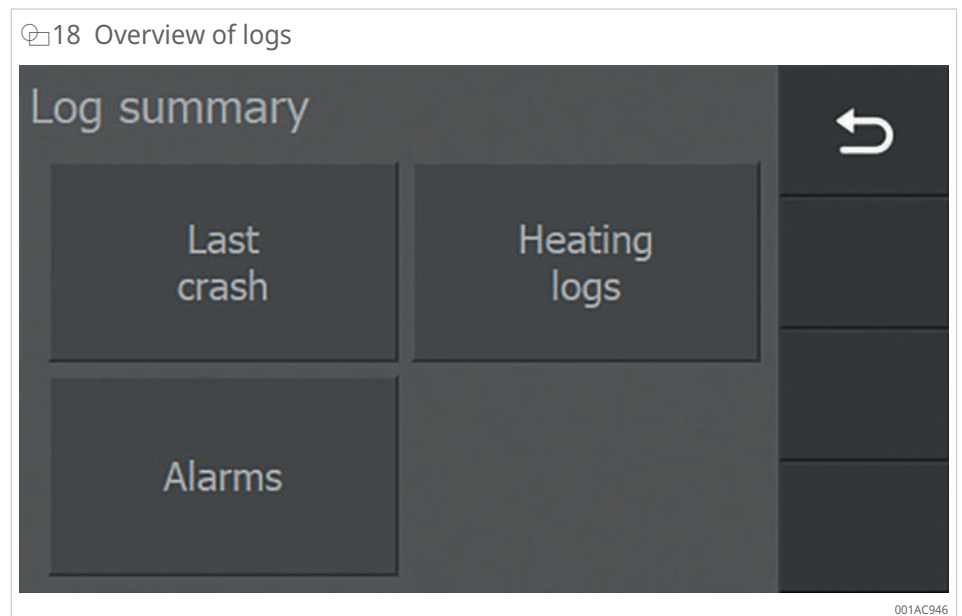
#### 17 Overview of the heating data



- ✓ 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.

## 4.8.2 Accessing log files

1. Press the [Heating logs] button to display stored logs.
  - › An overview window opens.



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:

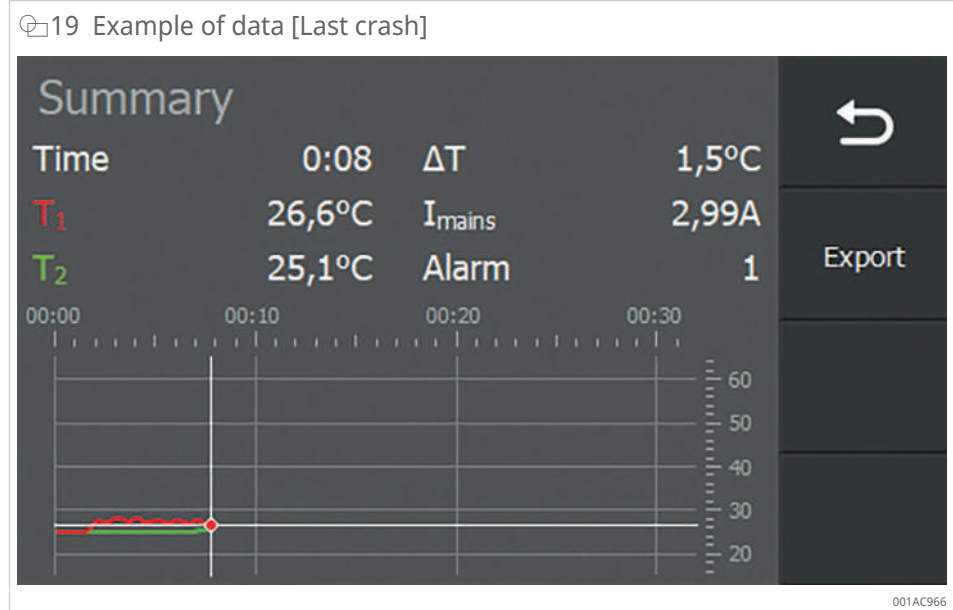
### 14 Automatically saved log files

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

## 4.8.3 [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.



- ✓ 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.

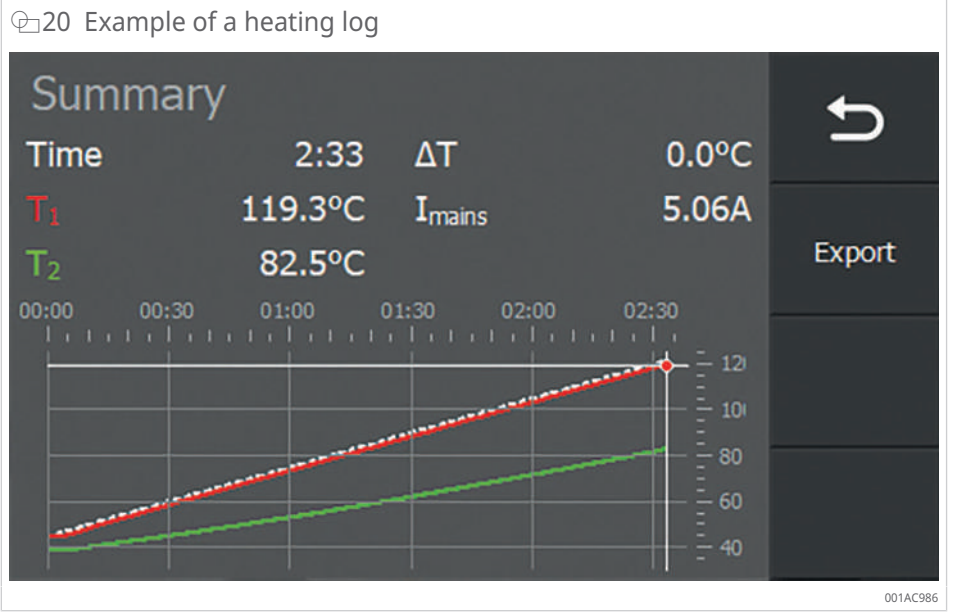
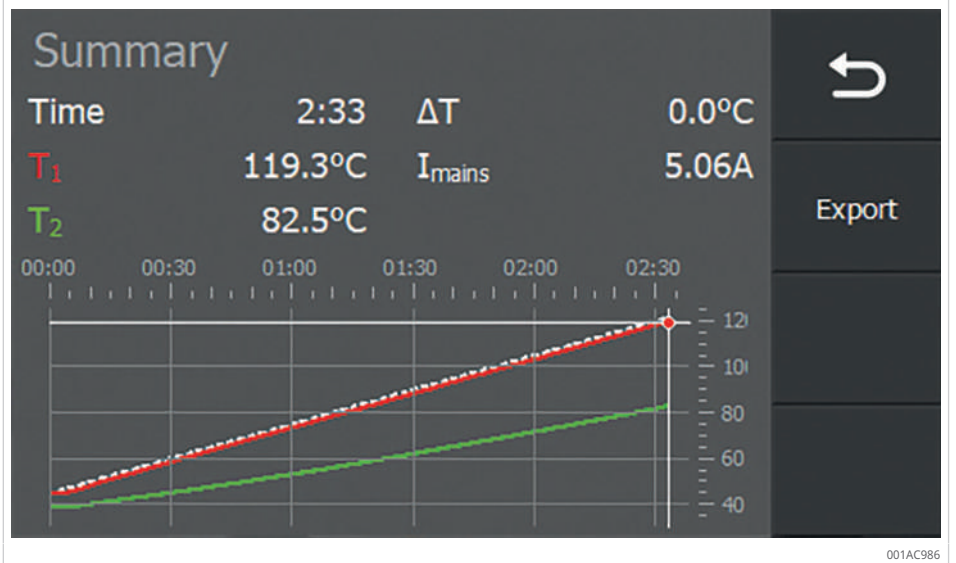
#### 4.8.4 [Heating logs]

[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.

##### 4.8.4.1 [VIEW]

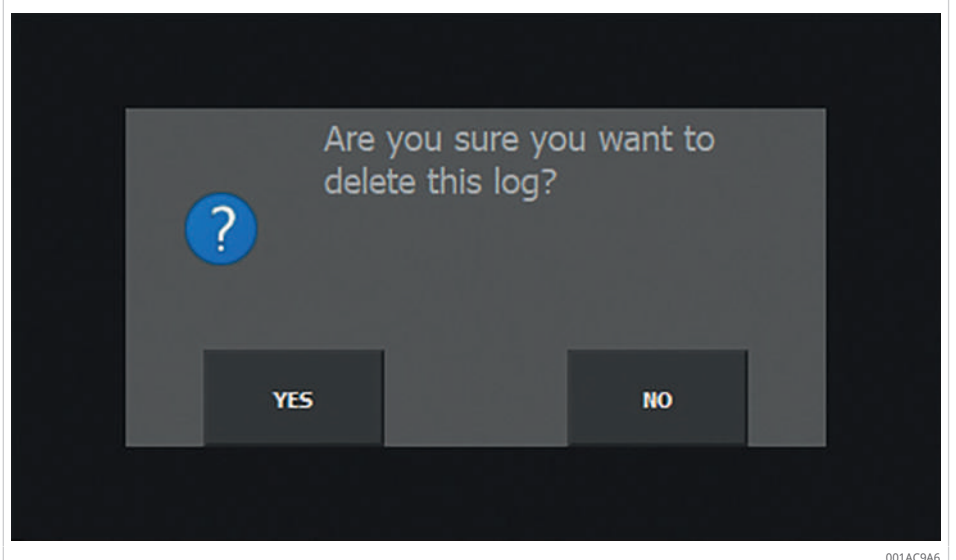
1. Open the selected log by pressing [VIEW].
  - › The chosen log is displayed.


 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.

#### 4.8.4.2 [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.

#### 4.8.5 [Alarms]

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

☰ 22 Example list [Alarms]

Alarms			↶
Nr	alarm id	alarm time	
5	3	06-07-2020 12:35	VIEW
4	1	06-07-2020 12:35	▲
3	3	06-07-2020 12:35	
2	1	06-07-2020 12:35	▼

001AC9C6

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.

A screenshot of a device's alarm message. The message is displayed on a dark background. On the left, there is a yellow triangular warning icon with a black exclamation mark. To the right of the icon, the text "No temperature increase measured" is displayed in white. Below the text, there is a dark rectangular button with the white text "OK".

23 Example of an alarm message

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

001AC9E6

## 4.9 Further functions

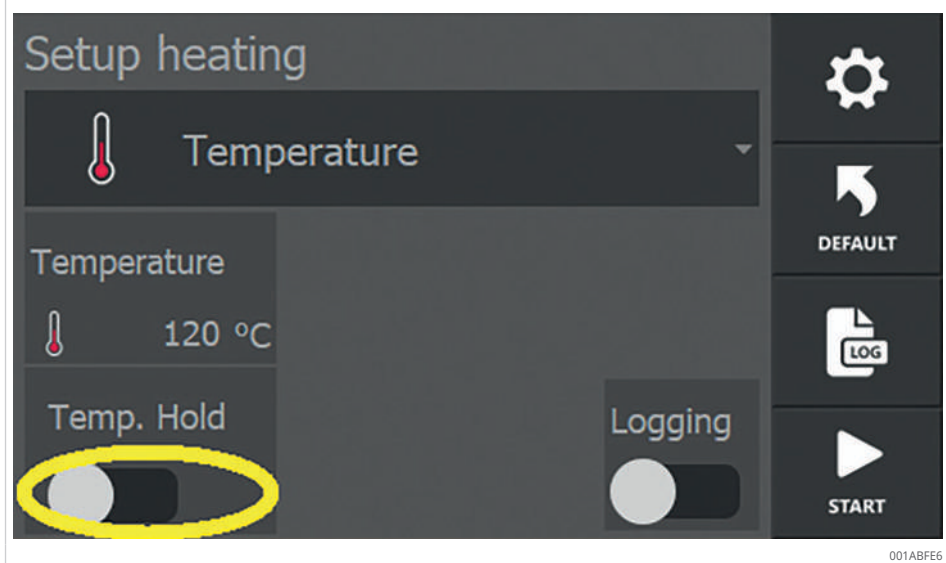
The generator has a number of additional functions for controlling the heating process.

### 4.9.1 Temperature hold function

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

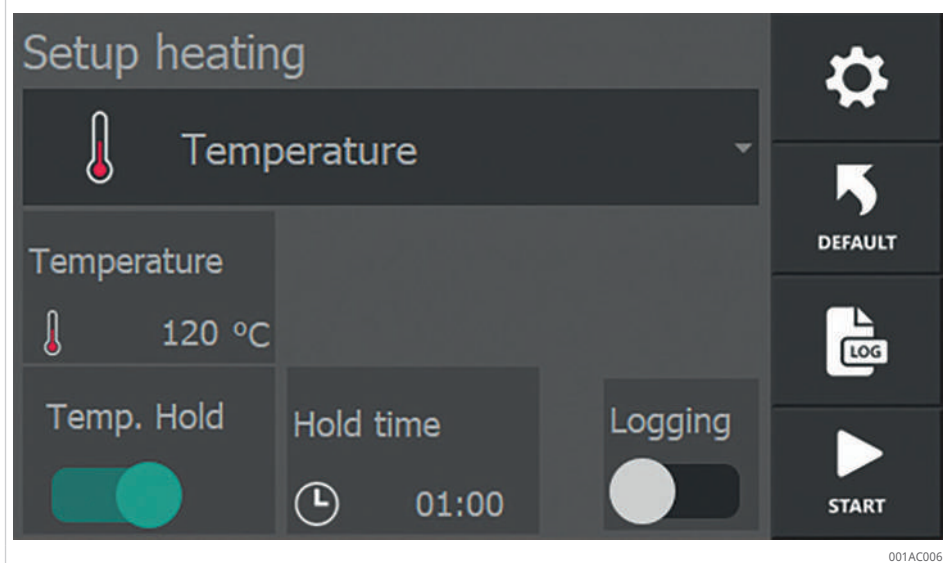
The temperature hold function is available in temperature mode as well as in temperature mode and speed mode, and is activated and deactivated using the [Temp. Hold] selector switch.

☞24 [Temp. Hold] selector switch



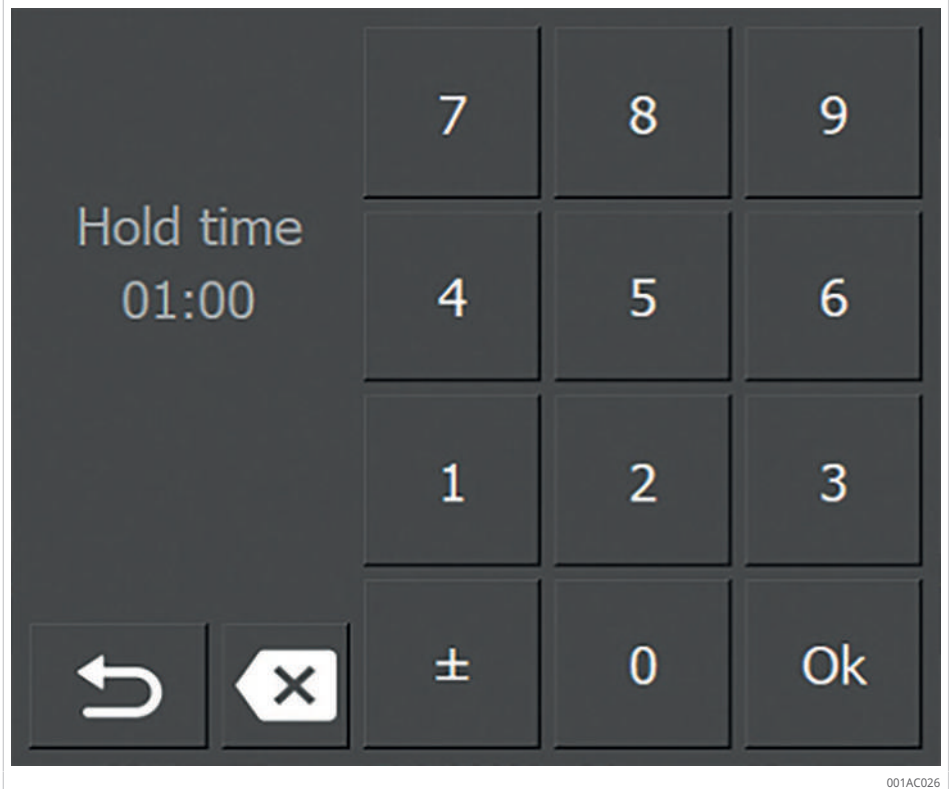
The temperature is held at a specific temperature with a switching hysteresis, which is set in the system settings. The temperature to which a workpiece can fall before the heater is automatically reactivated is set in the system settings.

☞25 [Temp. Hold] selector switch active



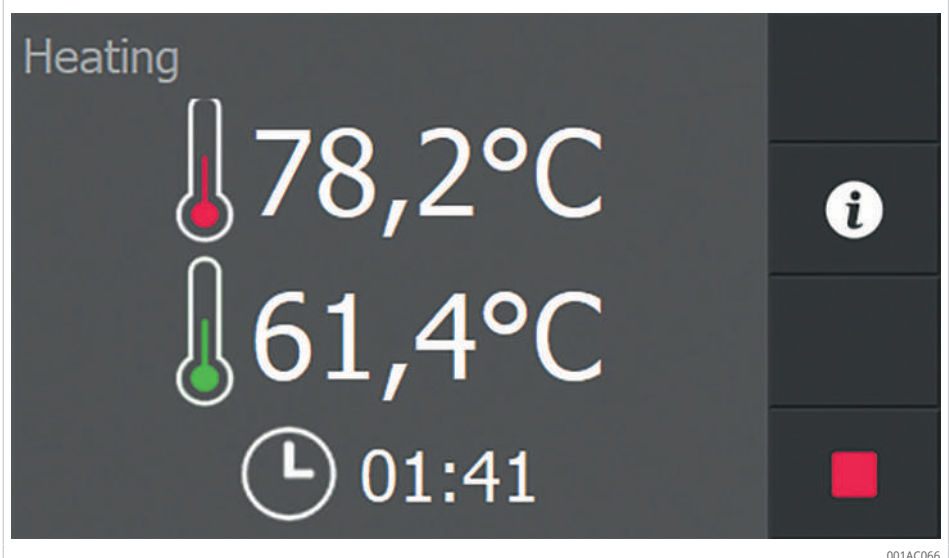
- ✓ When the [Temp. Hold] selector switch is active, the selector switch turns green and the menu shows how long the workpiece will be held at the specific temperature.
1. The length of time that a workpiece should be held at a specific temperature can be set by tapping [Hold time]. The time is set in mm:ss and can be between 00:01 and 99:00.

26 Entering the time for the temperature hold function



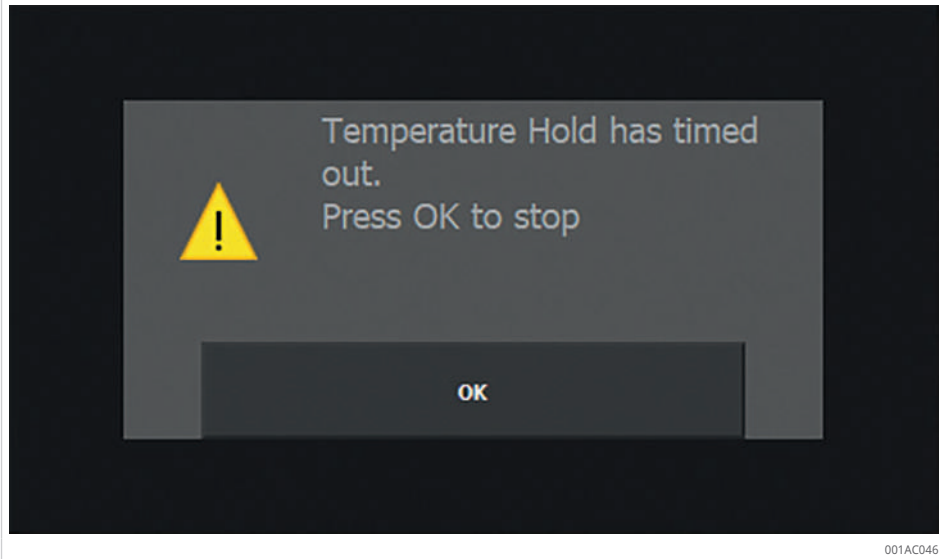
2. Tap [Back] to return.
  - › Once the target temperature has been reached during the heating process, the remaining temperature maintenance time is displayed on a timer.

27 Remaining temperature maintenance time



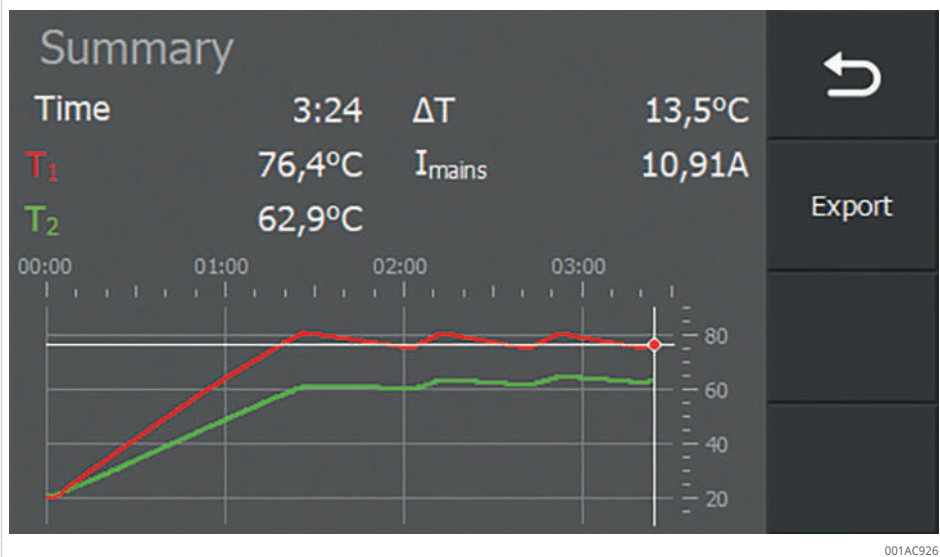
3. Once the set time has elapsed, a message will appear on the display.

28 Message confirming elapsed temperature hold function period



4. Press [OK] to close the message.
  - › The temperature curve over time is displayed.

29 Example of temperature curve for temperature hold function



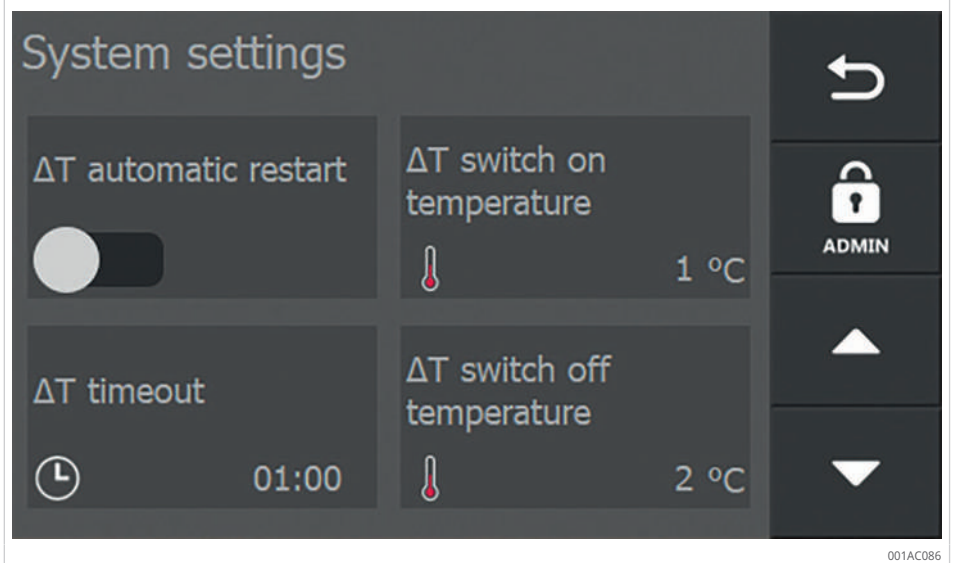
#### 4.9.2 Delta T function

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  $\Delta T$  control system is used when heating bearings where a significant difference in the temperatures of the inner and outer ring is not permitted.

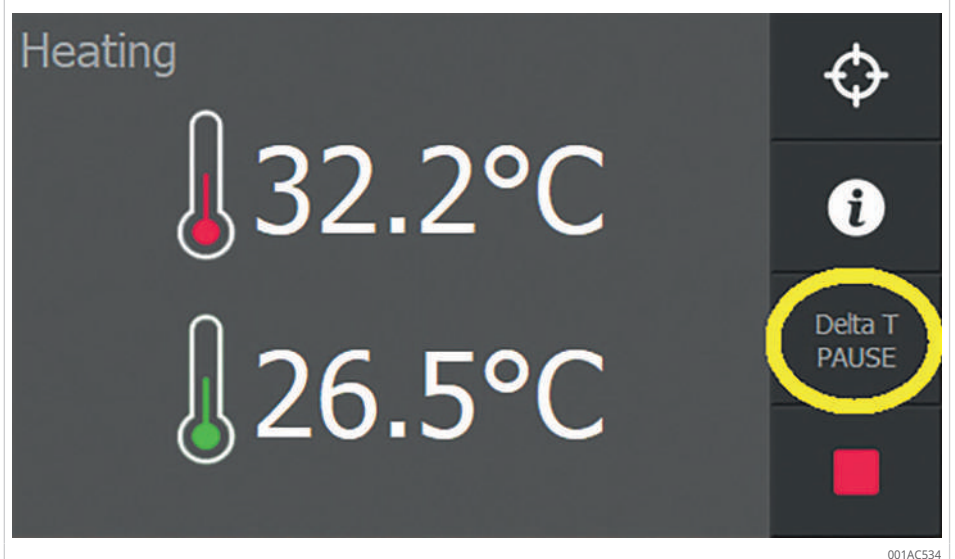
During heating, temperatures T1 and T2 are measured. The difference between these two temperatures is calculated on an ongoing basis.

30 Settings for the Delta T function



- ✓ Both temperature sensors are connected.
- 1. Activate the Delta T function in the [System settings] ▶22 | 4.6.5.
- 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.

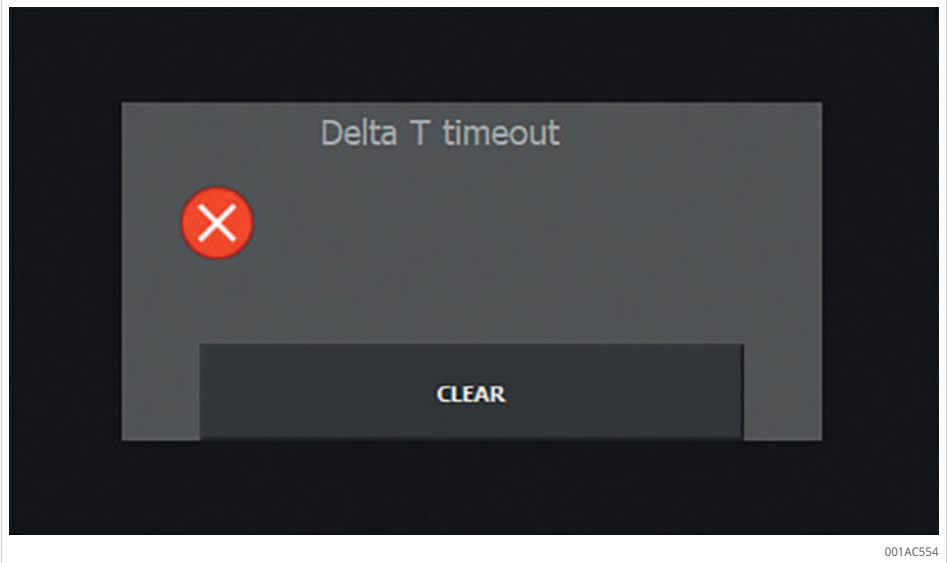
31 Delta T function paused



☰15 Description of [ $\Delta T$  automatic restart]

[ $\Delta T$ 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 [ $\Delta T$ switch on temperature]. The temperature difference must be reached within [ $\Delta T$ timeout]. If the time limit is exceeded, the error message [Delta T timeout] is displayed. 4. Press [CLEAR] to close the message.

📄32 Error message for exceeded time limit



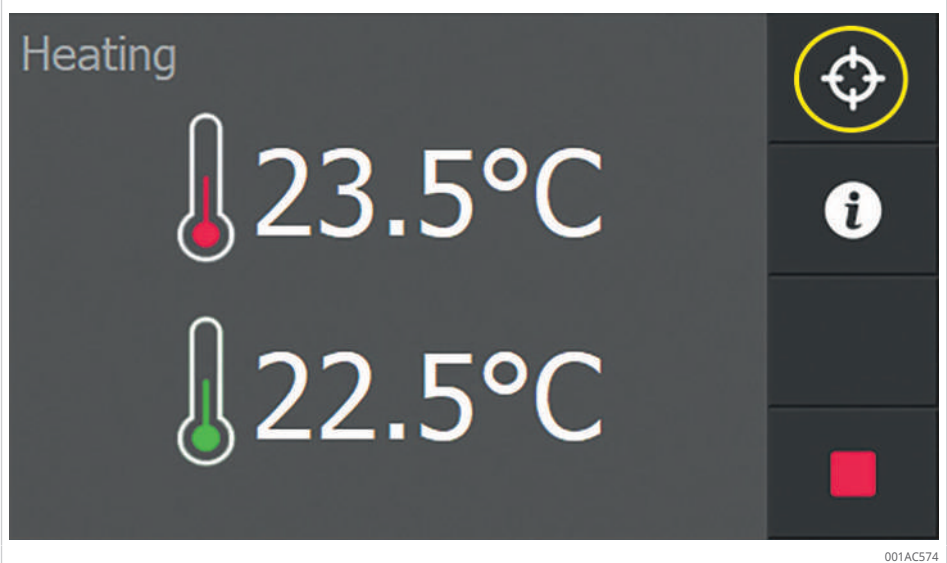
001AC554

### 4.9.3 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.

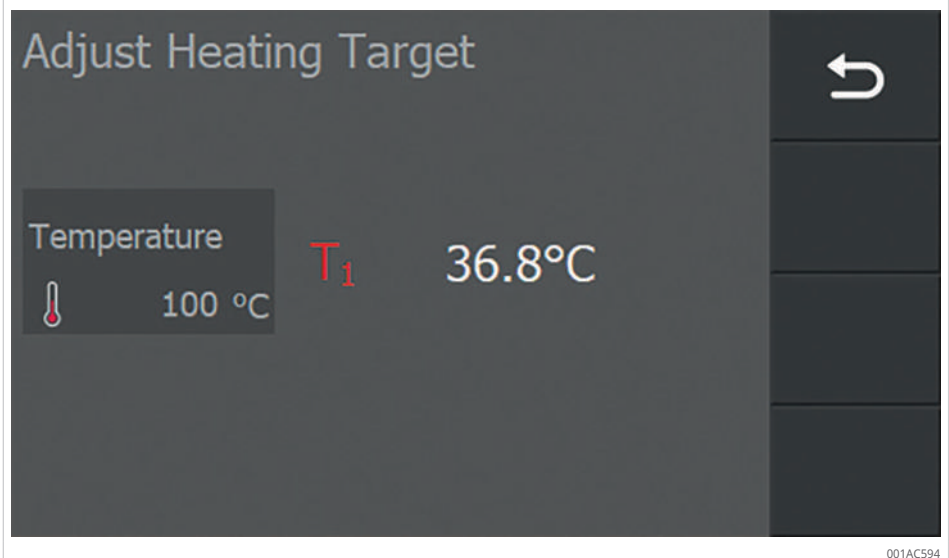
📄33 Example of temperature mode



001AC574

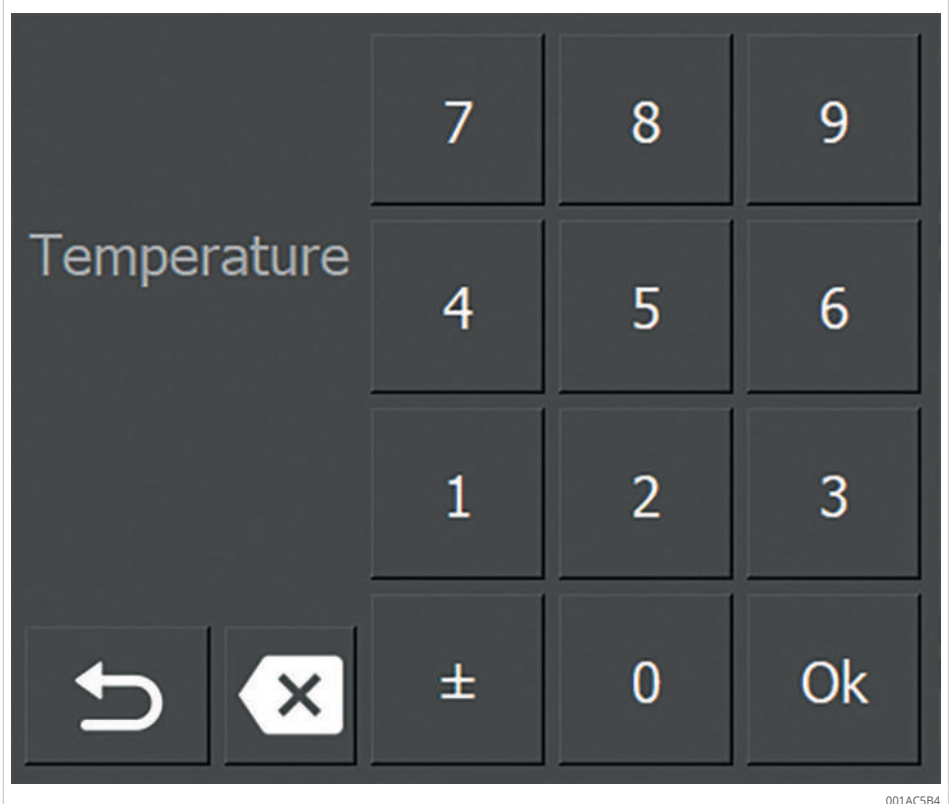
1. Select the [Adjust Heating Target] button.
  - › A menu containing the current settings and actual values will open.

☞ 34 Example of a heating target



2. Press on the value to be changed.
  - › An input keyboard will appear.
3. Enter the new value.

☞ 35 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 device is switched off and disconnected from the mains voltage.
  - ✓ Wear safety shoes.
1. Use both hands when transporting the device.
  2. Use the side handles when transporting the device.

 36 Side handles



001A5294

### 5.2 Storage

Wherever possible, the device should be stored in the transport packaging that it was delivered in.

 16 Storage conditions

Designation	Value
Ambient temperature	-5 °C ... +55 °C
Humidity	5 % ... 95 %, non-condensing

## 6 Commissioning

### 6.1 First steps

1. Remove the device from the transport box or storage box.
2. Check the housing for damage.
3. Place the device in a suitable workplace.
4. Activate the brakes whenever using a rollable transport device.

Characteristics of a suitable workstation:


- The surface is stable, level and non-metallic.
- The device is standing on all four feet.
- There is a clearance of 100 mm at the back.
- There is a clearance of 10 mm at the bottom.

6

### 6.2 Connecting the power supply

Connection with the supplied mains connection cable

- ✓ 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. Plug the mains connection cable into the opening provided on the back of the device.

 37 Connecting the mains connection cable





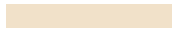



2. Insert the mains connection plug into a suitable socket.
3. Lay the connection cable in such a way as to prevent a trip hazard.

Connection with a different mains connection plug

- ✓ The plug of the mains connection cable supplied does not match the mains connection.
  - ✓ The power supply must comply with the technical data provided.
  - ✓ The mains connection must be established by qualified personnel.
1. Use a suitable mains connection cable with an IEC C19 plug.
  2. Establish the mains connection via phase and earthing.
  3. Lay the connection cable in such a way as to prevent a trip hazard.

### 17 Establish a mains connection

Voltage variant	Mains connection	Colour	
230 V CE, UKCA	Phase	Brown	
	Neutral conductor	Blue	
	Earthing	Green/yellow	
240 V CSA	Phase	Black	
	Neutral conductor	White	
	Earthing	Green	

## 6.3 Connecting the inductor

- ✓ Only use inductors that comply with the manufacturer's specifications.
  - ✓ Observe the regulations and instructions set down in the corresponding inductor operating manual.
  - ✓ The inductor shows no signs of damage.
  - ✓ The nominal output of the inductor used must match the nominal output of the generator.
  - ✓ Wear heat-resistant protective gloves effective up to +250 °C to avoid burns.
  - ✓ If an inductor is already connected to the generator, this should be disconnected as necessary ►61 | 11.1.
1. Insert the open ends of the inductor into the connection sockets on the front of the generator, ensuring that the knob is in the 12 o'clock position.
  2. Press the plug into the connection socket until an audible click is heard indicating that the locking position has been reached.
  3. Check that the locking position between inductor and generator is secure.
    - » The inductor is now ready for operation.

### 38 Connecting MF-INDUCTOR-3.5KW



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## 6.4 Mounting the inductor on the workpiece

- ✓ Wear heat-resistant protective gloves effective up to +250 °C to avoid burns.
- ✓ The inductor must be mounted on the workpiece before the heating operation begins.
- ✓ The inductor may only be mounted on a single workpiece.
- ▶ Fit the flexible inductor to the workpiece in accordance with the associated user manual.
  - » The inductor is ready for operation.

6

## 6.5 Connecting the temperature sensor

- ✓ Use temperature sensors in accordance with the manufacturer's specification.
- ✓ The temperature sensors show no signs of damage.
- ✓ The magnetic surface of the temperature sensors is contaminant-free.
- 1. Connect the plug of temperature sensor T1 (red) to designated connection T1.
- 2. Place temperature sensor T1 as close as possible to the inductor windings on the workpiece.
- 3. Connect the plug of temperature sensor T2 (green) to designated connection T2.
- 4. Place temperature sensor T2 at the point where the temperature in the workpiece is expected to be at its lowest.
- 5. Lay the temperature sensor cables in such a way as to prevent a trip hazard.
  - » The temperature sensors are ready for operation.



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

## 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. Fit the flexible inductor to the workpiece to be heated in accordance with the associated user manual.
5. Wear protective gloves that are heat-resistant up to +250 °C.
6. Wear safety shoes.
7. Wear eye protection.

### 7.3 Switching on the heating device

- ✓ The inductor is connected.
- ✓ 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 device using the main switch.
  - The device will commence the start-up operation.
  - The startup operation takes some time to complete, ~20 s.
  - A loading screen is displayed whilst the startup operation is in progress.

39 Loading screen

# SCHAEFFLER

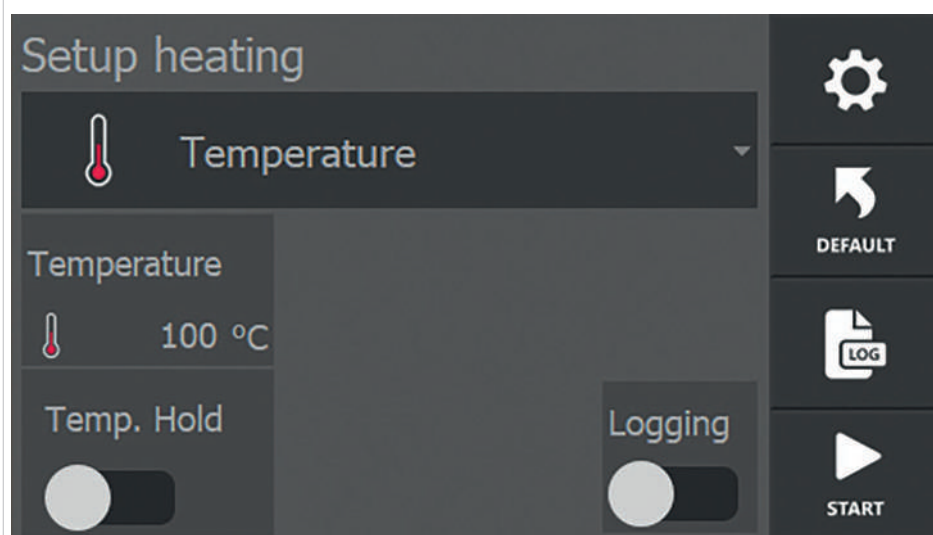
001A5244

7


## 7.4 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.

40 Example display for [Setup heating]



001ACFCC

 18 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.

## 7.5 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**



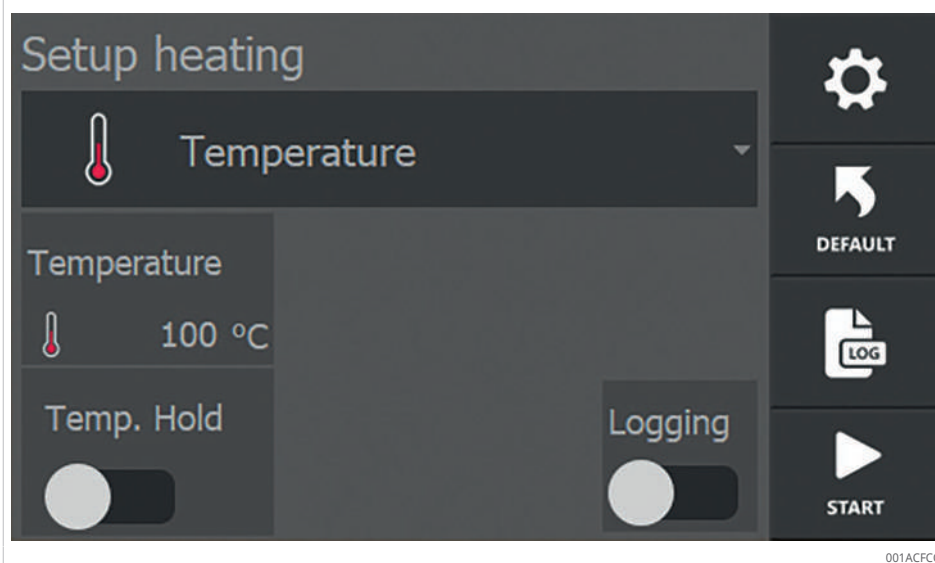
#### Strong electromagnetic field

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.

### 7.5.1 Heating in temperature mode

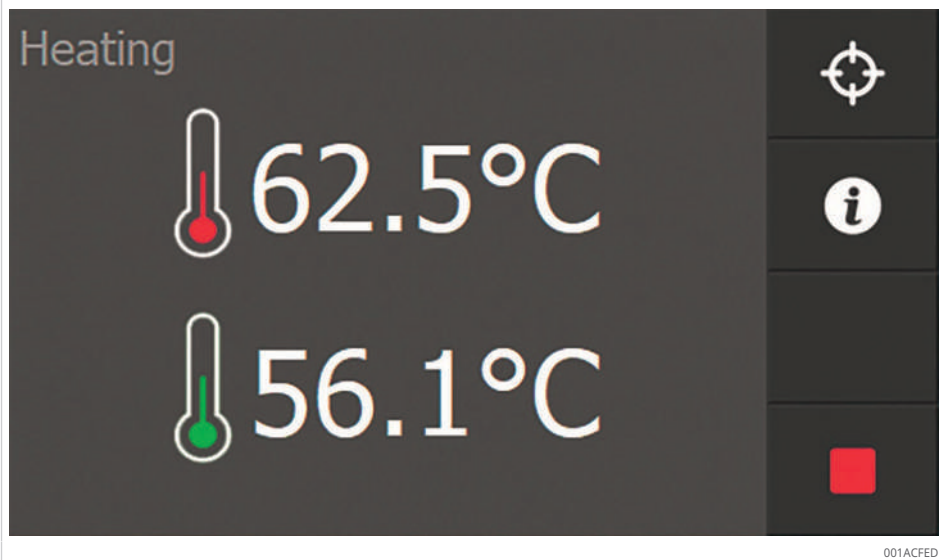
#### 41 Heating in temperature mode



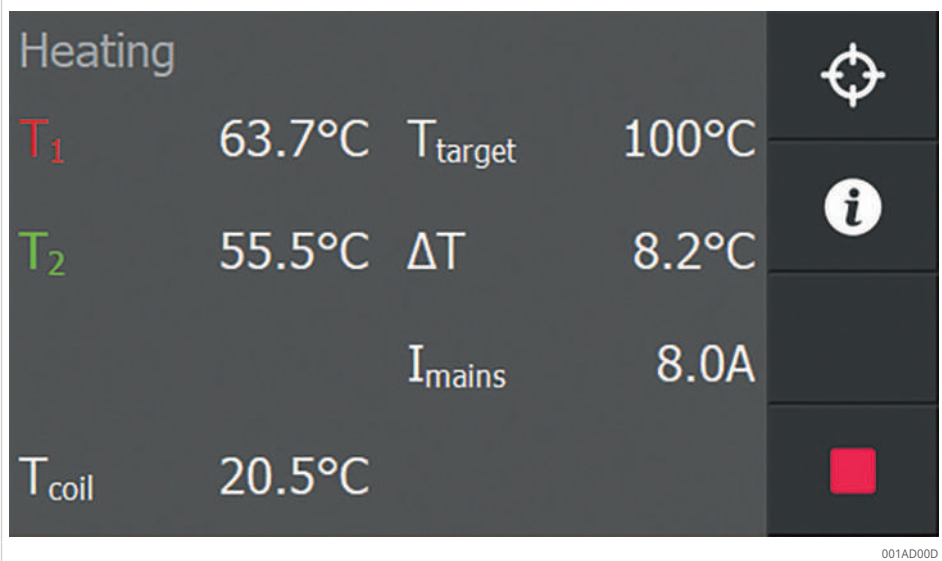
- ✓ The inductor is connected.
  - ✓ The required temperature sensors are connected. For a single measurement: T1, for Delta T measurement: T1 and T2.
1. Select [Temperature] as the [Heating mode].
  2. Touch [Temperature] and set the target temperature for the heating operation.
  3. Activate the [Temp. 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 red LED indicator lights up.
  - › 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.

42 Display of the workpiece temperatures



43 Expanded data overview



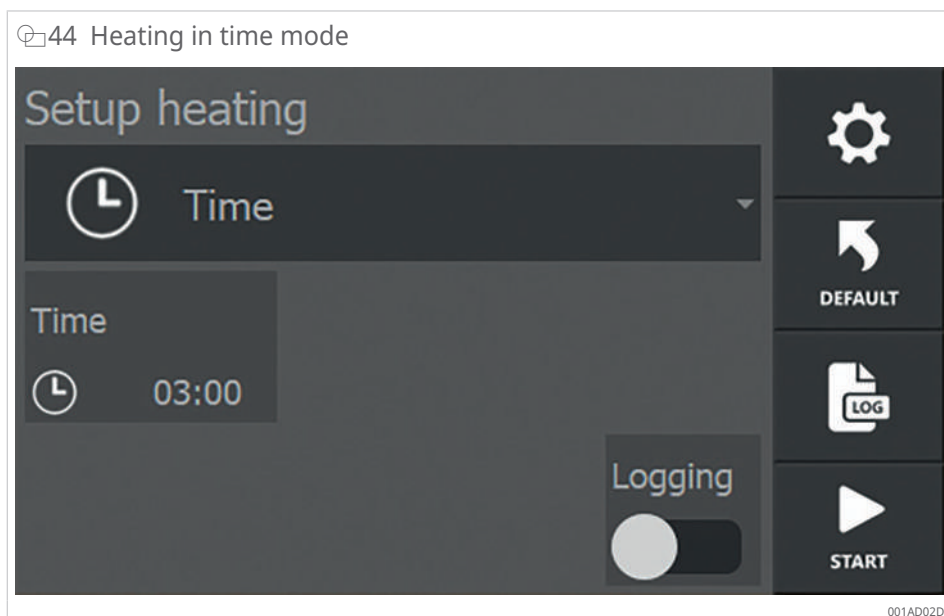
6. Press [Additional information] to toggle between a graphic representation and an expanded data overview.
  - » Once the workpiece has reached the target temperature, a loud beep will sound.
7. To cancel the beep, press [Stop].

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

### 19 Deviations with or without temperature hold function

[Temp. Hold]	Target temperature reached
Deactivated	Heating finishes automatically. The LED indicator goes out.
Activated	Heating finishes automatically. The LED indicator goes out. Heating recommences automatically if the temperature falls below the value of [T hold hysteresis]. The LED indicator lights up. 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.

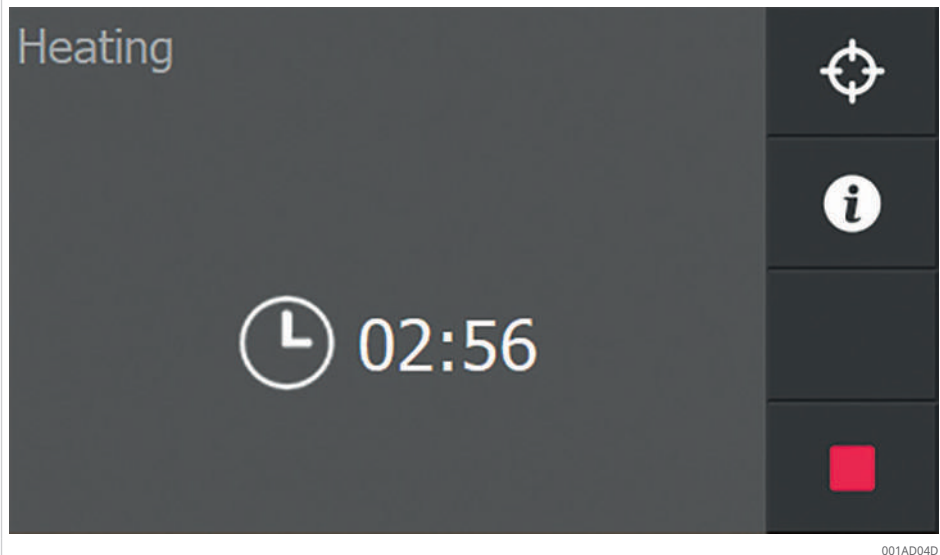
## 7.5.2 Heating in time mode



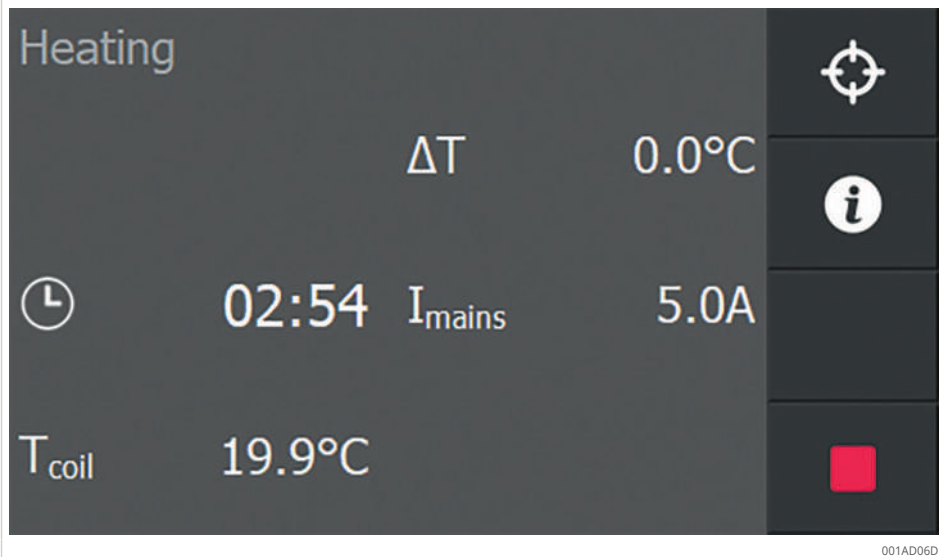
- ✓ The inductor is connected.
- 1. Select [Time] as the [Heating mode].
- 2. Touch [Time] and set the duration of the heating operation.
- 3. Activate the [Logging] selector switch if logging of the heating operation is required.
- 4. Press [Start] to start the heating operation.
  - › The heating operation will commence. The red LED indicator lights up.
  - › 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.

45 Display of the heating process in time mode



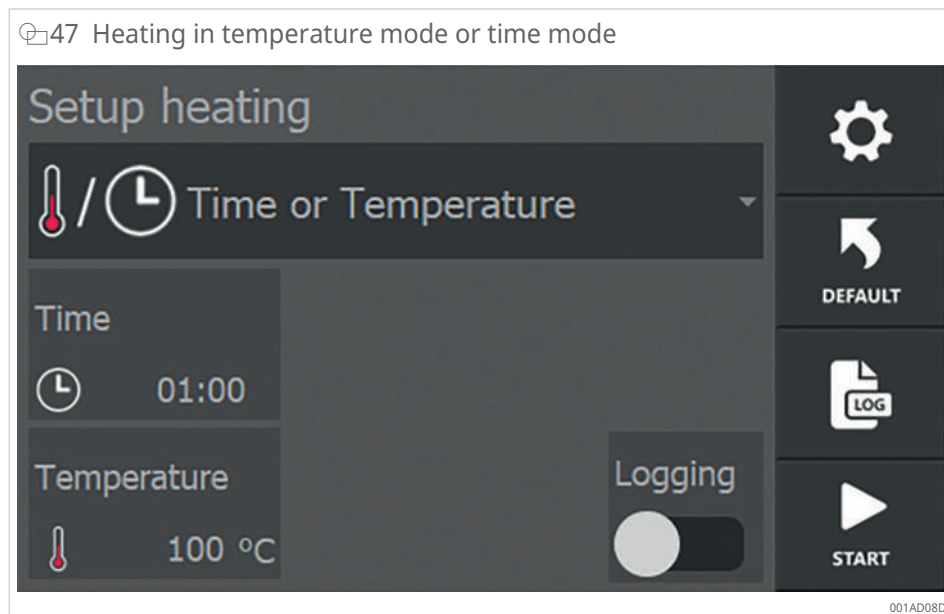
46 Expanded data overview



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].

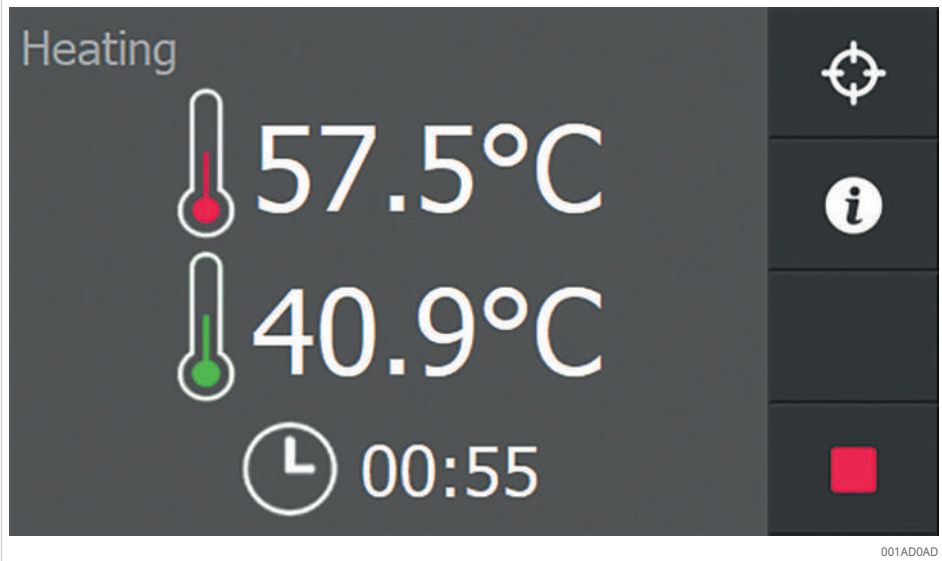
**!** The heating operation can be terminated at any time by pressing [Stop].

### 7.5.3 Heating in temperature mode or time mode

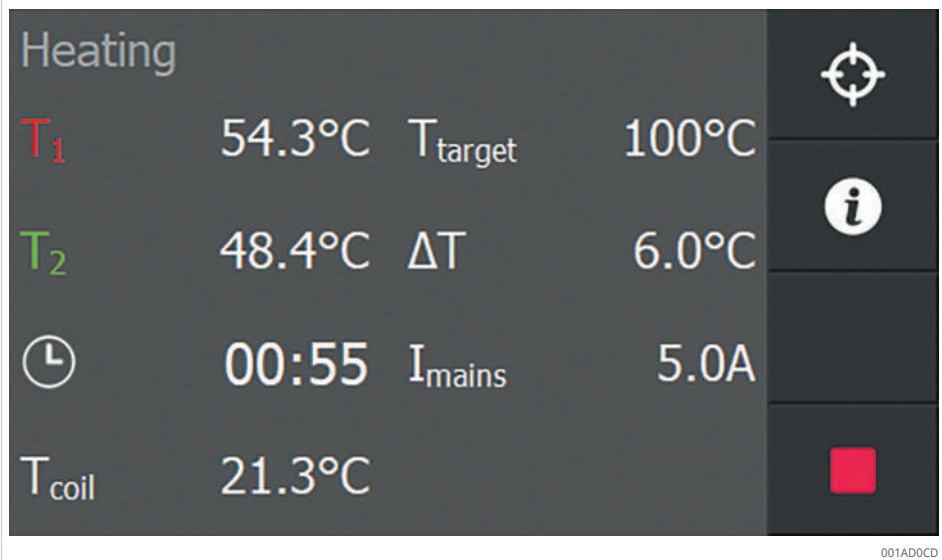


- ✓ The inductor is connected.
  - ✓ The required temperature sensors are connected. For a single measurement: T1, for Delta T measurement: T1 and T2.
1. Select [Time or Temperature] as the [Heating mode].
  2. Touch [Time] and set the duration of the heating operation.
  3. Touch [Temperature] and set 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 red LED indicator lights up.
    - › 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.

☰48 Display of the heating process in temperature mode or time mode

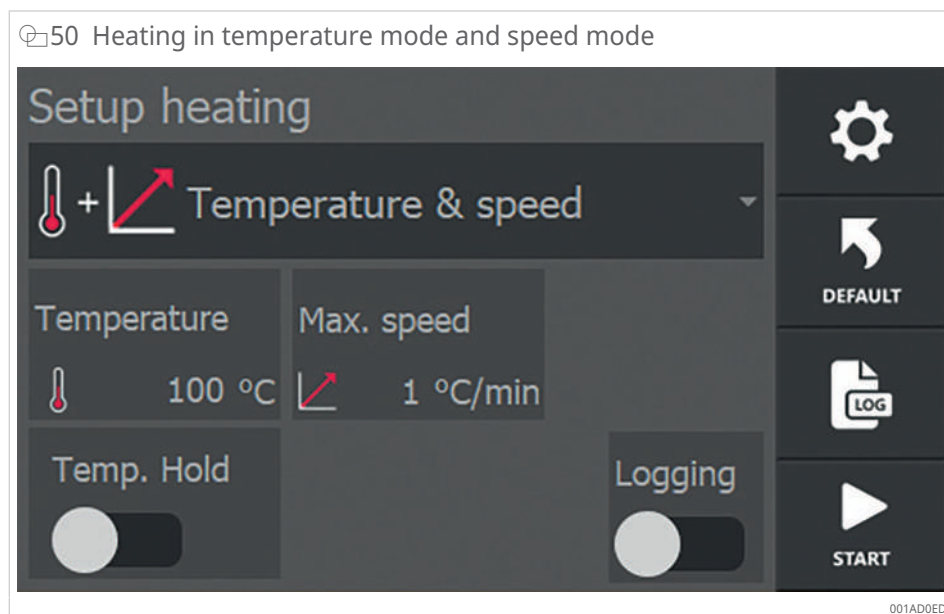


☰49 Expanded data overview



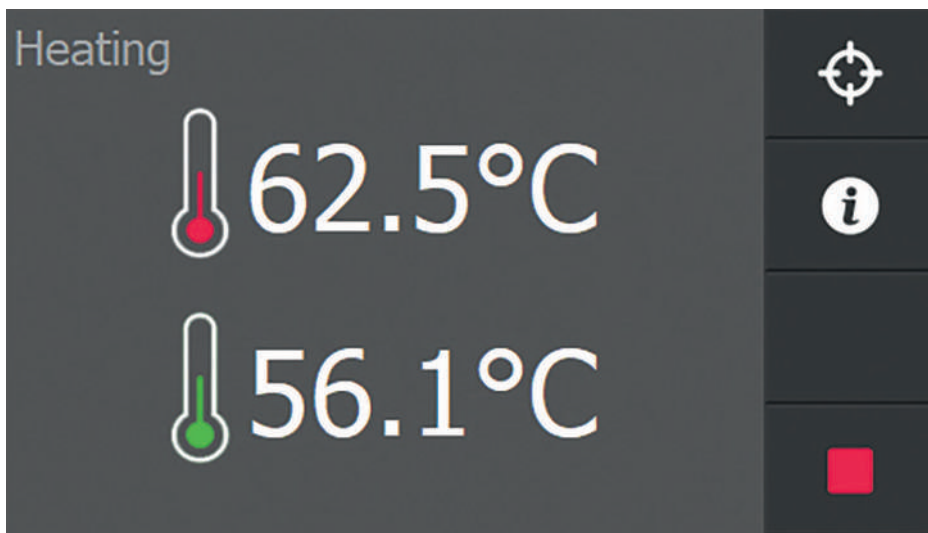
6. Press [Additional information] to toggle between a graphic representation and an expanded data overview.
    - » The heating device will switch off automatically once the set time has elapsed or the target temperature has been reached. A loud beep will sound.
  7. To cancel the beep, press [Stop].
- !** The heating operation can be terminated at any time by pressing [Stop].

## 7.5.4 Heating in temperature mode and speed mode

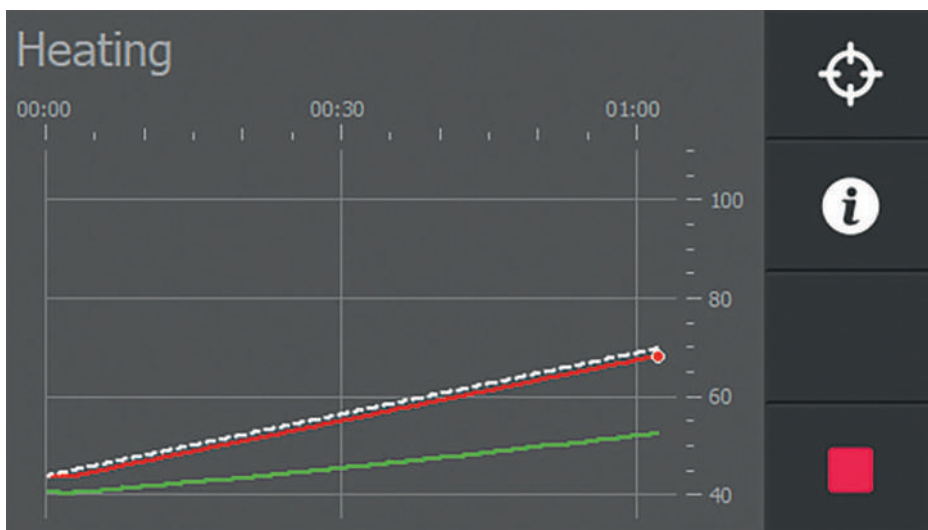


- ✓ The inductor is connected.
  - ✓ The required temperature sensors are connected. For a single measurement: T1, for Delta T measurement: T1 and T2.
1. Select [Temperature & speed] as the [Heating mode].
  2. Touch [Temperature] and set the target temperature for the heating operation.
  3. Touch [Max. 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 red LED indicator lights up.
    - › 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.

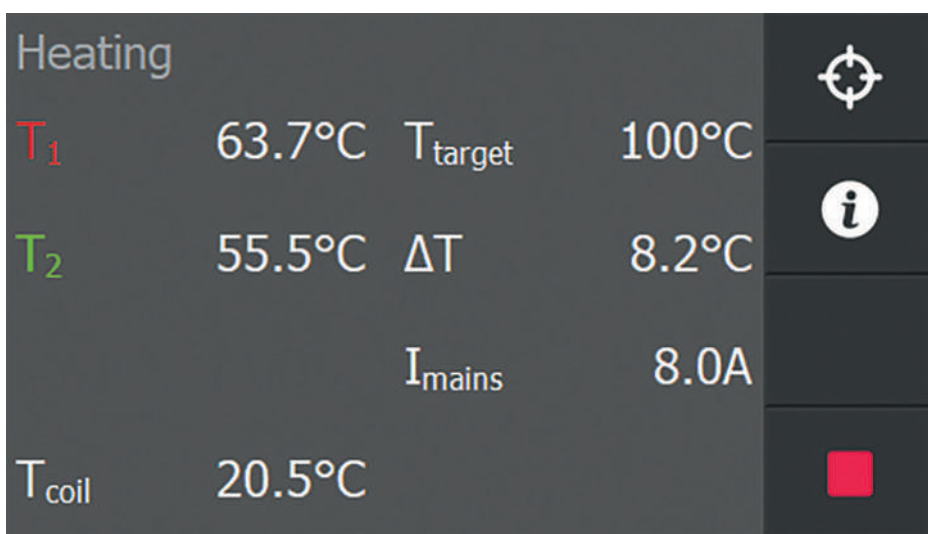
51 Display of the heating process in temperature mode and speed mode



52 Graphic representation



53 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.
8. To cancel the beep, press [Stop].

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

### ☰20 Deviations with or without temperature hold function

[Temp. Hold]	Target temperature reached
Deactivated	Heating finishes automatically. The LED indicator goes out.
Activated	Heating finishes automatically. The LED indicator goes out. Heating recommences automatically if the temperature falls below the value of [T hold hysteresis]. The LED indicator lights up. 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.

## 7.6 Removing the inductor from the workpiece

Once the heating operation has finished, the inductor can be removed from the workpiece.

- ✓ Wear heat-resistant protective gloves effective up to +250 °C to avoid burns.
- 1. Remove the temperature sensors from the heated workpiece.
- 2. Remove the flexible inductor from the heated workpiece.
  - » The heated workpiece is available for further use.

**!** Mount or dismount the heated workpiece as quickly as possible, before the workpiece begins to cool.

## 8 Troubleshooting

The 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.

### 21 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 occurred]	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 $\Delta T$ .	8. Extend the pause time for $\Delta T$ .
[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 $-10\text{ }^{\circ}\text{C}$ ( $+14\text{ }^{\circ}\text{F}$ ).	13. Switch off the device using the main switch. 14. Wait until the ambient temperature has risen above $-10\text{ }^{\circ}\text{C}$ ( $+14\text{ }^{\circ}\text{F}$ ). 15. If the temperature is within the limit value and the error still occurs, contact Schaeffler.
[The environment temperature is too high]	The ambient temperature is above $+70\text{ }^{\circ}\text{C}$ ( $+158\text{ }^{\circ}\text{F}$ ).	16. Switch off the device using the main switch. 17. Wait until the ambient temperature has fallen below $+70\text{ }^{\circ}\text{C}$ ( $+158\text{ }^{\circ}\text{F}$ ). 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 $-10\text{ }^{\circ}\text{C}$ ( $+14\text{ }^{\circ}\text{F}$ ).	19. Switch off the device using the main switch. 20. Wait until the ambient temperature has risen above $-10\text{ }^{\circ}\text{C}$ ( $+14\text{ }^{\circ}\text{F}$ ). 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 $+120\text{ }^{\circ}\text{C}$ ( $+248\text{ }^{\circ}\text{F}$ ).	22. Switch off the device using the main switch. 23. Wait until the ambient temperature has fallen below $+120\text{ }^{\circ}\text{C}$ ( $+248\text{ }^{\circ}\text{F}$ ). 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 $-10\text{ }^{\circ}\text{C}$ ( $+14\text{ }^{\circ}\text{F}$ ).
[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.

Error message	Possible cause	Remedy
[A coil current peak was detected]	A peak current has been detected.	30. Switch off the device using the main switch. 31. Wait a few seconds and switch the device back on.
[A coil voltage peak was detected]	A peak voltage over 500 V has been detected.	32. Switch off the device using the main switch. 33. Wait a few seconds and switch the device back on.
[No coil is attached to the system]	No inductor connected to the generator.	34. Connect the inductor to the generator.

## 9 Maintenance

Maintenance work and repairs may only be carried out by qualified personnel.

Regular maintenance of the generator and inductor is a prerequisite for reliable operation of the induction system.

- ✓ The device is switched off and disconnected from the mains voltage.
  - ✓ Ensured that the device cannot be switched on again without authorisation or unintentionally.
1. Do not open the device until 5 min after disconnecting it from the mains supply.
  2. Clean the device with a dry cloth.
  3. Carry out maintenance pursuant to the maintenance schedule.

## 10 Repair

Repairs may only be carried out by the manufacturer or by the manufacturer's authorised specialist dealer.

Contact your distributor if you feel that the device is not working properly.

## 11 Decommissioning

If the heating device is no longer used regularly, remove it from service.

- ✓ The device is switched off and disconnected from the mains voltage.
- ✓ Ensured that the device cannot be switched on again without authorisation or unintentionally.
- Disconnect the inductor plug from the generator ►61 | 11.1.
- » The device is out of operation

Adhere to the ambient conditions stipulated for storage.

### 11.1 Disconnecting the inductor from the generator

- ✓ Only disconnect the inductor plug from the generator when the generator is not in operation.
- 1. Press and hold the button on the top of the inductor plug.
- 2. Remove the inductor plug from the socket.
- » The inductor has been disconnected from the generator.

## 12 Disposal

Observe the locally applicable regulations for disposal.

## 13 Technical data

### 22 Available models

Model	P	Ordering designation	Certification
	max.		
	kW		
MF-GENERATOR3.0-3.5KW-230V	3,5	097975176-0000-10	CE
MF-GENERATOR3.0-3.5KW-230V-UK	3,5	306222558-0000-10	UKCA
MF-GENERATOR3.0-3.5KW-240V-CSA	3,5	305347837-0000-10	UL/CSA

### 23 Technical data

Model	P	U	I	f		f <sub>o</sub>		Mains connection plug	L	B	H	m
	max.			from	up to	from	up to					
	kW			Hz	Hz	kHz	kHz					
MF-GENERATOR3.0-3.5KW-230V	3,5	230	16	50	60	10	50	CEE-7/7	320	350	150	7,8
MF-GENERATOR3.0-3.5KW-230V-UK	3,5	230	13	50	60	10	50	CEE-7/7	320	350	150	7,8
MF-GENERATOR3.0-3.5KW-240V-CSA	3,5	240	16	50	60	10	50	NEMA6-20P to IEC C19	320	350	150	7,8

B	mm	Width
f	Hz	Frequency
f <sub>o</sub>	kHz	Output frequency
H	mm	Height
I	A	Amperage
L	mm	Length
m	kg	Mass
P	kW	Power
U	V	Voltage

## 13.1 Operating conditions

The product may only be operated under the following ambient conditions.

### 24 Operating conditions

Designation	Value
Ambient temperature	0 °C to +50 °C
Humidity	5 % to 90 %, non-condensing
Operating location	In closed rooms only.
	No explosion risk in the environment.
	Clean environment

## 13.2 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:** • MF-GENERATOR3.0-3.5KW

**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:**

- EN 55011:2016: Conducted and radiated emission
- EN 61000-6-2:2019: Immunity
- EN 61000-3-11:2019: Emmission
- EN 61000-3-12:2011 + A1:2021: Emmission
- EN 60335-1:2024: Safety of household and similar electrical appliances

H. van Essen,  
Managing Director  
Schaeffler Smart Maintenance Tools BV



Place, Date:  
Vaassen, 23-07-2025



# 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:** • MF-GENERATOR3.0-3.0KW-230V-UK

**Comply with the requirements of:**

- Electrical Equipment (Safety) Regulations 2016 S.I. 2016:1101
- Electromagnetic Compatibility Regulations 2016 S.I. 2016:1091
- RoHS Regulations 2012 S.I. 2012:3032

**Applicable harmonized standards:**

Electric Safety

- EN 60335-1:2020

EMC Emission

- EN 55011:2016
- EN 61000-3-11:2019
- EN 61000-3-12:2011 + A1:2021

EMC Immunity

- EN 61000-6-2:2019

13

H. van Essen,  
 Managing Director  
 Schaeffler Smart Maintenance Tools BV



Place, Date:  
 Vaassen, 25-07-2025



## 14 Accessories

### 14.1 Flexible inductors

④54 Flexible inductor MF-INDUCTOR-3.5KW



0019F803

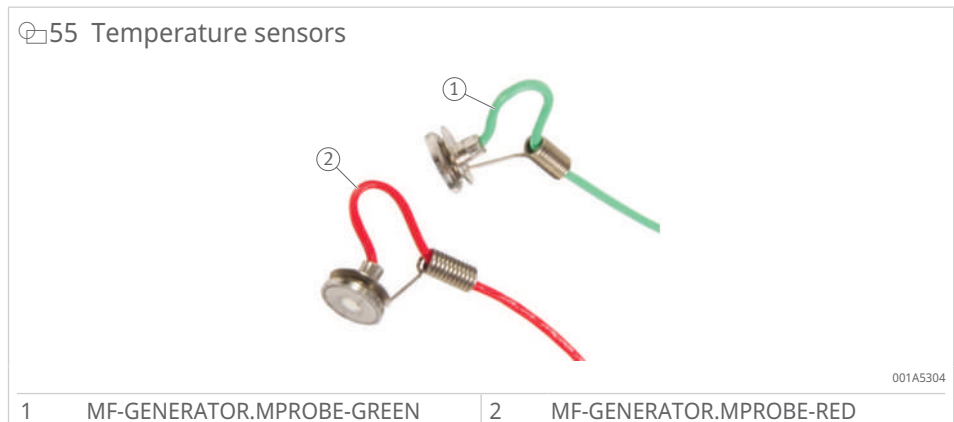
④25 Technical data MF-INDUCTOR

Ordering designation	P	t <sub>max</sub>	L	D	d <sub>min</sub>	T <sub>max</sub>		m	Ordering number
	kW	min	m	mm	mm	°C	°F	kg	
MF-INDUCTOR-3.5KW-5M-D12-180C	3,5	-	5	12	90	+180	+356	1,35	300217072-0000-10
MF-INDUCTOR-3.5KW-7.5M-D12-180C	3,5	-	7,50	12	90	+180	+356	1,95	300217080-0000-10
MF-INDUCTOR-3.5KW-10M-D12-180C	3,5	-	10	12	90	+180	+356	2,6	300217099-0000-10

d <sub>min</sub>	mm	Min. workpiece diameter
D	mm	Outside diameter
L	m	Length
m	kg	Mass
P	kW	Generator output
t <sub>max</sub>	min	Max. operating period
T <sub>max</sub>	°C or °F	Max. temperature

### 14.2 Temperature sensors

④55 Temperature sensors



001A5304

1	MF-GENERATOR.MPROBE-GREEN	2	MF-GENERATOR.MPROBE-RED
---	---------------------------	---	-------------------------

### 26 Temperature sensors

Ordering designation	Colour	L	T <sub>max</sub>		Ordering number
		m	°C	°F	
MF-GENERATOR.MPROBE-GREEN	Green	3,5	+350	+662	097334561-0000-01
MF-GENERATOR.MPROBE-RED	Red	3,5	+350	+662	097335029-0000-01

L                      m                      Length  
T<sub>max</sub>                  °C or °F                  Max. temperature

## 14.3 Magnetic holders

The magnetic holders for flexible inductors provide a rapid means of attaching a flexible inductor.

### 56 Magnetic holders MF-INDUCTOR.MAGNET-D12



Before use, check whether the high force of the magnet can cause damage to the workpiece. The magnetisation introduced by the magnet is > 2 A/cm.

### 27 Magnetic holder

Ordering designation	D	T <sub>max</sub>		Ordering number
	mm	°C	°F	
MF-INDUCTOR.MAGNET-D12	12	+200	+392	300258089-0000-10

D                      mm                      Outside diameter of the flexible inductors  
T<sub>max</sub>                  °C or °F                  Max. temperature

## 14.4 Protective gloves

### 57 Protective gloves, heat-resistant



Heat-resistant protective gloves effective up to +250 °C (+482 °F) are included in the scope of delivery. Heat-resistant protective gloves effective up to +300 °C (+572 °F) can be ordered as an accessory.

 28 Protective gloves, heat-resistant

Ordering designation	Description	T <sub>max</sub>		Ordering number
		°C	°F	
GLOVES-250C	protective gloves, heat-resistant	250	482	300966903-0000-10
GLOVES-300C	protective gloves, heat-resistant	300	572	300966911-0000-10

T<sub>max</sub>

°C or °F

Max. temperature



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