



UNASIS

PRECISION TOOLING



USH1100



USH1200



USH1300

Unasis Induction Heaters

Induktionsanwärmer | Appareil de chauffe par induction |
Calentador de inducción | Inductieverhitter

Instruction Manual





DISTRIBUTOR:



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1. User manual	EN
2. Betriebsanleitung	DE
3. Manual de uso	ES
4. Manuel utilisateur	FR
5. Handleiding	NL

READ THE MANUAL AND SAFETY INSTRUCTIONS BEFORE OPERATING THE DEVICE

Check all parts for possible damage during transportation. In case of damage, please contact the carrier immediately. Because our products are continuously subject to improvements, we reserve the right to make changes.

VOR INBETRIEBNAHME DIE BETRIEBSANLEITUNG UND DIE SICHERHEITSVORSCHRIFTEN AUFMERKSAM LESEN

Alle Teile auf möglichen Transportschaden kontrollieren. Eventuelle Schäden umgehend der Spedition melden. Da unsere Produkte ständig verbessert werden, behalten wir uns Änderungen vor.

ANTES DE LA PRIMERA PUESTA EN MARCHA, LEA ATENTAMENTE EL MANUAL DE USO Y LAS INSTRUCCIONES DE SEGURIDAD

Revise todos los elementos para detectar posibles daños sufridos durante el transporte. En caso de observar algún daño, avise inmediatamente a la empresa de transporte. Debido a que nuestros productos están continuamente sujetos a mejoras, nos reservamos el derecho de realizar cambios.

LISEZ LE MODE D'EMPLOI ET LES CONSIGNES DE SÉCURITÉ AVANT LA MISE EN SERVICE

Vérifiez pour l'ensemble des pièces que celles-ci n'ont pas été endommagées pendant le transport. En cas de dommages, avertissez immédiatement le transporteur. Nos produits étant constamment améliorés, nous nous réservons le droit d'apporter des modifications.

LEES VOOR INGEBRUIKNAME EERST DE GEBRUIKSAANWIJZING EN DE VEILIGHEIDSVORSCHRIFTEN

Controleer alle onderdelen op mogelijke transportschade. Waarschuw bij schade onmiddellijk het transportbedrijf. Omdat onze producten voortdurend worden verbeterd, behouden wij ons het recht voor om wijzigingen aan te brengen.



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1. Safety, warnings and potential hazards

1.1 Explanation of the pictograms








	Forbidden for persons with heart pacemaker or other sensitive implants.
	Wearing of metal parts, watches and jewellery forbidden.
	Forbidden for persons with metal implants.
	Forbidden for magnetically sensitive data media.
	Read the user manual!
	Wear heat-resistant gloves!
	Wear safety shoes!
	Warning of danger.
	Electric shock hazard.
	Warning of magnetic fields.
	Warning of hot surface.
	Warning of heavy object.

1.2 Description of potential hazards



Warning! Voltage

	<p>Be aware that you are working with an electrical appliance. On the mains side as well as internally, voltages occur that can lead to serious injury and death if used inexpertly or improperly.</p> <ul style="list-style-type: none"> - Connect the unit to the mains according to the information on the rating plate.
	<ul style="list-style-type: none"> - Before each use, check the power supply cable for damage. - Safe disconnection from the mains supply must be ensured at all times before starting maintenance and repair work. This can be achieved by removing the mains plug from the socket.




Warning! Electromagnetic field

	<p>Be aware that you are working with an appliance that generates electromagnetic fields. Keep a distance of 1 metre from the unit when switching on.</p>
	<p>These fields can be harmful for persons with active medical aids such as heart pacemakers.</p>
	<p>These fields can be harmful for persons with passive medical aids such as joint prostheses. The wearing of jewellery can also result in injuries due to burns.</p>
	<p>It is forbidden for persons with active medical aids to be in the immediate vicinity of the unit when it is in operation. The generated electromagnetic field may influence the proper function of such medical aids.</p>
	<p>It is forbidden to wear jewellery when working with the generator and inductors. There is a risk of the jewellery being heated by the electromagnetic field and resulting in injuries due to burns.</p>
	<p>For this reason, persons with passive implants are recommended not to enter the immediate vicinity of the induction heater when it is in operation.</p>
	<p>Furthermore, it cannot be ruled out that the electromagnetic fields could cause damage to electronic and magnetic data media. Keep such equipment away from the induction heater.</p>




Caution! Tripping hazard

	Limit the risk of injury due to tripping as far as possible.
	<ul style="list-style-type: none"> - Keep your place of work tidy. Remove any loose and superfluous objects from the immediate vicinity of the unit. - Position any (power supply) cables as low as possible to minimise the risk of tripping.

Caution! Risk of burns

	The workpiece becomes warm to very hot during heating.
	Parts of the unit may also become hot due to contact with the workpiece or the heat radiated by the workpiece.
	Therefore always wear heat-resistant gloves when handling workpieces in order to avoid injury due to burns.

Caution! Risk of injury during lifting

	A number of units in the Unasis heater range weigh more than 23 kg and may therefore not be lifted by one person alone. (see technical specs)
	If a unit weighs more than 23 kg, lift it with two persons or use suitable lifting equipment.
	Wear safety shoes to prevent injury from unintentionally falling workpieces and/or machine parts.

1.3 Safety measures to be taken

- The user must carefully read this manual and be familiar with the safety standards in the work practice.
- Follow the instructions in the manual at all times.
- Check the connection voltage against the rating plate on the unit. If the power cord does not have one, make sure it is fitted with the proper plug. This must be fitted by a qualified electrician.
- Never use or store an induction heater in a damp environment.
Only use Unasis induction heaters indoors.
- If using a mobile version; always lock the castors when not moving the device.
- If the heater is equipped with extendable horizontal supports, always secure them with the appropriate locking pin. both in the fully retracted and in the fully extended position.
- Use suitable lifting equipment according to the weight of the yoke or component.
- Never use a metal strap to support workpieces or suspend them in the magnetic field. High currents could start running through the strap, causing it to heat up.
- Do not hold metal objects near yoke and poles.
- Whilst heating, observe a minimum distance of 1 metre from the heater.
- Never remove the induction yoke during heating.
- Do not modify the heater. Never use home-made yokes.
- Always check that the induction yoke is positioned correctly against the poles, so excessive vibration cannot cause personal injury or damage to the device.
- Do not switch on the heater until the core is closed with a yoke.

1.4 Safety provisions

- The electronic systems switch off automatically if the ambient temperature rises above 70°C.
- When heating in temperature mode, the heater switches off if no 1°C temperature increase is measured during a time pre-set by the manufacturer.
- The coil of the heater is equipped with a temperature monitor. If the coil becomes too hot, the heating process is switched off entirely.
- Models with a swivel arm are equipped with a safety positioning cam.

An induction heater operates by means of a magnetic field.

At a distance of 1 metre, the magnetic field has been reduced to such an extent that it is below the applicable standard of 0.5mT.

WARNING!



We recommend that people be kept at least 1 metre away from the device once it has been switched on.

2. Introduction

2.1 Application

Unasis induction heaters are intended for heating bearings, so they can be assembled easily by means of a shrink fit. Subject to professional assessment, they can also be used to heat bushes, cogwheels, couplings and metal objects that form a closed circuit. Bearings and workpieces are demagnetised automatically after each heating cycle.

Bearings and workpieces can be heated to a maximum temperature of 240°C (464°F).

Unasis induction heaters are suitable for continuous use. However, when heating to a temperature of 240°C (464°F), we recommend that you do not do so for more than half an hour. Use an external thermometer.

CAREFUL!

- Bearings may be heated to a maximum of 120°C (248°F).
- Precision bearings may be heated to a maximum of 70°C (158°F). Higher temperatures can affect metallurgical structure and lubrication, resulting in instability and failure.
- Do not use a heater for bearings and workpieces that are outside the minimum and maximum dimensions specified in the technical data.
- Never switch off the unit with the main switch while it is still heating up.

2.2 Operating conditions

- Only use the device indoors.
- Fit for use in an industrial environment, at an ambient temperature of 0°C (32°F) to 50°C (120°F) and humidity of 5 to 90% – non-condensing.
At temperatures below 0°C (32°F), the unit stops operating.

2.3 Principle of operation




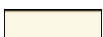


The operation of the heater is based on inducing a (low frequency) current in the bearing. This is achieved by incorporating the bearing as a secondary winding in a transformer.

The primary winding is connected to the mains by means of an electronic controller. The magnetic field induces a high current (short-circuit current) through the bearing, which then becomes hot. After each heating cycle, the bearing or workpiece is demagnetised.



3. Installation

- Remove the packaging and place the induction heater on a **non-ferrous, stable and level** surface. Put heaters with wheels on the brake to prevent the heaters from moving.
- A Unasis heater is supplied with yokes, temperature sensor, heat-resistant gloves (suitable up to 250°C / 482°F) and acid-free Vaseline.
- **Check the connection voltage against the rating plate on the unit.**
- Each heater is equipped with a plug. As there is a wide variety of plug types, the attached plug may not fit. In such cases, obtain a proper plug. It must be fitted by a qualified electrician. There are 2 fitting options depending on the type of cable on the heater:

120V/230V 1 phase heaters		120V/230V 1 phase heaters cCSAus	
 brown	phase	 black	phase
 blue	zero	 white	zero
 Green/yellow	earth	 green	earth

- Ensure that the power supply cable cannot come into contact with the workpiece to be heated. Insert the plug in a socket outlet with earth connection.
- Switch on the device by means of the main switch. The machine is starting up. Starting up takes some time.
- Connect the temperature sensor by inserting the plug into the socket. Make sure that the – and + of the plug correspond to that of the socket.
- The induction heater is now ready for use.

4. Explanation of display, buttons and connections



- Touchscreen:
 - time or temperature
 - heating mode
 - settings
 - information
 - red temperature = T1
 - green temperature = T2

- Start /Stop button heating / automatic demagnetisation



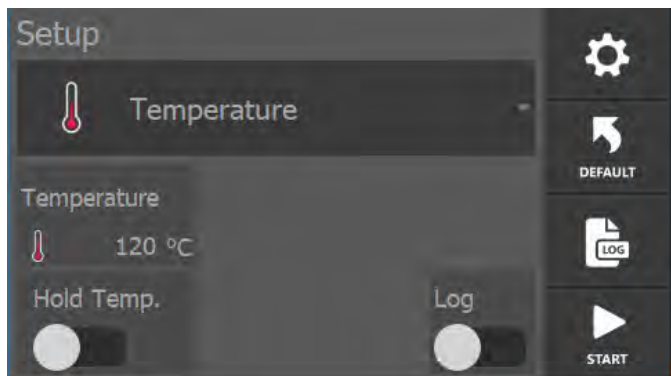
Sensor connections T1 and T2
 T1 (red on display) is the main temperature that controls the heating process.
 T2 (green on display) is an additional measurement that can be used to monitor and adjust a temperature difference, ΔT , in a workpiece during heating



USB port for logging purposes (stored heating data)

4.1 Explanation of touchscreen operating elements

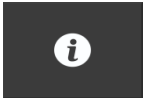


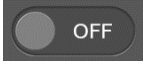

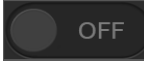
The operating panel consists of a touchscreen.

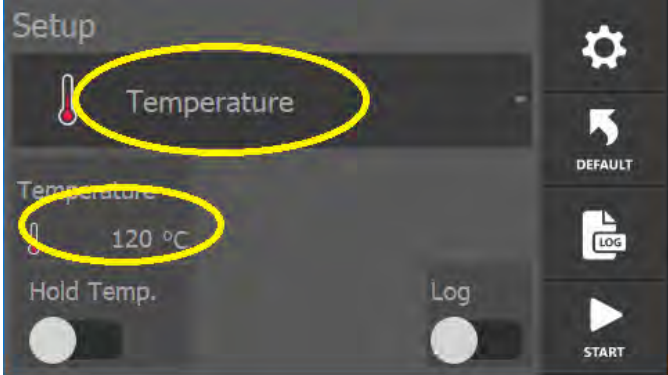


Different pages are displayed on the screen with i.a. different buttons, setting possibilities and operating modes.

The most frequently used buttons and how variables can be set are explained below.

	Start heating process.
	Stop heating process.
	To settings menu.
	To administrator (factory) settings. Not accessible to the end user.
	Back / previous screen.
	To next page.
	To previous page.
	Reset appliance to default settings.


	Call up additional heating information.
	Adapt target heating during heating process.
	Access to log data.
	Sliders on/off. The corresponding option is switched on or off.
	
	Slider "not available". The corresponding option cannot be switched on or off due to settings made elsewhere.

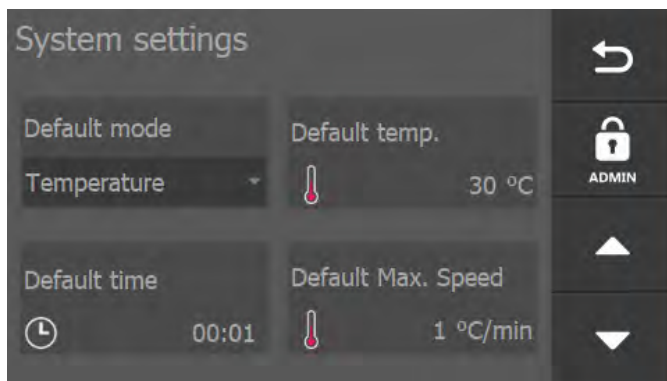





Variables can be set or changed by tapping them.
Usually, a selection menu or keypad is then displayed. This principle applies to every screen. With the help of the sliders, elements can be switched on or off.

5. System settings


5.1 General

The heater offers the possibility to set and adjust parameters according to personal wishes and preferences. The parameters can be set according to the demands made on a heating process. Pressing settings  displays the following screen:



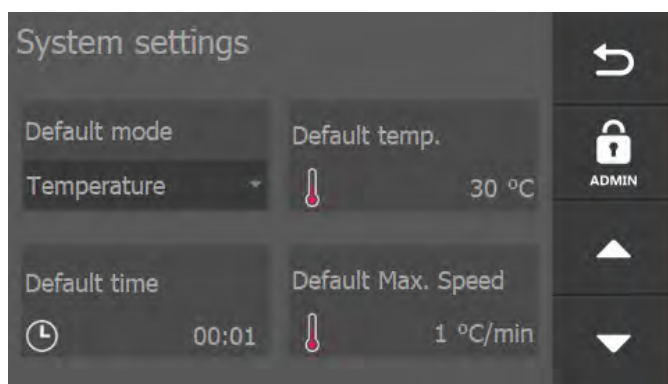
With the buttons “page forward” , “page back”  and “back / previous page”  the user can navigate through the various settings pages. Tapping allows its settings to be changed.

About Admin settings

An “ADMIN” button  is displayed on this screen.

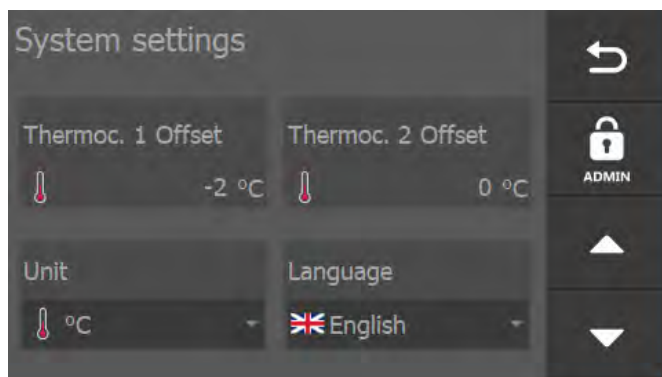
Settings are made by the manufacturer in the Admin settings. These settings are essential for the type of heater and are not at the user level and are therefore not accessible. These settings are protected by a password.

5.2 Explanation of system settings – screen 1



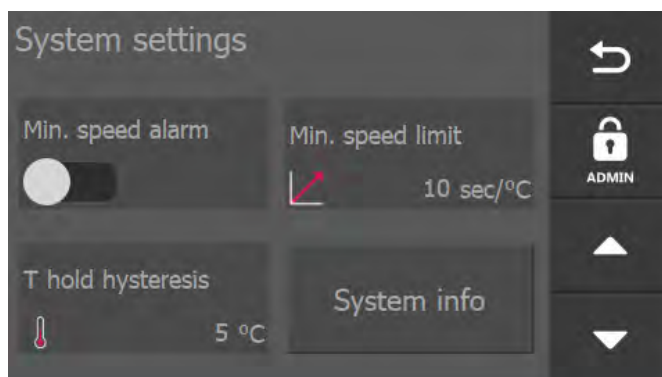
Default mode:	Heating mode to which the heater is set and in which it starts for the first time, or to which it returns if “Default” is pressed.
Default temp:	Setpoint temperature at which the heater starts, or to which it returns if “Default” is pressed.
Default time:	Setpoint time with which the heater starts, or to which it returns if “Default” is pressed.
Default Max. speed:	Maximum setpoint, maximum heating speed in the temp&speed modes. This does not mean that the heater will always reach this speed. This depends, among other things, on the geometry of the workpiece, the yoke used, etc.

5.3 Explanation of system settings – screen 2



Thermoc. 1 Offset	Calibration / correction readout thermocouple 1
Thermoc. 2 Offset	Calibration / correction readout thermocouple 2
Units:	Setting of the temperature measurement in °C or °F.
Language:	Setting of the language in which the texts on the screen are displayed. Choice of Dutch, English, German and Italian.

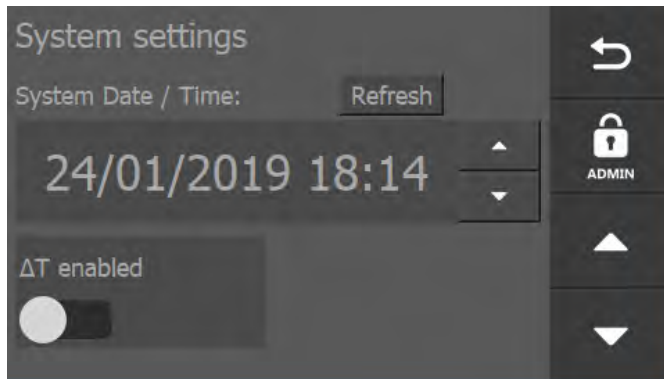
5.4 Explanation of system settings – screen 3



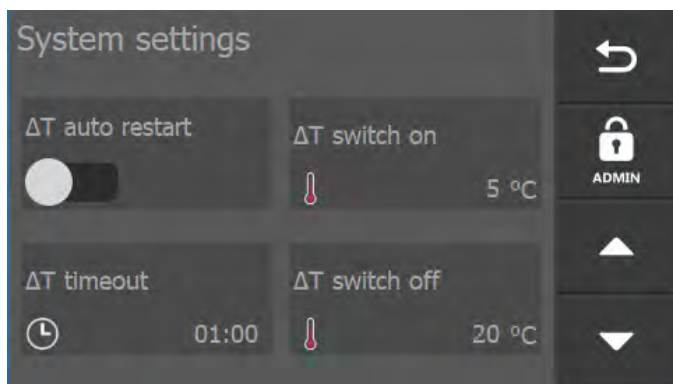
Min. speed alarm:	Alarm if insufficient temperature increase is measured according to the Min. speed limit setting.
Min. speed limit:	Minimum temperature gradient.
T hold hysteresis:	Temperature at which the workpiece may be lowered before the heating process restarts automatically
System info:	Information about firmware versions

T hold hysteresis is the setting that belongs to T hold in the set up (heating) screen.

5.5 Explanation of system settings – screens 4 and 5



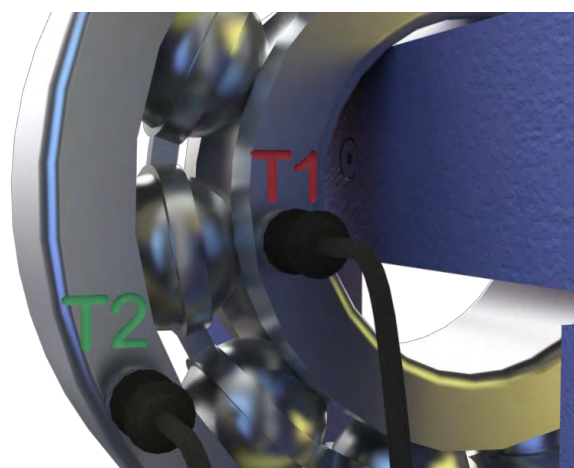
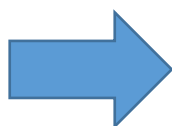
In this screen, the system date and time can be set.
Depending on whether you want to use the ΔT functionality, switch on “ ΔT enabled”.
Only when you switch on “ ΔT enabled”, another screen is available in which you can enter the desired settings for this functionality.



- | | |
|--------------------------|---|
| ΔT Auto restart: | Activate or deactivate automatic restarting of heating as soon as ΔT is within the permitted limits of “ ΔT switch on” again. |
| ΔT timeout: | Time within which a restart must take place after exceeding ΔT . |
| ΔT switch on: | The temperature difference between 2 measuring points on a workpiece at which the heating process is allowed to be switched on again after previously being switched off due to exceeding of the limit value for ΔT . |
| ΔT switch off: | The temperature difference between 2 measuring points on a workpiece at which the heating process is stopped. |

6. The magnetic temperature sensor

- The magnetic temperature sensor (sensor) must always be used when heating in one of the “temperature modes”.
- The sensor can be used as a tool for temperature control whilst heating in “time mode”.
- The sensor is suitable for a maximum temperature of 240°C (464°F).
- In the event of temperatures exceeding 240°C (464°F), the connection between the magnet and the sensor is interrupted. The heater switches off automatically when the sensor does not detect a temperature increase.
- Special clamp sensors are available for non-magnetic workpieces.
- Make sure that the sensor and workpiece surfaces are clean.
- Always place sensor T1 on a flat area as close as possible to the bore. Connect the sensor by inserting the plug into the socket (in the casing). Make sure that the – and + of the plug correspond to that of the socket. If desired, a second sensor, T2, can be used for additional control or monitoring of a temperature difference, ΔT , between 2 points on the workpiece.



- Correct sensor positions for heating with double temperature measurement and ΔT monitoring.
T1 (main temperature) on the bore.
T2 on the outer ring.

CAREFUL!

- Handle the sensor with care! It is a vulnerable part of the heater. After use, place the sensor on the side of a vertical pole.

7. Method of Investigation

WARNING!



Use suitable lifting equipment for heavy yokes and workpieces. Prevent personal injury by improper handling.

The weight of the workpiece may not exceed the value given in section 6.3 and in the technical data. This can cause failure of the device and personal injury.

Ensure that the power supply cable cannot come into contact with the workpiece to be heated. Damage to the cable can cause electrocution!

Never use a metal strap to support workpieces or suspend them in the magnetic field. High currents could start running through the strap, causing it to heat up.

A workpiece can be placed in 2 different ways:

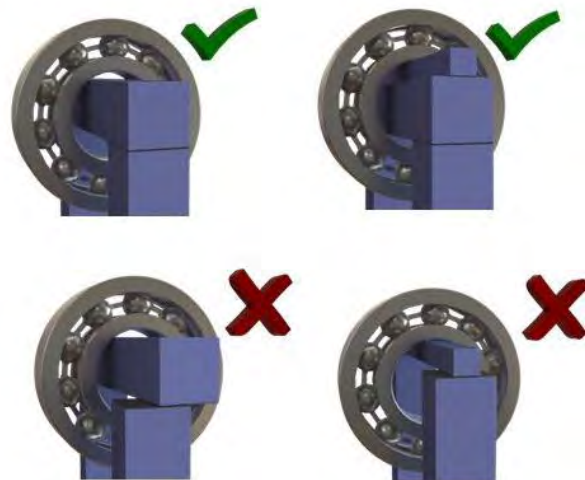


Hanging, with yoke through the workpiece Horizontal, with workpiece around the pole

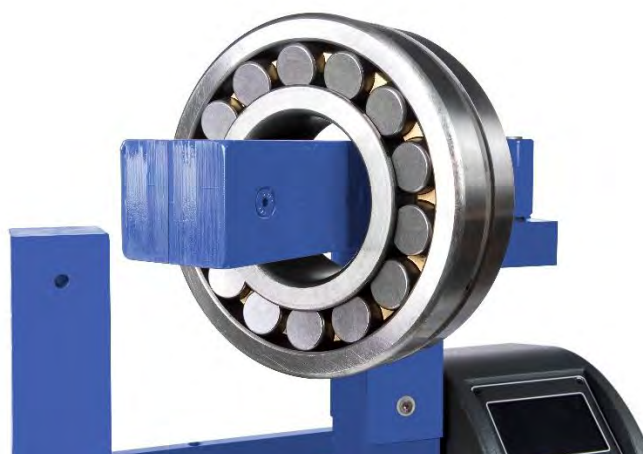
Large workpieces can be thermally insulated by wrapping them in insulating material, such as a welding blanket. This ensures that the heat stays in the workpiece and does not dissipate.

7.1 Heating a hanging workpiece

- Place the induction yoke with the bearing on the poles. Make sure that the ground side is positioned straight on the poles.
- Always choose an induction yoke that fills the bore of the bearing as much as possible. You can even use 2 yokes at the same time. This promotes optimal, fast and even heating.
- Make sure that the bare-metal sides are sufficiently coated with Vaseline to ensure optimal contact and avoid vibration.



- Swivel arm models: swivel the yoke open (towards you) until it drops in the safety positioning cam. Slide the workpiece over the yoke until it is in the middle. Swivel the yoke back to the pole.



- Always make sure that the workpiece does not come into contact with the plastic housing of the heater. When the heating is finished, follow the instructions in reverse order. Use heat-resistant gloves to move the heated workpiece.

7.2 Heating a horizontal workpiece

- This is only possible if the bore of the workpiece is large enough to fit over the pole.
- Place the workpiece as centrally as possible around the pole on the horizontal supports.
- The workpiece may not be wider than the horizontal supports.
- Always choose the largest induction yoke.
- Make sure that the bare-metal sides are sufficiently coated with Vaseline to ensure optimal contact and avoid vibration.



- Always make sure that the workpiece does not come into contact with the plastic housing of the heater. When the heating is finished, follow the instructions in reverse order. Use heat-resistant gloves to move the heated workpiece.

7.3 Maximum weights for swivel arm models

Table for maximum permitted weights on the horizontal supports and the (swivel) yokes:

Type	on supports	Size of (swivel) yoke								
		7 mm	10 mm	14 mm	20 mm	30 mm	40 mm	50 mm	60 mm	70 mm
USH-1100	50 kg	1 kg	2 kg	3 kg	5 kg	10 kg	15 kg	n/a	n/a	n/a
USH-1200	100 kg	n/a	2 kg	3 kg	5 kg	10 kg	15 kg	20 kg	n/a	n/a
USH-1300	150 kg	n/a	n/a	n/a	10 kg	15 kg	25 kg	40 kg	45 kg	50 kg

- Keep to these maximum weights and avoid tilting the heater or damaging the supports, (swivel) yokes or hinge.
- Workpieces with a higher weight can rest on the supports or be supported by a non-metallic sling of a crane, to prevent any weight resting on the yoke.

CAREFUL!

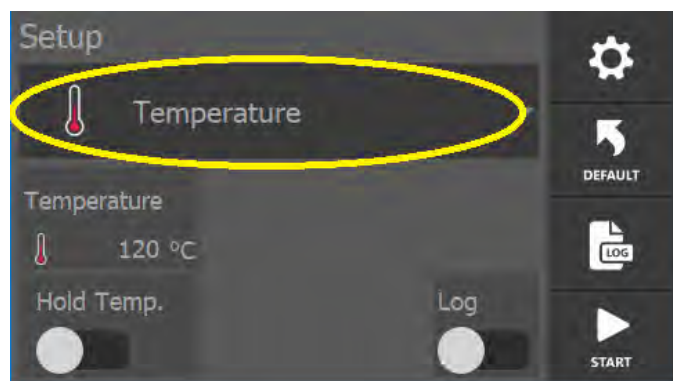
- Always handle induction yokes with care. They are damaged easily when dropped, knocked against something, etc. Store them immediately after use.

8. Operation

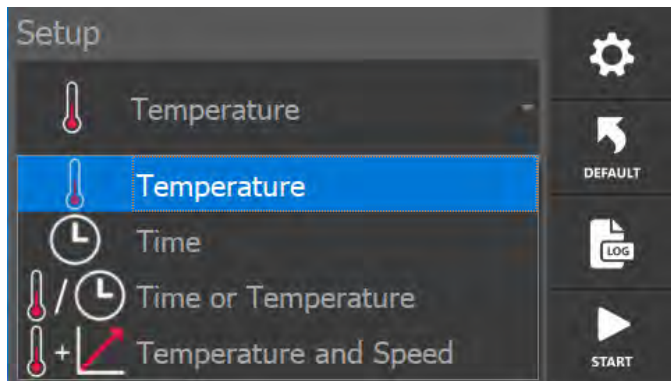
There are 4 heating modes:

Temperature mode	Time mode
<ul style="list-style-type: none"> For controlled heating up to the desired temperature. And if you want to make use of the thermostat feature. This feature maintains the heated workpiece at the pre-set temperature for a maximum period of 5 minutes. 	<ul style="list-style-type: none"> Suitable for series production. If the time needed to reach a certain temperature is known, the workpiece can be heated in series with the time mode. In the event of an emergency. If the sensor is faulty, as a contingency measure, the workpiece can be heated with the time mode. The temperature may be measured with an external thermometer.
With the temperature or time mode	With the temperature & speed mode
<ul style="list-style-type: none"> For controlled heating up to the desired temperature or duration. Depending on which of these is reached or elapsed first, the heater switches off. 	<ul style="list-style-type: none"> In the case of controlled heating to the desired temperature, whereby a maximum temperature gradient per time unit can be entered so the workpiece is heated according to a certain curve.

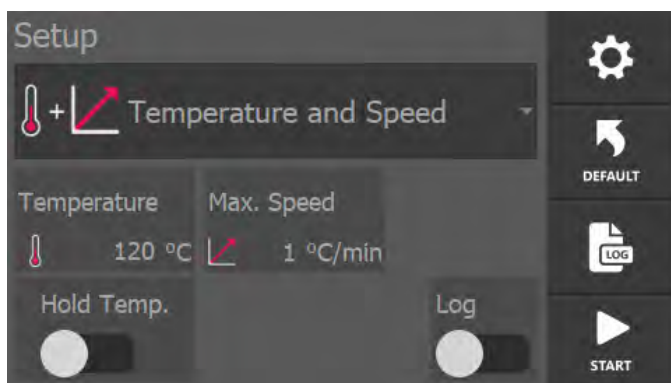
8.1 Selecting heating modes




The various heating modes can be selected by tapping the current mode on the settings screen.



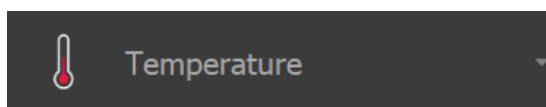
A selection menu appears below the current mode, in which one of the four heating modes can be selected by tapping. The selection made is then displayed under “Mode” and the selection menu disappears from the screen again. More, less or other variable parameters may be displayed, depending on the choice made.



Example screen after selecting “Temp & Speed”.

If required, press “Default”  to call up the default settings of the heater as set in the settings menu.

About the heating modes



Temperature mode

Heating of workpieces to a set temperature; the temperature of the workpiece is monitored during the whole process.

In the settings menu, it is possible to select a double measurement / ΔT measurement here. T1 (temperature sensor 1) is the main sensor here and is the master for the heating process.

In this mode, one or more temperature sensors have to be used that are positioned on the workpiece to be heated.



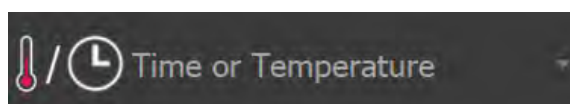
Time mode

Heating of workpieces over time. The heating process is performed for a set time. The workpiece temperature is not measured or checked.

This mode can be used when you know in advance how long it takes to heat a given workpiece to a

given temperature.

This is the only mode in which the heater can function without temperature sensors being connected.



Temperature or time mode

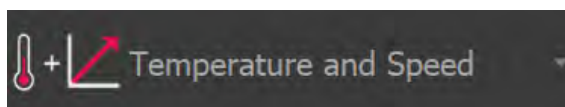
Heating of workpieces to a set temperature with the temperature of the workpiece being monitored during the whole process, or heating over time.

In the settings menu, it is possible to select a double measurement / ΔT measurement here. T1 (temperature sensor 1) is the main sensor here and is the master for the heating process.

In this mode, both the desired workpiece temperature and the desired heating time have to be set.

The heater switches off when one of the two settings (temperature or time) is reached or has elapsed.

In this mode, one or more temperature sensors have to be used that are positioned on the workpiece to be heated.



Temperature and speed mode

Heating of workpieces to a set temperature; the temperature of the workpiece is monitored during the whole process.

In this mode, a gradient is also entered with which the heating process may take place. In the settings menu, it is possible to select a double measurement / ΔT measurement here. T1 (temperature sensor 1) is the main sensor here and is the master for the heating process.

For example: Heat the workpiece to 120°C with a gradient of 5°C/min.

After switching on the process, the heater controls the power output so the heating curve for the workpiece follows the gradient set.

During heating, a white dotted line is shown in the chart, indicating the ideal curve for the heating process. The actual curve will be slightly above this line, since the controller first has to find a balance between temperature increase and the matching power output.

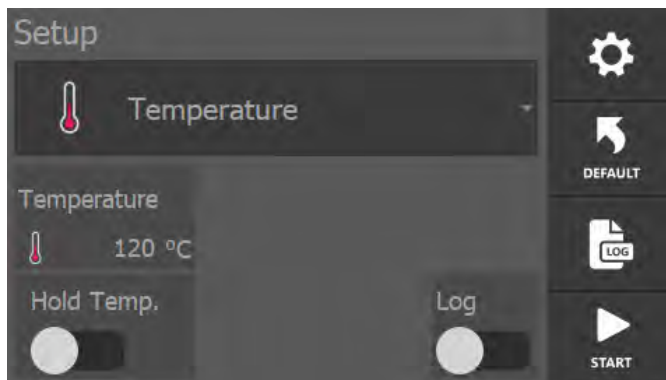
Note! This mode functions well only if the gradient set is realistic in relation to the maximum power that the heater can output and input into the workpiece.

The gradient can be set in X°C/min.

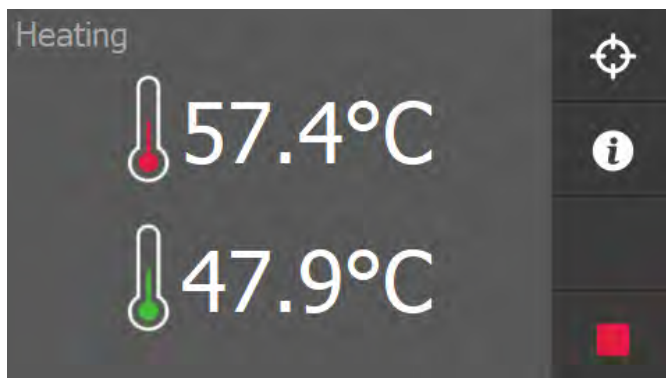
In this mode, one or more temperature sensors have to be used that are positioned on the workpiece to be heated.

8.2 Heating in temperature mode


- Position the workpiece and sensor (according to chapters 6 & 7.)
- Switch on the heater and select the temperature mode if necessary.



- If necessary, change the temperature set by pressing the current temperature.
- If desired, switch on the “hold temp.” (thermostat mode) and log functionality by moving the sliders to the right. These will now turn green.
- Press ‘**START**’. The heating starts, you will hear a slight humming sound.
- The display shows the current temperature of the workpiece.
If a second sensor is attached to the workpiece, this temperature also appears on the display.



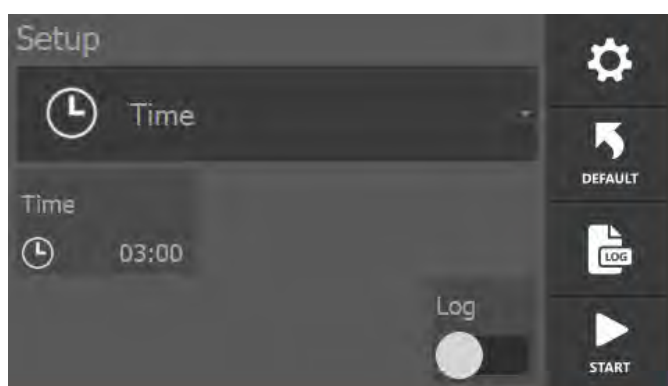
Heating				
T_1	71.9°C	T_{target}	120°C	
T_2	56.0°C			
		I_{mains}	16.0A	
T_{coil}	30.2°C			

By pressing the info button , the heating process is displayed graphically. Pressing info again displays additional information from the process.

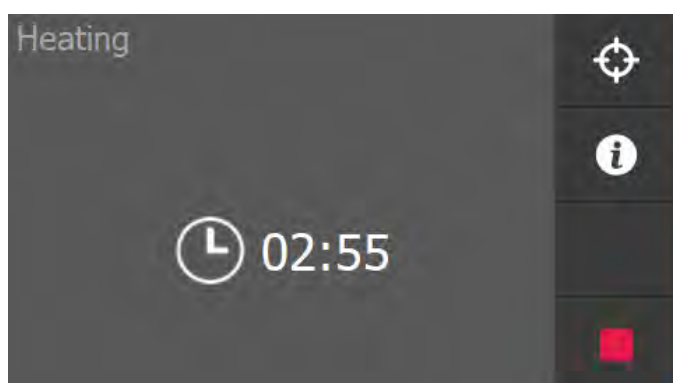
- Unless the thermostat function is switched on, heating will stop automatically when the set temperature is reached. A loud beep sounds, and the display shows information about how the heating process went. The beep can be ended by pressing “stop”.
- When the thermostat function is switched on, unless you press **STOP**, the workpiece will be kept at the set temperature for the time set. Heating starts again after the temperature has dropped to the temperature set in the system settings to which the workpiece is allowed to drop. Each time the set temperature is reached, the induction heater sounds a loud beep.
- During this cycle, a clock is displayed at the bottom of the screen with the time remaining for the temperature hold mode. After the temperature hold time has elapsed, the heater sounds a continued loud beep, which can be ended by pressing **STOP**.
- Each time the induction heater stops, it automatically demagnetises the workpiece.
- The heating process or thermostat feature can be interrupted by pressing ‘**STOP**’.

8.3 Heating in time mode

- Position the workpiece and any sensors (according to chapters 6 & 7.) Only use the sensor if you want to check the temperature before the countdown has completed.
- Switch on the heater and select the time mode if necessary.



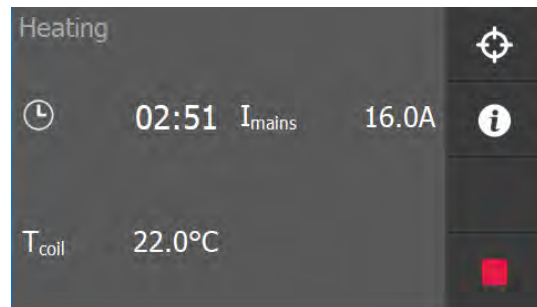
- If necessary, change the time set by pressing the current time.
- Press ‘**START**’. The heating starts, you will hear a slight humming sound. The display shows the time left until process completion.



If you have connected the sensors and placed them on the workpiece, the temperatures measured are also shown on the display.

NOTE! In time mode, the process does nothing with these temperatures!

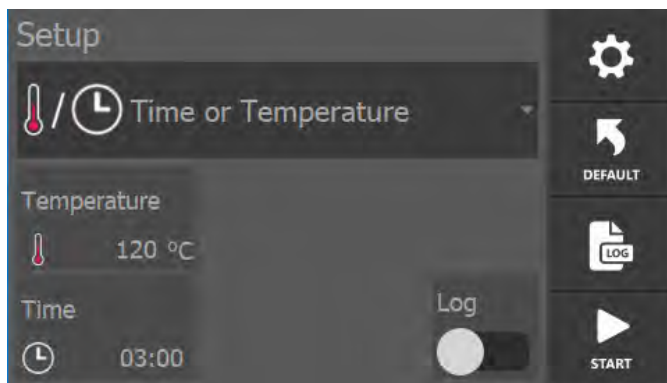
Only when sensors are connected, the heating process is displayed graphically by pressing the info button **i**. Pressing info again displays additional information from the process.



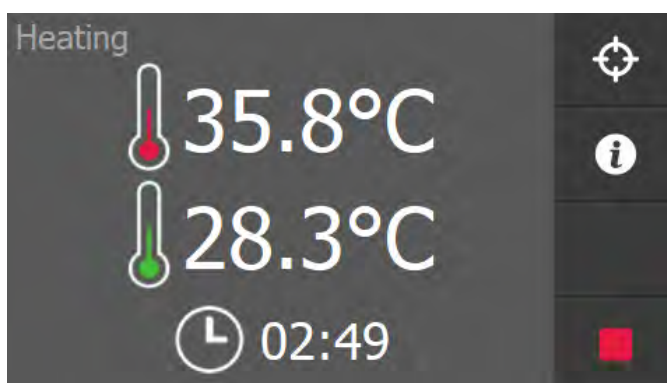
- During heating, the pre-set time counts down to 00:00. When 00:00 is reached, the induction heater switches off. The workpiece is then demagnetised automatically and a loud, continuous beep sounds. Press **STOP** to switch off the beep.

8.4 Heating in temperature or time mode

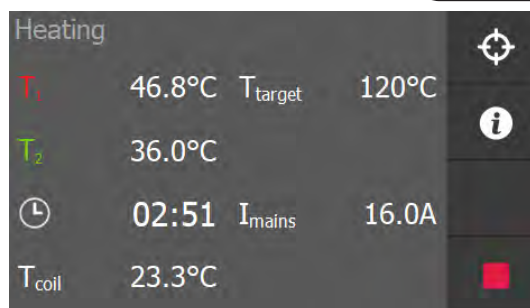
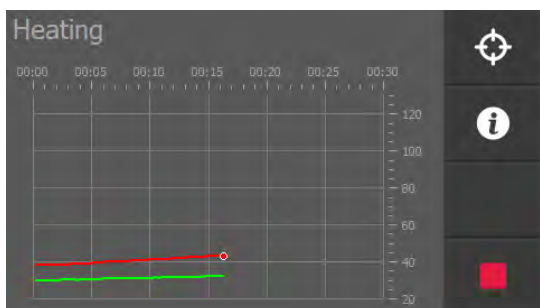
- Position the workpiece and sensor (according to chapters 6 & 7.)
- Switch on the heater and select the temperature or time mode if necessary.



- If necessary, change the temperature and/or time set by pressing the current values.
- Press '**START**'. The heating starts, you will hear a slight humming sound. The display shows the temperature and the time left until process completion.



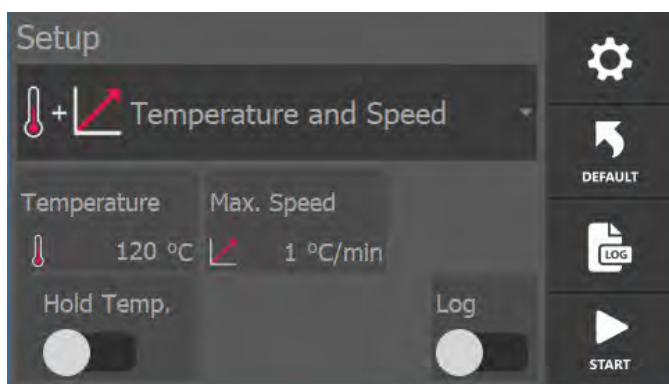
By pressing the info button **i**, the heating process is displayed graphically. Pressing info again displays additional information from the process.



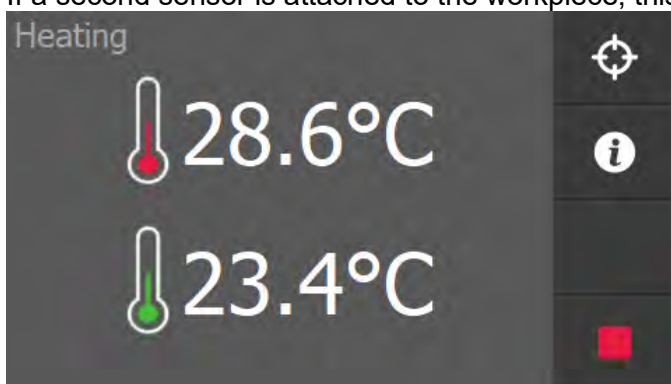
- Heating runs until the set temperature is reached or until the set time has elapsed, whichever comes first. The workpiece is then demagnetised automatically and a loud, continuous beep sounds. Press **STOP** to switch off the beep.

8.5 Heating in temperature & time mode

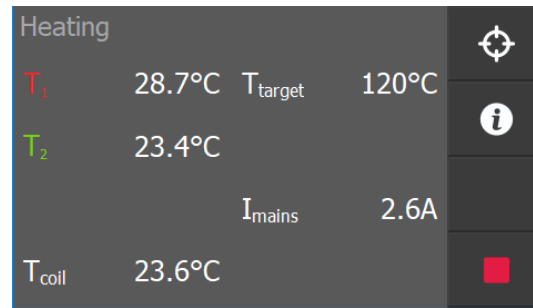
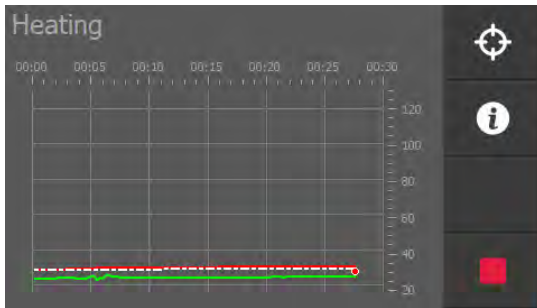
- Position the workpiece and any sensors (according to chapters 6 & 7.)
- Switch on the heater and select the temperature & speed mode if necessary.



- If necessary, change the temperature and gradient set by pressing the current values.
- Press **'START'**. The heating starts, you will hear a slight humming sound. The display shows the current temperature of the workpiece. If a second sensor is attached to the workpiece, this temperature also appears on the display.



By pressing the info button **i**, the heating process is displayed graphically. The white dotted line indicates the gradient at which the process is set. Pressing info again displays additional information from the process.



- Unless the thermostat function is switched on, heating will stop automatically when the set temperature is reached. A loud beep sounds, and the display shows information about how the heating process went. The beep can be ended by pressing “stop”.
- When the thermostat function is switched on, unless you press **STOP**, the workpiece will be kept at the set temperature for the time set. Heating starts again after the temperature has dropped to the temperature set in the system settings to which the workpiece is allowed to drop. Each time the set temperature is reached, the induction heater sounds a loud beep.
- During this cycle, a clock is displayed at the bottom of the screen with the time remaining for the temperature hold mode. After the temperature hold time has elapsed, the heater sounds a continued loud beep, which can be ended by pressing **STOP**.
- Each time the induction heater stops, it automatically demagnetises the workpiece.
- The heating process or thermostat feature can be interrupted by pressing the '**STOP**' button.

8.6 Workpiece installation

- After pressing '**STOP**', place the sensor(s) on the side of the pole. By pressing '**STOP**', the workpiece is demagnetised automatically.
- Wear heat-resistant gloves. Place the yoke with the workpiece on a clean surface or if the heater is equipped with a swivel arm, swivel the yoke forwards into the positioning cam, slide the workpiece off.
- Fit the workpiece without delay and prevent cooling down.

8.7 Error messages

The heater continuously monitors process parameters and other variables that are important for the heating process to run as smoothly as possible.

If something is wrong, the heating process usually stops, and a pop-up screen appears with an error message.

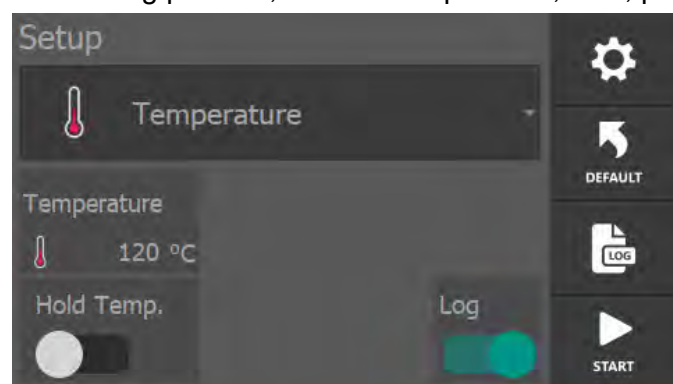
Error message	Nature of the error	Solution
"No temperature increase measured"	Insufficient temperature rise within set time.	Switch off the mode or set it differently. If the error still occurs, consider using a heavier device.
"An internal communication error occurred"	Communication problem between printing that could not be resolved automatically.	Switch off the device with the main switch and wait a few seconds. Then switch the device on again.
"Thermocouple 1 disconnected"	Thermocouple 1 is not connected or defective.	Connect a thermocouple or try a different thermocouple.
"Thermocouple 2 disconnected"	Thermocouple 2 is not connected or defective.	Connect a thermocouple or try a different thermocouple.
"Delta T timeout"	The difference in temperature between the two sensors did not fall below the set limit value within the set time during a ΔT pause.	If desired, increase the pause time for ΔT .
"The mains voltage has dropped below the operating limit"	The supply voltage is lower than 80V.	Check the mains voltage.
"The mains voltage has exceeded the operating limit"	The supply voltage is above 280V.	Check the mains voltage.
"The mains frequency has dropped below the operating limit"	The AC frequency is lower than 45Hz.	Check the mains frequency.
"The mains frequency has exceeded above the operating limit"	The AC frequency is higher than 65Hz.	Check the mains frequency.
"The mains frequency is too unstable for operation, Attention: the yoke has not been demagnetized!"	The AC frequency is unstable.	Check the mains frequency.
"The environment temperature is below the machine operating range"	The ambient temperature is lower than -10°C .	Switch off the device and wait until the ambient temperature has risen above -10°C (14°F). If the temperature is within the limit and the error still occurs, please contact your supplier.
"The environment temperature is above the machine operating range"	The ambient temperature is higher than 70°C .	Switch off the device and wait until the ambient temperature has dropped below 70°C (158°F). If the temperature is within the limit and the error still occurs, please contact your supplier.
"The mains current has exceeded its limit, Attention: the yoke has"	An effective current from the mains is too high.	Switch the device off and on and try again.

not been demagnetized!"		If the problem persists, contact your supplier.
"The coil current has exceeded its limit, Attention: the yoke has not been demagnetized!"	An effective current through the coil is too high.	Switch the device off and on and try again. If the problem persists, contact your supplier.
"The capacitor current has exceeded its limit, Attention: the yoke has not been demagnetized!"	An effective current through the capacitor is too high.	Switch the device off and on and try again. If the problem persists, contact your supplier.
"The coil temperature is too low"	The coil temperature -10°C.	Switch off the device and wait until the ambient temperature has risen above -10°C (14°F). If the temperature is within the limit and the error still occurs, please contact your supplier.
"The coil temperature is too high"	The coil temperature 120°C.	Switch off the device and wait until the ambient temperature has dropped below 120°C (248°F). If the temperature is within the limit and the error still occurs, please contact your supplier.
"A coil current peak detected, Attention: the yoke has not been demagnetized!"	A current peak has been detected.	Switch off the device and wait a few seconds before switching it on again.
"A coil voltage peak detected, Attention: the yoke has not been demagnetized!"	A voltage peak has been detected exceeding 500V.	Switch off the device and wait a few seconds before switching it on again.
"Lost connection to system!"	An internal communication error in the HMI or an application error, which should be resolved automatically; if not, a reboot may be necessary.	If this does not fix itself, switch off the device and wait a few seconds before switching it on again
"The heater is in alarm condition, Trying to clear the alarm."	The power control indicates a communication error and an attempt is made to fix it.	If this does not fix itself, switch off the device and wait a few seconds before switching it on again

9. Log functionality

9.1 Logging

Each heating mode has a slider on the screen with which the log functionality of the heater “Log” can be activated or deactivated. This functionality offers the possibility of defining certain parameters for the heating process, such as temperature, time, power, operator and workpiece data.

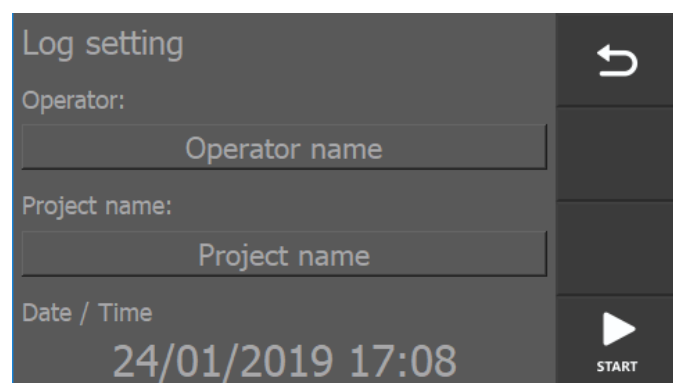


NOTE!

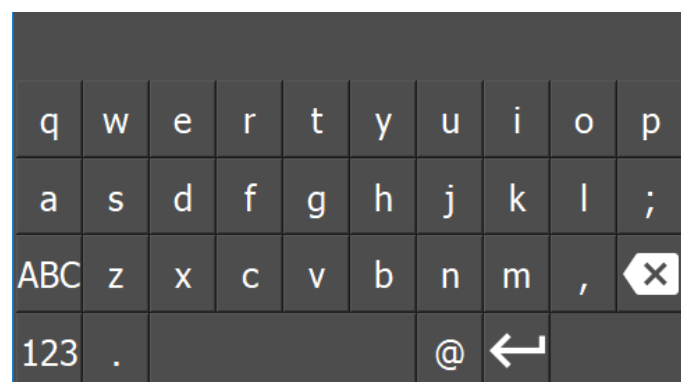
In order to be able to log and export these data, an empty USB data carrier (not supplied) must be plugged in to the USB port provided at the side of the device.


If this functionality is activated, a menu appears each time the “start” button is pressed in which data has to be entered. Only then can heating actually be started.

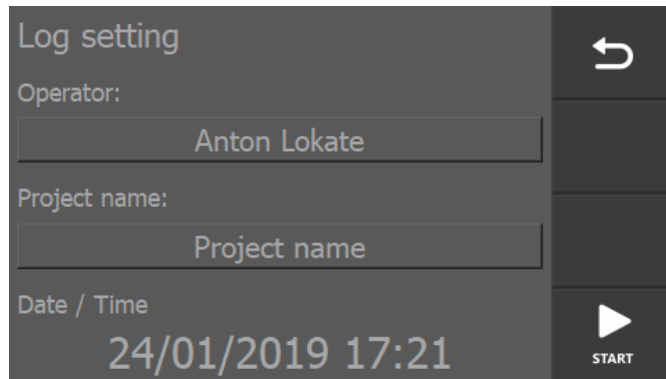
Pressing “Start”  displays the following screen:



Tap the item to be changed/entered. A keypad is displayed.



Enter the data and exit with enter. The keypad disappears from the display and the entered data is transferred to the corresponding field. 



Log setting


Operator:
Anton Lokate

Project name:
Project name

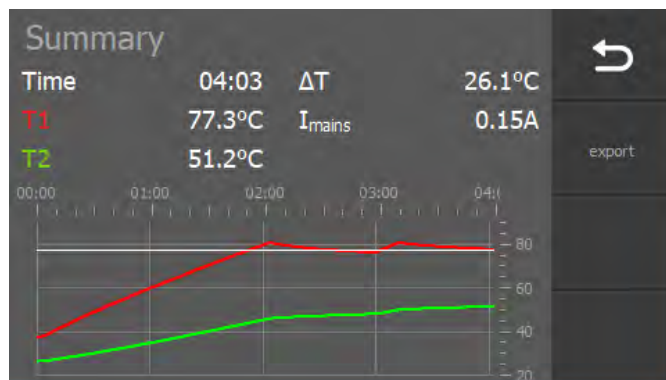
Date / Time
24/01/2019 17:21

START

Repeat the above steps, if necessary, for the other input field.

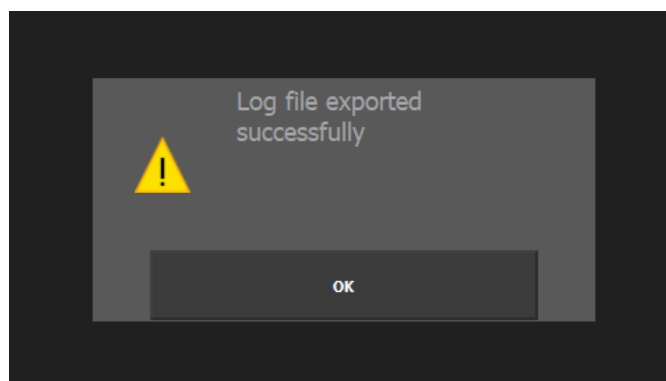
Pressing “Start”  now starts the heating process and the heating data are coupled to the entered data, operator and project name. The system date and time are also included.

When the process has been completed, an overview screen with all the heating data is displayed.



Now the heating data can be exported to a USB data carrier as a CSV file. To do so, tap the Export button.

The screen below appears as a sign that the export of the log file has been successful. Press “OK” to confirm the message and to clear the message from the screen.



The file is now stored as a **.CSV file** (comma separated variables) that can be imported, for example, into Microsoft Excel for processing as a report.

It is not necessary to export the log files immediately after each heating cycle. The files are stored on the heater and can be selected from a list at a later stage to view and/or export them to a USB data carrier. See section 9.5.

9.2 Access to the log files

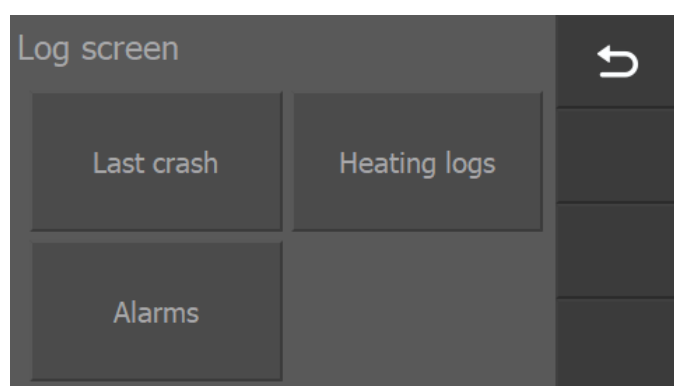
In addition to the log functionality, which can be switched on or off, the heater automatically saves certain data from the heating process.


This data includes:

- Last crash, data from the process shortly before the generator failed (crashed) for whatever reason
- Heating logs, data on stored heating processes
- Alarms occurring during the process

Press the “log” button  on the right side of the settings screen to view the logs.

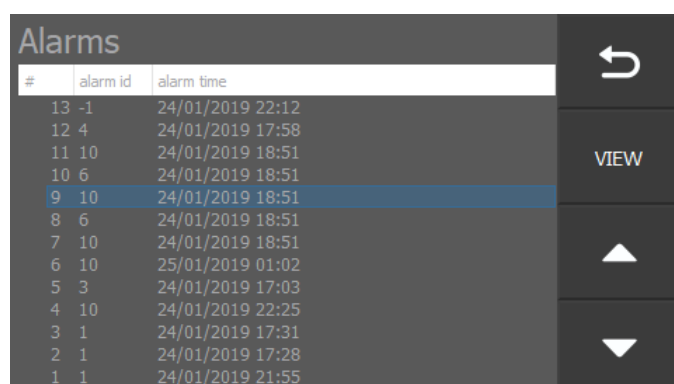
An overview screen is displayed with three types of log.



Leave the screen by pressing “previous” . Select the log you want to view by pressing it.

9.3 Alarms

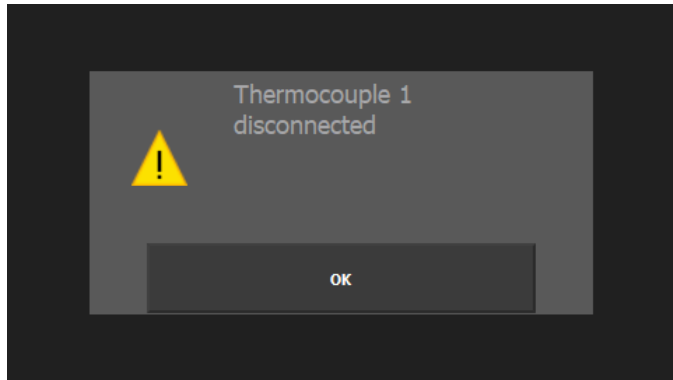
By pressing “Alarms” an overview will be displayed of alarms that have occurred.



#	alarm id	alarm time
13	-1	24/01/2019 22:12
12	4	24/01/2019 17:58
11	10	24/01/2019 18:51
10	6	24/01/2019 18:51
9	10	24/01/2019 18:51
8	6	24/01/2019 18:51
7	10	24/01/2019 18:51
6	10	25/01/2019 01:02
5	3	24/01/2019 17:03
4	10	24/01/2019 22:25
3	1	24/01/2019 17:31
2	1	24/01/2019 17:28
1	1	24/01/2019 21:55

Use the arrow keys to select which alarm you want to view and then press “view”

The type of alarm is now displayed. For example:



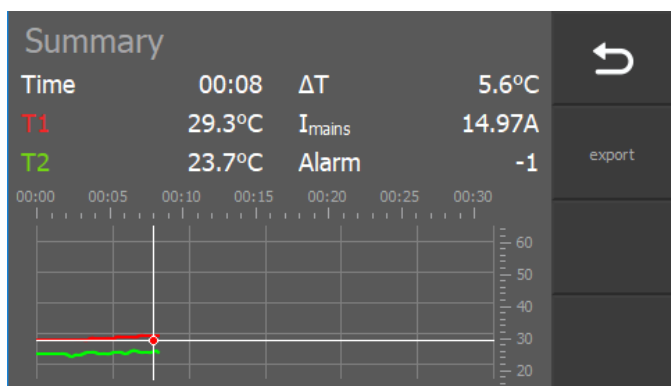
Press “ok” to return to the previous overview screen.

To leave the Alarm screen, tap “previous” .

9.4 Last crash


The last crash log shows – as far as possible – the heating data from shortly before the generator crashed/failed.

In the overview, tap “last crash”.



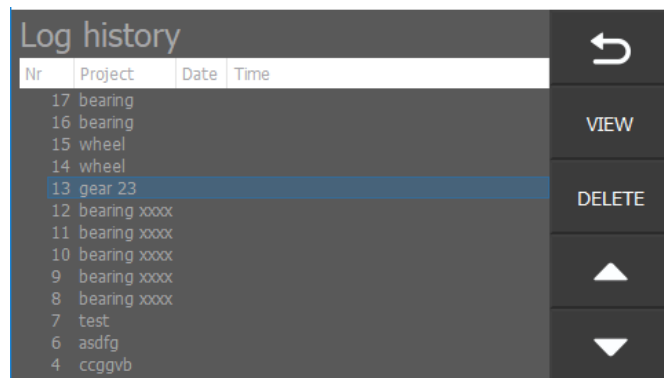
The data from shortly before the crash is displayed.

If a USB data carrier is connected, the heating data can now be exported. To do so, press “export”. When the file has been exported successfully, this will appear on the screen. Tap “OK”, the message disappears from the screen.

Press “back / previous screen”  once more to return to the previous screen.

9.5 Heating logs

Pressing the “heating logs button” displays a list of saved heating logs.



To scroll through the lines, use the arrow keys.

To select a log, press the corresponding line.

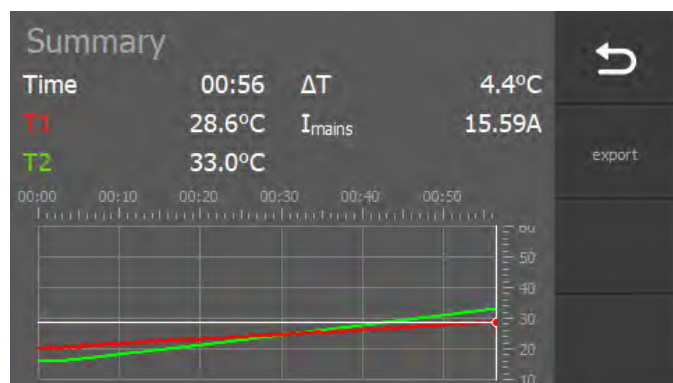
After selecting the desired line/file, select:

View – to display the selected log file on the screen

Delete – to delete the selected log file from the memory

View

Pressing “view” after selecting a file displays the heating information of the process.

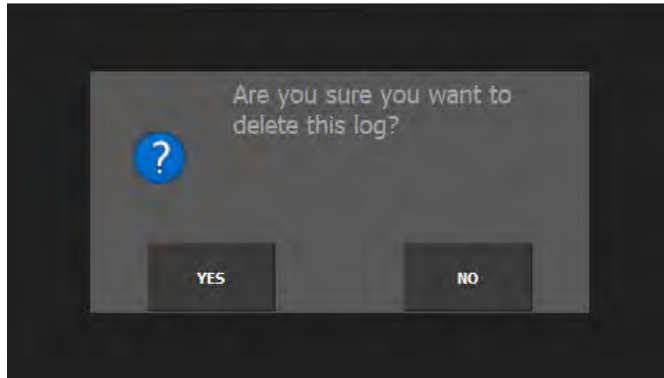


If a USB data carrier is connected, the heating data can also be exported from here. To do so, press “export”. If the file has been exported successfully, a message appears indicating that the export was successful. Press “OK” to clear the message from the screen.

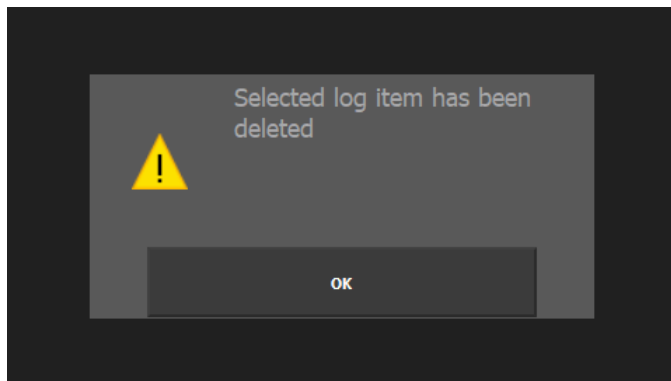
Press “back / previous screen”  to return to the previous screen.

Delete

If you press “delete” after selecting a log file, the file may be deleted.
A confirmation screen appears.



If you press “no”, you return to the list of log files.
If you press “yes”, a confirmation screen appears confirming that the file has been deleted.

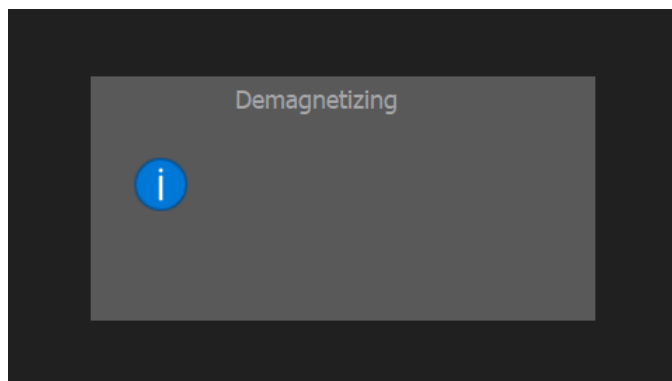


Press “ok” to return to the list of log files.

10. Other functionalities

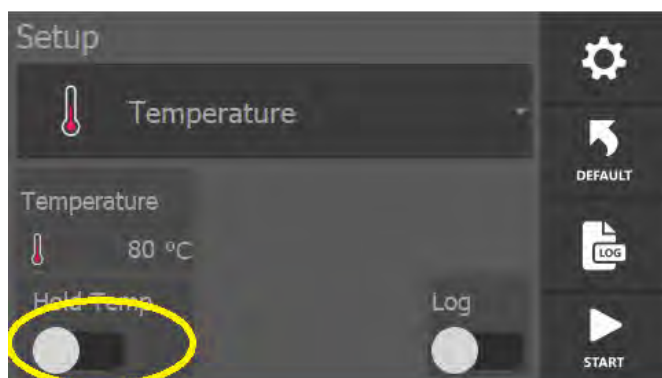
10.1 Demagnetisation

The workpiece is demagnetised each time the heating process stops or is stopped manually. This is briefly displayed on the screen.



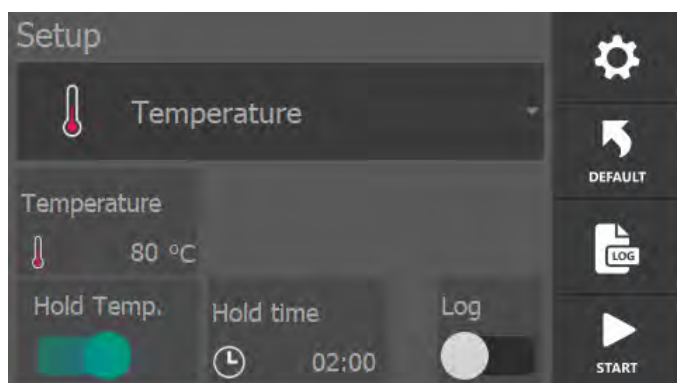
10.2 Hold functionality

In the temperature and the temperature & speed modes the screen displays a slider with which the temperature hold functionality “*hold temp*” can be switched on or off.

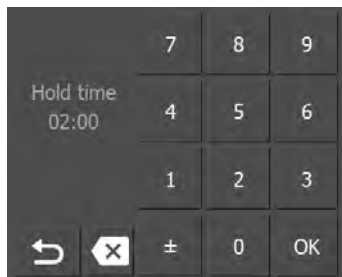


This functionality enables a workpiece to be held at a set temperature once that temperature has been reached. Maintaining the temperature of a workpiece follows a certain switching hysteresis (T hold hysteresis), which can be set in the system settings as described in section 5.4. The temperature set here is the temperature to which a workpiece may drop before the heater switches on again automatically.

When the Hold Temp functionality is activated, the slider turns green and the hold temp duration of the workpiece is displayed.

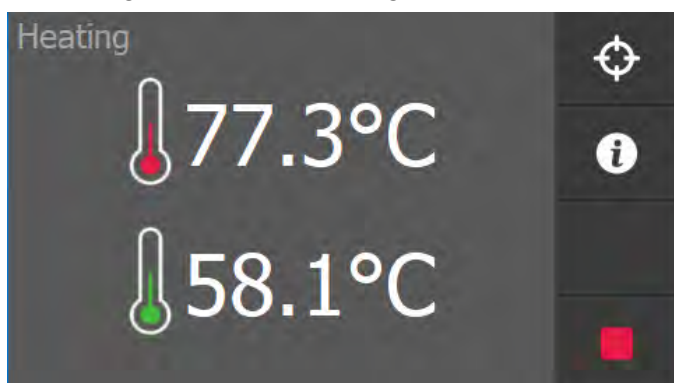


By pressing Hold Time you can adjust the hold temp duration of the workpiece. The time is entered in mm:ss and can be set between 00:01 and 99:00.

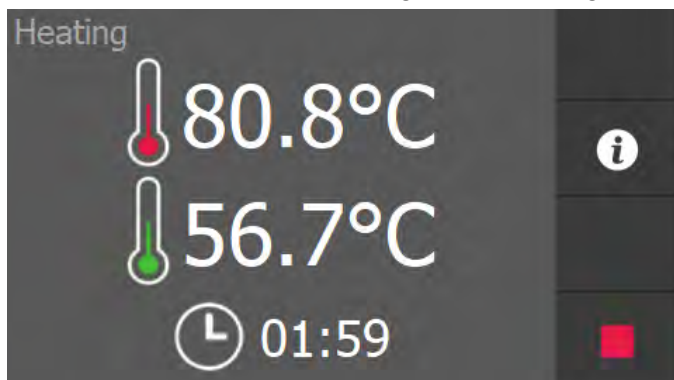


After adjusting the time, press “back / previous screen”  to return.

According to the above settings, the workpiece is heated to 80°C and then kept at 80°C for 2 minutes.



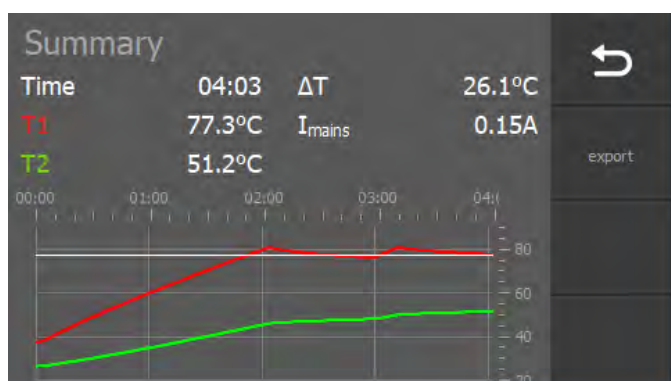
Once the set temperature, in this example 80°C, is reached for the first time, a timer will appear at the bottom of the screen, indicating the remaining time the workpiece is kept at the set temperature.



As soon as this time has elapsed, the heater displays a message indicating that the “temp hold” functionality has elapsed.



Press “ok” to leave this screen. The final screen of the heating process is now displayed.



10.3 ΔT functionality

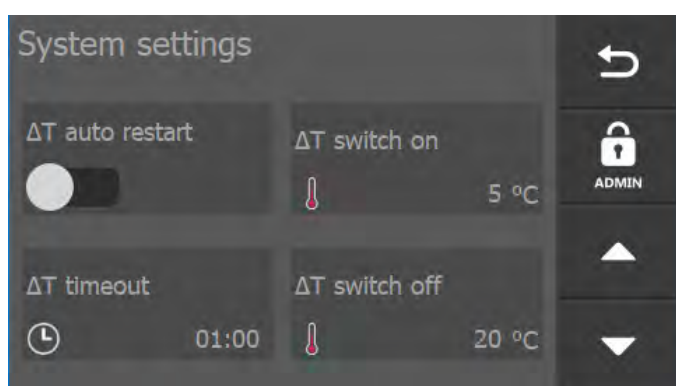
This functionality is used if the temperatures in a workpiece must not differ too much in order to avoid stresses in the material. The functionality is also used for bearings when the temperatures of the inner ring and outer ring must not differ too much. If necessary, ask the supplier of the workpiece what the maximum temperature difference in the workpiece may be.

The ΔT functionality is switched on and set as described in section 5.5.

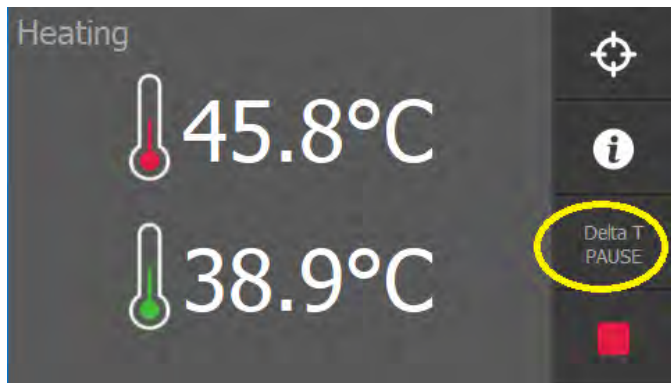
For the ΔT functionality it is necessary that the two sensors (T1 and T2) are connected to the heater and positioned correctly on the workpiece.

Positioning of sensors:

Position sensor T1 (red) at the point where the heat is applied to the workpiece; this is usually the bore. This sensor is the “main sensor” and the master in the heating process. Position sensor T2 (green) elsewhere on the workpiece. Position it in such a way that it is easy to monitor a possible difference in temperature between the two measuring points on the workpiece. See also the image in chapter 6.

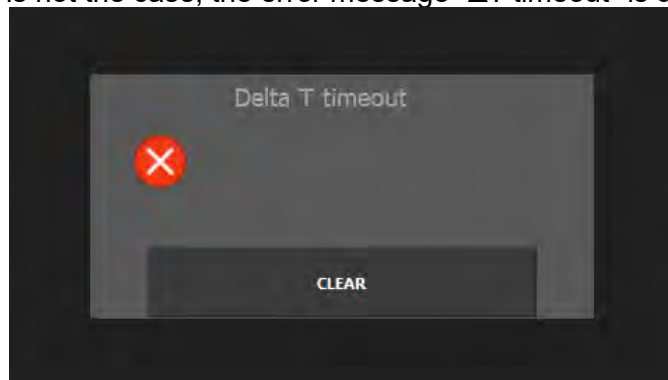


The temperatures T1 and T2 are measured during the heating process. The difference between these two temperatures is calculated continuously. If the difference is larger than the temperature set under “ ΔT switch off”, the heating process switches off or pauses. When the process is paused, the screen indicates “ ΔT pause”.




If “Auto restart” is not active, the heating process will not restart automatically and has to be restarted manually.

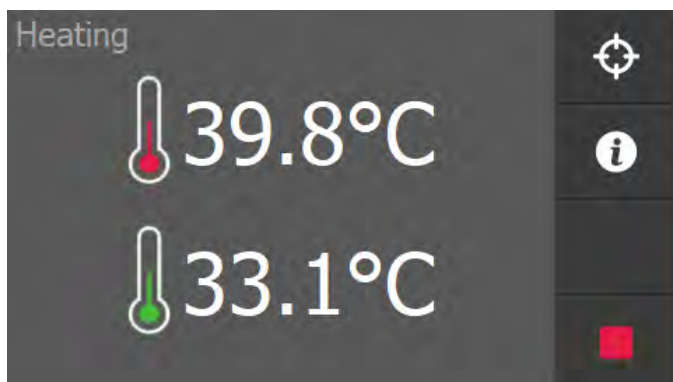
If “Auto restart” is active, the heating process will restart automatically as soon as the temperature difference is smaller than the temperature set under “ ΔT switch on”. This must be achieved within the “ ΔT timeout” time. If this is not the case, the error message “ ΔT timeout” is displayed, which can be



reset by pressing “clear”.

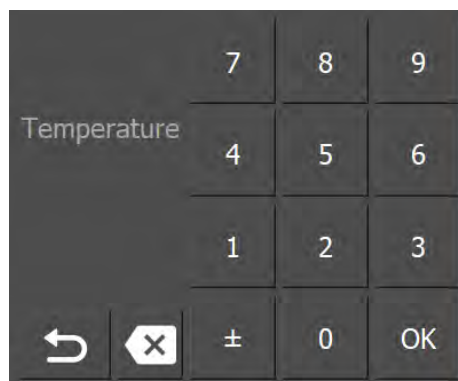
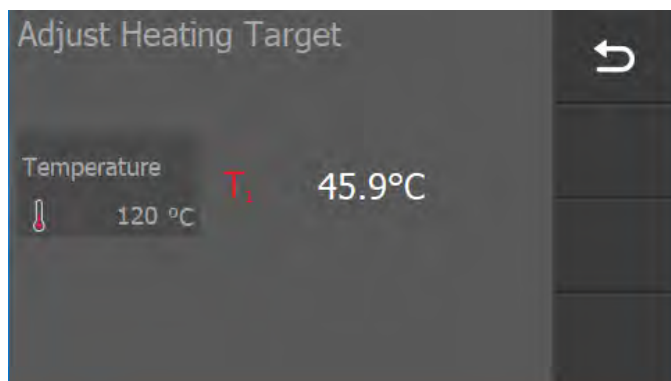
10.4 Target functionality

In all heating modes, a “target” button  is displayed in the top right-hand corner during heating. In this example, heating in the temperature mode is used for illustration purposes.



Pressing this button during heating allows the desired temperature or time (target) to be adjusted up or down without having to stop the process.

By pressing “target”, a screen with the current setting and current value is displayed first.



By pressing the set value, a keypad is displayed on which the new value can be entered. After entering the value, press “ok” to return to the heating screen. Only this cycle is then heated to the new “target”.

11. Cleaning, maintenance and trouble shooting

- Store in a dry place, free from frost and damp.
- Clean with a dry cloth. Never clean with water.
- Keep the bare parts of the poles clean. Lubricate regularly with acid-free Vaseline for better contact with the yokes and to prevent corrosion.
- Also lubricate the pivots regularly.

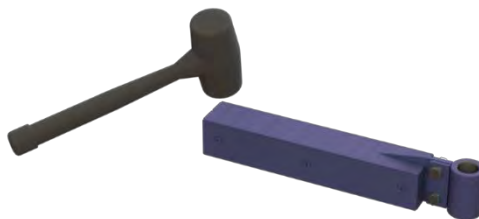
If the heater produces a loud vibrating sound:

- Stop the heating cycle
 - Are all contact surfaces clean and greased?
 - Is the yoke positioned level on the poles?
- If this is not the case, follow the instructions below to adjust the yoke.

1. Remove dirt, burrs, etc., from the yoke and poles and grease lightly.
2. Place the yoke on the hinge point and rotate it above the poles.



3. Loosen the socket screws and the bolts on the hinge bushing by about half a turn.



4. Switch on the heater by pressing start. The yoke now sets itself. If necessary, a dead blow (plastic) hammer may be used.



5. When noise reduces, tighten all bolts and switch off the heater.

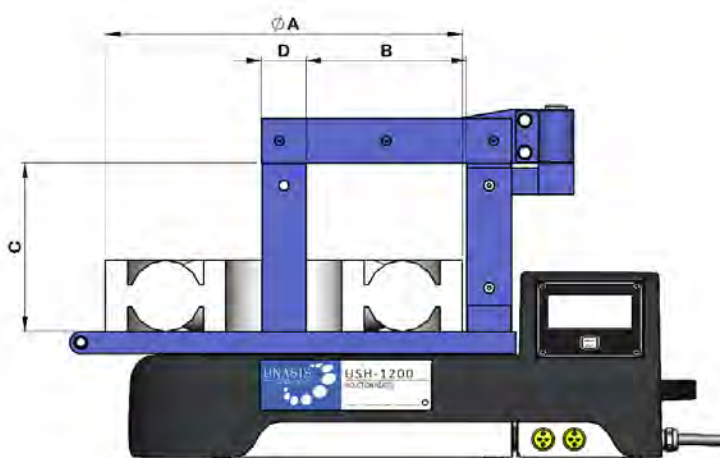
WARNING!



Carrying out the right maintenance and following the instructions is important.
Contact your supplier if in doubt about the correct functioning of the device.
Repairs must be carried out by the manufacturer or a specialist approved by the manufacturer.

12. Technical specifications

Smart series 4.3" Touchscreen Dual Temp	UNASIS USH 1100	UNASIS USH 1200	UNASIS USH 1300
Voltage/ Current	120V - 230V 13A - 13A	120V - 230V 15A - 16A	230V 16A
Output	1.5 kVA - 3.0 kVA	1.8 kVA - 3.7 kVA	3.7 kVA
Frequency	50-60Hz	50-60Hz	50-60Hz
Temperature measurement	Double, ΔT measurement, Log functionality	double, ΔT measurement, log functionality	double, ΔT measurement, log functionality
Operating modes	Time Temperature Temperature or time Temperature & speed	Time Temperature Temperature or time Temperature & speed	Time Temperature Temperature or time Temperature & speed
Weight in kg	21	31	52
Max. temperature	240°C / 464°F	240°C / 464°F	240°C / 464°F
Max. bearing weight in kg	50	100	150
Max. OD \varnothing mm A	400	500	600
Space between poles mm B	120	180	210
Pole height mm C	130	185	205
Pole surface mm D	40x50	50x50	70x80
Dimensions mm (L x W x H)	600x226x272	702x256x392	788x315x456



13. Miscellaneous

13.1 Warranty conditions

Unasis as manufacturer offers 12 months' warranty on the hardware of the original product. The warranty period commences on the date of delivery to the end user. Claims under warranty must be accompanied by a proof of purchase with delivery date. Within this period, Unasis shall remedy defects resulting from production and/or material faults.

1. A defect or fault must be reported immediately in order to avoid possible consequential damage.
Warranty claims will be voided if the defect or fault is not reported immediately.
2. The warranty does not cover defects resulting from failure to observe the installation, safety and operating instructions given in the user manual.
3. The warranty does not apply to damage resulting from:
 - Contact with aggressive substances,
 - Exposure to water,
 - Abnormal ambient or environmental conditions,
 - Inappropriate operating conditions or conditions of use.
4. Unauthorised modifications or modifications by third parties will void the warranty. The replacement of parts with non-OEM parts will also void the warranty.
5. The product must be sent to the manufacturer's Service department for repair.
6. A repair by Unasis within the warranty period will not result in a commencement of a new warranty period nor in a prolongation of the original warranty period.
7. Other claims for damages, such as damage occurring outside the product, will not be accepted.
8. Wear and tear parts such as gloves and temperature sensors are not covered by the warranty.
9. Damage to the glass of the operating panel/touchscreen in the form of fractures, scratches, etc. is not covered by the warranty
10. For further provisions, refer to the General Conditions of Sale and Delivery of Unasis International BV.

13.2 Disclaimer

The manufacturer and/or supplier cannot be held liable for any damage to workpieces or consequential damage resulting from incorrect use of the device or damage to workpieces and any consequential damage resulting from a defect in the device.

13.3 Waste disposal



Power tools, accessories and packaging must be reused at the end of their life cycle in an environmentally sound manner.
Do not dispose of used power tools as residual waste, but bring them to a recycling company that complies with the applicable environmental requirements.



14. Certificate of conformity



CERTIFICATE OF CONFORMITY

Unasis International Limited
Unit 7 Isis Court, Wydyke Furlong, Abingdon Business Park
Abingdon, Oxfordshire, OX14 1DZ, United Kingdom

hereby declares that the products

Unasis induction heater types:

- USH-1100
- USH-1200
- USH-1300

comply with *the requirements of Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.*

Where applicable, the following harmonised standards have been applied.

Electric Safety		: EN 60335-1
EMC	Emission	: EN 55011
		: EN 61000-3-2
		: EN 61000-3-3
	Immunity	: EN 61000-6-2

Other information:

Karl Brundell
Managing Director

April 15th, 2020

This catalogue has been produced with a great amount of care and attention; all data has been checked for its accuracy. However, no liability can be assumed for any incorrect or incomplete data.

Due to the constant development and expansion of the product range, we reserve the right to make modifications without prior notice.

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