SCHAEFFLER

Induction Heaters
BASIC Series - Bench-top devices

User manual

Contact

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ISO ISO 9001: 2015

Warning!

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 veiligheidsvoorschriften
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.

Foreword

The induction heating devices HEATER20-BASIC, HEATER50-BASIC, HEATER100-BASIC, HEATER150-BASIC and HEATER200-BASIC give rapid, clean operation. Their high efficiency level allows energy-efficient heating and shorter mounting times. This reduces the operating costs. The uniform, controlled heating allows consistently good quality of mounting.

Operation is simple and user-friendly, the touch-sensitive screen is oil-resistant, dustproof and waterproof.

When heating by induction is used, there is no need at all to use oil – this gives particularly good environmental compatibility. The scope of application is very extensive. It is possible to heat the loose inner rings of cylindrical or needle roller bearings as well as sealed and greased bearings. Compared with previous models, further improvements have been made in performance capacity and safety and the part to be heated need no longer be of a minimum mass.

In order to ensure durability in demanding industrial operation, the devices are extremely robust and reliable.

English

Contents

1. About the user manual

1.1 Current version A current version and translations of this user manual, can be found at “www.schaeffler.de/publications-heater” using the search term ‘HEATER-BASIC’.

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

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

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

2. Safety, warnings and potential hazards

2.1 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.

2.2 Description of potential hazards

Warning! Voltage

 	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. ■ Connect the unit to the power according to the information on the rating plate. ■ Before each use, check the power supply cable for damage. ■ Safe disconnection from the power supply must be ensured at all times before starting maintenance and repair work. This can be achieved by removing the power plug from the socket.

Warning! Electromagnetic field

	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.
	These fields can be harmful for persons with active medical aids such as heart pacemakers.
	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.
	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.
	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.
	For this reason, persons with passive implants are recommended not to enter the immediate vicinity of the induction heater when it is in operation.

	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.

Caution! Tripping hazard

 	Limit the risk of injury due to tripping as far as possible. ■ 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 Schaeffler 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.

2.3 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 Schaeffler 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 ledge 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 ledge and poles.
- Whilst heating, observe a minimum distance of 1 metre from the heater.
- Never remove the induction ledge during heating.
- Do not modify the heater. Never use home-made ledges.
- Always check that the induction ledge 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 ledge.

2.4 Safety provisions

- The electronic systems switch off automatically if the ambient temperature rises above 70ºC.
- 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.

3. Introduction

3.1 Application

Schaeffler 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 bushings, cogwheels, couplings and metal objects that form a closed circuit. Bearings and workpieces are demagnetized automatically after each heating cycle.

Bearings and workpieces can be heated to a maximum temperature of 240ºC (464°F), except for the HEATER20-BASIC type where the maximum temperature is set at 150ºC (300°F).

Schaeffler induction heaters are suitable for continuous use. However, when heating to 240°C (464°F), don't do so for more than half an hour. HEATER20-BASIC has a duty cycle of 1,5 hour.

CAREFUL!

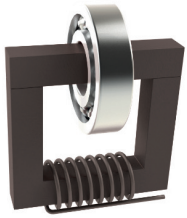
- Bearings may be heated to a maximum of 120°C (248°F).
- Precision bearings may be heated to a maximum of 70°C (158°F). Higher temperatures can affect metallurgical structure and lubrication, resulting in instability and failure.
- Do not use a heater for bearings and workpieces that are outside the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

3.2 Operating conditions

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

3.3 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 demagnetized.

4. 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 Schaeffler heater is supplied with ledges, temperature sensor, heat-resistant gloves (suitable up to 250°C / 482°F) and acid-free lubricant.
- 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		
	Brown	Phase
	Blue	Zero
	Green/Yellow	Ground

120V/240V 1 phase heaters cQPSus		
	Black	Phase
	White	Zero
	Green	Ground

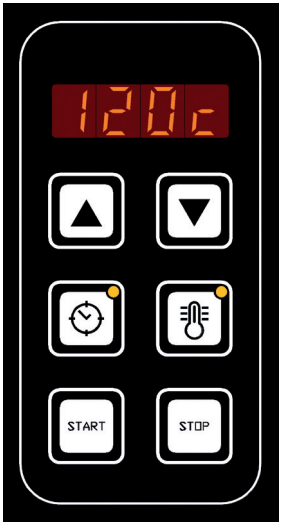
400V/450V/500V 2 phase heaters		
	Brown	Phase
	Blue or Black	Zero
	Green/Yellow	Ground

480V/600V 2 phase heaters cQPSus		
	Black	Phase
	White or Black	Zero
	Green	Ground

- Ensure that the power supply cable cannot come into contact with the workpiece to be heated. Insert the plug in a grounded socket outlet with connection.
- Switch on the device by means of the main switch. The machine briefly shows “Test”, and the display shows a “pre-set end temperature” programmed by the manufacturer.
- 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 in the temperature mode.

5. Explanation of display and keys

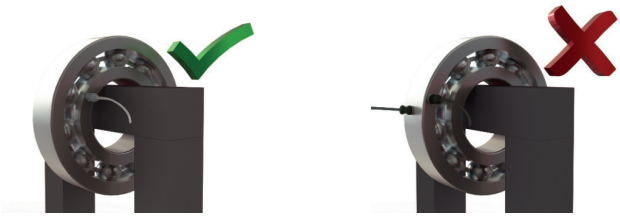
1. Time or temperature up
2. Heating in time mode
3. Start heating after setting time/temperature
4. Display: time or temperature
5. Time or temperature down
6. Heating in temperature mode
7. Stop heating / automatic demagnetise



6. The magnetic temperature sensor

- The magnetic temperature sensor must always be used when heating in “temperature mode”.

- 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 240ºC (464°F).
- In the event of temperatures exceeding 240ºC (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 the sensor 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.



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 operation

WARNING!	
	Use suitable lifting equipment for heavy ledges and workpieces. Prevent personal injury by improper handling.
	The weight of the workpiece may not exceed the value given in section 7.3 and in the technical specifications. 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 ledge 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 ledge with the bearing on the poles. Make sure that the ground side is positioned straight on the poles.
- Always choose an induction ledge that fills the bore of the bearing as much as possible. You can even use 2 ledges at the same time. This promotes optimal, fast and even heating.
- Make sure that the bare-metal sides are sufficiently coated with lubricant to ensure optimal contact and avoid vibration.

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

- Always make sure that the workpiece does not come into contact with the plastic casing 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 ledge.
- Make sure that the bare-metal sides are sufficiently coated with lubricant to ensure optimal contact and avoid vibration.

- Always make sure that the workpiece does not come into contact with the plastic casing 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 support and the (swivel) ledges:

		Size of (swivel) ledge								
Type	**On supports**	**7 mm**	**10 mm**	**14 mm**	**20 mm**	**30 mm**	**40 mm**	**50 mm**	**60 mm**	**70 mm**
HEATER20-BASIC	n/a	1 kg	2 kg	3 kg	5 kg	n/a	20 kg	n/a	n/a	n/a
HEATER50-BASIC	50 kg	1 kg	2 kg	3 kg	5 kg	10 kg	15 kg	n/a	n/a	n/a
HEATER100-BASIC	100 kg	n/a	2 kg	3 kg	5 kg	10 kg	15 kg	20 kg	n/a	n/a
HEATER150-BASIC	150 kg	n/a	n/a	n/a	10 kg	15 kg	25 kg	40 kg	45 kg	50 kg
HEATER200-BASIC	200 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) ledges 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 ledge.

CAREFUL!

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

8. Operation

There are 2 heating methods:

Temperature mode

- 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.

Time mode

- 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 can be measured with an external thermometer.
- In incidental cases when workpieces are too big for the heater, which in temperature mode would lead to an error message due to an insufficient increase in temperature, the time mode may be a solution. If this is often the case, choose a bigger heater from the Schaeffler range.

8.1 Selecting heating modes

- Position the workpiece and sensor (according to chapters 6 & 7).
- Switch on the heater. The display shows 100ºC. Enter the desired temperature by pressing the '▲' or '▼' button (by pressing the (🌡) button, you can select increments of either 1º or 10º).
- Press '**START**'. The heating starts, you will hear a slight humming sound.
- The display shows the current temperature of the bearing. Once the pre-set temperature has been reached, the display blinks and a clear beep is sounded. Unless you press **STOP**, the temperature of the bearing is maintained for 5 minutes, thanks to the thermostat feature. Heating will restart if the temperature drops by 3ºC. Once the pre-set temperature has been reached again, the induction heater will sound a clear beep.
- The display blinks during this cycle. After 15 minutes, the induction heater switches off and sounds a continuous beep. Each time the induction heater stops, it automatically demagnetises the workpiece.
- The heating process or thermostat feature can be interrupted by pressing '**STOP**'.

8.2 Heating in time mode

- Position the workpiece and sensor (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 press '◷'. Enter the desired time by pressing '▲' or '▼'; by pressing '◷', you can select increments of either 1 minute or 1 second.
- Press '**START**'. The heating starts, you will hear a slight humming sound. Press ' 🌡 ' during heating to display the current temperature for 3 seconds. The countdown then continues.
- 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 demagnetized automatically and a loud, continuous beep sounds. Press **STOP** to switch off the beep.

8.3 Workpiece installation

- After pressing '**STOP**', place the sensor on the side of the pole.
  By pressing '**STOP**', the workpiece is demagnetized automatically.
- Wear heat-resistant gloves. Place the ledge with the workpiece on a clean surface. If the heater has a swivel arm, open it up to the safety positioning cam and slide the workpiece off. Install the workpiece without delay and prevent it from cooling down.

8.4 Error message

- If no temperature increase of at least 1ºC is measured within the time pre-set by the manufacturer, the induction heater automatically switches off. The display blinks and shows 4 hyphens (----). An alternating, clear beep is sounded. Press **STOP** to switch off the beep and check whether:
  - the sensor has been placed on the workpiece
  - the sensor plug has been inserted in the socket (Make sure that the – and + of the plug correspond to that of the socket.)
  - the wiring of the sensor has not been damaged
  - the surface area of the sensor is clean
  - the workpiece is within the specifications for the heater as listed in chapter 10

  If the sensor is faulty, as a contingency measure, the workpiece can be heated with the time mode. The temperature needs to be measured with an external thermometer.

8.5 Switching between Celsius and Fahrenheit

- The induction heater operates in the temperature units °C or °F.
  Follow the procedure below to switch between these two units:
  - Press and hold the temperature key for 10 seconds. When pressing, a short beep is sounded.
  - After 10 seconds, another short beep is sounded and the display changes from one temperature unit to the other.
  - The heater can now be operated using the newly set temperature unit.
- Store in a dry place, free from frost and damp.

9. Cleaning, maintenance and troubleshooting

- Clean with a dry cloth. Never clean with water.
- Keep the bare parts of the poles clean. Lubricate regularly with acid-free lubricant for better contact with the ledges 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 ledge positioned level on the poles?
  If this is not the case, follow the instructions below to adjust the ledge.

1. Remove dirt, burrs, etc., from the ledge and poles and lubricant lightly.
2. Place the ledge 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.

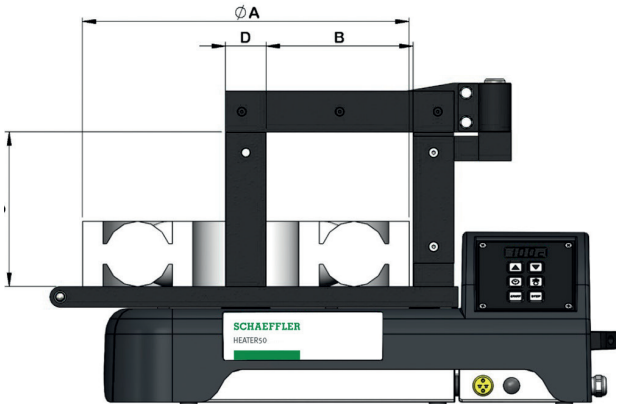
4. Switch on the heater by pressing start. The ledge now sets itself. If necessary, a dead blow (plastic) hammer may be used.

5. When noise reduces, then 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.

10. Technical specifications

BASIC series Key pad Single temperature	HEATER20-BASIC	HEATER50-BASIC	HEATER100- BASIC	HEATER150-BASIC	HEATER200-BASIC
Frequency	50-60Hz				
Temperature measurement	Single				
Operating modes	Time or temperature control				
Weight in kg	21	21	31	52	56
Max. temperature	150°C / 302°F	240°C / 464°F	240°C / 464°F	240°C / 464°F	240°C / 464°F
Max. bearing weight in kg	20	50	100	150	200
Max. OD Ø mm A	240	400	500	600	600
Space between poles mm B	120	120	180	210	210
Pole height mm C	135	130	185	205	205
Pole surface mm D	40x40	40x50	50x50	70x80	70x80
Dimensions mm (LxWxH)	460x240x280	600x226x272	702x256x392	788x315x456	788x315x456



Machine ID and certification
See machine plate on the machine.

Available models

Name	Voltage/Amp	kVA	Certification
HEATER20-BASIC-230V	230V/10A	2,3	CE
HEATER20-BASIC-120V-US	120V/10A	1,2	QPS
HEATER20-BASIC-240V-US	240V/5A	1,2	QPS
HEATER50-BASIC-230V	230V/13A	3	CE
HEATER50-BASIC-120V-US	120V/13A	1,5	QPS
HEATER50-BASIC-240V-US	240/13A	3,2	QPS
HEATER100-BASIC-230V	230/16A	3,7	CE
HEATER100-BASIC-120V-US	120V/15A	1,8	QPS
HEATER100-BASIC-240V-US	240V/15A	3,6	QPS
HEATER150-BASIC-230V	230V/16A	3,7	CE
HEATER150-BASIC-240V-US	240V/16A	3,8	QPS
HEATER200-BASIC-400V	2 ~ 400V/20A	8	CE
HEATER200-BASIC-450V	2 ~ 450V/16A	7,2	CE
HEATER200-BASIC-500V	2 ~ 500V/16A	8	CE
HEATER200-BASIC-480V-US	2 ~ 480V/16A	7,7	QPS
HEATER200-BASIC-600V-US	2 ~ 600V/14A	8,4	QPS

CE

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ELECTRICAL SAFETY
LR1601

11. Waste disposal

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.

12. Disclaimer

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.

13. Certificate of conformity

CERTIFICATE OF CONFORMITY

in accordance with Low Voltage Directive 2014/35/EU

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

Product description:	Inductive heater
Product name/type:	■ HEATER20-BASIC-230V ■ HEATER50-BASIC-230V ■ HEATER100-BASIC-230V ■ HEATER150-BASIC-230V ■ HEATER200-BASIC-400V ■ HEATER200-BASIC-450V ■ HEATER200-BASIC-500V
Applicable harmonized standards:	Electric Safety ■ EN 60335-1 EMC Emission ■ EN 55011 ■ EN 61000-3-2 ■ EN 61000-3-3 EMC Immunity ■ EN 61000-6-2
Name and address of the authorized person for the technical documentation:	Schaeffler Technologies AG & Co. KG Georg-Schäfer-Straße 30 D-97421 Schweinfurt

H. van Essen
Managing Director
Bega International BV

CE

Place, Date:
Vaassen, 30-07-2021

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