

IND 320

Induction heater

User manual



GRUETZNER
AUTOMATIC LUBRICATION

1. Safety recommendations



- ! During the heating process observe a safety distance of 30 cm (1 ft) with the workpiece or the heater. Electronic equipment, such as wristwatches, cellphones, etc. may also be affected.
- ! Because the IND 320 generates a magnetic field, people wearing a pacemaker or implants must not be within 5 m (16 ft) of the IND 320 during operation.
- ! Risk if metallic implants in the user's body: Due to the magnetic field, people with implants should take extra safety distance.
- ! Risk of pinching your fingers: Special care needs to be taken into account when positioning components on the heater or transporting them.
- ! Always follow the operating instructions.
- ! Make sure that the power supply voltage does not deviate from the acceptable range of 100 - 240V, 50 - 60Hz.
- ! Use the right power level, especially with shielded or sealed with metallic inserts bearings. We do not recommend heating bearings capped with seals or shields above 80 °C (175°F).
- ! Do not expose the IND 320 to high humidity, outdoors or to flammable atmospheres.
- ! Do not modify the IND 320. All repairs should be taken care by qualified repair shops. Do not touch a damaged heater if plugged to the mains.
- ! The IND 320 is solely intended to heat up bearings, gears, couplings and other industrial annular components. It is not intended to be used as a domestic inductive plate. Do not heat up cooking pans or pots.
- ! The heater needs to be operated by professionally trained people. Do not leave the heater unattended. Especially when using time mode.
- ! Use proper handling systems when lifting heavy workpieces.
- ! Avoid contact with hot surfaces. Always wear protective gloves. In case of burnings ask for first aid help if necessary.
- ! Never heat to temperatures above 200 °C (392 °F).
- ! The heater is designed for maintenance operations where some cooling in between jobs is allowed.
- ! In case of fire, do not use water nor powderbased extinguisher. This will damage the electronics. A CO₂ based extinguisher is recommended, if available.
- ! Be aware that fumes coming from the heated element might occur.
- ! Make sure that the component does not heat up above any desired limit by properly measuring temperature. If so, adjust the power level accordingly.

2. Scope of delivery

The IND 320 portable induction heater contains the following:

Art.No.	Description
IND-320 or IND-320-110V	Induction heater IND 320
IND-P320	Magnetic K-type 400 mm (1.31 ft) temperature probe
IND-protect	Temperature resistant gloves
	Only for 230V version: Schuko plug (not mounted)

3. Introduction

The IND 320 portable induction heater is designed for applications in maintenance jobs to heat up roller bearings that are mounted with an interference fit onto a shaft. Other ring-shaped metallic components can also be heated.

The heat causes the bearing to expand, which eliminates the need to use force during installation. A 90 °C (162 °F) temperature difference between the bearing and shaft is generally sufficient to enable the installation. At ambient temperature of 20 °C (68 °F) the bearing must be heated to 110 °C (230 °F).

Shielded bearings or sealed bearings with metallic insertions must be controlled as the shield or the metallic insert might heat much faster than the bearing itself. A reduced power setting is recommended in these cases.

3.1 Principle of operation

The IND 320 portable induction heater consists of a high temperature resistant glass filled polymer top plate with electromagnet coils beneath it. When the heater is switched on, electric current runs through these coils, generating a fluctuating magnetic field, but no heat on the top plate itself. However, once you set an iron or stainless-steel component on top, the magnetic field induces many smaller electric currents (Eddy currents) in the component's metal.



Fig. 1 – Magnetic field around bearing

Because iron is a poor conductor of electricity, when all these small currents run through the iron, much of the energy is converted into heat. Thus, on an induction heating plate, the heat is not coming from the top plate surface, but it is generated in the component itself. This makes heating a lot more efficient than other heating methods.

The drawback is that only components made from iron will work with induction plates. Components made of only copper or aluminum conduct electricity too good to generate significant heat. Cast-iron and stainless-steel work fine. A rule of thumb is: if a magnet sticks to the component, the inductive plate will heat it up. Nonetheless, small brass or copper rings (such as shields or bearing cages), due to its small mass, might heat much faster than the rest of the bearing and a low power setting must be always chosen.

3.2 Distinguishing features

- ✓ **Portable:**
Thanks to the medium frequency technology used and the right choice of materials, the heater is light weight. This, together with the built-in handle, makes it portable to use it in different locations or to easily store it in a locked place.
- ✓ **Innovative heating of bearings:**
Thanks to the smart construction and operating software of the heater, a low temperature difference in between the inner ring and outer ring of the bearing is achieved. This reduces the internal tensions generated due to the excessive thermal expansion of the inner ring compared to the one of the outer ring.
- ✓ **Versatile:**
Thanks to the flat shape of the induction plate, the user no longer must choose which yoke is needed for every component. This increases the number of different components that you can heat up on the plate and at the same time reduces the number of accessories needed.
- ✓ **Quiet:**
Due to the medium frequency technology the heating of components does not make noise. An LED indicates when the heater is heating, even if you cannot hear it. A fan might be heard after some use. This helps to cool down the electronics.
- ✓ **Power regulation:**
Thanks to the different power settings, the heater can heat up sensitive components at a slower pace or other than bearings.



4. Description

The operation of the heater is controlled by the internal electronics in two modes.

The operator can either select the desired temperature of the bearing in Temperature Mode or set the length of time that the bearing or component will be heated in Time Mode. The power level can be adjusted to Low Power Mode for slower heating of sensitive workpieces (for example, bearings with shields or metallic inserts in the seals).

4.1 Technical data

Housing			
Dimensions		450 × 500 × 100	mm
Length of connection cable		180	cm
Weight		6.6	kg
Electrics			
Maximum power	IND-320	2.3 kVA	
	IND-320-110V	1.8 kVA	
Voltage and frequency	IND-320	230 V ±10%, 50/60 Hz	
	IND-320-110V	110 V ±10%, 50/60 Hz	
Max. current consumption	IND-320	10	A
	IND-320-110V	16	A
Warming			
Temperature range	40 – 200		°C
	104 – 392		°F
Components			
Min. bore diameter		30	mm
Max. external diameter		320	mm
Max. width		85	mm
Weight *		0.5 – 20	kg

5. Installation

A qualified electrician must install a suitable plug. Make sure that the line voltage is within the specified range depending on the heater type.

Mains supply terminal	Cable color	
	IND-320	IND-320-110V
Neutral	Blue	White
Line	Brown	Black
Ground	Not connected	Not connected





IMPORTANT

The main switch in the heater is not a safety switch. The heater needs to be unplugged from the mains to perform any repair. If the mains cable is damaged, it must be replaced. The heater does not need to be connected to ground since it is a double insulated device with a plastic housing.

6. Preparation for use

- ✓ Place the IND 320 in horizontal position on a surface.
- ✓ Connect the mains plug to a suitable power supply.
- ✓ Carefully place the workpiece to be heated in the center of the top plate.
- ✓ The heater is designed to heat up one component at a time.
- ✓ If used in Temperature Mode, plug the temperature probe into the connector. Place the magnetic tip of the probe on the horizontal surface of the bearing inner ring or on the innermost surface of the workpiece.
- ✓ Switch on the heater from the main switch, which is located at the rear right of the heater. The power LED will be lit for few seconds until the entire display and heater will be ready.
- ✓ Select the right heating mode and settings.
- ✓ Once you have finished heating the component, attach the magnetic probe tip to the metallic sheet on the heater's housing. This is the temperature probe's parking spot, located at the rear left of the heater.



7. Operation

7.1 User interface



Fig. 2 – User interface

From left to right:

- ✓ The LOW POWER button and LED. This button reduces the power of the heater. If low power mode is selected, then the red LED is switched on.
- ✓ The temperature/time symbols button is the MODE button. This button shifts in between Temperature Mode and Time Mode.
- ✓ LED display. The process information is displayed here: goal temperature, actual temperature, error codes, time, etc.
- ✓ MINUS and PLUS buttons. These buttons decrease or increase the value shown on the LED display.
- ✓ START/STOP button and heating LED. Press to start or stop the heater. The LED button is permanently ON when the heater is heating.

7.2 Temperature mode

In this mode components can be heated to a given temperature.

- ✓ If the LED screen shows °C or °F, Temperature Mode is selected.
- ✓ The selected temperature is shown on the display. The default temperature for bearings is 110 °C (230 °F). If a different temperature is desired, press + or – to adjust the temperature in steps of 1°. Keep the + or – buttons pressed for a faster adjustment.
- ✓ It may be desirable to heat up bearings or other components to temperatures above 110 °C (230 °F) for an increased mounting time or a tighter interference fit. Consult the bearing specifications to determine the maximum permitted temperature. Always ensure that the bearing does not lock due to an excessive expansion of the inner ring compared to the outer ring.
- ✓ Make sure that the temperature probe is mounted on the bearing inner ring flange.
- ✓ Press START/STOP to start the heater. The heating LED will switch on. Even if you cannot hear it, the component is being heated.
- ✓ The user interface displays the temperature detected by the temperature probe.
- ✓ Temperature differences in between top and bottom might occur. This is due to the higher influence of the inductive coils on the bottom part of the component. This effect is automatically adjusted in the last stages of the heating.
- ✓ During heating, when pressing the MODE button, the heating time is shown.
- ✓ When the selected temperature has been reached, the bearing is then ready to be taken. An acoustic signal will be generated for 4 seconds.
- ✓ If the component is not removed nor the process stopped, the temperature holding feature will maintain the component at temperature for 10 minutes.
- ✓ By removing the temperature probe or the workpiece, the heating process will automatically stop. It can also be stopped by pressing the START/STOP button.

- ✓ Use heat protection gloves to remove the workpiece. Do not slide the hot component over the user interface surface as this will damage the heater.
- ✓ The heater is now ready to heat up another workpiece with the same settings.
- ✓ Depending on the size of the bearing, the temperature probe might take some time to register the first temperature increase. This is because the heat is mainly coming from the bottom part of the bearing and the heat takes some time to be transferred to the top.

7.3 Temperature measurement

- ✓ When the heater is not operating, the temperature of the workpiece can be measured by pressing MODE and START/STOP at the same time. Press any button to cancel the temperature measurement.
- ✓ The temperature probe is a valuable part of the heater. Treat it with care and after use, we suggest that it is placed on the probe's parking spot in the rear left of the heater to avoid damages on it.
- ✓ The surface of the workpiece where the temperature probe is located should be clean, dry and flat. Measuring on dirty, wet or curved surfaces will give wrong temperature readings and may result in overheating the workpiece or even damaging the heater.
- ✓ When heating one component after another in warm environments or with very high temperature settings, the temperature probe might need some extra time to cool down before starting a new heating job. Error code E06 might be triggered then. If this happens, simply allow some cooling time on a cold surface.

7.4 Change of temperature unit

Press MODE and "+" at the same time to change in between °C to °F. Once a heating cycle is completed, the temperature unit setting remains the same even after disconnecting the heater from the mains power.

7.5 Time mode

This mode is suitable for batch production, when the time required to heat a workpiece to a given temperature is already known. It is also used in emergency cases, when the temperature probe is missing or defective. The temperature of the workpiece must be then checked using an external thermometer, like a TKDT 10. Not monitoring the temperature might result in damages on the top plate due to too high temperatures.

- ✓ If the user interface display shows °C or °F, press the MODE button to select Time Mode.
- ✓ Press + or – to adjust the time.
- ✓ Press the START/STOP button to start the heater. The display will show the remaining time.
- ✓ Whilst heating, the temperature measured by the probe (if attached) can be displayed by pressing the MODE button. When pressed again it displays the remaining time again.
- ✓ When the time has elapsed, the heating stops, and an acoustic signal is generated for 4 seconds.
- ✓ Remove the workpiece with proper handling equipment.
- ✓ The IND 320 is now ready to heat another workpiece with the same settings.



IMPORTANT

The IND 320 can heat up components up to 200 °C (392 °F). Do not use Time Mode to go above 200 °C (392 °F). Heating above these temperatures might damage the heater. Do not leave the heater unattended in Time Mode.
We do not recommend heating bearings capped with seals or shields above 80 °C (175 °F).

7.6 Non-bearings mode selection

6.4 Non-bearings mode selection

A non-bearing mode is available. In this mode all the power is mainly focused on the innermost part of the component, where the interference fit with the shaft will be. This mode is intended to make the heating of

non-bearings faster; however, it might occur that this benefit is not accomplished due to the specific geometry of the workpiece to be heated.

The normal modes are designed for bearings. In these cases, the IND 320 is heating the inner and outer ring independently to maintain a small temperature difference and avoid internal tensions due to an excessive thermal expansion of the inner ring compared to the outer ring.

- ✓ Press the LOW POWER and the "+" buttons at the same time to enable the non-bearings mode. Once selected, the Low Power LED will be blinking.
- ✓ Now, Time or Temperatures modes can be selected.
- ✓ The maximum heating temperature capacity of the heater depends on the dimensions and weight of the component.
- ✓ Press the LOW POWER and the "+" buttons again to deactivate the mode.

7.7 Power level selection

The shape, weight, size and internal clearances, all affect to the time required to heat up a bearing. The large variety of bearings precludes the possibility of defining a specific power level setting for each type. Instead, the following guidelines are provided:

- ✓ In the case of shielded or sealed bearings with metallic inserts, a LOW POWER mode must be always selected. Light metallic rings can heat up much faster than the rest of the component. This might damage the bearing or the heater itself due to too high temperatures.
- ✓ In the case of very small bearings, the power of the IND 320 is automatically lowered. If too fast heating is detected, a LOW POWER mode must be selected. If the component heats up faster than what can be read by the temperature probe, the component might reach temperatures above the desired level.
- ✓ In the case of the IND 320, heating bearings with a tight internal clearance (C1 or C2) or preloaded bearings is not an issue.

If a too high temperature difference is detected, a LOW POWER mode must be selected. Slow heating ensures that the bearing expands evenly, thereby preventing damage to the bearing.

The low power modes can be selected by pressing the LOW POWER button. The display will indicate the power level selected.



8. Safety features

The IND 320 is equipped with the following safety features:

- ✓ Automatic overheating protection of the heater.
The heater has several internal temperature sensors to protect itself. In case that the temperature measured by one of them is too high, measures are automatically taken to stop this. For example, the heater might lower the power or stop. In any case, the user must monitor the process since too fast temperature increases might not be detected on time.
- ✓ Over current protection.
The heater has a built-in fuse.
- ✓ Too hot surface warning.
A "hot" message in the screen will be shown when the temperature of the surface of the top plate will be above 60 °C (140 °F) approximately.
- ✓ Faulty temperature probe detection.
In Temperature Mode, the heater will give an error and stop if no temperature increase is detected.

NOTE:

To increase the time to error E05 by a 50%, press the "Mode" and the "-" buttons simultaneously. "t1.5" will be shown on the display briefly when this is activated and "t1.0" when deactivated again. This setting has to be chosen for every individual heating job.

9. Troubleshooting

It might happen that you encounter a failure in the heater. If this happens, have a look to the following options:

- ✓ The heater does not start at all. Make sure that the heater is properly connected to the power supply and that the fuse holder is properly mounted. If the fuse holder is slightly out of place, no current will pass through.
- ✓ A system fault will be indicated by an acoustic signal and one of the following fault codes on the user interface display will be shown:

Error code	Fault	Action to fix it
E00	No workpiece detected • Too small workpiece • During heating, the workpiece has been moved	• Make sure that the workpiece is within the operating range (weight and size) • Place it centered and don't move it during the heating.
E01	Hardware defect • No communication from internal electronics • Wiring damage	• Return to reseller
E02	Fan Failure • Damaged fan • Fan wiring damaged	• Return to reseller
E03	Overheated coils • Too intense use without time to cool down • At start, coil temperature sensor damaged	• Remove workpiece • Do not switch off the heater to allow the fan to cool the heater down. The error will be automatically cleared
E04	Power electronics overheated • Too intense use without time to cool down • At start, coil temperature sensor damaged	• Remove workpiece • Do not switch off the heater to allow the fan to cool the heater down. The error will be automatically cleared
E05	Temperature increase too slow • Temperature probe not attached to the component • Workpiece out of range (too big or heavy for heating capacity)	• Make sure that the thermocouple is mounted correctly (to a flat, clean surface) • Increase the safety time to error by pushing MODE & "-" simultaneously for big components



Error code	Fault	Action to fix it
E06	Missing or Invalid Thermocouple - Temperature probe not connected or damaged - Temperature probe removed during operation - Temperature probe still cooling down from a previous heating job.	- Check Thermocouple connection and wire damage - If damaged, use Time Mode and use an external thermometer - Do not remove the probe during operation. - Allow some cooling time until temperature probe reading stabilization.
E07	Power electronics failure - Electronics disturbance - Electronic damage	- Reset the heater - Return to reseller
E08	Mains voltage outside the permissible range - Eventual voltage peak - Power supply out of tolerance (10%)	- Reset the heater - Check mains supply for correct level
E10	Ambient temperature outside the operating range	- Make sure the heater is within temperature range (0 to +40 °C; +32 to +104 °F) - Use it indoors and avoid sun
E11	No calibration data Electronics failure	Return to reseller
E12	Wrong voltage supply Voltage out of calibration range	- Check the voltage version of the heater - Check the voltage of the power supply

10. Maintenance and disposal

- ✓ Store the heater in a dry area, with low humidity (0-95% non-condensing).
- ✓ Store and transport the heater within a temperature range of 0- 50 °C (32 - 122 °F).
- ✓ Keep the heater clean with a soft dry cloth. Remove all oil drippings that might remain after use.
- ✓ The heater does not require any specific maintenance nor regular calibration.
- ✓ Do not try to fix the heater yourself. Approach your distributor if there is any malfunctioning or preventive repair needed.
- ✓ The heater is calibrated during production. If some repairs are performed, the heater needs to be recalibrated.
- ✓ In case of disposal of the heater, take the necessary measurements to recycle it. Do not dispose of it in a general waste bin.



11. Accessories

Designation	Description
IND-320-BAG	Carrying and storage bag for IND 320 Size: 450 x 450 x 100 mm Colour: Black Material: Outside - Polyester (1680D) / Lining- EVA-foam and PU



Fig. 3 – The IND 320-BAG is optional to the IND 320

REMARKS:

- ! The bag does not protect the heater against heavy impacts.
- ! Do not operate the heater inside of the bag.
- ! The bag is not heat resistant, do not place hot bearings against it or inside of it.
- ! The IND 320-BAG is available as a paid option for the IND 320 induction heater.

12. CE Declaration of Conformity



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DECLARATION OF CONFORMITY



We herewith declare under our sole responsibility that the products described below are in accordance with the conditions of the following Directive(s):

- EUROPEAN LOW VOLTAGE DIRECTIVE 2014/35/EU
- EMC DIRECTIVE 2014/30/EU

and are in conformity with the following standards:

- EN 61000-6-2 (2005) + AC (2005) Industrial (Immunity)
- EN 55011 (2009) + A1 (2010), Class A, Group II (Emission)
- EN 61000-3-2 (2014), A (Emission)
- EN 61000-3-3 (2013) (Emission)
- EN 60335-1 (2012): Safety of household and similar electrical appliances
- RoHS Directive (EU) 2015/863 and the harmonized standard: EN IEC 63000:2018: Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

The person authorised to compile the technical documentation on behalf of the manufacturer is Gruetznér GmbH, Dagobertstraße 15, 90431 Nuremberg, Germany,

PRODUCT INFORMATION

Product Name: IND 320

Item number: IND-320, IND-320-110V

Function: Heating device

Nuremberg, 09.09.2026

Place, date

Volker Grütznér

Name and signature of an authorised signatory



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13. UKCA Declaration of Conformity



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AUTOMATIC LUBRICATION

DECLARATION OF CONFORMITY

**UK
CA**

We herewith declare under our sole responsibility that the products described below are in accordance with the conditions of the following Directive(s):

- Electrical Equipment (Safety) Regulations 2016 (2016 No. 1101)
- Electromagnetic Compatibility Regulations 2016 (2016 No. 1091)

and are in conformity with the following standards:

- EN 61000-6-2 (2005) + AC (2005) Industrial (Immunity)
- EN 55011 (2009) + A1 (2010), Class A, Group II (Emission)
- EN 61000-3-2 (2014), A (Emission)
- EN 61000-3-3 (2013) (Emission)
- EN 60335-1 (2012): Safety of household and similar electrical appliances
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (2012 No. 3032)
- the harmonized standard: EN IEC 63000:2018: Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

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IND 320

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