

6.3 Time mode

This mode is suitable 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. 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 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.
- ✓ Use heat protection gloves to remove the workpiece.
- ✓ The **IND 320** is now ready to heat another workpiece with the same settings.



IMPORTANT

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.

6.4 Non-bearings mode

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.

- ✓ 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.

6.5 Power level selection

The shape, weight, size and internal clearances, all affect to the time required to heat up a bearing. 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. The low-power mode is suitable, for example, for:

- ✓ Shielded bearings

- ✓ Sealed bearings with metallic inserts
We do not recommend heating bearings capped with seals or shields above 80 °C (175°F).
- ✓ 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.
- ✓ Very small bearings
In the case of very small bearings, the power of the **IND 320** is automatically lowered.

7. 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	• Return to reseller
E02	Fan Failure	• Return to reseller
E03, E04	Overheating • 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
E06	Faulty temperature sensor • 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	• Reset the heater • Return to reseller

Error code	Fault	Action to fix it
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	• Return to reseller
E12	Wrong voltage supply	• Check the voltage version of the heater • Check the voltage of the power supply

8. Maintenance & Disposal

- ✓ Store the heater in a dry room with low humidity and a temperature range of 0–50 °C (32–122 °F).
- ✓ Keep the heater clean with a soft dry cloth.
- ✓ The heater does not require any specific maintenance nor regular calibration.
- ✓ In case of disposal of the heater, take the necessary measurements to recycle it. Do not dispose it in a general waste bin.

IND 320
Induction heater

Quick start guide



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This is a quick start guide to commissioning the **IND 320** for experienced users. Please visit www.G-LUBE.com to download the complete user manual including all safety instructions.

1. Product details



No.	Description	No.	Description
1	Temperature probe	3	Induction area
2	User interface	4	Main switch

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.

2. 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

* Depending on the geometry of the bearing, maximum heating temperature and power availability.

3. Safety

Please visit www.G-LUBE.com to download the complete user manual including all safety instructions.



- ! Risk of pinching your fingers
- ! Electro-magnetic field radiation
- ! Hot surfaces: During the heating process observe a safety distance of 30 cm (1 ft) with the workpiece or the heater.
- ! Wear safety goggles
- ! Use heat protection gloves
- ! Risk if metallic implants in the user's body
- ! Risk for people wearing pacemakers: 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.

The **IND 320** is equipped with the following safety features:

- ✓ Automatic overheating protection
- ✓ Over current protection
- ✓ 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

Please do not attempt to repair the heating unit yourself.

4. Electrics

A qualified electrician must install a suitable plug. Make sure that the line voltage is within the specified range depending on the heater type. The heater does not need to be connected to ground since it is a double insulated device with a plastic housing.

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.

5. Commissioning

- ✓ 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. 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 (see Chapter 6).
- ✓ When the selected temperature has been reached, the bearing is then ready to be taken. An acoustic signal will be generated for 4 seconds.
- ✓ 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.
- ✓ Allow the appliance to cool before storing. 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.

6. Operation



Key assignment	
LOW POWER button & LED	This button reduces the power of the heater. If low power mode is selected, then the red LED is switched on.
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.

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.

6.1 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.
- ✓ Press MODE and "+" at the same time to change in between °C to °F.
- ✓ 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.
- ✓ 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.
- ✓ The user interface displays the temperature detected by the temperature probe. Depending on the size of the bearing, the temperature probe might take some time to register the first temperature increase.
- ✓ 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.
- ✓ The heater is now ready to heat up another workpiece with the same settings.

Notes:

- ✓ 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.
- ✓ If the component is not removed nor the process stopped, the temperature holding feature will maintain the component at temperature for 10 minutes.

6.2 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 surface of the workpiece where the temperature probe is located should be clean, dry and flat.