

NTN®



INDUCTION HEATERS

**Read these operation
instructions attentively**

INSTRUCTION MANUAL

**Safe Therm 700
Safe Therm 1200**



**NTN-SNR Roulement
1 rue des Usines-BP 2017
74000 ANNECY Cedex - France
www.ntn-snr.com**

**Control all parts without delay for possible transport
damages. If such damages are determined inform the
carriers immediately**

TABLE OF CONTENTS

1. Safety precautions.....	2
2. Introduction	4
3. Installation.....	5
4. Setting up the work piece.....	5
5. Start the heater.....	6
6. Operations.....	8
7. Technical data.....	11
8. Electrical drawing Safe Therm.....	12
9. Declaration of conformity.....	14

1. SAFETY PRECAUTIONS:

The operation instruction should always be followed:

- NTN-SNR ROULEMENTS shall not be held liable for damages caused by improper handling or by use which does not comply with the designation purpose.
- Prerequisites of the operator:
 - He must be authorised to use this equipment
 - He must be familiar with the safety precautions
 -



- **DANGER : High risk injury**
- **WARNING : Potential risk injury**
- **CAUTION : Danger of damaging the device or the work piece**

WARNING! :

Since a magnetic field (4+5) is generated by the induction heater, people wearing a pacemaker (1) should not work or be in the immediate vicinity of the apparatus. Other sensitive equipment such as wrist watches, magnetic carriers, electronic circuits (3), etc. might also be affected. The safety distance is 1.5 meters (57”).

The equipment should not be used in areas where there is a risk for explosion.

Use protective gloves (danger of burning your hands). Delivered gloved (7) are suitable up to 150°C (302°F). Type Oil Tuff, 52-647, made by Ansell.

Hot surface avoid contact (6)

Do not operate an Induction heater in areas where there is a risk of an explosion.

Wear Safety Shoes (8)



CAUTION:

- All repair work should be taken care of by an official NTN-SNR ROULEMENTS distributor.
- Use original spare parts only.
- Protect heater from water or very high humidity.
- Protect the yoke support and yokes against corrosion, damage and deformation.
- Only preheat ball bearings to max 110°C (230°F).



1.1. SAFETY INSTRUCTIONS:

- The user should have an appreciation of the contents of this manual, and be familiar with safe workshop practices.
- Follow the User Manual at all times.
- Ensure that the machine operates at the correct supply voltage. The heater is supplied with a plug that should be changed only by a qualified person.
- Do not use or store the heater in humid environments. NTN-SNR ROULEMENTS Induction heaters are designed for indoor use only.
- Use proper handling equipment, appropriate for the weight of the work piece or yoke. Never support the pieces to be heated with a metal cable or have anything metallic hanging in the proximity of the magnetic field. Extremely high currents can flow through the cable, causing the cable to heat up.
- Do not hold metal objects near the yokes and poles.

1.2. SAFETY PRECAUTIONS:

- Place heater only on a horizontal surface.
- Keep distance to surrounding object by minimum of 1.5 Metre (57")
- Use only in well ventilated location.
- Prevent to heat up object containing Oil, grease or similar due to possible generator of fumes and smoke.
- Do not inhale/breath fumes or smoke
- Do not move or lift heater after heating process when warm
- Do not rout supply cable through the core.
- While heating keep at least 1.5 metre (57") distance from the heater.
- Never remove the yokes during the heating cycle.
- Do not modify the heater and do not use self-fabricated yokes.
- Always check that the yoke is correctly adjusted to the poles otherwise excessive vibration may occur.
- Only switch the machine on when the yoke is positioned correctly- on models equipped with a pivoting yoke, the yoke should always be closed.

NOTE: Since our products are subject to continuous improvement, we reserve the right to make changes.

1.3. SAFETY FEATURES:

The heater will automatically switch off if the temperature of coil or heat sink will be higher as 120°C (248°F). Let the heater cool down for 30 minutes and turn on the heater again (E 04).

When using temperature mode, the heater will switch off automatically if the rate of temperature rise is to low (E 02).

An induction heater works due a magnetic field. In figures below there are some measured values of the flow density in MilliTesla (mT). These measurements can be used as a guide in conforming to local regulations regarding the maximum time exposure of people to magnetic fields. The values below are only valid for this combination of bearing type and yoke bar. Different configurations may give different values. Due to the large variety of bearing types in combination with the different yoke bars it is impossible value.

Safe Therm 700:

Distance cm	0	10	20	30	40	50	60	70	80	90
X (mT)	2.4	1.9	0.69	0.4	0.3	0.23	0.16	0.15	0.09	0.08
Y (mT)	1.77	1.13	0.69	0.4	0.3	0.23	0.16	0.15	0.13	0.09

Safe Therm 1200:

Distance cm	0	50	60	70	80	90	100	110	120	130
X (mT)	4.8	1.9	0.69	0.4	0.3	0.23	0.16	0.15	0.09	0.08
Y (mT)	3.35	1.13	0.69	0.4	0.3	0.23	0.16	0.15	0.13	0.09

WARNING!

We advise a safety distance of at least 1.5 metre (57") for people.

CAUTION!

The machine works through an induction field. This can influence electronic equipment e.g. watches, magnetic charts etc.

2. INTRODUCTION:

The NTN-SNR ROULEMENTS induction heaters are intended for heating rolling bearings. Other metal components forming a closed circuit such as bushings, shrink rings, pulleys and gears can also be heated. This will facilitate mounting where an interference fit is required.

The heaters are designed to heat the work piece up to a maximum temperature of 240°C (464°F).

NTN-SNR ROULEMENTS heaters can be used on continuous bases.

By heating with the time function this has to be checked with an external temperature meter. Place always the temperature sensor to check within the first heating.

CAUTION:

Bearings should be heated up on most of the cases to a maximum temperature of 120°C (248°F). Do not use induction heaters for bearings or work pieces, which are outside the minimum or maximum dimensions specified in this manual. Do not switch off the heater with the main switch while heating cycle is running.

Operation condition:

The heater is designed to be used in an industrial environment with an ambient temperature of 0°C to 40°C (32°F to 104°F) and an atmospheric humidity between 5% and 90%. The induction heater is meant for indoor use only.

3. INSTALLATION:



- Remove packaging material and place the induction heater on a non-ferrous, stable, flat surface. The box will normally contain the heater, a yoke or a set of yokes, the temperature probe and a pair of heat-resistant gloves.
- Check that the supply voltage and current meet the specifications on the plate that is located on the back of the machine.
- As there are a large number of plug types, change the NTN-SNR ROULEMENTS induction heaters' plug provided with a plug that fits to your power supply.
- The wires should be connected as follows:
 - Safe Therm 700 Braun (Black us) = Phase | Blue = Phase (Black us) | Green / yellow: ground.
 - Safe Therm 1200 Braun (Black us) = Phase | Blue = Phase (Black us) | Green / yellow: ground | connect the wire (95²) to the fuse box.
- Make sure that the supply cable cannot come into contact with the bearing that is to be heated. Insert the plug into a shockproof wall socket.
- Connect the heater to electric mains,
- Keep distance to surrounding object by 0.5 metre (19")
- Turn main switch from 0 to 1
- The heater will emit a short beep and in the display 110°C (230°F) will appear.
- The induction heater is now ready to be used.

4. SETTING UP THE WORK PIECE:

WARNING!

Use appropriate hoisting equipment for heavy components and yokes. The manual lifting of heavy pieces is a common cause of injury.

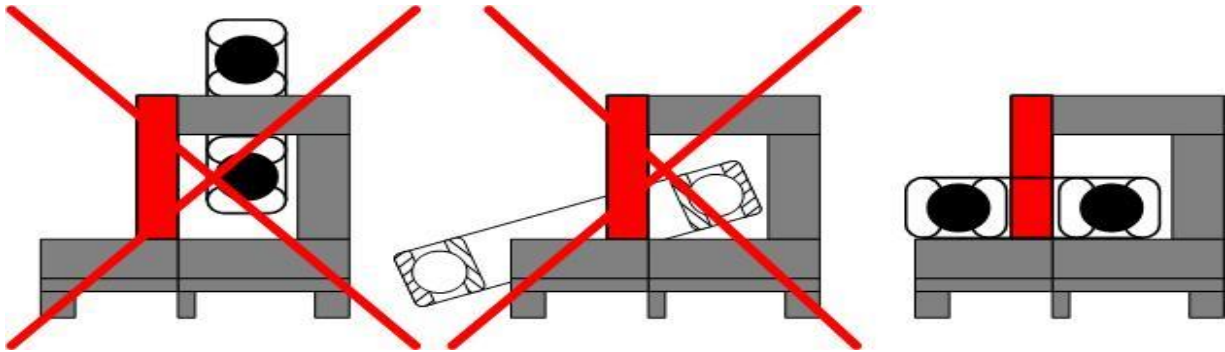
Wear Safety Shoes as inductor yokes can slip out of your hands.

The weight of the work-piece should not exceed the maximum weight shown in drawing below. Exceeding these limits may result in equipment failure leading to personal injuries.

Ensure that the mains cable cannot come into contact with the work piece. Damage to the cable may result in electrocution.

Never support components with a metal cable or have any hanging in the proximity of the magnetic field. Extremely high currents can flow through the cable causing a quick raise of temperature, resulting in a risk of burning.

The work piece can be set up only in one way:



- Only place part **horizontally**
- Do not touch the U-core
- Always lay part flat on surface
- Always use the sliding fiberglass parts between the heater and the part to be heated

Safe Therm 700:

Max dimentions part:
Max inner diameter: 800 mm (31.5")
Min. inner diameter: 45 mm (1.77")
Max outer diameter: 900 mm (35.43")
Min outer diameter: NA
Max height: 420 mm (16.54")
Min. weight: 30kg (66 lbs)
Max weight part (Bearing): 700 kg (1543 lbs)
Max Weight part (solid) : 700 kg (1543.23 lbs)

Safe Therm 1200:

Max dimentions part:
Max inner diameter: 1500 mm (59.06")
Min. inner diameter: 85 mm (3.35")
Max outer diameter: 1550 mm (61.02")
Min outer diameter : NA
Max height: 460 mm (18.11")
Min weight: 50 kg (110.23 lbs)
Max weight part (Bearing): 1200KG (2645 lbs)
Max Weight part (solid) : 1200KG (2645.55 lbs)

5. START HEATER:

The heater can be switched on with the "start/stop" button or remote control.
Standard the heater starts up with the remote control.



The remote control makes it possible to start and stop the heater outside of the magnetic field.

In case of loss of the remote or other reasons; it is possible to use the start/stop button only. This can be changed in the user mode:

Activate start/stop button (direct start without remote!)

Push 10 seconds Start /Stop

- In the display appears U08
- Push Button Start stop , in the display appears 1
- Change with down button to 0
- Push button start stop and U08 appears in the display
- Push button up button till U05 in the display appears
- Push Button start stop, in the display appears 00:30
- Change 30 with down button to 00:05
- Push button start stop till U05 in the display appears
- Push button up button till U10
- Push button start stop and 110°C appears in display

Start button activated

Activate Remote control

Start the heater with the remote control:

1. Set temperature, time or temperature/time ramp
2. Push the start /stop button
3. Display will count down for 30 seconds
4. Step away from heater
5. Start heater within this 30 seconds with the remote control

If the heater is not activated in these 30 seconds: --- appears Repeat above.



Start the heater with start/stop button only:

1. Set temperature, time or temperature/time ramp,
2. Push the start /stop button,
3. Display will count down for 5 seconds,
4. Step away from heater,
5. The heater will start to heat.

NOTE: Process can be interrupted by pressing "stop" at any time

Set up can be done in by 3 different ways:

- Temperature
- Time versus temperature ramp
- Time



Use protective gloves!

Heating temperature controlled:

- Place magnetic probe on work piece close to the bore. Make sure that the place reserved for the probe is free of any grease or oil.



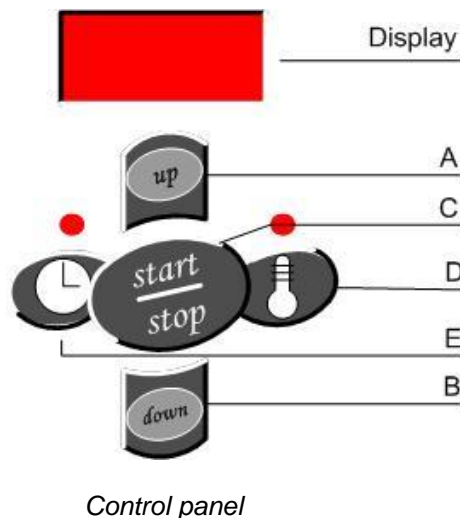
Sketches

- Always use magnetic temperature probe (hereafter referred to as the 'probe') for heating in the Temperature Mode.
- The probe is suitable for operation up to a maximum temperature of 240°C (484°F)
- As a safety feature, the connection between magnet and probe will break above the maximum temperature. If this occurs when operating in the Temperature Mode, the machine will turn itself off since the probe will fail to register any increase in the temperature over a set period of time.
- A probe fixed to a clamp is also available when heating non-magnetic work pieces.
- Ensure that the area where the probe is located is completely clean.
- Connect the probe by inserting the plug into the socket at the side of the heater, **watch out for + -!**

CAUTION:

Treat the probe with care. It is a valuable part of the heater and can easily be broken through careless handling. After use, we suggest that it is placed on the side of the vertical pole.

6. OPERATIONS:



Heating with temperature pre-selection function:

When heater is switched on the display will show: 110°C (230°F)

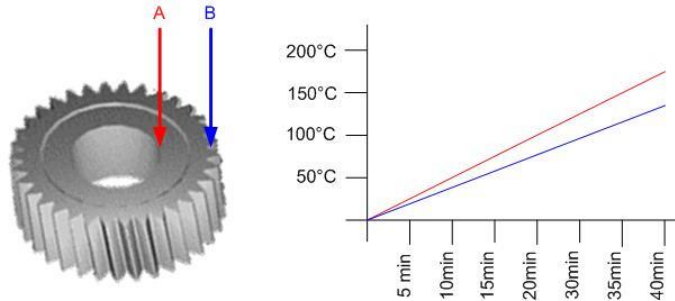
With A and B you can decrease the temperature to 0°C (32°F) and increase to 240°C. (484°F)

Select temperature and press "start/stop" to start the heating process. The heater will first count down for 30 seconds; this makes it able for the user to step away from the heater 1 meter (38"), start heater with remote control. The display will now show progress of heating cycle. Once pre-selected temperature is reached the acoustic signal will sound and the display will flash. Press "stop" on the remote control and place probe on one of the poles, remove work piece.

Heating time versus temperature ramp:

This is specially developed for the heating of gears and bearings with a small clearance. The user can set the temperature and time; the heater will heat the part exactly to the preset temperature in the preset time. The major advantage this provides is the temperature differential between the internal and external component material remains low thus reducing the potential for material stress accumulation and subsequent potential distortional damage.

Press D and set temperature, press E and set time (> 10 minutes). Both LED's are lightning. Press "start/stop" to start the heating process. The heater will first count down for 30 seconds; this makes it able for the user to step away from the heater 1 meter (38"), start heater with remote control. The display will now show progress of heating cycle. The power will automatically be regulated by the microprocessor. Once pre-selected temperature is reached the acoustic signal will sound and the display will flash. Press "stop" on the remote control and place probe on one of the poles, remove work piece.



Heating curve as a function of temperature

This slower heating process will avoid a big differential between A and B: low stress heating method

Temperature hold:

As soon as the temperature drops 5°C/F, heating will automatically repeat. This process will repeat itself 5 times. Press "stop" and place probe on one of the poles, remove work piece.

Heating with time pre-selection function:

Heating on the time pre-selection is only to use in production areas where constantly only one and the same part will be heated up!

Heat the part that have to be heated repeatability on the temperature mode and control the heating time with a separate stop watch. Now you can heat the part constantly on the time mode without placing a sensor.

- When heater is switched on the display will show: 110°C (230°F)
- Switch on the heater and press button E
- The display will show: **00.00**
- Select time and press "start/stop" to start the heating process. The heater will first count down for 30 seconds, this makes it able for the user to step away from the heater 1 meter (38") start heater with remote control. The display will count down first to 00.00.

When heating cycle has ended the acoustic signal will sound .Press C and remove work piece.

WARNING!
Use the time mode with care and only for the application described above.
Heating process may not be started unless the yoke is correct in place over the poles.

6.1. Malfunctioning / Error Signals:

- E01:** The probe is not plugged in or the cable of the probe is broken
- E02:** The increase of temperature is lower than 1°C in 10 minutes.
Please check:
- The probe, no damage and placed properly.
 - The part can be too big for the machine (heating time too long).
- E04:** Coil or heat sinks are too hot (more than 120°C)
- Inform your distributor.
- E06:** No Zero crossing.
- Inform your distributor
- E08:** Invalid ramp,
- Check time and temperature

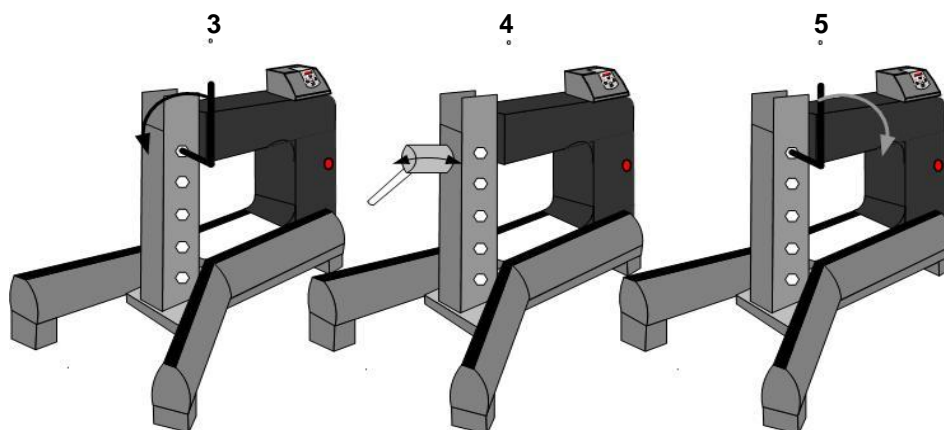
Press “start/stop” and check which of above possibilities is causing the Error signal.

If a loud vibrating noise heard, first check:

- Are the contact surfaces clean and greased sufficiently?
- Are the yokes 100% in contact with the surface?

6.2. Adjustment yokes:

1. Check if the grinded side is flat.
2. Place yoke or pivoting yoke on the heater.
3. Unscrew the screws in yoke and pivoting point an 1/4 turn.
4. Turn on the heater and the yoke will set itself or use a nylon hammer.
5. Fasten screws and turn off heater.



WARNING! If in any doubt, isolate the machine and contact your local distributor.

Cleaning and maintenance:

- Store in a dry, frost-proof area, free from humidity.
- Keep clean with a soft, dry cloth.
- Keep the contact parts of the poles clean. Grease regularly with an acid free grease for optimal contact with the yokes and to avoid corrosion (on swing-arm models, also grease the vertical pin regularly).
- Contact your supplier if there is any suspicion of malfunctioning.

7. TECHNICAL DATA:

7.1 Technical data for Safe Therm 700 :

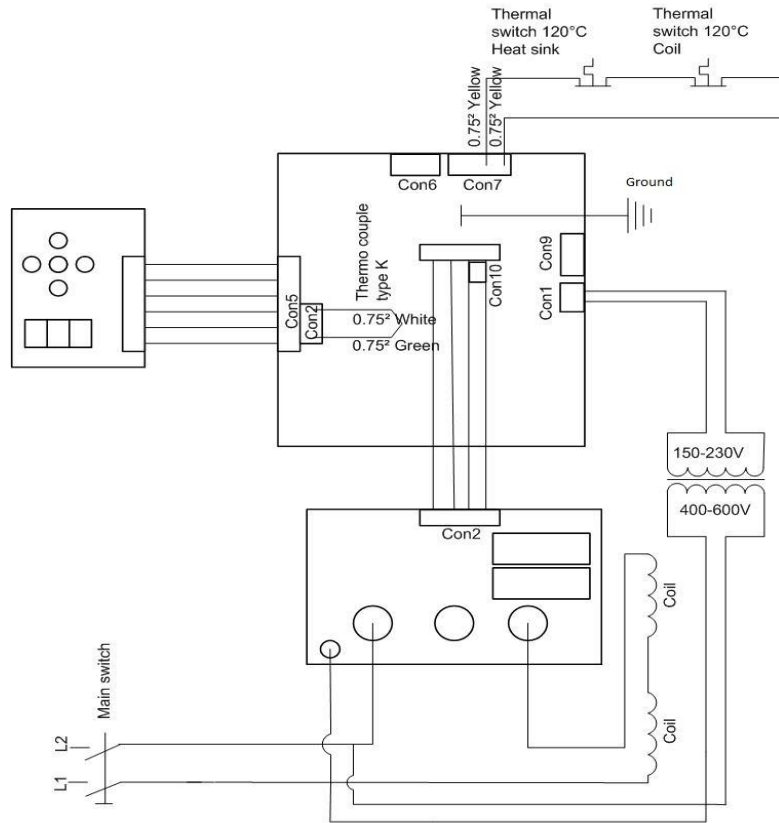
Type	NTN-SNR Safe Therm 700
Voltage	460V-63A-60Hz / 400V-63A-50Hz
Power	29KVA (460 V) / 25.2KVA (400 V)
Temperature control	Max. 240°C (464 °F)
Heating speed control	Microprocessor controlled
Overall dimensions	780x1200x1060 mm (30,7''x47,2''x41,7'')
Max. weight work piece	Solid component 700 kg(1543 lbs)
Max. weight Bearing	Bearing : 700 kg (1543 lbs)
Mass. Heater without yokes	280 kg (617.29 lbs)
TYPE:	Dimensions :
Induction yoke	
Tool ST700-yoke 45	30x30x700
Tool ST700-yoke 60	40x40x700
Tool ST700-yoke 70	50x50x700
Tool ST700-yoke 85	60x60x700
Tool ST700-yoke 100	70x70x700
Tool ST700-yoke 115	80x80x700
Tool ST700-yoke 130	90x90x700
Tool ST700-yoke 145	100x100x700
Magnetic probe: Tool temp probe 1000	
Crane: Tool ST 700-lifting device	

7.2. Technical data for Safe Therm 1200:

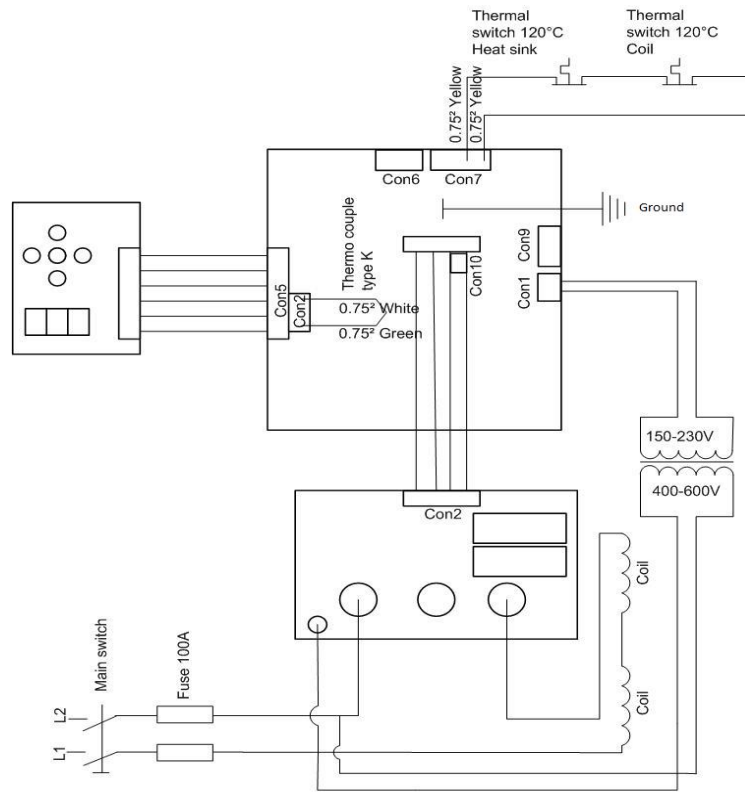
Type	NTN-SNR Safe Therm 1200
Voltage	460V-100A-60Hz / 400V-100A-50Hz
Power	46KVA (460V) / 40 KVA (400V)
Temperature control	Max. 240°C (464 °F)
Heating speed control	Microprocessor controlled
Overall dimensions	1200x1700x1250 mm (47,2''x66,9''x49,2'')
Max. weight work piece	Solid components: 1200 kg (2645 lbs)
Max. weight Bearing	Bearing: 1200 kg (2645 lbs)
Mass. Heater without yokes	850 kg (1873.92 lbs)
TYPE:	Dimensions :
Induction yoke	
Tool ST1200-yoke 85	60x60x850
Tool ST1200-yoke 115	80x80x850
Tool ST1200-yoke 145	100x100x850
Tool ST1200-yoke 215	150x150x850
Magnetic probe: Tool temp probe 1500	
Crane: Tool ST 1200-lifting device	

8. ELECTRICAL DRAWING

Safe Therm 700:



Safe Therm 1200:



9. DECLARATION OF CONFORMITY:

Manufacturer: NTN-SNR Bearing
Address: 1 rue des Usines - 74000 Annecy France

In accordance with low voltage Directive 2006/95/EC and EMV Directive 2004/108/EC and Machinery Directive 2006/42/EC

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: Induction heater device
Product name: Fast Therm and Safe Therm
Type: Fast Therm 20 / 35 / 150 / 300 and Safe Therm 700 / 1200

Applicable armonized standards:
EN-IEC 60204-1:2006/C11:201
EN-IEC 61000-4-6:2007/A1:201
IEC 60695-11-10
NEN 3140+A1:2015

Induction Heating Systems : Warranty Terms and Conditions

NTN-SNR ROULEMENTS guarantees this product to be free from defects in material and workmanship for a period of 3 years from date of purchase. It remains the customer's responsibility to provide proof of this date of purchase. During the warranty period NTN-SNR ROULEMENTS will either repair or replace any product that proves to be defective.

Limitations:

This warranty does not apply to defects resulting from product modification or misuse of any product or part without NTN-SNR ROULEMENTS' written consent. Furthermore, this warranty does not apply to fuses or problems arising from normal wear or failure to follow instruction.

Neither NTN -SNR ROULEMENTS nor its employees shall be liable for any direct or indirect damages arising either out of any defects in the products or the use of the products, even if NTN-SNR ROULEMENTS has been informed in advance of the possibility of such damage. Such excluded damages shall include, but are not limited to: costs of removal and installation, losses sustained as the result of injury to any person, or damage to property.