

Induction Heater



TABLE OF CONTENTS**1 INTRODUCTION / DESCRIPTION**

1.1	INTRODUCTION	3
1.2	DESCRIPTION	3
1.3	DESCRIPTION OF DEVICE COMPONENTS	3
1.4	BLOCK DIAGRAM	4
1.5	APPLICATION DEFINITION	4
1.6	TECHNICAL DATA	5

2 SAFETY

2.1	GENERAL SAFETY RULES WHEN USING INDUCTION HEATER	5
2.2	INFORMATION SYMBOLS	6
2.3	SYMBOLS INDICATED HEALTH RISKS	7
2.4	ELECTRIC SHOCK	7
2.5	CAUTION! HOT SURFACE	7
2.6	RISK OF FIRE	7
2.7	SYMBOLS WARNING WHILE HANDLING THE DEVICE	8
2.8	SAFETY EQUIPMENT WHEN WORKING WITH THE DEVICE	8
2.9	ELECTROMAGNETIC EFFECTS	8

3 USING THE INDUCTION HEATER

3.1	MAINTENANCE	9
3.2	STORAGE	9
3.3	COMMISSIONING	9
3.4	HEATING PROCEDURE	9
3.5	HEATING INDUCTOR REPLACEMENT PROCEDURE	10
3.6	WORKING CYCLE	10
3.7	PROTECTIONS AND LIST OF ERROR MESSAGES	10
3.8	ERROR MASAGE	11

4 HEATING INDUCTORS FOR INDUCTION HEATER AND RULES FOR THEIR USE

4.1	FRONT AND SIDE SOCKET COILS	12
4.3	FLEXIBLE INDUCTOR	13
4.2	FLAT INDUCTOR	14

5 ENVIRONMENTAL PROTECTION

5.1	ENVIRONMENTAL PROTECTION	14
5.2	DISPOSAL	14

1.1 INTRODUCTION

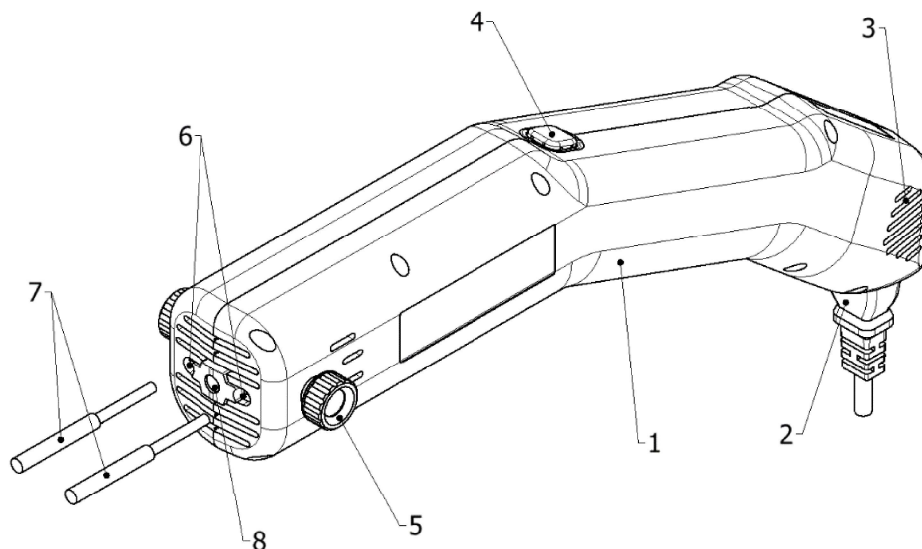
Dear customer, thank you for purchasing a product of BGS technic. We believe that you will be fully satisfied with our product and will choose us again in future. If you have any questions or comments, feel free to contact us via our web site or turn to your business representative.

CAUTION! Do not attempt to start (use) the equipment before you have read the whole Operating Manual. Keep the Manual for future use. Pursuant to this Manual, the first use of the equipment is the legal step whereby the user confirms with their free will that they have read this Manual properly, understood its meaning fully and are informed about all the risks.

1.2 DESCRIPTION

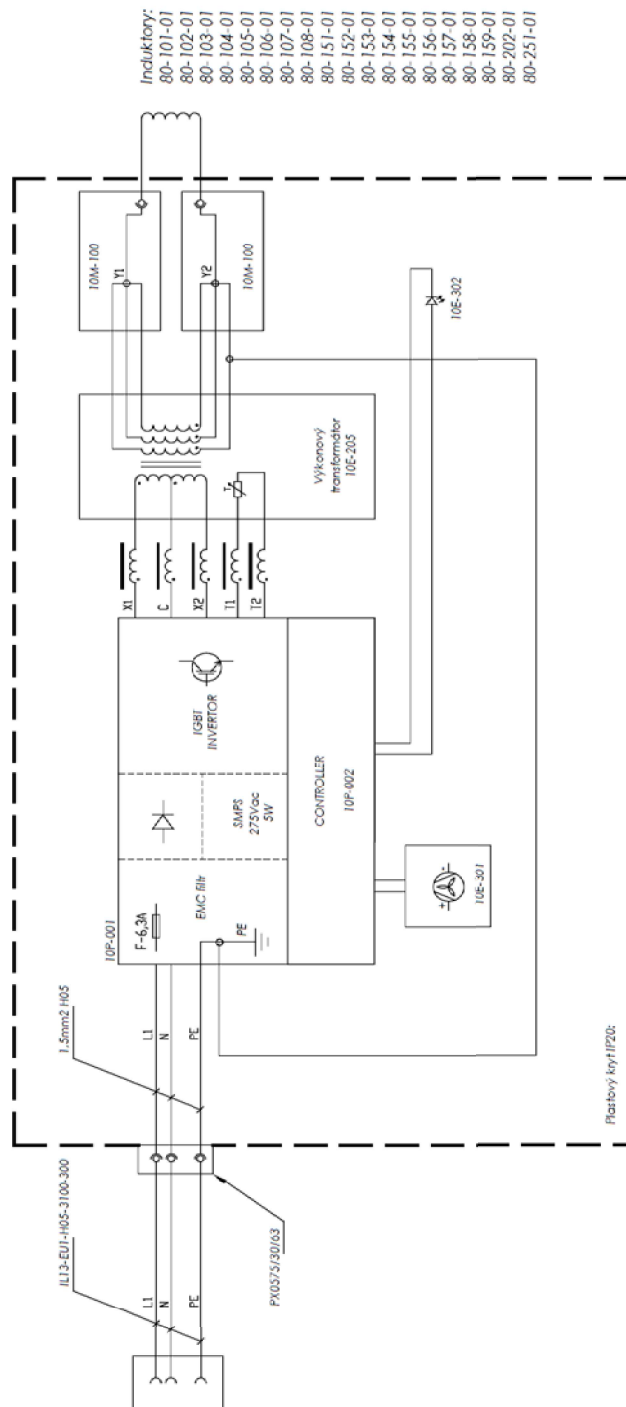
This is a small, compact, manual induction heater, designed primarily for work in home workshops and small-scale plants. The device is intended for heating parts made solely from ferrous metals.

1.3 DESCRIPTION OF DEVICE COMPONENTS



Position	Description
1	Induction heater unit
2	Removable power cable conforming to IEC 60320
3	Coolant (air) supply openings
4	Heater start button
5	Heating inductor securing screw
6	Heating inductor terminal inlet openings
7	Heating inductor (connecting part)
8	LED diode for lighting the heated component and device status indication

1.4 BLOCK DIAGRAM



1.5 APPLICATION DEFINITION

The INDUCTION HEATER can only be used by persons above 15 years of age and persons without metal implants and cardiac pacemakers familiar with the device functioning by means of the Instruction Manual. The device must not be used by persons with reduced decision-making ability and persons under the influence of drugs, alcohol or medication. The device must not be used in environments with an explosion hazard and near inflammable substances. The device must not be used outdoors and in humid environments.

1.6 TECHNICAL DATA

Input voltage	230	V _{AC}
Frequency	50/60	Hz
Maximum input current (6.3 A circuit breaker)	5,4	A _{RMS} ¹
Maximum input power	1,2	kW
Output frequency	40-60	kHz
Power factor	≥ 0,95	
Maximum working cycle	90% při 25°C	
Protective system	IP20	
Protection class	I.	
Dustiness class	II.	
Weight	1	kg
Dimensions	375x65x85	mm

1) For the purposes of measurement pursuant to EN 60335-1, the maximum current and power output are determined as nominal values under nominal supply voltage U=230 Vac / 50 Hz, during normal operation and with the load configuration: Inductor "80-108-01" and working object "Bar with a diameter D=45 mm made of unalloyed steel of class11 (S235JRG2)" inserted in the inductor with a length of 75 mm and heated to 100°C. The output power is read after 2 minutes of heating.

2 SAFETY

2.1 GENERAL SAFETY RULES WHEN USING INDUCTION HEATER

Symbols shown in this Manual warn and identify potential hazards when handling the device.

- Do not leave INDUCTION HEATER unattended while it is turned on. **Always deactivate INDUCTION HEATER with the master switch when not using it for heating!**
- Whenever the device is connected to the grid power supply, sufficient air supply for cooling has to be provided.
- Make sure that the ventilation openings are free of dust and dirt, to not preclude flow of air.
- Do not attempt to repair your INDUCTION HEATER. The device contains no parts that the user could repair.
- The user is responsible for the device installation and use in accordance with instructions shown in this Manual.
- The supplier is not liable for any damage due to inexperienced use and operation.
- Keep persons standing around and animals at a safe distance while working with the INDUCTION HEATER, including while the heated material is cooling down.
- Keep the working area well ventilated and dry, clean and well lit.

! The device must be protected from rain and moisture, mechanical damage and any ventilation of adjacent machines, excessive overloading and harsh handling!

SYMBOL	EXPLANATION
	DANGER! Denotes a dangerous situation that may result in a death or serious injury. The potential risks are shown under the following symbols, or explained in the text.
	Before plugging in your INDUCTION HEATER, make sure the socket voltage matches that on the product plate. If the power grid socket voltage does not match that shown on the type plate, it can result in a serious hazard and damage to your INDUCTION HEATER.
	IMPORTANT! Read this Manual carefully to familiarize yourself with the risks and working method of the INDUCTION HEATER. Inappropriate handling may cause death, injury, material damage or irreversible damage to your INDUCTION HEATER.

2.2 INFORMATION SYMBOLS

The symbols shown below will guide you through this Manual and warn you of potential risks. If you see the symbol, be careful! Follow the instructions shown below to avoid the dangers.

SYMBOL	EXPLANATION
	Risk of death by electrocution!
	Hot surface! Danger of burns!
	Risk of fire!
	Electromagnetic field risk!
	Must not be operated by persons with a cardiac pacemaker or other electronic implants!
	Do not wear watches, jewels or other metal objects while working!
	Must not be operated by persons with surgical implants!
	Use protective or surgical masks while working.
	Wear protective gloves while working.
	Wear protective goggles while working.
	Wear suitable protective work clothes free of metal components while working.

2.3 SYMBOLS INDICATED HEALTH RISKS

2.4 ELECTRIC SHOCK



CAUTION! Never remove casing and do any activity with the induction heater unless you have first disconnected the plug from the socket. **Then wait at least 1-2 minutes after unplugging it.**

DO NOT WORK WITH THE DEVICE IN RAIN AND HUMID AREAS.

CAUTION! Any interventions in the electric section may only be made by persons with adequate electrical engineering qualifications. There is a risk of electric shock during any unauthorised servicing.

2.5 CAUTION! HOT SURFACE



CAUTION! Do not touch any objects located near the induction heater unless you have checked that it has cooled down.

Do not touch the induction coil if it is activated and the strong magnetic field and heating are turned on.

Always wear protective gloves or other aids while working with the INDUCTION HEATER, as there is a risk of burns from the heating inductor or the heated working medium in the device.

2.6 RISK OF FIRE



DO NOT OPERATE THE EQUIPMENT IN ENVIRONMENTS WITH AN EXPLOSION HAZARD!

Do not overheat parts.

Do not heat materials above their melting temperature, as there is a risk of scalding with hot metal burns.

Be careful about fire near the INDUCTION HEATER. Keep inflammable substances outside the working area of the INDUCTION HEATER.

Do not put the device on, over or near inflammable surfaces.

Do not use the device if it is near objects that may contain inflammable particles of dust, gas, vapour or liquids. After completion of work with the device, check the area to make sure everything is secure and there is no risk of sparks, flames and fire.

2.7 SYMBOLS WARNING WHILE HANDLING THE DEVICE

2.8 SAFETY EQUIPMENT WHEN WORKING WITH THE DEVICE

	Always wear protective goggles or face mask when using the INDUCTION HEATER.
	Use of the device may produce dangerous waste gases from burning of old paints, lubricants, sealants, glues, etc. These exhausts may be toxic. Always use adequate protective masks or respirators.
	Always use protective gloves with adequate resistance when working with the device. The high temperatures produced by using the INDUCTION HEATER may cause serious burns on contact with the heated part.
	Always wear protective work clothes free of metal components while working with the device. If exposed to the variable magnetic field, such metal components may heat to a high temperature and cause burns or ignition of the clothes.

2.9 ELECTROMAGNETIC EFFECTS

	The electromagnetic field (EMF) may affect implanted medical devices. The device is not intended to be used by bearers of cardiac pacemakers or other implanted medical devices. Keep a safe distance of body parts from the heating inductor as shown in 3.4 while working. Short-term exposure of tissue to temporally variable magnetic fields of high intensity may lead to tissue heating due to induced currents. Long-term exposure to temporally variable magnetic fields of high intensity may lead to: – undesirable effects on nerve function, – fatigue, – headache, – blood formation disorders
  	Persons with other metallic or electronic surgical implants are not allowed to work with the INDUCTION HEATER and have to keep a safe distance of at least 1 m from the device. When working with the INDUCTION HEATER, do not wear any metal objects such as jewels, rings, watches, necklaces, identification plates, belt buckles, piercing or clothes with metal components such as metal rivets, buttons, zip fasteners, etc. The device can heat these metal objects very fast and thus cause serious burns or even ignition of clothes.

! Bearers of these devices should immediately consult their physician to avoid potential troubles connected with them while handling the device.

3 USING THE INDUCTION HEATER

3.1 MAINTENANCE

Persons without electrical engineering qualification are not permitted to do any servicing. Considerate use of the INDUCTION HEATER helps prevent needless defects and malfunctions. Contact the device vendor for any servicing.

3.2 STORAGE

The device has to be stored in a clean and dry room. Protect the device from moisture and direct sunlight. Leave the device switched on for 10 minutes after heating, until it cools down. Then switch it off by disconnecting it from the grid power supply. If you disconnect the device immediately, leave it and all the working coils to cool down for at least 20 minutes.

3.3 COMMISSIONING

Unpack the device and any accessories supplied and check that they are in good order and the device and the accessories are not damaged in any way. If you find any defects, do not continue and contact the device vendor!

3.4 HEATING PROCEDURE

1. Slide the heating inductor over or next to the heated material, but the inductor should not touch the heated object.
2. Press the heating button.
3. Hold the button down throughout the heating to the required temperature.
4. Release the heating button and carefully slide the inductor off the heated material.
5. Put the device down on a fireproof surface and leave it to cool for next use or cool down for 10 minutes before storage.

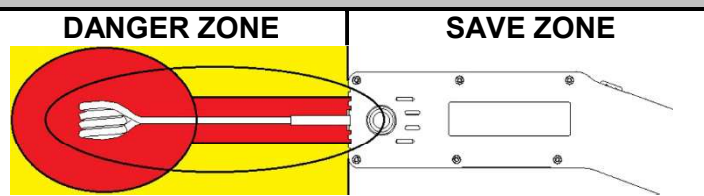
CAUTION

It is important not to expose your body parts to the variable magnetic field while heating. Therefore, observe sufficient distance between all body parts and the active inductor zones described in the picture.



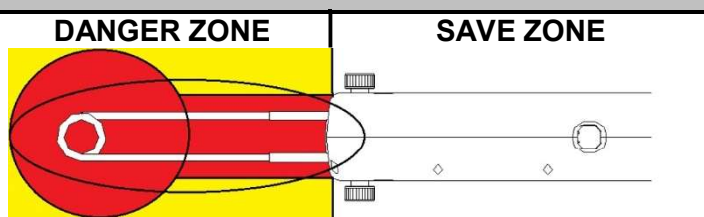
CLASS 2 RISK

Red colour marks active zones, where interaction with the magnetic field leads to a tissue damage risk even on short exposure to its effects.



CLASS 1 RISK

Zones marked in yellow pose a tissue damage risk on long-term exposure to the magnetic field effects.



3.5 HEATING INDUCTOR REPLACEMENT PROCEDURE

1. Leave the device on a fireproof surface for a time needed for the induction coil to cool down.
2. Disconnect the device from the grid power supply to prevent unwanted starting while replacing the induction coil.
3. Loosen the screws securing the coil and then slide the coil off the cooled terminal.
4. Insert the desired induction coil and tighten the fastening screws.
5. Connect the device to the grid power supply and wait for the fan to start; the device is ready for heating after that.

3.6 WORKING CYCLE

The INDUCTION HEATER is designed so that it can heat for up to 20 minutes when started cold under normal conditions with an ambient temperature of 25°C. However, various influences may occur in use that result in a shorter heating time.

These influences include:

- Reduced air supply to the device, reducing its cooling.
- Reverse heat transfer from the working object to the heating inductor.
- Dust clogging the device.
- Heating inductor condition.

That is why the device working cycle information is approximate only and always depends on the working conditions. The device has temperature measurement for critical components and does not permit the user to engage the output circuits for so long that device overheating might pose a risk arising from device overheating.

The recommended working cycle is 10 minutes of heating followed by a minute of cooling.

CAUTION: The coil and the heated object may reach high temperatures and cause burns and/or a fire.

3.7 PROTECTIONS AND LIST OF ERROR MESSAGES

Protection from short circuit and output overcurrent	10 A max. < 200 ns
Device overheating protection	Max. 80°C at device inverter cooler
Accessory overheating protection	Max 120°C at process coil terminals with thermally conductive connection via impedance transformer winding
Protection from operation under non-standard grid conditions	Grid power supply frequency outside the 45-65 Hz range

Error messages comprise simultaneous acoustic and light signals. The error message number always equals the number of short (0.5 s) light and acoustic signals following the long (2 s) light and acoustic signal, repeated 3 times. The error message repetition can be cancelled after the first indication by pressing the button. Pressing the button one more time places the device in the heating mode.

3.8 ERROR MESSAGES

Error message No.	Error title	Error description
1	Inverter overvoltage	Error due to connection of the instrument to a power supply network with too high a voltage greater than 276 VRMS, due to non-standard behaviour of the working load or due to defective HW.
2	Inverter overcurrent	Error caused by excessive load on the heating inductor, use of a non-original heating inductor, non-standard behaviour of the working cartridge or defective HW.
3	Inverter overheating	Error indicating overheating, failure to follow the recommended duty cycle or non-standard thermal stress on the instrument.
4	Network synchronization error	This is an error in the HW part that is responsible for synchronization with the network.
5	Fan fault I	Instrument fault due to dust clogging, fan braking, jamming or electrical short circuit.
6	Fan fault II	Instrument error due to fan connection discontinuity or fan inactivity
7	Power supply instability I	Power supply error of secondary circuits of the device - overvoltage of secondary circuits.
8	Power supply instability II	Power supply error of secondary circuits of the device - undervoltage of secondary circuits.
9	High inverter frequency	Error related to short circuit on the inductor or too low inductance (use of non-original inductor).

CAUTION! If the device shows any signs of thermal or mechanical damage, or shows no signs of operation, or if any error lingers after changing the power supply, the heating inductor or the working object, do not use the device anymore, disconnect it from the grid power supply, place it on a fireproof surface, leave it to cool safely for 20 minutes and contact the device vendor.

4 HEATING INDUCTORS FOR INDUCTION HEATER AND RULES FOR THEIR USE**4.1 FRONT AND SIDE SOCKET COILS**

Standard front and side socket coils are used for heating nuts, clutches, gaskets, hinges, exhaust pipes, bolts, etc., which are accessible for sliding on the coil.

FRONT COILS

Standard diameters: 15-45 mm

**SIDE COILS**

Standard diameters: 15-45 mm

**Rules for correct use:**

There should be a gap of approximately 3-5 mm between the coil and the heated material while heating it to prevent excessive wear of the coil insulation. Holding the coil directly on the hot material may burn the coil insulation, reducing coil lifetime. We recommend keeping direct contact between the coil and hot material to a minimum.



REMARK: Releasing of nuts, bolts, etc., typically does not require making the material red-hot. Heat the nut for 2 seconds and try to loosen it with a wrench. If you cannot, heat it for another 2 seconds and try to loosen it with a wrench again. Coil lifetime can be increased by removing rust, paints, lubricants, etc., from the heated material.

CAUTION: Use original heating inductors only. If non-original accessories are used, the device manufacturer is not liable for any damage due to device use. Use of a non-original inductor is considered use in contravention of the Instruction Manual

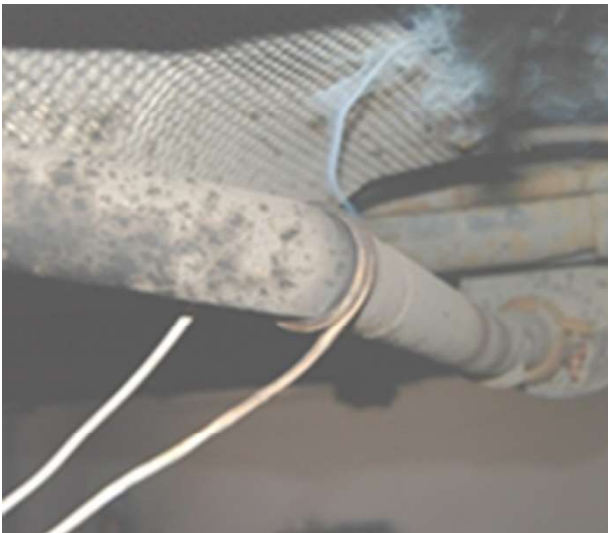
4.2 FLEXIBLE INDUCTOR

The flexible coil is used for releasing axle mounts, jammed sensors, ball joints, etc., where socket coils cannot be used.



Correct procedure:

1. Connect one end of the coil to the coil holder and secure it with the lock screw.
2. Wrap the loose end of the conductor around the part to be heated. Make approximately 2-4 spirals.
3. Connect other, loose end of the coil to the coil holder and secure it with the screw.
4. Press the button to active heating.
5. Once the heating is completed, release one end of the coil and unwind it from the heated material.



REMARK: The flexible inductor can be used for heating large nuts, exhaust pipes, bolts, axle parts, shafts, etc.

CAUTION: Use original heating inductors only. If non-original accessories are used, the device manufacturer is not liable for any damage due to device use. Use of a non-original inductor is considered use in contravention of the Instruction Manual.

4.3 FLAT INDUCTOR

The flat spiral-shaped coil is designed for heating flat sheet metal and straightening minor dents in car bodywork by heating. The flat coil is also intended for easy removal of stickers, rubbers, gaskets, sealants and the like by heating the substrate – sheet steel.



Correct procedure:

1. Connect the coil to the coil holder.
2. Apply the coil surface to the material.
3. Press the button and guide the coil a circular movement over the material.
4. After heating the material, leave the coil to cool for at least 2 minutes.



REMARK: The coil can be used for removing various stickers, rubber linings and gaskets glued on a metal or sheet metal material, e.g., in the automotive industry, car repair shops, etc. The coil is used for heating the substrate, thus softening or hardening the adhesive, sealant, etc. We recommend holding the coil approx. 5-15 mm from the heated material; the required temperature and heating speed can be adjusted by changing the distance.

CAUTION: Use original heating inductors only. If non-original accessories are used, the device manufacturer is not liable for any damage due to device use. Use of a non-original inductor is considered use in contravention of the Instruction Manual.

5.1 ENVIRONMENTAL PROTECTION

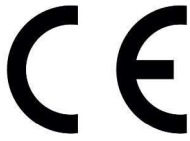
Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment.



5.2 DISPOSAL

Do not dispose electric and electronic units in household waste. They should be disposed of in a responsible manner, they must be disposed at appropriate collection point. Dispose of this product at the end of its working life in compliance with the EU Directive on Waste Electrical and Electronic Equipment. Contact your local solid waste authority for recycling information or give the product for disposal to BGS technic KG or to an electrical appliances retailer.





**EU-KONFORMITÄTSERKLÄRUNG
EC DECLARATION OF CONFORMITY
DÉCLARATION „CE“ DE CONFORMITE
DECLARATION DE CONFORMIDAD UE**

Wir erklären in alleiniger Verantwortung, dass die Bauart des Produktes:
We declare that the following designated product:
Nous déclarons sous propre responsabilité que ce produit:
Declaramos bajo nuestra sola responsabilidad que este producto:

Induktionsheizgerät (BGS 3391)

Induction Heater

Dégrippeur à induction

Calentador de inducción manual

folgenden einschlägigen Bestimmungen entspricht:
complies with the requirements of the:
est en conformité avec les réglementations ci-dessous:
esta conforme a las normas:
EMC Directive 2014/30/EU

LVD Directive 2014/35/EU

ROHS Directive 2011/65/EU + 2015/863/EU

Angewandte Normen:

Identification of regulations/standards:

Norme appliquée:

Normas aplicadas:

EN 61326-1 - 2:2013, EN 55011 - 4:2017
EN 61000-3-2 - 4:2015, EN 61000-3-3 - 3:2014
EN 61000-6-3 - 2:2007, EN 61000-6-2 - 3:2006
EN 61010-1 - 2:2011, EN 60335-1 - 3:2012
EN 60519-1 - 4:2015, EN 60519-3 - 2:2006
EN 62233:2008

EMC: Certificate No: EMC-B-02061-20/Final Report: 31-10493/EZ/DCI-12

LVD: Certificate No: LVD-B-02058-20/Final Report: 31-10493/EZ/DCI-12

RoHS: Declaration of Conformity: 2021/01/01-DWCZ / DCI-12

Wermelskirchen, den 29.11.2021

ppa.

Frank Schottke, Prokurist

BGS technic KG, Bandwirkerstrasse 3, D-42929 Wermelskirchen