



OPERATING AND MAINTENANCE INSTRUCTIONS

ELECTRO-MAGNETIC DENT REMOVAL SYSTEM

PART NO. 17500

Read this manual carefully before using the
Electro-Magnetic Dent Removal System

WARNINGS AND SAFETY MEASURES

WARNING!

Electric shock hazard!

The Electro-Magnetic Dent Removal system is designed for professional use in the car repair industry. It is not intended for home use. It can be used in both vehicle repair shops and garages. Any other use or use of the equipment contrary to the operating and maintenance instructions may result in an injury to the operator and/or damage or destruction of the equipment.

Only qualified personnel may carry out the electrical connection of the The Electro-Magnetic Dent System with mains supplies in compliance with applicable regulations.

Any personnel operating the equipment must possess thorough knowledge of and practical experience in the use of an induction heater, as well as in methods of heating metal vehicle components without damaging nearby parts. Operators must acquaint themselves with and understand these operating and maintenance instructions prior to using the induction heater.

Unauthorised persons shall not be allowed to enter the area where metal vehicle parts are heated. Only one authorised person may operate the induction heater at any one time.

WARNING!

Always use protective goggles with side shields or protective facial shields. Use dry, thermally resistant gloves and dry working clothes. Metal heats up very quickly with a risk of burns to fingers and palms when removing objects from hot metal surface.

Do not touch working parts of the equipment during heating.

Allow cooling period before handling parts or equipment.

The induction heater heats nearby metal objects very quickly and can cause serious burns or even ignite clothing. Bear that in mind and make sure that the operator's clothing is free of any metal objects, such as wristwatches, jewellery, necklaces, keys, belt buckles, coins, metal buttons, zippers, etc.

Do not use the induction heater in an environment containing conductive dust, high ambient humidity, high levels of moisture and/or in an explosive environment.

Do not place the equipment on flammable surfaces or in their vicinity.

Always make sure to have a filled fire extinguisher nearby. Always use a type of fire extinguisher suitable for extinguishing materials that may be present in the working area.

Flammable objects and materials must be placed at a sufficient distance from the working area where the induction heater is used. Do not use the equipment near degreasing, cleaning and/or painting facilities.

Corresponding respiratory protection must be chosen and used to protect the operator against the effects of dangerous gases, fumes and/or particles released by melting adhesive under heat. Respiratory masks provide protection against respiratory risks: fumes or gases, aerosols and airborne dust. A suitable mask and a filter are to be used in accordance with the specific toxic product and its concentrations. Filters must be replaced frequently.

Always have a trained watchperson nearby. Fumes and gases released by heating of materials can lower oxygen level and cause an injury or death.

When heating, especially in cases when heating galvanised, cadmium plated, varnished or blackened sheet metal, fumes may be generated. Ensure adequate ventilation and extraction of heating fumes from the working area. Use a suitable respirator in case of insufficient extraction.

It is very dangerous to heat containers and tanks, in which liquids and gases were stored before the heating. Do not heat aerosol containers or paint containers. The heat generated by the induction heater may cause the containers to explode.

Do not use the induction heater near airbags. The heat generated by the induction heater may ignite the airbag propellant and unexpected airbag activation. Ascertain the accurate location of any airbag in the repaired vehicle using the corresponding vehicle manual.

When installing, checking or maintaining the equipment, always disconnect it from the main supply.

Do not use cables with damaged insulation, insufficient cross-section or loose connectors. Avoid placing cables near heat sources, oils and grease, or sharp edges. Replace all cables with damaged insulation for new ones.

The induction heater contains parts with movable power supply. Always consider uneven weight distribution of the induction heater. Always follow safety procedures preventing the occurrence of hazardous situations.

Keep proper footing and balance at all times.

Allow cooling period

The equipment must always be placed in a way ensuring sufficient air supply to the built-in fan. Ventilation apertures must be kept clean.

The working area must be clean and well lit.

The equipment is fitted with overheating protection. Working tools do not have this protection.

The equipment also contains several additional protection systems.

Do not leave the equipment unattended if switched on.

Unplug induction heater from the power supply outlet or cord when not in use.

WARNING!

Persons using a cardiac pacemaker or any other kind of electronic or metallic surgical implant, or persons with a heart condition must not operate the mobile induction heater or come near the induction heater when operated.

GENERAL INFORMATION ON THE ELECTRO-MAGNETIC DENT REMOVAL SYSTEM

The microprocessor-controlled Electro-Magnetic Dent system is designed for heating of metal parts of vehicles without damaging adjacent components. It is easily portable, powered by a single-phase 230 V/50 Hz net.

The Electro-Magnetic Dent Removal system is designed to heat up all magnetic conductive materials using concentrated magnetic field at the end of the inductor. The magnetic field alternates at a frequency of approx. 50 kHz. The magnetic field creates eddy currents in the material with electric resistance causing the material to heat up. Generally, it applies that the more easily magnetized a substance is, the greater the heat developed in it. That is why induction heater heats ferrous metals and their alloys readily, but has no effect on glass, plastics, wood, cloth and other non-conductive materials. **It is not recommended to apply the device to aluminium.** The induction heater heats up brass, aluminium and its alloys considerably less than steel.

This equipment is manufactured in accordance with the following regulations and guidelines:

2006/95/EC	Low voltage Directive
2004/108/EC	Electromagnetic Compatibility Directive
93/68/EEC	CE Marking Directive
98/37/EEC	Machinery Directive
EN 55 011 class B	Radiated E-field emissions
EN 55 011 class B	Conducted emissions

EN61000-6-2	Electromagnetic compatibility (EMC) – Part 6: Generic standards – Part 6-2: Immunity standard for industrial environments
EN61000-6-4	Electromagnetic compatibility (EMC) – Part 6: Generic standards – Part 6-4: Emission standard for industrial environments
EN 61000-4-2	Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Part 4-2: Electrostatic discharge immunity test
EN 61000-4-3	Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Part 4-3: Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4	Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Part 4-4: Electrical fast transient/burst immunity test
EN 61000-4-5	Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Part 4-5: Surge immunity test Reference
EN 61000-4-6	Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Part 4-6: Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11	Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Part 4-11: Voltage dips, short interruptions and voltage variations immunity tests
EN 61000-3-2	Electromagnetic compatibility (EMC) – Part 3: Limits – Part 3-2: Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
ČSN 33 2000-1	Electrical installations in buildings – Part 1: Scope, purpose and basic frame of reference
IEC 60364-1	Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions
EN 61140	Protection against electric shock - Common aspects for installation and equipment
EN 175	Personal protection - Equipment for eye and face protection during welding and allied processes
EN 60204-1	Safety of machinery - Electrical equipment of machines – Part 1: General requirements

KEY TECHNICAL PARAMETERS

INPUT:	
Voltage	230V ~ ±10%
Frequency	50/60 Hz
Fuse	T 6,3 A
Power	max. 1100 VA
Power Factor	> 0,95
OUTPUT:	
Voltage	max. 250 V rms
Frequency	50 kHz
Power	max. 1000 W
UNIT:	
Dimensions	210x110x115 mm (with handle)
Weight	1.3 kg (unit only)
Ambient temperature	5-40 °C
Relative air humidity	< 90 %

Note: Information in this manual is not binding reflecting the continuous development of the product, its technical parameters, dimensions and weight.

UNPACKING

- Remove the device from the case
- Remove individual tools from their paper boxes
- Check the delivery for completeness according to the delivery bill
- Visually check the device and tools for any signs of damage incurred during transport
- If the delivery is not complete or if any of the components is damaged, contact HBC system
- When returning the equipment to the supplier for repairs, it must be placed in the original packaging

WARNING!

Keep the packaging materials – wood, nails, plastic parts, paper packaging, etc. – out of the reach of children, as it may be a source of risk.
Separate packaging materials and dispose of it in accordance with relevant regulations.

STORAGE CONDITIONS

Store the device and its accessories in a dry, covered place, under temperatures between -5 °C and +60 °C. Do not place the equipment near heat sources.

When handling the equipment, pay extra attention to avoiding shock, even to packaged device and tools as that could cause damage.

COMMISSIONING, SAFETY MEASURES AND CHECKING ELECTRICAL CONNECTIONS

Open the box, remove the induction heater and accessories and check for completeness.

NOTE!

The induction heater and tools can be switched on only after attaining the ambient temperature. Wait at least 30 minutes, i.e. after all condensation on the box and electronic components of the equipment evaporates. Pay attention to avoid damage to connector on the front and back panels when handling the induction heater and tools.

NOTE!

Before connecting the induction heater to the power supply, make sure that the voltage and frequency of the local power supply network, including the circuit breaker (min. 16 A, type B) conform to the standard CEI EN 6024/1 as well as the data on the type plate of the device, and that the electrical installations have been made in accordance with the relevant regulations. Electrical safety of the equipment is secured by using a three-conductor power cord with a protective conductor.

NOTE!

Installation and the first switching on of the induction heater must be carried out by a qualified person in accordance with the relevant regulations and instructions contained in this manual.

Switching on: Turn the main switch on front panel to the ON position. Red light in switch will light up, indicating that the device is under power. The machine prepared for work will emit standby sound signal double beep every 5 seconds.

It is possible to turn off the standby sound signal if you turn on the device with control knob set on the position 4s.

Switching off: Turn the main switch to the OFF position to turn the induction heater and the working tool off. Unplug the power cord from the power socket. Detach the tool connecting cable.

Before every use of the equipment, check correct setting and proper condition of the equipment.

CAUTION!

The case of the induction heater complies with enclosure protection rating IP 21. It is therefore not permitted to use the equipment in a humid environment.

Should the user modify, adjust or change the device or any of its accessories in any way, or integrate it in another device, the manufacturer shall be relieved of any responsibility and the user must remove the CE marking from the equipment.

Any breach of the above instructions may put the operator at risk and/or cause damage to property.

OPERATION AND CONTROL OF THE EQUIPMENT



1	CONNECTOR FOR TOOL CABLE
2	TIME/POWER CONTROL KNOB
3	MAIN SWITCH WITH RED LIGHT
4	HANDLE

Select a suitable working tool depending on the job to be performed and connect it to the induction heater using the tool cable. One end of the tool cable is plugged to the working tool and the other to the “TOOLS” socket on the front panel of the device. Only use working tools which are made for the Electro-Magnetic Dent Removal System and have a yellow point marked near the connection plug.

Using the rotary control knob on the front panel select the desired time or output power:

Time mode:

Positions on the left side of the control knob correspond to the output time when the machine is working on 100% of power. You can select the duration time in the range of: 0.5s, 1s, 1.5s, 2s, 2.5s, 3s, 4s and infinity (∞). If you press the button and keep pressing it, the device will switch off heating after the selected time has passed. If you release the button and press again the time will count again from the beginning.

Power mode:

Positions on the right side of the control knob correspond to the output power of the machine. In this mode the machine is working over infinite time. You can select from percentage values of power: 20%, 40%, 60%, 80%, 100%.

Place the working tool near the place or object to be heated. Heating starts after the control button on the working tool is pressed. Simultaneously, the machine will start producing quick tone switching sound. In power mode or infinity time (∞) the working tool will continue to heat the material for as long as the button remains depressed. Use individual working tools in accordance with instructions provided in the chapter "Use of individual working tools" below.

If an audible alarm sounds (continuous speaker sound), release the control button immediately. The equipment switches off automatically in certain cases using the overload protection, see chapter "Error messages / Protective systems"

TERMINATION OF EQUIPMENT OPERATION

After completion of work, turn the main switch to the off position. Leave the device and the tool(s) used to cool sufficiently, for at least 25 to 30 minutes. Then unplug the power cord from the socket. Unplug the working tool cable. Place the device and working tools in to the plastic case.

USING THE PDR TOOL – SMALL HEAT PEN

PDR - SMALL HEAT PEN



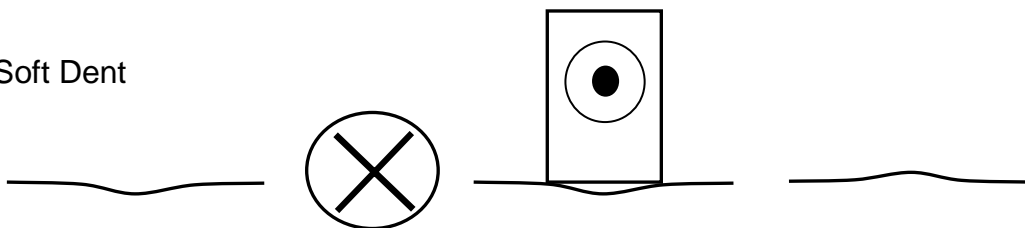
The Small Heat Pen is designed to heat a small concentrated area of a sheet metal. The power button is located directly on the tool itself. It is ideal for the heating of small areas on a car body. Its main purpose is the removal or reduction of small, shallow dents or blemishes without damaging the paint. Although the risk of damaging the paint is very high, if the heating is done too long. It can also be a helpful tool to any PDR (paintless dent removal) technician as with it he can bring up general lower areas with it.

In the dent removal application the concentrated heat will expand the metal and bring it up. This only works on soft dents. In some cases the dent can reappear once the metal has cooled off.

The following has to be made aware of:

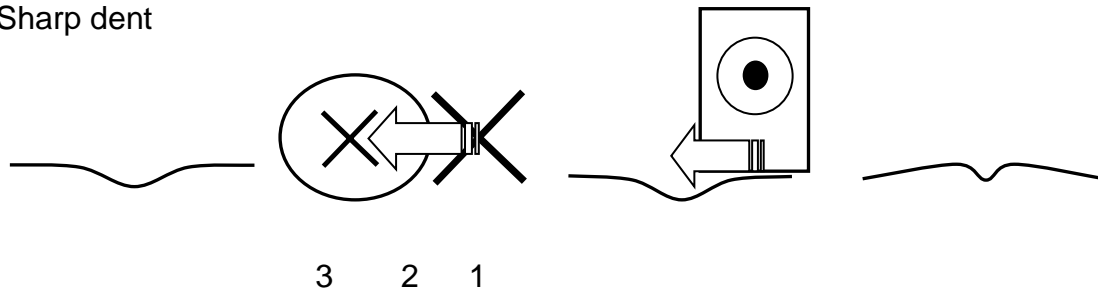
- Don't push down with the tool during the operation, as this might create a larger dent, due to the fact that the metal is soft once it is heated.
- Don't heat too long. As this might and will burn the paint. It is best to test it first on a similar panel. Normally .5 sec setting and even 1 sec. is ideal. But there might be the case that even at this setting that the paint might be damaged, due to the way the material is build up beforehand. We don't take any responsibility for any paint damage.
- It doesn't work on a negative curved area
- It doesn't work on an area which has a glued brace behind it.
- If the dent is too large then the risk is that the dent becomes larger. Then stop immediately. If this occurs you can first let it cool off before trying it again. Then first start heating on the side and then slowly move into the centre with impulse heating.

Soft Dent

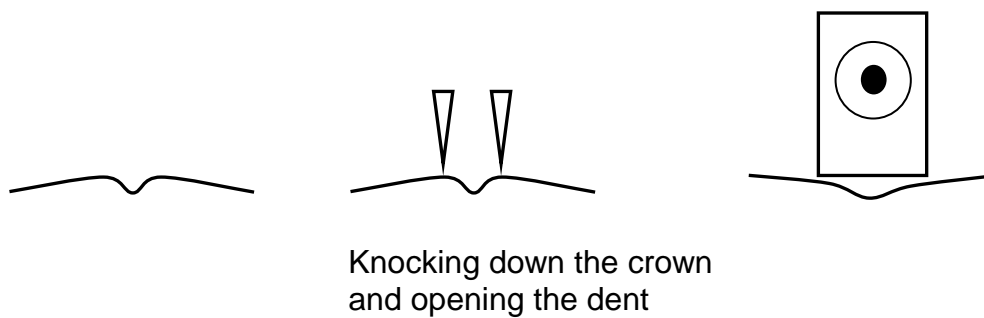


Heat in the middle. This is always the ideal area to heat. First try at a low time setting and then increase the time setting the more experience you get.

Sharp dent



With sharper dents the process is more difficult. As in most cases the metal is stretched or elongated. First it is best to heat on the side with a short impulse heating. Once you see the metal coming up you can move with some quick impulses and heatings to the centre of the dent. If the metal goes down, then the dent is simply to sharp, or there might be a negative curve, or there might be a brace behind it, or maybe you pushed down while heating the metal. If the metal comes up the centre of the dent remains. Possible now is to reopen the dent with a knock down and to heat the metal again to bring it up.



This process may have to be repeated several times. In most cases with a sharp dent the centre can't be removed.

It is recommended first to practice on a panel, in order to get used to the quick heating. Also try not to push down the tool onto the metal because this can also cause a larger dent.

CAUTION!

There is a risk of paint damage due to overheating. It depends on the build up of the paint. We don't take any responsibility for this. It is best first to test it

on a similar panel with the exact same paint material build up. There is always a rest risk at hand.

Shrinking or hardening of the metal is also possible. Try either on the top side as well as the bottom side. After the heating cool of the area to stiffen the material. The most efficient way is to do this with a longer heating time, but this will also increase the risk of burning the paint.

APPLICATION LIMITATIONS

This equipment is designed and manufactured, in its construction and dimensions, for heating of metal objects by means of induction. Any other use, incorrect procedures, use on other than recommended materials, and/or incorrect operational mode settings can place the operator at risk and/or cause damage to material and the induction heater. The manufacturer does not accept any responsibility for any injury and/or material damage caused by improper or incorrect use of the equipment.

OPERATIONAL ENVIRONMENT

Operational temperature range: 5-40 °C
Operational relative humidity range < 90%

HANDLING

CAUTION!

Handle the induction heater with care and ensure its stable positioning on a flat, non-flammable surface when in use.
Always operate the induction heater using the indicated handle.

The induction heater is fitted with a flexible power cord and a cable connecting the working tools. Proceed with care to avoid dangerous situations.

Before you start heating, check that the induction heater is in a level and stable position.

MAINTENANCE

The induction heater is designed to require very little maintenance. The internal space of the induction heater should be cleaned by a trained specialist depending on the frequency of use and the dustiness of the working environment.

If the equipment is transported frequently, it should be checked by a trained specialist depending on the frequency of transports and any loose mechanical components

inside the cabinet tightened as necessary. Any loose connections can cause short circuit inside the device.

NOTE!

Never remove the cabinet cover and do not interfere with the internal components in any way. Always contact HBC system. Removal of the cover by an unauthorised person invalidates the Electro-Magnetic Dent Removal System warranties.

PREVENTIVE MAINTENANCE

Avoid any mechanical damage to the control panel and connectors when transporting the equipment. The connector must be kept dry and clean at all times. If the connector become soiled, clean them with isopropyl alcohol and dry out.

Maintenance should take place regularly, once a week or more frequently, depending on operational conditions.

Check the condition of all cables and the induction heater frequently. If necessary, replace cabled with new ones.

Check the induction heater and remove dust and dirt that may settle on certain parts of the equipment, especially the ventilation apertures.

Proper maintenance ensures reliable and fault-free operation of the equipment.

ERROR MESSAGES / PROTECTIVE SYSTEM

The equipment is provided with a protective system designed to prevent damage/destruction of the equipment. Malfunctions are indicated by constant tone signal of the speaker. If the malfunction occurs repeatedly, contact your local dealer or importer. A list of protections and errors:

Constant tone signal while working

Output power exceeded. Release the control button immediately.

The constant tone signal will be terminated when the button is released.

This is internal overcurrent protection of the device. It is possible to resume work afterwards. If the error persists after several attempts to work, switch the device off and wait 20 minutes until it cools down.

The constant tone signal will not be terminated after the releasing the button.

Possible damage to the internal circuitry. If the error persists after next start of the device, contact your local dealer or importer

Constant tone signal while not working

Fan failure: Check the cleanliness around the fan, equipment vents and ensure sufficient air supply. If the error persists, contact your local dealer or importer.

Overheating of the heat sink: Switch the device off immediately and wait approximately 20 minutes until it cools down sufficiently. It is possible to restart work afterwards.

Damaged internal circuitry: Contact your local dealer or importer

Protection by a safety fuse:

The device contains an internal replaceable fuse, which is part of the system prevention of damage or destruction of the equipment. The fuse is high probably burned down, when all these three conditions are true:

- Device is switched on (Shining red light in the switch)
- Fan is not working (Rotor does not rotate)
- Device is not emitting standby sound signal (Double beep every 5 seconds)

Main incoming power lead wire is protected by fuse F1 which is located inside of the device. **This fuse can be changed only by certified person at service center.** Type of protective fuse and its breaking current value is situated on a printed circuit board near the fuse holder. The fuse value is also presented in table “KEY TECHNICAL PARAMETERS”.

SPECIAL MAINTENANCE

Any repairs, when required, must be performed by a qualified person only, using original spare parts, and in accordance with the relevant regulations and instructions provided in this manual.

CAUTION!

Replacing equipment parts for other than original spare parts and any modifications or alterations of the induction heater relieve the manufacturer of any liability and responsibility for any injury to operators and/or material damage.

Any such modifications also invalidate any equipment warranties.

EMERGENCY

In case of fire, use suitable extinguishers in accordance with relevant regulations.

CAUTION!

Never use water-based fire extinguishers as the induction heater may still be live.

WARRANTY

The supplier guarantees the induction heater to be free of fault for 12 months from the date of dispatch.

The warranty does not cover:

- the replacement of safety components designed to break/burn in case of induction heater overload
- the use of other than original spare parts
- any damage caused by improper handling, tempering with the equipment by a third party, and/or use of the induction heater for purposes other than for which it has been designed
- any damage caused during transport

CLAIMS

The user may claim a defect of the equipment before expiration of the warranty period. Any such claim must be made in writing, indicating the following:

- date of delivery subject to the malfunction (equipment batch number)
- description of the malfunction
- whether the equipment was used under operational conditions as per technical specifications
- the actual application of the induction heater, specification of the heated material, tool used
- date and circumstances under which the malfunction occurred
- any documentation and/or photos necessary for successful processing of the claim

Failure to observe the above conditions entitles the induction heater supplier to reject the claim.

The supplier carries the costs of accepted claims. The claimant shall carry the costs of a rejected claim.

The post date indicated on the claim letter received by the supplier shall serve as the claim date.

The user shall send the damaged or faulty part to the supplier upon request, at the user's cost. The induction heater must be carefully packaged and labelled for shipping. The relevant costs will be reimbursed to the user for all accepted claims.

DISASSEMBLY – WASTE DISPOSAL

The manufacturer or the supplier of the induction heater (electrical equipment) is responsible for the discharge of duties specified in the Act No. 185/2001 of the Czech Code, on waste management, as amended, in its section on waste electrical and electronic equipment, in particular Part 8, Section 37, letters f, g, h, i, j, k, l, m, n, and o. This Act conforms with the Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE), as amended by the Directive 2003/108/EC of the European Parliament and of the Council of 8 December 2003, and the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003.

The manufacturer (the final vendor) notifies the purchaser (consumer) that:

- 1) the electrical equipment must not be disposed of along with normal household waste; it must be placed at a dedicated container or be handed to a specialised recycling centre.
- 2) after decommissioning, the electrical equipment will be dismantled and its components reused as spare parts or recycled.
- 3) the electrical equipment does not contain hazardous substances harmful to human health and/or the environment.

The manufacturer (final vendor) notifies the purchaser (consumer) that the product is subject to the duty of collection of waste electrical and electronic equipment directly at the point of sale, unless another manner of collection is announced in writing at the time of sale. The collection of waste electrical and electronic equipment is free of charge and may not be conditioned by a purchase of any new equipment. The same quantity is collected as had been sold.

TROUBLESHOOTING

Possible malfunctions and recommended remedies

Description of malfunction	Likely cause	Remedy
The induction heater cannot be switched on	Faulty power supply connection	Check the power supply connection and mains voltage Check the power switch on the front panel
No heating	The tool connecting cable is incorrectly connected or is faulty	Check tool cable connection. Replace damaged tool cable Try another tool
The induction heater is correctly connected but the target is not heated	Secured electronic components overheated	Wait to cool off and reinitiate work

The induction heater emits constant tone signal while working (Tool button pressed)	Internal overcurrent protection	Possible to resume work afterwards Wait to cool off and reinitiate work
The induction heater emits constant tone signal all the time (Tool button not pressed)	Internal overheating protection or damaged internal circuitry	Wait to cool off and reinitiate work If the error persists, contact your local dealer or importer

STANDARD, OPTIONAL ACCESSORIES

(Range depends on selected set)

Power cord (Coupled to a device), length 4.7 m, nominal cross-section 3x1 mm²

Tool cable, length 1.2 m, nominal cross-section 3x2.5 mm² and shielding, with two plugs

Small heat pen PDR

Plastic case for device and accessories

Operating and maintenance instructions

HBC system

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DECLARATION OF COMPLIANCE





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