

Induction heating INDUCTOR 1.5

Instructions for use and maintenance

version 3



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2 Introduction

This device generates alternating current of high frequency. The current passing through a heating coil creates an alternating magnetic field which by using the principle of electromagnetic induction vibrates electrons inside the heated material. The energy of moving electrons is dissipated as heat, which heats the metal in the work field of the instrument. The more easily magnetizable material, the more heat it creates. That is why the device heats easily nonferrous metals and their alloys, but has no effect on glass, plastics, wood, textiles and other non-conductive materials.

3 Technical data

Name (type)	INDUCTOR 1.5
Input voltage	~230V, 50/60Hz
Input current	max. 7.5A
Power	max. 1.75kW
PF	0,99
Load factor	50%@1.5kVA a 100%@1.0kVA
Cover	IP20
Weight	4,5 kg / 9,921 lb
Dimensions	200x140x75 mm

4 Safety instructions

4.1 General safety rules



Read carefully all instructions in the manual. Failure to follow these instructions may result in electric shock or burns, fire and / or serious personal injury.

Users are responsible for installing and using the system in accordance with the instructions provided in this manual. The contractor shall not be liable for damages resulting from improper use and handling.

The device may be operated only by persons properly trained and appropriately qualified. Do not operate INDUCTOR 1.5 under the influence of drugs, alcohol or medication

Bystanders and animals should be kept safely away when operating with the device, even when cooling the heated material.

Avoid working in the rain, water and moist environments. Keep work area well ventilated and dry, clean and well lit.

When working with the device INDUCTOR 1.5 always have a fully functional fire extinguisher within reach.

4.2 Safety rules for personal protection



Persons with pacemakers or other metal or electronic surgical implants must not operate with the device INDUCTOR 1.5 and must keep a safe distance of at least 1m from the device.



When working with INDUCTOR 1.5 do not wear any metal objects such as jewelry, rings, watches, necklaces, identification tags, belt buckles, piercing and even clothing with metal parts such as metal rivets, buttons and zippers, etc. - INDUCTOR 1.5 can heat up these metal objects quickly and cause serious burns or clothing ignition.

ATTENTION: Coil applicator and heated object can reach high temperatures and cause burns or cause a fire.



When using the device INDUCTOR 1.5 always wear safety goggles or face shield.



When using the device INDUCTOR 1.5 hazardous fumes may be produced by burning old paint, lubricants, sealants, adhesives, etc. These exhalations can be toxic. Always wear appropriate protective masks or respirators.



When working with the device INDUCTOR 1.5 always wear protective gloves with corresponding thermal resistance. High temperatures generated by the use of INDUCTOR 1.5 may cause serious burns in the case of touching the heated part.

Always keep proper footing and balance for safe control of the device even in unexpected situations.

Do not use INDUCTOR 1.5 near the device with pyrotechnics (e.g. airbag). The resulting heat can cause their unexpected explosion. Keep a minimum distance of 10-20 cm from these devices.

4.3 Electrical safety rules



This is a safety class I device, which may be supplied with power only from the power outlet with a protective conductor, which must be connected to the device as first and in any case must not be interrupted (e.g. by an extension cord). Any interruption of the protective earth conductor, or its disconnection will cause a potential electric shock hazard that can cause injury. Make sure that the device (device chassis) is properly grounded.



Do not twist or sharply bend the power cord, as it may damage the internal wiring. Never use INDUCTOR 1.5 if the power cord shows any signs of damage. Keep the power cord away from heat, oil, sharp edges or moving parts. Never repair the power cord – if damaged, the power cord must be replaced. Damaged cords create a risk of electric shock.

Before replacing the applicator (coil), disconnect INDUCTOR 1.5 from the power source (wall outlet).

If you are not using INDUCTOR 1.5, unplug the power cord from the outlet.



CAUTION

This product is for class A industrial use. It may cause radio interference in residential, commercial and light industrial environments. This product is not intended for installation in residential environment, business environment and light industry with connection to the public supply network; user may be required to take adequate measures to reduce interference.

4.4 Fire safety rules



Do not heat aerosol or other cans, metal containers, and any pressure vessel used for the storage of fuel, compressed gases and liquids. The heat generated by heating INDUCTOR 1.5 may cause them to explode and their contents may ignite.

Do not use the heating spiral (coil), if the insulation is damaged. A defect in the insulation may cause sparks in contact with metal objects or between the turns of the coil. In particular, when working on / or near gas pipes and / or gas tanks it may pose a danger of explosion or fire. Using coils with damaged insulation will void the warranty.

4.5 Safety rules for using the device

Do not leave INDUCTOR 1.5 uncontrolled when it is started. **Always use the main switch to turn INDUCTOR 1.5 off if it is not used for heating!**

Make sure that the power supply unit and the handle has an adequate supply of air for cooling. Make sure the vents are clean and free of dust and dirt not to impede the flow of cooling air.

Do not attempt to repair INDUCTOR 1.5. The device does not contain any user-serviceable components, except for replaceable heating coils.



Before connecting INDUCTOR 1.5 to the wall outlet make sure the outlet voltage corresponds to the voltage on the rating plate. If the wall outlet voltage does not match the voltage indicated on the rating plate, it may result in a serious risk of damage to INDUCTOR 1.5.



Do not exceed the operating cycle INDUCTOR 1.5 – 2 minutes heating (on) a 2 minutes cooling (off). The main equipment is protected against device overheating, but heating coils are not, which may cause their damage.

EXTENSION CORDS:

Extension cords – if necessary, you may use only the following extension cords:

- up to 5m with 2.5 mm² diameter
- up to 15m with 4 mm² diameter

Use only one extension cord – do not connect two or more extension cords. Do not use any other extension cords than those mentioned above. Unpack the extension cords - tightly packed extension cords may overheat and cause fire.

GENERATORS:

When using the device with an alternate source of power – e.g. with mobile electric generator, it is necessary to use a quality alternate source of sufficient power and AVR quality control. Use a generator with a power output of at least 3-4 kW, or DC / AC inverter with a power output of 2-3 kW and only with a sine wave – do not use the inverter with a square or quasi-sine wave. Failure to comply with the above requirements may result in damage to the device and void the warranty.

The device must be protected from rain and moisture, mechanical damage and possible ventilation of neighboring machines, excessive overloading and rough handling.

5 Components



1. PLASTIC CASE WITH PROTECTIVE LINING
2. COIL HOLDER
3. CONNECTION CORD
4. SWITCH ON AND OVERHEATING INDICATION LIGHT
5. COVER FITTED COILS
6. ELECTRIC SUPPLY CORD

6 Use

Before usage of the device, check the incoming cable, handle and the handle cable to assure that they are not damaged.

1. Disconnect the device from the electric network and loosen the screws on the handle.
2. Insert the working coil into the holes in the clamping holder of the coils (handle, 2) and tighten the locking screws on the sides.
3. Connect the supply cable of the device into a properly grounded standard socket ~230V, 50/60Hz and turn on the device using the main switch. Before turning on, make sure that the handle is laid in a safe place and that the heating button is not pressed down.
4. Attach or put the working coil on the material you want to warm up and press the button on the handle. Heating remains activated during the pressing of the button - do not exceed the operating cycle of 2 minutes of heating and 2 minutes of cooling.
5. After finishing the cycle, release the button on the handle and remove the heating coil from the heated material.



NOTE: During heating there should be a gap of around 3-5mm between the coil and the heated material to avoid excessive wear of the heating coil. A gap larger than 3-5mm decreases heating efficiency and extends the heating time.

After finishing heating, place the handle with the heating coil in a safe, inflammable place until the heating coil is completely cooled. Then turn off the device using the main switch and disconnect it from the electric network.



ATTENTION: The coil and the heated object can reach a high temperature and/or cause burns or result in fire.

6.1 Detachable coils

FRONT ATTACHABLE COILS



The standard supplied diameters of front attachable coils are 15-45mm

SIDE ATTACHABLE COILS

The standard supplied diameters of the side attachable coils are 15-45mm



Application of the standard attachable front and side coils for the heating of nuts, couplings, gaskets, hinges, exhaust mains, screws etc which are accessible so as to allow the attaching of the coil.



NOTE: The service life of the coils can be increased by cleaning rust, paint, oil etc. from the heated material

During heating, there should be a gap around 3-5mm between the coil and the heated material to avoid excessive wear of the heating coil. Holding of the coil directly on the hot material can cause the burning of the coil insulation, thereby shortening the service life of the coils. We recommend limiting direct contact of the coil with the hot material to the minimum.

TIP! For loosening nuts, screws etc., it is not necessary to heat the material until it is red hot. Heat the nut for 2 seconds and try to loosen it using a wrench. If it is not possible, heat again for 2 seconds and then try loosening using the wrench again.

6.2 Flat coil



The flat spiral shaped coil is intended for the heating of flat sheet metals and for the straightening of small dents in car bodies by heating. The flat coil is also intended for easy peeling off of stickers, sealants, putties etc by heating of the base material - steel sheet metal.

1. Connect the coil to the coil handle
2. Place the coil with its area over the material
3. Press the button and guide the coil above the material in a gyratory movement
4. After heating of the material, allow the coil to cool off for at least 2 minutes.



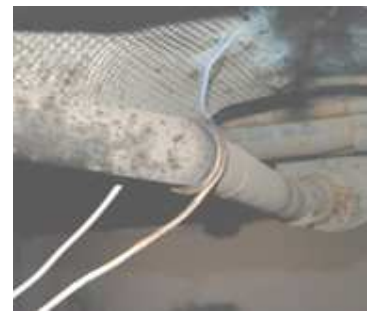
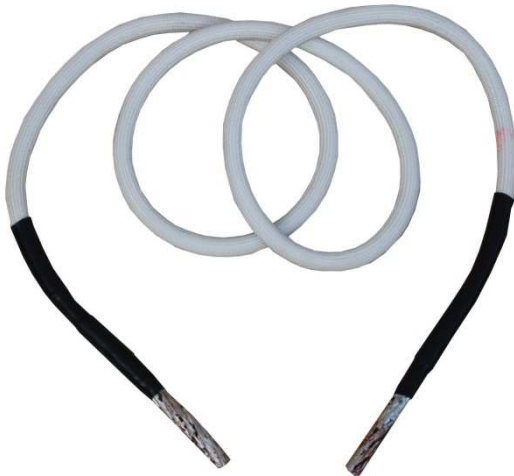
NOTE: It is possible to use the coil to remove various adhesive stickers, sealants and gaskets which are stuck to sheet metal or metal – for example in automotive, services etc. The coil is used heating of the base material and thus softening, or alternatively, hardening of the glue, putty, etc. We recommend holding the coil around 5-15mm far from the heated material - it is possible to regulate the required temperature and heating time by changing the distance.

6.3 Customized fixed coil

User shaped solid coils can be shaped and adapted directly by the user according to requirements of the individual application. They can be used for the same purposes as attachable coils.



6.4 Flexible coil



The flexible coil is used for the loosening of axle fitments, stiffened sensors, ball joints etc and in applications where is not possible to use attachable coils.

Applications:

1. Connect one end of the coil to the coil holder and secure it by the locking screw.
2. Wrap the free end of the conductor over the part which needs to be heated. Make around 2-4 turns.
3. Connect the second - free end of the coil into the coil holder and secure it by the locking screw.
4. Pressing of the key activates the heating.
5. After finishing heating, one end of the coil will be release and the coil will be unwound from the heated material.



If the overload of the device occurs (the LED warning light on the front panel is flashing red), unwind one loop and repeat the procedure until the heating is carried out without overload and turning off.

If the heating has a low intensity, on the contrary, try adding one loop.

6.5 Focus coil



They allow a higher intensity heating on a small area and are especially used for attaching to the heated material.

1. Connect the coil into the coil holder.
2. Attach the coil on the material with the circular area of the coil.
3. Press the button for a max. of 10 seconds.
4. After heating the material, let the coil cool off for at least 50 seconds.

7 Device indicators

Lights on the device indicate the following states of the device:

- Green - Standby
- Yellow - Heating in progress
- Yellow flashing - Device is overheated
- Red flashing - Bad coil or power overload
- Red light - Error

8 Possible problems and troubleshooting

1. INDUCTOR 1.5 is designed and constructed so that when an overload occurs, there is a temporary turning off, which is indicated by the flashing of the LED on the front panel.
2. The induction coils do not have any thermal protection and thus they are not protected against overload. The operating cycle of the induction coils is set for 2 minutes of activity - heating and 2 minutes of cooling.
3. If the device stops working, check that it is properly connected with the electric network and also check the plug connector and socket, the fuses or breaker. Check the value of the supplied network current. Also make sure that the incoming and connection cable (if you use it) is not damaged. Let the device cool off for at least 10 minutes and then reconnect it. If the problem persists, contact your supplier.

4. Usage of an inappropriate extension cable (too long, small diameter of wires) can cause insufficient power of the device - see the safety regulations.
5. In case of other problems contact your supplier.

9 Storage and maintenance

9.1 Cooling, dismantling and storage

After completion of heating, make sure that the coil holder and coils used are placed in a safe place. Handling the device or its parts before letting it cool down can result in injury, damage to the equipment or fire.

After completion of heating, leave the device turned on for 10 more minutes – the device will be cooled down by fans until cooled off completely and then will turn off the fans. Then shut it down by the main power switch and disconnect it from the power supply.

If you unplug the unit immediately, let all working coils cool down for at least 15 minutes.

After cooling, place the device and its accessories in the case. Place the cords so as to avoid their sharp bending or twisting – it could cause their damage.

9.2 Proper cleaning and maintenance

Make sure the device is turned off, unplugged and cooled. Use a dry, clean cloth or paper towel to remove grease, oil and other impurities from the machine, applicators and cables before placing INDUCTOR 1.5 in the storage case.

Use freely available non-volatile cleaning agents for grease, oil and dirt that is difficult to remove. Before the first reuse of INDUCTOR 1.5 allow all components to air dry.

Do not immerse any part of the device in water or other liquids. Do not spray and wash the device down with water spray. Do not clean the components with volatile organic compounds such as gasoline, benzene, kerosene, methyl ethyl ketone (MEK), fuel oil, brake parts cleaners, paint and thinner remover, varnish removers, self-adhesive solvents, etc. These substances cause fire and cause hardening or dissolving of polymeric materials used in the device.

Do not use heat sources, heaters, burners, microwave ovens or gas furnaces, etc. for drying the device and its parts after cleaning.

10 Warranty

1. Machine warranty period is determined by the manufacturer for 12 months from the sale of machinery buyer. Warranty period begins on the date of delivery of the machine to the purchaser, or the possible delivery date. The warranty period does not cover expendable parts – coils. Warranty period does not include the period from the application of a legitimate complaint until the machine is repaired.

2. Content of the guarantee is responsible for the delivery of machines at the time of delivery, and the warranty period will have the characteristics laid down by mandatory specifications and standards.
3. Responsibility for defects that occur after the machine sold under warranty, consists in the obligation of free defect removal machine supplier, or service organization authorized by the machine.
4. Condition of warranty is that the machine is used in a manner and for the purposes for which it is intended. Such defects are not recognized extraordinary wear and damage due to insufficient care or neglect seemingly insignificant defects. For example, the defect can not recognize:
 - a. Equipment damage due to inadequate maintenance.
 - b. Mechanical damage due to rough handling, etc.
5. The warranty does not cover damage due to failure to meet the obligations of the owner, his inexperience, of impairments, failure to comply with the provisions referred to in the instructions for use and maintenance, the use of machines for the purposes for which it is not intended, overloading the machine, even if temporary. Maintenance and repairs must be exclusively used by original equipment manufacturer.
6. During the warranty period are not allowed any modifications or changes to the machine, which can affect the function of each part of the machine. Otherwise the warranty will not be recognized.
7. Warranty claims must be applied immediately upon detection of manufacturing defects or material defects, and that at the retailer.
8. If a warranty repair will replace the defective part, transferred ownership of the defective part to the manufacturer.

11 Warranty service

1. Warranty service can be performed only by a trained service technician authorized by BADEK.
2. Before performing warranty repairs it is necessary to check the data of the machine – the date of purchase, serial number, machine type. If the data are not consistent with the conditions for the recognition of warranty repairs, for example, expiry of the warranty period, improper use of the product contrary to the instructions for use, etc., it is not a warranty repair. In this case, all costs associated with the repair shall be borne by the customer.

12 Disposal of used equipment



These machines are built with materials that do not contain substances that are toxic or poisonous to the user. For the disposal of waste equipment use the collection points for the abstraction of used EEE. Do not dispose of the used equipment in common waste.

13 Consumable spare parts

Indeks	Nazwa
IND1.5-SPOT	Cewka z ferrytem do grzania
IND1.5-SET-8-S	Zestaw 8 prostych cewek 15-45
IND1.5-SET-8-B	Zestaw 8 bocznych cewek 15-45
IND1.5-REMOVAL	PAD do odklejania listew,
IND1.5-M6-S	Cewka prosta /15/220mm/M6
IND1.5-M8-S/19	Cewka prosta /19/220mm/M8
IND1.5-M8-S/20	Cewka prosta /20/220mm/M8
IND1.5-M10-S	Cewka prosta /23/220mm/M10
IND1.5-M12-S	Cewka prosta /26/220mm/M12
IND1.5-M16-S	Cewka prosta /32/220mm/M16
IND1.5-M20-S	Cewka prosta /38/220mm/M20
IND1.5-M22-S	Cewka prosta /45/220mm/M22
IND1.5-M6-B	Cewka boczna /15/220mm/M6
IND1.5-M8-B/19	Cewka boczna /19/220mm/M8
IND1.5-M8-B/20	Cewka boczna /20/220mm/M8
IND1.5-M10-B	Cewka boczna /23/220mm/M10
IND1.5-M12-B	Cewka boczna /26/220mm/M12
IND1.5-M16-B	Cewka boczna /32/220mm/M16
IND1.5-M20-B	Cewka boczna /38/220mm/M20
IND1.5-M22-B	Cewka boczna /45/220mm/M22

Streight coil



Side coil



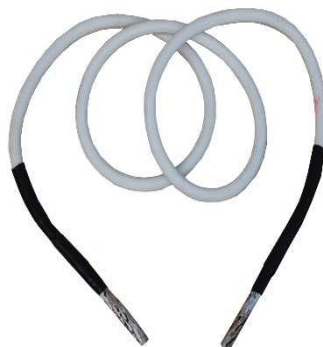
PAD



Focus



Flexi



Heating wire

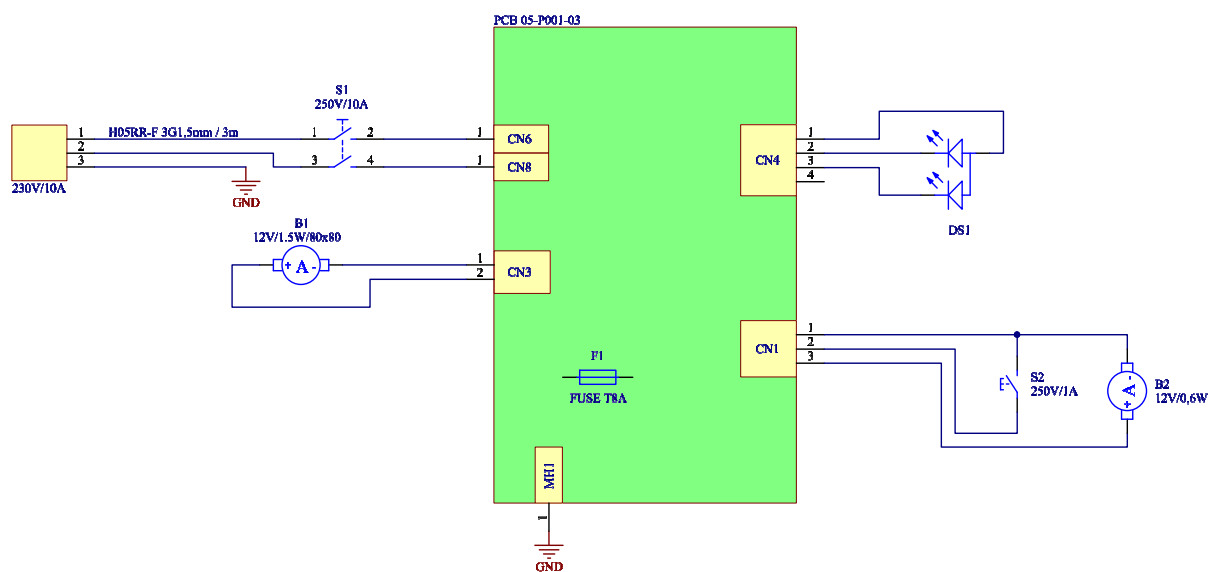


13 Consumable spare parts



No.	Name	Order No.
1	Coil	Wg rozmiaru
2	Clamping bolts	IND1.5-bolts
3	Holder of induction coil – handle	IND1.5-handle
4	Cable	IND1.5-cable
5	Strap	IND1.5-strap
6	Side cover	IND1.5-side cover

14 Electrotechnical scheme



15 Meaning of Used Symbols



- The equipment must not be used by person with pacemakers, or any other metal or electronic implants.
- The equipment may only be used by trained person.
- Risk of explosion.
- Risk of fire.
- Caution, intense magnetic field!
- Caution, source of intensive heat!



- Read the operation manual before starting the equipment.
- Use protective equipment, goggles.
- Use protective equipment, working suit.
- Use protective equipment, breathing masks.
- Use protective equipment, protective gloves.
- Always disconnect the equipment from the power supply when it is not being used.

16 Possible Defects and Remedy of Defects

Defect	Failure mode	Solution
The material to be heated is not heated up	Red LED located on the front panel is flashing: After the button is pressed when the coil is not loaded – incorrect (unsuitable size or number of coil threads) or incorrectly connected coil.	Use a standard coil and check correct connection (that the coil terminals are inserted enough and bolts are tightened).
	Red LED located on the front panel is flashing: After the button is pressed when the heating coil is inserted to the part to be heated, or when the heating coil is being inserted to the part, or during the heating process – the overload protection circuit of the power supply system was activated.	<p>Make the distance between the material and the coil larger – e.g. place the coil farther from the material, or use a bigger coil.</p> <p>Check where the equipment is connected to the mains. Power supply from the mains may be distorted or, supply voltage frequency may be distorted. The power socket may be connected to the mains which is supplied by standby source of power supply (generator), or by DC/AC inverter, where there is not a sine wave at the output (there is only square wave or quasi-sine wave), or the power output is not sufficient!</p> <p>Connect the equipment to another socket.</p> <p>Caused by interference by other equipment connected to the same mains.</p> <p>Caused by extension cable where the interference may be induced.</p> <p>Connect the equipment to another socket.</p> <p>Check the function of the equipment by pressing the button when a standard coil is connected correctly without the heated part inserted. Yellow LED must be lighting.</p>
The material to be heated is heated up slowly	Temperature of the material to be heated increases too slowly or not at all.	Use a coil the diameter of which is larger by 10 mm than the diameter of material to be heated is. Check that the material is ferromagnetic.
Handle wire is heated up	Higher temperature of the wire can be felt when the wire is touched.	Check the load time, check that the equipment is not overloaded. Keep the maximum operation time of 2 min. and cooling time of 2 min. The equipment must be controlled by the operator when cooling down.
The material to be heated is not heated up	Yellow LED located on the front panel is flashing. The equipment is overheated.	Let INDUCTOR 1.5 cool down; while it must be controlled by the operator.
	Red LED located on the front panel is lighting. Failure of the equipment.	Send INDUCTOR 1.5 to an authorized service centre.

17 Declaration of Conformity

Producent / Producer:

BADEK FIRMA WIELOBRAŻOWA, UL.GŁÓWNA 32A, 58-241 PIŁAWA DOLNA

Oświadczam, że produkt / Declare that the product:

Podgrzewacz indukcyjny INDUCTOR 1.5

posiadający znak CE jest zgodny z następującymi RRM wraz z późniejszymi zmianami i odpowiadającymi rozporządzeniami EU / This product is determined for the industrial use:

17/2003 Dz. U. (LVD) i 616/2006 Dz. U. (EMC)

i jest zgodny z niżej podanymi normami / verified by the compliance with the standard listed below:

PL EN 60335-1 ed.3

PL EN 55011

PL EN 61000-6-2

PL EN 61000-6-4

Data publikacji / Date of issue: 1/2014



Radoław Badek

18 Warranty certificate

Date of sale	
Dealer signature and stamp	

Record of the service operation			
Date of takeover by service	Date of repair	Number of claim protocol	Signature

Notes:			

