

I4 Evo X

Instruction Manual

English user and maintenance manual



1. Safety instructions



This manual describes the operation of the unit and the precautions to be taken for your safety.

Read it carefully before use and keep it in a safe place for future reference.

These instructions must be read and understood before use.

Do not undertake any modifications or maintenance other than those specified in the manual. The manufacturer shall not be held liable for physical or material damage due to improper use of the equipment

In case of problem or doubt, please consult a qualified person to use the unit correctly. The safety instructions must be observed.

The manufacturer declines all liability in the event of improper or hazardous use. Any use not mentioned in this manual is strictly forbidden and potentially dangerous.

This machine should only be used for the purpose for which it was expressly designed, that is: to generate heat inside ferrous materials.

Any other use not expressly covered in this manual is strictly prohibited as considered improper and therefore dangerous. The machine is semi-automatic and therefore requires the presence of an operator.

The operator has the direct responsibility for compliance with all safety standards not only where he is concerned but also for any persons who may be exposed to machine risks.

Do not use the unit if the power cord or plug is damaged.

It is considered misuse of the machine, therefore **prohibited**:

- using the machine in environments where an explosive atmosphere remains or is likely to form during normal operation;
- using the machine outdoors;
- using the machine without complying with the directions provided by the Manufacturer;
- use by operators who have not attained the minimum age for starting work required by the laws in force in the respective countries of use;
- use by operators who have not been previously trained and informed of any hazards and residual risks of the machine as well as trained in workplace hazards;
- not using personal protective equipment (PPE) as required in this manual;
- circumventing, even temporarily, machine protection measures;
- using the machine even when it exhibits symptoms of failure or is partially broken down;
- performing operations for which information has not been provided by the Manufacturer;
- performing operations expressly prohibited in the instructions.

Misuse of the machine is extremely dangerous. The manufacturer accepts no liability for any damage to persons or property resulting from use other than that intended.

	Caution! Very hot surface. Risk of burns. - Overheated objects and equipment can cause burns. - Do not touch hot objects with bare hands. - Wait for the objects and equipment to cool down before using them. In case of burns, rinse with plenty of water and seek medical advice immediately.
	- Machine use should only be entrusted to adult, suitably trained personnel in full compliance with current regulations and the instructions contained in the manual. - Remove any jewellery and/or metal object before using this unit. - Keep the machine in a suitable place, protected from weathering. - Use the machine on level surfaces only. After the machine has been brought to the desired working area, apply the brakes of the pivoting wheels.
	Warning! Risk of projection of hot metal parts Wear safety glasses with side shields or use a shield over the face. Wear appropriate work clothes. Wear gloves against mechanical hazards.
	Danger from gases and vapours. - Keep away from fumes and do not breathe vapours. - When working indoors, ventilate the room and/or use an air extractor to evacuate vapours and gases. - Induction heating of certain materials, adhesives and fluids can produce vapours and gases. Breathing these gases and vapours may be dangerous to your health. - If ventilation is insufficient, use a certified respirator. - Read the product technical and safety data sheets (MSDS) and the manufacturer's instructions for adhesives, metals, coatings, detergents, and pickling agents. - Do not use the heater on degreasing or spraying parts. Heat can react with vapours to form highly toxic and irritating gases. - Only work in a confined space if it is well ventilated or using a certified vacuum cleaner. Vapours and gases resulting from heating can replace the oxygen in the air and cause sickness or death. Verify the quality of the air you breathe. - Do not overheat metals, such as galvanized steel, lead-coated steel, or cadmium-coated steel, unless the coating is removed from the surface to be heated, air is well ventilated, and, if necessary, wear a certified respirator. Castings and all metals containing these elements can release toxic vapours when heated. - Refer to the MSDS for temperature information
	Caution! Electrical hazard. Disconnect the power supply cord when maintenance is performed on the machine.
	Caution! Strong magnetic field. Persons having active or passive implants must be informed. Do not approach the inductor at the head and vital parts level during operation. Keep the inductor at a minimum distance of 30 cm from body parts.

 	Persons with pacemakers or biomechanical equipment should not use the device. Risk of disturbances/interference in the operation of pacemakers/ biomechanical equipment in the vicinity of the device.
  	Wear PPE during use • Protective goggles; • Gloves against mechanical hazards; • Appropriate work clothing.

2. Connection

	This unit must be connected to a properly grounded electrical outlet.
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3. Regulatory information

	Device in compliance with European directives
	Device in compliance with UK directives
	EAC (Eurasian Economic Community) mark of conformity

4. Disposal

At the end of its life cycle, the product must be disposed of according to the applicable laws of the country in which it is used.

The various components that make up the product are suitable for separate collection.

PRODUCT WASTE	TYPE OF WASTE	MODE OF DISPOSAL
Iron	Non-hazardous	Recyclable
Steel	Non-hazardous	Recyclable
Plastic and rubber	Non-hazardous	Recyclable
Electronic Components	Hazardous	Recyclable
Electrical Cables	Hazardous	Recyclable



Used electrical and electronic equipment (WEEE) should not be thrown away with general household waste.

5. Product identification

A label is located on the back of the machine:

- Name and address of manufacturer
- Date of manufacturing
- Model
- Type of product
- Operating voltage

6. Noise emission

The machine has been designed and manufactured to reduce airborne noise emission at the source to the lowest possible level (Machinery Directive 2006/42/EC, Annex I, section 1.5.8.).

Measurement was conducted to determine the sound pressure level, in accordance with harmonized standards EN ISO 3746:1995; ISO 11200:1995.

The sound pressure level L_{pA} , measured at the operator's station, is found to be:

$$L_{pA} \leq 80 \text{ dB(A)}$$

7. Product specifications

	I4 Evo X	PL50	PL80/PL110	PL130/PL160/PL180
Rated power	4 kW	5 kW	8 / 11 kW	13 / 18 kW
Rated voltage	230 V	230 / 400 V	230 / 400 V	400 V
Mains voltage frequency	50 – 60 Hz	50 – 60 Hz	50 - 60 Hz	50 - 60 Hz
Plug amperage	16 A	16 A	16 A	32 A
Electrical frequency	15 – 30 KHz	15 – 30 KHz	15 - 30 KHz	15 - 30 KHz
Insulation class	IP 21	IP 21	IP 21	IP 21
Coolant tank capacity	6 L	6 L	6 L	20 L
Mains cable length	8 m	8 m	8 m	8 m
Inductor cable length	3 m	3 m	3 m	4.25 m
Weight (kg)	50	59	66	130
Dimensions (LxDxH) (mm)	470x490x870	475x490x950	600x630x1030	710x690x1050

8. Description of devices

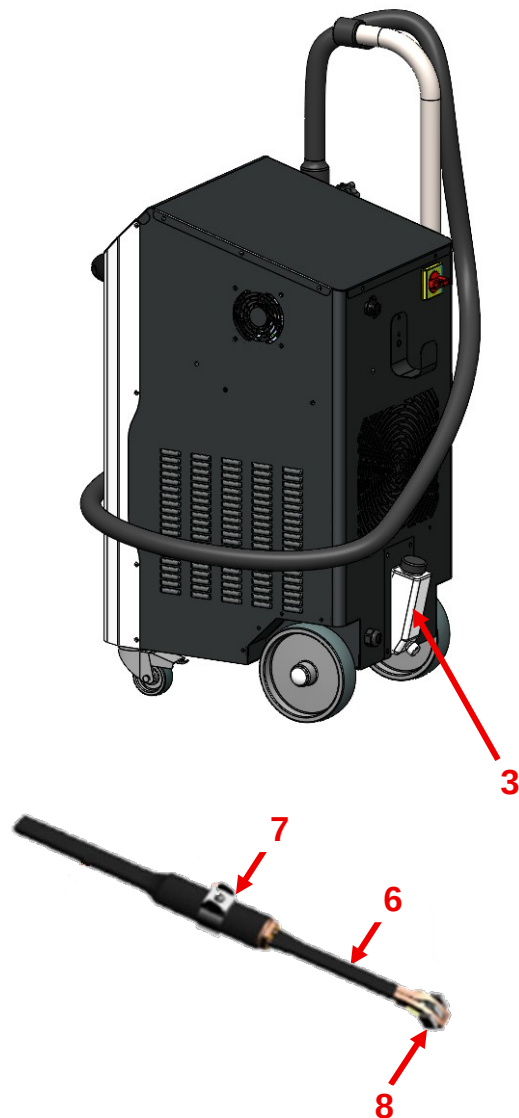


The PL Line heat inductors are ideal for a wide range of applications such as:

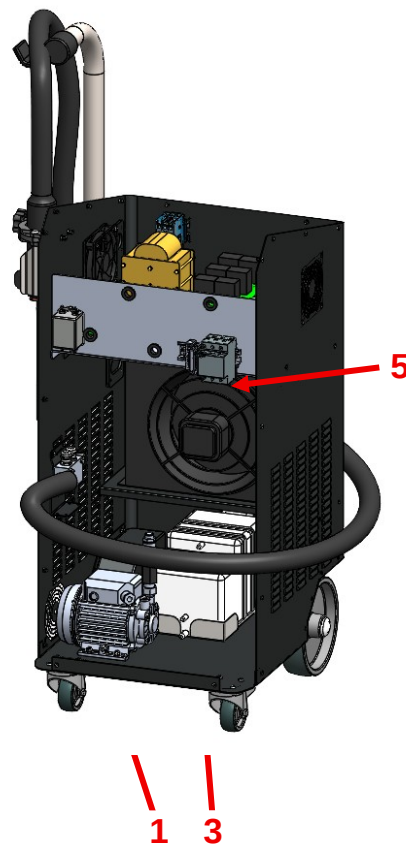
- Unlocking bolts/nuts
- Unlocking and replacing pins or bearings
- Heating for straightening
- Pre-heating before welding
- Bending
- Heat treatments
- Annealing

The main features of this range of machines are:

- Auto tuning
- Electronic safety protection
- Setting the heating temperature level
- Easy to use 5" colour touch control panel (PL8/PL16).



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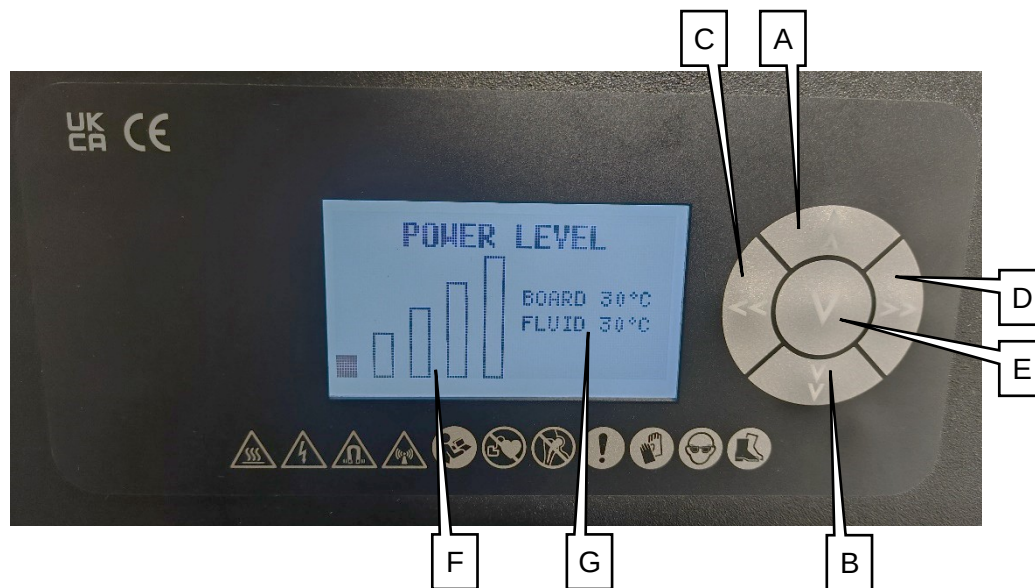


Legend

1	Pump
2	Radiator
3	Antifreeze liquid tank
4	Main switch
5	Fuse holder
6	Inductor
7	Heating start button
8	Flux concentrator

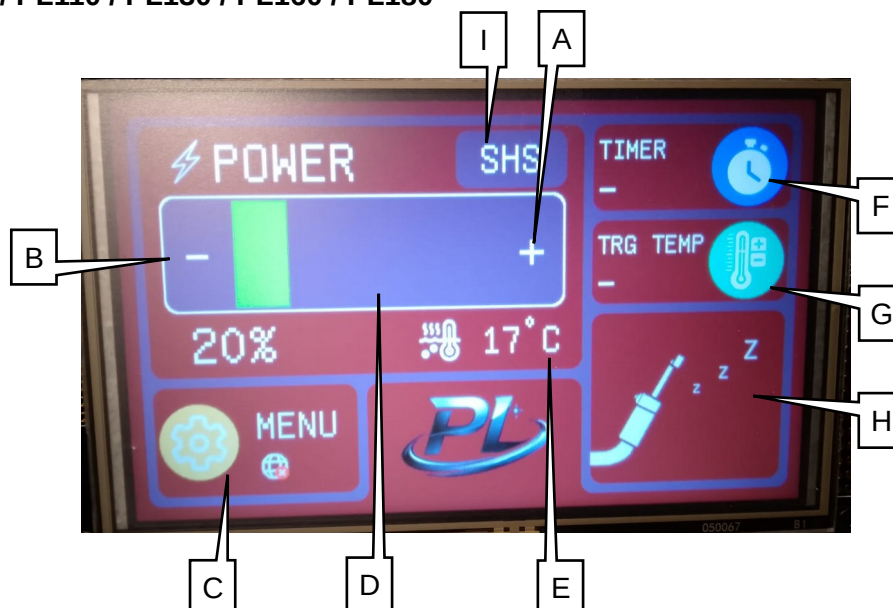
9. Commands

Models I4 Evo X / PL5



- A. Power increase: press and hold to quickly change the power level.
- B. Power decrease: press and hold to quickly change the power level.
- C. (Not enabled)
- D. (Not enabled)
- E. Error reset: press once to reset the errors shown on the display. If the error does not reset (because there is a malfunction or the liquid temperature is still too high), press and hold for about 5 seconds to cancel the audible alarm.
- F. Indicator of the set power level (level: from 1 to 5).
- G. Temperatures detected by the machine sensors, respectively of the control board and the cooling liquid.

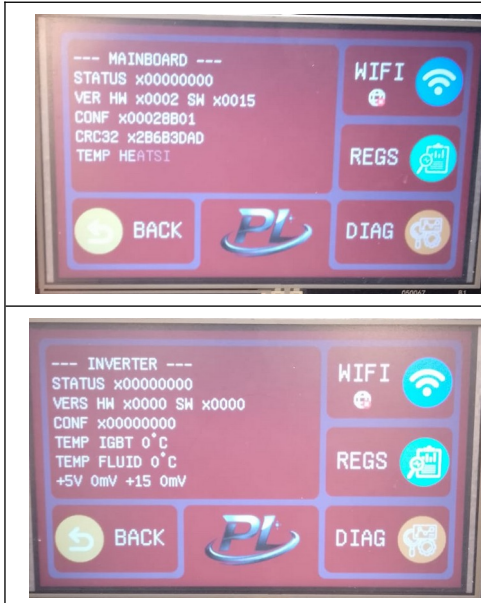
Models PL80 / PL110 / PL130 / PL160 / PL180



- A. Power increase: press and hold to quickly change the power level.
- B. Power decrease: press and hold to quickly change the power level.
- C. MENU: press this button to access the machine settings pages.
- D. Indicator of the set power level.
- E. Temperature value: temperature detected by the control board sensors.
- F. TIMER: press to set the desired heating time.
- G. TRG TEMP: press to set the laser sensor temperature value.
- H. Machine status: heating; ready for use; in operation.
- I. SHS: press to activate the heating self-hold. Heating stops after the time set in TIMER has elapsed.

By pressing the MENU button, it is possible to access the following subpages.

	WIFI page: on this page it is possible to enter the Wi-Fi network data to connect the machine to the company's internet network.
	DIAG page: on this page it is possible to access the Autotuning function (see section 10.1).



REGS page: on this page it is possible to view the data of the MAINBOARD and INVERTER boards.

10. Use

- Turn the main switch to the ON position. The machine will perform a system check and prepare for operation. Please wait a few seconds until the message shown in the following image disappears.



- Use the buttons to select the desired power level. The selected level is indicated by the power level indicators.
- Position the flow concentrator on the part to be heated and press the heating start button.

In the case of using any alternative flux concentrator different from the standard version, the machine can operate using adaptive inductance field reading (Autotuning: see the following sections).

NOTE: If the machine is used for long periods of time, it is advisable to leave it switched on for a few minutes before switching it off, so that the liquid in the tank can cool down more quickly.



10.1 Instruction of Autotuning

When using special induction heads outside the standard range, manufacturer's unique auto-tuning feature allows the machine itself to quickly auto-configure the electronics to the specific inductor head inductance to maintain maximum efficiency.

If the machine has the Touch control proceed with Autotuning as follows:

- Press the DIAG button.
- Scroll the right arrow to TEST 03
- Press the START icon and wait for the end of the test.
- Press the BACK button to return to the main page.

To reset the original configuration with the standard inductor head:

- Select TEST 04.
- Press the START icon and wait for the end of the test.
- Press the BACK button to return to the main page.

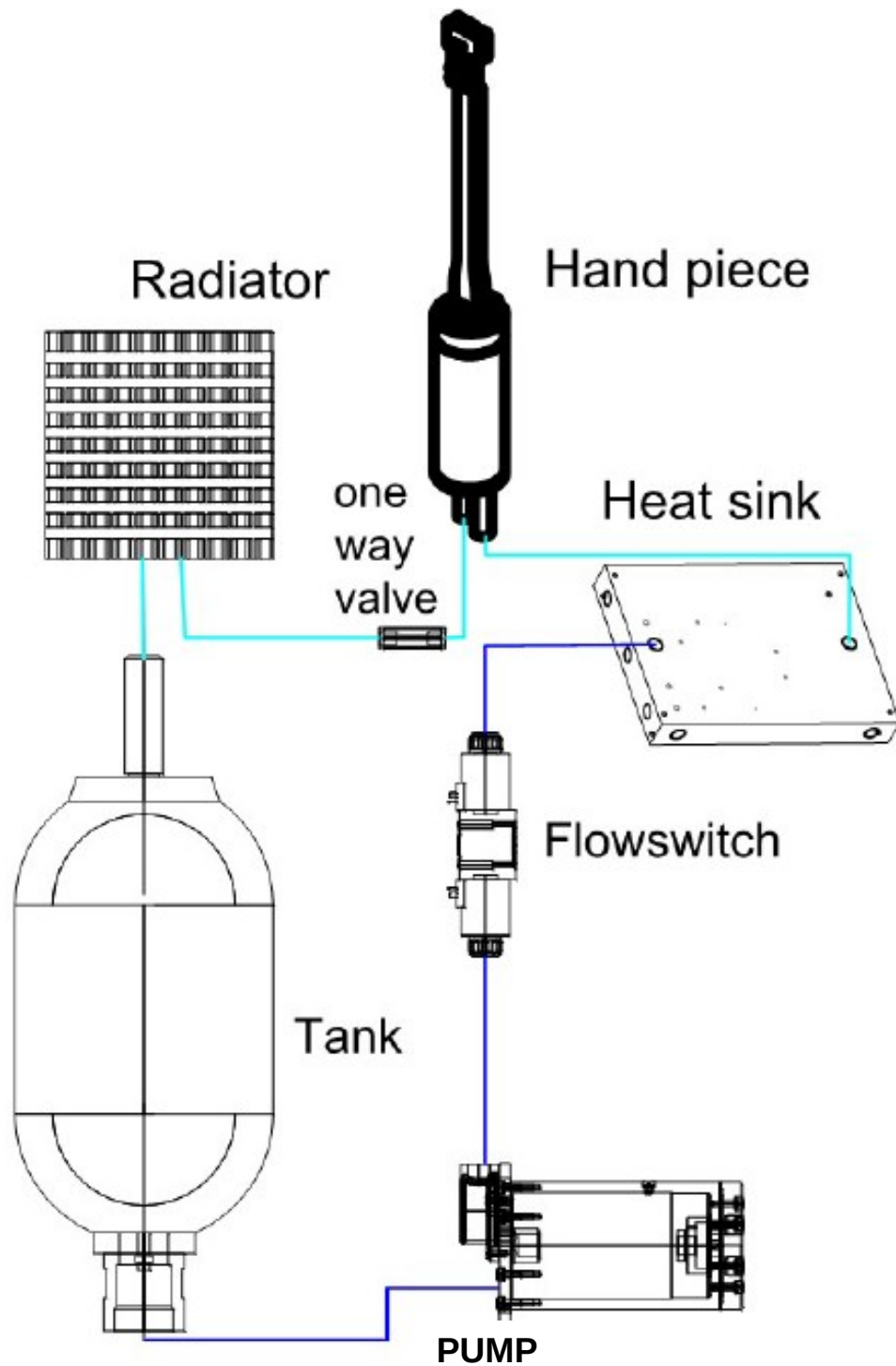
11. Wiring diagrams

Model	Wiring drawing
I4 Evo X PL50	

Model	Wiring drawing
PL80	

PL110
PL130
PL160
PL180

12. Hydraulic diagram



13. Application of the warranty

13.1 Return of products

When the reseller reports a product malfunction, they must provide the manufacturer with the following information:

- product serial number
- a description of the problem with the product
- photo of encountered defects, if possible

The reseller has the possibility to return defective products to the manufacturer, but the transport costs are at their expense; the manufacturer does not accept any returns shipped freight collect.

Products shall be repaired and resent with a customer's successive order. In case of request for sending in advance of order shipment, shipment costs shall be borne by the reseller.

If the products are not under warranty, the manufacturer will issue a quotation for the repair, which may be accepted or rejected by the customer. For any product returned for replacement or warranty repair that shows no defect or malfunction, a charge document will nevertheless be issued for the inspection carried out on the product.

The warranty does not apply in the case of products resent without being appropriately packaged and thus at risk of damage during shipment. Please take care as hauliers tend not to handle packages with due care!!

13.2 Recommendations regarding product transport

The manufacturer does not accept returns sent freight collect, but only freight prepaid.

The reseller is solely responsible for any damage the products may suffer due to improper packaging, even if the package has been accepted by our warehouse. Since it is not possible to open every package upon arrival, the manufacturer will place a reservation on the carrier's delivery note if the package packaging appears damaged.

13.3 Recommendations for packaging and transport

If possible, organise goods on pallets. This is considered the best solution to avoid damage to products during shipment.

If required, that goods are packaged in cardboard using bubble wrap so that packaging absorbs shock that may occur during shipment.

Place packaged product in very thick cardboard and ensure that all sides are wrapped in bubble wrap or other material that can ensure protection of products as much as possible during shipment.

13.4 Warranty duration and limits

A product remains in warranty for one year from date of purchase.

The warranty does not apply to the following cases:

- an external cause (mechanical shock, lightening, sudden changes in voltage)
- damage incurred during transport or storing
- a product installed in a manner that does not comply with manufacturer specifications
- a product containing too much dust in inner parts
- a product exposed to rain or humidity
- a product which has been modified by the client
- deteriorations caused by ill use of equipment
- use of unsuitable accessories or consumables
- natural wear of different parts of equipment
- freezing caused by insufficient or unsuitable use of the coolant

The guarantee does not apply to normal wear of accessories or consumables (ferrite).

If the equipment is modified or repaired by unauthorised personnel, the warranty shall be void.

CAUTION: The inductor must not be bent or altered in shape in any way. If the inductor is modified, the warranty shall be automatically rendered void.

14. Maintenance



Machine maintenance must be performed by qualified and authorized personnel who are knowledgeable about the operating procedures.

Warning! Disconnect the machine power cable from the electrical mains before carrying out any maintenance on the device.

- Machine maintenance must be carried out by qualified, authorised personnel who are aware of its operating procedures.
- Never perform any cleaning, lubrication or maintenance with the machine running.
- Before any maintenance work, set the main switch to "0" to cut off power, unplug it from the mains to prevent electrical shock or other hazards resulting from mishandling.
- Never wear rings, watches, jewellery, loose or dangling clothing such as ties, torn garments, scarves, unbuttoned jackets or jackets that zip open that can get tangled during work.
- It is instead advisable to use suitable clothes for accident prevention, for example: non-slip shoes, anti-noise headphones, goggles, appropriate gloves, etc.
- Never use gasoline or flammable solvents to clean the machine. Use water and, if necessary, commercial non-toxic solvents.
- Use a dry rag to clean surfaces.
- After operations have been completed, always refit any protections that were removed before re-starting the machine.

Wear the Personal Protective Equipment listed below during all phases of maintenance:

SYMBOL	DESCRIPTION
	Protective clothing EN 340
	Protective goggles or mask EN 166
	Protective gloves against general mechanical hazards EN 388
	Protective footwear EN 345-346-347

14.1 Preventive maintenance



Meticulous inspections carried out regularly are necessary in order to detect and eliminate faults quickly before they can cause any major damage.

Any time you need to use the PL series, first check the efficiency of safety devices, the conditions of connections and if there are any anomalies by performing some no-load tests and on ferrous scrap material. Check daily for wear and legibility of warning signs.

Operation		Daily	Weekly	Bi-weekly	Monthly	Twice-monthly	Quarterly	Every four	Biannual	Annual	On condition
General cleaning of the machine	1		X								
Check for liquid leakage	1				X						
Ensure that the ventilation openings are not obstructed	1	X									
Changing the coolant	1									X	
Bleeding of the hydraulic system	1									X	
Replacement of the flow concentrator	1										X
Replacing the inductor	1										X

14.2 Routine maintenance

Machine operating safety can only be guaranteed if repairs are performed using only original or however approved replacement parts and if maintenance instructions are followed correctly.

At the end of each use, with the machine disconnected from the electrical mains, proceed with a general cleaning of the machine, quickly removing dust or dirt deposits in general as this could reduce ventilation and alter machine function and durability.

Before each use, verify the functionality of control devices, safety devices and the conditions of electrical connecting cables.

14.3 Cooling liquid replacement and Hydraulic system purge

After a working period of about 1 year, due to coolant properties degradation, it is recommended to replace the antifreeze cooling liquid to increase the service life of the machine components and for a more efficient duty cycle.

Proceed as follows to replace the antifreeze fluid:

1. Turn off the machine
2. Remove the front panel of the machine to access the fluid tank
3. Close the hydraulic tap valve at the tank bottom
4. Place absorbent cloth to dry any liquid that can escape from a small section of the circuit
5. Release the rilsan hose from the tank bottom
6. Release the rilsan hose from the pump outlet (top) by pressing the ring
7. Use compressed air pressure attached to the "rilsan hose pipe" to clean the system it completely
8. Re-insert the rilsan hose into the pump outlet (top)
9. Unscrew the hose clamp nut over the tank cap
10. Remove the tank closing cap (together with the meshed rubber hose)
11. Take the tank off and empty completely the tank
12. Reposition the tank and reconnect the rilsan hose at the tank bottom
13. Open the hydraulic tap valve at the tank bottom
14. Fill approx. 20 L of new antifreeze liquid.
15. Close the tank with the cap, start the machine and wait a few seconds for the circuit supplying the inductor to charge.

14.4 Replacing the flow concentrator

In the event of flow concentrator (ferrite) replacement



Remove the screws fastening the brass tab, extract the flow concentrator, carefully clean the copper part and replace the worn concentrator with a new one fastening it with the appropriate tab and the respective screws.



14.5 Replacing the flow concentrator

	Inductor replacement should be carried out only by expressly authorized personnel and only after the power supply has been turned off.
	Wear protective gloves during maintenance and/or repair work. Electrically insulate the machine by disconnecting it from the power supply. During the inductor replacement operation make sure that there is no significant liquid leakage from the manipulator. In case of significant leakage, refill the liquid in the appropriate tank. When fixing the inductor, the tightening should not exceed 5Nm. Carry out tightening with appropriate torque wrench.

15. Troubleshooting

15.1 Unlocking the pump

If, when the machine is started, the user panel (*figure 3*) signals the error on the hydraulic circuit, open the front panel of the machine, check that the antifreeze fluid is flowing; otherwise, after switching off the machine, insert a screwdriver into the hole provided, move the pump fan until it is unlocked.



Note: Contact the manufacturer or an authorised dealer whenever there are any breakages requiring the removal of machine.

15.2 Alarm light

The display will show the error code if an abnormality is detected. Please contact the service department by reporting the code shown on the display.

I4 Evo X / PL5 Alarms

- **Error Flowmeter:** The control unit detects a malfunction in the hydraulic system.



- **Error Fluid Temp:** The maximum temperature of the coolant has been reached. The machine must be allowed to cool down before resuming operation.



- **Error Heat Sink Temp:** The maximum allowable temperature of the control board (heat sink) has been exceeded.



- **Error Tool:** A general fault indicating a malfunction occurred during current delivery.



- **No Answer From Motherboard:** The LCD display is unable to communicate with the main control board.



16. Accessories

Heat sensor iRT

The iRT heat sensor is ideal for targeted heating. It is equipped with integrated laser electronics in the head that detects temperatures from -30°C to 1000°C on metals, oxides and ceramics. Its laser cross-pointing system offers reliable and precise adjustment of the measuring range even when conditions are difficult, for example when there is heat transfer.



17. Special optional versions

If the following special optional versions has been ordered, here follow the instruction how to use the specific included accessories.

Induction machines with Smart heating switch

The integrated Smart Heating Switch, once activated, allows the machine to deliver the heat flow in continuous mode, without the need to keep the standard delivery button located on the tip pressed.

Induction machines with Foot pedal switch

In case of machines requested with an integrated pedal switch, the machine operates in a continuous mode as long as the pedal switch is pressed.

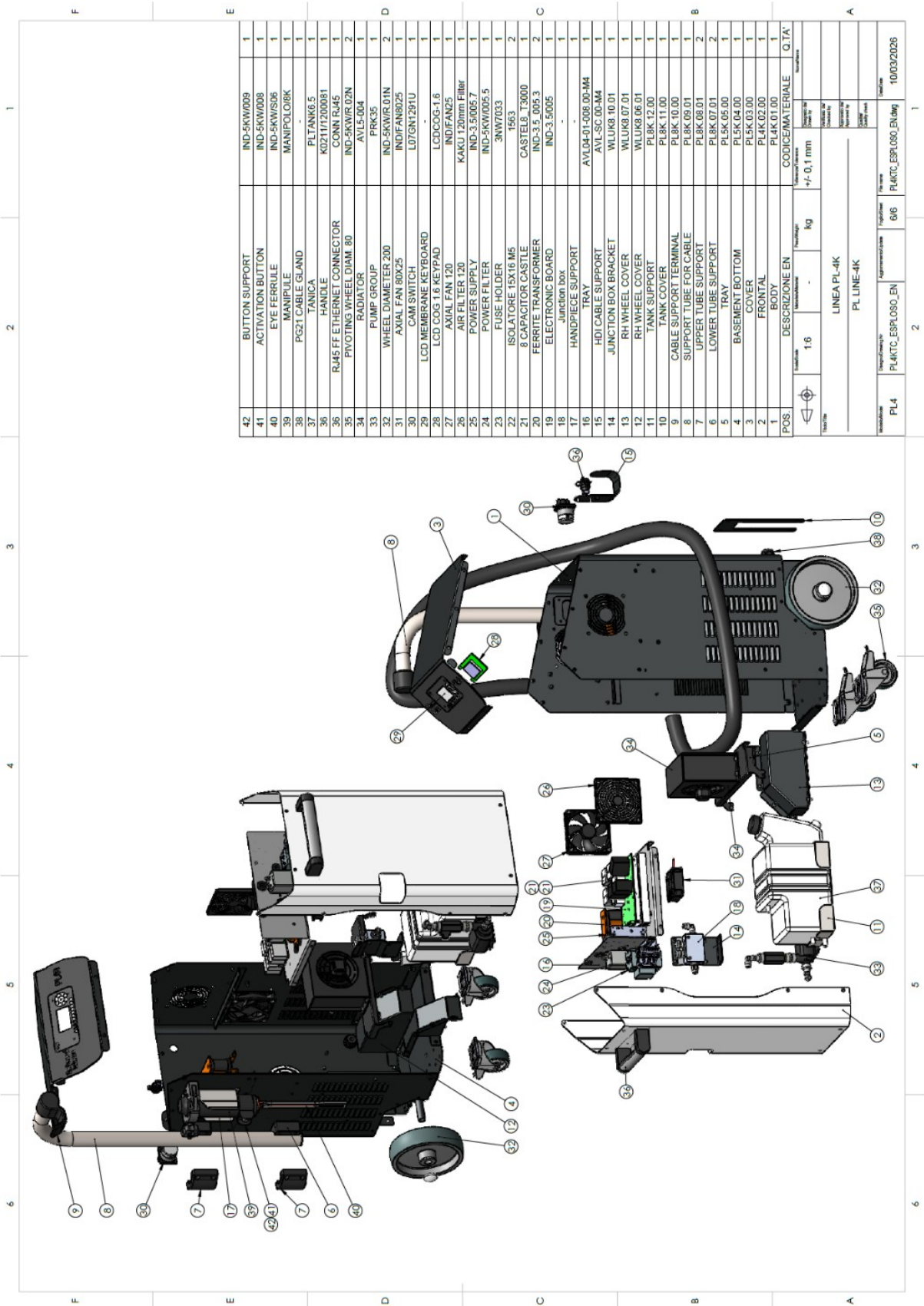


Induction machines with timer

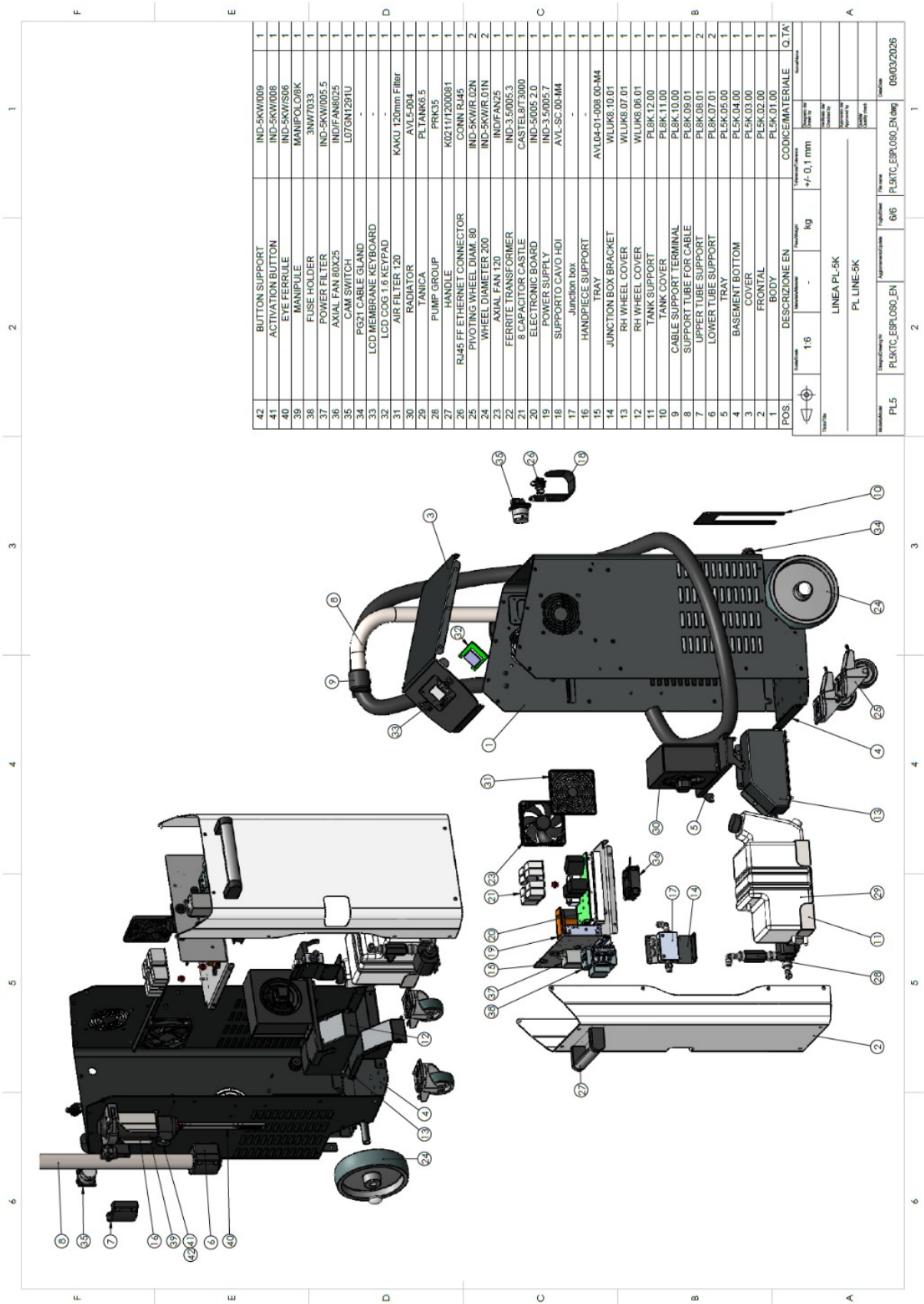
Once the timer is set for the desired induction period, the machine will deliver heat continuously until it is finished. This option prevents overheating of the material.

18. Exploded views

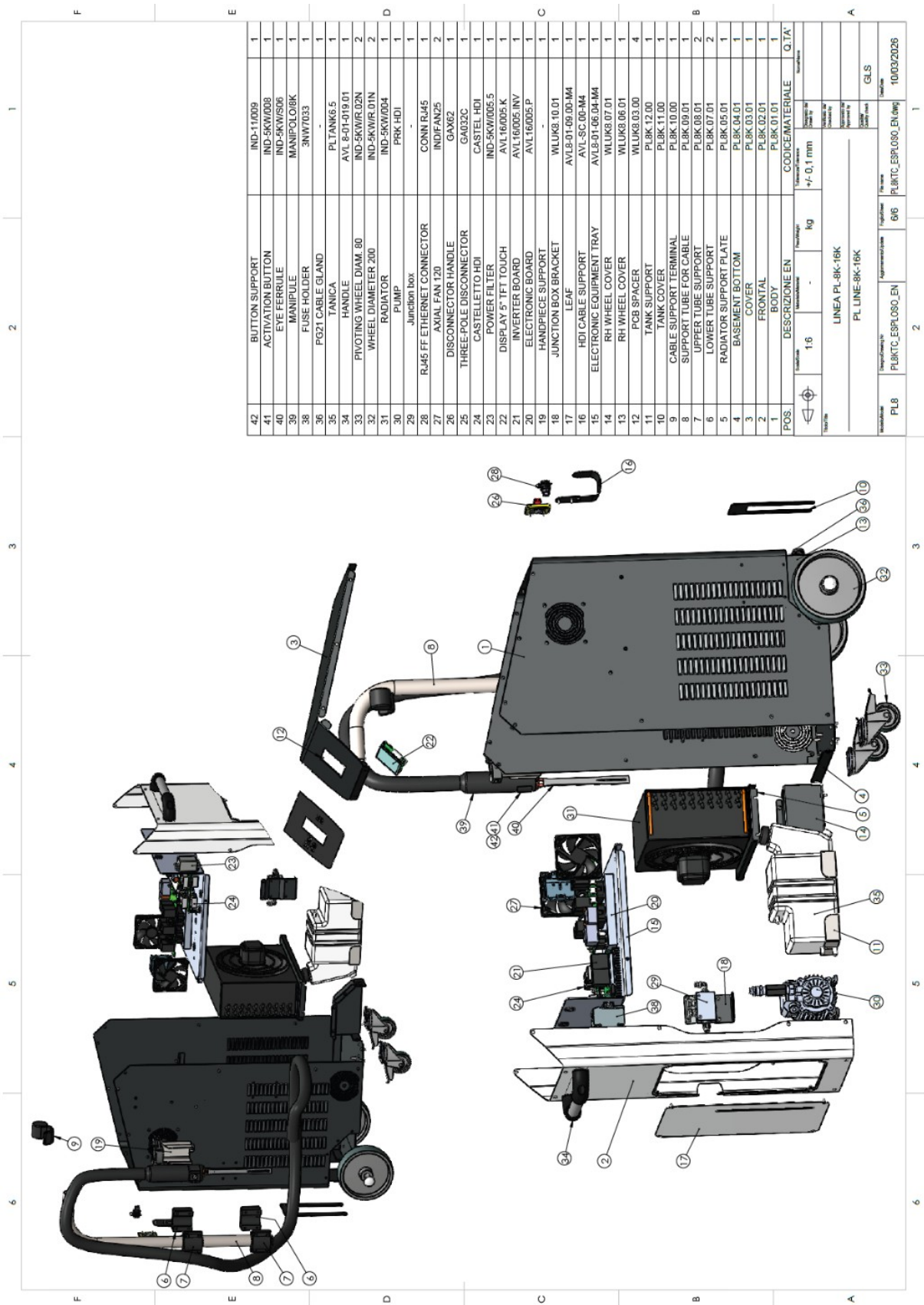
18.1 Exploded view I4 Evo X

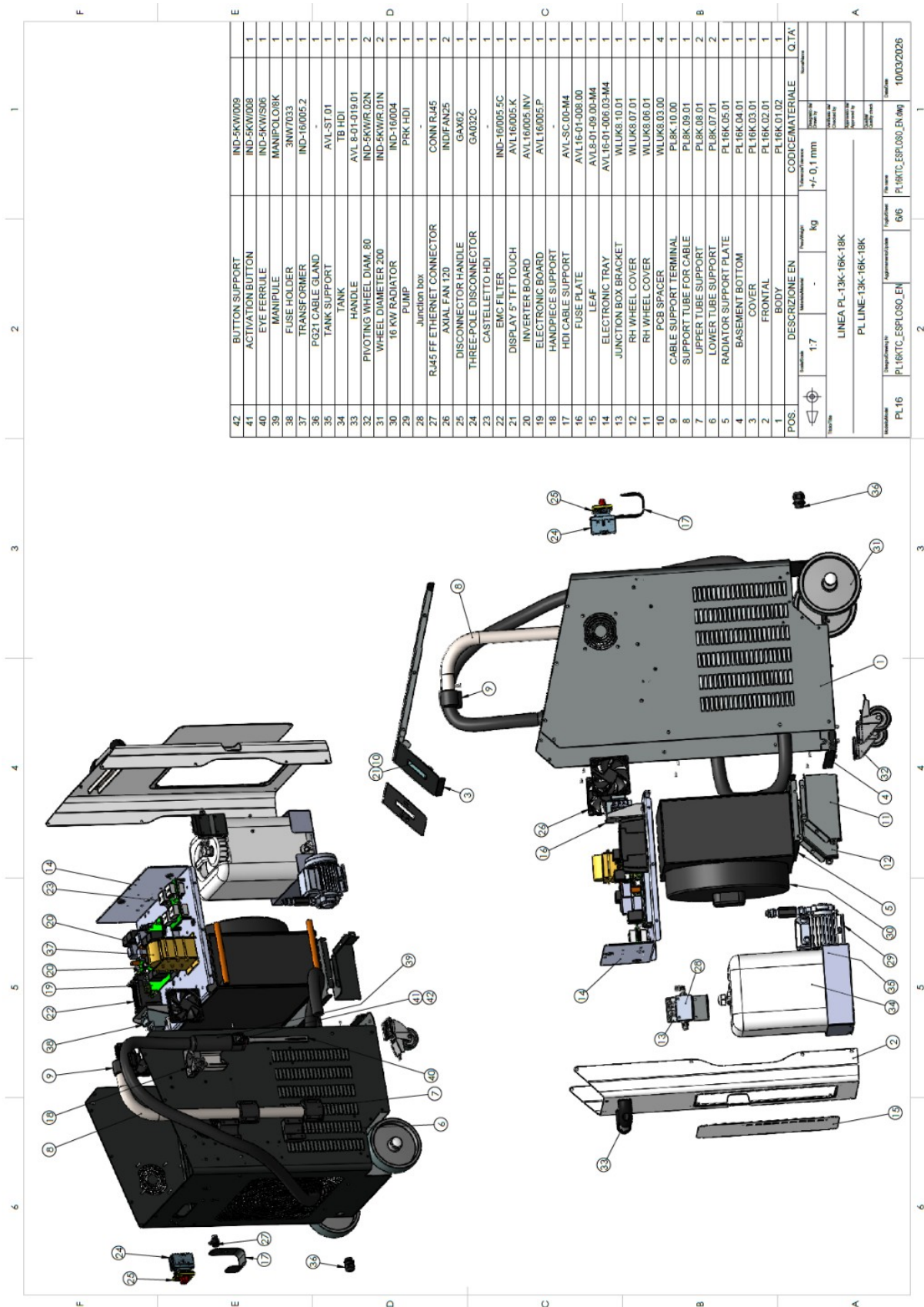


18.2 Exploded view PL50



18.3 Exploded view PL80 / PL110





It is advisable to use the following diagram to record Inductor PL series maintenance and any work performed on the tool over time.

This will allow the user to have appropriate information about the machine's operating cycle on hand at all times.

A correct record of inspections and maintenance in the Machine Logbook is expressly stipulated by the Manufacturer and, in addition to being good practice, is set forth as an obligation of the user.

Year of manufacturing

[illegible]

20. Conformity

EC DECLARATION OF CONFORMITY

(pursuant to Machinery Directive 2006/42/EC and subsequent amendments, Annex II/A)

The Manufacturer:

ALBATROS TRADE s.r.l.
Via Aurelia, 65
54033 CARRARA (MS)
ITALY

Declares that the machine:

PL

-

-

Model

Serial Number

Year of manufacture

High-performance induction heating equipment

Trade Name

Induction heating for unlocking, bending, treatment of metal parts

Intended Use

Complies with the Directives:

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 relating to machinery and amending Directive 95/16/EC.

Directive 2013/35/EU of the European Parliament and of the Council of 26 June 2013 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (electromagnetic fields).

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (EMCD).

Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (LVD).

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).

Reference to harmonised standards:

EN 60204-1:2018 – Safety of machinery – Electrical equipment of machines – Part 1: General requirements.

EN IEC 60519-1:2020 – Safety in electroheating and electromagnetic processing installations – Part 1: General requirements.

EN 55011:2016+A1:2017+A11:2020 – Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement.

EN IEC 61000-6-2:2019 – Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments.

And authorises the following person to compile the technical file on its behalf:

Gian Luca Simonini

Name and Surname

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City

Italia

Nation

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Changes affecting the technical specifications and the intended use specified in the instruction manual will invalidate this Declaration of Conformity.

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PI 01223100453
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Albatros Trade s.r.l. General manager