

PLASMA CUT 61i



GeKaMac®

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Introduction

Thank you for purchasing one of our products. Please read instructions on use in this manual **as well as the safety rules given in the attached booklet** and follow them carefully to get the best performance from the equipment and be sure that the parts have the longest service life possible. In the interest of customers, you are recommended to have maintenance and, where necessary, repairs carried out by the workshops of our service organisation, since they have suitable equipment and specially trained personnel available. All our machinery and systems are subject to continual development. We must therefore reserve the right to modify their construction and properties.

Description

This equipment, built with the latest INVERTER technology with IGBT, is an efficient solution for manually cutting any metal and perforated sheet.

The electronic control feature and the precision and flexibility of the inverter allow the best parameters to be determined in order to assure elevated cutting quality depending to the type and thickness of the material.


Powerful, lightweight and manageable, the three-phase **PLASMA CUT 61i** is suitable for use in car body repairs, metal structural work, industry and maintenance. The main technical features are:

- Innovative practical design.
- Free-standing metal structure with front panel in special shockproof fibre.
- Robust handle integrated into the chassis.
- Arc parameter control device for excellent cutting quality.
- Three-phase input.
- IP 23 S protection class and dust-proof electronic components, thanks to the innovative "Tunnel" fan cooling system, allow operation in the toughest work environments.
- Continuously regulated cutting current to improve the appearance of the cut.
- Stability of cutting parameters within $\pm 10\%$ of rated input voltage fluctuations.
- Mains voltage surge and drop protection with automatic reset feature.
- Switch for cutting solid or gridded materials.
- Indicator LED signalling worn electrodes and incorrect system operation.
- Button for testing initial airflow adjustment.
- Cutting operational cycle and alarm signals displayed with lights.
- Plasma torch with high frequency pilot arc striking.
- Heat protection against overloads.
- Low air consumption (130 l/min).
- Filter group and air regulator featuring automatic expulsion of impurities.
- Reduced energy consumption.

Technical data

The technical data for this equipment is summarized in the table 1.

Table 1

Model	PLASMA CUT 61i	
Three-phase power supply 50/60 Hz	V	400
Mains supply: Z_{max}	Ω	0,107
Power input @ I_2 Max	kVA	7,5
Delayed fuse (I_2 @ 100%)	A	10
Power factor / $\cos\phi$		0,94 / 0,99
Efficiency degree	η	0,89
Open circuit voltage (peak)	V	245
Current range	A	20 ÷ 60
Duty cycle @ 100% (40°C)	A	40
Duty cycle @ 60% (40°C)	A	50
Duty cycle @ 40% (40°C)	A	60
Maximum quality cutting thickness	mm	15
Maximum separation cutting thickness	mm	20
Standards	IEC 60974-1 IEC 60974-7 IEC 60974-10 CE S	
Protection class	IP 23 S	
Insulation class	H	
Dimensions 	mm	540-425-220
Weight	kg	23

WARNING: This equipment complies with **EN/IEC 61000-3-12** provided that the maximum permissible system impedance Z_{max} is less than or equal to 0,107 at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with maximum permissible system impedance Z_{max} less than or equal to 0,107.

This system, tested according to **EN/IEC 61000-3-3**, meets the requirements of **EN/IEC 61000-3-11**.

Usage limits (IEC 60974-1)

The use of plasma equipment for cutting is typically discontinuous as it consists of periods of effective operation (cutting) and rest periods (while the piece is being positioned, etc.). The size of the equipment is suitable for safe use of max. nominal current I_2 for a working time that is 40% of the total time of use. The regulations in effect stipulate that 10 minutes is the maximum total time of use. For the work cycle, 40% of that time is considered. Any excess of the permitted work cycle triggers a thermal circuit breaker which protects the internal components of the equipment against dangerous overheating. When the thermal circuit breaker is triggered, the yellow LED on the front of the equipment is lit (Pos. 4, Fig. B). After a few minutes the overheat cutoff resets itself automatically and the yellow LED goes off, indicating that the equipment is once again ready for use. This equipment is built to have a protection level of IP 23 S, which means:

- That it is protected against the penetration of solid foreign bodies with diameters in excess of \varnothing 12 mm.
- That it is protected against water spray hitting the surface with an angle of incidence up to 60° .
- That the equipment has been tested for withstanding harmful effects due to water getting in when the moving parts on the equipment are moving.

Opening the packaging

The standard composition of this plasma cutting system is made up of:

- **PLASMA CUT 61i** plasma cutting units.
- Plasma torch with centralised attachment and spare parts kit.
- Ground cable.
- CT10 trolley for transportation (optional).

On receipt of the unit, perform the following operations:

- Remove the plasma cutting unit and all relative accessories and components from the packaging.
- Check that the plasma cutting unit is in good condition. If it is not, inform your dealer immediately.
- Make sure that all the ventilation louvers are open and that the airflow is not obstructed.

Plasma cutting

The cutting system used by this equipment is a low current system that uses compressed air as its plasma equipment as well as for cooling. The air normally used is a mixture of 79% nitrogen and 21% oxygen. These two biatomic gasses have almost identical enthalpy and form a highly energetic blend. The low current also makes it possible to use torches with a low air capacity and moderate cutting speed, that are more suitable for manual procedures.

CUTTING PARAMETERS

In analyzing the parameters that characterize manual plasma cutting it is necessary to note that they depend on the material to be cut, its thickness and the skill of the operator in following the cutting line. Optimum speed depends largely on the skill of the operator and amount of material to be cut and is achieved when the fused material flows through the groove and is not projected in the direction of the torch. If the latter occurs, cutting speed has to be reduced.

The parameters that affect cutting are:

- **Electric power.** Any increase in electric power will permit higher cutting speed and greater thickness of the material to be cut
- **Compressed air capacity.** Increasing the air capacity enables cutting thicker material and ensures better quality at any thickness
- **Distance between hood and piece.** The appearance of the cut and wear of the active components of the torch depends on the hood being held as a correct distance from the piece.

NOTE: The width of the cutting groove is usually about twice the diameter of the hole in the hood.

Respect of the above recommendations ensures greatly reduced thermal alterations of the material due to cutting, that are in any case always fewer than those caused by oxygen torches. The thermally altered zone is in any case smaller than the zone on which the weld is effective, so that in welding pieces that have been cut by plasma it is not necessary to perform any cleaning or grinding operations.

Installation

The place where the equipment is installed should be selected with care so as to ensure satisfactory, safe use.

The user is responsible for installation and use of the equipment according to the instructions provided by the manufacturer in this manual.

Temperatures must be between -25°C e $+55^\circ\text{C}$. during transportation and/or storage in stores.

Before installing the equipment the user should take into consideration any possible electromagnetic problems in the work area.

In particular, we recommend that the equipment not be installed in the vicinity of:

- Signalling, control and telephone cables.
- Radiotelevision transmitters and receivers.
- Computers or controlling and measuring instrument.
- Safety and protection devices.

Table 2

Model		PLASMA CUT 61i
Power input @ I ₂ Max	kVA	7,5
Delayed fuse (I ₂ @ 100%)	A	10
Duty cycle @ 40% (40°C)	A	60
Mains supply connection cable		
Length	m	4
Section	mm ²	1,5
Ground cable		
Length	m	4
Section	mm ²	10

If the operator wears a pacemaker, hearing aid or other similar device, he should consult his doctor before approaching the equipment while it is running. The environment where the equipment is installed must conform with the degree of protection of the chassis that is IP 23 S (IEC publication 60529). The system is capable of working in environments where working conditions are particularly hard.

This equipment cools water by forced circulation of air and must therefore be positioned in such a way that the air can easily be drawn in and expelled through the openings in the chassis.

Connection to the electrical supply

Connection of the machine to the user line (electrical current) must be performed by qualified personnel.

Before connecting the cutting equipment to the mains supply, check that the data on the machine plate correspond to the supply voltage and frequency and its main switch is on the "0" position.

This system has been designed for nominal voltage 400 V - 50/60 Hz.

The connection to the supply, should be made with four core cable which is supplied with the machine, connecting:

- Three wires the supply.
- The fourth one, YELLOW-GREEN, to ground.

Connect a suitable plug (3p+e) of proper capacity to the mains cable and fix to a socket fitted with fuses or automatic switch: the proper ground terminal must be connected to the ground connector (yellow-green) of the main supply.

Table 2 shows the capacity values that are recommended for fuses in the line with delays.

NOTE: *If extensions of the power supply cable are used, they must be of adequate cross section and never inferior to that of the cable supplied.*

Usage norms

COMMAND AND CONTROL DEVICES (Fig. A)

- Pos. 1 Control panel (Fig. B).
- Pos. 2 Snap-in connector for ground line.
- Pos. 3 Centralised torch attachment.
- Pos. 4 Main switch.
- Pos. 5 Filter and cutting air pressure regulator. Adjust to pressure of 5 bar. The air filter automatically expels impurities.
- Pos. 6 Fast coupling to connect compressed air tube.

CONTROL PANEL (Fig. B)

- Pos. 1 Green LED: signals power ON. When on the system is powered and ready for use.
- Pos. 2 Red LED: signals activation of torch button. When the torch button is pressed the LED lights up and the system is ready for cutting operations.
- Pos. 3 Yellow LED: signals lack of compressed air. It lights up when air pressure is below 4 bar.
- Pos. 4 Yellow LED: signals intervention of overheat cutoff
- Pos. 5 Red LED (generic power warning signal). Lights up in the following cases: presence of unusual voltage > 200V, hazardous for the operator
- Pos. 6 Button for testing initial airflow adjustment.
- Pos. 7 Switch for cutting solid or grided materials.
- Pos. 8 Potentiometer for regulation of cutting current
- Pos. 9 Pressure gauge for reading cutting air pressure.

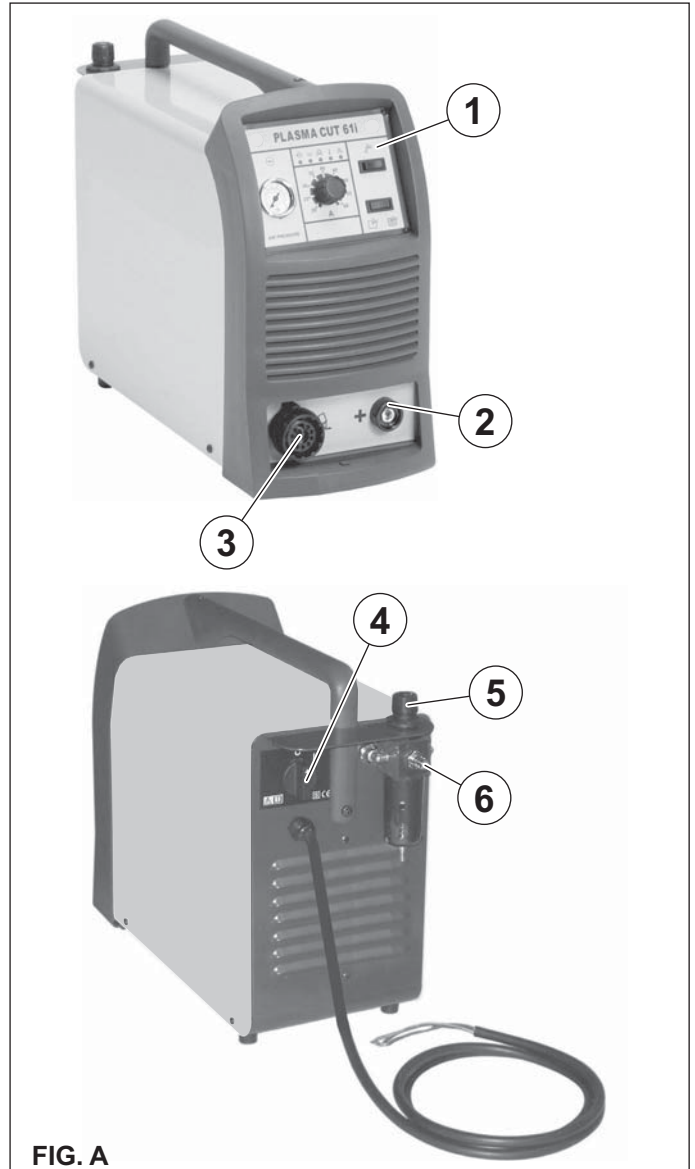


FIG. A

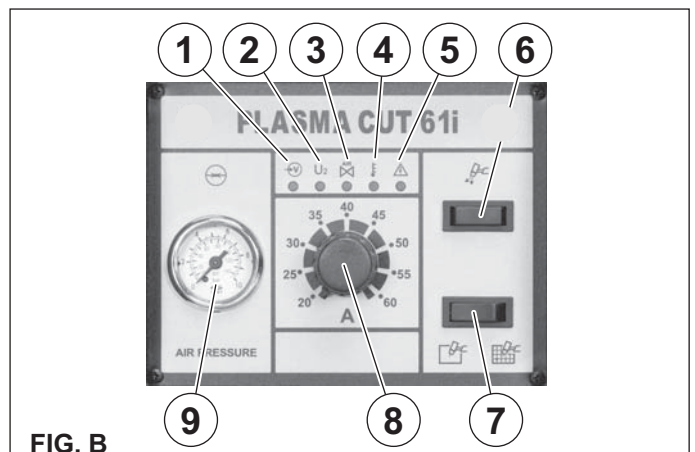


FIG. B

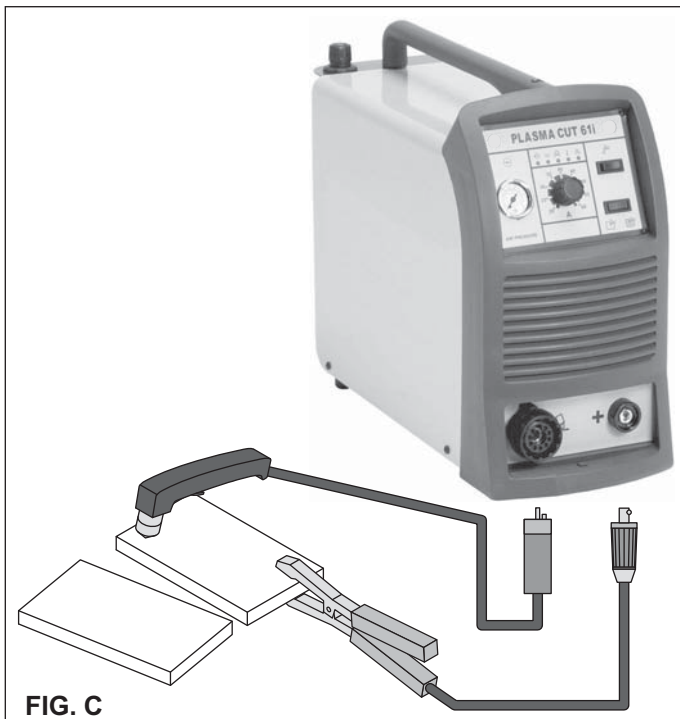


FIG. C

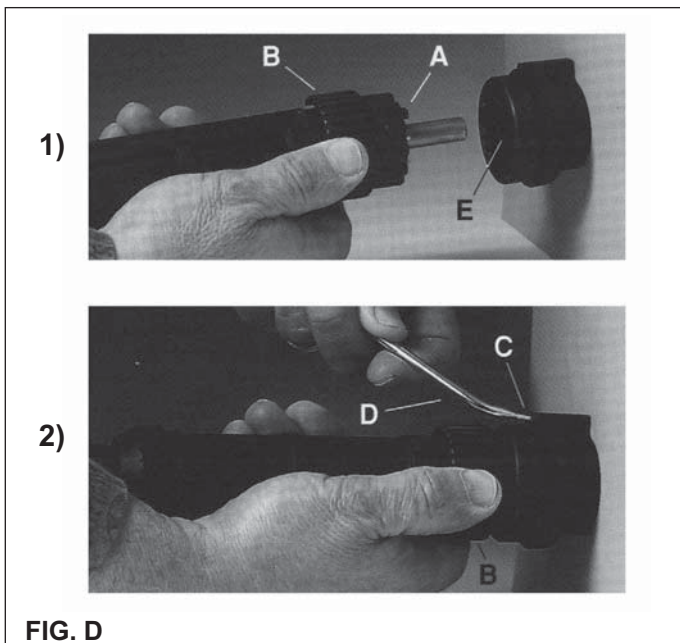


FIG. D

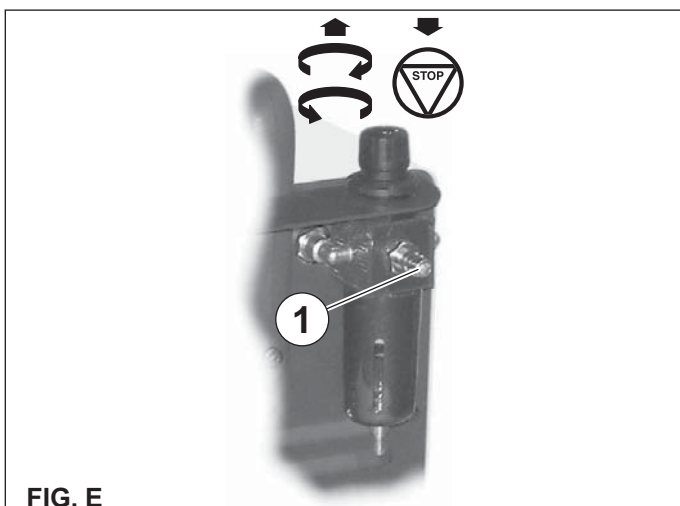


FIG. E

Connection of plasma torch and ground cable

IMPORTANT: Before performing any operation regarding connection of the torch and ground cable, disconnect the power to the system.

IMPORTANT: Do not connect to the Plasma equipment any other torch different from the standard supplied ones; the utilisation of other non suitable torches might be dangerous for the operator.

To obtain elevated cutting quality, the torch must transform the power generated by the equipment into a high energy density plasma jet, so that it can efficiently melt metal and guarantee sufficient strength to remove the metal part from the cutting zone, impeding the formation of burrs. The torch is this a fundamental, indispensable component of the plasma cutting equipment.

The standard supplied Plasma torch has special electrical connections in the central adaptor.

Before fitting a new equipment, make sure that the torch central adaptor electrical connections are matching the ones of the Plasma equipment.

Connect the plasma torch to the centralised connection, as shown in figures C-D, proceeding as follows:

- 1) Insert male connector (torch side) into the corresponding female connector (machine side). The tooth (Pos. A, Fig. D) must coincide with the special housing (Pos. E, Fig. D), then insert the locknut (Pos. B, Fig. D).
- 2) In order to lighten the locknut (Pos. B, Fig. D), first insert and press the tool provided (Pos. C, Fig. D) in the hole (Pos. D, Fig. D) so as to remove the retainer which prevents it from turning. This must be done until the locknut is completely tight.

To disconnect torch first remove the retainer by inserting tool (Pos. C, Fig. D) to hole (Pos. D, Fig. D) and unscrew the locknut (Pos. B, Fig. D) anti-clockwise.

Connect the ground cable to the rapid coupling on the positive pole as indicated in figure C.

The ground cable has to be connected on the specific terminal to the piece to be cut, **which must be effectively grounded as well as the cutting bench.** Do not connect the ground terminal to the piece of material to be removed.

WARNING: The work area must be free of oil, paint, and rust!

Connection of compressed air

Fasten the compressed air hose to the snap-in connector (Pos. 1, Fig. E). The system must be fed with a constant flow of air at about 5 bar) and with a minimum flow capacity of 130liters per minute.

Set the pressure regulator to obtain a pressure of about 5 bar by pulling up and turning the lock ring as shown in figure E. When adjusted, lower the lock ring into place.

NOTE: The pressure setting must always be made upward.

Sequence of operations to perform before cutting

IMPORTANT: Before switching on the equipment follow these instructions carefully:

- Make sure the voltage and frequency of the supply network correspond to the data on the rating plate.
- Make sure all the torch components are correctly installed.
- Do not point the torch toward yourself or other persons nearby. If switched on accidentally the pilot arc spark would ignite and cause dangerous burns.

- 1) Turn the main switch (Pos. 4, Fig. A) to 1.
- 2) Check that the green LED (Pos. 1, Fig. B) on the front of the machine is on. All the other LEDs should be off.

- 3) Push the testing button for initial airflow adjustment (Pos. 6, Fig. B) upward: air will come out of the torch for about 1 minute.
- 4) Turn adjustment filter (Pos. 5, Fig. A) to adjust air pressure until the pressure gauge (Pos. 9, Fig. B) reads 5 bar.
- 5) Turn switch for cutting solid or grided materials (Pos. 7, Fig. B) to desired position (appropriate for the piece to be cut).
- 6) Adjust the cutting current by turning the potentiometer (Pos. 8, Fig. B). The digital amperometer will display the set cutting current. Increasing the current will permit higher speed cutting or, at the same speed, cutting of greater thickness.
- 7) Move the torch toward the piece (see Fig. F) and, resting the spacer firmly without applying pressure, press the torch button to ignite the pilot arc and start emitting air. Go with the flame to the piece and start cutting. The red LED (Pos. 2, Fig. B) is on while you are cutting. Do not keep the pilot arc on with air so as not to cause unnecessary wear on the electrode and hood.
- 8) In special cases if the arc is switched off when the workpiece enters, observe the correct angle of inclination between the torch and the metal. A special control device prevents arc transfer in case of incorrect inclination between the torch and the workpiece.
- 9) Cut taking care that the fused material flows through the groove and is not projected in the direction of the torch. If this occurs, reduce cutting speed.
- 10) Upon completion of the cutting operation, the air will continue to issue from the torch for about one minute so as to cool the torch components. Wait for the air to stop flowing before switching the equipment off. During this time, you can also start a new cutting operation. If you have to make cuts near corners or indentations, it is advisable to use extended electrodes and hoods. If you have to perform circular cuts, it is advisable to use the special compass supplied on request.

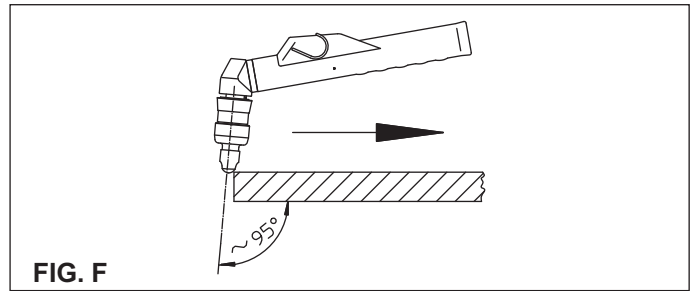


FIG. F

- Make sure the air circuit is completely free of any impurities and that the connections are tight and free of any leaks. In this connection, inspect the solenoid valve very carefully.
- Though the air filter has an automatic condensation drain, the filter-regulator insert should still be cleaned.

Possible problems and remedies

The power line is the cause of most problems. In case of breakdowns proceed as follows:

- 1) Check the line value of the voltage
- 2) Check that the power cable is perfectly fastened to the plug and mains switch
- 3) Make sure the fuses are not burnt or loose
- 4) Check the following for defects:
 - The switch that powers the machine
 - The wall socket for the plug
 - The equipment power switch

NOTE: Given the technical knowledge required for equipment repair, we recommend, in case of faults, that you contact qualified personnel or our technical support service.

TROUBLESHOOTING TABLE

It is normally possible to find the cause of a breakdown through the five warning LEDs located on the right hand side of the front of the system. The first thing to do, therefore, is to check which leds are on. Here below we are listing some of the possible breakdowns that may occur on the system.

Maintenance

ATTENTION: Cut off the power supply to the equipment before effecting any internal inspection.

SPARE PARTS

Original spares have been specifically designed for our equipment.

The use of spares that are not original may cause variations in the performance and reduce the safety level of the equipment. We are not liable for damage due to use of spare parts that are not original.

THE EQUIPMENT

As these systems are completely static except for the fan that is, in any case, provided with self-lubricating bushes, only the following operations are necessary:

- Periodic removal of accumulations of dirt and dust inside the equipment using compressed air.
- Periodical inspection for worn cables or loose connections that could cause overheating.

Troubleshooting table

Defect	Cause	Remedy
Main switch (Pos. 4, Fig. A) on but green LED off (Pos. 1, Fig. B)	<ul style="list-style-type: none"> No power 	<ul style="list-style-type: none"> Check connection of the power supply cable to the line or remove any interruptions
Yellow air LED (Pos. 3, Fig. B) on	<ul style="list-style-type: none"> Defective control board 	<ul style="list-style-type: none"> Replace
	<ul style="list-style-type: none"> Air pressure in system below required value (4 bar) Pressure switch defective 	<ul style="list-style-type: none"> Adjust air pressure to the required value Replace
Red protection LED (Pos. 5, Fig. B) on	<ul style="list-style-type: none"> Power higher than 200V on while equipment is idle 	<ul style="list-style-type: none"> Have your equipment checked by our technical support service
Yellow thermostatic safety LED on (Pos. 4, Fig. B)	<ul style="list-style-type: none"> Intervention of thermal protective device on transformer or rectifier 	<ul style="list-style-type: none"> Wait for it to reset after a few minutes and reduce the work cycle time
Lack of air with torch button pressed	<ul style="list-style-type: none"> Defective control board 	<ul style="list-style-type: none"> Replace
	<ul style="list-style-type: none"> Defective solenoid valve 	<ul style="list-style-type: none"> Replace
Pilot arc does not go on when torch button is pressed	<ul style="list-style-type: none"> Defective control board 	<ul style="list-style-type: none"> Replace
	<ul style="list-style-type: none"> Torch not completely screwed into the central attachment 	<ul style="list-style-type: none"> Reassemble or tighten torch nozzle
	<ul style="list-style-type: none"> Worn electrode and hood on torch 	<ul style="list-style-type: none"> Replace
	<ul style="list-style-type: none"> Torch button defective 	<ul style="list-style-type: none"> Replace
Arc goes out on contact with piece to be cut	<ul style="list-style-type: none"> Lack of connection of ground wire 	<ul style="list-style-type: none"> Connect ground wire

Common cutting defects

Defect	Cause	Remedy
Insufficient penetration	<ul style="list-style-type: none"> Cutting speed too high 	<ul style="list-style-type: none"> Reduce speed
	<ul style="list-style-type: none"> Current too low 	<ul style="list-style-type: none"> Increase current
	<ul style="list-style-type: none"> Ground wire connected wrong 	<ul style="list-style-type: none"> Check ground wire connection
Main arc goes out	<ul style="list-style-type: none"> Cutting speed too slow 	<ul style="list-style-type: none"> Increase speed
	<ul style="list-style-type: none"> Too much space between torch and piece 	<ul style="list-style-type: none"> Reduce space
	<ul style="list-style-type: none"> Excessive erosion of electrode 	<ul style="list-style-type: none"> Replace electrode
Excessive residues	<ul style="list-style-type: none"> Air pressure wrong 	<ul style="list-style-type: none"> Regulate the air pressure reducer correctly
	<ul style="list-style-type: none"> Cutting speed too slow 	<ul style="list-style-type: none"> Increase speed
	<ul style="list-style-type: none"> Hood hole eroded 	<ul style="list-style-type: none"> Replace hood
	<ul style="list-style-type: none"> Spacer wrong 	<ul style="list-style-type: none"> Reduce spacer
Hood overheated or black	<ul style="list-style-type: none"> Current too high 	<ul style="list-style-type: none"> Reduce current
	<ul style="list-style-type: none"> Space between hood and piece too small 	<ul style="list-style-type: none"> Increase space
	<ul style="list-style-type: none"> Air dirty 	<ul style="list-style-type: none"> Clean air filter
	<ul style="list-style-type: none"> Excessive erosion of electrode 	<ul style="list-style-type: none"> Replace electrode
Pilot arc intermittent or sparking	<ul style="list-style-type: none"> Air pressure wrong 	<ul style="list-style-type: none"> Adjust reducer to the right pressure
	<ul style="list-style-type: none"> Air dirty, greasy, wet 	<ul style="list-style-type: none"> Clean air filter
	<ul style="list-style-type: none"> Pilot arc current too low 	<ul style="list-style-type: none"> Check the equipment pilot arc circuit

IT Schema elettrico

EN Wiring diagram

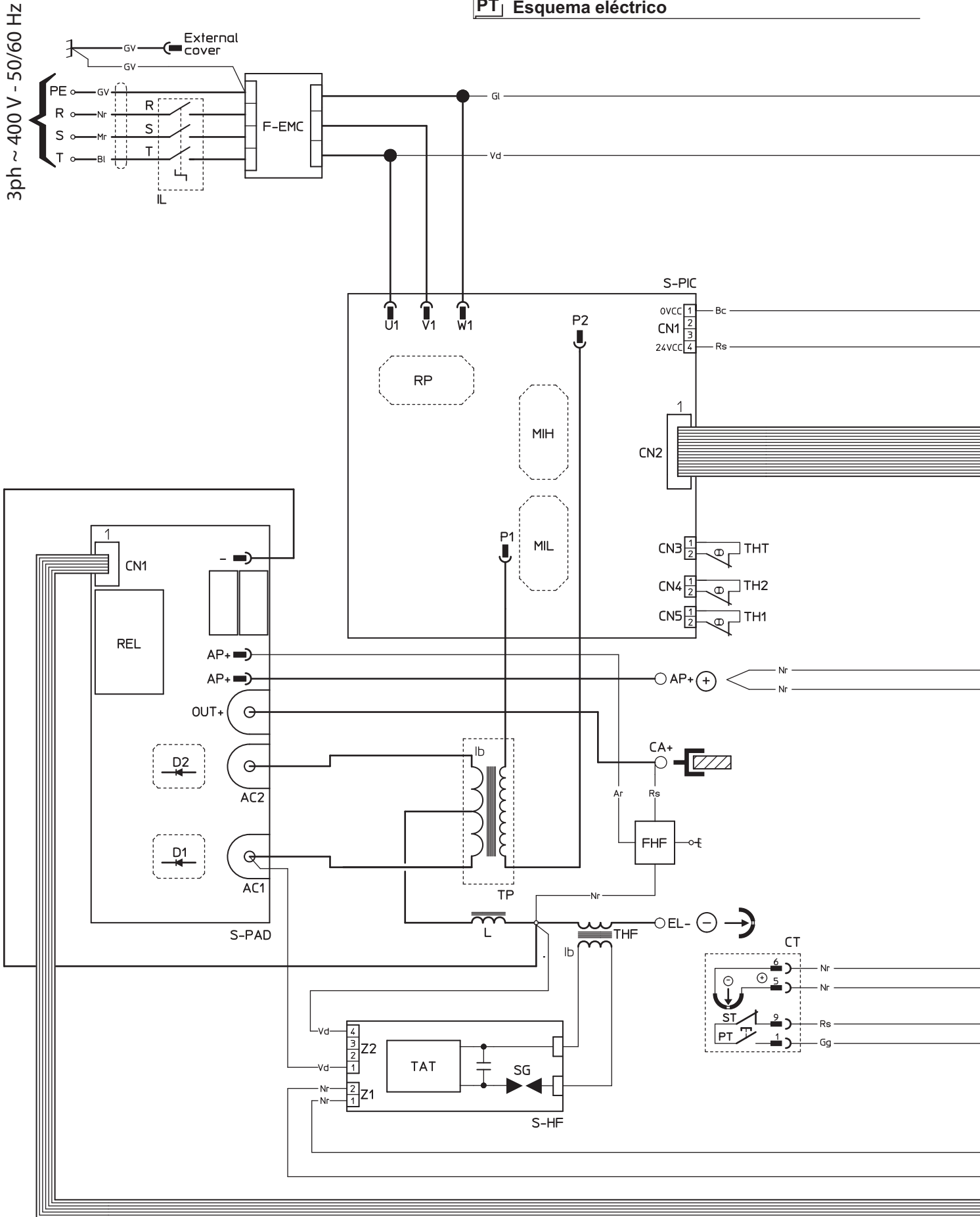
FR Schéma électrique

DE Schaltplan

ES Esquema eléctrico

NL Elektrisk skema

PT Esquema eléctrico



DA Forbindelsesdiagram

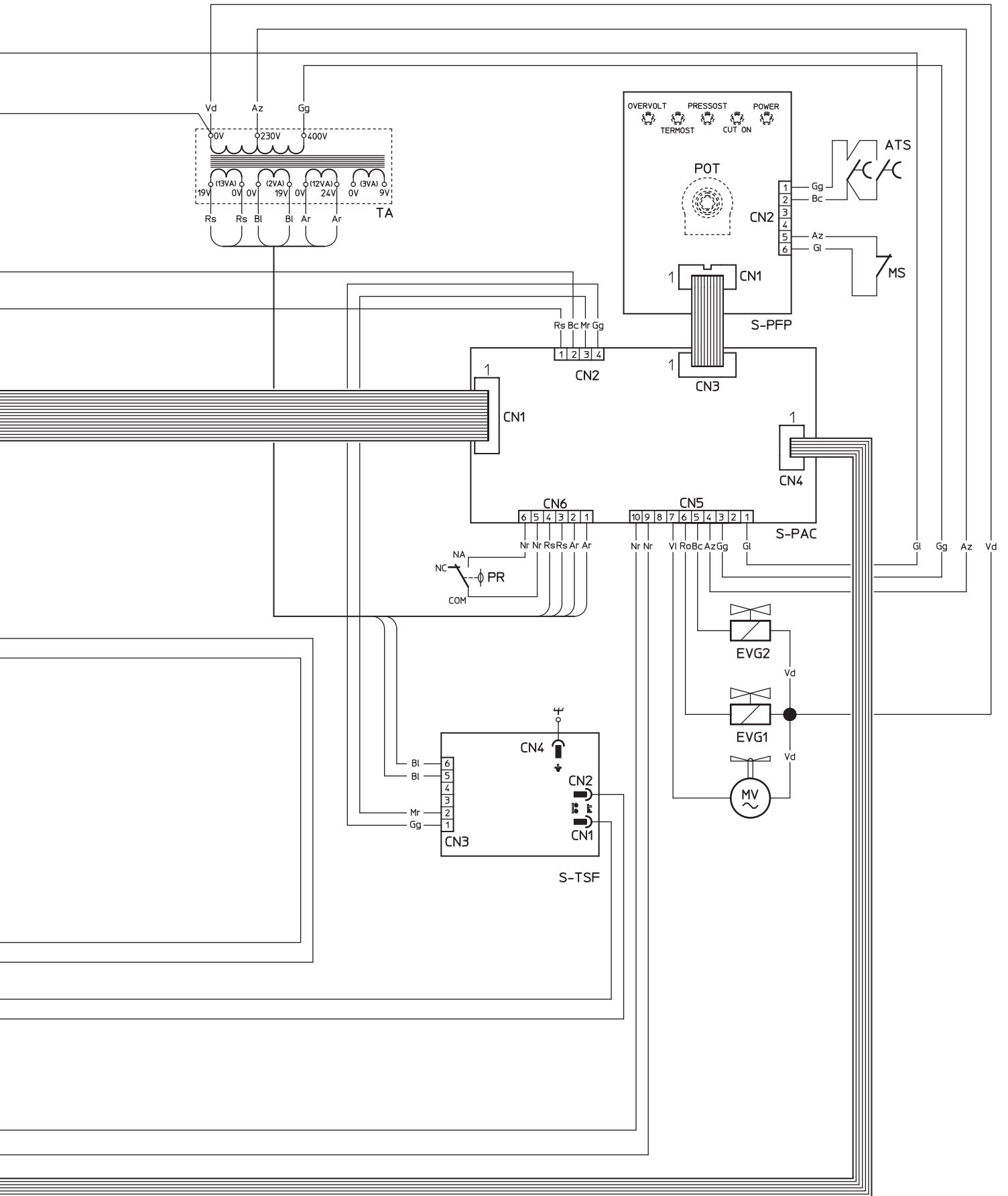
SV Elektiska schema

FI Sähkökaavio

N Elektriske skjema

EL Ηλεκτρικών ιαγραμμάτων

RU Схема электрическая



•1 AP+	•2 ATS	•3 CA+	•4 CN	•5 CT	•6 D1-2	•7 EL-	•8 EVG1	•9 EVG2	•10 F-EMC	•11 FHF	•12 Ib	•13 IL	•14 L
•15 MIH	•16 MIL	•17 MS	•18 MV	•19 P1	•20 P2	•21 POT	•22 PT	•23 RD	•24 REL	•25 RP	•26 SG	•27 S-HF	•28 S-PAC
•29 S-PAD	•30 S-PFP	•31 S-PIC	•32 ST	•33 S-TSF	•34 TA	•35 TAT	•36 TH1	•37 TH2	•38 THF	•39 THT	•40 TP	•41 Z1-2	

IT Legenda schema elettrico

•1 Ingresso arco pilota polo positivo •2 Pulsante test aria •3 Cappa torcia •4 Connettori schede elettroniche •5 Attacco centralizzato torcia •6 Diodi secondari •7 Elettrodo torcia •8 Elettrovalvola aria / arco pilota •9 Elettrovalvola aria taglio •10 Filtro EMC •11 Filtro HF •12 Inizio bobina •13 Interruttore linea •14 Induttore •15 Modulo IGBT primario superiore •16 Modulo IGBT primario inferiore •17 Interruttore modalità di taglio •18 Motore ventilatore •19 Primario trasformatore principale (inizio) •20 Primario trasformatore principale (fine) •21 Potenzimetro corrente •22 Pulsante torcia •23 Reed •24 Relè arco pilota •25 Raddrizzatore primario •26 Spinterometro •27 Scheda spinterometro •28 Scheda controllo •29 Scheda arco pilota e secondario •30 Scheda pannello frontale •31 Scheda INVERTER •32 Sicurezza torcia •33 Scheda filtro pulsante torcia •34 Trasformatore ausiliario •35 Trasformatore alta tensione •36 Termostato circuito primario •37 Termostato circuito secondario •38 Trasformatore alta frequenza •39 Termostato trasformatore •40 Trasformatore principale •41 Connettori scheda spinterometro

EN Key to the electrical diagram

•1 Positive pole pilot arc input •2 Air test button •3 Torch hood •4 Electronic PCBs connector •5 Torch centralized connection •6 Secondary diodes •7 Torch electrode •8 Pilot arc solenoid valve •9 Cutting air solenoid valve •10 EMC filter •11 HF filter •12 Coil start •13 Mains switch •14 Inductor •15 Primary upper IGBT module •16 Lower primary IGBT module •17 Switch for cutting solid or grided materials •18 Fan motor •19 Main primary transformer (start) •20 Main primary transformer (end) •21 Current potentiometer •22 Torch button •23 Reed •24 Pilot arc relay •25 Primary rectifier •26 Spark gap •27 Spark gap PCB •28 Control PCB •29 Pilot arc and secondary PCB •30 Front panel PCB •31 Inverter PCB •32 Protection on torch •33 Torch button PCB •34 Auxiliary transformer •35 High-voltage transformer •36 Primary circuit thermostat •37 Secondary circuit thermostat •38 HF transformer •39 Transformer thermostat •40 Main transformer •41 Spark gap electronic PCB connector

FR Légende schéma électrique

•1 Entrée arc pilote peut positive •2 Bouton-poussoir d'essai pour le réglage initial du flux d'air •3 Hotte torche •4 Connecteur fiche électronique •5 Raccordement centralisé de la torche •6 Diods secondaires •7 Electrode torche •8 Electrovanne arc pilote •9 Electrovanne air de coupe •10 Filtre EMC •11 Filtre HF •12 Début bobine •13 Interrupteur de ligne •14 Inducteur •15 Module IGBT primaire supérieur •16 Module IGBT primaire inférieur •17 Déviateur pour la coupe des matériaux pleins ou grillagés •18 Moteur ventilateur •19 Primaire transformateur principal (début) •20 Primaire transformateur principal (fin) •21 Potentiomètre courant •22 Bouton poussoir de la torche •23 Reed •24 Relais arc pilote •25 Redresseur secondaire •26 Eclateur •27 Fiche eclateur •28 Fiche de contrôle •29 Fiche électronique (arc pilote-secondaire) •30 Carte des commandes avant •31 Carte inverter •32 Contact sécurité torche •33 Fiche électronique (Bouton poussoir de la torche) •34 Transformateur auxiliaire •35 Transformateur de haute tension •36 Thermostat du circuit primaire •37 Thermostat du circuit secondaire •38 Transformateur HF •39 Thermostat transformateur •40 Transformateur principal •41 Connecteur carte eclateur

DE Schaltplan-Legende

•1 Eingang Pilotbogen Pluspol •2 Testschalter für die Anfangseinstellung des Luftstroms •3 Brennerhaube •4 Verbinder elektronische Karte •5 Zentralanschluss Gebläselampe •6 Sekundäre Dioden •7 Brennerlektrode •8 Elektroventil Pilotbogen •9 Elektroventil Schnitluft •10 Filter EMC •11 Filter HF •12 Spuleneinsatz •13 Betriebsschalter •14 Drosselspule •15 Oberprimär modul IGBT •16 Unterprimär modul IGBT •17 Umschalter zum Schneiden von vollen oder Gittermaterialien •18 Lüftermotor •19 Primärer Haupttransformator (Anfang) •20 Primärer Haupttransformator (Ende) •21 Strompotentiometer •22 Brennerschalter •23 Reed •24 Umschalter relais •25 Primärer Gleichrichter •26 Funkenstrecke •27 Karte Funkenstrecke •28 Kontrollkarte •29 Elektronikarte (steuerbogen-sekundärer) •30 Karte mit Frontsteuerungen •31 Inverter-Karte •32 Brennerschutzkontakt •33 Elektronikarte (Brennerschalter) •34 Hilfstransformator •35 Hochspannungstrafo •36 Thermostat primärer kreis •37 Thermostat Sekundärkreis •38 Transformator HF •39 Transformator-Thermostat •40 Haupttransformator •41 Verbinder Funkenstrecke karte

ES Leyenda esquema eléctrico

•1 Entrada arco piloto polo positivo •2 Pulsador de prueba para la regulación inicial del flujo de aire •3 Campana portaelectrodo •4 Conector tarjeta electrónica •5 Conexión centralizada antorcha •6 Diodos secundarios •7 Electrodo portaelectrodo •8 Electroválvula arco piloto •9 Electroválvula aire de corte •10 Filtro EMC •11 Filtro HF •12 Inicio bobina •13 Interruptor de línea •14 Inductor •15 Módulo IGBT primario superior •16 Módulo IGBT primario inferior •17 Desviador para el corte de los materiales llenos o enrejados •18 Motor ventilador •19 Primario transformador principal (inicio) •20 Primario transformador principal (final) •21 Potenciómetro corriente •22 Pulsador antorcha •23 Reed •24 Relé del arco piloto •25 Enderezador primario •26 Distribuidor •27 Tarjeta distribuidor •28 Placa de control •29 Tarjeta electrónica (arco piloto-secondario) •30 Tarjeta mandos frontal •31 Tarjeta inverter •32 Contacto desseguridad del soplete •33 Tarjeta electrónica (Pulsador antorcha) •34 Transformador auxiliar •35 Transformador alta tensión •36 Termostato circuito primario •37 Termostato circuito secundario •38 Transformador HF •39 Termostato transformador •40 Transformador principal •41 Conector tarjeta distribuidor

NL Legenda elektrisch schema

•1 Ingang pilootboog positieve pool •2 Testknop voor de begininstelling van de luchtstroom •3 Kap brander •4 Connector Elektronische kaart •5 Gecentraliseerde aansluiting brander •6 Secundaire diodes •7 Elektrode brander •8 Elektromagnetische klep ontstekingsboog •9 Elektromagnetische klep snijdlucht •10 Filter EMC •11 Filter HF •12 Begin spoel •13 Netschakelaar •14 Inductor •15 Bovenste Module IGBT •16 Onderste Module IGBT •17 Omschakelaar voor het snijden van vol materiaal of van materiaal met roosterstructuur •18 Ventilatormotor •19 Primair hoofdtransformator (begin) •20 Primair hoofdtransformator (einde) •21 Vermogensmeter stroom •22 Toortsknop •23 Reed •24 Relais booggeleiding •25 Primaire gelijkrichter •26 Vonkbrug •27 Vonkbrug kaart •28 Controlekaart •29 Elektronische kaart (booggeleiding-secondaire) •30 Kaart besturing voorkant •31 Kaart stroom inverter •32 Beveiligingscontact toorts •33 Elektronische kaart (Toortsknop) •34 Hulptransformator •35 Transformator hoogspanning •36 Primaire Thermostaat •37 Thermostaat secundair circuit •38 Transformator HF •39 Thermostaat transformator •40 Hoofdtransformator •41 Connector vonkbrug kaart

IT **Legenda colori**

Ar	Arancio
Az	Azzurro
Bc	Bianco
Bl	Blu
Gg	Grigio
Gl	Giallo
GV	Giallo Verde
Mr	Marrone
Nr	Nero
Ro	Rosa
Rs	Rosso
Vd	Verde
VI	Viola

EN **Colour key**

Ar	Orange
Az	Sky Blue
Bc	White
Bl	Blue
Gg	Grey
Gl	Yellow
GV	Yellow Green
Mr	Brown
Nr	Black
Ro	Pink
Rs	Red
Vd	Green
VI	Violet

FR **Légende couleurs**

Ar	Orange
Az	Bleu Clair
Bc	Blanc
Bl	Bleu
Gg	Gris
Gl	Jaune
GV	Jaune Vert
Mr	Marron
Nr	Noir
Ro	Rose
Rs	Rouge
Vd	Vert
VI	Violet

DE **Farbenlegende**

Ar	Orange
Az	Hellblau
Bc	Weiß
Bl	Blau
Gg	Grau
Gl	Gelb
GV	Gelb Grün
Mr	Braun
Nr	Schwarz
Ro	Rosa
Rs	Rot
Vd	Grün
VI	Violett

ES **Leyenda colores**

Ar	Anaranjado
Az	Luz
Bc	Blanco
Bl	Azul
Gg	Gris
Gl	Amarillo
GV	Amarillo Verde
Mr	Marrón
Nr	Negro
Ro	Rosa
Rs	Rojo
Vd	Verde
VI	Violeta

NL **Kleurenlegenda**

Ar	Oranje
Az	Blauw
Bc	Wit
Bl	Donkerblauw
Gg	Grijs
Gl	Geel
GV	Geel Groen
Mr	Bruin
Nr	Zwart
Ro	Roze
Rs	Rood
Vd	Groen
VI	Paars

PT **Legenda cores**

Ar	Laranja
Az	Azul
Bc	Branco
Bl	Azul-marinho
Gg	Cinza
Gl	Amarelo
GV	Amarelo Verde
Mr	Castanho
Nr	Preto
Ro	Cor-de-rosa
Rs	Vermelho
Vd	Verde
VI	Roxo

DA **Nøgle til farver**

Ar	Orange
Az	Lyseblå
Bc	Hvid
Bl	Blå
Gg	Grå
Gl	Gul
GV	Gul Grøn
Mr	Brun
Nr	Sort
Ro	Rosa
Rs	Rød
Vd	Grøn
VI	Lilla

SV **Färgförklaring**

Ar	Oransje
Az	Nyseblå
Bc	Hvit
Bl	Blå
Gg	Grå
Gl	Gul
GV	Gul Grønn
Mr	Brun
Nr	Svart
Ro	Rosa
Rs	Rød
Vd	Grønn
VI	Lilla

FI **Väriselytykset**

Ar	Oranssi
Az	Vaaleansininen
Bc	Valkoinen
Bl	Sininen
Gg	Harmaa
Gl	Keltainen
GV	Keltainen Vihreä
Mr	Ruskea
Nr	Musta
Ro	Vaaleanpunainen
Rs	Punainen
Vd	Vihreä
VI	Violetti

N **Fargeforklaring**

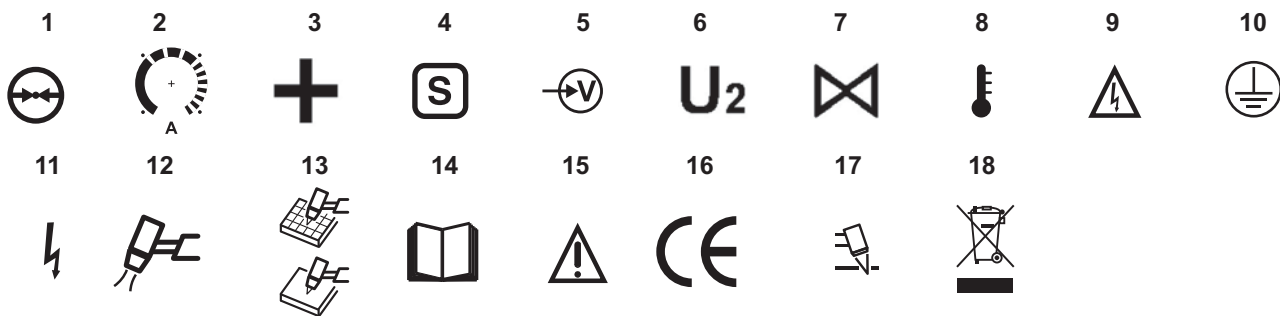
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Az	Ljusblå
Bc	Vit
Bl	Blå
Gg	Grå
Gl	Gul
GV	Gul Grön
Mr	Brun
Nr	Svart
Ro	Rosa
Rs	Röd
Vd	Grön
VI	Lila

EL **Υπόμνημα χρωμάτων**

Ar	Πορτοκαλί
Az	Γαλάζιο Κόκκινο
Bc	Σπτρο
Bl	Μπλε
Gg	Σκριζο
Gl	Κίτρινο
GV	Κίτρινο Μοβ
Mr	Καφε
Nr	Μαύρο
Ro	Ροζ
Rs	Κόκκινο
Vd	Μοβ
VI	Πράσινο

RU **Цветовая маркировка**

Ar	Оранжевый
Az	Голубой
Bc	Белый
Bl	Синий
Gg	Серый
Gl	Желтый
GV	Желто-зеленый
Mr	Коричневый
Nr	Черный
Ro	Розовый
Rs	Красный
Vd	Зеленый
VI	Фиолетовый



IT Significato dei simboli grafici riportati sulla macchina

•1 Pressione dell'aria di taglio •2 Scala corrente di taglio •3 Attacco rapido polo positivo per la connessione del cavo di massa •4 Apparecchio utilizzabile in ambienti con rischio accresciuto di scosse elettriche •5 LED verde di segnalazione presenza alimentazione •6 LED rosso di segnalazione attivazione pulsante torcia •7 LED giallo di segnalazione mancanza aria compressa •8 LED giallo di segnalazione intervento protezione termostatica •9 LED rosso di segnalazione generica di attenzione •10 Terra di protezione •11 Tensione pericolosa •12 Pulsante di prova per la regolazione iniziale del flusso dell'aria •13 Deviatore per il taglio dei materiali grigliati o pieni •14 Leggere il manuale di istruzioni •15 Attenzione! •16 Prodotto atto a circolare liberamente nella Comunità Europea •17 Taglio al plasma •18 Smaltimento speciale

EN Meaning of graphic symbols on machine

•1 Cutting area pressure •2 Cutting current scale •3 Positive pole rapid coupling for earth wiring connection •4 System for use in environments with increased risk of electrocution •5 Green LED: signals power ON •6 Red LED: signals activation of torch button •7 Yellow LED: signals lack of compressed air •8 Yellow LED for overheat cutoff •9 Red LED (generic power warning signal) •10 Grounding protection •11 Dangerous voltage •12 Button for testing initial airflow adjustment •13 Switch for cutting solid or gridded materials •14 Before using the equipment you should carefully read the instructions included in this manual •15 Warning! •16 Product suitable for free circulation in the European Community •17 Plasma cutting •18 Special disposal

FR Interprétation des symboles graphiques reportés sur la machine

•1 Pression de l'air de coupe •2 Echelle courant de coupe •3 Raccordement rapide pôle positif pour la connexion du câble de mise à la masse •4 Installation utilisable dans des milieux avec augmentation du risque de secousses électriques •5 LED vert signale la présence de l'alimentation •6 LED rouge signale l'actionnement du bouton de la torche •7 LED jaune signale le manque d'air comprimé •8 LED jaune de signalisation d'intervention de la protection thermostatique •9 LED rouge signal générique de danger •10 Terre de protection •11 Tension dangereuse •12 Bouton-poussoir d'essai pour le réglage initial du flux d'air •13 Déviateur pour la coupe des matériaux pleins ou grillagés •14 Avant d'utiliser l'installation il est nécessaire de lire avec attention les instructions qui se trouvent dans ce manuel •15 Attention! •16 Produit pouvant circuler librement dans la Communauté Européenne •17 Coupe au plasma •18 Elimination spéciale

DE Bedeutung der grafischen Symbole auf der Maschine

•1 Luftdruck zum Schneiden •2 Schneidstromskala •3 Schnellanschluss Pluspol für Verbindung des Massekabels •4 Möglicher Gebrauch der Anlage in Umgebung mit erhöhter Gefahr elektrischer Schläge •5 Grüne LED: zeigt die Netzspannung an •6 Rote LED: zeigt Betätigung des Brennerschalters an •7 Gelbe LED: zeigt mangelnde Druckluft an •8 Gelbe LED Auslösen Thermoschutz •9 Rote LED: allgemeine Warnung •10 Schutzterde •11 Gefährliche Spannung •12 Testschalter für die Anfangseinstellung des Luftstroms •13 Umschalter zum Schneiden von vollen oder Gittermaterialien •14 Vor der Anwendung der Anlage sind die Gebrauchsanweisungen des vorliegenden Handbuchs sorgfältig zu lesen •15 Achtung! •16 Für den freien Warenverkehr in der EU zugelassenes Produkt •17 Plasmaschneiden •18 Sonderentsorgung

ES Significado de los símbolos gráficos referidos en la máquina

•1 Presión del aire de corte •2 Escala corriente de corte •3 Acoplamiento rápido polo positivo para la conexión del cable de masa •4 Instalación utilizable en ambientes con grandes riesgos de descargas eléctricas •5 LED verde de señalación presencia alimentación •6 LED rojo de señalación activación pulsador antorcha •7 LED amarillo de señalación falta de aire comprimido •8 LED amarillo de señalación intervención protección termostática •9 LED rojo señalación genérica de atención •10 Tierra de protección •11 Tensión peligrosa •12 Pulsador de prueba para la regulación inicial del flujo de aire •13 Desviador para el corte de los materiales llenos o enrejados •14 Antes de utilizar la instalación, es necesario leer atentamente las instrucciones contenidas en este manual •15 Atención! •16 Producto apto para circular libremente en la Comunidad Europea •17 Corte al plasma •18 Eliminación especial

NL Betekenis grafische symbolen op het apparaat weergeven

•1 Druk van snijlucht •2 Snijschaal •3 Snelkoppeling positieve pool voor aansluiting aardkabel •4 Apparaat bruikbaar in ruimte met verhoogd risico voor elektrische schokken •5 Groene LED ter aanduiding van de aanwezigheid van voeding •6 Rode LED ter aanduiding van de aansluiting van toortsknop •7 Gele LED geeft gebrek aan perslucht weer •8 Gele LED inschakeling thermostatische beveiliging •9 Rode LED algemeen signaal ter aanduiding van aandacht •10 Beschermingsaarding •11 Gevaarlijke spanning •12 Testknop voor de begininstelling van de luchtstroom •13 Omschakelaar voor het snijden van vol materiaal of van materiaal met roosterstructuur •14 Voordat de aansluiting in gebruik genomen wordt is het noodzakelijk om aandachtig de gebruiksaanwijzing in deze handleiding te lezen •15 Let op! •16 Produkt mag overal binnen de EEG gebruikt worden •17 Plasmasnijden •18 Speciale verwerking

PT Significado dos símbolos gráficos existentes na máquina

•1 Pressão do ar de corte •2 Escala da corrente de corte •3 Acoplamento rápido pólo positivo para a ligação do cabo de massa •4 Equipamento utilizável em ambientes com risco acrescentado de choques eléctricos •5 SINALIZADOR LUMINOSO verde de sinalização de presença de alimentação •6 LED vermelho de sinalização da activação do botão da tocha •7 SINALIZADOR LUMINOSO amarelo de sinalização de falta de ar comprimido •8 LED amarelo de aviso de intervenção da protecção termostática •9 LED vermelho de sinalização genérica de atenção •10 Terra de protecção •11 Tensão perigosa •12 Botão de prova para a regulação inicial do fluxo de ar •13 Permutador de corte dos materiais cheios ou grelhados •14 Antes de usar a instalação é necessário ler atentamente as instruções contidas neste manual •15 Atenção! •16 Produto apto para circular livremente na Comunidade Europeia •17 Corte a plasma •18 Vazão especial

IT	Lista ricambi
EN	Spare parts list
FR	Liste pièces de rechange
DE	Ersatzteilliste
ES	Lista repuestos
NL	Onderdelenlijst
PT	Lista de peças de substituição

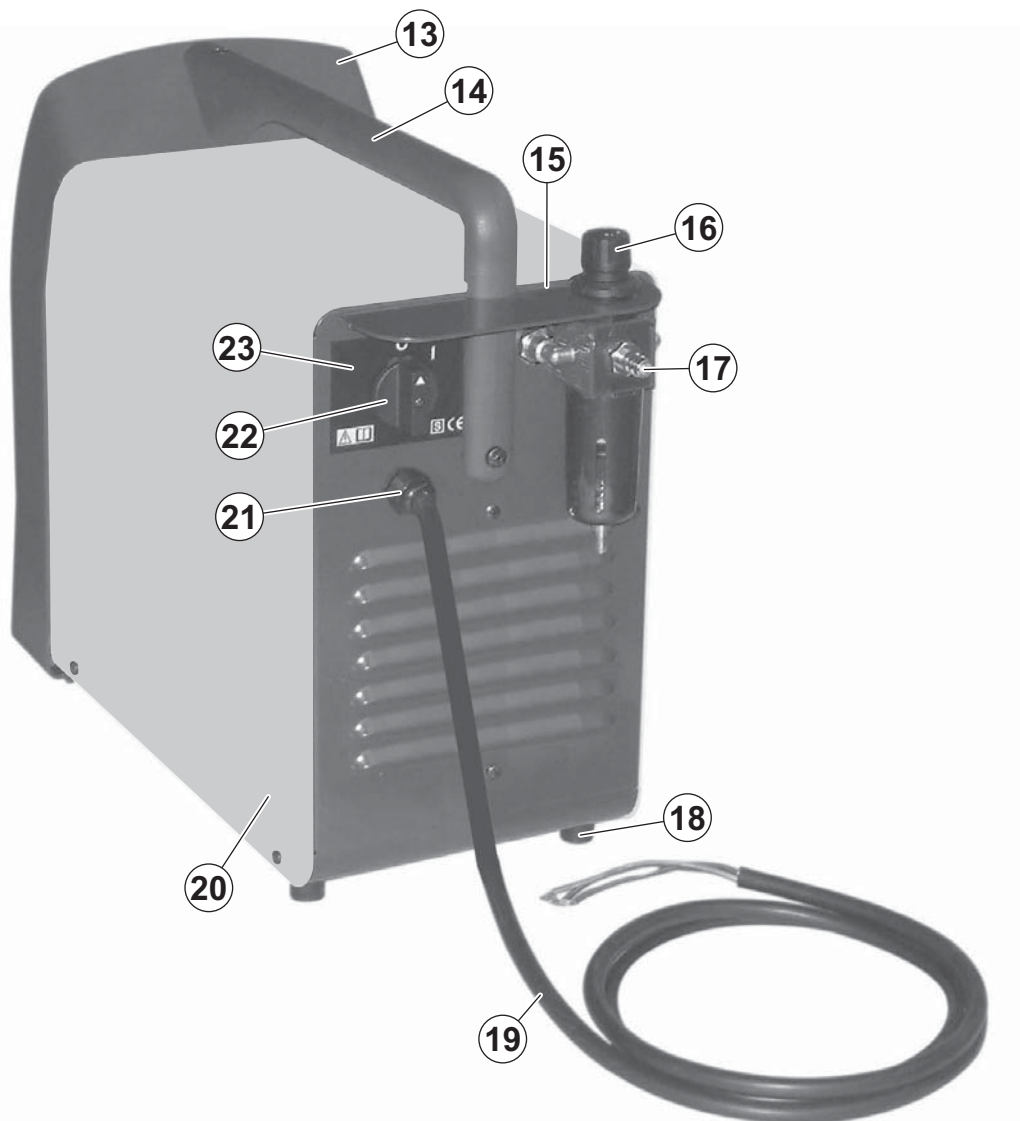
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SV	Reservdelslista
FI	Varaosaluettelo
N	Reservedelliste
EL	Κατάλογος ανταλλακτικών
RU	Список запчастей



Pos.	Cod.	Descrizione	Description
1	022071	Torcia plasma	Plasma torch
2	236619D	Attacco centralizzato torcia	Torch centralized connection
3	438402	Manometro	Manometer
4	439352	Pannello rack con adesivo regolazioni frontali	Rack panel with front adjustment sticker
5	467209	Adesivo regolazioni frontali	Front Adjustment Sticker
6	454508	Pulsante test aria	Button test air
7	438889	Manopola potenziometro	Potentiometer knob
8	454512	Interruttore modalità di taglio	Switch for cutting solid or gridded materials
9	352415	Pannello frontale	Front panel
10	468720	Adesivo frontale	Front sticker
11	403608	Attacco rapido	Quick connection
12	239623	Cavo massa	Ground cable

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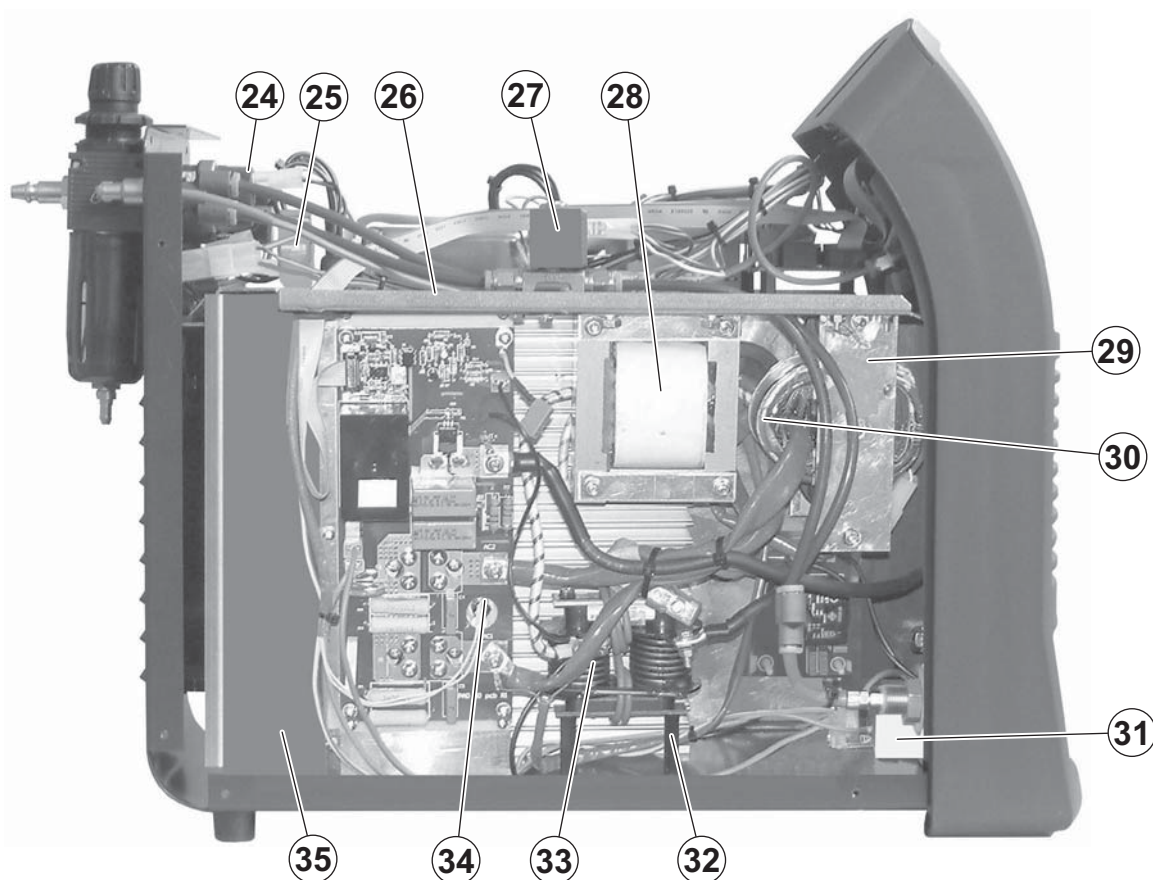
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RU	Список запчастей



Pos.	Cod.	Descrizione	Description
13	352419	Coperchio pannello frontale	Front panel cover
14	434696	Maniglia	Handle
15	454051	Protezione antiurto	Hit protection
16	432081	Filtro regolatore	Regulator filter
17	404370	Attacco tubo	Tube connection
18	431333	Piedino	Support foot
19	235947	Cavo linea	Mains cable
20	420529	Coperchio	Cover
21	427895	Pressacavo con ghiera	Cable clamp with lock ring
22	438710	Manopola interruttore di linea	Mains switch knob
23	473199	Adesivo interruttore di linea	Mains switch sticker

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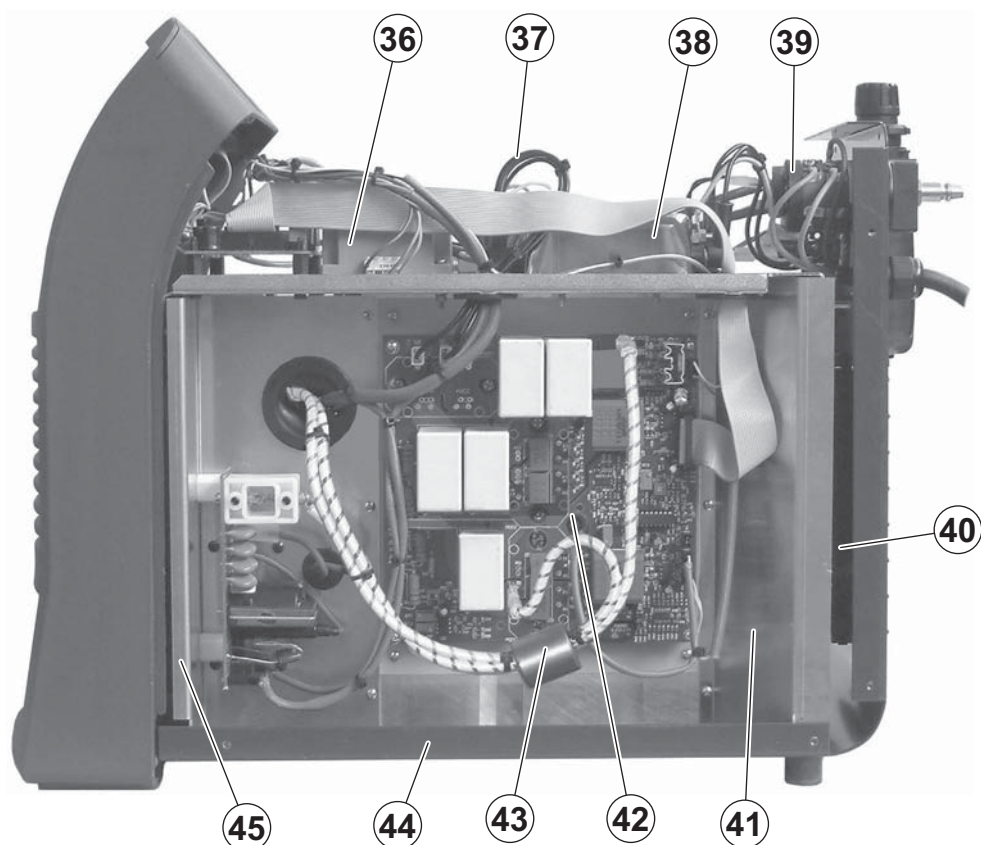
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Pos.	Cod.	Descrizione	Description
24	453245	Pressostato	Pressure Switch
25	427404	Ferrite soppressione EMI	EMI suppression ferrite ring
26	449569	Pianale superiore	Upper plate
27	425936	Elettrovalvola	Solenoid valve
28	240223	Induttore	Inductor
29	481409	Trasformatore principale	Main transformer
30	478865	Termostato trasformatore	Transformer thermostat
31	427676	Filtro HF	HF filter
32	424159	Distanziale trasformatore HF	HF transformer spacer
33	239993	Trasformatore HF	HF Transformer
34	478786	Termostato circuito secondario	Secondary circuit thermostat
35	463556	Deflettore posteriore sinistro	Left rear deflector

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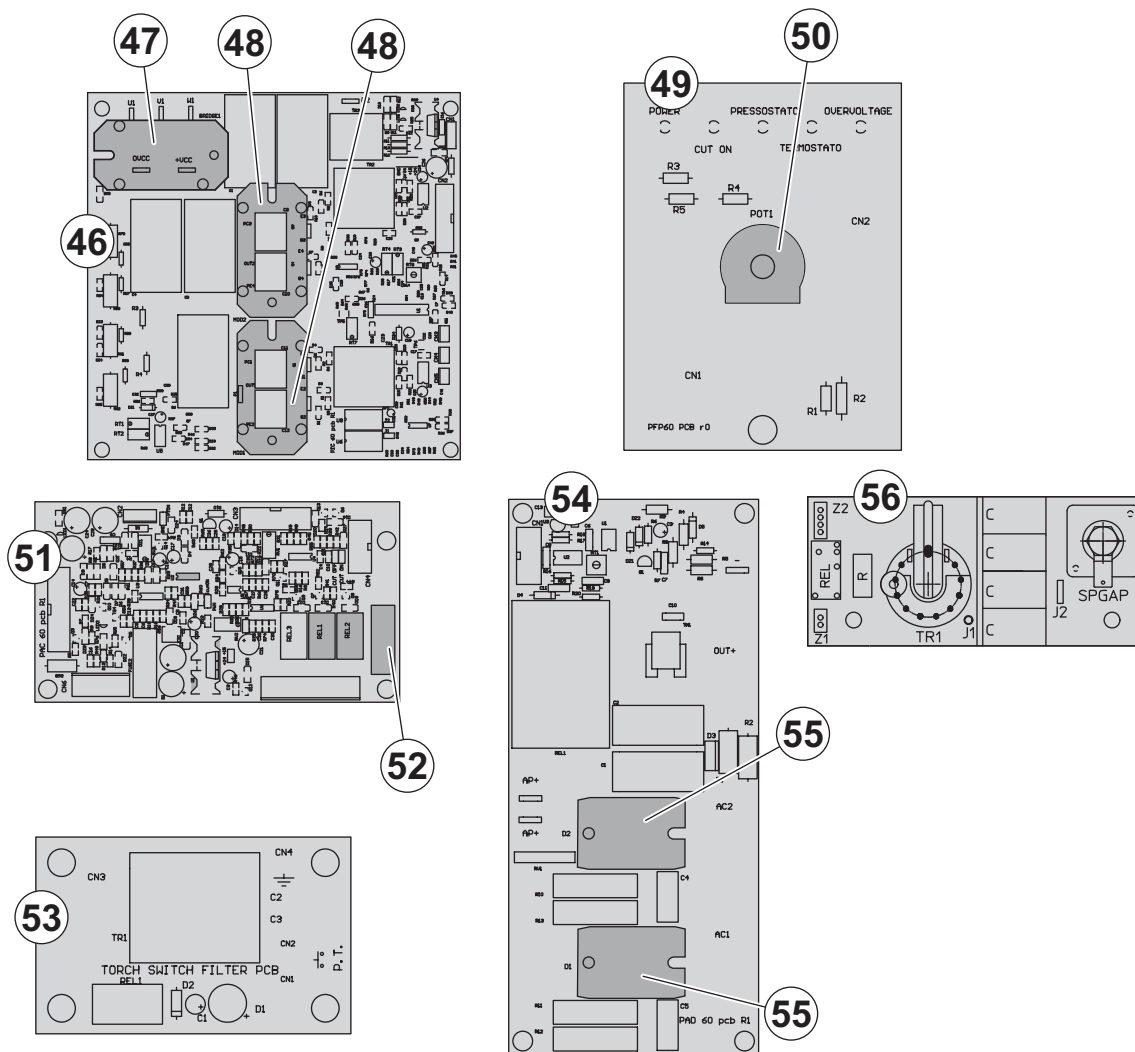
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RU	Список запчастей



Pos.	Cod.	Descrizione	Description
36	481919	Trasformatore ausiliario	Auxiliary transformer
37	413571	Cablaggio ausiliario	Auxiliary wiring
38	376887	Filtro EMC	EMC filter
39	435755	Interruttore di linea	Mains switch
40	486380	Motore ventilatore	Fan motor
41	463557	Deflettore posteriore destro	Right rear deflector
42	478846	Termostato circuito primario	Primary circuit thermostat
43	427408	Ferrite soppressione EMI	EMI suppression ferrite ring
44	404945	Basamento	Base
45	463558	Deflettore anteriore destro	Right anterior deflector

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RU	Список запчастей



Pos.	Cod.	Descrizione	Description
46	377028	Scheda inverter	Inverter PCB
47	455504	Raddrizzatore primario	Primary rectifier
48	286019	IGBT primari	Primary IGBT
49	377033	Scheda pannello frontale	Front panel PCB
50	453002	Potenziometro 1kOhm	1kOhm potentiometer
51	377032	Scheda controllo	Control PCB
52	428851	Fusibile ultrarapido 5x20 2A - 250V	5x20 2A - 250V ultra-quick fuse
53	377029	Scheda filtro pulsante torcia	Torch button PCB
54	377027	Scheda arco pilota e secondario	Pilot arc and secondary PCB
55	423251	Diodo secondario	Secondary diode
56	377031	Scheda spinterometro	Spark gap PCB

IT Ordinazione dei pezzi di ricambio

Per la richiesta di pezzi di ricambio indicare chiaramente:

- 1) Il numero di codice del particolare
- 2) Il tipo di impianto
- 3) La tensione e la frequenza che rileverete dalla targhetta dei dati posta sull'impianto
- 4) Il numero di matricola

ESEMPIO

N° 2 pezzi, codice n. 352419 - per l'impianto PLASMA CUT 61i - 400 V - 50/60 Hz - Matricola n°

EN Ordering spare parts

To ask for spare parts clearly state:

- 1) The code number of the piece
- 2) The type of device
- 3) The voltage and frequency read on the rating plate
- 4) The serial number of the same

EXAMPLE

N. 2 pieces code n. 352419 - for PLASMA CUT 61i - 400 V - 50/60 Hz - Serial number

FR Commande des pièces de rechange

Pour commander des pièces de rechange indiquer clairement:

- 1) Le numéro de code de la pièce
- 2) Le type d'installation
- 3) La tension et la fréquence que vous trouverez sur la petite plaque de données placée sur l'installation
- 4) Le numéro de matricule de la même

EXEMPLE

N. 2 pièces code 352419 - pour l'installation PLASMA CUT 61i - 400 V - 50/60 Hz - Matr. Numéro

DE Bestellung Ersatzteile

Für die Anforderung von Ersatzteilen geben Sie bitte deutlich an:

- 1) Die Artikelnummer des Teiles
- 2) Den Anlagentyp
- 3) Die Spannung und Frequenz, die Sie auf dem Datenschild der Anlage finden
- 4) Die Seriennummer der Schweißmaschine

BEISPIEL

2 Stück Artikelnummer 352419 - für Anlage PLASMA CUT 61i - 400 V - 50/60 Hz - Seriennummer

ES Pedido de las piezas de repuesto

Para pedir piezas de repuesto indiquen claramente:

- 1) El número de código del particular
- 2) El tipo de instalación
- 3) La tensión y la frecuencia que se obtien de la chapa datos colocada sobre la instalación
- 4) El número de matrícula de la soldadora misma

EJEMPLO

N. 2 piezas código 352419 - para instalación PLASMA CUT 61i - 400 V - 50/60 Hz - Matrícula N.

NL Bestelling van reserveonderdelen

Voor het bestellen van onderdelen duidelijk aangeven:

- 1) Het codenummer van het onderdeel
- 2) Soort apparaat
- 3) Spanning en frequentie op het gegevensplaatje te vinden
- 4) Het serienummer van het lasapparaat

VOORBEELD

N. 2 stuks code 352419 - voor apparaat PLASMA CUT 61i - 400 V - 50/60 Hz - Serie Nummer

PT Requisição de peças sobressalentes

Ao pedir as peças de substituição indique claramente:

- 1) O número de código da peça
- 2) O tipo de equipamento
- 3) A tensão e a frequência indicadas na la placa de dados do equipamento
- 4) O número de matrícula da própria máquina de soldar

EXEMPLO

N° 2 peças código n. 352419 - para o equipamento PLASMA CUT 61i - 400 V - 50/60 Hz

Matrícula n.

DA Bestilling af reservedele

For at bestille reservedele skal man nøjagtigt angive:

- 1) Reservedelens kodenummer
- 2) Anlæggets type
- 3) Spænding og frekvens, som står på anlæggets typeskylt
- 4) Selve svejsemaskinens registreringsnummer

EKSEMPEL

2 stk. nummer 352419 - til anlæg model PLASMA CUT 61i - 400 V - 50/60 Hz

Registreringsnummer Nr.

SV Beställning af reservdelar

Vid förfrågan av reservdelar ange tydligt:

- 1) Detaljens kodnummer
- 2) Typ av apparat
- 3) Spänning och frekvens - den står bland tekniska data på apparatens märkplåt
- 4) Svetsens serienummer

EXEMPEL

2 st. detaljer kod 352419 - för apparat PLASMA CUT 61i - 400 V - 50/60 Hz - Serienummer

FI Varaosien tilaus

Tiedustellessanne varaosia, ilmoittakaa selvästi:

- 1) Osan koodinnumero
- 2) Laitteiston tyyppi
- 3) jännite ja taajuus, jotka on ilmoitettu laitteistolle sijoitetusta tietokyltistä
- 4) Hitsauskoneen sarjanumero

ESIMERKKI

2 osaa, koodi 352419 - laitteistoon PLASMA CUT 61i - 400 V - 50/60 Hz - Sarjanumero