



GeKaMac[®]

**INVERTER
AC/DC-TIG
WELDING
MACHINE
USER'S GUIDE**

**PoWer TIG 400
AC/DC Pulse**

Users Manual

Please Read and Understand This Manual
Before Operating The Welding Machine

www.gedikwelding.com

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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 plant and be sure that the parts have the longest service life possible. In the interest of custom-

ers, 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

PoWer TIG 400 AC/DC high-frequency striking **TIG** generator - which is the result of the ultimate **IGBT**- based inverter technology - is equipped with a complete and new digital control on all welding parameters.

PoWer TIG 400 AC/DC is a technologically ultimate, strong and easy-to-use generator; when used in direct current, it allows **TIG** welding of stainless steel, carbon steel, copper and its alloys, aluminium and its alloys, also ensuring ideal performance in **MMA** weld, with any type of electrode.

FEATURES

- Digital control of all the welding parameters.
- Standard equipped with pulse mode integrated into the control with available "EASY PULSE" facility.
- Slow pulsation under 10Hz gives the possibility to set peak time and base time in independent way.
- Excellent TIG welding characteristics.
- High frequency Arc Striking, precise and efficient even from long distance.
- "Energy Saving" function to operate the power source cooling fan and the torch water cooling only when necessary.
- Automatic compensation for mains voltage fluctuations within +15% -20%.
- Very good MMA welding characteristics with any type of electrodes.
- Easy-to-use.
- Low energy consumption.
- Ability of storing and recalling personalised welding program.
- Electromagnetic disturbance reduction because of high frequency used at arc striking only.
- Using special TIG torches allows remote adjustment of welding current directly from the torch.
- Overheating thermostatic protection.
- Compact and innovative design.
- Metallic main structure with shock- proof plastic front panel.
- Control panel protected against accidental impact.
- Sloping front panel easy to read and adjust and highly visible from any direction.
- Reduced weight and size, easy-to-carry.


Technical data

The general technical data of the system are summarized in table 1.

Usage limits (IEC 60974-1)

The use of a welder is typically discontinuous, in that it is made up of effective work periods (welding) and rest periods (for the positioning of parts, the replacement of wire and underflushing operations etc. This welder is dimensioned to supply a I₂ max nominal current in complete safety for a period of work of 35% of the total usage time. The regulations in force establish the total usage time to be 10 minutes. The work cycle is considered to be 35% of this period of time. If the permitted work cycle time is exceeded, an overheat cut-off occurs to protect the components around the welder from dangerous overheating. Activation of thermal protection is signaled by "t° C" flash-

Table 1

Model		PoWer TIG 400 AC/DC
Three phase power supply 50/60 Hz	V	400
Power supply: Z _{max}	ohm	(*)
Current range	A	5 ÷ 400
Installation power	kVA	10
Open circuit voltage	V	65
Duty cycle at 100%	A	250
Duty cycle at 60%	A	320
Duty cycle at 35%	A	400
Insulation class		H
Protection class		IP 23
Dimensions 	mm	665-525-290
Weight	kg	49

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

ing on control panel display. After several minutes the overheat cut-off rearms automatically and the welder is ready for use again. This generator is constructed in compliance with the IP 23 protection level.

How to lift up the machine

Strap the hoisting belts around the machine and lift it up carefully and safely, slinging it from the bottom up. The welder has two handles to carry it around manually.

NOTE: These hoisting and transportation devices conform to European standards. Do not use other hoisting and transportation systems.

Open the packaging

The system essentially consists of:

- MATRIX 400 AC/DC weld unit;
- Welding TIG torches (optional);
- Coolant unit for welding torch (HR26) (optional);
- CT20 trolley for transportation (optional).

Upon receiving the system:

- Remove the welding generator and all relevant accessories-components from their packaging;
- Check that the weld machine is in good condition, if not report any problems immediately to the seller-distributor;
- Make sure all ventilation grilles are open and that no foreign bodies are blocking the air circulation.

Installation

The installation site for the system must be carefully chosen in order to ensure its satisfactory and safe use. The user is responsible for the installation and use of the system in accordance with the producer's instructions contained in this manual. Before installing the system the user must take into consideration the potential electromagnetic problems in the work area. In particular, we suggest that you should avoid installing the system close to:

- signalling, control and telephone cables
- radio and television transmitters and receivers
- computers and control and measurement instruments
- security and protection instruments

Persons fitted with pace-makers, hearing aids and similar equipment must consult their doctor before going near a machine in operation. The equipment's installation environment must comply to the protection level of the frame i.e. IP 23 (IEC 60529 publication). This system is cooled by means of the forced circulation of air, and must therefore be placed in such a way that the air may be easily sucked in and expelled through the apertures made in the frame.

Connection to the electrical supply

Before connecting the welder to the electrical supply, check that the machine's plate rating corresponds to the supply voltage and frequency and that the line switch of the welder is in the "O" position. Connect up the welder to industrial mains only and not to the electricity supply for general public.

Use the welder's own plug to connect it up to the main power supply. Proceed as follows if you have to replace the plug:

- 3 conducting wires are needed for connecting the machine to the supply
- the fourth, which is YELLOW GREEN in colour is used for making the "EARTH" connection.

Connect a suitable load of normalised plug (3p+t) to the power cable and provide for an electrical socket complete with fuses or an automatic switch. The earth terminal must be connected to the earth conducting wire (YELLOW-GREEN) of the supply.

Table 2 shows the recommended load values for retardant supply fuses chosen according to the maximum nominal current supplied to the welder and the nominal supply voltage.

Table 2

Model		PoWer TIG 400 AC/DC
I ₂ Max nominal 35% (*)	A	400
Installation power	kVA	10
Nominal voltage delayed fuse	A	16
Supply connection cable		
Length	m	4
Section	mm ²	4
Earth cable	mm ²	50

(*) Service factor

NOTE: Any extensions to the power cable must be of a suitable diameter, and absolutely not of a smaller diameter than the special cable supplied with the machine.

Usage norms

CONTROL APPARATUS (fig. A)

- Pos. 1 Welder cable
 Pos. 2 Power connector for cooling system
 Pos. 3 Weld gas inlet coupling
 Pos. 4 Supply switch. In the "O" position the welder is off
 Pos. 5 Fast coupling straight polarity
 Pos. 6 TIG weld auxiliary control connector (torch button, remote control pedal, etc.)
 Pos. 7 Fast coupling TIG torch gas tube
 Pos. 8 Fast coupling reverse polarity

FRONT PANEL (fig. B)

- Pos. 1 "Weld mode" button: 2 STROKE, 4 STROKE, CYCLE, SPOT-WELD
 Pos. 2 "Weld process" button: TIG AC with HF arc strike, TIG DC with HF arc strike, TIG with "lift" type arc strike, ELECTRODE
 Pos. 3 Digital display for pre-setting and visualizing all the parameters. The display also acts as a digital amperometer
 Pos. 4 Digital adjustment/control for all weld parameters
 Pos. 5 PULSATED TIG and EASY PULSE switch
 Pos. 6 SAVE button to be used for saving welding programs and parameters
 Pos. 7 PROG button to be used for calling welding programs and parameters up
 Pos. 8 POST GAS red led function
 Pos. 9 Red led FINAL CURRENT function
 Pos. 10 Red led SLOPE DOWN function
 Pos. 11 Red led PEAK CURRENT (I_p) function - only works with PULSE function on

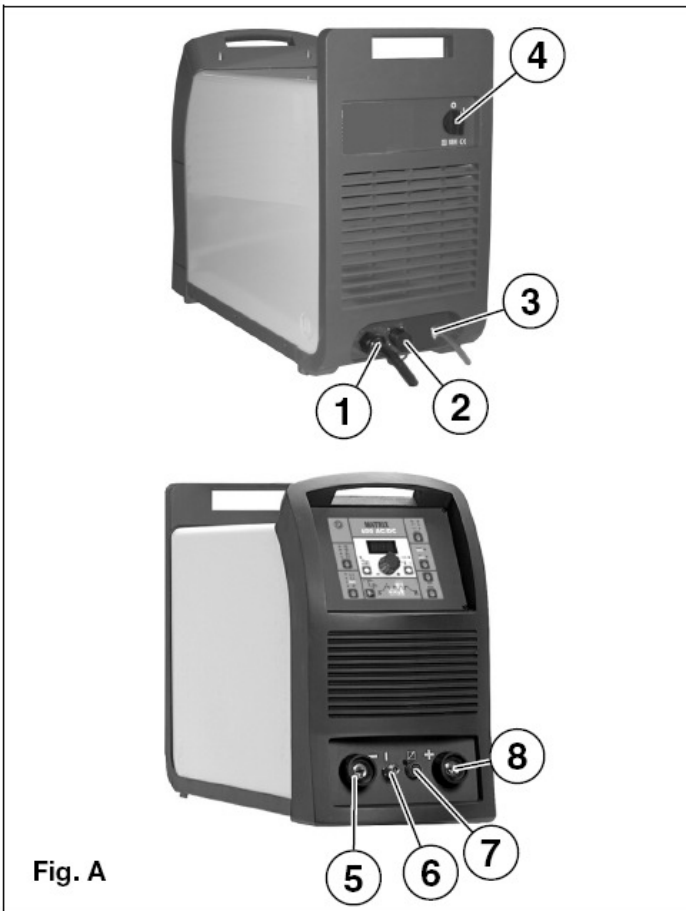


Fig. A

- Pos. 12 Red led PULSATION FREQUENCY (f) function - only works with PULSE function on
- Pos. 13 Red led BASIC CURRENT (I_b) function - only work with PULSE function on
- Pos. 14 RED LED 2nd LEVEL CURRENT (I₂) function, only works with CYCLE function on
- Pos. 15 GREEN LED MAIN CURRENT (I₁) function
- Pos. 16 Red led SLOPE UP function
- Pos. 17 Red led INITIAL CURRENT function
- Pos. 18 Red led PRE-GAS function
- Pos. 19 Red led for ARC FORCE function
- Pos. 20 **SET** button to be used for selecting welding parameters
- Pos. 21 Red led for HOT START function
- Pos. 22 "Wave" button to be used for selecting SQUARE, SINUS and MIXED wave.

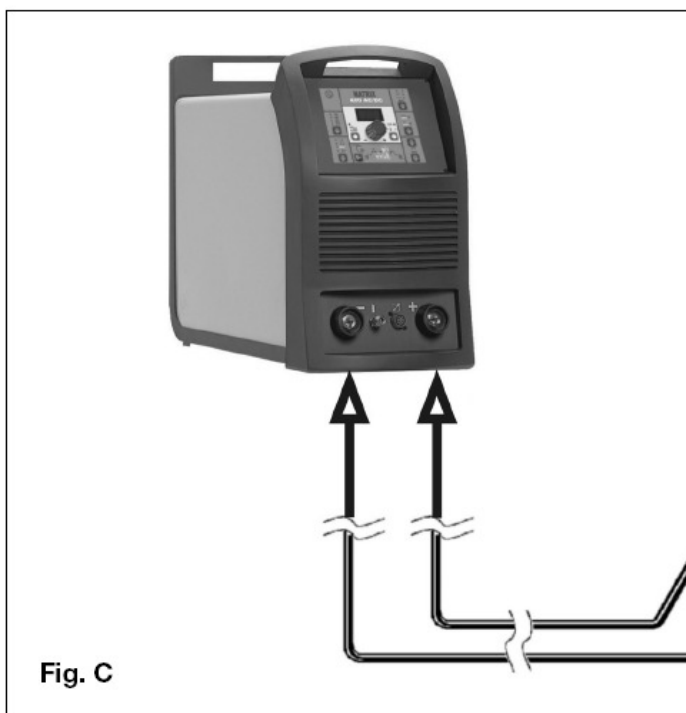


Fig. C

Pos. 23 "Electrode diameter" button, to be used for selecting the electrode diameter, for a better control of arc striking in AC.

Pos. 24 "Balance and Frequency" button, to be used for selecting alternating current balance and frequency.

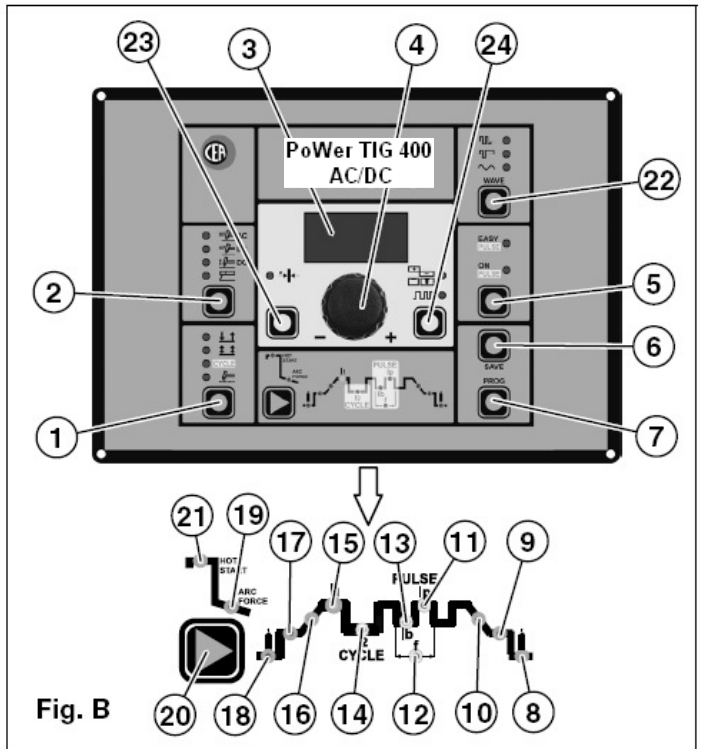


Fig. B

Electrode welding (MMA)

CONNECTION OF THE WELDING CABLES (Fig. C)

With the machine disconnected from the supply, connect the welding cables to the out terminals (positive and negative) of the welder, connecting them to the gripper and the earth, with the correct polarity provided for the type of electrode to be used (Fig. C).

The welding cables must be as short as possible, close to one other, and positioned at floor level or close to it.

WELDING PARAMETERS

Table 3 shows the values of current to use with the respective electrodes for the welding of common steels and low-grade alloys. These data have no absolute value and are indicative data only. For a precise choice follow the instructions provided by the electrode manufacturer. The current to be used depends on the welding positions and the type of joint, and it increases according to the thickness and dimensions of the part. The current intensity to be used for the different types of welding, within the field of regulation shown in table 4 is:

- High for plane, frontal plane and vertical upwards welding;
- Medium for overhead welding;
- Low for vertical downwards welding and for joining small pre-heated pieces.

A fairly approximate indication of the average current to use in the welding of electrodes for ordinary steel is given by the following formula:

$$I = 50 \times (\varnothing_e - 1)$$

where: I = intensity of the welding current

Ø ELECTRODE (mm)	ELECTRODE TYPE - Current adjustment field (A)									WELDING THICKNESS (mm)
	6010 6011	6012	6013	6020	6027	7014	7015 7016	7018	7024 7028	
1,6	-	20-40	20-40	-	-	-	-	-	-	≤ 5
2	-	25-60	25-60	-	-	-	-	-	-	≤ 5
2,4	40-80	35-85	45-90	-	-	80-125	65-110	70-100	100-145	≤ 6,5
3,2	75-125	80-140	80-130	100-150	125-185	110-160	100-150	115-165	140-190	> 3,5
4	110-170	110-190	105-180	130-190	160-240	150-210	140-200	150-220	180-250	> 6,5
4,8	140-215	140-240	150-230	175-250	210-300	200-275	180-255	200-275	230-305	> 9,5
5,6	170-250	200-320	310-300	225-310	250-350	260-340	240-320	260-340	275-365	
6,4	210-320	250-400	250-350	275-375	300-420	330-415	300-390	315-400	335-430	
8	275-425	300-500	320-430	340-450	375-475	390-500	375-475	375-470	400-525	> 13

Øe = electrode diameter

Example: for electrode diameter 4 mm

$$I = 50 \times (4-1) = 50 \times 3 = 150A$$

PART TO BE WELDED

The part to be welded must always be connected to earth in order to reduce electromagnetic emission. Much attention must be afforded so that the earth connection of the part to be welded does not increase the risk of accident to the user or the risk of damage to other electric equipment.

When it is necessary to connect the part to be welded to earth, you should make a direct connection between the part and the earth shaft. In those countries in which such a connection is not allowed, connect the part to be welded to earth using suitable capacitors, in compliance with the national regulations.



TIG welding

CONNECTION OF THE WELDING CABLES (Fig. D)

- Connect the gas pipe at the rear of the machine to the Argon gas cylinder then open it.
- When the machine is switched off connect the earth cable to the quick coupling marked + (positive).
- Connect the relative earth clamp to the piece to be welded or nearby ensuring that the area is free from rust, paint, grease, ecc..
- When the machine is switched off connect the earth cable to the quick coupling marked - (negative).
- Connect the torch gas tube to the connection.
- Insert the torch button connector in the 6 poles holder.

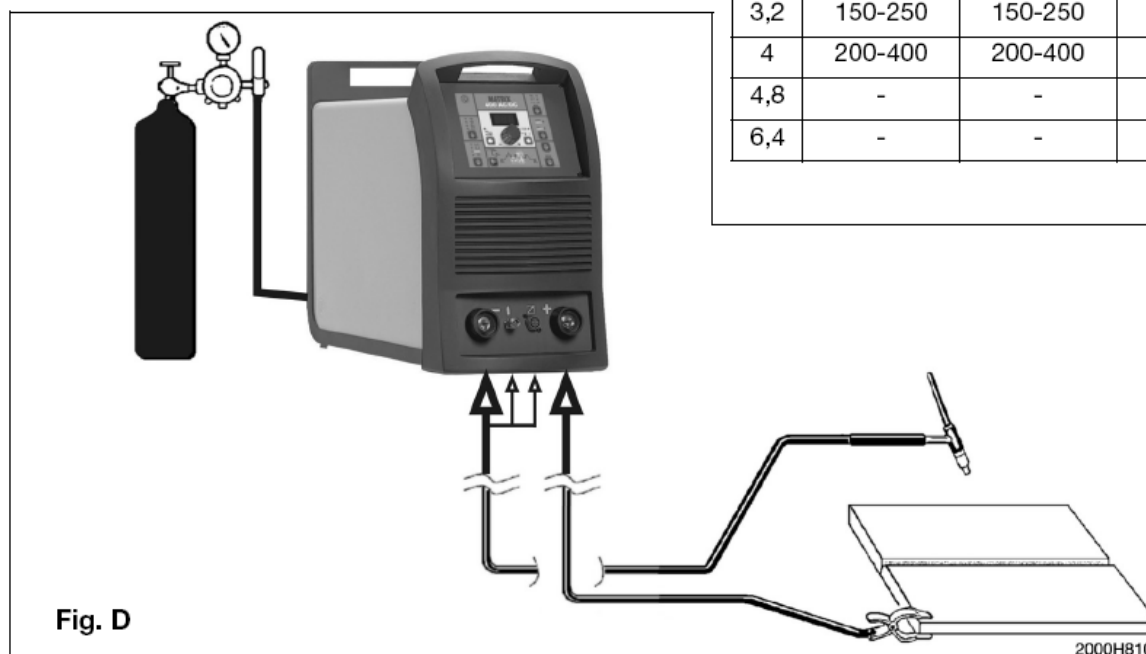


Fig. D

PART TO BE WELDED

The part to be welded must always be connected to earth in order to reduce electromagnetic emission. Much attention must be afforded so that the earth connection of the part to be welded does not increase the risk of accident to the user or the risk of damage to other electric equipment. When it is necessary to connect the part to be welded to earth, you should make a direct connection between the part and the earth shaft. In those countries in which such a connection is not allowed, connect the part to be welded to earth using suitable capacitors, in compliance with the national regulations.

WELDING PARAMETERS

Table 4 shows the currents to use with the respective electrodes for TIG AC and DC welding. This input is not absolute but is for your guidance only; read the electrode manufacturers' instructions for a specific choice. The diameter of the electrode to use is directly proportional to the current being used for welding.

Table 4

Ø ELECTRODE (mm)	ELECTRODE TYPE Current adjustment field (A)			
	TIG DC		TIG AC	
	Tungsten Ce 1% Grey	Tungsten Rare earth 2% Turquoise	Tungsten Pure Green	Tungsten Rare earth 2% Turquoise
1	10-50	10-50	-	-
1,6	50-80	50-80	30-60	30-60
2,4	80-150	80-150	60-120	60-120
3,2	150-250	150-250	80-160	80-160
4	200-400	200-400	100-240	100-240
4,8	-	-	200-300	200-300
6,4	-	-	275-400	275-400

Weld parameters

ATTENTION: parameters shown on the display in the pictures are purely meant as an indication.

RESETTING FACTORY SETTINGS

To reset the factory settings, proceed as follows:

- 1) With the welding machine switched off, press and hold down the "welding mode" (Pos. 1, Fig. B) and "welding process" (Pos. 2, Fig. B) buttons.
- 2) Starts the welder by turning the power switch to I.
- 3) After a few seconds, during which the display remains off, the preset current value (80A) appears.

ATTENTION: Resetting factory settings deleted all previously memorised welding programmes.

SOFTWARE VERSION DISPLAY

PoWer TIG 400 AC/DC is equipped with a digital control with software pre-set in the factory on board. This software is subject to being continuously evolved and improved. The software is identified by a specific number visualized on the display as follows:



- 1) With the welding machine switched off, press and hold down the **SAVE** button

- 2) Start up the welder by turning the main switch to position I



- 3) The type of software on board (e.g. b.01) appears on the display for a few seconds

ELECTRODE WELDING (MMA)

- 1) Start up the welder by turning the main switch to position I

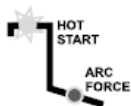
- 2) Press the "weld process" button and set on position:



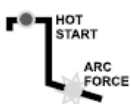
- **ELECTRODE** for basic electrode welding with automatic "arc force" and "hot start" devices



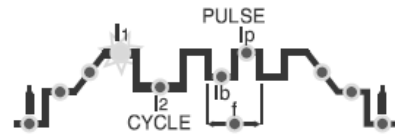
- 3) The following weld parameters can be set by pressing the **SET** button repeatedly



- **HOT START** (0 ÷ 100): this supplies a current peak which facilitates triggering the arc and the formation of the ideal crater



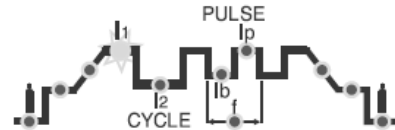
- **ARC FORCE** (0 ÷ 100): this increases the energy of the arc on poor welding conditions



- **PRINCIPAL** weld CURRENT I₁ (5 ÷ 400 A)



- 4) Keep pressing the **SET** key for about 1 second to leave the weld parameter setting phase



- The **GREEN LIGHT** I₁ is on

- 5) It is now ready for welding

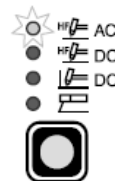


- 6) The digital display visualizes effective current used during welding

TIG WELDING AC/DC

- 1) Start up the welder by turning the main switch to position I

- 2) Press the "weld process" button and set on:



- **TIG "HF AC"** for TIG weld on alternating current with high frequency arc strike

OR



- **TIG "HF DC"** for TIG weld on direct current with high frequency arc strike

OR



- **TIG "lift"** for TIG weld on direct current without high frequency arc strike

ATTENTION: The correct "lift" type arc strike is only obtained by pressing the torch button after touching the piece to be welded with the electrode beforehand.

- 3) Press the "weld mode" button and set on one of the 4 options available:



• 2 STROKE

Press the torch button to perform the welding cycle starting from INITIAL CURRENT (if a SLOPE UP is set) and release it to terminate welding at FINAL CURRENT (if a SLOPE DOWN is set).



• 4 STROKE

TIG welding is done as follows:

- Pressing the torch button strikes up the arc and the current stays at the INITIAL value
- Releasing the torch button will start the SLOPE UP (if present) and the PRINCIPAL CURRENT will take itself to value I_1
- Pressing the torch button will start the SLOPE DOWN (if present) and the current will take itself to the FINAL value (*crater current*)
- Releasing the button will finish the weld cycle.



• CYCLE

TIG welding is done as follows with this function on:

- pressing the torch button will strike up the arc and the current stays at the INITIAL value
- releasing the torch button will start the SLOPE UP (if present) and the current will take itself to the PRINCIPAL value (I_1)
- pressing and releasing the torch button for less than 1 second, the weld current will take itself to the CYCLE (I_2) value; it will be possible to move an infinite number of times between the two current levels (I_1 , I_2) by repeating this operation
- pressing the torch button and keeping it pressed down (for more than 2 seconds) will start the SLOPE DOWN (if present) and the current will take itself to the FINAL value (*crater current*)
- releasing the torch button will finish the weld cycle

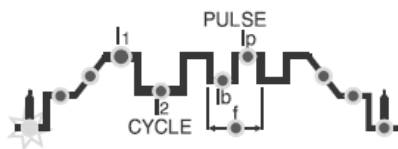


• SPOT-WELDING

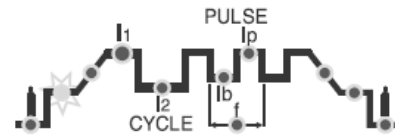
Spot-welding can be done for the set time (in seconds) by pressing the torch button after which the arc will automatically switch off



4) The following weld parameters can be set by pressing the **SET** button repeatedly



PRE-GAS time (0,05 ÷ 1 sec)

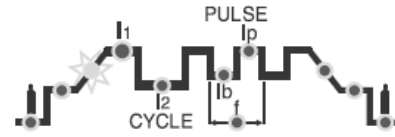


INITIAL weld CURRENT

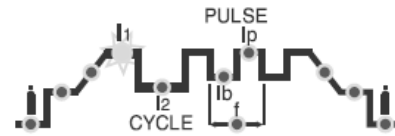
TIG DC: 5 ÷ 400 A

TIG AC: square wave 5 ÷ 400 A
mixed wave 5 ÷ 400 A
sine wave 16 ÷ 286 A

ATTENTION: only programmable with 4 STROKE or CYCLE functions on



SLOPE UP time (0,0 ÷ 5,0 sec)

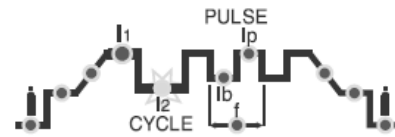


PRINCIPAL weld CURRENT I_1

TIG DC: 5 ÷ 400 A

TIG AC: square wave 5 ÷ 400 A
mixed wave 5 ÷ 400 A
sine wave 16 ÷ 286 A

ATTENTION: only programmable with 4 STROKE or CYCLE functions on

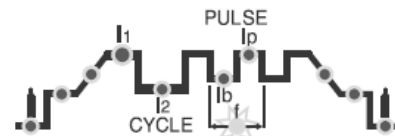


CYCLE CURRENT I_2

TIG DC: 5 ÷ 400 A

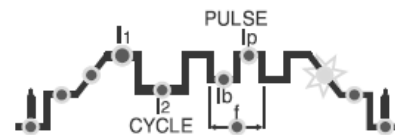
TIG AC: square wave 5 ÷ 400 A
mixed wave 5 ÷ 400 A
sine wave 16 ÷ 286 A

ATTENTION: programmable only with CYCLE function on

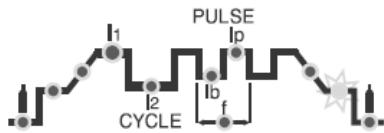


PULSATION FREQUENCY f (0,5 ÷ 500 Hz)

ATTENTION: only programmable with 4 STROKE or CYCLE functions on



SLOPE-DOWN time (0,0 ÷ 8,0 sec)

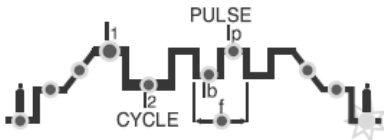


FINAL weld CURRENT

TIG DC: 5 ÷ 400 A

TIG AC: square wave 5 ÷ 400 A
mixed wave 5 ÷ 400 A
sine wave 16 ÷ 286 A

ATTENTION: only programmable with 4 **STROKE** or **CYCLE** functions on



POST-GAS time (0,5 ÷ 25 sec)

ATTENTION: During POST-GAS time, the POST-GAS LIGHT is flashing, the GREEN LIGHT I1 is on.



5) Keep pressing the **SET** key for about 1 second to leave the weld parameter setting phase

6) TIG weld as desired

120

NOTE: The display will visualize the current value used for welding if the GREEN LED I1 stays on continuously during welding

NOTE: During TIG pulsed welding (in the fast and slow EASY PULSE, ON PULSE modes) the display indicates the measured PEAK CURRENT I_p for 1 second and the measured BASE CURRENT I_b for 1 second.

PULSATING TIG WELD

Pulsating TIG welding can be done in 3 ways with PoWer TIG 400 AC/DC

- **Fast ON-PULSE (only TIG DC)**
Pulsating TIG weld with manually set weld parameters;
- **Slow ON-PULSE (TIG AC and DC)**
Pulsating TIG weld with manually set weld parameters;
- **EASY PULSE (only TIG DC)**
Pulsating TIG weld with weld parameters set in synergy.

NOTE: Pulsation is automatically cut off while the current is on INITIAL and FINAL.

1) Start up the welder by turning the main switch to position I

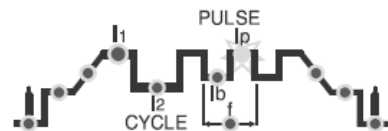
Fast ON-PULSE (only TIG DC)



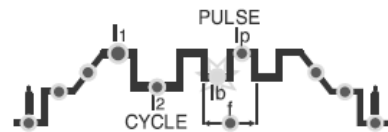
2A) Press the "pulsation" button until the desired function is working (the ON PULSE LIGHT is PoWer TIG 400 AC/DC



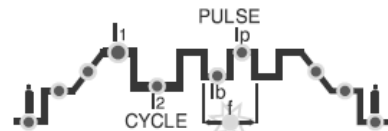
3A) Set the following pulsation parameters by pressing the **SET** button repeatedly:



PEAK CURRENT I_p (5 ÷ 400 A)



BASIC CURRENT I_b (5 ÷ 400 A)



PULSATION FREQUENCY f (0,5 ÷ 500 Hz)

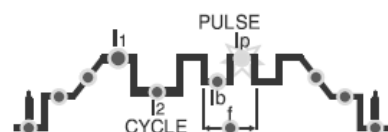
Slow ON-PULSE (TIG AC and DC)



2B) Press the "pulsation" button until the corresponding led starts flashing



3B) The following weld parameters can be set by pressing the **SET** button repeatedly



PEAK CURRENT I_p
TIG DC: 5 ÷ 400 A
TIG AC: 5 ÷ 400 A

TIG WELDING WITH SPOT-WELD FUNCTION ON

1) Start up the welder by turning the main switch to position I



2) Press the "weld mode" button and set to **SPOT-WELD** position

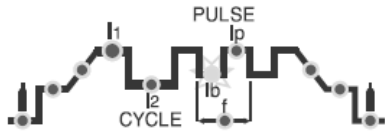


3) Press the **SET** button until the corresponding led starts flashing



4) Turn the knob to set to desired SPOT-WELD TIME (0,5 ÷ 10 sec)

5) Now continue in the same way as for normal TIG welding, setting the various parameters as indicated in the **TIG WELD** procedures



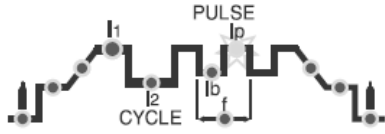
BASIC CURRENT I_b

TIG DC: 5 ÷ 400 A

TIG AC: square wave 5 ÷ 400 A

mixed wave 5 ÷ 400 A

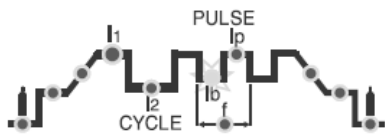
sine wave 16 ÷ 286 A



PEAK TIME t_p

TIG DC: 0,01 ÷ 0,99 sec

TIG AC: 0,10 ÷ 0,99 sec



BASIC TIME t_b

TIG DC: 0,01 ÷ 0,99 sec

TIG AC: 0,10 ÷ 0,99 sec



NOTE: setting the value of a parameter (usually I_p) while **EASY PULSE** is working, will give the values of the other parameters (I_b , f) in synergy



Keep pressing the **SET** key for about 1 second to leave the weld parameter setting phase

4) **TIG-weld** as desired



NOTE: The **RED I_p** and **GREEN I_1** leds will stay on continuously during the weld process and the display will visualize the current value used for welding

TIG PULSATING WELDING WITH CYCLE FUNCTION ON

Two different levels of pulsating current (I_1 and I_2) can be used for welding with this function. Here also welding can be done in the two ways **ON PULSE** and **EASY PULSE**.

It is also necessary to set the 2nd level **PEAK CURRENT (I_{2p})** (apart from the pulsating parameters I_b , I_p , f) with the **CYCLE** function on. The other 2nd level pulsating parameters (**BASIC CURRENT I_{2b}** and **FREQUENCY f**) are obtained in synergy. **FREQUENCY** remains constant while the 2nd level **BASIC CURRENT (I_{2b})** is in proportion to the ratio between the 1st level currents.

ON PULSE AND EASY PULSE METHODS

1) Start up the welder by turning the main switch to position I



2) Press the "weld mode" button and set on **CYCLE**

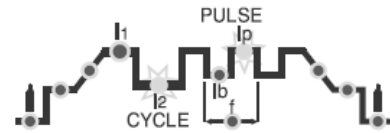
Fast ON-PULSE (only TIG DC)



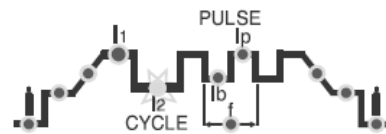
3A) Press the "pulsation" button until the desired function is working (the **ON PULSE LIGHT** is on)



4A) Press the **SET** key until the **GREEN led I_1** and the **RED led I_p** will start flashing; adjust the 1st level **PEAK CURRENT I_{1p}** (5 ÷ 400 A); value by turning the special dial.



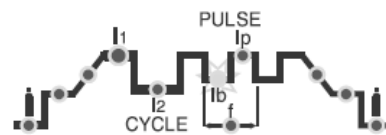
5A) Press the **SET** key until the **RED led** of the 2nd level of **PEAK CURRENT I_{2p}** (5 ÷ 400 A) starts flashing



• Adjust the parameter by turning the special dial



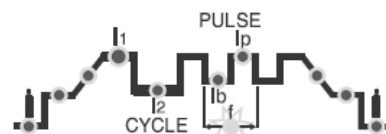
6A) Press the **SET** key until the **RED led** of the 1st level **BASIC CURRENT** (5 ÷ 400 A) starts flashing



• Adjust the parameter by turning the special dial



7A) Press the **SET** key until the **RED led** of the **PULSATION FREQUENCY** (0.5 ÷ 500 Hz) starts flashing





- Adjust the parameter by turning the special dial

ATTENTION: go on to point 9)

Slow ON-PULSE (TIG AC and DC)

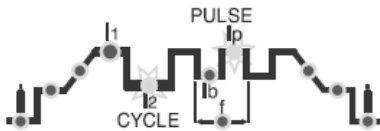


- 3B) Press the "pulsation" button until the desired function is working (the ON PULSE LIGHT is flashing)

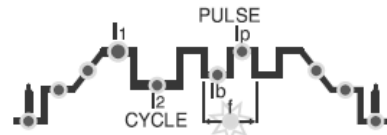


- 4B) Press the **SET** key until the GREEN led I_1 and the RED led I_p will start flashing; adjust the 1st level PEAK CURRENT I_{1p} ; value by turning the special dial.

TIG DC: 5 ÷ 400 A
TIG AC: square wave 5 ÷ 400 A
 mixed wave 5 ÷ 400 A
 sine wave 16 ÷ 286 A



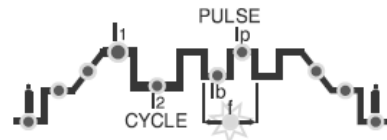
- 7B) Press the **SET** key until the RED led of the PEAK TIME t_p starts flashing
TIG DC: 0,01 ÷ 0,99 sec
TIG AC: 0,10 ÷ 0,99 sec



- Adjust the parameter by turning the special dial

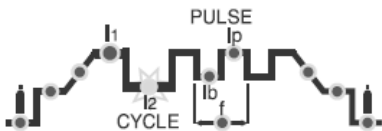


- 8B) Press the **SET** key until the RED led of the BASIC TIME t_b starts flashing
TIG DC: 0,01 ÷ 0,99 sec
TIG AC: 0,10 ÷ 0,99 sec



- 5B) Press the **SET** key until the RED led of the 2nd level of PEAK CURRENT I_{2p} starts flashing

TIG DC: 5 ÷ 400 A
TIG AC: square wave 5 ÷ 400 A
 mixed wave 5 ÷ 400 A
 sine wave 16 ÷ 286 A



- Adjust the parameter by turning the special dial

ATTENTION: go on to point 9)

EASY PULSE (only TIG DC)



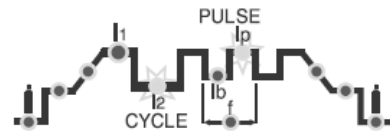
- 3C) Press the "pulsation" button until the **EASY PULSE** function is working



- Adjust the parameter by turning the special dial



- 4C) Press the **SET** key until the GREEN led I_1 and the RED led I_p will start flashing; adjust the 1st level PEAK CURRENT I_{1p} (5 ÷ 400 A); value by turning the special dial.

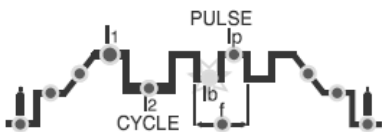


ATTENTION: with **EASY PULSE** working and adjusting the value of the 1st level PEAK CURRENT (I_{1p}) you will have the values of the other 1st level parameters (I_{1b} , f) in synergy



- 6B) Press the **SET** key until the RED led of the 1st level BASIC CURRENT starts flashing

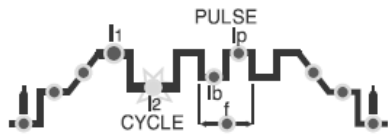
TIG DC: 5 ÷ 400 A
TIG AC: square wave 5 ÷ 400 A
 mixed wave 5 ÷ 400 A
 sine wave 16 ÷ 286 A



- 5B) Press the **SET** key until the RED led of the 2nd level PEAK CURRENT I_{2p} (5 ÷ 400 A) starts flashing



- Adjust the parameter by turning the special dial



- Adjust the parameter by turning the special dial

ATTENTION: adjusting the value of the 2nd level **PEAK CURRENT (I_{2p})** while **EASY PULSE** is working, you will have the values of the other 2nd level parameters (I_{2b}, f) in synergy



- If you want a test weld, the led of the selected parameter will flash and the value of the parameter being set will be visualized on the display while this is being done

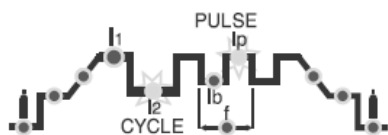


- Keep pressing the **SET** key for more than 1 second to leave the weld parameter setting phase

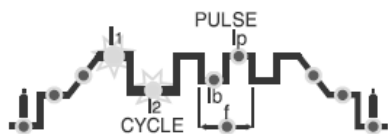
- Use the **CYCLE** function for **PULSATING TIG** welding



NOTE: The **RED LED I_p** and the **GREEN LED I₁** remain on continuously during the welding process and the current value being used for welding will be visualized on the display



NOTE: The **RED LED I₂** and the **RED LED I_p** remain on continuously during the welding process and the current value being used for welding will be visualized on the display



TIG AC WELDING



WAVE SHAPES

The MATRIX 400 AC/DC offers the possibility of choosing between 3 different types of wave shapes:



- **SQUARE WAVE:** highly arc stability; ideal for all thickness', both narrow and medium.

ATTENTION: During pre-setting and welding, the display indicates "peak" current.



- **MIXED WAVE:** ideal for narrow thickness and vertical welding; it increases thermal arc control and service life of electrode .

ATTENTION: During pre-setting and welding, the display indicates "peak" current.



- **SINE WAVE:** guarantees a quieter and softer arc: ideal for medium thickness and head-head welding .

ATTENTION: The display shows the current "RMS" value in pre-setting and welding.



ELECTRODE DIAMETER SELECTION

The MATRIX 400 AC/DC offer the possibility of setting the diameter of the electrode being used to achieve the best synergetic control over striking.

WELD CURRENT WAVE BALANCING AND FREQUENCY



- **BALANCING:** graduating the negative and positive half wave of the electrode appropriately increases the penetration of the welding or cleanliness on the surface of the piece.



- **FREQUENCY:** adjust the wave frequency to achieve arc concentration and reduce wear on electrode.

INPUT STORAGE

ATTENTION: The **GREEN LED I₁** must be on continuously to enter the input storage phase



- Keep pressing the **PROG** key (for about 3 seconds) until the letters **Pr** appear on the display



- Turn the dial to select the number of the programme where input must be stored



- Keep pressing the **SAVE** key until the letters **Sto** appear on the display



- Input has been stored

PROGRAMMED WELDING

Once the programme has been memorized the operator can only weld with the pre-set values and cannot change any of the parameters. Go to **MANUAL** welding to make any changes.

MANUAL WELDING

To return to set/modify selected parameters or to create a new programme, do as follows:

PROG



- 1) Keep pressing the **PROG** key (for about 3 seconds) until the number of the selected programme starts flashing



- 2) Turn the dial anti-clockwise until 3 dotted lines appear on the display

PROG



- 3) Pressing and releasing the **PROG** key, the machine will go back to the original operation (GREEN LED on continuously)

- 4) Any of the parameters may now be set or modified or new programmes created

- 5) Turn the knob to scroll the programmes until an empty and unused programme is found.

NOTE: Programme sequences can be created by placing an empty programme between saved ones.

CALLING UP STORED PROGRAMMES

PROG



- 1) Keep pressing the **PROG** key (for about 3 seconds) until the letters **Pr** with the number of the programme appear flashing on the display



- 2) Turn the dial until the number of the programme required appears on the display

PROG



- 3) Press and release the **PROG** key to call up the number of the selected programme

- 4) **PROGRAMMED** welding can now be done

VISUALIZING SET PARAMETRES

- 1) Call up the required programme (see "STORED PROGRAMME CALL UP")



- 2) Press and release the **SET** key to visualize the set parameters in sequence



- 3) Keep pressing the **SET** key for more than a second to return to the selected programme

NOTE: you will automatically leave programming if the set parameters are changed

"ENERGY SAVING" function

This function makes sure the cooling fan and coolant system are working properly, these are only activated when strictly necessary i.e.:

FAN MOTOR

The fan is activated:

- During welding or when welding has finished for a certain length of time;
- When the thermostat starts working or as soon as it has stopped working, for a certain length of time.

COOLANT SYSTEM

The coolant system is activated:

- When the machine is switched on for one minute so that the coolant liquid circulates in the system at the correct pressure (call for technical assistance if the failure messages do not disappear from the displays when the coolant system goes off);
- During welding or when welding has finished for a certain length of time.



Error signals

The welding machine is protected from faults in the mains power supply, in the welding circuit or in the torch water-cooling system. If a fault should develop in any of the above, various messages (E01, E02, E03, E04) will flash on the display.

These messages have the following meanings:

E01: flashes on the control panel display when the machine is connected to cooling system and its pressure switch does not close the circuit due to pressure lack in the hydraulic circuit.

E02: OVER VOLTAGE. This message flashes on the control panel display when the machine voltage input exceeds 460V. The machine stops automatically. Switch off the machine and identify the reason for the fault. Switch the machine back on again and if the fault is still present or crops up again, contact the technical assistance service.

E03: UNDER VOLTAGE. This message flashes on the control panel display when the machine voltage input is lower than 320V. The machine stops automatically. Switch off the machine and identify the reason for the fault. Switch the machine back on again and if the fault is still present or crops up again, contact the technical assistance service.

E04: OVER CURRENT. This message flashes on the control panel display when primary current exceeds dangerous levels. The machine stops automatically. Switch off the machine and identify the reason for the fault. Switch the machine back on again and if the fault is still present or crops up again, contact the technical assistance service.

Remote controls and accessories

The remote controls can be only used in the 2-STROKE and 4-STROKE 'welding modes'. Matrix generators can be fitted with various remote control devices and accessories, including:

CD6/8 manual remote control

IMPORTANT: When using the machine for TIG welding it is **OBLIGATORY** to use the kit for simultaneously using the PSR6 pedal and torch (code CEA n° 460056).

Weld current can be measured at a distance by connecting up this control. The display will show the previous maximum weld current value set on the welder. The remote control will adjust welding current from the minimum to this value (see Special functions "Changing the minimum and maximum limits of welding parameters" section). Just turn the adjustment knob on the welder to change the maximum output value.

PSR6 foot switch

The foot switch replaces the torch button and the welding current setting knob. The display will show the previous maximum weld current value set on the welder. The pedal will adjust the welding current from the minimum to this value (see Special functions "Changing the minimum and maximum limits of welding parameters" section). Just turn the adjustment knob on the welder to change the maximum output value.

NOTE: To use the pedal control correctly, set the "welding mode" to 2-STROKE and then the welding parameters SLOPE UP time to 0 sec., SLOPE DOWN time to 0 sec., INITIAL CURRENT to 5A and FINAL CURRENT to 5A.

Air and/or water-cooled torch up/ down

The up/down torch replaces the current setting knob on the front of the welder. Press right (+) and left (-) button to adjust the active parameter. With this kind of torch, it is also possible to scroll the saved programmes by pressing the two (+) and (-) buttons.

Turn the knob to scroll the programmes until an empty and unused programme is found.

NOTE: Programme sequences can be created by placing an empty programme between saved ones.

NOTE: The value shown on the display during welding represents the effective current output with all types of control.

The digital control unit of the generator is fitted with a control recognition device which allows it to identify which device is connected and take action accordingly. To allow the command recognition device to work correctly, connect (with the machine switched off) the required accessory to the relative connector and then switch on the welding machine with the on/off switch.

NOTE: It is not possible to memorize or open programmes when the remote controls are connected (except for the torch with UP/DOWN commands).

If a remote control is connected (followed by self-acknowledgement procedure) the machine will automatically return to the manual-welding phase if it has been pre-set for automatic welding.

Maintenance

ATTENTION: Before carrying out any inspection of the inside of the generator, disconnect the system from the supply.

SPARE PARTS

Original spare parts have been specially designed for our equipment. The use of non-original spare parts may cause variations in performance or reduce the foreseen level of safety. We decline all responsibility for the use of non-original spare parts.

GENERATOR

As these systems are completely static, proceed as follow:

- Periodic removal of accumulated dirt and dust from the inside of the generator, using compressed air. Do not aim the air jet directly onto the electrical components, in order to avoid damaging them.
- Make periodical inspections in order to individuate worn cables or loose connections that are the cause of overheating.

The pointing out of any difficulties and their elimination

The supply line is attributed with the cause of the most common difficulties. In the case of breakdown, proceed as follows:

- 1) Check the value of the supply voltage
- 2) Check that the power cable is perfectly connected to the plug and the supply switch
- 3) Check that the power fuses are not burned out or loose
- 4) Check whether the following are defective:
 - the switch that supplies the machine
 - the plug socket in the wall
 - the generator switch

NOTE: Given the required technical skills necessary for the repair of the generator, in case of breakdown we advise you to contact skilled personnel or our technical service department.

Special functions

The **MATRIX 400 AC/DC** allows some welding parameters to be modified, thus providing a more versatile welding machine for more expert welders.

Two special functions are provided for welders:

- Changing the minimum and maximum limits of parameters;
- Activation of special parameters (only valid for the TIG 'welding process' with HF ignition).

CHANGING THE MINIMUM AND MAXIMUM LIMITS OF WELDING PARAMETERS



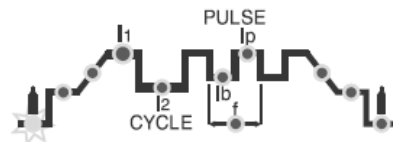
- 1) With the welding machine switched off, press and hold down the **SET** button

- 2) Start up the welder by turning the main switch to position I

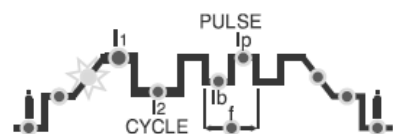


- 3) Press the **SET** button in sequence to modify the upper limits of the following welding parameters:

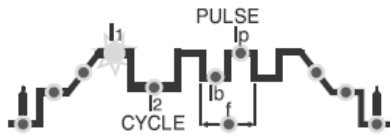
- PRE-GAS time (maximum settable limit from 1.00 to 2.50 sec)



- SLOPE UP time (maximum settable limit from 5.00 to 10.0 sec)

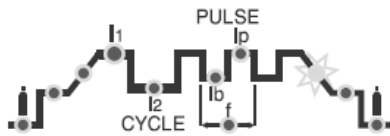


- remote control MINIMUM CURRENT (minimum limit from 5 to 400 A)

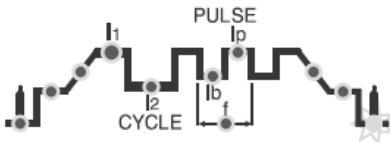


ATTENTION: If the set minimum limit (of remote control MINIMUM CURRENT) is greater or equal to the MAIN WELDING CURRENT I1, welding will take place at the MAIN WELDING CURRENT I1, regardless of the setting chosen on the remote control.

- SLOPE DOWN time (maximum settable limit from 8.00 to 15.0 sec)



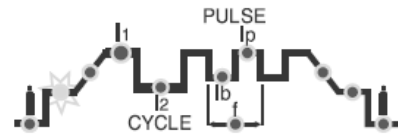
- POST GAS time (maximum settable limit from 10.00 to 25.0 sec)



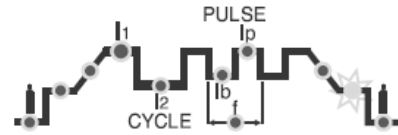
- STRIKE TIME (only adjustable in TIG AC from 0.01 to 0.99 sec.).

ATTENTION: Too low a value may impair striking.

- INITIAL CURRENT IN TIG HF 2T (5 ÷ 400 A)



- FINAL CURRENT IN TIG HF 2T (5 ÷ 400 A)



NOTE: These special welding parameters must be only activated by qualified staff or operators who have been trained by CEA technicians.



- 4) Keep pressing the **SET** key for more than 1 second to leave the weld parameter setting phase

- 5) The set values are now active and it is possible to weld.

ACTIVATION OF SPECIAL PARAMETERS

Activation of special parameters, only valid for the TIG 'welding process' with HF ignition, must be performed as follows:

PROG



- 1) With the welding machine switched off, press and hold down the **PROG** button

- 2) Start up the welder by turning the main switch to position I



- 3) Turn the 'Digital adjustment/control of all welding parameters' knob (pos. 4 fig. B) until **SPE** appears on the display.

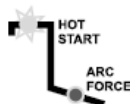
PROG



- 4) Press **PROG** to confirm.

The active welding parameters are:

- IGNITION CURRENT (5 ÷ 400 A)



IT Regolazione scheda elettronica

- 1) Regolazione della corrente minima
- 2) Regolazione della corrente massima

ES Regulaci3n tarjeta electr3nica

- 1) Regulaci3n de la corriente m3nima
- 2) Regulaci3n de la corriente m3xima

EN Adjustment of electronic circuit board

- 1) Adjustment of the minimum current
- 2) Adjustment of the maximum current

NL Afstellen elektronische kaart

- 1) Afstellen van de stroom minimaal
- 2) Afstellen van de stroom maximaal

FR R3glage fiche 3lectronique

- 1) R3glage du courant minimum
- 2) R3glage du courant maximum

PT Regulaci3o da placa electr3nica

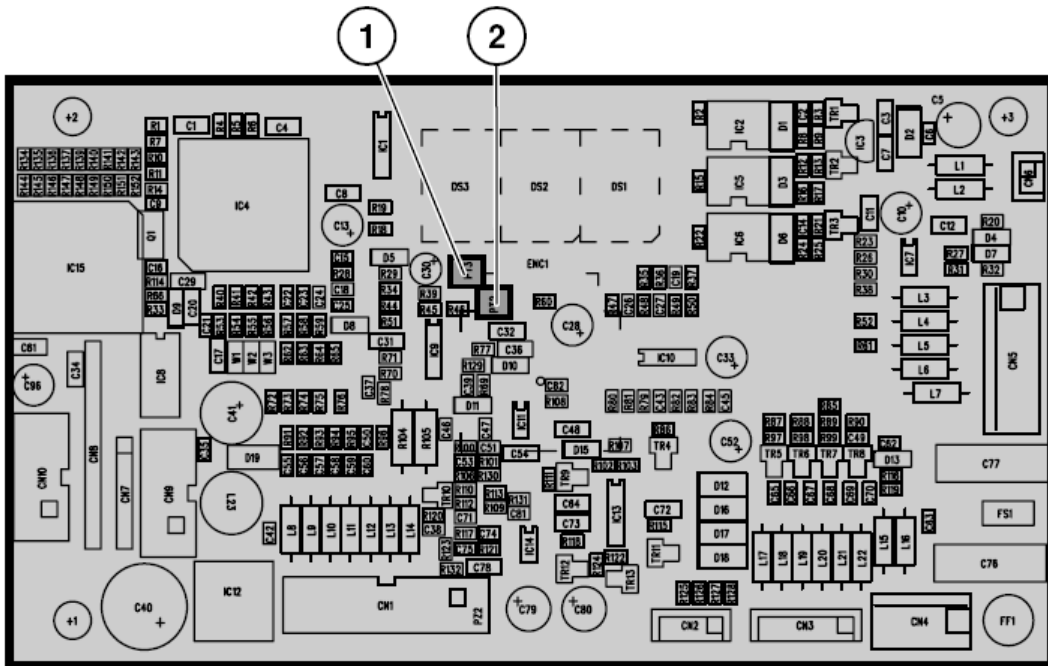
- 1) Regulagem da corrente m3nima
- 2) Regulagem da corrente m3xima

DE Einstellung der Elektronikarte

- 1) Einstellung des Mindestschweisstromes
- 2) Einstellung des H3chstschweisstromes

RU Р3гулировка 3лектронной платы

- 1) Р3гулировка минимального электрического тока
- 2) Р3гулировка максимального электрического тока



IT Schema elettrico

ES Esquema eléctrico

EN Wiring diagram

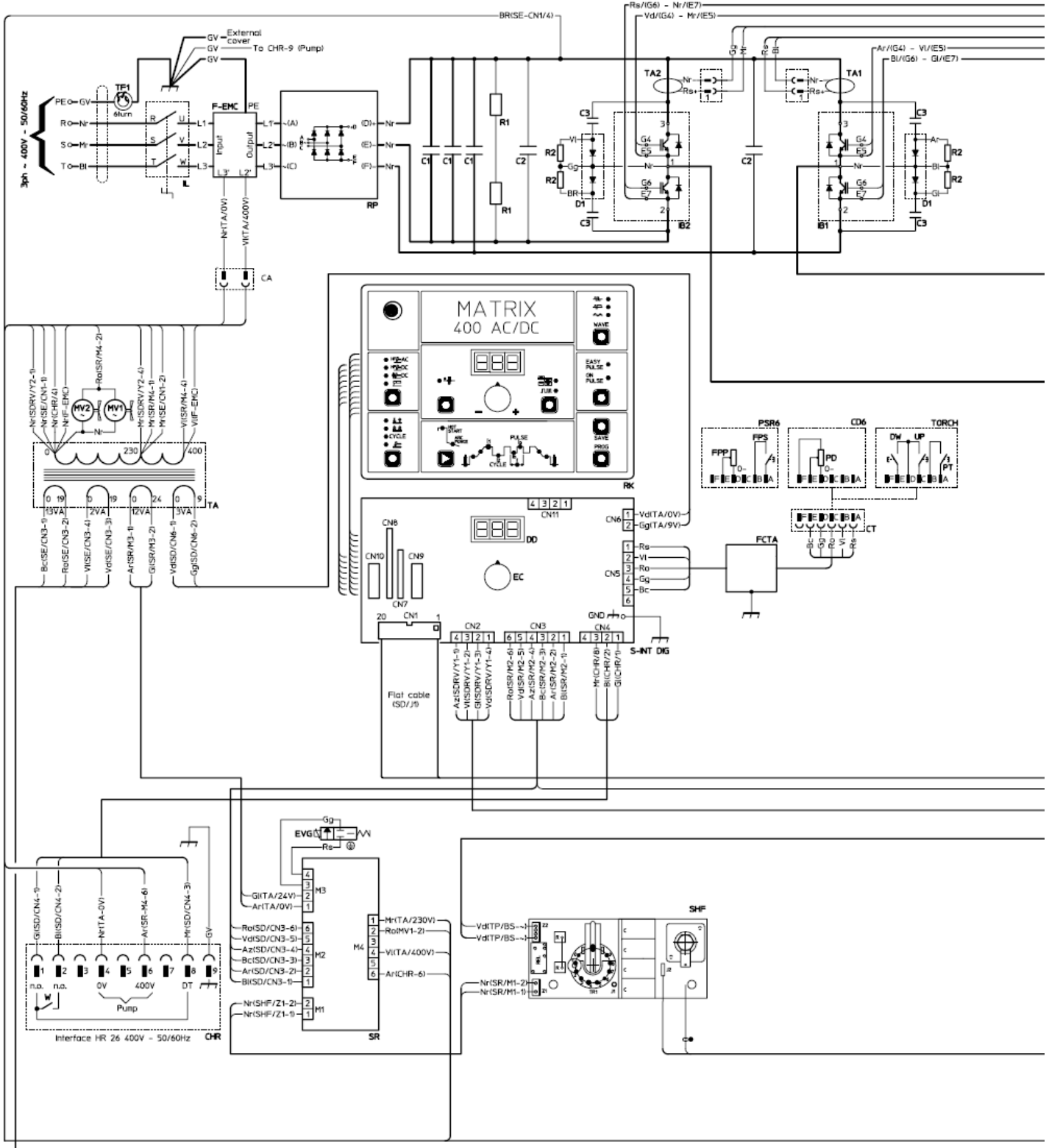
NL Elektrisk skema

FR Schéma électrique

PT Esquema eléctrico

DE Schaltplan

RU Электросхема



IT Schema elettrico

ES Esquema eléctrico

EN Wiring diagram

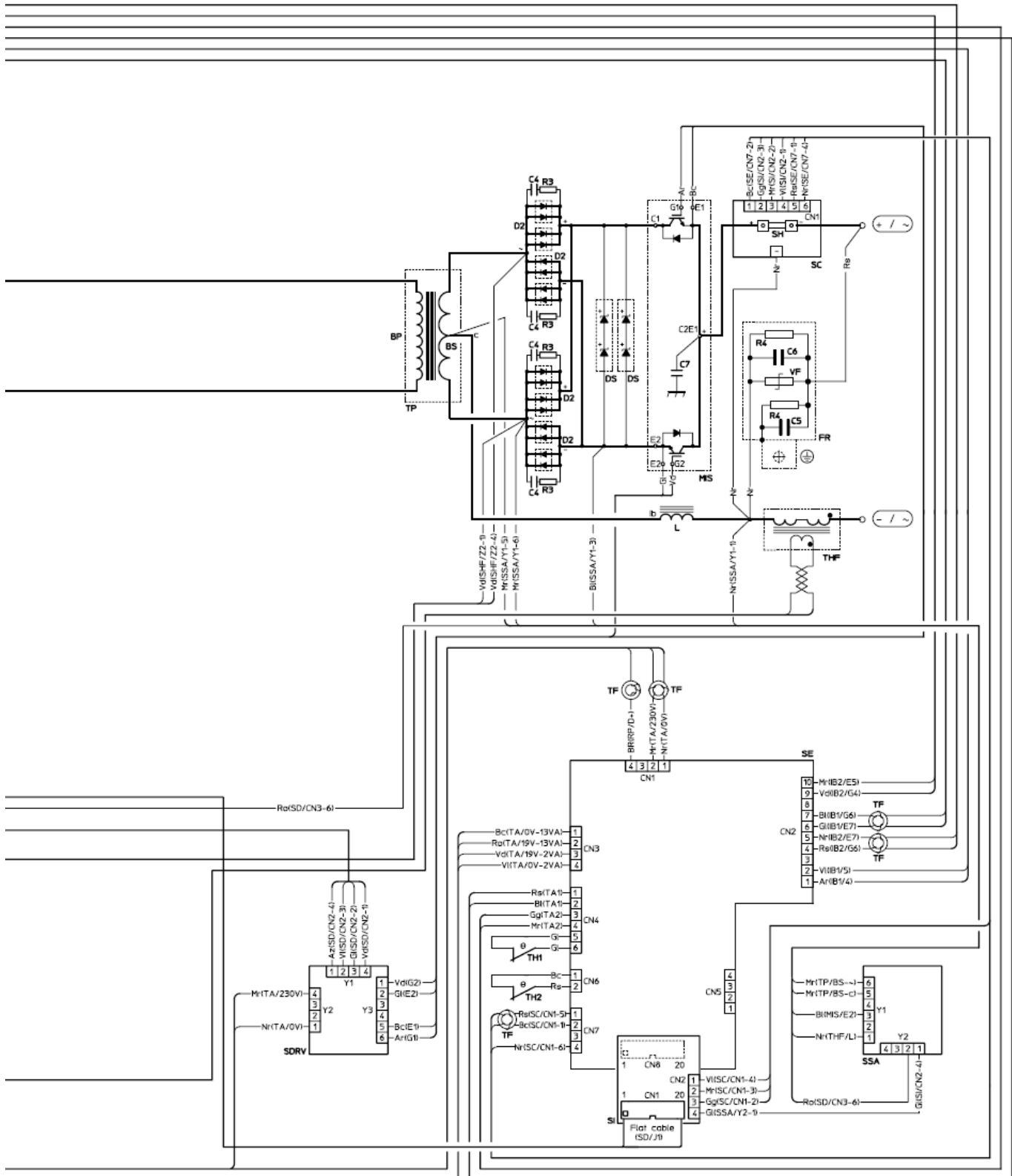
NL Elektrisk skema

FR Schéma électrique

PT Esquema eléctrico

DE Schaltplan

RU Электросхема



•1 BP	•2 BS	•3 C1-7	•4 CA	•5 CD6	•6 CHR	•7 CT	•8 D1	•9 D2	•10 DD	•11 DS	•12 DW
•13 EC	•14 EVG	•15 F-EMC	•16 FCTA	•17 FPP	•18 FPS	•19 FR	•20 Ib	•21 IB1-2	•22 IL	•23 L	•24 MIS
•25 MV1-2	•26 PD	•27 PSR6	•28 PT	•29 R1-4	•30 RK	•31 RP	•32 SC	•33 S-DRV	•34 SE	•35 SH	•36 SHF
•37 SI	•38 S-INT DIG	•39 SR	•40 SSA	•41 TA	•42 TA1-2	•43 TF	•44 TF1	•45 TH1	•46 TH2	•47 THF	•48 TP
•49 UP	•50 VF	•51 W									

IT Legenda schema elettrico

•1 Bobina primaria trasformatore •2 Bobina secondaria trasformatore •3 Condensatori •4 Connettore alimentazione •5 Comando a distanza •6 Connettore alimentazione raffreddamento HR26 •7 Connettore pulsante torcia •8 Diodi snubber •9 Diodi secondari •10 Display digitale •11 Scaricatore di tensione •12 Pulsante DOWN •13 Encoder •14 Elettrovalvola gas •15 Filtro EMC •16 Filtro torcia e accessori •17 Potenziometro comando a pedale •18 Microswitch •19 Filtro protezione HF •20 Inizio bobina •21 Modulo IGBT •22 Interruttore di linea •23 Induttore secondario •24 Modulo doppio IGBT secondario •25 Motore ventilatore •26 Potenziometro comando a distanza •27 Comando a pedale •28 Pulsante torcia •29 Resistori •30 Tastiera a membrana •31 Radrizzatore primario •32 Scheda segnale amplificato shunt •33 Scheda DRIVER •34 Scheda controllo inverter •35 Shunt •36 Scheda spinterometro •37 Scheda interfaccia •38 Scheda interfaccia digitale •39 Scheda relè •40 Scheda stabilizzatrice arco di saldatura •41 Trasformatore ausiliario •42 Trasformatore di corrente ramo IGBT •43 Toroidi soppressione disturbi •44 Toroide per cavo linea soppressione disturbi EMC •45 Termostato •46 Termostato •47 Trasformatore HF •48 Trasformatore principale •49 Pulsante UP •50 Varistore •51 Pressostato

EN Key to the electrical diagram

•1 Primary transformer coil •2 Secondary transformer coil •3 Condensers •4 Power supply connector •5 Remote control •6 HR26 power supply connector •7 Connector for torch push button •8 SNUBBER diodes •9 Secondary diodes •10 Digital display •11 Voltage surge arrester •12 DOWN button •13 Encoder •14 Gas solenoid valve •15 EMC filter •16 Torch filter and accessories •17 Pedal control potentiometer •18 Microswitch •19 HF filter •20 Coil start •21 IGBT unit •22 Supply switch •23 Secondary inductor •24 Dual secondary IGBT module •25 Fan motor •26 Remote current potentiometer •27 Pedal control •28 Torch button •29 Resistors •30 Membrane keyboard •31 Primary rectifier •32 Amplified SHUNT signal circuit board •33 DRIVER card •34 INVERTER control card •35 Shunt •36 Spark gap card •37 Interface card •38 Digital interface board •39 Relay circuit board •40 Welding arc stabilizer electronic board •41 Auxiliary transformer •42 IGBT transformer •43 Disturbance noise suppression garter springs •44 EMC disturbance suppression toroid for power line •45 Thermostat •46 Thermostat •47 HF transformer •48 Main transformer •49 UP button •50 Varistor •51 Pressure switch

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 schéma électrique

•1 Bobine primaire du transformateur •2 Bobine secondaire du transformateur •3 Condensateurs •4 Connecteur alimentation •5 Commande à distance •6 Connecteur alimentation HR26 •7 Connecteur bouton torche •8 Diodes SNUBBER •9 Diodes secondaires •10 Afficheur numérique •11 Déchargeur de tension •12 Touche directionnelle vers le bas "DOWN" •13 Encoder •14 Electrovanne du gaz •15 Filtre EMC •16 Filtre de la torche et des accessoires •17 Potentiomètre de la commande à pédale •18 Microswitch •19 Filtre HF •20 Début bobine •21 Module IGBT •22 Interrupteur de lignes •23 Inducteur secondaire •24 Module double IGBT secondaire •25 Moteur ventilateur •26 Potentiomètre courant à distance •27 Commande à pédale •28 Bouton poussoir de la torche •29 Résistance •30 Clavier tactile •31 Redresseur primaire •32 Carte signal amplifié SHUNT •33 Carte DRIVER •34 Carte de contrôle du CONVERTISSEUR •35 Shunt •36 Fiche éclateur •37 Carte interface •38 Carte interface numérique •39 Carte électronique relais •40 Fiche électronique stabilisateur de l'arc de soudure •41 Transformateur auxiliaire •42 Transformateur IGBT •43 Toroïdes de suppression de parasites •44 Toroïde élimination de parasites EMC pour câble ligne •45 Thermo-stat •46 Thermostat •47 Transformateur IIF •48 Transformateur principal •49 Touche directionnelle vers le haut "UP" •50 Varistor •51 Pressostat

DE Schaltplan-Legende

•1 Primäre Trafospule •2 Sekundäre Trafospule •3 Kondensators •4 Verbindervorsorgung •5 Fernsteuerung •6 HR26 Verbinder Versorgung •7 Druckknopf Schweißbrenner •8 SNUBBER Dioden •9 Sekundäre Dioden •10 Digital-Display •11 Spannungsableiter •12 Taster "DOWN" •13 Encoder •14 Gaselektroventil •15 Filter EMC •16 Brennerfilter und Zubehör •17 Potentiometer Pedalsteuerung •18 Microswitch •19 Filter HF •20 Spuleneinsatz •21 Modul IGBT •22 Leitungshalter •23 Sekundärdrossel •24 Doppeltes IGBT-Modul sekundär •25 Lüftermotor •26 Fernstrompotentiometer •27 Pedalsteuerung •28 Brennerschalter •29 Widerstand •30 Membrantastatur •31 Primärer Gleichrichter •32 Karte verstärktes Signal SHUNT •33 DRIVER Karte •34 INVERTER-Steuerkarte •35 Shunt •36 Karte Funkenstrecke •37 Schnittstellenkarte •38 Digitale Schnittstellenkarte •39 Elektronikkarte relais •40 Elektronische Karte Stabilisator Schweißbogen •41 Hilfstransformator •42 Transformator IGBT •43 Toroidi soppressione disturbi •44 Toroid EMC-Störunterdrückung für Leitungskabel •45 Thermostat •46 Thermostat •47 Transformator HF •48 Haupttransformator •49 Taster "UP" •50 Varistor •51 Druckwächter

FR Légende couleurs

Ar Orange
Az Bleu calir
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

IT Significato dei simboli grafici riportati sulla targa dati

•1 Nome e indirizzo costruttore •2 Denominazione impianto •3 Generatore ad inverter trifase •4 Saldatura TIG •5 Alimentazione di rete, numero delle fasi, frequenza nominale di rete •6 Corrente continua di saldatura •7 Impianto saldatura elettrodo •8 Tensione a vuoto secondaria •9 Tensione nominale di alimentazione •10 Grado di protezione dell'involturo •11 Raffreddamento ad aria forzata •12 Classe di isolamento •13 Massimo valore della corrente nominale di alimentazione •14 Saldatrice utilizzabile in ambienti con rischio accresciuto di scosse elettriche •15 Prodotto atto a circolare liberamente nella Comunità Europea •16 Smaltimento speciale •17 Massimo valore della corrente effettiva di alimentazione •18 Corrente nominale di saldatura •19 Minima e massima corrente e tensione di saldatura •20 Tensione nominale del carico •21 Rapporto di intermittenza •22 Normativa di riferimento •23 Numero di matricola

EN Meaning of graphic symbols on rating plate

•1 Name and address of manufacturer •2 Name of system •3 Three-phase INVERTER generator •4 TIG welding •5 Mains power supply, number of phases, nominal supply frequency •6 Continuous welding current •7 Electrode welding equipment •8 Secondary no-load voltage •9 Nominal value of supply voltage •10 Degree of protection of casing •11 Forced air cooling •12 Insulation class •13 Maximum value of rated supply current •14 Welder usable in environments with enhanced risk of electroshock •15 Product suitable for free circulation in the European Community •16 Special disposal •17 Maximum value of effective input current •18 Nominal welding current •19 Minimum and maximum current and welding voltage •20 Nominal load voltage •21 Duty cycle •22 Reference standards •23 Serial number

FR Interprétation des symboles graphiques sur la plaque de données

•1 Nom et adresse du fabricant •2 Dénomination de l'installation •3 Générateur à CONVERTISSEUR triphasé •4 Soudure TIG •5 Alimentation de réseau, numéro des phases, fréquence nominale d'alimentation •6 Courant de soudure continu •7 Installation soudure électrode •8 Tension secondaire à vide •9 Valeur nominale tension d'alimentation •10 Degré de protection de l'enveloppe •11 Refroidissement à air forcée •12 Classe d'isolation •13 Valeur maximale du courant d'alimentation assigné •14 Soudeuse pouvant être utilisée dans un environnement avec risque croissant de décharges électriques •15 Produit pouvant circuler librement dans la Communauté Européenne •16 Élimination spéciale •17 Valeur maximale du courant effectif d'alimentation •18 Courant nominal de soudure •19 Minimum et maximum courant et tension de soudure •20 Tension nominale de la charge •21 Rapport d'intermittence •22 Réglementation de référence •23 N° de série

DE Bedeutung der grafischen Symbole auf dem Datenschild

•1 Name und Anschrift des Herstellers •2 Bezeichnung der Anlage •3 Dreiphasiger INVERTER-Generator •4 TIG-Schweißen •5 Netzspeisung, Phasenzahl, Nennwert Versorgungsfrequenz •6 Gleichstrom Schweißen •7 Anlage Elektrodenschweißen •8 Sekundär-Leerlaufspannung •9 Nennwert Versorgungsspannung •10 Gehäuse-Schutzgrad •11 Zwangsluftkühlung •12 Isolationsklasse •13 Höchstwert des zugeführten Nennstromes •14 Möglicher Gebrauch in Umgebung mit erhöhter Gefahr elektrischer Schläge •15 Für den freien Warenverkehr in der EU zugelassenes Produkt •16 Sonderentsorgung •17 Höchstwert des tatsächlich zugeführten Stromes •18 Nennwert Schweißstrom •19 Min. und Max. Schweißstrom und Schweißspannung •20 Nennwert Ladespannung •21 Aussetzungsverhältnis •22 Referenznormen •23 Seriennummer

ES Significado de los símbolos referido en la chapa datos

•1 Nombre y dirección del constructor •2 Denominación sistema •3 Generador de INVERTER trifásico •4 Soldadura TIG •5 Alimentación de red, número de las fases, frecuencia nominal de alimentación •6 Corriente de soldadura continua •7 Equipo de soldadura con electrodo •8 Tensión secundaria en vacío •9 Valor nominal de la tensión de alimentación •10 Grado de protección de la caja •11 Refrigeración por aire forzado •12 Clase de aislamiento •13 Máximo valor de la corriente nominal de alimentación •14 Soldadora utilizable en lugares con riesgo acrecido de choques eléctricos •15 Producto apto para circular libremente en la Comunidad Europea •16 Eliminación especial •17 Máximo valor de la corriente efectiva de alimentación •18 Corriente nominal de soldadura •19 Corriente y tensión de soldadura mínimas y máximas •20 Tensión nominal de la carga •21 Relación de intermitencia •22 Normas de referencia •23 N° de matricola

NL Betekenis van de grafische symbolen op gegevensplaat

•1 Naam en adres van de fabrikant •2 Benaming apparaat •3 Driefasensengelijkrichter met INVERTER •4 TIG lassen •5 Netvoeding, aantal fasen, nominale netfrequentie •6 Doorlopende soldeerstroom •7 Aansluiting elektrodensoldeering •8 Secundaire leegloopspanning •9 Nominale waarde voedingsspanning •10 Beschermingsklasse omhulsel •11 Gedwongen luchtafkoeling •12 Isolatieklasse •13 Maximumwaarde van de nominale voedingsstroom •14 lasapparaat bruikbaar in plaatsen met verhoogd risico van elektrische schokken •15 Produkt mag overal binnen de EEG gebruikt worden •16 Speciale verwerking •17 Maximumwaarde van de effectieve voedingsstroom •18 Nominale lasstroom •19 Minimale en maximale stroom en spanning van het soldeeren •20 Nominale spanning van de lading •21 Intermittentierapport •22 Referentienorm •23 Registratienummer

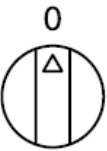











PT Significado dos símbolos gráficos da placa de dados

•1 Nome e endereço do fabricante •2 Denominação do equipamento •3 Gerador de INVERTER [INVERTOR] trifásico •4 Soldadura TIG •5 Alimentação de rede, número das fases, frequência nominal de alimentação •6 Corrente de solda continua •7 Equipamento de solda a eletrodo •8 Tensão secundária a vácuo •9 Valor nominal da tensão de alimentação •10 Grau de protecção do invólucro •11 Resfriamento a ar forçado •12 Classe de isolamento •13 Valor máximo da corrente de alimentação nominal •14 Máquina de soldar a utilizar em ambientes com risco acrescentado de choques eléctricos •15 Produto apto a circular livremente na Comunidade Europeia •16 Eliminação especial •17 Valor máximo da corrente de alimentação efectiva •18 Corrente nominal de soldadura •19 Mínima e máxima corrente e tensão de soldadura •20 Tensão nominal da carga •21 Relação de intermitência •22 Normativa de referência •23 Seriennummer

RU Значение графических символов, указанных на табличке характеристик

•1 Имя и адрес фирмы-изготовителя •2 Название системы •3 Трёхфазный инверторный генератор •4 Сварка TIG •5 Напряжение питания, число фаз, номинальная частота питания •6 Постоянный сварочный ток •7 Сварка электродом •8 Напряжение холостого хода вторичной обмотки •9 Номинальное напряжение электропитания •10 Класс защиты корпуса •11 Принудительное охлаждение воздухом •12 Класс изоляции •13 Максимальное значение эффективного тока питания •14 Сварочный аппарат, пригодный для использования в средах с повышенной опасностью ударов током •15 Изделие, предназначенное для свободного перемещения в Европейском Сообществе •16 Специальная утилизация •17 Максимальное действующее значение тока электропитания •18 Номинальный сварочный ток •19 Минимальный и максимальный ток и напряжение сварки •20 Номинальное напряжение нагрузки •21 Отношение прерывистости •22 Стандарт для ссылки •23 Серийный номер

CEA costruzioni elettromeccaniche annettoni S.p.A. Corso E. Filiberto, 27 - 23900 Lecco - Italia - www.ceaweld.com Made in ITALY		CEC	
1	MATRIX 400 AC/DC	N°	23
2	3~	IEC 60974-1 IEC 60974-10	22
3		10A/10,5V - 400A/26V	
4		U ₀ = 65V	21
		X 35% 60% 100%	
5		I ₂ 400A 320A 250A	
6		U ₂ 26V 23V 20V	20
		U ₁ = 400V	
		I _{1 max} = 22A I _{1 eff} = 10A	
7		10A/20,5V - 400A/36V	19
8		U ₀ = 65V	18
		X 35% 60% 100%	
		I ₂ 400A 320A 250A	
9		U ₂ 36V 33V 30V	17
		U ₁ = 400V	
		I _{1 max} = 28A I _{1 eff} = 15A	
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		I.C.L.H	
		10 11 12 13 14 15	

•1 	•2 	•3 	•4 	•5 	•6 	•7 	•8 	•9 
•10 	•11 	•12 						

IT Significato dei simboli grafici riportati sulla macchina

•1 Interruttore acceso/spento •2 Impianto che può essere utilizzato in ambienti con rischio accresciuto di scosse elettriche •3 Prodotto atto a circolare liberamente nella Comunità Europea •4 Tensione pericolosa •5 Terra di protezione •6 Terra •7 Attacco rapido polo positivo •8 Attacco rapido polo negativo •9 Connettore per comandi ausiliari saldatura TIG •10 Attenzione! •11 Attacco rapido connessione del tubo del gas della torcia TIG •12 Prima di utilizzare l'impianto è necessario leggere attentamente le istruzioni contenute in questo manuale

EN Meaning of graphic symbols on machine

•1 On/off switch •2 System for use in environments with increased risk of electroshock •3 Product suitable for free circulation in the European Community •4 Danger! High voltage •5 Grounding protection •6 Grounding •7 Positive pole snap-in connector •8 Negative pole snap-in connector •9 TIG weld auxiliary control connector •10 Warning! •11 Fast coupling TIG torch gas tube •12 Before using the equipment you should carefully read the instructions included in this manual

FR Interprétation des symboles graphiques reportés sur la machine

•1 Interrupteur allumé/éteint •2 Installation pouvant être utilisée dans des milieux avec augmentation du risque de secousses électriques •3 Produit pouvant circuler librement dans la Communauté Européenne •4 Tension dangereuse •5 Terre de protection •6 Terre •7 Prise rapide pôle positif •8 Prise rapide pôle négatif •9 Connecteur pour commandes auxiliaires de soudage TIG •10 Attention! •11 Raccord rapide de connexion du tube d'alimentation en gaz de la torche TIG •12 Avant d'utiliser l'installation il est nécessaire de lire avec attention les instructions qui se trouvent dans ce manuel

DE Bedeutung der grafischen Symbole auf der Maschine

•1 Schalter EIN/AUS •2 Möglicher Gebrauch der Anlage in Umgebung mit erhöhter Gefahr elektrischer Schläge •3 Für den freien Warenverkehr in der EU zugelassenes Produkt •4 Gefährliche Spannung •5 Schutzerde •6 Erdung •7 Schnellanschluß Pluspol •8 Schnellanschluß Minuspol •9 Steckverbinder für die Zusatzsteuerungen für das WIG-Schweißen •10 Achtung! •11 Schnellanschluss für Gasleitung des WIG-Brenners •12 Vor der Anwendung der Anlage sind die Gebrauchsanweisungen des vorliegenden Handbuchs sorgfältig zu lesen

ES Significado de los símbolos gráficos referidos en la máquina

•1 Interruptor conectado/apagado •2 Instalación que puede ser utilizada en ambientes con grande riesgo de descargas eléctricas •3 Producto apto para circular libremente en la Comunidad Europea •4 Tensión peligrosa •5 Tierra de protección •6 Tierra •7 Toma rápida polo positivo •8 Toma rápida polo negativo •9 Conector para mandos auxiliares soldadura TIG •10 Atención! •11 Acoplamiento rápido conexión del tubo del gas del portaelectrodo TIG •12 Antes de utilizar la instalación, es necesario leer atentamente las instrucciones contenidas en este manual

NL Betekenis grafische symbolen op het apparaat weergeven

•1 Onderbreker aan-uit •2 Apparaat bruikbaar in ruimte met verhoogd risico voor elektrische schokken •3 Produkt mag overal binnen de EEG gebruikt worden •4 Gevaarlijke spanning •5 Beschermingsaarding •6 Aarding •7 Snelkoppeling positieve pool •8 Snelkoppeling negatieve pool •9 Verbindingsstuk voor hulpwerkstukken TIG-lassen •10 Let op! •11 Snelkoppeling verbinding van de gasbuis van de TIG-lasspuit •12 Voordat de aansluiting in gebruik genomen wordt is het noodzakelijk om aandachtig de gebruiksaanwijzing in deze handleiding te lezen

PT Significado dos símbolos gráficos existentes na máquina

•1 Interruptor ligado/desligado •2 Equipamento que pode ser utilizado em ambientes com risco acrescentado de choques eléctricos •3 Produto apto a circular livremente na Comunidade Europeia •4 Tensão perigosa •5 Terra de protecção •6 Terra •7 Encaixe rápido polo positivo •8 Encaixe rápido polo negativo •9 Conector para comandos auxiliares de soldagem TIG •10 Atenção! •11 Acoplamento rápido da conexão do tubo do gás do maço TIG •12 Antes de usar a Instalação é necessário ler atentamente as instruções contidas neste manual

RU Значение графических символов на сварочном аппарате

•1 Двухпозиционный выключатель •2 Агрегат, пригодный для использования в средах с повышенной опасностью ударов током •3 Изделие, предназначенное для свободного перемещения в Европейском Сообществе •4 Опасное напряжение •5 Защита заземлением •6 Заземление •7 Быстрый соединитель положительного полюса •8 Быстрый соединитель отрицательного полюса •9 Соединитель для дополнительных команд сварки TIG •10 Внимание! •11 Быстрое соединение фитинга газовой трубы горелки TIG •12 Перед использованием агрегата необходимо внимательно прочитать инструкции, приведенные в данном руководстве

IT Lista ricambi

DE Ersatzteilliste

PT Lista de peças de substituição

EN Spare parts list

ES Lista repuestos

RU Перечень запчастей

FR Liste pièces de rechange

NL Onderdelenlijst



Pos.	Cod.	Descrizione	Description
1	352435	Coperchio pannello posteriore	Rear panel cover
2	438888	Manopola	Knob
3	447828	Tastiera a membrana	Key board
4	352420	Pannello frontale	Front panel
5	403617	Attacco rapido	Quick connection
6	467087	Adesivo frontale attacco rapido	Quick connection front sticker
7	419050	Pres a comandi a distanza	Remote Control Socket
8	403635	Attacco rapido gas	Gas quick connection
9	352422	Guida laterale	Side guide
10	420522	Coperchio	Cover

IT Lista ricambi

DE Ersatzteilliste

PT Lista de peças de substituição

EN Spare parts list

ES Lista repuestos

RU Перечень запчастей

FR Liste pièces de rechange

NL Onderdelenlijst



Pos.	Cod.	Descrizione	Description
11	352430	Coperchio pannello frontale	Front panel cover
12	438700	Manopola interruttore	Switch knob
13	352425	Pannello posteriore	Rear panel
14	485040	Tubo gas	Gas tube
15	419049	Presca pannello 9 poli	9 Pin panel plug
16	235988	Cavo linea	Mains cable
17	427876	Pressacavo con ghiera	Cable clamp with lock ring

IT Lista ricambi

ES Lista repuestos

RU Перечень запчастей

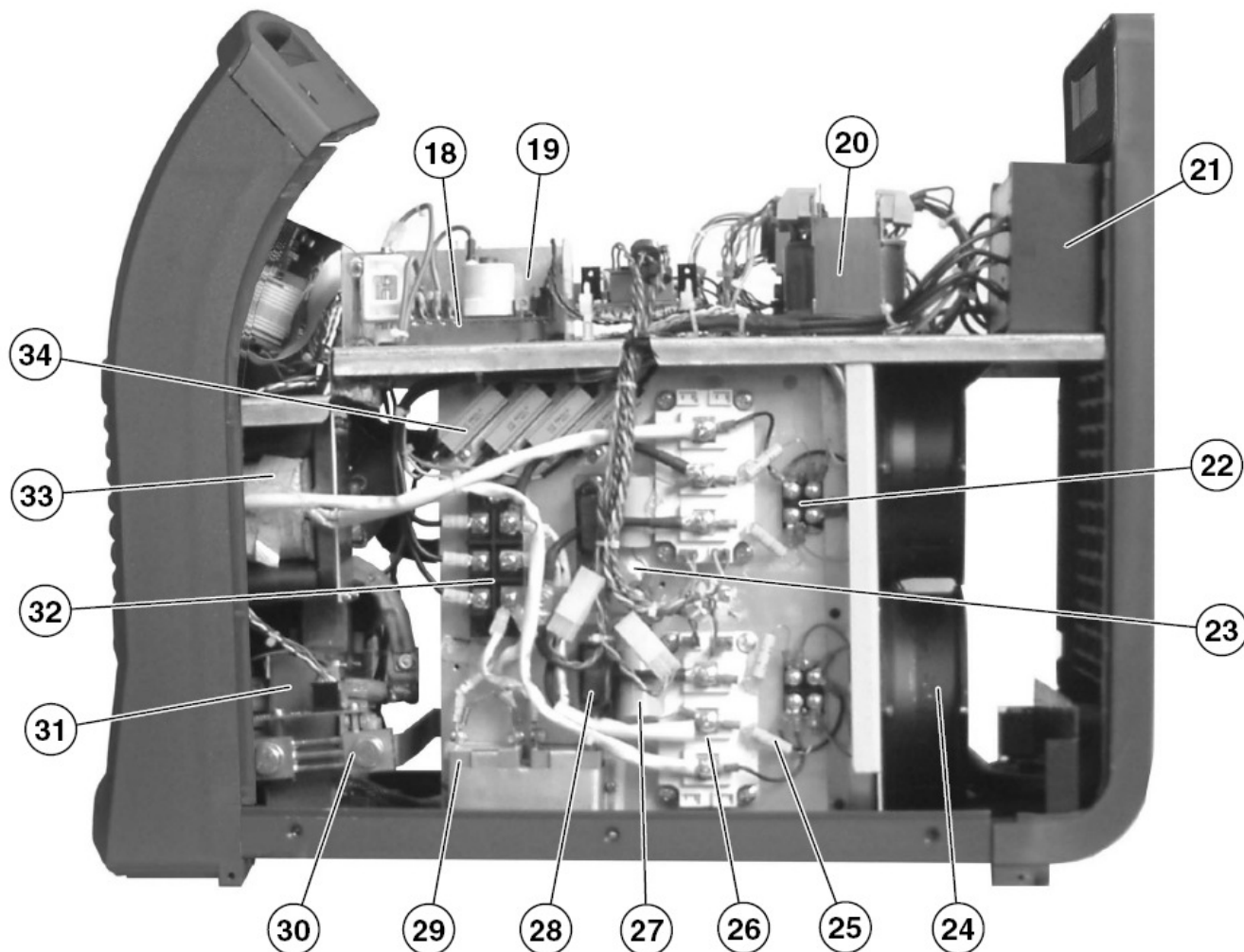
EN Spare parts list

NL Onderdelenlijst

FR Liste pièces de rechange

PT Lista de peças de substituição

DE Ersatzteilliste



Pos.	Cod.	Descrizione	Description
18	377059	Scheda spinterometro	Spark gap PCB
19	463235	Supporto scheda spinterometro	Spark gap PCB support
20	481458	Trasformatore ausiliario	Auxiliary transformer
21	427667	Filtro EMC	EMC Filter
22	423242	Diodo primario di snubber	Snubber primary diode
23	478787	Termostato su dissipatore primario	Thermostat on primary heatsink
24	486380	Ventilatore	Fan
25	418781	Condensatore 4700pF - 1500V	4700pF - 1500V Capacitor
26	286030	IGBT primario	Primary IGBT
27	418782	Condensatore 1µF - 850V	1µF - 850V Capacitor
28	481948	Trasformatore di corrente	Current transformer
29	418783	Condensatore di livellamento 25µF - 1000V	25µF - 1000V Capacitor
30	376485	Shunt	Shunt
31	240210	Induttore	Inductor
32	455503	Ponte raddrizzatore	Rectifier
33	481418	Trasformatore	Transformer
34	457122	Resistore di snubber primario	Snubber primary resistor

IT Lista ricambi

DE Ersatzteilliste

PT Lista de peças de substituição

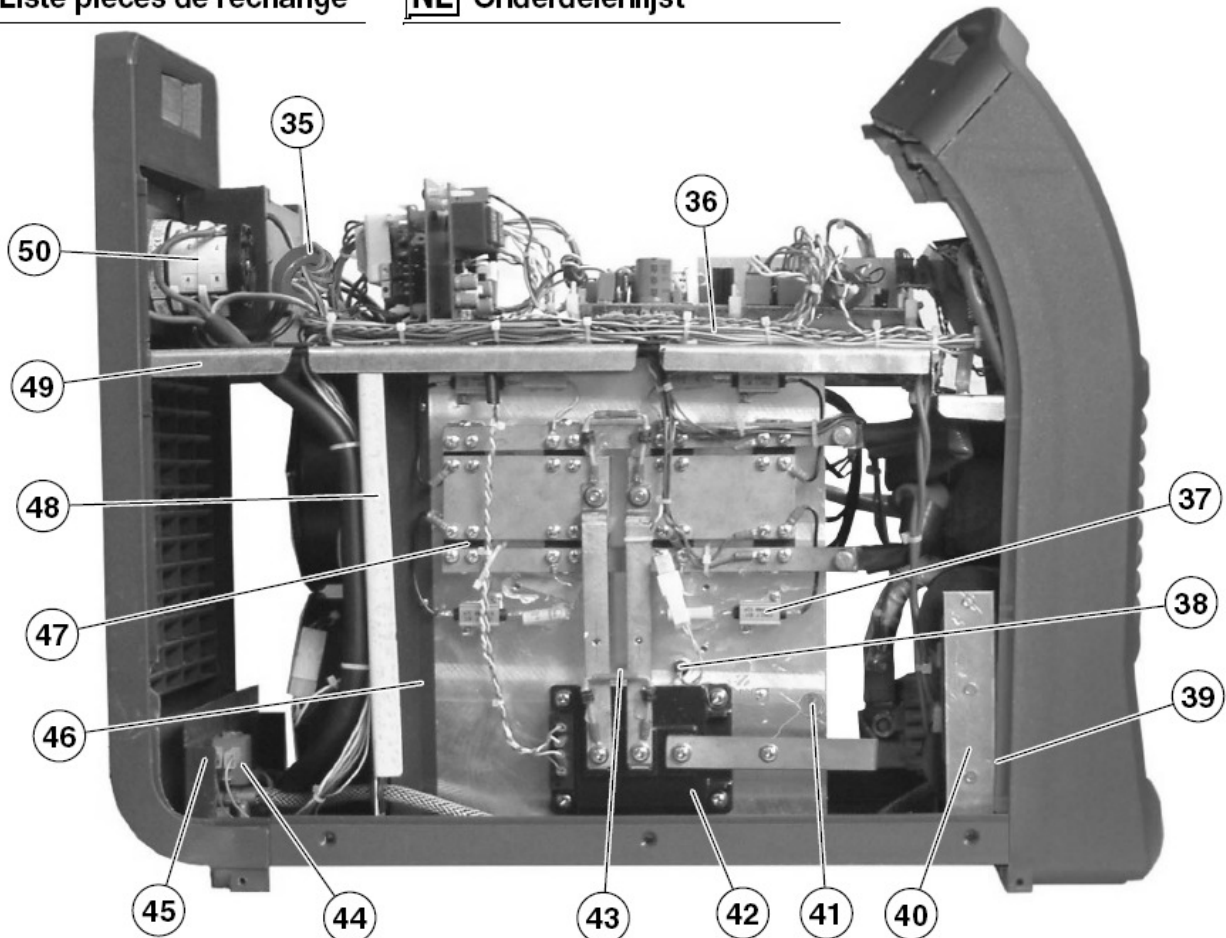
EN Spare parts list

ES Lista repuestos

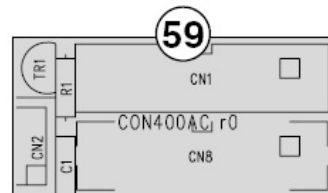
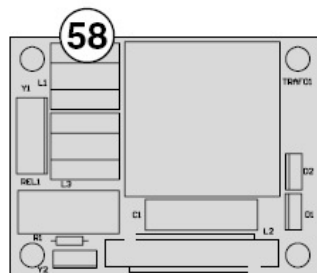
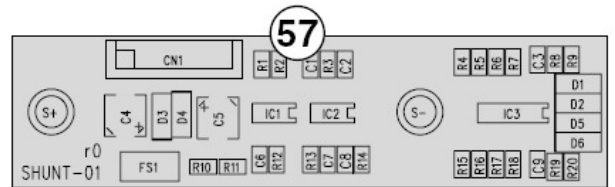
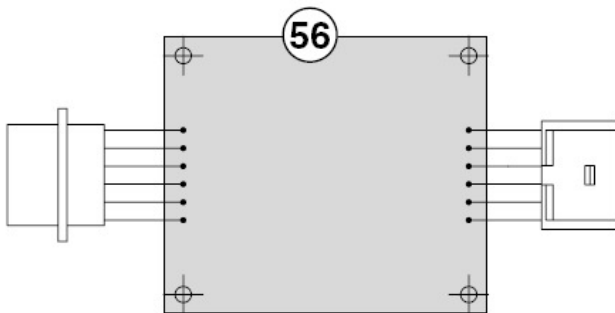
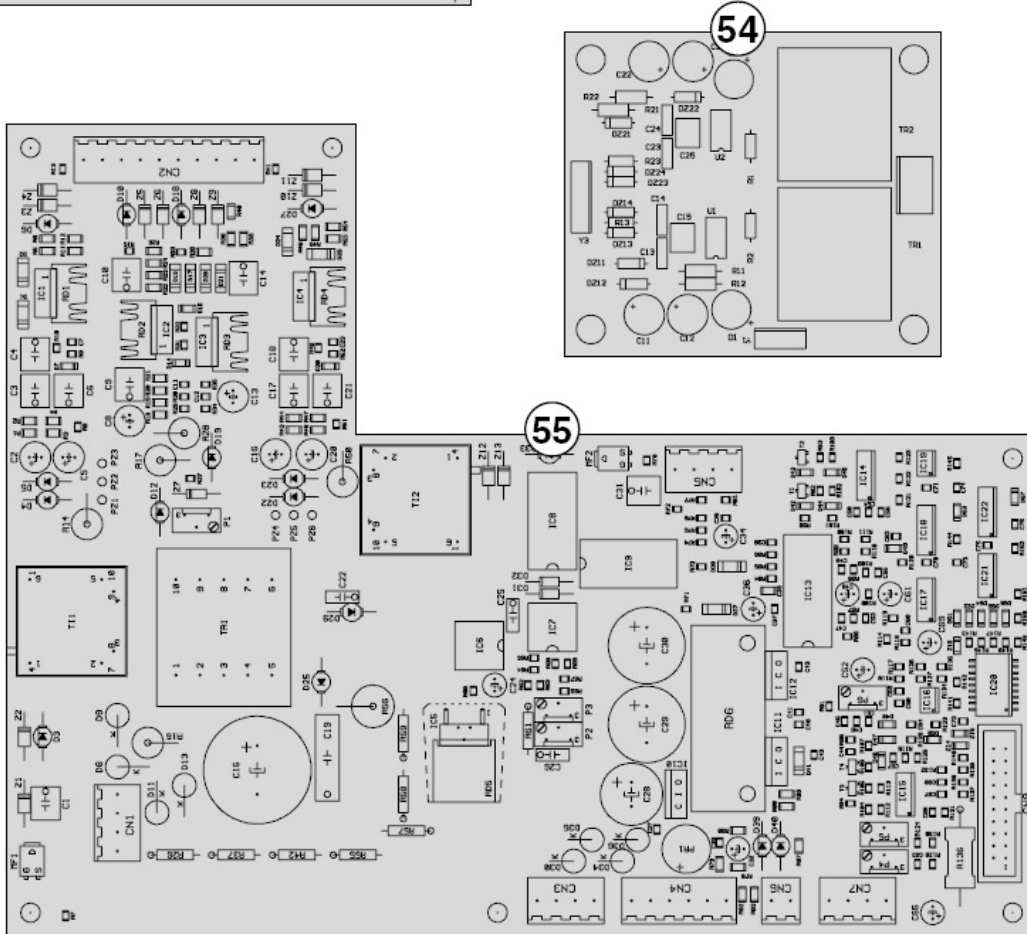
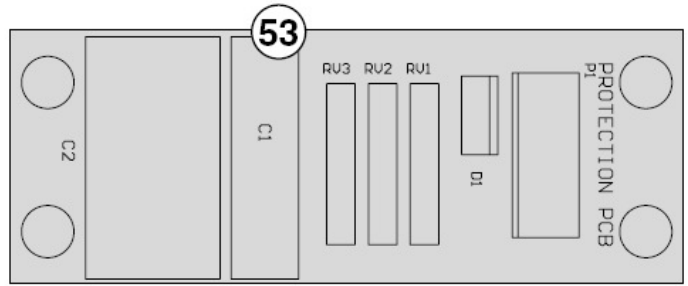
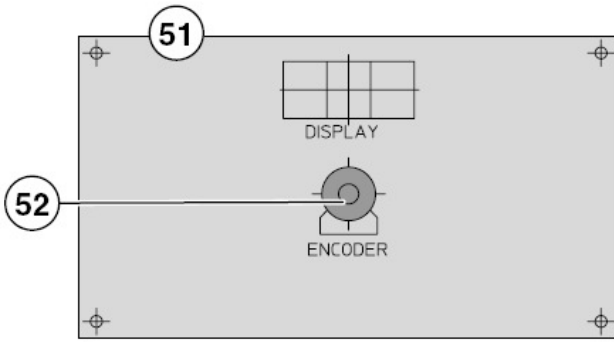
RU Перечень запчастей

FR Liste pièces de rechange

NL Onderdelenlijst



Pos.	Cod.	Descrizione	Description
35	427404	Ferrite soppressione EMI	EMI suppression ferrite ring
36	413682	Cablaggio ausiliario	Auxiliary wiring
37	457123	Resistore di snubber secondario	Snubber secondary resistor
38	478848	Termostato su dissipatore secondario	Thermostat on secondary heatsink
39	427682	Filtro HF	HF Filter
40	481574	Trasformatore HF	HF transformer
41	418877	Condensatore EMC	EMC Capacitor
42	286029	IGBT secondario	Secondary IGBT
43	418915	Scaricatore di protezione	Surgeblock
44	425937	Elettrovalvola gas	Gas solenoide valve
45	404975	Basamento	Base
46	466140	Paratia proteggi polvere	Dust protection
47	423236	Diodo secondario di snubber	Snubber secondary diode
48	466135	Piastra supporto ventilatori	Fan support plate
49	449562	Piastra superiore	Upper plate
50	435760	Interruttore alimentazione	Mains switch
51	377068	Scheda interfaccia digitale	Digital interface PCB
52	454150	Encoder	Encoder
53	376927	Scheda relè	Relay PCB
54	376777	Scheda driver	Driver PCB
55	376948	Scheda controllo inverter	Inverter control PCB
56	376930	Filtro torcia ed accessori	Torch filter and accessories
57	376946	Scheda segnale amplificato shunt	Amplified shunt signal PCB
58	376773	Scheda stabilizzatrice arco di saldatura	Welding arc stabilizer PCB
59	376968	Scheda interfaccia PWM-Digitale	Digital PWM interface 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. 352420
Per saldatrice mod. **PoWer TIG 400 AC/DC 400V - 50/60Hz**
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. 352420
for welding machine type **PoWer TIG 400 AC/DC 400V - 50/60Hz**
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 352420
pour soudeuse modèle **PoWer TIG 400 AC/DC 400V - 50/60Hz**
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 352420
für Schweißmaschine Mod. **PoWer TIG 400 AC/DC 400V - 50/60Hz**
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 obtiene de la chapa datos colocada sobre la instalación
- 4) El número de matrícula de la soldadora misma

EJEMPLO

N. 2 piezas código 352420
para soldadora modelo **PoWer TIG 400 AC/DC 400V - 50/60Hz**
Matricula 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 352420
voor lasapparaat model **PoWer TIG 400 AC/DC 400V - 50/60Hz**
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 placa de dados do equipamento
- 4) O número de matrícula da própria máquina de soldar

EXEMPLO

N° 2 peças código n. 352420
para máquina de soldar mod. **PoWer TIG 400 AC/DC 400V - 50/60Hz**
Matricula n.

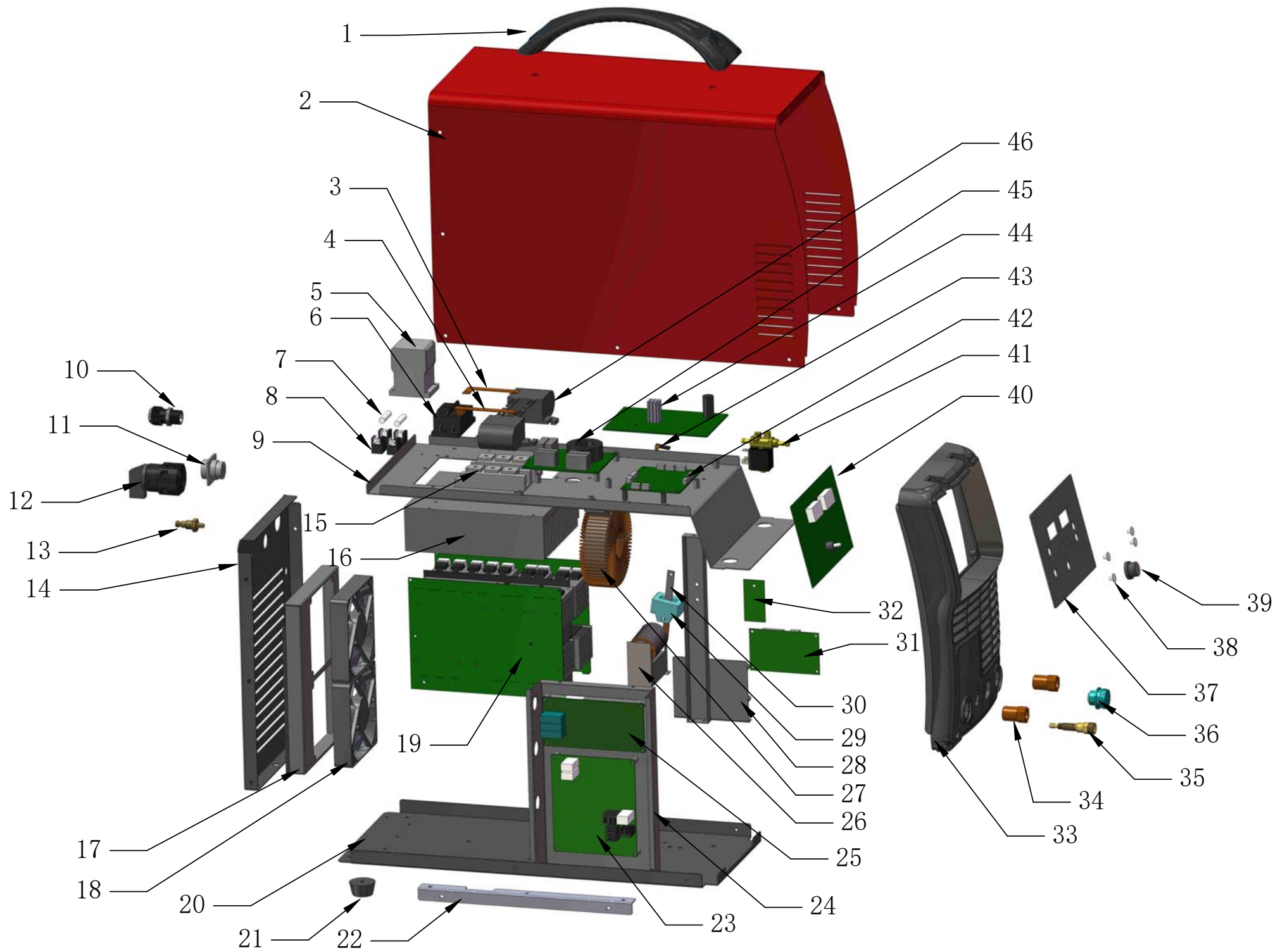
RU Заказ запчастей

Для заказа запчастей необходимо четко указать:

- 1) Код детали
- 2) Тип агрегата
- 3) Напряжение и частота, которые можно найти на табличке номинальных характеристик на оборудовании
- 4) Серийный номер

ПРИМЕР

2 шт., код № 352420
Для устройства мод. **PoWer TIG 400 AC/DC 400V - 50/60Hz**
Серийный номер №



S.006RM.568-TR POWER PLUS TIG 400 AC/DC PULSE G.U.

No	Item code	SAP KODU	Description	Unit	QTY
1	8.253RM.003-B	6064200067	FLAMA handle	PCS	1
2	8.301RM.565-C	*	Shell	PCS	1
3	8.511RM.020	*	Connecting Copper Bars (II)	PCS	1
4	8.511RM.021	*	Connecting Copper Bars (III)	PCS	1
5	7.201.112	*	AC contactor	PCS	1
6	7.411.115-B	6064100062	Three Phase rectifier	PCS	1
7	7.202.123	*	Fuses (extended)	PCS	2
8	22307070005	*	6X30 fuse holder with wire	PCS	2
9	8.062RM.565-F	*	Circuit installation board	PCS	1
10	7.155.003	*	Cable joints	PCS	1
11	7.132.114-A	1000901989	14 pin aviation socket	PCS	1
12	7.232.033-C	6064200400	Rotating switch	PCS	1
13	8.462.116	*	Quick plug	PCS	1
14	8.068RM.565	6064200094	Rear panel	PCS	1
15	7.425.105-A	6064100058	IGBT module	PCS	2
16	8.422RM.305	*	IGBT heat sink	PCS	1
17	8.122RM.565	*	Fan installation plate	PCS	2
18	7.720.010-A	6064100398	Fan	PCS	1
19	S.200RM.565	6064000130	TIG 400AC/DC PULSE IGBT BLOCK	PCS	1
20	8.055RM.565-A	*	Baseboard	PCS	1
21	8.046RM.002	*	Machine foot	PCS	2
22	8.123RM.370	*	Water tank connection plate	PCS	2
23	W.496RM.408-C	6064000078	PCBA, TIG400ACDC auxiliary power board	PCS	1
24	8.123RM.317	*	Installation box	PCS	1
25	W.496RM.409-C	6064000079	capacitor board	PCS	1
26	L.271RM.565-B	*	inductance	PCS	1
27	L.185RM.565-D	6064100422	Amorphous transformer	PCS	1
28	8.123RM.568	*	High frequency mounting plate	PCS	1
29	7.321.305	*	Hall Current Sensor	PCS	1
30	8.511RM.015	*	Sheet metal, connecting copper bars (1)	PCS	2
31	W.496RM.247-F	6064000071	PCB substrate, three-phase high-frequency board	PCS	1
32	W.496RM.450	6064000126	PCBA, TIGACDC high-frequency absorption plate	PCS	1
33	8.069RM.971	6064200046	front panel	PCS	1
34	7.152.312-A	*	Euro connector	PCS	2
35	8.462.028	6064200062	Front air connector	PCS	1
36	7.132.012-B	6064100570	12 pin aviation socket	PCS	1
37	8.306RM.565	*	Panel mounting plate	PCS	1
38	7.224.300-B1	*	Key shaped switch cap (Minghan)	PCS	4
39	7.458.440	*	knob	PCS	1
40	W.496RM.B99	6064000040	ACDC TIG front PCBA	PCS	1
41	7.253.051-A	*	solenoid valve	PCS	1
42	WP.496RM.312-E-1	6064000172	Fully functional TIG400ACDC control board	PCS	1
43	W.496RM.901	6064000162	PCBA, wireless circuit board	PCS	1
44	W.496RM.427-Q	6064000081	ACDC power board	PCS	1
45	W.496RM.286-D	6064000072	Wide voltage EMC board	PCS	1
46	2120I040010	*	Metallized thin film capacitors	PCS	2

Power TIG Series



GeKaMac[®]



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