

POWER ARC 4200



GeKaMac®



Users Manual

Please Read and Understand This Manual
Before Operating The Welding Machine

www.gedikwelding.com

Introduction	2
Description	2
Technical data	3
Usage limits (IEC 60974-1)	3
How to lift up the machine	3
Open the packaging	3
Installation	3
Connection to the electrical supply	3
Instructions for use	4
Electrode welding (MMA)	4
TIG welding	5
Maintenance	5
Optional	6
The pointing out of any difficulties and their elimination	6
Procedure for cover assembly and disassembly	6
Digital interface PCB replacement	6
Meaning of graphic symbols on machine	7
Key to the electrical diagram	7
Colour key	7
Wiring diagram	8

Introduction

Thank you for buying our product.

In order to get the best performance out of the plant and ensure the maximum lifespan of its parts, the use and maintenance instructions contained in this manual must be read and strictly complied with, as well as **the safety instructions contained in the relevant folder**. If repairs to the plant are required, we recommend that our clients contact our service centre workshops, as they have the necessary equipment and personnel that are specifically trained and constantly updated.

All our machines and equipment are constantly developed and so changes may be made in terms of their construction and features.

Description

Powerful, compact, and light-weight - thanks to the innovative digital welding control the **POWER ARC 4200** units are the highest performance and most technically advanced electrode welding generators you can find.

Built according to the very latest IGBT based inverter technology, these DC power sources thanks to their excellent arc characteristics, are recommended for highest standard applications with any electrode.

POWER ARC 4200 units guarantee absolute stability of welding parameters and thanks to their "characteristic dynamic speed" they are ideal for quality welding particularly difficult jobs using basic and cellulosic electrodes. The **POWER ARC 4200** units can also be used for TIG welding with a "Lift" type ignition.

FEATURES

- Innovative and compact design.
- Reduced weight and size, easy-to-carry.
- Metallic main structure with shock-proof plastic front panel.
- Controls protected against accidental blows.
- Robust handle integrated into the chassis.
- Slanting front panel with wide range of visibility from all angles to facilitate reading and adjusting parameters.
- Digital ammeters and voltmeters are standard fittings, with pre-setting of welding current and saving of the latest value (Hold function).
- Digital control of all welding parameters.
- Possibility of saving the welding parameters (99 automatic welding points - JOBS).
- Self-diagnosis device.
- Exceptional welding characteristics for all types of electrode, including cellulosic.
- MMA welding:
 - "Arc Force" adjustable to select the best dynamic characteristics for the welding arc.
 - "Hot Start" adjustable to improve ignition with particularly difficult electrodes.
 - Anti-sticking function to avoid the electrodes sticking.
- TIG welding:
 - TIG welding using the innovative "Lift" type thermally controlled ignition (TCS). Ignition comes about precisely and quickly, reducing the inclusions of tungsten to a minimum and doing away with incisions into the workpiece to be welded.
 - A synergic SWS (Smart welding stop) system that reduces electrode consumption and avoids oxidation of the welded joint.
- Overheating thermostatic protection.
- Automatic compensation for mains voltage fluctuations within +15% -20%.
- Safety barrier against excess voltage from mains.
- The VRD (Voltage Reduction Device) can be activated, which reduces voltages to below 12 V, which means that the welding machine can be used in ambient conditions in which there is a high electrical risk, thereby providing maximum operator safety.
- An "Energy Saving" function that only activates ventilation of the generator when necessary, making significant energy saving possible and reducing maintenance, due to the small quantity of dust and pollutants that are taken in.
- 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.
- Can be connected to motor-powered generators of adequate capacity providing high dependability - 30 kVA (MATRIX 420-4200 E-MG).
- Useable with power supply cables more than 100 m long.
- Reduced energy consumption.

- This generator also conforms to all the standards and directives in force in the European Community.

Technical data

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

Table 1

Model	POWER ARC 4200	
Three-phase input 50/60 Hz	V	400 +15% -20%
Power supply: Z_{max}	Ω	0,034
Input power @ I_2 Max	kVA	17,4
Delayed fuse (I_2 @ 100%)	A	16
Power factor / $\cos\phi$		0,95 / 0,99
Efficiency degree	η	0,88
Open circuit voltage	V	100
Current range	A	5 ÷ 420
Duty cycle @ 100% (40°C)	A	270
Duty cycle @ 60% (40°C)	A	340
Duty cycle @ 40% (40°C)	A	420
Usable electrodes	mm	1,6 ÷ 6,0
Standards	IEC 60974-1 IEC 60974-10  	
Protection class	IP 23 S	
Insulation class	H	
Dimensions   	mm	500 - 425 - 220
Weight	kg	20

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 0,034 Ω 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 0,034 Ω .

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 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 I_2 max nominal current in complete safety for a period of work of 40% 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 40% 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" flashing on control panel display (for further information see the MX control panel manual). After several minutes the overheat cut-off rearms automatically and the welder is ready for use again.

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 weld machine has a strong handle all in one with the frame, used for transporting the machine manually only.

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:

- **POWER ARC 4200** weld unit.
- Welding cables or RTA TIG torch (optional).
- Trolley for transportation (optional).
- Protective roll bar (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 environment in which the equipment is installed must be suitable for the casing's protection level.

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.

The welding unit is characterised by the following levels:

- Protection level IP 23 S indicates that the equipment can be used both indoors and outdoors.
- Use class "S" means that the equipment can be used in conditions subject to heightened electrical shock.

Connection to the electrical supply

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

Before connecting the welding machine to the mains power supply, make sure that rated voltage and frequency correspond to those provided by the mains power supply and that the welding machine's power switch is turned to "O".

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

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 ground terminal must be connected to the ground conducting wire (YELLOW-GREEN) of the supply.

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

Table 2

Model		POWER ARC 4200
Input power @ I ₂ Max	kVA	17,4
Delayed fuse (I ₂ @ 100%)	A	16
Duty cycle @ 40% (40°C)	A	420
Mains cable		
Length	m	4
Section	mm ²	2,5
Ground cable		
Section	mm ²	50

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.

Instructions for use

COMMAND AND CONTROL UNITS (Fig. A)

- Pos. 1** POWER ARC 4200 command and control panel. For detailed information on the control panel, see the instruction manual enclosed.
- Pos. 2** 6 pole remote control connector.
- Pos. 3** Positive pole quick connection.
- Pos. 4** Negative pole quick connection.
- Pos. 5** Power supply switch. In the "O" position the welder is off.
- Pos. 6** Mains cable.

Electrode welding (MMA)

Electrode welding is used for welding most metals (various types of steels, etc.) using rutilic, basic, and cellulosic electrodes with diameters from 1.6 mm to 6.0 mm.

- Connecting the welding cables (Fig. B):
Disconnect the machine from the mains power supply and connect the welding cables to the output terminals (Positive and Negative) of the welding machine, attaching them to the clamp and ground with the polarity specified for the type of electrode being used (Fig.B). Always follow the electrode manufacturer's instructions. The welding cables must be as short as possible, they must be near to one another, positioned at or near floor level. Do not touch the electrode clamp and the ground clamp simultaneously.
- Switch the welding machine on by moving the power supply switch to I (Pos. 5, Fig. A).
- Make the adjustments and select the parameters on the control panel (for further information see the MX control panel manual).
- Carry out welding by moving the torch to the workpiece. Strike the arc (press the electrode quickly against the metal and then lift it) to melt the electrode, the coating of which forms a protective residue. Then continue welding by moving the electrode from left to right, inclining it by about 60° compared with the metal in relation to the direction of welding.

PART TO BE WELDED

The part to be welded must always be connected to ground in order to reduce electromagnetic emission. Much attention must be afforded so that the ground 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 ground, you should make a direct connection between the part and the ground shaft. In those countries in which such a connection is not allowed, connect the part to be welded to ground using suitable capacitors, in compliance with the national regulations.

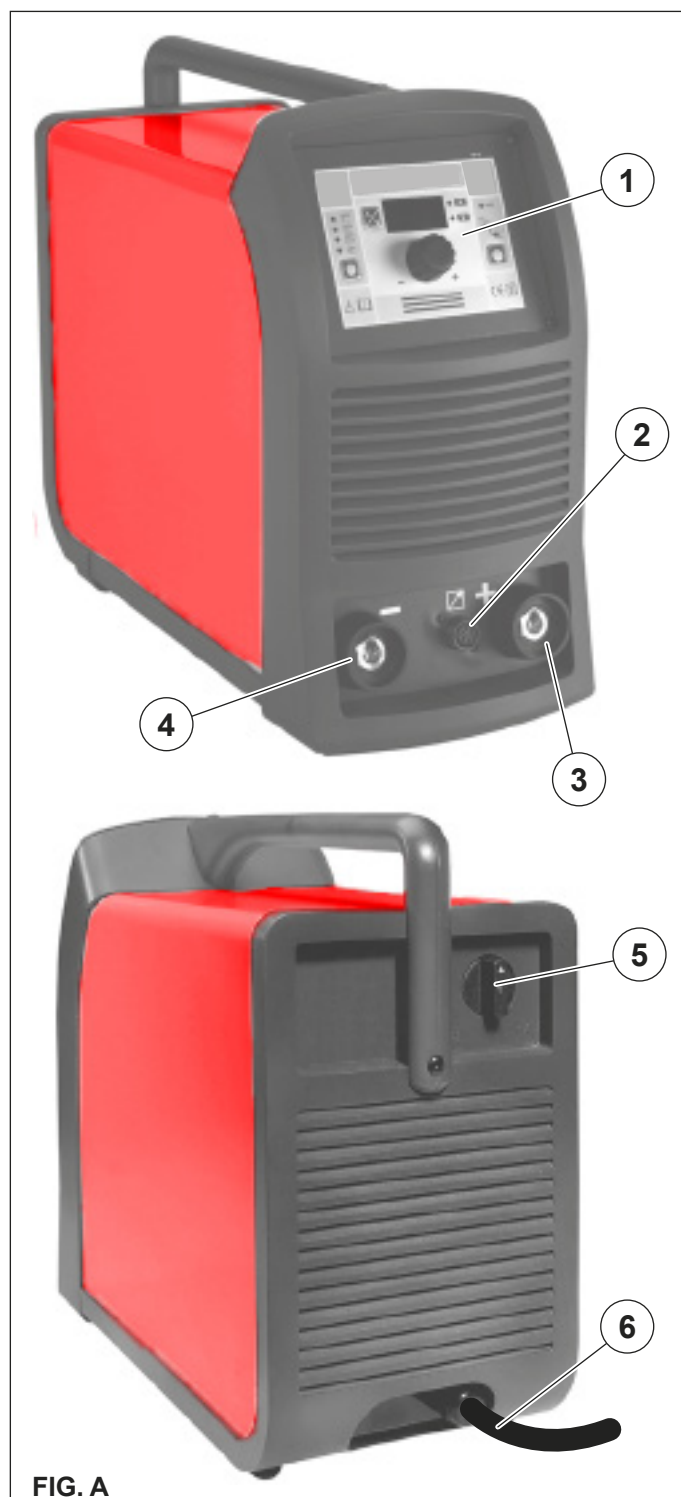


FIG. A

Table 3

WELDING THICKNESS (mm)	Ø ELECTRODE (mm)
1,5 ÷ 3	2
3 ÷ 5	2,5
5 ÷ 12	3,2
≥ 12	4

Table 4

Ø ELECTRODE (mm)	CURRENT (A)
1,6	30 ÷ 60
2	40 ÷ 75
2,5	60 ÷ 110
3,2	95 ÷ 140
4	140 ÷ 190
5	190 ÷ 240
6	220 ÷ 330

WELDING PARAMETERS

Table 3 shows some general indications for the choice of electrode, based on the thickness of the parts to be welded. The values of current to use are shown in the table 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.

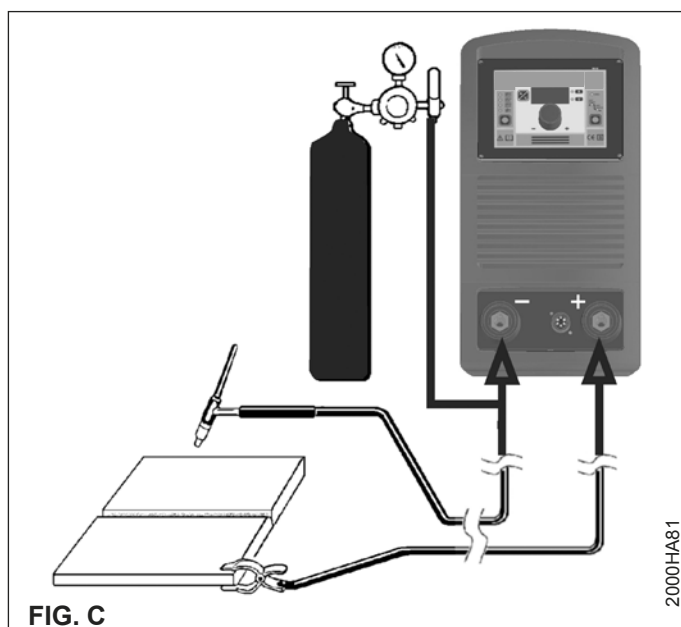
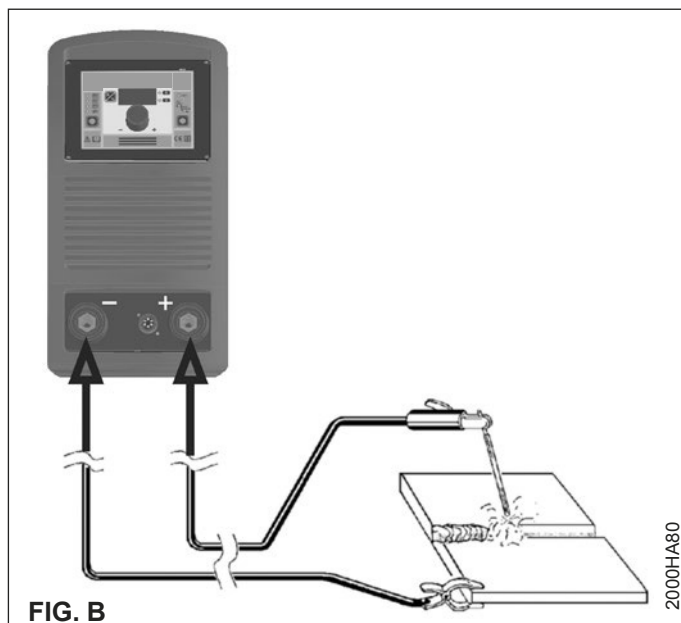
A fairly approximate indication of the average current to use in the welding of electrodes for ordinary steel is given by the following formula:

$$I = 50 \times (\varnothing e - 1)$$

Where:

I = intensity of the welding current

$\varnothing e$ = electrode diameter



Example:

For electrode diameter 4 mm

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

TIG welding

TIG welding melts the metal of the workpiece, using an arc struck by a tungsten electrode. The fusion bath and the electrode are protected by gas (Argon). This type of welding is used to weld thin sheet metal or when elevated quality is required.

- 1) Connecting the welding cables (Fig. C):
 - Connect one end of the gas hose to the gas connector on the TIG torch and the other end to the Argon cylinder and open it.
 - With the machine switched off:
 - Connect the ground cable to the snap-on connector marked + (positive).
 - Connect the relative ground clamp to the workpiece or to the workpiece support in an area free of rust, paint, grease, etc..
 - Connect the TIG torch power cable to the snap-on connector marked - (negative).
- 2) Switch the welding machine on by moving the power supply switch to I (Pos. 5, Fig. A).
- 3) Make the adjustments and select the parameters on the control panel (for further information see the MX control panel manual).
- 4) Open the gas cylinder and regulate the flow by adjusting the valve on the TIG torch by hand.
- 5) Ignite the electric arc by contact, using a decisive, quick movement at the welding current set ("Lift" type ignition - Fig. D).

To end welding:

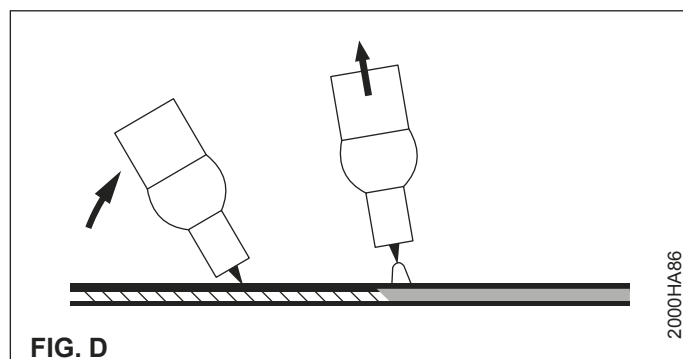
- Lift the torch slowly, at a certain point the welding current decreases, and then stop.
 - The welding machine follows an automatic down slope along with extinguishing of the arc.
- 6) When you have finished welding remember to shut the valve on the torch and the gas cylinder.

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.



Optional

- **CD 6** manual remote control.

When this accessory is activated the welding current can only be remote controlled (value adjustable from 5 to 420A), and this value will be shown on the welding machine's display.

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.

The remote control can be connected whether the welding machine is on or off.

NOTE: The POWER ARC 4200 control panel has a **STAND-BY** function that, when the remote control is on, switches off the inverter when the minimum welding current value is reached (to reinstate normal, correct functioning of the machine, increase the welding current value by rotating the remote control knob).

- External mechanical polarity inverter.



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.



Procedure for cover assembly and disassembly

Proceed as follows (Fig. E):

- 1) Unscrew the two screws fastening the handle.
- 2) Take off handle pulling it backwards.
- 3) Take off covering lid and unscrew the 3 screws fastening the top.
- 4) Use both hands to push the top towards the front part freeing the back part.
- 5) Remove top by lifting with both hands.

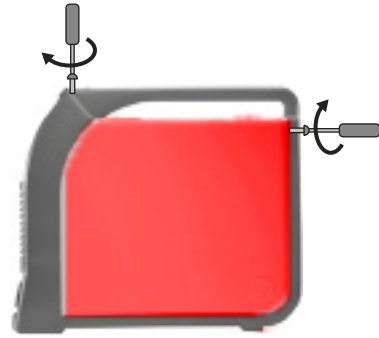
Proceed vice versa for assembly.



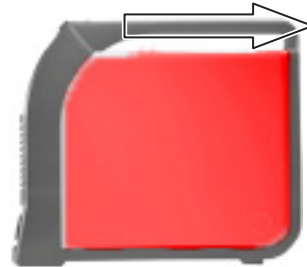
Digital interface PCB replacement

- Unscrew the 4 screws fastening the front rack panel.
- Remove control dials.
- Extract wiring connectors from the digital interface PCB.
- Unscrew small supporting columns.
- Remove the digital interface PCB by lifting it out of its supports.
- Proceed vice versa to assemble the new digital interface PCB.

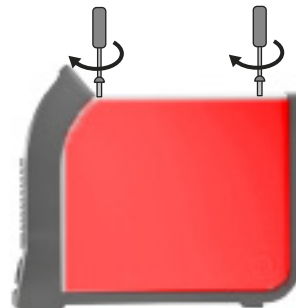
1



2



3



4



5



FIG. E

Meaning of graphic symbols on machine

	Power supply switch
	System for use in environments with increased risk of electroshock
	Product suitable for free circulation in the European Community
	Dangerous voltage
	Grounding
	Positive pole snap-in connector
	Negative pole snap-in connector

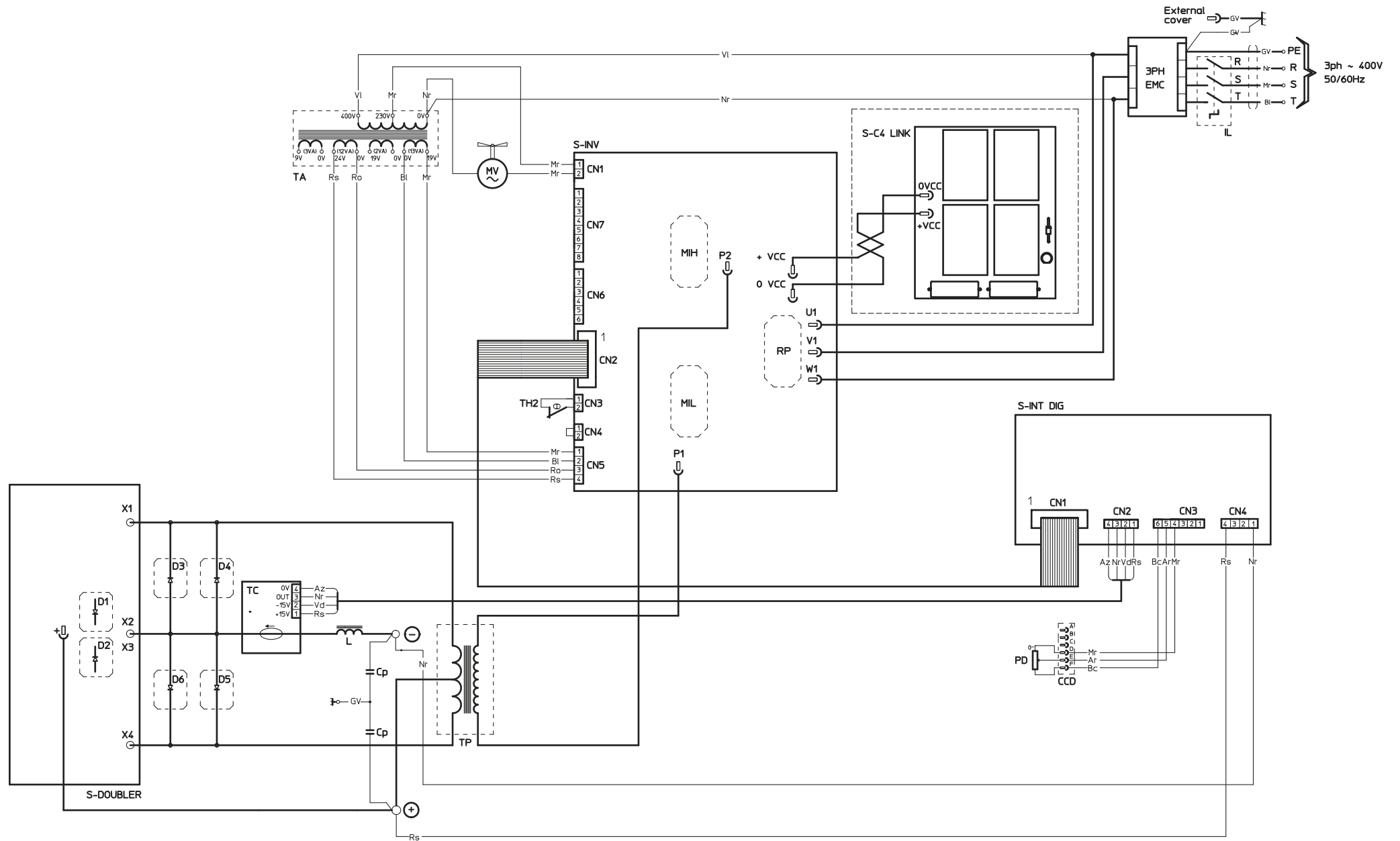
	Remote control socket
	Warning!
	Before using the equipment you should carefully read the instructions included in this manual
	TIG welding
	MMA welding
	Special disposal

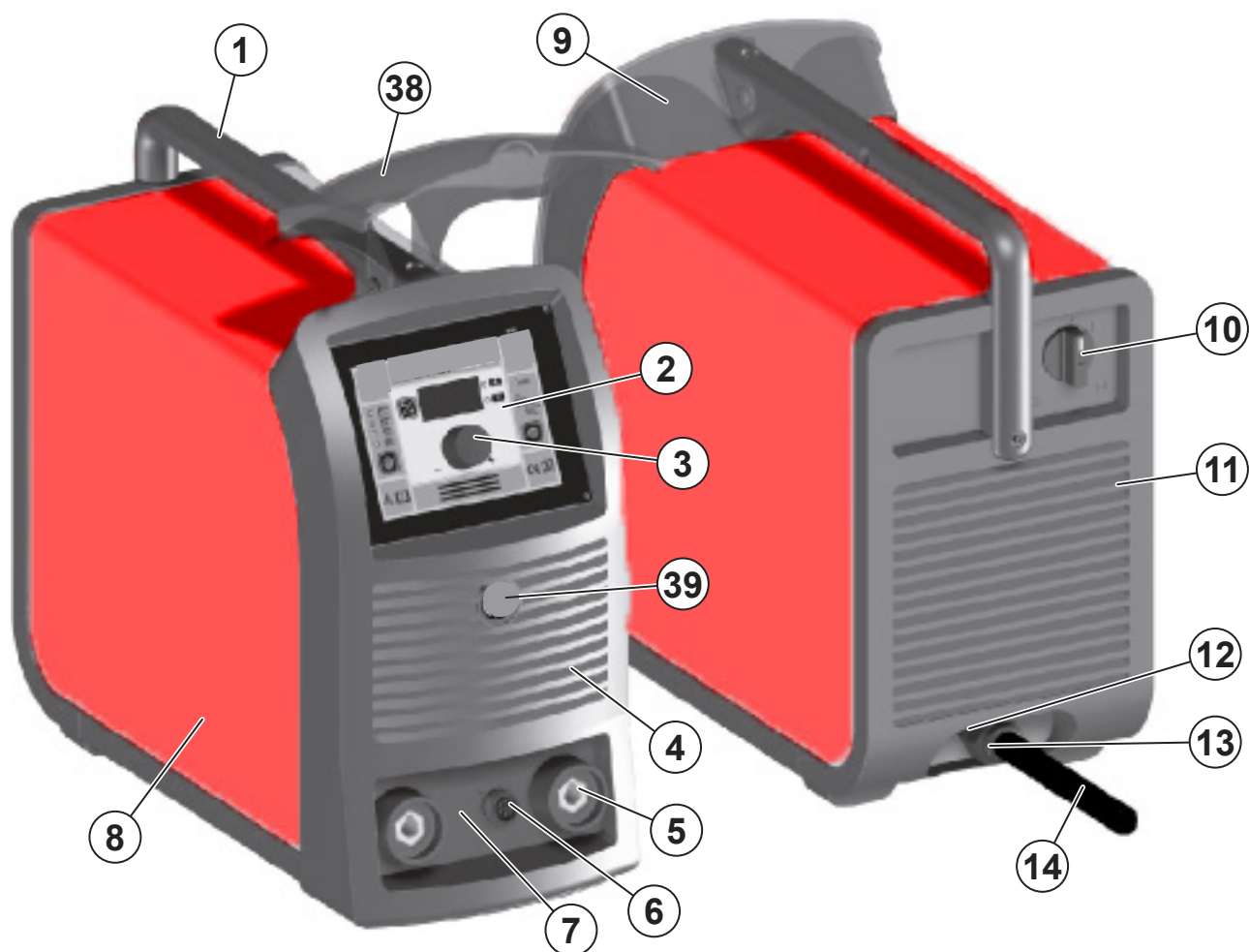
•1 3PH-EMC	•2 CCD	•3 Cp	•4 D1-2-3-4-5-6	•5 IL	•6 L	•7 MIH
•8 MIL	•9 MV	•10 P1	•11 P2	•12 PD	•13 RP	•14 S-C4 LINK
•15 S-DOUBLER	•16 S-INT DIG	•17 S-INV	•18 TA	•19 TC	•20 TH2	•21 TP

Key to the electrical diagram

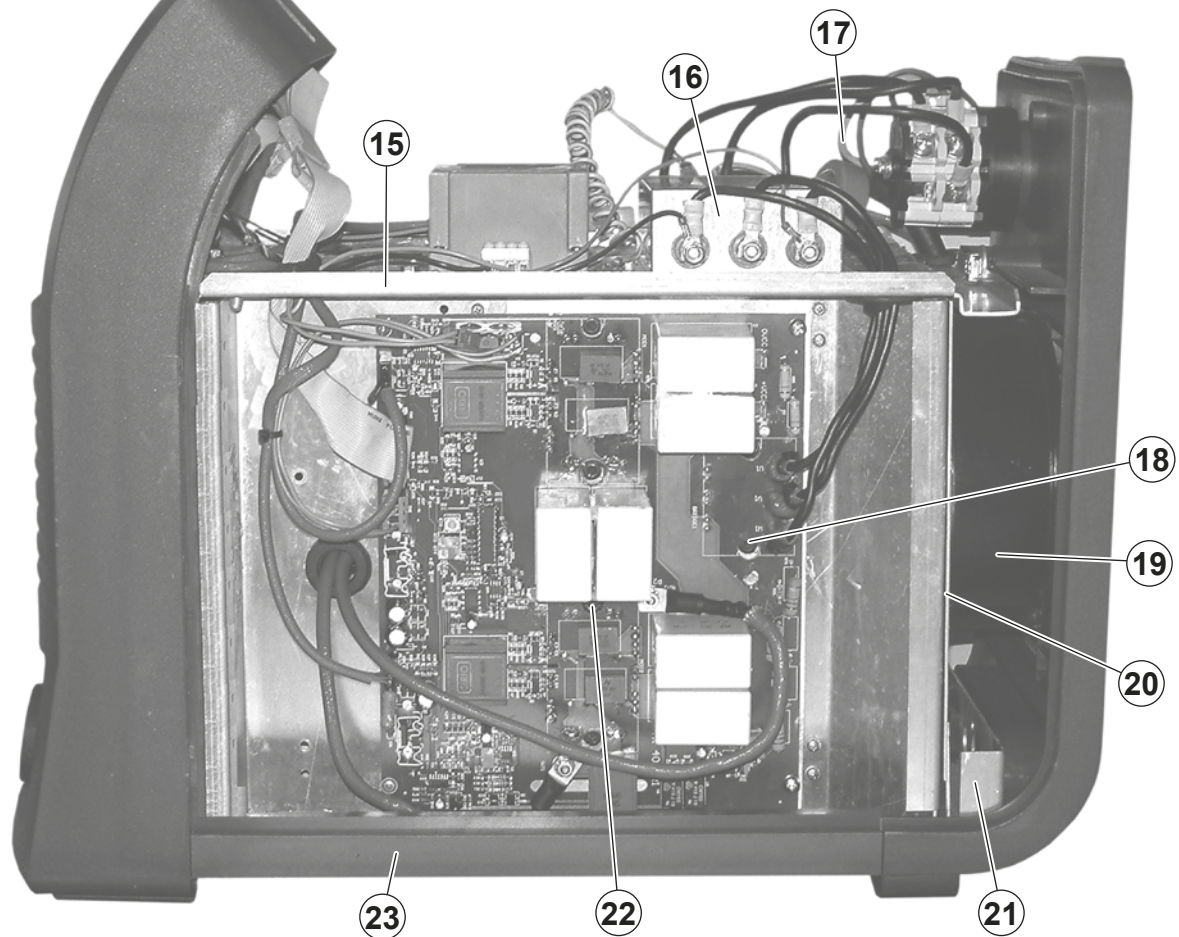
•1 EMC filter •2 Remote control socket •3 Protection capacitor •4 Secondary diodes •5 Power supply switch •6 Secondary inductor •7 Primary upper IGBT •8 Lower primary IGBT •9 Fan motor •10 Main primary transformer (start) •11 Main primary transformer (end) •12 Remote current potentiometer •13 Primary rectifier •14 Capacitors PCB (MATRIX 420 E-MG) •15 Booster board •16 Digital interface PCB •17 Inverter PCB •18 Auxiliary transformer •19 Current transducer •20 Thermostat on the secondary heatsink •21 Transformer

Wiring diagram

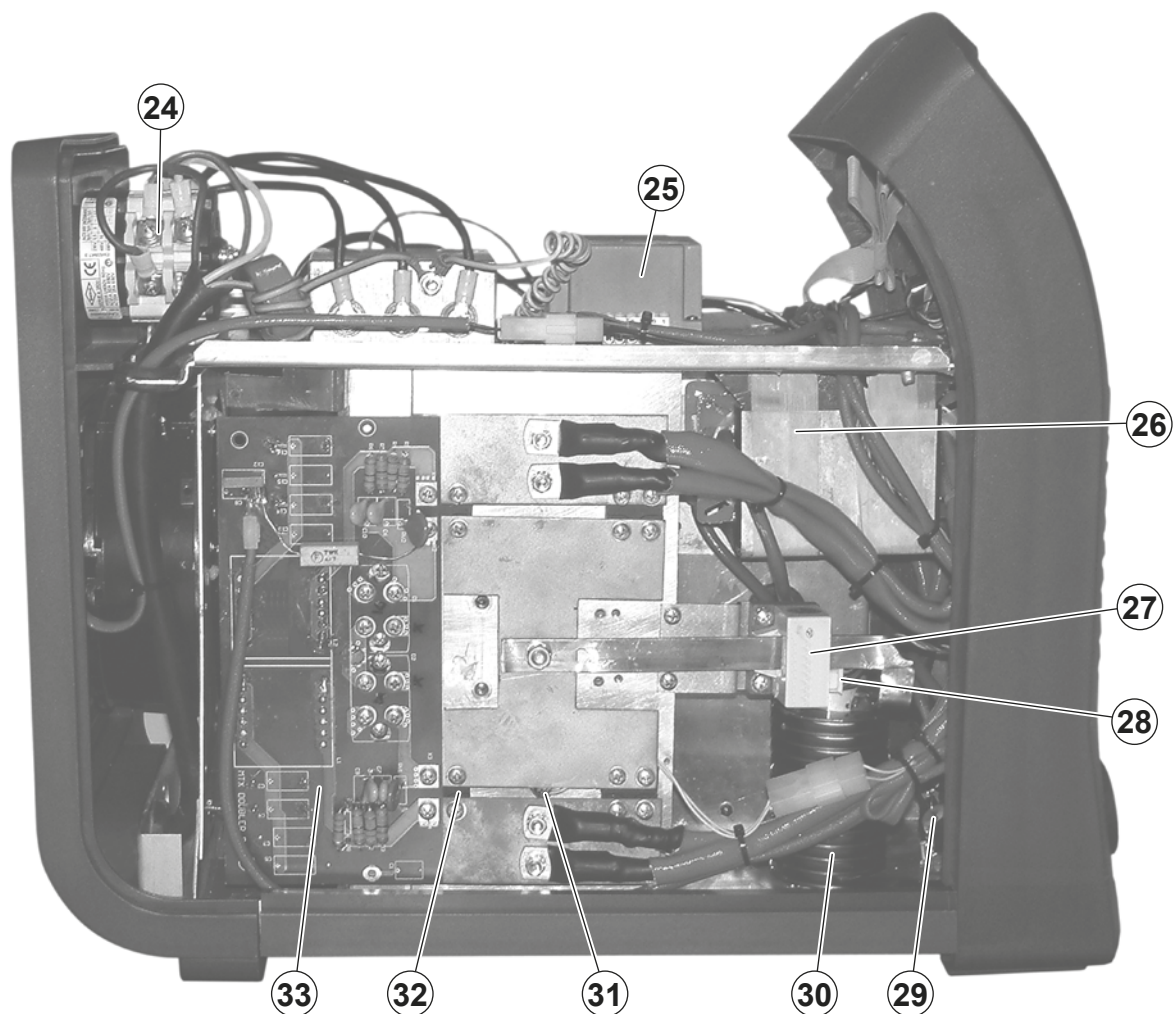




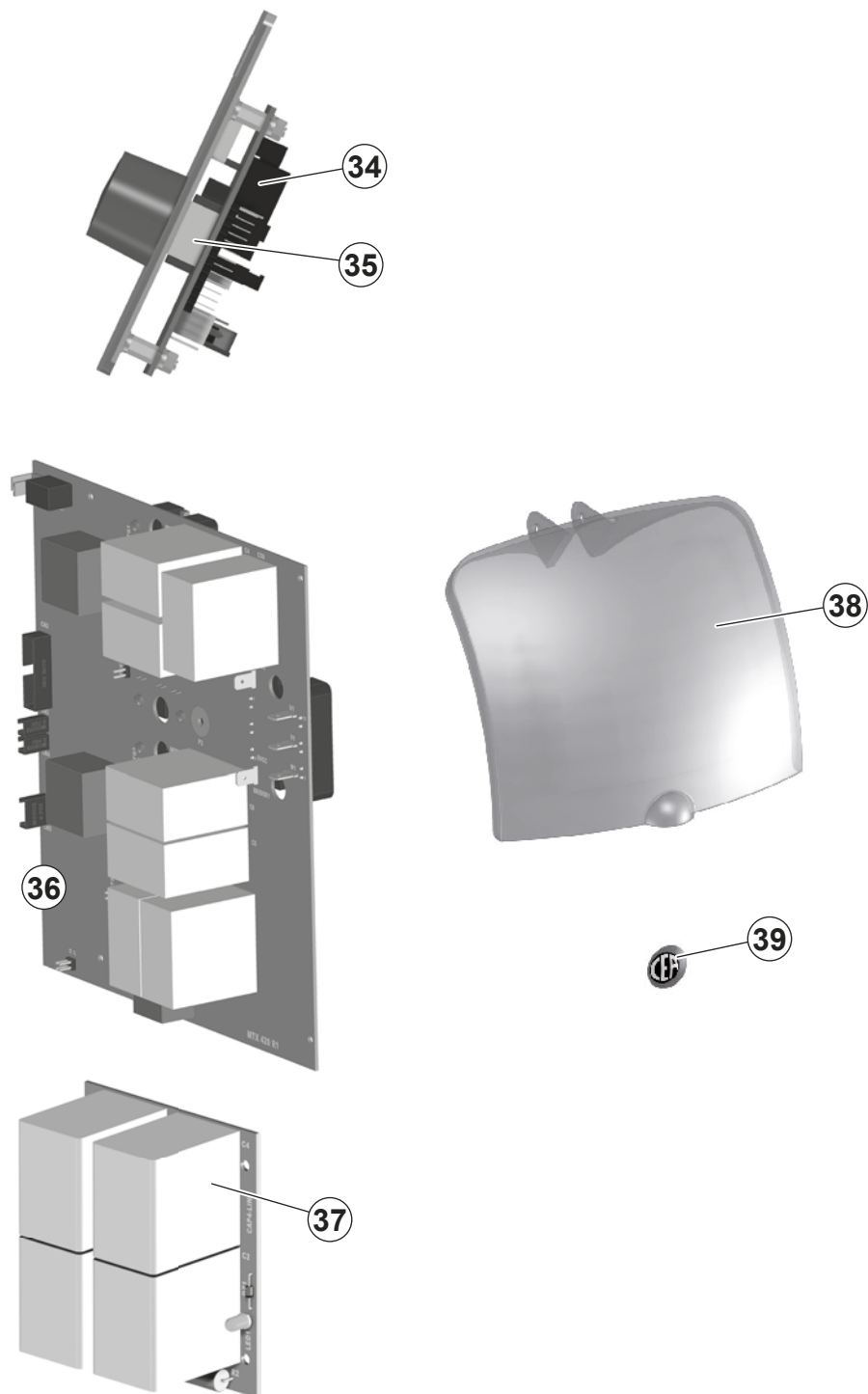
Pos.	POWER ARC 4200	Description
1	434696	Handle
2	439404	Rack panel with "MATRIX" sticker
3	438888	Ø29mm Knob without index
4	352373	Front panel
5	403614	Quick connection
6	419050	Remote Control Socket
7	467055	Front sticker
8	420497	Cover
9	352419	Front panel cover
10	438710	Mains switch knob
11	352416	Rear panel
12	427882	Cable clamp
13	430757	Cable clamp lock ring
14	235948	Mains cable



Pos.	POWER ARC 4200	Description
15	449499	Upper plate
16	427667	EMC Filter
17	413541	Auxiliary wiring
18	455508	Primary rectifier
19	486380	Fan motor
20	466144	Fan motor support plate
21	404935	Base
22	286034	Primary IGBT
23	352412	Side guide



Pos.	POWER ARC 4200	Description
24	435760	Mains switch
25	481919	Auxiliary transformer
26	481407	Transformer
27	481952	Current transducer
28	413619	Current transducer wiring
29	418872	Protection capacitor
30	240231	Secondary inductor
31	478846	Thermostat on secondary heatsink
32	423236	Secondary diode
33	377087	Doubler PCB



Pos.	POWER ARC 4200	Description
34	377089	Digital Interface PCB
35	454150	Encoder
36	240470	Primary inverter assembly
37	377157	Capacitors PCB (only for Matrix 420-4200 E-MG)
38	352374	Front rack transparent visor
39	468725	Logo CEA sticker for front panel

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

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

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

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

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

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

PT Encomenda das peças de reposição

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

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

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

N Bestilling av reservedeler

Ved bestilling av reservedeler må du oppgi:

- 1) Delenes kodenummer
- 2) Type apparat
- 3) Apparatets spenning og frekvens som finnes på merkeplaten for data på apparatet
- 4) Sveiseapparatets serienummer

EL Παγγελία των ανταλλακτικών

Όταν ζητάτε ανταλλακτικά παρακαλείσθε να ημειώνετε καθαρά:

- 1) τον κωδικό της λεπτομέρειας
- 2) τον τύπο της μονάδας ψύξης
- 3) την τάση και τη συχνότητα που αναγράφονται στην πινακίδα των τεχνικών χαρακτηριστικών
- 4) τον αριθμό μητρώου της μηχανής

RU Заказ запасных частей

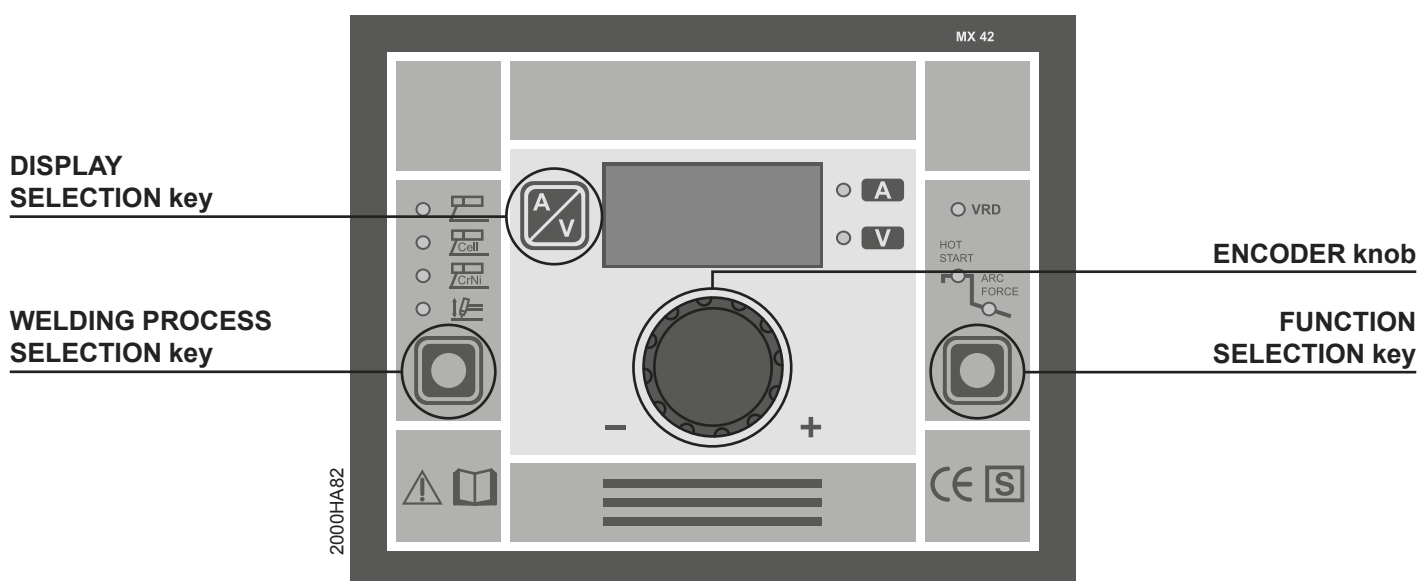
Для запроса запасных частей укажите точно:

- 1) код запчасти,
- 2) модель машины,
- 3) напряжение и частоту, написанные на пластине,
- 4) ее серийный номер.

Control panel	10
Switching on the welding machine and initial screen	12
Displaying the software version installed	12
MMA welding (Electrode)	12
TIG welding	13
Creating and memorising automatic welding points	13
Recalling automatic welding points	14
Activating the VRD device	14
Accessory functions	15
Error and protection conditions	16

Control panel

KEY AND KNOB CONTROLS



■ DISPLAY SELECTION key

When this key is pressed the DISPLAY can show the CURRENT (A) or VOLTAGE (V) values corresponding to the DISPLAY INDICATION LED switched on.

■ WELDING PROCESS SELECTION key

This can be used to select the following 4 welding processes, and each time the key is pushed the welding machine selects the next welding process, in the following order:

- | | | | |
|-------------------------|--|-----------------------------------|--|
| 1) ELECTRODE. | | 3) Stainless steel ELECTRODE. | |
| 2) Cellulose ELECTRODE. | | 4) TIG with "Lift" type ignition. | |

■ ENCODER knob

On the basis of the corresponding LED switched on, this can be used to regulate the following values:

- 1) Regulation of the current values (A).
- 2) DOES NOT ALLOW the voltage (V) values to be regulated, but when the knob is rotated you go back to regulating the current value (A).
- 3) Regulation of the values for the HOT START function.
- 4) Regulation of the values for the ARC FORCE function.



■ FUNCTION SELECTION key

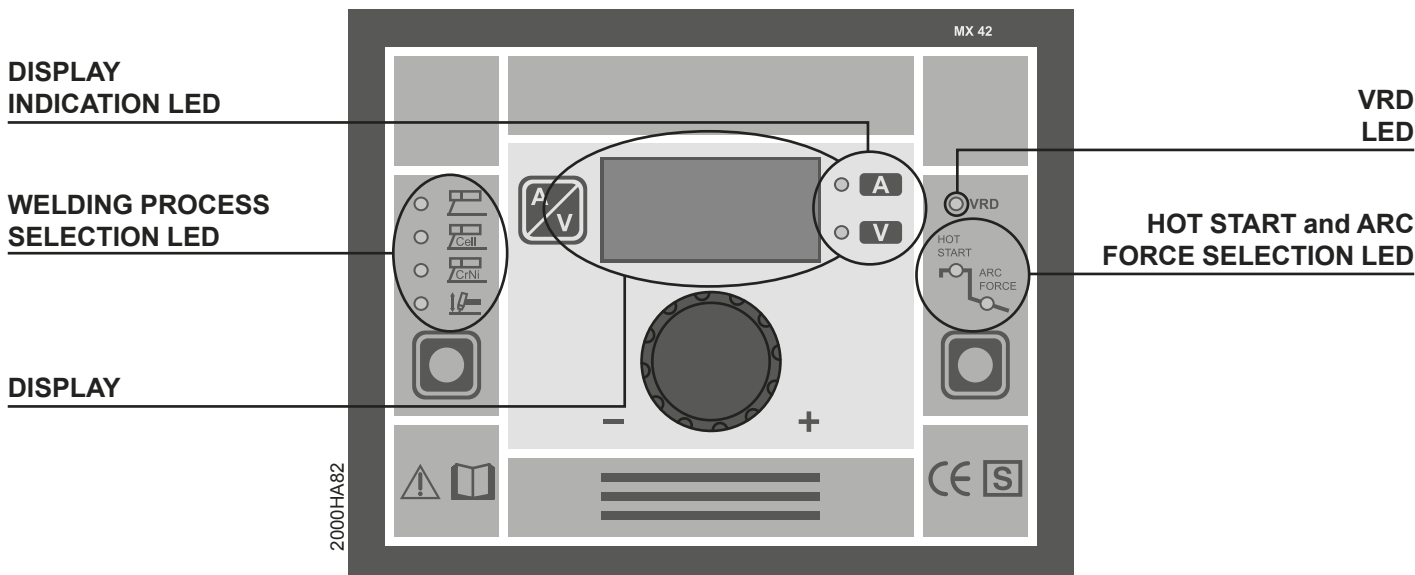
When one of the three electrode welding processes available on the welding machine is activated, this key is used to select the HOT START and ARC FORCE functions, the values for which can be regulated by means of the ENCODER knob. Each time the key is pressed the welding machine switches to selecting the next function in the following order:

- HOT START.
- ARC FORCE.

- Exit the functions - DISPLAY INDICATION LED **A** on and welding machine ready again to weld at the current indicated on the DISPLAY.

If it is held down for about 5 seconds, the FACTORY DEFAULT setting for the welding machine is activated, that is, the machine's parameters are returned to their settings when they left the factory.

DISPLAY AND LED INDICATIONS



■ DISPLAY INDICATION LED

- 1) When this LED is on it means that the DISPLAY is showing the CURRENT value (the value displayed depends on and can be regulated on the basis of the type of process or function selected).
- 2) When this LED is on it means that the DISPLAY is showing the VOLTAGE value (the value displayed cannot be changed or regulated, but merely indicates the actual VOLTS on the quick connections for the welding machine's positive and negative poles).



■ HOT START and ARC FORCE SELECTION LED

These two LEDs can only be on when welding in MMA.

- 1) When this LED is on it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the HOT START function.
- 2) When this LED is on it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the ARC FORCE function.



■ WELDING PROCESS SELECTION LED

When one of these LEDs is on it means that the corresponding welding process has been selected.

■ VRD LED

The Voltage Reduction Device (VRD) is a safety device that reduces the voltage.

It prevents voltages forming on the output terminals that may pose a danger to people.

Two-tone LED (off - red - green) indicates enabling of the VRD device.

The standard, preset settings for the CEA do not activate the VRD function on the welding machine and so this LED is normally off (to activate the VRD device see the relevant paragraph).

■ DISPLAY

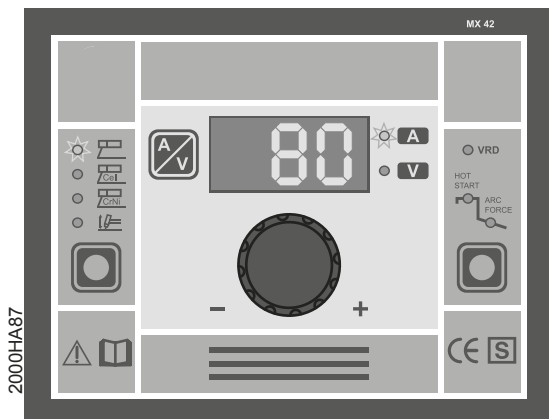
Displays, in numerical format, the selections made using the DISPLAY SELECTION key or the FUNCTION SELECTION key and regulated using the ENCODER knob.

- When the **A** LED is on it displays:
 - When the machine is in stand-by, the Amps (A) set.
 - When the machine is welding the real Amps (A) at which the operator is actually welding.
- When the **V** LED is on it displays the real VOLTS (V) at the quick connections for the machine's positive and negative poles.
- When the HOT START LED is on the numerical value the operator has set for the HOT START function is displayed.
- When the ARC FORCE LED is on the numerical value the operator has set for the ARC FORCE function is displayed.



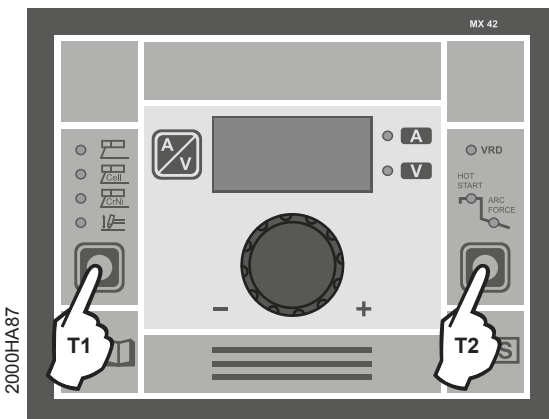
Switching on the welding machine and initial screen

- 1) Start the welding machine by pushing the switch on the rear panel to position I.
- 2) The welding machine carries out a short MACHINE CHECK (all the LEDs switch on and off, one at a time, following a preset, established start-up procedure. Then the display shows the following message “---”).
- 3) Next the control panel display's the INITIAL SCREEN for the machine, which is then ready to weld, and the DISPLAY shows the last numerical value set (example: **80**) for the CURRENT. Remember that since the welding machine is in stand-by mode this value (in Amps) is not real but is the setting.



Displaying the software version installed

- 1) When the welding machine is running, hold the WELDING PROCESS SELECTION key (T1) and FUNCTION SELECTION key (T2) down simultaneously, for at least **3** seconds.



- 2) The DISPLAY continuously runs the message shown in Figure A, indicating the SOFTWARE VERSION INSTALLED on the welding machine, until the two-key combination is pushed again. In detail, the meaning is as follows:
 - **H04-04.02** indicates the version of HARDWARE installed.
 - **F04-01.00** indicates the version of FIRMWARE installed.

- **C00-02.06** indicates the version of WELDING CURVES installed.

MMA welding (Electrode)

- 1) Start the welding machine by pushing the switch on the rear panel to position I.
- 2) Push the WELDING PROCESS SELECTION key to select one of the 3 electrode welding processes according to the electrode material you are using:

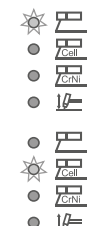


• ELECTRODE

For welding with coated electrodes: Rutile, basic, cast iron, and aluminium.

• Cellulose ELECTRODE

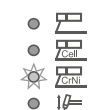
For welding with cellulose electrodes.



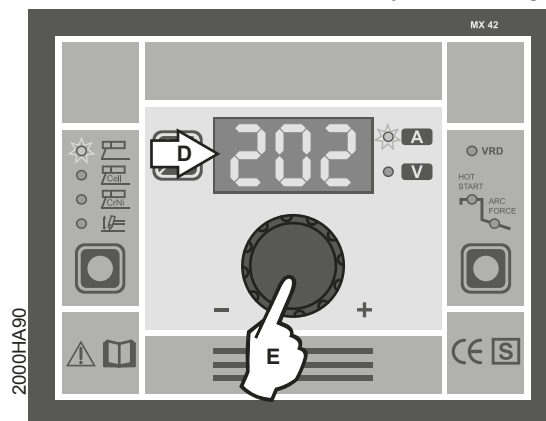
NOTE: Only valid for the MATRIX 2700 E - 2700 E SV welding machines. In order to optimise fusion and the stability of the cellulose electrode weld, the welding machine automatically activates a booster in this position only, which provides the welding machine with further power. This booster works at a MAX current of up to 130 A. We therefore recommend using cellulose electrodes for welding with currents up to 130 A. Once this value is exceeded the booster is deactivated automatically, and so instability and interruptions in the arc may occur.

• Stainless steel ELECTRODE

For welding stainless steel. Thanks to the special dynamic characteristic it is possible to weld with a soft, extremely stable arc in order to achieve high quality welds.



- 3) Turn the ENCODER Knob (E) until the DISPLAY shows the CURRENT VALUE at which you wish to weld, in relation to the diameter of the electrode you are using.



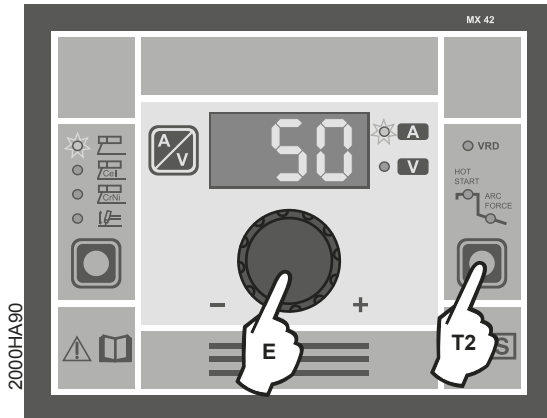
H04-04.02 F04-01.00 C00-02.06

FIG. A

- 4) To improve the quality of the welding the following accessory functions are available that relate to the MMA welding process selected:
- **HOT START** - This increases the welding current, in percentage terms, for a time interval that can be set at the start of the welding process, thereby reducing the risk of poor fusion at the start of the joint (HOT START - 0-100 - regulation step: 1).
 - **ARC FORCE MMA** - Regulates, in percentage terms, the dynamic characteristics of the arc (ARC FORCE - 0-100 - regulation step: 1).

WARNING: Both the values for the accessory functions are pre-set at a value of 50, which is the value deemed best for welding.

To select these two accessory functions, simply press the FUNCTION SELECTION key (T2) and regulate the value using the ENCODER Knob (E).



- 5) Once the all the selections/regulations indicated above have been made, welding can begin.

TIG welding

- 1) Start the welding machine by pushing the switch on the rear panel to position I.
- 2) Press the WELDING PROCESS SELECTION Key and select the following process:

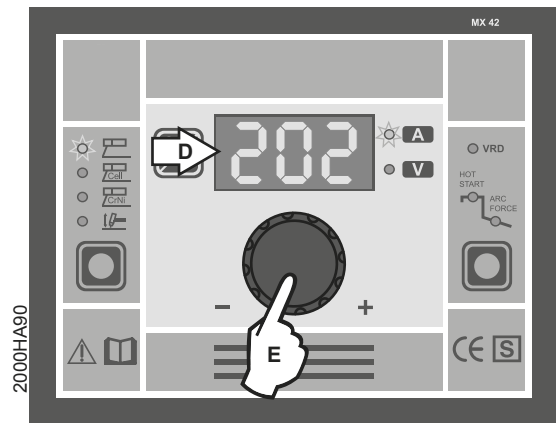


• TIG with “Lift” type ignition

With TIG welding using the innovative “Lift” type thermally controlled ignition (TCS), ignition comes about precisely and quickly, reducing the inclusions of tungsten to a minimum and doing away with incisions into the workpiece to be welded. The SWS (Smart Welding Stop) system avoids oxidation of the welded joint.



- 3) Turn the ENCODER Knob (E) until the DISPLAY shows the CURRENT VALUE at which you wish to weld.

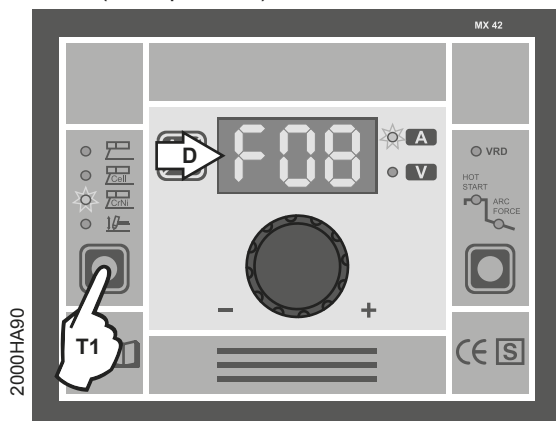


- 4) Once the all the selections/regulations indicated above have been made, welding can begin.

Creating and memorising automatic welding points

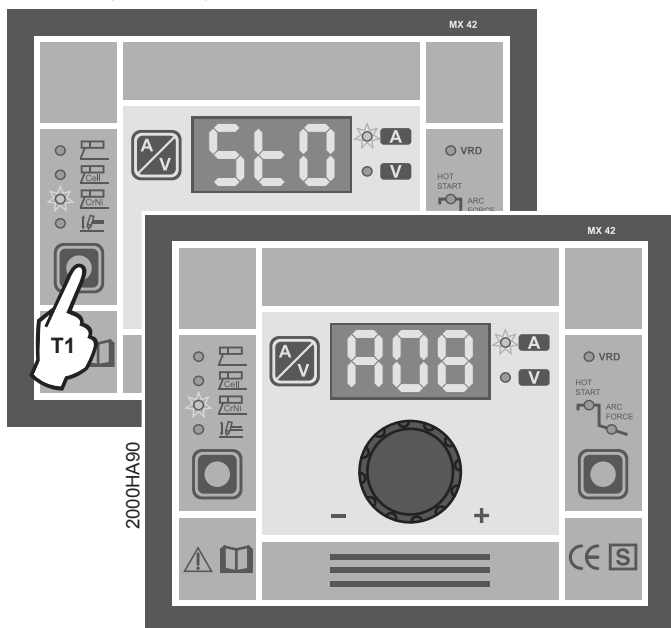
Once you have defined the parameters that characterise a new automatic welding point (abbreviated as JOB), it can be stored in the memory in the following manner:

- 1) Hold down the WELDING PROCESS SELECTION Key for at least 5 seconds, until the DISPLAY (D) shows a flashing message that represents the first AUTOMATIC WELDING POINT (JOB) free and/or available, in which the data can be saved (example: F08).



In order to choose another free JOB simply rotate the ENCODER knob and see the other JOBS available. The MX control panel allows you to save a maximum of 99 AUTOMATIC WELDING POINTS (JOBS).

- 2) To SAVE the JOB simply push the WELDING PROCESS SELECTION Key (T1) again until the DISPLAY reads "Sto" for about 1 second, which confirms that the JOB has been saved and then the automatic point chosen (for example: **A08**).



Once the saving operation has been completed the control panel automatically goes to the last JOB saved. If the user wants to weld in this way they do not need to adjust any parameter, but if they wish they can view them by pressing the relevant keys.

NOTE: Creating a JOB implies saving all the special functions associated with it.

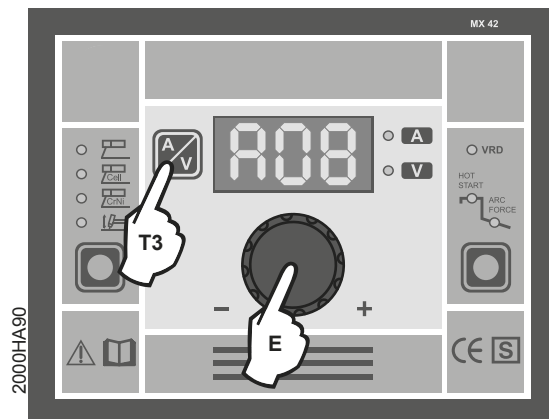
- 3) To exit the JOB, hold the DISPLAY SELECTION key down for at least 5 seconds. The welding machine will automatically load the values for the JOB from which it comes.



Recalling automatic welding points

To recall a JOB saved previously:

- 1) Enter JOB mode by holding the DISPLAY SELECTION key (T3) down for at least 5 seconds.
- 2) Rotate the ENCODER knob (E) until you find the JOB required.



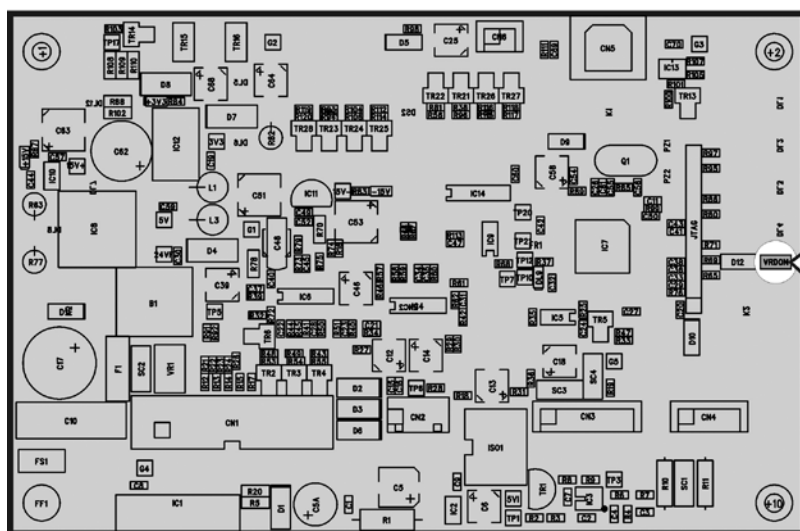
Activating the VRD device

To activate the VRD device, which must be done when the welding machine is switched off:

- 1) Use a suitable screwdriver to unscrew the 4 screws that fix the MX control panel to the welding machine.
- 2) Remove the "VRD" JUMPER on the DIGITAL INTERFACE BOARD (Fig. B).
- 3) Use a suitable screwdriver to tighten the 4 screws that fix the MX control panel to the welding machine.
- 4) Start the welding machine by pushing the switch on the rear panel to position I.

When the MX control panel switches on the VRD LED will come on and will be GREEN, which means that the VRD function is on.

To "deactivate" the VRD device and therefore start to weld, follow this simple procedure: First touch the workpiece with the electrode, then detach it and ignite the arc within a MAX of **0,3** seconds, otherwise if this time is exceeded the VRD device starts and prevents welding.



JUMPER "VRD"



FIG. B

During welding the VRD LED turns RED, which does not indicate any malfunction on the welding machine, but that the VRD device has been deactivated to allow welding.

Accessory functions

“Energy saving”

This function manages correct functioning of the cooling fan that only runs when strictly necessary, to guarantee lower energy consumption, that is:

- During welding or for an adequate period of time after this is finished.
- When the thermostat intervenes or for an adequate period of time after it has just been reset.

Hold

During welding the operator can decide whether to display the VOLTAGE and CURRENT values on the DISPLAY by simply pressing the DISPLAY SELECTION Key.

When welding ends for about 15 seconds the DISPLAY memorises the last parameter values (VOLTAGE and CURRENT) selected / regulated (HOLD FUNCTION).

These values can be seen by simply pressing the DISPLAY SELECTION Key.

To interrupt the display before the 15 seconds are up, simply rotate the ENCODER Knob.

Aut - rEm - LoC

Matrix generators can be fitted with a manual remote control that allows the welding current to be remote controlled (value adjustable according to the model of the MX control panel you are using). When this is on, the welding machine's DISPLAY will show the current value set previously using the same remote control.

The MX control panel allows the operator to choose between 3 different parameter adjustment modes, by means of this simple procedure:

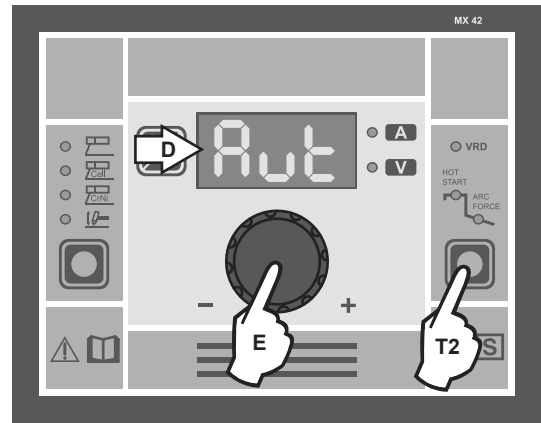
- 1) Switch off the welding machine by turning the main switch to position 0.
- 2) Hold down the SELECT FUNCTION (T2) key and simultaneously switch in the welding machine by turning the main switch to position I.
- 3) Now, when the ENCODER knob (E) is rotated the DISPLAY (D) will provide the following indications and the operator can choose between:
 - **Aut** - Automatic recognition of the manual remote control connected up (DEFAULT setting) and therefore allowing the current to be adjusted.
 - **rEm** - Automatic recognition of the manual remote control connected up and therefore allowing the current to be adjusted.

PLEASE NOTE: The welding machine does not work if the remote control is not connected to it!

- **LoC** - The welding current may only be adjusted from the welding machine's control panel.

WARNING: The remote control does not work, even if connected up correctly!

- 4) Hold the SELECT FUNCTION (T2) key down to confirm the choice made previously.

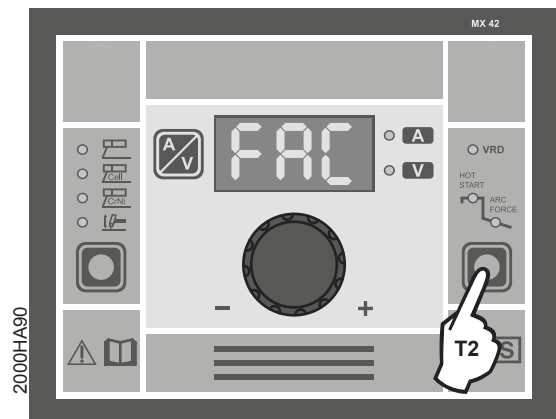


NOTE: The MX control panel has a STAND-BY function that, when the remote control is on, switches off the inverter when the minimum welding current value is reached (to reinstate normal, correct functioning of the machine, increase the welding current value by rotating the remote control knob).

Factory default

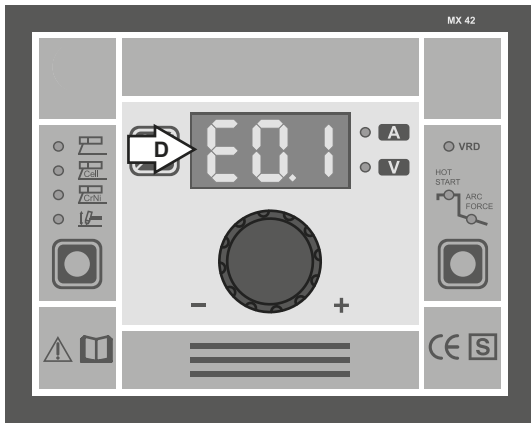
WARNING: This operation results in complete resetting of all parameters to the factory settings (FAC).

To reset the settings hold the FUNCTION SELECTION Key (T2) down for at least 5 seconds, until the DISPLAY reads FAC.



At this point the welding machine carries out a short MACHINE CHECK (all the LEDs switch on and off, one at a time, following a preset, established start-up procedure). The reset procedure has now been completed successfully.

Error and protection conditions



The equipment is protected against problems and if any arise the DISPLAY shows fixed or flashing (error code) messages (depending on the type of error) that serve to inform the operator that a fault has occurred in the equipment (see table 1). The table provides a summary of all the error conditions that may arise on the equipment and, if possible, what the operator must do to attempt to resolve the problem.

The table contains 2 types of errors:

- **Errors reset automatically:** once the alarm condition has been resolved the equipment starts working again and the operator can weld again!
- **Errors NOT reset automatically:** To eliminate the alarm states and reinstate correct functioning of the machine, the equipment must be switched off. When it is switched on again, the machine will be working again and the operator can weld again!

PLEASE NOTE: If when it switches on the error condition recurs, contact the technical assistance immediately.

All of this is necessary to allow our technical assistance department (**which must be contacted each time error messages appear on the equipment's operator interface**) to resolve problems more easily, as quickly as possible and thanks to the user's reports, also because, in the meantime the machine will not allow the operator to do their work.

Table 1

Display	Diagnosis
E0.1	UNDER & OVER VOLTAGE Automatic reset error. If the fault persists look for the cause of the fault and contact our technical assistance department if necessary.
E0.2	OVER VOLTAGE This is activated when the power supply voltage to the equipment exceeds 480 V . Automatic reset error. The welding machine stops automatically and resets itself automatically when the voltage returns within the limits again. If the fault persists look for the cause of the fault and contact our technical assistance department if necessary.
E0.3	UNDER VOLTAGE This is activated when the power supply voltage to the equipment is less than: • 320 V (POWER ARC 4200) Automatic reset error. The welding machine stops automatically and resets itself automatically when the voltage returns within the limits again. If the fault persists look for the cause of the fault and contact our technical assistance department if necessary.

Display	Diagnosis
E0.4	PRIMARY OVER CURRENT This is activated when the primary current goes beyond dangerous values. Automatic reset error. The welding machine stops automatically and resets itself automatically when the current returns within the limits again. If the fault persists look for the cause of the fault and contact our technical assistance department if necessary.
E0.5	POWER FAIL NON automatic reset error. Immediately contact technical assistance dept.
E1.0	CONFIGURATION FILE MISSING NON automatic reset error. Immediately contact technical assistance dept.
E1.1	USER FILE MISSING NON automatic reset error. Immediately contact technical assistance dept.
E2.0	FILE SYSTEM ERROR NON automatic reset error. Immediately contact technical assistance dept.
E4.0	USER SETTINGS MISSING NON automatic reset error. Immediately contact technical assistance dept.
t°C	THERMAL PROTECTION The welding stops due to an excessively high temperature (thermostat activated). Automatic reset error.

WARNING: Errors E0.1 – E0.2 - E0.3 cannot be picked up on the MX22 control panel!

POWER ARC 4200



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