MTA 22

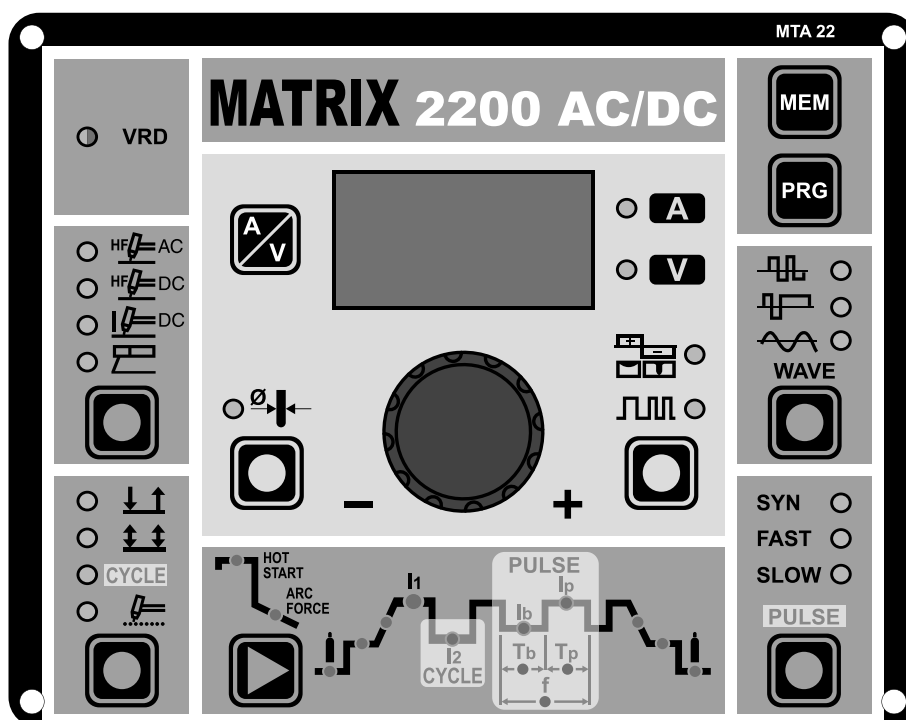| IT	*Manuale d'istruzioni*	**3**	LEGGERE ATTENTAMENTE
EN	*Operator's manual*	**17**	READ CAREFULLY
FR	*Manuel d'instructions*	**31**	LIRE ATTENTIVEMENT
DE	*Bedienungsanleitung*	**45**	SORGFÄLTIG LESEN
ES	*Manual de instrucciones*	**59**	LEER ATENTAMENTE
NL	*Gebruikershandleiding*	**73**	EERST GOED DOORLEZEN
PT	*Manual de instruções*	**87**	LER ATENTEMENTE
SV	*Ågarhandbok*	**101**	LÄS NOGAS
FI	*Omistajankäsikirja*	**115**	LUE HUOLELLISESTI
N	*Eierens håndbox*	**129**	LES NØYE
RU	*Инструкция по эксплуатации*	**143**	ПЕРЕД НАЧАЛОМ РАБОТЫ ВНИМАТЕЛЬНО ПРОЧТИТЕ ИНСТРУКЦИЮ

EN ENGLISH

Introduction

This manual describes the functions on and how to use the following control panels:
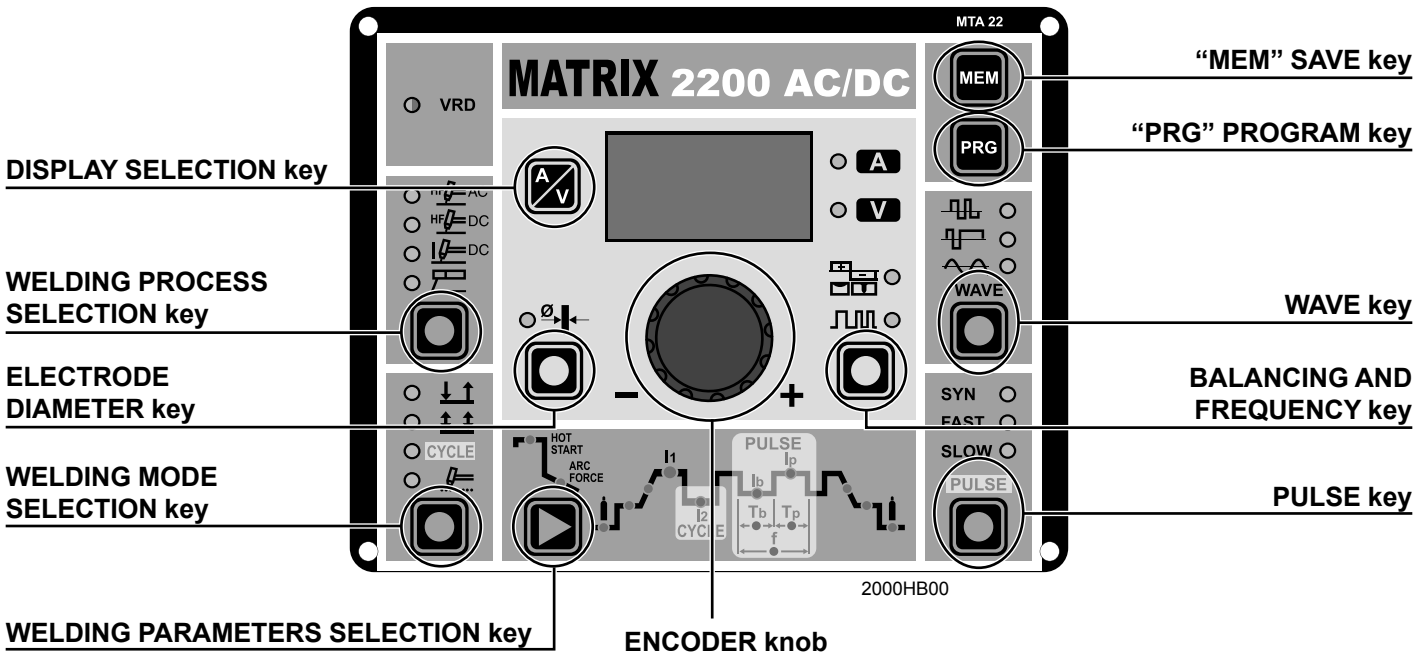• **MTA 22** fitted on the **MATRIX 2200 AC/DC** welding machine.

For general information on how the **MATRIX 2200 AC/DC** welding machine works, see the individual manual provided with the machine.

Control panel

2000HB00

MTA 22

MATRIX 2200 AC/DC

"MEM" SAVE key

"PRG" PROGRAM key

DISPLAY SELECTION key

WELDING PROCESS SELECTION key

WAVE key

ELECTRODE DIAMETER key

BALANCING AND FREQUENCY key

WELDING MODE SELECTION key

PULSE key

WELDING PARAMETERS SELECTION key

ENCODER knob

2000HB00

■ 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.
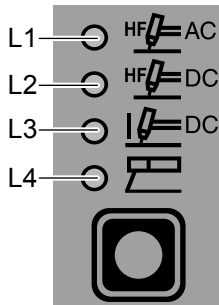
■ WELDING PROCESS SELECTION key

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

L1 *TIG AC with HF ignition*

L2 *TIG DC with HF ignition*

L3 *TIG DC with "Lift" type ignition*

L4 *ELECTRODE*

■ ELECTRODE DIAMETER key

When using the TIG AC welding process
with HF ignition, this key can be used to set the diameter of the electrode used in order to achieve synergic better control of the ignition and AC arc.

■ WELDING MODE SELECTION key

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

L5 *2 STROKES*

When the torch button is pushed welding begins starting with the INITIAL CURRENT (if SLOPE UP is selected), while when it is released welding ends when the FINAL CURRENT is reached (if SLOPE DOWN is set).

L6 *4 STROKES*

TIG welding takes place as follows:

• When the torch button is pushed welding begins at the INITIAL current.
• When the torch button is released the SLOPE UP process is carried out (if applicable) and the current returns to the PRINCIPAL value I_1.
• When the torch button is pushed the SLOPE DOWN process is carried out (if applicable) and the current returns to the FINAL value.
• When the button is released the welding cycle ends.
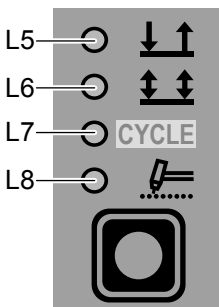
L7 *CYCLE*

When this function has been activated, TIG welding takes place as follows:

• When the torch button is pushed welding begins at the INITIAL current.
• When the torch button is released the SLOPE UP process is carried out (if applicable) and the current returns to the PRINCIPAL value I_1.
• When the torch button is pressed and released within less than 1 second the welding current goes to the CYCLE value (I_2), and by repeating this operating you can move between the two current levels (I_1), (I_2) an infinite number of times.
• When the torch button is pushed and held down (for more than 2 seconds) you exit the cycle, the SLOPE DOWN process is carried out (if applicable) and the current returns to the FINAL value. When the torch button is released the welding cycle ends.

L8 *SPOT WELDING*

This can be used by pushing the torch button to spot weld for a pre-set period of time (in seconds) at the end of which the arc switches off automatically.

■ ENCODER knob

This is used to regulate and change the welding parameters, according to which LED is switched on and the value shown on the DISPLAY, which is necessary for the machine to work correctly.

■ WELDING PARAMETERS SELECTION key

Each time the key is pressed the welding machine switches to selecting the next function.
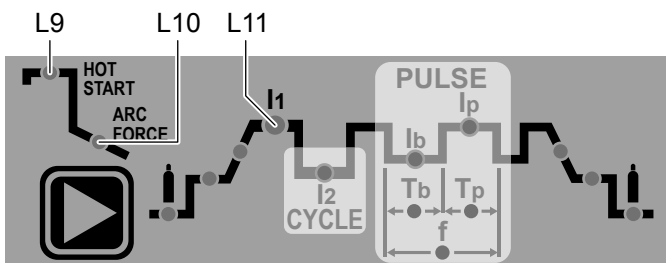
1 - STANDARD CONFIGURATION
1A) ELECTRODE WELDING

When using the electrode welding process, this allows you to select the following welding parameters, based on which LED is flashing:

L9 *HOT START*

L10 *ARC FORCE*

L11 *PRINCIPAL welding CURRENT* I_1

18

2A) TIG WELDING

When one of the **3** TIG welding processes available on the welding machine is activated, this allows you to select the following welding parameters, based on which LED is flashing:

L12 *PRE-GAS duration*

L13 *SLOPE UP duration*

L14 *BASE current duration* T_b

WARNING: *This can only be programmed when* **SLOW** *pulsation is activated.*

L15 *PEAK current duration* T_p

WARNING: *This can only be programmed when* **SLOW** *pulsation is activated.*

L16 *SLOPE DOWN duration*

L17 *POST-GAS duration*

L18 *INITIAL welding CURRENT*

L11 *PRINCIPAL welding CURRENT* I_1

L19 *CYCLE CURRENT* I_2

WARNING: *This can only be programmed when* **CYCLE** *welding mode is activated.*

L20 *BASE CURRENT* I_b

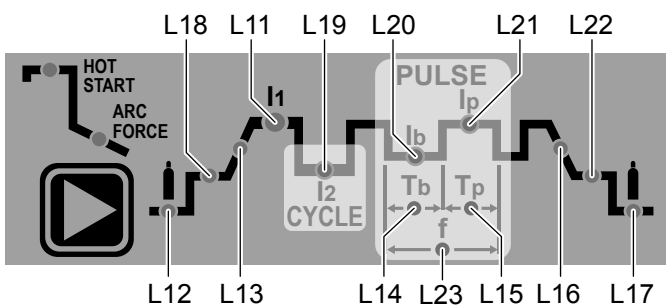**WARNING:** *This can only be programmed when at lease one pulsation mode is activated.*

L21 *PEAK CURRENT* I_p

WARNING: *This can only be programmed when at least one pulsation mode is activated.*

L22 *FINAL welding CURRENT*

L23 *PULSATION FREQUENCY* f

WARNING: *This can only be programmed when* **FAST** *or* **SYN** *pulsation is activated.*

2 - SPECIAL CONFIGURATION (only for expert welders)

For this configuration, in addition to the parameters already defined for the STANDARD configuration, you can also set the following parameters:

L9 *IGNITION CURRENT*

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *or* **TIG DC with HF ignition** *welding processes are used.*

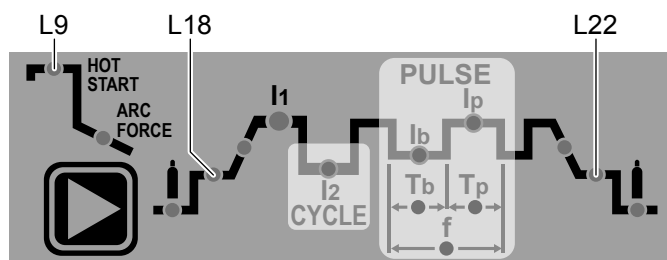**L9** *IGNITION TIME duration*

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *welding processes are used.*

L18 *INITIAL welding CURRENT*

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *or* **TIG DC with HF ignition** *welding processes and the* **2 STROKES** *welding mode are used.*

L22 *FINAL welding CURRENT*

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *or* **TIG DC with HF ignition** *welding processes and the* **2 STROKES** *welding mode are used.*

WARNING: *This special parameter is only to be activated by qualified personnel, or those trained by CEA technicians.*

■ PULSE key

This is used to select one of the following pulsation modes, depending on which LED is switched on:

L24 *Synergic pulsations (SYN PULSE)*

WARNING: *This can only be programmed when the* **TIG DC with HF ignition** *or* **TIG DC with "Lift" type ignition** *welding processes are used.*

L25 *Fast pulsations (FAST PULSE)*

WARNING: *This can only be programmed when the* **TIG DC with HF ignition** *or* **TIG DC with "Lift" type ignition** *welding processes are used.*

L26 *Slow pulsations (SLOW PULSE)*

WARNING: *This can only be programmed when the* **3 TIG** *welding processes are used.*
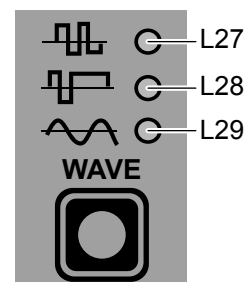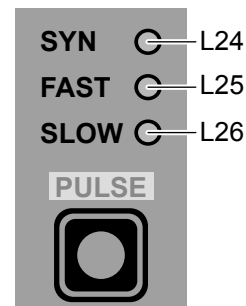
■ WAVE key

When using the TIG AC with HF ignition welding process, this allows you to select the following wave shapes, based on which LED is switched on:

L27 *SQUARE*

L28 *MIXED*

L29 *SINUSOIDAL*

■ BALANCING and FREQUENCY key

When using the TIG AC with HF ignition welding process, this allows you to set one of the following parameters, based on which LED is flashing:

L30 *BALANCING of the AC welding current*
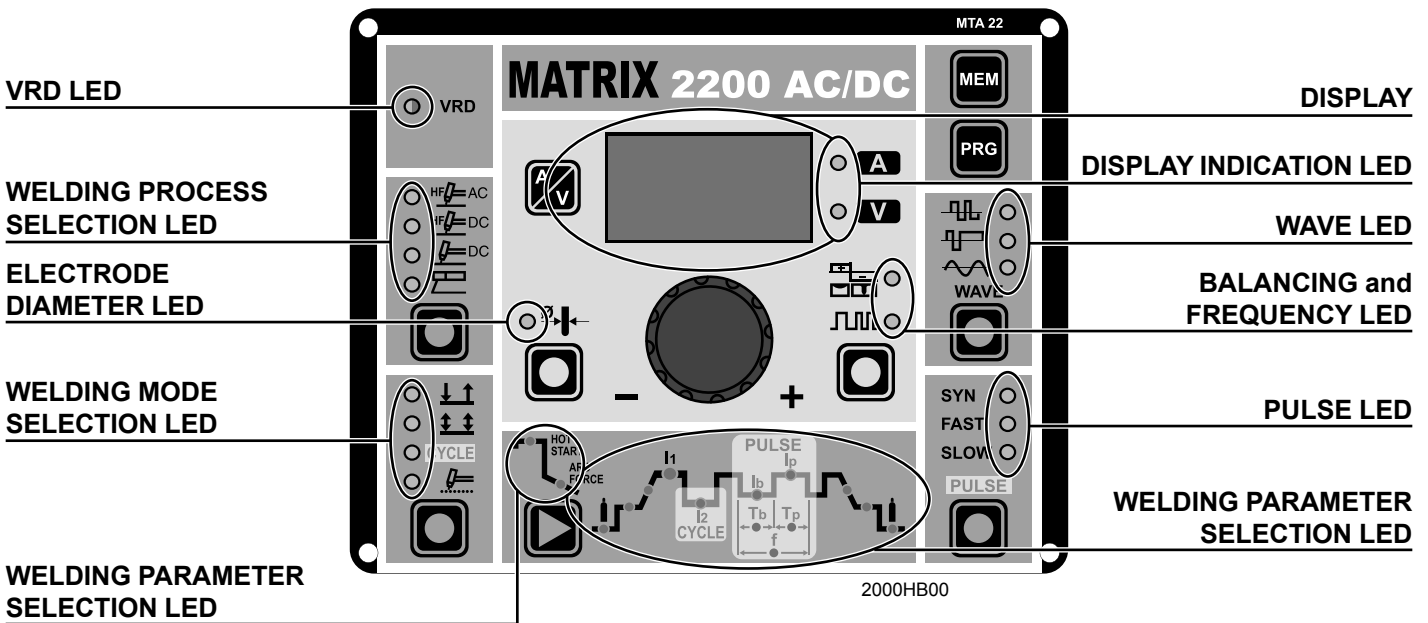
L31 *FREQUENCY of the AC welding current*

■ "PRG" PROGRAM key

Used to call up welding programs.

■ "MEM" SAVE key

Used to save the parameters for the welding programs.

2000HB00

VRD LED

WELDING PROCESS SELECTION LED

ELECTRODE DIAMETER LED

WELDING MODE SELECTION LED

WELDING PARAMETER SELECTION LED

DISPLAY

DISPLAY INDICATION LED

WAVE LED

BALANCING and FREQUENCY LED

PULSE LED

WELDING PARAMETER SELECTION LED

■ **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.

■ **WELDING PROCESS SELECTION LED**
When one of these LEDs is on it means that the corresponding welding process has been selected.

■ **ELECTRODE DIAMETER LED**
When this LED flashes (only when TIG AC welding with HF ignition is activated) it means that the operator has activated the corresponding key and wishes to edit the diameter of the tungsten electrode using the ENCODER knob.

■ **WELDING MODE SELECTION LED**
When one of these LEDs is on it means that the corresponding welding mode has been selected.

■ **WELDING PARAMETER SELECTION LED**
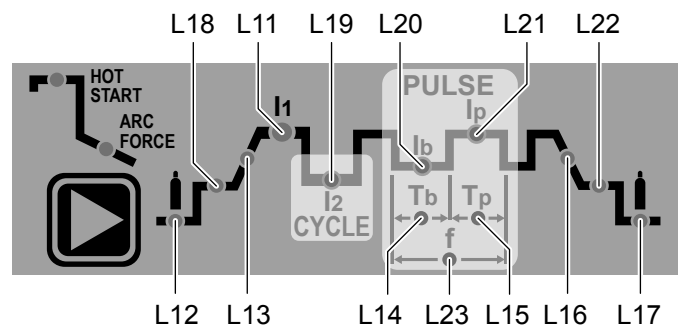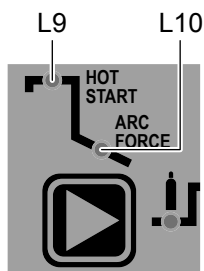**L9** *HOT START*
1 - STANDARD Configuration
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the HOT START function.
2 - SPECIAL Configuration
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the IGNITION CURRENT and the IGNITION TIME.

L10 *ARC FORCE*
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the ARC FORCE function.

L12 *PRE-GAS duration*
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the PRE-GAS duration.

L18 *INITIAL welding CURRENT*
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the INITIAL welding CURRENT.

L13 *SLOPE UP duration*
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the SLOPE UP duration.

L11 *PRINCIPAL welding CURRENT* I_1
When this LED flashes (this LED can flash even when the ELECTRODE welding process has been activated) it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the PRINCIPAL welding CURRENT I_1.

L19 *CYCLE CURRENT* I_2
When this LED flashes (only when the CYCLE welding mode is activated) it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the CYCLE CURRENT I_2.

L20 *BASE CURRENT* I_b
When this LED flashes (only when at least one pulse mode is activated) it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the BASE CURRENT I_b.

L14 *BASE current duration* T_b
When this LED flashes (only when SLOW pulse is activated) it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the BASE CURRENT DURATION T_b.

20

L23 *PULSATION FREQUENCY* **f**
When this LED flashes (only when SYN or FAST pulse is activated) it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the PULSATION FREQUENCY **f**.

L21 *PEAK CURRENT* **Ip**
When this LED is on (only when at least one pulse mode is activated) it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the PEAK CURRENT **Ip**.

L15 *PEAK current duration* **Tp**
When this LED flashes (only when SLOW pulse is activated) it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the PEAK CURRENT DURATION **Tb**.

L16 *SLOPE DOWN duration*
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the SLOPE DOWN duration.

L22 *FINAL welding CURRENT*
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the FINAL welding CURRENT.

L17 *POST-GAS duration*
When this LED flashes it means that the operator can use the ENCODER Knob to regulate the value shown on the DISPLAY for the POST-GAS duration.

■ **DISPLAY**
Displays the selections made using the various Keys (with corresponding LED on or flashing) and regulated using the ENCODER knob.

When LED **A** 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 LED **V** is on it displays the real VOLTS (V) at the machine's welding terminals.
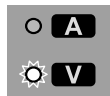
■ **PULSE LED**
These LEDs can only be on when one of the welding machine's **3** TIG processes has been selected. When one of these LEDs is on it means that the corresponding pulse mode has been selected (you may also see them all off, which means that the operator has decided to weld without using any pulsations).

■ **BALANCING and FREQUENCY LED**
When one of these **2** LEDs flashes it means that the operator has activated the corresponding key and wishes to edit BALANCING of the AC welding current or the FREQUENCY of the same, using the ENCODER knob.

■ **WAVE LED**
These LEDs can only be on when the welding machine's TIG welding process with HF ignition has been selected. When one of these LEDs is on it means that the corresponding wave shape has been selected.

■ **DISPLAY INDICATION LED**
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).

When this LED is on it means that the DISPLAY is showing the VOLTAGE value (the value displayed CANNOT BE EDITED OR REGULATED, but merely indicates the actual VOLTS at the welding terminals).
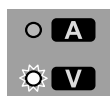
Displaying the software version installed

The **MATRIX 2200 AC/DC** has a digital control with software on board defined in the factory. This software is subject to continuous evolution and improvement. The software is identified by a specific number that can be viewed on the DISPLAY (D) as follows:
1) When the welding machine is off, push and hold the **"MEM" SAVE** key down (T1).
2) Start the welding machine by turning the line switch to position **I**.
3) For a few seconds the DISPLAY (D) shows the type of software on board (e.g. n 11) where:
   • **N** indicates the YEAR the software installed was created.
   • **1** indicates the RELEASE of the software installed
   • **1** indicates the VERSION of the software installed
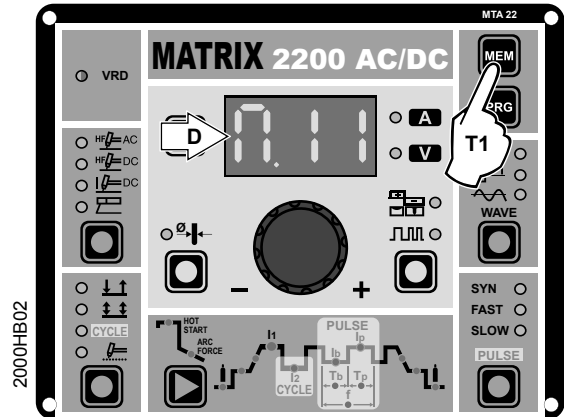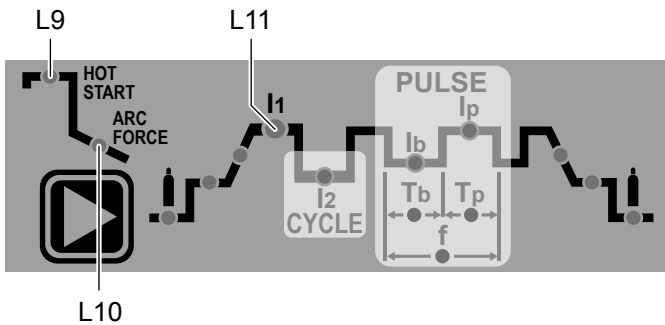

MMA Welding (Electrode)

1) Start the welding machine by turning the line switch to position **I**.
2) **WELDING PROCESS SELECTION**
   Push the WELDING PROCESS SELECTION key (T7) to select the ELECTRODE welding processes for welding with "HOT START" or "ARC FORCE" devices that can be programmed by the user. This machine is suitable for welding with all types of electrodes excepting for cellulose.
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.
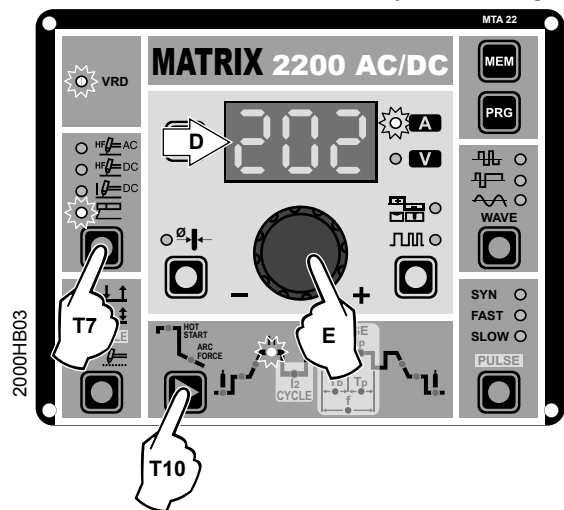
4) **WELDING PARAMETERS SELECTION**
   To refine the weld quality, the following parameters can be set by pushing the WELDING PARAMETERS SELECTION key (T10) in succession:
   - **HOT START -** This increases the welding current, in percentage terms, for a time interval that can be set at the start of the welding process, thereby reducing the risk of poor fusion at the start of the joint (**L9** - HOT START - 00-100).
   - **MMA ARC FORCE -** Regulates, in percentage terms, the dynamic characteristics of the arc (**L10** - ARC FORCE - 00-100).
   - **PRINCIPAL welding CURRENT I1 (L11** - 05÷180 A).

The value for the welding parameters can be regulated using the ENCODER Knob (E).
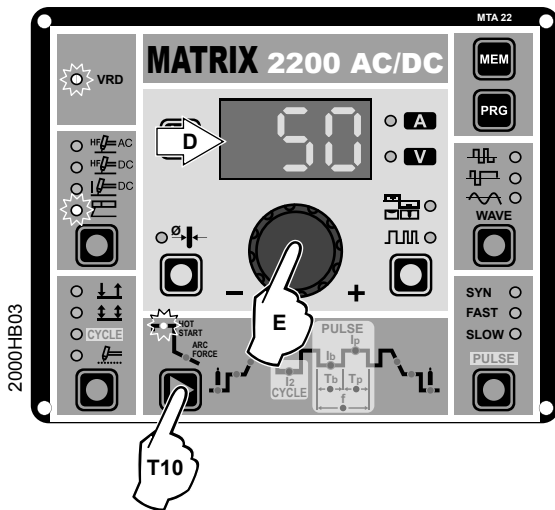
5) To exit these functions hold the FUNCTION SELECTION key (T10) down for about **1** second, after which the DISPLAY INDICATION LED switches on and the welding machine is once again ready to weld at the current indicated on the DISPLAY (D).
6) Once the all the selections/regulations indicated above have been made, welding can begin.
7) During the welding process the DISPLAY (D) shows the real Amps (A) at which the operator is actually welding.

TIG "AC" welding

1) Start the welding machine by turning the line switch to position **I**.
2) Push the WELDING PROCESS SELECTION key (T7) to select the **TIG "HF AC"** welding processes for TIG welding in alternating current with high frequency (HF) ignition.
3) **ELECTRODE DIAMETER SELECTION**
   Select the diameter of the electrode to achieve the best control of ignition in a synergic manner. **MATRIX 2200 AC/DC** machines can be used to weld with electrodes between 1,0 and 4,0 mm Ø. Selection is done by pushing the ELECTRODE DIAMETER Key (T8) (ELECTRODE DIAMETER LED flashing) and using the ENCODER Knob (E) to regulate the value indicated on the DISPLAY (D).
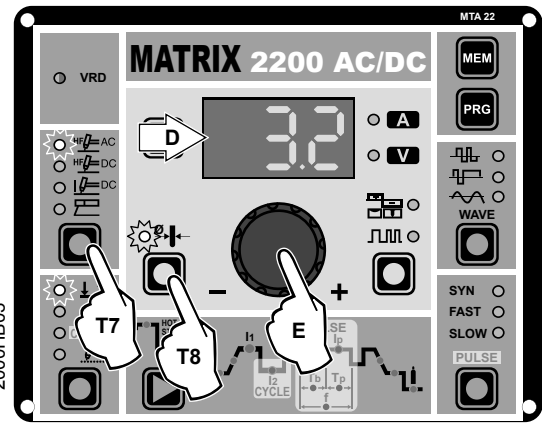
To confirm the diameter selected, simply push the ELECTRODE DIAMETER Key (T8) again (ELECTRODE DIAMETER LED off).

4) **SELECTING THE WAVE SHAPE**
   Push the WAVE key (t3) and choose which of the 3 different wave shapes is best for the specific welding needs:

   L27 SQUARE WAVE - Highly stable arc, ideal for all thicknesses, both thin and average.

   WARNING: *The display shows the peak current for pre-setting and welding.*

   L28 MIXED WAVE - Ideal for average / thick thicknesses and vertical welds. Increases penetration, thermal control of the arc, and lifespan of the electrode.

   **WARNING:** *The display shows the peak current for pre-setting and welding.*

   L29 SINUSOIDAL WAVE - Guarantees a softer, quieter arc: Ideal for average thicknesses and butt welds.

   WARNING: *The display shows the "RMS" current value for pre-setting and welding.*

5) **BALANCING** (-35÷+10 with f < 150Hz; -30÷+10 with f > 150Hz)
   By suitably graduating the electrode's positive and negative semi-wave, weld penetration or cleanliness of the workpiece's surface is increased.
   Push the BALANCING and FREQUENCY key (T4) once (BALANCING LED flashing) and use the ENCODER Knob (E) to regulate the value indicated on the DISPLAY (D).
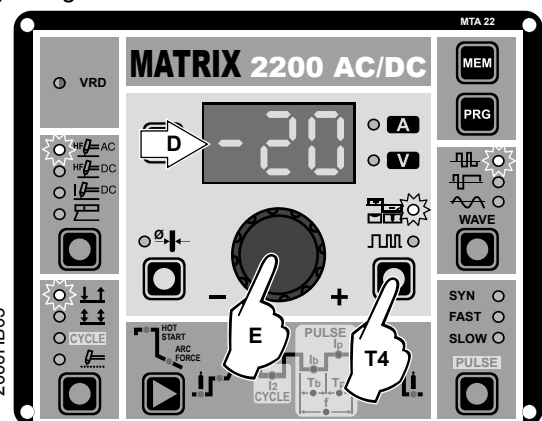
To confirm the value selected, simply push the BALANCING & FREQUENCY Key (T8) again (BALANCING LED off).
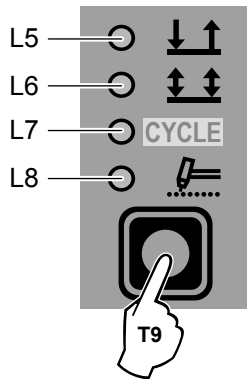
6) **FREQUENCY** (40 ÷ 250 Hz)
   If you want to regulate the wave FREQUENCY (f), to achieve concentration of the arc and reduce wear on the electrode, push the BALANCING and FREQUENCY key (T4) twice (FREQUENCY LED flashing) and use the EN-CODER Knob (E) to regulate the value (40 - 250 Hz) indicated on the DISPLAY (D).
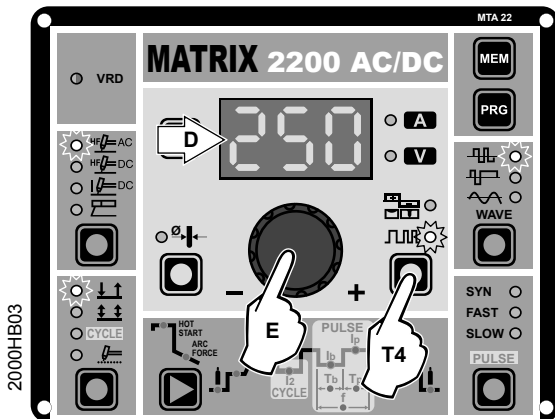
   To confirm the value selected, simply push the BALANCING & FREQUENCY Key (T8) again (FREQUENCY LED off).
7) Press the WELDING MODE SELECTION Key (T9) and go to one of the 4 options available:
   L5 2T
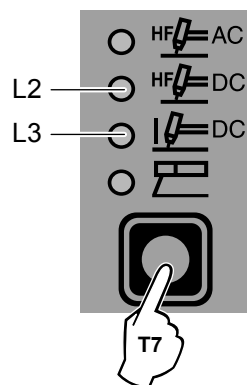   **L6** 4T
   L7 CYCLE
   L8 SPOT WELD
8) By pushing the WELDING PA-RAMETERS SELECTION key a number of times it is possible to set the various TIG WELDING PA-RAMETERS (see the "TIG AC and DC Welding" paragraph - WELD-ING PARAMETERS).
9) Once the all the selections/regula-tions indicated above have been made, welding can begin.
10) During the welding process the DISPLAY shows the real Amps (A) at which the operator is actually welding.

TIG "DC" welding

1) Start the welding machine by turning the line switch to po-sition **I**.
2) Press the WELDING PROCESS SELECTION Key (T7) and select:
   L2 a TIG "HF DC" welding pro-cess for direct current TIG weld-ing with high frequency ignition.
   L3 a TIG "Lift DC" welding pro-cess for direct current TIG "Lift" type welding without high frequen-cy.
   WARNING: *The "Lift" ignition cur-rent is created by pushing the torch button only after having touched the workpiece with the electrode.*
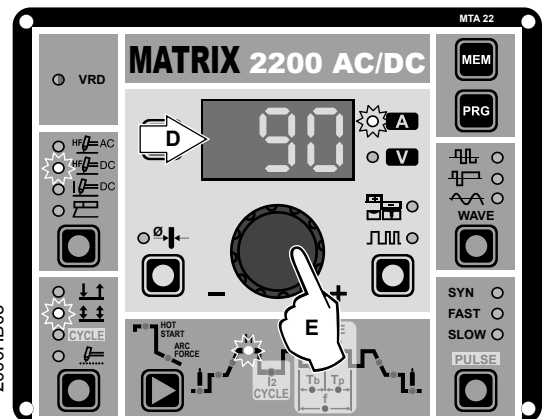

3) Press the WELDING MODE SELECTION Key (T9) and go to one of the 4 options available:
   L5 2T
   L6 4T
   L7 CYCLE
   L8 SPOT WELD
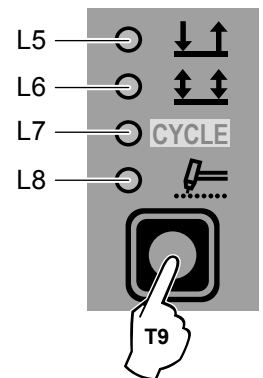
4) Turn the ENCODER Knob (E) until the DISPLAY (D) shows the CURRENT VALUE at which you wish to weld.
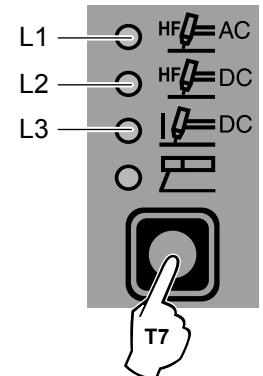

5) By pushing the WELDING PARAMETERS SELECTION (T10) key a number of times it is possible to set the vari-ous TIG WELDING PARAMETERS (see the "TIG AC and DC Welding" paragraph - WELDING PARAMETERS).
6) Once the all the selections/regulations indicated above have been made, welding can begin.
7) During the welding process the DISPLAY shows the real Amps (A) at which the operator is actually welding.

TIG "AC and DC" welding with the SPOT WELDING function on

1) Start the welding machine by turning the line switch to po-sition **I**.
2) Press the WELDING PROCESS SELECTION Key (T7) and select one of the welding machine's 3 TIG processes:
   L1 TIG "HF AC"
   L2 TIG "HF DC"
   L3 TIG "Lift DC"
3) Press the WELDING MODE SE-LECTION Key (T9) and go to one of the **SPOT WELDING** function.
4) Press and release the WELDING PARAMETERS SELECTION Key (T10) until the corresponding LED flashes.

5) Rotate the ENCODER knob (E) to set the SPOT WELD-ING time required (0,5 - 10 sec).

6) By pushing the WELDING PARAMETERS SELECTION (T10) key a number of times it is possible to set the various TIG WELDING PARAMETERS (see the "TIG AC and DC Welding" paragraph - WELDING PARAMETERS).
7) Once the all the selections/regulations indicated above have been made, welding can begin.
8) During the welding process the DISPLAY shows the real Amps (A) at which the operator is actually welding.
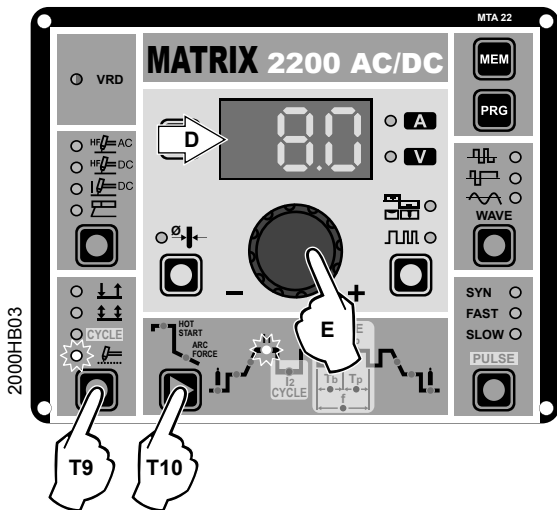
## TIG "AC and DC" welding - Welding parameters

The **MATRIX 2200 AC/DC** welding machine can be configured in the following **2** ways:
- **STANDARD (Std)** configuration - Valid for all the machine's welding processes.
- **SPECIAL (SPE)** configuration - That can only be activated when for TIG AC with HF ignition and TIG DC with HF ignition welding processes.

When it leaves the factory the welding machine is normally configured in STANDARD (Std) mode.
To check the configuration, carry out the following operations:
1) When the welding machine is off, push and hold the "PRG" PROGRAM key down (T2).
2) Start the welding machine by turning the line switch to position **I**.
3) The DISPLAY (D) shows the following message: **Std** (welder configured in STANDARD mode).
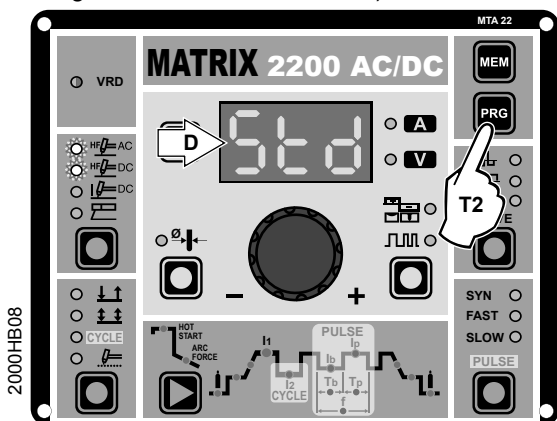
4) Press the "PRG" PROGRAM key (T2) to confirm.

■ STANDARD CONFIGURATION (Std)
The **WELDING PARAMETERS** included, programmable, and that can be edited (by turning the ENCODER key) in a **STANDARD (Std)** configuration can be broken down into 3 different sub-groups:
1) **"BASIC"**
2) With PULSE key active
3) With PULSE key and CYCLE welding mode active (CYCLE LED on)

1 - "BASIC" WELDING PARAMETERS
Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set:
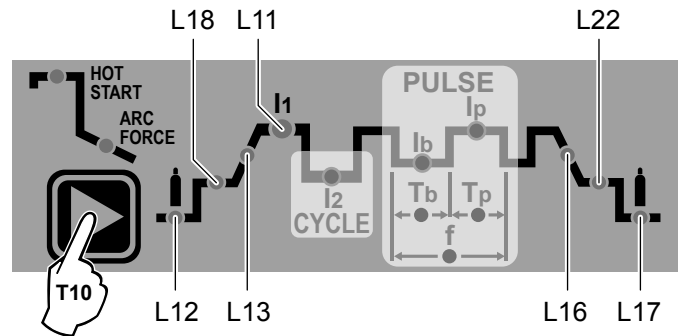
L12 *PRE-GAS duration (0,05 ÷ 1,00 sec)*

WARNING: *This cannot be programmed when the* **TIG DC with "Lift" type ignition** *welding processes is active.*

L18 *INITIAL welding CURRENT*

TIG DC 05 ÷ 220 A

TIG AC Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

WARNING: *This can only be programmed when* **4 STROKES** *or* **CYCLE** *welding mode is activated.*

L13 *SLOPE UP duration (0,0 ÷ 5,0 sec)*

L11 *PRINCIPAL welding CURRENT* I1

TIG DC 05 ÷ 220 A

TIG AC Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

L16 *SLOPE DOWN duration (0,0 ÷ 8,0 sec)*

L22 *FINAL welding CURRENT*

TIG DC 05 ÷ 220 A

TIG AC Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

WARNING: *This can only be programmed when* **4 STROKES** *or* **CYCLE** *welding mode is activated.*

L17 *POST GAS duration (0,5 ÷ 25 sec)*

WARNING: *When the post-gas LED flashes and the LED* I1 *is on at the same time, this means that the welding machine is in the post-gas stage.*

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**.

2 - WELDING PARAMETERS with PULSE key active
The **MATRIX 2200 AC/DC** welding machine can be used to do "pulse" TIG AC and DC welding in **3** different modes:
2A) SLOW PULSE
TIG pulse welding with manual setting of parameters.

WARNING: *This can only be programmed when the* **3** *TIG welding processes are used.*

2B) FAST PULSE
TIG pulse welding with manual setting of parameters.

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *or* **TIG DC with "Lift" type ignition** *welding processes are used.*

2C) SYN PULSE
TIG pulse welding with synergic setting of parameters.

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *or* **TIG DC with "Lift" type ignition** *welding processes are used.*
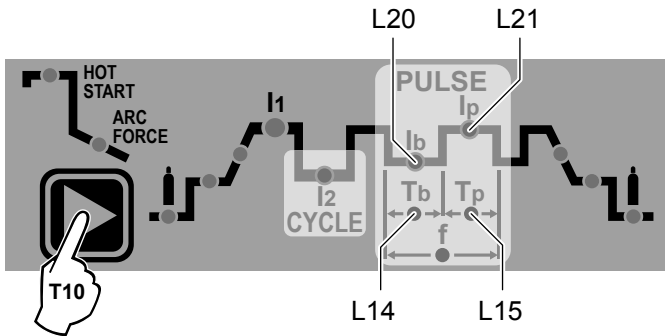
NOTE: *Pulsation is deactivated automatically for the duration of the INITIAL and FINAL current.*

2A - SLOW PULSE
Press the PULSE key (T5) until the requited pulsation is active.

Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the following (in addition to the WELDING PARAMETERS defined as being "BASIC"):

L21 *PEAK CURRENT* **Ip**

TIG DC   05 ÷ 220 A
TIG AC   Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

L20 *BASE CURRENT* **Ib**

TIG DC   05 ÷ 220 A
TIG AC   Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

L15 *PEAK current duration* **Tp**

TIG DC   0,01 ÷ 0,99 sec
TIG AC   0,10 ÷ 0,99 sec

L14 *BASE current duration* **Tb**

TIG DC   0,01 ÷ 0,99 sec
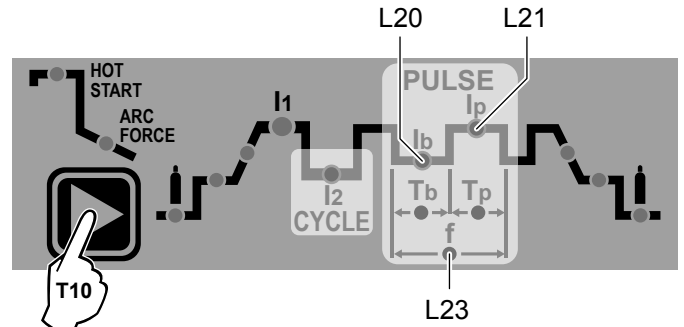**TIG AC**   0,10 ÷ 0,99 sec

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1** second.

2B - FAST PULSE
Press the PULSE key (T5) until the requited pulsation is active.

Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the following (in addition to the WELDING PARAMETERS defined as being "BASIC"):

L20 *BASE CURRENT* **Ib** *(05 ÷ 220 A)*
L21 *PEAK CURRENT* **Ip** *(05 ÷ 220 A)*
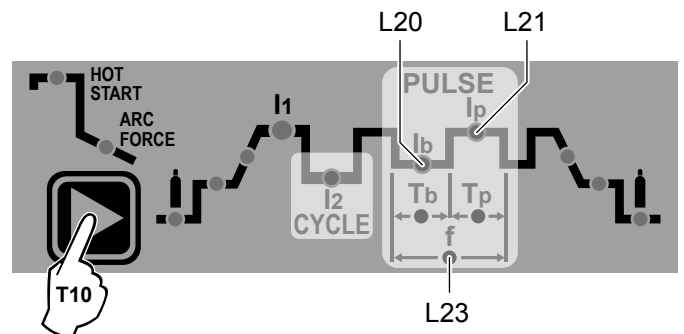**L23** *PULSATION FREQUENCY* **f** *(05 ÷ 2000 Hz)*

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**.

2C - SYN PULSE
Press the PULSE key (T5) until the requited pulsation is active.

Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the following (in addition to the WELDING PARAMETERS defined as being "BASIC"):

L20 *BASE CURRENT* **Ib** *(25 ÷ 220 A)*
L21 *PEAK CURRENT* **Ip** *(05 ÷ 60 A)*
L23 *PULSATION FREQUENCY* **f** *(70 ÷ 2000 Hz)*

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**.

3 - WELDING PARAMETERS with PULSE key and CYCLE welding mode active (CYCLE LED on)

When this welding mode is active it is possible to work at 2 different pulse current levels (I_1 and I_2). To do so you must also set (not only pulse parameters I_b, I_p, and f), but also the 2nd level PEAK current (I_{2p}). The other 2nd level pulse parameters (BASIC CURRENT I_{2b} and FREQUENCY f) are achieved synergically. The FREQUENCY remains constant while the 2nd level BASIC CURRENT I_{2b} is proportional to the ratio between the 1st level currents.

3A - SLOW PULSE + CYCLE

Press the PULSE key (T5) until the requited pulsation is active (SLOW LED on).
Press the WELDING MODE SELECTION key (T9) until the CYCLE welding mode is active (CYCLE LED on).
Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the following (in addition to the WELDING PARAMETERS defined as being "BASIC"):
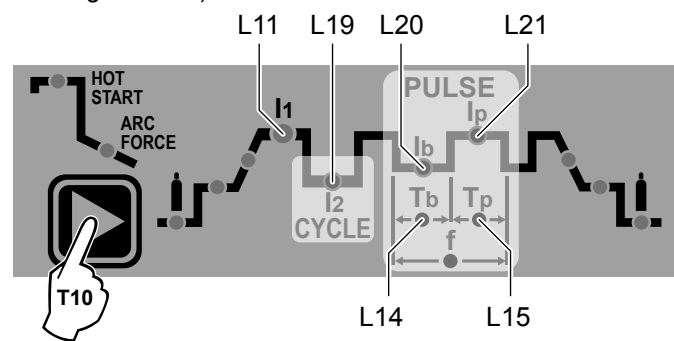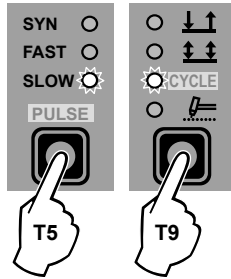
L11 - L21 *1st LEVEL PEAK CURRENT* I_{1p}

TIG DC 05 ÷ 220 A

TIG AC Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

L19 *2nd LEVEL PEAK CURRENT* I_{2p}

TIG DC 05 ÷ 220 A

TIG AC Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

L20 *1st LEVEL BASE CURRENT* I_{1b}

TIG DC 05 ÷ 220 A

TIG AC Square wave: 05 ÷ 220 A
Mixed wave: 05 ÷ 220 A
Sinusoidal wave: 16 ÷ 154 A

L15 *PEAK current duration* T_p

TIG DC 0,01 ÷ 0,99 sec

TIG AC 0,10 ÷ 0,99 sec

L14 *BASE current duration* T_b

TIG DC 0,01 ÷ 0,99 sec
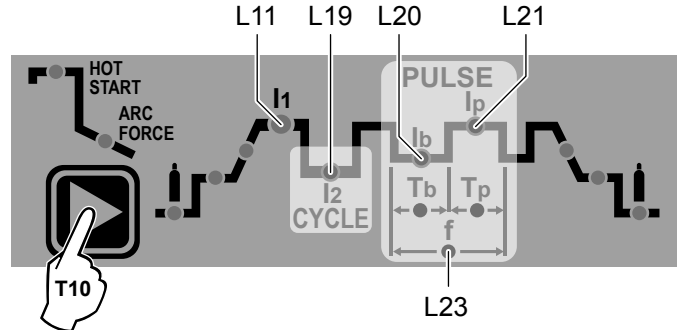
TIG AC 0,10 ÷ 0,99 sec

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**.

3B - FAST PULSE + CYCLE

Press the PULSE key (T5) until the requited pulsation is active (FAST LED on).
Press the WELDING MODE SELECTION key (T9) until the CYCLE welding mode is active (CYCLE LED on).
Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the following (in addition to the WELDING PARAMETERS defined as being "BASIC"):

L11 - L21 *1st LEVEL PEAK CURRENT* I_{1p} *(05 ÷ 220 A)*
L19 *2nd LEVEL PEAK CURRENT* I_{2p} *(05 ÷ 220 A)*
L20 *1st LEVEL BASE CURRENT* I_{1b} *(05 ÷ 220 A)*
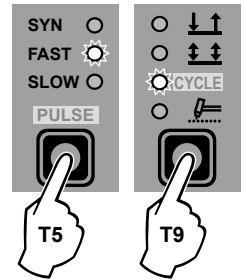**L23** *PULSATION FREQUENCY* f *(0,5 ÷ 2000 Hz)*

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**.

3C - SYN PULSE + CYCLE

Press the PULSE key (T5) until the requited pulsation is active (SYN LED on).
Press the WELDING MODE SELECTION key (T9) until the CYCLE welding mode is active (CYCLE LED on).
Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the following (in addition to the WELDING PARAMETERS defined as being "BASIC"):
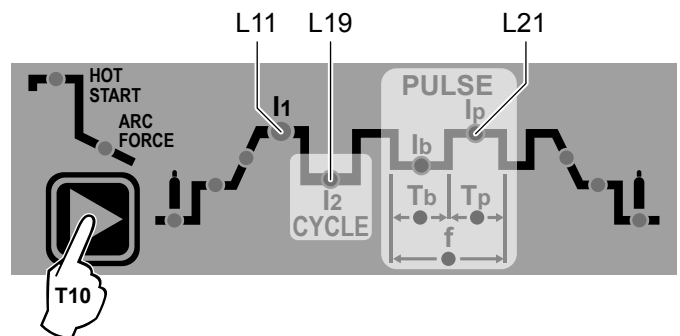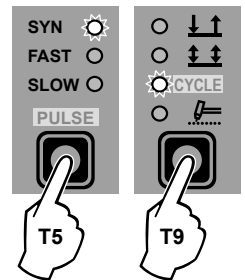
L11 - L21 *1st LEVEL PEAK CURRENT* I_{1p} *(05 ÷ 220 A)*

WARNING: *When the* **SYN PULSE** *function is active, the 1st level PEAK CURRENT (*I_{1p}*) is regulated to achieve a synergy with the values for the other 1st level parameters (*I_{1b}*, *f*).*

L19 *2nd LEVEL PEAK CURRENT* I_{2p} *(05 ÷ 220 A)*

WARNING: *When the* **SYN PULSE** *function is active, the 2nd level PEAK CURRENT (*I_{2p}*) is regulated to achieve a synergy with the values for the other 2nd level parameters (*I_{2b}*, *f*).*

If you want to do a test weld, during the test the LED for the parameter selected flashes and the DISPLAY shows the value for the parameter you are setting.
To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**.

NOTE: *During the welding process if LED* I_p *and LED* I_1 *stay switched on on the DISPLAY, the 1st level current at which you are welding is displayed.*

NOTE: *During the welding process if LED* I_2 *and LED* I_p *stay switched on on the DISPLAY, the 2nd level current at which you are welding is displayed.*

■ SPECIAL CONFIGURATION (Spe)

The **MATRIX 2200 AC/DC** makes it possible to activate modification (only when welding using TIG AC with HF ignition and TIG DC with HF ignition welding processes) of some WELDING PARAMETERS therefore providing a more expert welder with a more versatile welding machine.
To change the welding machine's configuration and configure it in **SPECIAL (SPE)** mode, carry out the following operations:
1) When the welding machine is off, push and hold the "PRG" PROGRAM key down (T2).
2) Start the welding machine by turning the line switch to position **I**.
3) The DISPLAY (D) shows the following message: **Std** (welder configured in STANDARD mode).
4) Turn the ENCODER Key (E) until the DISPLAY (D) shows the following message: **SPE** (welder configured in SPECIAL mode).
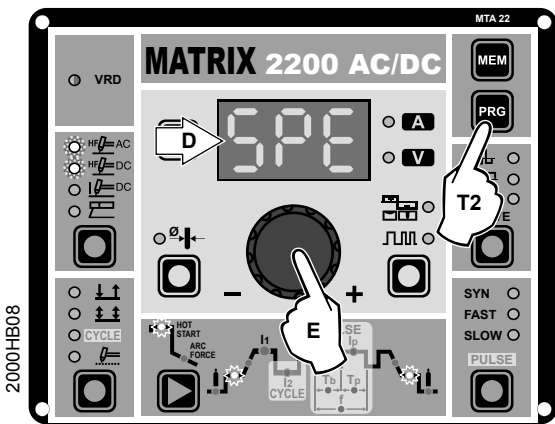
5) Press the "PRG" PROGRAM key (T2) to confirm.

The **WELDING PARAMETERS** included, programmable, and that can be edited (by turning the ENCODER knob) in a **SPECIAL (SPE)** in addition to those already included in the STANDARD configuration are shown below.
Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the following (in addition to the WELDING PARAMETERS defined as being "BASIC"):
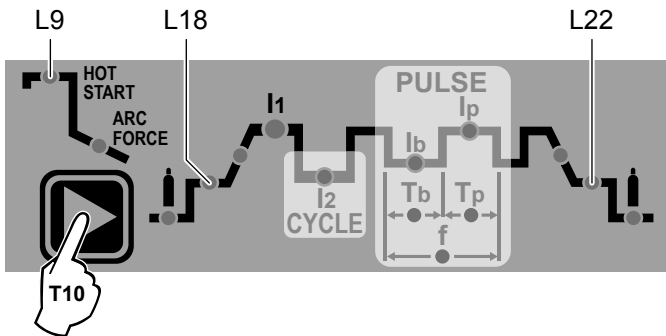
L9 *IGNITION CURRENT (0,5 ÷ 220 A)*
L9 *IGNITION TIME duration (t.01 (0,01 sec) - t.50 (0,50 sec))*

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *welding process is active.*

WARNING: *If the value of these 2 parameters is too low, this could prejudice ignition.*

L18 *IGNITION welding CURRENT (0,5 ÷ 220 A)*

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *or* **TIG DC with HF ignition** *welding processes and the* **2 STROKES** *welding mode are used.*

L22 *FINAL welding CURRENT (0,5 ÷ 220 A)*

WARNING: *This can only be programmed when the* **TIG AC with HF ignition** *or* **TIG DC with HF ignition** *welding processes and the* **2 STROKES** *welding mode are used.*

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**.

WARNING: These WELDING PARAMETERS are only to be activated by qualified personnel, or those trained by CEA technicians.

Creating and memorising automatic welding points

Once you have defined the parameters the operator requires to do their work properly, you can save them in the memory and create a WELDING PROGRAM by proceeding as follows.

WARNING: *To access the setting saving phase, the PRINCIPAL CURRENT LED* I_1 *must be switched on without flashing.*

1) Hold the "PRG" PROGRAM Key (T2) down for at least **5** consecutive seconds until the DISPLAY (D) reads **Pr**, accompanied by a flashing number (e.g. Pr 1).
   In order to be able to choose WELDING PROGRAM that is free, simply rotate the ENCODER knob (E) and look for a program for which the MTA 22 control panel has all the LEDs for the various settings switched off.
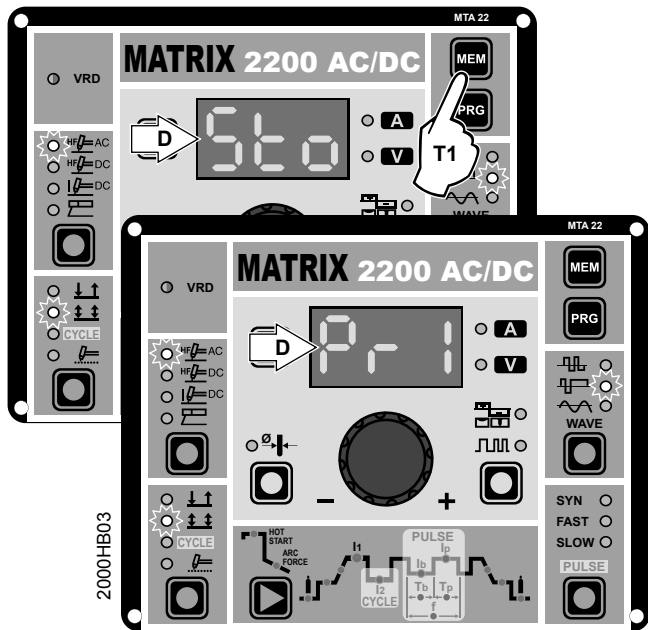   **WARNING:** *The MTA 22 control panel allows you to save a maximum of* **7** *WELDING PROGRAMS.*
   It is also possible to overwrite a program already saved.
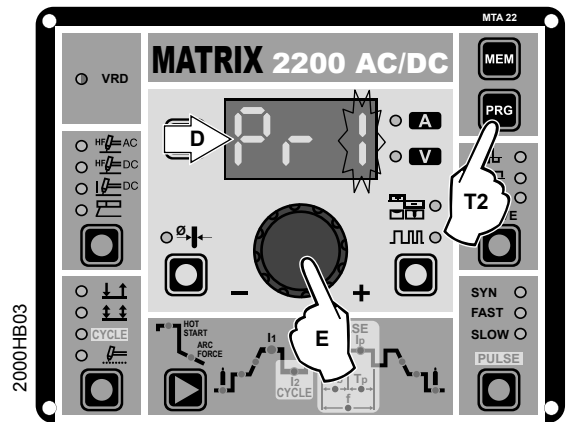
2) To SAVE the PROGRAM hold the "MEM" SAVE Key (T1) down until the DISPLAY reads **"Sto"**.

3) The WELDING PROGRAM has now been saved and its number appears in the DISPLAY (D) along with the other settings saved (corresponding LEDs on without flashing).

## PROGRAMMED and/ or MANUAL welding

PROGRAMMED WELDING
When the WELDING PROGRAM has been saved, the operator can weld using only pre-set values as they cannot edit any type of parameter / function. To edit, switch to MANUAL welding mode.
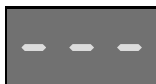
MANUAL WELDING
To go back to set / edit the parameters selected or to create a new program, proceed as follows:
1) Hold the "PRG" PROGRAM Key (T2) down (about **3** seconds) until the DISPLAY (D) shows the number of the program selected flashing (e.g. **Pr6**).
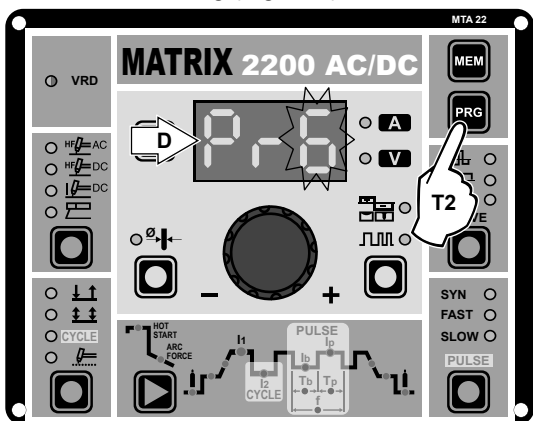
2) Turn the ENCODER Key (E) anticlockwise until the DISPLAY (D) shows 3 dashes.

3) Press and release the "PRG" PROGRAM key (T2) and the machine goes back to the initial operation condition.
4) You can now set or edit the individual parameters or create new programs.
5) Rotate the ENCODER Knob (E) to scroll the programs until you find an empty, unused program slot.

NOTE: *You can create a sequence of programs to be used by means of the up/down control, putting an empty program among those that have been saved.*

Calling up saved programs

1) Hold the "PRG" PROGRAM Key (T2) down (about 3 seconds) until the DISPLAY (D) shows the number of the program selected flashing (e.g. Pr 6).
2) Turn the ENCODER Knob (E) until the DISPLAY (D) shows the program number (flashing) you wish to call up (e.g. Pr5).

NOTE: *If when you are rotating the ENCODER knob (E) to look for a saved welding program to call up the MTA 22 panel does not have any LEDs switched on without flashing, this means that the welding program you are trying to call up has not been saved and, as a result, cannot be called up!*

3) Press and release the "PRG" PROGRAM key (T2) to call up the program number selected.
4) You can now carry out **PROGRAMMED** welding.

Viewing the parameters set

1) Call up the program required (see the "Calling up saved programs" paragraph).
2) Press and release the WELDING PARAMETERS SELECTION Key (T10) to view the parameters set in sequence.
3) Hold the WELDING PARAMETERS SELECTION Key (T10) down for more than **1** second to go back to the program selected.

**NOTE:** *If the parameters set are edited, you automatically exit programming.*

Editing the maximum and minimum limits for welding parameters

The **MATRIX 2200 AC/DC** makes it possible to activate modification (only when welding using TIG AC with HF ignition and TIG DC with HF ignition welding processes) of the MAXIMUM AND MINIMUM LIMITS for some welding parameters thereby providing a more expert welder with a more versatile welding machine.
1) When the welding machine is off, push and hold the WELDING PARAMETERS SELECTION key (T10).
2) Start the welding machine by turning the line switch to position **I**.

3) Press the WELDING PARAMETERS SELECTION Key (T10) a number of times to set the limits for the following welding parameters:
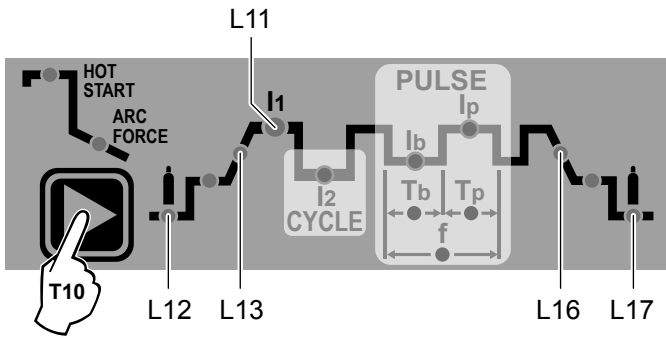
L12 *PRE-GAS duration (maximum limit settable from 1,00 to 2,50 sec)*

L13 *SLOPE UP duration (maximum limit settable from 5,00 to 10,0 sec)*

L11 *MINIMUM CURRENT for remote controls (minimum limit settable from 05 to 220 A)*

WARNING: *If the minimum limit setting (for the remote control MINIMUM CURRENT) is greater than or equal to the value for the PRINCIPAL welding CURRENT* I_1*, you will weld at the PRINCIPAL welding CURRENT* I_1*, irrespective of the setting you have chosen for the remote control.*

L16 *SLOPE DOWN duration (maximum limit settable from 8,00 to 15,0 sec)*

L17 *POST-GAS duration (maximum limit settable from 10,0 to 25,0 sec)*

To exit the setting phase, hold the WELDING PARAMETERS SELECTION key (T10) down for about **1 second**. The values set are now active and welding can begin.

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 MTA 22 control panel to the welding machine.
2) Remove the "VRD" JUMPER on the FRONT PANEL of the DIGITAL ELECTRONIC BOARD (Fig. A).
3) Use a suitable screwdriver to tighten the 4 screws that fix the MTA 22 control panel to the welding machine.
4) Start the welding machine by pushing the switch on the rear panel to position **I**.

When the MTA 22 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.

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.

Auxiliary functions

"Energy saving"
This function manages correct functioning of the cooling fan and cooling equipment that only run when strictly necessary, that is:
• **FAN MOTOR -** The fan is activated when:
  - During welding or for a certain period of time after this is finished.
  - When the thermostat intervenes or for a certain period of time after it has just been reset.
• **COOLING DEVICE -** The cooling device is activated:
  - When the machine is switched on for about **1** minute in order to allow the cooling liquid to circulate through the equipment at the correct pressure (if the error message does not disappear from the DISPLAY (D) when the cooling equipment switches off, contact our technical assistance department).
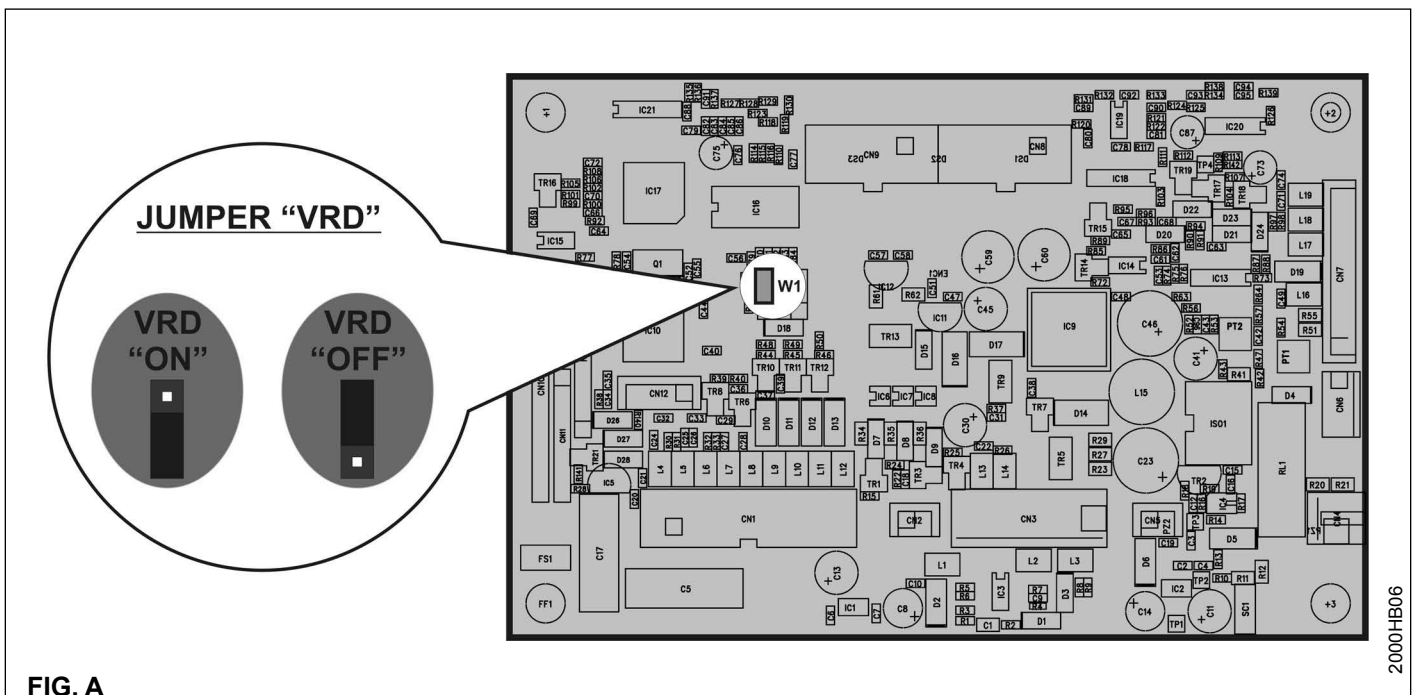 - During welding or for a certain period of time after this is finished.
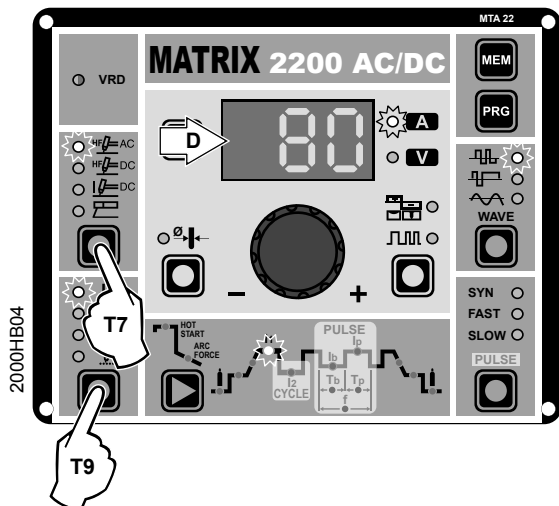

FIG. A

Factory default

Table 1

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

To reset the settings, you must:
- When the welding machine is off, push and hold the WELDING PROCESS SELECTION (T7) and WELDING MODE SELECTION (T9) keys down together.
- Switch on the welding machine and hold down the keys until the DISPLAY (D) reads 80.
- Release the two keys.
- The reset procedure has now been completed successfully.

Display	Diagnosis
E01	**PRESSURE SWITCH** This message appears when the cooling equipment is connected to the machine and its pressure switch does not close due to a lack of pressure in the hydraulic circuit. Automatic reset error.
E05	**SECONDARY OVER VOLTAGE** This is activated when the power supply voltage to the equipment exceeds **113 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.
t°C	**THERMAL PROTECTION** The welding stops due to an excessively high temperature (thermostat activated). Automatic reset error.

WARNING: *The MATRIX 2200 AC/DC welding machine has a built-in electronic protective device to deal with fluctuations in mains voltage that switches the machine off automatically (voltage exceeding 300 V), without indicating any type of error or warning message for the operator. Subsequently it starts functioning again automatically when the voltage has dropped to below the value indicated above.*

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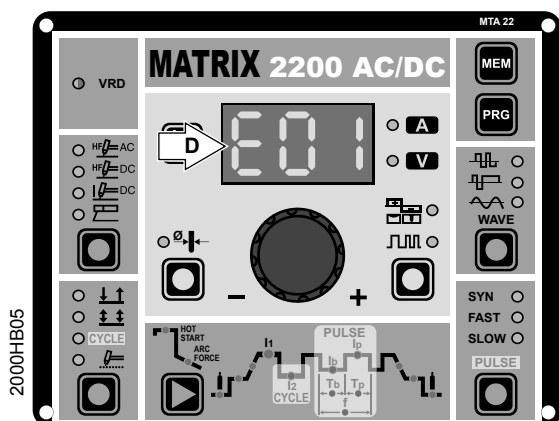
The equipment is protected against problems and if any arise the DISPLAY shows fixed or flashing (error code) messages (depending on the type of error) that serve to inform the operator that a fault has occurred in the equipment (see table 1). The table provides a summary of all the error conditions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

Automatic reset error: once the alarm condition has been resolved the equipment starts working again and the operator can weld again!

PLEASE NOTE: *If the fault persists look for the cause of the fault and contact our technical assistance department if necessary.*

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.