GB

INSTRUCTION MANUAL

MMA/MIG-MAG/TIG MULTIFUNCTION WELDER

CE

INDEX

SAFETY INFORMATION

INTRODUCTION

Make sure this manual is carefully read and understood by the welder, and by the maintenance and technical workers.

PERSONAL PROTECTION

Welding processes of any kind can be dangerous not only to the operator but to any person situated near the equipment, if safety and operating rules are not strictly observed.

Arc rays can injure your eyes and burn your skin. The welding arc produces very bright ultra violet and infra red light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

- Wear closed, non-flammable protective clothing, without pockets or turned up trousers, gloves and shoes with insulating sole and steel toe. Avoid oily greasy clothing.
- Wear a non-flammable welding helmet with appropriate filter lenses designed so as to shield the neck and the face, also on the sides. Keep protective lens clean and replace them when broken, cracked or spattered. Position a transparent glass between lens and welding area.
- Weld in a closed area that does not open into other working areas.
- Never look at the arc without correct protection to the eyes. Wear safety glasses with the side shields to protect from flying particles.

Gases and fumes produced during the welding process can be dangerous and hazardous to your health.

- Adequate local exhaust ventilation must be used in the area. It should be provided through a mobile hood or through a built-in system on the workbench that provides exhaust ventilation from the sides, the front and below, but not from above the bench so as to avoid raising dust and fumes. Local exhaust ventilation must be provided together with adequate general ventilation and air circulation, particularly when work is done in a confined space.
- Welding process must be performed on metal surfaces thoroughly cleaned from rust or paint, to avoid production of harmful fumes. The parts degreased with a solvent must be dried before welding.
- Be very carefull when welding any metals which may contain one or more of the follwing:

Antimony	Beryllium	Cobalt
Manganese	Selenium	Arsenic
Cadmium	Copper	Mercury
Silver	Barium	Chromium
Lead	Nickel	Vanadium

- Remove all chlorinated solvents from the welding area before welding. Certain chlorinated solvents decompose when exposed to ultraviolet radiation to form phosgene gas (nerve gas).

FIRE PREVENTION

Fire and explosion can be caused by hot slag, sparks or the welding arc.

- Keep an approved fire extinguisher of the proper size and type in the working area. Inspect it regularly to ensure that it is in proper working order;
- Remove all combustible materials from the working area. If you can not remove them, protect them with fire-proof covers;
- Ventilate welding work areas adequately. Maintain sufficient air flow to prevent accumulation of explosive or toxic concentrations of gases;
- Do not weld on containers that may have held combustibles;
- Always check welding area to make sure it is free of sparks, slag or glowing metal and flames;
- The work area must have a fireproof floor;

ELECTRIC SHOCK

WARNING: ELECTRIC SHOCK CAN KILL!

- A person qualified in First Aid techniques should always be present in the working area; If a person is found unconscious and electric shock is suspected, do not touch the person if she or he is in contact with cable or electric wires. Disconnect power from the machine, then use First Aid. Use dry wood or other insulating materials to move cables, if necessary away from the person.
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the welding circuit.
- Make sure the main line is properly grounded.
- Do not coil the torch or the ground cables around your body.
- Never touch or come in physical contact with any part of the input current circuit and welding current circuit.

Electric warning:

- Repair or replace all worn or damaged parts.
- Extra care must be taken when working in moist or damp areas.
- Install and maintain equipment according to local regulations.
- Disconnect power supply before performing any service or repair.
- Should you feel the slightest electrical shock, stop any welding immediately and do not use the welder until the fault has been found and corrected.

NOISE

Noise can cause permanent hearing loss. Welding processes can cause noise levels that exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

- To protect your hearing from loud noise, wear protective ear plugs and/or ear muffs.
- Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.

ELECTROMAGNETIC COMPATIBILITY

Before installing your welder, carry out an inspection of the surrounding area, observing the following guidelines:

- Make sure that there are no other power supply cables, control lines, telephone leads or other equipment near the unit.
- Make sure that there are no radio receivers, television appliances, computers or other control systems near the unit.
- People with pace-maker or hearing-prosthesis should keep far from the power source.

! In particular cases special protection measures may be required.

Interference can be reduced by following these suggestions:

- If there is interference in the power source line, an E.M.T. filter can be mounted between the power supply and the power source;
- The output cables of the power source should be not too uch long, kept together and connected to ground;
- After the maintenance all the panels of the power source must be securely fastened in place.

PROTECTIVE WELDING GASES

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Treat them carefully.

- These welders use only inert or non-flammable gases for welding arc protection. It is important to choose the appropriate gas for the type of welding being performed;
- Do not use gas from unidentified cylinders or damaged cylinders;
- Do not connnect the cylinder directly to the welder, use a pressure regulator;
- Make sure the pressure regulator and the gauges function properly;
- Do not lubricate the regulator with oil or grease;
- Each regulator is designed for use with a specific gas. Make sure the regulator is designed for the protective gas being used;
- Make sure that the cylinder is safely secured tightly to the welder with the chain provided.
- Never expose cylinders to excessive heat, sparks, slag or flame;
- Make sure that the gas hose is in good condition;
- Keep the gas hose away from the working area.

INTRODUCTION

This manual was edited to give some indications on the operation of the welder and was thought to offer information for its practical and secure use. Its purpose is not teach welding techniques. All given suggestions are indicative and intended to be only guidelines.

To ensure that your welder is in good condition, inspect it carefully when you remove it from its packing having care to ascertain that the cabinet or the stocked accessories are not damaged.

Your welder is capable of daily activity of construction and reparation. Its simplicity and versatility and its excelling welding characteristics are granted by the inverter technology. This welding inverter allows to be finely set to obtain optimal arc characteristics with a reduced consumption of energy and with respect to the welders based on a traditional transformer.

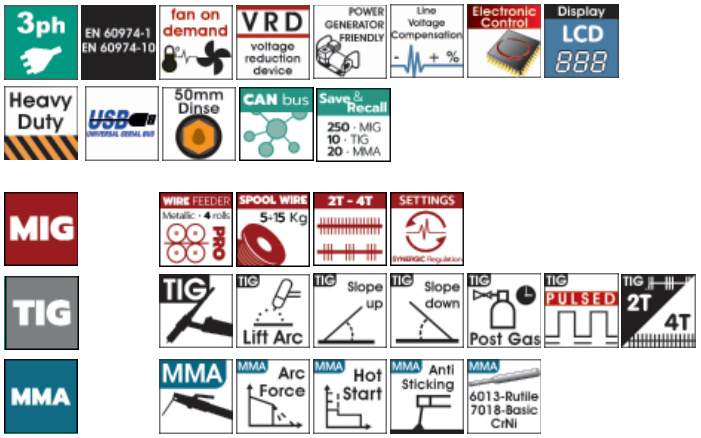
Respect the duty cycle of the welder making reference to the technical data label on the welder's back/bottom. Duty cycle is given as percentage on a 10 minute time. During this period of time the unit can be used at a defined power regulation. Duty cycle exceeding may cause overheating or welder's damage.

MAIN FEATURES

Your welder is a multiprocess unit capable of exe-cellent performances in TIG, MMA and MIG/MAG welding. Available configurations are:

- Compact Welding Machine on wheels only air cooled
- Compact Welding Machine with carry trolley with water cooler
- Power Generator with Separate Wire Feeder and Water cooler available in two models.

Common standard features are:



Electrodes:
Your welder can weld electrodes ø 1,6 ÷ 6mm, 6011, 6013, 7018., cast iron.

The top model can weld also 6010 and Aluminum electrodes, perform the gouging and work as Constant Voltage supplier.

Welding Wire Selection:
Your welder can work with Aluminum wire 0,8÷1,6 thick, solid steel wire 0,6÷1,6 thick and stainless steel wire 0,8÷1,6 thick. The top model can work also with Aluminum and Stainless Steel wires 2.0 thick.

Feed Rolls:
Wide selection of rolls made special for different welding wires and diameters. Grooves available from 0,6 till 1,6.

Gas Selection:
According to the material to be welded and to the wire you are going to use select the shielding gas. The here below table can give you some useful in-dications:

MATERIAL TO WELD	GAS CYLINDER	WIRE
Mild steel	Argon + CO2 cylinder or CO2 cylinder	Copper coated mild steel wire spool.
Stainless steel	Argon 98% + CO2 2% cylinder	Stainless steel wire spool.
Aluminium	Argon cylinder	Aluminium wire spool
Brazing Alloys	Argon cylinder	Brazing wire spool

Table 1

Optional features and functions are:

Mig Pulsed

Mig Double Pulsed

Root Welding

Push-Pull

Spool-Gun


Torches with remote control, analog or digital

T-Link

INSTALLATION

LOCATION

Be sure to locate the welder according to the following guidelines.

- In areas, free from moisture and dust;
- Ambient temperature between 0° to 40°C;
- In areas, free from oil, steam and corrosive gases;
- In areas, not subjected to abnormal vibration or shock;
- In areas, not exposed to direct sunlight or rain;
- Place at a distance of 300mm or more from walls or similar that could restrict natural air flow for cooling.

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

MAIN SUPPLY VOLTAGE REQUIREMENTS

Before you make any electrical connection, check that supply voltage and frequency available at site are those stated in the ratings label of your generator.
The main supply voltage should be within ±10% of the rated main supply voltage. Too low a voltage may cause poor welding performance. Too high a supply voltage will cause components to overheat and possibly fail. The welder Power Source must be:

- Correctly installed, if necessary, by a qualified electrician;
- Correctly grounded (electrically) in accordance with local regulations;
- Connected to the correct size electric circuit.

In case the supply cable is not fitted with a plug, connect a standardized plug (3P+T) to the supply cable (in some models the supply cable is supplied with plug).
To connect the plug to the supply cable, follow these instructions:

- the brown (phase) wire must be connected to the terminal identified by the letter L1
- the blue or grey wire must be connected to the terminal identified by the letter L2
- the black or grey wire must be connected to the terminal identified by the letter L3
- the yellow/green (ground) wire must be connected to the terminal identified by the letter PE or by the symbol ⏚ .

In any case, the connection of the yellow/green wire to the PE terminal ⏚ must be done in order that in the event of tearing of the power supply cable from the plug, the yellow/green wire should be the last one to be disconnected.

The outlet should be protected by the proper protection fuses or automatic switches.

Notes:

- Periodically inspect supply cable for any cracks or exposed wires. If it is not in good conditions, have it repaired by a Service Centre.
- Do not pull violently the input power cable to disconnect it from supply.
- Do not squash the supply cable with other machines, it could be damaged and cause electric shock.
- Keep the supply cable away from heat sorces, oils, solvents or sharp edges.
- In case you are using an extension cord, try to keep it well straight and avoid its heating up.

SAFETY INSTRUCTIONS

For your safety, before connecting the power source to the line, closely follow these instructions:

- An adequate switch must be inserted before the mains outlet; this switch must be equipped with time-delay fuses;
- The connection with ground must be made with a plug compatible with the above mentioned socket;
- When working in a confined space, the power source must be kept outside the welding area and the ground cable should be fixed to the workpiece. Never work in a damp or wet area, in these conditions.
- Do not use damaged input or welding cables
- The welding torch should never be pointed at the operator's or at other persons' body;
- The power source must never be operated without its panels; this could cause serious injury to the operator and could damage the equipment.

ASSEMBLY

TROLLEY MOUNTING AND INSTALLATION

- Follow the mounting instructions supplied with the trolley to install the welding unit, compact or with separate wire feeder and the cooling unit.

HOSEPACK CONNECTION

- Connect the dinse plugs of the interconnecting hosepack to the Positive Sockets - **L** - on the back side of wire feeder and power generator.
- Connect the military connectors of the interconnecting hosepack to the Sockets - **J** - on the back side of wire feeder and power generator.
- Connect the blue water feed hose of the interconnecting hosepack to the connections marked in blue - **Q** - on the back side of wire feeder and water cooler.
- Connect the red water feed hose of the interconnecting hosepack to the connections marked in red - **Q** - on the back side of wire feeder and water cooler.

WATER COOLER CONNECTION

Important: read also the Operating instructions supplied with the water cooler before connecting it to the welding unit.

For Compact Units:

- Remove the covering metal plate from the back panel of the unit - **U** -.
- Connect through the quick connectors the power cable and the pressostat cable of the water cooling unit to the welding unit.
- Fix the metal plate assembled to the power and pressostat cables to the back panel of the unit.

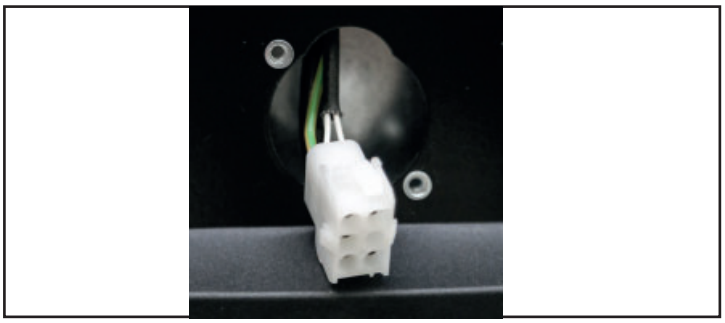


Figure 1 - Water Cooler Connector

Important: The water cooler is activated from the menu "Basic Setup". Refer to "Basic Setup" section.

PREPARATION FOR WELDING

- Refer to the Assembly Paragraph for the unit's installation, for the connection of the hosepack and of the water cooler (if present).
- Load the wire, connect the gas cylinder and replace the wire liner if necessary following the instructions in this paragraph.
- Check line voltage and connect power cable.
- Control the amount of the cooling liquid in the water coller and power it ON.
- Power the welding unit ON. The display shows the screen of the last welding process performed by the unit.
- Check the activation of the cooler unit on Initial Setup Menu before proceeding.

EARTH CABLE AND TORCH CABLE CONNECTION

Ensure unit is powered off and unpluged from the mains.

NO-GAS WELDING

- Connect the earth cable to the positive current socket – **B** – of the power source.
- Connect the torch connection cable to the negative socket on the Voltage change board on the horizontal internal panel.

GAS WELDING

- Connect the earth cable to the negative current socket – **E** – of the power source.
- Connect the torch connection cable to the positive socket on the Voltage change board on the horizontal internal panel.
- Plug the torch hose into the socket – **A** – on the front of the welder having care to not damage the contacts and secure by hand screwing in the threaded connection.

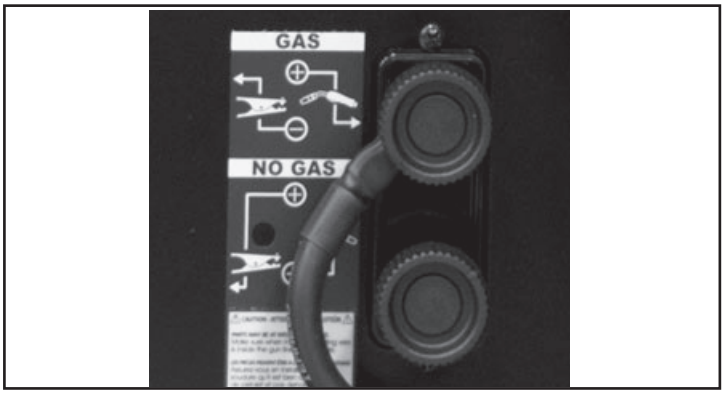


Figure 2 - Voltage Change

WIRE LOADING

Ensure the gas and electrical supplies are disconnected. Before proceeding, remove the nozzle and the contact tip from the torch.

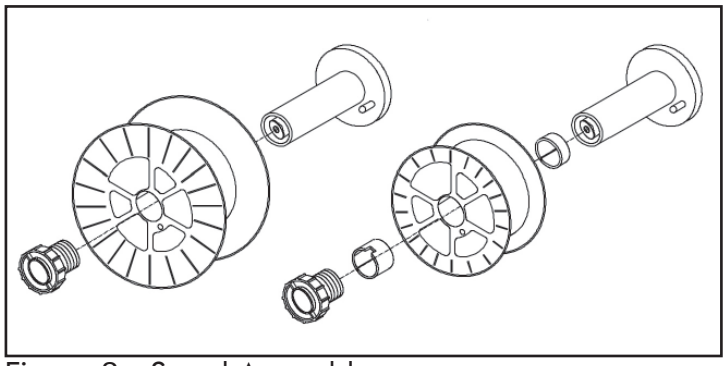


Figure 3 - Spool Assembly

- Open the side panel.
- Loosen the nut of the spool holder (brake drum). In the case you are replacing the wire spool, extract it.
- Remove the plastic protection from the spool. Place it on the spool holder.
- If required for the type of spool being installed, mount also the spacers as shown in the Figure 3.
- Tighten the lock nut turning it.

Tighten nut (A) to appropriate tightness. Excessive pressure strains the wire feeding motor. Too little pressure does not allow the proper wire feeding.

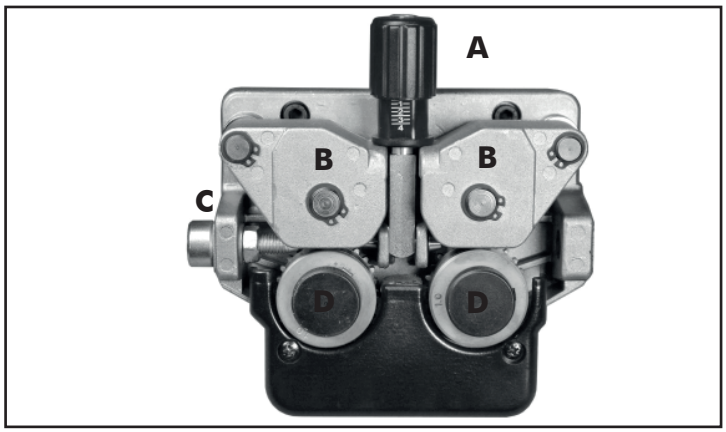


Figure 4 - Wire Feeding Motor

- Loosen and lower the plastic knob (A) (Figure 4). Open the pressure arm (B) of the feeder. (Extract the wire from the torch liner if some wire is left into the torch).
- When the wire is disconnected, grasp it with pliers so that it cannot exit from the spool. If necessary, straighten it before inserting it in the wire input guide (C). Insert the wire on the lower roll (D) and in the torch liner.

WARNING: keep the torch straight. When feeding a new wire through the liner, make sure the wire is cut cleanly (no burrs or angles) and that at least 2 cm from the end is straight (no curves). Failure to follow these instructions could cause damage to the liner.

- Lower the pressure arm (B) and place the knob (A). Tighten slightly. If tightened too much, the wire gets locked and could cause motor damage. If not tighten enough, the rolls will not feed the wire.

WARNING: When changing the wire diameter being used, or replacing the wire feed roll, be sure that the correct groove for the wire diameter selected is inside, closest to the machine. The wire is driven by the inside groove. Feed rolls are marked on the side identifying the groove nearest that side.

- Close the side panel of the machine.
- Connect the power supply cable to the power output line. Turn on the machine. Press the torch switch. The wire fed by the wire feeding motor at variable speed must slide through the liner. When it exits from the torch neck, release the torch switch.

Note: after three seconds that torch trigger is pressed wire feeding speed increases to allow a fast exit of the wire on the torch neck and gas stop flowing.

- Turn off the machine.
- Mount the contact tip and the nozzle.

When checking the correct exit of the wire from the torch do not bring your face near the torch, you may run the risk to be wounded by the outgoing wire. Do not bring your fingers close to the feeding mechanism when working! The rolls, when moving, may crush the fingers. Periodically, check the rolls. Replace them when they are worn and compromise the regular feeding of the wire.

GAS CYLINDER AND REGULATOR CONNECTION

Ensure unit is powered off and unpluged from the mains.

WARNING: Cylinders are highly pressurized. Handle with care. Serious accidents can result from improper handling or misuse of compresses gas cylinders. Do not drop the cylinder, knock it over, expose it to excessive heat, flames or sparks. Do not strike it against other cylinders.

The bottle (not supplied) should be located at the rear of the welder, securely held in position by the chain provided.
For safety, and economy, ensure that the regulator is fully closed, (turned counter-clockwise) when not welding and when fitting or removing the gas cylinder.

- Turn the regulator adjustment knob counter-clock wise to ensure the valve is fully closed.
- Screw the gas regulator fully down on the gas bottle valve, and fully tighten.
- Connect the gas hose to the regulator securing with clip/nut provided.
- Open the cylinder valve, then set the gas flow on the regulator to approx. 5-15l/min. For Pulsed Welding it is suggestable to set the gas flow to approx. 13-14l./min.
- Operate the torch trigger to ensure that the gas is flowing through the torch.

REPLACE WIRE LINER

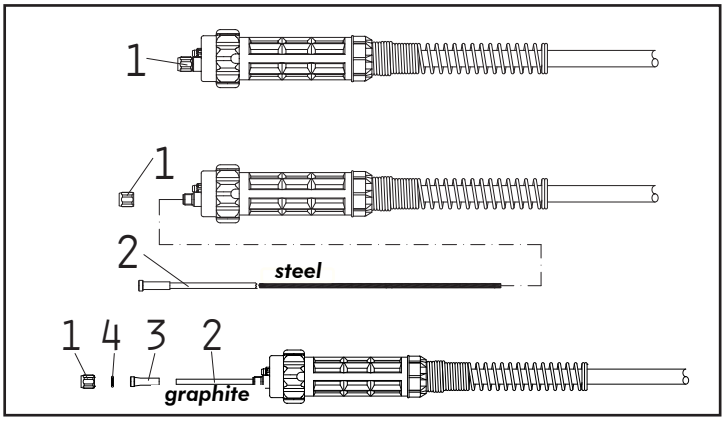


Figure 5 - Wire Liner Assembly

Ensure unit is powered off and unpluged from the mains.

- Chose the suitable wire liner to install. Mainly there are 2 types of wire liners:

1. Steel wire liners. These can be coated or not coated: the coated wire liners are used for air cooled torches; the wire liners which are not coated are used for water cooled torches.
2. Teflon/Graphite wire liners. These are suggested for the welding of Aluminium, as they allow a smooth feeding of the wire. For Pulsed Welding of Aluminium a Teflon/Graphite wire liner with copper or brass terminal is required to ensure a good electric contact of the wire.

COLOR	BLUE	RED	YELLOW
DIAMETER Ø	0.6 - 0.9	1.0 - 1.2	1.2 - 1.6

Table 2

- Disconnect the torch from the machine.
- Place it on a flat surface and carefully remove the brass nut (1).
- Pull the liner out of the hose.
- Install the new liner and mount the brass nut (1) again. Verify that liner head reaches the torch tip.
- Connect the torch to the machine and install the wire into the feeding system.
- In case you are replacing a Teflon or graphite wire liner, follow these instructions:
- Install the new liner and insert the wire liner collet (3) and the O ring (4).
- Mount the brass nut (1).
- At least 20cm of teflon liner have to come out of the brass nut.
- Remove the brass pin on the Euro connector (keep it apart to use it with steel wire liners).
- Tightly and carefully connect the torch to the Euro connector.
- Cut the wire liner 1mm from the wire feed roll.
- Install the welding wire into the feeding system.

Warning: the length of the new wire liner must be the same of the liner you have just pulled out of the hose.

ALUMINUM WELDING

The machine will be set up as for mild steel except for the following changes:

- 100% ARGON as welding protective gas.
- Ensure that your torch is set up for aluminium welding:

1. The lenght of the torch should not exceed 3m (it is advisable not to use longer torches).
2. Install a teflon or graphite wire liner with copper or brass terminal (follow the instructions for the renewing of the wire liner at paragraph REPLACING THE WIRE LINER).
3. Ensure that drive rolls are suitable for aluminium wire.
4. Use contact tips that are suitable for aluminium wire and make sure that the diameter of the contact tip hole corresponds to the wire diameter that is going to be used. To obtain a high duty cycle without wire feeding problems it is advisable to install the gas diffuser, the contact tip with 8mm thread and the nozzle.

For easy welding of Aluminium and good quality welding results it is advisable to work in Pulsed Mode.

COMPACT UNIT (ONLY AIR COOLED)

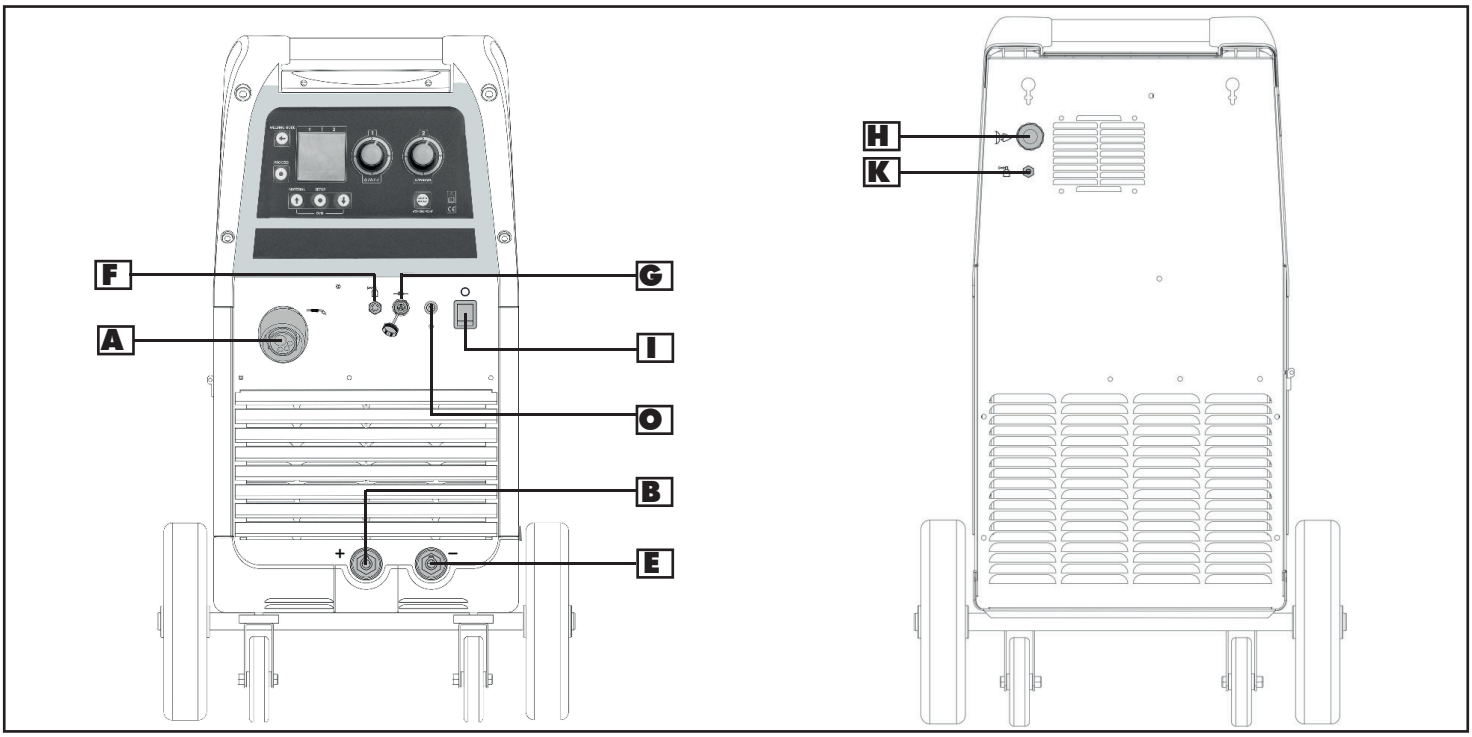


Figure 6 - Compact unit - Front and Rear View

COMPACT UNIT (WITH WATER COOLING)

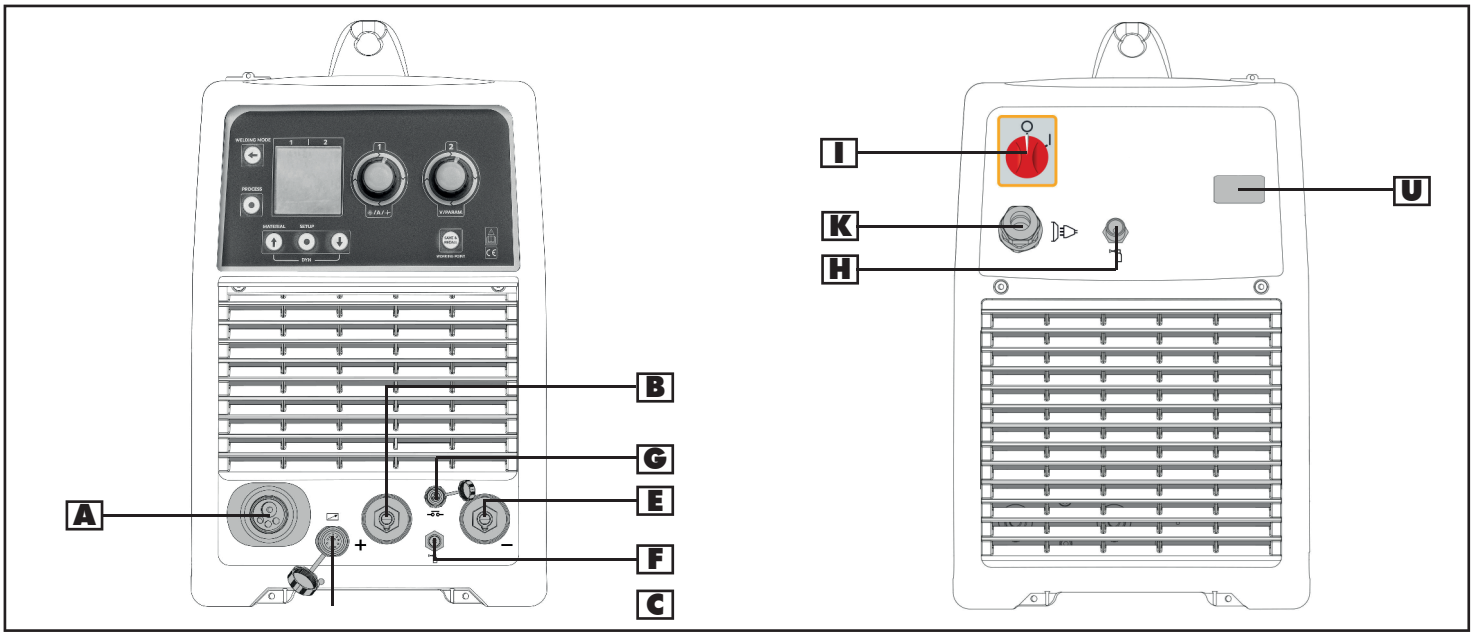


Figure 7 - Compact unit with water cooling - Front and Rear View

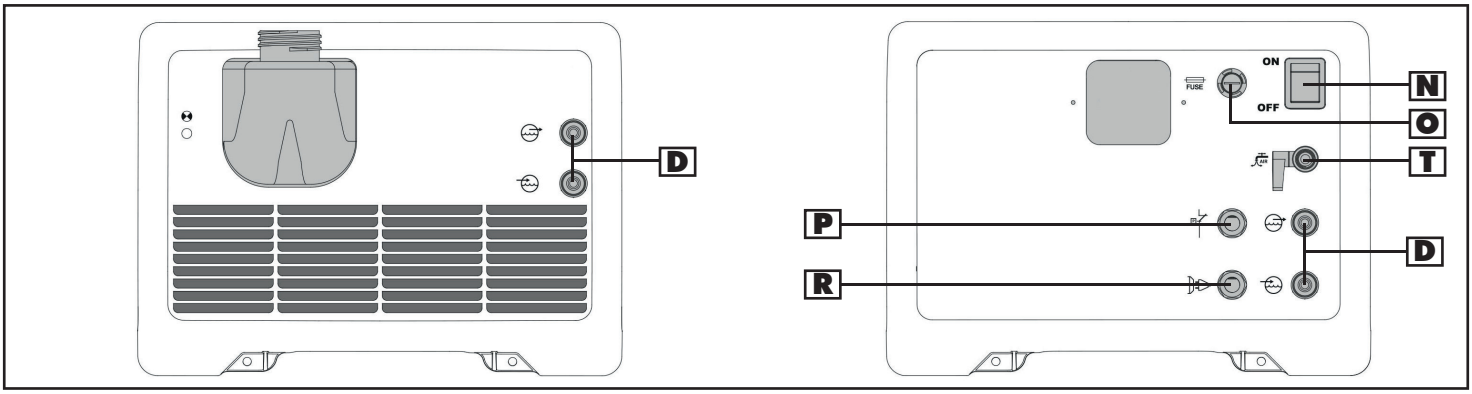


Figure 8 - Water Cooler Front and Rear View

POWER UNIT WITH SEPARATE WIRE FEEDER (WITH WATER COOLING)

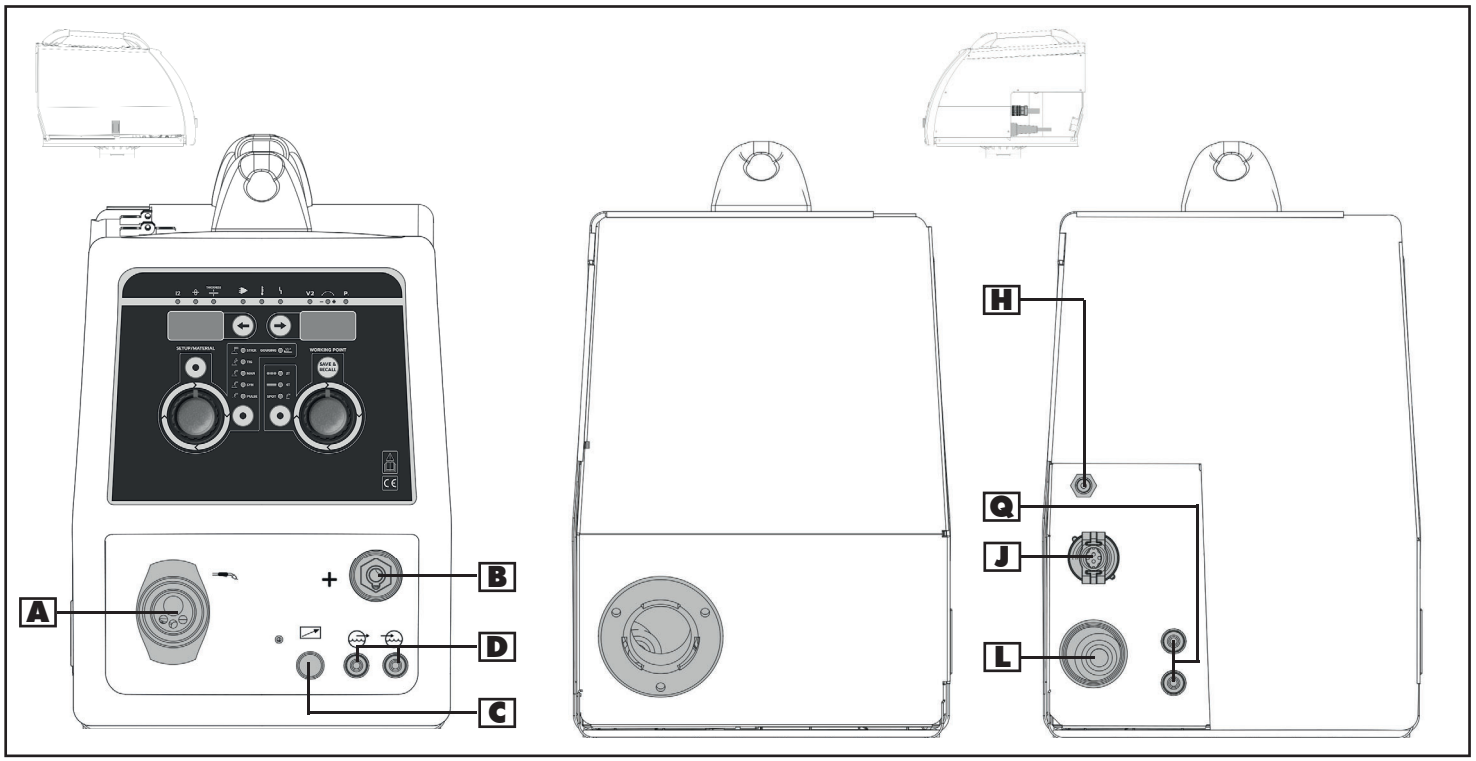


Figure 9 - Wire Feeder Front and Rear View

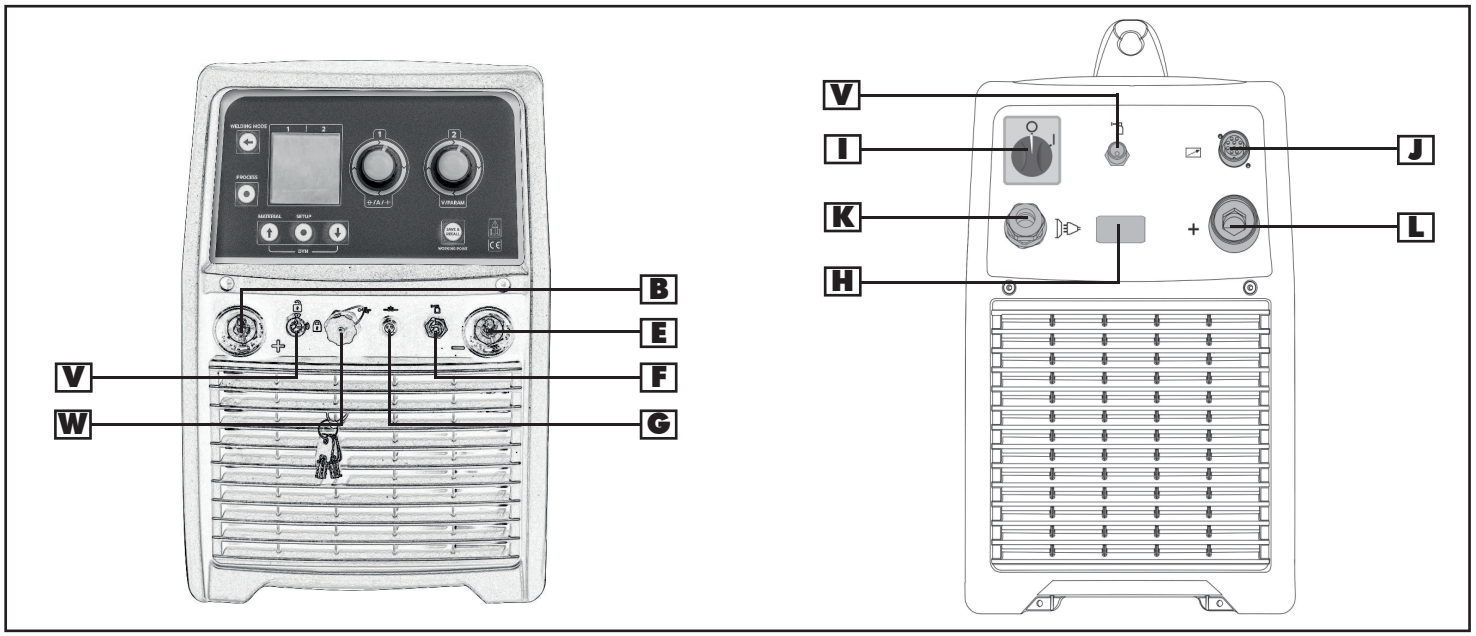


Figure 10 - Power Source Front and Rear View

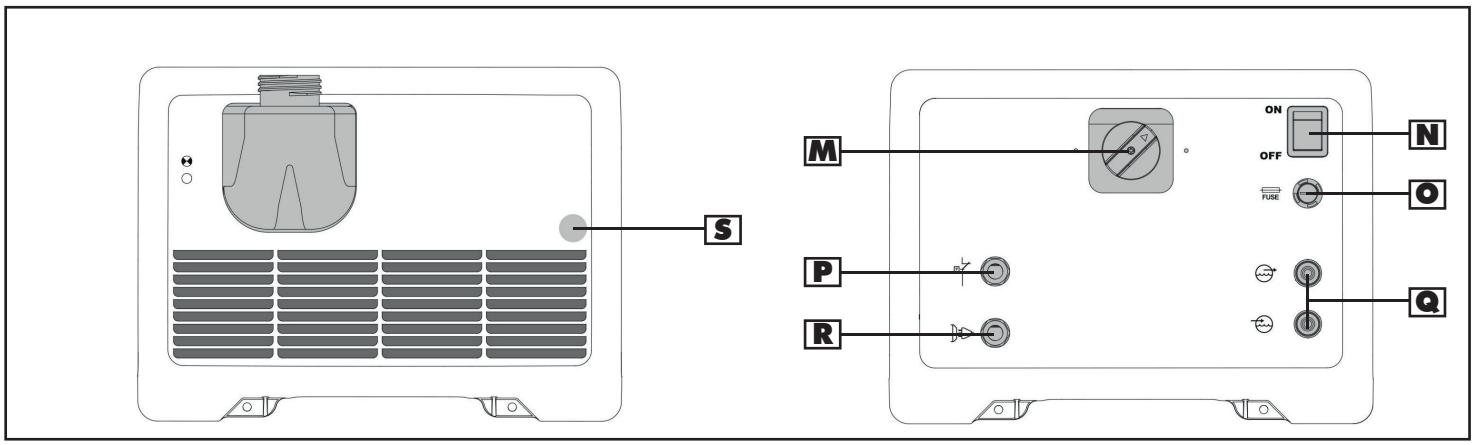


Figure 11 - Water Cooler Front and Rear View

A Centralized Connection for the connection of the welding torch on MIG/MAG welding.

B Positive Current Socket (+)
- for the connection of the earth cable on TIG welding
- for the connection of the welding cable or earth cable according to the type of electrode in MMA welding

C 12 pin Connection (optional)

D Water Cooling Connection for MIG Torch
- Blue for the water feed hose connection
- Red for the water return hose connection

E Negative Current Socket (-)
- for the connection of the earth cable on MIG/MAG welding
- for the connection of the torch on TIG welding

F Gas Connection of the torch for TIG welding

G Trigger Connection of the torch for TIG welding

H Connection of gas feed hose

I Main switch for generator power ON and OFF

J 10 pin Connection for the interconnecting hosepack

K Power Cable

L Positive Current Socket (+) for the connection of the interconnecting hosepack

M Voltage Selection Switch

N Main switch for water cooler power ON and OFF

O Protection Fuse

P Connection for the Pressure Switch Cable

Q Water Cooling Connection for Hosepack
- Blue for the water feed hose connection
- Red for the water return hose connection

R Power Cable of the water cooler

S Power ON Status LED

T Drain Valve

U Compartment for Water Cooling Power and Pressostat Cables Connection

V Locking Key (optional)

W USB socket

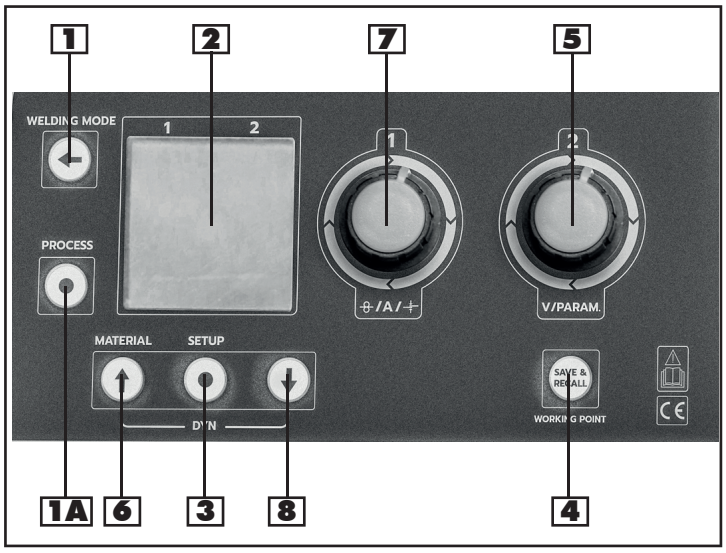


Figure 12 - Power Source Control Panel

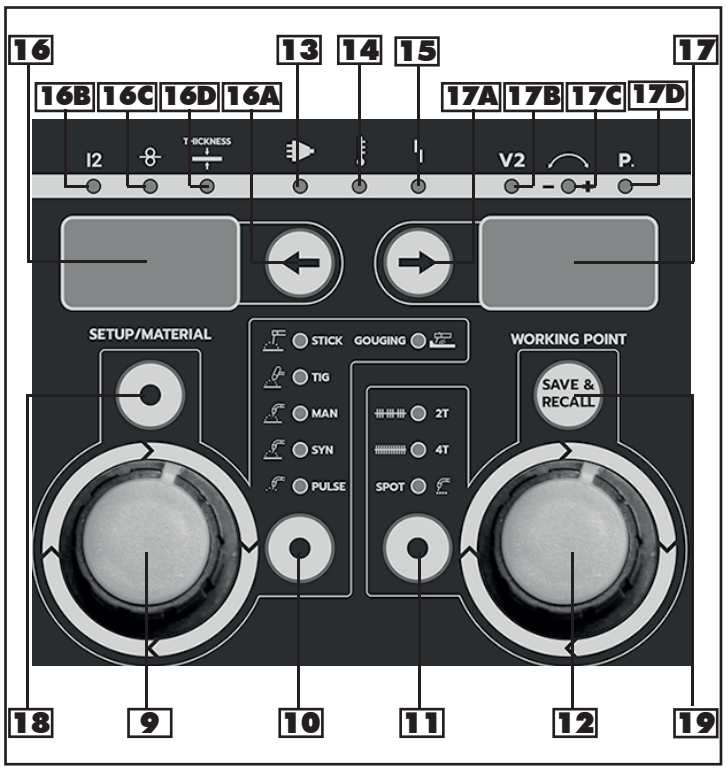


Figure 13 - Wire Feeder Control Panel

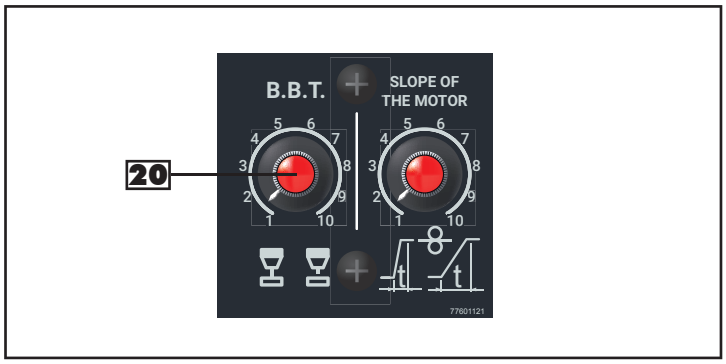


Figure 14 - BBT & Slope of the Motor Regulation Knobs in the wire spool compartment (only on some models)

1 *Mode Key*

- for selecting the following welding types: MMA/STICK, GOUGING (only top model), TIG, MIG
- for returning back to the previous screen after the parameters' setting.

1A *Process Key*

- for selecting the welding processes MIG SYN, MIG PULSE (optional), ROOT WELDING (Optional) available for synergic curves.

2 *Graphic Display*

for displaying the welding parameters.

3 *Setup Key*

for setting the secondary parameters in TIG and MIG/MAG welding processes.

	TIG	MIG/MAG MAN	MIG/MAG SYN	MIG/MAG PULSE & ROOT
2stroke/4stroke				
Pulse Function				
V2 Cut				
Slope Up				
Slope Down				
Pre-Gas		0-25s	0-25s	0-25s
Post-Gas		0-25s	0-25s	0-25s
I min Val				
Frequency				
Wave Balance				
Crater Filler value				
Spot Welding				
P-W				
Spot Time				
Wire Slope				
Cycle		Normal	Normal/Full	Normal/Full
BBT				ms
Hot Start %				
Hot Start V				
Hot Start t				
Hot Slope t				
Crater Slope				
Crater %				
Crater V				
L0 Level %				
L0 Level V				
Hi Time				
Slope Time				
L0 Time				

Table 3

4 *Save & recall Key*

for saving and recalling the working points that may be changed by the operator.

5 *Right Regulation Knob*

for adjusting the following welding parameters & values:
MMA/STICK - Hot Start
TIG - Down Slope
MIG MAN - Voltage (10-45V)
MIG SYN / MIG PULSE / ROOT WELDING Balance

6 *Navigation / Material Key*

for decreasing the following welding parameters:
MMA/STICK - Arc Force
TIG - Post-Gas Time
MIG MAN - Inductance
MIG SYN / MIG PULSE / ROOT WELDING Dynamics

- for selecting the synergic curve in MIG SYN / MIG PULSE / ROOT WELDING by keeping holding it.
- for navigating the Submenu

7 ***Left Regulation Knob***
for adjusting the following welding parameters & values:
MMA/STICK - Amperes
GOUGING - Amperes
TIG - Amperes
MIG MAN - wire speed m/min
MIG SYN / MIG PULSE / ROOT WELDING Amp, Wire Speed, Thickness mm

8 ***Navigation Key***
for increasing the following welding parameters:
MMA/STICK - Arc Force
TIG - Post-Gas Time
MIG MAN - Inductance
MIG SYN / MIG PULSE / ROOT WELDING Dynamics

9 ***Left Regulation Knob***
for adjusting the following welding parameters & values:
MMA/STICK - Amperes
GOUGING - Amperes
TIG - Amperes
MIG MAN - wire speed m/min
MIG SYN / MIG PULSE / ROOT WELDING Amp, Wire Speed, Thickness mm

10 ***Mode Key***
for selecting the following welding processes:
MMA/STICK
GOUGING (only top model)
TIG
MIG MAN
MIG SYN
MIG PULSE (optional)
ROOT WELDING (Optional)

11 ***Selection Key***
for selecting the following parameters in MIG/MAG welding:
2 Stroke / 4Stroke
Spot Welding
Pause/Work

12 ***Right Regulation Knob***
for adjusting the following welding parameters & values:
MMA/STICK - Hot Start
TIG - Down Slope
MIG MAN - Voltage (10-45V)
MIG SYN / MIG PULSE / ROOT WELDING Voltage, Balance, Operation Point

13 ***Green LED***
lights up when unit is working

14 ***Warning LED***
lights up if the power source overheats (e.g. because the duty cycle has been exceeded) or if there is a problem on the water cooling. For more information on this, see the "Troubleshooting" section.

15 ***Warning Red LED***
lights up because of Over Voltage, Phase Loss, Max I.out, Max P.out or if a generic problem occurrs.

16 ***Left Display***
views the welding parameters values.

16A ***Selection Key***
for selecting the following welding parameters:
MMA/STICK - Amperes
GOUGING - Amperes
TIG - Amperes
MIG MAN - wire speed m/min
MIG SYN / MIG PULSE / ROOT WELDING Amp, Wire Speed, Thickness mm

16B ***Amperes LED***
lights up when the welding current parameter is selected.

16C ***Wire Speed LED***
lights up when the wire speed parameter is selected.

16D ***Thickness LED***
lights up when the thickness parameter is selected.

17 ***Right Display***
views the welding parameters values.

17A ***Selection Key***
for selecting the following welding parameters:
MMA/STICK - Hot Start
TIG - Down Slope
MIG MAN - Voltage (10-45V)
MIG SYN / MIG PULSE / ROOT WELDING Voltage, Balance

17B ***V2 LED***
lights up when the welding voltage parameter is selected.

17C ***Balance LED***
lights up when the balance parameter is selected.

17D ***P. LED***
lights up when the other parameters need to be selected and adjusted, i.e. Hot Start in MMA/STICK, Down Slope in TIG and Operation Point in MIG SYN / MIG PULSE / ROOT WELDING.

18 ***Setup Key / Material***
for setting the following secondary parameters:
MMA/STICK - Arc Force
TIG - V2 CUT and Gas Time 0-25s
MIG MAN - Inductance 0-30
MIG SYN / MIG PULSE / ROOT WELDING Dynamic -20% / +20%

19 ***Save & recall Key***
for saving and recalling the working points that may be changed by the operator.

20 ***BBT & Motor Slope Regulation Knobs***
for setting the Burn Back Time and the Slope of the motor in MIG/MAG. Note: knobs are located in the wire spool compartment close to the wire feeding motor. If the two knobs are not present, the two values are set in the MIG Setup menu.

INITIAL SETUP MENU

To enter the "Initial Setup Menu" power the unit on; while the display views the unit logo, press the Setup Key - **3** -. Use the keys - **6** - and - **8** - to select the parameter and the Right Regulation Knob - **5** - to adjust the modificable values.

BASIC SETUP

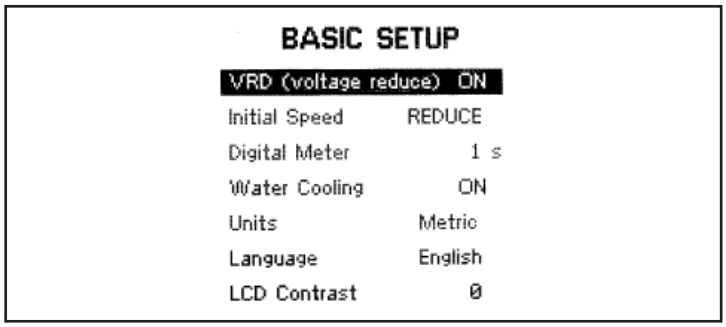


Figure 15 - Basic Setup Screen

VRD - ON/OFF
Selection of the "Voltage Reduction Device" ON or OFF. As default this is OFF.
If ON the unit reduce the OCV below a safety level at the end of welding. Automatically reset to normal value when the electrode get in touch with the workpiece.

INITIAL SPEED - reduced/normal
Reduced Initial Speed setting reduces the speed of the wire feeding on the workpiece to optimize the striking.

D.M. DIGITAL METER - OFF/MEASURE TIME
1''÷10'' (ON): selection of how many seconds the welding parameters, voltage and current, have to be displayed after you stop welding. It is possible to set from 1'' to 10 '', by default, set time is 2''.
OFF: the display views always, even during welding, the screen of the performed welding process.

WATER COOLING
Activate or deactivate Water Cooling control

UNITS
Select the unit of lenght between meters or inches or both meters/inches.

LANGUAGE
Select language of your choice

LCD CONTRAST
Setting of the LCD display contrast according to the environment temperarure and brightness.

Press the "Mode Key" - **1** - to go back to the welding process screen and save set parameters. The display views the screen of the last welding process performed by the unit.

RESET
Press and hold "SAVE & RECALL" Key - **4** - to reset all parameters and go back to the parameters set as default.

SPECIAL SETUP

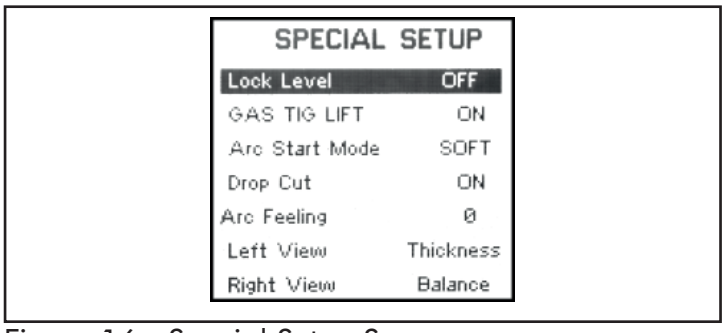


Figure 16 - Special Setup Screen

From "initial setup menu" press setup key - **3** - to enter special setup menu.

LOCK LEVEL (Table 4)
Select the level and number of parameters available to the user :
OFF : all setting are unlock
LOW : blocks most sensitive parameters
MEDIUM : welding parameters are blocked, operator can recall program and change parameters adjustments
HIGH / KEY: all parameters are locked (wire speed balance still ajustable)

GAS TIG LIFT
Select ON if you want to use tig torch with gas valve in lift mode (without using the machine internal valve)

ARC START MODE
Type of arc starting selection, choose between SOFT or HARD

DROP CUT
ON: in MIG welding processes (GMAW), wire gets sliced through cleanly to get a better arc re-ignition. By default set is ON.

ARC FEELING
In MIG welding processes (GMAW) it allows to enlarge the electric arc if set to negative, to restrict it if positive. The value is adjustable from -16 to +16.

LEFT VIEW
It allows to select the value to be displayed on the left side of the display in MIG welding processes (GMAW): Thickness, Current, Speed .
By default set is "Thickness".

RIGHT VIEW
It allows to select the value to be displayed on the right side of the display in MIG welding processes (GMAW): Balance (Arc Length), Voltage.
By default set is "Balance".

REMOTE SETUP

Note: This screen is only active if Push-Pull / Spool Gun and / or Analog-Digital expansion PCBs are installed.

From "Special setup menu" press setup key - **3** - to enter Remote Setup menu.
Set:

- Push-Pull
- Spool-Gun
- Analog for remote controls or torches with one or two potentiometers.
- Digital for torches with 2 or 4 Up & Down keys.

PUSH-PULL withou potentiometer

It is not possible to adjust any parameter.

PUSH-PULL with potentiometer - Pot. 1

- Adjust "Parameter 1" to associate the parameter displayed on the left side of the display according to the setting made on the previous screen.
- Adjust "Parameter 2" to associate the parameter displayed on the right side of the display according to the setting made on the previous screen.

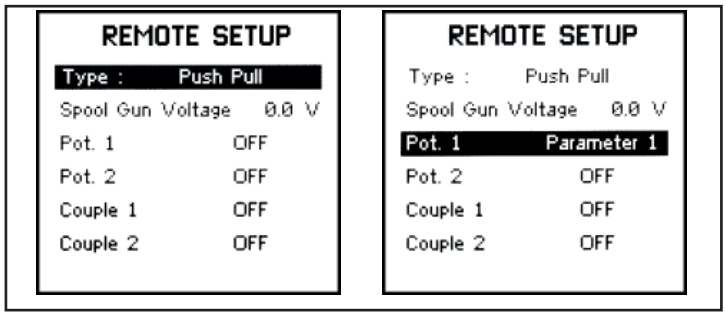


Figure 17 - PUSH-PULL view

SPOOL-GUN

Select the input voltage of the Spool-Gun motor. It is not possible to adjust any other parameter.

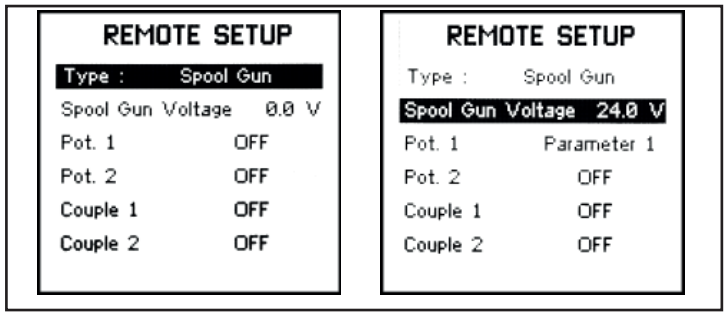


Figure 18 - PUSH-PULL view

ANALOG - Pot. 1 - Pot. 2

- Adjust "Parameter 1" to associate the parameter displayed on the left side of the display according to the setting made on the previous screen.
- Adjust "Parameter 2" to associate the parameter displayed on the right side of the display according to the setting made on the previous screen.

In the case of remote devices with only one potentiometer, the parameter can only be set on "Pot.1".

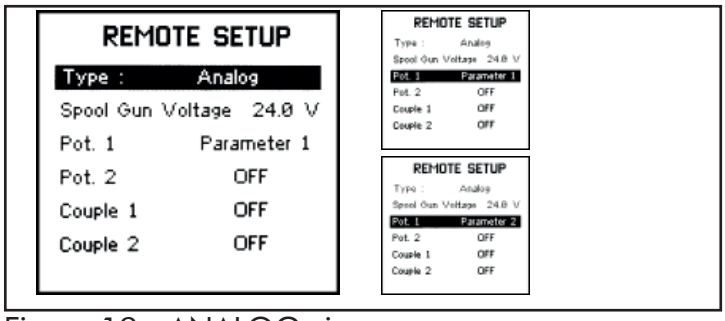


Figure 19 - ANALOG view

DIGITAL - Couple 1 - Couple 2

- Adjust "Parameter 1" to associate the parameter displayed on the left side of the display according to the setting made on the previous screen.
- Adjust "Parameter 2" to associate the parameter displayed on the right side of the display according to the setting made on the previous screen.
- Adjust "Working List" to associate the control of the Working List.

In the case of torches with only one couple of Up&Down keys, the parameter can only be set on "Couple 1".

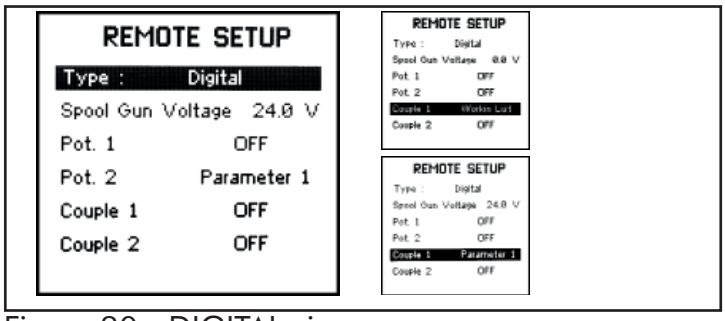


Figure 20 - DIGITAL view

Refer to the section "Remote control torches connection" for the connection of the torches.

SYSTEM LOG

From "Special Setup" press setup key - **3** - to enter system info. It shows:

- Expansion pcb installed on the machine
- Software version of PCBs

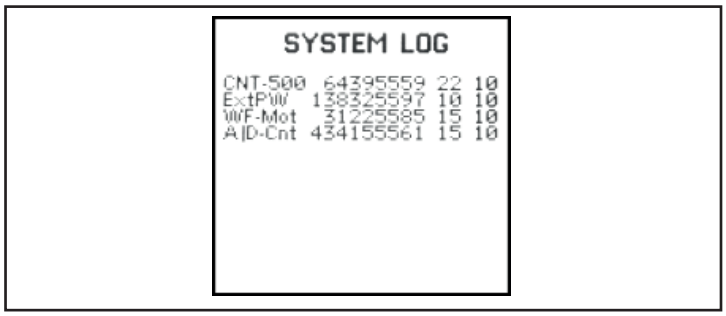


Figure 21 - System Log Screen

SYSTEM INFO

From "System Log" press setup key - **3** - to enter System Info. It shows:

- Alarms sequence
- Type of alarm
- Time of unit ON
- Arc ON time

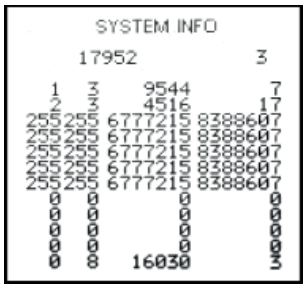


Figure 22 - System Info Screen

INTERCONNECTION WIRE TEST

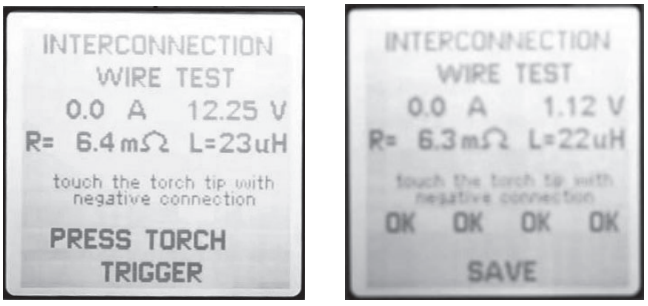


Figure 23 - Interconnection Wire Test Screen

- Power on the generator by holding the Material key - **6** - until the display shows the Interconnection Wire Test Screen.
- If you know the interconnection cable's length, adjust the correct length, 2/5/10/15/20/30 meters.
- To make the interconnection cable test, remove the outside protection nozzle from the torch neck, put in contact the torch with the clamp on the earth cable and press the torch trigger.
- The generator loads the values according to the interconnection and working cables connected to the machine. Once loaded the display views ok.
- Press the Setup Key - **3** -to save the setting.

T-LINK DEVICE ASSOCIATION AND DELAY TIME SETUP

Your T-Link device can be associated to more welding units. On the other side your welding unit can accept the association to only one T-Link device per time.

1 Press Mode key to enter the MIG menu.

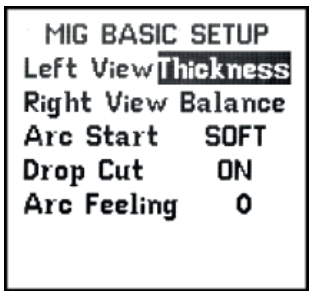


Fig. 24 - MIG Basic Setup Screen

- Starting from all MIG Display Views, hold the Setup key - **3** - to enter the MIG Basic Setup. From the MIG Basic Setup press the Setup Key - **3** - to enter T-Link Setup Menu.
- Turn ON the T-Link filter ensuring there are no other not connected T-Link devices in the same area. A LED on the filter will blink approximately each 2 seconds.

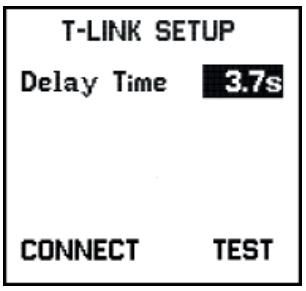


Fig. 25 - T-Link Setup

6 ***Material Key***

- for connecting the welding unit to the filter. The system will search for any free T-Link device and will associate the first one it will find. Once the association is done the LED on the T-Link filter will stay lit.

This operation is required at the first start-up or when you want to associate a new T-Link filter device.

8 ***Navigation Key***

- for testing the mask once connected.

5 ***Right Regulation Knob***

- for adjusting the delay time from 0 to 10''.

PLEASE REFER TO THE INSTRUCTIONS MANUAL OF THE T-LINK FILTER FOR OPERATING.

POSSIBLE FIRMWARE SETTINGS

In addition to establishing the blocking level of the possible settings from the "Special Setup" menu, the parameters can be locked using a key switch - **V** - installed in the front or internal panel depending on models.

- In the "closed" position, all parameters are locked;
- In the "open" position, the block level corresponds to the level selected in the "Special Setup" menu.

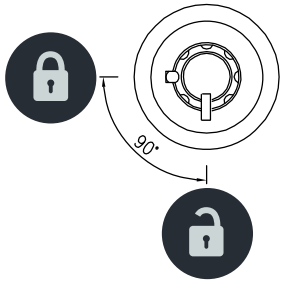


Figure 26 - Lock key

			OFF	LOW	Medium	High/Key
STICK						
		Current	XX	XX	XX	
		Current Balance	XX			XX +-25%
		Hot Start	XX	XX	XX	
		Arc Force	XX	XX	XX	
TIG						
		Current	XX	XX	XX	
		Current Balance	XX			XX +-25%
		PT Mode	XX	XX	XX	
		Pulsed	XX	XX		
		VCUT	XX			
		Pregas	XX	XX		
		Slope Up	XX	XX		
		IMIN	XX	XX		
		Frequency	XX	XX		
		Wave Balance	XX	XX		
		Slope Down	XX	XX		
		Crater Filler	XX			
		Post-gas	XX	XX	XX	
MIG						
MIG MANUAL		Voltage	XX	XX	XX	
		Voltage Balance	XX			XX +-25%
		Speed	XX	XX	XX	
		Speed Balance	XX			XX +-25%
		Inductance	XX	XX	XX	
MIG SYNERGIC		Thickness	XX	XX	XX	
		Thickness Balance	XX			XX +-25%
MIG PULSED		V Balance	XX	XX	XX	
		V Balance Balance	XX			XX +-25%
		Dynamics Balance	XX	XX	XX	
			XX			
		Synergies Menu	XX	XX	XX	
MIG SETUP			XX	XX	XX	
	PT Mode		XX	XX	XX	
	TIME_W		XX	XX	XX	
	TIME_P		XX	XX		
	Wire Slope		XX	XX	XX	
	Pregas		XX			
	BBT		XX	XX	XX	
	Postgas		XX	XX	XX	
	Normal/Full Cycle		XX	XX	XX	
		HSVAL	XX	XX		
		HSBIL	XX			
		HSTIME	XX	XX		
		HSSLOPE	XX	XX		
		CFSLOPE	XX			
		CFVAL	XX	XX		
		CFBIL	XX			
		CFTIME	XX			
	Pulsed Wire		XX			
		% Min. Level	XX	XX		
		V Balance Min. Level	XX	XX		
		T Min. Level	XX	XX		
		T Max. Level	XX	XX		
		T Connection Ramp	XX	XX		
SAVE & RECALL						
W.P.	STICK_OP		XX	XX		
W.L.		SAVE	XX	XX		
		REC	XX	XX		
	TIG_OP		XX	XX		
		SAVE	XX	XX		
		REC	XX	XX		
	MIG_OP		XX	XX	XX	
		SAVE	XX	XX		
		REC	XX	XX	XX	
		ADD_WL	XX	XX		
	MIG_WL		XX	XX	XX	XX
		ADD_WL	XX	XX		
		REC	XX	XX	XX	XX
		DeELL	XX	XX		
SETUP						
Basic Setup			XX	XX	XX	XX
	Vrd		XX	XX	XX	
	Approching Speed		XX	XX		
	Display Time		XX	XX		
	ON/OFF Group		XX			
	Measurement Unit		XX			
	Language		XX			
	Contrast		XX			
Basic setup 1	Start Up Mode		XX			
	Gas Tig Lift		XX			
	Drop Cut		XX			
	Block Level (block Key voice modification)		XX	XX	XX	XX
Basic setup 2			XX			
Diagnostics	Log system		XX	XX	XX	
	Alarms List		XX	XX	XX	
	Peripherals State		XX	XX	XX	

Table 4

Connect the earth cable to the Negative output terminal (plus) - **E** - on the front of the unit and the earth clamp to the workpiece.
Plug the torch hose into the socket - **A** -on the front of the welder having care to not damage the contacts and secure by hand screwing in the threaded connection.
Only for models with water cooling:
Connect the water feed and return hose of the torch to the water cooling connections - **D**.

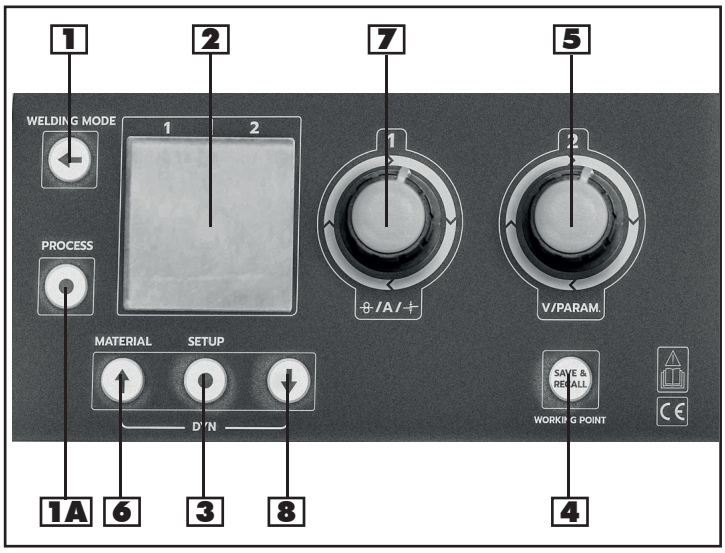


Figure 12 - Power Source Control Panel - copy

1 Press Mode key to enter the MIG menu. A default screen or the last screen activated will appear.

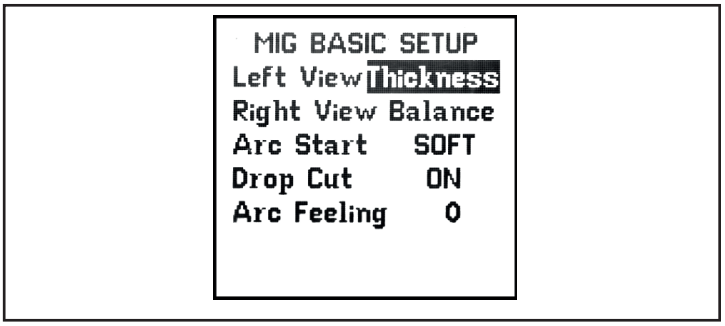


Figure 27 - MIG Basic Setup Screen

3 ***Tasto Setup***

- Starting from all MIG Display Views, hold the Setup key - **3** - to enter the MIG Basic Setup and change the MIG patameters set on the Special Setup Menu.

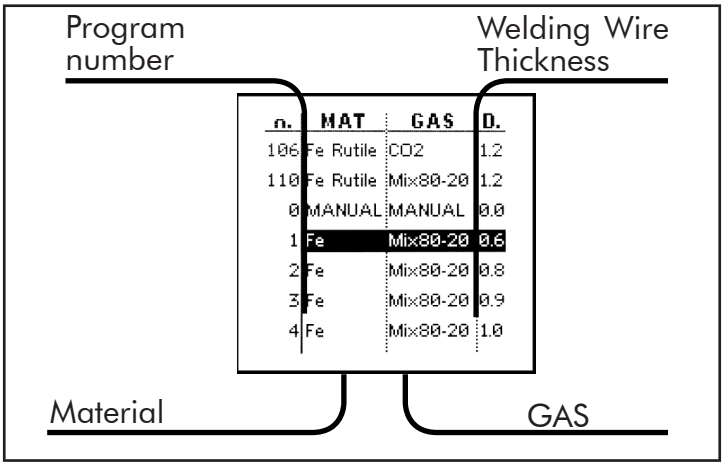


Figure 28 - Synergic Welding Curves View

6 ***Navigation / Material key***

- Hold the key for viewing the Welding Programs available in the unit.
- Turn the Right Regulation Key - **5** - or press the Material Key - **6** - to choose the desired Synergic Curve, suitable to the type of wire and to the gas going to be used for welding, or to select the Manual Welding Mode (Program 0);
- Press the Mode Key - **1** - to go back to the main screen and confirm your choice.

MIG SYN - PULSED - ROOT WELDING WITH POWER SOURCE

1A ***Process key***

- Press the Process key to select the desired welding process among those available for the synergic curve loaded: MIG SYN, MIG PULSED (optional), ROOT WELDING (optional)

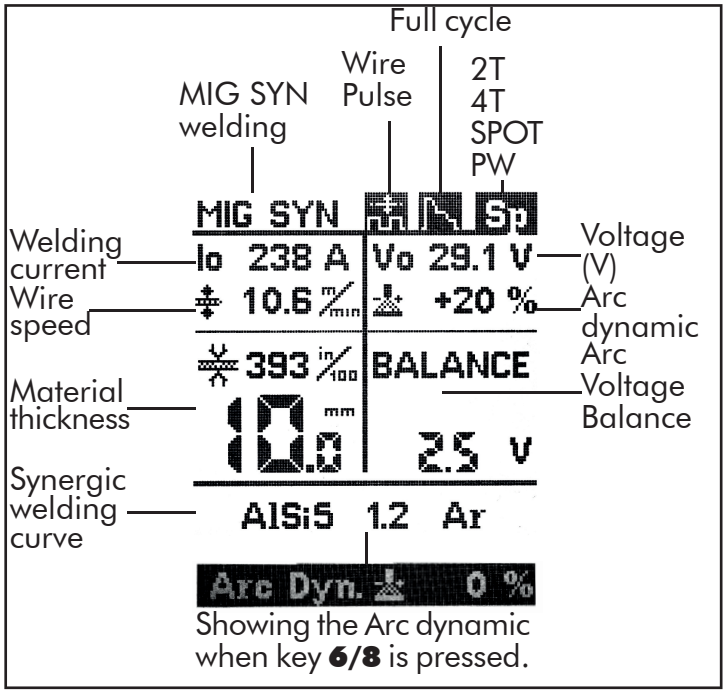


Figure 29 - MIG SYN Display View

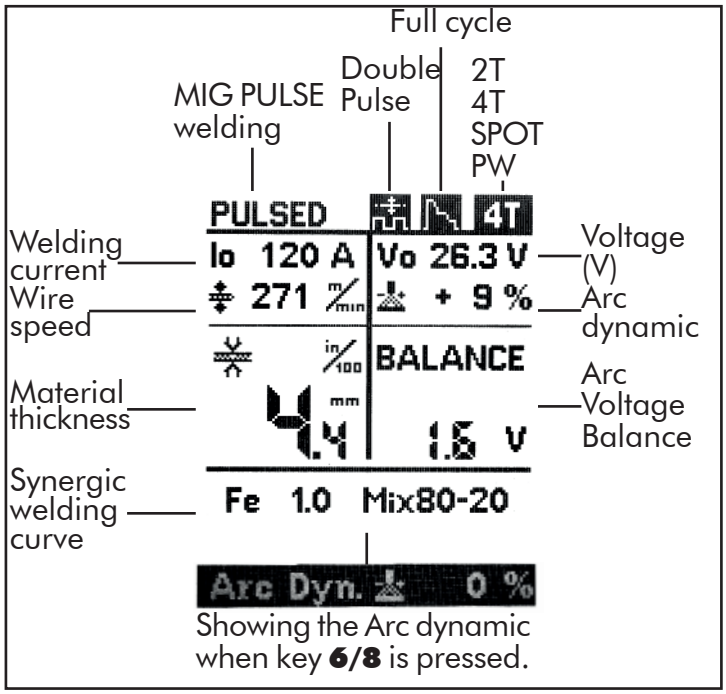


Figure 30 - MIG PULSE Display View

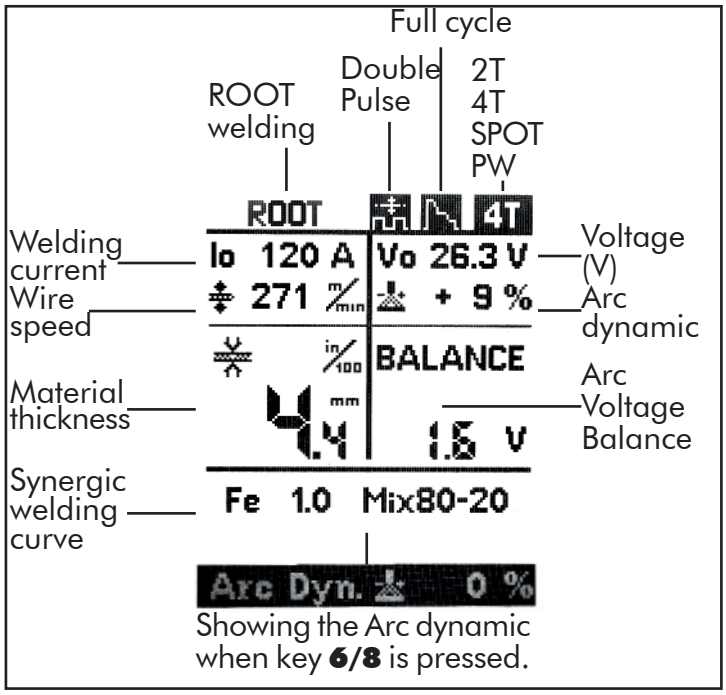


Figure 31 - ROOT WELDING Display View

3 ***Setup Key***
for entering the parameters' setup screen.

6 **8** ***Navigation Key***
for running thru the parameters.

5 ***Right Regulation Knob***
for changing the parameters.

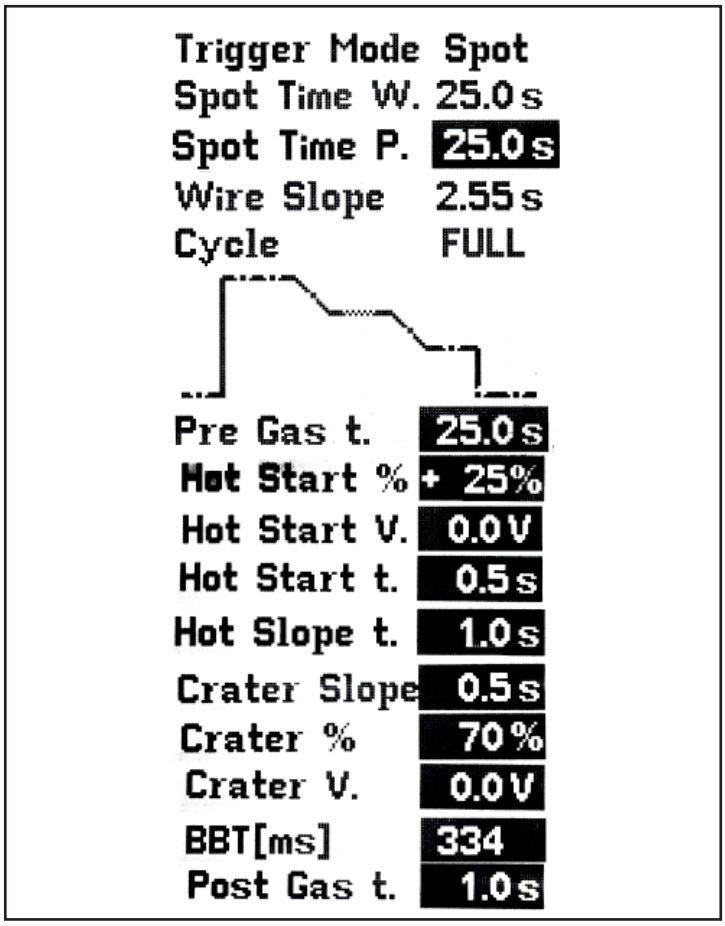


Figure 32 - MIG SYN Setup View

TRIGGER MODE
Selection of the 2Stroke / 4Stroke / Spot Welding Mode / Pause-Work Mode (P-W)

SPOT TIME W
Adjustable only when Spot Welding Mode or P-W Mode is set: regulation of the maximum duration of the Spot Welding Time (0-25 sec)

SPOT TIME P
Adjustable only when P-W Mode is set: regulation of the maximum duration of pause (0-25 sec)

WIRE SLOPE
Regulation of time needed to reach wire set speed after arc striking. Time (0-2.55sec). Adjustable with knob inside wire spool compartment if installed (see control interface paragraph).

CYCLE
Normal or full

PRE GAS TIME
Regulation of the Gas outflow before the welding start (0-25 sec.)

HOT START %
Percentage of current increase during hot start phase

HOT START VOLTAGE
Adjust arc voltage compensation during hot start phase

HOT START TIME
Time of hot start phase

HOT SLOPE TIME
Time required to shift from hot start phase to welding phase

CRATER SLOPE
Time required to shift from welding phase to crater fill phase

CRATER %
Percentage of current decrease during crater fill phase

CRATER VOLTAGE
Adjust arc voltage compensation during crater fill phase

BBT
Regulation of the lenght of the wire protruding from the torch at the end of welding (1-510).
Adjustable with knob inside wire spool compartment if installed (see control interface paragraph).

POST GAS
Regulation of the gas outflow time at the end of welding (0 – 25 Sec.)

WIRE PULSE / DOUBLE PULSE - OPTIONAL

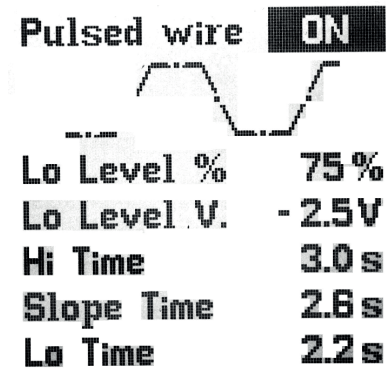


Figure 33 - WIRE PULSE / DOUBLE PULSE Setup View

3 ***Setup Key***
For entering the Wire Pulse Setup Menu by pressing the setup key - **3** - from "setup menu".

PULSE WIRE
Activate/Deactivate Wire pulse

Lo LEVEL %
Low welding current. It's a percentage of welding current

Lo LEVEL V.
Low welding current arc voltage compensation

Hi TIME
Welding time at high current

SLOPE TIME
Time needed to switch between high and low current

Lo TIME
Welding time at low current

5 ***Right Regulation Knob***
Arc voltage Balance regulation (V)

6 ***Navigation / Material Key***
- Decrease the Arc Dyn. value (-20%)
- Hold the key for viewing the Synergic Welding Curves available in the unit.
  Turn the Right Regulation Key - **5** - or press the Material Key - **6** - to choose the desired Synergic Curve, suitable to the type of wire and to the gas going to be used for welding;
- press the Mode Key - **1** - to go back to the main screen and confirm your choice.
  Once selected a Synergic Curve, Slope, Inductance, Wire Speed Balance and Material thickness settings go back to their default values.

7 ***Left Regulation Knob***
adjusts the welding current (A), wire speed, material thickness

8 ***Navigation Key - Arc Dyn***
Increase the Arc Dyn. value (+20%)

4 ***Save & Recall***
for saving and recalling the points that the operator can customize. Refer to the chapter "Save & Recall" .

MIG SYN WELDING WITH WIRE FEEDER

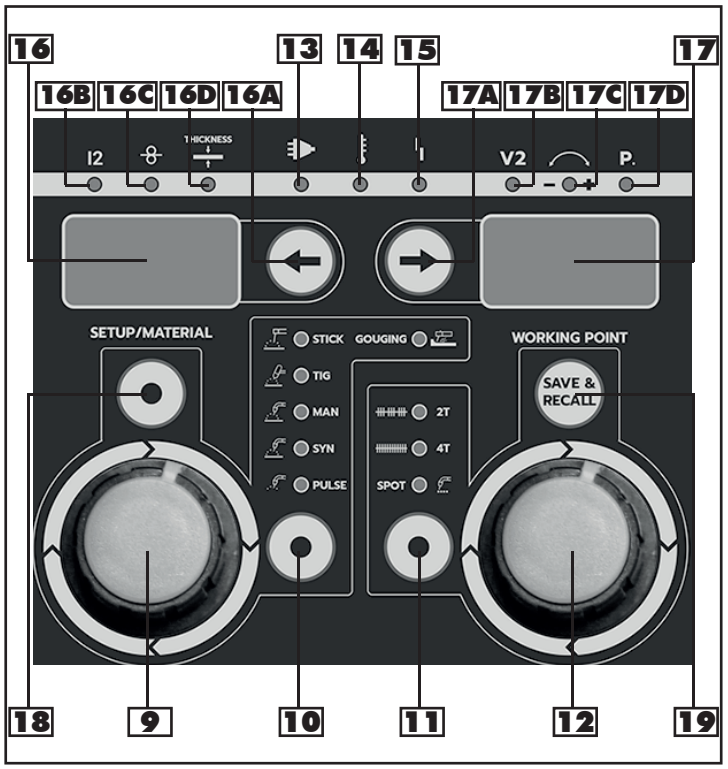


Figure 13 - Wire Feeder Control Panel - Copy

11 ***Selection Key***
Selection of the 2Stroke / 4Stroke / Spot Welding Mode / Pause-Work mode (P-W) (Spot LED blinking)

16A ***Selection Key***
for selecting the available welding parameters:
Current, **16B** - LED is lit
Wire Speed, **16C** - LED is lit
Thickness mm, **16D** - LED is lit

16 ***Left Display***
for viewing the parameter selected with key **- 16A -**

9 ***Left Regulation Knob***
Adjusts the parameter show in display **- 16 -**

17A ***Selection Key***
for selecting the available welding parameters:
Voltage, **17B** - LED is lit
Arc Voltage Balance, **17C** - LED is lit
Operation Point, **17D** - LED is lit

17 ***Right Display***
for viewing the parameter selected with key **- 17A -**

12 ***Right Regulation Knob***
Adjusts the parameter show in display **- 17 -**

18 **Setup Key - *Dynamics***
Press key for regulation of the arc dynamics value (-20% +20%), use right regulation knob - **12** - for setting the parameters.

19 ***Save & Recall***
for saving and recalling the points that the operator can customize. Refer to the chapter "Save & Recall" .

CONSTANT VOLTAGE FUNCTION

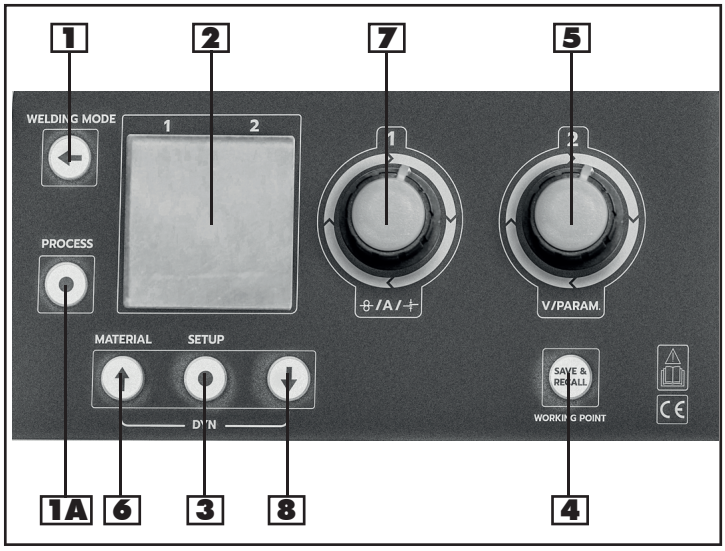


Figure 12 - Power Source Control Panel - Copy

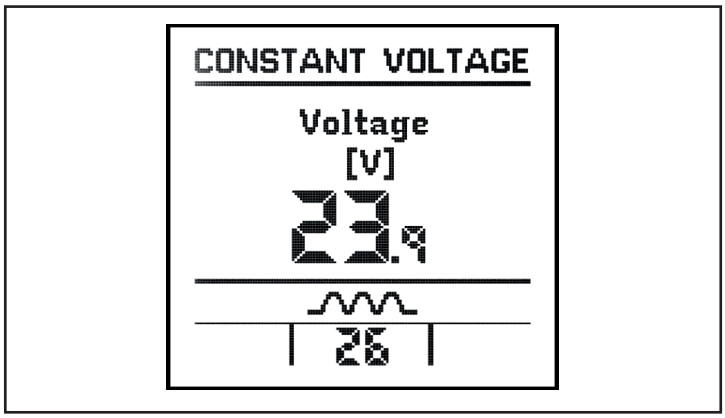


Figure 34 - Constant Voltage View

This function is suitable for the wire feeders powered by the power source. Voltage must be adjusted on the power source according to the welding wire type and diameter, wire speed on the wire feeder.

MIG MAN WELDING WITH POWER SOURCE

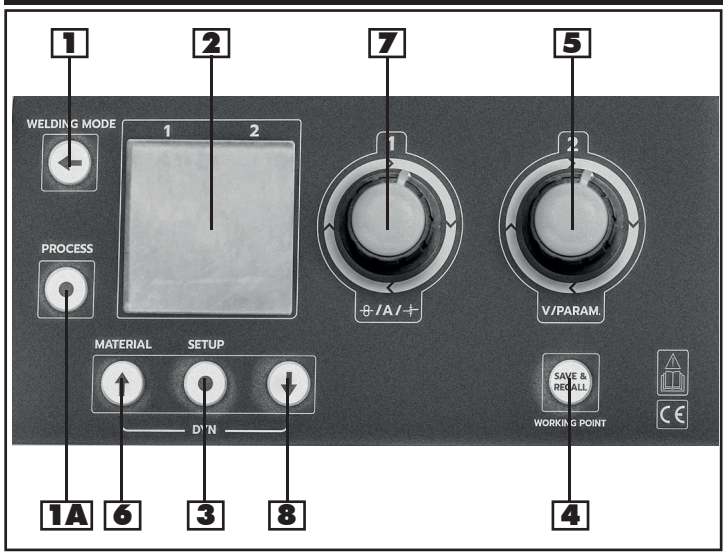


Figure 12 - Power Source Control Panel - Copy

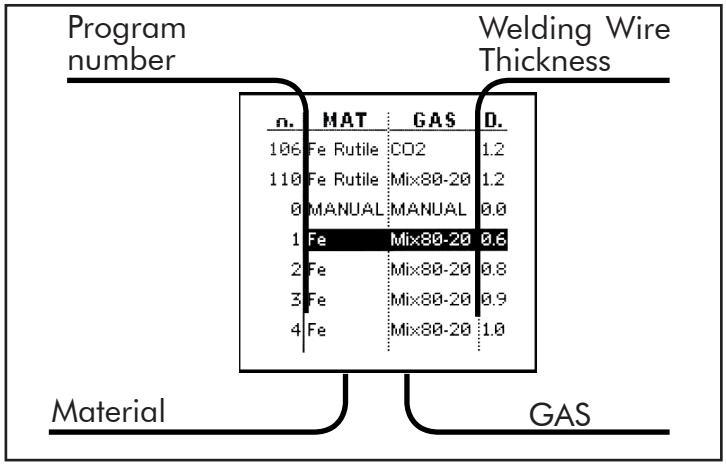


Figure 28 - Synergic Welding Curves View - Copy

6 ***Navigation / Material key***

- Hold the key for viewing the Welding Programs available in the unit.
- Turn the Right Regulation Key - **5** - or press the Material Key - **6** - to select the Manual Welding Mode (Program 0);
- Press the Mode Key - **1** - to go back to the main screen and confirm your choice.

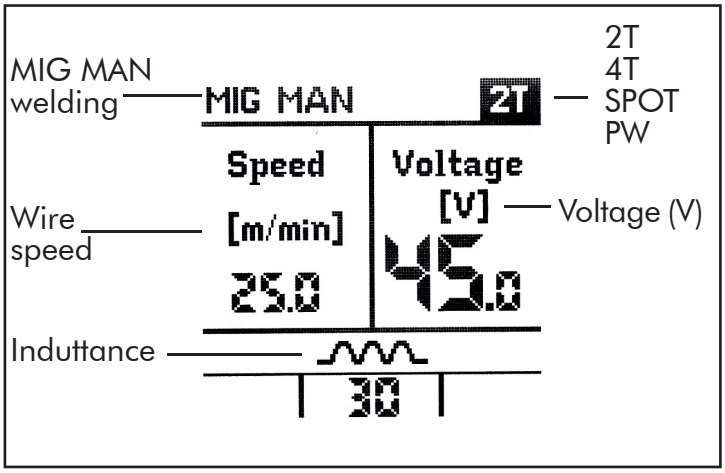


Figure 35 - MIG MAN Display View

3 ***Setup Key***
for entering the parameters' setup screen.

6 8 ***Navigation Key***
for running thru the parameters.

5 ***Right Regulation Knob***
for changing the parameters.

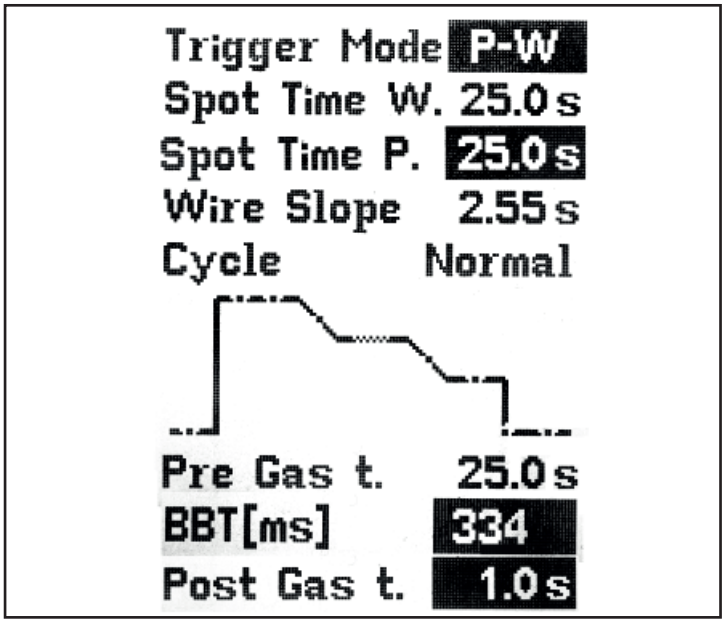


Figure 36 - MIG MAN Setup View

TRIGGER MODE
Selection of the 2Stroke / 4Stroke / Spot Welding Mode / Pause-Work mode (P-W)

SPOT TIME W
Adjustable only when Spot Welding Mode or P-W Mode is set: regulation of the maximum duration of the Spot Welding Time (0-25 sec)

SPOT TIME P
Adjustable only when P-W Mode is set: regulation of the maximum duration of pause (0-25 sec)

WIRE SLOPE
Regulation of time needed to reach wire set speed after arc striking. Time (0-2.55sec). Adjustable with knob inside wire spool compartment if installed (see control interface paragraph).

PRE GAS T.
Regulation of the gas outflow before the welding start (0 – 25 sec.)

BBT
Regulation of the lenght of the wire protruding from the torch at the end of welding (1-510). Adjustable with knob inside wire spool compartment if installed (see control interface paragraph).

POST GAS
Regulation of the gas outflow time at the end of welding (0 – 25 sec.)

5 ***Right Regulation Knob - Voltage***
Regulation of the voltage (10V to 45V)

6 **8** ***Navigation Key - Inductance***
Regulation of the electronic inductance value (0-30)
Low Value = colder arc High Value = hotter arc

7 ***Left Regulation Knob - Speed***
Adjusts the wire speed regulation (1-25 m/min or 39-984 in/min)

4 ***Save & Recall***
for saving and recalling the points that the operator can customize. Refer to the chapter “Save & Recall”.

MIG MAN WELDING WITH WIRE FEEDER

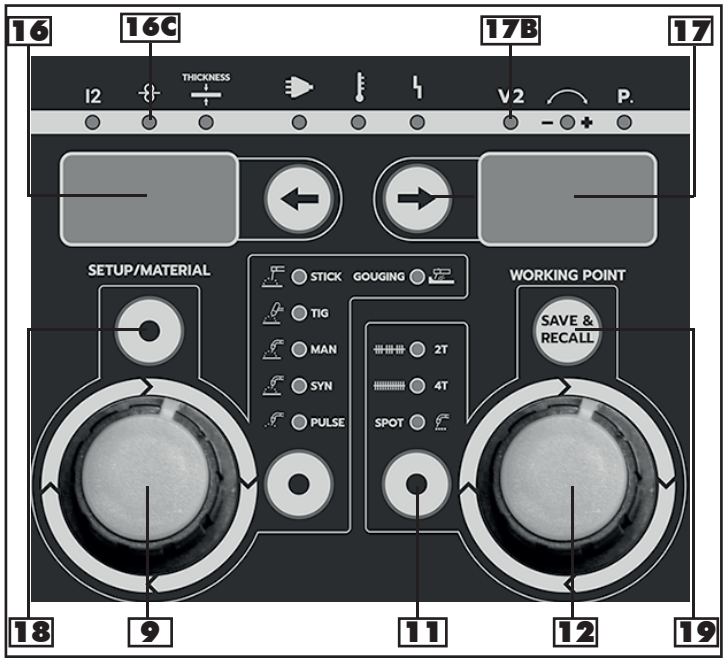


Figure 13 - Wire Feeder Control Panel - Copy

11 ***Selection Key***
Selection of the 2Stroke / 4Stroke / Spot Welding Mode / Pause-Work mode (P-W) (Spot LED blinking)

9 ***Left Regulation Knob - Speed***
for adjusting the wire speed regulation (1-25 m/min or 39-984 in/min)

16 ***Left Display - Speed***
for viewing wire speed in m/min or in/min, **16C** - LED is lit

12 ***Right Regulation Knob - Voltage***
for adjusting the voltage (10V to 45V)

17 ***Right Display***
for viewing the set voltage - **17B** - LED is lit

18 ***Inductance***
Press key for regulation of the electronic inductance value (0-30), use right regulation knob - **12** - for setting the parameters.
Low Value = colder arc High Value = hotter arc

19 ***Save & Recall***
for saving and recalling the points that the operator can customize. Refer to the chapter “Save & Recall” .

CONNECTION FOR REMOTE CONTROL TORCHES

ANALOG / DIGITAL

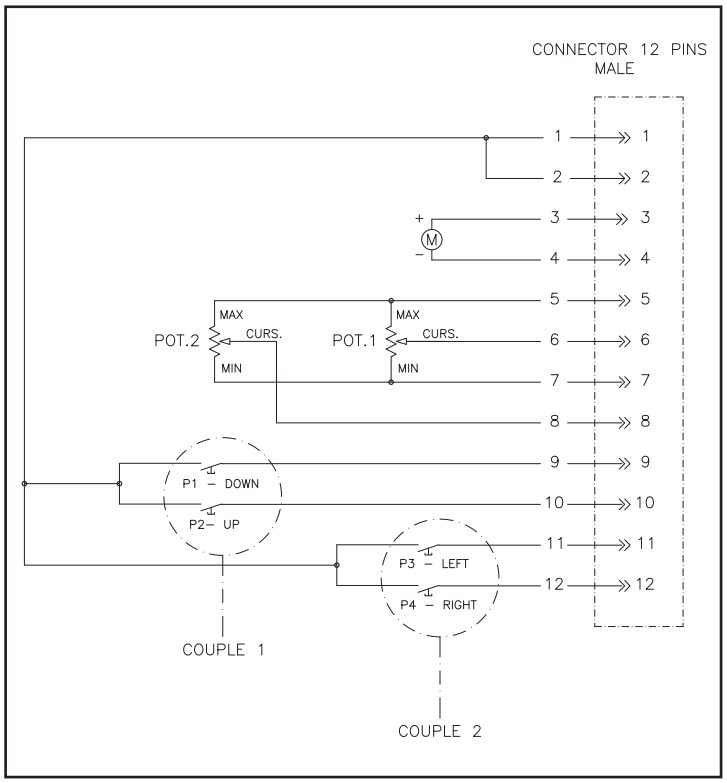


Figure 37 – Connection of Analog / Digital Torches

PUSH-PULL & SPOOL GUN

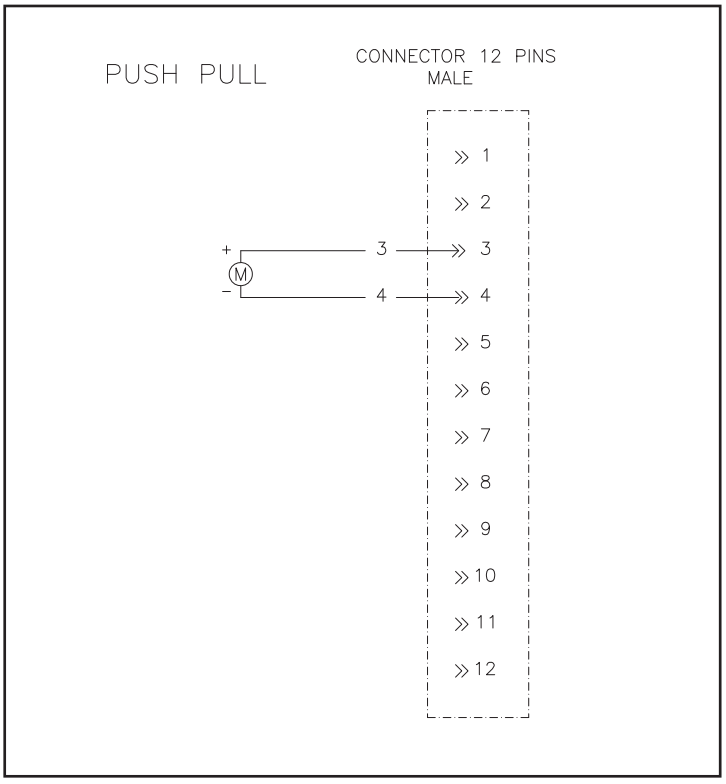


Figure 38 – Connection of Push-Pull torch without potentiometer

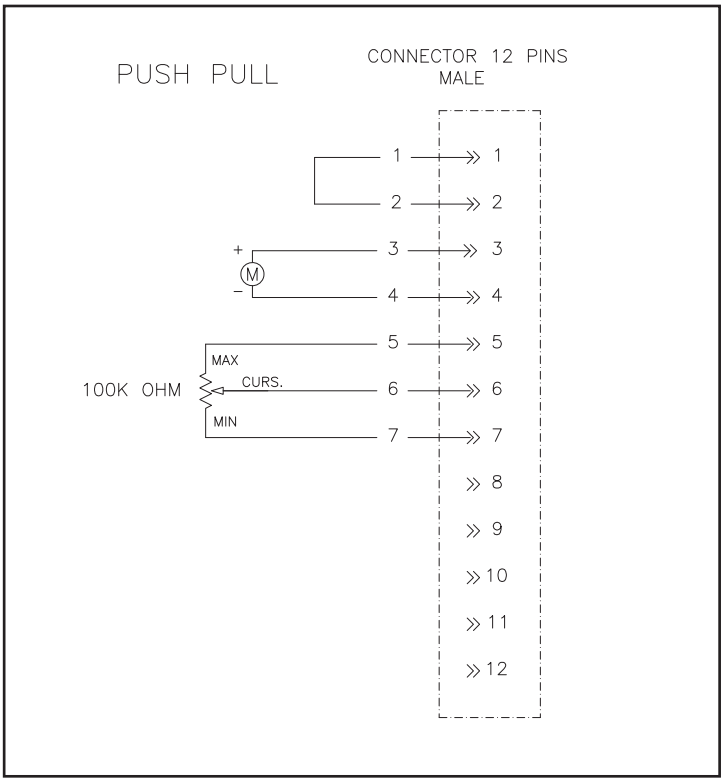


Figure 39 – Connection of Push-Pull torch with potentiometer

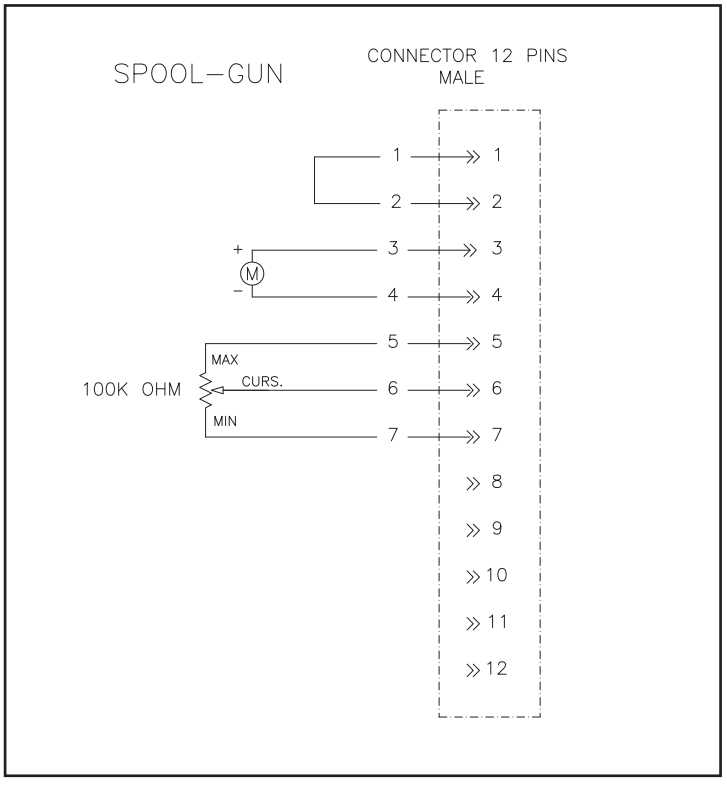


Figure 40 – Connection of Spool-Gun

MMA WELDING

In STICK/MMA Welding (SMAW), for the connection of the ground cable connector check for correct polarity for the electrode you are going to use, refer to the information on its box.

Most of the electrodes requires to connect the ground cable on the negative (minus) connector - **E** - and to connect the electrode holder on the positive (plus) - **B** -. Positive connectors are allocated on the generator and also on wire feeder, you can use both but just one at time.

1 Press Mode key to enter in MMA menu

MMA WELDING WITH POWER SOURCE

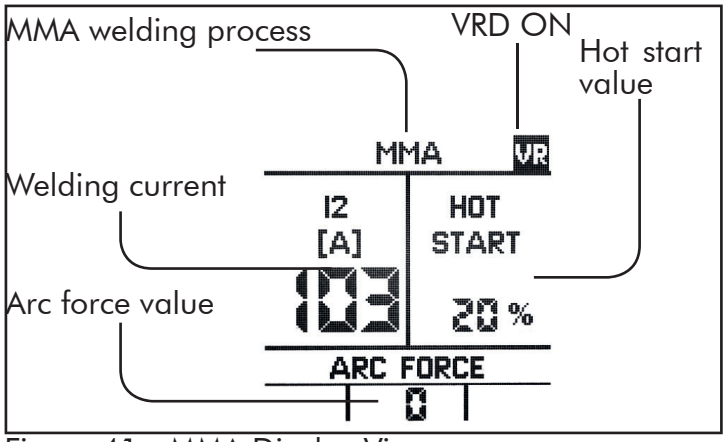


Figure 41 - MMA Display View

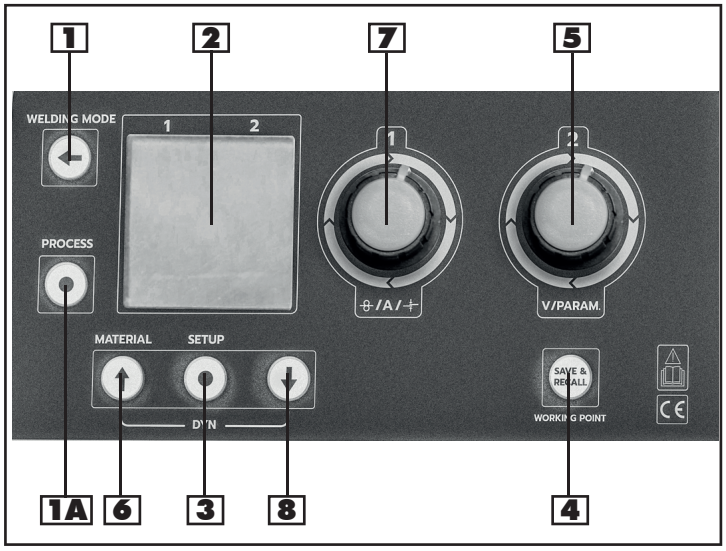


Figure 12 - Power Source Control Panel - Copy

7 ***Left Regulation Knob - Current***
adjust the welding current (A) on a range from 5 to maximum current value. Note: adjust the welding current according to the diameter of the electrode to be used.

RANGE	Ø MM
UP TO 40 A	1.6mm
40÷70 A	2.0mm
55÷90 A	2.5mm
90÷135 A	3.2mm
135÷160 A	4.0mm
170÷220 A	5.0mm
230÷300 A	6.0mm

Table 5

5 ***Right Regulation Knob - Hot start***
Adjust, in the start phase, the welding current increase percentage variable from 0 to 50% on the set current. Thanks to an initial peak current, this function makes the welding arc striking easier.

6 8 ***Arc force key***
Adjust arc force value on a range from 0 to 20

4 ***Save & Recall***
Use this key to save and recall the points that the operator can customize. Refer to "Save & Recall".

MMA WELDING WITH WIRE FEEDER

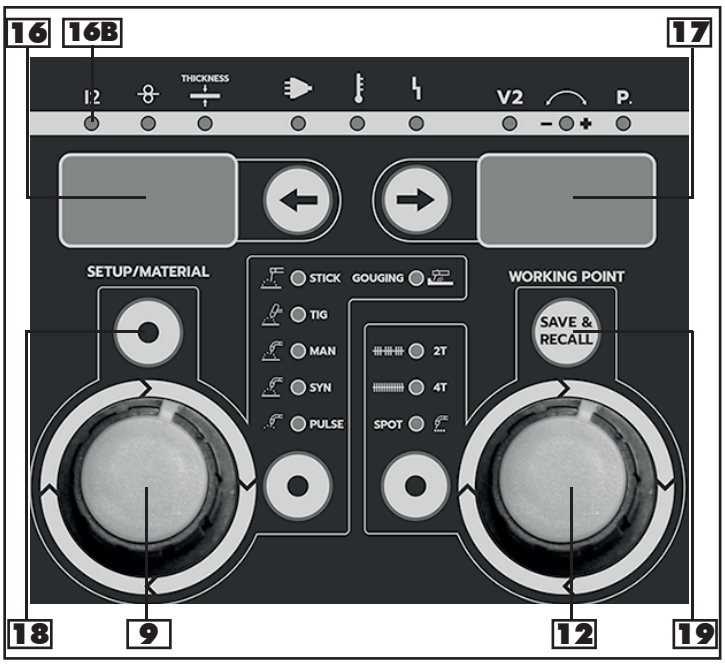


Figure 13 - Wire Feeder Control Panel - Copy

9 ***Left Regulation Knob - Current***
Adjust the welding current (A) on a range from 5 to the maximum current value. Note: adjust the welding current according to the diameter of the electrode to be used.

12 ***Right Regulation Knob - Hot start***
Adjust, in the start phase, the welding current increase percentage variable from 0 to 50% on the set current. Thanks to an initial peak current, this function makes the welding arc striking easier.

16 ***Left Display - Current***
I2 Visualization in Amp, **16B** - I2 LED is lit

17 ***Right Display - Hot start***
Hot start value in percentage

18 ***Arc force key***
Adjust arc force value on a range from 0 to 20, change value with right knob, press again Key for exit in main menu

19 ***Save & Recall***
Use this key to save and recall the points that the operator can customize. Refer to "Save & Recall".

In GOUGING process,connect the ground cable on the negative (minus) - **E** - and connect the arc gouging torch on the positive (plus) - **L** -.
Connect torch with an external air compressor
1 Press Mode key to enter the gouging menu.

GOUGING WITH POWER SOURCE

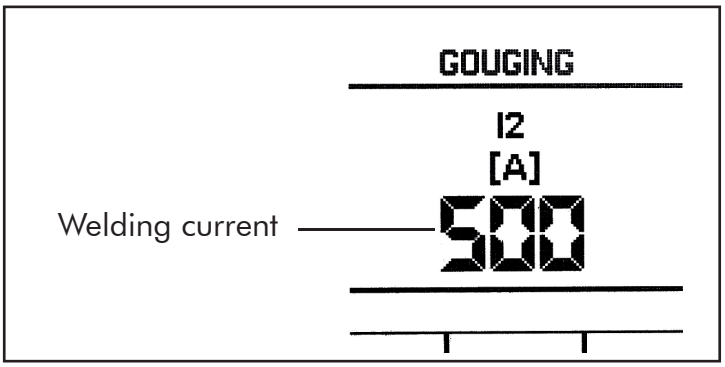


Figure 42 - Gouging Display View

7 ***Left Regulation Knob - Current***
Adjust the welding current (A) on a range from 50 to the maximum current value.

GOUGING WITH WIRE FEEDER

9 ***Left Regulation Knob - Current***
Adjust the welding current (A) on a range from 50 to the maximum current value.

16 ***Left Display - Current***
I2 Visualization in Amp

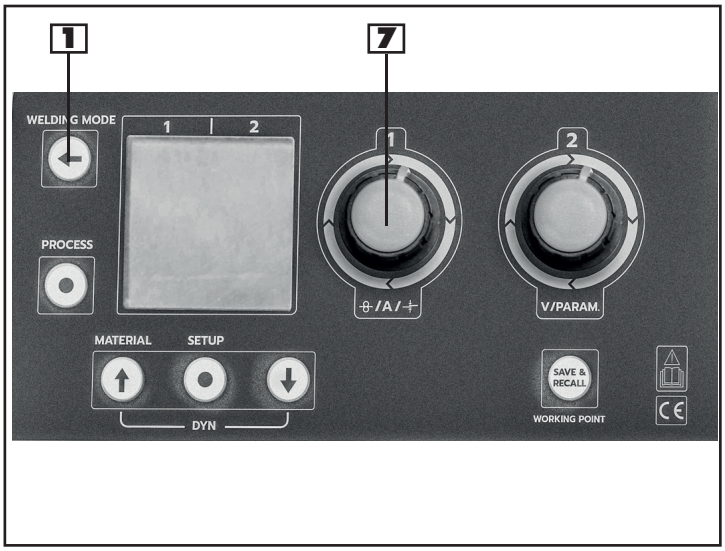


Figure 12 - Power Source Control Panel - Copy

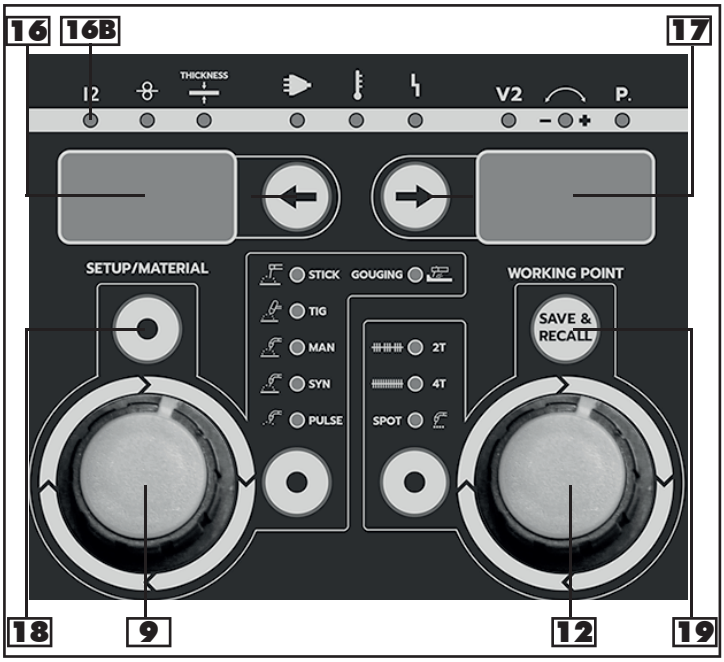


Figure 13 - Wire Feeder Control Panel - Copy

Connect the earth cable to the Positive output terminal (plus) - **B** - on the front of the unit and the earth clamp to the workpiece.
Connect the Tig torch to the negative output terminal (minus) - **E** - on the front of the unit.
Connect the torch trigger plug (if present) and the gas hose (if present) to the corresponding connectors - **G** - and - **F** - on the front panel (use inert gas) and if available the water connection - **D** -.

1 Press Mode key to enter the TIG menu.

TIG WELDING WITH POWER SOURCE

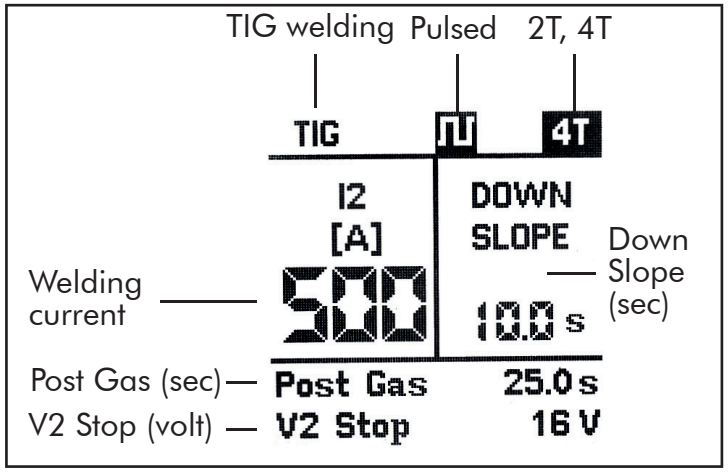


Figure 43 - TIG Display View

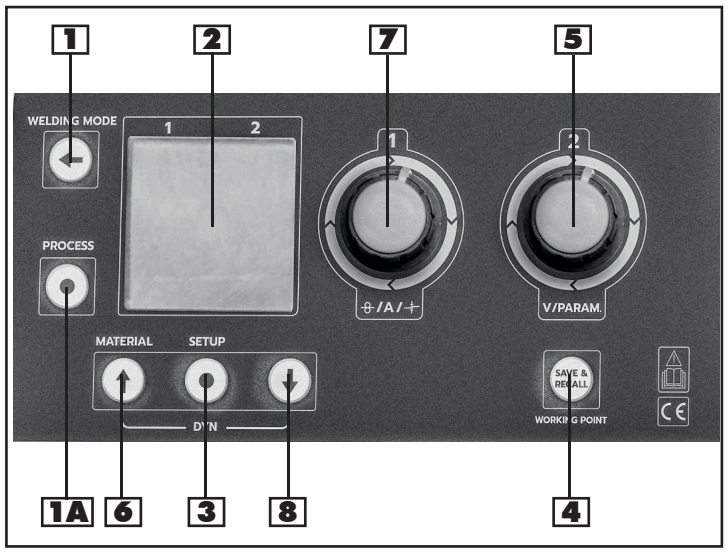


Figure 12 - Power Source Control Panel - Copy

3 ***Setup Key***
for entering the parameters' setup screen.

6 8 ***Navigation Key***
for running thru the parameters.

5 ***Right Regulation Knob***
for changing the parameters.

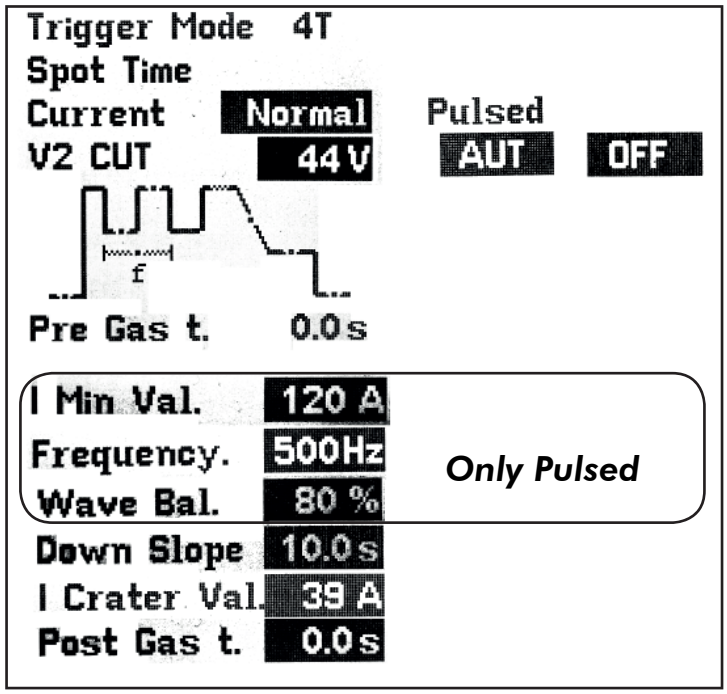


Figure 44 - TIG Setup View

2 Stroke
In Manual Welding Mode the unit will weld continuously while the torch trigger is pressed (Welding ON). Releasing the torch trigger will interrupt welding immediately (Welding OFF).

4 Stroke
In Automatic Welding Mode the welding process is performed as follows:
- first torch trigger pression (Welding ON as current is fed, Slope Up as set till the set current value is reached)
- first torch trigger release
- second torch trigger pression (Slope down and Final Current)
- second torch trigger release (Arc OFF and Post Gas)

Current
Normal / Pulsed

V2 CUT
Arc voltage value over which the arc switches off
Automatic - 16V to 44V - OFF

PRE GAS
Regulation of the Gas outflow before the welding start (0 -25 sec)

I MIN VAL
Regulation of the base current value (5 till set current in A)

FREQUENCY
Regulation of the pulsation frequency to grant excellent quality and apparance results (1-500Hz)

WAVE BAL.
Corresponds to the Time ON percentage (20% - 80%); adjusting the duty cycle in pulsed mode allows the peak current keeping for a longer or shorter time.

Slope Up
Regulation of the time needed by the welding current to reach the set value (0 – 10 Sec)

Down Slope
Regulation of the time needed by the welding current to reach the final current value (Crater Filler 0 – 10 Sec)

Crater VAL
Regulation of the Final Current Value or Crater Filler (5 till set current in A)

Post Gas
Regulation of the gas outflow time at the end of welding (0 – 25 Sec.)

Use the Mode Key - **1** - to go back to the TIG main screen after parameters are adjusted.

5 ***Right Regulation Knob - Down Slope***
Regulation of the time needed by the welding current to reach the final current value (Crater Filler OFF / 0 – 10 Sec)

6 **8** ***Navigation key***
adjusts Post Gas value on a range from 0 to 25 sec

7 ***Left Regulation Knob - Current***
adjusts the welding current (A) on a range from 5 to maximum current value

4 ***Save & Recall***
for saving and recalling the points that the operator can customize. Refer to the chapter “Save & Recall”.

TIG WELDING WITH WIRE FEEDER

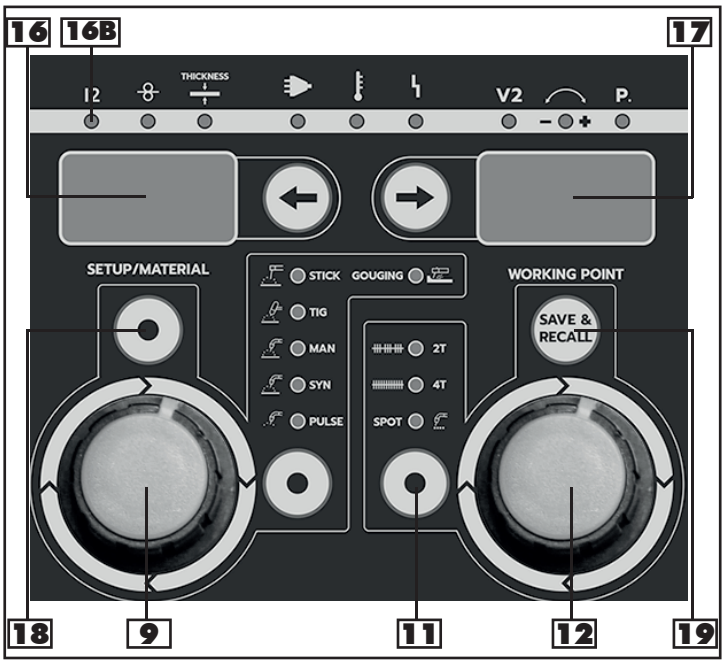


Figure 13 - Wire Feeder Control Panel - Copy

9 ***Left Regulation Knob - Current***
adjusts the welding current (A) on a range from 5 to maximum current value

11 ***Selection Key***
Selection of the 2Stroke / 4Stroke

12 ***Right Regulation Knob - Down Slope***
Regulation of the time needed by the welding current to reach the final current value (Crater Filler OFF / 0 – 10 sec)

16 ***Left Display - Current***
I2 Visualization in Amp, **16B** - I2 LED is lit

17 ***Right Display - Down Slope***
Down slope value in sec

18 ***Setup Key***
Press Key 1 time for post gas setting, 2 time for v2 cut setting
Post Gas Regulation of the gas outflow time at the end of welding (0 – 25 Sec.)
V2 CUT Arc voltage value over which the arc switches off
Automatic - 16V to 44V - OFF

19 ***Save & Recall***
for saving and recalling the points that the operator can customize. Refer to the chapter “Save & Recall”.

TIG - MMA WITH POWER UNIT

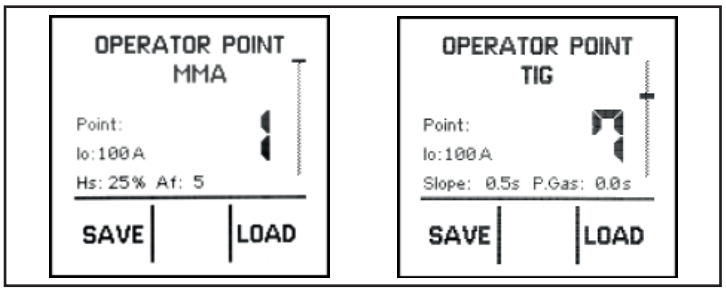


Figure 45 - Save & Recall Views for MMA/TIG

4 Save & Recall Key

Use the Save & Recall Key to save and recall the parameters set by the operator. The available memories are 10.

To save the parameters proceed as follows:

- Press the Save & Recall Key - **4** -
- Turn the Right Regulation knob - **5** - to choose the program number to save in.
- To save the program push the SAVE Key - **6** -

To recall a saved program proceed as follows:

- Press the Save & Recall Key - **4** -
- Turn the Right Regulation knob - **5** - to choose the desired program number.
- Press the LOAD Key - **8** -.

MIG MAG WITH POWER UNIT

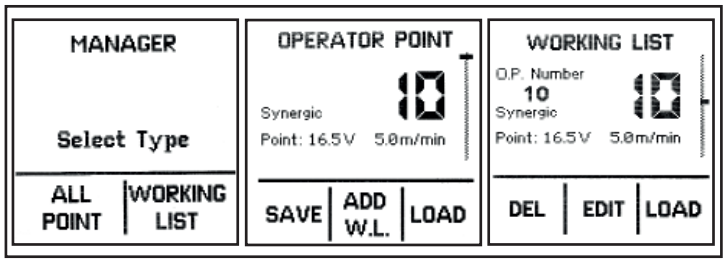


Figure 46 - Save & Recall Views for MIG/MAG

4 Save & Recall Key

Use the Save & Recall Key to save and recall the parameters set by the operator. The available memories are 250.

To save the parameters proceed as follows:

- Press the Save & Recall Key - **4** -
- press - **6** - to enter in memory selection (ALL POINTS)
- Next screen is Operator Point.
- Turn the Right Regulation knob - **5** - to choose the program number to save in.
- To save the program push the SAVE Key - **6** -.
- To add the operator point in the working list press - **3** - (ADD W.L.).
- Turn the Right Regulation knob - **5** - to choose the program number to save in.
- To save the program into the working list push the SAVE Key - **6** -.

To recall a saved program proceed as follows:

- Press the Save & Recall Key - **4** -
- press - **6** - to enter in memory selection (ALL POINTS)
- Turn the Right Regulation knob - **5** - to choose the required program number
- Press the LOAD Key - **8** -

WORKING LIST WITH POWER UNIT (ONLY FOR MIG/MAG)

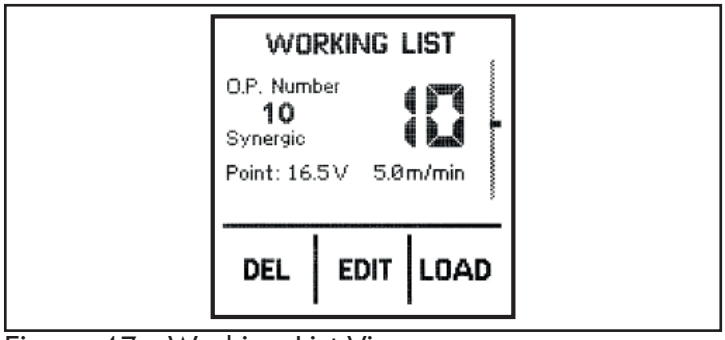


Figure 47 - Working List View

The user can select up to 20 memories and place them in the working list.

To save the parameters directly proceed as follows:

- Press the Save & Recall Key - **4** -
- press - **8** - to enter in the working list (WORKING LIST)
- Next screen is the Working List.
- Turn the Right Regulation knob - **5** - to choose the program number to save in.
- press - **3** - (EDIT) to enter in the operator point memory selection
- Turn the Right Regulation knob - **5** - to choose the program number to add to the working list
- press - **3** - (ADD W.L.) to add the parameters to the selected memory of working list
- To save the working list point push the SAVE Key - **6** -

To recall a saved operetor point into the working list proceed as follows:

- Press the Save & Recall Key - **4** -
- press - **8** - to enter in the working list selection (WORKING LIST)
- Turn the Right Regulation knob - **5** - to choose the required program number.
- Press the LOAD Key - **8** -

To delete a saved operetor point into the working list proceed as follows:

- Press the Save & Recall Key - **4** -
- press - **8** - to enter in the working list selection (WORKING LIST)
- Turn the Right Regulation knob - **5** - to choose the required program number.
- Press the DEL Key - **6** -

To exit SAVE & RECALL mode press MODE key - **1** - till you reach your required welding process menu

TIG - MMA WITH WIRE FEEDER

19 Save & Recall Key

Use the Save & Recall Key to save and recall the parameters set by the operator. The available memories are 10.
To save the parameters proceed as follows:

- Press the Save & Recall Key - **19** -, the Left Display - **16** - views the wording "OP" and the Right Displays - **17** - views the number of the selected operator point.
- Turn the Right Regulation knob - **12** - to change the program number to save in.
- To save the program hold the SAVE Key - **19** -

To recall a saved program proceed as follows:

- Press the Save & Recall Key - **19** -, the Left Display - **16** - views the wording "OP" and the Right Displays - **17** - views the number of the selected operator point.
- Turn the Right Regulation knob - **12** - to change the required program number.
- To load the program press the RECALL Key - **19** -

To exit SAVE & RECALL mode press Setup/Material key - **18** -.

MIG MAG WITH WIRE FEEDER

19 Save & Recall Key

Use the Save & Recall Key to save and recall the parameters in the working list. The available memories are 20.
To save the parameters proceed as follows:

- Press the Save & Recall Key - **19** -, the Left Display - **16** - views the wording "LSt" and the Right Displays - **17** - views the number of the selected operator point.
- Turn the Right Regulation knob - **12** - to change the program number to save in.
- To save the program hold the SAVE Key - **19** -

To recall a saved program proceed as follows:

- Press the Save & Recall Key - **19** -, the Left Display - **16** - views the wording "LSt" and the Right Displays - **17** - views the number of the selected operator point.
- Turn the Right Regulation knob - **12** - to change the required program number.
- To load the program press the RECALL Key - **19** -

Note: with the wire feeder you can recall only the operator points in the working list.

To exit SAVE & RECALL mode press Setup/Material key - **18** -.

SOFTWARE UPDATE

Ensure unit is powered off and unpluged from the mains.

EXPANSION PCB

- Remove the side panel of the power unit (which side depends on the model) to locatem the expansion PCB.
- Take the expansion PCB and place it into the white corresponding border on the PCB already installed in the power unit.
- Plug and turn ON the machine, check that the status led is working.
- After 60 seconds on the screen you will see the new configuration vs. the old one.
- Install the side panel.

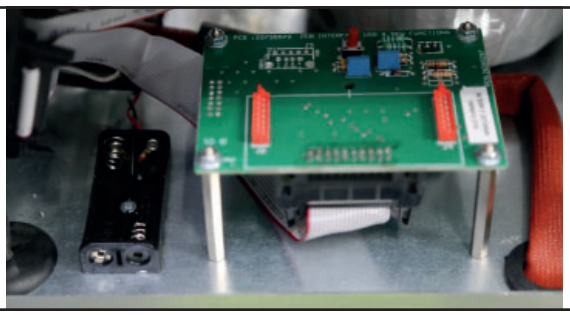


Figure 48 - Expansion PCB

USB UPDATE

- Get an empty USB drive with maximum capacity of 8GB. Format it in FAT 32. SAVE into the USB drive the updated program.
- Remove the side panel of the power unit (which side depends on the model) to locate the USB socket. On some models the USB socket is on the front panel - **W** .
- Insert the USB drive into the USB socket.
- Switch ON the machine holding MODE key - **1** -. On the screen will appear USB CONNECTED.
- Release MODE key - **1** -.
- Once the software is updated a sound will confirm you that the process is completed
- Remove the USB drive from the socket
- Install the side panel.

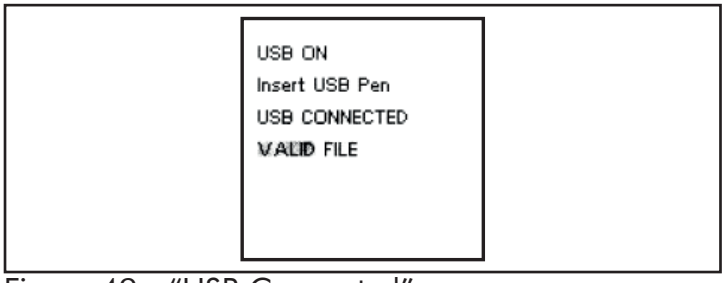


Figure 49 - "USB Connected" screen

PROTECTION GASES GUIDE

METAL	GAS	NOTE
Mild steel	CO2 Argon + CO2 Argon + CO2 + Oxygen	High Penetration Argon controls spatters Oxygen improves arc stability
Mild steel - Pulsed Mode	98%Argon + 2% CO2 (C2)	Recommended.
Aluminium	Argon Argon + Helium	Arc stability, good fusion and minimum spatter. Higher heat input suitable for heavy sections. Minimum porosity.
Stainless steel	98%Argon + 2% CO2 (C2) 80% Argon + 20% CO2 Argon + CO2 + Oxygen Argon + Oxygen	Recommended. Arc stability. Minimum spatter.
Copper, Nickel and Alloys	Argon Argon + Helium	Suitable for light gauges because of low flowability of the weld pool. Higher heat input suitable for heavy sections.

Table 6

Contact the technical service of your gas supplier to know the percentages of the different gases which are the most suitable to your application.

WELDING HINTS AND MAINTENANCE

- Always weld clean, dry and well prepared material.
- Hold gun at a 45° angle to the workpiece with nozzle about 5 mm from the surface.
- Move the gun smoothly and steadily as you weld.
- Avoid welding in very drafty areas. A weak pitted and porous weld will result due to air blowing away the protective welding gas.
- Keep wire and wire liner clean. Do not use rusty wire.
- Sharp bends or kinks on the welding cable should be avoided.
- Always try to avoid getting particles of metal inside the machine since they could cause short circuits.
- If available, use compressed air to periodically clean the hose liner when changing wire spools

IMPORTANT: Disconnect from power source when carrying out this operation.

- Using low pressure air (3/5 Bar=20-30 PSI), occasionally blow the dust from the inside of the welder. This keeps the machine running cooler. Note: do not blow air over the printed circuit board and electronic components.
- The wire feed roller will eventually wear during normal use. With the correct tension the pressure roller must feed the wire without slipping. If the pressure roller and the wire feed roller make contact (when the wire is in place between them), the wire feed roller must be replaced.
- Check all cables periodically. They must be in good condition and not cracked.

LIST OF ERRORS

This table lists the most common errors solvable by the operator following the instructions provided. In the case of error reporting is not listed in the table below, contact the service center providing the error reported and the number of your machine.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Machine powered ON, but not working, Overtemperature alarm LED on the wire feeder ON.		
Generator: display viewing the alarm screen, message "Over T" Wire Feeder: display showing "ot"	Thermic Protection Intervention cause of overload, duty cycle exceeded.	Respect the duty cycle of the machine.
	Thermic Protection Intervention cause of overtemperature	Allow welder to cool. The extinguishing of the pilot lamp on the wire feeder front panel indicates the thermostat has closed.
	Thermic Protection Intervention cause of overtemperature, fan defective or blocked	Free the fan from possible obstructions or replace it.
Generator: display viewing the alarm screen, message "Water Cooling" Wire Feeder: display showing "H2O"	Water cooler fault	Check that water cooler is correctly connected to the mains and to the power generator. Check that the water pump is working properly.
Machine powered ON, but not working, red alarm LED on the wire feeder ON		
Generator: display viewing the alarm screen, message "Over Voltage" Wire Feeder: display showing "VIN"	Overvoltage	*Check the mains voltage and/or set the power unit adequately.*
Generator: display viewing the alarm screen, message "Phase Loss"	Loss of one phase, problems on a power line	Check whether the plug is properly assembled and plugged into the socket. Check the socket fuses.
Generator: display viewing the alarm screen, message "Max Iout" Wire Feeder: display showing "IO"	The output currrent has exceeded the safety limit.	Adjust again the operator point parameters. Reset the power unit. Contact the service center.
Generator: display viewing the alarm screen, message "Max Pout" Wire Feeder: display showing "PO"	The required power exceeds the generator's supply capacity.	When the machine is powered at 220V, limit the welding parameters.
Generator: display viewing the alarm screen, message "Drivers Voltage"	Inverter fault.	Contact the service center.

Machine powered ON, but not working, no alarm LED ON		
Generator: display viewing the alarm screen, no message.	Torch or torch trigger fault.	Replace the torch trigger or the torch.
	Wrong earth connection	Check the earth connection and the correct polarity of the clamp.
	Interconnecting Hosepack faulty or not properly connected	Check the Interconnecting Hosepack
Generator: display viewing the alarm screen, message "Check Cables"	Positive (+) and negative (-) terminal in short circuit	Check for the correct connection of positive (+) and negative terminal (-)

TROUBLESHOOTING

This chart will assist you in resolving common problems you may encounter. These are not all the possible solutions.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
No “life” from welder, display is off	Input cable or plug malfunction.	Check for proper input cable connection
	Wrong size fuse.	Check fuse and replace as necessary
Feed motor operates but wire will not feed	Faulty wire feeding motor (rare)	Replace wire feeding motor
	Insufficient feed roller pressure	Increase roller pressure
	Burr on end of wire	Re-cut wire square with no burr
	Liner blocked or damaged	Clear with compressed air or replace liner
Lack of penetration	Voltage or wire feed speed too low.	Re-adjust the welding parameters.
	Loose connection inside the machine (rare).	Clear with compressed air and tighten all connections.
	Worn or wrong size contact tip.	Replace the contact tip.
	Loose gun connection or faulty gun assembly	Tighten or replace torch.
	Wrong size wire.	Use correct size welding wire.
	Torch moved too fast.	Move the gun smoothly and not too fast.
Wire is birdnesting at the drive roller	Eccessive pressure on drive roller	Adjust pressure on drive roller.
	Gun liner worn or damaged	Replace wire liner
	Contact tip clogged or damaged	Replace contact tip
	Liner stretched or too long	Cut wire liner at the right lenght
Wire burns back to contact tip	Contact tip clogged or damaged	Replace the contact tip
	Wire feed speed to slow	Increase wire speed
	Wrong size contact tip	Use correct size contact tip.
Workpiece clamp and/or cable gets hot.	Bad connection from cable to clamp	Tighten connection or replace cable.
Gun nozzle arcs to work surface.	Slag buildup inside nozzle or nozzle is shorted.	Clean or replace nozzle.

Wire pushes torch back from the workpiece	Wire feed speed too fast	Decrease wire feed speed
	Bad connection between earth clamp and workpiece.	Clean and deoxidate the contact area of the earth clamp.
	The workpiece is excessively oxidized or painted.	Brush carefully the point to be welded.

Poor quality welds	Nozzle clogged	Clean or replace nozzle
	Torch held too far from the workpiece	Hold the torch at the right distance
	Insufficient gas at weld area	Check that the gas is not being blown away by drafts and if so move to more sheltered weld area. If not check gas cylinder contents gauge, regulator setting and operation of gas valve.
	Rusty, painted, damp, oil or greasy workpiece	Ensure workpiece is clean and dry.
	Rusty or dirty wire	Ensure wire is clean and dry.
	Poor ground contact	Check ground clamp/workpiece connection
	Incorrect gas / wire combination	Check on the manual for the correct combination.

Weld deposit “stringy” and in-complete	Torch moved over workpiece too quickly	Move the torch slower
	Gas mixture incorrect	See shielding gas table

Weld deposit too thick	Torch moved over workpiece too slowly	Move the torch faster
	Welding voltage too low	Increase welding voltage

Display not clear		Set display controst.

DISPOSAL OF WASTE EQUIPMENT BY USERS IN PRIVATE HOUSEHOLDS IN THE EUROPEAN UNION

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is yr responsibility to dispose of yr waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of yr waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off yr waste equipment for recycling, please contact yr local city office, yr household waste disposal service or the shop where you purchased the product.