

Owners Manual

# **PROMAX** **MIG-250DP**

MICRO PROCESSING  
DOUBLE PULSE  
ALUMINUM WELDING MACHINE

[Digital]



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**Congratulations on your purchase of a new  
PROMAX MIG-250DP D/Pulse Mig Welder.**

We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry.

This product is backed by a 12-month trade warranty.

**Proline Welding Supplies** would like to thank you for your business, we look forward to assisting with any technical support or welding supplies required to keep your welder operating.

Please contact the friendly team:

**Proline Welding Supplies**

**Phone: 0800 699 353 | Email:**

**sales@prolinewelding.com**

**Website: [www.prolineindustrial.co.nz](http://www.prolineindustrial.co.nz)**

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# SAFETY INSTRUCTIONS AND WARNINGS

## Symbol Usage

This manual contains important information that you need to know and understand in order to assure YOUR SAFETY and PROPER OPERATION of EQUIPMENT. The following symbols help you recognize this information. Please read the manual and pay attention to these sections.

### Save These Important Safety Instructions!

Read and understand all of these safety instructions. Be sure to retain them for future use.



#### **WARNING!**

*Warnings indicate a certainty or strong possibility of personal injury or death if instructions are not followed.*



#### **CAUTION:**

*Cautions indicate a possibility of equipment damage if instructions are not followed properly.*



#### **NOTE:**

*Note gives helpful information*

Welding products and welding processes can cause serious injury, death, or damage to other equipment or property if the operator does not strictly observe all safety rules and take precautionary actions.

Safety practices are outlined in the American National Standard Z49.1 entitled: SAFETY IN WELDING AND CUTTING. This publication and other guides to what you should learn before operating this equipment are listed at the end of these safety precautions. HAVE ALL INSTALLATION, OPERATION, REPAIR WORK,

AND MAINTENANCE PERFORMED BY QUALIFIED PROFESSIONALS.

### Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.

#### **Electric Shock can kill.**



Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

Do not touch live electrical parts.

Wear dry, hole-free insulating gloves and body protection.

Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.

Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.

Use AC output ONLY if required for the welding process.

If AC output is required; use remote output control if present on unit.

Disconnect input power or stop engine before installing or servicing this equipment.

Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.

Always verify the supply ground-check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.

When making input connections attach proper grounding conductor first-double-check connections.

Frequently inspect input power cords for damage or bare wiring-replace cord immediately; damaged-bare wiring can kill.

Turn off all equipment when not in use.

Do not use worn, damaged, undersized, or poorly spliced cables.

Do not drape cables over your body.

If earth grounding of the work-piece is required, ground it directly with a separate cable.

Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.

Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.

Wear a safety harness if working above floor level.

Keep all panels and covers securely in place.

Clamp work cable with good metal-to-metal contact to work-piece or worktable as near the weld as practical.

Insulate work clamp when not connected to work-piece to prevent contact with any metal object.

Do not contact more than one electrode or work cable to any single weld output terminal.

## **FUMES AND GASES can be hazardous.**



Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health. Keep your head out of the fumes. Do not breathe the fumes.

If inside, ventilate the area and /or use exhaust at the arc to remove welding fumes and gases.

If ventilation is poor, use an approved air-supplied respirator.

Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, Consumables, Coatings, cleaners, and degreasers.

Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.

Do not weld in locations near degreasing, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.

Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if

necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.  
Shut off shielding gas supply when not in use.

**ARC RAYS can burn eyes and skin.**



Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching

Wear approved safety glasses with side shields under your helmet.

Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.

Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

**Welding can cause fire or explosion.**



Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot work-piece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

Protect yourself and others from flying sparks and hot metal.

Do not weld where flying sparks can strike flammable material.

Remove all flammables within 35 ft(10.7m) of the welding arc. If this is not possible, tightly cover them with approved covers.

Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.

Watch for fire, and keep a fire extinguisher nearby.

Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.

Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1(see Safety Standards).

Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and hazards.

Do not use welder to thaw frozen pipes.

Remove MMA electrode from holder or cut off welding wire at contact tip when not in use.

Wear oil-free protective garments such as leather gloves, heavy shirt, cuff less trousers, high shoes, and a welding helmet.

Remove any combustibles, such as butane lighters or matches, from yourself before doing any welding

**FLYING METAL can injure eyes.**



helmet.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. When your welder is cooling, it can eject sparks.
- Wear approved safety glasses with side shields even under your welding

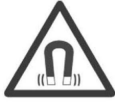


**HOT PARTS can cause severe burns.**



Do not touch hot metal barehanded.  
Allow cooling period before working on gun or torch.

**MAGNETIC FIELDS can affect pacemakers.**



Pacemaker wearers keep away.  
Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

**NOISE can damage hearing.**



Excessive noise from some processes or equipment can damage hearing.  
Wear approved ear protection if noise level is high.

**CYLINDERS can explode if damaged.**



Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.

Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.

Keep cylinders away from any welding or other electrical circuits.

Never drape a welding torch over a gas cylinder.

Never allow a welding electrode to touch any cylinder.

Never weld on a pressurized cylinder-explosion will result.

Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.

Turn face away from valve outlet when opening cylinder valve.

Keep protective helmet in place over valve except when cylinder is in use or connected for use.

**Environment**

Examples of environments with increased hazards are:

A: In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts.

B: In locations which are fully or partially limited by conductive elements, and in which there is a

high risk of unavoidable or accidental contact by the operator.

C: In wet or damp hot location where humidity or perspiration considerably reduces the skin resistance of the human body and the insulation properties of accessories.

Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

## INTRODUCTION

This highly developed digital controlled welder unit adopt advanced chip programmed inverter IGBT technology , It serves for versatile welding process which integrate MIG/MAG gas welding , flux cored wire welding , MMA and TIG lift welding .The welder was developed for semi industrial welding purpose , suitable to weld a wide range of materials like aluminum , aluminum alloy , low carbon steel , low alloy steel, stainless steel , etc . The incredible welder always ensures excellent performance and high reliability.



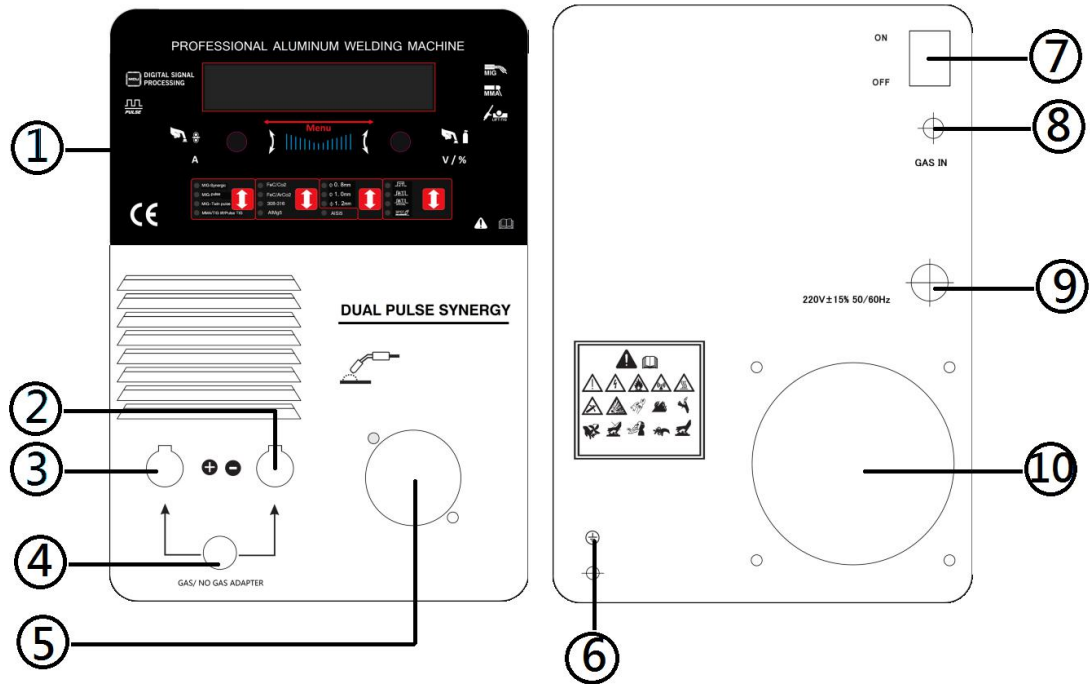
- **7 welding processes**

1. MIG-synergy
2. MIG-monopulse
3. MIG-twinpulse
4. MMA
5. TIG-LIFT
6. TIG-PULSE

- **Advantages**

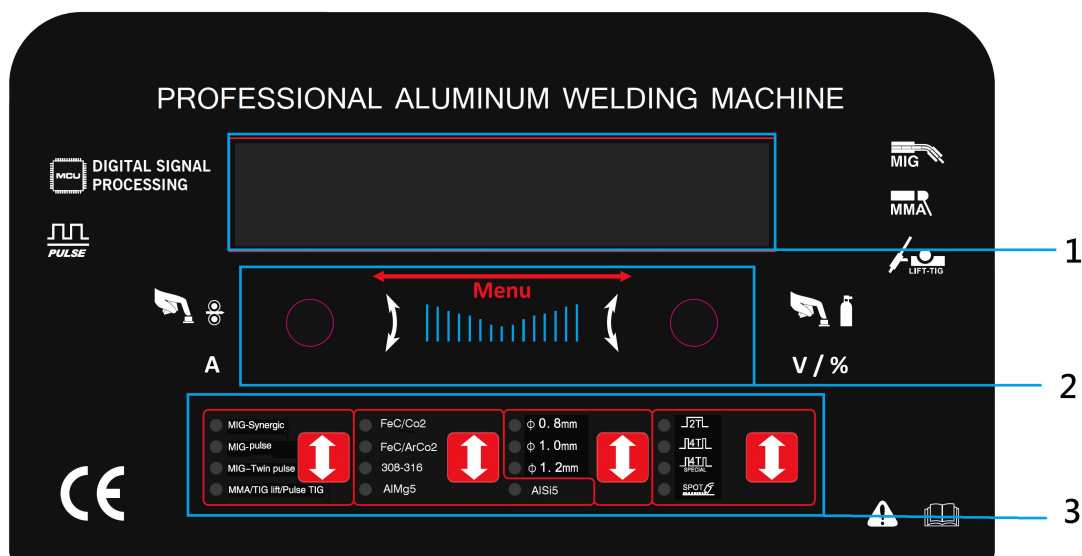
1. Adopt full-digital signal processing system.
2. Rich in functions , delivers versatile welding process . embedding welding expert database , specification match automatically via synergy technology .
3. Suitable to weld a broad range of materials like Aluminum-magnesium ,Aluminium-silicon , Carbon steel ,stainless steel , alloy steel , etc .
4. Applicable for stainless steel wire , flux cored wire , Aluminum-magnesium wire ,Aluminium-silicon wire , acid electrode rod , alkaline electrode rod , fiber electrode rod
5. Wide range of output current that suitable to weld different thickness of metal plate .
6. Software programmed welding specification that unaffected by hardware components , better consistency than analog inverter machines .
7. Higher control precision , low deviation , Time can be accurate to microsecond , current can be accurate to 0.1Amp . precise and smooth wire feeding ,
8. The use of decreased hardware components greatly reduced malfunctions , ensures better stability and reliability .
9. Higher efficiency. The high speed pulse MIG welding increased efficiency by 30 % against analog welding machine .
10. Able to weld in full angles and directions , dynamic response , deeper welding pool , better mechanical welding joint , minimum welding spatter and good-looking appearance of welding joint . small heat output .stable and smooth arc length during welding.
11. The special 4T function is suitable for welding materials with good thermal conductivity , excellent welding performance during arc initiating and ending.

12. Intelligent cooling fan, that switches to sleep mode automatically during no-load condition , and prolong service life of welding machine . energy saving .
13. Intelligent saving of welding specification .
14. Can be connect to robot automatic welding equipment .
15. Usable for remote control welding torch
16. Big display window , simple control panel for easy operation .
17. Strong 4 rolls wire feeding engine . smooth and easy wire feeding .



1. Control panel
2. Negative polarity
3. Positive polarity
4. Gas -no gas adapter
5. MIG torch
6. earthing
7. Power switch
8. Gas in
9. Power input
10. Cooling fan





1. LED display.

2. Set of knobs - buttons for setting all available parameters:

a. left knob:

- rotation - welding current adjustment,

- pressing and holding - wire feed test,

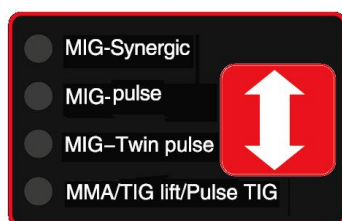
b. right knob:

- rotation - voltage correction expressed in [V] or [%],

- short press - change units [V] or [%]. Press and hold - test gas flow.

Pressing both knobs simultaneously (but in order first right then left) causes entry advanced menu devices. A detailed description can be found later in the manual in chapter "Advanced menu".

3. Quick selection menu:



Choice of welding method.

| Mold           | DISPLAY    | Description                            |                                     |
|----------------|------------|----------------------------------------|-------------------------------------|
| MIG            | SNNC MIG   | Synergic MIG-MAG welding               |                                     |
| MIG pulse      | PULSE MIG  | Synergic MIG welding with single pulse |                                     |
| MIG Twin pulse | TWIN PULSE | Synergic MIG welding with double pulse |                                     |
| MMA/TIG LIFT   | MMA MODE   | MMA welding                            | Detailed selection on control panel |
|                | TIG MODE   | TIG welding                            |                                     |
|                | PULSE TIG  | TIG pulse welding                      |                                     |



| items     | materials | wire diameter | description                                                                                                |
|-----------|-----------|---------------|------------------------------------------------------------------------------------------------------------|
| FeC/Co2   | Fe CO2    | 0.8/1.0mm     | Welding of carbon steels by the MAG method CO2 shield.                                                     |
| FeC/ArCo2 | Fe Ar82   | 0.8/1.0mm     | Welding of carbon steels by the MAG method Ar + CO2 gas mixture cover.                                     |
| 308-316   | E308 Ar98 | 0.8/1.0mm     | Welding of stainless steels MIG method, in the shield argon with an admixture of 2% CO2, or in pure argon. |
|           | E316 Ar98 | 0.8/1.0mm     |                                                                                                            |
| AlMg5     | AlMg5 Ar  | 0.8/1.2mm     | Welding aluminum and magnesium alloys, MIG method, argon shielding.                                        |
| AlSi5     | AlSi5 Ar  | 0.8/1.2mm     | Welding of aluminum alloys with silicon, MIG method, argon shielding.                                      |



Selection of wire diameter available for a given method



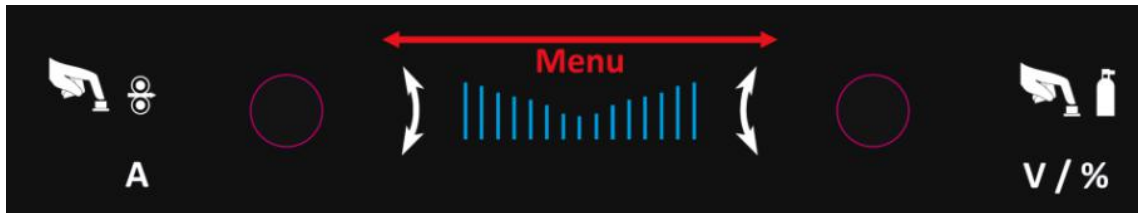
Choice of control / control method

| items      | Display   | description                                    |
|------------|-----------|------------------------------------------------|
| 2T         | Mode 2T   | Simple two-act                                 |
| 4T         | Mode 4T   | Normal four-bar                                |
| Special 4T | Mode S4T  | Special four-cycle hot start and final current |
|            | Mode S2T  | Special two-step hot start and final current.  |
| SPOT       | Mode SPOT | Normal spot welding.                           |
|            | Mode SPOT | Cyclic spot welding                            |

## ADVANCED MENU AND SETTINGS

Advanced menu - method selection.

Pressing both knobs simultaneously (but in order first right then left) causes entry advanced menu devices.



Then the display will show the symbol of the currently set welding method.

By turning the right rotary knob you can select the desired welding method e.g. Pulse TIG which is not available in quick selection menu.

After selecting a given method, turn the left knob to select the desired parameter and set the right one value.

After about 10 seconds of inactivity, the device remembers the current settings and exits automatically from the advanced menu, or earlier by pressing the right rotary knob.

Settings options.

After selecting the desired welding method, select or set other available parameters.

This can be done using the quick selection buttons or in the advanced menu.

The selection of a given parameter / function in the advanced menu is made with the left rotary knob and the value for this parameter / function with the right rotary control.

### **The advanced menu of the device offers many detailed settings.**



Burn height (burn back time).



Wire access speed (soft start).



Gas flow time before welding.



Gas flow time after welding.



Welded material thickness. The available adjustment range is different for individual materials and selected wire diameter.



For MIG welding (SYNC MIG) this is an inductance correction.  
For MIG Pulse and MIG 2-Pulse welding (Pulse MIG and Twin Puls) this is correction of peak current (first) amplitude. This is the Arc Force value for MMA welding

Freq 15Hz

Pulsation frequency when welding with double pulse MIG 2-Pulse.

Duty 50%

Double pulse balance for double pulse welding

IP-P 20%

Peak current amplitude when welding with double pulse

PU 20%

Correction of the peak voltage (arc length) when welding with double pulse.

BU 20%

Correction of the voltage (arc length) of the base current when welding with double pulse.

Slop 10

Transition time between two currents (current fall time).

### Device and current control options through a combination of pressing / releasing the handle button MIG.

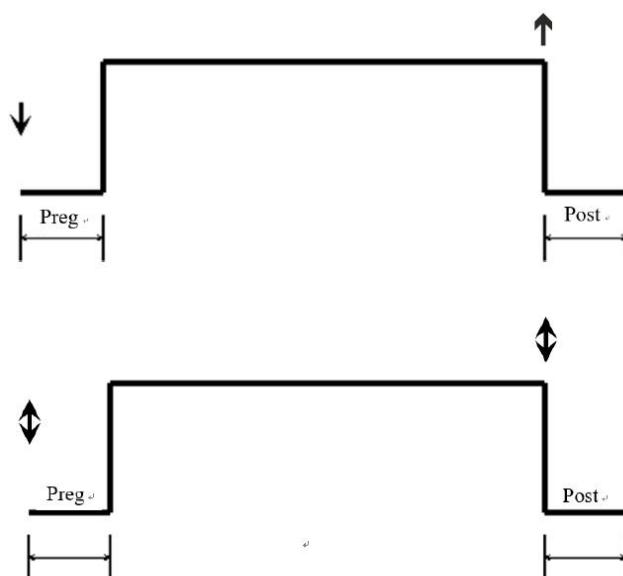
- ↓ - pressing the button on the work handle.
- ↑ - releasing the button on the work handle.
- ↕ - pressing and releasing the button on the work handle.

Mode 2T

Two-act - pressing the button initiates gas flow and welding current, release button turns off welding current

Mode 4T

Four tact - pressing and releasing MIG torch button initiates outflow gas and welding current. Press again and releasing the button turns the power off welding

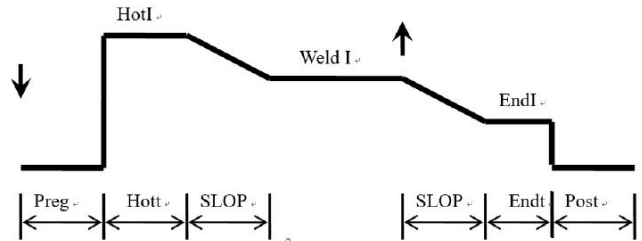


## Mode 52T

A special two-act with Hot Start and final current (filling crater).

Pressing the MIG torch button initiates the flow of gas and hot start current to the set Hot I values, which lasts according to the set Hot time. After the time Hot t has elapsed, the current drops to the "normal" welding current. Duration of the current decrease is the same as the Slop position. By releasing the button on the TIG torch, the welding current drops to the final current End I. The duration of the current drop is the same as set in the Slop position.

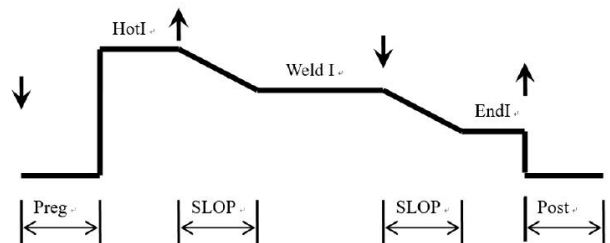
The value of the final current is set in the End I position and its duration in the End position t. After End time t arc goes out. Remember that the slop fall time is identical at the beginning and end of the cycle.



## Mode 54T

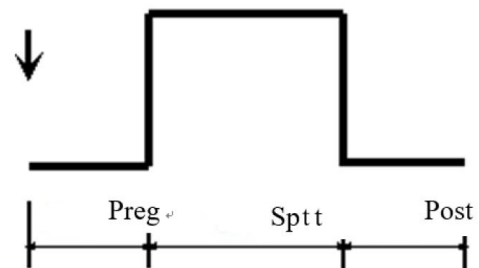
Special four-bar with Hot Start and final current (filling crater).

Pressing the button on the MIG handle initiates gas leaks and Hot Start current to the set Hot I value, which lasts as long as the handle button is pressed MIG. Releasing the button causes the current to drop to the "normal" welding current. The duration of the current drop is the same as set in the Slop position. Pressing the MIG torch button again starts the welding current drop to the current value End End I. The duration of the current drop is the same as set in the Slop position. The final current (crater filling) End I lasts as long as the button on the MIG handle is pressed. Releasing the button extinguishes the arc. Remember that the Slop current fall time is identical at the beginning and end of the cycle.



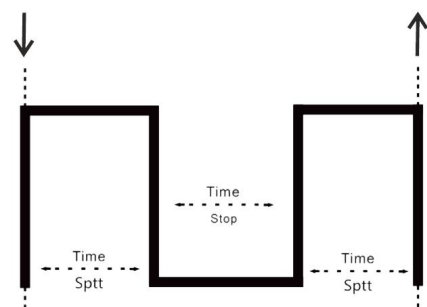
## Mode SPOT

Normal spot welding. Pressing the MIG torch button initiates gas flow and welding current start. The welding current lasts as long as it is set to position Sptt.



## Mode CPOT

Cyclic spot welding. Pressing the MIG torch button causes welding current start. The welding current lasts as long as it is set to Sptt. Then the arc goes out and the stop is stopped. The break time is adjustable and can be 0.1 ÷ 25.5 seconds. After the set time has elapsed Stop time, device again will start welding. Welding-break cycle, welding-break cycle ...it lasts as long as the button is pressed MIG torch. Releasing the button ends the cycle.





Final current (crater fill). The parameter is available only in S2T and S4T mode.

Correction of the arc length of the crater fill current. Parameter available only in S2T and S4T mode.

The duration of the crater fill current. The parameter is available only in S2T mode.

Hot Start current value. The parameter is available for the MMA method and MIG - MAG in S2T and S4T modes.

Duration of the Hot Start current. The parameter is available for the MMA method and MIG - MAG in S2T mode.

Correction of the arc length for Hot Start. The parameter is available only in S2T and S4T mode.

Welding time at the point. The parameter is available in SPOT and CPOT

Break time (distance) between welding points point cyclical CPOT.

Normal (general) mode for MMA welding

Special mode designed for welding with coated electrodes pulp using the MMA method.

The device's identification number

## Storing and recalling settings.

The device has 36 memory channels on which the user can save and recall any settings.

1. To save the settings, press the two knobs simultaneously and enter the menu Advanced.

2. Turn the left rotary knob to reach the Save position.

3. Set the channel number from 0 to 35 by turning the right rotary knob.

4. Press and hold the right rotary knob - the display should show SaveData confirming that the settings have been saved to the selected channel.

1. To recall saved settings, simultaneously press both knobs to enter the menu Advanced.

2. Turn the left rotary knob to reach the Load position.

3. Turn the right rotary control (7) to select the desired channel number on which the settings are saved.

Note: The right rotary knob must also be turned if it is displayed in Load position immediately desired channel number (i.e. change the channel number and then return to it).



## USE

### Connection

Before connecting this device to the mains, check the voltages, number of phases and frequency.

Power supply voltage parameters are given in the chapter with technical data of this manual and on the plate rated device.

Check the connections of the device's ground wires to the mains.

Make sure the mains can provide coverage of the input power requirement for this the device under normal operating conditions.

The fuse size and power cord parameters are listed in the technical data of this manual.

The supply network should have stable voltage. Cross section of power cables it should be not less than 2.5 mm.

Connect devices without power plugs according to the following instructions.



**Connection and replacement of the power cord and plug should be made qualified electrician**

The yellow-green insulated wire is grounded and should always be connected to socket marked with the earth symbol, regardless of whether we are dealing with 230 V power supply or 400 [V].



Fitting welding cables - MIG / MAG.

**ATTENTION!** Before any activities carried out on the device pull the plug out of the power socket.

1. Make sure that the device is not connected to the mains.
2. Check whether the earth lead is terminated with a pinch or screw clamp.
3. Connect the ground cable plug to the output socket on the front panel in correct polarity, press and turn. Too loose a plug connection causes premature burning of the plug and socket. We usually connect the ground cable in the MIG-MAG method to the "-" socket. When using the so-called self-shielding wires ground wire is connected to the "+" socket. The polarity change is made by switching the built-in plug to second socket.

**NOTE - THE POLARIZATION CHANGE PLUG MUST BE FIXED TO ONE OF THE SOCKETS - THIS IS NECESSARY TO CLOSE THE CURRENT CIRCUIT.**

4. Before installing the welding cable, make sure that the correct armor is installed leading to the right diameter and type of wire. For ease of use leading armors, mark them with appropriate colors. For wire with a diameter of 0.6 ÷ 0.8 mm, it has blue, for wire with a diameter of 1.0 ÷ 1.2 mm, red, and for a wire with a diameter 1.6 mm, yellow. For welding alloy steel and aluminum, we use Teflon armor. Down welding low-carbon steel, low-alloy steel, copper, bronze, etc., spiral armor is used metal. Remember to equip the welding gun with a contact tip suitable for grade and diameter of the wire.
5. Insert the "euro-plug" welding lead plug into the socket (Euro socket) located on front panel of the welding machine, then tighten the nut by hand until it stops.

### Installation of the wire

1. Ensure that the rollers installed in the power package match the type and diameter introduced wire. If the roller groove differs with the diameter of the wire, adjust the groove, by turning or replacing the roller. For steel wires, rolls with grooves should be used V, and for aluminum wires with U-shaped grooves.
2. Place the wire spool on the spool attachment mechanism, paying attention to the direction the unwinding of the wire was consistent with the direction of the wire's entry into the power unit.
3. Lock the spool against falling by tightening the nut on the spool body.
4. The end of the wire wound on the spool should be straightened or cut off the bent section, then sawn off, so it's not sharp.

5. To enable wire insertion in the feeder, release the pressure of the feed rollers.
6. Insert the end of the wire into the guide at the back of the feeder and route it over with drive rollers and insert into the guide pipe into the welding gun.
7. Push the wire into the grooves of the drive rollers by tightening pressure.
8. Remove the gas nozzle and unscrew the contact tip.
9. Turn on the device.
10. Unroll the handle so that it is in a straight line, then press button on the handle or control panel (wire feed) up to when the wire appears in the outlet (approx. 20 mm), release button.
11. Screw on the contact tip, install the gas nozzle.
12. Adjust the feed roller pressure by turning the knob pressing. Too low downforce will cause slipping the drive roller. Too high clamping force increases the feed resistance and deformation wire, which can result in cutting.



### **Shielding gas connection.**

1. A cylinder with suitable protective gas should be placed on the semi-automatic machine shelf (if present) or next to it wall and secure it against falling over, fastening it to the bracket with a chain.
2. Remove the protective cap and unscrew the cylinder valve for a moment to remove any pollution.
3. Mount the regulator so that the pressure gauges are in a vertical position.
4. Connect the semi-automatic machine with the cylinder (outlet from the regulator with the welding nozzle) with a suitable hose. Connection to shielding gas connection is located on the back of the device.
5. Only unscrew the regulator valve before starting to weld. After welding, the valve the cylinder should be turned off.
7. Avoid welding in the open or draft - a gust of air can disturb you shielding gas stream and deprive liquid metal of protection.

### **Gas feeding .**

When using the MIG(GMAW)welding process (solid wire) a shielding gas is required . MAG welding shall be conducted using mixed gas . Mixing of two gas (OC2 and Argon ) shall be performed with a gs mixer to avoid uneven mixed gas .

- 1.A stainless steel hose clamp is recommended to ensure a leak-proof connection. Using a secured GMAW shielding gas cylinder, slowly open them.Close the cylinder valve while standing off to the side of the value. This will remove any debris that may be around the valve &regulator seat area.
- 2.Install the regulator and tighten with a wrench.
- 3.Connect the gas hose to the outlet of the regulator, and tighten with a wrench.
- 4.Connect the other end of the gas hose to the “Gas Connector” on the rear panel of the welder. (See image on previous page) A stainless steel hose clamp is recommend to ensure a leak-proof connection.
5. Be sure the gas value on the torch is closed, and slowly open the cylinder value to the fully open position.
- 6.Connect the ground clamp to your work piece.
7. Plug the power cable into the appropriate outlet, and turn switch to the “ON” position. The power LED. light should illuminate.
- 8.Set the “Adjustment Switched” to the desired voltage.

You are now ready to begin MIG Welding

## Selecting Wire Types

For thin metals, use a smaller diameter wire. For thicker metal use a larger wire and a larger machine. See machine recommendations for welding capacity.

| Welding Wire Thickness Chart |                        |      |      |      |                         |      |      |
|------------------------------|------------------------|------|------|------|-------------------------|------|------|
|                              | RECOMMENDED WIRE SIZES |      |      |      |                         |      |      |
| MATERIAL THICKNESS           | MIG SOLID WIRE         |      |      |      | GASLESS FLUX-CORED WIRE |      |      |
|                              | 024"                   | 030" | 035" | 045" | 030"                    | 035" | 045" |
| 24Gauge(025)                 |                        |      |      |      |                         |      |      |
| 22Gauge(031)                 |                        |      |      |      |                         |      |      |
| 20Gauge(037)                 |                        |      |      |      |                         |      |      |
| 18Gauge(050)                 |                        |      |      |      |                         |      |      |
| 16Gauge(063)                 |                        |      |      |      |                         |      |      |
| 14Gauge(078)                 |                        |      |      |      |                         |      |      |
| 1/8"(125)                    |                        |      |      |      |                         |      |      |
| 3/16"(188)                   |                        |      |      |      |                         |      |      |
| 1/4"(25)                     |                        |      |      |      |                         |      |      |
| 5/16"(313)                   |                        |      |      |      |                         |      |      |
| 3/8"(375)                    |                        |      |      |      |                         |      |      |
| 1/2"(5)                      |                        |      |      |      |                         |      |      |

Multi-pass welding or a beveled joint design may be required on material thickness 3/16" and Greater depending on your welding machine's amperage capability.

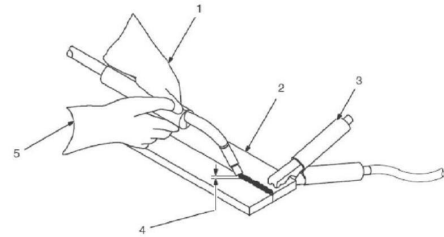
Use the correct wire type for the base metal being welded. Use stainless steel wires for stainless steel, aluminum wires for aluminum, and steel wires for steel. For steel, there are two common wire types. Use an AWS classification ER70S-3 for all purpose, economical welding. Use ER70S-6 wire when more deoxidizers are needed for welding on dirty or rusty steel.

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solid Carbon-Steel ER 70S-6     | <ul style="list-style-type: none"> <li>•Must be used with CO2 or 75% Argon /25% (C-25) shielding gas</li> <li>•CO2 gas is economical and Provides deeper penetration</li> <li>•75% Argon/25% CO2 has less spatter and a better bead appearance</li> <li>•Indoor use with no wind</li> <li>• For auto body and manufacturing Fabrication</li> <li>•Welds thinner materials(22 gauge) than flux cored wires</li> </ul> |
| Flux Cored/Carbon-steel E71T-11 | <ul style="list-style-type: none"> <li>•NO shielding gas required</li> <li>•Excellent for outdoor or windy Conditions</li> <li>•For dirty ,rusty, or painted Materials</li> <li>•Hotter than solid wires</li> <li>•Welds to 18 gauge material and thicker</li> </ul>                                                                                                                                                 |
| Aluminum ER4043                 | <ul style="list-style-type: none"> <li>•Must be used with Argon Shielding gas</li> <li>•Recommended to me used withSpool gun for best results</li> <li>•Harder wire for stronger welds And easier feeding</li> </ul>                                                                                                                                                                                                 |
| Stainless Steel ER 308L         | <ul style="list-style-type: none"> <li>•Must be used with Trimix (Helium/argon/CO2 or sprayShielding gas</li> <li>•Used for 301,302,304,305,and 308 stainless based materials</li> </ul>                                                                                                                                                                                                                             |

### Holding and Positioning Welding Gun

WELDING WIRE IS ENERGIZED WHEN GUN TRIGGER IS PRESSED, BEFORE LOWERING HELMET AND PRESSING TRIGGER, BE SURE WIRE IS NO MORE THAN 1/2 IN (13 MM) PAST END OF NOZZLE, AND TIP OF WIRE IS POSITIONED CORRECTLY ON SEAM.

1. Hold Gun and Control Gun Trigger
2. Work-piece
3. Work Clamp
4. Electrode Extension (MMA-out) 1/4 To 1/2 in (6 To 13 mm)
5. Cradle Gun and Rest Hand on Work-piece.



### Practical recommendations for MIG / MAG welding.

Butt welds in the upright position should be carried out using the "push" technique for thin elements and "pull" technique for thicker elements. Vertical butt joints for thin elements should be done from top to bottom. Fillet welds in the lateral position should be carried out using the technique "push", but taking into account the additional inclination of the welding gun in the perpendicular plane for welding direction. When filling wide grooves in a downward or vertical position, the end of the handle should be transverse swinging movements. Welding gun during welding should be guided at the right angle in relation to the elements to be welded - angle too large tilting may cause air to be sucked into the liquid metal pool (handle angle from plumb should be  $\leq 10^\circ$ ). Long arc welding reduces the depth of penetration - the weld is wide and flat, and welding is accompanied by increased spatter. Short arc welding (at the same current density) increases the penetration depth - the weld is narrower and the material spatter becomes smaller. Welding speed is the result parameter at given current and arc voltage, and maintaining proper weld bead shape and speed welding is to be even slightly changed, current or voltage should be changed accordingly arc. The increase in welding speed makes the weld narrower and the penetration depth decreases, and at further growth appear flooding of the face. The fastest welding speeds, without flooding, can be done obtained by increasing the free electrode outlet and tilting the object from top to bottom or tilting torch in the welding direction. Low welding speeds increase the penetration depth, face width and head height. Inductance also affects the shape of spines and the amount of spatter. Higher inductance (soft arc) causes a wider weld pool and less splashes. In contrast, lower inductance produces a stable, focused arc.

### MMA welding

The device described in this manual has the option of welding with coated electrodes hot melt. It has two modes to optimally adjust the parameters to the type of electrode. Cc mode for rutile, basic and acid electrodes, and Cp for cellulose electrodes. In addition, you can adjust the Arc-force, the value and duration of the Hot-start function and use the VRD function increasing safety during welding works. Recommended welding current, polarity, drying requirements are usually given by electrode manufacturers on their packaging. Connect the welding leads to the current sockets (plus and minus). Connect the earth lead to the workpiece, insert the electrode into the electrode lead

To avoid splashes during welding and to obtain a good quality weld, should be used recommendations given by the electrode manufacturer: welding current, welding positions, time and temperature drying. This is particularly important when using electrodes with a basic coating or acid (EB, EA)

The basic parameters of the MMA welding process are:

- welding current,
- welding speed,
- thickness, type of electrode and material to be welded.

The amount of current is regulated so that the arc can ignite confidently, and during welding was even and stable.

For example, the "Pink 6012" electrode needs: 2.0 mm 40 ÷ 60 A / 2.5 mm 50 ÷ 70 A / 3.25 mm 70 ÷ 110 A / 4.0 mm 110 ÷ 160 A / 5.0 mm 160 ÷ 220 A.

## TIG LIFT welding

The device described in this manual can be used for TIG LIFT welding.

To do this, purchase a handle designed for this method - it is equipped with a mechanical handle protective gas valve placed in the handle.

To TIG LIFT welding:

Insert the welding cable plugs into their respective sockets and lock them (earth clamp to (+), TIG torch to (-)).

- Connect the gas hose of the TIG torch directly to the gas outlet of the gas regulator
- shielding (ARGON gas).
- Connect the ground clamp to the workpiece.
- Check the condition of the tungsten electrode.
- Insert the plug of the mains cable into the mains socket.
- Switch on the power supply to the device using the power switch.
- Select the TIG or Pulse TIG function on the control panel.
- Set the required welding parameters.
- Unscrew the valve on the protective gas reducer and the valve on the TIG torch, this will cause flow shielding gas.

The arc strikes by rubbing the non-fusible electrode on the workpiece.

## MAINTENANCE

**The following operation involving maintenance requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge . Operators should be holders of valid qualification certificates which can prove their skills and knowledge . Make sure the input cable of the machine is cut off from the electricity unity before uncovering the welding machine**

- (1) Check periodically whether inner circuit connection is in good condition(esp plugs) .Tighten the loose connection .if there is oxidization , remove it with sandpaper and then reconnect .
- (2) Keep hands ,hair and tools away from the moving parts such as the fan to avoid personal injury or machine damage .
- (3) Clean the dust periodically with dry and clean compressed air .if welding environment with heavy smoke and pollution , the machine should be cleaned daily . The pressure of compressed air should be at a proper level in order to avoid the small parts inside the machine to be damaged .
- (4) Avoid rain , water and vapor instill the machine . if there is , dry it and check the insulation with equipment (including that between the connection and that between the connection and the enclosure ) only when there are no abnormal phenomena anymore , then the machine can be used
- (5) Check periodically whether the insulation cover of all cable is in good condition . if there is any dilapidation ,replace it .
- (6) Put the machine into the original packing in dry location if it is not to be used for a long time
- (7) Check the inter circuit of welding machine regularly and make sure the cable circuit is connected correctly and connectors are connected tightly (especially insert connector and components ) if scale and loose are found , please give a good polish to them , then connect then again tightly
- (8) The machine works accumulates for every 300 hours ,the electric carbon brush and armature rectifier should be polished , the reducer should be cleaned and lubricator should be added to the turbo and bearing .
- (9) Welding cables : regularly inspect their connections
- (10) Torch: regularly clean the contact tip and shroud to remove spatter that will eventually disturb the gas flow of wire feeding . spraying the tip and shroud with anti-spatter spray can reduce the build up of spatter . replace the tip periodically to maintain a good electrical contact between the tip and the wire . blow clean dry air through the torch liner from time to time to ensure the wire passes freely though it . if this has does not work, the liner should be replaced .

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