

# 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.

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

- 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.
- 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.
- 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.

### **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.
- 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 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.
- Removal 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.
- 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.**

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 helmet.

### **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.**



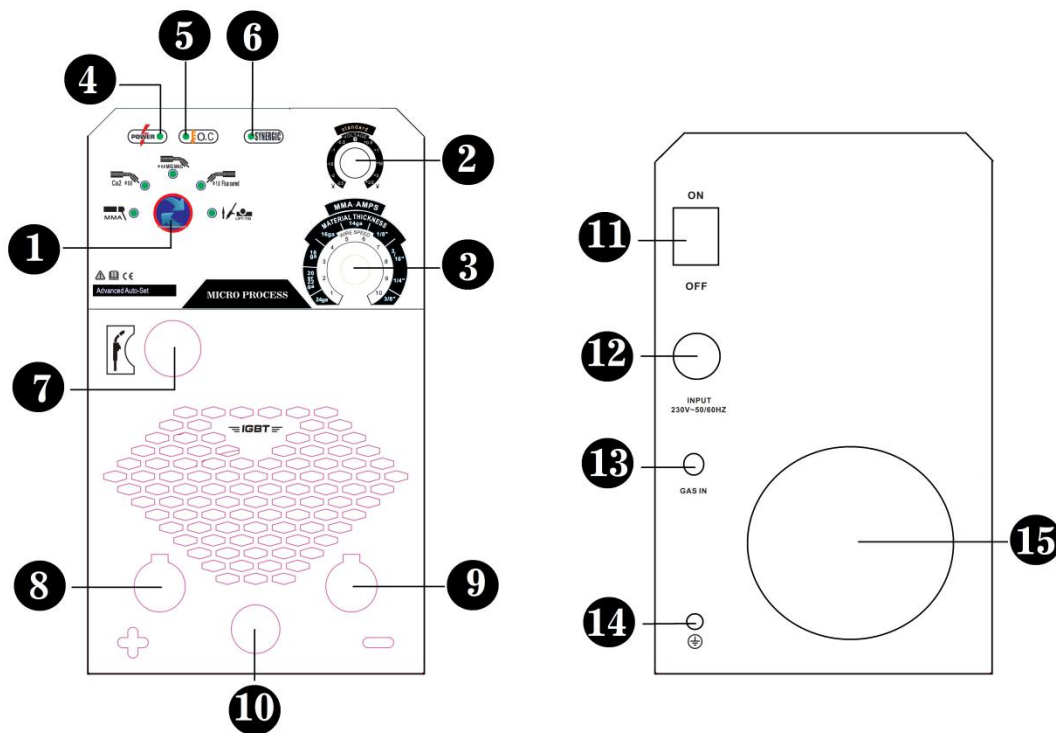
Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- 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.

## INTRODUCTION AND SPECIFICATIONS

This highly developed digital controlled welder unit adopt advanced chip programmed inverter IGBT technology ,portable design .wire spool takes maximum 1 kg wire . the wire speed and working voltage are automatically matched at optimal status . The incredible welder always ensures excellent performance and high reliability ideal for home use , DIY , work shop , and all the way up for semi-industrial welding purpose .

**Versatile mini MIG welding machine :** MIG gas and no gas welding , MMA welding , TIG lift welding .



1. Welding process set up .
2. Compensation voltage adjustment
3. Potentiometer
4. Power indicator
5. Thermal indicator
6. Synergy indicator
7. MIG torch
8. Positive polarity
9. Native polarity
10. Gas/no gas adaptor
11. Power switch
12. Power input
13. Gas input
14. Earthing
15. Cooling fan

# INSTALLATION

## Selecting a Location

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

- In areas, free from moisture and dust.
- Ambient temperature between 22F (10 c) to 104 F(40C)
- In areas free from oil, steam and corrosive gases.
- In areas, not subjected to abnormal vibration or shock
- In areas, not exposed to direct sun light or rain.
- Place at a distance of 12"-18"(300-460mm) or more from walls or similar that could restrict natural air flow for cooling.

## 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.

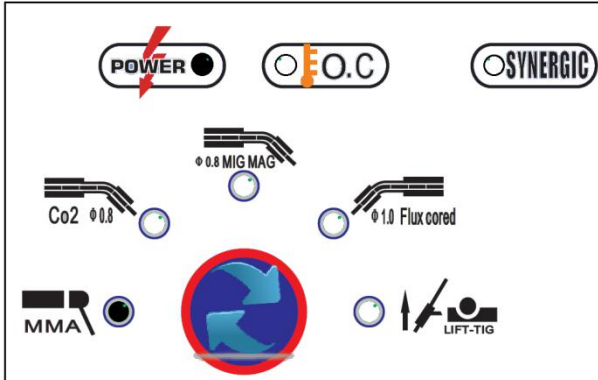
Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard ,have been insulated.

## Setup for Welding

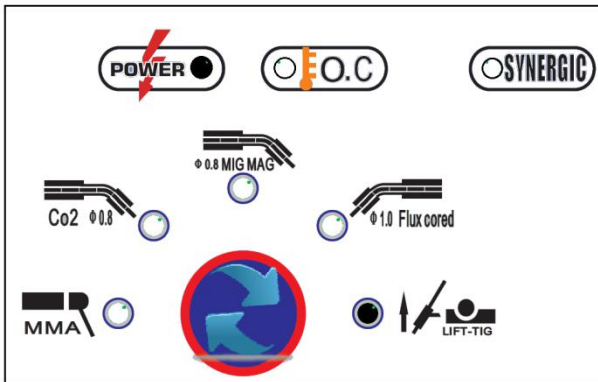
Conventional operating procedures apply when using the Welding Power Source, i.e. connect work lead directly to work piece and electrode lead is used to hold electrode. Wide safety margins provided by the design ensure that the Welding Power Source will withstand short-term overload without adverse effects. The welding current range values should be used as a guide only. Current delivered to the arc is dependent on the welding arc voltage, and as welding arc voltage varies between different classes of electrodes, welding current at any one setting would vary according to the type of electrode in use. The operator should use the welding current range values as a guide then fine tune the welding current to suit the application.

Press **1** to select desired welding process for MMA , MIG Gas welding , MIG mixed gas welding , MIG no gas welding , TIG lift welding .

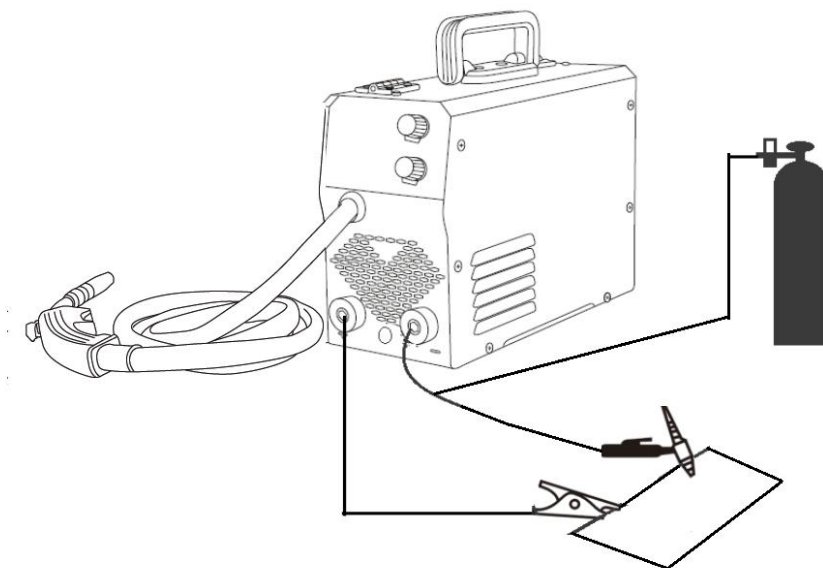
### MMA Setup



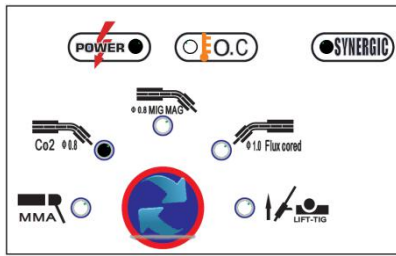
### TIG Setup



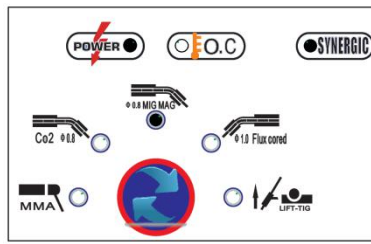
The TIG is for LIFT TIG , so gas hose connect to argon cylinder directly .



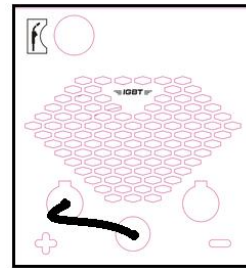
## MIG Setup



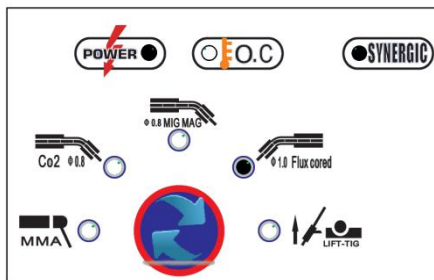
MIG CO2 gas welding .



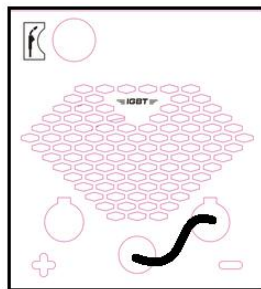
MIG mix gas welding



Adaptor connection



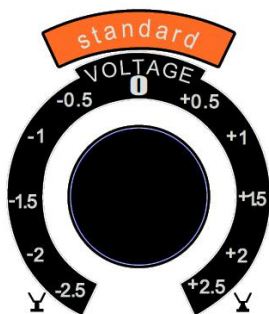
MIG no gas flux cored welding



Adaptor connection



**SYNERGY MIG** basically requires just adjust welding current , other parameters like voltage , wire speed will automatically match .



For precise welding , adjust compensation voltage . micro adjustment for desired welding voltage . position at middle is for standard welding .

Adjust leftwards for Decrease . adjust rightwards for Increase

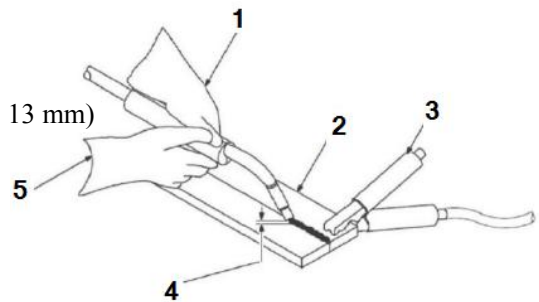
# OPERATION

## General Operation

Conventional operating procedures apply when using the Welding Power Source, i.e. connect work lead directly to work piece and electrode lead is used to hold the electrode. The welding current range values should be used as a guide only. Current delivered to the arc is dependent on the welding arc voltage, and as welding arc voltage varies between different classes of electrode, welding current at any one setting would vary according to the type of electrode in use. The operator should use the welding current range values as a guide then fine tune the welding current to suit the specific application. Refer to the electrode manufacture's literature for further information.

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.



## 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							
MATERIAL THICKNESS	RECOMMENDED WIRE SIZES						
	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)							

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>

### 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 gas 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 valve. 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.
9. You are now ready to begin MIG Welding.

## 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 , rewrap it or 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 .