MIG-205DP

MULTI-PROCESS IGBT INVERTER WELDER & CUTTER(MIG,MMA,CUT,TIG,CLEAN)

ANDELI

Website: www.andelitools.com
Email: support@andeligroup.com
Tel: +1 949 617 9002 (Hong Kong): +852 8480 7265
Service Center: (USA): LIPO INC D-100,12 Hughes Irvine, CA 92618 US
(Hong Kong): Workshop 60, 3/F, Block A,East Sun Industrial Centre, No.16 Shing Yip Street, Kwun Tong, Hong Kong

USE MANUAL

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TABLE OF CONTENTS

SAFETY

THANK YOU FOR SELECTING A QUALITY PRODUCT BY ANDELI.

PLEASE EXAMINE THE PACKING BOX AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, the title passes to the purchaser upon receipt by the carrier.Consequently, claims for material damaged in shipment must be filed by the purchaser against the transportation company when the shipment is received.

SAFETY DEPENDS ON YOU

ANDELI arc welding and cutting equipment are designed and built with safety. However, your overall safety can be increased by proper installation and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And most importantly, think before you act and be careful.

⚠ WARNING

This statement appears where the information must be followed precisely to avoid serious personal injury or loss of life.

⚠ CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance from the arc.

READ and obey the Safety Data Sheet (SDS) and the warning label on all welding materials containers.

USE ENOUGH VENTILATION or exhaust at the arc, or both, tokeep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from spatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition. Also, wear safety glasses in work area **AT ALL TIMES.**

SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures:

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall. BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.

WARNINGS

CALIFORNIA PROPOSITION 65 WARNINGS

WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

· Always start and operate the engine in a well-ventilated area.
· If in an exposed area, vent the exhaust to the outside.
· Do not modify or tamper with the exhaust system.
· Do not idle the engine except as necessary.

For more information go to www.P65 warnings.ca.gov/diesel

WARNING:This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer.
(California Health & Safety Code § 25249.5 et seq.)

WARNING: Cancer and Reproductive Harm www.P65warnings.ca.gov

ARC WELDING CAN BE HAZARDOUS.
PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY.
PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended you download free PDF of Standard ANSI Z49.1 from the American Welding Society.
https://www.aws.org/library/doclib/AWS-Z49-2021.pdf

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE POWERED EQUIPMENT.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1.b. Operate engines in open, wellventilated areas or vent the engine exhaust fumes outdoors.

1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank.
If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.
1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from Vbelts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
2.c. Exposure to EMF fields in welding may have other health effects which are now not known.
2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and workcables. If the electrode cable is on your right side, the work cable should also be on your right side.
2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
2.d.5. Do not work next to welding power source.

ELECTRIC SHOCK CAN KILL.

3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot”
parts with your bare skin or wet clothing.
Wear dry, hole-free gloves to insulate hands.
3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:
· Semiautomatic DC Constant Voltage (Wire) Welder.
· DC Manual (Stick) Welder.
· AC Welder with Reduced Voltage Control.
3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot” .
3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
3.f. Maintain the electrode stinger, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
3.g. Never dip the electrode in water for cooling.
3.h. Never simultaneously touch electrically “hot” parts of electrode stingers connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
3.i. When working above floor level, use a safety belt to protect
yourself from a fall should you get a shock.
3.j. Also see Items 6.c. and 8.

ARC RAYS CAN BURN.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Welding shield and filter lens should conform to ANSI Z87. Istandards.
4.b. Use suitable clothing made from durable flameresistant material to protect your skin and that of your helpers from the arc rays.
4.c. Protect other nearby personnel with suitable , non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES CAN BE DANGEROUS.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding,
keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.
5.b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
5.e. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer’s safety practices. SDS forms are available from your welding distributor or from the manufacturer.
5.f. Also see item 1.b.

SAFETY

WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydrauliclines. Have a fire extinguisher readily available.
6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to “Safety in Welding and Cutting” (ANSI Standard Z49.1) and the operating information for the equipment being used.
6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned” . For information, purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”, AWS F4.1 from the American Welding Society (see address above).
6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains
or cables until they fail. 6.h. Also see item 1.c.
6.I. Read and follow NFPA 51B “Standard for Fire Prevention During Welding, Cutting and Other Hot Work”, available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.
6.j. Do not use a welding power source for pipe thawing.

CYLINDER MAY EXPLODE IF DAMAGED.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
7.c. Cylinders should be located:
· Away from areas where they may be struck or subjected to physical damage.
· A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
7.d. Never allow the electrode, electrode stinger or any other electrically “hot” parts to touch a cylinder.
7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-I, “Precautions for Safe Handling of Compressed Gases in Cylinders,” available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.

FOR ELECTRICALLY POWERED EQUIPMENT.

8.a. Turn off the power using the disconnect switch at the fuse box before working on the equipment.
8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer’s recommendations.
8.c. Ground the equipment following the U.S. National Electrical Code and the manufacturer’srecommendations.

PRODUCT OVERVIEW

ANDELI MIG-205DP is a multiprocess plasma cutter welder combo supporting HF TIG welding, Flux MIG welding, Gas MIG welding, Stick (MMA) welding, Plasma cutting, MIG aluminum welding, and post-weld bead cleaning functions.

With a maximum welding current of **200A** and a maximum cutting current of **50A**, as well as **2T/4T operating modes**, the machine provides high efficiency and adaptability for applications ranging from thin sheet metal fabrication to heavy-duty repair work.

FUNCTION OVERVIEW

Multi Functions Design

1.8 in1 Multiprocess Welding, Cutting and Cleaning Machine

This machine integrates HF TIG welding, Flux MIG welding, Gas MIG welding, Stick (MMA) welding, Plasma cutting, MIG aluminum welding, cold welding (TIG mode), and weld bead cleaning, providing a comprehensive solution for welding, cutting, and post-weld finishing applications.

2.LED Display Screen

Equipped with a large high-definition LED display, the machine clearly shows welding modes and parameter settings, allowing users to quickly and accurately adjust operating parameters.

3.Intelligent Parameter Selection

Users can select welding modes, materials, welding wire types, tungsten electrodes, electrode sizes, and workpiece thickness by rotating and pressing the control knob. All parameters are displayed in real time for convenient operation.

4.Dual Voltage Input (230V)

The machine operates on a 230V input voltage, delivering a maximum welding current of 200A and a maximum cutting current of 50A, making it suitable for both household and workshop use.

5.High-Frequency Arc Start (TIG)

Built-in high-frequency arc ignition circuit ensures reliable arc starting in TIG mode without direct contact, reducing tungsten contamination.

6.High-Frequency Pilot Arc Start (Plasma Cutting)

Supports high-frequency pilot arc ignition during plasma cutting, enabling stable cutting performance on coated, rusty, or uneven metal surfaces.

7.Cold Welding Function (TIG Mode)

Suitable for welding thin stainless steel, thin steel, and carbon steel. The low heat input reduces deformation and discoloration, resulting in improved weld appearance.

Note: Pure argon gas is required.

8.MIG Aluminum Welding Function

Supports MIG welding of aluminum materials and is also suitable for thin steel, iron, stainless steel, low-carbon steel, and mold repair applications.

9.Weld Bead Cleaning Function

Designed for post-weld cleaning and finishing, especially for stainless steel weld seams. Effectively removes oxidation and discoloration, improving surface appearance and overall weld quality.

PERFORMANCE CHARACTERISTICS

IGBT inverter technology

- The adoption of 60 kHz inverting frequency and strong shock resistance IGBT for the main loop contributes to smaller welder size and lighter weight, and higher reliability.
- A great reduction in copper and core loss greatly enhances welding efficiency and saves energy.
- Switching frequency is beyond audio frequency, which almost eliminates noise pollution.

Cutting-edge control technique

- Advanced control scheme craters for various welding process requirements and greatly enhances welder performances.
- New control technology contributes to smaller voltage spike which is caused by second inversion, thus higher reliability and effi- ciency as well as smaller size.
- The adoption of MCU intelligent digital control technology and software digital controlled core welding functions brings upgraded performances when compared with traditional welders.
- Applicable to various acid and basic electrodes.

Nice shape and structure design

- Streamline design for the front and rear panels to achieve a better integral shape.
- Panels made of high-intensity engineering plastics guarantee high work efficiencyin case of strong impact and drop or other harsh conditions.
- Excellent insulating property.
- Fine anti-static and anti-corrosion performance.

Optimized auto protection

- The machine has an optimized auto protection function. When there is large-scale voltage fluctuation, the welder will shut off auto-matically and display the failure information; the welder will restart when the network voltage is stable. The welder will shut off in case of over-heat, or other abnormalities, and display the according failure information. Multi protections largely prolong the welder's lifespan.

Excellent consistency and performance

- This product adopts intelligent digital control technology which is not sensitive to component parameters'change; certain compo- nents'changes won't affect the welder's performance. It's also insensitive to temperature and humidity. All the above contribute to better consistency and performance when compared with traditional welders.

Friendly interaction interface

- This welder adopts an international diagram form display, which is easy to understand and convenient to achieve accurate opera- tion for different types of users.

Capable of high quality Stick welding

- The adoption of an excellent control algorithm largely improves Stick welding performance, bringing easy arc start, stable current, minimum spatter, no sticking, good shaping, and self-adaption to different cable lengths and cross-sections.

Capable of highly demanding argon arc welding

- Optimized digital CC adjustment technology guarantees low noise and stable arc; meanwhile, accurate control technology pro-vides convenient operation for welding current. This welder is capable of 2T/4T to meet various welding process demands.

Non-volatile Memory

- The welding parameters will be automatically memorized when power off. And the latest welding parameter could be restored when power on.

INSTALLATION

Read the entire installation section before you start the installation.

INSTALLATION

⚠ WARNING

ELECTRIC SHOCK can kill.
· Only qualified personnel should perform this installation.
· Only personnel reading and understanding the MIG-205DP Operator's Manual should install and operate this equipment.
· The machine must be plugged into a grounded receptacle per national, local, or other applicable electrical codes.
· The MIG-205DP power switch should be in the OFF("O") posi-tion when installing the work cable and gun and connect-ing the power cord to input power.

SELECT SUITABLE LOCATION

Locate the **MIG-205DP** in a dry place with free clean air circulation to minimize the chance of dirt accumulation that can block air passages and cause overheating.

STACKING

MIG-205DP can not be stacked.

TILTING

The machine should be placed on a secure, level surface or a recommended cart. The equipment may topple over if this requirement is not followed.

DESCRIPTION

1. **Gas Selection Button**
2. **Preferences**
3. **2T / 4T / Spot Select**
4. **Wire Ø**
5. **Weld Mode**
6. **Wire check function**
7. **Encoder**
8. **Knob**
9. **Europe Type torch connector**
10. **Negative (-) Welding Output Terminal**
11. **Polar conversion line**
12. **Aviation socket for Cutting torch and TIG switch**
13. **Positive (+) Welding Output Terminal**
14. **CUT/ Negative (-) Welding Output Terminal**
15. **Power Switch ON/OFF**
16. **Power Input Cable with Plug**
17. **Gas Connector**
18. **Remote Welding Helmet Control Cable Connector**
19. **Air Filter Mounting Bracket**

FUNCTION OVERVIEW

Professional parameter adjustment: it can control the inductance, slow wire feeding time, reburn time, pre-gas time, and after-gas time

Easy to use: Wire diameter/ plate material /gas/ 2T/4T/spot welding function can be selected

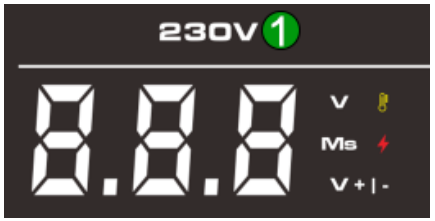


Fig 1 Input Voltage

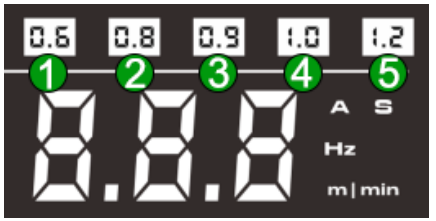


Fig 2 Wire Diameter Selection

1. 230V Voltage Input Display

1. 0.6mm (0,023″)
2. 0.8mm(0,030″)
3. 0.9mm(0,035″)
4. 1.0mm (0,040″)
5. 1.2mm (0,045″)

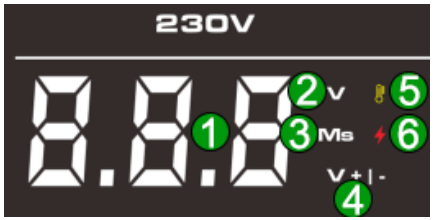


Fig 3 Volltage Display Area

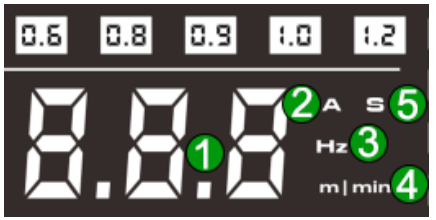


Fig 4 Current Display Area

1. Digital Voltage Display
2. Value
3. Time parameter used to control welding duration or delay, depending on the selected welding mode.
4. Fine adjustment of welding voltage.
5. Overheating protection warning symbol
6. Overcurrent protection warning symbol

1. Digital Current Display
2. Value
3. Frequency
4. Wire Feeding Speed（in/min）
5. Second

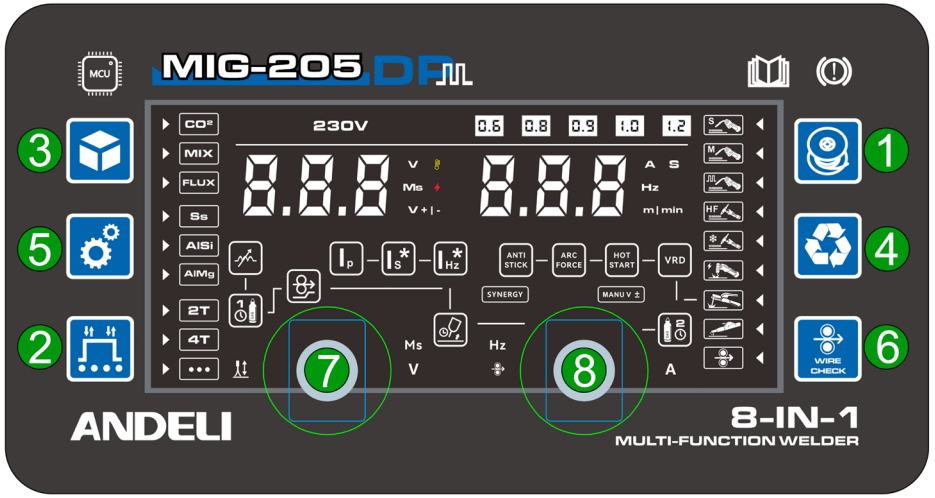
Panel function description

CO²	Compatible with CO_2 gas, carbon steel welding wire, and steel (Fe) materials.
MIX	Compatible with mixed gas, carbon steel welding wire, and steel (Fe) materials.
FLUX	Compatible with flux-cored wire (gasless), suitable for steel (Fe) and stainless steel.
Ss	Compatible with argon (Ar) gas, stainless steel welding wire, and stainless steel materials.
AlSi	Compatible with argon (Ar) gas, ER4043 silicon aluminum welding wire, and aluminum materials.
AlMg	Compatible with argon (Ar) gas, ER5356 magnesium aluminum welding wire, and aluminum materials.
2T	Standard trigger operation where the arc is active only while the torch trigger is pressed.
4T	Latch trigger operation allowing continuous welding without holding the trigger; press and release to start, press and release to stop.
•••	Delivers a fixed-duration weld at each trigger press for consistent spot welds, ideal for thin metals or sheet assembly.
S	Synergic MIG mode with automatic parameter matching.
M	Manual MIG mode with user-adjustable parameters.
	Pulsed MIG mode for controlled welding and reduced spatter.
HF	HF TIG mode for stable arc start
	Cold welding Low-heat TIG mode for thin metals

	High-Frequency Plasma Cutting Mode
	MMA Mode（Stick Welding）
	Weld Cleaning Mode：Post-weld seam cleaning for improved surface quality
	Slow wire feed time (0~10S) Slow wire feed time" refers to the period of time in the Gas Metal Arc Welding (GMAW) process when the welding wire is fed at aslower speed. This function is usually used in the initial phase of welding or specific process requirements, in order to better control the arc initiation process, stabilize the arc and improve the welding quality.
	Inductance (-10~+10) The inductance regulation allows optimization of the arc characteristics depending on the thickness of the welded plate as well as welding methods and conditions. The function is useful when welding thin steel plate, preventing their burning and during soldering of galvanized plate. The change in the inductance value also reduces the amount of welding spatter. The higher the inductance value (+) the spatter drops, when the value is negative (-), the amount of spatter increases. -10% (hard arc / weld convex / more spatter) / + 10% (soft arc / flat)
	Pre-flow time (0~5S) Before starting welding, pre-flow of shielding gas(such as carbon dioxide, argon, or gas mixture) time, This time is set to ensure that before arc welding, the welding area has been fully covered by protective gas, so as to avoid oxygen and nitrogen in the air to pollute the welding pool and affect the welding quality
	Inch wire feeding (10.16m/min) The welding wire is controlled to be fed in a discontinuous manner by press button choose this icon on front panel. This function is usually used for pre-welding preparations or special operational needs, such as changing the wire, adjusting the length of the wire extension, or performing short distance welding
	Cold Welding Current: Sets the welding current in cold welding mode to control heat input and achieve high-quality welds on thin metals.

	Cold Welding Time: Sets the duration of welding in cold welding mode to control heat input and weld seam formation.
	Cold Welding Frequency (Hz): Sets the arc or pulse frequency to control heat input and weld seam appearance.
	Burnback time (0~10S) This adjustment controls the short period of time that the wire feed will continue to run for after the main welding current stops.
	Prevents electrode sticking by reducing current automatically.
	Current adjustment for stable arc and reduced sticking.
	Temporary current boost for easier arc starting
	VRD for reduced idle voltage and improved safety
	Post gas time（0~10S） Post gas mainly protect molten pool cooling, it also can protect the welding wire and conduct nozzle. make the arc extinguish in a relatively stable environment, prevent the strong impact and interference caused by the sudden extinguishment of the arc, reduce the adverse phenomena such as welding splash and arc blowing, and improve the welding quality.
	Synergic MIG with automatic parameter matching for stable welding
	Manual voltage adjustment for MIG welding

Keys Operation Instructions



1.Button- to select Wire diameter-0.6/0.8/0.9/1.0/1.2mm

2.Button- to select 2T/4T/spot welding

3.Button / Gas selection button CO_2 / mixture / no less self-protection / stainless steel Pulse mode: Aluminum silicon / aluminum magnesium selection

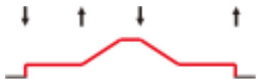
4.Button- to select welding mode MIG/MANU/Pulse/TIG/CUT/MMA/CLEAN

5.preferences ： adjusting voltage tuning / inductance adjustment / front gas / slow wire / front gas / back gas / gas welding mode) Anti-stick / thrust / thermal arc / VRD function (manual welding mode) \ front gas (cutting range 1.0S-5.0S Post-gas regulation 5.0S-10.0S) Time / frequency

6.Wire check function

7.Encoder-adjusting voltage tuning / inductance adjustment / front gas / slow wire / front gas / back gas / gas welding mode) Anti-stick / thrust / thermal arc / VRD function (manual welding mode) \ front gas (cutting range 1.0S-5.0S Post-gas regulation 5.0S-10.0S) Time / frequency

8.Knob -adjust Fine Voltage/Welding Current & Voltage/ Wire feed speed/ Inductance

Mode No.	Operation	Torch Trigger Operation and Current Curve
1	**Standard 2T mode:** 1. Push the torch trigger: arc is ignited and current rises gradually. 2. Release the torch trigger: current drops gradually, and arc stops.If push the torch trigger again before arc stops, the current will gradually rise again, and then turn to 1.	
2	**Standard 4T mode:** 1. Push the torch trigger: arc is ignited and current reaches the initial value. 2. Release it: current rises gradually to the set amperage/voltage. 3. Push it again: current drops to pilot arc current value. 4. Release it: arc stops.	

Note: When using the fast spot welding function, the continuous spot welding will be carried out by using the pre- set time value, which makes the operation more convenient

MODEL	MIG-205DP			
Power Supply Voltage(V)	230±10%			
Rated Input Capacity(KVA)	8.1	6.4	7.9	7.6
Rated Input Current(A)	37/17	29/13	36/18	33/18
Output CurrentRange(A)	50-205	10-205	10-205	20-50
Function	MIG	TIG	MMA	CUT
Duty Cycle (40°C 10min) (40°C 10min)	30%205A	20%205A	25%205A	30%40A
	60%118A	60%118A	60%132A	60%35A
	100%92A	100%92A	100%103A	100%27A
No Load Voltage(V)	57	57	57	350
Efficiency%	78	74	80	85
Power Factor	0.67	0.66	0.67	0.68
IP	21S			
Insulation Class	H			
Cooling Way	FAN & AIR			
Dimension(L*W*H)(mm)	490*225*340			
Wire Diameter	0.6-0.9	/	Ø2.5	
Net Weight(Kg)	12.8			

Note: The welding duty cycle is the percentage of actual continuous welding time that can occur in a ten minute cycle. For example: 25% at 200amps- this means the welder can weld continuously at 200 amps for 2.5 minutes and then the unit will need to be rested for 7.5 minutes.

The duty cycle can be affected by the environment in which the welder is used. In areas with temperatures exceeding 40°C , the duty cycle will be less than stated. In areas less than 40°C , higher duty cycles have been obtained

All tests on duty cycles have been carried out at 40°C , so in practical working conditions the duty cycles will be much greater than those stated above

Welding Parameters Setting

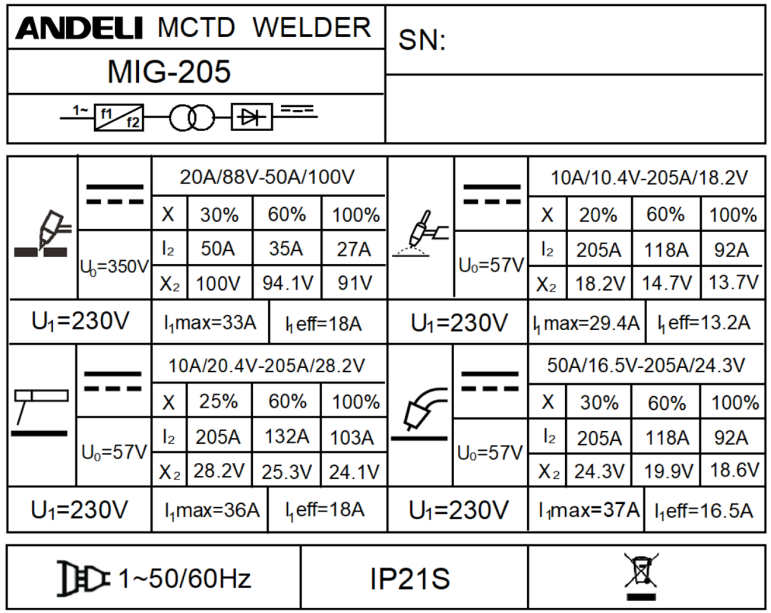
Press rotary encoder potentiometer to adjust welding parameters based on actual demands. The parameters' setting can be done during no load or in the middle of welding without affecting welding.

Welding Mode	Torch Mode	Inductance	Pre-flow	Slow wire feed	Burnback	Post gas	Anti Stick	Arc Force	Hot Start	VRD
Stick	NO	×	×	×	×	×	●	●	●	●
SYNC MIG	2T	●	●	●	●	●	×	×	×	×
	4T	●	●	●	●	●	×	×	×	×
	SPOT	●	●	●	●	●	×	×	×	×
MANU MIG	2T	●	●	●	●	●	×	×	×	×
	4T	●	●	●	●	●	×	×	×	×
	SPOT	●	●	●	●	●	×	×	×	×
PULSE MIG	2T	●	●	●	●	●	×	×	×	×
	4T	●	●	●	●	●	×	×	×	×
TIG	2T	×	×	×	×	●	×	×	×	×
	4T	×	×	×	×	●	×	×	×	×
CUT	2T	×	×	×	×	●	×	×	×	×
	4T	×	×	×	×	●	×	×	×	×
Weld Cleaning	2T	×	×	×	×	×	×	×	×	×
	4T	×	×	×	×	×	×	×	×	×
Adjusting Direction		→								

Note:
●means available, x **means not applicable**

Performance Data Plate And Duty Cycle

On the machine,there is a plate that includes all the operating specifications for your new unit. The duty cycle rating of a welder de- fineshow long the operator can weld and how long the welder must rest and be cooled. Duty cycle is expressed as a percentage of 1 O minutes and represents the maximum welding time allowed. The balance of the 1 0-minute cycle is required for cooling For ex- ample, a welder has a duty cycle rating of 30% at the rated output of 90A. With that machine, you can weld at 90 A output for three (3) minutes out of every 10 min with the remaining seven (7) minutes required for cooling The duty cycle of your new welder can be found on the data plateaffixed to the machine. The picture below shows that the "X" row lists duty cycle percentages while the "I2" row lists the amp draw corresponding to the duty cycle. Various duty cycles at other amperage are listed on your data plate.



Internal Thermal Protection

If you exceed the welder's duty cycle, the thermal protection system will engage, shutting offall welder output. After cooling, the ther- mal protector will automatically reset, and the welding functions can resume. The user needs to know it is the expected behavior of this machine. However, it would be best if you waited at least ten minutes after the thermal protector engages be fore resuming welding. You must do this even if the thermal protector resets itself before the ten minutes is up, or you may experience less than specified duty cycle performance.

Welding/Cutting Preparation

The key to making a good weld is preparation. It includes studying the process and equipment and practicing welding before at- tempting to weld the finished product. An organized, safe, ergonomic, comfortable, and well-lit work area should be prepared for the operator. The work area should be free of all flammables, with a fire extinguisher and a bucket of sand available to smother poten- tial possible fires.

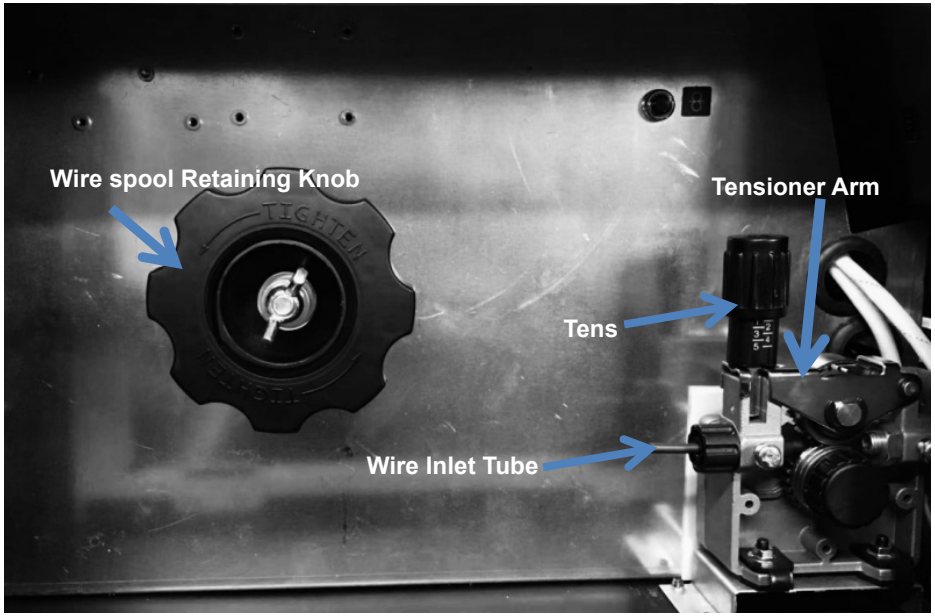
To properly prepare for welding with your new welder, it is necessary to:

- Read the safety precautions at the front of this manual.
- Prepare an organized, well-lit work area.
- Protect the eyes and skin of the operator and bystanders.
- Attach the work clamp to the bare metal to be welded, ensuring good contact.
- When for TIG Welding, ensure opening the gas cylinder valve for 100% Argon and adjust the gas pressure regulator to the correct flow rate.
- When for Cutting, ensure installing the air compressor filter regulator correctly.
- Plug the machine into a suitable power outlet, and recommend NEMA6-50.

EXPOSURE TO WELDING ARC IS EXTREMELY HARMFUL TO THE EYES AND SKIN. PROLONGED EXPOSURE TO A WELDING ARC CAN CAUSE BLINDNESS AND BURNS. NEVER STRIKE AN ARC OR BEGIN WELDING UNLESS YOU ARE ADEQUATELY PROTECTED. WEAR FIRE RESISTANT WELDING GLOVES, HEAVY LONG SLEEVED SHIRT, CUFFLESS PANTS; HIGH TOPPED SHOES AND A WELDING HELMET.

Fitting the wire spool& Wire feeder Tension Adjustment

Wire feeder



- Open the welder door and remove the Spool Retaining Knob from the wire spool spindle.
- Slide the wire spool onto the center of the spindle. When doing so, make sure the drive pin of the spindle is engaged with a spoke of the wire spool.
- Reinstall the Spool Retaining Knob.
- To set the spool tension, gradually tighten the Spool Retaining Knob until there is slight resistance when spinning the wire spool on the spindle.
- If the tension is set too loose, the wire spool may spin freely on the spindle and cause the wire to unspool.
- If the tension is too tight, the drive roller may have difficulty pulling the wire from the spool, and slipping may occur.

Warning! - Before changing the feed roller or wire spool, ensure that the mains power is switched off

Warning! - The use of excessive feed tension will cause rapid and premature wear of the drive roller, the support bearing and the drive motor.

Set Up for MIG/MAG Welding(GMAW)

The polarity adapter is located inside the machine, please wire it as shown above in MIG/ MAG GAS mode

Setup Guide:

Setup Guide:

1.MIG Gun Connection

1.Connect the MIG gun to the Euro Torch Connector on the machine.

2.Polarity Setup

○Attach the Wire Drive Polarity Lead to the Positive (+) Output Terminal.

○Connect the work clamp to the Negative (-) Output Terminal, ensuring it is securely attached to clean, bare metal on the workpiece (avoid rust or paint).

3.Load Welding Wire

○Install the wire spool into the cabinet.

○Feed the wire through the feeder and into the MIG torch (refer to “Installing the Welding Wire” for guidance).

4.Gas System Connection

○Attach the gas regulator to the gas cylinder.

○Connect the gas line to the regulator.

5.Prime the Wire

Hold the torch trigger or the "Wire Check" button on the panel to feed the wire.

6.Gas Flow Setup

○Open the gas cylinder valve.

○Pull the trigger to verify gas flow and adjust the regulator to 20–30 CFH (cubic feet per hour).

7.Power On & Process Selection

○Turn on the machine.

○Select MIG/MAG Welding Process from the Home Menu .

○Navigate to the MIG/MAG Parameter Settings page.

8.Parameter Setup

○Wire Type: Choose from Steel, Stainless Steel, AL4043 (AlSi), or AL5356 (AlMg).

○Gas Type: Select 100% CO_2 , Mixed Gas (90% Ar / 10% CO_2), or 100% Argon.

○Wire Diameter: Adjust to match your wire size(0.6mm–1.2mm).

○Trigger Mode: Set to 2T, 4T, or Spot Welding.

9.Final Checks

○Confirm Standard MIG Torch Mode is active.

○Test wire feed by triggering the torch control switch.

○Start to weld.

Basic MIG/MAG Welding Parameter Recommendation

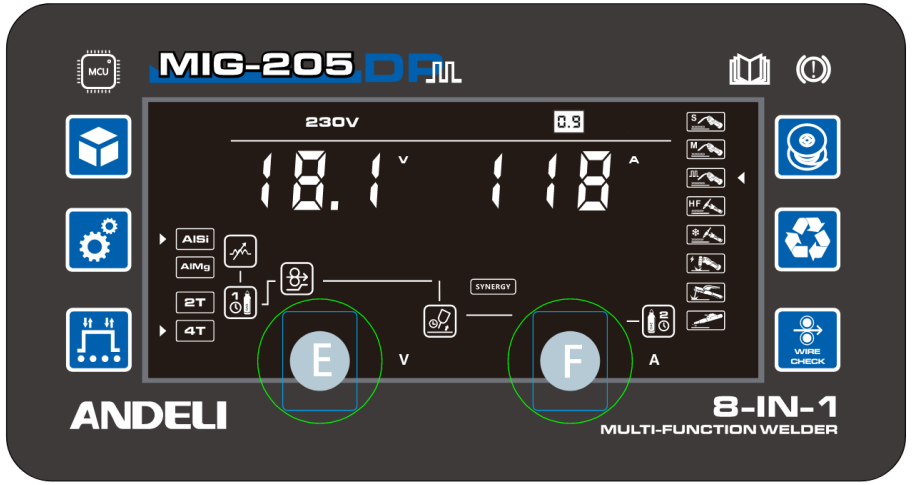
MIG-205DP Synergic mode presets parameters by material thickness. Wire feed can be adjusted manually; current and voltage are automatic, with ±5V fine-tuning. Recommended settings are shown in the table below.

Basic MIG/MAG Welding Recommended Parameter Settings

Mode	Voltage	Material	Gas Type	Wire Diameter	Parameter	Display	Thickness							
							0.6mm	0.8mm	1.0mm	1.2mm	1.6mm	2.0mm	3.0mm	5.0mm
2T/4T/ SPOT	230V	Steel	75%AR 25%CO_2	.024"(0.6mm)	WFS(m/min)	0.058	0.066	0.083	0.125	0.167	0.212	/	/	/
				.024"(0.6mm)	Voltage(V)	13.8	14.1	14.7	16	17	18	/	/	/
				.024"(0.6mm)	Amperage(A)	30	40	50	60	80	120	/	/	/
				.030"(0.8mm)	WFS(m/min)	/	/	0.041	0.041	0.057	0.071	0.119	0.136	382
				.030"(0.8mm)	Voltage(V)	/	/	14.8	15	15.8	16.5	18	20	20
				.030"(0.8mm)	Amperage(A)	/	/	50	60	80	90	130	160	160
				.035"(0.9mm)	WFS(m/min)	/	/	/	0.037	0.041	0.064	0.101	0.136	331
				.035"(0.9mm)	Voltage(V)	/	/	/	14.3	14.6	15	17.5	21	21
				.035"(0.9mm)	Amperage(A)	/	/	/	60	80	90	130	160	160
				.045"(1.2mm)	WFS(m/min)	/	/	/	/	/	0.033	0.045	0.074	154
				.045"(1.2mm)	Voltage(V)	/	/	/	/	/	15	15.8	17.5	17.5
				.045"(1.2mm)	Amperage(A)	/	/	/	/	/	90	130	160	160
		Steel	100% CO_2	.024"(0.6mm)	WFS(m/min)	0.053	0.058	0.083	0.125	0.167	0.212	/	/	/
				.024"(0.6mm)	Voltage(V)	16.2	16.3	16.5	17.3	18	19	/	/	/
				.024"(0.6mm)	Amperage(A)	30	40	50	60	80	90	/	/	/
				.030"(0.8mm)	WFS(m/min)	/	/	0.041	0.048	0.053	0.071	0.125	0.188	449
				.030"(0.8mm)	Voltage(V)	/	/	15.3	15.5	16	17	19.5	22.2	22.2
				.030"(0.8mm)	Amperage(A)	/	/	50	60	80	90	130	160	160
				.035"(0.9mm)	WFS(m/min)	/	/	/	0.033	0.041	0.054	0.105	0.128	350
				.035"(0.9mm)	Voltage(V)	/	/	/	15	15.8	17	19.3	21.5	21.5
				.035"(0.9mm)	Amperage(A)	/	/	/	60	80	90	130	160	160
				.045"(1.2mm)	WFS(m/min)	/	/	/	/	/	0.033	0.045	0.074	154
				.045"(1.2mm)	Voltage(V)	/	/	/	/	/	17.5	18.8	19.8	19.8
				.045"(1.2mm)	Amperage(A)	/	/	/	/	/	90	130	160	160
		Stainless	He Tri-Mix	.024"(0.6mm)	WFS(m/min)	0.066	0.092	0.15	0.183	0.217	/	/	/	/
				.024"(0.6mm)	Voltage(V)	15.1	16.5	17.2	17.6	18	/	/	/	/
				.024"(0.6mm)	Amperage(A)	30	40	50	60	80	/	/	/	/
				.030"(0.8mm)	WFS(m/min)	/	/	0.074	0.083	0.1	0.125	0.175	0.217	512
				.030"(0.8mm)	Voltage(V)	/	/	19	19.2	19.7	20.5	41.2	52	23
				.030"(0.8mm)	Amperage(A)	/	/	50	60	80	90	130	160	160
				.035"(0.9mm)	WFS(m/min)	/	/	/	0.053	0.064	0.071	0.136	0.136	390
				.035"(0.9mm)	Voltage(V)	/	/	/	15	16.5	17.3	21.9	22.3	22.3
				.035"(0.9mm)	Amperage(A)	/	/	/	60	80	90	130	160	160
				.045"(1.2mm)	WFS(m/min)	/	/	/	/	/	0.033	0.069	0.083	197
				.045"(1.2mm)	Voltage(V)	/	/	/	/	/	16	18.1	19.7	19.1
				.045"(1.2mm)	Amperage (A)	/	/	/	/	/	90	130	160	160
		AL 4043	100% AR	.035"(0.9mm)	WFS(m/min)	/	/	/	0.067	0.092	0.136	0.15	0.188	413
				.035"(0.9mm)	Voltage(V)	/	/	/	13	13	17.5	22	25.5	25.5
				.035"(0.9mm)	Amperage(A)	/	/	/	60	80	90	130	160	160
				.045"(1.2mm)	WFS(m/min)	/	/	/	/	/	0.033	0.069	0.083	0.094	276
				.045"(1.2mm)	Voltage(V)	/	/	/	/	/	13	15.5	20.5	23.6	23.5
				.045"(1.2mm)	Amperage(A)	/	/	/	/	/	80	90	130	160	160
		AL 5356	100% AR	.035"(0.9mm)	WFS(m/min)	/	/	/	0.086	0.109	0.136	0.15	0.188	480
				.035"(0.9mm)	Voltage(V)	/	/	/	13	13	15.2	21.2	22.8	22.8
				.035"(0.9mm)	Amperage(A)	/	/	/	60	80	90	130	160	160
				.045"(1.2mm)	WFS(m/min)	/	/	/	/	0.053	0.069	0.136	0.128	354
				.045"(1.2mm)	Voltage(V)	/	/	/	/	13	13.5	20.5	21.7	21.7
				.045"(1.2mm)	Amperage(A)	/	/	/	/	80	90	130	160	160

Note: these values serve as general guidelines, and actual welding performance may differ depending on variables such as material condition, environmental factors, and specific requirements of project requirements.

MIG Aluminium instruction and wiring operaton



1.Gas Selection:

○Use 100% pure argon (required for aluminum welding).

2.Mode & Material Setup:

○Press Button to select PULSE.

○For precise material matching: Use Button to choose ALSI (Aluminum-Silicon, e.g., ER4043) or ALMG (Aluminum-Magnesium, e.g., ER5356).

3.Wire Diameter Selection:

○Press Button to choose 0.9mm recommended for most aluminum applications

4.Parameter Adjustment:

○Press Button E to fine-tune voltage, wire speed, or pulse frequency (if required).

○PRotate Knob F to adjust the welding current as required.

5.Torch Operation Setup:

○Press Button to select 2T (tap/hold trigger) or 4T (auto-lock for continuous welding).

Aluminium welding torch instruction

Aluminium Welding Torch Setup Guides

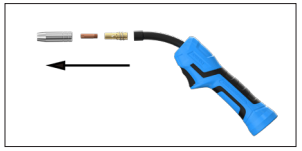
Compatibility Note：

●The included graphene liner is optimized for use with the factory-supplied MIG gun in pulse or non-pulse modes.

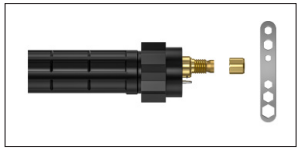
●Third-party liners/guns: Verify compatibility to prevent feed issues or liner damage.

Step-by-Step Installation：

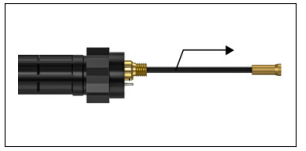
1. Lay the MIG gun straight on a clean, flat surface.
2. Remove all front-end consumables (nozzle, contact tip, gas diffuser).
3. Unscrew the liner retaining nut at the torch base.
4. Carefully pull the steel liner out of the gun cable assembly.
5. Uncoil the new graphene liner and feed it gently into the gun cable:
   - Use short, forward movements to avoid kinks (kinking damages the liner).
   - Ensure the liner exits fully through the torch neck.
6. Attach the tip holder to the liner end and screw it into the torch neck. Tighten securely.
7. Reinstall components in this order:
   - Gas diffuser
   - Special aluminum A+ contact tip (designed for soft aluminum wire)
   - Nozzle
8. Secure the liner retaining nut and O-ring at the torch base.
9. Disengage the drive roller to free the wire feed mechanism.
10. Outlet Guide Tube Removal:
    - Use a screwdriver to push out the outlet guide tube through the Euro connector.
    - Loosen the retaining screw and remove the tube with long-nose pliers.
11. Unscrew the inlet guide tube from the wire feeder.
12. Feed the extended graphene liner:
    - Insert into the Euro connector outlet guide tube hole.
    - Route the liner over the drive roller and tighten the Euro connection.
13. Trim excess liner with a sharp knife for a clean edge.
14. Install a U-groove knurled drive roller (matched to your aluminum wire diameter).
15. Replace the metal inlet guide tube with the graphene liner and reattach to the feeder.
16. Load the aluminum spool and thread the wire through the liner.
17. Power on the welder and select MIG/MAG mode from the Home Menu.
18. Set parameters:
    - Wire type: ALSI (e.g., ER4043) or ALMG (e.g., ER5356)
    - Gas: 100% argon (mandatory for aluminum)
    - Wire diameter: 0.9mm (match roller and tip size)
    - Pulse/non-pulse mode (pulse recommended for cleaner welds)



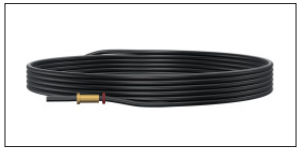
1.Remove all front-end consumables (nozzle, contact tip, gas diffuser)



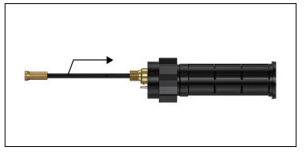
2.Unscrew the liner retaining nut at the torch base



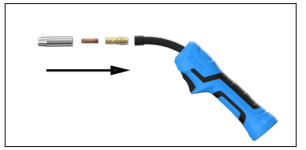
3.Carefully pull the steel liner out of thegun cable assembly



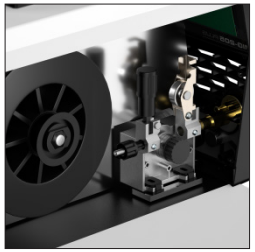
4.Uncoil the new graphene liner..



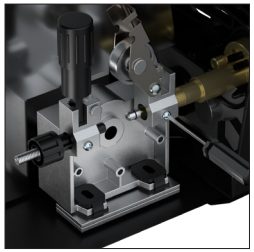
5. Feed the liner gently into the gun cable and ensure it exits fully through the torch neck.



6. Reinstall components in this order.gas diffuser, special Aluminum A+contact tip, nozzle.



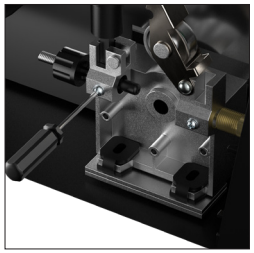
Disengage the drive roller.



Loosen the retaining screw.

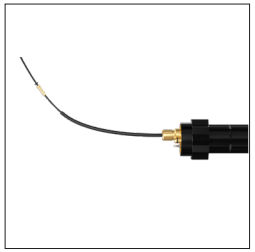
Use a screwdriver to push out the outlet guide tube through the Euro connector.

Remove the tube with long-nose pliers.



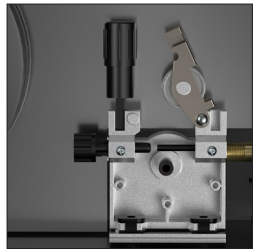
Unscrew the inlet guide tube from the wire feeding mechanism.

Remove the metal tube from the inlet guide tube.



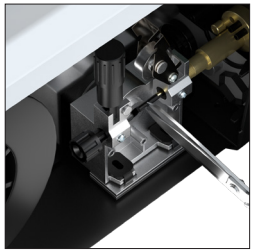
Push the liner firmly into the torch lead and tighten retaining nut.

Feed the extended graphene line into the Euro connector outlet guide tube hole.

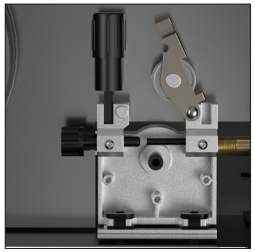


Route the liner over the drive roller.

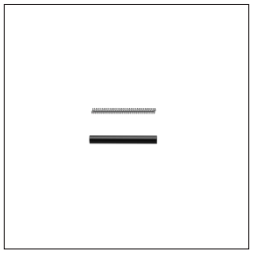
Tighten the Euro connection.



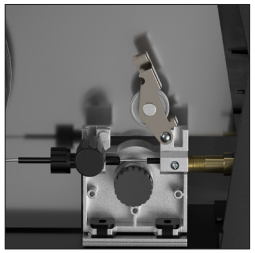
Trim excess liner with a sharp knife for a clean edge..The remaining part should be about 1/16"~5/64"(1.6mm~2mm) away from the wire drive roller.



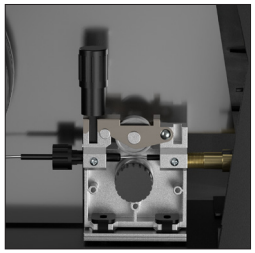
Install a U-groove knurled drive roller (matched to your aluminum wire diameter).



Cut a slightly longer tube based on the metal guide tube.



Replace the metal inlet guide tube with the graphene liner and reattach to the feeder.



Load the aluminum spool and thread the wire through the liner.

Set Up for Flux-cored Welding (FCAW)

The polarity adapter is located inside the machine, please wire it in FLUX

GASLESS mode as shown above

1.Connect the MIG gun to the Euro Torch Connector on the welding machine.

2.Secure the Wire Drive Polarity Lead to the Negative (–) .

3.Clamp the Work Clamp to the Positive (+) , ensuring direct contact with clean, bare metal (remove paint, rust, or coatings).

4.Load the flux-cored wire spool into the cabinet.

5.Thread the wire through the feeder and into the gun (refer to “Installing the Welding Wire” for guidance).

6.Press the gun trigger or hold the Value Adjustment Knob to feed the wire through the gun until it extends slightly beyond the nozzle.

7.Turn on the welder.

8.Select Flux-Cored Welding Process from the Home Menu.

9.Navigate to the Flux-Cored Parameter Settings page.

○Wire Diameter: Choose 0.8mm, 09mm, or 1.0mm (match to spool size).

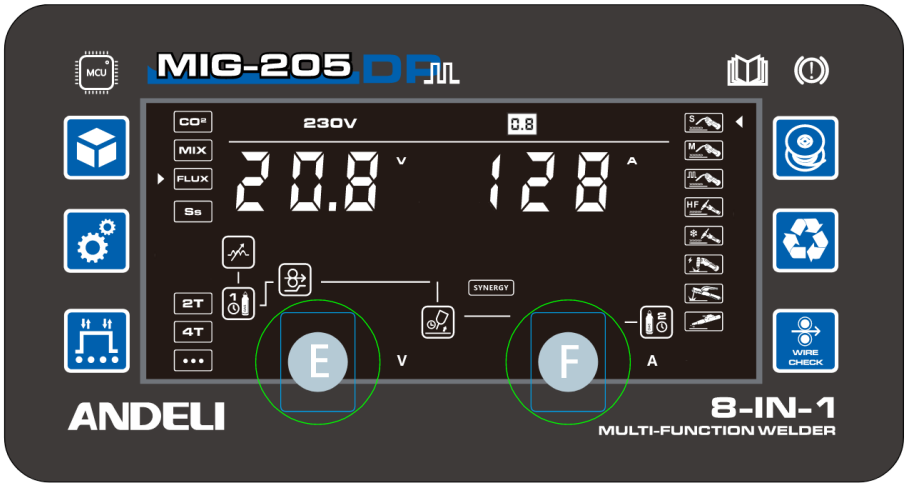
○Trigger Mode: Set to 2T (press/hold), 4T (tap to start/stop), or Spot Welding.

○Confirm Standard MIG Gun Mode is active.

Overview of Basic Flux-cored Parameters

This section provides an overview of basic Flux-cored parameters for welding tasks:

1.Flux-cored Parameters Introduction



Select Wire Diameter

Press Button to choose 0.8, 0.9, or 1.0 (match to your spool).

Note: When the 0.6 wire diameter option is selected, the control panel will not display the Gasless Flux-Cored Welding mode.

Set Trigger Mode

Press Button to select:

2T: Press/hold trigger to weld (manual control).

4T: Tap to start/stop (hands-free continuous welding).

SPOT: Timed welding for tack applications.

Fine-Tune Voltage

Rotate Knob E to adjust voltage within –5V to +5V (offsets the base voltage for precise arc tuning).

Rotate Knob F to adjust the welding current as required..

Note: Parameter behavior and adjustments mirror GAS MIG mode for consistency.

Flux-cored Welding Parameters Recommendation

To achieve optimal welding results, it's crucial to select the appropriate settings for specific welding application. The table below provides recommended voltage, wire diameter, and wire feed speed values for various materials. Adjusting these parameters based on the material and wire type ensures efficient performance and high-quality welds.

Basic Flux-cored Welding Recommended Parameter Settings

Mode	Voltage	Material	Gas Type	Wire Diameter	Parameter	Thickness								
						0.6mm	0.8mm	1.0mm	1.2mm	1.6mm	2.0mm	3.0mm	5.0mm	6.0mm
2T/4T/ SPOT	230V	Steel	/	.030"(0.8mm)	WFS(m/min)	/	/	0.049	0.058	0.066	0.071	0.083	0.133	/
				.030"(0.8mm)	Voltage(V)	/	/	13.8	14.2	15	16.5	16.5	18	/
				.030"(0.8mm)	Amperage(A)	/	/	90	100	110	120	140	160	/
				.035"(0.9mm)	WFS(m/min)	/	/	/	0.041	0.059	0.073	0.093	0.133	0.159
				.035"(0.9mm)	Voltage(V)	/	/	/	15	15.9	16.6	18	18.5	19.2
				.035"(0.9mm)	Amperage(A)	/	/	/	105	110	120	130	140	160
				.039"(1.0mm)	WFS(m/min)	/	/	/	/	/	0.033	0.055	0.075	0.083
				.039"(1.0mm)	Voltage(V)	/	/	/	/	/	15.2	17	18.5	19
				.039"(1.0mm)	Amperage(A)	/	/	/	/	/	80	100	130	200

Note: these values serve as general guidelines, and actual welding performance may differ depending on variables such as material condition, environmental factors, and specific requirements of project requirements.

Set Up for HF TIG Welding(GTAW)

WARNING: TIG TORCH IS ALWAYS LIVE (ELECTRICALLY HOT). Use caution and ensure the TIG torch is not in contact with or close to a conductive or grounded material.

Note: REMOVE ALL THE COLLECTION FROM THE POSITIVE(+) , NEGATIVE(-) OUTPUT RECEPTACLE, AND TORCH CONNECTOR.

- Connect the TIG torch gas connector to the welder's Torch Connector.
- Plug the 5-pin torch control switch cable into the Trigger Connector Receptacle.
- Connect the work clamp to the welder's Positive (+) Output Receptacle. Ensure it has good contact with the workpiece on a clean, bare metal surface free of rust, paint, or coating.
- Attach the work clamp to the workpiece that needs welding.
- Set the tungsten electrode to stick out approximately 1/4" inch from the end face of the gas cup. Use the correct size and type of tungsten electrode for your project: small-sized tungsten can handle low welding current; the tungsten electrode requires a sharpened tip for DC welding and a round tip for AC welding.
- Put the TIG torch away from all conductive materials.
- Install the gas hose into the Inlet for Argon Gas and connect to the gas pressure regulator (100% Argon only).
- Open the gas cylinder valve and adjust the gas pressure regulator to the correct flow rate (Recommend 20-35 CFH).
- Plug the power cable into a suitable power outlet.
- Turn on the power source and select TIG process with the Welding Process Selection.
- Press the Value Knob to set parameters and rotate the knob to adjust the values.
- Position the tungsten electrode 2–3 mm (0.08–0.12 in) above the workpiece, and trigger the torch control switch to initiate the welding arc using the HF technique.

REMEMBER TO CLOSE THE VALVE ON THE GAS CYLINDER IMMEDIATELY AFTER ALL WELDING IS COMPLETED.

Welding Tips:

- Always weld on clean, dry, and properly prepared materials.
- Hold the torch at a 45° angle to the workpiece, keeping the gas cup about 1/2" from the surface.
- Move the torch smoothly and steadily during welding.
- Avoid welding in drafty areas, as air flow can disrupt shielding gas coverage and cause porosity.
- Keep the welding wire and liner clean. Do not use rusty or contaminated wire.
- Please don't bend or kink the welding torch cable.

Torch Assembling

Step-by-Step Guide

Match Components to Tungsten Size
- Ensure the **Collet** and **Collet Body** are sized to match your **Tungsten Electrode** diameter.
- Tip: Mismatched sizes can cause poor arc stability or damage the torch.

Install the Collet Body
- Thread the **Collet Body** securely into the **front end of the TIG Torch.**
- Avoid over-tightening to prevent cross-threading.

Select & Attach the Ceramic Nozzle
- Choose a **Ceramic Nozzle** size based on material thickness and shielding gas flow (refer to the **Settings Chart**).
- Screw the nozzle onto the Collet Body until snug.

Assemble the Collet and Tungsten
- Insert the **Collet** into the **Collet Body**.
- Slide the **Tungsten Electrode** through the collet, ensuring it is straight and centered.

Secure the Electrode
- Thread the **Back Cap** onto the torch to lock the tungsten in place.
- Adjust the electrode so it extends **1/8" to 1/4" beyond the Ceramic Nozzle**.

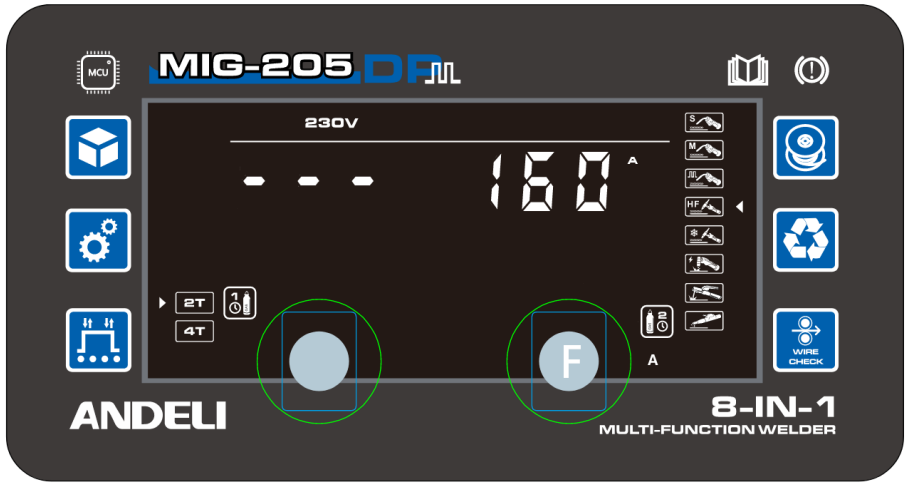
WP-17

TIG Recommoned welding current

TIG Electrodes Specification Reference Table

Settings Chart									
Material	Material Thickness	Amps	Tungsten Color	Tungsten Dia.	Filler Metal	Filler Metal Diameter	Ceramic Nozzle size	Gaas Flow	Gas Flow Rate
Mild Steel	1.6mm	55~90	Grey, Orange, Red, White	1.6mm	ER70S-2	1.6mm	#4	2	5–6 L/min
Mild Steel	0.8mm	90~120	Grey, Orange, Red, White	1.6mm	ER70S-2	1.6mm	#4-5	2	5–6 L/min
Mild Steel	3.2mm	95~135	Grey, Orange, Red, White	1.6-2.4mm	ER70S-2	2.4mm	#5-6	10	5–6 L/min
Mild Steel	4.8mm	140~165+	Grey, Orange, Red, White	2.4mm	ER70S-2	3.2mm	#6-7	10	6–7 L/min
Stainless Steel	1.6mm	50~80	Grey, Orange, Red, White	1.6mm	ER70S-2	1.6mm	#4	2	5–6 L/min
Stainless Steel	0.8mm	80~110	Grey, Orange, Red, White	1.6mm	ER70S-2	1.6mm	#4-5	2	5–6 L/min
Stainless Steel	3.2mm	85~120	Grey, Orange, Red, White	1.6-2.4mm	ER70S-2	2.4mm	#5-6	10	5–6 L/min
Stainless Steel	4.8mm	125~205+	Grey, Orange, Red, White	2.4mm	ER70S-2	3.2mm	#6-7	10	6–7 L/min

TIG PANEL INTRODUCTION



Activate TIG Mode

○ Press Button to switch to TIG Welding Mode.

Set Welding Current

○ Rotate Knob F to adjust amperage:

■ 230V Input: 15–205A range.

○ Note: Current selection depends on material thickness and tungsten size (refer to TIG settings chart).

Select Torch Trigger Mode

○ Press Button → Choose:

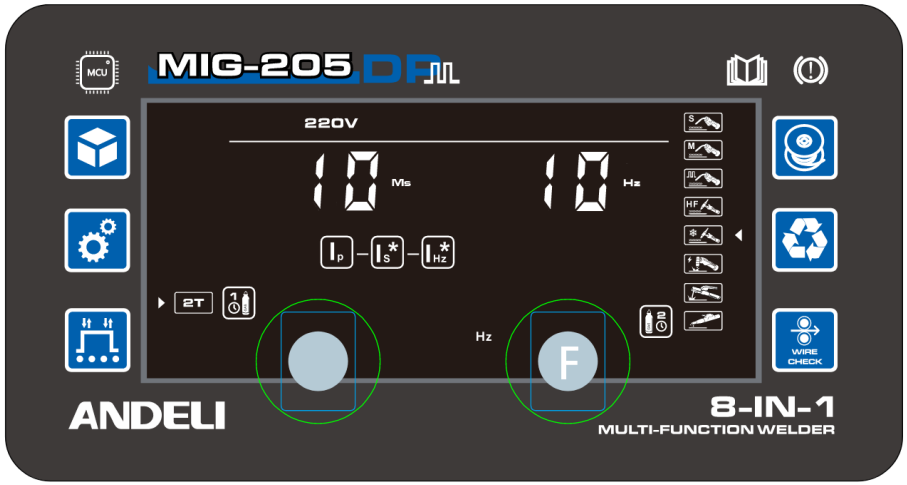
■ 2T: Press and hold the torch trigger to start/stop welding (manual control).

■ 4T: Tap once to start welding, tap again to stop (hands-free operation).

Voltage Adjustment

○ No action required – Voltage is automatically regulated in TIG mode based on current and arc length.

TIG COLD WELDING PANEL INTRODUCTION



Application

Cold welding mode is suitable for thin materials, precision welding, and applications requiring low heat input and minimal distortion, such as stainless steel, carbon steel, aluminum, and aluminum alloys.

This mode uses low-heat pulsed welding to reduce burn-through and deformation.

Activate TIG Mode

○ Press Button to switch to TIG Cold Welding Mode.

Set Welding Current

○ Rotate Knob F to adjust amperage:
○ Select TIG Cold Welding mode on the control panel.
○ Set the appropriate welding current according to material thickness.
○ Set the pre-gas and post-gas time to protect the tungsten electrode.
○ It is recommended to start with a lower current and adjust gradually.

Welding Operation

○ Hold the tungsten electrode 1–2 mm (approx. 1/32"–1/16") above the workpiece.
○ Press the torch switch to initiate the arc.
○ Use spot welding, or perform welding by adjusting the welding frequency (Hz).
○ Move the torch evenly and avoid staying in one position for too long.
○ Release the torch switch and remove the torch after the post-gas flow ends.

Voltage Adjustment

○ No action required – Voltage is automatically regulated in TIG Cold Welding mode based on current and arc length.

Set Up for Plasma Cutting

Torch Installation:

○ Connect the cutting torch to the Torch Connector on the machine.
○ Plug the 2-pin torch control switch cable into the Trigger Connector Receptacle.

Work Clamp Setup:

○ Attach the work clamp to the Positive (+) Output Receptacle.
○ Ensure clamp contact is on clean, bare metal (remove rust, paint, or coatings).
○ Critical: Incorrect polarity (e.g., negative clamp connection) will damage the machine.

Air System Configuration:

○ Install the air filter regulator between the air compressor and the machine's air inlet.
○ Adjust the regulator to 60–90 PSI (4.0–6.2 bar) (do not exceed the rated pressure).

Workpiece Preparation:

○ Securely clamp the workpiece to a stable surface.
○ Position the cutting torch away from conductive materials to prevent accidental arcing.

Power & Mode Selection:

○ Plug the machine into a grounded power outlet matching voltage requirements.
○ Turn on the machine and select CUT mode from the control panel.

System Check:

○ Trigger the torch to verify airflow and pilot arc activation.
○ Adjust airflow if uneven or sputtering.

Set Cutting Parameters:

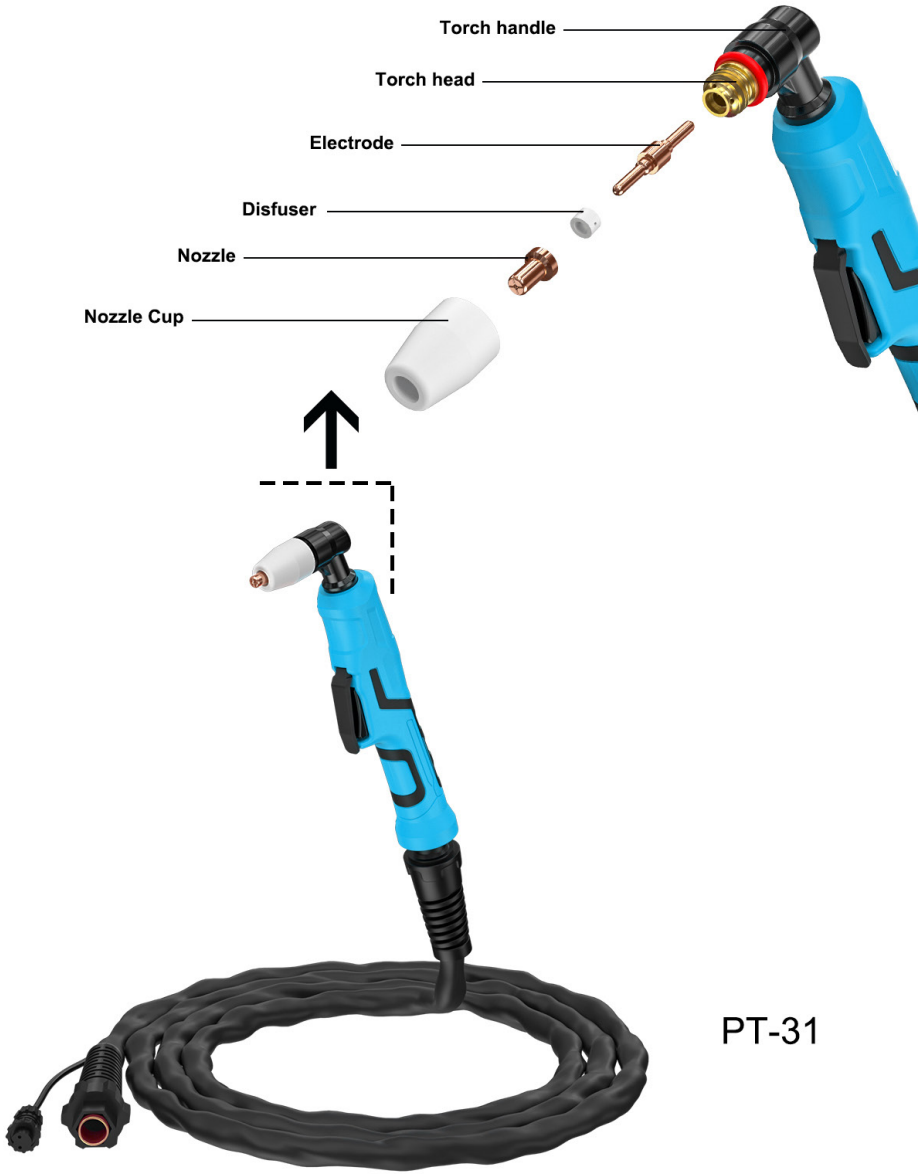
○ Press the Value Knob to select parameters (e.g., current, pre-flow time).
○ Rotate the knob to adjust values (refer to material thickness charts).

Initiate Cutting:

○ Hold the torch perpendicular to the workpiece, with the torch positioned above and in contact with the workpiece surface.
○ Trigger the torch control switch to ignite the arc using the blowback technique (automatically retracts the pilot arc).
○ Maintain a steady travel speed for clean cuts.

Cutting Torch Assembly

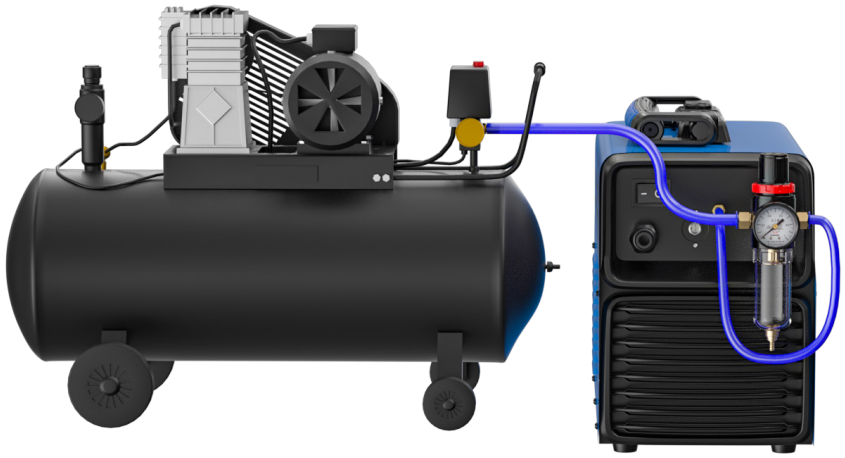
Plasma Cutting Torch Accessory



Installation for Air Pressure Compressor Filter Regulator

ANDELI MIG-205DP Plasma Cutter offers dual air supply options for versatile cutting performance.

External Air Compressor Compatibility: Delivers higher air pressure (PSI) for faster, cleaner cuts on thick materials. Improves cut quality with consistent airflow, reducing dross and slag. Sustains prolonged cutting tasks without overheating.



Note:

- Regularly drain moisture from the pressure-reducing valve's water filter cup.
- When to drain: Empty the cup immediately if the water level reaches ⅔ of its capacity.

Consequences of Neglect:

- Excess moisture degrades cut quality (increased dross, uneven edges).
- Water ingress can damage internal components (e.g., valves, regulators).

Best Practices:

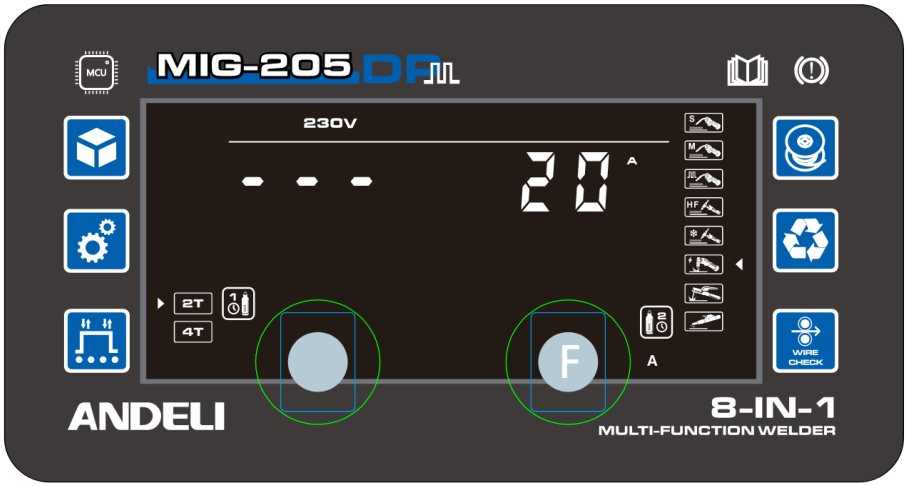
- Check the filter cup daily (or after prolonged use).
- Store the compressor in a dry environment to minimize condensation.

Cutting Features

Non-touch Pilot Arc

The pilot arc torch excels at cutting through challenging surfaces (rust, paint, or uneven textures) while minimizing slag production. Its non-contact design, powered by pilot arc technology, eliminates the need to touch the workpiece, enhancing precision and extending consumable lifespan by reducing tip wear.

CUT PANEL INTRODUCTION



Activate Plasma Cutting:

Press button to select CUT Mode.

Adjust Cutting Current:

Rotate knob F to set amperage:

230V Input: 10–50A range.

Note: Higher amps for thicker materials; lower for precision or thin metals.

Set Trigger Mode:

Press button to choose:

2T: Press and hold the torch trigger to start/stop cutting (manual control).

4T: Tap once to start cutting, tap again to stop (hands-free operation).

Cutting Setting Recommendation 1

Cutting Thickness	Distance to Torch	50A				30A			
		Quality Cutting		Productive Cutting		Quality Cutting		Productive Cutting	
		Cutting Speed	Output Voltage	Cutting Speed	Output Voltage	Cutting Speed	Output Voltage	Cutting Speed	Output Voltage
mm	mm	mm/min	V	mm/min	V	mm/min	V	mm/min	V
2 mm	1,5	5537	128	7925	125	2794	128	3962	128
3 mm		3962	128	5588	128	1422	130	2100	127
4 mm		2794	128	3962	128	1021	133	1385	130
6 mm		4122	130	2110	127	780	136	920	134
8 mm		1016	133	1385	130	540	140	700	138
10 mm		787	136	920	134	310	146	400	141
12 mm	cut from the edge	540	140	690	138	170	152	240	147
16 mm		310	146	400	141	110	157	145	154
20 mm		170	152	240	147	-	-	-	-
Recommended air flow rate/pressure:188 L/min (400 scfh) @ 5,9 bar (90 psi)									
The actual parameters can be flexibly selected according to the actual cutting workpiece thickness and technology.									

· Quality Cutting Setting: refers to the starting setting for qualified cut quality (best angle, least dross, best cut surface finish).

· Production Setting: Under this setting, at these recommended speeds, the maximum number of parts can be cut, but the quality will be not good.

Cutting Setting Recommendation 2

	Material	230V	
CUT	Stainless Steel, Carbon Steel, Copper, Aluminum, Aluminum Alloy	Quality Cutting Thickness	Max Servance Thickness
		15mm	18mm

Material Characteristics Notice

Stainless steel has lower thermal conductivity than carbon steel. When plasma cutting stainless steel of the same thickness, the cutting current remains unchanged; however, a slower cutting speed may be required to maintain stable cutting performance and good cut quality. This is a normal material characteristic and does not indicate reduced machine output or insufficient power.

Copper, aluminum, and aluminum alloys have higher thermal conductivity than carbon steel. Heat dissipates more rapidly during plasma cutting, which may require a slower cutting speed or higher cutting current to achieve stable arc performance and full penetration. This behavior is inherent to the material and does not indicate reduced machine performance.

Proper adjustment of cutting parameters, including cutting speed, air pressure, and torch height, is essential to obtain optimal cutting results when working with different materials.

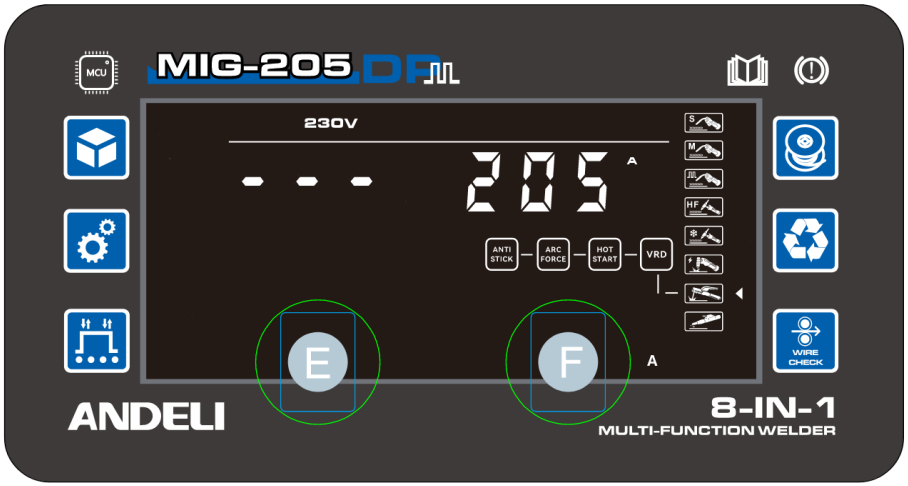
MMA Welding Mode Introduction

MMA (Manual Metal Arc Welding), also known as Stick Welding, is a widely used welding process suitable for a broad range of applications. In MMA mode, welding is performed using a coated electrode, which melts during welding to form the weld pool while releasing shielding gas to protect the molten metal from oxidation.

MMA welding is highly adaptable and can be used in outdoor environments and on surfaces with light rust, paint, or oil contamination. It is suitable for welding carbon steel, stainless steel, and low-alloy steel. Due to its simple operation and strong penetration, MMA welding is ideal for construction, maintenance, repair work, and general fabrication.

This machine supports stable arc ignition, smooth current output, and adjustable welding current, ensuring reliable performance and consistent weld quality for both beginners and professional welders.

WELD CLEANING PANEL INTRODUCTION



Activate Plasma Cutting:

Press button to select MMA Mode.

Adjust Cutting Current:

Rotate knob F to set amperage:

Note: Higher amps for thicker materials; lower for precision or thin metals.

Press button to choose:

Select parameters such as ANTI STICK, ARC FORCE, HOT START, VRD, etc.

Rotate knob E to set the parameters

Set Up for Stick Welding (SMAW)

- Remove all the connection from the Positive(+) or Negative (-) Output Receptacle (Remove the TIG torch at the same time.)
- Check the electrode packaging to determine the recommended polarity and connect the electrode stringer and work clamp to the Positive(+) or Negative (-) Output Receptacle accordingly.
- Place the electrode into the electrode holder firmly.
- Ensure the work clamp has a good contact with the workpiece on a clean, bare metal surface free of rust, paint, or coating.
- Attach the work clamp to the workpiece that needs welding.

Note: For Stick welding, DCEP means the electrode holder is connected to the positive socket while the work clamp (workpiece) is connected to the negative socket.

However, various electrodes require a different polarity for optimum results. Please follow the electrode manufacturer's recommendation on the correct polarity.

Electrode	Polarity	Usage
E7018, E6011, E6013	DCEP	This electrode is best for use with clean, bare steel and is suitable for moderate penetration.
E6010	DCEN	This electrode is usually used for building up heavy deposits of materal with less penetration and thin sheet welding.

- Turn the power source on and select the MMA function with Process Selection Button on the front panel.
- Set the amperage with the Value Adjusting Knob.
- Strike the electrode against the workpiece to create an arc and hold the electrode steady to maintain the arc.
- Hold the electrode slightly above the work, maintaining the arc while traveling at an even speed.
- Break the arc by quickly snapping the electrode away from the workpiece to finish the weld.
- Wait to let the workpiece cool and chip away the slag carefully to reveal the below welding metal.

Welding Current Guide

Choosing the correct current for a particular welding job is critical. If the welding current is too low, the user will experiencedifficulty in striking and maintaining a stable arc. The electrode tends to stick to the workpiece, penetration is poor, and the weld ends up with a rounded profile. If the current is too high, the problems include burning through the base metal, undercut, and excessive spatters. The standard welding current for a particular job should be the maximum that won't burn through the base metal, overheat the tung- sten electrode, or leave spatters sticking to the workpiece surface.

The table shows current ranges generally recommended for a general purpose type E6013 electrode.

Electrode Size ø mm/Inch	Current Range (Amps)
3/32" or 0.09" (2.4mm)	60~95
1/8" or 0.125" (3.2mm)	100~130
11/64" 0r 0.15" (4.0mm)	130~205

Built-in VRD

The voltage reduction device (VRD) is a hazard reduction device that lowers the welder's open circuit voltage (OCV) to prevent elec- tric shock from welding current. A VRD is usually equipped with a stick welding machine in wet environments or conductive confined spaces.

ANDELI MIG-205DP has a VRD feature embedded in this welder and activates when the welder is on. It reduces the voltage of the open circuit to a safer level, thus reducing the chances of electric shock in case the wrong connection is for cutting the torch when the OCV is high in Cutting.

- The VRD function will promptly activate when the electrode does not touch the workpiece.
- When the electrode touches the workpiece to start welding, the VRD will be released.
- when welding is completed and leaves the workpiece, the VRD will be on again.

Adjustable Arc Force:

Arc force is a momentarily increase of the welding current during welding when the machine senses the drop of the arc voltage caused by a short arc length (when the output voltage is lower than 13.5V). Arc force compensates for the voltage drop by increas- ing the amperage. Increased amperage ensures that the heat stays the same and that the electrode will not dip into the base metal. This function dramatically helps stabilize the arc, prevent the arc from cutting out in the welding process, and prevent the electrode from sticking to the workpiece.

Arc force should be set according to the electrode diameter, preset current and the technical requirement. If the arc force is big, the molten drop can be transferred quickly, and electrode sticking seldom occurs. However, too big arc force may lead to excessive spatter. If the arc force is small, there will be littlespatter, and the weld bead will be shaped well. However, too small arc force may lead to soft arc and electrode sticking. Therefore, the arc force should be increased when welding with thick electrode under low current.

In general welding operation, the user can set the arc force between 0-10A. For example, when the preset current is 50A, and the arc force is 10A, the actual welding current will be 60A. However, when the current increases to the maximum allowable value of 205A, the welding current won't ascend anymore.

Adjustable Hot Start

Hot start（0~10 adjustable） is a feature that pumps up the amperage for a short time when you start the arc. Higher amperage helps to start the arc easier without sticking the electrode to the base metal. A hot start helps warm the base metal to achieve deep penetration at the weld start.

Set Up for Weld Cleaning Overview

The Weld Cleaning Mode is designed to clean and restore weld beads after welding, especially for stainless steel applications.

By using a dedicated cleaning torch and conductive cleaning solution, this mode effectively removes surface oxides, discoloration, and heat marks from the weld area without grinding or damaging the base material.

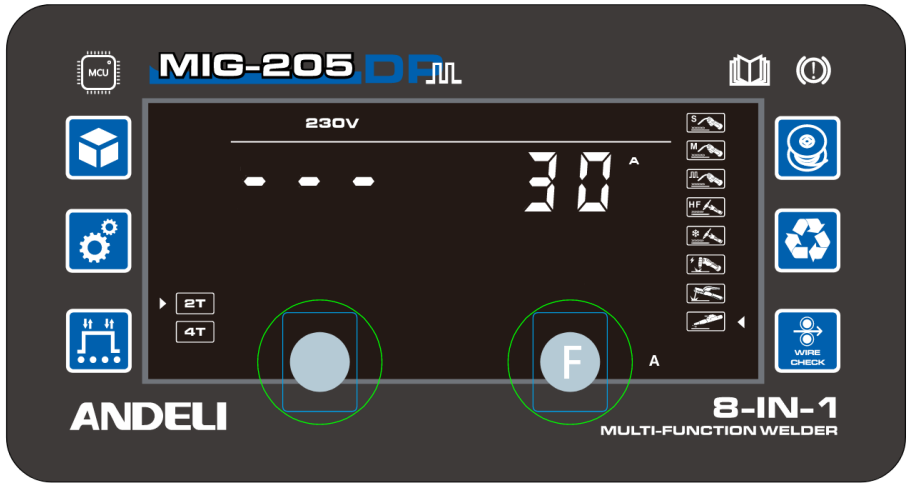
This process improves the appearance of the weld bead, enhances corrosion resistance, and helps achieve a clean and professional finish.

Weld Cleaning Mode is suitable for post-weld cleaning operations in fabrication, maintenance, and finishing work.

Statement:

This mode is suitable for cleaning weld beads after TIG welding.

WELD CLEANING PANEL INTRODUCTION



Weld Cleaning Mode – Operating Instructions

1.Press button to switch to Weld Cleaning Mode.

2.Connect the cleaning torch control cable to the two-pin aviation socket on the welder.

3.Connect the cleaning torch to the negative (–) terminal.

4.Connect the ground clamp to the positive (+) terminal.

5.Attach the brush tip to the cleaning torch and dip the brush into the cleaning solution.

6.Place the brush so that it fully covers the weld bead.

7.Rotate knob F to set amperage: 10-30A range.

8.Press and hold the trigger on the cleaning torch, and move the torch steadily and evenly along the weld bead to clean the weld surface.

Note

After cleaning is completed, wipe the weld bead thoroughly with a damp cloth to remove any remaining cleaning solution.

OPERATION

Weld Cleaning Installation Diagram

CAUTION

Working Environment

1. Welding should be carried out in a dry environment with humidity of 90% or less.
2. The working environment temperature should be between -10°C and 40°C.
3. Avoid welding in the open air unless sheltered from sunlight and rain. Keep the welder dry.
4. Avoid welding in a dusty area or environment with corrosive chemical gas.
5. Gas shielded arc welding should be operated in an environment without strong airflow.

Safety Tips

Over-current/over-voltage/over-heating protection circuit is installed in this machine. When the network voltage, output current, or in- ner temperature exceeds the set standard, the machine will stop working automatically. However, excessive operation (over- voltage) will lead to welder damage. Therefore, please note:

1) Ventilation

This is an industrial welding machine and can create a large current that requires strict cooling devices instead of natural ventilation. Therefore the built-in two fans are very important to ensure effective cooling and stable working performance. The operator should make sure that the louvers be uncovered and unblocked. The minimum distance between the machine and nearby objects should be 30cm. Good ventilation is of critical importance to the normal performance and lifespan of the machine.

2) Over-load is forbidden

The welder is operated according to the allowable duty circle (refer to the corresponding duty cycle). Make sure that the welding cur- rent should not exceed the max load current. An overload could obviously shorten the machine's lifespan, or even damage the ma- chine.

3) Over-voltage is forbidden

Please refer to "Technical Parameters" for the power supply voltage range. This machine is of automatic voltage compensation to ensure the welding current is within the given range. If the input voltage exceeds the stipulated value, it would possibly damage the components of the machine. The operator should take according measures in this case.

4) Reliable ground connection. There is an ground screw (with ground remark) in the rear part of each machine. Connect it with an earth cable to avoid the static and electric shock.

5) A sudden halt may occur with the front panel's red indicator lighting up while the machine is of over-load status. Under this circumstance, it is unnecessary to restart the machine for it's resulted from over-heating and triggering the temperature control switch. Keep the built-in fans working to lower the machine's temperature. Welding can be resumed when the temperature falls into the standard range and the red indicator is off.

Basic Knowledge of Stick

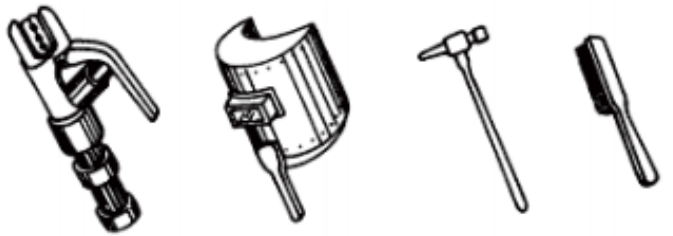
Manual metal arc welding (MMA/Stick) is arc welding by manually operating electrodes. Stick requires simple equipment and is a convenient, flexible, and adaptive welding processing type. Stick is applied to various metal materials with thicknesses of more than 2mm. It's suitable for various material structures, particularly for workpieces with complex structures and shapes, short weld joints or bending shapes, as well as weld joints in various spatial locations.

Welding Process of Stick

Connect the two output terminals of the welder to the workpiece and electrode holder respectively, and then clamp the electrode by the electrode holder. When welding, the arc is ignited between the electrode and the workpiece, and the end of the electrode and part of the workpiece is fused to form a welding crater under the high-temperature arc. The weld crater is quickly cooled and con- densed to form a weld joint that can firmly integrally connect two separate pieces of the workpiece. The coating of the electrode is fused to produce slag to cover the weld crater. The cooled slag can form a slag crust to protect the weld joint. The slag crust is re- moved at last, and the joint welding is finished.

Tools for Stick

Common tools for Stick include electrode holder, welding mask, slag hammer, wire brush (see FIG 10), welding cable, and labor pro- tection supplies.



a) Electrode Holder b) Welding Mask c) Slag Hammer d) Wire Brush

FIG 10 Tools for Stick

a) Electrode holder: a tool for clamping electrode and conducting current, mainly including 300A type and 500A type.

b) Welding mask: a shielding tool for protecting eyes and face from injury due to arc and spatter, including hand holding type and helmet type. Colored chemical glass is installed on the viewing window of the mask to filter ultraviolet rays and infrared rays. Arc burning condition and weld crater condition can be observed from the viewing window during welding. Thus, welding can be carried out by operators conveniently.

c) Slag hammer (peen hammer): for the use of removing slag crust on the surface of the weld joint.

d) Wire brush: for the use of removing dirt and rust at the joints of the workpiece before welding, as well as cleaning the surface of the weld joint and the spatter after welding.

e) Welding cable: generally cables formed from many fine copper wires. Both YHH type arc welding rubber sleeve cable and THHR type arc welding rubber sleeve extra-flexible cable can be used. The electrode holder and welding machine are connected via a cable,and this cable is named as welding cable (live wire). The welding machine and workpiece are connected via another ca- ble (earth wire). The electrode holder is covered with insulating material performing insulation and heat insulating.

Basic Operation of Stick

1) Welding joint cleaning

Rust and greasy dirt at the joint should be removed completely before welding in order to implement arc igniting and arc stabilizing conveniently as well as ensure the quality of the weld joint. A wire brush can be used for conditions with low requirements for dust removal; a grinding wheel can be used for conditions with high requirements for dust removal.

2) Posture in operating

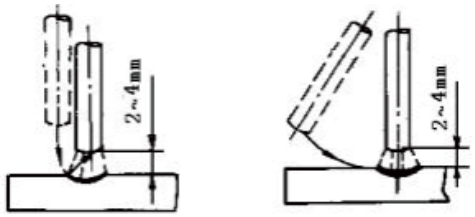
Take flat welding of butt joint and T-shaped joint from left to right as an example. The operator shouldstand on the right side of the working direction of the weld joint with a maskin the lefthand and an electrode holder in the right hand. The left elbow of the opera- tor should be put on his left knee to prevent his upper body from following downwards, and his arm should be separated from the costal part so as to stretch out freely.

a) Flat Welding b) Vertical Welding

Fig 11 Posture in Welding

3) Arc Igniting

Arc igniting is the process of producing a stable arc between electrode and workpiece in order to heat them to implement welding. Common arc ignition mode includes scraping mode and striking mode. During welding, touch the surface of the workpiece with the end of the electrode by scraping or light striking to form a short circuit, and then quickly lift the electrode 2~4mm away to ignite the arc. If arc ignition fails, it is probably because there is coating at the end of the electrode, which affects the electric conduction. In this case, the operator can strongly knock the electrode to remove the insulation material until the metal surface of the core wire can be seen.



a) Striking Mode b) Scraping Mode

FIG12 Arc Extinguishing Modes

4) Tack Weld

For fixing the relative positions of the two pieces of weldment and welding conveniently, 30~40mm short weld joints are welded ev- ery certain distance in order to fix the relative positions of the workpiece during welding assembly. This process is named tack weld.

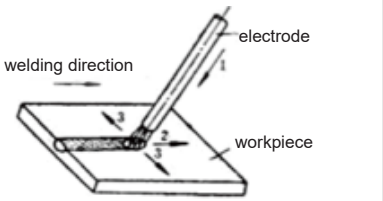
5) Electrode Manipulation

The electrode manipulation actually is a resultant movement in which the electrode simultaneously moves in three basic directions: the electrode gradually moves along the welding direction; the electrode gradually moves toward the weld crater, and the electrode transversely swings. (See Fig 13) Electrode should be correctly manipulated in three movement directions after the arc is ignited. In butt welding and flat welding, the most important is to control the following three aspects: welding angle, arc length, and welding speed.

(1) Welding angle: the electrode should be inclined 70~80º forwards. (See Fig 14)

(2) Arc length: the proper arc length is equal to the diameter of the electrode in general.

(3) Welding speed: proper welding speed should make the crater width of the weld bead about twice the diameter of the electrode, and the surface of the weld bead should be flat with fine ripples. If the welding speed is too high, and the weld bead is narrow and high, the ripples are rough, and the fusion is not well implemented. If the welding speed is too low, the crater width is excessive, and the workpiece is easy to be burned through. Besides, the current should be proper, the electrode should be aligned, the arc should below, and the welding speed should not be too high and should be kept uniform during the whole welding process.



1. downwards feed
2. move toward welding direction
3. transversely swing

Fig 13 Three basic movement directions of electrode

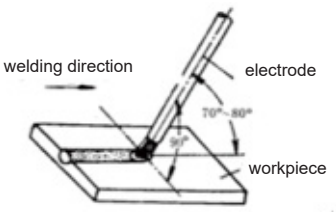
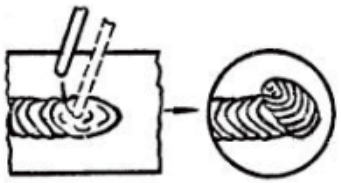


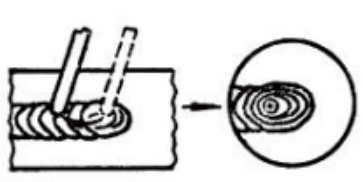
Fig 14 Angles of electrode in flat welding

6) Arc Extinguishing

Arc extinguishing is unavoidable during welding. Poor arc extinguishing may bring shallow weld craters and poor density and strength of weld metal by which cracks, air holes, slag inclusion, and shortage the like are easy to be produced. Gradually pull the end of the electrode to the groove and raise the arc when extinguishing the arc, in order to narrow the weld crater and reduce the metal and heat. Thus, defects such as cracks and air holes can be avoided. Pile up the weld metal of the crater to make the weld cratersufficiently transferred. Then, remove the excessive part after welding. The operation modes of arc extinguishing are shown in Fig 15.



a) Arc Extinguishing at the Outside of Weld Bead



b) Arc Extinguishing on the Weld Bead

Fig 15 Arc Extinguishing Modes

7) Weldment Cleaning

Clean welding slag and spatter with wire brush and tools the like after welding.

Argon Arc Welding

General Description of Argon Arc Welding

Argon arc welding is a kind of gas shielded arc welding using argon as shield gas, and the process of argon arc welding is shown in Fig 16. Tightly close protective layer is formed in the arc zone by the argon gas flow output from the torch nozzle. Thus, the metal molten pool can be protected and separated from the air. Meanwhile, the filler wire and base metal are molten by the heat generated from the arc. After the liquid molten pool cools down, a weld bead is formed.

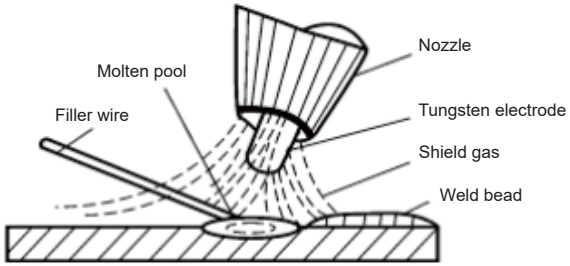


Fig 16 Sketch Map of Argon Arc Welding

Since argon is a kind of inert gas and it does not react with metals, the alloying elements in the weld metal will not be burned out and the metal molten pool can be fully protected from oxidation. Besides, because argon is insoluble in liquid metal at high tempera- tures, air holes can be avoided in the weld bead. Therefore, the protective effect of argon is effective and reliable, and better weld- ing quality can be obtained.

Characteristics of Argon Arc Welding

Compared with other arc welding methods, argon arc welding has the following features.

1. Argon has excellent protective performance, so corresponding flux is not needed when welding. It is basically a simple process of metal melting and crystallization, and pure weld beads of high quality can be obtained.

2. Due to the compression and cooling effect of argon flow, the heat of the arc is concentratedat a high temperature. Therefore, the heat-affected zone is very narrow, and there is little welding deformation stress and crack tendency. Thus, argon arc welding is es- pecially suitable forthin plate welding.

3. Argon arc welding is a kind of open flame welding and is easy to operate and observe, so the mechanization and automation of the welding process can be achieved easily. Besides, welding at various spatial locations can be carried out under certain condi- tions.

4. Argon arc welding can be applied to welding a wide range of welding materials. Almost all metal materials can be welded by ar- gon arc welding, and it is especially suitable for welding chemically active metals and alloys. Generally, it is used in the welding of aluminum, titanium, copper, low alloy steel, stainless steel, refractory steel, etc.

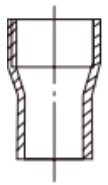
With the increase in product structure of non-ferrous metals, high alloy steel, and rare metals, common gas welding methods and arc welding methods are difficult to obtain the required welding quality. However, argon arc welding is being more and more widely used due to its remarkable characteristics above.

Gas Tungsten Arc Welding (GTAW)

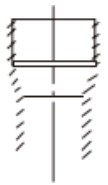
a) Welding Torch

The function of the welding torch for GTAW is to clamp the electrode, conduct current, and carry argon flow. For manual welding, the ON/OFF button is mounted on the handle of the welding torch. Generally, welding torches can be divided into three categories, large-type, medium-type, and small-type. For small-type welding torches, the maximum welding current is 100A. And the welding current can reach up to 400~600A for a large-type welding torch with water cooling. The torch body is pressed from nylon, so it is light, small-sized, insulated, and heat-resistant.

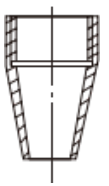
The torch nozzle plays an important part in the protective performance of argon. The common nozzle shapes are shown in Fig 18. Cylindrical nozzle with a cone-shaped or spherical end has the best protective effect, since the argon flow speed is uniform, and lam- inar flow is easy to hold. The protective effect of the coniform nozzle is worse because the argon flow speeds up. However, this kind of nozzle is easy to operate and the visibility of the molten pool is good, so it is also commonly used in welding.



(1) Cylindrical nozzle with cone-shaped end



(2) Cylindrical nozzle with spherical end



(3) Coniform nozzle

GTAW Process

1. Preweld cleaning

Clean the electrode and the zone near the weld joint of the workpiece, and remove impurities such as oil pollution and the oxidized film on the surface of the metal before carrying out argon arc welding to ensure good quality of weld bead. The methods for preweld cleaning are: mechanical cleaning, chemical cleaning and chemical & mechanical cleaning.

A. Mechanical cleaning: This method is simple with good effect, and it is suitable for large-sized workpiece. Generally, remove the oxidized film by grinding with a small-diameter stainless steel wire brush or by shoveling with a scraper to make the welding position appearing with metal luster, and then clean the weld joint zone with organic solvent for eliminating oil pollution.

B. Chemical cleaning: Chemical cleaning is commonly used for cleaning the filling electrode and small-sized workpiece. Compared with mechanical cleaning, this method has such characteristics as high cleaning efficiency, uniform and stable quality and long dura- tion of clean state. The chemical solutions and processes used in chemical cleaning should be chosen according to the welding ma- terials and welding requirements.

C. Chemical & mechanical cleaning: Use chemical cleaning method when cleaning firstly, and clean the welding position with me- chanical cleaning method before welding. This combined cleaning method is suitable for the high quality welding.

2. Protective effect of gas

Argon is ideal protective gas. The boiling point of argon is -186°C, which is between that of helium and oxygen. Argon is a byprod- uct when the oxygen installation gets oxygen by fractionating the liquid air. Bottled argon is used for welding in our country. The fill- ing pressure is 15MPa under room temperature, and the cylinder is painted gray and marked with "Ar" . The chemical composition re- quirements of pure argon are: Ar≥99.99%; He≤0.01%; O2≤0.0015%; H2≤0.0005%; C≤0.001%; H2O≤30mg/m3.

Welding arc can be better protected and the consumption of shield gas can be reduced in flat position welding. As inert gas, argon does not react with metal chemically even under high temperature. Thus, the alloying elements will not be oxidized or burned out, and problems caused accordingly will be avoided. Meanwhile, argon is insoluble in liquid metal, so air holes can be avoided. Argon is a kind of monatomic gas, existing in atomic state, without molecular decomposition and atomic endotherm under high tempera- ture. Besides, the specific heat capacity and heat conductivity is low, so the arc heat is not easy to lose. Accordingly, the welding arc can burn stably and heat can be concentrated, which is advantageous to welding.

The disadvantage of argon is that its ionization potential is high. When the arc space is fully filled with argon, arc is hard to ignite. However, arc will become stable once it is successfully ignited.

The gas protective effect of argon can be affected by various process factors during welding. Therefore, special attention should be paid to the effective protection of argon in GTAW to avoid interference and damage. Otherwise, satisfactory welding quality is hard to obtain.

Welding process factors such as gas flow, shape and diameter of nozzle, distance between nozzle and workpiece, welding speed and weld joint form may affect the gas protective effect, so all these should be fully considered and chosen correctly.

The gas protective effect can be judged by welding spot testing method through measuring the size of the effective gas protective area. For example, keep all welding process factors fixed when carrying out spot welding on aluminum plate with AC manual TIG, maintain the torch in the fixed position after arc is ignited, and cutoff the power after the 5~10s, there will be a molten welding spot left on the aluminum plate. Due to the cathode cleaning action against the area around the welding spot, the oxidized film on the sur- face of the aluminum plate is eliminated, and a gray area with metallic luster appears. As shown in 26, this area is called effective ar- gon protective area. The greater the diameter of the effective gas protective area, the better is the gas protective effect.

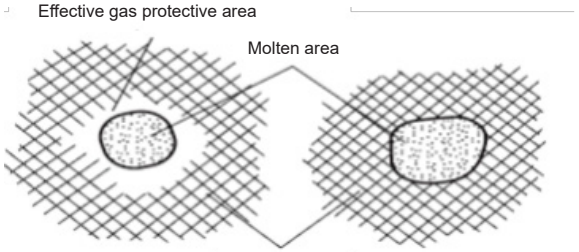


Fig 17 Effective protective area of argon

In addition, the gas protective effect can be judged by directly observing the color of the weld bead surface. Take stainless steel welding for example. If the weld bead surface appears silvery white or golden, it indicates that the gas protective effect is good. However, if the weld bead surface appears gray or black, it indicates that the gas protective effect is poor.

Welding Process Parameters

The gas protective effect, welding stability, and weld bead quality of GTAW have a direct relationship with the welding process pa- rameters. Therefore, select appropriate welding process parameters to ensure high-quality weld joint.

The welding process parameters for GTAW include type and polarity of current, the diameter of tungsten electrode, welding current, argon gas flow, welding speed, and process factors, etc.

A. The type and polarity of current for GTAW should be chosen according to the workpiece material and also the operation mode.

B. Select tungsten electrodes with proper diameter mainly according to the thickness of the workpiece. Besides, when the thickness of the workpiece is the same, tungsten electrodes with different diameters should be chosen due to the different current types and polarities and different allowable current ranges for the tungsten electrode. Improper tungsten diameter will lead to unstable arc, seri- ous burn, and tungsten in the weld bead.

C. Select proper welding current after the tungsten diameter is determined. Overly high or overly low welding current will cause poor weld bead or welding defects. For the allowable current ranges for thorium-tungsten/cerium tungsten electrodes with different diam- eters, please refer to the table below (Table 1).

Table 1 Allowable Current Ranges for Tungsten Electrodes with Different Diameters

Tungsten Dia. (mm)	DCEN (A)	DCEP (A)	AC (A)
1.0	15~80	–	20~60
1.6	70~150	10~20	60~120
2.4	150~250	15~30	100~180
3.2	250~400	25~40	160~250
4.0	400~500	40~55	200~320

D. The argon gas flow is selected mainly according to the tungsten diameter and nozzle diameter. For a nozzle with a certain aper- ture, the argon gas flow should be appropriate. If the gas flow is too high, the gas flow speed will increase. Thus, it is difficult to main- tain stable laminar flow, and the welding zone can not be well protected. Meanwhile, more arc heat will betaken away, which will af- fect the arc stability. If the gas flow is too low, the gas protective effect will be affected due to the interference of the environmental airflow. Generally, the argon gas flow should be within 3~20L/min.

E. Under the condition of fixed tungsten diameter, welding current, and argon gas flow, overly high welding speed will make the pro- tective gas flow deviate from the tungsten electrode and molten pool, and the gas protective effect will be affected accordingly. Be- sides, the welding speed affects the weld bead shape significantly. Therefore, it is very important to select the appropriate welding speed.

F. Process factors mainly refer to the shape and diameter of the nozzle, the distance between the nozzle and workpiece, stick-out and the diameter of filling wire, etc. Although the change in these factors is not big, it has more or less influence on the welding pro- cess and gas protective effect. Therefore, all factors should be selected according to specific welding requirements.

Generally, the nozzle diameter should be within 5~20mm, the distance between the nozzle and workpiece should not be greater than 15mm, the stick-out should be 3~4mm, and the filling wire diameter should be selected according to the thickness of the workpiece.

General Requirements for Argon Arc Welding

1. The control of gas: Pre-flow and post-flow are required in argon arc welding. Argon is a kind of inert gas that can be broken down easily. Fill the space between the workpiece and the tungsten electrode with argon firstly, and then the arc can be easier to ignite. Keep the gas flowing after welding ends, and the workpiece will not cool down too quickly. Thus, the oxidization of the workpiece can be avoided, and a good welding effect can be ensured.

2. The manual switch control of current: When the manual switch is switched on, the current supply should be delayed for the pre- flow time. After the manual switch is switched off and welding ends, the current supply should be cutoff first and the gas flow main- tainsaccording to the post-flow time.

3. The generation and control of high voltage: The argon arc welding machine adopts high voltage arc ignition mode. It is required that there should be high voltage when igniting the arc and there should be no high voltage after the arc is successfully ignited.

4. Protection from interference: The high voltage for arc ignition in argon arc welding is accompanied by high frequency, which pro- duces serious interference to the machine circuit. Thus, good anti-interference ability is required for the circuit.

Basic Knowledge of CUT

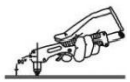
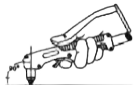
General Description of CUT (Plasma Cutting)

1. Economic and practical, since it can cut metals by adopting compressed air as the plasma gas source.
2. The cutting speed has increased by 1.8 times when compared with oxyacetylene cutting.
3. It can cut thick steel plates conveniently and quickly.
4. And the post-flow function is available.
5. Metal workpiece such as stainless steel, copper, cast iron, and aluminum can all be cut.
6. With simple operation and high cutting speed, a smooth cutting surface can be obtained, and polishing is unnecessary.
7. It is easy to ignite an arc by adopting HF arc ignition or non-HF pilot arc ignition, especially non-HF pilot arc, which is safer and re- liable.

Operation Method of CUT (Plasma Cutting)

1. Turn on the power switch of the machine, the power indicator illuminates and the preset CUT current will show on the screen.
2. Check the indicators normal and select proper working mode 2T or 4T.
3. Set cutting current according to the thickness of the workpiece.
4. Bring the copper nozzle of the cutting torch into contact with the workpiece (For models with pilot arc function, keep a distance of about 2mm between the copper nozzle of the torch and the workpiece.), and then push the torch trigger. After the arc is ignited and started,raise the cutting torch to the position about 1mm above the workpiece, and start cutting.

Notes for Cutting Operation

	It is recommended not to ignite the arc in the air if not necessary,for it will shorten the lifespan of the electrode and nozzle of the torch.
	It is recommended to initiate the cutting from the edge of workpiece,unless penetration is needed.
	Ensure spatters fly from the bottom of workpiece while cutting.If spatters fly from the top of workpiece,it indicates that the workpiece can not be fully cut because the cutting torch is moved too fast or the cutting current is too low.
	Keep the tips touch the worksheet when cutting , no set up to high , otherwiese fail to detect closed circuits , which will cause arc stop
	For cutting round workpiece or to meet precise cutting requirement,molding board or other assistant tools are needed.
	It is recommended to pull the cutting torch while cutting.
	Keep the nozzle of cutting torch upright over the workpiece,and check if the arc s moving with the cutting line.If the space is not enough,don't bend the cable too much, step on or press upon the cable to avoid suffocating of gas flow.The cutting torch may be burned because the gas flow is too small.Keep the cutting cable away from edge tools.
	Clean up the spatters on the nozzle timely,for it will affect the cooling effect of the nozzle.Clean up the dust and spatters on the torch head after using everyday to ensure good cooling effect

The workpiece is not cut fully. This may be caused by:

The cutting current is too low.

The cutting speed is too high.

The electrode and nozzle of the torch are burned. The workpiece is too thick.

Molten slag drops from the bottom of workpiece. This may be caused by:

The cutting speed is too low.

The electrode and nozzle of the torch are burned.

\The cutting current is too high.

Replacement of Electrode and Nozzle

When the phenomena below occur, the electrode and nozzle should be replaced. Otherwise, there will be strong arc in the nozzle, which will breakdown the electrode and the nozzle, or even burn the torch. Nozzles of different models are different, so ensure the nozzle is of the same model when replacing it.

1) Electrode wear ＞ 1.5mm
2) Distortion of the nozzle
3) Cutting speed declining, arc with green flame
4) Difficult in arc ignition
5) Irregular cut

MAINTENANCE

GENERAL MAINTENANCE

This welder has been engineered to need minimal service providing that a few very simple steps are taken to properly maintain it.

1. Keep the cabinet cover closed at all times unless the wire needs to be changed or the drive pressure needs adjusting.

2. Keep all consumables (contact tips, nozzles, and liner) clean and replace when necessary. See "Consumable Maintenance" (below) and "Troubleshooting" (page 25) for detailed information.

3. Replace INPUT POWER CABLE, ground cable, work clamp, or gun assembly when damaged or worn.

4. Avoid directing grinding particles towards the welder. These conductive particles can build up inside the machine and cause severe damage.

5. Periodically clean dust, dirt, grease, etc. from your welder. Every six months or as necessary, remove the side panels from the welder and use compressed air to blowout any dust and dirt that may have accumulated inside the welder.

6. If available, use compressed air to periodically clean the liner, especially when changing wirespools WARNING: DISCONNECT FROM POWER SOURCE WHEN CARRYING OUT THIS OPERATION.

7. The wire feed drive roller will eventually wear during normal use. With the correct pressure, the idler roller must feed the wire without slipping. If the grooves in the wire feed drive roller are worn deep enough that the idler roller and the wire feed drive roller make contact when the wire is in place between them, the wire feed drive roller must be replaced.

8. Check all cables periodically. They must be in good condition and not cracked.

WARNING: ELECTRIC SHOCK CAN KILL! Be aware that the ON/OFF SWITCH, when OFF, does not remove power from all internal circuitry in the welder. To reduce the risk of electric shock, always unplug the welder from its AC power source and wait several minutes for electrical energy to discharge before removing side panels.

CONSUMABLE MAINTENANCE

IT IS VERY IMPORTANT TO MAINTAIN THE CONSUMABLES TO AVOID THE NEED FOR PREMATURE REPLACEMENT OF THE GUN ASSEMBLY.

MAINTAINING THE CONTACT TIP:

The purpose of the CONTACT TIP is to transfer welding current to the welding wire while allowing the wire to pass through it smoothly.

Always use a contact tip stamped with the same diameter as the wire it will be used with.

1. If the wire burns back into the tip, remove the tip from the gun and clean the hole running through it with an oxygen-acetylene torch tip cleaner or tip drill. If the burned-back wire cannot be removed, the tip will have to be replaced.

2. With extended use over time, this hole will become worn. Increased wear on the hole causes increased resistance in the transfer of welding current from the contact tip to the wire. This will result in less stable arc characteristics and difficult arc starting.

CAUTION: KEEP THE NOZZLE CLEAN!

During the welding process, spatter and slag will build up inside the nozzle and must be cleaned out periodically. Failure to clean and/or replace the nozzle in a timely fashion will cause damage to the front end of the gun assembly, which is not replaceable. The results of the inaction may require the replacement of the entire gun assembly.

Failure to keep the nozzle adequately cleaned can result in the following problems:

A shorted nozzle results when spatter buildup bridges across the insulation in the nozzle allowing welding current to flow through it as well as the contact tip. When shorted, a nozzle will steal welding current from the wire whenever it contacts the grounded workpiece. This causes erratic welds and reduced penetration. In addition, a shorted nozzle overheats the end of the gun which can damage the front-end of the gun.

TESTING FOR A SHORTED NOZZLE

Arcing between the nozzle and the workpiece always means the nozzle is shorted, but this can be hard to detect through the lens of a welding helmet. The following testing method is another way to tell if a nozzle is shorted.

With the welder unplugged from the AC power source, touch the probes of an ohmmeter or continuity tester to the end of the contact tip and the outside of the nozzle. If there is any continuity at all, the nozzle is shorted. Clean or replace as needed.

TROUBLESHOOTING

HOW TO USE TROUBLESHOOTING GUIDE

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).

Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.

The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION

This column provides a course of action for the possible cause, If you do not understand or are unable to perform the Recommended Course of Action safely, contact ANDELI support@andeligroup.com

OBSERVE ALL SAFETY GUIDELINES DETAILED THROUGHOUT THIS MANUAL

Type	Alarm	Error Code	Reason	Solutions
Over-Flow	Display error code	E-1	Load current is too big or main power device is under over-current protection.	Pleas restart welder. If the warning still remains , please contact professional maintenance personnel.
Over-heat	Display error code	E-2	Over-working of main circuit	Do not power off; restart welding when the overheat indicator stop lighting up.
Wire Feeder Fault	Display error code	-E3	The wire delivery machine is abnormal	The wire feeder has malfunctioned. Please check the wire feeder circuit.
MIG adapter connection error protection	Display error code	-E8		CUT And TIG Status MIG adapter must not be connected to the fast socket

TIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor starting.	Poor work clamp connection.	Check and secure work connection.
	Start current is too low.	Increase Start current.
Black area along weld bead.	Oily or organic contamination on work	Clean work piece.
	Tungsten electrode may be contaminated.	Grind to clean electrode.
	Leaks in gas line or torch connection.	Check connection.
	Gas tank is near empty.	Replace the gas tank.
Unstable Arc.	Contaminated base metal.	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
	Tungsten is contaminated.	Remove 10mm of contaminated tungsten and re-grind the tungsten.
	Arc length too long.	Lower torch so that the tungsten is off of the work piece 5/64"-13/64"(2-5mm).
Arc wanders.	Tungsten incorrect or in poor condition.	Check that correct type of tungsten is being used. Remove tungsten 3/4"(20mm) from the weld end and re-sharpen the tungsten.
	Insufficient gas shielding.	Check and set the gas flow between 20-30cfh flow rate.
	Contaminated gas or leaks in gas line, torch, or connections.	Check gas line & connections.
	Poorly prepared tungsten.	Recommend tungsten grind angles range from 15 to 60 de- grees based on the type of metal, joint design and penetra- tion you desire. Standard is 30 degrees.
	Contaminated base metal.	Remove contaminating materials like paint, grease, oil, and dirt, including mill scale from base metal.
	Contaminated/Incorrect filler.	Check the filler wire and remove all grease, oil, or moisture from filler metal.

TROUBLESHOOTING

TIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
HF TIG doesn't initi- ate an arc:	No gas, incorrect gas flow.	Check the gas is connected and cylinder valve open, check hoses, gas valve and torch are not restricted. Set the gas flow between 20-30 cfh flow rate.
	Poor work clamp connection.	Check & secure work clamp.
	Contaninated Tungsten.	Grind to ctean Tungsten.
	Loose connection.	Check all connectors and tighten.
	Earth clamp not connected to work.	Connect the work clamp directly to the work piece wher- ever possible.
Tungsten burning away quickly.	Incorrect Gas/Inadequate gas flow.	Check the gas cylinder contains pure Argon gas and is connected and the torch gas valve is open. Set the gas flow between 20-30cfh flow rate.
	Back cap not fitted correctly.	Make sure the torch back cap is fitted so that the o-ring is inside the torch body.
	Incorrect tungsten being used.	Check and change the tungsten type if necessary.
Contaminated tung- sten.	Touching tungsten into the weld pool.	Keep tungsten from contacting weld puddle. Raise the torch so that the tungsten is off of the work piece 3-6mm.
	Touching the filler wire to the tungsten.	Keep the filler wire from touching the tungsten during welding, feed the filler wire into the leading edge of the weld pool in front of the tungsten.
	Tungsten melting into the weld pool.	Check that correct type of tungsten is being used. Too much current for the tungsten size so reduce the amps or change to a larger tungsten.

CUTTING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
The arc does not transfer to the workpiece.	Insufficient work clamp contact with the workpiece.	Clean the area where the work clamp attaches to the workpiece to ensure a good metal to metal connection.
		Inspect the work clamp and its lead for damage, repair or replace as necessary.
	Improper cutting technique.	1. keep your hand steadty ehrn useiing c cut torch , touching the tips on the worksheet 2. Place the torch close and start cut from the edge of the metal with a roll 45-to-90 degree roll in case the sparks blow up into the torch.
	Plasma torch may not be in contact with the workpiece.	Be sure to physically drag the cutting nozzle on the workpiece as you cut.
Poor cut quality.	Improper use of Plasma torch.	Review operating instructions.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new ANDELI consumable parts.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be con- taminating the air supply. Install a moisture filter in the air supply line prior to machine.
Insufficient cut pene- tration.	Cutting speed too fast.	Decrease your torch travel speed.
	Plasma torch is too tilted.	Ensure that Plasma torch head is perpendicular to the workpiece.
	Workpiece is too thick.	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Cutting current too low.	Turn current setting up.
		Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new ANDELI consumable parts.
	Non-genuine manufacturer's parts.	Use only genuine ANDELI consumables for optimum per- formance.
	Insufficient air flow or pressure.	Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.

CUTTING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Excessive dross.	Cutting speed too slow (bottom dross).	Increase your torch travel speed.
	Cutting speed too fast (top dross).	Decrease your torch travel speed.
	Cutting current too low.	Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new ANDELI consumable parts.
	Non-genuine manufacturer's parts.	Use only genuine ANDELI consumables for optimum per- formance.
Excessive wear of the cutting nozzle or electrode.	Air pressure too low.	Inspect air compressor, airlines, and filters for proper oper- ation.
		Inspect consumables for obstructions and proper installa- tion.
	Exceeding plasma cutting machine capa- bility (material too thick).	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be con- taminating the air supply. Install a moisture filter in the air supply line prior to machine.
	Improperly assembled or loose Plasma torch consumables	Check Plasma torch consumables for proper installation.
	Damaged Plasma torch consumable.	Check plasma torch consumables for damage and replace if damaged.
	Non-genuine manufacturer's parts.	Use only genuine ANDELI consumables for optimum per- formance.
Tilted cut edge an- gle (not perpendic- ular).	Plasma torch position not correct.	Ensure that plasma torch head is perpendicular to the workpiece.
	Workpiece thickness is near the capacity of the machine.	Cut thinner material. 12mm thick material cuts will not have a clean cut edge.
	Asymmetric wear of cutting nozzle hole or wrong assemblage of the plasma torch parts.	Check plasma torch consumables for wear and proper in- stallation.
		Examine the consumables for wear and replace worn parts with new ANDELI consumable parts.

TROUBLESHOOTING

STICK WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor starting.	Poor work clamp connection.	Check and secure work connection
Stick elect rode " blasts off " when arc is struck.	Current may be set too high for electrode size.	Adjust current.
Electrode "stick" in weld puddle.	Current may be set too low for electrode size.	Adjust current.
Porosity − small cav- ities or holes result- ing from gas pock- ets in weld metal.	Arc length too long.	Reduce arc length.
	Damp electrode.	Use dry electrode.
	Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.
Excessive Spatter − scattering of molten metal particles that cool to solid form near weld bead.	Amperage too high for electrode.	Decrease amperage or select larger electrode.
	Arc length too long or voltage too high.	Reduce arc length or voltage.
Incomplete Fusion − failure of weld metal to fuse completely with base metal or a preceeding weld bead.	Insufficientheat input.	Increase amperage. Select larger electrode and increase amperage.
	Improper welding technique.	Place stringer bead in proper location at joint during welding.
		changed the word "work" to "electrode" to help better exapling angle when welding various positions.
		Momentarily hold arc on groove side walls when using weaving technique.
		Keep arc on leading edge of weld puddle.
	Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.
Lack Of Penetration − shallow fusion be- tween weld metal and base metal.	Improper joint preparation.	Material too thick. Joint preparation and design must pro- vide access to bottom of groove.
	Improper weld technique.	Keep arc on leading edge of weld puddle.
	Insufficientheat input.	Increase amperage. Select larger electrode and increase amperage.
		Reduce travel speed.
Burn Through −weld metal melting completely through base metal resulting in holes where no metal remains.	Excessive heat input.	Select lower amperage. Use smaller electrode.
		Increase or maintain steady travel speed.

WIRING DIAGRAM