MIG-145

IGBT INVERTER WELDER
(MIG, FLUX CORE MIG, Aluminum Pulse, LIFT TIG, STICK)

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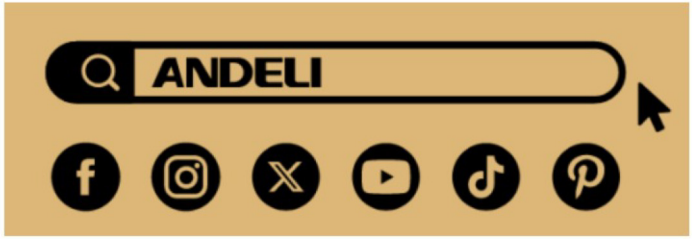

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1. SAFETY

THANK YOU FOR CHOOSING THIS PRODUCT BY ANDELI.

PLEASE EXAMINE THE PACKING BOX AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When equipment is transported, ownership of the equipment passes to the purchaser upon receipt by the carrier. Therefore, claims for items damaged during transportation must be made by the purchaser against the carrier upon receipt of the goods.

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 neces- sary to stay a reasonable dis- tance from the arc.
READ and follow the Safety Data Sheet (SDS) and the warning label on all containers of welding materials.
USE ADEQUATE VENTILATION or exhaust at the arc, or both, to keep the fumes and gases away from your breathing zone and surrounding area.
IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See be- low).
USE NATURAL DRAFTS or fans to keep the fumes away from your face.
If you experience unusual symptoms, see your supervisor. Perhaps the welding environment and ventilation system should be checked.

WEAR PROPER EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with properly fitted welding helmet and with properly rated filter plate (See ANSI Z49.1).
PROTECT your body from welding spatter and arc splatter with protective clothing including woolen clothing, flame-resistant aprons and gloves, leather leggings, and high boots.
PROTECT others from splashes, splatters, and glare with protective screens or barriers.
IN SOME AREAS, noise protection measures may be appropriate.
BE SURE protective equipment is in good condition. In addition, wear safety glasses in the work area **AT ALL TIMES.**

SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials that have been in contact with hazardous substances unless they have been properly cleaned.
DO NOT WELD OR CUT painted or plated parts unless special ventilation measures are taken. They can emit highly toxic fumes or gases.
Other precautions:
PROTECT compressed gas cylinders from overheating, me- chanical shocks, and arcing; secure 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: Inhalation 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 unless 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 containing 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 Hazards 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

ENSURE 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 , well - ventilated areas or vent the engine ex- haust fumes outdoors.

1.c. Do not add fuel near an open welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing and igniting if it comes in contact with hot engine parts. Do not spill fuel when filling the tank.If fuel is spilled, wipe it up and do not start the engine until the fumes are eliminated.

1.d. Keep all equipment safety guards, covers and devices in proper position and in good repair. Keep hands, hair, clothing and tools away from V- belts, 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 the guards only when necessary and replace them after the maintenance requiring their removal has been complete. Always use the extreme caution 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 radi- ator 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.

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.

SAFETY PRECAUTIONS
Read entire operation section before operating the WIRE FEEDER WELDER.

⚠ WARNING

ELECTRIC SHOCK can kill.
· Do not touch electrically live parts such as output terminals or internal wiring.
· Insulate yourself from the work and ground.
· Always wear dry insulating gloves.

FUMES AND GASES can be dangerous.
· Keep your head out of fumes.
· Use ventilation or exhaust to remove fumes from breathing zone.

WELDING SPARKS can cause fire or explosion
· Keep flammable material away.
· Do not weld on closed containers.

ARC RAYS can burn eyes and skin.
Wear eye, ear and body protection.

PRODUCT DESCRIPTION (PRODUCT CAPABILITIES)

This compact, portable wire feed welder offers versatile capa- bilities, including MIG (GMAW), flux-cored (FCAW), stick weld- ing (SMAW), and DC lift TIG welding (GTAW) on mild steel and stainless steel.

MIG Welding requires shielding gas to protect the weld pool dur- ing cooling, sourced locally based on the material. It's ideal for thinner materials, providing a clean finish, particularly for auto- motive body panels.

Self-Shielded Flux-Cored Welding eliminates the need for addi- tional shielding gas, using flux additives in the wire to protect the weld. It's effective for medium to thicker materials and works well on painted or rusty surfaces, making it suitable for outdoor use, though the finish may not be as refined as MIG welding.

Stick Welding (SMAW) is portable and versatile, allowing for welding in various positions. It's effective for thicker materials and outdoor environments, accommodating various electrodes.

DC Lift TIG Welding (GTAW) requires a lift TIG torch with a gas valve for optimal performance. It excels in high-quality, precise welds on thin materials, providing excellent control. The ma- chine lacks a built-in gas solenoid, requiring manual gas flow management. The arc is initiated with a lift arc technique for clean starts, enhancing efficiency and weld quality in precision applications.

COMMON WELDING ABBREVIATIONS
GMAW (MIG/MAG)
Gas Metal Arc Welding
SMAW(STICK)
Shielded Metal Arc Welding
GTAW(TIG)
Gas Tungsten Arc Welding
FCAW(INNERSHIELD OR OUTSHIELD)
Flux-Cored Arc Weldin

2.1 Technical Specifications

TECHNICAL SPECIFICATIONS: MIG-160

INPUT-SINGLE PHASE ONLY				
Standard Voltage / Frequency			Input Current	
220V±10% 50/60Hz			$I_{1\,max}$=20A $I_{1\,eff}$=5.5A	
110V±10% 50/60Hz			$I_{1\,max}$=32.9A $I_{1\,eff}$=10.9A	
RATED OUTPUT-DC ONLY				
Voltage	Mode	Duty Cycle	Current	Volts at Rated Current
220V	GMAW (MIG)	30%	145A	21.2V
		60%	84A	18.2V
		100%	65A	17.2V
	GTAW (TIG)	30%	145A	15.8V
		60%	84A	13.4V
		100%	65A	12.6V
	SMAW (STICK)	30%	145A	25.8V
		60%	84A	23.4V
		100%	65A	22.6V
110V	GMAW (MIG)	30%	145A	21.2V
		60%	84A	18.2V
		100%	65A	17.2V
	GTAW (TIG)	30%	145A	15.8V
		60%	84A	13.4V
		100%	65A	12.6V
	SMAW (STICK)	30%	145A	25.8V
		60%	84A	23.4V
		100%	65A	22.6V

OUTPUTRANGE				
Voltage	Mode	Open Circuit Voltage	Welding Current Range	Welding Voltage Range
220V	GMAW	56V	20~145A	17.2V~21.2V
	SMAW		20~145A	22.6V~25.8V
	GTAW		20~145A	12.6V~15.8V
110V	GMAW		20~145A	17.2V~21.2V
	SMAW		20~145A	22.6V~25.8V
	GTAW		20~145A	12.6~15.8V

OTHER PARAMETERS				
Machine	Power Factor	Efficiency	Protection Class	Insulation Class
MIG-145	0.8	≥80%	IP21S	F

PACKING DIMENSIONS				
Machine	Length	Width	Height	Weight
MIG-145	13.2inch	6.1inch	9.4inch	9.9lbs
	335mm	155mm	240mm	4.5Kg

TEMPERATURE RANGE	
Operating Temperature Range	Storage Temperature Range
-20°C ~ +50°C(-4°F~122°F)	-20°C ~ +50°C(-4°F~122°F)

Read the entire installation section before you start the installation.

INSTALLATION

⚠ WARNING

ELECTRIC SHOCK can kill.
· Only qualified personnel should perform this installation.
· Only persons who have read and understood the MIG-145 Operator's Manual should install and operate this equipment.
· The machine must be plugged into a grounded outlet in accordance with national, local, or other applicable electrical codes.
The MIG-145 power switch should be in the OFF("O") position when installing the work cable and gun and when connecting the power cord to input power.

SELECT SUITABLE LOCATION

Locate the MIG-145 in a dry place with free clean air circulation to minimize the chance of dirt accumulation that can block air passages and cause overheating.

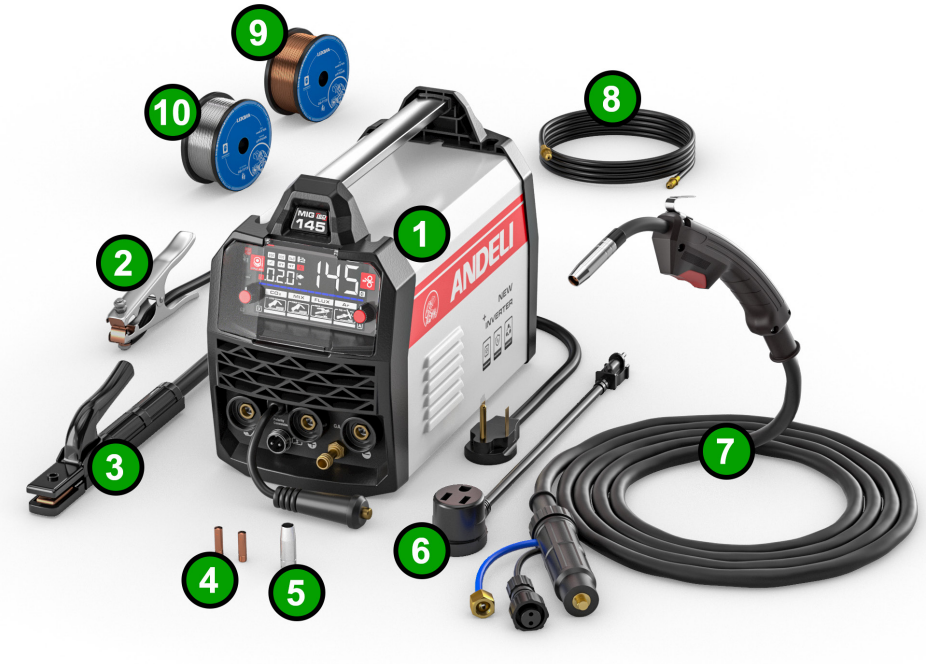
STACKING

MIG-145 cannot 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.

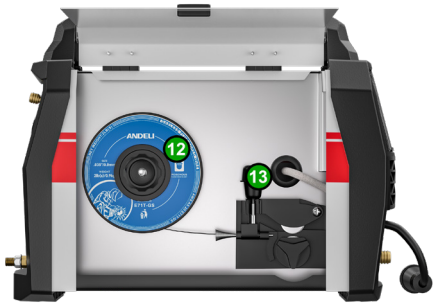
2.2 Accessories



1. **MIG-145 Welder**
2. **Groud Clamp**
3. **Electrode Holder**
4. **Contact Tips**
5. **Nozzles**
6. **220V~110V Power Adapter**
7. **MIG Torch (Built in Teflon hose)**
8. **Gas Hose**
9. **Carbon Steel Wire**
10. **FLUX Wire**

2.3 Controls and Settings

1. LED Display Screen
2. Torch Connector
3. Wire Drive Polarity Lead
4. Positive Output Terminal
5. Negative Output Terminal
6. Control Interface
7. Air Tube Interface
8. Power Switch
9. Air Tube Interface
10. Input Power Cable
11. Ground



12. Wire Feeder & Components
13. Wire Spool Spindle and Brake

2.4 Installing the MIG Gun Assembly

Connect the standard MIG welding gun to the front-mounted Euro Torch Connector. Make sure the gun connector is fully inserted into the wire drive system, then tighten the thumbscrew to secure it in place.

2.5 Gas Cylinder and Regulator Connection

For MIG welding, the gas supply system requires a separate gas cylinder (not included with the machine and must be purchased separately). The gas hose is connected from the gas inlet at the rear of the machine to the regulator, which is then attached to the gas cylinder. The cylinder should be securely positioned in a well-ventilated area to prevent accidents, such as tipping over.

Setup steps:

- Ensure the regulator valve is fully closed by turning the knob counterclockwise.
- Attach the gas regulator securely to the cylinder valve.
- Connect the gas hose from the regulator to the gas inlet at the rear of the machine
- Open the cylinder valve and adjust the gas flow to approximately 20~30 CFH (Cubic Feet per Hour).
- Trigger the MIG gun to ensure that shielding gas flows through the gun.

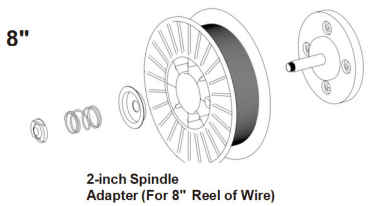
For Lift TIG welding, the gas is supplied through the hose attached to the Lift TIG torch (which is also sold separately). This hose is connected directly to the gas regulator and cylinder, bypassing the machine's rear gas inlet.

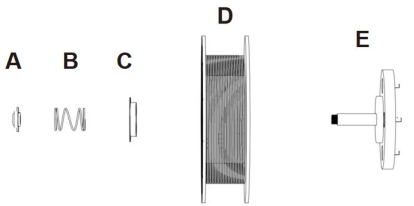
WARNING: Cylinders are highly pressurized. Handle with care. Serious accidents can result from improper handling or misuse of compressed gas cylinders. Please do not drop the cylinder, knock it over, and expose it to excessive heat, flames, or sparks. Do not strike it against other cylinders or strike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

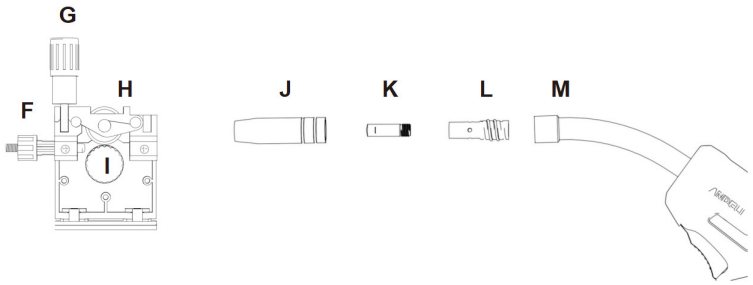
2.6 Installing the Welding Wire

ENSURE GAS AND ELECTRICAL SUPPLIES ARE DISCONNECTED. Before proceeding, remove the nozzle and the contact tip from the gun.

WARNING: ELECTRIC SHOCK CAN KILL! Always turn the Power SWITCH OFF and unplug the welder's **INPUT POWER CABLE** from the AC power source before installing wire. When the gun trigger is pressed, the drive rolls, spool of wire, fed wire, and electrode are all electrically live (hot).







2.6.1 Installing 4-Inch Spool(See Figure For Part Identification)

- Open the access panel.
- Unscrew and remove the wire pool retention cap used for 8-inch spools (A) and store it someplace safe.
- Remove the spindle adapter for 8-inch spools (B) and keep it someplace safe.
- Remove the nut (C), spring (D),and washers (E).
- Remove the outer wrapping from the included spool of wire and then find the leading end of the wire (it goes through a hole in the outer edge of the spool and is bent over the spool edge to prevent the wire from unspooling) but do not unhook it yet.
- Place the spool on the WIRE SPOOL SPINDLE so that the wire unspools from the bottom, and the spool will rotate counterclockwise.
- Place the washer, wire spool, bushing, spring, and nut back.
- Proceed to the “FEEDING WIRE THROUGH THE MIG GUN” instructions below.

2.7 Feeding Wire Through the MIG Gun:

FIGURE A.1

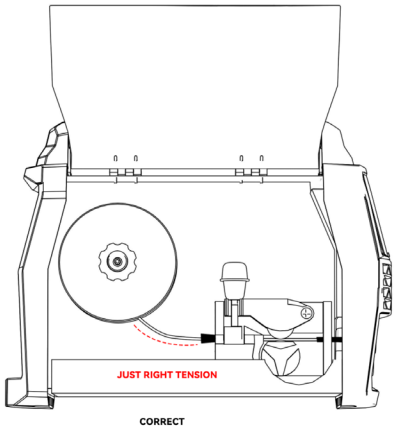
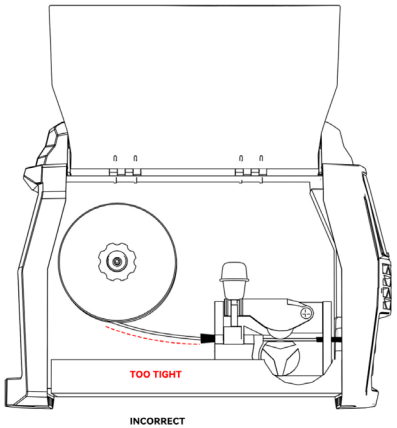


FIGURE A.2



Before beginning, ensure all necessary components are correctly assembled and the machine is powered off. Follow the steps below to properly feed wire through the MIG gun, ensuring smooth and efficient welding performance.

Secure the Wire Spool
Unhook the wire and hold both the wire end and the spool in one hand. Use the other hand to tighten the Spool Tension Nut (C) slightly, ensuring the spool doesn't spin freely but isn't too tight, which could cause inconsistent feeding.

Trim the Wire End
While holding the wire in place, use a wire cutter to trim the bent end, leaving a straight section of wire.

Open the Drive Mechanism
Release the drive roller pressure arm (I) by pulling the Pressure Arm Adjustment Knob (G) toward you. Lift the pressure arm and insert the wire into the Inlet Guide Tube (H), pushing it across the Drive Roller (J) and into the Gun Assembly(O)approximately six inches.

Important: Before proceeding, verify that the drive roller is the correct size and type for the wire size being used. Incorrect roller selection can result in poor wire feeding performance or damage to the wire.
Reference section 3.5 below for instructions on selecting the appropriate roller size and type.

Align the Wire
Align the wire within the groove of the drive roller. Lower the pressure arm back onto the roller, securing it by pulling the adjustment knob over the pressure arm. Tighten the knob enough to prevent the wire from slipping.
Note: Excessive pressure can cause wire feeding issues or damage the motor.

Release the Wire
Once the wire is secured, release it.

Remove Nozzle, Contact Tip, Contact Tip Holder, and Gas Diffuser
Remove the Nozzle (K), Contact Tip (L), Contact Tip Holder (M), and Gas Diffuser (N) from the Gun Assembly(O).

Connect Power to the Welder
Plug the welder’s INPUT POWER CABLE into the power source. Adjust the machine’s front panel settings as per the setup chart inside the machine door.

Feed the Wire Through the Gun
Pull the MIG gun trigger to feed the wire through the Gun Assembly(O). Check for slippage and, if necessary, adjust the pressure arm knob for proper tension.

Reinstall Contact Tip, Contact Tip Holder, Gas Diffuser, and Nozzle
Once approximately one inch of wire extends from the end of the gun, slide the Contact Tip (L) over the wire and screw it securely into place. Then install the Contact Tip Holder (M), followed by the Gas Diffuser (N), and finally reinstall the Nozzle (K) over the Gun Assembly(O).

Trim Excess Wire
Trim any excess wire extending beyond the nozzle, leaving about 1/4 inch.

2.INSTALLATION

Fine-Tune Drive Pressure

Adjust the pressure arm knob until the wire feeds smoothly without slipping.

Note: Ensure the correct tension to prevent slippage or excessive pressure that could crush the wire.

Verify Spool Tension

Ensure the wire stays under proper tension on the spool without loosening when the feeding stops.

Components Overview:

Nozzle (K): Covers the tip of the gun to focus gas flow.
Contact Tip (L): Conducts electricity to the welding wire.
Contact Tip Holder (M): Secures the contact tip in place.
Gas Diffuser (N): Evenly distributes gas for shielding.
Gun Assembly (O): The complete welding torch, including all attached components.

KEEP THE GUN STRAIGHT. WHEN FEEDING A NEW WIRE THROUGH THE LINER, MAKE SURE THE WIRE IS CUT CLEANLY (NO BURRS OR ANGLES) AND THAT AT LEAST 1" FROM THE END IS STRAIGHT (NO CURVES). FAILURE TO FOLLOW THESE INSTRUCTIONS COULD CAUSE DAMAGE TO THE LINER.

WHEN CHECKING THE CORRECT EXIT OF THE WIRE FROM THE GUN DO NOT BRING YOUR FACE NEAR THE GUN. YOU MAY RUN THE RISK OF BEING WOUNDED BY THE OUTGOING WIRE. DO NOT BRING YOUR FINGERS CLOSE TO THE FEEDING MECHANISM WHEN WORKING! THE ROLLS, WHEN MOVING, MAY CRUSH FINGERS. PERIODICALLY CHECK THE ROLLS. REPLACE THEM WHEN THEY ARE WORN AND COMPROMISE THE REGULAR FEEDING OF THE WIRE.

3.OPERATION

3.1 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 welding machine defines how long the operator can weld and how long the welding machine must rest and be cooled. Duty cycle is expressed as a percentage of 10 minutes and represents the maximum welding time allowed. The balance of the 10-minute cycle is required for cooling.

For example, a welding machine has a duty cycle rating of 30% at the rated output of 90A. With that welding 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 welding machine can be found on the data plate affixed 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.

MODEL:MIG-145					NO.:			
1 ~ f1/f2					EN IEC 60974-1			
		U_1 = 110V			U_1 = 220V			
		20A/15V-145A/21.2V			20A/15V-145A/21.2V			
S	U_0 = 64V	X	20%	60%	100%	20%	60%	100%
		I_2	145A	84A	65A	145A	84A	65A
		U_2	21.2V	18.2V	17.2V	21.2V	18.2V	17.2V
		U_1 = 110V				U_1 = 220V		
		20A/20.8V-145A/25.8V				20A/20.8V-145A/25.8V		
S	U_0 = 64V	X	20%	60%	100%	20%	60%	100%
		I_2	145A	84A	65A	145A	84A	65A
		U_2	25.8V	23.4V	22.6V	25.8V	23.4V	22.6V
		U_1 = 110V				U_1 = 220V		
		15A/10.6V-145A/15.8V				15A/10.6V-145A/15.8V		
S	U_0 = 56V	X	20%	60%	100%	20%	60%	100%
		I_2	145A	84A	65A	145A	84A	65A
		U_2	15.8V	13.3V	12.6V	15.8V	13.3V	12.6V
1~50/60Hz		U_1 = 110V				U_1 = 220V		
	MIG	I_{1max}=32.9A		I_{1eff}=14.7A		I_{1max}=16.4A		I_{1eff}=7.3A
	MMA	I_{1max}=40A		I_{1eff}=17.9A		I_{1max}=20A		I_{1eff}=8.9A
	TIG	I_{1max}=24.5A		I_{1eff}=10.9A		I_{1max}=12.3A		I_{1eff}=5.5A
Protection Grade:IP21S			Insulation Class:F			CE		

3.2 Internal Thermal Protection

If you exceed the welding machine duty cycle, the thermal protection system will engage, shutting off all welding current output. After cooling, the thermal 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 before 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.

CAUTION: DO NOT REGULARLY EXCEED THE DUTY CYCLE OR DAMAGE TO THE WELDER CAN RESULT.

3.3 Welding Preparation

The key to making a good weld is preparation. It includes studying the process and equipment and practicing welding before attempting 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 potential 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 MIG/MAG, Flux-cored Welding, ensure that the wire-roller groove in the roller corresponds to the diameter and type of wire used.
- Plug the machine into a suitable power outlet, and recommend NEMA6-50.
- Completely open the gas cylinder valve. Adjust the gas pressure regulator to the correct flow rate. (Not applicable to Stick welding / SMAW).

EXPOSURE TO A 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.

3.4 Welding Wire Selection

This welder can work with solid steel wire and stainless steel wire from .030"~.035" (0.8~0.9mm) diameter (MIG welding,"GMAW"), with .030"~.040" (0.8~1.0mm) flux-cored wire.

3.5 Wire Feed Roller Selection

Select the appropriate V-groove,U-groove, or K-groove roller based on the wire type and diameter to ensure smooth feeding and optimal performance.

Type	Size		Suitable Welding Wire
V-Groove Roller	.030"/.035"	0.8/0.9mm	ER70S-6 mild steel wire
K-Groove Roller	.030"/.035"	0.8/0.9mm	E71-GS flux-core wire
U-Groove Roller	035"	0.9mm	AlSi/AlMg wire

3.6 Gas Selection

Select the appropriate shielding gas based on the material and welding process being used.Below is a brief introduction to the gas requirements for each mode:

Shielding Gas Selection Guide

Type	MATERIAL	GAS
MIG/MAG	Steel	75% Argon 25%CO_2
		100%CO_2
		90% Argon 10%CO_2
	Stainless Steel	98% Argon 2%CO_2
	AL	100% Argon
Flux-cored	Steel	No Gas
TIG	Steel	100% Argon
	Stainless Steel	
Stick	Steel	No Gas

3.7 Setup for Home Menu

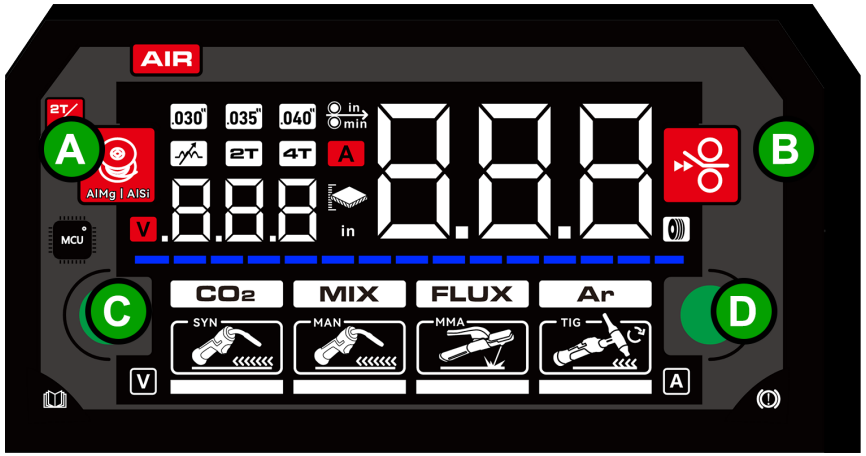
· Power on the machine, select the welding mode via the MODE OPTION.

· Install the necessary accessories according to the provided instructions and procedures.

· Configure parameters using the function buttons and adjustment knobs based on your specific application.

· Set finished, begin welding.

· Fine-tune the machine's performance parameters to achieve optimal results for different welding outcomes if needed.



A: Wire Diameter &Trigger Mode Selection, Press to select wire diameter: 030'', 035'', 040'' , Long-press 3s to switch between 2T/4T modes, long-press again to cancel.

B: press to select fast wire feed, then release to exit.

C: **Voltage Control Knob /Gas Selection / Induction Selection**

Manually adjust voltage(12.0V~21.0V) in Manual MIG mode

Press to choose CO2/MIX/AR,Aluminum welding must use AR

Gas selection isn't required for LIFT TIG, Ar (argon) is automatically chosen.

Long-press 3s to select induction adjustment (-9.9~9.9)

D: Current Control Knob

Function switching, Adjust output current in all welding modes(20A~145A).

3.8 Set Up for MIG/MAG Welding(GMAW)

3.8.1 Basic Connections

- Connect the MIG gun to the Euro Torch Connector on the machine .
- Attach the Wire Drive Polarity Lead to the Positive (+) Output Terminal.
- Connect the ground clamp to the Negative (-) Output Terminal, ensuring it is securely attached to clean, bare metal on the workpiece (avoid rust or paint).
- Load the wire spool into the cabinet and feed it through the wire feeder into the gun (see “Installing the Welding Wire”).
- Connect the gas line to the regulator and connect it to the gas cylinder.
- Press the gun trigger or hold Value Adjustment Knob to load the wire through the gun.
- Turn on the gas cylinder, pull the trigger to check for gas flow,and set the flow rate between 20~30 CFH.
- Open the machine panel settings
- Select MIG mode for applicable materials
- Applicable materials: Steel, Stainless Steel,Aluminum
- Select the gas type: 100% CO2 , He Tri-Mix, (90% Argon / 10% CO_2 ,) 98% Argon / 2% CO_2 , 100%Ar
- Choose the wire diameter (.030"~.040").
- Apply to the panel thickness (24ga~1/4").
- Set torch trigger operation 2T/4T.
- Choose standard MIG gun mode, trigger the torch control switch to feed the wire, and begin welding.

3.9 Set up for Stick Welding (SMAW)

3.9.1 Overview of Basic MIG/MAG Parameters

This section provides an overview of basic MIG/MAG parameters for welding tasks:

SYN MIG MODE

Current adjustment: Turn knob D to set the current, then the voltage will auto-sync accordingly(220V: 20~145A, 110V: 20~145A).

SYN MIG MODE

Current is adjusted via wire feed speed (varies by wire diameter). The interface will return to current display after 3 seconds of selecting your desired wire feed speed.

Note: Voltage is independently adjustable within a range of 12.0-21.0V during this process

Inductance Adjustment Mode
-- Press and hold knob C for 3 seconds.
-- Adjust inductance (-9.9 to 9.9) to optimize spatter control during welding.
Note: Inductance settings are shared across all gas welding modes.

NOTE!
Wire Checking：Press and hold the torch switch for 3 seconds to turn on the wire inspection function, and release the torch switch to stop the wire inspection function.
Gas Checking: Before starting the welding process, activate the gas flow by pressing the gun switch to verify whether the shielding gas output is normal or not.

3.9.2 Basic MIG/MAG Welding Parameter Recommendation

The mig-145 features a synergic setting that provides preset parameters for different material thicknesses. Users can manually adjust the wire feed speed, while the machine automatically adjusts the current and voltage.

To assist users in achieving optimal welding results, the following table provides recommended settings for various materials, wire diameters, and plate thicknesses in MIG/MAG welding.

Basic MIG/MAG Welding Recommended Parameter Settings

Mode	Voltage	Material	Gas Type	Wire Diameter	Parameter	Display	Thickness								
							24ga	22ga	20ga	18ga	16ga	14ga	1/8"	3/16"	1/4"
2T/4T	220V	Steel	75%AR 25%CO_2	.030"(0.8mm)	WFS(IPM)	48~340	/	/	48	100	150	200	250	300	340
				.030"(0.8mm)	Voltage(V)	12~21	/	/	12	12.3	12.6	13.5	14.2	16	19
				.030"(0.8mm)	Amperage(A)	20~145	/	/	30	50	70	90	110	130	145
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	87	113	143	180	220	274
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	12.3	14.0	14.2	16.5	18	20
				.035"(0.9mm)	Amperage(A)	20~145	/	/	/	60	80	90	130	170	145
				.040"(1.0mm)	WFS(IPM)	31~222	/	/	/	/	/	50	92	147	202
				.040"(1.0mm)	Voltage(V)	12~21	/	/	/	/	/	15	15.8	17.5	21
				.040"(1.0mm)	Amperage(A)	20~145	/	/	/	/	/	80	100	120	145
		Steel	100%CO_2	.030"(0.8mm)	WFS(IPM)	48~340	/	/	48	100	150	200	250	300	340
				.030"(0.8mm)	Voltage(V)	12~21	/	/	12	15	15.8	16.5	18	20	21
				.030"(0.8mm)	Amperage(A)	20~145	/	/	30	50	70	90	110	130	145
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	87	113	143	180	220	274
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	14.3	14.6	15	17.5	19	21
				.035"(0.9mm)	Amperage(A)	20~145	/	/	/	60	80	90	130	170	145
				.040"(1.0mm)	WFS(IPM)	31~222	/	/	/	/	/	70	112	167	222
				.040"(1.0mm)	Voltage(V)	12~21	/	/	/	/	/	15	15.8	17.5	21
				.040"(1.0mm)	Amperage(A)	20~145	/	/	/	/	/	80	100	120	145
		Stainless	He Tri-Mix	.030"(0.8mm)	WFS(IPM)	48~340	/	/	48	100	150	200	250	300	340
				.030"(0.8mm)	Voltage(V)	12~21	/	/	12	15	15.8	16.5	18	20	21
				.030"(0.8mm)	Amperage(A)	20~145	/	/	30	50	70	90	110	130	145
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	87	113	143	180	220	274
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	14.3	14.6	15	17.5	19	21
				.035"(0.9mm)	Amperage(A)	20~145	/	/	/	60	80	90	130	170	145
				.040"(1.0mm)	WFS(IPM)	31~222	/	/	/	/	/	31	112	167	222
				.040"(1.0mm)	Voltage(V)	12~21	/	/	/	/	/	15	15.8	17.5	21
				.040"(1.0mm)	Amperage(A)	20~145	/	/	/	/	/	80	100	120	145
		AL 4043	100% AR	.035"(0.9mm)	WFS(IPM)	79-320	/	/	/	157	228	260	300	320	/
				.035"(0.9mm)	Voltage(V)	13~25.5	/	/	/	13	13	17.5	22	25.5	/
				.035"(0.9mm)	Amperage(A)	60~145	/	/	/	60	80	90	130	145	/
		AL 5356	100% AR	.035"(0.9mm)	WFS(IPM)	79~233	/	/	/	102	132	164	198	233	/
				.035"(0.9mm)	Voltage(V)	13~22.8	/	/	/	13	13	15.2	21.2	22.8	/
				.035"(0.9mm)	Amperage(A)	60~160	/	/	/	60	80	90	130	145	/

Mode	Voltage	Material	Gas Type	Wire Diameter	Parameter	Display	Thickness								
							24ga	22ga	20ga	18ga	16ga	14ga	1/8"	3/16"	1/4"
2T/4T	110V	Steel	75%AR 25%CO_2	.030"(0.8mm)	WFS(IPM)	48~340	/	/	48	100	150	200	250	300	340
				.030"(0.8mm)	Voltage(V)	12~21	/	/	12	12.3	12.6	13.5	14.2	16	19
				.030"(0.8mm)	Amperage(A)	20~145	/	/	30	50	70	90	110	130	145
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	87	113	143	180	220	274
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	12.3	14.0	14.2	16.5	18	20
				.035"(0.9mm)	Amperage(A)	20~145	/	/	/	60	80	90	130	170	145
		Stee	100%CO_2	.030"(0.8mm)	WFS(IPM)	48~340	/	/	48	100	150	200	250	300	340
				.030"(0.8mm)	Voltage(V)	12~21	/	/	12	15	15.8	16.5	18	20	21
				.030"(0.8mm)	Amperage(A)	20~145	/	/	30	50	70	90	110	130	145
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	87	113	143	180	220	274
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	14.3	14.6	15	17.5	19	21
				.035"(0.9mm)	Amperage(A)	20~145	/	/	/	60	80	90	130	170	145
		Stainless	He Tri-Mix	.030"(0.8mm)	WFS(IPM)	48~340	/	/	48	100	150	200	250	300	340
				.030"(0.8mm)	Voltage(V)	12~21	/	/	12	15	15.8	16.5	18	20	21
				.030"(0.8mm)	Amperage(A)	20~145	/	/	30	50	70	90	110	130	145
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	87	113	143	180	220	274
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	14.3	14.6	15	17.5	19	21
				.035"(0.9mm)	Amperage(A)	20~145	/	/	/	60	80	90	130	170	145
		AL 4043	100% AR	.035"(0.9mm)	WFS(IPM)	79-320	/	/	/	157	228	260	300	320	/
				.035"(0.9mm)	Voltage(V)	13~25.5	/	/	/	13	13	17.5	22	25.5	/
				.035"(0.9mm)	Amperage(A)	60~145	/	/	/	60	80	90	130	145	/
		AL 5356	100% AR	.035"(0.9mm)	WFS(IPM)	79~233	/	/	/	102	132	164	198	233	/
				.035"(0.9mm)	Voltage(V)	13~22.8	/	/	/	13	13	15.2	21.2	22.8	/
				.035"(0.9mm)	Amperage(A)	60~160	/	/	/	60	80	90	130	145	/

Note: The above parameters are for reference only. Actual welding results may vary due to factors such as material condition, environmental conditions, and specific project requirements.

3.10 Set Up for Flux-cored Welding (FCAW)

3.10.1 Basic Connections

- Connect the MIG gun to the Euro Torch Connector.
- Attach the Wire Drive Polarity Lead to the Negative (-) Output Terminal.
- Connect the work clamp to the Positive (+) Output Terminal, ensuring a solid connection to clean, bare metal (avoid rust or paint).
- Load the wire spool into the cabinet and feed it through the wire feeder into the gun (see “Installing the Welding Wire”).
- Press the gun trigger or hold Value Adjustment Knob to load the wire through the gun.
- Set welding mode to MIG and gas mode to FLUX.
- Choose the wire diameter (.030"~.040").
- Select the panel thickness (24ga~1/4").
- Set torch trigger operation 2T/4T.
- Choose standard MIG gun mode, trigger the torch control switch to feed the wire, and begin welding.

3.10.2 Overview of Basic Flux-cored Parameters

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

SYN MIG MODE

Current adjustment: Turn knob D to set the current, then the voltage will auto-sync accordingly(220V: 20~145A□110V: 20~145A)

MAN MIG MODE

Current is adjusted via wire feed speed (varies by wire diameter). The interface will return to current display after 3 seconds of selecting your desired wire feed speed.

Note: Voltage is independently adjustable within a range of 12.0-21.0V during this process

Inductance Adjustment Mode

-- Press and hold knob C for 3 seconds.

-- Adjust inductance (-9.9 to 9.9) to optimize spatter control during welding.

3.10.3 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	Display	Thickness								
							24ga	22ga	20ga	18ga	16ga	14ga	1/8"	3/16"	1/4"
2T/4T	220V	Steel	/	.030"(0.8mm)	WFS(IPM)	48~340	/	/	118	138	157	169	197	315	330
				.030"(0.8mm)	Voltage(V)	12~21	/	/	13.8	14.2	15	16.5	16.5	18	19
				.030"(0.8mm)	Amperage(A)	20~145	/	/	85	95	105	115	125	135	145
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	98	142	173	220	264	315
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	15	15.9	16.6	18	18.5	19.2
				.035"(0.9mm)	Amperage(A)	20~145A	/	/	/	105	110	120	130	140	145
				.040"(1.0mm)	WFS(IPM)	31~222	/	/	/	/	/	79	130	177	197
				.040"(1.0mm)	Voltage(V)	12~21	/	/	/	/	/	15.2	17	18.5	19
				.040"(1.0mm)	Amperage(A)	20~145	/	/	/	/	/	90	105	120	145
	110V	Steel	/	.024"(0.6mm)	WFS(IPM)	48~340	/	/	118	138	157	197	315	/	/
				.030"(0.8mm)	Voltage(Vag)	12~21	/	/	13.8	14.2	15	16.5	18	/	/
				.030"(0.8mm)	Ampere(A)	20~145	/	/	55	85	105	125	145	/	/
				.035"(0.9mm)	WFS(IPM)	38~274	/	/	/	98	142	173	220	/	/
				.035"(0.9mm)	Voltage(V)	12~21	/	/	/	15	15.9	16.6	18	/	/
				.035"(0.9mm)	Amperage(A)	20~145	/	/	/	50	64	84	140	/	/

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.

3.11 Set Up for Lift Arc TIG Welding(GTAW)

3.11.1Basic Connections

Setup of Equipment for Tungsten Inert Gas Welding (GTAW): The TIG torch is not furnished with the machine. For the sake of attaining optimal performance, it is recommended to utilize the additional ANDELI WP-17V(10-25) Lift TIG torch along with Lanthanated Tungsten electrodes.

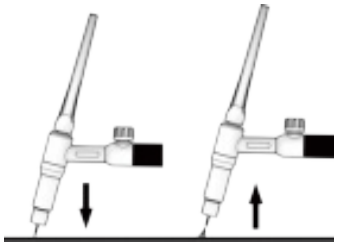
WARNING: TIG TORCH IS ALWAYS LIVE (ELECTRICALLY HOT). Use caution and ensure the TIG torch is not in contact or close to a conductive or grounded material.

- Remove the Wire Drive Polarity Lead from the Positive (+) Output and Negative (-) Output Terminals.
- Connect the TIG torch connector to the welder's Negative (-) Output Terminal.
- Connect the work cablecable to the welder's Positive (+) Output Terminal.
- Ensure the work clamp has good contact with the workpiece on a clean, bare metal surface free of rust, paint, or coating.
- Connect the TIG torch gas line to the gas regulator (use 100% Argon gas only).Turn on the gas at the regulator, check for gas flow,and adjust the flow rate as needed.

· Set the tungsten electrode to extend approximately 1/4 inch from the gas cup. Ensure you are using the correct size and type of tungsten electrode. Smaller electrodes are suitable for lower welding currents. The tungsten must have a sharpened tip for direct current (DC) welding.
· Put the TIG torch away from all conductive materials.
· Turn on the welder's power switch.
· Select the Lift TIG process with the Control Knob on the Home Menu Page.
· Open the gas valve on the TIG torch to start the gas flow. Set the flow rate to 20~30 CFH.
· Select material and tungsten diameter to match the project.
· Set the welding amperage through the Value Adjustment Knob.
· Turn the valve on the TIG torch to start the shielding gas flow.
· Initiate the welding arc with a lift arc technique:
a. Briefly touch the tungsten electrode to the workpiece.
b. Lift the electrode slightly, and the machine will automatically increase the voltage and current to establish the arc.

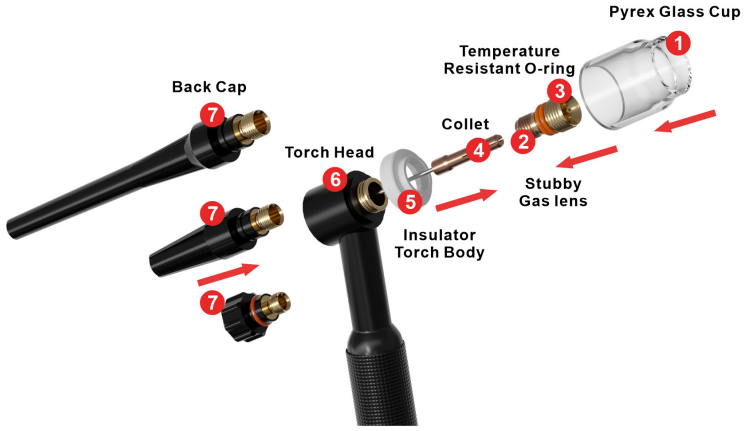
REMEMBER TO CLOSE THE VALVE ON THE GAS CYLINDER IMMEDIATELY AFTER ALL WELDING IS COMPLETED. Welding Tips:

· Always work with clean, dry, and well-prepared materials for best results.
· Hold the torch at a 45° angle to the workpiece, keeping the gas cup about 1/2" above the surface.
· Maintain smooth and steady torch movement throughout the weld to ensure consistent results.
· Avoid welding in drafty environments, as drafts can disrupt the shielding gas and cause porosity defects.
· Keep the wire and liner clean. Avoid using rusty or dirty wire, as it can affect weld quality.
· Do not bend or kink the welding torch cable, as this can restrict gas flow and damage the internal components.



3.11.2 TIG Torch Assembling

Assemble the TIG torch correctly to ensure proper shielding, arc stability, and optimal welding performance.



3.OPERATION

Here's step-by-step guidance for assembling the TIG torch:

Match Collet and Collet Body:
Collet (4): Holds the tungsten electrode in place within the Torch Head (6).

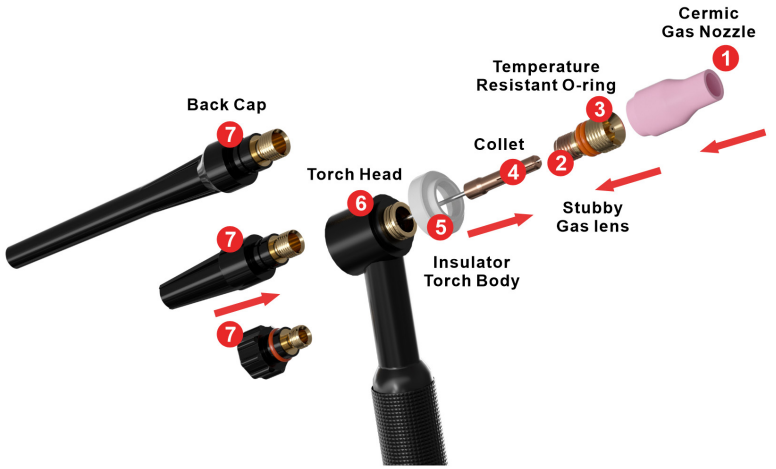
Thread Collet Body:
· Stubby Gas Lens (2): Functions as the Collet Body, providing enhanced gas coverage and flow.
· Screw the Stubby Gas Lens (2) into the Torch Head (6).

Ceramic Nozzle Selection:
Pyrex Glass Cup (1): Thread this nozzle onto the Stubby Gas Lens (2) for gas shielding and better visibility during welding.

Insert Collet and Electrode:
Insert the Collet (4) into the Stubby Gas Lens (2), then insert the tungsten electrode.

Secure Electrode:
Back Cap (7): Tighten to lock the tungsten electrode in place, ensuring that 1/8" to 1/4" of the tungsten protrudes from the Pyrex Glass Cup (1).

Additional Components:
· Temperature Resistant O-ring (3): Seals the gas flow in high-temperature areas, typically around the gas lens or torch head.
· Insulator Torch Body (5): Provides insulation around the Torch Head (6) to prevent overheating.



3.OPERATION

Here's step-by-step guidance for assembling the TIG torch:

Install the Collet Body:
Thread the Collet Body (2) into the Torch Head (5) securely.

Insert the Collet:
Place the Collet (3) inside the Collet Body. This holds the tungsten electrode.
Insert the Tungsten Electrode: Insert the tungsten electrode through the Collet (3), leaving 1/8" to 1/4" of the electrode extending from the gas nozzle.

Tighten with Back Cap:
Screw the Back Cap (6) onto the rear of the Torch Head (5) to lock the tungsten electrode in place.

Insert Collet and Electrode:
Insert the Collet (4) into the Stubby Gas Lens (2), then insert the tungsten electrode.

Attach Insulator and Gas Nozzle:
Place the Insulator Torch Body (4) over the Torch Head (5) to protect the assembly from heat. Thread the Ceramic Gas Nozzle (1) onto the Collet Body for proper shielding gas coverage during welding.

TIG Electrodes Specification Reference Table

Material	Thickness (inch/mm)	Tungsten Diameter	Tungsten Type	Filler Metal	Ceramic Nozzle Size	Gas Flow (CFH)	Amperage Range (A)
Carbon Steel	1/16"~1/8" (1.5~3.0mm)	1.6mm (1/16")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray)	ER70S-6	#5~#6	15~20 CFH	50~150A
	1/8"~1/4" (3.0~6.0mm)	2.4mm (3/32")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray)	ER70S-6	#6~#7	15~25 CFH	150~200A
	1/4"~3/8" (6.0~10.0mm)	3.2mm (1/8")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray)	ER70S-6	#6~#7	15~25 CFH	150~250A
	3/8" and above (10mm +)	4.0mm (5/32")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray)	ER70S-6	#7~#8	20~30 CFH	200~250A
Stainless Steel	1/16"~1/8" (1.5~3.0mm)	1.6mm (1/16")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray) Rare Earth (Purple)	ER308/ ER3 16	#5~#6	15~20 CFH	50~150A
	1/8"~1/4" (3.0~6.0mm)	2.4mm (3/32")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray) Rare Earth (Purple)	ER308/ ER3 16	#6~#7	15~25 CFH	150~250A
	1/4"~3/8" (6.0~10.0mm)	3.2mm (1/8")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray) Rare Earth (Purple)	ER308/ ER3 16	#6~#7	15~25 CFH	150~250A
	3/8" and above (10mm +)	4.0mm (5/32")	2% Thoriated (Red) 2% Lanthanated (Blue) 2% Ceriated (Gray) Rare Earth (Purple)	ER308/ ER3 16	#7~#8	20~30 CFH	200~250A

This chart serves as a general guideline; actual results may differ based on welding methods, equipment calibration, and the specific application.

3.11.3 Overview of Basic TIG Parameters

This section provides an overview of basic TIG parameters for welding tasks:

LIFT TIG Mode Settings:
Gas: Automatically set to Ar (argon)
Current Range: Adjustable from 20A~145A

3.11.4 TIG Welding Parameters Recommendation

Proper configuration of welding parameters is critical for achieving optimal TIG welding results. This section details recommended settings based on material type, thickness, and tungsten diameter. This section provides recommended settings based on material type, thickness, and tungsten diameter. Following these guidelines ensures accurate heat control, improved weld quality, and enhanced performance.

TIG Welding Recommended Parameter Settings

Voltage	Electrode Type	Diameter	Amperage	Thickness							
				22ga	20ga	18ga	16ga	14ga	1/8"	3/16"	1/4"
220V	Steel	1/16" (1.6mm)	20~145A	20	25	40	50	65	95	/	/
		3/32" (2.4mm)		20	25	40	50	65	95	120	145
		1/8" (3.2mm)		20	25	40	50	65	95	120	145
	Stainless Steel	1/16" (1.6mm)		20	25	40	50	65	95	/	/
		3/32" (2.4mm)		20	25	40	50	65	95	120	145
		1/8" (3.2mm)		20	25	40	50	65	95	120	145
110V	Steel	1/16" (1.6mm)	20~145A	20	25	40	50	65	95	/	/
		3/32" (2.4mm)		20	25	40	50	65	95	/	/
	Stainless Steel	1/16" (1.6mm)		20	25	40	50	65	95	/	/
		3/32" (2.4mm)		20	25	40	50	65	95	/	/

The amperage settings outlined are aligned with material thickness, type, and tungsten diameter. These recommendations serve as a reference to assist users in setting up their welding parameters. Users should adjust the settings to their specific welding conditions and needs to ensure the best possible results.

3.12 Set up for Stick Welding (GTAW)

3.12.1 Basic Connections

· Remove the Wire Drive Polarity Lead form the Positive (+) Output and Negative (-) Output Terminal (Remove the MIG gun at the same time).
· Check the electrode packaging to determine the recommended polarity and connect the electrode holder and work clamp to the Positive (+) or Negative (-) Output Terminal accordingly.
· Place the electrode into the electrode holder firmly.
· Ensure the work clamp has good contact with the workpiece on a clean, bare metal surface free of rust, paint, or coating.
· Turn the power source on and select the Stick welding process with Function Knob on the Home Menu Page.
· Set the amperage with the Value Adjustment 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.
· To finish the weld, break the arc by quickly snapping the electrode away from the workpiece.
· Wait for the weld to cool and carefully chip away the slag to reveal the weld metal below.

3.12.2 Polarity Setup for Stick Welding (SMAW):

DCEP (Direct Current Electrode Positive):

Connect the electrode holder to the Positive (+) Output Terminal and the work clamp (connected to the workpiece) to the Negative (-) Output Terminal.
Recommended for most stick welding applications, as it provides deeper penetration on thicker materials.

DCEN (Direct Current Electrode Negative):

Connect the electrode holder to the Negative (-) Output Terminal and the work clamp to the Positive (+) Output Terminal. Recommended for welding thin metals or when required by specific electrode types.

Electrode Recommendations

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.

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

3.12.3 Overview of Basic Stick Parameters

This section provides an overview of basic Stick welding parameters for welding tasks:

MMA Mode Settings:
Current Range: Adjustable from 20A~145A.

3.12.4 Stick Welding Parameters Recommendation

The table below outlines optimal parameter settings based on electrode types, material thicknesses, and specific job requirements. These recommendations assist users in configuring their machine for maximum efficiency and weld quality.

Stick Welding Recommended Parameter Settings

Voltage	Electrode Type	Diameter	Amperage	Thickness									
				24ga	22ga	20ga	18ga	16ga	14ga	1/8"	3/16"	1/4"	3/8"
220V	6***	1/16" (1.6mm)	20~145A	/	/	28	33	36	45	/	/	/	/
		3/32" (2.4mm)		/	/	/	/	/	70	90	/	/	/
		1/8" (3.2mm)		/	/	/	/	/	/	105	110	120	/
		5/32" (4.0mm)		/	/	/	/	/	/	/	115	130	145
	7***	1/16" (1.6mm)		/	/	28	33	36	45	/	/	/	/
		3/32" (2.4mm)		/	/	/	/	/	70	90	/	/	/
		1/8" (3.2mm)		/	/	/	/	/	/	105	110	120	/
		5/32" (4.0mm)		/	/	/	/	/	/	/	115	130	145
110V	6***	1/16" (1.6mm)	20~145A	/	/	28	33	36	45	/	/	/	/
		3/32" (2.4mm)		/	/	/	/	/	70	90	/	/	/
	7***	1/16" (1.6mm)		/	/	28	33	36	45	/	/	/	/
		3/32" (2.4mm)		/	/	/	/	/	70	90	/	/	/

The above values are common industry standards for reference only. Your machine's actual performance parameters take precedence

Selecting the appropriate welding current for the job is essential to prevent common welding defects and ensure a high-quality weld. Low current can result in difficulty striking and maintaining a stable arc, with the electrode tending to stick to the workpiece. This leads to shallow penetration and a rounded, weak weld profile.
High current introduces risks such as excessive heat, which may burn through the base metal, cause undercut, and result in signifi- cant spatter buildup on the work surface.
After selecting the appropriate welding current, fine-tune additional parameters such as Arc Force and Hot Start. Proper adjust- ments of these settings, in alignment with the chosen current, will enhance arc stability, penetration, and overall weld quality.

4. MAINTENANCE & SERVICING

4.1 General Maintenance

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

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

· Keep all consumables (contact tips, nozzles, and liner) clean and replace them when necessary. See “Consumable Main- tenance” (below) and “Troubleshooting” (page 27) for detailed information.

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

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

· 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.

· If available, use compressed air to clean the liner periodically, especially when changing wire spool.

WARNING: DISCONNECT FROM POWER SOURCE WHEN CARRYING OUT THIS OPERATION.

· The wire feed drive roller could wear out during service. Therefore, replacing the drive roller is required under specific cir- cumstances. For example, if the idler roller and the wire feed drive roller make contact when the correct size of welding wire in the groove of the drive roller, the wire feed drive roller must be replaced immediately.

· 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.

4.2 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.

· If the wire burns back into the contact tip, remove it 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 contact tip must be replaced.

· A failure mode of the contact tip is a worn-out hole with enlarged hole size. A worn-out contact tip usually results in unstable arc characteristics and difficult arc starting.

CAUTION: KEEP THE GAS NOZZLE CLEAN!

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

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

If the spattering buildup inside the gas nozzle bridges the gas nozzle and the welding torch, it allows the welding current to pass through the gas nozzle beside the contact tip. This phenomenon causes erratic welds and less weld penetration. In addition, it leads to an overheating of the end of the welding gun and, in turn, damages the welding gun.

TESTING FOR A SHORTED NOZZLE

Arcing between the nozzle and the workpiece means the nozzle is shorted.

Unplug the AC power source, and use an ohmmeter to measure the resistance between the gas nozzle and the contact tip. If the resistance is not unlimited, the nozzle is shorted. Please clean or replace the gas nozzle.

5.TROUBLESHOOTING

HOW TO USE TROUBLESHOOTING GUIDE

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

Step 1. LOCATE PROBLEM (SYMPTOM).

Look under the column labeled “PROBLEM (SYMPTOMS)” . This column describes the sign that the machine is showing. Find the listing that best describes the symptom that the machine is exhib- iting.

Step 2. POSSIBLE CAUSE.

The second column labeled “POSSIBLE CAUSE”, lists the ob- vious 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 cannot perform the Recom- mended Course of Action safely, contact ANDELI sup- port@ANDELI.com.

OBSERVE ALL SAFETY GUIDELINES DETAILED THROUGHOUT THIS MANUAL

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
	Welding current exceeds machine’s capacity	When the protection indicator illuminates and the digital display reads "E01",it indicates that over current occurs.Restart the machine,then the welding can be continued.
	OVER HOT	When the overheating indicator illuminates and the digital display reads "E02",it indicates that welding is forced to stop because the main circuit of the machine gets overheated.In this condition,it is unnecessary to turn off the machine,just wait a few minutes til the indicator turns off and the error code disappears,then the welding can be continued.
Frequent circuit breaker Trips.	Machine is drawing too much amperage due to use of larger size electrode.	Use a smaller electrode.
	Machine is not the only piece of electrical equipment on the circuit.	Make sure the welder is on a dedicated circuit or is the only equipment plugged into a circuit.
	Circuit breaker is incorrect/insufficient for use with this machine.	Verify that the circuit breaker for the circuit is a 30A breaker for 120V and 20A for 240V. If it is not, have a qualified electrician install the proper breakers.
Screen’s OFF, No output power, Fan not operating.	No input power.	Connect machine to proper input power source.
		Verify that circuit breaker has not been tripped in your main power panel. Reset if needed.
		Wire loose connection.
	POWER SWITCH is OFF.	Ensure POWER SWITCH (rear) is in the ON position.
Screen is OFF, but fan is operating	Power supply issue.	Check and secure power connections to display/control board.
	Control board malfunction	Contact our support team for further assistance and repair.

MIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
No arc or wire feed. Screen's on, Fan operates nor- mally (can be heard, auto start/ stop).	Gun trigger is not being pulled or is not making contact.	Ensure the trigger is fully pulled. Inspect and replace the trigger switch if it is faulty.
	Incorrect gun modeselected (Spool gun vs. Standard).	Check and adjust the gun mode settings to match the correct gun type.
	Exceeded duty cycle; thermal protection engaged	Allow the machine to cool down. Stay within the machine's duty cycle to avoid overheating.
	Insufficient air flow causing machine to overheat before reaching duty cycle.	Ensure proper ventilation and airflow around the machine. Check the fan for blockages or malfunctions.
	Wire Feed Motor Fault.	Inspect the wire feed motor and connections. Replace if necessary.
	Control Board Malfunction.	Inspect the control board for damage. Contact our support team for further assistance and repair.
	Blocked or Worn Contact Tip.	Clean or replace the contact tip. Ensure it's the right size for the wire.
Feed motor oper- ates but wire will not feed.	Insufficient feed drive roller pressure.	Adjust drive roller pressure.
	Burr on end of wire.	Re-cut wire so it is square with no burr.
	Liner blocked or damaged.	Clear with compressed air or replace liner.
	Despooler tension too high.	Adjust despooler tension.
Wire feeds but no arc.	Incorrect polarity setting.	Verify polarity is correct for the type of wire used. For flux- cored wire, set to DCEN; for solid wire, set to DCEP.
	Poor ground connection.	Ensure the ground clamp is securely attached to clean, bare metal.
	No gas flow (if MIG welding with solid wire).	Check the gas flow and ensure the cylinder is not empty and the regulator is set properly.
	Settings such as voltage or wire feed speed may be incorrect, preventing arc formation.	Adjust the voltage, wire feed speed, and other arc settings to match the material and process.
	Control board malfunction.	Inspect the control board for issues. Contact our support team for further assistance and repair.
	Faulty or dirty nozzle.	Clean or replace the nozzle.
	Faulty contact tip.	Inspect and replace the contact tip if worn out or damaged.
	Trigger not pulled while wire is in con- tact with workpiece.	Pull the trigger while in contact with the workpiece. The machine does not arc unless the trigger is pulled.
	Internal connection issue in the welding machine.	Check internal machine connections or contact technical support.

MIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor quality welds.	Insufficient gas at weld area.	Check that the gas is not being blown away by drafts and, if so, move to a more sheltered weld area. If not, check gas cylinder contents, gauge, regulator setting, and operation of gas valve.
	Rusty, painted, oily or greasy workpiece	Ensure workpiece is clean and dry.
	Poor ground connection or torch/electrode connection.	Check work clamp/workpiece connection and all connections to the machine.
	Incorrect settings.	Check welding parameters and polarity.
Arc works but not feeding wire.	No pressure on the drive roller; insufficient or excessive pressure on the drive roller.	Adjust the drive pressure. See "Installing The Welding Wire" .
	Wire spool is empty.	Check if wire is in place and replace if necessary.
Wire is "bird- nesting" at the drive roller or jam- ming.	Too much pressure on drive roller.	Adjust the drive pressure. See "Installing The Welding Wire" .
	Contact tip is clogged or damaged.	Replace contact tip.
	Worn guides or drive roll alignment.	Replace parts.
Low output or non- penetrating weld.	Weld parameters too low.	Adjust welding parameters.
	Wrong type or size wire.	Use .030" (0.8mm) ~ .035" (0.9mm) wire.
	Poor ground connection or gun connec- tion.	Reposition clamp and check cable to clamp connection. Check connection of ground cable, gun, and Wire Polarity Drive Lead.
	Wrong size or worn contact tip.	Use .030" (0.8mm) or 0.035" (0.9mm) contact tip with the corresponding wire. Replace contact tip if worn.
	Input power too low.	Have a qualified electrician verify the voltage at your outlet. If the voltage is appropriate, verify that the circuit wiring is sufficient for the circuit breaker size.
	Stick out too long.	Decrease stick out (the amount the wire extends past the contact tip).
Work clamp, ground cable, and/or welding ca- ble get hot.	Bad ground or loose ground connection.	Check the connection of the work clamp and gun to the machine. Check the connection of the MIG Gun Connection. Check connection of the ground cable to the work clamp. Tighten cable connection to work clamp if needed. Ensure the connection between the work clamp and workpiece is good and on clean, bare (not painted or rusted) metal. Make sure cable is not damaged.
Gun nozzle arcs to work surface.	Spatter or Slag build-up inside nozzle or nozzle is clogged.	Clean or replace nozzle as needed.
Wire burns back to contact tip.	Wire feed speed may be too high, caus- ing the wire to burn back to the contact tip.	Reduce the wire feed speed.
	High voltage can overheat the wire, lead- ing to burn back.	Decrease the voltage settings.
	Stick-out too short.	Increase stick-out (the amount the wire extends past the contact tip).
	Insufficient or incorrect gas flow can cause arc instability.	Adjust the gas flow to the recommended level.
	The contact tip may be worn, dirty, or not the right size for the wire.	Clean, replace, or ensure the tip size matches the wire.

Lift 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 25/64" 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" from the weld end and re-sharpen the tungsten.
	Insufficient gas shielding.	Check and set the gas flow between 20-30 CFH 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.

Lift TIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Lift TIG does not ini-tiate 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 clean 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 20-30 CFH 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 1/8-1/4.
	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.

5.TROUBLESHOOTING

STICK WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor starting.	Poor work clamp connection.	Check and secure work connection
Stick electrode“ 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 cavities or holes resulting from gas pockets 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.	Insuficient heat 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 between 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