Need Information?
Contact:
sales@ahpwelds.com
925-391-3599

Technical Issues?
Contact:
tech@ahpwelds.com
925-391-3599 (Ext. 102)

alphaMIG 231ms

OPERATOR'S MANUAL

SAFETY AND USE INSTRUCTIONS

Purchase Date (Attach Receipt to Cover For Proof of Purchase)

Serial Number

Issue Date: 04/25/2023
Publication: AHP231MS-0307

WELDING SYSTEMS

380 Swift Ave. #11 South San Francisco, CA 94080

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NOTICE: *This AHP welding product is designed for use by individuals with a both knowledge and skills in MIG ,TIG and Stick welding. It is designed with commercial operation in mind. AHP cannot be held accountable for instruction and training of inexperienced users or damage or malfunctions that may result from use by inexperienced users or improper installation. If you do not have the skill level or knowledge base to properly operate and install this machine, do not use this machine until proper training and instruction has been received. This manual is not intended to be an exhaustive welding guide or a "how-to" manual for beginners. Please seek out qualified instruction on welding that focuses on welding safety and operation if you are unsure of your capabilities before attempting to use this unit .*

SHIPPING ISSUES?

IMPORTANT! This unit has been thoroughly tested and inspected for function at the factory. However, you should be prepared to inspect and test this unit completely within 72 hours after receipt. Please do not delay in doing this. Ahp needs to know if there is any damage caused in shipping as soon as possible. Damage caused by shipping and discovered after 30 days due to lack of inspection will not be covered under the free 30 day shipping policy.

Please contact us immediately should you have any questions or concerns about the welder after delivery. We'll be glad to help.

⚠ WARNING!

California Proposition 65 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/or Reproductive Harm

www.P65warnings.ca.gov

NOTICE:

Due to our constant effort to improve our products, specifications are subject to change without notice or revision to this manual. In addition, minor changes in product cosmetics, accessory type and quantity may change without notice. These do not constitute a major change in function or operation.

Ahp Welding Systems makes no warranty for merchantability or fitness for a particular purpose or application. Any claims of such are expressly denied by Ahp Welding Systems. Furthermore, Ahp Welding Systems does not accept liability for injury or damages, consequential or incidental, resulting from the use of this product or resulting from the content found in this document or accept claims by a third party of such liability.

SAFETY FIRST!

Ahp Welding Systems takes safety seriously. You should as well. Please read this entire manual before using. Keep a copy of this manual available for all employees or potential users of this machine to read and thoroughly review before use.

No matter how detailed may be nothing can substitute for careful planning and common sense required to operate and safe work environment.

Welding is an inherently dangerous activity. Failure to follow safety protocols while welding may result in severe burns, blindness, severe shock, or death from electrocution.

BE AWARE OF YOUR WORK AREA AND THE WHO OR WHAT IS IN IT!

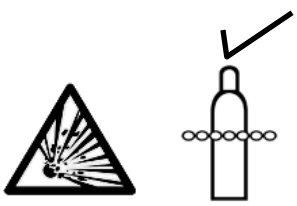
AS THE USER OF THIS PRODUCT YOU ARE RESPONSIBLE FOR YOUR OWN PERSONAL SAFETY AND FOR THE SAFETY AND SECURITY OF THE PEOPLE AND ITEMS AROUND YOU!

If you feel you do not have the resources to provide a safe work environment, or do not have the skills or (for whatever reason) the capability to safely operate this unit, do not use this unit until you seek professional instruction in safe operation and care of this unit.

NOTICE:

Welding and cutting operations may generate undesirable High Frequency (HF) and EMF energy. This can interfere with surrounding electronic equipment such as computers, routers, CNC equipment, televisions, radios, fluorescent lighting etc. If disturbance in surrounding electrical and electronic equipment is noted, consult a licensed electrician to help properly ground surrounding equipment to limit the interference. This machine may cause GCFI and ground fault outlets to malfunction. This unit is designed to be operated on a dedicated, properly grounded circuit.

Safety Warnings, Dangers, Cautions and Instructions

	NOTICE. This unit manual is intended for users with basic knowledge and skillset in welding. It is your responsibility to make certain that the use of this welder is restricted to persons who have read, understand and follow the warnings and instructions in this manual. If you or the operator needs further instruction, contact AHP welding support or seek qualified professional advice and training.
	WARNING! High Frequency (HF) energy can interfere with the operation of pacemakers and can damage pacemakers. Consult with your physician and pacemaker manufacturer before entering an area where welding and cutting equipment is in operation and before using this welder. Some pacemakers have limited shielding. Alert any users or customers of this potential problem.
	WARNING! Use approved safety glasses with wrap around shields and sides while welding and working in the weld area or serious eye damage or loss of vision may result. Use a grinding shield in addition to the safety glasses during chipping and grinding operations.
	WARNING! When welding always use an approved welding helmet or shielding device equipped with at least an equivalent of a shade 9 or greater. Increase the shade number rating as amperage increase over 100 amps. Inspect helmet for cracks in lenses and in the helmet. Keep lens covers in good condition and replace as necessary.
	WARNING! Welding/cutting operations carry inherent risks which include but not limited to possible cuts burns, electrical shocks, lung damage, eye damage and even death. Take all appropriate measures to use proper Personal Protective Equipment (PPE). Always use leather welding gloves, closed toe (preferably reinforced or steel toe leather shoes, and long-sleeved flame resistant clothing (i.e. denim). Do not wear Poly/Nylon blend materials.
	DANGER! Welding/cutting poses shock and electrocution risks. Keep this welding equipment dry. Do not weld in the rain or where moisture accumulates. Use dry, rubber soled shoes, gloves and clothing when welding. Do not rest or contact work clamp (ground) when welding. Keep all parts of the body insulated from the part being welded when possible. Do not touch terminals or connections while the unit is on. Consider all parts to be “live” at all times even if no live work is being performed. Do not use frayed welding cables.
	CAUTION! Fires are possible but also preventable while welding. Always remove flammable rags, papers, and other materials from the weld area. Keep rags stored in an approved flame proof canister. Keep a fully charged fire extinguisher at hand. Remove any fuels, oils, paint, pressurized spray cans, and chemicals from the weld area. Make sure any smoke/fire detectors are function properly. Do not weld on tanks, drums or barrels, especially if pressurized or sealed. Do not weld on any container that previously held fuel or chemicals. Make sure the weld area is clear of flammable materials such as grass or wood shavings solvents and fuels. Do not wear frayed or loose clothing. Visual-
	WARNING! Welding gas cylinders are under high pressure. Keep all gas cylinders upright and chained to a cart or held safely in a safety holding pen. Never transport gas cylinders in an enclosed car van or other vehicle. Transport gas cylinders securely. Keep all cylinders capped while not in use or during transport. Replace the cap on the cylinder when it is going to be more than 24 hours before use. Do not use or attempt to repair faulty regulators. Never weld on gas cylinders. Keep gas cylinders away from direct sparks.

Safety Warnings, Dangers, Cautions and Instructions

	DANGER! Welding and cutting operations pose serious inhalation hazards. Some of these hazards are immediate while others are cumulative in their effect. Do not weld in enclosed spaces or in areas without adequate ventilation. Fumes and gases released in the welding and cutting operations can be toxic. Use fans or respiration equipment to insure adequate ventilation if you are welding in a shop or garage area. Do not weld on galvanized metal under any circumstance. You may develop metal fume fever. Symptoms are similar to lu-like symptoms. Seek medical advice and treatment if you are exposed to galvanized welding fumes. If you experience any eye burning, nose or throat irritation while welding, these are signs that you need more ventilation. If you feel these symptoms: • Stop work immediately and relocate work area with better ventilation. • Wash and clean your face and hands. • Stop work completely and seek medical help if irritation persists
	DANGER! Never use brake cleaner or any chlorinated solvent to clean or degrease metal scheduled to be welded or other related equipment in the area being welded. The heating of this cleaner and its residue will create highly toxic phosgene gas. Small amounts of this vapor are harmful and can lead to organ failure and death. If degreasing of a part is necessary, use Acetone or an approved pre-weld cleaner. Use the proper personal protective equipment (PPE) when handling any cleaners/solvents.
	DANGER! People with pacemakers should consult a physician and pacemaker manufacturer before welding. There is a potential for damage or serious malfunction resulting in death. High Frequency energy (HF)/Electromagnetic Fields generated during welding can interfere with pacemaker signals, even permanently damaging it. Some pacemakers offer some shielding, but restrictions regarding amperage proximity to the welding arc may be placed upon the individual. Warn all potential bystanders that they should exit the work area if they have a pacemaker or similar medical equipment before welding. Severe electrical shock leading to injury or death may occur while using the plasma cutter if the user becomes part of the circuit path. While the Amp output of the plasma cutter is limited, the unit may produce an OCV of 300V or greater. Consult with a Physician if a pacemaker is expected to be implanted.
	DANGER! Never defeat or modify any safety guards or shields. Keep all safety covers and shields in place. Never place your fingers in or near a fan shroud or insert any object into the fan(s).
	CAUTION! Trip Hazards exist around welders. Cords, cables, welding leads and hoses pose a trip hazard. Be aware of their location and inform others of their location. Tape and secure them so they will stay out of high traffic areas.

Safety Warnings, Dangers, Cautions and Instructions

	CAUTION! Welded metal can stay hot long after welding is completed. Burns may occur. Always wear gloves or use tongs/pliers when handling welded or cut metal. Remember the heat from the metal may catch other material on fire. Always have a fire-proof area ready to place welded components until they fully cool. Use soap stone or a metal marking marker to label the metal as "HOT" to serve as a reminder to all present in the area.
	CAUTION! Welding and cutting operations generate high levels of ultraviolet (UV) radiation which can burn and damage skin and eyes. The intensity is so high that exposed skin and eyes can burn in a few minutes of exposure. Minimize direct skin and eye exposure to this intense form of radiation by using proper PPE and sun screen where appropriate.
	CAUTION! Do not allow untrained, unqualified bystanders to observe welding. Do not allow others without proper Personal Protection Equipment (PPE) suitable for welding to stand in the welding area or to observe welding and welding related activities. If protection is not readily available, use a welding screen to separate the welding area from the rest of the area. If no protection or screen is available, physically exclude them from the welding area by a wall or other solid divider. Keep all pets and young children away from the welding area.
	CAUTION! Electromagnetic Fields can be generated by this welder and radiate into the work place. The effect of EMF is not fully known. Exercise caution when welding by: NOT draping welding leads (guns/cables) over your shoulders or arms, NOT coiling them around your body, NOT inserting yourself directly between the cables, and by NOT contacting the unit while welding. DO keep the work clamp connected as close as possible to the area of the weld and directly to the object being welded whenever possible.
 	DANGER! Never touch connectors or fittings while this machine is turned on. Keep all safety covers in place when not in use.

About the AlphaMIG 231ms

The AlphaMIG 231ms is a class-leading MIG/Stick welder design from AHP. It is capable of MIG, Gasless Flux-cored, and DC Stick welding. This combination of functions allows the user to cover a broad spectrum of welding needs. This unit's design, combined with its outstanding duty cycle, ends itself well to small fabrication and body shops as well as production facilities.

The MIG process gives the user the ability to join nearly any metal. Even aluminum can be joined with ease (1/8-5/16"). This unit can be used with the optional spool gun which allows the user to weld Aluminum or the standard 10 ft. MIG gun equipped with the optional polymer liner and optional U-groove drive rolls (best for .035 and .045" wire).

The stick welding process provides excellent "on the job site" capability for manufacturing and repair. This unit utilizes the latest in digitally controlled IGBT inverter welding technology, while providing the user with an easy-to-use interface. This unit will run most electrodes up to 1/8" smoothly. When using electrodes with a cellulose flux base, such as E6010 and E6011, the arc gap must be held tight.

The unit comes standard with the following items and features:

- Dual Voltage 120/240V operation capability
- 230A MIG, 180A DC Stick Output
- Spool Gun capable (Spool Gun is sold separately)
- Euro-Type Quick Connector
- 24 series MIG gun 3m (10 ft)
- 250A Stick Electrode Holder 2m (6.5ft)
- 250A work clamp 2m (6.5 ft)
- Billet Brass Floating Ball type MIG Ar/CO_2 Gas regulator
- MIG Tips
- 240V to 120V Stepdown pigtail adapter

Ahp Warranty Statement

WARRANTY ONLY APPLIES TO UNITS WITH PROOF OF PURCHASE FROM AN AUTHORIZED DEALER. NO EXCEPTIONS. PLEASE FEEL FREE TO REQUEST A LIST OF AUTHORIZED DEALERS.

The AHP Golden Circle Warranty:

All new AHP welders, shall be warrantied to the original owner for a period to extend for 3 years from date of purchase against breakage, malfunction, or other unit failure resulting from manufacturing defect. The faulty unit will either be repaired or an exchange will be made for a new or factory reconditioned unit at AHP Welds discretion. The customer must contact the technical support team to review unit failure so that the warranty claim can be established. Items such as electrodes, contact tips, nozzles, cups, shields, liners etc, considered to be consumable items, are NOT covered under warranty. Torches, foot pedals and spool guns are warrantied for a period of 6 months. Additionally, certain items such as torches, foot pedals and easily serviced parts may be individually exchanged without returning the entire unit assembly should a failure with these items occur, at AHP Welds discretion. AHP Welds will not be responsible for time/contract loss from unit failure, damages occurring from improper or unskilled operation, damages resulting from improper maintenance, improper wiring, poor quality power sources, abuse or neglect. Nor will AHP assume responsibility for the customer's failure to heed/read safety instructions, to read and understand operator's manual, obey occupational laws or to ensure the unit's safe operation complies with state or local laws, personal injury arising from the inherent risks involved with welding, including burns, electric shock or death. Warranty extends only to the machine, its accessories and parts contained inside as stated above. No other warranty is expressed or implied.

In the event of unit failure or malfunction, the customer must contact AHP to obtain a location of a designated return/repair facility. The replacement/repaired unit will then be returned to the customer. Additionally for USA customers, AHP offers shipping coverage in the lower 48 states for a limited time. Please call with receipt to verify shipping coverage status. After the shipping coverage time ends, the customer shall be responsible for all shipping and handling costs both ways of non-functioning units for repair or replacement. **Customers located outside of the USA lower 48 states will have to pay shipping and handling charges both ways from the purchase date.** It is the customer's responsibility to adequately insure the unit, as AHP is not responsible for lost or damaged returns. Labor coverage only applies if the unit is serviced at our facility or one of our authorized dealers. We will not reimburse the labor if the customer decides to have a third-party or unauthorized repair technicians work on the unit. **View full warranty, terms of sale and shipping details here: https://ahpwelds.com/**

AlphaMIG 190MP Specifications

Input/Output Operating Range

Input Voltage	Welding Process	Operating Range A/V	OCV
120V (± 10%)	DC MIG	30-125A, 15.5-20.25V	60V
120V (± 10%)	DC Stick	10-100A, 20.4-24V	60V
240V (± 10%)	DC MIG	30-230A, 15.5-25.5V	60V
240V (± 10%)	DC Stick	20-160A, 20.4-27.2V	60V

Duty Cycle Range

Input Voltage	Process	50%	60%	100%
120V (± 10%)	DC MIG	125A @ 20.25V	115A @ 19.75V	90A @ 18.5V
120V (± 10%)	DC Stick	100A @ 24V	90A @ 23.6V	70A @ 22.8V
240V (± 10%)	DC MIG	230A @ 25.5V	200A @ 24V	160A @ 22V
240V (± 10%)	DC Stick	180A @ 27.2V	160A @ 26.4V	130A @ 25.2V

Input Demand Inrush / Rated Effective Current

Consult a local, licensed electrician before wiring your electrical connections.
Reference Article 630 of the NEC for correct welder wiring code information.

Voltage	I_{1Max} / I_{1Eff} (Inrush/Rated)
120V 1Ph 50/60Hz	30/ 22A
240V 1Ph 50/60Hz	38/27A

Weight / Dimensions / Other

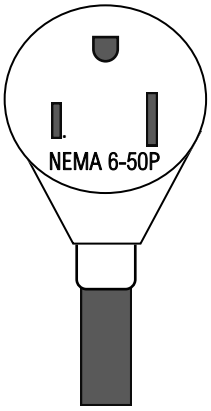
65 lbs. / 18" H X 11.25" W X 26" L / Ingress Rating IP21S
Use between 14°F and 104°F
Store between –20°F and 120°F

Features

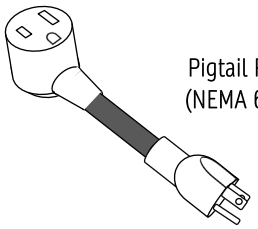
Feature	Range
Process	DC MIG, and DC Stick
MIG Wire Speed	120V: 60-425 IPM/ 240V: 60-600 IPM (No load)
MIG Wire Feeder	4 roller system with .023-.045" (.6-1.2mm) V-groove roller inc.
Wire Spool Diameter	8" and 12" (10-12 lbs and 30-44 lbs.)
Remote Function	2T/4T Switch Control Sequencer or Pedal Control
Pre/Post-Flow	Auto/Off
Spot Timer	Yes
Stitch Timer	Yes
MIG Inductance	Yes
Stick Hot Start	Yes
Stick Arc Force	Yes
Stick Electrodes	E6013, E6010, E6011, E7014, E7018, 309L and others

IMPORTANT: Be responsible. *Consult a local, licensed electrician before wiring your electrical connections.* Reference Article 630 of the NEC for correct welder wiring code information. The code is different for wiring a welder circuit than for household circuits.

This unit uses a NEMA 6-50P for 240V use. This is the standard welder plug for 240V 1 phase use in North America.



This unit is supplied with a 240V to 120V pigtail adapter. No internal adjustment or change is required to use it on 120V. Simply install the adapter. The unit will adjust automatically.

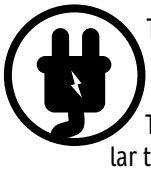


Pigtail Power Adapter
(NEMA 6-50R to 5-15P)

CAUTION: Use only with extension cords 50 feet long or less, rated for 240V welder 50A use, or damage may result. For 120 operation, use only with 30A rated cords, less than 25 feet in length.

NOTICE: Place the unit at least 6 feet away from the weld area. The cooling fan is powerful enough to blow the shielding gas off the weld. The fans do run continuously and are used to provide the high duty cycle of the unit.

Generator Operation Information



This unit may be used with any clean power rated 240V generator with a 9500W Surge Watt rating. Clean Power is defined as 5% or less Total Harmonic Distortion (THD). This means the generator produces a clean sine wave similar to what is produced by power companies. If operating on a 120V generator, a 30A receptacle must be available and adapted for use. Additionally 5% or less THD is still required. The generator must not share "duties" with other tools or appliances.

NOTICE: Operation with generators not rated by the generator manufacturer as a "clean power" source is prohibited and will void the warranty. Many manufacturers produce a version or series of their generators that produce clean power. This is usually stated up front. If not, consult the manufacturer of the generators to confirm THD. Clean power generators are made in both inverter types and conventional types of generators. Do not assume all inverter type generators produce clean power unless the manufacturer states it. Clean power is needed for most electronic equipment to prevent damage.

Duty Cycle Performance

The MIG/Stick duty cycle of this machine has been established at 50% while operating at the following Amperages. 120V: MIG @ 125A, Stick @ 100A.
240V: MIG @ 230A, Stick @ 180A
Duty Cycle is the amount of time, out of a solid 10 minute block of time that the unit may operate at the rated setting. For the example of 50% @ 230A, this means the unit may be operated up to 5 minutes continuously (or intermittently) out of 10 minutes of time before overheating. The balance of time remaining in the 10 minutes (5 minutes in this example) should be spent letting the unit rest without welding but while the unit is continuing to run and cool. As Amps are lowered, or as the ambient temperature decreases below the 40°C testing benchmark, duty cycle will increase.

It is not necessary to try to keep up with the duty cycle exactly by timing it or recording it. The unit is equipped with a thermal sensor which will trigger an interruption of operation if the temperature has been exceeded. Keep in mind this is not a timed feature. A duty cycle statement is based on time welding at a particular amperage, but because so many variables exist, and ultimately the unit's temperature is the regulating concern, duty cycle is determined by a preset operating temperature threshold, rather than a timed one.

If you have triggered the duty cycle interrupt on this machine, allow the unit to cool for a full 15 minutes. The unit should automatically reset during this time, but allow a few more minutes so the machine can cool sufficiently so as not to overheat quickly. If it does not reset during this time, turn the machine off and back on to reset it.

Even though this unit is equipped with a duty cycle safety feature, intentionally and repeatedly surpassing the duty cycle will shorten the lifespan of the unit. Routine overheating damage will usually leave signs that can be determined during warranty repair. Damage caused by intentional abuse of the duty cycle will not be covered under warranty.

If you find that you are constantly running into duty cycle issues, it is likely you will need a bigger machine, or need to adjust your welding strategies to comply with the duty cycle limits of this machine.

To assure maximum lifespan of the unit, never block the cooling vents in the rear, sides, or front. Keep the unit 16" away, on all sides, from any obstacle to free air flow such as a wall or partition.

Required Routine Maintenance

Most places where a welder is in operation, floating and flying debris are factors that can lead to internal damage and failure. Dust, dirt and sparks are often present in the air. The machine will draw these contaminants in during operation and they can be deposited inside the machine onto critical components. These particles can conduct electricity and create new circuit paths, not only causing poor operation, unit lock up, but it can also cause long term damage. **For this reason, the machine should be opened up and cleaned with dry, compressed air on a regular basis, once every month in heavy use, and ever 3 to 6 months under light use. If the unit remains stored most of the time, dust still will accumulate, and this should be done at least every 6 months. When not in use, keep the machine covered. Failure to do so constitutes neglect and may void the warranty.**

To clean and service this welder:

1. Unplug the welder. Wait 10 minutes for the capacitors to discharge. (To prevent electrical shock or electrocution.)
2. Put on a pair of safety glasses to prevent debris from blowing into your eyes during this operation.
3. Remove the top handle.
4. Remove the steel cover screws.
5. Pull the cover up and to the rear while carefully watching for wires that may catch on the louvered vents of the cover.
6. Check all wires and connections to make sure they are seated and/or tight.
7. Use dry compressed air (or "canned" air) to blow the air off connections, boards, and fittings. If the unit is particularly dirty, unseat the affected connectors themselves, and blow out the connections as well.
8. Reassemble the unit. Do not forget the handle!

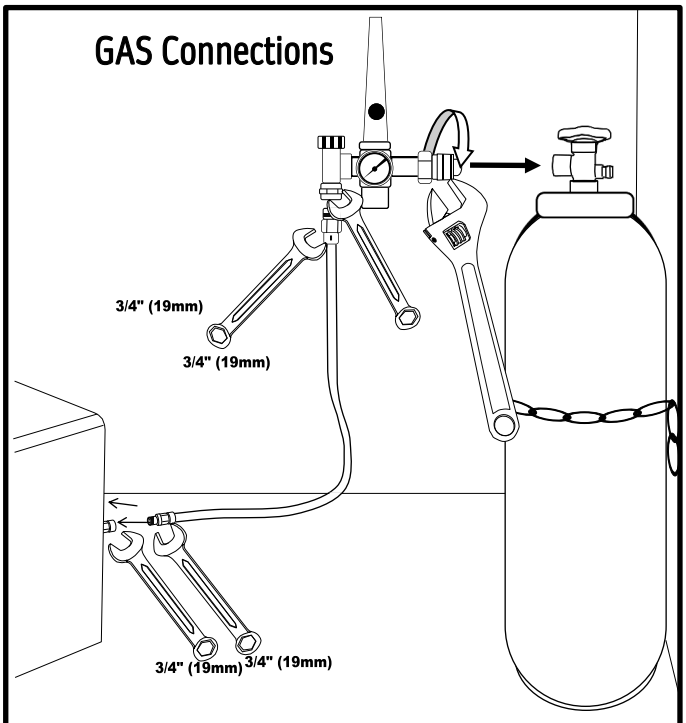
NOTICE: *Opening the unit to clean and check connections will not void the warranty. In fact it is required to maintain your in-warranty status during the duration of your warranty. However, under no circumstances should you attempt to modify or make unauthorized changes to the welder or its programming. To do so will void the warranty.*

Shielding Gas Information

Before you connecting the shielding gas, please note that the shielding gas connection is located on the rear of the unit. This connection is a 5/8" CGA connection, which is the standard MIG gas connection for North America.

REMEMBER: *Always close the gas valve when turning off the welder to prevent unwanted leakage and wasted gas. Shielding gas may fill a room if leaks occur and can cause asphyxiation.*

The regulator is a floating ball type. This means that when gas is flowing the ball in the clear cylinder will float, indicating not only that gas is actively flowing, but also the amount of gas flowing through the regulator. This type is more accurate in general than the gauge type, and is easier to read at a distance. When installing the regulator and making it ready for use, be sure to snug all fittings using two wrenches. One will hold the stationary fitting, the other will be used to turn the rotating fitting. If you do not hold the stationary fitting, either on the regulator, or on the back of the unit, you can crack or damage the fitting. Once installed, and all fittings have been tightened, test all fittings for leaks with a spray of warm soapy water (or leak detector) to check for leaks. If bubbles are present, retighten. Do not use thread sealant, locking compound, anti-seize or tape to seal the threads. If the threads do not seal, remove and check the connections for debris or pieces of metal on the sealing surfaces.



Remember to select the proper gas for the type of welding you are performing. Also double check the correct gas line is connected to the correct fitting. This happens more often than you may realize!

This unit can accommodate multiple gases for different applications. However, when using 100% C02 you will need to purchase a different type of regulator that is specific for CO_2 shielding gas rather than the regulator supplied with the welder that is designed for pure Argon and Ar/CO_2 mixes. However, the input connection at the rear of the unit should remain the same.

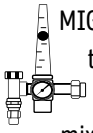
When you open the cylinder valve, do so slowly and stand to the opposite side of the cylinder. Do not stand directly in front or behind the regulator, in case of damage to or malfunction of the regulator. Open the cylinder slowly, but open the cylinder valve completely. Cylinder valves may leak if they are not fully open or fully closed.

Gas flow rates will vary by process and cup/nozzle size Fpr MIG with mixed Ar/CO_2, gas flow rates typically range from 20 to 30 CFH, and may need a minimum of 35 to 40 CFH for welding Aluminum. Of course, the larger the nozzle, and greater the turbulence in the area, greater gas flow rates may be needed. These is just general rules. More or less gas may be used, depending upon the circumstances. *Use the information below to select the proper shielding gas.*

- **Steel:** For Short Circuit Transfer use 75/25 Argon/CO_2. (75% Argon/25% CO_2). For Axial Spray Transfer use 90/10 Argon/CO_2 (90% Argon/10% CO_2).
- **Stainless:** 98/2 Argon/CO_2. or Tri-MIX. Tri-Mix has Helium as a component and is very expensive. It is only used for short circuit transfer welding of Stainless. 98/2 Argon/CO_2 is a cheaper alternative and can be used for Short Circuit or Spray Transfer. 98/2 Argon/O_2 can be used, but it can be too hot for thin materials and is good for Spray transfer only. Do not use pure Argon.
- **Aluminum:** 100% Argon. This is the only gas that is to be used with Aluminum MIG on this welder. MIG aluminum welding should welded with axial spray transfer and not short circuit transfer. Short Circuit transfer will result in weak welds.

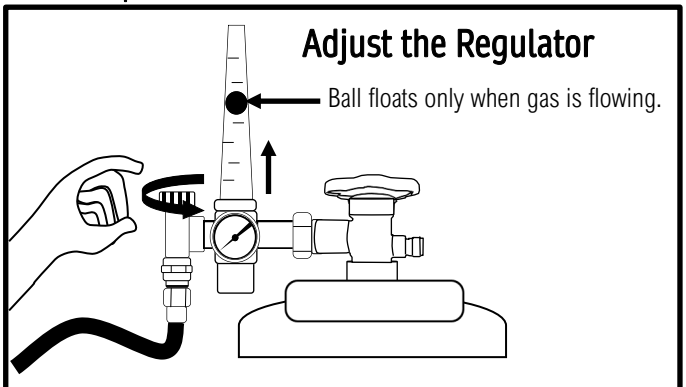
IMPORTANT: This unit is suitable for welding steel or stainless in axial spray (a.k.a Spray Arc) transfer with .035" steel or stainless wire for up to 3/8 to 1/2" in multiple passes. However, extended use will overheat the standard gun. Contact AHP for larger gun options. However, since Aluminum sprays at a much lower threshold, and Axial Spray is the recommended way of welding Aluminum with the MIG process, this unit may be used for light spray arc use with welding aluminum from .090" to 5/16". Aluminum less than .090" should not be welded.

Adjusting The Regulator



MIG flow rate requirements can vary by application and metal type. However, the process of setup is the same. Keep in mind this flow meter is only for 100% Argon and Argon/CO_2 gas mixes. It is not designed for 100% CO_2. If used with 100% CO_2, source a regulator direct from your cylinder supplier.

- Switch the unit on. While holding the MIG trigger (or spool gun trigger), start opening the the regulator valve by twisting the regulator adjustment knob counter clockwise As you open the valve, the floating ball will begin to rise. **NOTICE:** *To avoid spooling out and wasting wire during this time, release the tension on the drive wheels by flipping the tensioning lever to the down position before you begin. This will release tension and allow the drive rolls to safely turn without feeding any wire.*
- For Steel and Stainless MIG, increase the gas flow rate to a beginning point of 20-25 Cubic Feet Per Hour (indicated on the clear gauge with the floating ball by CFH). If welding Aluminum, increase flow rate to 35 to 40 CFH. Read the middle of the ball for the best reading. **Do not confuse pressure on the cylinder gauge with the flow rate on the floating ball gauge. Pressure present on the cylinder gauge does not mean gas is flowing. However, a lack of pressure on the gauge may mean there is no gas flowing.**
- Once adjustment is completed release the trigger. The gas will delay slightly until the post flow timer automatically shuts off the gas flow. The ball will settle. **If gas continues to flow after the arc has stopped for more than a few seconds, the gas solenoid may have stuck. Contact AHP for maintenance (cleaning) and repair solutions.**



Turning the adjustment knob counterclockwise (when viewed from the top) increases flow rate. Turning the knob clockwise until it seats will shut off gas flow at the regulator. Do not use the regulator to shut off the gas flow. Shut off the gas flow at the cylinder when the welder is not in use for more than 20 minutes.

- When welding it may be necessary to increase or decrease gas flow rate to compensate for conditions. If you are welding outdoors or in drafty conditions, increase the flow rate until weld porosity disappears. In extreme cases, you may need to set up a tarp or plywood to serve as a wind-break. In mild conditions, if a breeze is lightly blowing, you can position your body to block the wind. *Alternatively, you can choose to weld with flux-cored wire or use the stick function to eliminate this problem.*
- If you are concerned about wasting gas, or think gas consumption is too high, you may turn down the gas. While testing on scrap metal, turn the gas down incrementally until bubbles and porosity just begin to appear. Once they appear, adjust the regulator slightly so that they once again disappear. When bubbles fully disappear, add another full CFH and you will have a properly adjusted regulator.
- When pressure on the cylinder drops below 500 psi, it is common to have to readjust the flow regulator to compensate for the lower pressure. Pressures under 100 psi may create unstable gas flow or exhibit contamination symptoms while welding. Keep a full spare cylinder handy if working on weekend projects.

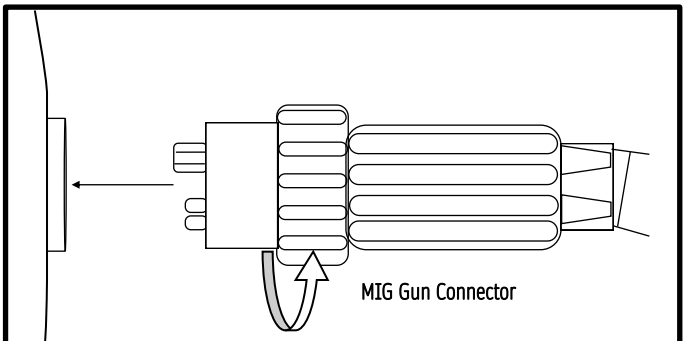
NOTICE: If you are planning on welding during holidays or during weekends, always take notice of the cylinder pressure well before hand. This will allow you time to get another cylinder before stores close for the holidays or weekends. If possible, you may want to purchase a 20CFH cylinder in addition to the regular gas cylinder that you lease or purchase so that you have a backup cylinder in case of an emergency. A 20CF cylinder will last an hour or two of intermittent welding. An 80CF cylinder may last up to a day to a day and a half of fabrication if being used intermittently. An 125CF cylinder may last anywhere from a day to three days of fabrication. A large 300 to 330CF cylinder can last a week with regular fabrication use. However, with production welding these time estimates given may be cut anywhere by 1/2 to 2/3's. All but the largest cylinders are typically available for purchase locally. Some companies limit maximum purchase size cylinders to 80 CF, while others may allow up to 125CF. Cylinders larger than 125 CF are seldom available for purchase. The smaller cylinders are relatively inexpensive and can even be bought "pre-loaded" with shielding gas and can also be refilled when empty.

WARNING! *Don't purchase large cylinders from private individuals unless accompanied by a genuine original bill of sale from the gas company. It is common for individuals to sell leased or rented cylinders (knowingly or unknowingly). Gas supply companies may confiscate these cylinders if presented for refill if you cannot establish legitimate ownership. They will also refuse to fill them if they are owned by another gas supply company. Don't buy a stolen cylinder.*

Installing the MIG Gun

After inspecting the unit for power up, it is necessary to confirm wire feed operation. This is a simple process that requires you to install the MIG gun on the unit. To install the MIG gun:

- Locate the 10 ft. 24 series MIG gun in the accessory box. Uncoil the gun and straighten it out.
- **Refer to the drawing below.** Line up the Euro-Connector on the end of the gun with the connector on the unit, making sure the protruding pins are lining up with the corresponding hole.
- Once the pins are lined up, push the connector in until it is seated. Hand tighten the collar nut clockwise. **Do not overtighten or use tools or damage may occur.**
- Once the nut is tight, gently shake the connector to confirm that the gun is fully seated and the nut is still tight.
- After you install the MIG gun, set the wire speed knob to maximum. Open the MIG door so that you can see the drive feeder mechanism. Set the wire feed control to the maximum setting. Pull the trigger to check that the drive mechanism is turning. If it does not turn, check the MIG gun connection once again. If the drive wheel fails to rotate, contact technical support for further assistance.



Rotate nut clockwise (hand tight).

IMPORTANT! Remove MIG Gun while using Stick process. The MIG Gun will remain live if connected. If it comes into contact with metal, the MIG Gun may short out, and may cause damage to the unit. Personal injury may also occur.

Selecting Polarity

Selecting the correct polarity for the welding Without the correct polarity, weld quality and weldability of a metal will be an issue. Incorrect polarity can also cause undesirable operation of the welder such as excess spatter, birds nesting of the wire, wire/electrode sticking, excessive Tungsten/consumable wear, poor penetration and even arc instability. See the following images to determine which polarity should be used with your process. Always double check, especially after switching over processes that you have the correct polarity. **In MIG, if you forget to change the work clamp but change the polarity under the cover, or vice versa, you will not even get a spark.** If something doesn't seem right about the way the welder is welding, or there is no arc at all, always check your gun/torch polarity first. Then check your work clamp location and make sure it is direct to the part being welded. If this has been checked and things still don't seem to weld well, consider replacing the work clamp. Inspect it for burns, corrosion, missing copper strap, damaged hinge joint. Stop and inspect the cable for tightness also.

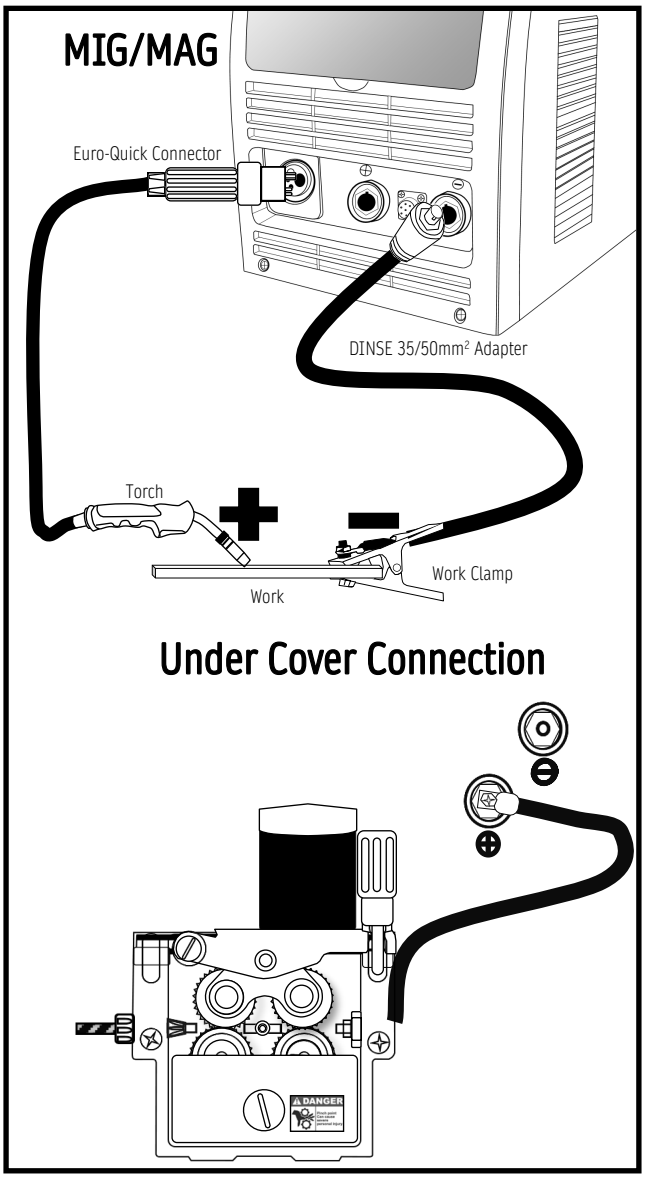
MIG/ Flux-Cored Polarity

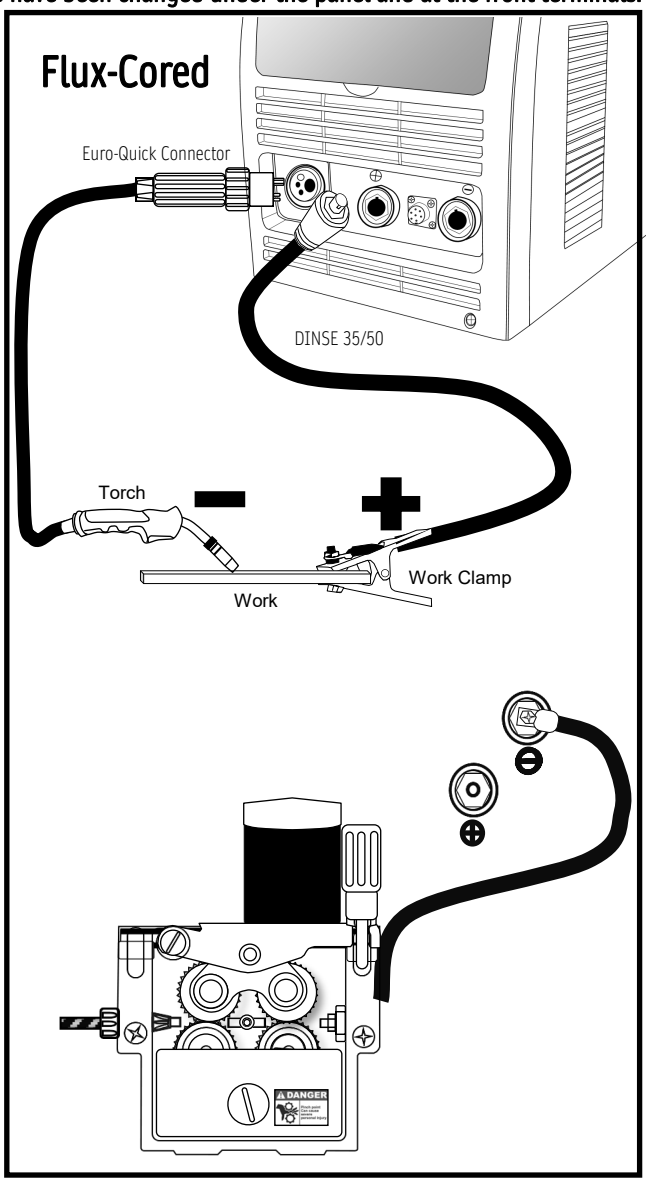
MIG and self-shielded Flux-Cored are similar processes. However MIG uses a shielding gas, while self-shielded Flux-Cored wire inner core provides the shielding without gas. Because of the difference in the way solid MIG wire is formulated and the way self-shielded Flux-Cored wire is formulated, the polarity required to weld is different.

For MIG, the torch will be used with the wire feeder connected to the positive terminal under the cover and the work clamp will be located in the negative terminal on the front panel of the machine. Drop open the cover on the left side of the MIG to access the wire spool and feeder. Just above the feeder, the are two terminal lugs. The lower is positive, and the upper is negative. If there are no positive (+) or negative (-) symbols, there may also be a label that says "Gas MIG" and "Gasless" or something similar. Regardless, the lower terminal is positive and the upper terminal is negative. For MIG, the wire feeder cable should be connected to the lower positive (+) terminal via the provided screw.

For Flux-Cored wire, the torch will be used with the wire feeder connected to the negative terminal under the cover, and the work clamp will be connected to the positive terminal. When welding most all gasless flux-cored wires, polarity will be negative. There are a small number of exceptions. However, if the manufacturer doesn't state the polarity, assume it is negative. Drop open the cover on the left side of the MIG to access the wire spool and feeder. Just above the feeder, the are two terminal lugs. The lower terminal is positive, and the upper is negative. If there are no positive (+) or negative (-) symbols, there may also be a label that says "Gas MIG" and "Gasless" or something similar. Connect the wire feeder cable to the upper terminal lug via the provided screw.

See the illustrations below for proper polarity for MIG and Flux-Cored setup.



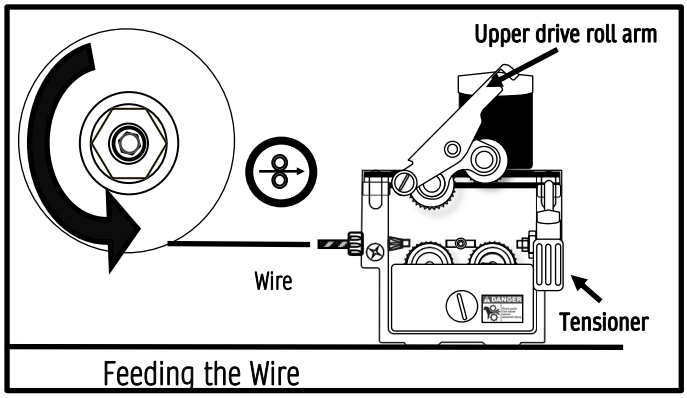


NOTICE: MIG is particularly susceptible to issues with poor work clamp connections. Improper connection can lead to arc outages, and spatter. When connecting the work clamp, always be sure that you have it connected directly to the part being welded. Connecting to the table, through a vice or fixture may cause arc instability and even loss of weld power through resistance. If you are not able to connect directly to the part being welded, consider using a jumper wire, or at least connect as close as possible and grind a clean connection point where the work clamp will be. This will help achieve the best weld and offer the best transfer of power to the weld puddle. **Don't forget to swap from electrode negative back to electrode positive when switching from Flux-Cored to MIG or to Stick or vice versa. If the unit acts as if there is no output check that both positive and negative connections have been changed under the panel and at the front terminals.**

MIG Wire Installation and Tension

The spool carrier assembly consists of several parts. Each part must be assembled correctly. **See the illustration on the next page.** The carrier supports both 8" and 12" diameter spools of wire. For 8" use, the unit should be used with the adapter. Some brands of wire spools may not fit flush on the spool holder assembly. This is because the locating hole on the spool is too shallow. The spool hole may be drilled out or the locating pin on the inside collar may be trimmed if needed. the locating pin on the collar until it fits flush. **NOTICE:** The wire spool must be installed so that the wire unwraps and feeds into the feeder from the bottom of the spool and the spool turns counter-

clockwise.. It should never be installed so the wire comes over the top. When installed properly, the spool will turn counter clockwise.

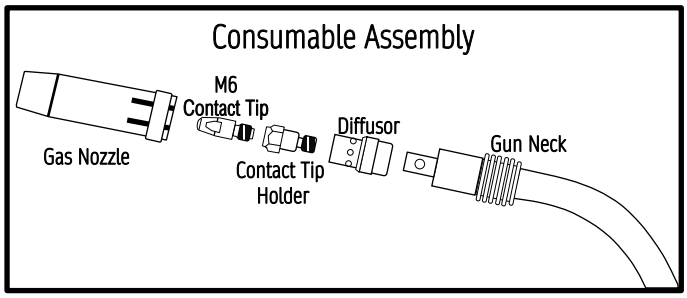


Feeding the Wire

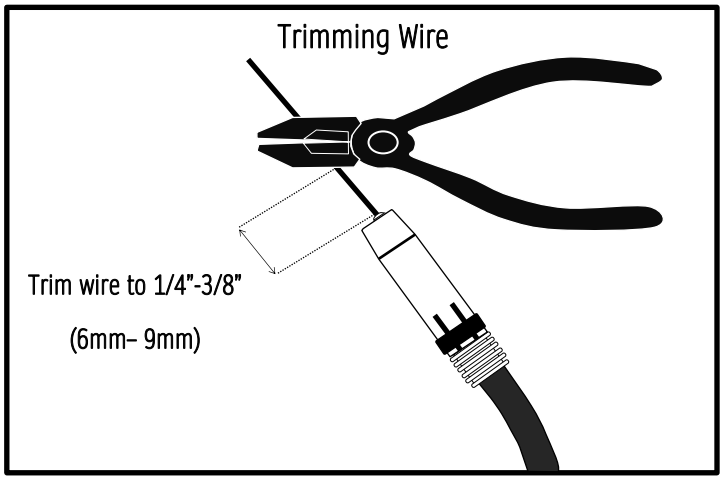
See the above illustration for proper rotation Small diameter wire such as .023" wire is not recommended unless a smaller (blue) liner is installed into the standard MIG gun. Gun length for .023" and. .030" wire should not exceed 10 ft. 4" diameter spools of wire cannot be fed directly from the machine however. If you wish to feed 4" rolls or if you want maximum distance feeding, the spool gun option is best solution. For welding Aluminum the unit can weld with .035" or .045" Aluminum wire direct from the unit and standard gun (10 ft) as long as the optional polymer liner and U-groove drive rolls are installed. Of course, the optional AHP spool gun may also be used. However, with .030" wire, the maximum wire feed speed will be barely enough to keep up with the melting rate of the wire and many "burn back" to the tip events will occur. Larger wire requires a slower wire feed speed to deliver the same Amperage. This is why .035" and .045" wire is recommended while welding Aluminum. Minimum weld thickness for Aluminum is usually considered between 11 gauge and 1/8" due to the spray arc nature of it. The AHP 200A Spool gun is calibrated and best synchronized for this unit. Gently guide the wire from the spool over through the wire feeder and into the front section of the gun at least 6 inches. Make sure the wire lays neatly in the groove. Hold it with your finger if necessary as you lower the top drive roll down and raise the tensioning lever with your other hand. When complete the wire should look like the illustration on the previous page. *Hint: The wire on the spool is usually bent and threaded through a small hole in the side of the spool to lock it in place and prevent de-spooling of the wire. Keep one hand on the wire spool to prevent de-spooling and cut the wire loose with a pair of wire cutters. Trim the wire to make sure the end of the wire is straight and able to be threaded through the wire feeder mechanism and gun.*

After the tensioner is raised back to the vertical position, confirm the wire is still in the groove and is not riding up on the shoulders of the drive roll.

Be sure to turn the welder on. Then, remove the gas nozzle and unscrew the contact tip as shown in the illustration below.



Hold the gun cable and gun straight as possible. Press and hold the cold feed wire button on the panel. The wire should slowly begin to feed through the gun cable and eventually through the gun. As the wire exits the gun, allow 3 to 4 extra inches of wire to be fed out past the diffusor. Re-install the contact tip over the wire and screw it in clockwise until it is tight. Be careful not to strip the threads. Install the gas nozzle. Trim the wire before welding. See the illustration below.

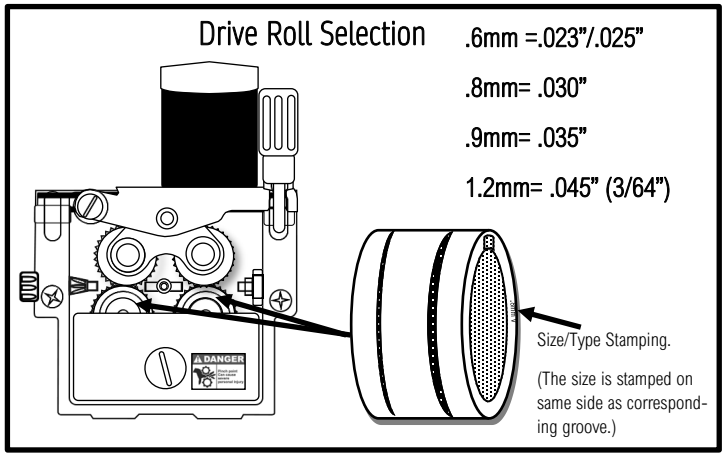


The unit comes with and .035" and .045" drive rolls installed. NOTICE: *For most purposes you will likely want to use .035" wire in this unit since it covers the greatest range of metal thicknesses and amperages within the capability of this unit.* However, if you change wire size or type, you will need to change the drive roll to the correct size and type. There are extra sizes and types in the bag for the consumables.

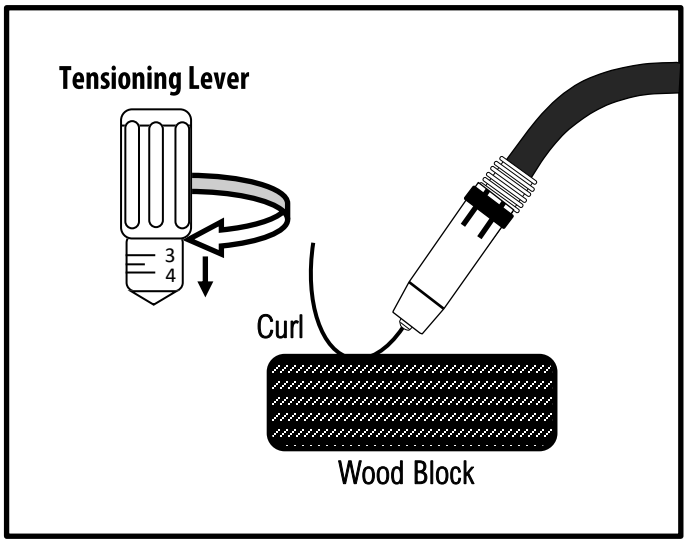
This unit uses four drive rolls to feed the wire. The top drive rolls are actually driven smooth rollers that serve to hold tension and keep the wire in the groove. These are not changeable. Only the bottom drive roll needs to be changed. On each bottom drive roll there are two small grooves that are sized for .035"and .045" wire. If you need other sizes, remember that additional sizes and types of drive rolls are included in the packaging. The standard installed drive roll is meant to feed hard (solid) steel wire. The groove on this drive roll has a "V" shape designed for the solid wire. You will also find Flux-

Cored drive rolls in the packaging that have a serrated edge to the groove, which grips the softer, cored wire. Viewing a flux-core drive roll from the top, you will see a "zipper" like pattern. This should never be used to feed hard steel or stainless wire or aluminum wire. This will result in damage to the wire, metal flaking and possible plugging of the MIG gun liner. To determine the exact size of wire and type you have, look at the side of the drive roll. The size of the drive roll groove is stamped on the side of the drive roll closest to the corresponding groove. The type of the drive roll will also be stamped with a V if it is for solid hard wire. If it is stamped with a "U", this is a special drive roll for feeding aluminum wire. Aluminum wire is best fed with a spool gun.

The drive roll has a safety cover held in place by a slotted screw. Remove this cover to access the drive rolls. Also, the drive rolls are held in place on the shaft by slotted screws. Use a flat head screw driver to remove the screws on the cover and drive roll shafts. Eash drive roll is mounted on an inner bushing that slides over the shaft. The bushing should be held in place with one finger of one hand while the other hand removes the drive roll. This will prevent both bushing and drive roll from being removed from the wire feeder drive shaft. When removing make sure that the square locating key is not dismounted. If the key falls out, replace it before replacing the drive roll. The drive roll size is located on the same side that the groove is closest to. So install the drive roll with the size desired facing in. This may be different from your experience with other brands. Always remember to check for correct sizing before welding or slippage may occur. Reassemble the drive rolls in reverse order. The screws have knurling on the outer edge for grip so use only finger-tight pressure to tighten the drive rolls. Do not reassemble the drive rolls with the screwdriver. Overtightening the drive rolls with the screw driver may strip the screws.



CAUTION: The drive rolls create a pinch point. When reassembling, you must reinstall the safety cover or personal injury or unit damage may occur. Do not leave this off during reassembly.



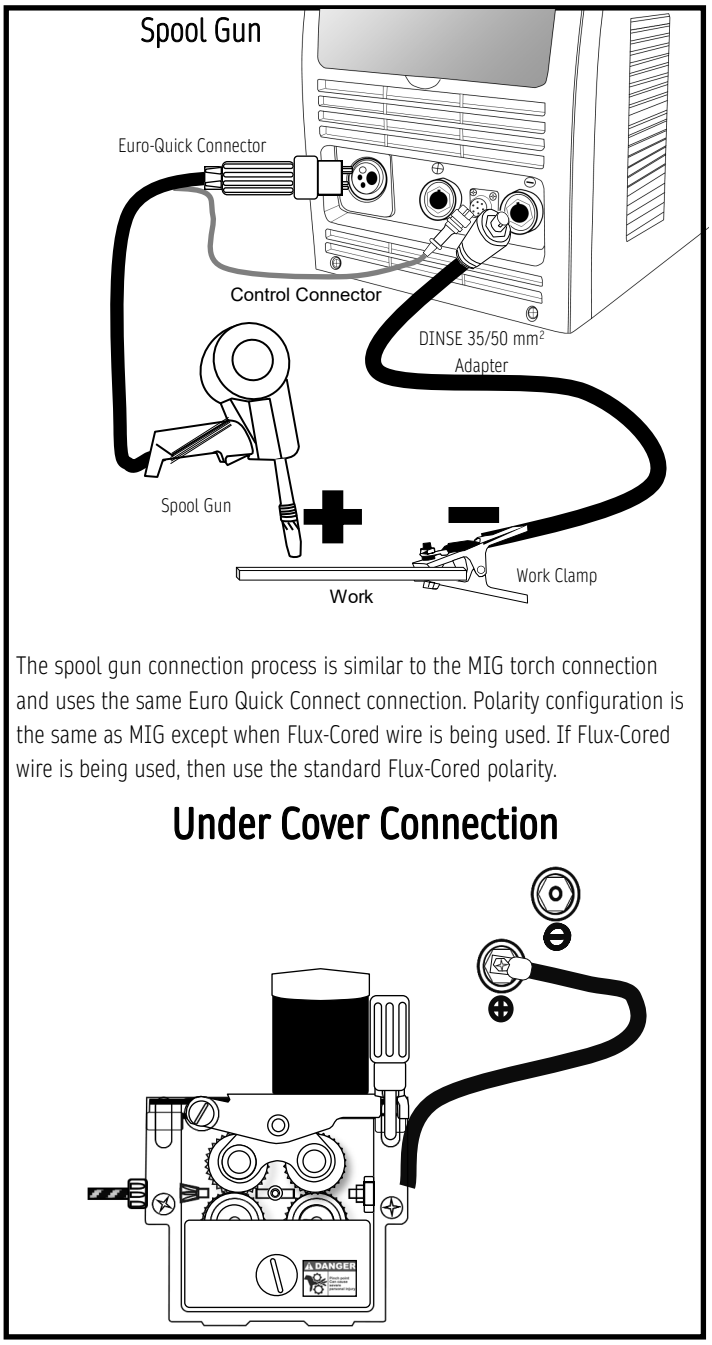
To feed the wire properly, the wire must be tensioned properly before you begin welding. The tensioning lever has numbers on the dial. To increase tension, rotate the tension lever clock-wise. Different types of wires require different tensions. There is no exact tension that works for all wire types. However, for steel wire, you will generally tension to at least 3 or 4 on the dial. For flux-cored wire, it may only require a setting of two or three. Wire diameter also plays a small part in the amount of required tension that is needed. Regardless of the wire type or wire diameter, follow the process below and refer to the following illustration. Turn the unit on and pull the trigger so that the wire extends approximately 1" beyond the gas nozzle.

- Find a small block of wood, such as a two by four, and secure it to the welding table or other solid object. **Do not test this on metal!**
- Hold the gun approximately 2 inches off the wood. Aim the gun at the block of wood so that the nozzle is at a 30 degree angle to the wood.
- Pull the trigger and allow the wire to contact the block.
- Increase wire tension so that the wire contacts the block of wood and is forced to curl up. Continue holding the trigger so that two or three full spirals are made.
- If the wire stops, or stutters during this process, let go of the trigger immediately and increase tension.
- Adjust the wire until the stuttering or jerking disappears.
- Do not over-tighten the tensioner or use more tension than necessary. When the wire begins to curl without any stoppage, the tension is enough.

Spool Gun Installation.

When connecting the optional AHP spool gun to weld Aluminum or other small 4" diameter spools, selecting the correct polarity is important both on the lower panel and under cover. The Spool gun picks up it's welding power from the Euro-Quick connector as it welds. It does not come through the control cable.

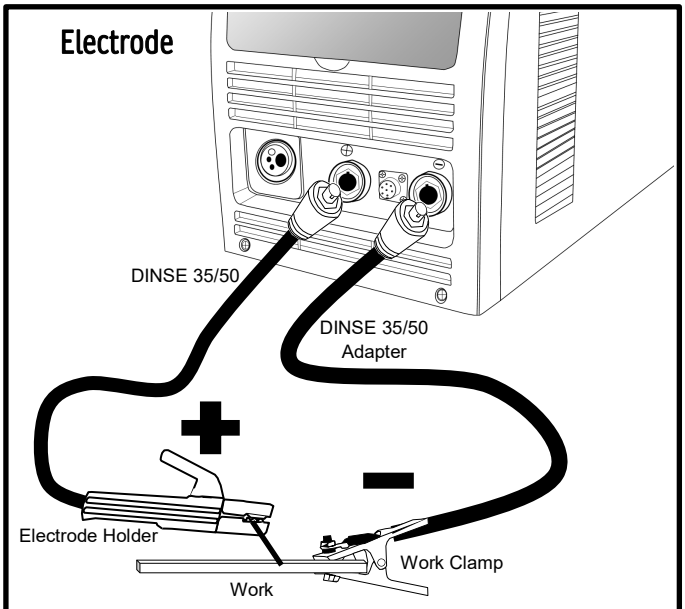
When using the optional AHP spool gun the wire speed control is located on the side of the gun handle. This allows you to control wire speed without having to return to the unit to readjust. However, Voltage will still need to be set correctly on the main panel for proper operation. The main panel will still be used to set the maximum wire feed speed, but the gun will control the wire speed within the range from Minimum speed the unit is capable of up to the maximum wire feed speed you have set on the panel.



The spool gun connection process is similar to the MIG torch connection and uses the same Euro Quick Connect connection. Polarity configuration is the same as MIG except when Flux-Cored wire is being used. If Flux-Cored wire is being used, then use the standard Flux-Cored polarity.

Under Cover Connection

Stick Polarity and Electrode Types



IMPORTANT! Remove MIG Gun while using it in the Stick mode. Gun will remain live if connected. If it comes into contact with metal, the MIG Gun may short out, and may cause damage to the unit. Personal injury may also occur.

Stick welding is usually performed in DC with the electrode positive (DCEP+), or " Reverse Polarity". Some electrodes may be used in either polarity. For example, the E6011 may be operated either in DCEP, DCEN. Some people mistake it for an AC only rod, because of its ability to be used with old style transformer "buzz box" welders that only produce AC current, but in reality it will operate just as well, if not better on DCEP. In most cases, even if a welding rod allows operation with DCEN,it will typically perform better in DCEP. a very rare occurrence. The illustration on the next page depicts the standard connection for most welding rods. Always consult your welding rod manufacturer's recommendation as an ultimate source of information. Usually the box or can will have polarity and Amp range recommendations on it if you are in doubt about settings or polarity.

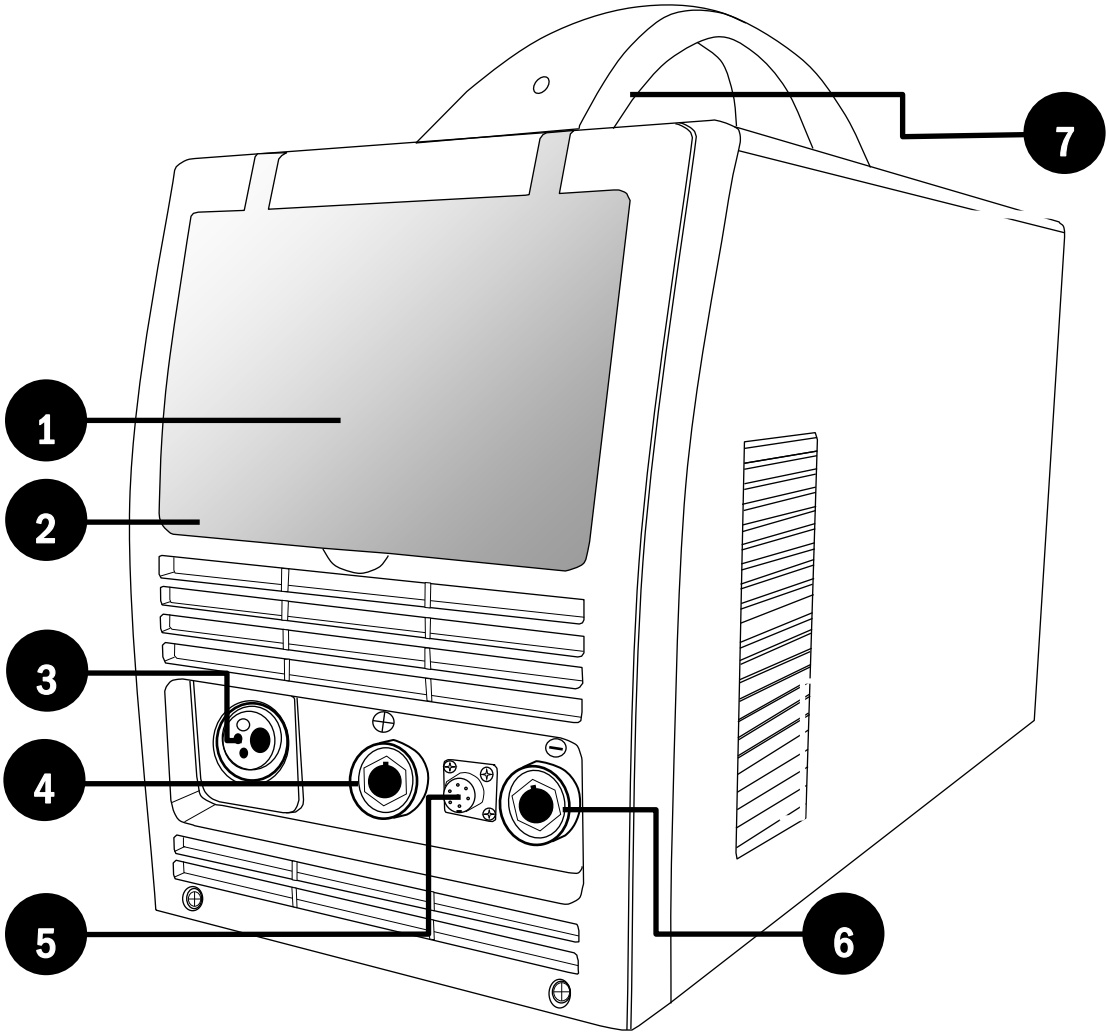
This welder is designed to weld with a variety of welding rods, including E6010, E6011, E7014, E6013, E7018, E7024, and even stainless rods like E309L. When welding with E6010 and other rods with a Cellulose based flux such as E6011 it is best to keep the arc held closely. Exaggerated "whip and pause" technique may result in arc outage. For general purpose fabrication, and practical use, consider using E7014. This is considered a "fabrication rod". With these rods, high-quality, rapid, self-releasing welds can be made. E7014 rods are particularly easy to use, and leave a smooth, high quality appearance, even in the hands of novice users and don't require special storage or hot boxes that E7018 does. The E7014 can be easily drug along the work piece while maintaining an arc. The slag is medium heavy and will self release if the amp range and technique is correct. However for structural and code work E7018 may be required, as will a hot box or rod oven.

IMPORTANT: Whenever welding, this unit performs best with a short arc distance. Long arc lengths will create arc outages. A light drag works best.

This welder has a maximum output of 180 Amps while operating on 240V. This is sufficient to weld with most welding rods up to 5/32". Running larger rods may be difficult and may make the duty cycle interrupt or over current interrupt engage. When operating on 120V, use a 3/32" or smaller welding rod. Operation at higher than 85A while on 120V may trip a 20A circuit breaker,

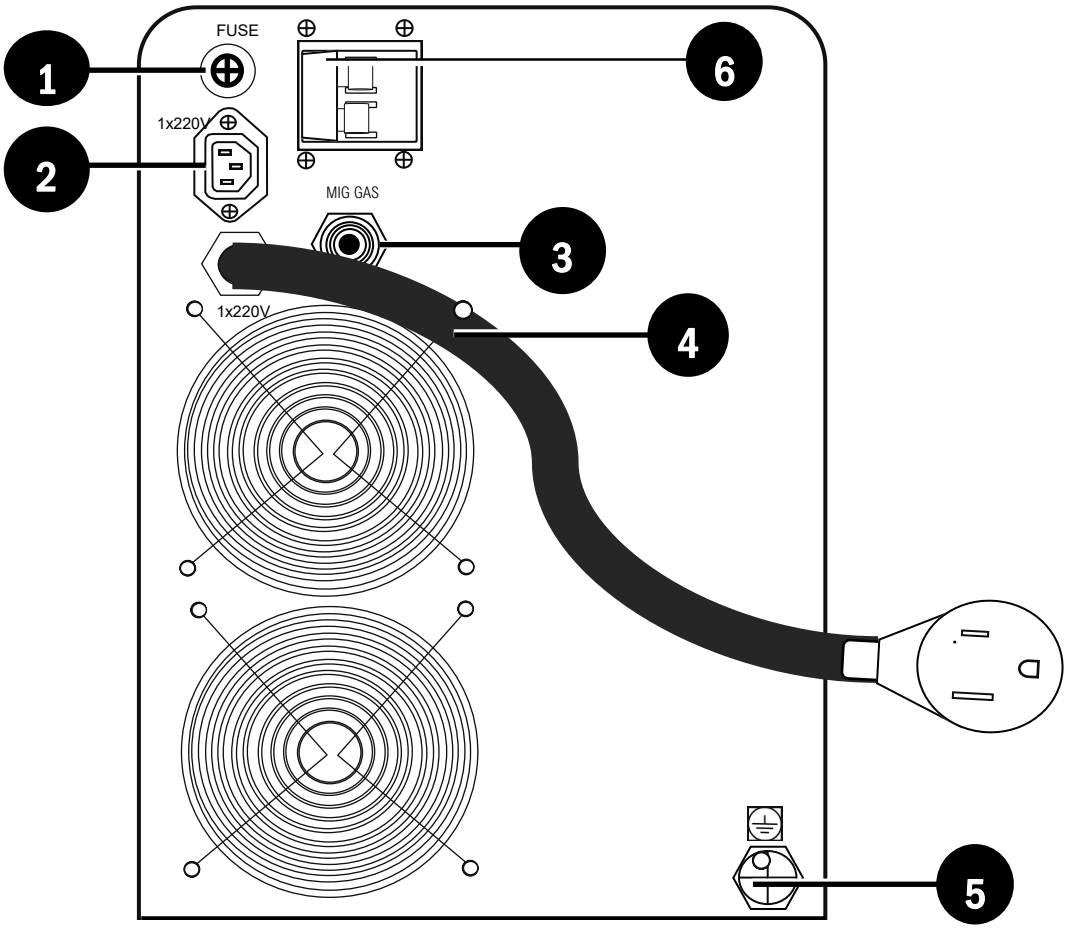
NOTICE: This welder utilizes a slow run-in feature which feeds the wire at a reduced rate until the arc is started. This is designed to improve arc starting and reduce stuttering when the arc is in the process of being initiated. This means the you cannot directly measure or calibrate the wire feed speed unless special machinery is used such as a load bank and a R.P.M meter. This is done for you at the factory and can only be recalibrated in an authorized AHP service center. If you suspect the wire feed speed is not feeding within specifications, contact AHP. When welding, the unit stops reading a static WFS and voltage value and reads actual voltage and amperage output

Front Panel View



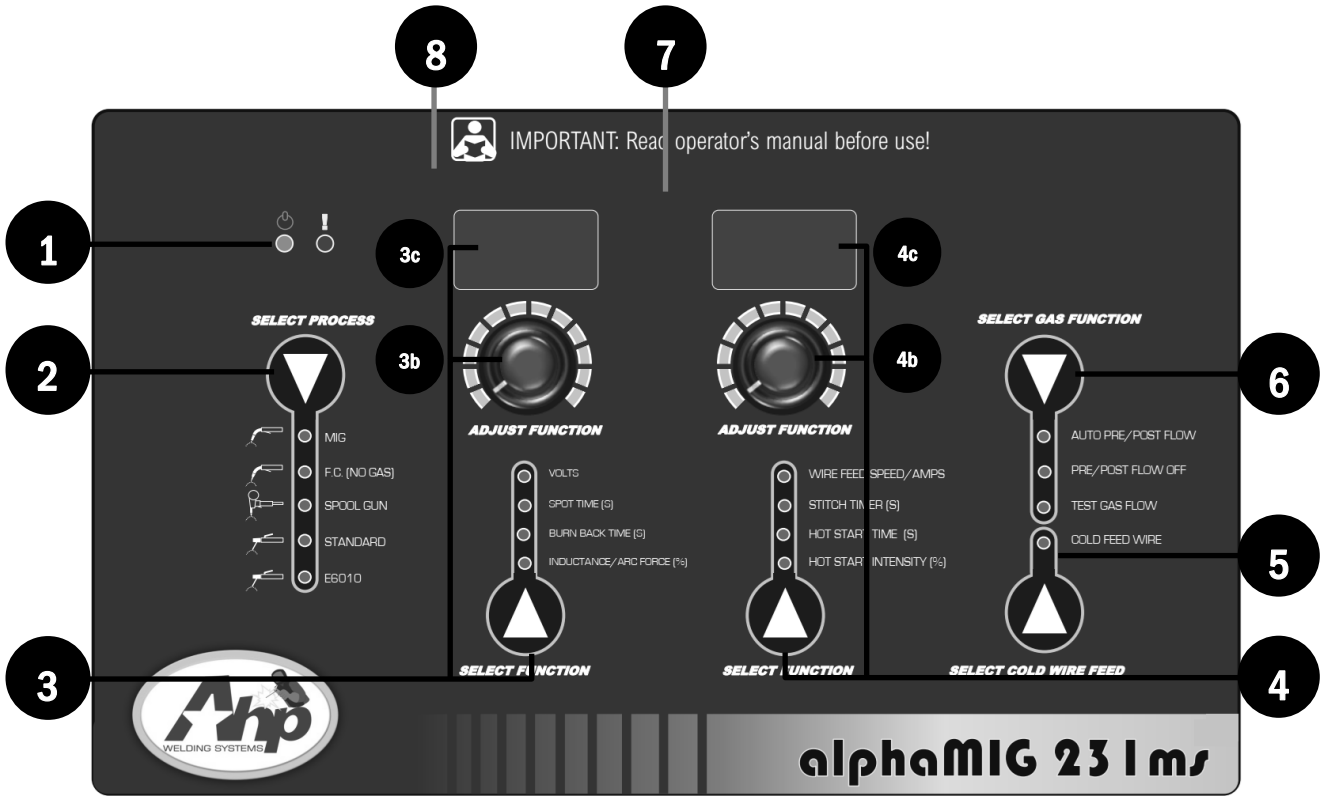
#	Component Identification	Component Note
1.	Operator Panel Interface	See Operator Panel Page for detailed information
2.	Door and Latch	Keep door closed while in use. Only open for wire replacement and starting.
3.	MIG and Spool Gun Euro Style Connector	The MIG gun and spool gun connect to this same fitting. The MIG gun must be removed to connect the spool gun. Both cannot connect at the same time.
4.	Positive Terminal (+) (DINSE 35 Type, 1/2" approximate dia.)	For MIG (GMAW): This is the location of the wire feeder lead (terminal under the cover) For Gasless (self-shielded) Flux-Cored (FCAW): This is the location of the work clamp. For Stick: This is the location of the electrode holder (torch).
5.	7 Pin Control Connector	This connector is the control connector for the Spool Gun. Do not leave connected with when the Main Gun is connected or when the Stick processes is selected.
6.	Negative Terminal (-) (DINSE 35 Type, 1/2" approximate dia.)	For MIG (GMAW): This is the location of the work clamp. For Gasless (self-shielded) Flux-Cored (FCAW): This is the location of the wire feeder lead (terminal under the cover). For Stick: This is the location of the work clamp.
7.	Handle	

Rear Panel View



#	Component I.D.	Component Note
1	Fuse	This fuse protects the wire feeder and certain components from damage. If the wire feeding stops or the machine suddenly powers down without warning, check the fuse. Replace the fuse with the identical type supplied with the machine. Check the marking on the fuse for Amperage and type. Do not replace with smaller or larger Amperage fuses. This is a common type automotive fuse.
2	240V Cooler Outlet	This is a low Amp 240V receptacle. Use only with AHP 240V coolers. Other use may cause damage or fire. Do not attempt to modify this receptacle or wiring. This outlet is switched via the main power switch and will not supply power while the machine is off.
3	MIG inlet connector	5/8" CGA Inert Gas fitting. This is a standard fitting use for connection of all argon and argon/CO2 gas fittings to regulators in the North American Market. Other regions may vary the type supplied.
4	Input Cable and Plug	The unit may be operated on either 240V 50/60Hz (± 10%) 1 phase input power. 208V will affect accuracy of adjustment and output. Use a buck-boost transformer if voltage is derived from 208V Wye type service. North American standards require only 3 wires for 1 phase operation of welders. A neutral wire is not used. For wiring a 1 phase connection to the unit: Use Black for L1, White for L2, and Green for ground (not neutral) use. Red is not typically used in wiring a welder circuit. This is in accordance with North American codes for welder wiring (see Article 630 of the NEC for more wiring info). The supplied NEMA 6-50P is the proper plug used for wiring single phase 240V welders in North America. It should not be changed or removed unless wiring directly into a cut-off switch. Other regions may vary and may have a different plug type or no plug at all.
5	Ground Service Bolt	For use in a combined effort to mitigate any electrical interference that may be caused by the operation of this unit. This should be connected (if needed) to an outside ground rod driven into the soil. Normally this is not used unless interference is observed. If it is needed, this will be an extensive grounding project. First try relocating the welder and affected objects. If no success is obtained, inspect building ground. If nothing is found then All metal objects should be attached to a separate ground outside the shop. Contact AHP for further details.
6	Power Switch.	This switch doubles as the main power switch and disconnect switch. If this switch trips and the welder power turns off, a significant internal event or failure of the switch may have occurred. If this occurs, immediately remove this unit from service and mark/tag according to regulations. Contact AHP Tech Support for further diagnosis and/or repair options.

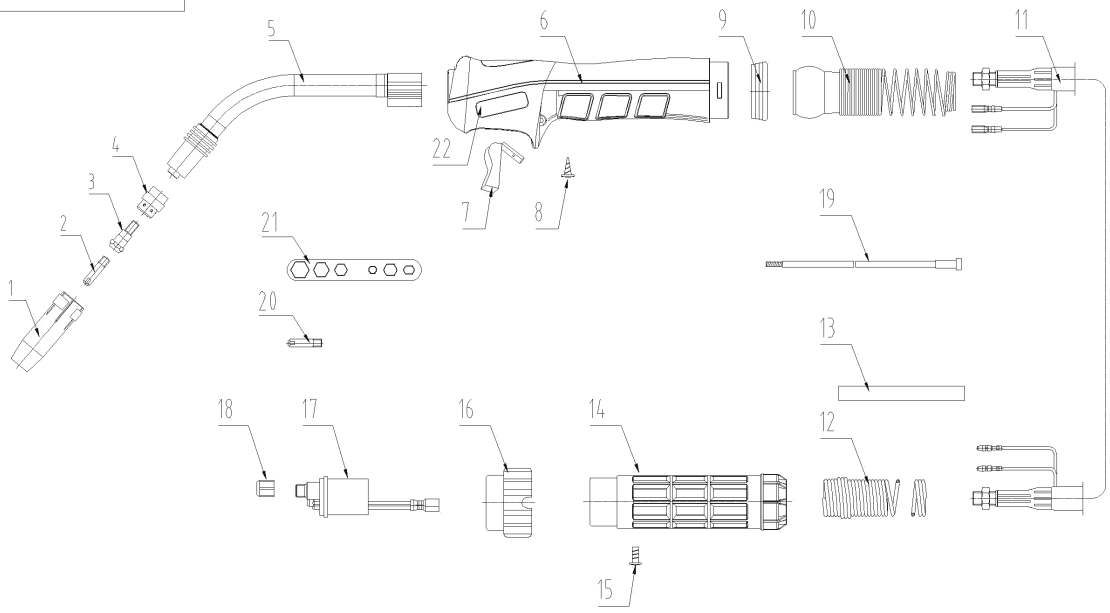
Operator Panel



NOTICE: Depending on the process selected, some functions will be blocked from adjustment since they serve no purpose in that process.

#	Component I.D.	Component Note
1	On/Warning LEDs	The Power symbol LED will be on when the unit is switched on. The warning light will only come on if there is a unit fault. An error code will be displayed when certain codable errors occur. Contact AHP if codes cannot be resolved.
2	Process Selector	Choose between the following Processes: MIG (solid wire), Gasless Flux-cored Wire, Spool Gun Operation, Standard Stick Welding (for all non cellulose fluxed rods), and E6010 Stick welding (Includes all cellulose based flux rods such as E6011, E7010 etc.)
3	Volts, Spot Timer, Burn Back/ Inductance/Arc Force adjustment **Selector, Adjustment, Display**	Press the button to select the function desired for adjustment. When a function is selected, the corresponding LED will be lit. Use the function adjuster (3b) to increase or decrease the function value. The display (3c) will display the value. Volts (V) will be the default value displayed. Spot Timer and Burn Back Display in Seconds (S). Inductance/Arc Force displays in percent (%). (In MIG mode inductance will be adjusted. In stick mode this controls arc force settings) See the "Explanation of Terms and Features" pages following this section for more information about the functions and what they do. **NOTICE:** While welding the display displays actual welding voltage.
4	Wire Feed Speed, Amperage/ Stitch Timer, Hot Start Timer, and Hot Start Intensity adjustment, **Selector, Adjustment, Display**	Press the button to select the function desired for adjustment. When a function is selected, the corresponding LED will be lit. Use the function adjust (4b) to increase or decrease the function value. The display (4c) will display the value. Wire Feed Speed (WFS) will be the default value displayed (In stick this will display as Amps). Stitch Timer and Hot Start Timer displays in Seconds (S). Hot Start Intensity displays in percent (%). **NOTICE**: While welding the display changes function and displays actual welding amperage.
5	Cold Wire Feed	When this button is pressed and held wire will be fed through the machine and out of the gun. This is used to feed wire without wasting gas or having to stand and hold the trigger down.
6	Pre/Post Flow Control/ Test Gas Flow	This button controls gas flow function. When Pre/Post flow is selected, the unit automatically provides a short flow of gas to the weld before the welding is started and after the arc has terminated. This helps improve weld quality. However, a slight start delay may be noticed since the gas flow cycle must be completed before the arc actually starts . For best results hover over the weld until the weld is finished so the weld receives the maximum amount of shielding while it is cooling. If rapid tacking is being performed, this function may be turned off. When the Test Gas Flow function is selected, the gas will flow freely so that the gas flow rate may be set at the regulator. This prevents the user from using the torch trigger and feeding out extra while setting the gas flow rate.

Series 24KD Torch



serial number	drawing number	name	quantity	note
15	IFT0063	SCREW M4X6 UNI 6107	1	
14	IHJ0645	Back Box Hole	1	
13	IHQ0050	INSULATOR TUBE/Ø5 M	0.13m	
12	IFT0897	SPRING FOR CABLE SUPPORT/BLACK	1	
11	ICN0664	COAXIAL CABLE 25mmq 3m	1	
10	IZH0864	Joint With Spring	1	
9	IHJ0715	HOUSING FOR HANDLE	1	
8	IFT0874	SCREW D.3x10 UNI9707	3	
7	IHQ0070	TRIGGER RED	1	
6	ICV0757	MIG HANDLE BLUE/INNO/GRIP	1	
5	ICZ0630	Torch Head 24KD	1	
4	ICF0539	White Ceramic Gas Diffuser 24KD	1	
3	ICU0683	Contact Tip Holder 24KD M6 26mm	1	
2	ICU0004-10	Contact Tip 1.0/M6×28	2	
1	ICS0806	Gas Nozzle Ø12,5 24KD	1	

serial number	drawing number	name	quantity	note
22	IFT0104	LABEL ERGO 24KD	1	
21	ICG6000	SPANNER FOR MIG	1	
20	ICU0004-08	Contact Tip 0.8/M6×28	1	
19	IIC0560-02	Insulated Steel Liner 1,0-1,2 3.1m Red/TORCH	1	
18	IZT0071	Liner Nut	1	
17	ITB0059	Euro Central Adaptor Body/Spring pins	1	
16	IHJ0070	Gun Plug Nut	1	

marking	Places	Revifed file NO	Signature	date	description
					ICT2698-26
designer			standardization		MIG 24KD Torch 3m With Spring Pins GRIP/INNO/BLUE HANDLE
drafted			craft		
proofread			approval		Shanghai Innotec Co.,Ltd
Audit			date	2016-08-15	

range of tolerance			
a<6	6<a<30	30<a<120	a>120
±0.1	±0.2	±0.3	±0.5

reference number	material	weight(g)	edition
			A

page one | one page in total

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Explanation of Terms and Features

To help understand the settings and features of this basic machine, a basic explanation of the terms and proper use is necessary. The following information should be used to help setup and weld with the machine.

MIG and Stick Basics.

MIG Volt and Amp Settings.

When welding, the two main functions that require adjustment are Voltage and Wire feed speed. The function of voltage in MIG welding is to control the overall width and to a great extent, the height of the weld bead. In other words, voltage controls the bead profile. It controls wet-in at the toes of the weld, and arc length. Short arc lengths provide wider welds. The wire feed speed directly controls the amps, and in turn amps control penetration. When setting the welder up you will notice that the wire speed is displayed in Inches Per Minute. **However, while actively welding, the display will change function and display actual amp output.** The relationship between wire diameter, wire speed and amps is easily figured with the following approximate industry conversions:

.023": 3.5 x Amps = Inches per minute (IPM)

.025": 3.1 x Amps = Inches per minute (IPM)

.030": 2 x Amps = Inches per minute (IPM)

.035": 1.6 x Amps = Inches per minute (IPM)

.045": 1 x Amps = Inches per Minute (IPM)

To convert wire speed (IPM) into approximate Amps, use the following conversion formula:

.023": IPM ÷ 3.5 = Amps

.025": IPM ÷ 3.1 = Amps

.030": IPM ÷ 2 = Amps

.035": IPM ÷ 1.6 = Amps

.045": IPM ÷ 1 = Amps

Keep in mind these are approximate conversions and do fall off in accuracy as amps are increased into the upper current limits for the given wire diameter.

Even though you will find general recommendations about setting the Amps, Volts and even shielding gas through a variety of free downloadable apps and online calculators, every filler metal manufacturer has its own specific parameters for Volt and Amp settings for each wire diameter and class of wire. The ranges of volt and amp parameters generally varies somewhat from brand to brand, so be sure to read the packaging and/or manufacturer literature to determine what range of settings are recommended. The wire diameter also limits the practical maximum thickness of what can be reasonably welded. The issue with following charts, graphs and calculator recommendations is that most people find them either too hot or too cold. For some people, it may not be close to the setting they are used to. However, nothing can substitute for watching and listening to the arc. If the arc is correct, a steady sound, similar to the sound of bacon should be heard. The actual frying sound can vary somewhat and may have somewhat of a higher pitch whine to it. If these sounds are present, look at the arc to see if it is steady, and producing low amounts of spatter. If large amounts of spatter are present, the puddle seems fluid (appears wet) and the wire speed is within the targeted range, decrease volts a little at a time to reduce the spatter. If this does not correct the problem, change the torch angle and torch height. Hold the torch more vertical, with less than a 15 degree deviation from vertical and reduce stick-out of wire to 3/8" or less. If this still does not help, reduce the wire speed. Some spatter is normal, though it should be minimal overall.

The wire can also pop and spatter if the voltage is too low for the wire speed and/or wire diameter. This is mostly observed as flying bits of red-hot but un-melted wire, along with popping as the wire inconsistently stubs into the puddle. This is followed by the wire pushing back against your hand pressure while the wire visibly turns white/red hot before burning off. Too low of voltage will also produce a high piled bead with the toes (edges) of the weld not properly wetting in resulting in poor fusion.

Starting the Arc in MIG Mode

Starting the arc is a relatively simple process. Before beginning, the wire should initially be trimmed to between 1/4 to 3/8". Once the wire is trimmed, the gun should be firmly grasped to prevent a phenomenon often referred to as "machine gunning". A light grasp, especially at start, can cause the arc to stutter as the wire pushes back on the gun, lengthening the wire stick-out and creating an irregular start and a porous weld.

The end of the wire should be positioned just barely above the metal when the trigger is pulled for the cleanest start. This will position the end of the contact tip about 1/2" above the weld. The gun should be in the vertical position, with no more than 5 to 10 degrees lean in

Explanation of Terms and Features

NOTICE:

While welding, the Wire Feed Speed display changes function. It changes to read actual Amp output. This Amp output will vary slightly with arc length.

For stick, the function changes from reading amps set to actual amps output. This will vary based off of arc force settings and arc length. If the arc is held short, the preset arc force automatically increases amperage to maintain an arc as the voltage falls due to a shorter arc gap.

result in rough starting and too long of wire stick out.

Once the arc has been established, the gun can then either be pushed or pulled in the direction of the weld. In either case, the gun nozzle should be positioned directly over the weld without angling the wire to one side or the other of the weld as already mentioned. The gun should have no more than 15 degrees lean pointed into (push) or pointed away from (pull) the direction of travel. In most cases a push motion is desired. However, a lot of texts offer conflicting information on whether to push or to pull the gun. In reality, both are correct if used correctly and with each having particular strength and weakness. Either one done with too much gun angle will result in undesirable results. Most open-minded people who are well versed in MIG quickly develop a sense of when to push and when to pull the gun. Even for novices, a sense of when to push and pull the gun comes quickly with a little practice. Pushing can result in shallower penetration but the molten puddle is easier to see and the arc sits easily on the leading edge. It will usually leave a aesthetically pleasing bead. However, be careful to prevent the gun from leaning toward or away from the direction of travel too much as spatter will increase and shielding gas flow may become turbulent, creating porosity in the weld. Pulling will result in deeper penetration, but can result in a narrow bead without much side fusion. It also can leave an undesirable humped appearance if not done correctly or if travel is too slow. **Whenever MIG welding with Aluminum, whether with the standard MIG gun or the Spool gun ALWAYS push the gun. If using Flux Cored wire, a dragging motion is almost always recommended.**

Weaving in Welding.

Weaving (oscillating the torch or electrode from side to side in one pattern or the other), particularly in MIG, is a topic of controversy as much as whether to push or pull the MIG gun. Stringer beads are often best for novice welders. This includes both MIG and Stick processes. Stringers are simply straight beads that move forward with little or no side to side travel, stepping or oscillation. These will offer the most sound and reliable welds for a beginner. Stringer welds leave little or no room for contaminates to enter the weld and are the fastest to produce without creating an opportunity for cold lap. Moving too quickly however with a stringer can create undercut which will weaken the weld. The best policy is to move a slow steady speed, making sure the sides of the weld are filled. If undercut is present, it is either from too much voltage or moving before the wire has time to fill the area the arc has melted.

Think of weaving as a method of "sewing" the metal together. If weaving is of interest to you, start with the basic weave pattern. Simple weaves using one variation or the other of a cursive "e" motion are best to begin with. Other weave patterns can be used of course. C's, V'S, U's , Triangles and many more weave patterns can be used depending upon the application. Weaves are employed for a number of reasons. Weaves are often considered to have a more pleasing appearance and can help bridge gaps where fit up is a problem. A weave is also frequently used to manage heat build up. For example: when welding vertically weaves are almost always used to prevent the molten metal from sagging due to the force of gravity. The major drawback of weaving is that it introduces a greater possibility of getting inclusions and other forms of contamination in the weld. Properly done weaving is a valuable tool, but it must be practiced before employing it in any structural or critical application.

Metal Cleaning.

MIG welding requires a well prepped surface to obtain a sound weld. The removal of paint, rust mill scale, or other contaminate such as grease should be done before welding. Stick welding is more forgiving of rust and mill scale, but when MIG welding, contaminates will result in porosity and inclusions in the weld, weakening it. A grinder will usually prep the metal sufficiently to remove oxidation and paint. However, to remove grease a degreaser such as acetone should be used. Do not use any degreaser such a brake cleaner with chlorinated solvents or death or serious injury may occur!

MIG wires such as ER70S-6 or ER70S-2 include a sufficient level of deoxidizers such as silicone and copper that are formulated to allow it to handle minor to moderate amounts of rust and mill scale. These deoxidizers will float out most moderate amounts of contaminates out of the weld and will appear in the usual form of glassy like deposits on top of the cooled metal. They are easily brushed off before starting the next pass. They should not be welded over. Any pinholes that appear are a result of trapped gas in the weld and should be ground out before the next pass. It should be noted that some MIG wires such as ER70S-3 have low levels of deoxidizers and must be thor-

Explanation of Terms and Features

oughly cleaned and ground before welding. MIG and TIG ER70S-2 and ER70S6 are the same except that TIG wire is cut to lengths and MIG wire is continuous. When welding fine gauge materials in TIG, you can substitute sections of thinner MIG wire.

Multiple Pass Welds.

One of the common misunderstandings that people have when beginning to weld is that if the welder has the power, then a single heavy pass should be used to weld it up. This is wrong, whether it is MIG, TIG or Stick. This technique is a good way to induce cold-lap and inclusions into the weld. Single pass welds should not exceed 1/4" even with the heaviest wire the welder is capable of handling. On this unit, we suggest no more than 3/16". A thick pass may also begin to cool before contaminates and gas pockets have the time to float out to the surface. It's far better to make multiple smaller passes to complete a plate weld for a higher quality result. For best results, this requires that most joints 1/4" and over be prepared with a grinder to accept multiple weld passes. The weldment edges should be ground to form a V, U or J shaped groove to create a recess where the welds can be welded one on top of another. For welding with .035" wire and under, create a bead no thicker than 3/16" in a single pass, no more than 1/8" with .030" wire, and with .025" wire and smaller no more than 3/32 for best results. This will help maintain proper fluidity of the weld and prevent gas from being trapped in the weld and give time for any minor contaminates to float out of the weld. It will also help to maintain reasonable forward travel speeds. Too slow of travel speeds will create excess build up and can tend to create cold lap at the weld toes resulting in poor tie in. One issue created with a weaving technique even if the metal deposited is the correct thickness is that it can slow the forward progress down. If weaving is too wide, one side of the puddle will cool and oxidize before the torch is brought back across to that side. This is a point where porosity can be introduced.

Welder Functions Explained.

MIG Inductance.

MIG inductance is sort of the "throttle" of MIG welding. It controls how fast the current rises to the point the wire pinches off another drop of molten metal after the arc shorts during the short circuit transfer process. This has the effect of making the puddle more fluid, or less fluid. In general, fluidity of the puddle is a good thing. Increasing the inductance to 60 to 75% for steel hard wire welding is a good starting point for flat welding and yields a generously fluid and flat puddle. However, if the weld is to take place vertically, or in an open root, or even in the overhead position, less inductance is desirable. In general, however, 40 to 75% inductance should always be used when welding steel wire. More inductance will be required when welding with 100% CO_2 or when welding with Stainless. Too much or too little inductance however can result in excess spatter. Once Volts and Wire Feed speed have been set, use the inductance function to fine tune the "feel" of the arc.

MIG and TIG Pre-Flow and Post Flow.

Pre and Post Gas Flow are invaluable tools that can be used for both MIG and TIG welding. This feature provides an automatic flow of gas before the arc starts and after the arc terminates. The duration of the pre and post flow are different and are determined automatically according to the machine settings for Amps. The use of Pre and Post Flow is optional as it can be turned on and off. However, whenever possible it is recommended to use this feature. Doing so will increase weld quality on start up as well as at arc termination by providing a protective shield of gas around the weld area to prevent porosity and oxidation around the weld.

MIG Spot and Stitch Timers.

The purpose of the spot timer is to allow you to automatically create repeatable tack welds or small seam welds by controlling the "arc on" time. When the spot time is set, the unit will automatically shut off the arc when the trigger is held down after the set amount time. This allows the same weld to be repeated over and over. Although the spot timer can be used with or without the stitch timer, the stitch timer is used to set an "arc off" period of time that will allow the arc to cycle on and off as long as the trigger is held down. The spot and stitch timers work together to create a "On/Off/On" pattern based off your settings. This is perfect for seam welding or for auto body on thin panels.

MIG Burn-back Timer.

The MIG Burn-back Timer allows the arc to stay energized after the trigger is released and the wire stops feeding. This is set to allow the wire to continue to burn and "trim" back. This is useful to prevent the wire from sticking in the weld puddle. Usually not much burn-back time is needed. Depending on wire diameter, set burn-back time to .2 to .3 seconds. Too much burn-back time may melt the wire up into the tip. For best results, after the trigger is released, hover over the weld briefly to allow the burn-back to occur. If you immediately remove the gun from the puddle, the burn-back may not work. When enough time has been set, no further trimming of the wire will be

Explanation of Terms and Features

necessary on restarts. If the wire sticks in the puddle or continues to feed out after welding has stopped, increase burn back time until this clears up.

Stick Hot Start Timer and Intensity.

The stick function works well in this machine. But to improve arc starting, the machine has a hot start setting for both time and intensity. The hot start timer sets the duration of time in seconds (s) of the hot start itself. With a possible duration of up to 2 full seconds, the hot start can be set much longer than is practical. Usually .7 seconds or less is sufficient. There may be times where more is required, particularly on poorly prepped materials. However, with most rods, at least .2 seconds is needed or the rod may stick or refuse to start cleanly even on clean metals. The intensity of the Hot start is adjusted by percentage. This is the amount, in percentage, of extra welding amperage supplied at the time of arc initiation. If for example you have the welding Amperage set for 100A, and hot start is set to 50%, then the arc starting amperage will be close to 150A. Depending upon a few factors like arc length and available total amperage for the hot start to use the actual amperage spike could be less.

Stick Arc Force Control.

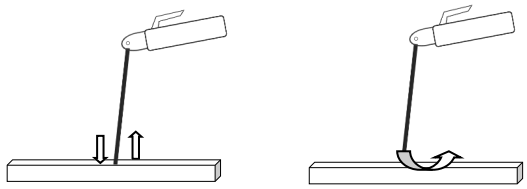
Arc length in stick welding determines arc voltage. The longer the arc, the higher the voltage goes. And similarly, the shorter the arc, the lower the voltage goes. When this happens on ordinary Stick welders total welding wattage begins to drop and the arc may even extinguish. To help maintain a constant welding wattage even when the voltage drops well below ideal limits, the arc force reacts by adding extra amperage to help try to stabilize the arc and maintain total wattage. (Volts x Amps= Watts). The arc force controls, in percentage, the amount of extra amps added over the set welding amps when the arc voltage begins to drop. This can result in an arc that is much more crisp and stable than a standard stick welder when conditions are severe. For most rods, 20 to 30% is sufficient. However, when operating rods such as E6010 and E6011, which have a cellulose based flux, 60 to 70% may be required to maintain a stable arc without the rod snuffing or sticking in the weld pool.

Welding with Stick.

The most challenging part of learning stick is starting an arc. There are a couple of different starting techniques used and are depicted below. Once the arc is started, simply drag the rod along the metal in a straight line at a 10 to 20 degree drag angle. As mentioned earlier, weaving isn't necessary. Amp selection is more tied to rod diameter than metal thickness, although thickness is a component of it. For best results, take a look at the manufacture's on-box recommendations on Amp range for the rod type and diameter. For best all around performance for general purpose fabrication select a 3/32" or 1/8" E7014. For really rusted materials, pipe or for general code work with root passes, E6010 may be required. For structural steel, E7018 is a common choice. But E7018 requires special handling and storage to maintain their low-hydrogen rating.

How Do I Start an Arc With Stick?

There are two basic types of arc starting methods used. The tapping motion allows pin point placement of the arc, while the scratch start method is similar to a match strike and is easier for beginners.

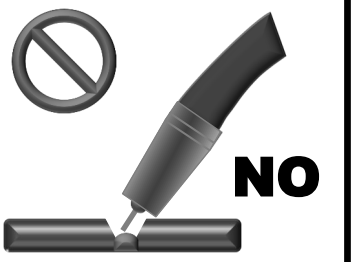
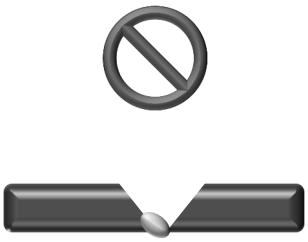
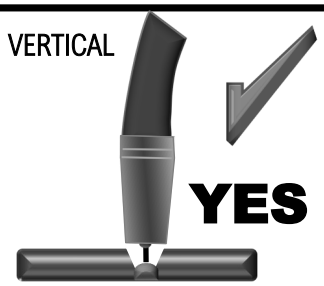
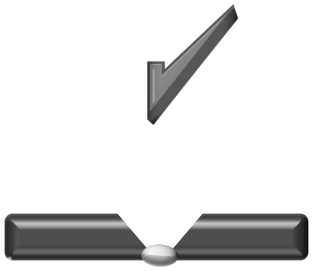
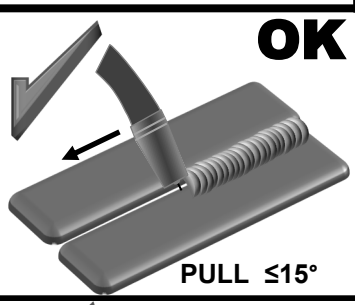
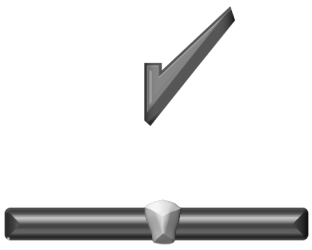
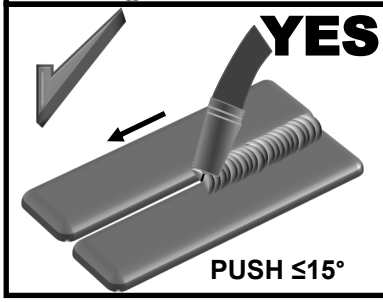
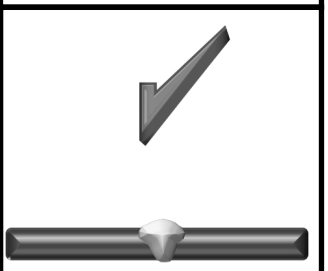


Tapping Method

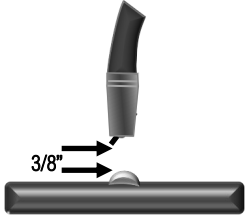
Scratch/Match Method

DRAGGING VERSUS PUSHING:

MIG Welding is fairly simple if you keep travel angle and direction in mind when welding. MIG in general works best with a push motion. This will provide the smoothest weld and best bead profile. Dragging in MIG can cause excess spatter. However, If you are welding flux-core, the gun angle is reversed and it is welded at a drag angle due to the flux accumulation possibility in front of the weld. **Remember: If it has gas, you use a push angle. If it is gas-less you use a drag angle.** *The old welder's saying "If it has slag, you drag." applies to Flux-Cored Wire welding.*

	**Problem Technique:** The Gun is not being held vertical from side to side. Wire is not being directed to the center of the puddle. This concentrates heat on one side of the joint and results in poor fusion on the neglected side. It also can create more buildup on one side of the joint than the other. **Correction:** Hold the gun so that the angle of the neck stands perpendicular from side to side.	
	**Correct Technique:** The gun is held in a near vertical position. A variance of 5 degrees or less is acceptable from side to side. The purpose is to prevent the arc from being concentrated on one side of the weld joint or the other. This balances the heat on both sides of the joint and keeps the bead centered. Don't confuse this with push or pull angle in the travel direction.	
	**Correct Technique:** The gun is angled toward the back of the weld when traveling forward. This angle should not exceed 15 degrees. This provides a narrower but more deeply penetrating weld. Use this method when Flux Core wire is being used. Use this method where the unit may be reaching its maximum welding capacity. Not for use with Aluminum wire.	
	**Correct Technique:** The gun can be angled toward the front of the weld when traveling forward. This angle should not exceed 15 degrees. This provides a wider and generally more pleasing weld. However it is shallower penetrating. This method typically allows a much better view of the arc. Use for most types of welding unless deeper penetration must be achieved.	

The overall stick-out of MIG and Flux-Cored wire is important to creating a good weld. The distance of the stick-out of the wire from the end of the contact tip to the weld puddle is the Contact-Tip-to-Work-Distance. For a small MIG like this typically hold 3/8-1/2" CTWD. Flux-Cored wire is similar but is a bit more forgiving and able to hold a longer arc, up to 3/4".

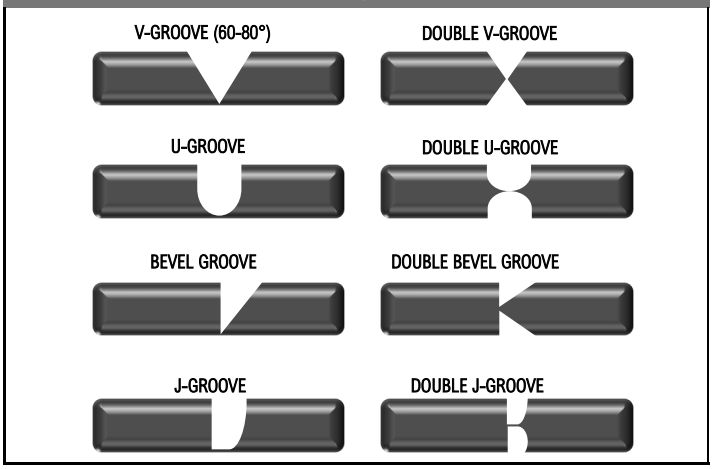


Explanation of Terms and Features

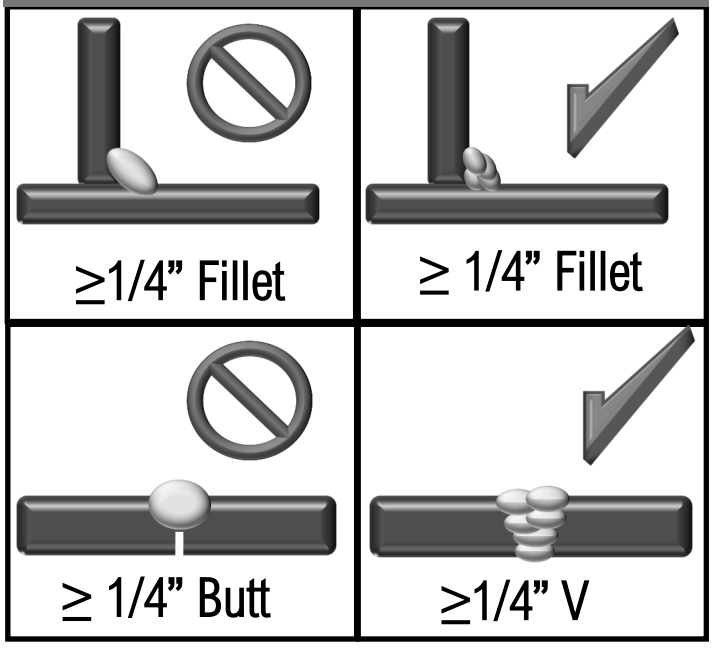
Different Types of Welds

Besides a butt joint (Flat edge to flat edge) and lap joint (overlapping edges) which are often used for thinner metal gauges, consider using one of these groove joints for best welding results. When grinding or cutting the bevels, especially with a single V-groove, it may be beneficial to leave a small land with a gap between the joint to achieve full penetration. In this case a temporary backer plate can be used to support the bottom of the weld to create the root pass. The root weld will weld the backer to the main plate. This backer can later be ground or cut off. However, in many cases a plain open root can be used as a backer plate adds to the time and labor involved. A knife edge is also acceptable so long as the joint is fully penetrated when the weld is completed. Open root gaps without a backer can range from 1/16" to 1/8" depending upon wire diameter and application.

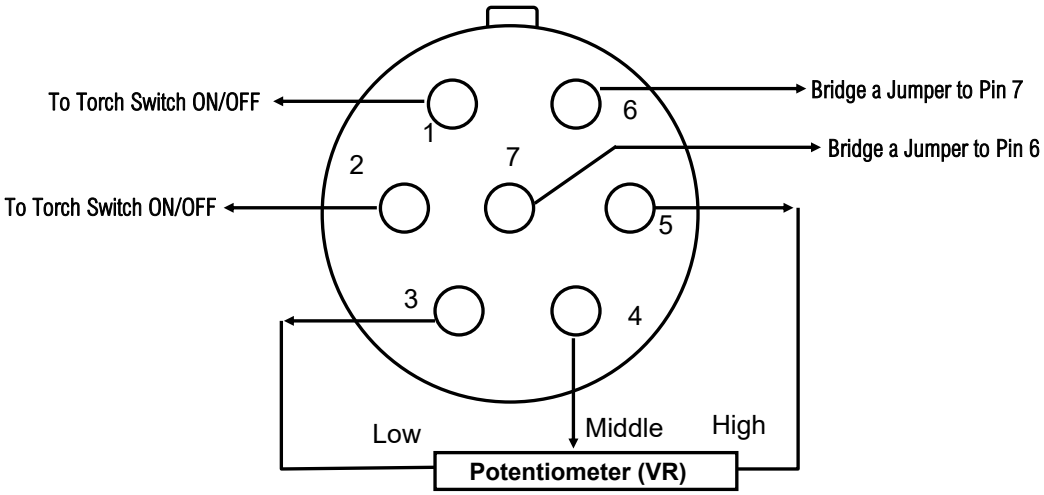
Joint Preparation



Weld Pass Examples



7 PIN CONNECTOR



Troubleshooting

Trouble	Possible Cause	Solution
Unit is switched on, but the power light isn't on.	Switch damaged. Service Breaker/ Input Line Damaged	Check. Replace.
After welding machine is overheating and the fan does not work.	Fan damaged. Fan connector plus is loose	Replace. Check. Reinstall.
Intermittent, wandering arc..	Work Clamp not connected directly to part being welded. Work Clamp worn/damaged Torch height too high. Draft	Reconnect. Replace work clamp and/or cable. Reduce MIG torch height to under 3/8". Move welder further away.
MIG wire burns back	Wire feed speed is too low Voltage is too high Wrong drive rolls installed Tension is too low Kinked or damaged or wrong liner/tip	Reduce Wire feed speed. Lower Voltage. Check drive roll size. Increase tension on drive roll. Check liner and Tip size.
MIG wire balls up/Creates bird's nest	Damaged liner Wire is too small of diameter to feed in long gun	Check liner. Use shorter gun length.
MIG spatters badly,	Wire polarity is incorrect Settings are too high for the capability of the wire diameter	Check wire polarity. Use larger wire diameter, or thinner material.
Porosity of the Weld. Discolored weld color	Low flow rate of shielding gas. High flow rate of shielding gas. Possible gas leaks internally or externally due to loose fittings. Base metal is contaminated with dirt or grease.	Increase flow rate on regulator. Check for kinks in tubing. Increase post-flow time. Reduce stick-out to less than 1/4". Increase gas nozzle size. Lower Gas Flow rate. Clean metal thoroughly with approved metal cleaner, or use acetone and a rag to clean metal.
Weld quality is poor. Weld is dirty/oxidized, or porous.	Drafty conditions. The welder is located on the workpiece and is blowing gas off due to fan activity. Solenoid is sticking.	Eliminate drafts. Move welder. Check if there is sufficient shielding gas left in tank. Check gas flow. Adjust for higher flow of gas. Listen for audible click of gas solenoid. If no click is heard, then contact AHP Support. Clean weld properly. Increase pre flow or post flow.
Unstable Arc. Spatter.	Bad work clamp connection. Metal is indirectly connected through table or other item. Incorrect settings	Change Work Clamp. Use a direct connection to the part being welded. Check and adjust settings. Spatter usually increases when smaller wires are at the maximum welding capacity.
Continuous Overheating	Settings too high. Too large of wire for job. Fan not running. Unit needs to be cleaned	Reduce Settings, use smaller wire. Check fan, repair or replace if not running or running at low speed. If it is not running correctly (fan should run continuously) contact AHP
Tungsten is Rapidly consumed	Wrong Polarity. No gas. Wrong gas. Bad gas. Draft. Wrong Tungsten	Check Gas. Check for Drafts. Move welder away from work area. Make sure correct gas is connected at rear. Use Blue 2% Lanthanated Tungsten.
Electrode sticks or won't light (Stick)	Too large of electrode for amperage set "Wet" rods (in the case of low hydrogen types) Using E6010 Wrong polarity	Increase amperage. Use fresh sealed rods from sealed canister. Do not use E7018 from paper boxes. Use a rod oven. Use E6011. Use Electrode positive.
Other.		Contact AHP

TROUBLE CODE WITH WARNING LIGHT/UNIT STOPS WELDING BUT IS TURNED ON.	DIAGNOSIS
01	OVER TEMPERATURE/ DUTY CYCLE EXCEEDED. Allow unit to rest for 15 minutes. Check for obstacles, clean welder, and heat sinks. Make sure unit is unplugged for 30 minutes before opening up for cleaning.
02	OVER CURRENT. Check to make sure input power cable is correct length and size. Internal unit fault or low input voltage. Possible issue running on generator with dirty power. Identify cause, plug directly into the receptacle. Cycle the switch one time. If the code does not clear, call AHP Tech Support.
OTHER	Contact AHP

MIG Quick Setup Guide

NOTE TO USER: This guide is offered only as a basic starting point for settings. Additional adjustments may be required up to 15%. Joint design, technique and welding position will affect settings. Be sure to set Inductance before fine tuning settings.

Metal	Diameter	Wire Type	Polarity	Shielding Gas	Inductance	120V Input: 22 ga. .8mm	20 ga. .9mm	18 ga. 1.2mm	16 ga. 1/16" 1.5mm	14 ga. 5/64" 1.9mm	12ga. 7/64" 2.7mm	240V Input: 11ga. 1/8" 3 mm	10 ga. 9/64" 3.4mm	7 ga. 3/16" 4.5mm	3 ga. 1/4" 6mm	5/16" 8mm	3/8" 9.5mm
STEEL	.023"/.6mm	ER70S-6	DCEP +	75/25 Ar/CO_2	30-60%	15.5V 130 IPM	16.0V 180 IPM	16.5V 260 IPM	17.2V 300 IPM	17.5V 380 IPM	18.0V 420 IPM						
STEEL	.030"/.8mm	ER70S-6	DCEP +	75/25 Ar/CO_2	50-70%	15.8V 100 IPM	16.2V 140 IPM	16.5V 180 IPM	17.2V 240 IPM	17.5V 260 IPM	18.0V 290 IPM	18.5V 300 IPM	18.7V 320 IPM	19.2V 380 IPM	20.0V 420 IPM		
STEEL	.035"/.9mm	ER70S-6	DCEP +	75/25 Ar/CO_2	60-75%	16.2V 110 IPM	16.5V 160 IPM	17.4V 200 IPM	17.6V 230 IPM	18.1V 260 IPM	18.6V 270 IPM	18.8V 290 IPM	19.3V 320 IPM	21.0V 340 IPM	21.5V 400 IPM	23.2V 410 IPM	
STEEL	.045"/1.2mm	ER70S-6	DCEP +	75/25 Ar/CO_2	60-75%	17.5V 100 IPM	17.8V 120 IPM	18.2V 130 IPM	18.7V 140 IPM	19.0V 150 IPM	19.5V 160 IPM	21.2V 190 IPM	21.6V 190 IPM	23.3V 210 IPM			
STAINLESS	.030"/.8mm	ER308L	DCEP +	98/2 Ar/CO_2	70-90%	18.0V 300 IPM	18.6V 330 IPM	19.6V 400 IPM	19.8V 450 IPM	23.0V 500 IPM							
STAINLESS	.035"/.9mm	ER308L	DCEP +	98/2 Ar/CO_2	70-90%	18.1V 180 IPM	18.6V 210 IPM	19.6V 260 IPM	20.5V 350 IPM	20.4V 290 IPM	20.8V 300 IPM	21.8V 400 IPM	24.0V 450 IPM	24.5V 460 IPM			

Use the optional AHP recommended Spool Gun for welding Aluminum or, as an alternative, use the main gun with an optional polymer liner and optional .035" U-groove drive roll.

ALUMINUM	.035"/.9mm	4043/5356	DCEP +	100% Argon	30-65%							21.0V 375 IPM	21.5V 390 IPM	22.0V 410 IPM	22.0V 420 IPM	24.0V 450 IPM	

For Flux-Cored (Gasless) operation, use knurled drive roll. Be sure to change polarity to Electrode Negative (-) by changing terminal under the cover location and relocate work clamp to the Positive (+) lug.

FLUX-CORED	.035"/.9mm	E71T-11	DCEN -	No Gas	30-70%	15.5V 70 IPM	16.0V 130 IPM	19.0V 340 IPM	20.0V 280 IPM	22.0V 340 IPM	22.0V 360 IPM	22.5V 370 IPM					

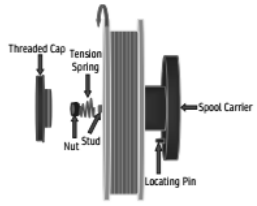
Generator Requirement*: Minimum of 9500 W Surge with 5% or Less THD (Clean Power Rated)

*** Use with generators smaller than the minimum required wattage or with generators not labeled as producing 5% or less Total Harmonic Distortion (THD) by the generator manufacturer will void the warranty.**

Stick Setup Guide

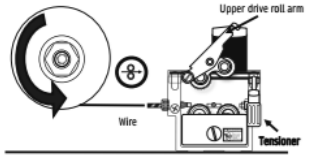
NOTE: Some electrode manufacturer's Amperage suggestions may vary.

Rod Class	Diameter	Input	Arc Force	Polarity	120V: 14 ga. 5/64" 1.9mm	12 ga. 7/64" 2.7mm	11 ga. 1/8" 3 mm	240V: 10 ga. 9/64" 3.4mm	7 ga. 3/16" 4.5mm	3 ga. 1/4" 6mm
E7018	3/32"	120/240V	10-30%	DCEP +	55-70A	70-75A	70-80A	70-85A	75-90A	80-95A
E7018	1/8"	240V	10-40%	DCEP +				85-90A	90-100A	90-125A
E7014	3/32"	120/240V	20-30%	DCEP +	70-80A	80-85A	85-90A	85-95A	90-110A	90-115A
E7014	1/8"	240V	20-40%	DCEP +				95-100A	95-120A	95-130A
E6010/6011	3/32"	120/240V	50-70%	DCEP +			55-65A	60-65A	65-70A	70-80A
E6010/6011	1/8"	240V	50-70%	DCEP +			70-75A	75-80A	80-85A	85-95A



Front View of Spool Carrier Assy.

The wire should unroll from the bottom to be able to feed into the wire drive.



Flip Tensioner down and raise the upper drive roll arm on the wire drive to install wire. Feed the wire into gun manually for the first 6 inches.

Consumable Assembly
24 Series MIG Gun