



OM-292017A

2022-10

Processes



TIG (GTAW) Welding



Stick (SMAW) Welding

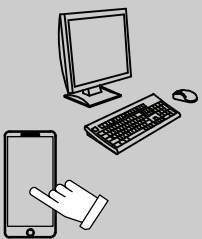
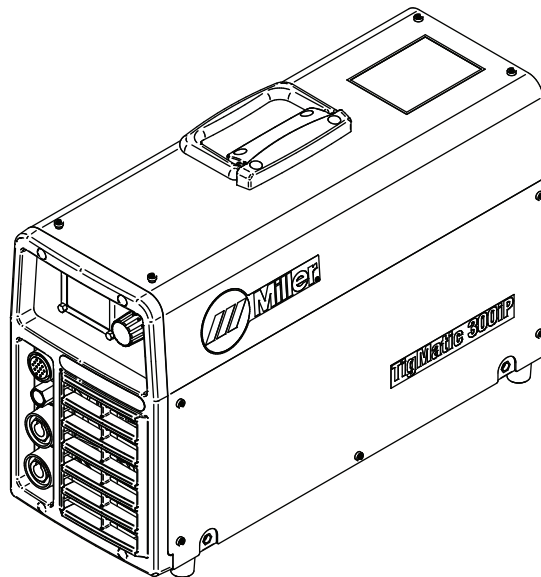
Description



Arc Welding Power Source

# TigMatic 300iP

## CE



For product information,  
Owner's Manual translations,  
and more, visit

[www.MillerWelds.com](http://www.MillerWelds.com)

# OWNER'S MANUAL

# From Miller to You

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*Thank you and congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety Precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller, you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is, and our extensive service network is there to help fix the problem. Warranty and maintenance information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding-related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets.



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.



ISO 9001  
Quality

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.



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# DECLARATION OF CONFORMITY

for European Community (CE marked) products.

**Orbitalum Tools, Business Unit Miller Europe, Josef Schüttlerstrasse 17, 78224, Singen Germany, declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s), Commission Regulation(s) and Standard(s).**

Product/Apparatus Identification:

Product	Stock Number
TigMatic 300iP	059016034
TigMatic Cool	028042110

Council Directives and Commission Regulations:

- 2014/35/EU Low voltage
- 2014/30/EU Electromagnetic compatibility
- 2009/125/EC and regulation 2019/1784 Ecodesign requirements for energy-related products
- 2011/65/EU and amendment 2015/863 Restriction of the use of certain hazardous substances in electrical and electronic equipment

Standards:

- EN IEC 60974-1:2018/A1:2019 Arc welding equipment – Part 1: Welding power sources
- EN IEC 60974-2:2019 Arc welding equipment – Part 2 Liquid cooling systems
- EN IEC 60974-3:2019 Arc welding equipment – Part 3: Arc striking and stabilizing devices
- EN 60974-10:2014/A1:2015 Arc welding equipment – Part 10: Electromagnetic compatibility requirements
- EN IEC 63000:2018 – Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Signature:

07.10.2022

**Juergen Jaeckle**  
ENG. / IWE, PRODUCT COMPLIANCE MANAGER

Date of Declaration



## DECLARATION OF CONFORMITY

For United Kingdom (UKCA marked) products.

**Orbitalum Tools, Business Unit Miller Europe, Josef Schüttlerstrasse 17, 78224, Singen Germany, declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Regulation(s) and Standard(s).**

Product/Apparatus Identification:

Product	Stock Number
TigMatic 300iP	059016034
TigMatic Cool	028042110

Regulations:

- S.I. 2016/1101 Electrical Equipment (Safety) Regulations 2016
- S.I. 2016/1091 Electromagnetic Compatibility Regulations 2016
- S.I. 2009/125/EC and regulation 2019/1784 Ecodesign requirements for energy-related products
- S.I. 2012/3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Standards:

- EN IEC 60974-1:2018/A1:2019 Arc welding equipment – Part 1 Welding power sources
- EN IEC 60974-3:2013 Arc welding equipment – Part 3: Arc striking and stabilizing devices
- EN 60974-10:2014/A1:2015 Arc welding equipment – Part 10: Electromagnetic compatibility requirements
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Date of Declaration

# EMF DATA SHEET FOR ARC WELDING POWER SOURCE



## Product/Apparatus Identification

Product	Stock Number
TigMatic 300iP	059016034

## Compliance Information Summary

Applicable regulation                      Directive 2014/35/EU

Reference limits                              Directive 2013/35/EU, Recommendation 1999/519/EC

Applicable standards                      IEC 62822-1:2016, IEC 62822-2:2016

Intended use                                   for occupational use                       for use by laymen

Non-thermal effects need to be considered for workplace assessment                       YES                       NO

Thermal effects need to be considered for workplace assessment                       YES                       NO

Data is based on maximum power source capability (valid unless firmware/hardware is changed)

Data is based on worst case setting/program (only valid until setting options/welding programs are changed)

Data is based on multiple settings/programs (only valid until setting options/welding programs are changed)

Occupational exposure is below the Exposure Limit Values (ELVs) for health effects at the standardized configurations                       YES                       NO  
(if NO, specific required minimum distances apply)

Occupational exposure is below the Exposure Limit Values (ELVs) for sensory effects at the standardized configurations                       n.a                       YES                       NO  
(if applicable and NO, specific measures are needed)

Occupational exposure is below the Action Levels (ALs) at the standardized configurations                       n.a                       YES                       NO  
(if applicable and NO, specific signage is needed)

## EMF Data for Non-thermal Effects

Exposure Indices (EIs) and distances to welding circuit (for each operation mode, as applicable)

	Head		Trunk	Limb (hand)	Limb (thigh)
	Sensory Effects	Health Effects			
Standardized distance	10 cm	10 cm	10 cm	3 cm	3 cm
ELV EI @ standardized distance	0.07	0.06	0.09	0.05	0.12
Required minimum distance	1 cm	1 cm	1 cm	1 cm	1 cm

Distance where all occupational ELV Exposure Indices fall below 0.20 (20%)                      2 cm

Distance where all general public ELV Exposure Indices fall below 1.00 (100%)                      83 cm

Tested by:                      Joe Krueger                      Date tested:                      2022-09-14

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# SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING

 Protect yourself and others from injury—read, follow, and save these important safety precautions and operating instructions.

## 1-1. Symbol Usage

 **DANGER!** – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

 Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.


**NOTICE** – Indicates statements not related to personal injury.


 Indicates special instructions.




This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid these hazards.

## 1-2. Arc Welding Hazards

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

 Only qualified persons should install, operate, maintain, and repair this equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.

 During operation, keep everybody, especially children, away.



### ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on.

The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC weld output in damp, wet, or confined spaces, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual

(stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!

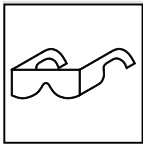
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install, ground, and operate this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground—check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first—double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord and ground conductor for damage or bare wiring—replace immediately if damaged—bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or repaired cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal. Disconnect cable for process not in use.
- Use GFCI protection when operating auxiliary equipment in damp or wet locations.



### HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to

prevent burns.



### FLYING METAL OR DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.



### FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- Ventilate the work area and/or use local forced ventilation at the arc to remove welding fumes and gases. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



### BUILDUP OF GAS can injure or kill.

- Shut off compressed gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



### ARC RAYS can burn eyes and skin.

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

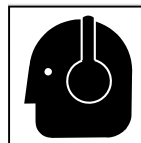
- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare, and sparks; warn others not to watch the arc.
- Wear body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



### WELDING can cause fire or explosion.

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

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not cut or weld on tire rims or wheels. Tires can explode if heated. Repaired rims and wheels can fail. See OSHA 29 CFR 1910.177 listed in Safety Standards.
- Do not weld on containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere can contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.



### NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



### ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.



### **CYLINDERS can explode if damaged.**

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

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.

- Never weld on a pressurized cylinder—explosion will result.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve. Do not stand in front of or behind the regulator when opening the valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the proper equipment, correct procedures, and sufficient number of persons to lift, move, and transport cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

## **1-3. Additional Hazards For Installation, Operation, And Maintenance**



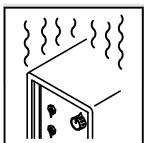
### **FIRE OR EXPLOSION hazard.**

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring—be sure power supply system is properly sized, rated, and protected to handle this unit.



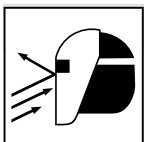
### **FALLING EQUIPMENT can injure.**

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use correct procedures and equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94-110) when manually lifting heavy parts or equipment.



### **OVERUSE can cause OVERHEATING.**

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



### **FLYING SPARKS can injure.**

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires—keep flammables away.



### **STATIC (ESD) can damage PC boards.**

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.



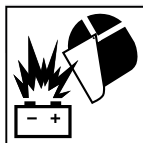
### **MOVING PARTS can injure.**

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



### **WELDING WIRE can injure.**

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



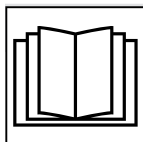
### **BATTERY EXPLOSION can injure.**

- Do not use welder to charge batteries or jump start vehicles unless it has a battery charging feature designed for this purpose.



### **MOVING PARTS can injure.**

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



### **READ INSTRUCTIONS.**

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform installation, maintenance, and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



### **H.F. RADIATION can cause interference.**

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



### ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as microprocessors, computers, and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.

- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

## 1-4. California Proposition 65 Warnings

**⚠ WARNING – This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm.**

For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

## 1-5. Principal Safety Standards

*Safety in Welding, Cutting, and Allied Processes*, American Welding Society standard ANSI Standard Z49.1. Website: <http://www.aws.org>.

*Safe Practice For Occupational And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute. Website: [www.ansi.org](http://www.ansi.org).

*Safe Practices for the Preparation of Containers and Piping for Welding and Cutting*, American Welding Society Standard AWS F4.1. Website: <http://www.aws.org>.

*National Electrical Code*, NFPA Standard 70 from National Fire Protection Association. Website: [www.nfpa.org](http://www.nfpa.org).

*Safe Handling of Compressed Gases in Cylinders*, CGA Pamphlet P-1 from Compressed Gas Association. Website: [www.cganet.com](http://www.cganet.com).

*Safety in Welding, Cutting, and Allied Processes*, CSA Standard W117.2 from Canadian Standards Association. Website: [www.csagroup.org](http://www.csagroup.org).

*Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, NFPA Standard 51B from National Fire Protection Association. Website: [www.nfpa.org](http://www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: [www.osha.gov](http://www.osha.gov).

OSHA *Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs*. Website: [www.osha.gov](http://www.osha.gov).

*Applications Manual for the Revised NIOSH Lifting Equation* from the National Institute for Occupational Safety and Health (NIOSH). Website: [www.cdc.gov/NIOSH](http://www.cdc.gov/NIOSH).

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## 1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). The current from arc welding (and allied processes including spot welding, gouging, plasma arc cutting, and induction heating operations) creates an EMF field around the welding circuit. EMF fields can interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passers –by or conduct individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.


4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.





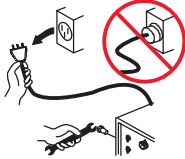

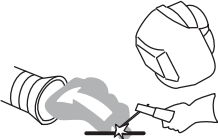

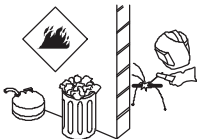
### About Implanted Medical Devices:




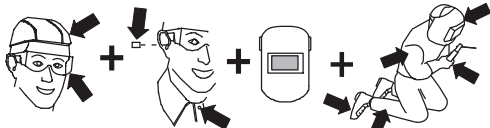
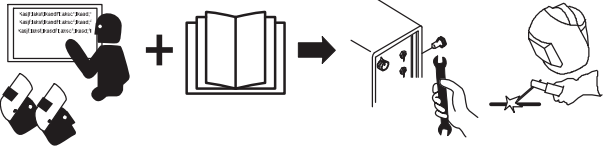
Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

# SECTION 2 – DEFINITIONS










## 2-1. Additional Safety Symbol Definitions









 Some symbols are found only on CE products.








	<p>Warning! Watch Out! There are possible hazards as shown by the symbols.</p>
	<p>Do not discard product (where applicable) with general waste. Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility. Contact your local recycling office or your local distributor for further information.</p>
	<p>Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.</p>
	<p>Protect yourself from electric shock by insulating yourself from work and ground.</p>
	<p>Disconnect input plug or power before working on machine.</p>
	<p>Keep your head out of the fumes.</p>
	<p>Use forced ventilation or local exhaust to remove the fumes.</p>
	<p>Use ventilating fan to remove fumes.</p>
	<p>Keep flammables away from welding. Do not weld near flammables.</p>




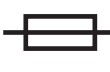


	Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.
	Do not weld on drums or any closed containers.
	Do not remove or paint over (cover) the label.
	Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
	Become trained and read the instructions before working on the machine or welding.

## 2-2. Miscellaneous Symbols And Definitions

<b>A</b>	Amperage	$3\sim$	Three Phase	$I_2$	Rated Welding Current
<b>V</b>	Voltage	$U_1$	Primary Voltage	<b>X</b>	Duty Cycle
	Direct Current (DC)	$I_{1max}$	Rated Maximum Supply Current	<b>%</b>	Percent
	Remote		Directional Arrow (Next/Go Back)	$U_0$	Rated No Load Voltage (OCV)
<b>I</b>	On		Process (Welding)	<b>IP</b>	Degree of Protection
<b>O</b>	Off		Suitable for Welding in an Environment with Increased Risk of Electric Shock		Home
	Protective Earth (Ground)	$I_{1eff}$	Maximum Effective Supply Current		Prewflow Time Postflow Time
	Line Connection	$U_2$	Conventional Load Voltage	<b>—</b>	Negative

	Positive
	Settings
	Input Voltage
<b>Hz</b>	Hertz
	Read Operator's Manual
	Initial Current
	Final Current
	Initial Slope
	Final Slope

	Temperature Indication
	Disturbance
	Shielded Metal Arc Welding (SMAW)
	Gas Tungsten Arc Welding (GTAW) / Tungsten Inert Gas (TIG) Welding
<b>Up</b>	Rated Peak Voltage
	Three Phase Static Frequency Converter-Transformer-Rectifier
	Check (Confirm)
	Set Up (Navigate Through Sequence Screen)

<b>X</b>	X (Cancel)
<b>S</b>	Seconds
	Gas Output
	Gas Input
	USB
	Fuse
	Cooling
COM	Custom RS232 Port
	Output Enabled

# SECTION 3 – SPECIFICATIONS

## 3-1. Serial Number and Rating Label Location

The serial number and rating information for this product is located on the top of the machine. Use the rating labels to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.


## 3-2. Software Licensing Agreement


The End User License Agreement and any third-party notices and terms and conditions pertaining to third-party software can be found at <https://www.millerwelds.com/eula> and are incorporated by reference herein.

## 3-3. Information About Default Weld Parameters And Settings

**NOTICE** – Each welding application is unique. Although certain Miller Electric products are designed to determine and default to certain typical welding parameters and settings based upon specific and relatively limited application variables input by the end user, such default settings are for reference purposes only; and final weld results can be affected by other variables and application-specific circumstances. The appropriateness of all parameters and settings should be evaluated and modified by the end user as necessary based upon application-specific requirements. The end user is solely responsible for selection and coordination of appropriate equipment, adoption or adjustment of default weld parameters and settings, and ultimate quality and durability of all resultant welds. Miller Electric expressly disclaims any and all implied warranties including any implied warranty of fitness for a particular purpose.

## 3-4. Specifications

 Do not use information in unit specifications table to determine electrical service requirements. (See Sections 4-10 and 4-9 for information on connecting input power.)

 This equipment will deliver rated output at an ambient air temperature up to 104°F (40°C).

Mode	Rated Output			Amperage Range DC	Max OCV	Low OCV	Rated Peak Striking Voltage (U <sub>P</sub> )	Dimensions	Weight
	100%	60%	35%						
Stick	200 A	250 A	300 A	5–300 A	70 V	18 V	—	Length: 570 mm Width: 205 mm Height: 360 mm	24 kg (net) 26 kg (ship)
	28 V	30 V	32 V						
TIG	200 A	250 A	300 A			—	8.5 kV		
	18 V	20 V	22 V						

## 3-5. Environmental Specifications

### A. IP Rating


IP Rating
IP23S
This equipment is designed for outdoor use. It may be stored, but is not intended to be used for welding outside during precipitation unless sheltered.

### B. Temperature Specifications

Operating Temperature Range*	Storage/Transportation Temperature Range
-10 to 40°C (14 to 104°F)	-20 to 55°C (-4 to 131°F)

\*Output is derated at temperatures above 40°C (104°F).

### C. Information On Electromagnetic Compatibility (EMC)


 This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

This equipment does not comply with IEC 61000-3-12. If it is connected to a public low voltage system, it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment can be connected. IEC/TS 61000-3-4 can be used to guide parties concerned by the installation of arc welding equipment with an input current greater than 16 A in a low voltage network.



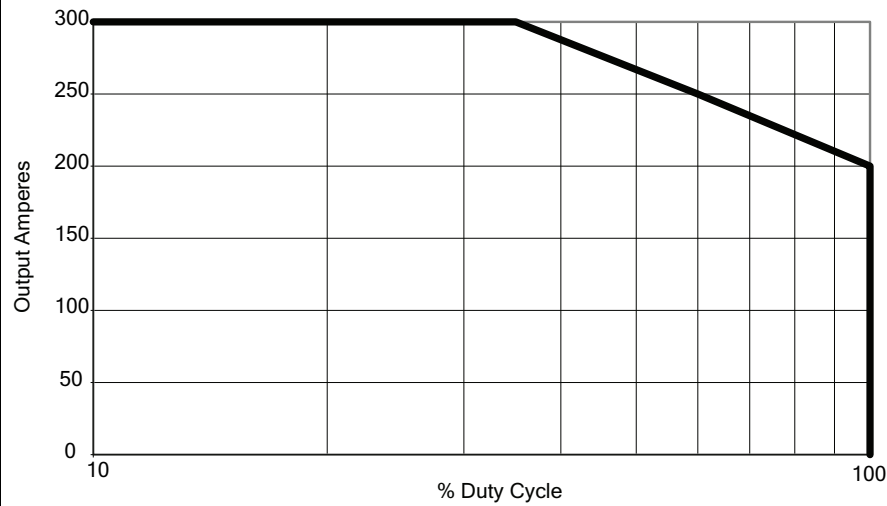
## D. EU Ecodesign Information

Model	Input	Minimum Power Source Efficiency	Maximum Idle State Power Consumption
TigMatic 300iP	400V Three Phase	86%	27 W

	<p>Do not discard product (where applicable) with general waste. Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility. Contact your local recycling office or your local distributor for further information.</p>
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Critical raw materials possibly present in indicative amounts higher than 1 gram at component level	
Component	Critical Raw Material
Printed circuit boards	Baryte, Bismuth, Cobalt, Gallium, Germanium, Hafnium, Indium, Heavy Rare Earth, Light Rare Earth, Niobium, Platinum Group Metals, Scandium, Silicon Metal, Tantalum, Vanadium
Plastic components	Antimony, Baryte
Electrical and electronic components	Antimony, Beryllium, Magnesium
Metal components	Beryllium, Cobalt, Magnesium, Tungsten, Vanadium
Cables and cable assemblies	Borate, Antimony, Baryte, Beryllium, Magnesium
Display panels	Gallium, Indium, Heavy Rare Earth, Light Rare Earth, Niobium, Platinum Group Metals, Scandium
Batteries	Fluorspar, Heavy Rare Earth, Light Rare Earth, Magnesium

### 3-6. Duty Cycle And Overheating

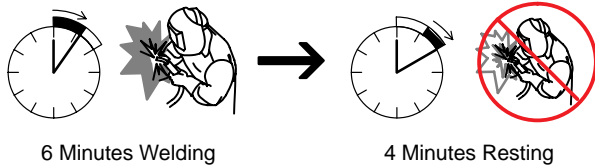


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

**NOTICE** – Exceeding duty cycle can damage unit and void warranty.

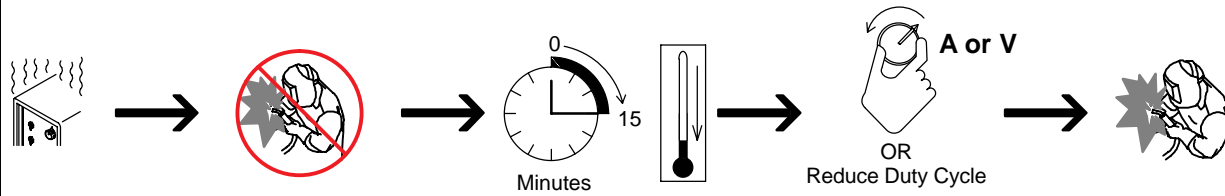
60% Duty Cycle At 250 Amperes



100% Duty Cycle At 200 Amperes

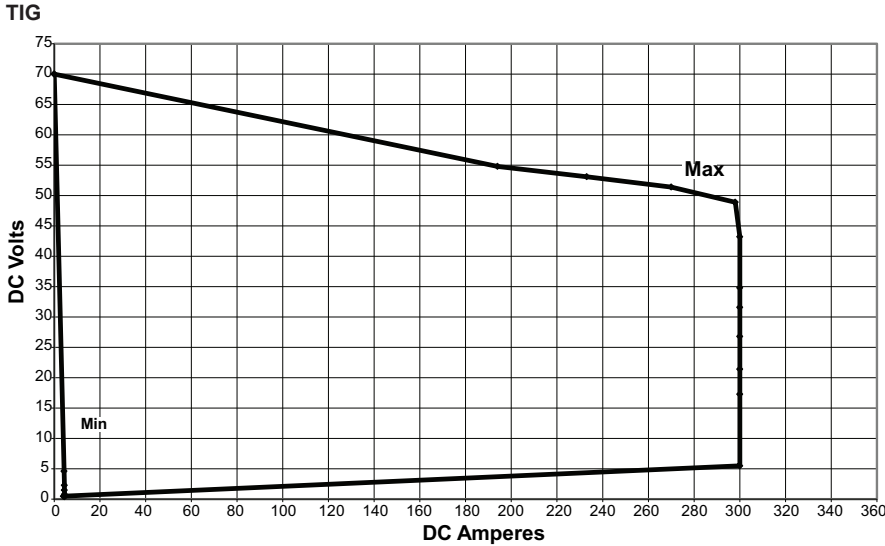
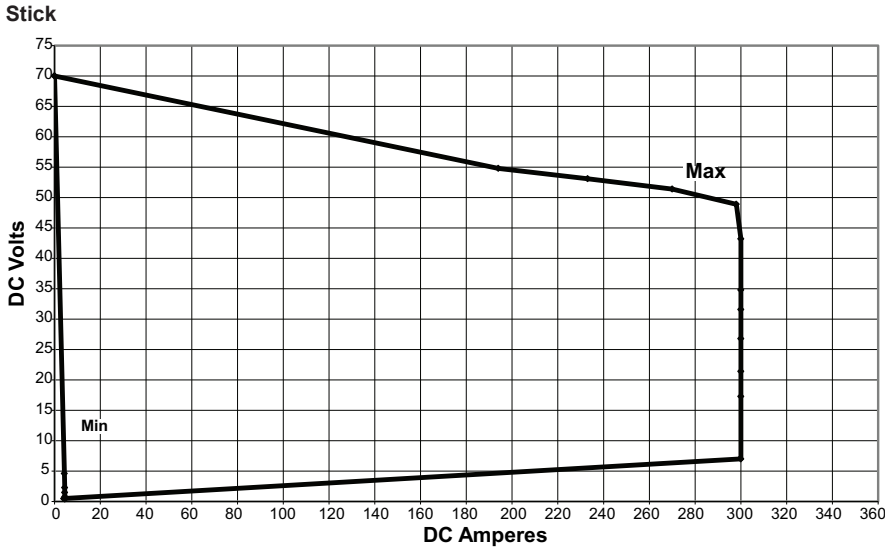


Overheating



### 3-7. Volt-Ampere Curves

The volt-ampere curves show the normal minimum and maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall between the curves shown.

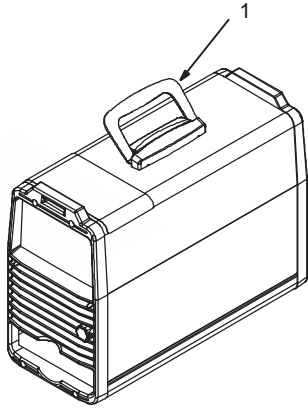



# SECTION 4 – INSTALLATION

## 4-1. Selecting A Location



### Movement



 Do not move or operate unit where it could tip.

 Special installation may be required where gasoline or volatile liquids are present - see NEC Article 511 or CEC Section 20.

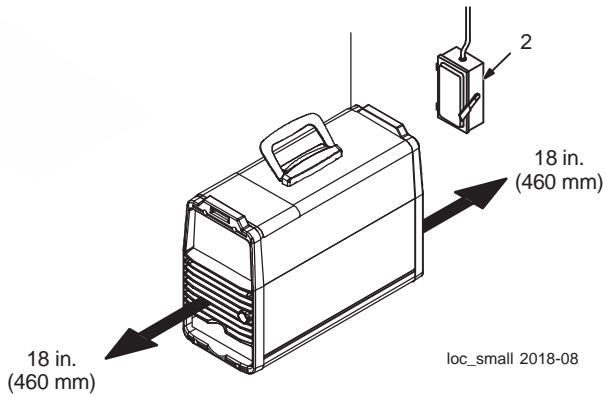
1 Lifting Handle

Use handle to lift unit.

2 Line Disconnect Device

Locate unit near correct input power supply.

### Location And Airflow



## 4-2. Selecting Cable Sizes\*

**NOTICE** – The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 30 m (100 ft) from the workpiece, the total cable length in the weld circuit is 60 m (2 cables x 30 m). Use the 60 m (200 ft) column to determine cable size.

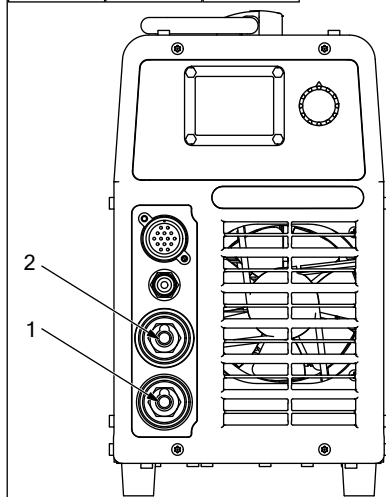
Welding Amperes	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***			
	30 m (100 ft) or Less		45 m (150 ft)	60 m (200 ft)
	10 - 60% Duty Cycle mm <sup>2</sup> (AWG)	60 - 100% Duty Cycle mm <sup>2</sup> (AWG)	10 - 100% Duty Cycle mm <sup>2</sup> (AWG)	
100	20 (4)	20 (4)	20 (4)	30 (3)
150	30 (3)	30 (3)	35 (2)	50 (1)
200	30 (3)	35 (2)	50 (1)	60 (1/0)
250	35 (2)	50 (1)	60 (1/0)	70 (2/0)
300	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)

\* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

\*\*Weld cable size is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.

\*\*\*For distances longer than those shown in this guide, see AWS Fact Sheet No. 39, Welding Cables, available from the American Welding Society at <http://www.aws.org>.

## 4-3. Weld Output Terminals



Turn off power before connecting to weld output terminals.

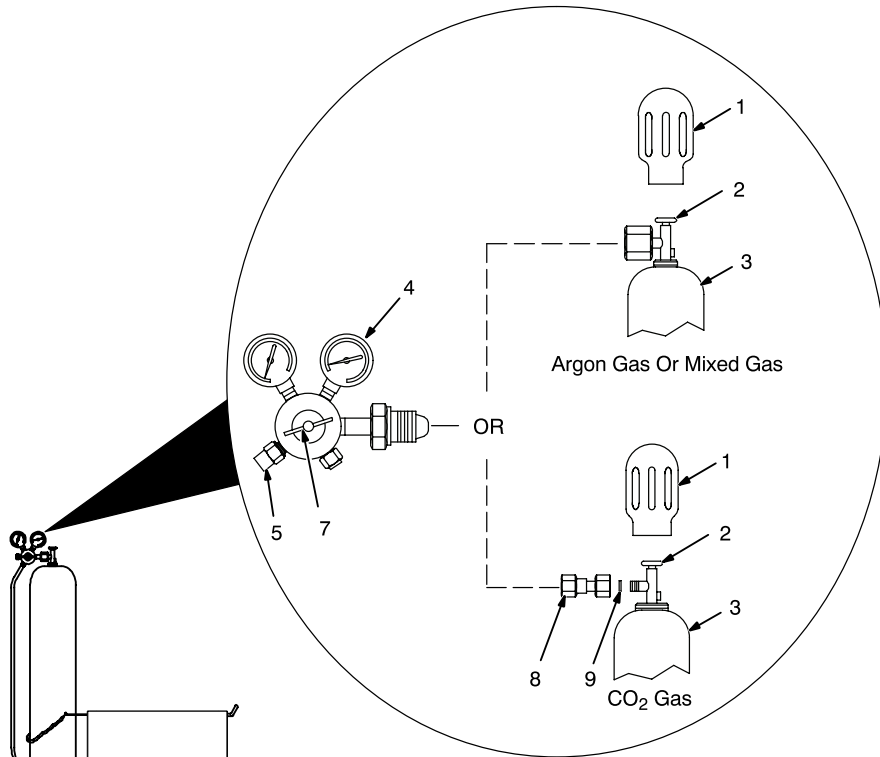
Do not use worn, damaged, undersized, or repaired cables.

1 Positive Weld Terminal

2 Negative Weld Terminal

Insert Dinse connector fully into terminal. Rotate connector clockwise to lock in position.

## 4-4. Installing Gas Supply



Obtain gas cylinder and chain to running gear, wall, or other stationary support so cylinder cannot fall and break off valve.

- 1 Cap
- 2 Cylinder Valve

Remove cap, stand to side of valve, and open valve slightly. Gas flow blows dust and dirt from valve. Close valve.

- 3 Cylinder
- 4 Regulator/Flowmeter

Install so face is vertical.

- 5 Regulator/Flowmeter Gas Hose Connection
- 6 Welding Power Source Gas Hose Connection

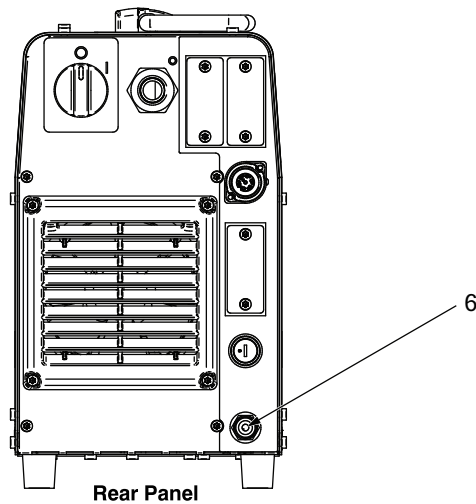
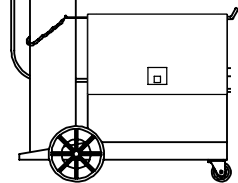
Connect supplied gas hose between regulator/flowmeter gas hose connection, and fitting on rear of welding power source.

- 7 Flow Adjust


Typical flow rate is between 15-20 liters per minute. Check wire manufacturer's recommended flow rate.

- 8 CO<sub>2</sub> Adapter (Customer Supplied)
- 9 O-Ring (Customer Supplied)

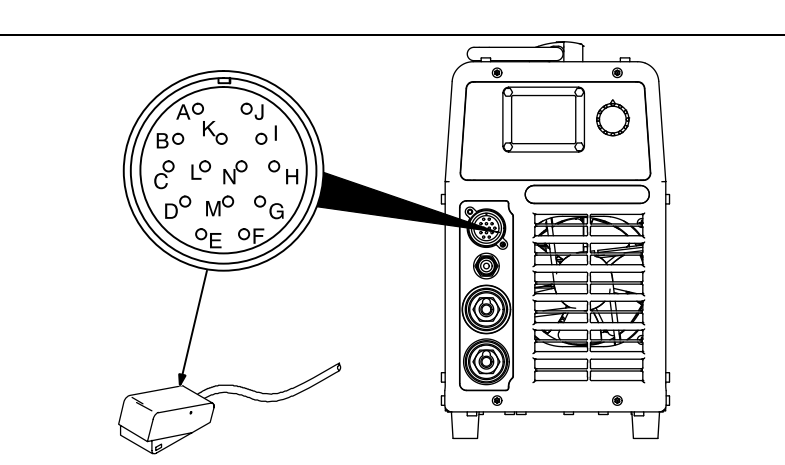
Install adapter with O-ring between regulator/flow meter and CO<sub>2</sub> cylinder.



Rear Panel

 19/32 in. (15 mm)

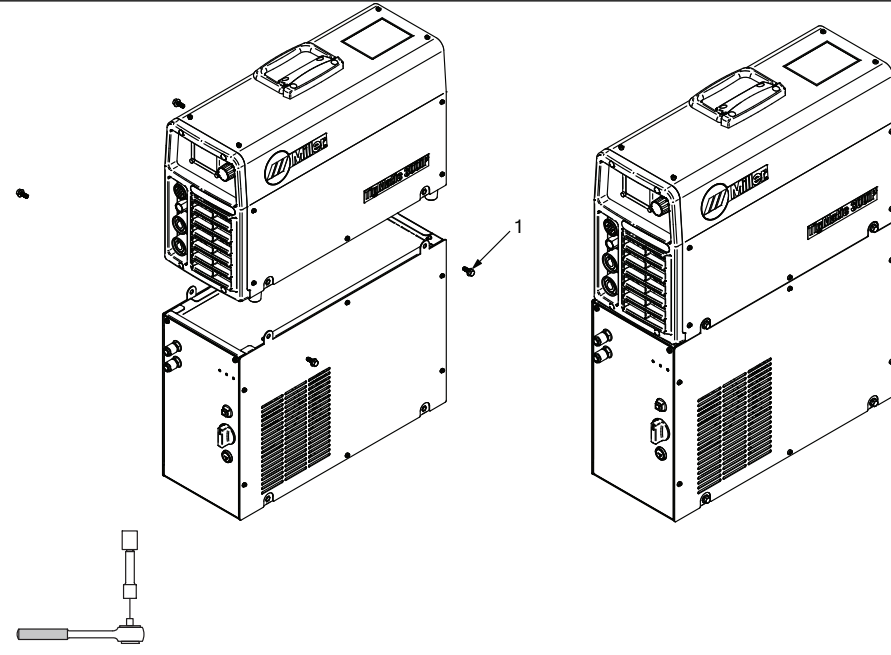
### 4-5. Remote 14-Pin Receptacle Information



Socket	Socket Information
A	Torch switch
B	Torch switch
C	+5 VDC output to remote control
D	Remote control circuit common
E	0 to +5 VDC input command signal from remote control
I	Valid arc (dry contact to 2A max) (optional)
J	Valid arc (dry contact to 2A max) (optional)
K	Chassis

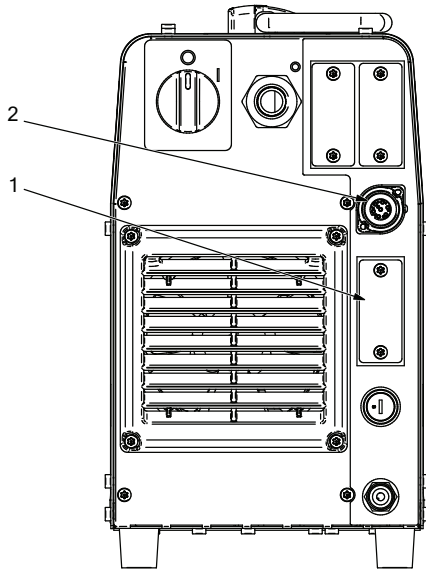
The remaining sockets are not used.

### 4-6. Installing Cooler



1 Screw (M6x12) (4)  
 Remove screws from power source.  
 Place power source on top of TigMatic Cool.  
 Reinstall four screws from power source through eyelets provided on cooler

## 4-7. Installing Cooler Power Supply Receptacle



- 1 Rear Panel Cover
- 2 7-Pin Cooler Control Receptacle


Remove and retain two screws from rear panel cover.

Pull out cover with the attached connector and cap.

- 3 Connector
- 4 Power Supply Receptacle
- 5 Receptacle Support

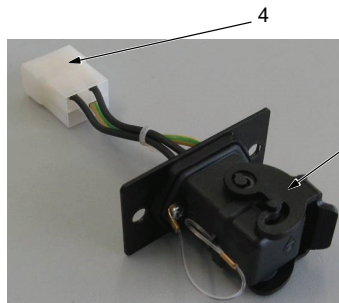
Remove cap from the connector. Set aside rear panel cover and cap.

Install power supply receptacle (Part No. 056076326) on the connector.

 *Cooler power supply receptacle is provided with the cooler.*

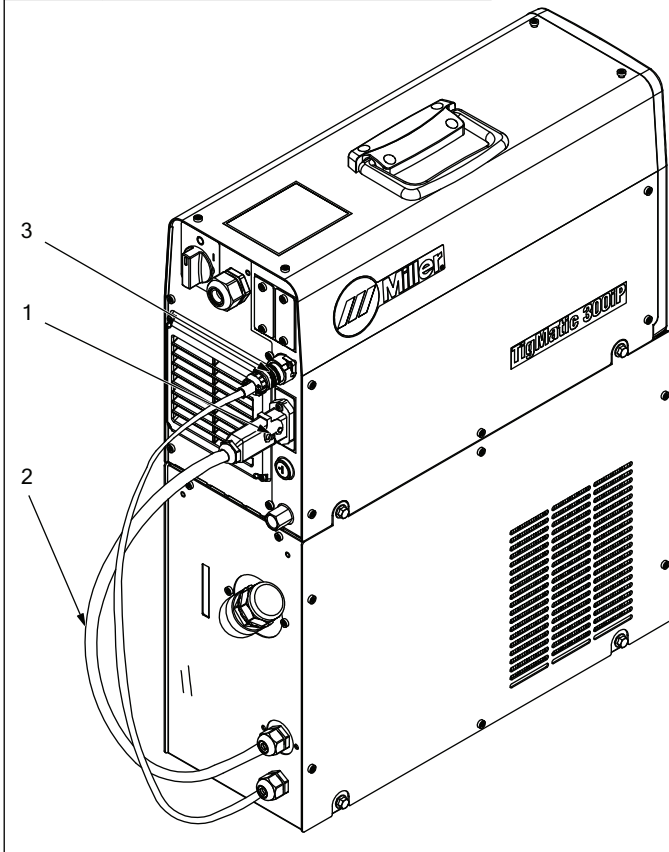
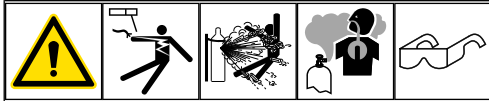
Insert the connection inside the machine.

Install the receptacle on the rear panel with the two screws that were removed earlier.





## 4-8. Connecting Cooler



1 400 V AC, 1 Amp Receptacle

Part No. 056076326 included in the cooler.

2 400 V AC Cord

Provides 400 V AC to power cooler.

3 7-Pin Receptacle

Provides signal to activate the cooler, checks the presence of the liquid pressure, and checks the presence of the cooler.

## 4-9. Electrical Service Guide

**⚠** Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for an individual branch circuit sized for the rated output and duty cycle of one welding power source. In individual branch circuit installations, the National Electrical Code (NEC) allows the receptacle or conductor rating to be less than the rating of the circuit protection device. All components of the circuit must be physically compatible. See NEC articles 210.21, 630.11, and 630.12.

**⚠** CE-marked equipment shall only be used on a supply network that is a three-phase, four-wire system with an earthed neutral.

*☞ Actual input voltage should not fall below 340 volts AC or rise above 460 volts AC. If actual input voltage is outside this range, unit may not operate according to specifications.*

	3 Phase, 50/60 Hz
<b>Rated Supply Voltage (V)</b>	400
<b>Rated Maximum Supply Current <math>I_{1max}</math> (A)</b>	22.5
<b>Rated Effective Supply Current <math>I_{1eff}</math> (A)</b>	13.9
<b>Maximum Recommended Standard Fuse Rating In Amperes <sup>1</sup></b>	
<b>Time Delay Fuses <sup>2</sup></b>	25
<b>Normal Operating Fuses <sup>3</sup></b>	30
<b>Maximum Recommended Supply Conductor Length In Feet (Meters) <sup>4</sup></b>	127 (39)
<b>Raceway Installation</b>	
<b>Minimum Supply Conductor Size In AWG (mm<sup>2</sup>) <sup>5</sup></b>	14 (2.5)
<b>Minimum Grounding Conductor Size In AWG (mm<sup>2</sup>) <sup>5</sup></b>	14 (2.5)

Reference: 2020 National Electrical Code (NEC) (including article 630)

1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.

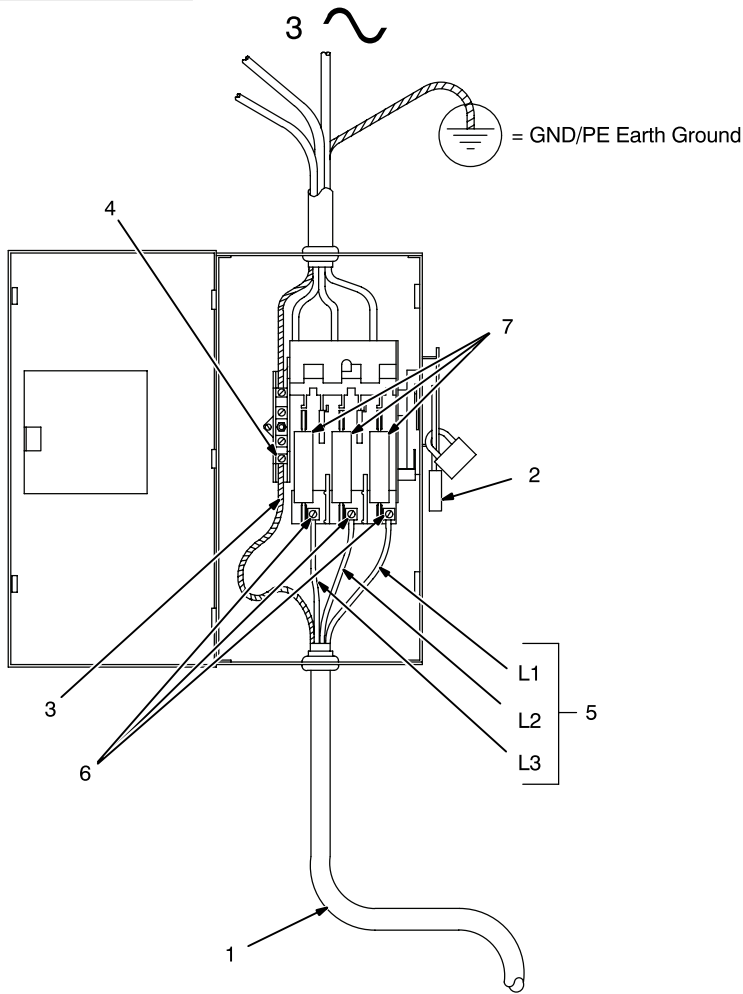
2 "Time-Delay" fuses are UL class "RK5" . See UL 248.

3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amps), and UL class "H" ( 65 amps and above).

4 Maximum total length of copper input conductors in entire installation, raceway and/or flexible cord.

5 Raceway conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.15(B)(16) and is based on allowable ampacities of insulated copper conductors having a temperature rating of 75°C (167°F) with not more than three single current-carrying conductors in a raceway.

## 4-10. Connecting 3-Phase Input Power



- ⚠ Installation must meet all National and Local Codes—have only qualified persons make this installation.
- ⚠ Disconnect and lockout/tagout input power before connecting input conductors from unit. Follow established procedures regarding the installation and removal of lockout/tagout devices.
- ⚠ Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

See rating label on unit and check input voltage available at site.

### For Three-Phase Operation

- 1 Input Power Cord
- 2 Disconnect Device (switch shown in the OFF position)
- 3 Green Or Green/Yellow Grounding Conductor
- 4 Disconnect Device Grounding Terminal
- 5 Input Conductors (L1, L2, And L3)
- 6 Disconnect Device Line Terminals

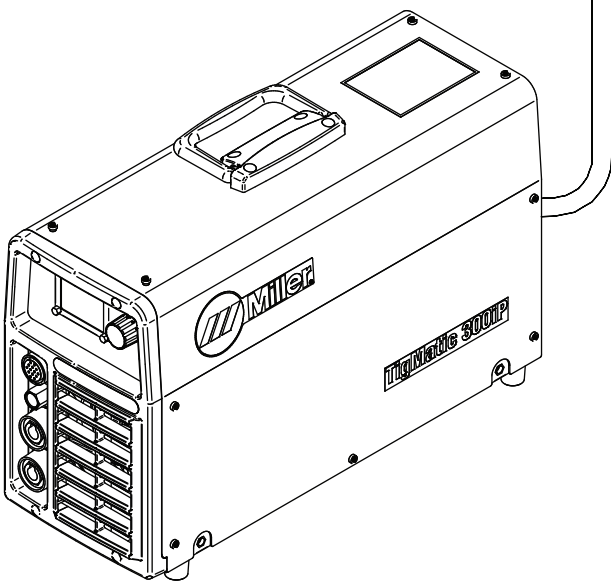
Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

Connect input conductors L1, L2, and L3 to disconnect device line terminals.

### 7 Over-Current Protection

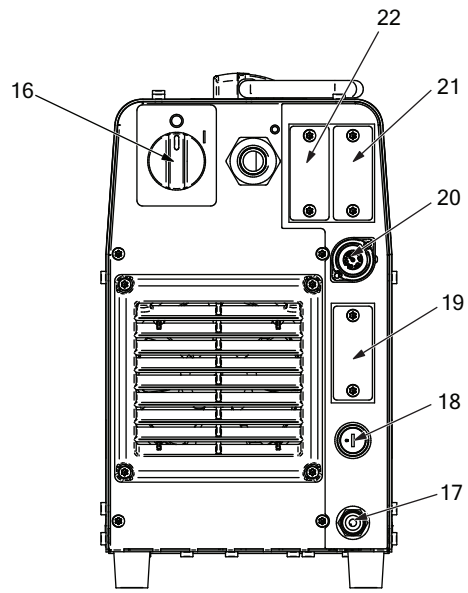
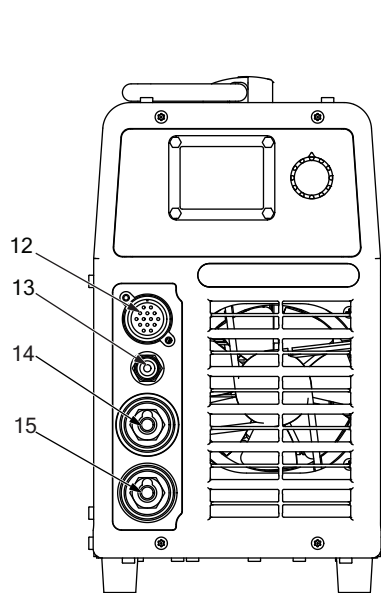
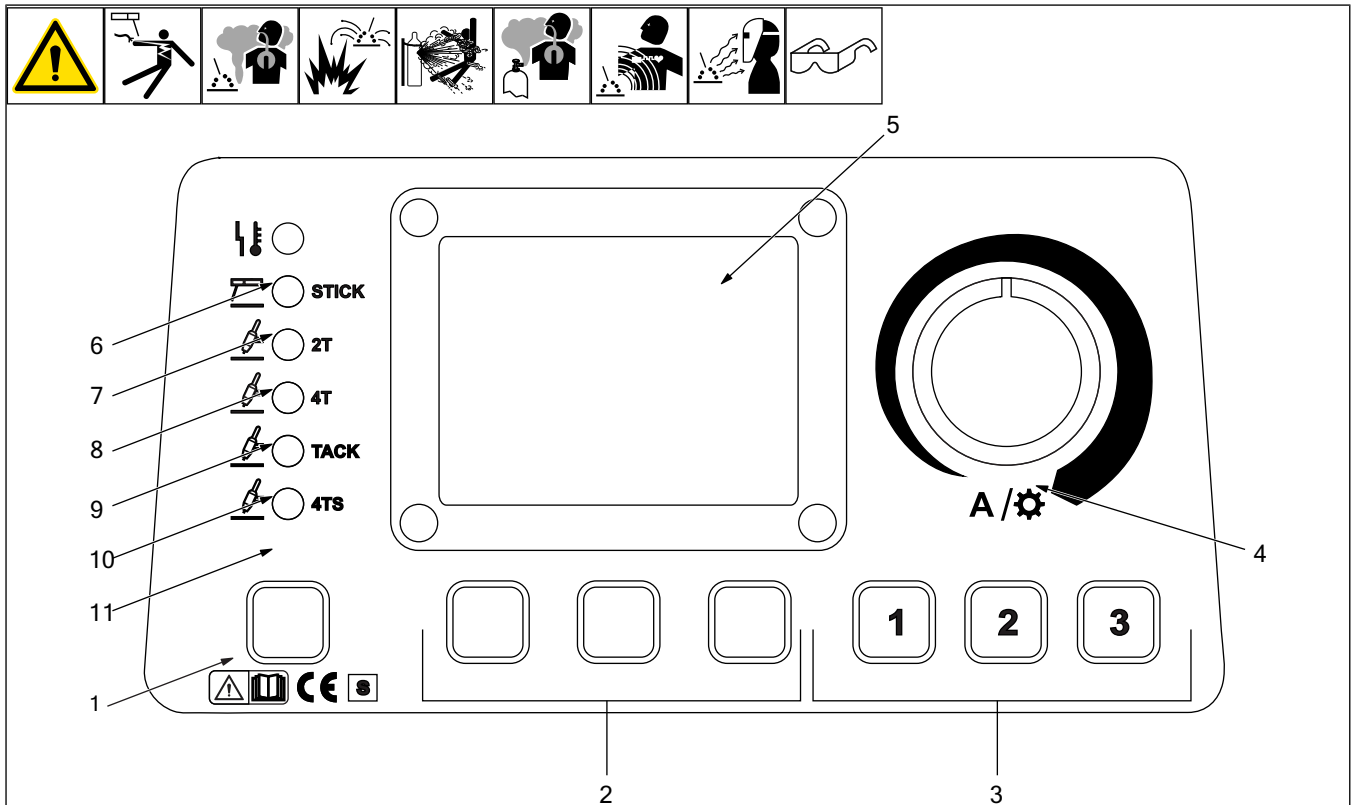
Select type and size of over-current protection using Electrical Service Guide (fused disconnect switch shown).

Close and secure door on disconnect device. Follow established lockout/tagout procedures to put unit in service.



# SECTION 5 – OPERATION

## 5-1. Front Panel Controls



- 1 Mode Button
- 2 Menu Navigation Buttons
- 3 Program Buttons
- 4 Amperage/Settings Knob
- 5 LCD Screen
- 6 Temperature Indicator LED
- 7 Stick Indicator LED
- 8 2T Indicator LED
- 9 4T Indicator LED
- 10 Tack Indicator LED
- 11 4TS Indicator LED
- 12 Remote Control Receptacle (See Section 4-5)

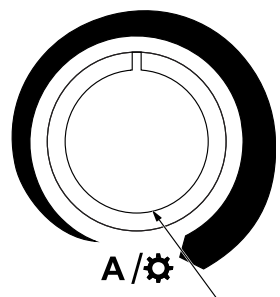
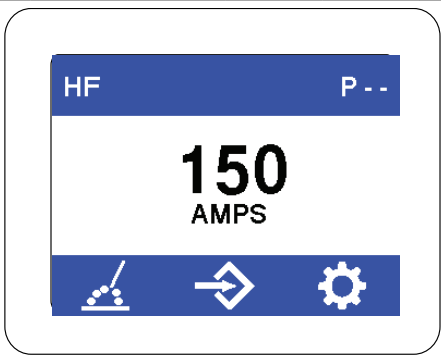
- 13 Gas Out To Torch Connection
  - 14 Negative (-) Weld Output Terminal
  - 15 Positive (+) Weld Output Connection
  - 16 Main Power Switch
  - 17 Gas In Connection
- TIG Torch connection for TIG welding.  
Work lead connection for Stick Welding.  
Work lead connection for TIG Welding  
Stick electrode holder connection for Stick Welding

- Fitting has 5/8–18 in. right hand threads.
- 18 Fuse
- 19 Optional TigMatic Cool Dedicated Power Supply Receptacle
- 20 7-Pin Receptacle for TigMatic Cool (See Section 4-8)
- 21 USB-A Port
- Use for installation of firmware.
- 22 COM, Custom RS232 Port (Optional)

## 5-2. Remote Settings



- 
- STICK
- 2T
- 4T
- TACK
- 4TS



- 1 Settings Button
- 2 Amperage/Settings Knob
- 3 Change Button
- 4 Home Button
- 5 Remote Icon

Press Settings button.

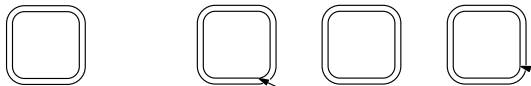
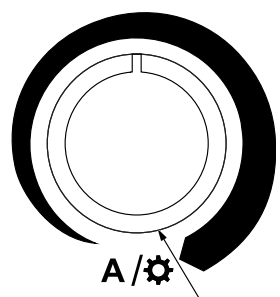
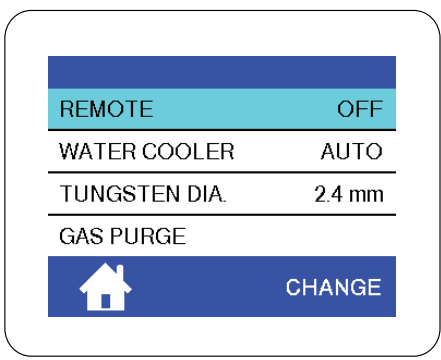
Rotate the Amperage/Settings knob to select Remote. Press Change button to toggle between Off, Finger, and Foot.

Press Home button to return to the main screen. When the remote control is enabled, the remote icon is displayed.



1

- 
- STICK
- 2T
- 4T
- TACK
- 4TS



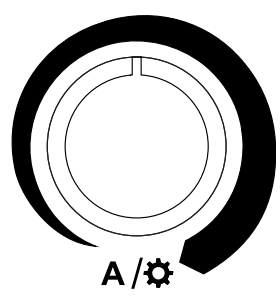
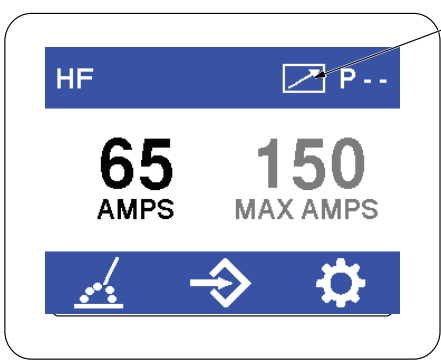
2

4

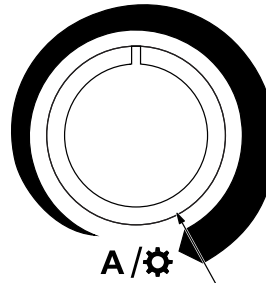
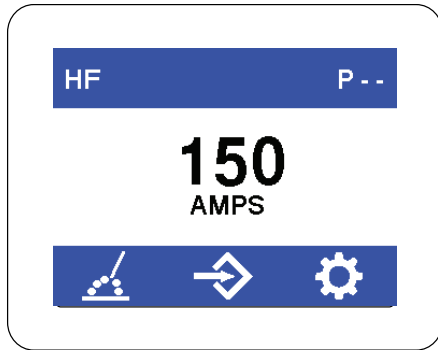
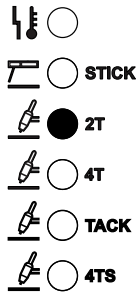
3

5

- 
- STICK
- 2T
- 4T
- TACK
- 4TS



## 5-3. Cooler Settings



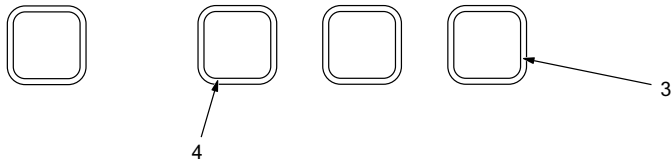
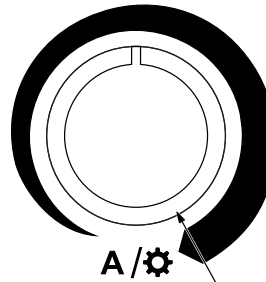
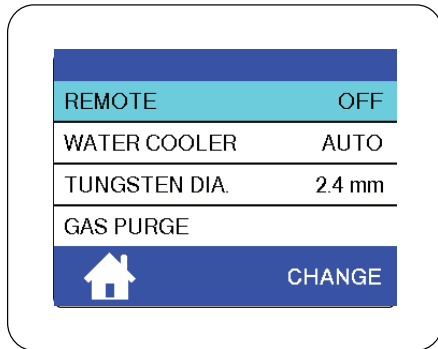
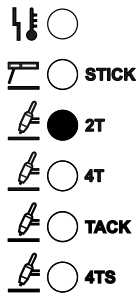
- 1 Settings Button
- 2 Amperage/Settings Knob
- 3 Change Button
- 4 Home Button

Press Settings button.


Rotate the Amperage/Settings knob to select **Water Cooler**. Press Change button.

Water cooler Auto mode set (on-demand). Press again to select On mode (always active).

Press Home to return to main screen.



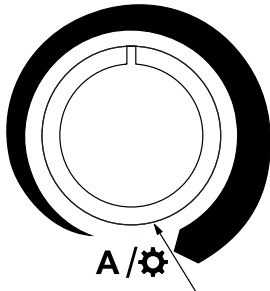
## 5-4. Updating Firmware



- 
- STICK
- 2T
- 4T
- TACK
- 4TS

HF P --

150  
AMPS



2

1

- 
- STICK
- 2T
- 4T
- TACK
- 4TS

OCV (VRD) NORM

---

FACTORY RESET

---

UPDATE FIRMWARE

---

CHANGE

3

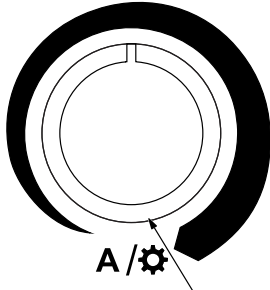
- 
- STICK
- 2T
- 4T
- TACK
- 4TS

PROCEED WITH UPDATE?  
READ MANUAL FOR MORE  
INFORMATION

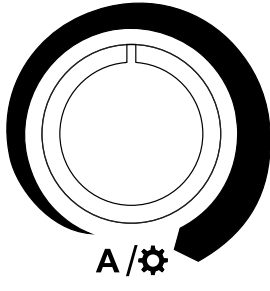
0.16 - 0.16 - 0.00

✘
✔

5                      4



2



A / ⚙️

- 1 Settings Button
- 2 Amperage/Settings Knob
- 3 Change Button
- 4 Green Check (Confirm)
- 5 Red X (Cancel)
- 6 USB Port

Obtain update file (.suf) from . Read documentation that accompanies update file to ensure it is the correct update for the machine version.

Copy the .suf file onto a USB flash drive. It must be at the root level, not inside a folder. No other .suf files may be in that location.

Connect welding power source to power supply and turn on. Press Settings button.

Rotate the Amperage/Settings knob to select **Update Firmware**. Press Change button.

Insert the USB flash drive with the updated firmware. The numbers under the request to confirm are the software versions of the three microprocessors. Press the green check to confirm, or press X to cancel.

During the update, the green LED near the USB port stays on and the red LED blinks in different way according to the programming phase. Do not remove the USB key if the green LED is still on. During the update, the machine may reboot several times. Do not remove the USB flash drive or turn off the main power switch until the green LED near the USB port turns off.

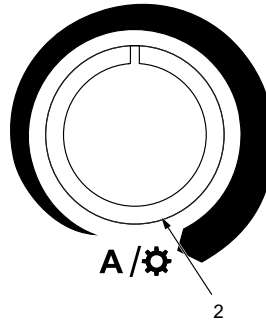
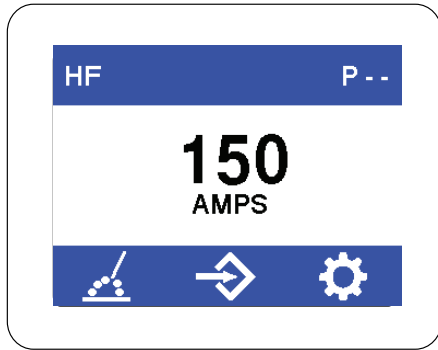
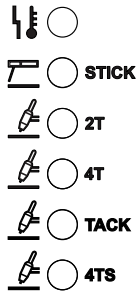
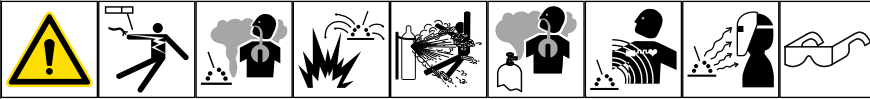
If the update is successful, the machine will reboot and the green LED will turn off, indicating that the update procedure is complete.

On the USB flash drive, you will find a file "logx.txt" that reports the result. Opening the file with a text editor you will find something like this:

```
L476_USB2021_MAIN - 1.02 - Tue Feb 01
16:34:10 2022
MODEL: 0x0002
UPDATE 1: OK
UPDATE 2: OK
UPDATE 3: OK
```

If an update fails, retry and check the log results again. If the problem persists, contact a factory authorized service agent.

## 5-5. Factory Reset Procedure

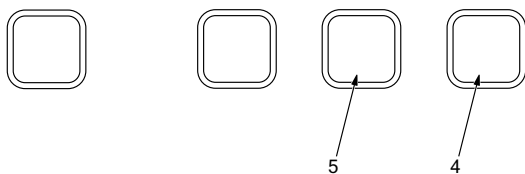
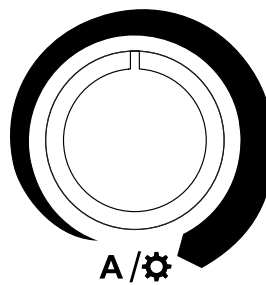
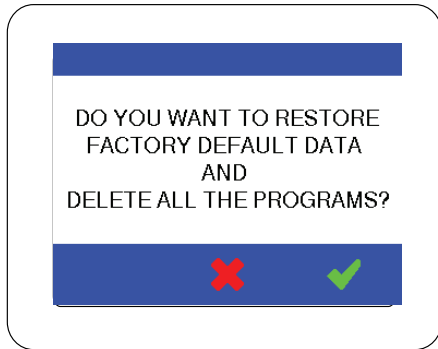
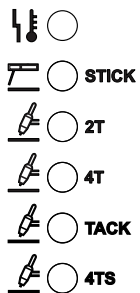
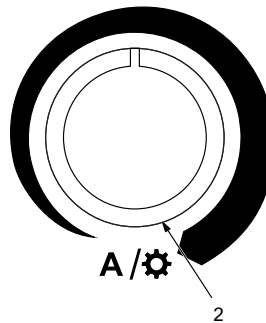
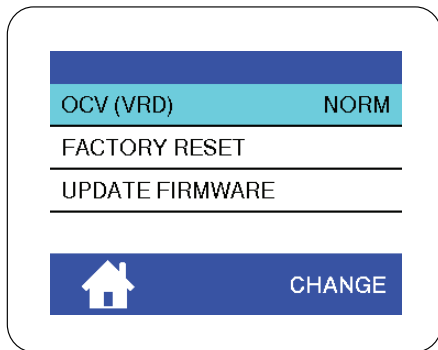
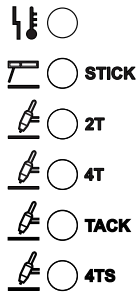


- 1 Settings Button
- 2 Amperage/Settings Knob
- 3 Change Button
- 4 Green Check (Confirm)
- 5 Red X (Cancel)

Press Settings button.

Rotate the Amperage/Settings knob to select **Factory Reset**. Press Change button.

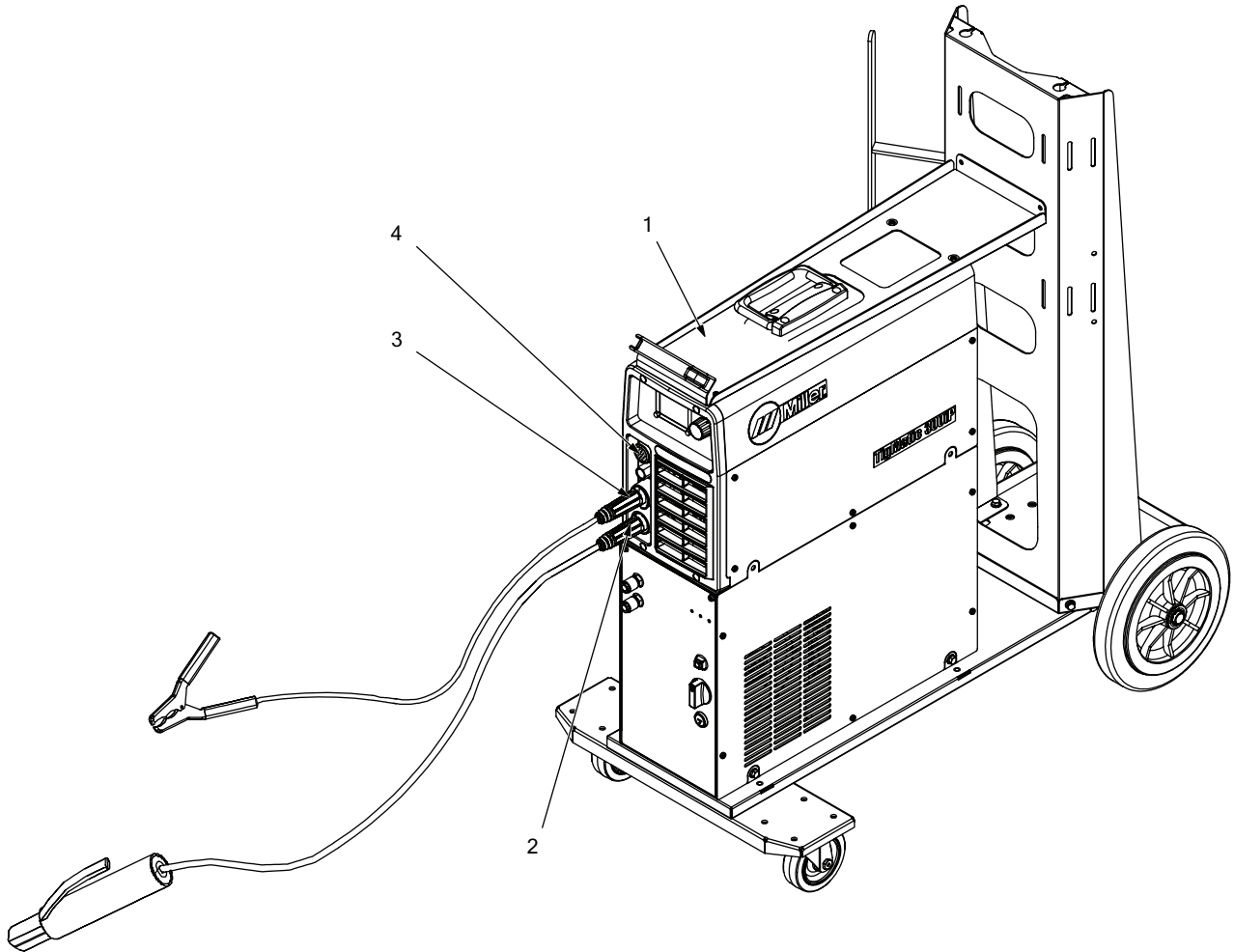
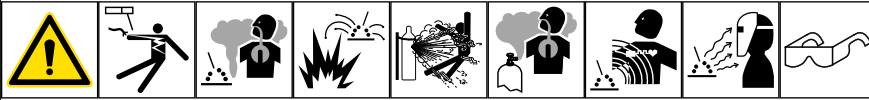
Press the green check to confirm, or press X to cancel.






# SECTION 6 – STICK OPERATION

## 6-1. Stick Connections

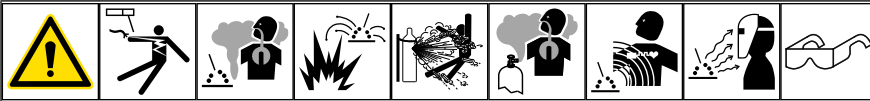


- 1 Welding Power Source
- 2 Positive (+) Weld Output Terminal
- 3 Negative (-) Weld Output Terminal

- 4 Remote 14-Pin Receptacle
- Connect work lead to negative weld output terminal.
- Connect electrode holder to positive weld output terminal.
- If desired, connect remote control to remote 14-pin receptacle (see Section 4-5).

 *Cart and cooler are optional equipment.*

## 6-2. Stick Settings



1 Process Select Button

2 Stick Indicator LED

3 Weld Button

4 Amperage/Settings Knob

5 Green Check (Confirm)

6 Home Button

7 Set Up Button

8 Change Selection Button

Press Process Select button until Stick indicator LED is illuminated.

Press Weld button to open the electrode selection menu. Rotate the Amperage/Settings knob to highlight the desired electrode. Press the green check to confirm, or press Home to return to the home screen.

Press Set Up button to set the Hot Start and DIG parameters. Use the Amperage/Settings knob to change the value. Use the Change Selection button to toggle selection between Hot Start and DIG. Hot Start values range from AUTO to +50%. DIG values range from AUTO to 500%. Press the Home button to save settings and return to the home screen.

1 Process Select Button

2 Stick Indicator LED

3 Weld Button

4 Amperage/Settings Knob

5 Green Check (Confirm)

6 Home Button

7 Set Up Button

8 Change Selection Button

Press Process Select button until Stick indicator LED is illuminated.

Press Weld button to open the electrode selection menu. Rotate the Amperage/Settings knob to highlight the desired electrode. Press the green check to confirm, or press Home to return to the home screen.

Press Set Up button to set the Hot Start and DIG parameters. Use the Amperage/Settings knob to change the value. Use the Change Selection button to toggle selection between Hot Start and DIG. Hot Start values range from AUTO to +50%. DIG values range from AUTO to 500%. Press the Home button to save settings and return to the home screen.

1 Process Select Button

2 Stick Indicator LED

3 Weld Button

4 Amperage/Settings Knob

5 Green Check (Confirm)

6 Home Button

7 Set Up Button

8 Change Selection Button

Press Process Select button until Stick indicator LED is illuminated.

Press Weld button to open the electrode selection menu. Rotate the Amperage/Settings knob to highlight the desired electrode. Press the green check to confirm, or press Home to return to the home screen.

Press Set Up button to set the Hot Start and DIG parameters. Use the Amperage/Settings knob to change the value. Use the Change Selection button to toggle selection between Hot Start and DIG. Hot Start values range from AUTO to +50%. DIG values range from AUTO to 500%. Press the Home button to save settings and return to the home screen.

### 6-3. VRD Operation

1 Settings Button  
2 Amperage/Settings Knob

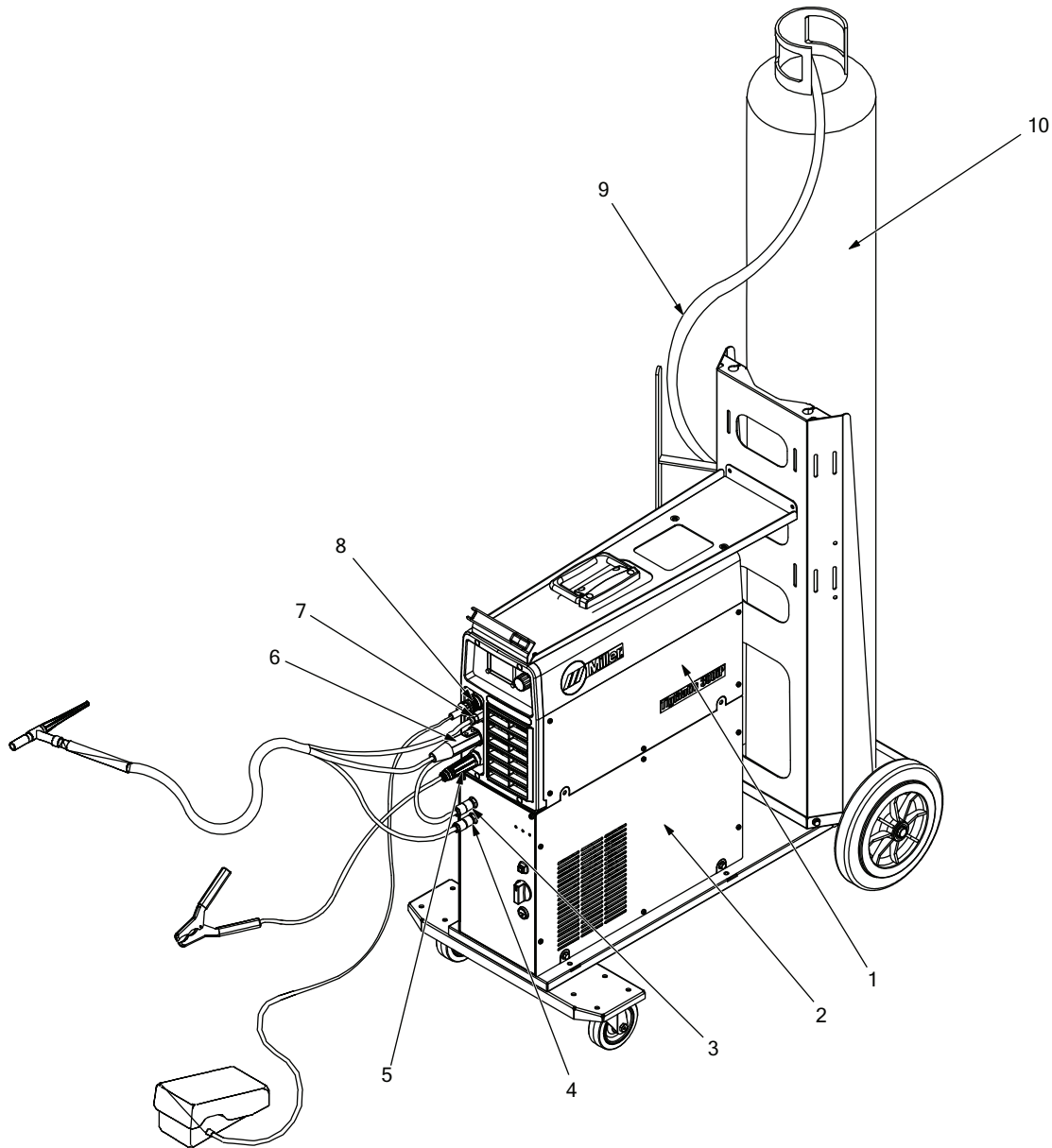
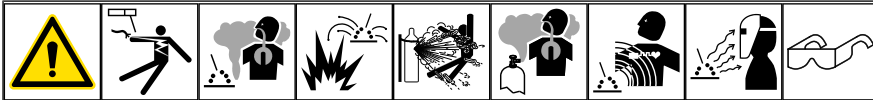
Press Settings button to open the main menu.

Rotate the Amperage/Settings knob to highlight VRD. Press the Change button to set to either NORM (normal) or LOW.

Press the Home button to return to the home screen. When VRD is set to LOW, VRD is shown on the top of the screen.

# SECTION 7 – TIG OPERATION

## 7-1. TIG Connections



1 Welding Power Source

2 Cooler

3 Water In (From Torch) Connection

Connect torch water return (red) hose to the Water In connection on the cooler.

4 Water Out (To Torch) Connection

Connect torch water supply (blue) hose to the Water Out connection on the cooler.

5 Positive (+) Weld Output Terminal

Connect work lead to positive weld output terminal.

6 Negative (-) Weld Output Terminal


Connect TIG torch to negative weld output terminal.

7 Gas Output Connection

8 Remote 14-Pin Receptacle (See Section 4-5)

9 Gas Hose

10 Gas Cylinder

 *Cart and cooler are optional equipment.*

## 7-2. TIG Settings

**1** Mode Button  
**2** Indicator LEDs  
**3** Process Button  
**4** Amperage/Settings Knob  
**5** Next Button  
**6** Green Check Button  
**7** Home Button  
**8** Back Button

Press Mode button until indicator LED for desired mode is illuminated.


Press Process button.







Rotate Amperage/Settings knob to select either Standard or Pulsed. Press Green Check button to confirm.

Rotate Amperage/Settings knob to select either Lift Arc or High Frequency. Press Next button.

Press Home button at any point in the process to discard changes and return to the main screen. Press Back button to modify the previous setting.




### 7-3. Setting Sequence



 ○  
 ○ STICK  
 ○ 2T  
 ○ 4T  
 ○ TACK  
 ● 4TS

HF P --

**150**  
AMPS

1 Mode Button

2 Setup Button

3 Amperage/Settings Knob


4 Next Button




5 Home Button

Use Mode button to select desired TIG welding mode.

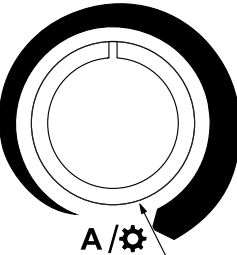
Press Setup button. Use the Amperage/Settings knob to adjust each setting. Available settings and value ranges for each mode are shown below. Press the Next button to advance to the next setting. When finished, press the Home button to exit to the home screen, or press the Setup button for more settings. See Section 7-4.

1







  

3

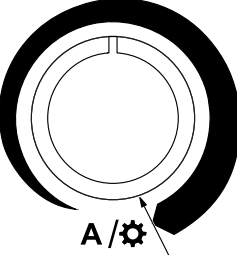


5

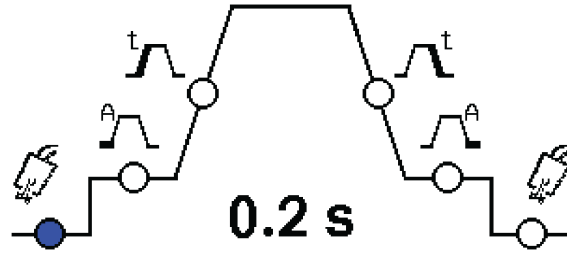








  

3

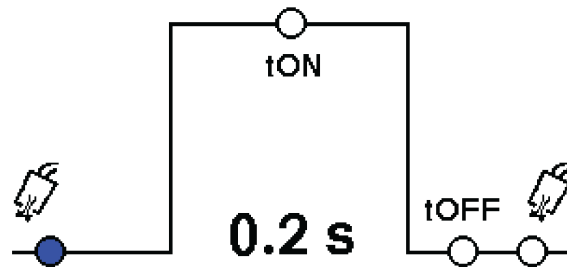




### 2T Sequence and 4T Sequence



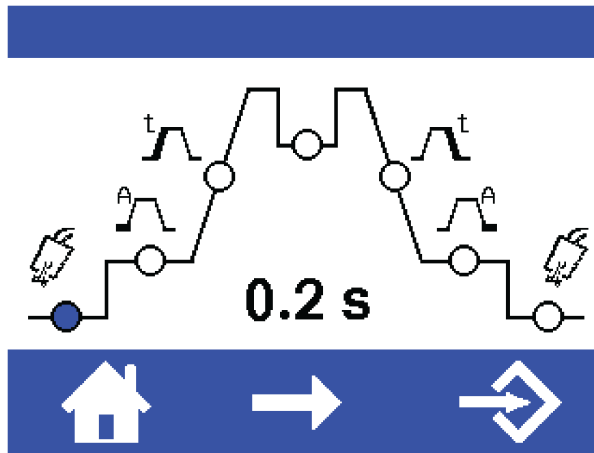
	Pre-gas	0.1–2.5 seconds
	Initial Current	5–250A 0–25.0 seconds (2T Only)
	Slope up	0.1–25.0 seconds
	Slope down	0.1–25.0 seconds
	Final Current	5–250A 0–25.0 seconds (2T Only)
	Post-gas	0.1–25.0 seconds







### TACK Sequence



	Pre-gas	0.1–2.5 seconds
tON	Time ON	0.1–20.00 seconds
tOFF	Time OFF	0–25.0 seconds
	Post-gas	0.1–25.0 seconds

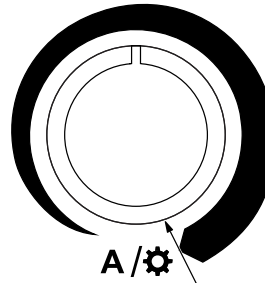
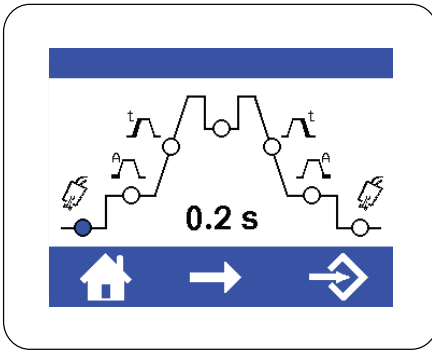
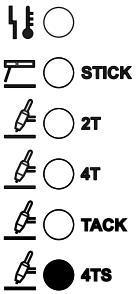
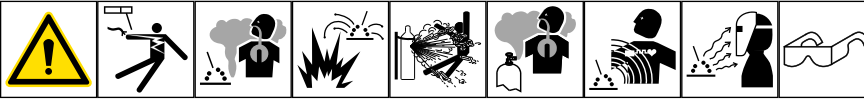
4TS Sequence



	Pre-gas	0.1–2.5 seconds
	Initial Current	5–250A
	Slope Up	0.1–25.0 seconds
	Base Current	5–95%
	Slope Down	0.1–25.0 seconds
	Final Current	5–250A
	Post-Gas	0.1–25.0 seconds



## 7-4. Setting Sequence Continued



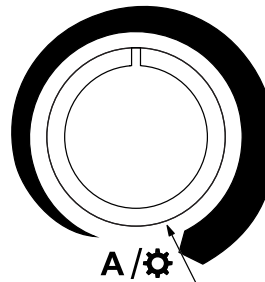
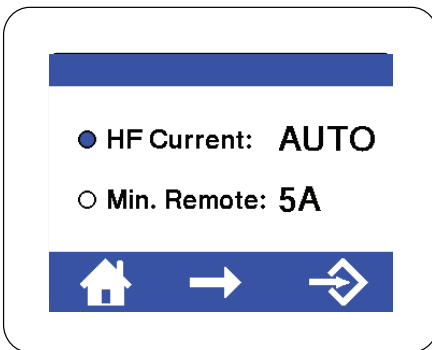
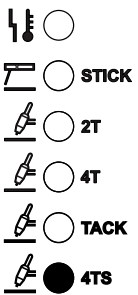
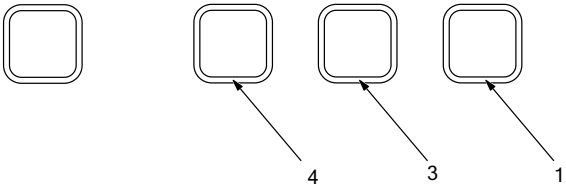
- 1 Set Up Button
- 2 Amperage/Settings Knob
- 3 Next Button
- 4 Home Button

Press Set Up button to set additional parameters. Use Amperage/Settings Knob to change parameter. Press Next button to advance to next setting, or press Home button to exit to the home screen.

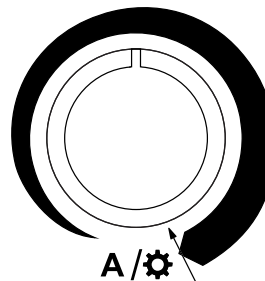
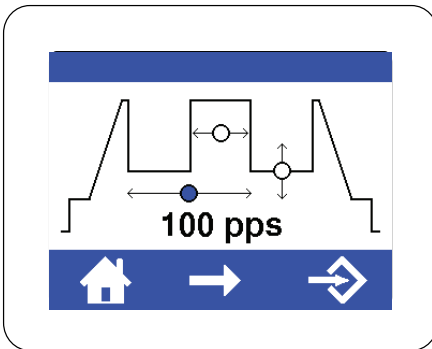
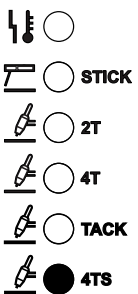
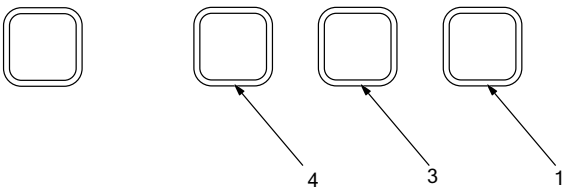
HF Current options are AUTO to 150A.

Min. Remote options are 5A to 100A.

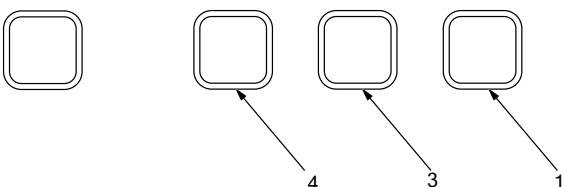
Pulse options are 0.4 to 1000 pps and 5 to 95%.



2



2



## 7-5. Programs

The diagram illustrates the control panel for setting and recalling programs. At the top, a row of safety icons includes a warning sign, a person with a speech bubble, a person with a cloud, a person with a flame, a person with a spray, a person with a bottle, a person with a fan, and a person with a mask. Below these icons is the main control area. On the left, there are six radio buttons with corresponding icons: a temperature gauge, a stick, a 2T torch, a 4T torch, a TACK torch, and a 4TS torch. The central display shows 'HF' and 'P01' at the top, '150 AMPS' in the middle, and a bottom bar with a graph icon, a right arrow, and a gear icon. To the right of the display is a large rotary knob with 'A/gear' below it. Below the knob are three buttons labeled '1', '2', and '3'. A line connects the number '1' to the text '1 Program Buttons (3)'.

1 Program Buttons (3)

**Setting Programs**

The operator can store all selected parameters in the three memory programs available. These programs can be recalled at any time.

**Recalling Programs**

To save current settings, press and hold Program button 1 for three seconds to save the program in position 1. Use the same procedure to save Programs 2 and 3.











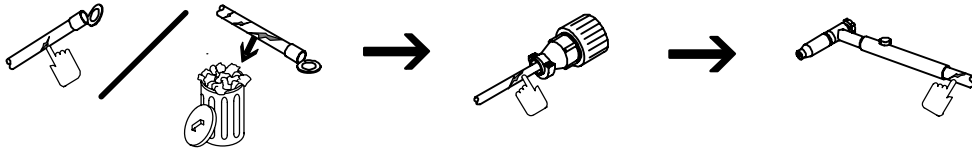
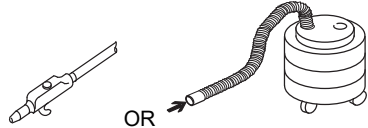
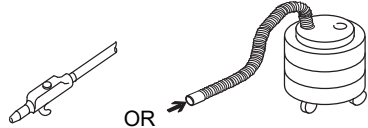
*A program can be stored over existing settings. The data of the overwritten program will be lost.*

**Deleting Programs**

To delete all stored programs, select Factory Reset and delete all programs (see Section 5-5).



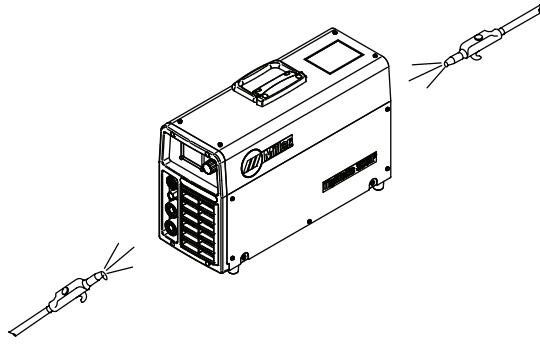

# SECTION 8 – MAINTENANCE AND TROUBLESHOOTING

## 8-1. Routine Maintenance

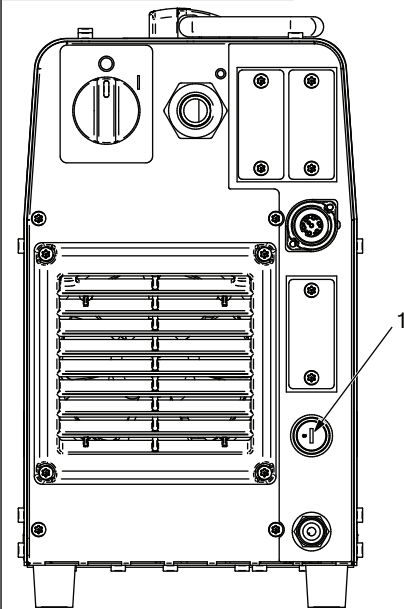
   	
<p> <b>Disconnect power before maintaining.</b></p> <p> <i>Maintain more often during severe conditions.</i></p>	
	<p>✓ = Check                      ○ = Clean                      ☆ = Replace</p>
<p>Every 3 Months</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   </div> <div style="text-align: center;">  </div> </div> <p>✓ ☆ Labels                      ○ Weld Terminals</p>
	 <p>✓ ☆ Cables And Cords</p>
<p>Every 6 Months</p>	<div style="text-align: center;">  <p>OR</p>  </div> <p>○ During heavy service, clean monthly.</p>

\*To be done by factory authorized service agent.

## 8-2. Blowing Out Inside Of Unit

 	
	<p> <b>Do not remove case when blowing out inside of unit.</b></p> <p>To blow out unit, direct airflow through front and back louvers as shown.</p>

### 8-3. Overload Protection



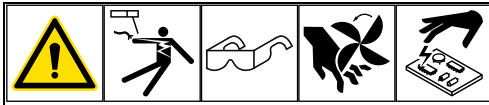
#### 1 2AT Fuse (Time-Delay Fuse)

Protects cooler dedicated power supply from overload.

If the fuse blows, replace the fuse.

Check the cooler or contact a factory authorized service agent if fuse blows frequently.

## 8-4. Troubleshooting



Trouble	Remedy
No weld output.	Be sure line disconnect switch is On (see Section 4-10).
	Replace building line fuse or reset circuit breaker if open (see Section 4-10).
	Secure torch trigger connections.
	Check continuity of power switch S1 and replace if necessary.
	Have Factory Authorized Service Agent check main transformer T1 for signs of winding failure. Check continuity across windings and check for proper connections. Check secondary voltages. Replace T1 if necessary.
	Have Factory Authorized Service Agent check continuity of thermostats TP4 and TP5. Replace TP4 and TP5 if necessary.
	Have Factory Authorized Service Agent check main control board PC1 and connections, and replace if necessary.
No weld output; display boards front panel PC1 and PC3 on.	Unit overheated, see Section 8-5.
	Have Factory Authorized Service Agent check connections of J1 receptacle for damage if remote control was connected.
	Check remote control and replace if necessary
	Have Factory Authorized Service Agent check front panel board PC1, and replace if necessary.
Maximum weld output, no current control.	Check output LEM sensor HD1 connections and replace if necessary.
	Have Factory Authorized Service Agent check front panel board PC1, and replace if necessary.
Fans do not work.	Check fans connections and supply voltage. Replace if necessary.
	Have Factory Authorized Service Agent check front panel board PC1, and replace if necessary.
Low weld output with no control.	Check output LEM sensor HD1 connections and replace if necessary.
	Have Factory Authorized Service Agent check front panel board PC1, and replace if necessary.

## 8-5. Error Codes



Code	Error	Description	Remedy
004	Overtemperature IGBT1	—	Unit overheated. Allow unit to cool. See Section 3-6.
	Overtemperature IGBT2	—	
005	Overtemperature Secondary Rectifier	—	Contact a factory authorized service agent.
101	Temperature Sensor Fail IGBT1 (Short Circ)	—	
	Temperature Sensor Fail IGBT2 (Short Circ)	—	
102	Temperature Sensor Fail Secondary 1 (Short Circ)	—	
	Temperature Sensor Fail AUX (Short Circ)	—	
103	Temperature Sensor Fail IGBT1 (Open)	—	
	Temperature Sensor Fail IGBT2 (Open)	—	
104	Temperature sensor fail secondary rectifier, or Overtemperature on Inductance (OpenCirc)	—	
45	Trigger Protection	Trigger pressed or problem with torch wiring during turning on of the machine	Check torch and torch wiring. Refer to torch owner's manual.
019	Water Cooler Alarm	Cooler signals a malfunction due to no liquid.	Add more coolant.
		Cooler is enabled but not connected.	Check connections to cooler.
131	Phase Fail Alarm	Machine signals a missing phase.	Check for proper input power connections. See Section 4-10.
130	Low 24 V Alarm	Machine signals a low internal voltage.	Check input line voltage.
111	Communication with Main Microcontroller Fail	Logic problem: error during update or fault logic	Contact a factory authorized service agent.
112	Communication with USB Board Fail	USB board fault or USB board not installed.	Contact a factory authorized service agent.



# SECTION 9 – ELECTRICAL DIAGRAMS

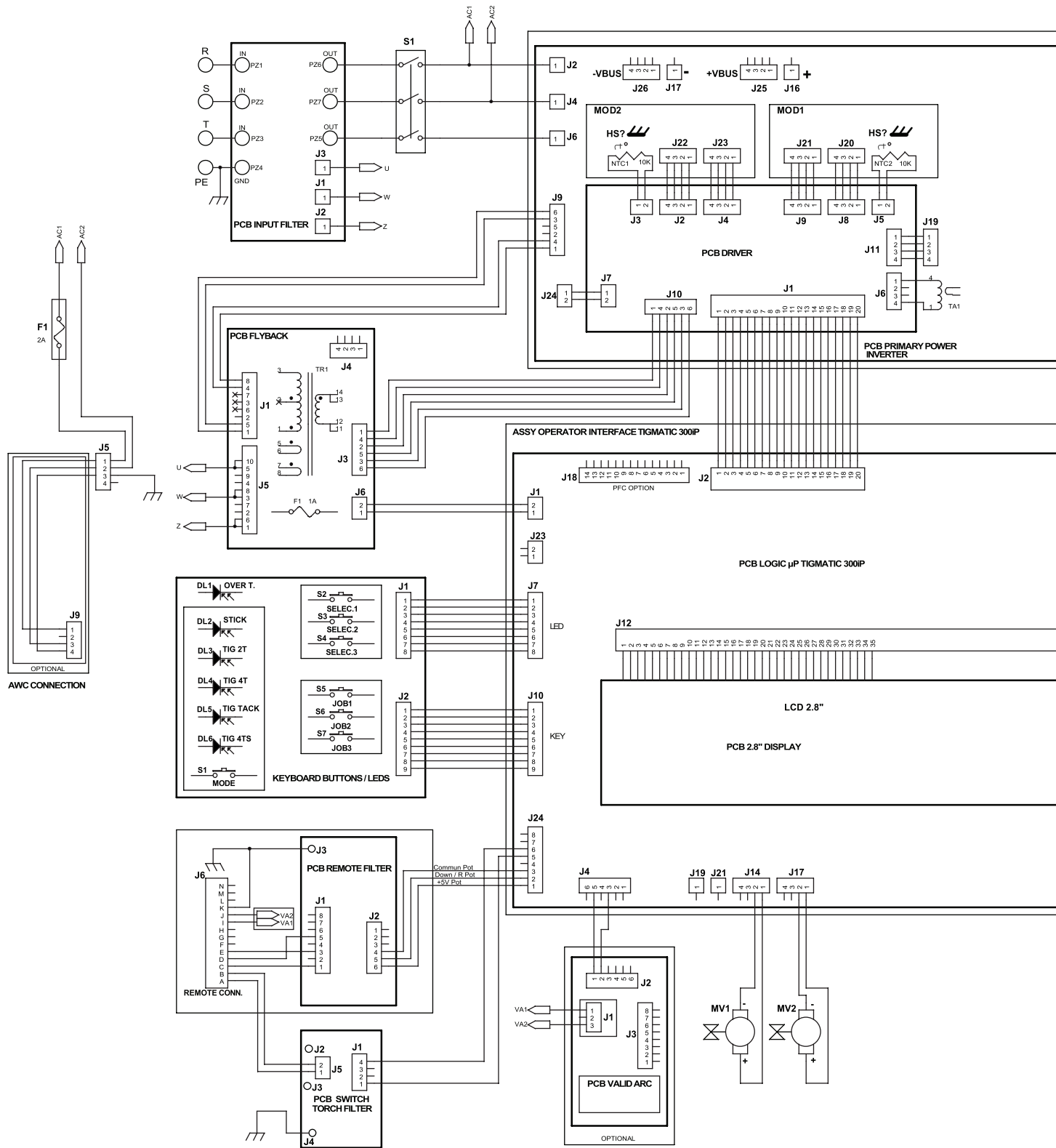
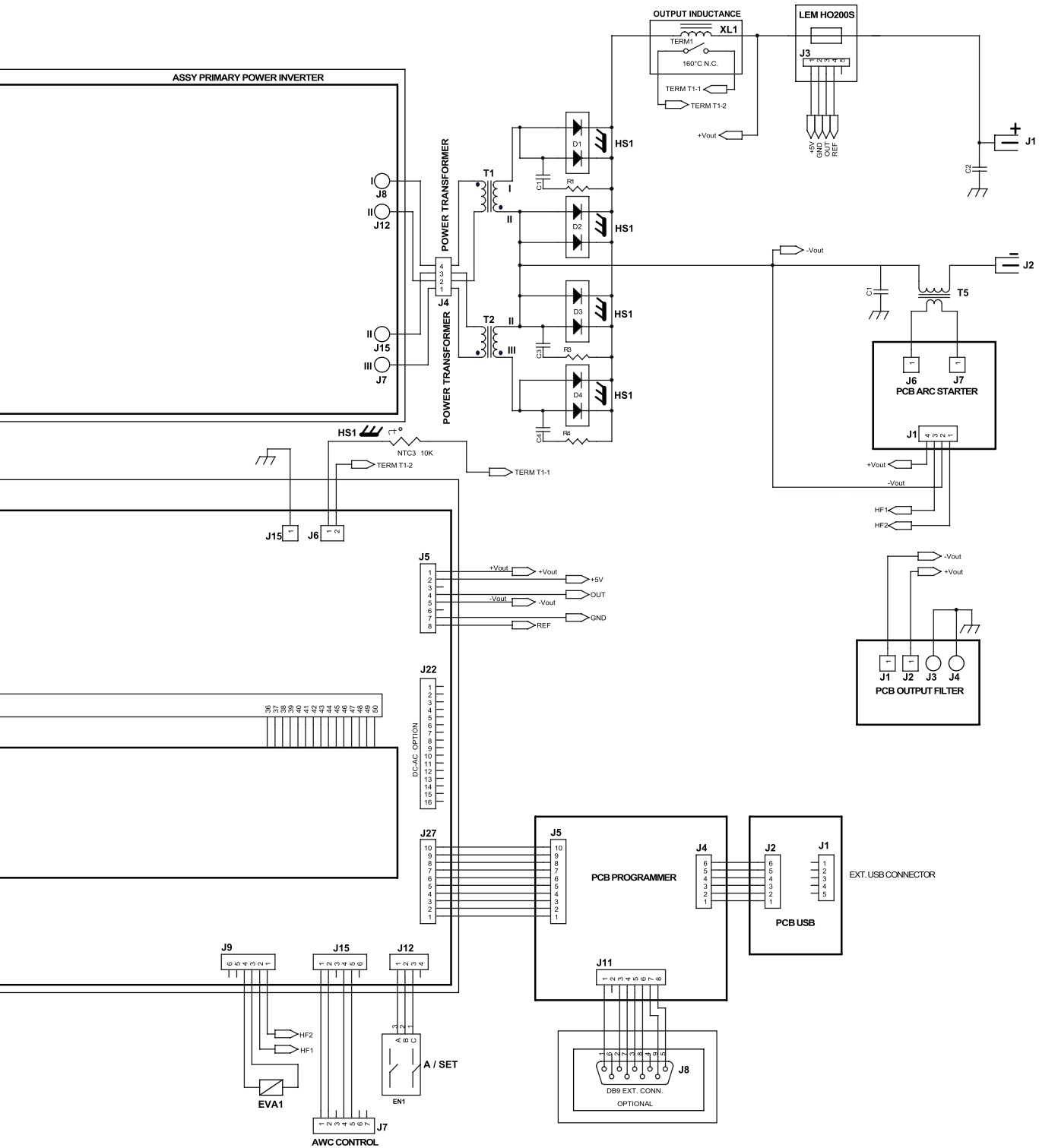


Figure 9-1. Circuit Diagram





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Effective January 1, 2022 (Equipment with a serial number preface of NC or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions below, Miller Electric Mfg. LLC, Appleton, Wisconsin and ITW Welding (hereafter referred to as Miller) warrant to authorized distributors that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed. Notifications submitted as online warranty claims must provide detailed descriptions of the fault and troubleshooting steps taken to diagnose failed parts. Warranty claims that lack the required information as defined in the Miller Service Operation Guide (SOG) may be denied by Miller.

Miller shall honor warranty claims on warranted equipment listed below in the event of a defect within the warranty coverage time periods listed below. Warranty time periods start on the delivery date of the equipment to the end-user purchaser, or 18 months after the equipment is shipped to an International distributor, whichever occurs first.

1 5 Years Parts — 3 Years Labor

- Original Main Power Rectifiers Only to Include SCRs, Diodes, and Discrete Rectifier Modules in non-inverter products

2 3 Years — Parts and Labor Unless Specified

- Auto-Darkening Helmet Lenses (No Labor)
- Engine Driven Welder/Generators (Including EnPak) (NOTE: Engines are Warranted Separately by the Engine Manufacturer.)
- Insight Welding Intelligence Products (Except External Sensors)
- Inverter Power Sources
- Plasma Arc Cutting Power Sources
- Process Controllers
- Semi-Automatic and Automatic Wire Feeders
- Transformer/Rectifier Power Sources

3 2 Years — Parts and Labor

- Auto-Darkening Weld Masks (No Labor)
- Fume Extractors - Capture 5 and Industrial Collector Series

4 1 Year — Parts and Labor Unless Specified

- ArcReach Heater
- AugmentedArc, LiveArc, and MobileArc Welding Systems

- Automatic Motion Devices
- Bernard BTB Air-Cooled MIG Guns (No Labor)
- CoolBelt, PAPR Blower, and PAPR Face Shield (No Labor)
- Desiccant Air Dryer System
- Field Options (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
- RFCS Foot Controls (Except RFCS-RJ45)
- Fume Extractors - Filtair 130, MWX and SWX Series, ZoneFlow Extraction Arms and Motor Control Box
- HF Units
- ICE/XT Plasma Cutting Torches (No Labor)
- Induction Heating Power Sources, Coolers (NOTE: Digital Recorders are Warranted Separately by the Manufacturer.)
- Insight Sensors
- Load Banks
- Motor-Driven Guns (except Spoolmate Spoolguns)
- Positioners and Controllers
- Racks (For Housing Multiple Power Sources)
- Running Gear/Trailers
- Subarc Wire Drive Assemblies
- Supplied Air Respirator (SAR) Boxes and Panels
- TIG Torches (No Labor)
- Tregaskiss Guns (No Labor)
- Water Cooling Systems
- Wireless Remote Foot/Hand Controls and Receivers
- Work Stations/Weld Tables (No Labor)

5 6 Months — Parts

- 12 Volt Automotive-Style Batteries

6 90 Days — Parts

- Accessories (Kits)
- ArcReach Heater Quick Wrap and Air Cooled Cables
- Canvas Covers
- Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
- MDX Series MIG Guns
- M-Guns
- MIG Guns, Subarc (SAW) Torches, and External Cladding Heads
- Remote Controls and RFCS-RJ45
- Replacement Parts (No labor)
- Spoolmate Spoolguns

Miller's True Blue' Limited Warranty shall not apply to:

1. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.
4. Defects caused by accident, unauthorized repair, or improper testing.

MILLER PRODUCTS ARE INTENDED FOR COMMERCIAL AND INDUSTRIAL USERS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

The exclusive remedies for warranty claims are, at Miller's option, either: (1) repair; or (2) replacement; or, if approved in writing by Miller, (3) the pre-approved cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon use). Products may not be returned without Miller's written approval. Return shipment shall be at customer's risk and expense.

The above remedies are F.O.B. Appleton, WI, or Miller's authorized service facility. Transportation and freight are the customer's responsibility. TO THE EXTENT PERMITTED BY LAW, THE REMEDIES HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES REGARDLESS OF THE LEGAL THEORY. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT) REGARDLESS OF THE LEGAL THEORY. ANY WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY, OR REPRESENTATION, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, ARE EXCLUDED AND DISCLAIMED BY MILLER.

This Limited Warranty provides specific legal rights, and other rights may be available, but may vary by country.

**Warranty Questions?**  
Call your ITW Welding Regional Office.

# Owner's Record

Please complete and retain with your personal records.

Model Name \_\_\_\_\_ Serial/Style Number \_\_\_\_\_

Purchase Date \_\_\_\_\_ (Date which equipment was delivered to original customer.) \_\_\_\_\_

Distributor \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

## For Service

**Contact a *DISTRIBUTOR* or *SERVICE AGENCY* near you.**

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

Welding Supplies and Consumables

Options and Accessories

Personal Protective Equipment (PPE)

Service and Repair Replacement Parts

Training (Schools, Videos, Books)

Welding Process Handbooks

To locate a Distributor or Service Agency visit  
[www.millerwelds.com](http://www.millerwelds.com) or call 1-800-4-A-Miller

Contact the Delivering Carrier to:

File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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GmbH  
Singen, DE  
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