AWT®

MMA-155

Inverter Welding Machine(MMA/LIFT TIG) ARC155

OPERATOR'S MANUAL

READ AND UNDERSTAND ALL INSTRUCTIONS AND PRECAUTIONS BEFORE PROCEEDING.

CONTENTS

1.PACKING

1.MMA-155 welder
2.110V~220V Adapter Cord
3.Electrode Holder With 10'(3m) Cable
4.Ground Clamp With 10'(3m) Cable
5.Brush/Hammer
6.Shoulder Strap
7.Electrode E6013 φ2.5*5
8.Glove
9.Mask

2.SAFETY PRECAUTIONS - READ BEFORE USING

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

2.1 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.

2.2 Arc Welding Hazards

Welding can be dangerous to you and other persons in the work area. Read and understand this instruction manual before using your AWT welding machine. Injury or death can occur if safe welding practices are not followed.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.

Safety information is set forth below and throughout this manual.

The following explanations are displayed in this manual, on the labeling, and on all other information provided with this product.

ELECTRIC SHOCK CAN KILL

- The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing.
- Always wear dry, protective clothing and leather welding gloves and insulated footwear. Use suitable clothing made from durable flame-resistant material to protect your skin.
- Always operate the Welder in a clean, dry, well ventilated area. Do not operate the Welder in humid, wet, rainy or poorly ventilated areas.
- Do not touch live electrical parts.
- Disconnect Welder from power supply before assembly, disassembly or maintenance of the torch, contact tip and when installing or removing nozzles.
- Frequently inspect input power cord and ground conductor for damage or bare wiring – replace immediately if damaged – bare wiring can kill.
- Be sure that the work piece is properly supported and grounded prior to beginning an electric welding operation.
- Always attach the Ground Clamp to the piece to be welded and as close to the weld area as possible. This will give the least resistance and best weld.

⚠ 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.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator.
- 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.

⚠ 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 durable, flame−resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

⚠ Welding And Cutting Sparks Can Cause Fire Or Explosion

- Electric welding produces sparks which can be discharged considerable distances at high velocity igniting flammable or exploding vapors and materials.
- DO NOT operate electric arc Welder in areas where flammable or explosive vapors are present.
- DO NOT use near combustible surfaces. Remove all flammable items from the work area where welding sparks can reach (min. of 35 feet).
- Always keep a fire extinguisher nearby while welding.
- Use welding blankets to protect painted and or flammable surfaces; rubber weatherstripping, dash boards, engines, etc.
- Ensure power supply has properly rated wiring to handle power usage.

⚠ ELECTROMAGNETIC FIELDS CAN BE A HEALTH HAZARD!

- The electromagnetic field that is generated during arc welding may interfere with various electrical and electronic devices such as cardiac pacemakers. Anyone using such devices should consult with their physician prior to performing any electric welding operations.

- Exposure to electromagnetic fields while welding may have other health effects which are not known.

⚠ 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.

⚠ 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.

⚠ 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.

⚠ CAUTION INADEQUATE WIRING CAN CAUSE FIRE AND INJURY!

- Verify that the facility power source has properly rated wiring to handle power requirements of this Welder.

3.PRODUCT DESCRIPTION

3.1 Features

- MCU digital control achieves intelligent synergy.
- Latest IGBT Inverter Technology.
- LED display screen for easy operation.
- High output no-load voltage, available for cellulose electrode.
- Smart cooling fan, excellent heat dissipation.
- Compact and portable with light weight.
- Easy arc starting, less spatter, stable current and good shaping.
- Application to aerial work, indoor, outdoor and decoration, etc.

3.2 Function Overview

- MMA Manual Control
- Lift TIG argon arc welding(TIG).
- Hot start.
- Anti-stick.
- Arc-force.
- VRD (Voltage reduce device).
- Dual voltage 110V/220V.
- O.C protection.
- LED Meter display.

3.3 Technical Parameter

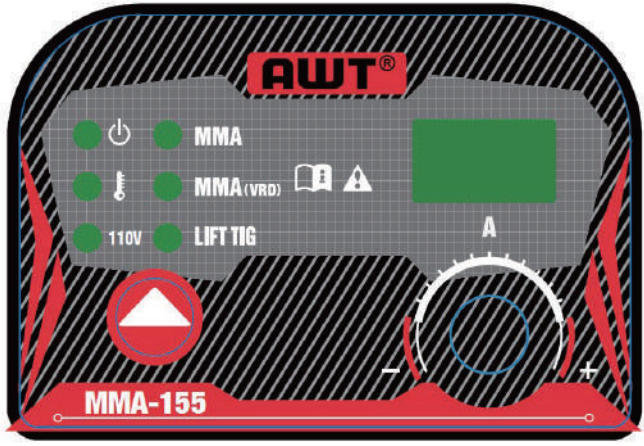
Technical Parameter	Unites	MMA-155	
Rated Input Voltage	V	AC110V±15% 50/60HZ	AC220V±15% 50/60HZ
Rated Input Power	KVA	4.7	7
Welding Current Range（MMA)	A	20-100	20-140
	V	20.8-24	20.8-25.6
Welding Current Range（TIG)	A	20-100	20-140
	V	10.8-14	10.8-15.6
Rated Duty Cycle		60%	
No-Load Voltage	V	73	
Overall Efficiency		85%	
Protection Grade		IP21S	
Power Factor		COSφ=0.7	
Insulation Grade		F	
Standard		UL60974-1	
Size	mm/inch	320x185x220mm/12.6"x7.3"x8.6"	
Weight	kg/lb	3kg/6.6lb	
Applicable Electrode	Inch/ mm	1/16"-3/25" 1.6-2.5	1/16"-1/8" 1.6-3.2

3.4 Duty Cycle

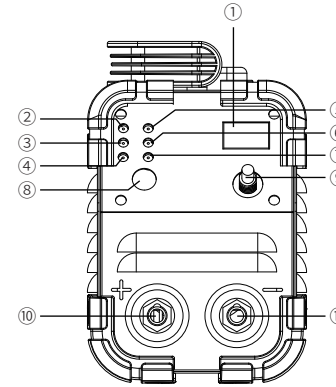
The rated Duty cycle refers to the amount of welding that can be done within an amount of time. The AWT MMA-155 has a duty cycle of 60% at 140 Amps for 220 Volts. It is easiest to look at your welding time in blocks of 10 Minutes and the Duty Cycle being a percentage of that 10 Minutes. If welding at 140 Amps with a 60% Duty Cycle, within a 10 Minute block of time you can weld for 6 Minutes with 4 Minutes of cooling for the Welder.

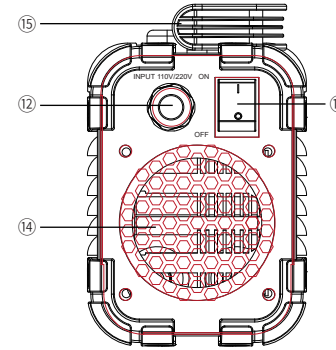
If the Duty Cycle is exceeded, the Welder will automatically shut off, however the fan will continue running to cool the components. When a safe temperature has been reached, the Welder will automatically switch the Welder output back on. To increase the duty cycle you can turn down the Voltage Output control.

4.OPERATION AND DESCRIPTION



1.LED meter：Indicate the output welding current in AMPS
2. POWER indicator: Indicates the power source
3. Overheat indicator: If the welder overheats due to high internal air temperature, or if the duty cycle is exceeded. The internal thermostat will open, disabling the weld output. During this time the cooling fan will continue to run to cool the unit.
4.110V: Automatically detects the voltage of the power supply. When the power supply is 110V, the light is on. When the power supply is 220V, the light is off
5.MMA: MMA welding mode without VRD
6.MMA VRD: Voltage reduce device. MMA welding mode with VRD.
7.LIFT TIG: LIFT TIG welding mode
8.Choose button: Choose MMA or LIFT TIG welding mode
9.Current knob: Welding current can be adjusted from low to high by rotating the knob clockwise
10.+ output terminal
11.- output terminal
12.Power cord
13.Power switch: Control power
14.Cooling fan
15.Handle





Fault code table

Digital tube display code	Code meaning
E01	Over-current protection
E02	Overheat protection
E04	15V power failure
E05	Input voltage switching failure

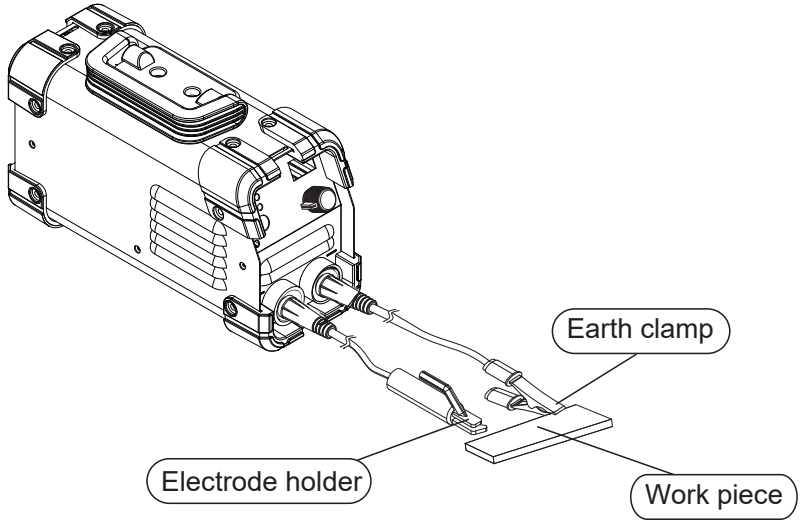
5.INSTALLATION AND OPERATION

Note:

- **Please install the machine strictly according to the following steps.**
- **Turn off the power supply switch before any electric connection operation.**
- **The housing protection grade of this machine is IP21S, so do not use it in rain.**

5.1 Installation:

Schematic Diagram of MMA Welding



1.Ensure that the power switch is “OFF".

2) A primary power supply cable is available for this welding machine. Connect the primary power supply cable to the corresponding voltage class based on rated input power of the welder. Incorrect connections should be avoided.

3) The primary cable should be tightly connected to the corresponding power binding post or socket to avoid oxidization.

4) Check whether the input voltage value varies in acceptable range with a multi-meter.

5) Insert the cable plug with electrode holder into the “+” socket on the front panel of the welding machine, and tighten it clockwise.

6) Insert the cable plug with ground clamp into the “-” socket on the front panel of the welding machine, and tighten it clockwise.

7)Insert the electrode to be used into the electrode holder.

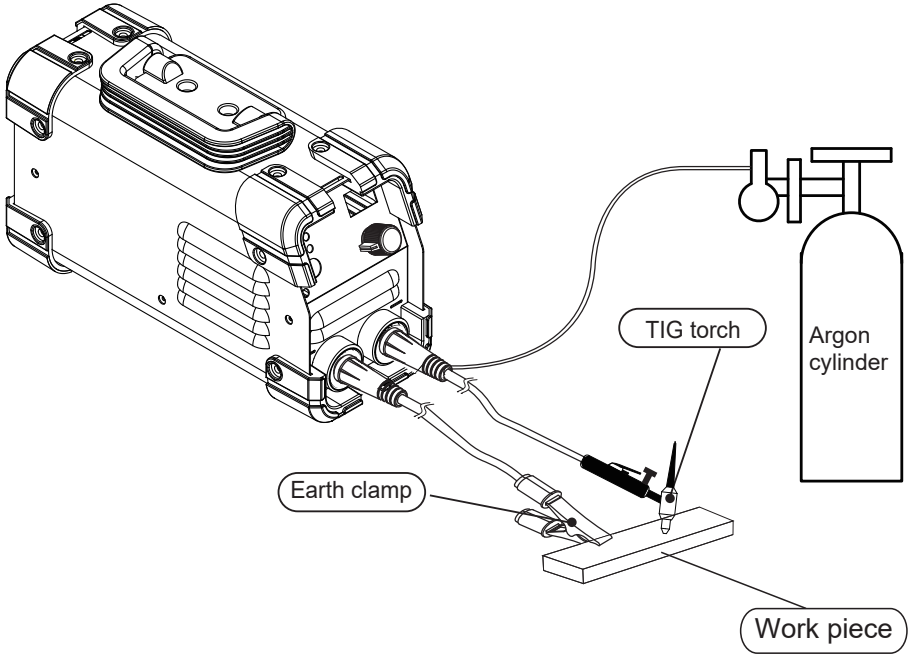
8)Connect the ground clamp to a clean bare metal surface of the part to be welder.

9)Turn on the power switch at the back panel of the welder.

10)The welder is now ready to use.

The connection as mentioned above in 4) and 5) is DCEP connection. Operator can choose DCEP connection according to work piece and electrode application requirement.

Schematic Diagram of LIFT TIG Welding



1.Ensure that the power switch is “OFF".

2) A primary power supply cable is available for this welding machine. Connect the power supply cable to the rated input power.

3) The primary cable should be tightly connected to the correct socket to avoid oxidization.

4) Check whether the voltage value varies in acceptable range with a multi-meter.

5) Insert the cable plug with TIG torch(not include) into the “-” socket on the front panel of the welding machine, and tighten it clockwise.

6) Insert the cable plug with earth clamp into the “+” socket on the front panel of the welding machine, and tighten it clockwise.

7)Connect the ground clamp to a clean bare metal surface of the part to be welder.

8)Turn on the power switch at the back panel of the welder.

9)The welder is now ready to use.

5.2 Operation

MMA/Stick Welding

- Connect the Electrode lead to the (+) output terminal on the front of the machine.
- Connect the work clamp lead to the (-) output terminal on the front of the machine.
- Press “choose” button on MMA/ MMA VRD
- Adjust the welding current
- Take up the electrode holder, install the electrode-point the electrode into the joint to be welded, scratch the work piece to start the arc.

Lift TIG Welding (TIG torch is not include)

- The TIG welding torch should connect to negative(-) output terminal, and work clamp lead to the positive(+) output terminal.
- Turn on the gas regulator on the gas cylinder, the gas pressure is shown on the gauge.
- Press “choose” button on Lift TIG.
- Adjust the welding current.
- Turn the gas valve located on the TIG torch to start the flow of shielding gas.
- Touch the tungsten electrode to the work piece,then lift the tungsten and the welding arc will start.
- To stop welding lift the TIG torch away from the work piece.
- Turn the gas valve located on the TIG torch off to stop the flow of shielding gas.

5.3 Welding parameters table（for reference only)

Electrode Diameter(mm)	Recommended Welding Current(A)	Recommended welding voltage(V)
1.6	30~70	21.2~22.8
2.0	40~90	21.6~23.6
2.5	50~100	22~24
3.2	70~150	22.8~26

Note:

- **This table is suitable for mild steel welding. For other materials, consult related materials and welding process for reference.**

6.TROUBLESHOOTING

WARNING

The following operation requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is disconnected from the electricity utility before uncovering the welding machine.

1) **Common Malfunction Analysis and Solution:**

Malfunction Phenomena	Causes and Solutions
Turn on the machine, the power indicator is off, the fan doesn't work, and no welding output.	1) Check if the power switch is closed 2) Make sure there is power for input cable.
Turn on the machine, the fan works, but the output current is unstable and can't be controlled by potentiometer when welding.	1) The current potentiometer fails. Replace it. 2) Check if any loose contact exists inside the machine, especially connector, etc. If any, check.
Turn on the machine, the power indicator is on, the fan works, but no welding output.	1) Check if any poor contact exists inside the machine. 2) Open circuit or poor contact occurs at the joint of output terminal. 3) The abnormity indicator is on. A. The machine is under over-heating protection status due to long time operation. For this situation, it is unnecessary to unplug the power plug so that cooling fan can continue to cool down the welder. Welding can be continued after indicator is off; B. Check if the thermal switch is ok. Replace it if damaged. C. Check if the thermal switch connection is under good contact. D. It is possible for welder to be under over-current protection status if indicator is on for a long time. For this situation, please do not restart the machine, but contact local agent for professional assistance.
The electrode holder becomes very hot.	The rated current of the electrode holder is lower than its actual working current. Replace it with a bigger rated current.
Excessive spatter in MMA welding.	The output polarity connection is incorrect. Exchange the polarity.

7.MAINTENANCE

The following operation requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is disconnected from the electricity utility before uncovering the welding machine.

1) Check periodically whether inner circuit connection is in good condition, connector is fastened (esp. plugs or components). Tighten the loose connection. If there is oxidization, remove it with sandpaper and then reconnect.
2) Keep hands, hair and tools away from the charged parts such as the fan to avoid personal injury or machine damage when the machine is energized.
3) Clean the dust periodically with dry and clean compressed air. If welding environment with heavy smoke and pollution, the machine should be cleaned daily. The pressure of compressed air should be at a proper level in order to avoid the small parts inside the machine being damaged.
4) Avoid water and vapor infiltrating the machine. If there is, dry it and use tramegger to check the insulation of the equipment (including that between the connections and that between the connection and the enclosure). Only when there are no abnormal phenomena anymore, can the machine be used.
5) Check periodically whether the insulation cover of all cables is in good condition. If there is any dilapidation, rewrap it or replace it.
6) Put the machine into the original packing in dry location if it is not to be used for a long time.