



Handheld 120 IGBT MMA ARC Welder

USER GUIDE



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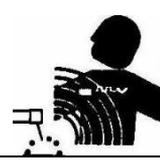
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PRECAUTIONS AND SAFE USE

Welding may result in injury to you and others, so please implement proper protections and precautions when welding.

	<p>Electric shock-may result in serious injury or even death! Ensure devices are properly grounded. Do not touch live parts with naked skin, wet gloves or wet clothes. Be sure you are insulated from the ground and workpiece. Confirm the safety of your working position.</p>
	<p>Smoke may be harmful to your health! Keep your head away from fumes and smoke to avoid inhalation of waste gas while welding. When welding, keep the working environment well-ventilated with exhaust or ventilation equipment.</p>
	<p>Arc radiation may hurt your eyes and burn your skin! Use a proper welding mask and wear protective clothing to protect your eyes and body. Ensure onlookers have a proper mask or curtain to avoid injury.</p>
	<p>Improper use and operation may result in fire or explosion. Welding sparks may cause fires, please ensure there are no flammables near the welding are and pay attention to fire safety. Ensure there is a fire extinguisher nearby, and make sure someone has been trained to operate the fire extinguisher. Do not weld in a closed unventilated container. Do not use this machine for pipe thawing.</p>
	<p>Hot workpieces can cause severe scalds or burns. Do not touch the workpiece(s) with bare hands. If continuously working, periodically cool the welding torch to avoid overheating the tip.</p>

	<p>Excessive noise can be harmful to people's hearing. Wear proper hearing protection when welding. Ensure onlookers have a proper hearing protection or distance to avoid injury.</p>
	<p>Magnetic field can impair cardiac pacemaker operation. People with a cardiac pacemaker should consult their physician prior to attempting to use welding equipment.</p>
	<p>Moving parts may injure your body. Please keep away from moving parts (like fan). Each door, panel, cover, baffle plate, and protective device the like should be closed and located correctly.</p>
	<p>Seek professional support with operating issues. When an issue arises with the installation and operation of the unit, please refer to the operating manual before attempting repairs. If the issue persists, or you still cannot solve the problem, please contact the dealer to obtain professional support.</p>

Working Environment

Prior to welding, properly inspect the work area for potential hazards before starting any welding operations.

- 1) Welding should be carried out in a dry environment with humidity below 90%.
- 2) The temperature of the work area should be between 14°F and 104°F.
- 3) Avoid welding in sunlight and rain. Keep everything dry at all times.
- 4) Avoid welding in dusty areas or environment with corrosive chemical gas.
- 5) Arc welding should be operated in an environment without strong airflow.
- 6) Weld in a well-ventilated area or use proper ventilation systems to remove harmful fumes and gases.

Safety Tips and Recommendations

This unit is equipped with an over-current/over-voltage/over-heating protection circuit. When the supplied voltage, output current or inner temperature exceeds these limits, the unit will stop automatically. Please check those conditions prior to restarting. **WARNING:** excessive use of the unit with these conditions will lead to welder damage.

1. Ventilation
 - 1.1. This welder will create powerful electrical currents that require the unit to have constant cooling.
 - 1.2. The internal fans are critical to ensuring proper and effective cooling of the machine.
 - 1.3. The operator must ensure that the louvers are uncovered and unblocked for proper airflow.
 - 1.4. The minimum distance between the unit and nearby objects should be 76 inches.
 - 1.5. Good ventilation is of critical importance for optimum performance and longer lifespan of the unit.
2. Overload Operation
 - 2.1. Remember to operate the welder within the allowable duty cycle (refer to the corresponding duty cycle).
 - 2.2. Ensure that the welding current does not exceed the max load current.
 - 2.3. Overload could obviously shorten the machine's lifespan, or even damage the machine.
3. Exceeding Recommended Voltage
 - 3.1. Verify the power supply voltage range of the unit, please refer to "Technical Parameters" table.
 - 3.2. This unit is equipped with automatic voltage compensation, which enables it to maintain a voltage range within the allowable supply ranges.
 - 3.3. Power supply voltage that exceeds the recommended levels may lead to damaging the components of the unit.



Safety Tips and Recommendations

4. Fault/Halt Indicator
 - 4.1. A sudden halt may occur and the red indicator on the front panel is lit.
 - 4.2. The welder has exceeded the standard duty cycle which triggers temperature alert due to overheating.
 - 4.3. Should this occur, halt the welding operations and allow the unit to cool down. Do not turn off the power and keep the cooling fan operating to reduce the unit temperature.
 - 4.4. Welding can be resumed after the unit temperature falls back to the standard operating range and the red indicator is off.

Welding Fundamentals

Welding is a relatively simple process for bonding two pieces of metal together. As an example, soldering two wires together is the same concept. To connect the wires, we use heat to melt solder onto the wires to create the connection and a permanent bond and circuit.

The welding process utilizes a very strong electrical current that creates enormous heat that literally melts the two pieces together, and a consumable rod (ARC Welder) or wire (MIG Welder) is melted into the joint and creates a strong metallic bond between the two pieces.

The Handheld 120 is the latest evolution, if not revolution in welder design utilizing IGBT (Insulated-Gate Bipolar Transistor) technology that reduces the power demands while generating sufficient energy to create welds.

The handheld design is clean, simple and easy to use. As with any ARC welder (Stick Welder) a consumable electrode conducts current to the pieces, as well as the bonding material to create the weld. This type of welder is perhaps the easiest to use, as it is somewhat of a point-and-shoot type of welder suitable for hobbyists and even professionals.

There is a slight learning curve and experimentation as to the welding voltage and the electrode type (charts are provided at the end of this document). We recommend starting with an E-6013 general purpose welding rod which is ideal for most shallow welding needs.

The Handheld 120 will work with nearly all generally available electrodes; however, some electrodes may require reversed polarities and the larger diameter / demand electrodes may exceed the holder capacity and power delivery of this unit.

WHAT IS IN THE BOX / PARTSLIST

The Handheld 120 is a clean, simple and easy to use design.

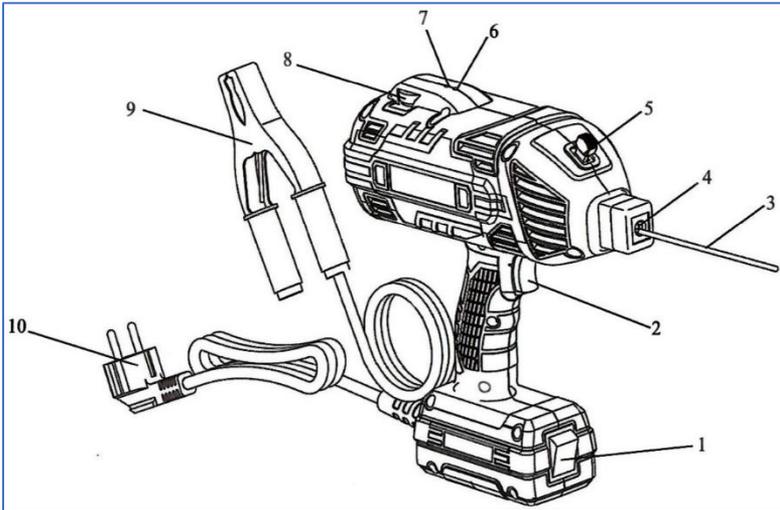
NOTE: The Safety Face Shield is shown assembled and consists of three parts.



1	Welding Face Shield
2	Handheld Welding Unit
3	Transport Carry Case
4	Welding Sticks (Electrodes)
5	Cleaning Brush
6	Grounding Clamp



FEATURES AND FUNCTIONS



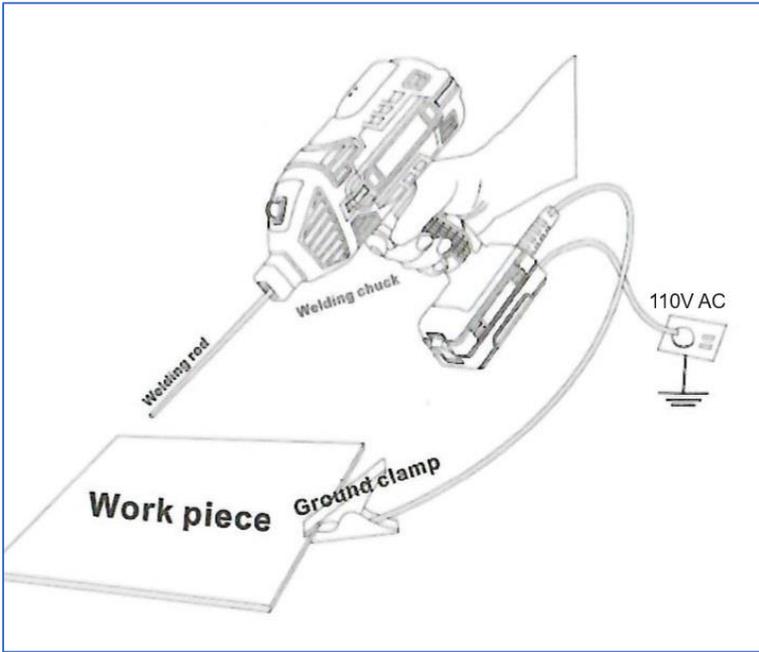
1	Power Switch
2	Welder Activation Button
3	Welding Stick / Electrode
4	Welding Chuck
5	Electrode Release / Replacement Button
6	Power Indicator
7	Alert Indicator
8	Current Adjustment Knob
9	All-in-One Ground Clamp
10	Power Connector and Cable

SAFETY FACE SHIELD ASSEMBLY

Proper eye and face protection is required and essential! Here are the steps to assemble the basic handheld safety face shield.



SETUP AND OPERATION



The picture above illustrates how the handheld welder and cables are connected for proper operation. The connections outlined below are for “Basic Operation”.

1. Verify that the Power Switch is in the OFF position.
2. Connect the power plug to a power outlet.
3. Press the electrode release button and insert the electrode.
4. Connect the Grounding Clamp Cord to the workpiece.

At this point, you are ready to begin welding. Ensure your workspace is safe and you have the proper safety clothing, eye protection and equipment ready.



OPERATING YOUR WELDER

To begin your welding project!

1. For basic welding parameters, please refer to the table below. Preset the welding current according to the type and size of the electrode (see recommendations below) and turn the Current Adjustment Knob to the recommended welding current position.
2. Press the Welding Main Power Switch to the ON position.
3. The unit will “spin up” and verify that the Aert Indicator is not lit.
4. Pull the Welder Activation Button (Trigger) and make contact with the electrode to your piece and begin welding.
5. Ensure you are following all the Safety Procedures and Precautions outlined above before proceeding.
6. Enjoy your welding!

Welding Parameters Table

Electrode Diameter (mm)	Recommend 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
4.0	140~180	25.6~27.2
5.0	160~200	26.4~28

NOTE: This table is suitable for mild steel welding. For other materials, consult related materials and welding process charts for reference.

If you experience issues while using your Handheld 120 Welder, please review the Common Problems and Solutions Section.

If any conditions persist, please contact product support for assistance, ProductSupport@HValleyTools.Com or



COMMON ARC WELDER ELECTRODES

Electrode	Coating	Position	Current	Penetration	Tensile Strength
E-6010	High Cellulose Sodium	All Positions	DCEP	Deep	60,000 PSI
E-6011	High Cellulose Potassium	All Positions	DCEP AC	Deep	60,000 PSI
E-6012	High Titania Sodium	All Positions	DCEP AC	Medium	60,000 PSI
E-6013	High Titania Potassium	All Positions	DCEP DCEN AC	Shallow	60,000 PSI
E-7018	Iron Powder Low hydrogen	All Positions	DCEP AC	Shallow to Medium	70,000 PSI
E-7028	Iron Powder Low hydrogen	Flat Horizontal Fillets	DCEP AC	Shallow to Medium	70,000 PSI

ELECTRODE POLARITY CHART

ELECTRODE	DC*	AC	POSITION	PENETRATION	USAGE
6010	EP	—	ALL	DEEP	MIN. PREP, ROUGH, HIGH SPATTER
6011	EP	✓	ALL	DEEP	
6013	EP, EN	✓	ALL	LOW	GENERAL
7014	EP, EN	✓	ALL	MED.	SMOOTH, EASY, FAST
7018	EP	✓	ALL	LOW	LOW HYDROGEN, STRONG
7024	EP, EN	✓	FLAT HORIZ. FILLET	LOW	SMOOTH, EASY, FASTER
Ni-CI	EP	✓	ALL	LOW	CAST IRON
308L	EP	✓	ALL	LOW	STAINLESS
*EP = ELECTRODE POSITIVE (REVERSE POLARITY) EN = ELECTRODE NEGATIVE (STRAIGHT POLARITY)					



Common Problems and Solutions

Problem	Causes and Solutions
Arc striking is difficult and pauses easily	<ol style="list-style-type: none">1) Use a different electrode.2) Verify that the electrode is a high-quality tungsten electrode.3) Electrode may have been exposed to moisture.4) If extension cords are being used, they are not of sufficient heavy gauge.
Output current not up to the rated value.	<ol style="list-style-type: none">1) Verify the input power supply meets the input demands for the unit.2) Variances in low power will impact units performance.
Current is not stabilizing while being operated.	<ol style="list-style-type: none">1) Unstable input power supply is affecting the unit.2) Check if other equipment is running on the input power supply circuit and reducing or interfering with power levels.
Excessive spattering	<ol style="list-style-type: none">1) Too much current for the stick diameter being used.2) Polarity for the selected electrode is incorrect. Reversing the polarity may correct the excessive spattering.



Recommended Maintenance

- 1) Clean and blow the unit out periodically with dry and clean compressed air. Perform this operation more frequently in environments with heavy dust and smoke. 60-80 PSI should be sufficient and avoid excess pressure to avoid damaging the small parts inside the unit.
- 2) Check that all cables and connectors are in good condition. If there is any oxidization on the connectors, carefully remove it with fine steel wool or a high grit sandpaper and then reconnect.
- 3) Store your welder in its original box and in a dry location if it is not going to be used for a long period of time.



Technical Specifications

Specification	Unit of Measure	Model Handheld 120
Rated input voltage	V	AC110 ± 10%
Frequency	Hz	50/60
Rated input power	KVA	4.6
No-load voltage	V	57
Welding current range (MMA)	A	20-120
	V	20.8-24.8
Rated duty cycle	%	20
No-load voltage	V	57
No-load loss	W	10
Overall efficiency	%	85
Power factor	COSφ	0.76
Insulation Grade		F
Protection grade		IP21
Size	Inch	9.8 x 3.93 x 9.8
Weight	LB	3.96
Applicable electrode	Inches	1/16 – 1/8
	MM	1.6 – 3.2

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