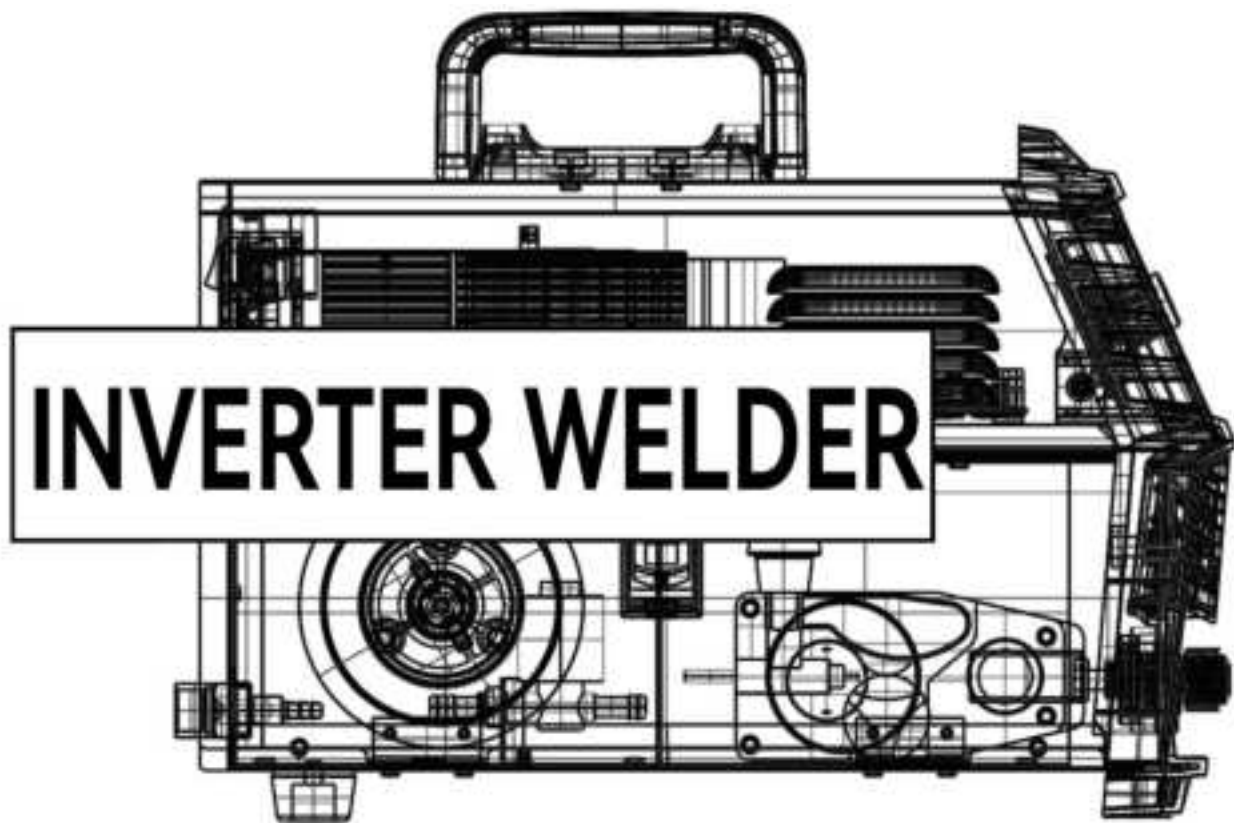




Inverter Welding Machine MIG165



User Manual

www.arccaptain.com



Dear Valued Customer,

Thank you for going with ARCCAPTAIN! We're all about making welders superior for you. ARCCAPTAIN was built by high quality components, every single unit machine was passed multiple industry leading laboratory tests to provide a great welding experience and performance.

Two-year warranty service is provide to yours! When unpacking, make sure that the product is intact and undamaged. DO NOT return directly before contact our customer service.

Six ways to connect us and join in ARCCAPTAIN Community:

Email: service@arccaptain.com

Online: www.arccaptain.com/pages/contact-us

Facebook: [arccaptainwelder](https://www.facebook.com/arccaptainwelder)

Instagram: [arccaptain_welder](https://www.instagram.com/arccaptain_welder)

Youtube: [arccaptain-weld](https://www.youtube.com/channel/UCarccaptainwelder)

Whatsapp: [+19892449456](https://wa.me/6219892449456)



This manual is designed to help you get the most out of your ARCCAPTAIN products. Please save this manual and take time to read the safety warnings and precautions, assembly, operating, inspection, maintenance. They will help you protect yourself against potential hazards on the worksite. Failure to do so can result in serious injury!

Save for future reference:

Product:	
Date Purchased:	
Serial Number:	
Product Feedback:	

CONTENTS

1. SAFETY.....	1
1.1 General Safety.....	1
1.2 Electrical Safety.....	1
1.3 Fire Safety.....	2
1.4 Fumes and Gases Safety.....	2
1.5 Arc Rays and Noice Safety.....	2
1.6 Gas Shielded Welding – Cylinder Safety.....	3
1.7 Additional Safety Information.....	3
2. PRODUCT INTRODUCTION	3
2.1 Function Overview	3
2.2 Package	4
2.3 Technical Parameters	4
3. OPERATION CONTROL AND INSTRUCTIONS	5
3.1 Panel Instruction	5
3.2 Multi-function digital operation panel.....	6
3.3 Wire feeding Description	8
3.4 Nameplate.....	9
4. INSTALLATION AND CONNECTION	9
4.1 Selecting the Welding Wire	9
4.2 Checking the Torch Accessories	10
4.3 Installing the Welding Wire	10
4.4 Wire Feeding Installation	12
5. Operation for MIG Welding	13
5.1 Connection.....	13
5.2 Input Power Connection.....	14
5.3 Wire Stick Out.....	15
5.4 Operation.....	16
6. Operation for MIG Flux-Cored Welding	17
6.1 Connection.....	17
6.2 Input Power Connection.....	18
6.3 Wire Stick Out.....	18
6.4 Operation.....	19
7. Operation for MMA and TIG	20
7.1 MMA Welder Cable Connection	20
7.2 MMA Welder Operation	21
7.3 Lift TIG Welder Cable Connection	23
7.4 Lift tig Welder Operation	25
8. Strap Installation	27
9. MIG Basic Welding Technique	28
9.1 Basic MIG Welding	28
10. MAINTENANCE	30
10.1Routine and Periodic Maintenance.....	30
10.2Daily maintenance.....	31
11. TROUBLESHOOTING.....	32

1. SAFETY



WARNING

READ ALL SAFETY WARNINGS BEFORE WORKING!

Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury. Save all warnings and instructions for future reference!

If you encounter any issues during installation or operation, refer to the relevant sections in this manual for inspection. If you're still unsure or unable to resolve the problem, please contact ARCCAPTAIN professional support.

1.1 General Safety

- Do NOT use the welder if the switch does not turn it on and off.
- Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the welder.
- Ensure the switch is off before connecting to power or moving the welder to prevent accidental starting.
- Always maintain and use safety guards, covers, and devices properly.
- Keep hands, hair, clothing, and tools away from moving parts like V-belts, gears, and fans.
- Follow these instructions and consider working conditions when using the welder and accessories.
- This manual may not cover every possible situation. It's important for the operator to use common sense and caution while using this product.

1.2 Electrical Safety



WARNING

BEWARE OF ELECTRIC SHOCK!



- DO NOT weld in a damp area or come in contact with a moist or wet surface.
- DO NOT modify any wiring, ground connections, switches, or fuses in this welding equipment.
- DO NOT come into physical contact with any part of the welding current circuit, including the workpiece, ground clamp, electrode or welding wire, and metal parts on the electrode holder or MIG gun.
- DO NOT connect the ground clamp to electrical conduit, and DO NOT weld on electrical conduit.
- NEVER leave the Welder unattended while energized. Turn off the power if you have to leave.
- DO NOT attempt to plug the welder into the power source if the ground prong on INPUT POWER CABLE plug is bent over, broken off, or missing.
- DO NOT alter INPUT POWER CABLE or plug in any way.
- People with pacemakers should consult their physicians before use. Magnetic field can make cardiac pacemaker a bit wonky.



WARNING

REPLACING COMPONENTS CAN BE DANGEROUS!

- Only experts should replace machine parts. Avoid dropping foreign objects into the machine during component replacement. Ensure correct wire connections after replacing PCBs to prevent property damage.

1.3 Fire Safety



WARNING

BEWARE OF FIRE HAZARD!

- Place the machine on non-combustible surfaces to prevent fires.
- Ensure no flammable materials are near the working area to reduce fire risk.
- Avoid installing the machine near water sources to prevent water damage.
- Always weld/cut materials in a dry environment with humidity below 90% and maintain a working temperature between -10°C and 40°C.
- When welding/cutting outdoors, ensure shelter from sunlight and rain, keeping the machine dry at all times.
- Do not operate the machine in dusty or chemically corrosive environments.
- Remove or secure all combustible materials within a 35 feet (10 meters) radius of the work area. Use fire-resistant material to cover or seal open doorways, windows, cracks, and other openings.
- Improper use can lead to fire or explosion. Avoid flammable materials near the working area, keep a fire extinguisher nearby with trained personnel, refrain from cutting closed containers, and do not use the machine for pipe thawing.

1.4 Fumes and Gases Safety



WARNING

SMOKE CAN BE HARMFUL TO YOUR HEALTH!

- Keep your head away from the smoke while cutting to avoid breathing in harmful gases.
- Ensure the working area is well-ventilated with exhaust or ventilation equipment during cutting.
- Only work in a confined area if it's well-ventilated, or wear an air-supplied respirator.

1.5 Arc Rays and Noise Safety



WARNING

EXCESSIVE NOISE DOES GREAT HARM TO HEARING!

ARC RADIATION MAY HURT YOUR EYES AND BURN YOUR SKIN !

- Arc radiation can harm eyes and skin; excessive noise can damage hearing.
- Use certified welding eye protection with at least a number 10 shade lens rating.
- Wear leather leggings and fire-resistant shoes or boots; avoid clothing that can catch sparks or molten metal. Do not touch hot workpiece with bare hands.
- Keep clothing free of flammable substances and wear dry, insulating gloves and protective clothing.
- Wear an approved head covering and use appropriate welding attire.
- When welding overhead or in confined spaces, use flame-resistant ear plugs or ear

muffs.

- Wear ear covers or other hearing protectors when cutting.

1.6 Gas Shielded Welding – Cylinder Safety



⚠ WARNING CYLINDERS CAN EXPLODE WHEN DAMAGED!

- Never weld on a pressurized or closed cylinder.
- Avoid letting the electrode holder, electrode, welding torch, or welding wire touch the cylinder.
- Keep cylinders away from all electrical circuits, including welding circuits.
- Always keep the protective cap on the valve except when the cylinder is in use.
- Use only the correct gas shielding equipment designed for your specific type of welding, and maintain it properly.
- Protect gas cylinders from heat, physical damage, slag, flames, sparks, and arcs.
- Always follow proper procedures when moving cylinders.
- Do not install the machine in an environment with explosive gas to avoid an explosion.

1.7 Additional Safety Information

- Use only the supplied power cord for this welder or an identical replacement cord. Do not install a thinner or longer cord on this Welder.
- Maintain labels and nameplates on the Welder. These carry important information.
- Ensure the ground clamp is securely connected to the workpiece during welding.
- Pressing the gun switch when welding or cutting.
- When disposing of the cutting machine, please note the following:
Burning electrolytic capacitors on the main circuit or PCB board may cause explosions.
Burning plastic components such as the front panel may produce toxic gases. Dispose of it as industrial waste.

2. PRODUCT INSTRUCTION

2.1 Function Overview

This is MIG165, with advanced technology, perfect function and high performance. This ultra-portable welding system is suitable for various application needs.

- Synergic MIG: Automatically adjusts voltage and wire feeding speed based on wire diameter.
- 4-in-1 Multi-functionality: Supports Gasless MIG, MIG, MMA, and Lift TIG welding modes.
- Advanced IGBT Inverter and MCU Technology: Enhances welding performance.
- Portable and Lightweight: Easy to carry with a handle or shoulder strap.
- Smart Cooling Fan: Ensures excellent heat dissipation.
- Hot Start: Facilitates easier and more reliable arc ignition in MMA welding.
- Arc Force: Improves machine performance, especially for long-distance welding.
- Anti-stick Feature: Enhances welding performance by preventing sticking.
- Multiple Protections: Includes built-in overheating and over-current protection mechanisms.

2.2 Package

Name	Specification	Quantity (pcs)
Welding machine	MIG165	1
MIG welding torch	6.5ft	1
Torch accessories	Conduct tips	2
Ground clamp	9.8ft	1
Electrode holder	9.8ft	1
Gas hose	9.8ft	1
Adapter	220V to 110V	1
Welding wire	2lb	1
Operator's manual	For MIG165	1

2.3 Technical Parameters

Technical Parameter	Units	Model MIG165	
Rated input voltage	V	AC110V±15% 50/60HZ	AC220V±15% 50/60HZ
Rated input power	KVA	6.3	7.4
Rated input current	A	47.6	43.3
Welding current range (MMA)	A	20--145	20--165
Welding current range (TIG)	A	20--145	20--165
Welding voltage range (MIG)	A	30--145	30--165
	V	15.5--21.3	15.5--22.3
Rated duty cycle	%	60	60
Open circuit voltage	V	U ₀ : 65 U _r :14.5	
Overall efficiency	%	85	
Enclosure class	IP	21S	
Power factor	COSφ	0.72	
Insulation class		H	
Standard		ANSI/NEMA/IEC 60974-1	
Noise	db	<70	
Dimension	inch	14.7*5.9*9.8	

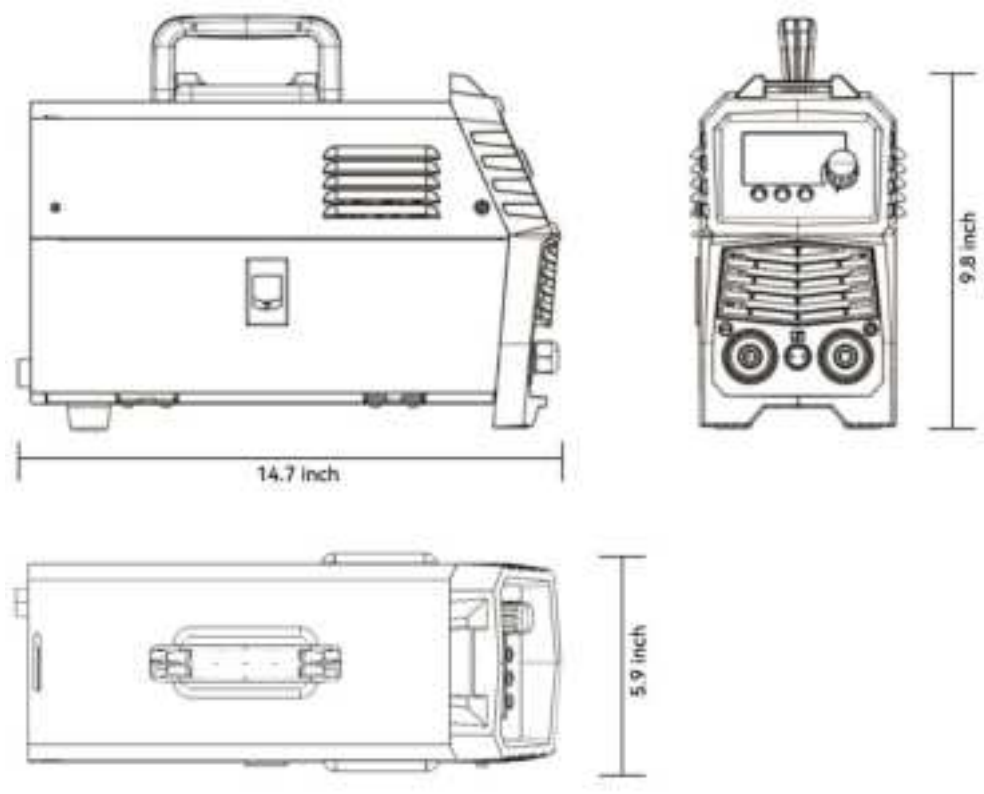


Figure 1 Size

3. OPERATION CONTROL AND INSTRUCTIONS

3.1 Panel Instruction

Part	Picture
1. LED Display 2. MIG Torch 3. Polarity changeover plug 4. Negative Welding Terminal(-) 5. Positive Welding Terminal(+) 6. adjustment knob	Figure 2 shows the front view of the welding power source with numbered callouts 1 through 6. 1 points to the LED Display, 2 points to the MIG Torch, 3 points to the Polarity changeover plug, 4 points to the Negative Welding Terminal(-), 5 points to the Positive Welding Terminal(+), and 6 points to the adjustment knob.

Figure 2

- 7. Power Switch
- 8. Power Input Cable
- 9. Gas Inlet
- 10. Cooling Fan

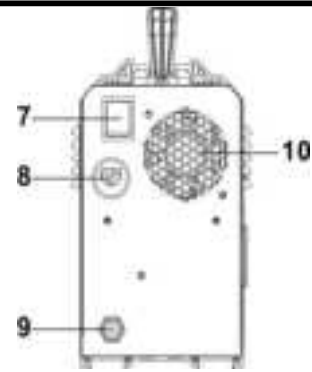


Figure 3

3.2 Multi-function Digital Operation Description

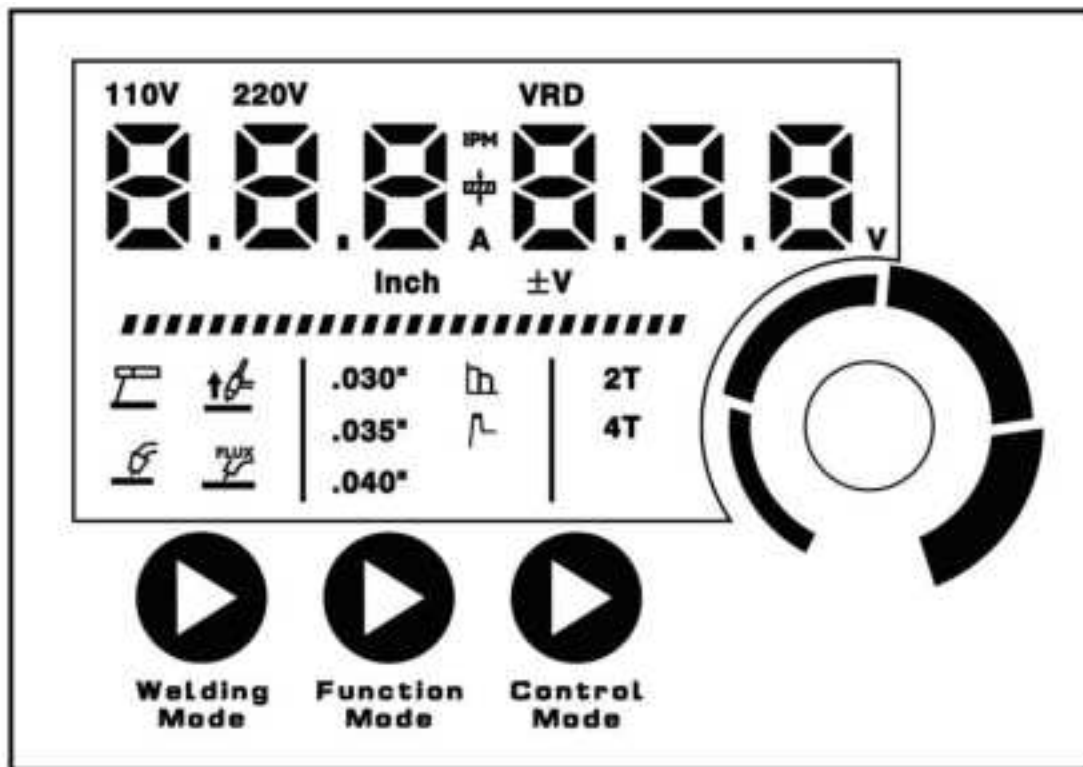
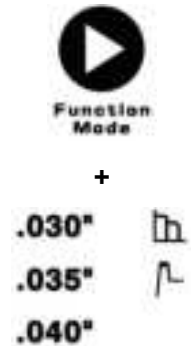


Figure 4 operation panel

- Detailed description for operation panel functions:

NO.	Picture	Description	Item	Function
1	110V 220V Inch	Parameter selection area 1	110V 220V	Input Voltage
				Value Display
			IPM	MIG Wire feeding speed

				Welding Workpiece thickness
			A	Current
			Inch	Welding Workpiece thickness unit
2		Parameter selection area 2	VRD	MMA VRD mode is open
				Value Display
			V	Voltage
			±V	Default voltage regulation
3		Welding mode selection area		Parameter switch button
				Flux MIG LED
				MIG LED
				MMA LED
				Lift TIG LED
4		Function selection area		selection button
			.030"	Φ0.030 inch wire diameter LED
			.035"	Φ0.035 inch wire diameter LED
			.040"	Φ0.040 inch wire diameter LED
				MMA Arc force
				MMA Hot Start
5		Control mode selection area		selection button
			2T	2T mode

	2T 4T		4T	4T mode			
			VRD	Long press for 5 seconds control Mode to turn on/off VRD			
6		Adjustment knob/button	Turn	Adjust the value			
			Tap	IPM		A	±V

3.3 Wire Feeding Description

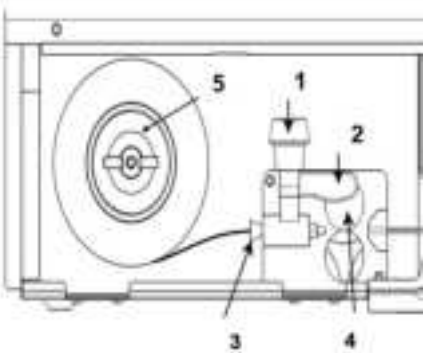
Part name	Function	Picture
1. Feed Tensioner	Fixed the Idler Arm and adjusts the pressure on the wire	
2.Idler Arm	Press down on the welding wire	
3. Wire Inlet Liner	Guide the welding wire into the wire feeder	
4. Feed Roller	V0.8-0.9 feed roller,Transfer welding wire	
5. Wire Spool	Fixed welding wire spool	

Figure 5 Inside wire feeder

Figure 5 Inside wire feeder

3.4 Nameplate

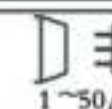
 ARCCAPTAIN®						
MIG165			MIG/MAG inverter welder			
			ANSI/NEMA/IEC 60974-1			
	U_0 59V	Input:AC110V	X	60%	100%	
		Output:38A/15.5V	I_2	14.5A	110A	
		~14.5A/21.3V	U_2	21.3V	19.5V	
		Input:AC220V	X	60%	100%	
	U_r 14.5V	Output:38A/15.5V	I_2	16.5A	125A	
		~16.5A/22.3V	U_2	22.3V	20.3V	
		Input:AC110V	X	60%	100%	
		Output:20A/10.8V	I_2	14.5A	110A	
	U_0 59V	~14.5A/21.3V	U_2	15.8V	14.4V	
		Input:AC220V	X	60%	100%	
		Output:20A/10.8V	I_2	16.5A	125A	
		~16.5A/22.3V	U_2	26.6V	25V	
	U_1	Input:AC110V	X	60%	100%	
		Output:20A/20.8V	I_2	14.5A	110A	
		~14.5A/21.3V	U_2	25.8V	24.4V	
		Input:AC220V	X	60%	100%	
	U_1	Output:20A/20.8V	I_2	16.5A	125A	
		~16.5A/22.3V	U_2	26.6V	25V	
		1~50/60Hz		I_{max} / A	I_{eff} / A	
		IP21S		110V	36.6A	
Insulation class:H				220V	24.2A	10.8A

Figure 6 Nameplate

4. INSTALLATION AND CONNECTION



WARNING

BEWARE OF ELECTRIC SHOCK!

Check and follow the instructions listed in the "Safety" section of this manual.



WARNING

DO NOT set up without SWITCH OFF !

4.1 Selecting the Welding Wire

This welder is compatible with **2lb** spools of 0.030", 0.035", or 0.040" flux-core wire or MIG solid wire. Using thicker wire will not improve welding performance on thicker materials, nor will it increase deposition rate. Additionally, it may strain your AC power source.

NOTE: Oxidized welding wire can affect welding results.

If you find rust on a wire spool, it's best to throw it away. But before you do, unwind a bit of wire to see if the rest is still good. If it's also rusty, get rid of the whole spool.

NOTE: MIG165 is NOT available Aluminum wire.

4.2 Checking the Torch Accessories

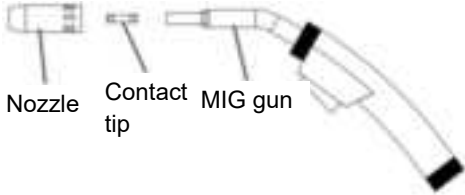


WARNING

DO NOT set up without SWITCH OFF !



Before welding, verify that the contact tip size in your MIG torch matches your welding wire type. Do as following steps.

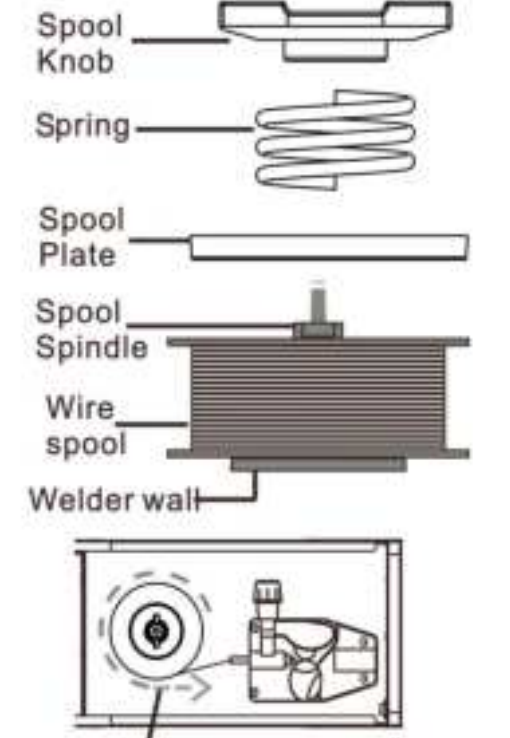
Description	Picture
1. Continuously rotate the nozzle clockwise, as if pulling it upwards. Since the nozzle is spring-loaded internally, some force is required to remove it. NOTICE: ONLY TURN CLOCKWISE.	 Figure 7
2. Use a wrench to turn the tip of the contact nozzle counterclockwise. While doing so, ensure to steady the torch with one hand. Removing the torch might be difficult if it's not stabilized.	 Figure 8
3. Checking the size number on the contact tip. The original machine is equipped with 0.035" type. If not confirmed with your welding wire, change it.	
4. Replace the nozzle in clockwise NOTICE: ONLY TURN CLOCKWISE.	 Figure 9

4.3 Installing the Welding Wire

NOTE: Turn machine power switch to the OFF position before working inside the wire feed enclosure. Make sure that the wire feed drive roll and the contact tip of the gun match the diameter and type of wire used.



NOTE: DO NOT unhook leading end of the wire! It will prevents scattering the entire coil of wire.

Description	Picture
1.Pull up on the Door Latch, then open the Door. Then you will see Wire Spool and wire feeder.	 Figure 10 Door latch
2. Start to install the wire: Turn counterclockwise to remove the spool knob, then remove the spring.	 Wire must unwind in this direction Figure 11 Wire spool
3.Remove the spool plate, then spool spindle will be exposed.	
4.Place the wire spool over the spool spindle. NOTICE: To prevent wire feed problems, set the leading end of spool wire towards to wire inlet liner (refer to the picture), so that it will unwind counterclockwise. NOTICE: To prevent welding wire to unravel and unspool which can cause tangling and feeding problems, DO NOT release the wire before spool knob replace.	
5.Replace the spool plate back on the spool spindle.	
6.Replace the spring and spool knob over the spool plate, then turn the spool knob clockwise to tighten. NOTICE: If Wire Spool can spin freely, Knot is too loose. This will cause the welding wire to unravel and unspool which can cause tangling and feeding problems.	

4.4 Wire Feeding Installation



WARNING

DO NOT set up without SWITCH OFF !

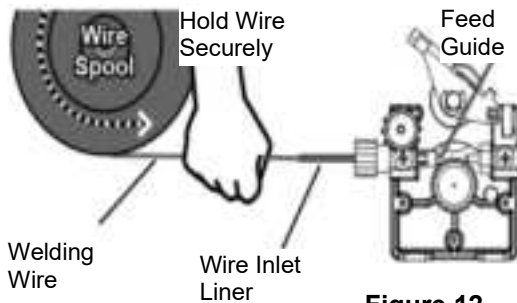


Figure 12

NOTE: MUST Securely hold onto the end of the welding wire and keep tension on it during the following steps. If this is not done, the welding wire will unravel and unspool which can cause tangling and feeding problems!

Description	Picture
1. Release Feed Tensioner and rotate the Idler Arm away from the Feed Roller. NOTICE: *Feed Tensioner knob could be turn counterclockwise to loosen it. Then, pull it down to remove tension. The spring-loaded Idler Arm will move upwards as illustrated.	Figure 13
2.Feed roller instructions. Ensure that the visible, stenciled size on the drive roll side facing you matches the wire size being used. NOTICE: *The original machine is equipped with a 0.035in knurled groove feed roller and a 0.035in flux core wire(ONLY for Flux cored wire). *If not match, need to change feed roller: • Unscrew the Feed Roller Knob counterclockwise. • Remove the Feed Roller Knob to access the Feed Roller. • Flip or replace the Feed Roller as necessary. Ensure it matches the wire type and diameter indicated on the Spool.	Figure 14
3.Carefully detach the end of the wire from the spool. Maintain tension on the wire to prevent the	

spool from unwinding.

NOTICE: DO NOT release the wire

4. Trim all bent and crimped wire. Ensure the cut end is smooth without any burrs or sharp edges; re-cut if necessary.

5. Keep tension on the wire and guide at least 12 inches of wire through the **Wire Inlet Liner**, over the **Feed Roller**, and into the **gun liner**.

NOTICE: The spool will rotate in a counter-clockwise fashion.

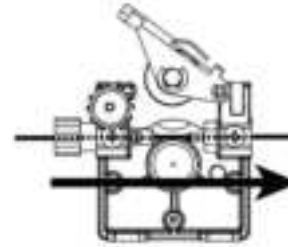


Figure 15

6. Close the **Idler Arm** and turn down the **Feed Tensioner** until the idle roller presses down firmly on the wire.

Now you may release the welding wire. Make sure the wire is positioned in the groove of the lower feed roller.

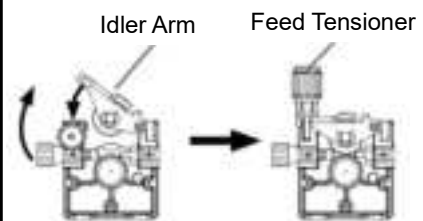


Figure 16

7. The **Feed Tensioner** on the **Idler Arm** adjusts the pressure on the wire. Adjust pressure by turning the **Feed Tensioner** to prevent spool overrun, but still allow smooth and easy wire feeding. Start with the pressure set to an intermediate value. Readjust, if necessary. If the drive roll slips while feeding wire, the pressure should be increased until the wire feeds properly.

5. Operation for MIG Welding

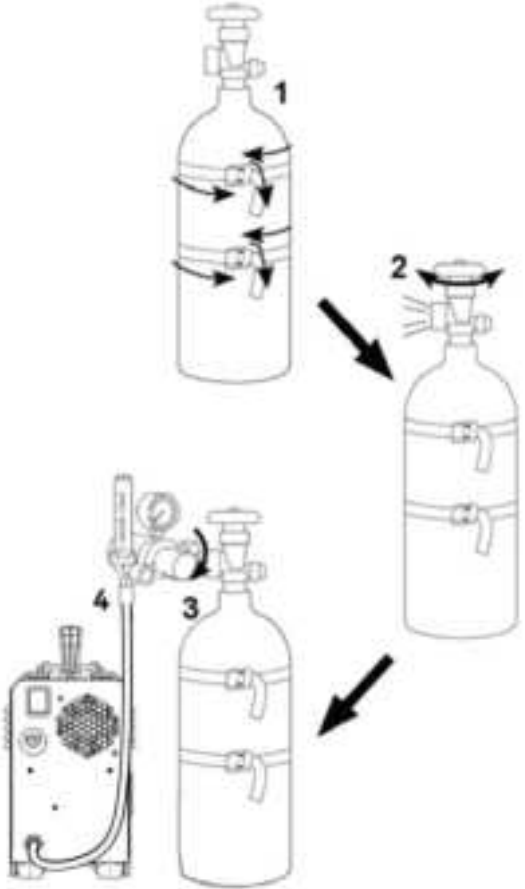
⚠ WARNING DO NOT set up without SWITCH OFF !



5.1 Connection

Description	Picture
1. Connect the ground clamp to “-” negative polarity NOTICE: The ground clamp connector MUST be tightly connected to the socket to avoid power short circuit.	
2. Connect the welding gun to euro connector NOTICE: The MIG gun connector MUST be tightly connected to the socket to avoid power	

Figure 17

short circuit or air leakage	
3. Connect the polarity changeover plug to “+” Positive polarity NOTICE: The polarity changeover plug MUST be tightly connected to the socket to avoid power short circuit.	
4. With assistance, place an 100% CO2 cylinder (not included) onto a cabinet or cart near the Welder and secure the cylinder in place with two straps (not included) to prevent tipping.	
5. Remove the cylinder’s cap. Stand to the side of the valve opening, then open the valve briefly to blow dust and dirt from the valve opening. Close the cylinder valve.	
6. Locate the Regulator(not included) and close its valve until it is loose, then thread Regulator onto cylinder and wrench-tighten connection.	
7. Connector the gas hose to the Regulator’s Outlet and the welder’s MIG Gas inlet connector. NOTICE: The gas hose connector MUST be tightly connected to the socket to avoid air leakage. 8. The gas hose MUST connect to the MIG gas inlet connector.	 Figure 18

5.2 Input Power Connection



WARNING

BEWARE OF ELECTRIC SHOCK!



NOTICE: The following steps require applying power to the Welder with the cover open.

To prevent serious injury from fire or electric shock:



- 1.DO NOT touch anything, especially not the ground clamp, with the gun or welding wire or an arc will be ignited.**
- 2. DO NOT touch internal Welder Components while it is plugged in.**

The MIG165 operates with a **110V or 220V** power supply. Plug the Power Cord into a properly grounded. Set MIG Gun down on nonconductive, nonflammable surface away from any grounded objects. And then turn the Power Switch ON.

NOTE:

- For optimal performance, connect the MIG165 to a 50A branch circuit. If connected to a circuit with lower capacity, expect reduced welding current and duty cycle. The circuit must be equipped over 50A with delayed action-type circuit breaker or fuses.
- Ensure the mains supply voltage remains within $\pm 15\%$ of the rated value (110V/220V). Low voltage can lead to subpar welding results, while excessively high voltage may cause components to overheat and potentially fail. Check whether the voltage value varies in acceptable range with a multi-meter.
- Code Requirements for Electrical Input Connections
- This welding machine must be connected to a power source in accordance with applicable electrical codes. The National Electrical Code provides standards for amperage handling capability of supply conductors based on duty cycle of the welding source.
- NOTICE: Do not remove the power cord ground prong.

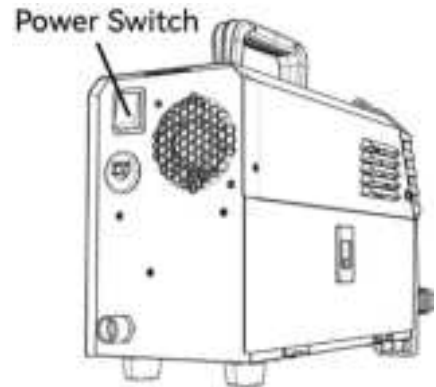


Figure 19

If there is any other question about the installation meeting applicable electrical code requirements, consult a qualified electrician.

5.3 Wire Stick Out



WARNING

BEWARE OF ELECTRIC SHOCK!



Description	Picture
1.Set the Mode Switch to MIG setting.	
2. Inching In MIG mode, not during welding, press torch trigger for at least 3S, the welder will go in fast inching status, closing output port voltage and gas valve. Release torch trigger,the welder will stop inching.	

3. Press and hold the gun trigger to load the wire through the gun, until the wire feeds through the end of the Gun.

NOTE:

- Before feeding, Remove the nozzle and contact tip before feeding the wire to ensure smooth wire feeding.
- If the wire does not feed properly and the Spool is stationary, turn OFF and unplug the Welder and slightly tighten the Feed Tensioner clockwise before retrying.
- If the wire stops instead of bending, disconnect the Welder, tighten the Feed Tensioner slightly clockwise, and try again. If the wire bends due to feed pressure, the tension is set correctly.
- Point the Gun away from all objects.
- The welding wire should match the Feed Roller and contact tips.

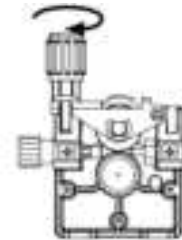
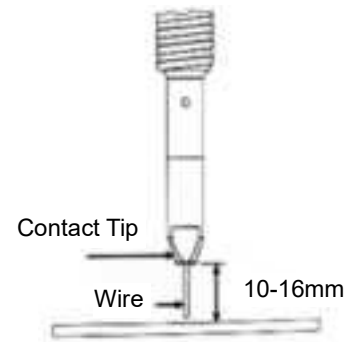


Figure 20

4. Turn off the machine after the wire stick out. Then install the nozzle and contact tip.

NOTE:

Cut the wire 3/8" to 5/8" from the end of the tip.

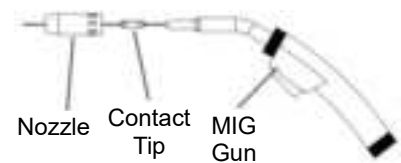


Figure 21

5. Turn on the machine. The machine is now ready to weld.

6. Close the Door Latch. Make sure. Door is securely latched.

5.4 Operation



WARNING

BEWARE OF ELECTRIC SHOCK!



- Turn on the power switch of the machine, and the power indicator illuminates.
- Select proper working mode and proper function according your welding situation.
- Clamp the Ground clamp onto the workpiece, The Ground clamp must be securely connected to the workpiece.

Function with synergic	Part	Select
Select MIG		
Select wire diameter		.030" .035" .040"

Turn the knob to find the required current		
--	---	---

NOTICE:

- Always weld clean, dry and well-prepared material.
- Hold gun at a 45° angle to the workpiece with nozzle about 1/2" from the surface.
- Move the gun smoothly and steadily as you weld.
- On thin gauge material, move quickly and only weld 1/4" stitch-welds at a time to avoid melt-through.
- Avoid welding in very drafty areas. A weak, pitted and porous weld will result due to drafts blowing away the
- Keep wire and liner clean. Do not use rusty wire.
- Sharp bends or kinks in the welding cable should be avoided
- ONLY use MIG solid welding wire.

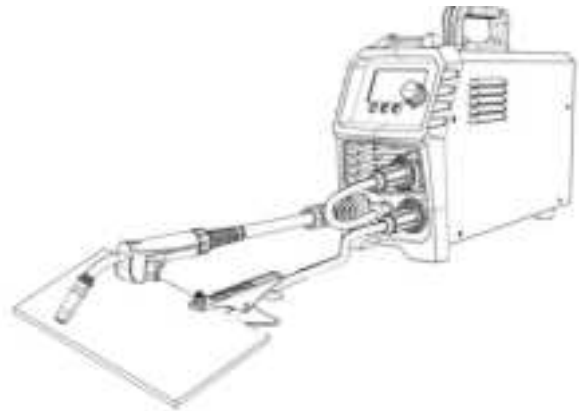


Figure 22

6. Operation for MIG Flux-Cored Welding

⚠ WARNING DO NOT set up without SWITCH OFF !



6.1 Connection

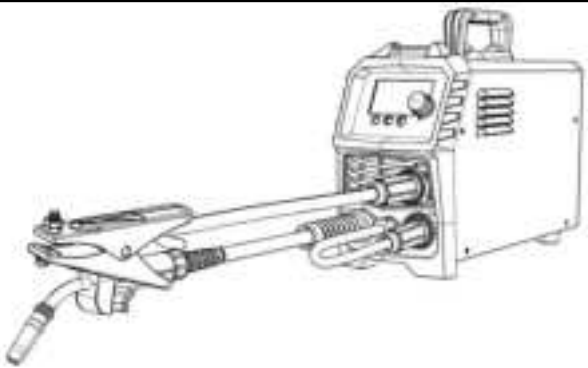
Description	Picture
1. Connect the ground clamp to "+" positive polarity NOTICE: • The ground clamp connector MUST be tightly connected to the socket to avoid power short circuit.	
2. Connect the polarity changeover plug to "-" negative polarity NOTICE: The polarity changeover plug MUST be tightly connected to the socket to avoid power short circuit.	

Figure 23

6.2 Input Power Connection



WARNING

BEWARE OF ELECTRIC SHOCK!

NOTICE: The following steps require applying power to the Welder with the cover open.

To prevent serious injury from fire or electric shock:

- 1. DO NOT touch anything, especially not the ground clamp, with the gun or welding wire or an arc will be ignited.**
- 2. DO NOT touch internal Welder Components while it is plugged in.**



The MIG165 operates with a **110V or 220V** power supply. Plug the Power Cord into a properly grounded. Set MIG Gun down on nonconductive, nonflammable surface away from any grounded objects. And then then turn the Power Switch ON.

NOTE:

- For optimal performance, connect the MIG165 to a 50A branch circuit. If connected to a circuit with lower capacity, expect reduced welding current and duty cycle. The circuit must be equipped over 50A with delayed action-type circuit breaker or fuses.
- Ensure the mains supply voltage remains within $\pm 15\%$ of the rated value. Low voltage can lead to subpar welding results, while excessively high voltage may cause components to overheat and potentially fail. Check whether the voltage value varies in acceptable range with a multi-meter.
- Code Requirements for Electrical Input Connections
- This welding machine must be connected to a power source in accordance with applicable electrical codes. The National Electrical Code provides standards for amperage handling capability of supply conductors based on duty cycle of the welding source.
- **NOTICE:** Do not remove the power cord ground prong.

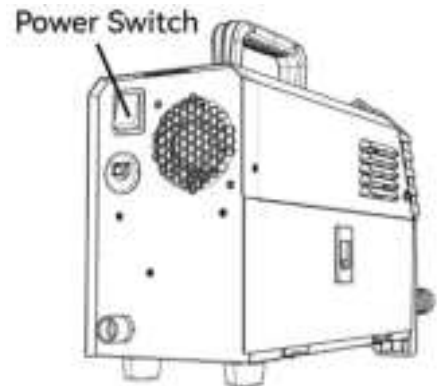


Figure 24

If there is any other question about the installation meeting applicable electrical code requirements, consult a qualified electrician.

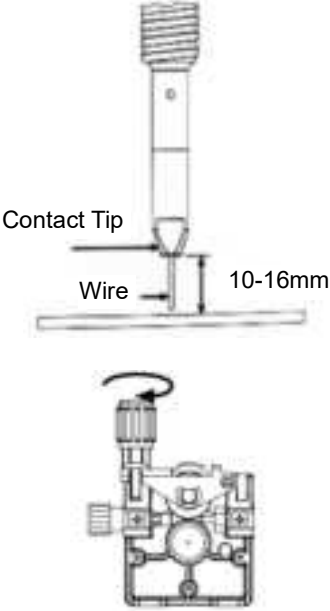
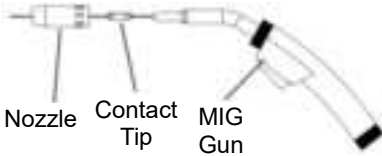
6.3 Wire Stick Out



WARNING

BEWARE OF ELECTRIC SHOCK!



Description	Picture
1.Set the Mode Switch to Flux MIG setting.	
2. Inching In MIG mode, not during welding, press torch trigger for at least 3S, the welder will go in fast inching status, closing output port voltage and gas valve. Release torch trigger,the welder will stop inching.	
3. Press and hold the gun trigger to load the wire through the gun, until the wire feeds through the end of the Gun. NOTE: - Before feeding, Remove the nozzle and contact tip before feeding the wire to ensure smooth wire feeding. - If the wire does not feed properly and the Spool is stationary, turn OFF and unplug the Welder and slightly tighten the Feed Tensioner clockwise before retrying. - If the wire stops instead of bending, disconnect the Welder, tighten the Feed Tensioner slightly clockwise, and try again. If the wire bends due to feed pressure, the tension is set correctly. - Point the Gun away from all objects. - The welding wire should match the Feed Roller and contact tips.	 Figure 25
4.Turn off the machine after the wire stick out. Then install the nozzle and contact tip. NOTE: Cut the wire 3/8" to 5/8" from the end of the tip.	 Figure 26
5.Turn on the machine. The machine is now ready to weld.	
6.Close the Door Latch. Make sure. Door is securely latched.	

6.4 Operation



WARINING

BEWARE OF ELECTRIC SHOCK!



- Turn on the power switch of the machine, and the power indicator illuminates.
- Select proper working mode and proper function according your welding situation.

Function with synergic	Part	Select
Select MIG		
Select wire diameter		.030" .035" .040"
Turn the knob to find the required current		

- Clamp the Ground clamp onto the workpiece, The Ground clamp must be securely connected to the workpiece.

NOTICE:

- Always weld clean, dry and well-prepared material.
- Hold gun at a 45° angle to the workpiece with nozzle about 1/2" from the surface.
- Move the gun smoothly and steadily as you weld.
- On thin gauge material, move quickly and only weld 1/4" stitch-welds at a time to avoid melt-through.
- Avoid welding in very drafty areas. A weak, pitted and porous weld will result due to drafts blowing away the
- Keep wire and liner clean. Do not use rusty wire.
- Sharp bends or kinks in the welding cable should be avoided
- ONLY use Flux Cored MIG welding wire.

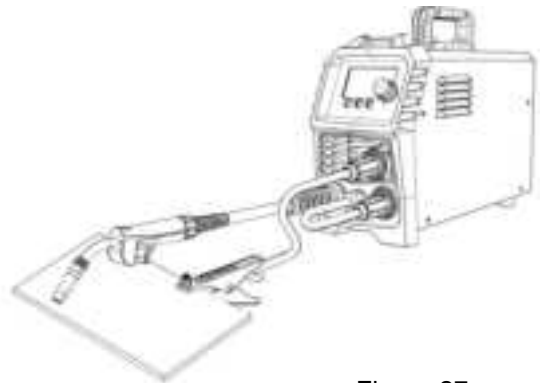


Figure 27

7. Operation for MMA and TIG



WARNING

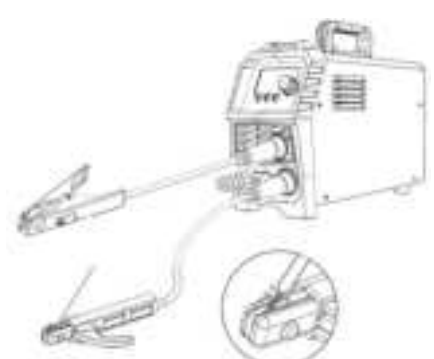
DO NOT set up without SWITCH OFF !



7.1 MMA Welder Cable Connection

NOTICE: Before setting up or using this product for new function, make sure to read the entire Important Safety Information section at the beginning of this manual!



Description	Picture
1. Connect the ground clamp to “-” Negative polarity NOTE: • The ground clamp connector MUST be tightly connected to the socket to avoid power short circuit. • Ensure the ground clamp is connected on clean, bare metal (not rusty or painted).	 Figure 28 DCEP
2. Connect the Electrode Holder to “+” Positive polarity NOTE: The Electrode Holder connector MUST be tightly connected to the socket to avoid power short circuit.	 Figure 29 DCEN
3. When you use Alkaline rods (E7018), need to DCEP, that is connect the holder and ground clamp as mentioned above in above 1. and 2. If you use Acidic rods(E6013), need to DCEN, that is connect the holder to “-”and ground clamp to “+” . NOTE: Incorrect wiring can affect welding results.	 Figure 30
4. Place the bare metal end of the Stick Electrode (sold separately) inside the jaws of the Electrode Holder. NOTE: Set Electrode Holder down on nonconductive, nonflammable surface away from any grounded objects. Install Stick Electrode with the machine turned off.	

7.2 MMA Welder Operation



WARINING

BEWARE OF ELECTRIC SHOCK!



NOTICE: The following steps require applying power to the Welder with the cover open.

To prevent serious injury from fire or electric shock:

1.DO NOT touch anything, especially not the ground clamp, with the gun or welding wire or an arc will be ignited.

2. DO NOT touch internal Welder Components while it is plugged in.

Operation steps	Picture
1. connect power cord NOTE: Turn the Power Switch off before connecting Power Cord. Plug the Power Cord into a properly grounded and rated receptacle that matches the plug. The circuit must be equipped with delayed action-type circuit breaker or fuses.	 Figure 31
2. Place the bare metal end of the Stick Electrode (sold separately) inside the jaws of the Electrode Holder.	
3. Turn the Power Switch ON. The Operation interface will light up and the Cooling fan will rotate. NOTE:Welder is now energized and open circuit Voltage is present.	 Figure 32
4. Select MMA	
5. Stroke the workpiece lightly to ignite the arc. Tips for igniting the arc: - Tap the surface with the Electrode. - Stroke the surface with the Electrode. - Strike the surface like a match with the Electrode.	
6. After the arc ignites: - Lift the Electrode off workpiece the same distance as the diameter of the bare metal end. - Tilt Electrode back 10 to 20 degrees. - Drag Electrode to the back end of the weld puddle to deposit material as needed.	

7. The initial settings may need to be adjusted after stopping and carefully inspecting the weld. Proper welding takes experience.
8. When finished welding; lift the Electrode from the workpiece, then set Electrode Holder down on nonconductive, nonflammable surface away from any grounded objects.
9. Turn the Power Switch OFF
NOTE:
To prevent accidents, after use:
 - Allow Welder to cool down.
 - Unplug Welder's power cord from outlet.
 - Remove Ground Clamp.
 - Disconnect Electrode Holder and Ground Cables.
10. Clean, then store Welder and its accessories indoors out of children's reach.

7.3 Lift TIG Welder Cable Connection



WARNING

BEWARE OF ELECTRIC SHOCK!



NOTICE: The following steps require applying power to the Welder with the cover open.

To prevent serious injury from fire or electric shock:

1. DO NOT touch anything, especially not the ground clamp, with the gun or welding wire or an arc will be ignited.
2. DO NOT touch internal Welder Components while it is plugged in.

Description	Picture
1. Connect the ground clamp to "+" Positive polarity NOTICE: • The ground clamp connector MUST be tightly connected to the socket to avoid power short circuit. • Ensure the ground clamp is connected on clean, bare metal (not rusty or painted).	Figure 33
2. Connect the tig gun (WP-17V) to "-" Negative polarity NOTICE: • The tig gun connector MUST be tightly connected to the socket to avoid power short circuit.	

1. With assistance, place an 100% Argon cylinder (not included) onto a cabinet or cart near the Welder and secure the cylinder in place with two straps (not included) to prevent tipping.

2. Remove the cylinder's cap. Stand to the side of the valve opening, then open the valve briefly to blow dust and dirt from the valve opening. Close the cylinder valve.

3. Locate the Regulator (not included) and close its valve until it is loose, then thread Regulator onto cylinder and wrench-tighten connection.

4. Connect Shielding Gas Hose on TIG Torch Cable Connector to the Regulator's Outlet and wrench-tighten connection.



Figure 34

• Sharpen tungsten Electrode

WARNING! TO PREVENT SERIOUS INJURY: Some Electrodes may contain materials that are hazardous to breathe. Wear a respirator and ANSI-approved safety goggles when grinding an Electrode.

To avoid Electrode contamination, dedicate a fine grit grinding wheel exclusively to Electrode grinding.

1. Shut off the welder and wait until Electrode and Torch have cooled enough to handle.

2. Remove Back Cap to release Collet's grip on Electrode.

3. Pull Electrode out from front of Torch. (Pulling it from rear will damage Collet and create burrs on Electrode).

4. If Electrode has dulled or been otherwise contaminated, use pliers or a suitable tool to grip the Electrode above the contaminated section and snap off the end of the Electrode.

5. Lightly press Electrode tip against the surface of the grinding wheel at an angle. Rotate Electrode tip until a blunt point is formed.

NOTE: Grinding direction must be parallel to length of Electrode.

6. The conical portion of the ideal tip will be 2-1/2 times as long as the Electrode diameter.

7. Re-insert Electrode into Collet with tip protruding 1/8"-1/4" beyond the Ceramic Nozzle, then re-tighten the Back Cap to secure the Electrode in place.



Figure 35

• Assemble tig torch

1. Consult Settings Chart, on top of Welder, to determine proper Tungsten Electrode size to be used with thickness of material to be welded.

2. Match Collet and Collet Body sizes to Tungsten Electrode size.

3. Thread Collet Body into the front of the Torch.
4. Make sure Ceramic Nozzle size is appropriate for application.
5. Thread Ceramic Nozzle onto Collet Body.
6. Insert Collet into back of Torch and into Collet Body.
7. Insert Tungsten Electrode into Collet on front of Torch.
8. Lock Electrode in place with Back Cap. Electrode should protrude 1/8" to 1/4" beyond the Ceramic Nozzle.

NOTE: The tig torch and tungsten electrode are not included in the machine. If you need to purchase, please log in to the official website:
WWW.ARCCAPTAIN.COM

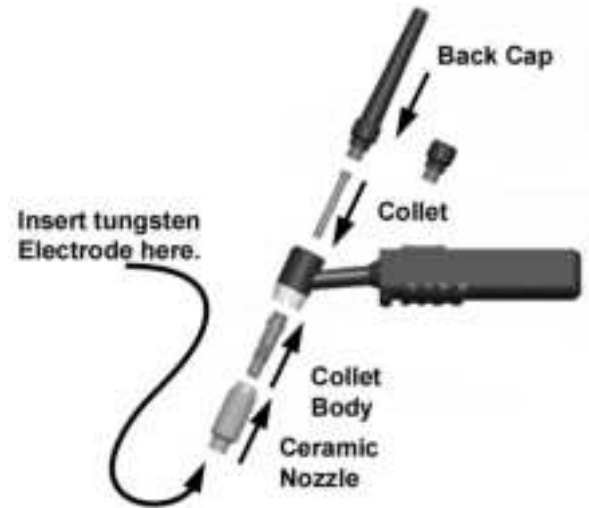


Figure 36

7.4 Lift tig Welder Operation



WARNING

BEWARE OF ELECTRIC SHOCK!



NOTICE: The following steps require applying power to the Welder with the cover open.

To prevent serious injury from fire or electric shock:

1. DO NOT touch anything, especially not the ground clamp, with the gun or welding wire or an arc will be ignited.
2. DO NOT touch internal Welder Components while it is plugged in.



Operation steps

1. Open gas cylinder's valve all the way.

NOTE: TO PREVENT DEATH FROM ASPHYXIATION:

Do not open gas without proper ventilation. Fix gas leaks immediately. Shielding gas can displace air and cause rapid loss of consciousness and death. **Shielding gas without carbon dioxide can be even more hazardous because asphyxiation can start without feeling shortness of breath.**

2. Set Flow Gauge to SCFH value

3. connect power cord

NOTE: Turn the Power Switch off before connecting Power Cord. Plug the Power Cord into a properly grounded and rated receptacle that matches the plug. The circuit must be equipped with delayed action-type circuit breaker or fuses.



Figure 37

4. Turn the Power Switch ON. NOTE: Set TIG Torch down on nonconductive, nonflammable surface away from any grounded objects. The Operation interface will light up and the Cooling fan will rotate.	 Figure 38
5. Select Lift TIG NOTE: Welder is now energized and open circuit Voltage is present.	
6. Hold TIG Torch in one hand and the TIG Rod (sold separately) in other hand. Both hands need to wear protective gloves. WARNING! TO PREVENT SERIOUS INJURY: Metalwork bench must be grounded when TIG welding. NOTE: Maintain a constant distance between the Tungsten Electrode and the workpiece: between 1 and 1.5 times the diameter of the Electrode.	
7. The initial settings may need to be adjusted after stopping and carefully inspecting the weld. Please refer to 6.7 Lift TIG Welding parameters table, Proper welding takes experience.	
8. Open valve on TIG Torch to start gas flow.	
9. To initiate welding arc, touch Electrode to work piece and lift.	
10. When welding puddle is hot enough, tilt Torch backward about 10-15 degrees from vertical and move it back slightly. Add TIG Rod material as needed to the front end of the weld puddle.	
11. Alternate between pushing the torch/weld puddle and adding the TIG Rod material. NOTE: Remove the TIG Rod each time the Electrode is advanced, but do not remove it from the gas shield. This prevents oxidation from contaminating the weld.	
12. When finished welding, pull Torch away from work piece until welding arc is broken, then return the gas coverage until weld solidifies.	
13. Close valve on TIG Torch and turn Right Knob to OFF to turn off power to TIG Torch.	
14. Set TIG Torch down on nonconductive, nonflammable surface away from any grounded objects.	
15. Turn the Power Switch OFF.	
16. To prevent accidents, after use: • Allow Welder to cool down. • Unplug Welder's power cord from outlet. • Remove Ground Clamp from workpiece or table. • Disconnect TIG Torch and Ground Cables. • Close gas cylinder's valve securely, remove regulator and replace cap.	

- Disconnect Gas Hose from Welder.
- Store and secure gas cylinder.
- Clean, then store Welder and its accessories indoors out of children's reach.

8. Strap Installation

1. Thread the strap through the strap hole in front of the welder



Figure 39

2. Thread the strap through the nylon buckle as shown in the diagram

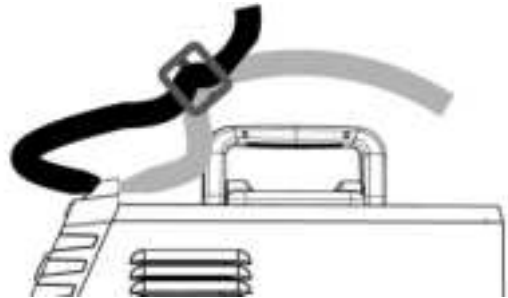
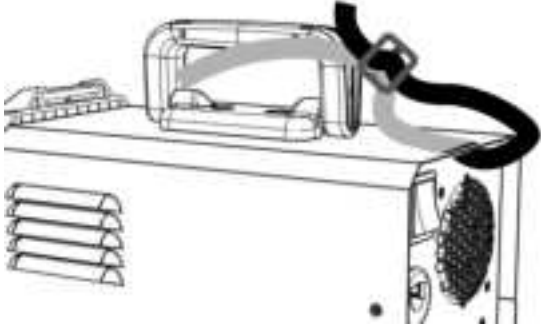
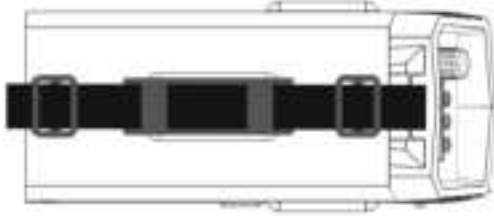


Figure 40

3. Thread the strap through the strap hole in back of the welder



Figure 41

4. Thread the strap through the nylon buckle as shown in the diagram	 Figure 42
5. The strap installation is complete	 Figure 43

9. MIG Basic Welding Technique



WARNING

BEWARE OF ELECTRIC SHOCK!



NOTICE: The following steps require applying power to the Welder with the cover open.

To prevent serious injury from fire or electric shock:

1. DO NOT touch anything, especially not the ground clamp, with the gun or welding wire or an arc will be ignited.
2. DO NOT touch internal Welder Components while it is plugged in.



9.1 Basic MIG Welding

Good weld quality and profile depend on factors like gun angle, travel direction, electrode extension (stick out), feeding speed, base metal thickness, wire feed speed (amperage), and arc voltage. Here are some basic guidelines to help with your setup:

- **Gun Position and Travel Direction**

Gun position refers to how the wire is directed at the base metal, including the angle and travel direction chosen. Feeding speed and work angle affect the weld bead profile and penetration depth.

- **Push Technique**

In the push technique, the wire is positioned at the leading edge of the weld pool and pushed towards the unmelted work surface. This technique offers a clear view of the weld joint and wire direction. It directs heat away from the weld puddle, allowing for faster feeding speeds, resulting in a flatter weld profile with light penetration. It's suitable for welding thin materials, producing wider and flatter welds with minimal cleanup or grinding required.

- **Perpendicular Technique**

In the perpendicular technique, the wire is fed directly into the weld. This method is primarily used in automated situations or when necessary. It typically results in a higher weld profile and deeper penetration.

- **Drag Technique**

With the drag technique, the gun and wire are pulled away from the weld bead. The arc and heat focus on the weld pool, resulting in more heat on the base metal, deeper melting, increased penetration, and a higher weld profile with more buildup.

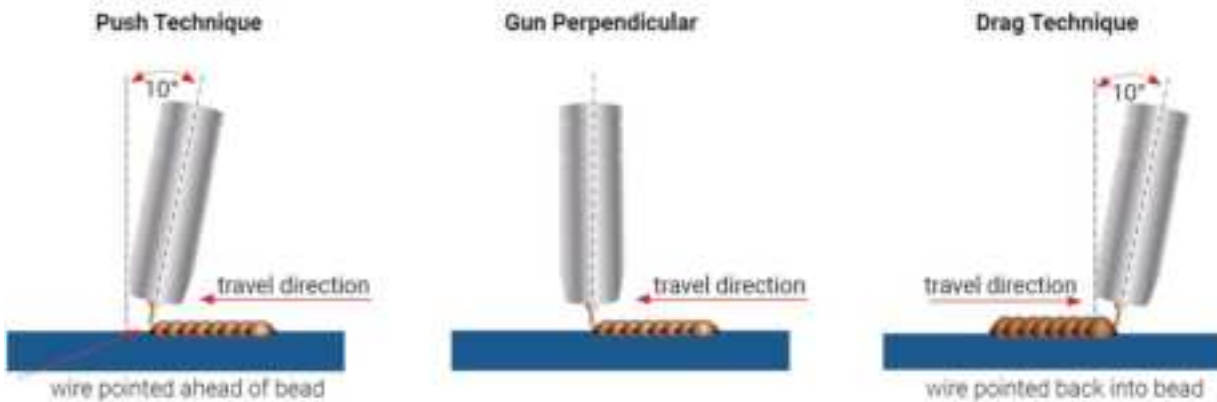


Figure 44

- **Travel Angle**

Travel angle is the right to left angle relative to the direction of welding. A travel angle of 5°- 15° is ideal and produces a good level of control over the weld pool. A travel angle greater than 20° will give an unstable arc condition with poor weld metal transfer, less penetration, high levels of spatter, poor gas shield and poor quality finished weld.

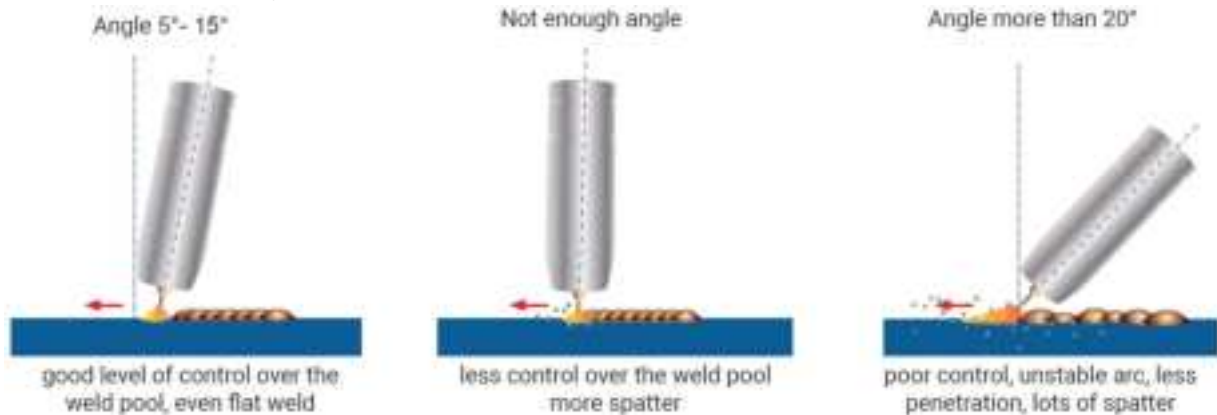


Figure 45

- **Angle to Work**

The work angle is the forward back angle of the gun relative to the work piece. The correct work angle provides good bead shape, prevents undercut, uneven penetration, poor gas shield and poor quality finished weld.

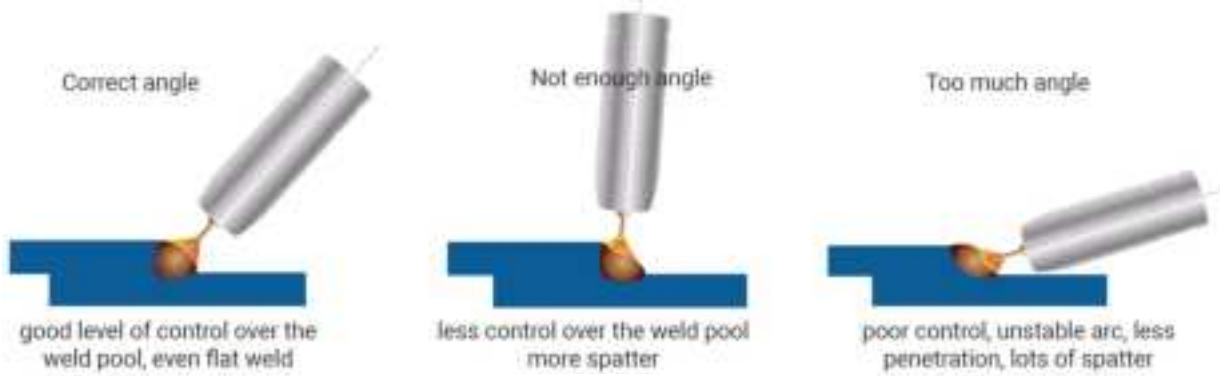


Figure 46

- **Stick Out**

Stick out is the length of the unmelted wire protruding from the end of the contact tip. A constant even stick out of 0.2-0.4in will produce a stable arc, and an even current flow providing good penetration and even fusion. Too short stick out will cause an unstable weld pool, produce spatter and over heat the contact tip. Too long stick out will cause an unstable arc, lack of penetration, lack of fusion and increase spatter.

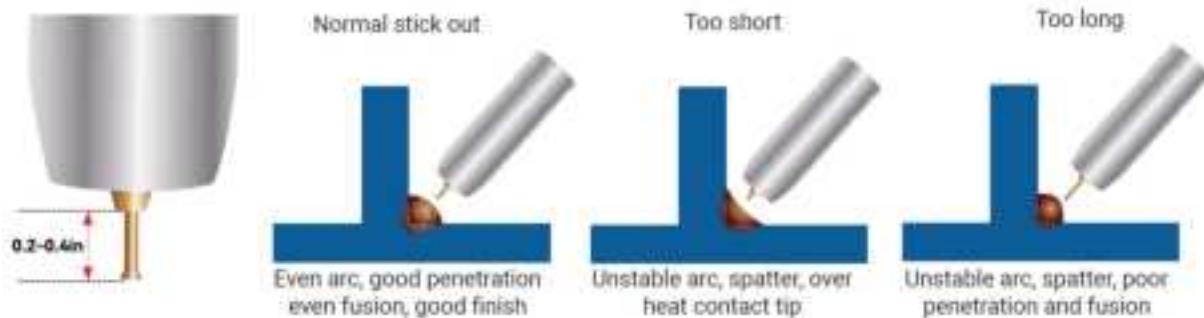


Figure 47

10. MAINTENANCE



WARNING

BEWARE OF ELECTRIC SHOCK!



NOTICE: To prevent serious injury, fire, and burns:

Unplug the welder.

Place the MIG gun on a heat-proof, electrically non-conductive surface.

Allow all parts of the welder to cool completely before servicing.



10.1 Routine and Periodic Maintenance

- **Before Each Use** -Check over machine and accessories for any obvious condition that may prevent safe performance or operation, repair or replace items as necessary to correct any abnormal condition.

- loose hardware
- misalignment or binding of moving parts
- damaged cord/electrical wiring
- frayed or damaged cables
- cracked or broken parts
- any other condition that may affect its safe operation.
- Store in a clean and dry location.
- **For optimal weld quality, clean and inspect the contact tip and nozzle before each use. Cleaning Tip and Nozzle-** With the power switch OFF, keep the contact tip and nozzle clean to prevent issues like shorted nozzles, poor welds, and overheating of the gun.

NOTE:

- Make sure that the entire Mig gun is completely cool and that the power cord is unplugged from the electrical outlet before proceeding.
- Torch accessories are consumables, ARCCAPTAIN provided more for your replacement.

10.2 Daily maintenance

The power of the switching box and the welding machine should be shut down before daily checking (except appearance checking without contacting the conductive body) to avoid personal injury accidents such as electric shock and burns.

- Daily checking is very important in keeping the high performance and safe operation of this welding machine.
- Do daily checking according to the table below, and clean or replace components when necessary.
- In order to ensure the high performance of the machine, please choose components provided by ARCCAPTAIN when replacing components.

Daily checking of the welding machine

Items	Checking requirements	Remarks
Front panel	Whether any of the components are damaged or loosely connected; Whether the output quick sockets are tightened; Whether the abnormality indicator illuminates.	If unqualified, check the interior of the machine, and tighten or replace the components.
Back panel	Whether the input power cable and buckle are in good condition; Whether the air intake is unobstructed.	
Cover	Whether the bolts are loosely connected.	If unqualified, tighten or replace the components.
Chassis	Whether the screws are loosely connected.	
Routine	Whether the machine enclosure has color fading or overheating problems;	If abnormal, check the interior of the machine.

	Whether the fan sounds normal when the machine is running; Whether there is abnormal smell, abnormal vibration or noise when the machine is running.	
Cleaning the Feed Rolls	Clean the grooves in the drive rolls frequently. This can be done by using a small wire brush. Also wipe off, or clean the grooves on the upper feed roll. After cleaning, tighten the feed roll retaining knobs.	

Daily checking of the cables

Items	Checking requirements	Remarks
Earth cable	Whether the grounding wires (including workpiece Earth wire and welding machine earth wire) break off.	If unqualified, tighten or replace the components.
Welding cable\ MIG gun	Whether the insulating layer of the cable is worn, or the conductive part of the cable is exposed; Whether the cable is drawn by an external force; Whether the cable connected to the workpiece is well connected.	Use appropriate methods according to the work site situation to ensure safety and normal cutting.

11. TROUBLESHOOTING



WARINING DO NOT set up without SWITCH OFF !



NOTICE: For safety and to maintain warranty validity:

- Only qualified authorized personnel should perform service and repairs!
- Unauthorized repairs may endanger the technician and machine operator!
- To prevent electrical shock, follow all safety precautions in this manual!
- Use only original spare parts when replacing components!
- When ordering spare parts, provide machine type, serial number, and item number, along with type designation and item number of the spare parts!

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three step procedure listed below.

• Locate Problem(Symptom)

Look under the column labeled "PROBLEM(SYMP TOMS)". This column describes possible **symptoms** that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

• Possible Cause

The second column labeled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

- **Recommended Course of Action**

This column provides a course of action for the Possible Cause, generally it states to contact you local after-sales service center.

Problem (symptoms)	Possible areas of mis-adjustment	Recommended course of action
Bead is too thick(intermittently)	Feeding speed is slow and/or inconsistent	Increase and maintain a constant feeding speed.
	Output heat range is too high.	Set the knob to low
Bead does not penetrate base metal.	Feeding speed is inconsistent.	Decrease and maintain a constant feeding speed.
	Output heat range is too low.	Set the knob to high
Wire sputters and sticks to workpiece	The wire is damp.	Change to dry wire. Be sure wire is stored in a dry location
	Wire feed speed is too fast.	Reduce wire feed speed.
Edge of weld has ragged depressions	Feeding speed is too fast.	Reduce feeding speed.
	Wire feed speed is too fast.	Reduce wire feed speed.
	Output heat range is too high	Set the knob to low
There is no current after turning on the machine.	The power cord is not well connected.	Reconnect the power cord.
	The welding machine fails.	Ask professionals to check.
The fan does not work during welding.	The power cord for the fan is not well connected.	Reconnect the power cord for the fan.
	Auxiliary power fails.	Ask professionals to check.
The overheating indicator is on.	The overheating protection circuit works.	It can be recovered after the machine cools down.
There is no response when pushing the torch trigger and the alarm indicator	The torch trigger fails.	Repair or replace the welding torch.

does not illuminate.		
When the torch trigger is pushed, there is gas output, but there is no output current, and the alarm indicator does not illuminate.	The earth cable is not well connected with the workpiece.	Reconnect it.
	The torch trigger fails.	Repair or replace the welding torch.
There is output current when pushing the torch trigger to feed gas, but the wire feeder does not work.	The wire feeder is clogged.	Unclog it.
The welding current is unstable.	The wire feeder fails.	Repair it.
	The control PCB or wire feeding power PCB inside the machine fails.	Replace it.
	The pressure arm on the wire feeder is not properly adjusted.	Adjust it to get proper pressure.
	The drive roll does not match the wire size being used.	Make sure they match with each other.
	The contact tip of the welding torch is badly worn.	Replace it.
	The wire-feeding tube of the welding torch is badly worn.	Replace it.
	The electrode is of poor quality.	Use electrode of good quality.

Common Failure Analysis and Troubleshooting:

Common failure and troubleshooting

Failure	Cause	Solution
Turn on the machine, there is no current	- Power is not well connected - Welder fails	- Reconnect power - Ask professional personnel for help
Fan does not work during welding	- Fan power cord is not well connected - Auxiliary power supply fails	- Reconnect fan power cord - Ask professional personnel for help

E10	Current acquisition Error	Turn off the machine and restart it
E20	The welding current over rated	Turn off the output
E34	Low voltage protection	Turn off the output
E60	High temperature protection	Turn off the output

GMAW (MIG/MAG) failure and troubleshooting

Failure	Cause	Solution
There are no response and error code after pressing torch trigger	• Torch is not well connected to wire feeder • Torch trigger fails	• Reconnect torch and wire feeder • Repair or replace the torch
There are gas output and wire feeding after pressing torch trigger but no current output and error code	• Ground wire is not well connected to workpiece • Wire feeding unit or torch fails	• Reconnect ground wire and workpiece • Repair the wire feeding unit or torch
There are gas supply and current output but no wire feeding after pressing torch trigger	• Wire feeding unit is stuck • Wire feeder fails • Control board in the welder fails	• Unblock the wire feeding unit • Repair the wire feeder • Ask professional personnel for help
Welding current is instable	• Unsuitable moment adjustment for wire feeder • Wire feed rolls do not match welding wire • Contact tip is worn severely • Wire liner of torch is worn severely • Welding wire is of poor quality	• Readjust moment of wire feeder • Select suitable wire feed rolls and welding wire • Replace the contact tip of torch • Replace the wire liner • Replace wire with one of better quality

If you do not understand or are unable to perform the Recommended Course of Action safely, contact **arccaptain.com** for after-sale service.

Save for future reference:	
Product:	
Date Purchased:	
Serial Number:	
Product Feedback:	

