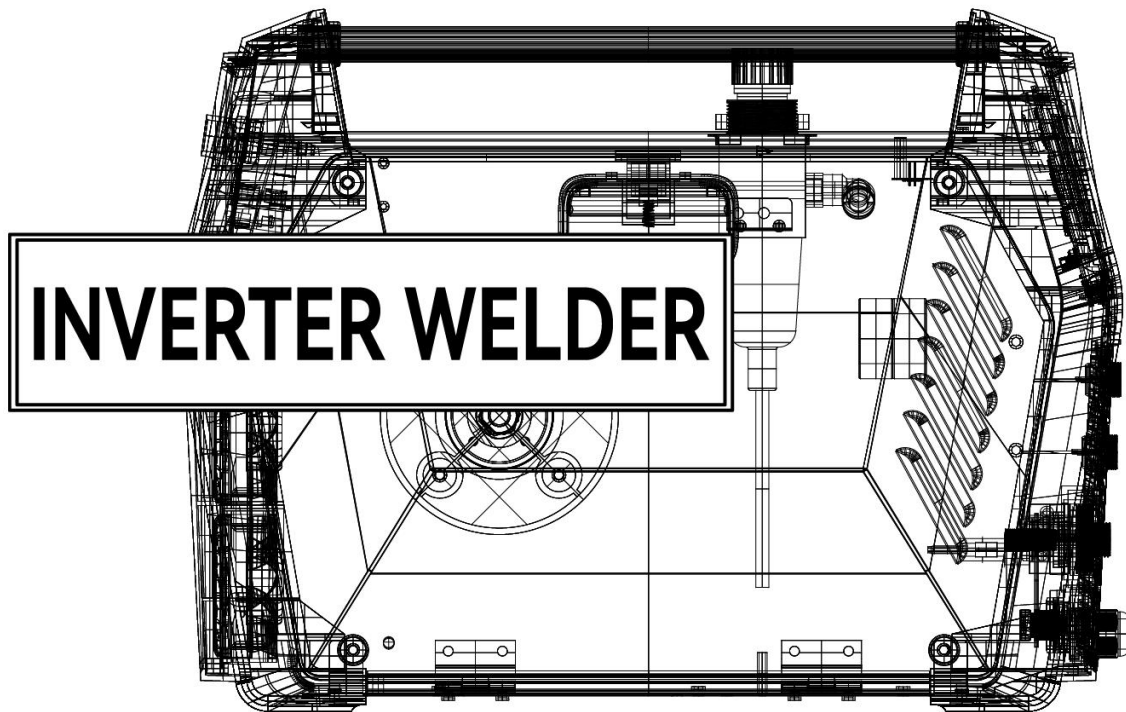




# Inverter Welding Machine MIG205 MP



English

Español

Français

## User Manual

[www.arccaptain.com](http://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](mailto:service@arccaptain.com)

Online: [www.arccaptain.com/pages/contact-us](http://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/UCarccaptain-weld)

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



---

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

<b>1. SAFETY.....</b>	<b>1</b>
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
<b>2. PRODUCT INTRODUCTION .....</b>	<b>3</b>
2.1 Function Overview .....	3
2.2 Package.....	4
2.3 Technical Parameters .....	4
<b>3. OPERATION CONTROL AND INSTRUCTIONS .....</b>	<b>6</b>
3.1 Panel Instruction .....	6
3.2 Multi-function digital operation panel.....	8
3.3 Wire feeding Description .....	14
3.4 Nameplate.....	14
<b>4. INSTALLATION AND CONNECTION .....</b>	<b>15</b>
4.1 Selecting the Welding Wire .....	15
4.2 Checking the Torch Accessories .....	16
4.3 Installing the Welding Wire .....	17
4.4 Wire Feeding Installation .....	18
<b>5. Operation for MIG Welding.....</b>	<b>19</b>
5.1 Connection.....	19
5.2 Input Power Connection.....	20
5.3 Wire Stick Out.....	21
5.4 Operation.....	22
<b>6. Operation for Spool gun.....</b>	<b>24</b>
6.1 Set Up Spool gun.....	24
6.2 Connection.....	26
6.3 Input Power Connection.....	27
6.4 Wire Stick Out.....	27
6.5 Operation.....	28
<b>7. Operation for MIG Flux-Cored Welding .....</b>	<b>30</b>
7.1 Connection.....	30
7.2 Input Power Connection.....	30
7.3 Wire Stick Out.....	31
7.4 Operation.....	32
<b>8. Operation for MMA/HFTIG/Lift TIG .....</b>	<b>34</b>
8.1 MMA Welder Cable Connection .....	34
8.2 MMA Welder Operation .....	35
8.3 MMA Welding parameters table .....	36
8.4 HF-TIG/Lift TIG Welder Cable Introduce .....	37
8.5 Tig Welder Operation .....	44
8.6 TIG Welding parameters table .....	46
<b>9. Operation for CUT .....</b>	<b>46</b>
9.1 Installation of the cutting torch .....	46
9.2 Installation of the Connection Cable .....	47
9.3 Operation method .....	49
9.4 Notes for cutting operation .....	51
9.5 Cutting parameters table .....	52
<b>10. Operation for CLEAN .....</b>	<b>52</b>
10.1 Clean Welder Cable Connection .....	52
10.2 Clean Welder Operation.....	53
<b>11. Engineer Mode .....</b>	<b>55</b>
11.1 Setting of system parameters .....	55
<b>12. MIG Basic Welding Technique .....</b>	<b>56</b>
12.1 Basic MIG Welding .....	56
12.2 Feeding speed.....	58
<b>13. MAINTENANCE .....</b>	<b>59</b>
13.1Routine and Periodic Maintenance.....	59
13.2Daily maintenance.....	60
<b>14. TROUBLESHOOTING.....</b>	<b>61</b>

# 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 NEW Pro Serial MIG205 MP, with advanced technology, perfect function and high performance. This ultra-portable welding system is suitable for various application needs. Additionally, the new Serial includes the latest remote control via **APP**.

- Multi-functions: Pulse-MIG/MIG/Gasless MIG/MMA/Lift-TIG/HF-TIG/CUT/CLEAN are available.
- Synergic MIG: Automatic matching of the voltage & wire feeding speed by adjusting wire diameter, material, plate thickness and gas.
- Separated MIG: Output voltage and wire feed speed adjustment, meet your welding requirement.
- Accurate Preset Parameter: 10 groups parameter can be set and storage for each welding mode.
- 2T/4T: Realize wide application, easy welding and continuous long-term welding.

- Inductance Adjustment: Improve welding performance.
- Burn Back Adjustment: software could automatically set burn-back time and voltage at MIG.
- Hot Start: Make the arc ignition in MMA welding easier and more reliable.
- Arc Force: Obviously improve the performance of the machine contribute to long-distance welding.
- Anti-stick: Improve welding performance to prevent stickiness.
- VRD: Reduce the risk of electric shock to ensure operator's safety.
- Suitable for complex working environment: LED light in the feed wire house, could easily check wire or roller.
- Voice prompt: equipped with voice prompts for polarity wiring, protection, warning, and other functions for each welding mode

## 2.2 Package

Name	Specification	Quantity (pcs)
Welding machine	MIG205MP	1
MIG welding torch	9.8ft	1
Torch accessories	Conduct tips/Nozzle/Diffuser	4
Ground clamp	9.8ft	1
Electrode holder	9.8ft	1
Lift TIG/HF-TIG gun*	13Ft	1
CUT gun	9.8ft	1
CO2 Gas regulator	/	1
Gas hose	9.8ft	1
protection cover	For MIG205 MP	1
Adapter	240V to 120V	1
Rollers	/	2
Operator's manual	For MIG205 MP	1
CLEAN gun	13Ft	1

\*Suit For HF-TIG welding or Lift TIG welding.

## 2.3 Technical Parameters

Technical Parameter	Units	Model MIG205MP
---------------------	-------	-------------------

<b>Rated input voltage</b>	<b>V</b>	AC120V±15% 50/60HZ	AC240V±15% 50/60HZ
<b>Rated input power</b>	<b>KVA</b>	4.9	6.9
<b>Rated input current</b>	<b>A</b>	46	35.6
<b>Welding current range (MMA)</b>	<b>A</b>	20~140	20~205
<b>Welding current range (TIG)</b>	<b>A</b>	20~140	20~205
<b>Welding voltage range (MIG)</b>	<b>A</b>	30~140	30~205
	<b>V</b>	11~22	11~26
<b>Welding current range (CUT)</b>		20-40	20-50
<b>Wire feed speed range</b>	<b>m/min</b>	1.5~12	1.5~16
<b>Rated duty cycle</b>	<b>%</b>	60	60
<b>Open circuit voltage</b>	<b>V</b>	U <sub>0</sub> : 67 U <sub>r</sub> :11 / CUT (U <sub>0</sub> : 310V)	
<b>Overall efficiency</b>	<b>%</b>	85	
<b>Enclosure class</b>	<b>IP</b>	21S	
<b>Power factor</b>	<b>COSφ</b>	0.72	
<b>Insulation class</b>		H	
<b>Standard</b>		IEC60974-1 / EN60974-1 / ANSI/NEMA/IEC 60974-1	
<b>Noise</b>	<b>db</b>	<70	
<b>Dimension</b>	<b>Inch</b>	17.3*12.7*7.9	
<b>Weight</b>	<b>kg</b>	9.8	
<b>Applicable electrode/wire</b>	<b>mm</b>	1.6 – 3.2 0.6/0.8/0.9/1.0	

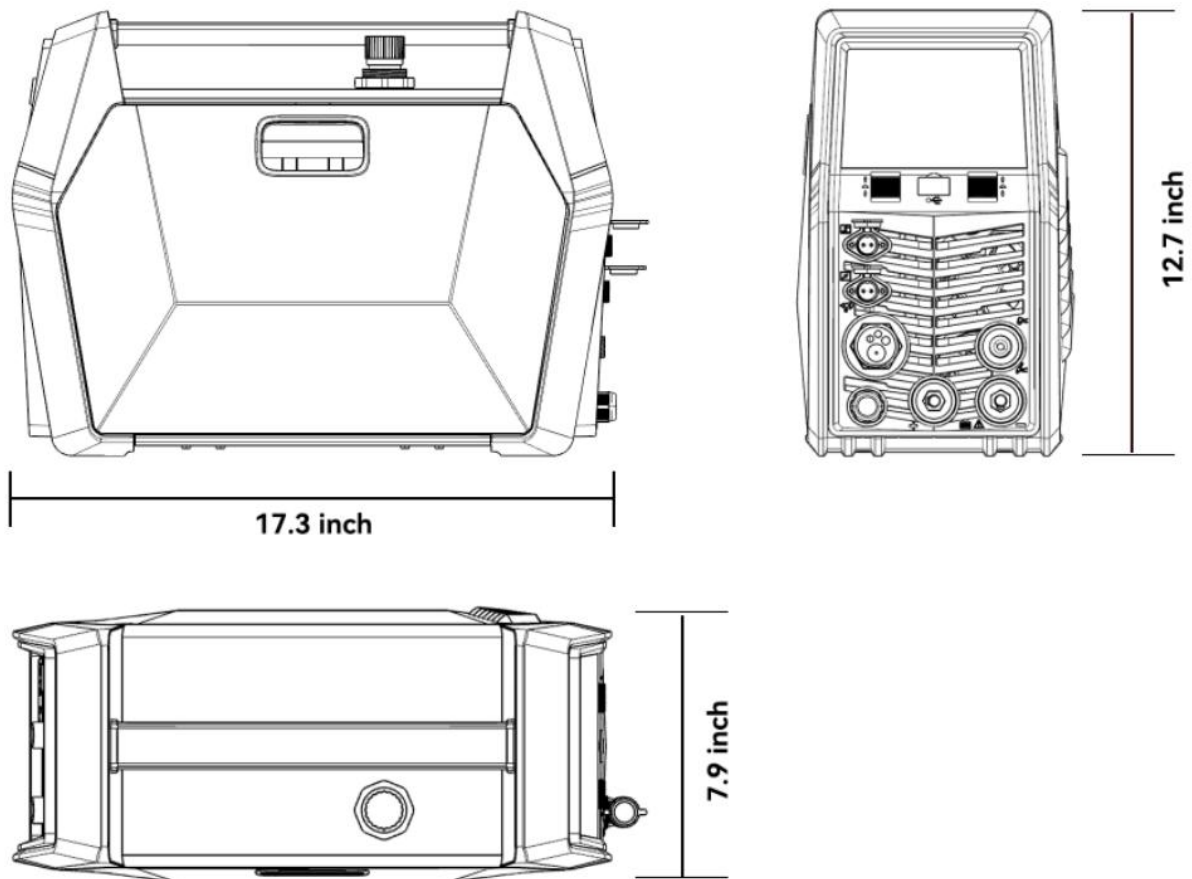
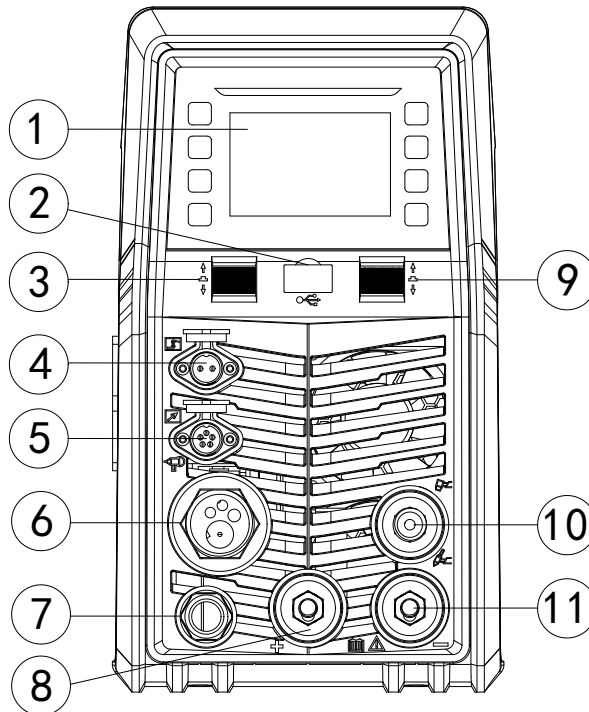
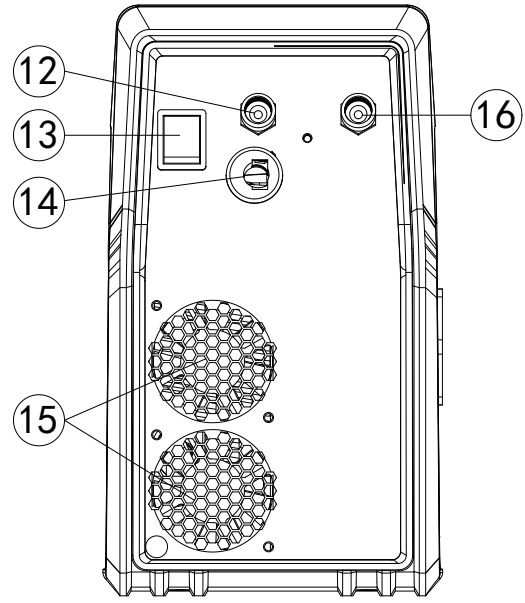


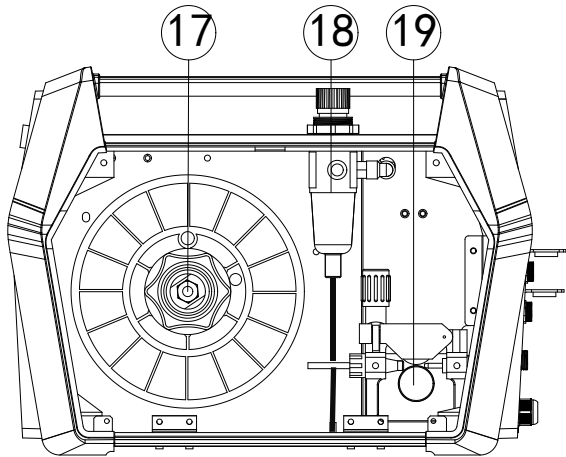
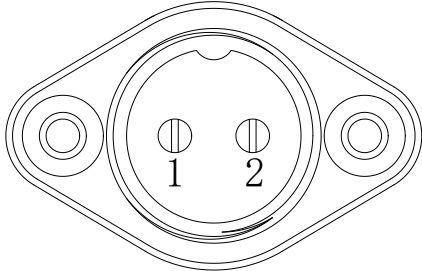
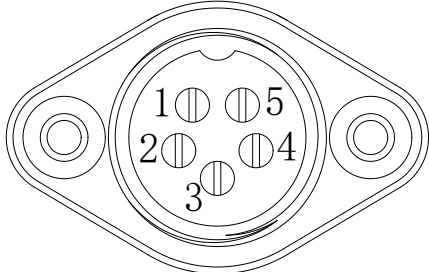
Figure 1 Size



## 3. OPERATION CONTROL AND INSTRUCTIONS

### 3.1 Panel Instruction

Part	Picture
<ol style="list-style-type: none"> <li>1. Digital screen display area</li> <li>2. USB Charging port</li> <li>3. Left scroll wheel and confirm button</li> <li>4. HFTIG/Lift TIG/CUT/CLEAN gun switch socket*</li> <li>5. MIG wire Spool gun socket/foot pedal socket*</li> <li>6. Euro connector for torch</li> <li>7. Polarity changeover plug</li> <li>8. "+" output terminal</li> <li>9. Right scroll wheel and confirm button</li> <li>10. HFTIG/Lift TIG/CUT gas electric integrated output interface</li> <li>11. "-" output terminal</li> </ol>	 <p>Figure 2</p>
<ol style="list-style-type: none"> <li>12. Gas inlet for MIG</li> <li>13. Power switch</li> <li>14. Input power cable</li> <li>15. DC Fan</li> <li>16. Gas inlet for HFTIG/Lift TIG/CUT</li> </ol>	 <p>Figure 3</p>

<p>17. Spool holder 18. Air Regulator 19. Wire feeding unit</p>	 <p>Figure 4</p>
<p>*4. TIG/CUT/CLEAN gun switch socket* PIN 1: TIG/CUT/CLEAN gun switch signal line 1 PIN 2: TIG/CUT/CLEAN gun switch signal line 2</p>	 <p>Figure 5</p>
<p>*5. MIG wire Spool gun socket, remote control/foot pedal socket* 1: Spool gun power source " +" 2: Spool gun power source " -" 3: Foot pedal/remote control adjustment potentiometer 3-pin 4: Foot pedal/remote control adjustment potentiometer 2-pin 5: Foot pedal/remote control adjustment potentiometer 1-pin</p>	 <p>Figure 6</p>

3.2 Multi-function Digital Operation Description

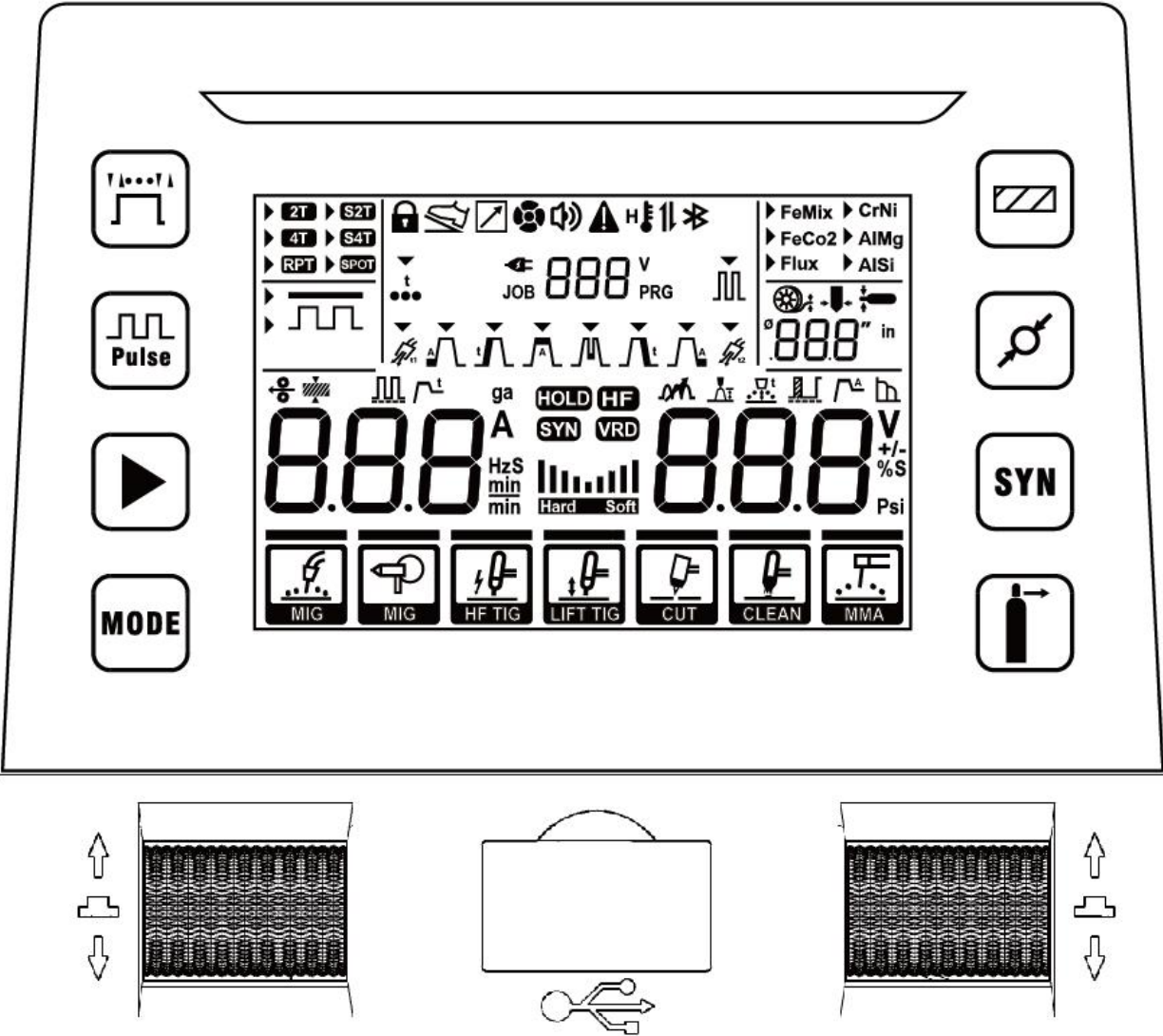


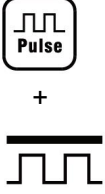
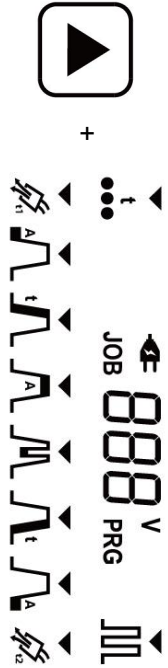




















































Figure7 operation panel

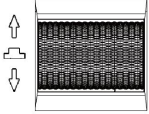
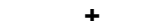
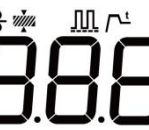



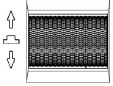





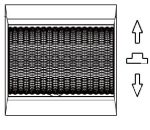

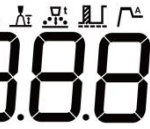


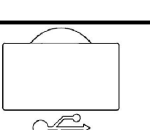
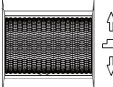







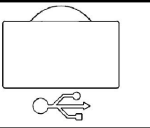
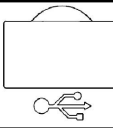
Detailed description for operation panel functions:

Picture	Description	Item	Function
 + ▶ 2T ▶ S2T ▶ 4T ▶ S4T ▶ RPT ▶ SPOT	Operation mode selection area		operation mode selection button
		▶ 2T	2T mode
		▶ 4T	4T mode
		▶ RPT	Repeat mode
		▶ S2T	S2T mode
		▶ S4T	S4T mode
		▶ SPOT	SPOT mode

	Pulse function switch area	▶ —	DC Output
	Parameter selection area	▶ 	Parameter selection button
	Welding mode selection area	▶ 	MIG Mode
		▶ 	SPOOL GUN Mode
		▶ 	<b>Pre-flow time</b> indicator. When the indicator is on, it indicates the pre-flow protection time.
		▶ 	<b>Initial current</b> indicator. When the indicator is on, it indicates the initial current.
		▶ 	<b>Up-slope time</b> indicator. When the indicator is on, it indicates the time when the initial current reaches the peak current.
		▶ 	<b>Peak current</b> indicator. When the indicator is on, it indicates the welding current.
		▶ 	<b>Background level</b> indicator. When the indicator is on, it indicates the background level if there is pulse.
		▶ 	<b>Down-slope time</b> indicator. When the indicator is on, it indicates the time when the peak current drops to the crater current.
		▶ 	<b>Crater current</b> indicator. When the indicator is on, it indicates the current when stopping arc.
		▶ 	<b>Post-flow time</b> indicator. When the indicator is on, it indicates the delayed air-off time.
		▶ 	<b>Pulse frequency</b> indicator. When the indicator is on, it indicates the pulse frequency.
		▶ 	<b>Spot welding</b> time indicator. When the indicator is on, it indicates the spot welding time.
		▶ 	Input voltage
		▶ 	<b>JOB</b> is the saved parameter number

			HF-TIG Mode
			LIFT TIG Mode
			Plasma CUT Mode
			CLEAN Mode
			MMA Mode
 ▶ FeMix ▶ CrNi ▶ FeCo2 ▶ AlMg ▶ Flux ▶ AISi	MIG material selection area		Welding wire material selection button
		▶ FeMix	Carbon steel welding wire+80% CO2, 20% AR ( Steel(carbon steel) + Ar80% CO2 20% +ER50S-6/ER70S-6 )
		▶ FeCo2	Carbon steel welding wire+100% CO2% ( Steel(carbon steel) + CO2 100% +ER50S-6/ER70S-6 )
		▶ Flux	Gas free self-protection welding wire ( FCAW+gasless+E71T-GS )
		▶ CrNi	Stainless steel welding wire ( CrNi(stainless steel) + Ar98% CO2 2% + ER308 )
		▶ AlMg	Aluminum magnesium welding wire ( AlMg(Aluminum-magnesium alloy) + Ar100% + ER5356 )
		▶ AISi	Aluminum silicon welding wire ( AlMg(Aluminum-magnesium alloy) + Ar100% + ER4043 )
  ∅.888" in	Diameter selection area		Diameter selection button
			welding wire needle diameter
			Tungsten Electrode diameter
			Welding rod diameter
		∅.888" in	Diameter value

	Synergic selection button		Press the button for “synergic” and “separated” *
	Gas check		Gas check button Press to turn on gas <b>check</b> , press again within 20 seconds to turn off gas detection; Automatically turn off gas <b>check</b> after 20 seconds.
	Welding machine status indicator icon		When the control panel is not operated for more than one minute, all button functions on the panel will be locked and cannot be used. To unlock the button functions, long press the scroll wheel for 3 seconds
			Foot switch
			SPOOL GUN remote control
			Cooling fan
			Voice prompt, How to open and close, please refer to <b>11.1 Setting of system parameters</b>
			When there is a problem with the machine, this symbol lights up
			When the machine experiences overheating protection, this symbol lights up
			When the down arrow lights up, it indicates that the data is being downloaded, and when the up arrow lights up, it indicates that the data is being uploaded
			The symbol lights up to indicate that Bluetooth is connected, otherwise Bluetooth is not connected*
	Welding machine status indicator icon		When this symbol is on, it indicates that the displayed value is the latest actual current and voltage maintained during welding
			When this symbol is on, it indicates that the welding machine is in a high-frequency release state
			“synergic” Mode is open
			MMA VRD mode is open
			Inductance parameter display


     	Welding parameter adjustment		Press the scroll wheel to select welding parameters, and adjust the welding parameters by rolling the scroll wheel up and down
			MIG Wire feeding speed
			MIG Workpiece thickness
			Pulse frequency MIG mode has a fixed pulse frequency and cannot be adjusted
			MMA Hot start time
			Value Display
     	Welding parameter adjustment		Press the scroll wheel to select welding parameters, and adjust the welding parameters by rolling the scroll wheel up and down
			MIG Inductance LED, recommended to be set to 0
			MIG Default voltage fine-tuning Adjust by rolling the scroll wheel up and down
			MIG Bum-back time
			TIG Pulse width percentage
			MMA Hot Start Increased Current Percentage
			MMA Arc force Increased current percentage
			Value Display
	Type-C		Mobile phone charging port

**\* For more detailed information about the connection and operational guidelines for the ARCCAPTAIN APP, please visit [arccaptain.com](https://www.arccaptain.com/) and explore the resources available there.**

#### **\* Parameter group**

“PRG”, function of parameter group storage and usage, is in support of ten parameter group storage “0~9” with one group covering all adjustable parameters on the machine panel, including welding mode and the related conditions and settings. Prior to any other parameters, the parameter group will

automatically save the adjusted parameters(save after keeping the same parameters for 20S).The parameter group keeps the last used parameters when the machine is turned on again.No designated button for storage and no manual operation for parameter storage and usage.It is easy to use parameter

group. Press the parameter switch button  , turn on the parameter group “PRG” LED, and switch parameter groups by left scroll wheel . Select the parameter group and work with the related parameters, and the group will automatically save the adjusted parameters.

### \* MIG welding mode “Synergic” and “separated”

There are two MIG/MAG welding mode, “synergic” and “separated”, for welding specification adjustment:

**Synergic:** Current and voltage settings vary with different welding wire, wire diameter and gas; and also at the same welding current, wire feed speed and synergic voltage may differ; the welder will auto-match preset current and welding voltage, and users can adjust the inductance to the standard position according to the process requirements.

In synergic mode, the welder panel will display preset current on the right LED and preset voltage on the left LED. The synergic parameter database will auto-match the voltage based on the preset current, with adjustment range of synergic voltage  $\pm 3.0V$ .

This MIG mode is suitable for unskilled welders

**Separated:** No relation between wire feed speed and voltage adjustment, and users need to set values separately.

This MIG model is suitable for skilled welders

### • Attention



**Attention! Please select welding functions according to welding requirements. During welding, choose proper welding process and parameters according to the technology requirements of workpiece. With improper welding process and parameters, there will be unstable arc, excessive spatter and wire and electrode sticking during welding.**

Current display shows actual welding current, while voltage display shows actual welding voltage during welding. Below is display in standby:

Welding process	Voltage display	Current display
MMA	Open circuit voltage or VRD voltage (V)	Preset current value (A)
TIG	Open circuit voltage or VRD voltage (V)	Preset current value (A)
MIG	Preset voltage value (V)	Preset wire feed speed (inch/min)

※During MIG welding, actual welding current is displayed when current knob is not rotated, preset wire feed speed is displayed when current knob is rotated.



### 3.3 Wire Feeding Description

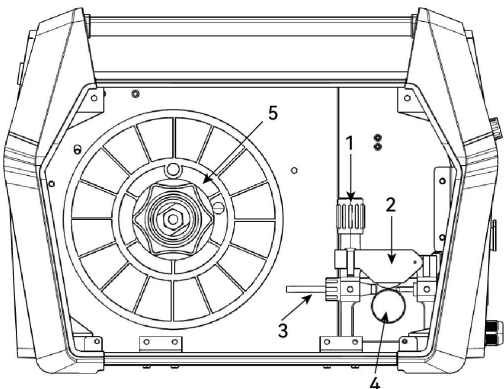
Part name	Function	Picture
<b>1. Feed Tensioner</b>	Fixed the Idler Arm and adjusts the pressure on the wire	
<b>2. Idler Arm</b>	Press down on the welding wire	
<b>3. Wire Inlet Liner</b>	Guide the welding wire into the wire feeder	
<b>4. Feed Roller</b>	V0.8-0.9 feed roller, Transfer welding wire	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





Figure 8 Inside wire feeder

### 3.4 Nameplate

On the machine, there is a plate that includes all the operating specifications for your new unit. The serial number of the product is also found on this plate.

The duty cycle rating of a welder defines how long the operator can weld and how long the welder must rest and be cooled. Duty cycle is expressed as a percentage of 10 minutes and represents the maximum welding time allowed. The balance of the 10-minute cycle is required for cooling.

For example, a welder has a duty cycle rating of 60% at the rated output of 205A. This means with that machine: you can weld at 205 A output for six (6) minutes out of 10 with the remaining four (4) minutes required for cooling. The duty cycle of your new welder can be found on the data plate affixed to the machine. It looks like the diagram below.

	
MIG205MP	MIG/MAG inverter welder
	ANSI/NEMA/IEC 60974-1
	Input:AC120V Output:30A/15.5V~140A/21V
	X 60% 100%
	I <sub>2</sub> 140A 110A
	U <sub>2</sub> 21V 19.5V
	Input:AC240V Output:30A/15.5V~205A/24.3V
	X 60% 100%
	I <sub>2</sub> 205A 160A
	U <sub>2</sub> 24.3V 22V




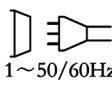
	$U_0$ 67V	Input:AC120V Output:20A/10.8V~140A/15.6V		
		X	60%	100%
		$I_2$	140A	110A
	$U_r$ 11V	$U_2$	15.6V	14.4V
		Input:AC240V Output:20A/10.8V~205A/18.2V		
		X	60%	100%
	$U_0$ 67V	Input:AC120V Output:20A/20.8V~140A/25.6V		
		X	60%	100%
		$I_2$	140A	110A
	$U_r$ 11V	$U_2$	25.6V	24.4V
		Input:AC240V Output:20A/20.8V~205A/28.2V		
		X	60%	100%
	$U_0$ 310V	Input:AC120V Output:20A/88V~40A/96V		
		X	60%	100%
		$I_2$	40A	30A
		$U_2$	96V	92V
		Input:AC240V Output:20A/88V~50A/100V		
		X	60%	100%
	$U_1$	120V	$I_{\max}$ /A	$I_{\text{eff}}$ /A
		240V	46A	20.5A
		240V	35.6A	15.5A
IP21S		Insulation class:H		

Figure 9 Nameplate

## 4. INSTALLATION AND CONNECTION



**WARNING**

**BEWARE OF ELECTRIC SHOCK!**

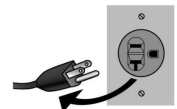


Check and follow the instructions listed in the "Safety" section of this manual.



**WARNING**

**DO NOT set up without SWITCH OFF !**



### 4.1 Selecting the Welding Wire

This welder is compatible with **2lb** or **10lb** spools of 0.023", 0.030", 0.035", or 0.040" MIG 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.

- **Matching table of relation between welding wire, diameter, shielding gas, material and wire feeding roll:**

In synergic mode, different welding wire, diameter, shielding gas, material and wire feeding roll have corresponding matching relationship as below table. Please select correct settings to achieve optimal welding performance.

Function Item	Fe CO <sub>2</sub>	Fe MIX	Flux	CrNi	AlMg
<b>MATERIAL</b>	STEEL	STEEL	FLUX CORED	STAINLESS	ALUMINIUM
<b>WIRE TYPE</b>	ER70S-6	ER70S-6	E71T-GS	ER308	ER5356
<b>DRIVE ROLLER</b>	V GROOVE	V GROOVE	KNURLED	V GROOVE	U GROOVE
<b>POLARITY</b>	DCEP	DCEP	DCEN	DCEP	DCEP
<b>GAS TYPE</b>	100%CO <sub>2</sub>	20%CO <sub>2</sub> +80%Ar	NO GAS	2%CO <sub>2</sub> +98%Ar	100%Ar

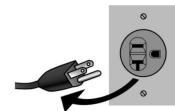
**NOTE: Oxidized welding wire can affect welding results.**

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.

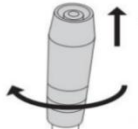
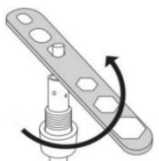
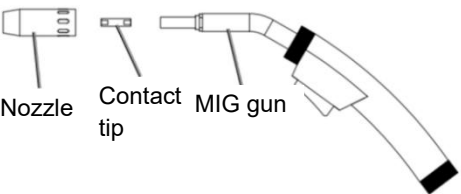
## 4.2 Checking the Torch Accessories



**WARNING DO NOT set up without SWITCH OFF !**

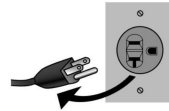


Before welding, verify that the contact tip size in your MIG torch matches your welding wire type. Do as following steps.

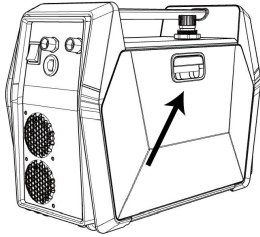


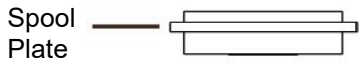
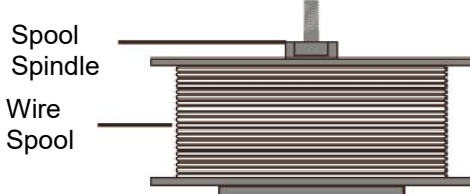

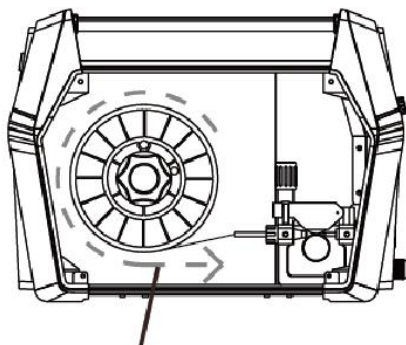
Description	Picture
<p>1. Continuously rotate the nozzle clockwise, as if pulling it upwards. Since the nozzle is spring-loaded internally, some force is required to remove it.</p> <p><b>NOTICE: ONLY TURN CLOCKWISE.</b></p>	 <p>Figure 10</p>
<p>2. Use a wrench to turn the tip of the contact nozzle counterclockwise. While doing so, ensure to steady the torch with one hand. Removing the torch might be difficult if it's not stabilized.</p>	 <p>Figure 11</p>
<p>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.</p>	
<p>4. Replace the nozzle in counterclockwise</p>	 <p>Figure 12</p>

## 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 prevent scattering the entire coil of wire.

Description	Picture
<p>1.Pull up on the Door Latch, then open the Door. Then you will see Wire Spool and wire feeder.</p>	 <p>Figure 13 Door latch</p>
<p>2. Start to install the wire: Turn <b>counterclockwise</b> to remove the spool knob, then remove the spring.</p>	 <p>Spool Knob</p>
<p>3.Remove the spool plate, then spool spindle will be exposed.</p>	 <p>Spring</p>
<p>4.Place the wire spool over the spool spindle. <b>NOTICE:</b> 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. <b>NOTICE:</b> To prevent welding wire to unravel and unspool which can cause tangling and feeding problems, DO NOT release the wire before spool knob replace.</p>	 <p>Spool Plate</p>  <p>Spool Spindle Wire Spool</p>  <p>Welder Wall</p>
<p>5.Replace the spool plate back on the spool spindle.</p>	 <p>Wire must unwind in this direction</p> <p>Figure 14</p>
<p>6.Replace the spring and spool knob over the spool plate, then turn the spool knob clockwise to tighten. <b>NOTICE:</b> 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.</p>	

## 4.4 Wire Feeding Installation



**WARNING DO NOT set up without SWITCH OFF !**

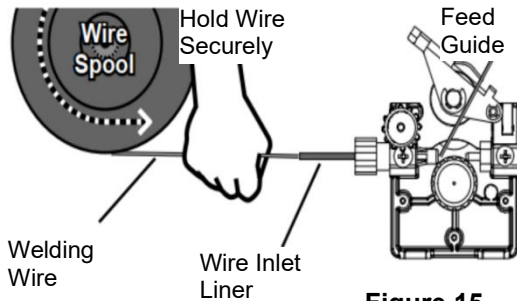
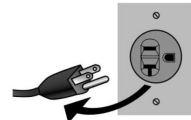
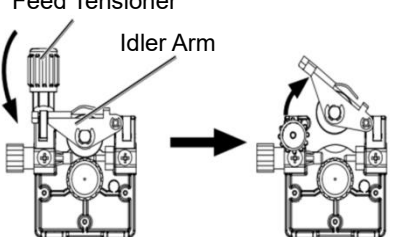
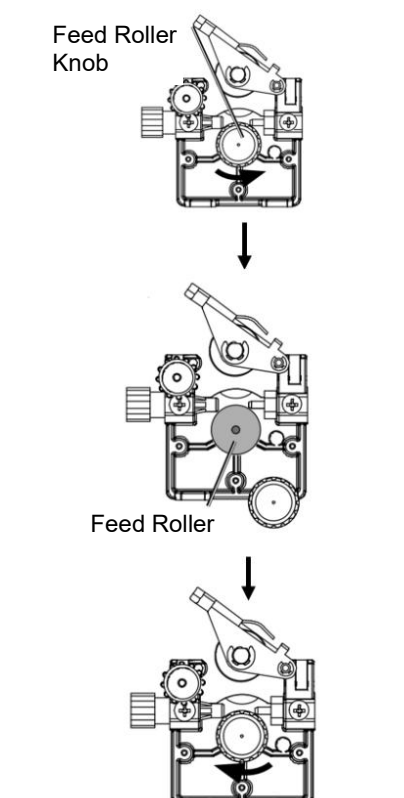


Figure 15

**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
<p>1. Release <b>Feed Tensioner</b> and rotate the <b>Idler Arm</b> away from the <b>Feed Roller</b>.</p> <p><b>NOTICE:</b></p> <p><b>*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.</b></p>	 <p>Figure 16</p>
<p><b>2.Feed roller instructions.</b></p> <p>Ensure that the visible, stenciled size on the drive roll side facing you matches the wire size being used.</p> <p><b>NOTICE:</b></p> <p><b>*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).</b></p> <p><b>*If not match, need to change feed roller:</b></p> <ul style="list-style-type: none"> <li>• Unscrew the Feed Roller Knob counterclockwise.</li> <li>• Remove the Feed Roller Knob to access the Feed Roller.</li> <li>• Flip or replace the Feed Roller as necessary. Ensure it matches the wire type and diameter indicated on the Spool.</li> </ul>	 <p>Figure 17</p>
<p>3.Carefully detach the end of the wire from the spool. Maintain tension on the wire to prevent the</p>	

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.**

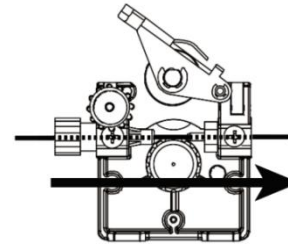


Figure 18

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.

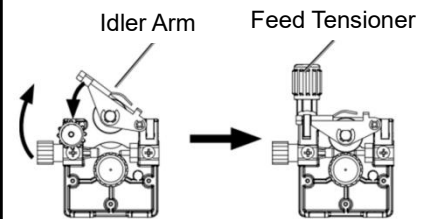


Figure 19

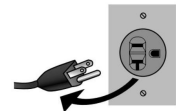
7. The **Feed Tensioner** on the **Idler Arm** adjusts the pressure on the wire. Adjust pressure by turning the **Feed Tensioner** to prevent spool overrun, but still allow smooth and easy wire feeding. Start with the pressure set to an intermediate value. Readjust, if necessary. If the drive roll slips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

## 5. Operation for MIG Welding



**WARNING**

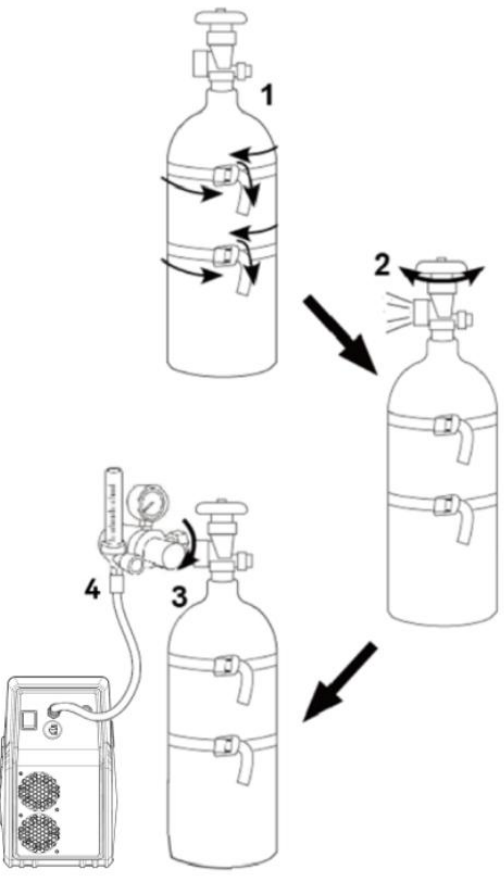
**DO NOT set up without SWITCH OFF !**



### 5.1 Connection

Description	Picture
<p>1. Connect the ground clamp to “-” negative polarity</p> <p><b>NOTICE:</b></p> <ul style="list-style-type: none"> <li>The ground clamp connector <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</li> </ul>	
<p>2. Connect the welding gun to euro connector</p> <p><b>NOTICE:</b></p> <ul style="list-style-type: none"> <li>The MIG gun connector <b>MUST</b> be tightly connected to the socket to avoid power</li> </ul>	

Figure 20

<p><b>short circuit or air leakage</b></p>	
<p>3. Connect the polarity changeover plug to “+” Positive polarity</p> <p><b>NOTICE:</b></p> <p><b>The polarity changeover plug MUST be tightly connected to the socket to avoid power short circuit.</b></p>	
<p>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.</p>	
<p>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.</p>	
<p>6. Locate the Regulator and close its valve until it is loose, then thread Regulator onto cylinder and wrench-tighten connection.</p>	
<p>7. Connector the gas hose to the Regulator’s Outlet and the welder’s MIG Gas inlet connector.</p> <p><b>NOTICE:</b></p> <p><b>The gas hose connector MUST be tightly connected to the socket to avoid air leakage.</b></p> <p>8. The gas hose MUST connect to the MIG gas inlet connector.</p>	 <p>Figure 21</p>

## 5.2 Input Power Connection



**WARNING**

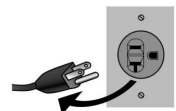
**BEWARE OF ELECTRIC SHOCK!**



**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 MIG205 MP operates with a **120V or 240V** 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 MIG205 MP 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 (120V/240V). 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.

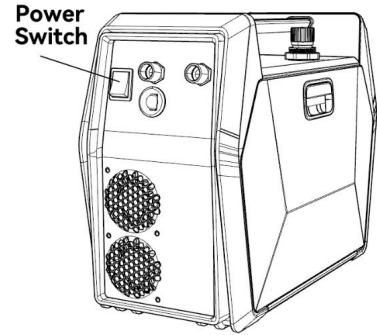


Figure 22

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!**



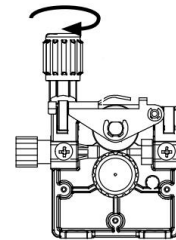
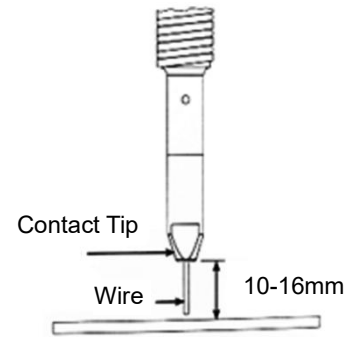
Description	Picture
1.Set the Mode Switch to MIG setting.	
2. Inching In MIG mode, not during welding, press torch trigger for at least 3S, the welder will go in fast inching status, closing output port voltage and gas valve. Release torch trigger,the welder will stop inching.	



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.

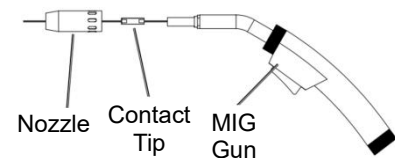


**Figure 23**

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 24**

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










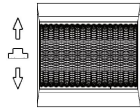
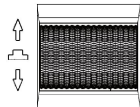
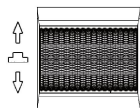

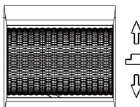
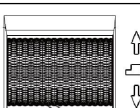
**WARNING**




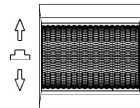
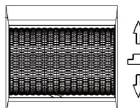

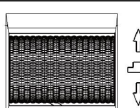
**BEWARE OF ELECTRIC SHOCK!**



- 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		
Open SYN		
Select wire diameter		

Select MIG material according to the workpiece and inlet gas, For details, see <b>3.2 Multi-function digital operation panel</b>		► FeMix ► CrNi ► FeCo2 ► AlMg ► AlSi
Turn the Left scroll wheel to find the required current		8.8.8 <sup>A</sup>
You can also press the Left scroll wheel and select the IPM of wire feed speed to automatically match other parameters		8.8.8 <sup>min min</sup>
You can also press the Left scroll wheel and select the thickness of the workpiece to automatically match other parameters		8.8.8 <sup>ga</sup>
Select 2T / 4T / Spot		► 2T ► 4T ► SPOT
You can also press the right scroll wheel and select the Select inductance level You can also choose to use the default Settings		8.8.8 <sup>+/-</sup>
Default voltage fine-tuning Adjust by rolling the scroll wheel up and down		8.8.8 <sup>+/-</sup>

Function with separated	Part	Select
Select MIG		
Close SYN		/
Turn the knob to find the required voltage		8.8.8 <sup>V</sup>
Turn the knob to find the required IPM		8.8.8 <sup>IPM</sup>
Select 2T / 4T / Spot		► 2T ► 4T ► SPOT
You can also press the right scroll wheel and select the Select inductance level You can also choose to use the default Settings		8.8.8 <sup>+/-</sup>

## 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.
- MIG Welding parameters table (for reference only)

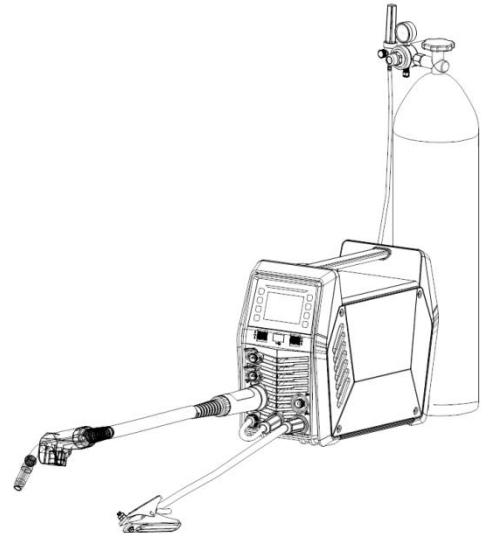


Figure 25

This set up information is intended to act as a guide only.  
Please refer to the operating manual for further information.

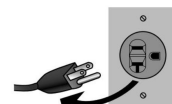
MATERIAL	WIRE TYPE	DRIVE ROLLER	POLARITY	GAS TYPE	GAS FLOW RATE	WIRE Ø	Material Thickness:				
							19ga (1mm)	14ga (2mm)	11ga (3mm)	8ga (4mm)	6ga (5mm)
							V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$
STEEL	SOLID ER70S-6	V GROOVE	DCEP	CO <sub>2</sub>	17-25CFH(8-12L/min)	.023" (0.6mm)	18.8 $\frac{372}{9.3}$	22.0 $\frac{640}{16.0}$	-	-	-
	SOLID ER70S-6	V GROOVE	DCEP	CO <sub>2</sub>	17-25CFH(8-12L/min)	.030" (0.8mm)	18.4 $\frac{188}{4.7}$	21.2 $\frac{348}{8.7}$	25.3 $\frac{500}{12.5}$	26.5 $\frac{596}{14.9}$	-
	SOLID ER70S-6	V GROOVE	DCEP	CO <sub>2</sub>	17-25CFH(8-12L/min)	.035" (0.9mm)	18.0 $\frac{140}{3.5}$	21.5 $\frac{292}{7.3}$	23.7 $\frac{400}{10.0}$	26.1 $\frac{468}{11.7}$	28.0 $\frac{560}{14.0}$
	SOLID ER70S-6	V GROOVE	DCEP	CO <sub>2</sub>	17-25CFH(8-12L/min)	.040" (1.0mm)	17.9 $\frac{112}{2.8}$	20.3 $\frac{192}{4.8}$	22.3 $\frac{292}{7.3}$	26.0 $\frac{352}{8.8}$	28.0 $\frac{436}{10.9}$
	SOLID ER70S-6	V GROOVE	DCEP	ARCO <sub>2</sub>	17-25CFH(8-12L/min)	.023" (0.6mm)	17.5 $\frac{400}{10.0}$	20.0 $\frac{640}{16.0}$	-	-	-
	SOLID ER70S-6	V GROOVE	DCEP	ARCO <sub>2</sub>	17-25CFH(8-12L/min)	.030" (0.8mm)	16.5 $\frac{200}{5.0}$	18.5 $\frac{360}{9.0}$	20.0 $\frac{460}{11.5}$	24.5 $\frac{580}{14.5}$	27.0 $\frac{640}{16.0}$
	SOLID ER70S-6	V GROOVE	DCEP	ARCO <sub>2</sub>	17-25CFH(8-12L/min)	.035" (0.9mm)	15.6 $\frac{140}{3.5}$	17.4 $\frac{268}{6.7}$	19.7 $\frac{360}{9.0}$	21.3 $\frac{452}{11.3}$	28.0 $\frac{600}{15.0}$
	SOLID ER70S-6	V GROOVE	DCEP	ARCO <sub>2</sub>	17-25CFH(8-12L/min)	.040" (1.0mm)	16.4 $\frac{116}{2.9}$	17.8 $\frac{208}{5.2}$	18.4 $\frac{268}{6.7}$	21.0 $\frac{320}{8.0}$	25.0 $\frac{400}{10.0}$
STAINLESS	ER308LSI	V GROOVE	DCEP	ARCO <sub>2</sub>	17-25CFH(8-12L/min)	.030" (0.8mm)	16.2 $\frac{252}{6.3}$	18.3 $\frac{464}{11.6}$	23.3 $\frac{612}{15.3}$	24.0 $\frac{640}{16.0}$	-
	ER308LSI	V GROOVE	DCEP	ARCO <sub>2</sub>	17-25CFH(8-12L/min)	.035" (0.9mm)	15.5 $\frac{168}{4.2}$	17.1 $\frac{312}{7.8}$	17.9 $\frac{420}{10.5}$	22.5 $\frac{500}{12.5}$	25.5 $\frac{580}{14.5}$
	ER308LSI	V GROOVE	DCEP	ARCO <sub>2</sub>	17-25CFH(8-12L/min)	.040" (1.0mm)	15.0 $\frac{144}{3.6}$	17.2 $\frac{264}{6.6}$	18.2 $\frac{340}{8.5}$	19.6 $\frac{412}{10.3}$	24.0 $\frac{480}{12.0}$

## 6. Operation for Spool gun



**WARNING**

**DO NOT set up without SWITCH OFF !**



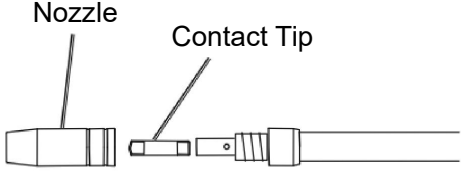
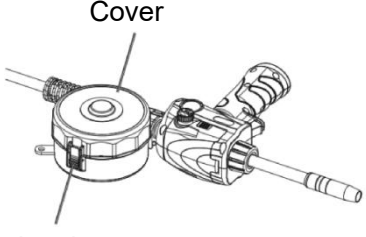

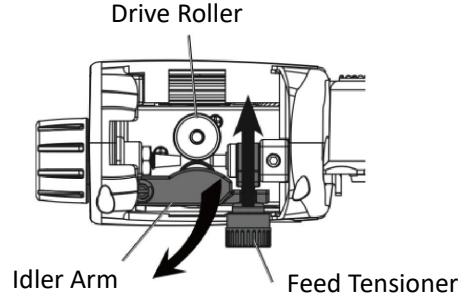
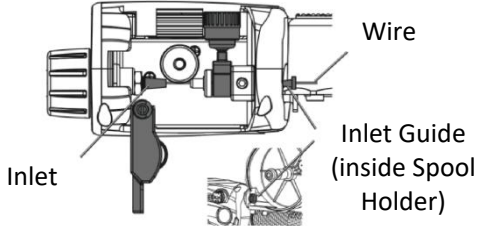
### 6.1 Set Up Spool gun



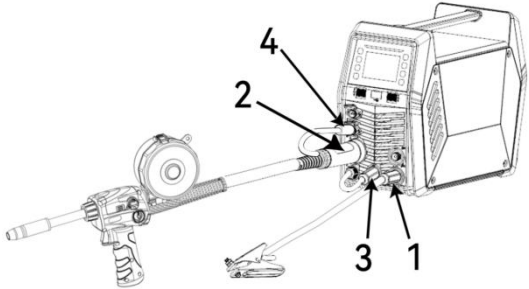
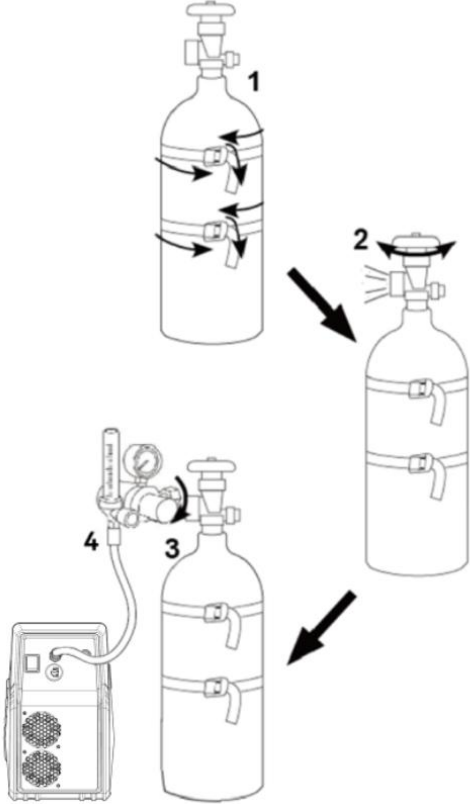
**WARNING**

**BEWARE OF ELECTRIC SHOCK!**



Description	Picture
<ul style="list-style-type: none"> <li>Pull the Nozzle to remove it. Unscrew the Contact Tip counterclockwise and remove.</li> </ul>	 <p>Figure 26</p>
<ul style="list-style-type: none"> <li>Open Latch and remove Cover.</li> </ul> <p><b>note:</b> To prevent unraveling, leave wire secured to Spool.</p>	 <p>Figure 27</p>
<ul style="list-style-type: none"> <li>Loosen Spool Tension Nut.</li> <li>Install Spool so wire will feed clockwise.</li> <li>Tighten Spool Tension Nut until Spool cannot spin freely.</li> </ul>	 <p>Figure 28</p>
<ul style="list-style-type: none"> <li>Open Wire Feed Cover.</li> <li>Pull up on Feed Tensioner, then swing up and over to expose Idler Arm.</li> <li>Open Idler Arm to expose wire feed components.</li> <li>Remove Drive Roller knob. Make sure number on Drive Roller matches wire diameter. Flip Drive Roller if necessary.</li> </ul>	 <p>Figure 29</p>
<ul style="list-style-type: none"> <li>Hold end of wire while releasing from Spool. Cut off any bent wire.</li> <li>Keeping tension on Spool, feed Wire through Inlet Guide and 1/4" into Inlet .</li> <li>Close Idler Arm and Feed Tensioner.</li> <li>Replace Spool Cover.</li> <li>Set Spool Gun down on nonconductive, nonflammable surface away from any grounded objects.</li> </ul>	 <p>Figure 30</p>

## 6.2 Connection

Description	Picture
<p>1. Connect the ground clamp to “-” negative polarity</p> <p><b>NOTICE:</b></p> <p><b>The ground clamp connector MUST be tightly connected to the socket to avoid power short circuit.</b></p>	 <p>Figure 31</p>
<p>2. Connect the spool gun to euro connector</p> <p><b>NOTICE:</b></p> <p><b>The spool gun connector MUST be tightly connected to the socket to avoid power short circuit or air leakage</b></p>	
<p>3. Connect the polarity changeover plug to “+” Positive polarity</p> <p><b>NOTICE:</b></p> <p><b>The polarity changeover plug MUST be tightly connected to the socket to avoid power short circuit.</b></p>	
<p>4. Connect the spool gun control line to socket and tighten it.</p>	
<p>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.</p>	 <p>Figure 32</p>
<p>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.</p>	
<p>3. Locate the Regulator and close its valve until it is loose, then thread Regulator onto cylinder and wrench-tighten connection.</p>	
<p>5. Connector the gas hose to the Regulator's Outlet and the welder's Gas inlet connector.</p> <p><b>NOTICE:</b></p> <p><b>The gas hose connector MUST be tightly connected to the socket to avoid air leakage.</b></p>	

## 6.3 Input Power Connection



**WARNING**

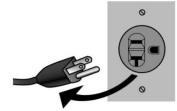
**BEWARE OF ELECTRIC SHOCK!**



**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 MIG205 MP operates with a **120V or 240V** 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 MIG205 MP 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 (120V/240V). 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.

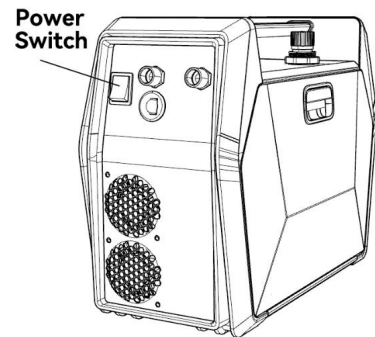


Figure 33

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

## 6.4 Wire Stick Out


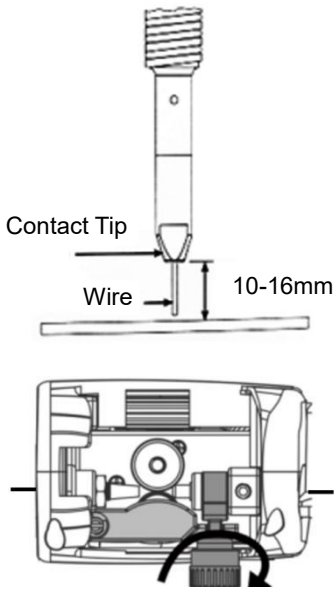
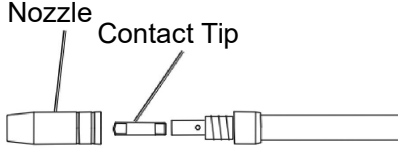


**WARNING**

**BEWARE OF ELECTRIC SHOCK!**





Description	Picture
1.Set the Mode Switch to Spool gun MIG setting.	 <p>MIG</p>
2. Inching In Spool gun 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.  <b>NOTE:</b> <ul style="list-style-type: none"> <li>Before feeding, Remove the nozzle and contact tip before feeding the wire to ensure smooth wire feeding.</li> <li>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.</li> <li>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.</li> <li>Point the Gun away from all objects.</li> <li>The welding wire should match the Feed Roller and contact tips.</li> </ul>	 <p>Figure 34</p>
4.Turn off the machine after the wire stick out. Then install the nozzle and contact tip.  <b>NOTE:</b> Cut the wire 3/8" to 5/8" from the end of the tip.	 <p>Figure 35</p>
5.Turn on the machine. The machine is now ready to weld.	
6.Close the Door Latch. Make sure. Door is securely latched.	

## 6.5 Operation



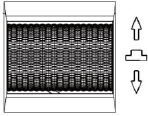
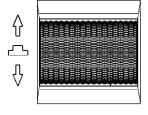

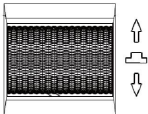


**WARINING**

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

Function with separated	Part	Select
Select MIG		
Turn the knob to find the required voltage		<b>8.8.8</b> <sup>V</sup>
Turn the knob to find the required IPM		<b>8.8.8</b> <sup>IPM</sup>
Select 2T / 4T / Spot		<div>▶ 2T</div> <div>▶ 4T</div> <div>▶ SPOT</div>
You can also press the right scroll wheel and select the Select inductance level You can also choose to use the default Settings		<b>8.8.8</b> <sup>+/-</sup>

#### 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.
- MIG Welding parameters table (for reference only)

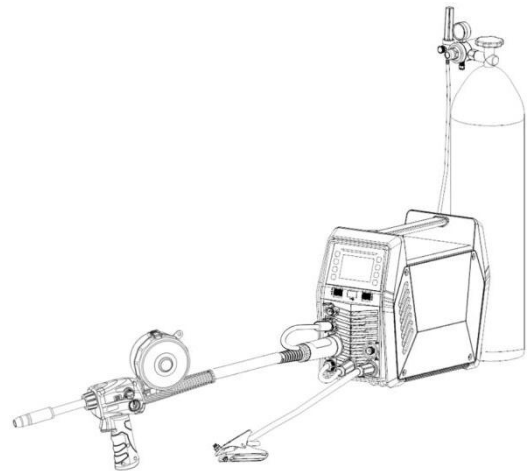


Figure 36

This set up information is intended to act as a guide only.  
Please refer to the operating manual for further information.

MATERIAL	WIRE TYPE	DRIVE ROLLER	POLARITY	GAS TYPE	GAS FLOW RATE	WIRE Ø	Material Thickness:				
							19ga (1mm)	14ga (2mm)	11ga (3mm)	8ga (4mm)	6ga (5mm)
ALUMINIUM	ER5356	U GROOVE	DCEP	ARGON	17-25CFH(8-12L/min)	.035"(0.9mm)	V/ <sup>340</sup> / <sub>8.5</sub> IPM/ m/min	V/ <sup>560</sup> / <sub>14.0</sub> IPM/ m/min	V/ <sup>640</sup> / <sub>16.0</sub> IPM/ m/min	-	-
	ER5356	U GROOVE	DCEP	ARGON	17-25CFH(8-12L/min)	.040"(1.0mm)	V/ <sup>280</sup> / <sub>7.0</sub> IPM/ m/min	V/ <sup>448</sup> / <sub>11.2</sub> IPM/ m/min	V/ <sup>560</sup> / <sub>14.0</sub> IPM/ m/min	V/ <sup>640</sup> / <sub>16.0</sub> IPM/ m/min	-

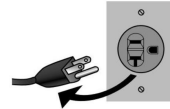


## 7. Operation for MIG Flux-Cored Welding

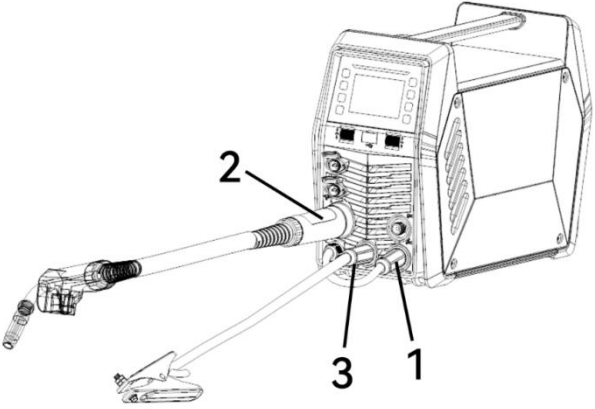


**WARNING**

**DO NOT set up without SWITCH OFF !**



### 7.1 Connection

Description	Picture
<p>1. Connect the ground clamp to “+” positive polarity</p> <p><b>NOTICE:</b></p> <ul style="list-style-type: none"> <li>The ground clamp connector <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</li> </ul>	 <p>Figure 37</p>
<p>2. Connect the welding gun to euro connector</p> <p><b>NOTICE:</b></p> <ul style="list-style-type: none"> <li>The MIG gun connector <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</li> </ul>	
<p>3. Connect the polarity changeover plug to “-” negative polarity</p> <p><b>NOTICE:</b></p> <p>The polarity changeover plug <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</p>	

### 7.2 Input Power Connection



**WARNING**

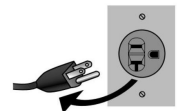
**BEWARE OF ELECTRIC SHOCK!**



**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 MIG205 MP operates with a **120V or 240V** 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 MIG205 MP 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.

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

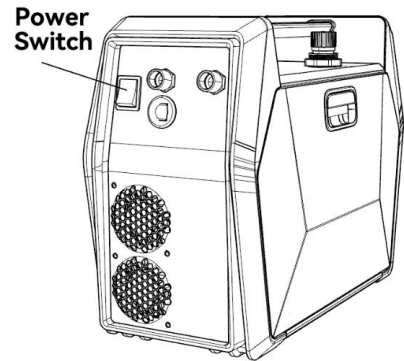


Figure 38


## 7.3 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.

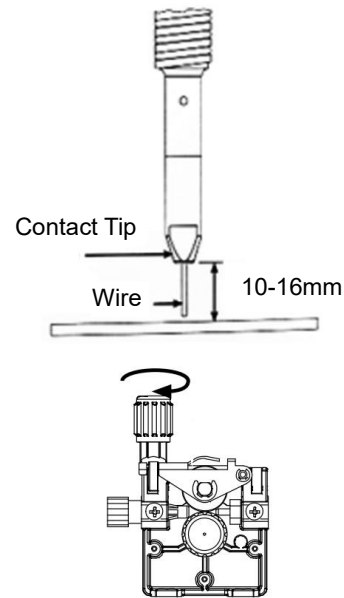


Figure 39

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.

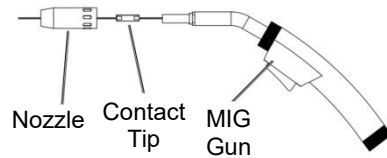


Figure 40

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

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

## 7.4 Operation








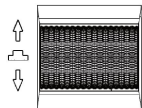
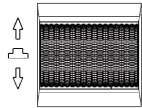
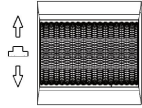

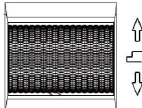
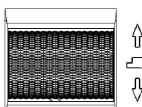
**WARNING**

**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.

Function with synergic	Part	Select
Select MIG		
Open SYN		<b>Syn</b>
Select wire diameter		<b>.023"/.030"/.035"/.040"</b>

Select Flux-Cored		► Flux
Turn the Left scroll wheel to find the required current		8.8.8 <sup>A</sup>
You can also press the Left scroll wheel and select the IPM of wire feed speed to automatically match other parameters		8.8.8 <sup>min</sup> min
You can also press the Left scroll wheel and select the thickness of the workpiece to automatically match other parameters		8.8.8 <sup>ga</sup>
Select 2T / 4T / Spot		► 2T ► 4T ► SPOT
You can also press the right scroll wheel and select the Select inductance level You can also choose to use the default Settings		8.8.8 <sup>+/-</sup>
Default voltage fine-tuning Adjust by rolling the scroll wheel up and down		8.8.8 <sup>+/-</sup>

- 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.
- Flux core MIG Welding parameters table (for reference only)

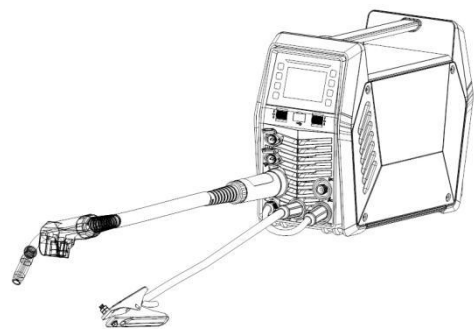


Figure 41

This set up information is intended to act as a guide only.  
Please refer to the operating manual for further information.

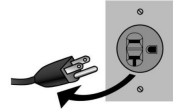
						Material Thickness:									
						19ga (1mm)		14ga (2mm)		11ga (3mm)		8ga (4mm)		6ga (5mm)	
MATERIAL	WIRE TYPE	DRIVE ROLLER	POLARITY	GAS TYPE	GAS FLOW RATE	WIRE Ø	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$	V/ $\frac{IPM}{m/min}$
STEEL	E71T-GS	KNURLED	DCEN	NO GAS	-	.030" (0.8mm)	15.7 3.3	17.8 6.0	20.0 9.0	21.0 11.0	22.0 13.0	22.0 13.0	22.0 13.0	22.0 13.0	22.0 13.0
	E71T-GS	KNURLED	DCEN	NO GAS	-	.035" (0.9mm)	16.0 2.3	19.0 4.5	20.0 6.5	21.0 7.5	22.0 8.5	22.0 8.5	22.0 8.5	22.0 8.5	22.0 8.5
	E71T-GS	KNURLED	DCEN	NO GAS	-	.040" (1.0mm)	15.5 2.0	17.3 3.8	18.8 5.3	21.0 7.0	22.5 8.5	22.5 8.5	22.5 8.5	22.5 8.5	22.5 8.5

## 8. Operation for MMA/HF-TIG/Lift TIG



**WARNING**

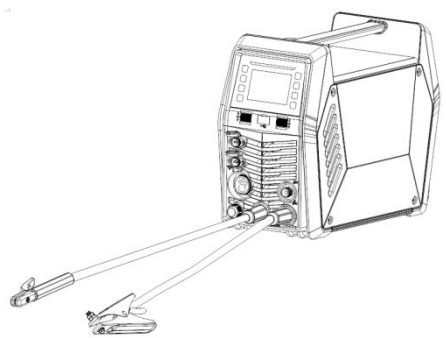
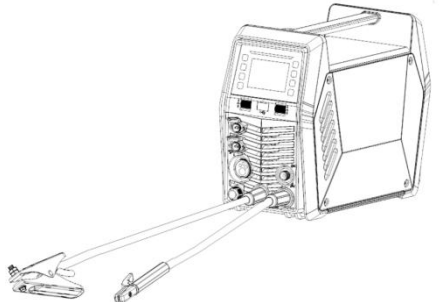
**DO NOT set up without SWITCH OFF !**



### 8.1 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
<p>1. Connect the <b>ground clamp</b> to “-” Negative polarity</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The <b>ground clamp connector MUST</b> be tightly connected to the socket to avoid power short circuit.</li> <li>Ensure the ground clamp is connected on clean, bare metal (not rusty or painted).</li> </ul>	 <p>Figure 42 DCEP</p>
<p>2. Connect the <b>Electrode Holder</b> to “+” Positive polarity</p> <p><b>NOTE:</b> The <b>Electrode Holder connector MUST</b> be tightly connected to the socket to avoid power short circuit.</p>	 <p>Figure 43 DCEN</p>
<p>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.</p> <p>If you use Acidic rods(E6013), need to DCEN, that is connect the holder to “-”and ground clamp to “+” .</p> <p><b>NOTE:</b> Incorrect wiring can affect welding results.</p>	

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.**

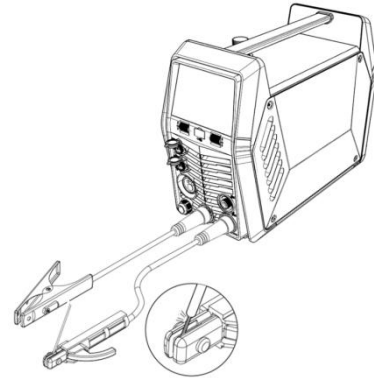


Figure 44

## 8.2 MMA 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

### 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.**

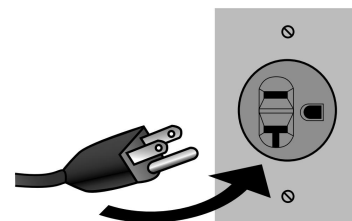
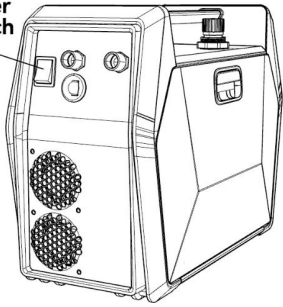



Figure 45

2. Place the bare metal end of the Stick Electrode (sold separately) inside the jaws of the Electrode Holder.

<p>3. Turn the Power Switch <b>ON</b>. The Operation interface will light up and the Cooling fan will rotate. <b>NOTE:Welder is now energized and open circuit Voltage is present.</b></p>	<p>Power Switch</p>  <p>Figure 46</p>
<p>4. Select MMA</p>	
<p>5. Stroke the workpiece lightly to ignite the arc. Tips for igniting the arc:</p> <ol style="list-style-type: none"> <li>Tap the surface with the Electrode.</li> <li>Stroke the surface with the Electrode.</li> <li>Strike the surface like a match with the Electrode.</li> </ol>	
<p>6. After the arc ignites:</p> <ol style="list-style-type: none"> <li>Lift the Electrode off workpiece the same distance as the diameter of the bare metal end.</li> <li>Tilt Electrode back 10 to 20 degrees.</li> <li>Drag Electrode to the back end of the weld puddle to deposit material as needed.</li> </ol>	
<p>7. The initial settings may need to be adjusted after stopping and carefully inspecting the weld.Proper welding takes experience.</p>	
<p>8. When finished welding; lift the Electrode from the workpiece, then set Electrode Holder down on nonconductive, nonflammable surface away from any grounded objects.</p>	
<p>9. Turn the Power Switch OFF <b>NOTE:</b> <b>To prevent accidents, after use:</b></p> <ul style="list-style-type: none"> <li>• Allow Welder to cool down.</li> <li>• Unplug Welder's power cord from outlet.</li> <li>• Remove Ground Clamp.</li> <li>• Disconnect Electrode Holder and Ground Cables.</li> </ul>	
<p>10. Clean, then store Welder and its accessories indoors out of children's reach.</p>	

## 8.3 MMA Welding parameters table

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



Stick Setup Guide						
Material Type	Electrode Type	Electrode Thickness	1/16" 1.6mm	3/32" 2.5mm	1/8" 3.2mm	5/32" 4.0mm
Steel	E 60XX	Amperage Range (A)	30-60A	60-90A	80-130A	120-205A
		Polarity	DCEP+			
	E 70XX	Amperage Range (A)	—	70-110A	80-150A	130-205A
		Polarity	DCEN-			

## 8.4 HF TIG / Lift TIG Welder Cable Introduce



**WARNING**

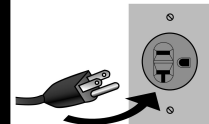
**BEWARE OF ELECTRIC SHOCK!**



**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).

2. Connect the **TIG gun** to "-" Negative polarity

**NOTICE:**

- The tig gun connector **MUST** be tightly connected to

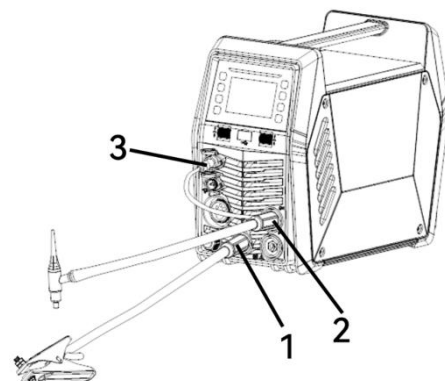
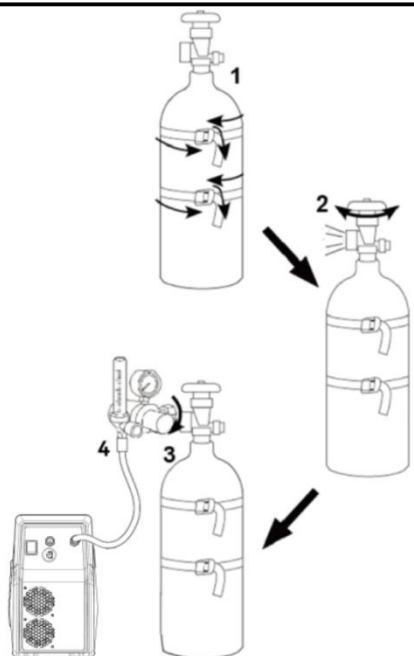


Figure 47



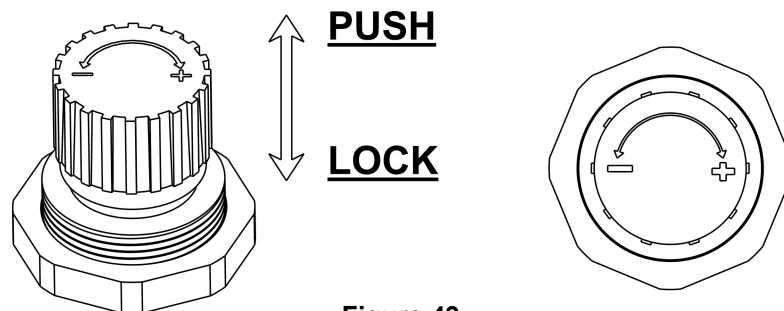
<p><b>the socket to avoid power short circuit.</b></p> <ul style="list-style-type: none"> <li>• <b>Lift TIG mode of the MIG205MP use with HF TIG GUN as well as HF TIG mode*</b></li> </ul>	
<p><b>3.</b> Connect the aviation plug on the TIG torch to the corresponding socket on the machine panel.</p>	
<p><b>4.</b> 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.</p>	
<p><b>5.</b> 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.</p>	
<p><b>6.</b> Locate the Regulator (included) and close its valve until it is loose, then thread Regulator onto cylinder and wrench-tighten connection.</p>	
<p><b>7.</b> Connect Shielding Gas Hose on TIG Torch Cable Connector to the Regulator's Outlet and wrench-tighten connection.</p>	 <p><b>Figure 48</b></p>

\* Compared to the HF TIG welding mode, the Lift TIG welding mode does not have high-frequency functionality and can have less impact on electronic products

**NOTICE:** When in TIG and CUT modes, it is crucial to adjust the air filter in advance.

1.Pull the drain button upward to unlock and adjust the input air pressure.

2.Press the drain button down to lock and prevent misadjustment.



**Figure 49**

## TIG MODE

1.Pull the drain button upward to unlock.

2.Turn the drain button towards the "+"(clockwise direction) to the maximum.

3.Install a TIG gas hose between the gas cylinder regulator and MIG205MP CUT/TIG gas inlet,then you are ready to TIG weld.

- **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.

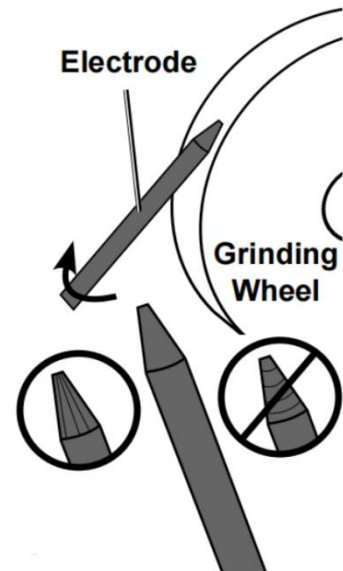


Figure 50

#### • 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.

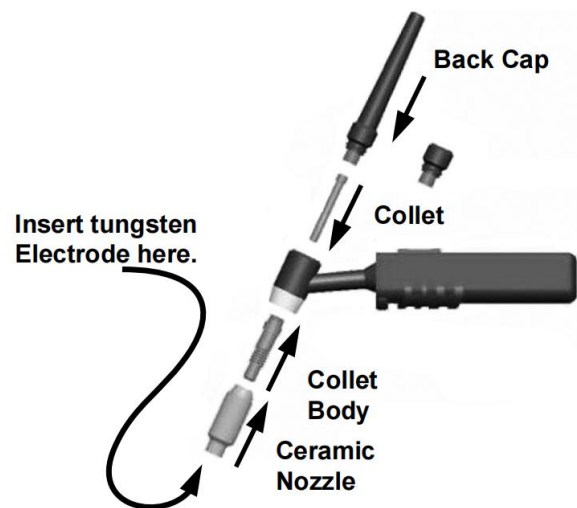
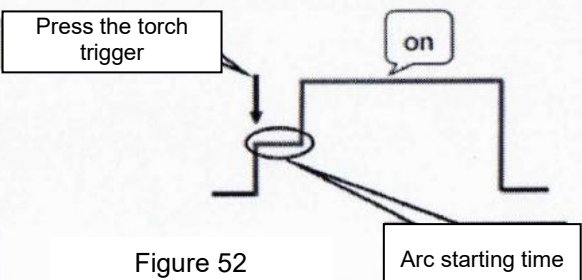
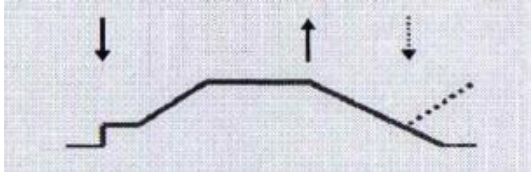
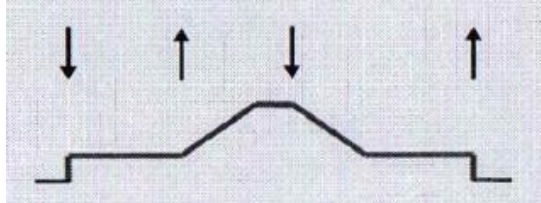
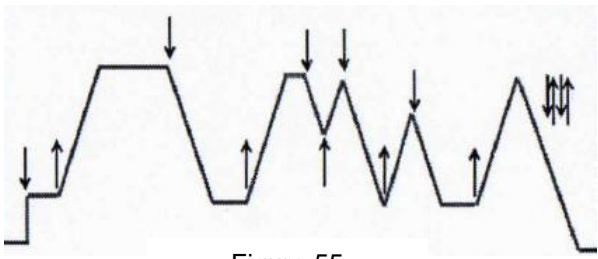
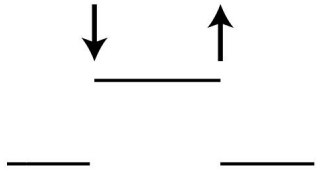


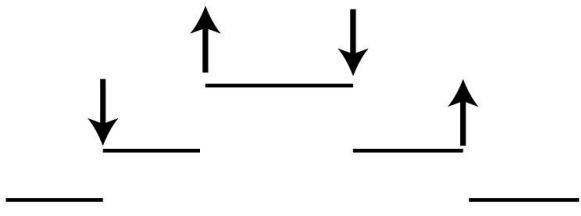
Figure 51

**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](http://WWW.ARCCAPTAIN.COM)**

### Welding method description

Legend for commonly-used torch trigger operations			
↓	Press the torch trigger	↑	Release the torch trigger
Mode No.	Operation Schedule	Torch trigger operation and typical DC TIG current curve	

1	<p>Spot welding mode:</p> <ol style="list-style-type: none"> <li>1. Press the torch trigger to start the arc to the set value;</li> <li>2. The arc extinguishes after the spot welding finishes running for the set time.</li> </ol>	 <p>Figure 52</p>
2	<p>S2T mode:</p> <ol style="list-style-type: none"> <li>1. Press the torch trigger to increase the arc up to the designated peak current</li> <li>2. Release the trigger to slowly extinguish the arc</li> <li>3. If the trigger is pressed again before the arc is extinguished, it will slowly increase to the peak current</li> </ol>	 <p>Figure 53</p>
3	<p>S4T mode:</p> <ol style="list-style-type: none"> <li>1. Press the torch trigger to start the arc to the initial value</li> <li>2. Release the trigger to slowly increase to the peak current</li> <li>3. Press the trigger to slowly drop to the finish current</li> <li>4. Release the trigger to extinguish the arc</li> </ol>	 <p>Figure 54</p>
4	<p>RPT(repeat) mode:</p> <ol style="list-style-type: none"> <li>1. Press the torch trigger to start the arc to the initial value</li> <li>2. Release the trigger to slowly increase to the peak current</li> <li>3. Press the trigger to slowly drop to the finish current</li> <li>4. Release the trigger to slowly step up to the peak current</li> <li>5. Repeat steps 3 and 4 until the arc is extinguished by pressing the torch trigger twice within 300ms.</li> </ol>	 <p>Figure 55</p>
5	<p>2T mode:</p> <ol style="list-style-type: none"> <li>1. Press the torch trigger to welding with the designated peak current</li> <li>2. Release the trigger to extinguish the arc</li> </ol>	 <p>Figure 56</p>

6	<p>4T mode:</p> <ol style="list-style-type: none"> <li>1. Press the torch trigger to start the arc to the initial value</li> <li>2. Release the trigger to increase to the peak current</li> <li>3. Press the trigger to drop to the finish current</li> <li>4. Release the trigger to extinguish the arc</li> </ol>	 <p>Figure 57</p>
---	--	---

### • Set DC TIG welding parameters

The HF-TIG/ Lift Tig welding parameters are as shown in Figure 58.

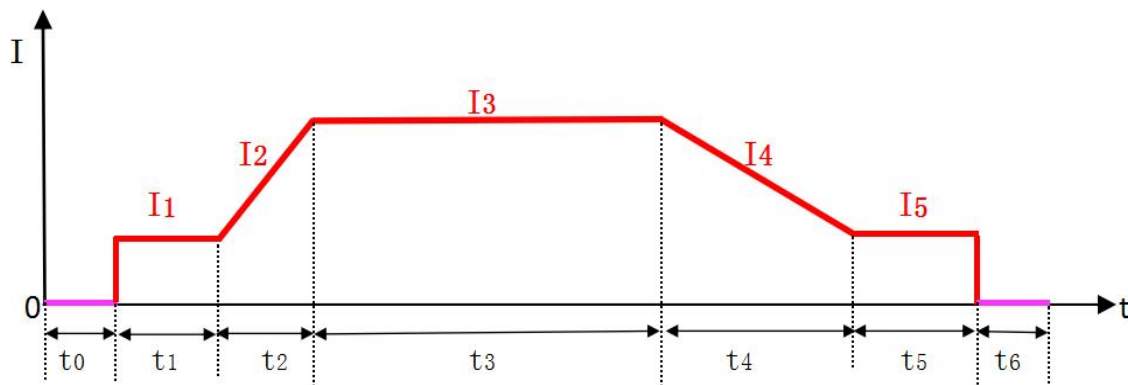









Figure 58 Current waveform of DC TIG

TIG welding parameters	MIG205MP	Current
t0-Pre-flow time		/
t1-Initial current period		I1-Initial current
t2-Up-slope time		I2-Current during up-slope time
t3-Peak current period		I3-Peak current
t4-Down-slope time		I4-Current during down-slope time
t5-Finish current period		I5-Finish current
t6-Post-flow time		/

• Initial current (I1): The initial current is the current after the torch trigger is pressed to start the arc, which should be determined according to the process requirements. A large initial current makes it easy to start the arc, but it should not be too large when welding thin plates, otherwise, it may burn through the

workpiece. After the arc is started in 4T operation, the current remains at the initial current to achieve the purpose of preheating the workpiece or lighting.

- Up-slope time ( $t_2$ ): Refers to the time as the current slowly rises from the initial current to the peak current, which can be determined according to the usage and process requirements.
- Peak current ( $I_3$ ): Set by the user according to the actual process requirements.
- Down-slope time ( $t_4$ ): Down-slope time refers to the as when the current drops from the peak to the finish current, which can be determined according to the usage and process requirements.
- Finish current ( $I_5$ ): In 4T operation mode, the arc is not extinguished after the current down-slope and remains in a state of continuous arcing, which can avoid weld defects or large craters caused by immediately cutting off the output. The operating current in this state is called the finish current, which should be determined according to the process requirements.
- Pre-flow time ( $t_0$ ): Refers to the time from pressing the torch trigger to sending argon gas to arc starting. Generally, it should be greater than 0.5s to ensure that the gas has been sent to the welding torch at normal flow when discharging arc initiation. It should be increased when the gas pipe is long.
- Post-flow time ( $t_6$ ): Refers to time from cutting off the welding current to turning off gas the valve in the welder. It should be determined according to the usage conditions and process requirements; too long will cause waste of argon gas, but too short will cause oxidation of the weld.

The parameters are set as follows:

Enter DC TIG mode, and press the encoder to select the welding parameter to be set. If the parameter indicator is on, it indicates that the parameter is selected.

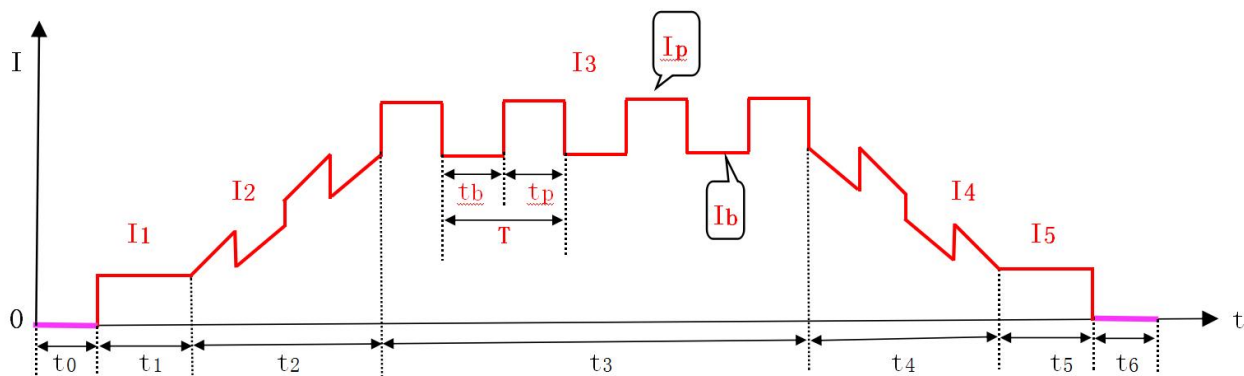
Press the encoder once. If the indicator is on, it indicates that the parameter has been selected for configuration; rotate it clockwise to increase the value, and counterclockwise to decrease the value.

After setting the parameter, press the encoder again to save the current settings, and the parameter indicator will change to always on.











Set all the welding parameters according to the above steps.

- Set Pulse TIG welding parameters

The DC pulse TIG welding parameters are as shown in Figure 59.



**Figure 59 Current waveform of DC pulse TIG**

TIG welding parameters	MIG205MP parameter	Current
t0-Pre-flow time		/
t1-Initial current period		I1-Initial current
t2-Up-slope time		I2-Current during up-slope time
t3-Peak current period		I3-Peak current
t4-Down-slope time		I4-Current during down-slope time
t5-Finish current period		I5-Finish current
t6-Post-flow time		/
tb-Pulse base time		Ib-Pulse base current
tp-Pulse peak time		Ip-Pulse peak current
T-Pulse period		/

Pulse TIG includes all DC TIG parameters, except that the parameters are set differently. The parameters will not be explained again here. In addition, there are 4 adjustable parameters, which are explained separately in conjunction with the figure:

- Peak current (Ip): Maximum pulse current, adjusted according to the process requirements.
- Base current (Ib): Minimum pulse current, adjusted according to the process requirements.
- Pulse frequency (1/T):  $T = t_p + t_b$ , adjusted according to the process requirements.
- Duty cycle ( $100\% \cdot t_p / T$ ): the percentage of peak current duration in the pulse cycle, adjusted according to the process requirements.

The parameters are set as follows:

Enter DC TIG mode, and press the encoder to select the welding parameters to be set. If the parameter indicator is on, it indicates that the parameter is selected.

Press the encoder once. If the indicator is on, it indicates that the parameter has been selected; press the encoder clockwise to increase the value, and counterclockwise to decrease it.

After setting the parameter, press the encoder again to save the current settings, and the parameter indicator will change to always on.

Set all welding parameters according to the above steps.

NOTE: Open the gas valve on the gas cylinder, adjust the argon gas flow, and realize TIG welding by lift arc starting or HF arc starting.

During welding:

- 1) The TIG parameter indicator changes with the welding state

- 2) If the parameter indicator is in initial current, peak current, or finish current, directly press the encoder to adjust the value, and the parameter indicator will flash
- 3) If the parameter indicator is in pre-flow time, up-slope time or down-slope time, the value cannot be adjusted, and operations on the encoder will not be effective.

After welding, release the torch trigger to extinguish the arc.

**Note! When starting the arc, if the short-circuit time exceeds 2 seconds, the welder turns off the output current. Lift the welding torch to restart the arc again.**

**Note! During welding, if there is short circuit between tungsten electrode and the workpiece, the welder will immediately reduce the output current; if the short circuit exceeds 1 second, the welder will turn off the output current. If this happens, lift the welding torch to restart the arc again.**

## 8.5 Tig Welder Operation



**WARNING**

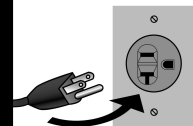
**BEWARE OF ELECTRIC SHOCK!**



**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.

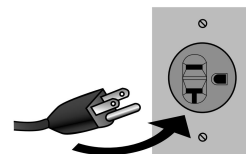
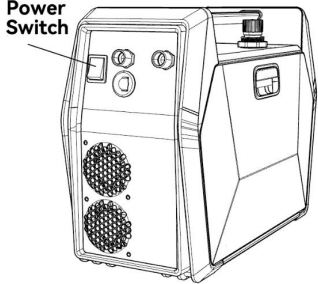



Figure 60



<p>4. Turn the Power Switch <b>ON</b>.</p> <p><b>NOTE: Set TIG Torch down on nonconductive, nonflammable surface away from any grounded objects.</b></p> <p>The Operation interface will light up and the Cooling fan will rotate.</p>	 <p>Figure 61</p>
<p>5. Select Lift TIG or HF- TIG</p> <p><b>NOTE:Welder is now energized and open circuit Voltage is present.</b></p>	
<p>6. Hold TIG Torch in one hand and the TIG Rod (sold separately) in other hand. Both hands need to wear protective gloves.</p> <p><b>WARNING! TO PREVENT SERIOUS INJURY: Metalwork bench must be grounded when TIG welding.</b></p> <p><b>NOTE:</b> Maintain a constant distance between the Tungsten Electrode and the workpiece: between 1 and 1.5 times the diameter of the Electrode.</p>	
<p>7. The initial settings may need to be adjusted after stopping and carefully inspecting the weld. Please refer to <b>8.7 TIG Welding parameters table</b>, Proper welding takes experience.</p>	
<p>8. Hold TIG Torch in one hand and the TIG Rod (sold separately) in other hand. Both hands need to wear protective gloves.</p> <p>Lift TIG: To initiate welding arc, touch Electrode to work piece and Press the torch trigger, then lift</p> <p>HF-TIG: Place the electrode at a certain distance from the workpiece and Press the torch trigger</p> <p><b>WARNING! TO PREVENT SERIOUS INJURY: Metalwork bench must be grounded when TIG welding.</b></p> <p><b>NOTE:</b> Maintain a constant distance between the Tungsten Electrode and the workpiece: between 1 and 1.5 times the diameter of the Electrode.</p>	
<p>9. 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.</p>	
<p>10. Alternate between pushing the torch/weld puddle and adding the TIG Rod material.</p> <p><b>NOTE:</b> 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.</p>	
<p>11. When finished welding, close the torch trigger, then let the gas coverage until weld solidifies.</p>	
<p>12. Set TIG Torch down on nonconductive, nonflammable surface away from any grounded objects.</p>	
<p>13. Turn the Power Switch OFF.</p>	
<p>14. To prevent accidents, after use:</p> <ul style="list-style-type: none"> <li>• Allow Welder to cool down.</li> <li>• Unplug Welder's power cord from outlet.</li> <li>• Remove Ground Clamp from workpiece or table.</li> </ul>	



- 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.

## 8.6 TIG Welding parameters table

Following table is suitable for stainless steel welding. For other materials, consult related materials and welding process for reference.

TIG Setup Guide (Pure Argon Gas / DC- Polarity)						
Tungsten Diameter	Filler Rod	Material	16ga 1.6mm	10ga 3.2mm	6ga 4.8mm	3ga 6.0mm
1/16" 1.6mm	1/16" 1.6mm	Steel	60-90A	80-115A		
		Stainless	40-70A	65-110A		
3/32" 2.4mm	3/32" 2.4mm	Steel			115-165A	
		Stainless			100-150A	
1/8" 3.2mm	3/32" 2.4mm	Steel				160-205A
		Stainless				135-205A

## 9. Operation for CUT



**WARNING**

**BEWARE OF ELECTRIC SHOCK!**

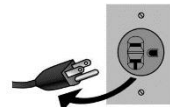


Check and follow the instructions listed in the "Safety" section of this manual.



**WARNING**

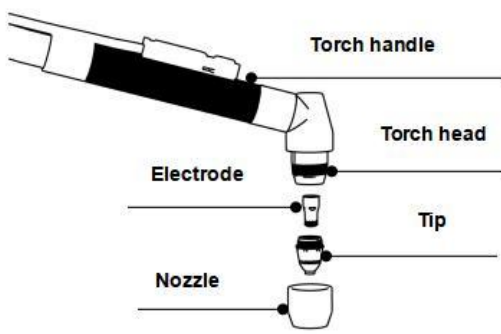
**DO NOT set up without SWITCH OFF !**



### 9.1 Installation of the cutting torch

Check the torch for proper assembly. Install proper torch parts for the desired application (Refer to the following Torch head figure).

**NOTE:** The power supply will **NOT** operate unless the torch shield cup is fully seated against the Parts in Place pins in the torch head.

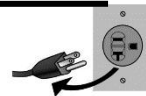
<ol style="list-style-type: none"> <li>1. Insert one end of the electrode into the torch head.</li> <li>2. Connect the tip to the electrode.</li> <li>3. Connect the nozzle with the tip, screw it into the torch head. And tighten it.</li> </ol>	 <p><b>Figure 62 cutting torch head</b></p>
--	---

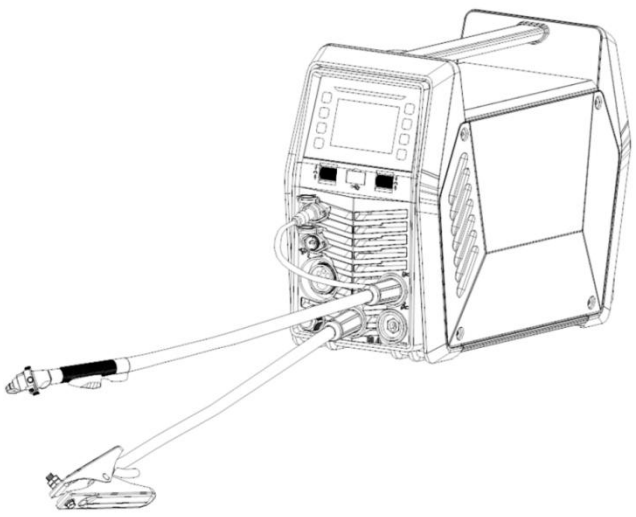
## 9.2 Installation of the Connection Cable



**WARNING**

**DO NOT set up without SWITCH OFF !**



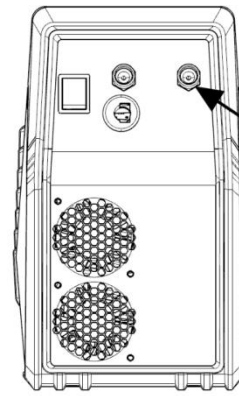
Description	Picture
<ol style="list-style-type: none"> <li>1. Connect the Cutting gun to TIG/CUT gas electric integrated output interface</li> </ol> <p><b>NOTICE:</b></p> <p>The Cutting gun connector <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</p>	 <p><b>Figure 63 Connection of cutting torch</b></p>
<ol style="list-style-type: none"> <li>2. Connect the aviation plug on the cut torch to the corresponding socket on the machine panel.</li> </ol>	
<ol style="list-style-type: none"> <li>3. Connection of earth cable</li> </ol> <p>Insert the quick plug on the earth cable into the terminal and tighten it clockwise.</p> <p><b>NOTICE:</b></p> <p>The ground clamp connector <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</p> <p>Ensure the ground clamp is connected on clean, bare metal (not rusty or painted).</p>	

## 2.Connection of air compressor

The MIG205MP requires compressed air to be attached to the unit. Use a hose clamp to tighten the gas hose to avoid air leakage

### NOTICE:

The input air pressure mini-mum must be 72.5 PSI, 5 Bar and must not exceed 150 PSI, 10.3 Bar. An air regulator is included with the unit with optimum pressure setting set to 57.5 PSI, 4 Bar. The unit is also equipped with an air filter which captures water and oil vapor. The vapor collected can be drained out of the bottom of the unit by turning the drain button.



Connect the  
air compressor

**Figure 64 Connection of air compressor**

## 3.Connection of input power

The MIG205MP operates in 240V or 120V power supply. Plug the Power Cord into a properly grounded. Set Cutting Gun down on nonconductive, nonflammable surface away from any grounded objects. And then then turn the Power Switch ON. The fan should start. The Digital screen should turn on.

### NOTICE:

Adjust the Voltage Switch to match the outlet voltage:

For 120VAC, attach the provided adapter to the Power Cord.

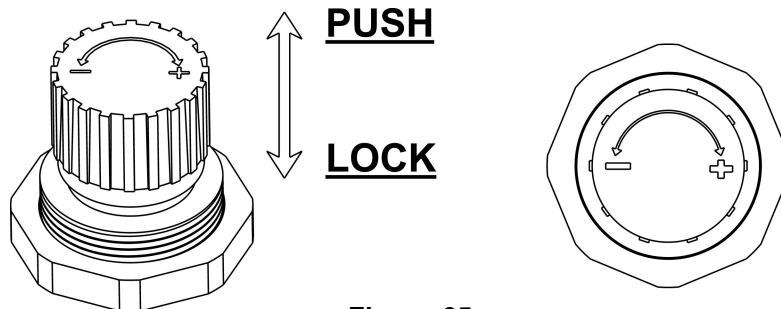
For 240VAC, do not use the adapter.

Plug the Power Cord into a properly grounded and rated receptacle matching the plug and selected voltage.

Need to be connected to circuits with 50A and above circuit breakers

**NOTICE:** When in TIG and CUT modes, it is crucial to adjust the air filter in advance.

- 1.Pull the drain button upward to unlock and adjust the input air pressure.
- 2.Press the drain button down to lock and prevent misadjustment.



**Figure 65**

## CUT MODE

- 1.Pull the drain button upward to unlock.
- 2.Turn the drain button towards “-”(clockwise direction) to the minimum.
- 3.Connect the air hose between the air compressor MIG205MP CUT/TIG gas inlet,then you are ready to CUT.When starting cutting, slowly turn the drain button towards”+” (clockwise direction) to the needed air pressure.

**NOTICE:** The nominal air pressure setting is 58 PSI(4.0 Bar).The regulator should never be set above 87 PSI(6 Bar).

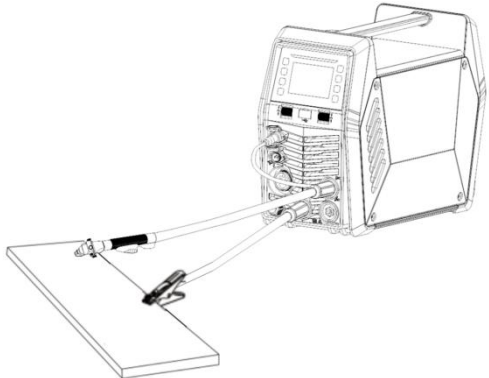
### 9.3 Operation method



**WARINING**

**BEWARE OF ELECTRIC SHOCK!**

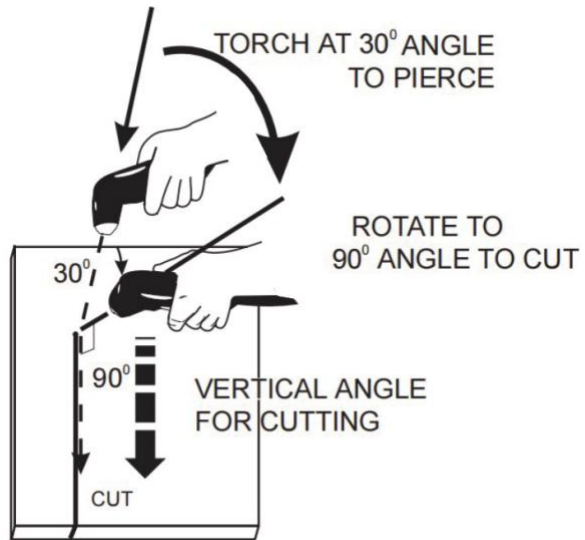


Description	Picture
1. Clamp the Ground clamp onto the workpiece, The Ground clamp must be securely connected to the workpiece.	 <p><b>Figure 66 Clamp the Ground clamp</b></p>
2. Set the output current control knob at maximum position for higher cutting speed and less dross formation. Reduce the current, if desired to reduce the cut width, heat affected zone or travel speed as required.	
3. 2T/4T mode select <b>2T (2 touch) mode:</b> <ul style="list-style-type: none"><li>• Press the trigger to start the cutting current</li><li>• Release trigger to stop the cutting current.</li></ul> <b>4T (4 touch) mode:</b> <ul style="list-style-type: none"><li>• Press trigger to start cutting</li><li>• Release trigger during cutting.</li><li>• Press and release trigger to shut cutting current off.</li></ul>	

4. Bring the copper nozzle of the cutting torch into contact with the workpiece, and then push the torch trigger. After the arc is ignited and started, raise the cutting torch to the position about 0.04inch above the workpiece, and start cutting.

5. Pierce the work piece by slowly lowering the torch onto the metal at a 30° angle away from the operator. This will blow the dross away from the torch nozzle. Slowly rotate the torch to vertical position as the arc becomes deeper.

**NOTE:** Graphics shown are for understanding torch angles for best results – the distances from the workpiece are exaggerated. In actual operation, the nozzle should be held just above the work piece surface.



**Figure 67 Cutting operation**

## • NOTE

For better torch control, it is acceptable to let the nozzle drag along the work piece surface. This will shorten nozzle life. Also, it is acceptable to place a non-conductive torch guide on the work piece in order to achieve a cleaner cut

- When the trigger is released, the arc will stop. The gas will continue to flow for 5 seconds of postflow. If the trigger is activated within this time period
- If the dross is difficult to remove, reduce the cutting speed. High speed dross is more difficult to remove than low speed dross.
- The right side of the cut is more square than the left as viewed along the direction of travel.
- Clean spatter and scale from the nozzle frequently.

## • Parts in place

**If the accessories of cutting torch need to be replaced, please log in to the official website:**

**WWW.ARCCAPTAIN.COM**

- Check the assembly of the torch consumables. If they are not properly in place, the machine will not start. **Make sure that the shield cup is hand tight. Do not use pliers or over tighten.**
- Check the conditions of the inside of the nozzle. If debris has collected, rub the electrode on the inside bottom of the nozzle to remove any oxide layer that may have built up. Refer to the "Routine Maintenance Section".
- Check the condition of the electrode. If the end has a crater-like appearance, replace it along with the nozzle. The maximum wear depth of the electrode is approximately .062". A green and erratic arc will indicate definite electrode failure and the electrode should be replaced immediately.
- Replace the nozzle when the orifice exit is eroded away or oval shaped.








## 9.4 Notes for cutting operation



**WARNING**

**BEWARE OF ELECTRIC SHOCK!**



	It is recommended to initiate the cutting from the edge of workpiece, unless penetration is needed.
	Ensure spatters fly from the bottom of workpiece while cutting. If spatters fly from the top of workpiece, it indicates that the workpiece can not be fully cut because the cutting torch is moved too fast or the cutting current is too low.
	Keep the nozzle slightly touching the workpiece or keep a short distance between the nozzle and workpiece. If the torch is pressed against the workpiece, the nozzle may stick to the workpiece, and smooth cutting is unavailable.
	For cutting round workpiece or to meet precise cutting requirement, molding board or other assistant tools are needed.
	It is recommended to pull the cutting torch while cutting.
	Keep the nozzle of cutting torch upright over the workpiece, and check if the arc is moving with the cutting line. If the space is not enough, don't bend the cable too much, step on or press upon the cable to avoid suffocating of gas flow. The cutting torch may be burned because the gas flow is too small. Keep the cutting cable away from edge tools.
	Clean up the spatters on the nozzle timely, for it will affect the cooling effect of the nozzle. Clean up the dust and spatters on the torch head after using everyday to ensure good cooling effect.

● **The workpiece is not cut fully. This may be caused by:**

1. The cutting current is too low.
2. The cutting speed is too high.
3. The electrode and nozzle of the torch are burned.
4. The workpiece is too thick.

● **Molten slag drops from the bottom of workpiece. This may be caused by:**

1. The cutting speed is too low.
2. The electrode and nozzle of the torch are burned.
3. The cutting current is too high.

## 9.5 Cutting parameters table



**WARNING**

**BEWARE OF ELECTRIC SHOCK!**



Select proper current according to the cutting parameters table, workpiece material, cutting thickness and cutting speed, etc. (The figure in the below table is an approximation.)

**Figure 18 Cutting speed (in/min) when cutting current is 50A**

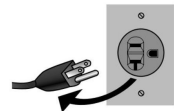
Cutting thickness (inch)	0.004	1/32	1/16	1/8	3/16	7/32	1/4	9/32	5/16	3/8
Mild steel		315		59			15			
Galvanized steel		315		59			15			
Stainless steel		315		59			15			
Aluminum		315		59						
Brass		29.5								
Red copper		29.5								

## 10. Operation for CLEAN



**WARNING**

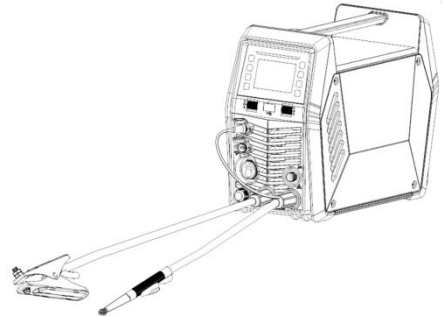
**DO NOT set up without SWITCH OFF !**



### 10.1 Clean 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!



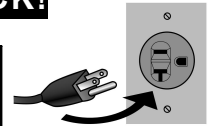
Description	Picture
<p>4. Connect the Clean gun to “-” Negative polarity</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The ground clamp connector <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</li> <li>Ensure the ground clamp is connected on clean, bare metal (not rusty or painted).</li> </ul>	 <p>Figure 68</p>
<p>5. Connect the ground clamp to “+” Positive polarity</p> <p><b>NOTE:</b> The Electrode Holder connector <b>MUST</b> be tightly connected to the socket to avoid power short circuit.</p>	

## 10.2 Clean Welder Operation



**WARNING**

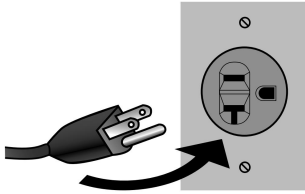
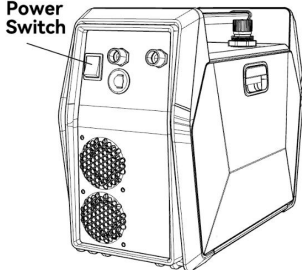

**BEWARE OF ELECTRIC SHOCK!**



**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	Picture
<p>1. connect power cord</p> <p><b>NOTE:</b> 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.</p>	 <p>Figure 69</p>
<p>2. Connect the ground clamp to the workpiece, Prepare the workpiece to be cleaned. Make sure the area is clean and the floor is dry.</p>	
<p>3. Turn the Power Switch <b>ON</b>.</p> <p>The Operation interface will light up and the Cooling fan will rotate.</p> <p><b>NOTE:</b>Welder is now energized and open circuit Voltage is present.</p>	 <p>Figure 70</p>
<p>4. Select CLEAN</p>	
<p>5. With the brush secure into the the end of the wand, dip the brush into the container with weld cleaning solution.</p> <p>Make contact with the brush to the welded area to be cleaned.</p> <p>As the chemical reaction happens keep the brush moving back and forth over the weld until desired results are achieved. Do not dwell in one spot more than a few seconds. If the brush starts to burn or is leaving black marks on your part use more weld cleaning solution.</p> <p><b>Note :</b> weld cleaning solution needs to be purchased separately, MIG205MP is not provided solution</p>	



6. As the solution in the brush dissipates, re-dip the brush into the solution to keep the brush saturated in solution

7. Removal of Weld cleaning solution and metal residues

Electrochemical cleaning leaves electrolyte and metal residues on the workpiece surface. Such residues may cause deposits on the workpiece and affect corrosion resistance.

After weld cleaning is complete, Rinse or wipe off excess solution off the workpiece.

Spray on neutralizer everywhere the solution contacted. Rinsing off with clean running water is also acceptable.

Wipe off neutralizer with a separate rag or rinse with clean water

Neutralizer wipes can be used in place of the neutralizer spray.

**Note:** During electrochemical cleaning ensure that no cleaning electrolyte enters into any workpiece cavities or seams. In most cases complete removal of solution residue from cavities, overlaps or seams can be difficult.

8. 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.

9. Clean, then store Welder and its accessories indoors out of children's reach.

● **Note:**

Proper brush usage can improve brush life and cleaning efficiency. Do not use excessive downward pressure on the brush. The Capital Weld Cleaner uses an electro-chemical process, and is not an abrasive process. Pushing down too hard will splay the fibers and cause them to not clean as effectively and can shorten the life of the brush. The electro-chemical process will allow more electrical current to flow through the ends of the fibers than it will if you are cleaning against the sides of the fibers. When trimming the silicone sleeving do not expose more than ½" of carbon fiber, allowing the silicone sleeving to keep the fibers tighter together making it easier to clean at the ends of the fibers.

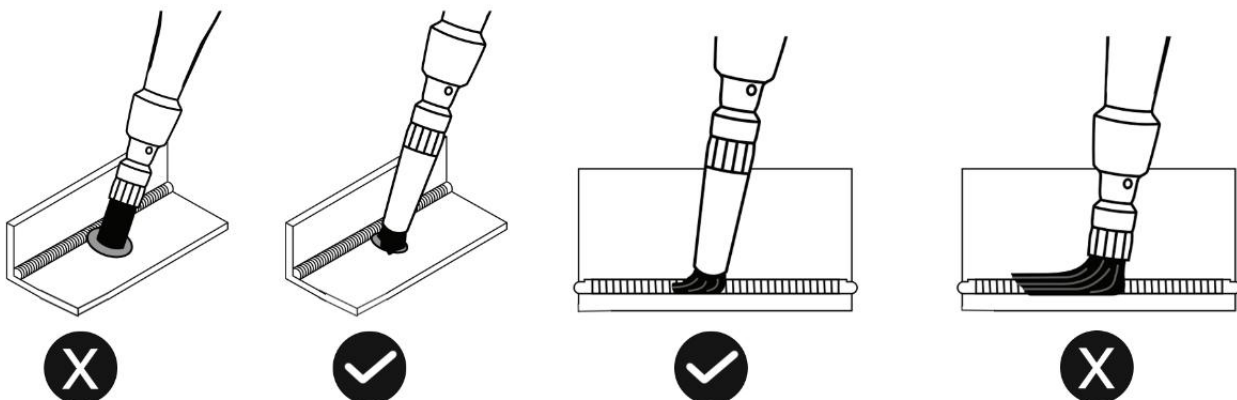


Figure 71

# 11. Engineer Mode



**WARNING**

**BEWARE OF ELECTRIC SHOCK!**



## 11.1 Setting of system parameters

- A default set of common welding parameters for this machine can be revised by revising system parameters in case of need. Below is method:

**NOTE:**

- The default parameters of the welder are modified for experienced welders.
- The default parameters of the welder have been set in the best state. Do not change the default parameters of the welder unless necessary.

NO	operation	Picture
1	1. Turn on the power switch of the welding machine, and when the display screen is fully lit, touch the "Operation Mode" button with your finger once. After the header displays "dbg"+"bcs", touch the "Operation Mode" button again. When the LED displays "P01", you can enter the background parameter setting interface;	
2	Select system parameters of <b>TIG</b> or <b>MMA</b> by pressing <b>Welding process selection button</b> .	
3	3. Rotate the "left scroll wheel" to select the parameter items to be modified, rotate the "right scroll wheel" to modify the parameters of the selected items, and touch the "operation mode" button once to save after modifying the parameters;	
4	After revising parameters, press <b>Synergic selection button</b> to exit the setting of system parameters to be in normal standby.	

- System parameter:**

**MMA mode**

No.	Function parameters	Default	Setting range	Unit	Description
P01	Background parameters initialization	on	on/off	-	Restore factory default (Select "on" to restore factory default)
P02	Welding time calculation	0.0	0.0~999	day	Calculate welding time
P03	VRD switch at MMA	off	on/off	-	VRD switch at MMA ( "off": VRD is off, "on": VRD is on )
P04	Arc-force current at MMA	50	20~80	A	Given current value when output voltage is below 14V at MMA

P05	Arc ignition current at MMA	60	20~100	A	Given current value of arc ignition at MMA
P06	Arc ignition time at MMA	0.4	0.3~1.0	S	Duration for given current value of arc ignition at MMA
P07	Voice prompt	on	on/off	-	Voice prompt switch

#### TIG mode(HFTIG and LIFT TIG)

No.	Function parameters	Default	Setting range	Unit	Description
P01	Background parameters initialization	on	on/off	-	Restore factory default (Select "on" to restore factory default)
P02	Welding time calculation	0.0	0.0~999	day	Calculate welding time
P03	Lift TIG current	50	35~65	A	Current value when tungsten and workpiece are shorted at Lift TIG
P04	Post-flow time at TIG	5.0	1.0-10.0	S	Post-flow time at TIG

## 12. MIG Basic Welding Technique



**WARNING**

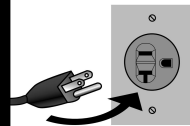
**BEWARE OF ELECTRIC SHOCK!**



**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.



### 12.1 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.

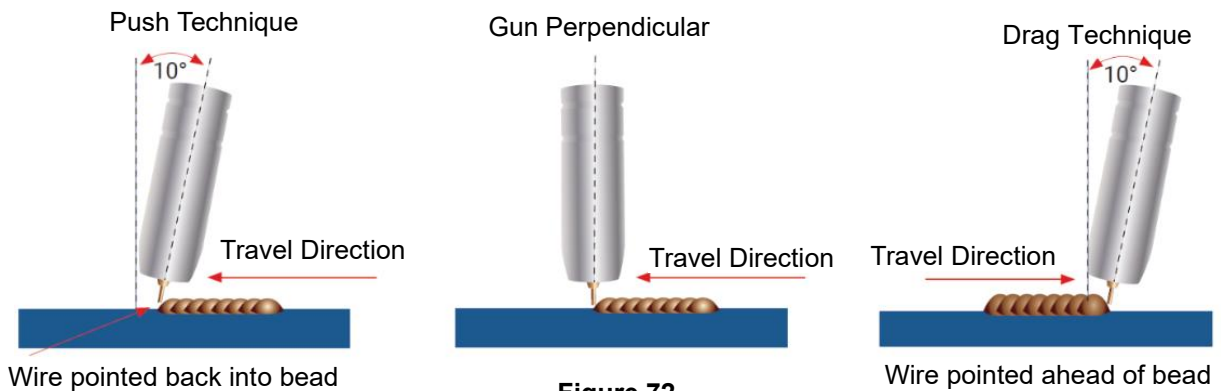


Figure 72

- **Travel Angel**

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.

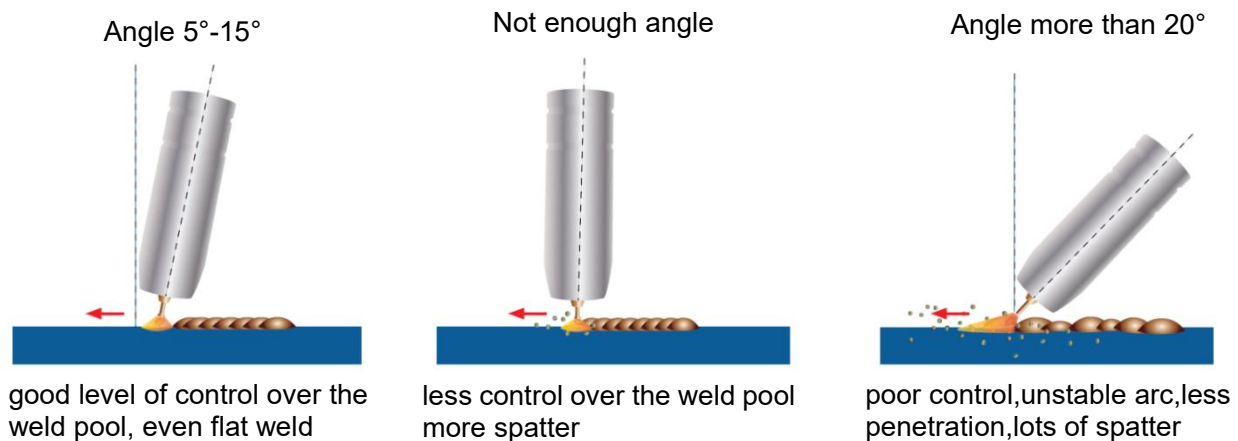
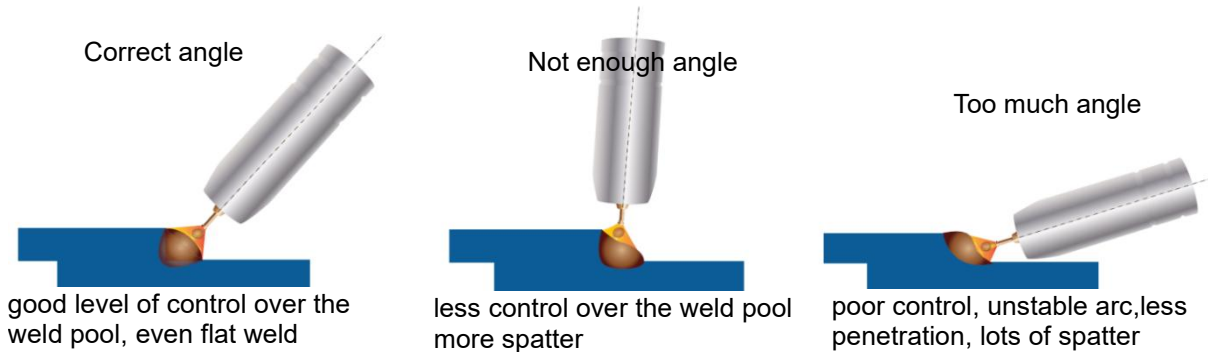


Figure 73

- **Angle to Work**

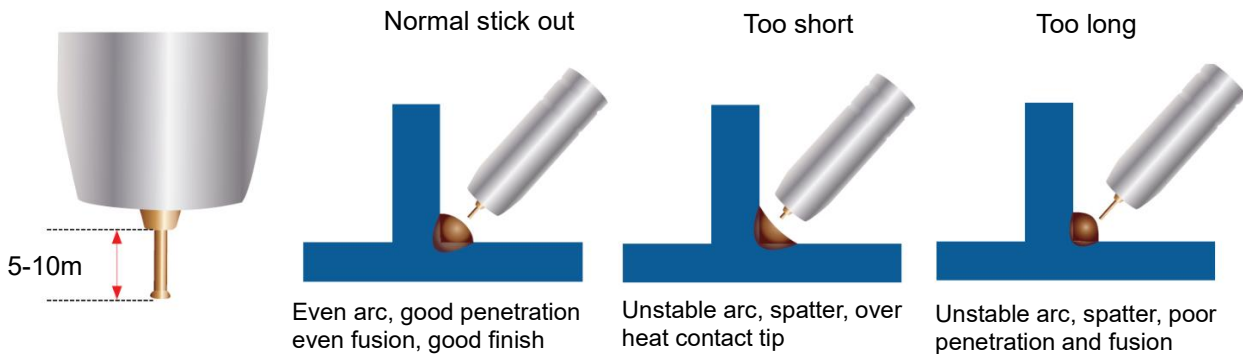
The work angle is the forward back angle of the gun relative to the work piece. The correct work angle provides good bead shape, prevents undercut, uneven penetration, poor gas shield and poor quality finished weld.



**Figure 74**

- **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 75**

## 12.2 Feeding Speed

Feeding speed refers to how quickly the gun is moved along the weld joint, measured in inches per minute. It can vary based on conditions and the welder's skill, limited by their ability to control the weld pool. The push technique allows for faster feeding speeds compared to the drag technique. Gas flow should match the feeding speed, increasing with faster feeding and decreasing with slower speed. Feeding speed should match the amperage and decreases as material thickness and amperage increase.

- **Too Fast Feeding Speed**

Too fast feeding speed results in insufficient heat per inch of travel, leading to less penetration and reduced weld fusion. The weld bead solidifies quickly, trapping gases inside and causing porosity. Undercutting of the base metal may occur, leaving an unfilled groove in the base metal.

- **Too Slow Feeding Speed**

Too slow feeding speed produces a wide weld with inadequate penetration and fusion. The arc energy remains on top of the weld pool, resulting in excessive weld metal deposition per inch and poor-quality weld deposits.

- **Correct Feeding Speed**

The correct feeding speed maintains the arc at the leading edge of the weld pool, allowing sufficient melting of the base metal for good penetration, fusion, and wetting out of the weld pool. This produces a high-quality weld deposit.

## 13. MAINTENANCE

---



### WARNING

BEWARE OF ELECTRIC SHOCK!

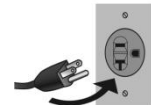


**NOTICE: To prevent serious injury, fire, and burns:**

**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.**



### 13.1 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.

## 13.2 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; Whether the fan sounds normal when the machine is running; Whether there is abnormal smell, abnormal vibration or noise when the machine is running.	If abnormal, check the interior of the machine.
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

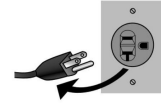
Items	Checking requirements	Remarks
Earth cable	Whether the grounding wires (including workpiece Earth wire and welding machine earth wire) break off.	If unqualified, tighten or replace the components.
Welding cable\ MIG gun	Whether the insulating layer of the cable is worn, or the conductive part of 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.

## 14. TROUBLESHOOTING



**WARNING**

**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
<b>Bead is too thick(intermittently)</b>	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
<b>Bead does not penetrate base metal.</b>	Feeding speed is inconsistent.	Decrease and maintain a constant feeding speed.
	Output heat range is too low.	Set the knob to high



<b>Wire sputters and sticks to workpiece</b>	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.
<b>Edge of weld has ragged depressions</b>	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
<b>There is no current after turning on the machine.</b>	The power cord is not well connected.	Reconnect the power cord.
	The welding machine fails.	Ask professionals to check.
<b>The fan does not work during welding.</b>	The power cord for the fan is not well connected.	Reconnect the power cord for the fan.
	Auxiliary power fails.	Ask professionals to check.
<b>The overheating indicator is on.</b>	The overheating protection circuit works.	It can be recovered after the machine cools down.
<b>There is no response when pushing the torch trigger and the alarm indicator does not illuminate.</b>	The torch trigger fails.	Repair or replace the welding torch.
<b>When the torch trigger is pushed, there is gas output, but there is no output current, and the alarm indicator does not illuminate.</b>	The earth cable is not well connected with the workpiece.	Reconnect it.
	The torch trigger fails.	Repair or replace the welding torch.
<b>There is output current when pushing the torch trigger to feed gas, but the wire feeder does not work.</b>	The wire feeder is clogged.	Unclog it.
	The wire feeder fails.	Repair it.
	The control PCB or wire feeding power PCB inside the machine fails.	Replace it.

<b>The welding current is unstable.</b>	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	<ul style="list-style-type: none"> <li>• Power is not well connected</li> <li>• Welder fails</li> </ul>	<ul style="list-style-type: none"> <li>• Reconnect power</li> <li>• Ask professional personnel for help</li> </ul>
Fan does not work during welding	<ul style="list-style-type: none"> <li>• Fan power cord is not well connected</li> <li>• Auxiliary power supply fails</li> </ul>	<ul style="list-style-type: none"> <li>• Reconnect fan power cord</li> <li>• Ask professional personnel for help</li> </ul>
Display “Err10”	<ul style="list-style-type: none"> <li>• Over-current protection for welder</li> </ul>	<ul style="list-style-type: none"> <li>• Restart the welder, if problem cannot be solved, contact maintenance personnel</li> </ul>
Display “Err14”	<ul style="list-style-type: none"> <li>• Short-circuit current protection</li> </ul>	<ul style="list-style-type: none"> <li>• Restart the welder, if problem cannot be solved, contact maintenance personnel</li> </ul>
Display “Err15”	<ul style="list-style-type: none"> <li>• Power limitation protection</li> </ul>	<ul style="list-style-type: none"> <li>• Restart the welder, if problem cannot be solved, contact maintenance personnel</li> </ul>
Display “Err60”	<ul style="list-style-type: none"> <li>• Overheat protection</li> </ul>	<ul style="list-style-type: none"> <li>• It gets to normal after cooling the welder</li> </ul>
Display “Err34”	<ul style="list-style-type: none"> <li>• 15V undervoltage protection</li> </ul>	<ul style="list-style-type: none"> <li>• 15V undervoltage protection</li> </ul>

### GMAW (MIG/MAG) failure and troubleshooting

Failure	Cause	Solution
There are no response and error code after pressing torch trigger	<ul style="list-style-type: none"> <li>• Torch is not well connected to wire feeder</li> <li>• Torch trigger fails</li> </ul>	<ul style="list-style-type: none"> <li>• Reconnect torch and wire feeder</li> <li>• Repair or replace the torch</li> </ul>
There are gas output and wire feeding after pressing torch trigger but no current output and error code	<ul style="list-style-type: none"> <li>• Ground wire is not well connected to workpiece</li> <li>• Wire feeding unit or torch fails</li> </ul>	<ul style="list-style-type: none"> <li>• Reconnect ground wire and workpiece</li> <li>• Repair the wire feeding unit or torch</li> </ul>

There are gas supply and current output but no wire feeding after pressing torch trigger	<ul style="list-style-type: none"> <li>● Wire feeding unit is stuck</li> <li>● Wire feeder fails</li> <li>● Control board in the welder fails</li> </ul>	<ul style="list-style-type: none"> <li>● Unblock the wire feeding unit</li> <li>● Repair the wire feeder</li> <li>● Ask professional personnel for help</li> </ul>
Welding current is instable	<ul style="list-style-type: none"> <li>● Unsuitable moment adjustment for wire feeder</li> <li>● Wire feed rolls do not match welding wire</li> <li>● Contact tip is worn severely</li> <li>● Wire liner of torch is worn severely</li> <li>● Welding wire is of poor quality</li> </ul>	<ul style="list-style-type: none"> <li>● Readjust moment of wire feeder</li> <li>● Select suitable wire feed rolls and welding wire</li> <li>● Replace the contact tip of torch</li> <li>● Replace the wire liner</li> <li>● Replace wire with one of better quality</li> </ul>

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:	