

USER MANUAL




MODEL: TIG220ACDCP

Preface

This manual provides a hardware description and an operational overview of the equipment. For your safety and the safety of others, please read this manual carefully.

Pay attention

Pay attention to the words following the signs below.

Sign	Description
 DANGER	The words following this sign indicate a significant potential danger. Failure to comply may result in serious accidents, damage, or even death.
 WARNING	The words following this sign indicate some potential danger. Failure to comply may result in injury or property loss.
 ATTENTION	The words following this sign indicate a potential risk. Failure to comply may result in equipment malfunction or damage.

Version

The contents of this manual are updated irregularly to reflect product updates. This manual is intended solely as an operational guide and does not constitute any additional commitments. No warranties, either express or implied, are provided regarding the descriptions, information, suggestions, or any other contents within this manual.

The images shown are for reference only. In the event of any discrepancy between the images and the actual product, the actual product shall prevail.

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1 Safety Warnings

The safety notes in this manual are provided to ensure proper use of the machine and to protect you and others from harm.

The welding machine is designed and manufactured with safety in mind. Please refer to the safety warnings in this manual to prevent accidents.

Improper operation of the equipment may cause various types of damage, as outlined below. To minimize such risks, please read this user manual carefully.

Sign	Description
	<ul style="list-style-type: none">✧ Contact with electrical components may result in severe electric shock or burns, potentially leading to fatal injuries.
	<ul style="list-style-type: none">✧ Gases and fumes can be hazardous to your health.✧ Operating in confined spaces may lead to suffocation.
	<ul style="list-style-type: none">✧ Sparks and hot workpieces after welding can cause fires.✧ Poorly connected cables may lead to fire hazards.✧ Incomplete connection of the workpiece-side circuit may result in a fire.✧ Never weld near flammable materials, as it may cause an explosion.✧ Never weld airtight containers, such as tanks or pipes, as they may rupture.
	<ul style="list-style-type: none">✧ Arc rays can cause eye inflammation or skin burns.✧ Sparks and residue may burn your eyes and skin.
	<ul style="list-style-type: none">✧ The toppling of a gas cylinder may cause bodily injury.✧ Improper use of a gas cylinder can result in a high-pressure gas eruption, leading to serious injuries.
	<ul style="list-style-type: none">✧ Keep fingers, hair, clothing, and other items away from moving parts, such as the fan.
	<ul style="list-style-type: none">✧ The wire ejected from the torch may injure the eyes, face, or other exposed body parts.
	<ul style="list-style-type: none">✧ Never stand in front of or beneath swinging equipment, as it may fail and cause injury.

**DANGER**

To prevent serious accidents, please follow the rules below:

- Never use the equipment for purposes other than welding.
- Comply with relevant regulations regarding the construction of the input power source, site selection, use of high-pressure gas, storage, configuration, handling of workpieces after welding, and disposal of waste materials.
- Restrict access to the welding area to authorized personnel only.
- Individuals with pacemakers must not approach the welding machine or area without prior approval from a doctor, as the magnetic field generated by the machine may interfere with the pacemaker.
- Ensure that installation, operation, inspection, and maintenance of the equipment are performed by qualified personnel.
- Thoroughly understand the contents of this user manual to ensure safe operation.

**DANGER**

To avoid electric shock, please follow the rules below:

- Stay away from all electrical components.
- Ensure the machine and workpiece are properly grounded by qualified personnel.
- Turn off the power supply before installation or inspection, and wait at least 5 minutes before restarting. Since the capacitor is a chargeable component, ensure it is fully discharged and has no voltage before resuming operation, even if the power is off.
- Do not use wires with insufficient cross-sectional area, damaged insulation, or exposed conductors.
- Ensure proper insulation of all wire connections.
- Never operate the device with its casing removed.
- Do not use damaged or wet insulating gloves.
- Use a safety net when working at heights.
- Regularly inspect and maintain the equipment. Do not use it until all damaged components have been repaired properly.
- Turn off the power supply when the machine is not in use.
- Follow all national or local standards and regulations when operating AC welding machines in confined or elevated areas.

**DANGER**

To avoid fire and explosions, please follow the precautions below:

- Ensure there are no combustible materials in the welding area.
- Keep flammable substances at a safe distance from the welding site.
- Store hot workpieces away from flammable gases after welding.
- Remove combustible materials from areas such as courtyards, floors, and walls before welding.
- Position the grounding wire connection of the base metal as close to the welding point as possible.
- Never weld facilities that include gas pipes or airtight containers.
- Keep a fire extinguisher near the welding area to quickly address potential fires.

**WARNING**

To protect your health from harmful gases and fumes, follow these

guidelines:

- Wear protective equipment as required by regulations.
- Use exhaust systems and breathing protection devices to prevent gas poisoning or suffocation.
- Utilize recommended local exhaust equipment and breathing protection devices to safeguard against harm or poisoning from gases and other particulates.
- To avoid oxygen deficiency, ventilate enclosed spaces filled with gases like CO₂ or argon, especially in confined areas such as tanks, boilers, or cabins.
- Undergo supervisor inspection when operating in narrow spaces. Ensure proper ventilation and wear breathing protection equipment.

- Never operate in areas used for degreasing, washing, or spraying.
- Wear breathing protection devices when welding shielded steel, as it produces toxic dust and gases.



WARNING

The arc, spark, residue and noise are harmful to health, please wear protective appliance.

- Use eye protection against arcs when welding or supervising welding operations.
- Wear safety goggles or protective spectacles.
- Welders must wear standard protective gear, including welding gloves, goggles, long-sleeved clothing, leather aprons, and other necessary protective equipment.
- Install a protective screen at the welding site to shield others from exposure to the arc.



WARNING

To prevent gas cylinders from toppling over or being damaged, please follow these precautions:

- Use gas cylinders properly and in accordance with guidelines.
- Always use the supplied or recommended gas regulator.
- Carefully read the gas regulator's manual before use, paying special attention to the safety instructions.
- Secure the gas cylinder with an appropriate holder and other related safety equipment.
- Do not expose the cylinder to high temperatures or direct sunlight.
- Keep your face away from the cylinder's outlet when opening it.
- Cover the gas cylinder with a protective cap when not in use.
- Never place the torch on the gas cylinder, and ensure that the electrode does not come into contact with the cylinder.



WARNING

The wire end can cause injury. Please observe the following precautions:

- Never look into the electrical conduction hole while checking the wire feed. The shooting wire could injure your eyes or face.
- Keep your eyes, face, and other exposed body parts away from the torch end when manually feeding the wire or pressing the switch.



WARNING

The wire end can cause injury. Please follow these precautions:

- Never look into the electrical conduction hole when checking if the wire feed is functioning properly, as the ejected wire could injure your eyes or face.
- Keep your eyes, face, and other exposed body parts away from the torch end when manually feeding the wire or pressing the switch.



ATTENTION

For improved work efficiency and proper power source maintenance, please follow these precautions:

- Take precautions to prevent the equipment from toppling over.
- Do not use the welding equipment for pipe thawing.
- When using a forklift, lift the power source from the sides to prevent tipping.
- When using a crane for lifting, secure the rope to the lifting ears at an angle no greater than $\phi 15^\circ$ from the vertical.
- If lifting a welding machine equipped with a gas cylinder and wire feeder, remove these components from the power source beforehand and ensure the machine remains level. Secure the gas cylinder with a belt or chain during transport to prevent injury.
- Ensure the wire feeder is securely fastened and properly insulated when lifting it with the swing ring for welding.



ATTENTION

Electromagnetic Interference Precautions

Attention is required to minimize electromagnetic interference.

- Extra preventive measures may be necessary when using the equipment in specific locations.
- Before installation, assess the potential electromagnetic interference in the environment, considering the following factors:
 - a) Proximity of power cables, control cables, signal cables, and telephone lines to the upper and lower parts of the welding equipment.
 - b) Wireless devices and TV broadcasting or reception equipment.
 - c) Computers and other control equipment.
 - d) Safety monitoring systems, such as industrial supervision equipment.
 - e) Health concerns for individuals nearby, such as those using pacemakers or hearing aids.
 - f) Adjustment and measurement devices.
 - g) Electromagnetic immunity of other equipment in use. Users must ensure compatibility between devices and the environment, which may require additional measures.
 - h) The practical setup of the welding operation and surrounding activities.
- To reduce radiation interference, users should adhere to the following guidelines:
 - a) Connect welding equipment properly to the power supply.
 - b) Perform regular maintenance on welding equipment.
 - c) Keep cables short, close to one another, and grounded.
 - d) Ensure all metallic welding components and nearby parts are secure and safe.
 - e) Properly ground the workpiece.
 - f) Shield or protect other cables and equipment to minimize disturbance. In certain cases, fully shielding the welding equipment may be required.
- Users are responsible for addressing any interference caused by welding activities.

2 Product

2.1 Introduction

Congratulations on your purchase!

This welding machine is a state-of-the-art rectifier incorporating the latest inverter technology. The advancement of inverter gas-shielded welding equipment stems from progress in inverter power supply theory and components. The inverter gas-shielded welding power source uses high-power IGBT components to convert the 50/60Hz frequency to 43kHz. This frequency is then stepped down, rectified, and outputted as high-power voltage via PWM technology. The significant reduction in the size and weight of the main transformer increases efficiency by 30%, marking a revolutionary milestone in the welding industry.

The **AC/DC series welding machines** are versatile two-way machines newly developed by our company. Their standout feature is the DC function, ideal for welding materials such as stainless steel, alloy steel, carbon steel, copper, and other non-ferrous metals. The AC function is designed for welding aluminum and aluminum alloys, making them perfect for applications like scooter or bicycle manufacturing.

Our AC/DC series machines utilize our exclusive **HF inverter technology**, offering numerous advantages over traditional machines, such as:

- **Compact size and lightweight design**
- **Efficient energy transfer and power savings**
- **Cost-effective pricing and strong adaptability to power grids**

These machines feature **dual inverter technology**, delivering:

- **Pure square wave output**
- **Excellent arc force**
- **A wide cleaning range**
- **Stable arcs at low currents**, ensuring superior welding performance.

Additionally, the **AC/DC series includes a pedal current adjustment device**, enabling hands-free operation. This feature offers several benefits:

- **Easily adjust current by foot**
- **Quickly increase current at the start of welding or when adding wire**
- **Reduce current at the end of welding for precise line shaping**

The pedal device enhances welding efficiency, reduces operational difficulty, and ensures high-quality results.

We sincerely thank you for choosing our product and welcome your valuable feedback. We remain committed to producing top-notch equipment and delivering exceptional service.

2.2 Technical data

model parameters	TIG220ACDCP			
Power voltage (V)	Single Phase 120/240±10%			
Frequency (HZ)	50/60			
Rated input current (A)	TIG	32.7	TIG	34
	MMA	39.8	MMA	35
Rated output voltage (V)	TIG	15.6	TIG	18
	MMA	24.8	MMA	26.4
Rated output current (A)	TIG	140	TIG	220
	MMA	120	MMA	180
No-load voltage(V)	68			
Arcing way	HF/LF			
Pre-flow (S)	0.1-3			
Current descending time (S)	0-25			
Post flow time (S)	1-15			
Duty cycle (%)	25			
No-load loss(W)	40			
Efficiency(%)	71			
Power factor	0.73			
Insulation grade	F			
Housing protection grade	IP21S			
Weight(kg)	9.2			
Dimensions (mm)	420×195×345			

3 Installation

The welding machine is equipped with a power voltage compensation device. It can operate normally when the power voltage fluctuates within $\pm 10\%$ of the rated voltage.

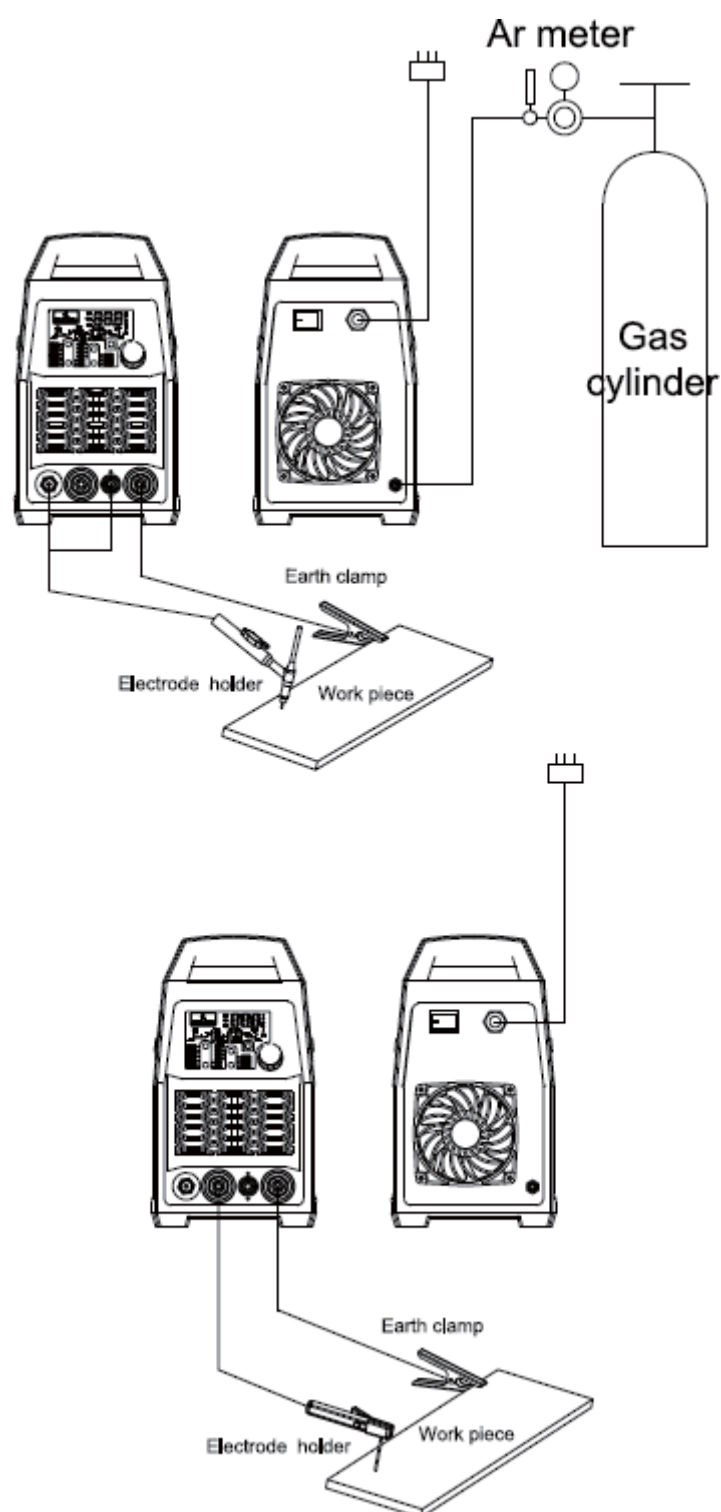
If a longer cable is required, use a cable with a larger cross-sectional area to reduce voltage loss. Excessively long cables may adversely affect the machine's performance, such as reduced arc-starting efficiency or irregular system operation. We recommend using cables of the specified length for optimal performance.

Installation Steps:

1. **Ensure proper ventilation:**
 - Keep the vents of the welder unobstructed to avoid cooling system failure.
2. **Connect the protective gas source:**
 - The gas supply setup should include a gas cylinder, an argon decompression flowmeter, and a gas pipe.
 - Secure the gas pipe connections with hose clamps or similar devices to prevent leaks or air intake.
3. **Ground the machine:**
 - The welder's casing must be reliably grounded using a conductive wire with a cross-sectional area of at least 6mm².
4. **Connect the loop cable:**
 - Insert the quick plug of the loop cable into the quick socket on the welder's front panel, ensuring correct polarity (“+”), and tighten it clockwise.
 - Attach the ground clamp at the other end to the workpiece.
5. **Connect the pedal switch (if applicable):**
 - Attach the 2-core aviation plug and 3-core aviation plug of the pedal switch to their respective sockets on the machine.
6. **Connect the power supply:**
 - Match the input voltage class of the welder with the corresponding voltage class in the distribution box.
 - Avoid incorrect voltage connections. Ensure that the input voltage error is within the allowable range.
7. **Connect the welding torch:**
 - Properly connect the copper nut at the other end of the welder to the gas-electric integration fitting on the front panel. Tighten it firmly in a clockwise direction.

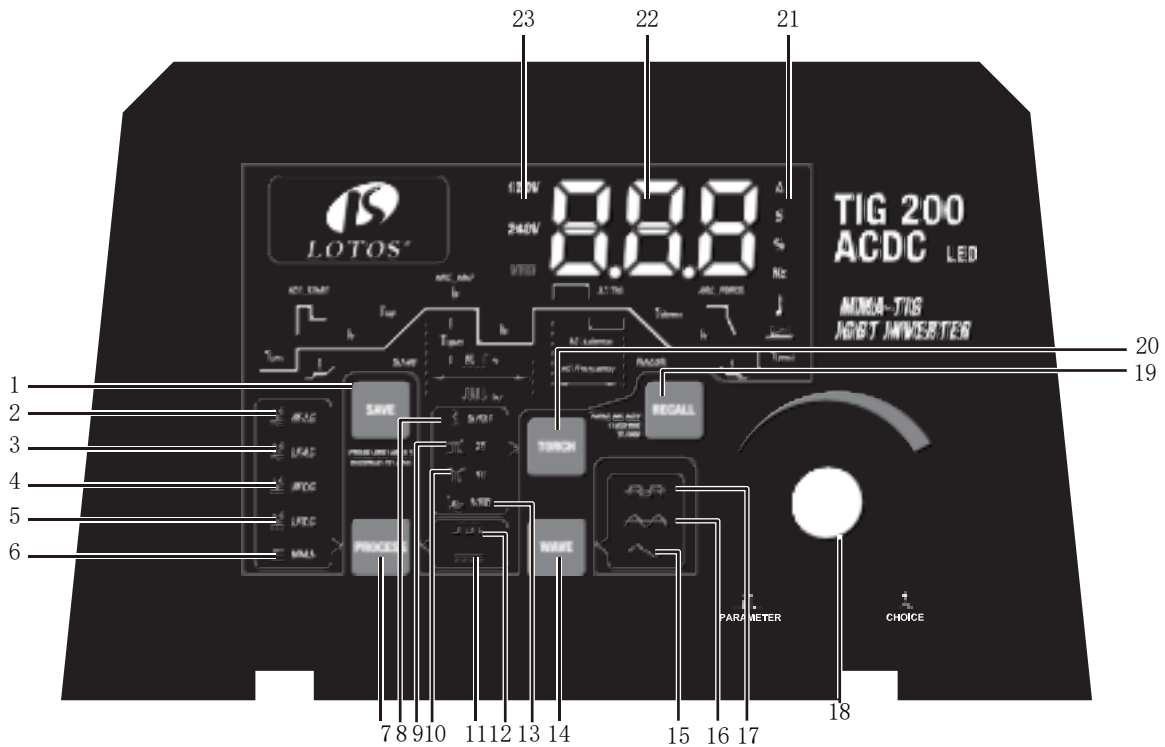
After completing the steps above, the installation of the welding machine is complete, and the machine is ready for operation.

- **Installation diagram**



4 Operation

4.1 Panel Layout

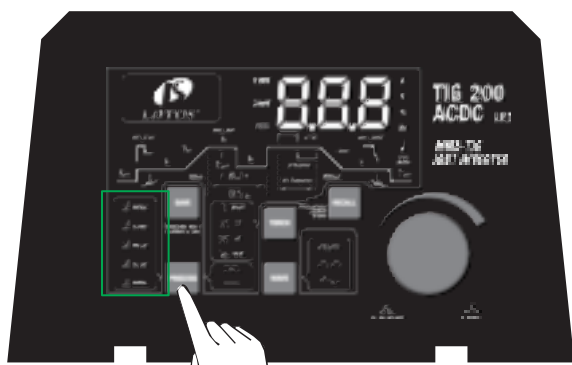


No.	Label/Function	No.	Label/Function
1	Save Button	13	VRD Indication
2	High-Frequency AC Indication	14	Wave Selector Button
3	Lift AC Indication	15	Triangle Wave Indication
4	High-Frequency DC Indication	16	Single Wave Indication
5	Lift DC Indication	17	Square Wave Indication
6	MMA Indication	18	Encoder (press and rotate to adjust parameters)
7	Mode Selector Button	19	Load Button
8	Spot Indication	20	SPOT/2T/4T Mode Selector Button
9	2T Mode Indication	21	Unit Parameter Indication
10	4T Mode Indication	22	Digital Display Meter
11	No Pulse Indication	23	Input Voltage and VRD Function Display
12	Pulse Indication		

4.2 Operation interface specification

The following images help indicate the machine setup process

- **MMA MODE**



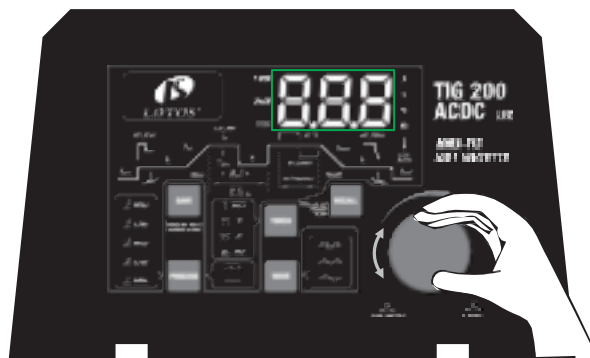
Step 1: Press the **PROCESS** button to select the **MMA Mode**.



Step 2: Rotate the **parameter knob** to adjust the **welding current** to the desired level.



Step 3: Press the **parameter knob** to select the **Hot-Start mode***.



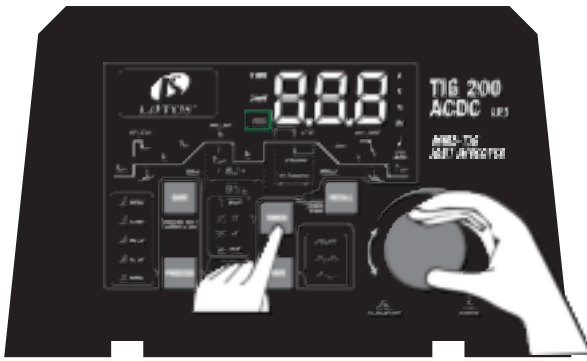
Step 4: Rotate the **parameter knob** to adjust the **Hot-Start current**.



Step 5: Press the **parameter knob** to select the **ARC-Force mode***.



Step 6: Rotate the **parameter knob** to adjust the **ARC-Force current**.



Step 7: Hold the **TORCH** button for 3 seconds to enter the **VRD mode***. Turn the parameter knob to toggle **VRD On/Off**.

***Hot-Start Mode**

Hot-Start mode temporarily increases the welding current at the beginning of the welding process. This feature ensures easier arc ignition, prevents sticking of the electrode to the workpiece, and enhances the start quality of the weld.

***Arc-Force Mode**

Arc-Force mode automatically increases the welding current when the arc length decreases. This function prevents the electrode from sticking to the workpiece and ensures better control and stability of the welding arc, especially during short arc welding.

***VRD Mode**

Voltage Reduction Device (VRD) mode reduces the open-circuit voltage of the welding machine when not in operation, improving safety by minimizing the risk of electric shock. This feature is especially important in environments with high safety standards or when welding in damp or confined spaces.

• TIG MODE

HFDC: High-Frequency Arc Start DC TIG Mode

- In HFDC mode, the arc is initiated using high-frequency (HF) ignition, allowing for a non-contact start.
- Used for Direct Current (DC) TIG welding, suitable for materials like stainless steel, carbon steel, and copper.
- Benefits: Cleaner starts, reduced contamination, and precise control.

LFDC: Lift Arc Start DC TIG Mode

- In LFDC mode, the arc is initiated by touching the tungsten electrode to the workpiece and lifting it away.
- Also used for DC TIG welding, often in environments sensitive to electromagnetic interference.
- Benefits: Safe arc starting without HF, suitable for electronic-sensitive applications.

HFAC: High-Frequency Arc Start AC TIG Mode

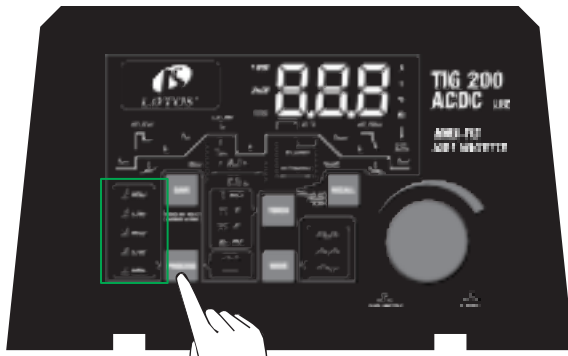
- In HFAC mode, high-frequency ignition is used for Alternating Current (AC) TIG welding.
- Ideal for materials like aluminum and aluminum alloys, requiring oxide cleaning during welding.
- Benefits: Non-contact starts and a stable arc for high-quality welds.

LFAC: Lift Arc Start AC TIG Mode

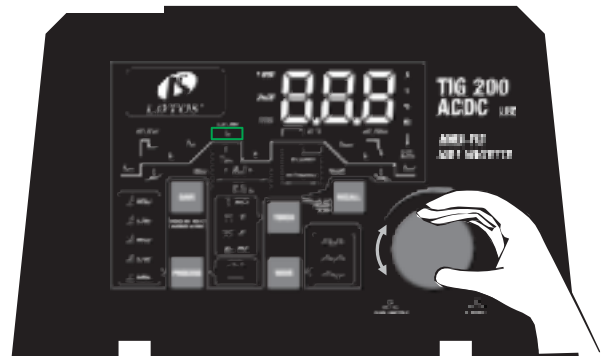
- In LFAC mode, the arc is initiated by lifting the electrode in AC TIG welding applications.
- Used for materials like aluminum where high-frequency starts are not suitable or permitted.
- Benefits: HF-free ignition with good arc control for sensitive environments.

Each mode is designed to cater to specific material types, welding applications, and operational environments.

Welding Mode & Welding Current Settings: Step 1 to 2



Step 1: Press the **PROCESS** button to select the appropriate mode (**HFDC**, **LFDC**, **HFAC**, or **LFAC**) based on your project requirements.



Step 2: Rotate the **parameter knob** to adjust the **welding current** to the desired level.
 120V: 10 - 140A
 240V: 10 - 220A

Down-Slope & End AMP Settings: Step 3 to 8



Step 3: Press the **parameter knob** to select the **Down-Slope** function.

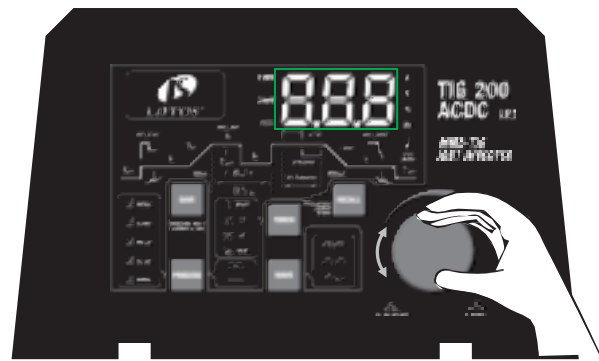


Step 4: Rotate the **parameter knob** to adjust the **Down-Slope time (0-25S)**.

The **Down-Slope** function controls the gradual reduction of welding current at the end of the welding process. This feature helps to prevent crater formation, improve weld quality, and reduce the risk of cracking at the end of the weld. By adjusting the down-slope time, the welder can ensure a smooth transition as the arc fades out.



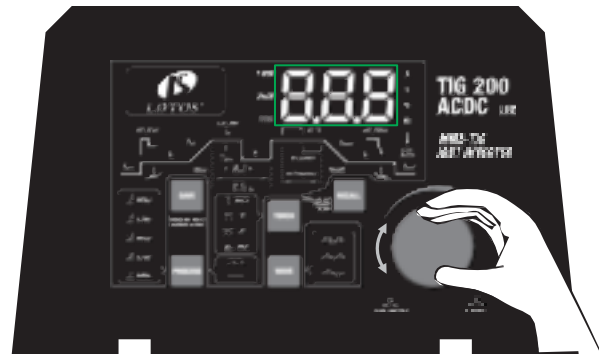
Step 5: Press the **parameter knob** to select the **End Amps** function.



Step 6: Rotate the **parameter knob** to adjust the **End Amps**.



Step 7: Press the **parameter knob** to select the **End Amps Time** function.



Step 8: Rotate the **parameter knob** to adjust the **End Amps Time**.

The **End Amps** function allows the welder to set the final welding current at the end of the welding process. This feature ensures a controlled and gradual cooling of the weld puddle, preventing defects such as craters or cracks. Adjusting the end amps is particularly useful for achieving high-quality weld finishes and maintaining weld integrity.

Post Flow & Pre-Flow Settings: Step 9 to 12



Step 9: Press the **parameter knob** to select the **Post-Flow** function.



Step 10: Rotate the **parameter knob** to adjust the **Post-Flow time.(0-10S)**

The **Post-Flow** function controls the duration of shielding gas flow after the welding arc has been extinguished. This feature helps protect the molten weld pool and the tungsten electrode from oxidation as they cool. Adjusting the post-flow time ensures optimal shielding, leading to improved weld quality and electrode longevity.



Step 11: Press the **parameter knob** to select the **Pre-Flow** function.



Step 12: Rotate the **parameter knob** to adjust the **Pre-Flow time.(0.1-3.0S)**

The **Pre-Flow time** sets the duration of shielding gas flow before the welding arc is initiated. This ensures that the weld area is adequately shielded from atmospheric contamination before the arc starts, resulting in a cleaner and higher-quality weld. Adjusting the pre-flow time helps optimize the gas coverage for different welding conditions and materials.

Start AMPs & Up-Slope Settings: Step 13 to 18



Step 13: Press the **parameter knob** to select the **Start Amps Time** function.



Step 14: Rotate the **parameter knob** to adjust the **Start Amps Time.(0-10S)**

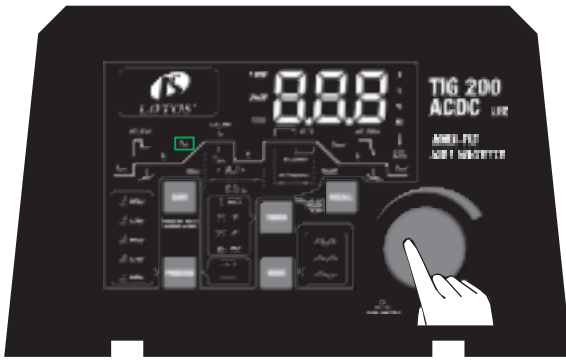


Step 15: Press the **parameter knob** to select the **Start Amps** function.

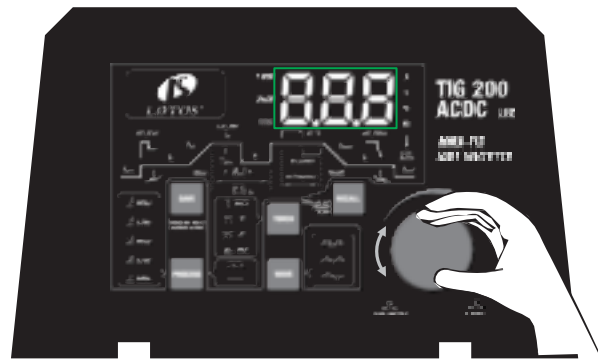


Step 16: Rotate the **parameter knob** to adjust the **Start Amps**.

The **Start Amps Time** function controls the duration for which the start current is maintained at the beginning of the welding process. This feature ensures a smooth arc initiation and stable weld pool formation, reducing the risk of defects at the weld start. Adjusting the Start Amps Time allows for better control over the welding process, especially for thin or heat-sensitive materials.



Step 17: Press the **parameter knob** to select the **Up-Slope** function.



Step 18: Rotate the **parameter knob** to adjust the **Up-Slope time**.(0-15S)

The **Up-Slope** function controls the gradual increase of welding current at the start of the welding process. This feature prevents sudden heat input, allowing the welder to establish a stable arc and avoid damage to the workpiece or electrode. Adjusting the up-slope time ensures a smoother transition to the full welding current, enhancing weld quality and precision.

Torch Mode 2T/4T/SPOT Settings: Step 19 to 20



Step 19: Press the **TORCH** button to select the **2T/4T/SPOT** function.



Step 20: In **SPOT** mode, press the **parameter knob** to select the **SPOT** function, then rotate the knob to adjust the **SPOT** time.

2T Mode (Two-Touch Mode):

In **2T mode**, the welding machine operates as long as the torch button is pressed. Releasing the button stops the welding process. This mode is suitable for short, simple welds or when precise control is not required.

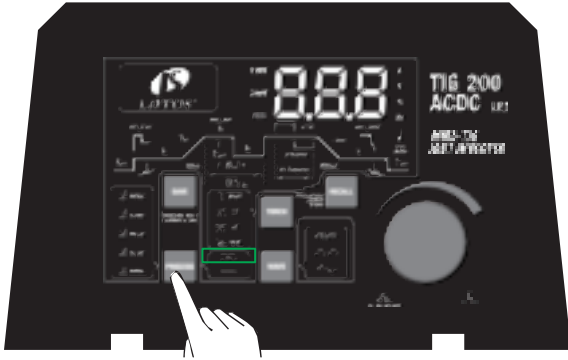
4T Mode (Four-Touch Mode):

In **4T mode**, pressing and releasing the torch button starts the welding process. To stop welding, press and release the button again. This mode reduces hand fatigue during long welds and is ideal for extended or intricate welding operations.

SPOT Mode:

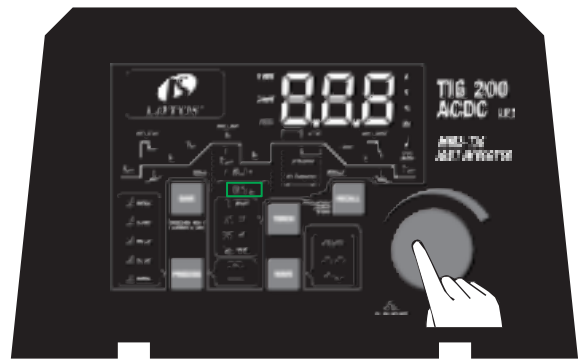
In **SPOT mode**, the welding machine operates for a preset time after the torch button is pressed. This mode is useful for creating consistent spot welds and is often used in applications like tacking or joining thin sheets. The **SPOT time** can be adjusted to suit the specific welding requirements.

Pulse Settings: Step 21 to 27

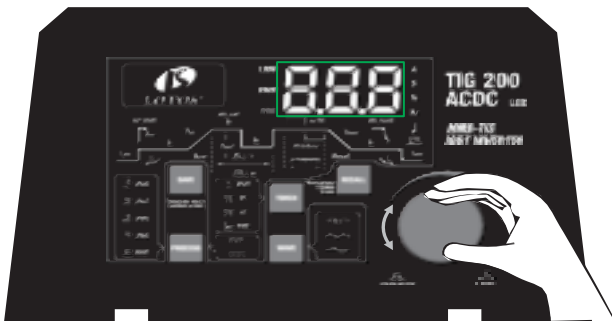


Step 21: Hold down the **PROCESS** button for 2 seconds to select the **Pulse** function.

- When the **top square wave icon** is lit, it indicates that the **Pulse** function is **ON**.
- When the **flat bottom icon** is lit, it indicates that the **Pulse** function is **OFF**.



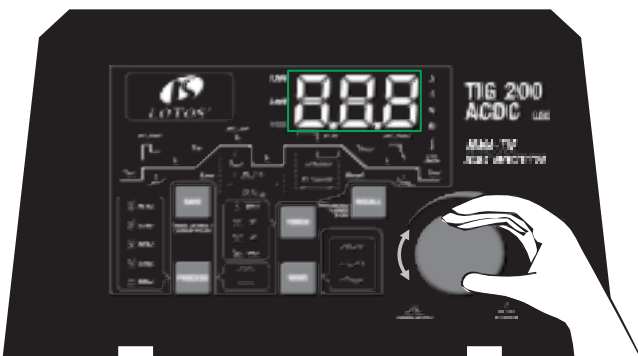
Step 22: Press the **parameter knob** to select the **Pulse Frequency** function.



Step 23: Rotate the **parameter knob** to adjust the **Pulse Frequency**. (AC: 0.5-20Hz DC: 0.5-200HZ)



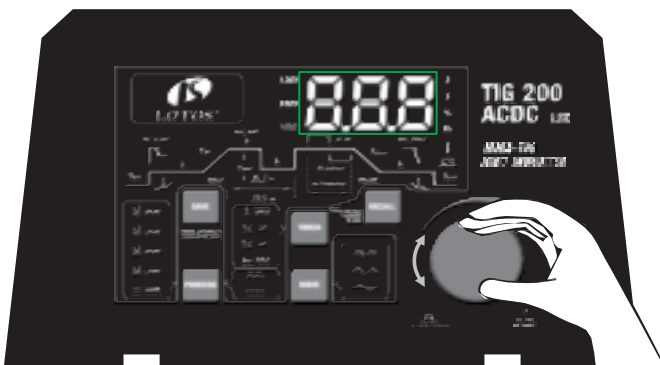
Step 24: Press the **parameter knob** to select the **Peak On-Time** function.



Step 25: Rotate the **parameter knob** to adjust the **Peak On-Time**. (10%-90%)



Step 26: Press the **parameter knob** to select the **Base Amps** function.



Step 27: Rotate the **parameter knob** to adjust the **Base Amps Percentage**. (5%-95%)

The **Base Amps** is calculated using the welding current (set in **Step 2**) multiplied by the **Base Amps Percentage**.

For example:

- If the welding current set in **Step 2** is **200 Amps**, and the **Base Amps Percentage** is set to **80%**,
- Then the **Base Amps** will be:
 $200 \text{ Amps} \times 80\% = 160 \text{ Amps}$.

The **Pulse function** alternates the welding current between a high (peak) current and a low (base) current during the welding process. This provides greater control over heat input, making it ideal for welding thin materials or heat-sensitive metals.

Benefits of the Pulse Function:

- **Reduced Heat Input:** Minimizes the risk of warping or overheating the material.
- **Improved Penetration:** Ensures consistent weld penetration with better arc stability.
- **Enhanced Weld Appearance:** Produces a clean and uniform weld bead.
- **Control over Weld Pool:** Allows better management of the weld pool size and shape.

The **Pulse function** is especially useful for TIG welding applications where precision and weld quality are critical.

Pulse Frequency refers to the number of pulse cycles (high and low current transitions) that occur per second during pulsed welding. It is measured in Hertz (Hz). Adjusting the **Pulse Frequency** allows the welder to control the heat input, penetration, and weld bead appearance. A higher frequency results in a smoother arc and finer control, while a lower frequency is better suited for thicker materials or when a distinct pulsed appearance is desired.

The **Peak On-Time function** controls the proportion of time the welding current stays at the peak (high) level during each pulse cycle. It is expressed as a percentage of the total pulse cycle duration.

Key Effects of Adjusting Peak On-Time:

Higher Peak On-Time (%):

- Increases heat input.
- Produces deeper penetration and a wider weld bead.
- Useful for thicker materials requiring more energy.

Lower Peak On-Time (%):

- Reduces heat input.
- Helps prevent warping or overheating of thin or delicate materials.
- Produces a smaller, narrower weld bead.

By optimizing the **Peak On-Time**, welders can fine-tune the balance between penetration, heat input, and weld bead appearance for specific applications.

Base Amps

The **Base Amps** is the lower current level maintained during the low phase of a pulse welding cycle. It is a percentage of the welding current (peak current) set earlier. The Base Amps helps control the heat input to the weld, ensuring stable arc performance and weld quality, especially for heat-sensitive materials.

Key Benefits of Base Amps:

1. **Heat Control:** Reduces heat input during the low phase of the pulse, minimizing distortion and overheating of the workpiece.
2. **Arc Stability:** Maintains the arc between pulses, ensuring smooth and continuous welding.
3. **Weld Appearance:** Helps achieve a clean and uniform weld bead.

Formula for Base Amps Calculation:

Base Amps = Welding Current × Base Amps Percentage

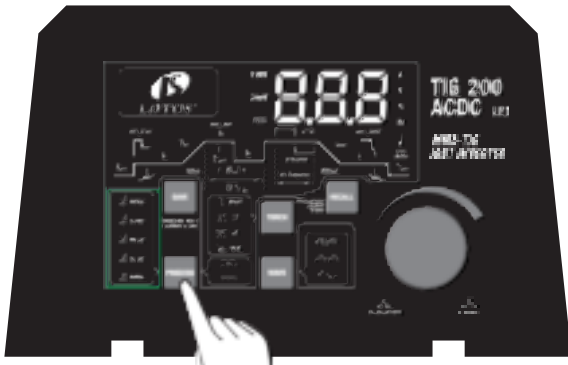
Example:

- If the welding current is **200 Amps** and the Base Amps Percentage is **80%**,
The **Base Amps = 200 Amps × 80% = 160 Amps**.

Adjusting the Base Amps Percentage allows precise control over the welding process, improving the overall weld quality.

AC Frequency, Balance & Wave Settings: Step 28 to 33

Steps 28 to 33 are applicable only in HFAC or LFAC Mode.



Step 28: If the welder is not in **HFAC** or **LFAC** Mode, press the **PROCESS** button to select the **HFAC** or **LFAC** Mode.



Step 29: Press the **parameter knob** to select the **AC Frequency** function.



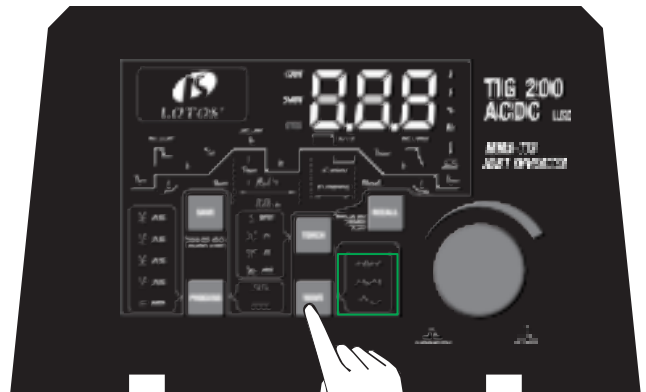
Step 30: Rotate the **parameter knob** to adjust the **AC Frequency**. (20HZ-300HZ)



Step 31: Press the **parameter knob** to select the **AC Balance** function.



Step 32: Rotate the **parameter knob** to adjust the **AC Balance**. (20%-80%)



Step 33: Press the **WAVE** button to select the output waveform (**Square**, **Single**, or **Triangle**).

AC Frequency

AC Frequency refers to the number of times per second that the welding current alternates between positive and negative polarity during AC welding. It is measured in Hertz (Hz).

- **Higher AC Frequency:**
 - Provides a tighter arc, improved arc stability, and better control over the weld puddle.
 - Ideal for precision work or welding thin materials.
 - **Lower AC Frequency:**
 - Produces a broader arc, better for wider weld beads and heavier materials.
-

AC Balance

AC Balance determines the proportion of time the welding current spends in the positive and negative polarity during each AC cycle.

- **Positive Polarity (Cleaning Action):** Removes the oxide layer on the surface of metals like aluminum.
- **Negative Polarity (Penetration):** Provides deeper penetration into the base material.

By adjusting **AC Balance**, welders can optimize the cleaning action and penetration to suit different materials and welding conditions.

Square Wave

The **Square Wave** has a sharp transition between positive and negative polarity, creating a stable arc and strong cleaning action.

- Suitable for high-frequency welding.
 - Provides consistent arc performance and high efficiency.
-

Single Wave

The **Single Wave** is less abrupt, with a smoother transition between polarities.

- Offers reduced arc noise.
 - Suitable for applications requiring moderate cleaning action and penetration.
-

Triangle Wave

The **Triangle Wave** has a gradual rise and fall between positive and negative polarity.

- Produces less heat, making it ideal for thin or heat-sensitive materials.
- Provides lower cleaning action and penetration compared to square waves.

Each waveform is selected based on the welding material and desired weld characteristics.

Save & Recall Settings: Step 34 to 37

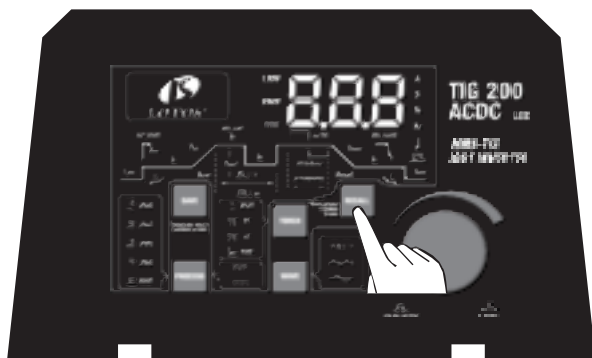
The welder can save up to 10 settings, allowing users to store and quickly recall preferred configurations for different welding tasks.



Step 34: Hold the **SAVE** button for 3 seconds to enter the **SAVE** mode.



Step 35: Rotate the **parameter knob** to select a number, then wait for 3 seconds to **SAVE** the



Step 36: Hold the **RECALL** button for 3 seconds to enter the **RECALL** mode.



Step 4: Rotate the **parameter knob** to select the desired serial number, then wait for 3 seconds to **Recall** the saved settings.

Fault Display:

1. Overheating Fault Code

- If the panel displays **E02**, the welder cannot operate.
- Action: Allow the welder to cool down for 3-5 minutes with the fan running.

2. Wiring Fault Code

- If the panel displays **E04**, the welder cannot operate.
- Action: Check and reconnect all wiring connections properly.

5 INSTRUCTION NOTES

5.1 Operation Environment

- 1) Welding operations should be performed in a relatively dry environment, with air humidity not exceeding **90%**.
- 2) The ambient temperature should be maintained between **14°F to 104°F** or **-10°C and 40°C**.
- 3) Avoid welding in direct sunlight or rain, and ensure that water or rainwater does not seep into the interior of the welder.
- 4) Do not weld in dusty areas or environments with corrosive gases.
- 5) Avoid gas-shielded welding operations in environments with strong airflow, as it may compromise the protective gas shield.

5.2 SAFTY

The welder is equipped with over-voltage, over-current, and overheat protection circuits. When grid voltage, output current, or machine temperature exceeds the set standards, the machine will automatically shut down to prevent damage. However, excessive use, such as operation under extreme voltage conditions, may still cause welder breakdown. Please observe the following safety guidelines to ensure proper operation and longevity of the welder:

1) Ensure Good Ventilation

- This is a compact welder, and high currents generate significant heat during operation. A fan is included to provide effective cooling, but proper ventilation is essential.
 - Ensure the vents are not blocked or covered. Maintain a distance of at least **0.3 meters** between the welder and nearby objects.
 - Consistent airflow is critical for smooth operation and extended service life of the machine.
-

2) Avoid Overloading

- Always adhere to the maximum permissible load current (as specified for the selected load duration factor).
 - Never exceed the maximum allowable welding current.
 - Overloading can significantly shorten the welder's service life or even cause irreparable damage.
-

3) Prevent Over-Voltage

- Refer to the **main performance parameter table** for the permissible power voltage range.
 - The welder's built-in voltage auto-compensation circuit ensures welding current stays within acceptable limits. However, if the power voltage surpasses the permissible range, the welder may fail.
 - Operators must monitor power voltage and take preventive measures to avoid over-voltage conditions.
-

4) Ground the Welder Properly

- Each welder has a grounding screw at the back, marked with a grounding symbol.
 - Before operation, ensure the welder's casing is securely grounded using a cable with a cross-sectional area of **at least 6mm²**.
 - Proper grounding releases static electricity and prevents accidents caused by electrical leakage.
-

5) Manage Overheating Protection

- If the welder operates beyond the standard load duration factor, it may enter a protective state and stop functioning. This indicates that the load duration factor has been exceeded.
- Excessive heat will activate the temperature control switch, causing the machine to stop

operation.

- Do **not turn off the power**. Allow the cooling fan to continue running to lower the machine's temperature.
- Once the temperature returns to a safe range, the welder will automatically resume normal operation.

By following these safety measures, operators can ensure the safe and efficient use of the welder while extending its service life.

6 MAINTENANCE AND TROUBLESHOOTING

6.1 MAINTENANCE

1. Regular Cleaning:

- Remove dust regularly using dry, clean compressed air.
- In heavily polluted environments with dense smoke and polluted air, clean the welder monthly.

2. Compressed Air Pressure:

- Ensure the pressure of compressed air is moderate to avoid damaging delicate components inside the welder.

3. Electric Circuit Inspection:

- Regularly check all electrical connections to ensure proper connectivity and secure joints (especially plug-in joints or elements).
- If rusting or loosening is detected, clean the rust or oxidation layer with abrasive paper, reconnect, and tighten firmly.

4. Water and Moisture Prevention:

- Prevent water or steam from entering the welder.
- If water ingress occurs, dry the welder and measure insulation using a megohm-meter (test connections and between connections and the shell). Resume welding only when no abnormalities are detected.

5. Long-Term Storage:

- If the welder will not be used for an extended period, repackage it in its original packaging and store it in a dry environment.

6.2 FAULT INSPECTION

Common Issues and Solutions

1. Black Welding Spot:

- Indicates oxidation due to insufficient gas protection. Inspect the following:
 - i. **Argon Cylinder:**
 1. Ensure the argon cylinder valve is open and the pressure is sufficient. Refill if pressure is below **0.5 MPa**.
 - ii. **Argon Flow-Meter:**
 1. Verify sufficient argon flow.
 2. Minimum flow: **3L/min**, regardless of current strength.
 - iii. **Gas Delivery:**
 1. Check the nozzle of the welding torch to confirm no blockage in the gas passage.
 - iv. **Gas Quality:**
 1. Ensure gas passage seals are intact, and argon purity is adequate.
 - v. **Environmental Factors:**
 1. Avoid strong airflow that could compromise weld quality.

2. Arc Starting Problems:

- If the arc fails to start or remains unstable:
 1. Ensure the tungsten electrode is of good quality.
 2. Sharpen the tungsten electrode for proper arc discharge.
-

3. Output Current Issues:

- When output current does not match the set value, check for:
 1. **Voltage Fluctuations:**
 - Variations in grid voltage may reduce the maximum output current.
 2. **Grid Interference:**
 - External power grid interference or nearby power equipment may impact performance.
-

4. Tungsten Overheating:

- If tungsten overheats due to excessive heat emission:
 1. Check if the welding gear is correctly selected.
 2. Verify the duty cycle setting is appropriate (avoid excessively long or short settings).
 3. Inspect the secondary inverter for potential damage to field pipes.
-

5. Abnormal Operation Indicator:

- If the indicator light turns on during abnormal operation:
 1. Turn off the power switch and reboot the machine. If normal operation resumes, continue use.
 2. If the issue persists, consult a professional technician or the manufacturer for repair.
-

By following these maintenance and troubleshooting guidelines, you can ensure the welder operates safely and efficiently.