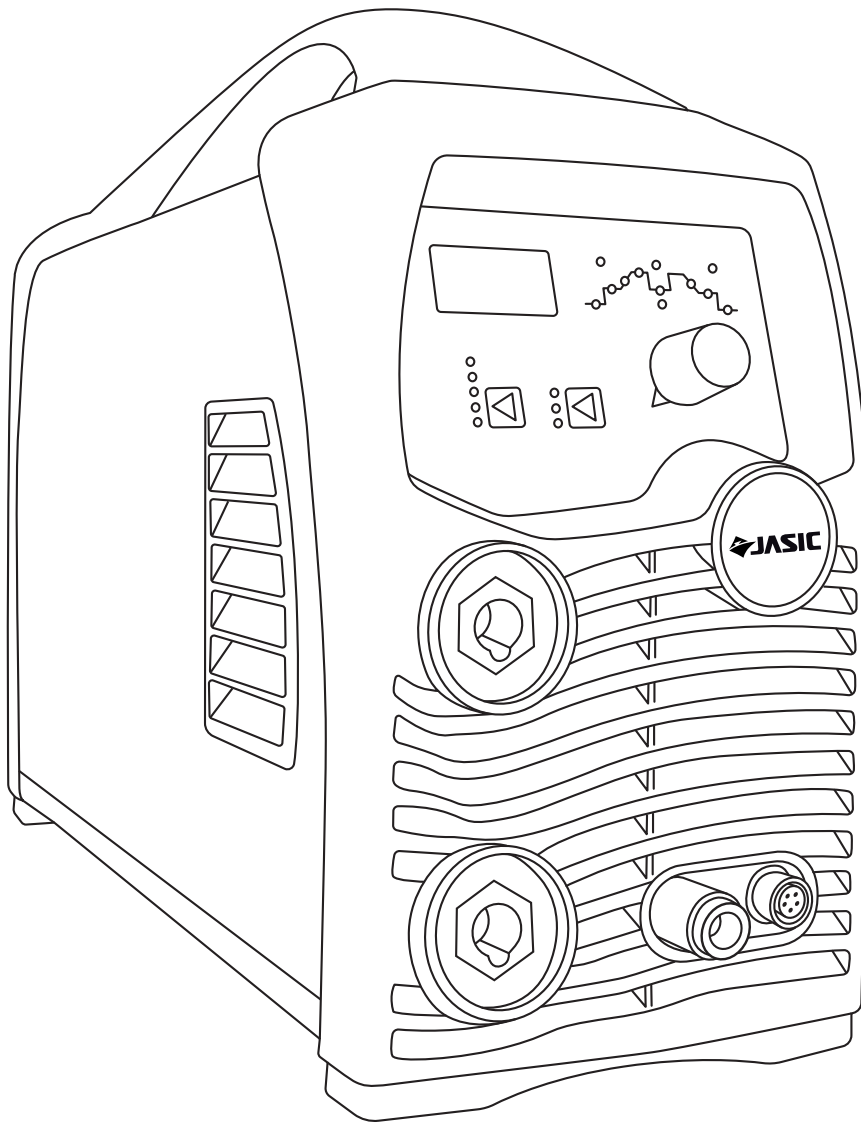


TIG Series

| TIG 200 Pulse AC/DC Mini Digital (JT-200DS) |



Operator Manual

Your new product

Thank you for selecting this Jasic Technology, Wilkinson Star product.

This product manual has been designed to ensure that you get the most from your new product. Please ensure that you are fully conversant with the information provided paying particular attention to the safety precautions. The information will help protect yourself and others against the potential hazards that you may come across.

Please ensure that you carry out daily and periodic maintenance checks to ensure years of reliable and trouble free operation.

Wilkinson Star Limited are a leading supplier of equipment in the UK and our products are supported by our extensive service network. Call your distributor in the unlikely event of a problem occurring. Please record below the details from your product as these will be required for warranty purposes and to ensure you get the correct information should you require assistance or spare parts.

Date purchased _____

From where _____

Serial Number _____

(The serial number will normally be located on the equipment data plate on the underside of the machine or on the rear panel)

SAFETY

These general safety norms cover both arc welding machines and plasma cutting machines unless otherwise noted.

The equipment must only be used for the purpose it was designed for. Using it in any other way could result in damage or injury and in breach of the safety rules.

Only suitably trained and competent persons should use the equipment. Operators should respect the safety of other persons.

PREVENTION AGAINST ELECTRIC SHOCK

The equipment should be installed by a qualified person and in accordance with current standards in operation. It is the users responsibility to ensure that the equipment is connected to a suitable power supply. Consult with your utility supplier if required

If earth grounding of the work piece is required, ground it directly with a separate cable.

Do not use the equipment with the covers removed.

Do not touch live electrical parts or parts which are electrically charged.

Turn off all equipment when not in use.

Cables (both primary supply and welding) should be regularly checked for damage and overheating. Do not use worn, damaged, under sized, or poorly jointed cables.

Ensure that you wear the correct protective clothing, gloves, head and eye protection.

Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work ground.

Never touch the electrode if you are in contact with the work ground, or another electrode from a different machine.

Do not wrap cables over your body.

Ensure that you take additional safety precautions when you are welding in electrically hazardous conditions such as damp environments, wearing wet clothing, and metal structures. Try to avoid welding in cramped or restricted positions.

Ensure that the equipment is well maintained. Repair or replace damaged or defective parts immediately. Carry out any regular maintenance in accordance with the manufacturers instructions.

SAFETY AGAINST FUMES AND WELDING GASES

Locate the equipment in a well-ventilated position.

Keep your head out of the fumes. Do not breathe the fumes.

Ensure the welding zone is in a well-ventilated area. If this is not possible provision should be made for suitable fume

extraction.

If ventilation is poor, wear an approved respirator.

Read and understand the Material Safety Data Sheets (MSDS's) and the manufacturer's instructions for metals, consumable, coatings, cleaners, and de-greasers.

Do not weld in locations near any de-greasing, cleaning, or spraying operations. Be aware that heat and rays of the arc can react with vapours to form highly toxic and irritating gases.

Do not weld on coated metals, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings on many metals can give off toxic fumes if welded.

PREVENTION AGAINST BURNS AND RADIATION

Arc rays from the welding process produce intense, visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin.

Wear an approved welding helmet fitted with a proper shade of filter lens to protect your face and eyes when welding or watching

Wear approved safety glasses with side shields under your helmet.

Never use broken or faulty welding helmets.

Always ensure there are adequate protective screens or barriers to protect others from flash, glare and sparks from the welding area. Ensure that there are adequate warnings that welding or cutting is taking place.

Wear suitable protective flame resistant clothing.

The sparks and spatter from welding, hot work pieces, and hot equipment can cause fires and burns

Welding on closed containers, such as tanks, drums, or pipes, can cause them to explode.

Accidental contact of electrode to metal objects can cause arcs, explosion, overheating, or fire.

Check and be sure the area is safe and clear of inflammable material before carrying out any welding.

PROTECTION AGAINST NOISE

Some welding and cutting operations may produce noise.

Wear safety ear protection to protect your hearing.

PROTECTION FROM MOVING PARTS

When the machine is in operation keep away from moving parts such as motors and fans. Moving parts, such as the fan, may cut fingers and hands and snag garments.

Protections and coverings may be removed for maintenance and controls only by qualified personnel, after first

disconnecting the power supply cable.

Replace the coverings and protections and close all doors when the intervention is finished, and before starting the equipment.

Take care to avoid getting fingers trapped when loading and feeding wire during set up and operation.

When feeding wire be careful to avoid pointing it at other people or toward your body.

Always ensure machine covers and protective devices are in operation.

PRECAUTIONS AGAINST FIRE AND EXPLOSION

Avoid causing fires due to sparks and hot waste or molten metal

Ensure that appropriate fire safety devices are available near the cutting / welding area.

Remove all flammable and combustible materials from the cutting / welding zone and surrounding areas

Do not cut/weld fuel and lubricant containers, even if empty. These must be carefully cleaned before they can be cut/welded.

Always allow the cut/welded material to cool before touching it or placing it in contact with combustible or flammable material.

Do not work in atmospheres with high concentrations of combustible fumes, flammable gases and dust.

Always check the work area half an hour after cutting to make sure that no fires have begun.

RISKS DUE TO MAGNETIC FIELDS

The magnetic fields created by high currents may affect the operation of pacemakers or electronically controlled medical equipment.

Wearers of vital electronic equipment should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

Do not go near welding equipment with any sensitive electronic equipment as the magnetic fields may cause damage.

RF DECLARATION

Equipment that complies with directive 2004/108/EC concerning electromagnetic compatibility (EMC) and the technical requirements of EN60974-10 is designed for use in industrial buildings and not those for domestic use where electricity is provided via the low voltage public distribution system. Difficulties may arise in assuring class A electromagnetic compatibility for systems installed in domestic locations due to conducted and radiated emissions.

In the case of electromagnetic problems, it is the responsibility of the user to resolve the situation. It may be necessary to

shield the equipment and fit suitable filters on the mains supply.

LF DECLARATION

Consult the data plate on the equipment for the power supply requirements.

Due to the elevated absorbance of the primary current from the power supply network, high power systems affect the quality of power provided by the network. Consequently, connection restrictions or maximum impedance requirements permitted by the network at the public network connection point must be applied to these systems.

In this case the installer or the user is responsible for ensuring the equipment can be connected, consulting the electricity provider if necessary.

MATERIALS AND THEIR DISPOSAL

The equipment is manufactured with materials, which do not contain any toxic or poisonous materials dangerous to the operator.

When the equipment is scrapped, it should be dismantled separating components according to the type of materials.

Do not dispose of the equipment with normal waste. The European Directive 2002/96/EC on Waste Electrical and Electronic Equipment states the electrical equipment that has reached its end of life must be collected separately and returned to an environmentally compatible recycling facility.

HANDLING OF COMPRESSED GAS CYLINDERS AND

REGULATORS

All cylinders and pressure regulators used in welding operations should be handled with care.

Always secure the cylinder safely.

Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application;

Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) recommendations.

NEVER DEFACE OR ALTER ANY CYLINDER

PRODUCT OVERVIEW

The JT 200DS ACDC is numerical controlled inverter AC DC welder of advanced technologies, multiple functions and excellent performance. Equipped with **AC square wave TIG welding, AC pulse TIG welding, DC TIG welding, DC pulse TIG welding, DC flux-coated electrodes MMA, TIG spot welding (DC, pulse or AC) and complex wave TIG welding and other AC DC TIG functions**, it's widely suited to the controlled welding of various materials. The integration of a unique electrical structure with air channel design in the JT 200DS ACDC series can speed up the heat dissipation of the power devices, so that to improve duty cycle. The unique air channel can effectively prevent damages to the power devices and control circuits resulting from the dust absorbed by the fan, and greatly improve welder's reliability.

The overall streamline design with arc transition perfectly integrates front and back panels, forming the most coherent and natural joints of the machine. The front panel and the rear panel are coated with **rubber oil** to achieve soft texture for handling, and good appearance. Optimized welding performance, integration of various welding functions, and a combination of high efficiency with small size, lightweight, low cost makes it suitable for both heavy industries and open field operation. No matter you are an experienced welding operator or novice operator; the JT 200DS ACDC would be an excellent choice to meet your requirements for various industries and fields.

FEATURES

IGBT inverter technology

The adoption of 43 KHz inverting frequency and strong shock resistance IGBT for main loop contributes to smaller welder size, lighter weight, and higher reliability.

Great reduction in copper and core loss greatly enhances the welding efficiency and saves energy.

Switching frequency is beyond audio frequency, which almost eliminates noise pollution.

Cutting-edge control technique

Advanced control system caters for various welding process

requirements and greatly enhances welder performances.

New control technology

The adoption of a MCU intelligent digital control technology and software digital controlled core welding functions brings upgraded performances when compared with traditional



welders.

Easy arc starting, less spatter, stable current and good bead shaping.

Structure design

Streamline design for front and rear panels to achieve a better integral shape.

Panels made of high intensity engineering plastics guarantee high work efficiency in case of strong impact and drops or other harsh conditions.

Excellent insulating property.

Three proofing design; fine antistatic and anticorrosion performance.

Optimized auto protection

JT 200DS ACDC has an optimized auto protection function.

When there is large scale voltage fluctuation, welder will shut off automatically and display the failure information; welder will restart when network voltage is stable. The welder will shut off in case of over-current, over-heat, or other abnormalities, and display the according failure information. Multi protections largely prolong welder's lifespan.

Excellent consistency and performance

This product adopts intelligent digital control technology, which is not sensitive to component's parameters' change; certain components' changes won't affect welder's performances. It's also insensitive to temperature and when compared with traditional welders.

Easy adjustments of welding parameters and convenient software update

Common analog circuit control or hybrid analog & digital circuit control need to depend on according circuit to realize multi welding functions and welding parameters' adjustment, which will leads to complicated electric circuit when there are multi parameters and it's also hard to achieve the adjustments. Intelligent digital controlled welder's main functions are realized by software, which is of easy operation and high accuracy. Moreover, welder's upgrading and building requires no circuit change, but only need to download upgrade software.

Intuitive control interface

This welder adopts international diagram form display, which is easy to understand and convenient to achieve accurate operation for different types of users.

Capable of high quality MMA welding

The adoption excellent control algorithm largely improve MMA welding performance, bringing easy arc start, stable current, minimum spatter, no sticking, good shaping and self adaption to different cable length and cross section.

Capable of highly demanding TIG welding

Optimized digital CC adjustment technology guarantees low noise and stable arc; meanwhile accurate control technology provides convenient operation for welding current. This welder is capable of 2T/4T/spot welding to meet various

welding process demands.

Remote control is available

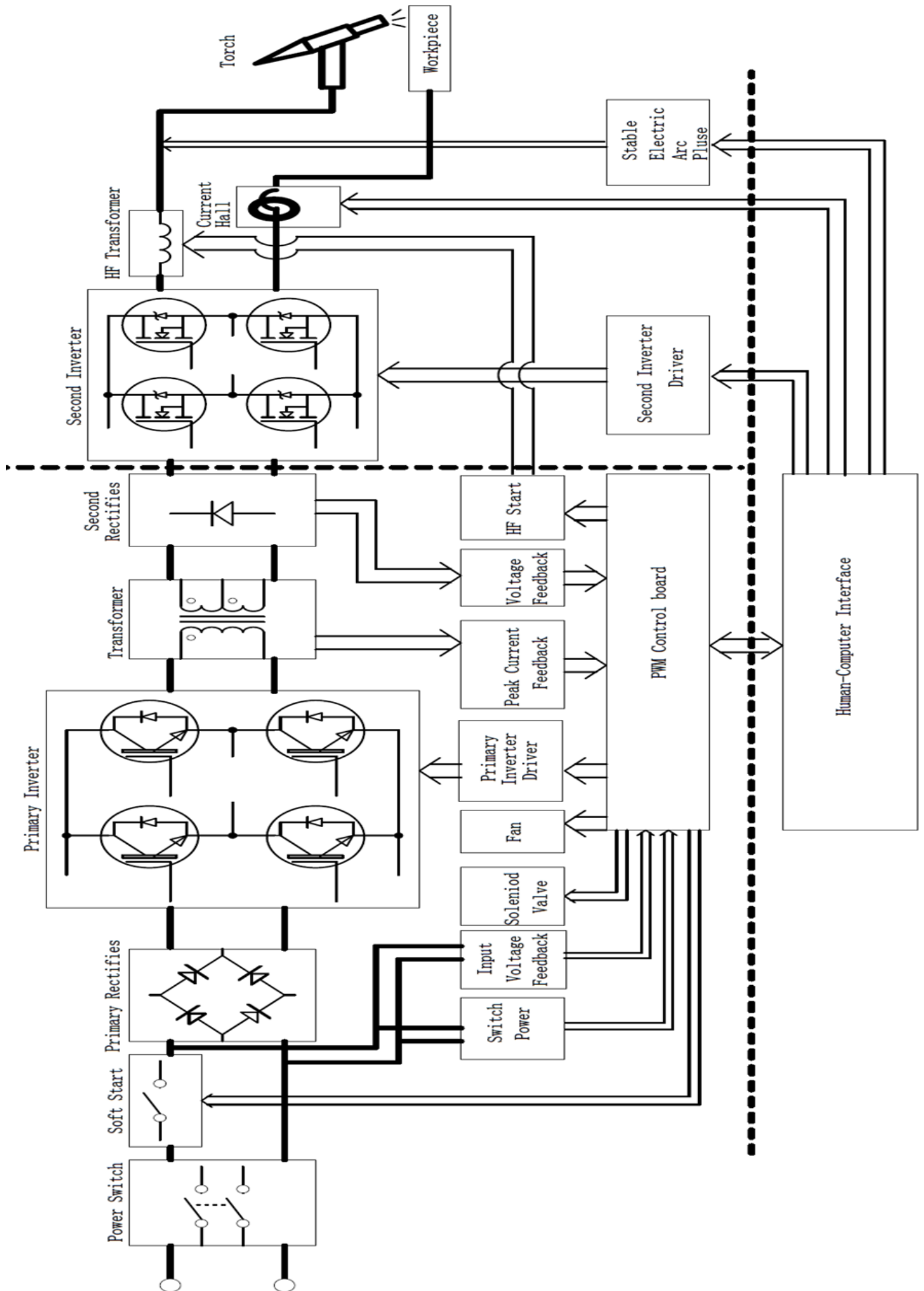
This welder is capable of pedal remote control, allowing operator's control on real time welding current even further than 10m.

TECHNICAL PARAMETERS

Model		JT 200DS
Supply voltage (V)		Single phase AC220 ±15%
Input frequency (Hz)		50/60
Rated input peak current (A)		30
Power capacity (KVA)		6
Rated output current (A)	MMA	160
Rated output current (A)	TIG	200
Output current range (A)	MMA	10 ~ 160
Output current range (A)	TIG	5 ~ 200
Arc force current range		0-40
No load voltage (V)	With VRD	56
No load voltage (V)	Without VRD	9
Pre-flow time (S)		0.1-10
Initial current (A)		5-200
AC output frequency (Hz)		20 ~ 250
Balance (%)		15-85
Downslope time (S)		0-15
Post-flow time (S)		0.5-15
Background current (A)		5 ~ 200
Pulse frequency (Hz)	Resolution 0.1Hz	0.2 ~ 20.0
Pulse frequency (Hz)	Resolution 1Hz	21 ~ 200
Pulse duty factor (%)	0.2Hz ~ 10Hz	1 ~ 99
Pulse duty factor (%)	11Hz ~ 200Hz	10 ~ 90
Remote control		YES
Arc start		HF oscillation
Efficiency (%)		85
Duty cycle (%)		160A(ARC)-30% 200A(TIG)-25%
Power factor		0.7
Insulation grade		B
Enclosure protection class		IP21S
Weight (kg)		9

Due to continual product improvements technical parameters are subject to change without notice

ELECTRICAL SCHEMATIC



PANEL LAYOUT

Front

1. **Operation panel:** function selection and parameters setting
2. **Positive output terminal:** to connect holder clamp
3. **Negative output terminal:** to connect earth clamp or welding torch
4. **Argon gas connector**
5. **Torch switch socket**
6. **Trademark**
7. **Welding current adjusting knob**
8. **Handle**



Rear

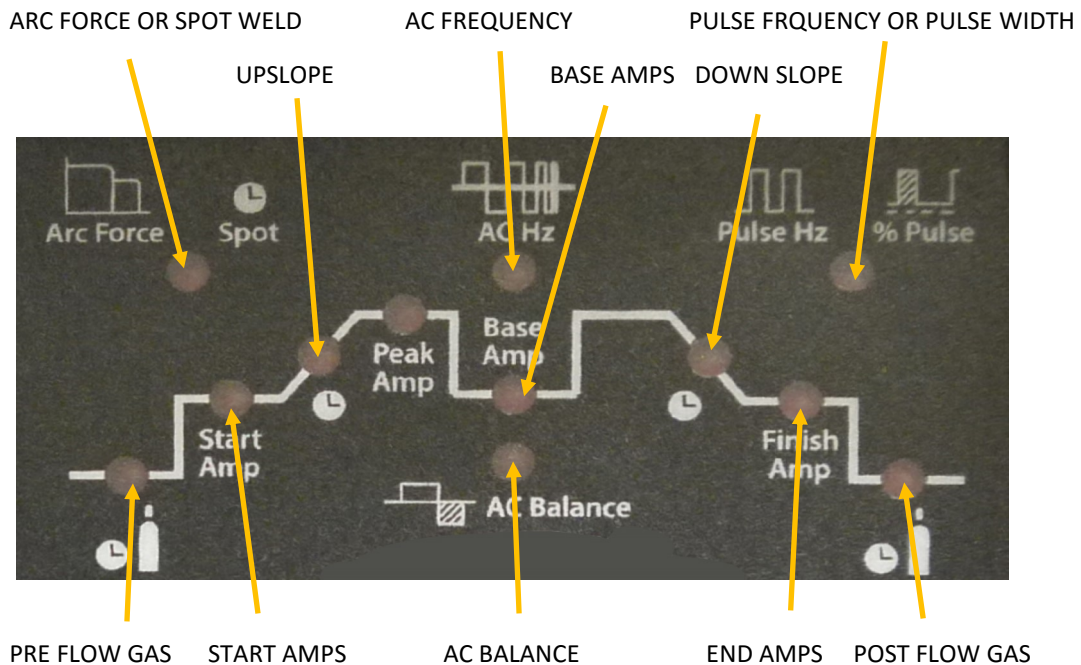
9. **Power switch**
10. **Caution label**
11. **Mains input cable**
12. **Fan grill**
13. **Argon inlet**



CONTROL PANEL



PARAMETERS SECTION



PRE FLOW GAS TIME - NO ARC WILL START UNTIL PRE FLOW TIME ENDS

START AMPS— NORMALLY USED IN 4T TO ESTABLISH AN ARC BEFORE WELDING COMMENCES

UPSLOPE— TIME TAKEN TO RISE TO THE SET WELDING CURRENT

PEAK AMPS— WELDING CURRENT OR PEAK WELDING CURRENT WHEN IN PULSE MODE

BASE CURRENT— BACKGROUND WELDING CURRENT IN PULSE MODE

DOWN SLOPE— TIME TAKEN FOR THE CURRENT TO FALL FROM THE PEAK AMPS TO FINISH AMPS

POST FLOW GAS TIME— TIME THE GAS WILL FLOW AFTER WELDING ENDS TO SHIELD THE WELD AREA

ARC FORCE— ADDITIONAL CURRENT WHEN SHORT CIRCUIT OCCURS IN MMA ONLY

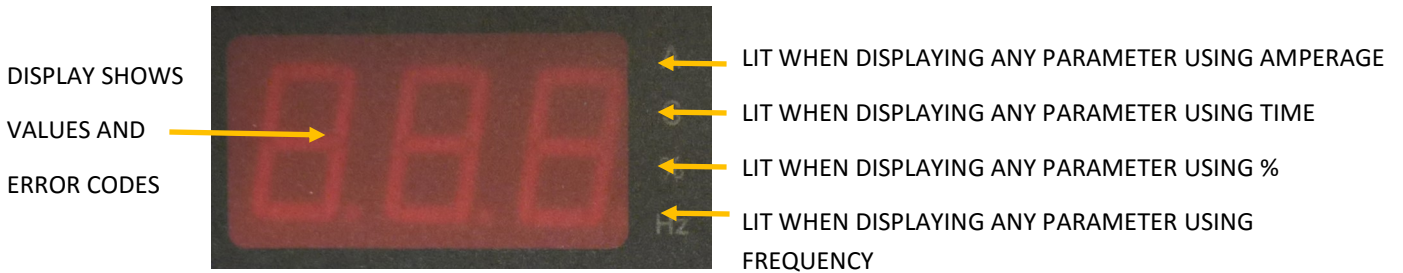
SPOT WELD— LIT WHEN SPOT WELDING SELECTED IN THE TIG WELDING MODE

AC FREQUENCY— THE FREQUENCY OF THE AC WELDING CURRENT

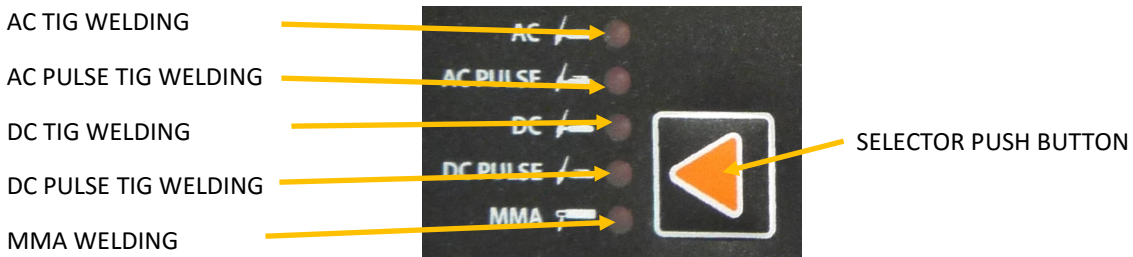
PULSE FREQUENCY— THE FREQUENCY OF WELDING CURRENT IN THE PULSE WELDING MODE

PULSE WIDTH— LIT WHEN SELECTING THE PULSE WIDTH

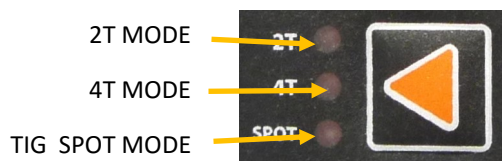
DISPLAY SECTION



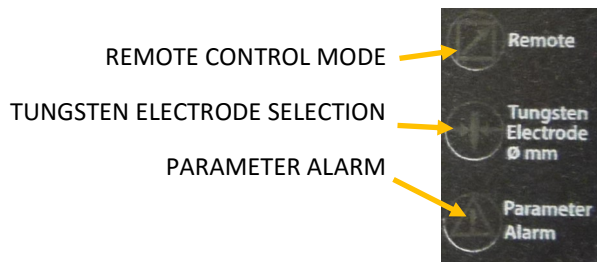
WELDING MODE SELECTOR



TORCH SWITCH MODE



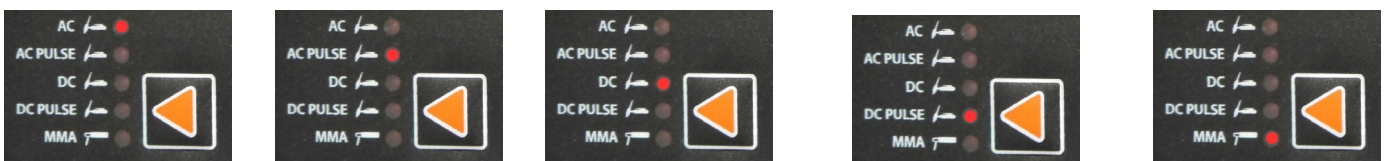
OTHER FUNCTIONS



KEY OPERATION DESCRIPTION

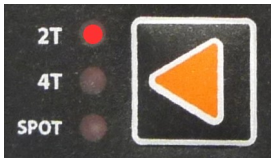
SELECTING THE WELDING MODE.

Switch on the machine and without welding, press the selector push button until the LED is lit against the welding mode required



TIG TORCH SWITCH MODE

When selecting the TIG torch switch mode press the selector button until the LED is lit against the corresponding mode.



2T mode. Press trigger to weld
And release to end welding



4T mode. Press the trigger to establish the arc.
Release the trigger and the current will go to the
set weld current. Press the trigger again and the
current will reduce to the final current. Release
the trigger to end welding current and the post
gas time will start



Spot welding. Press the trigger and
the arc will start until the spot
welding time is reached and the
arc will go off. Release the trigger
to carry out another spot

OTHER FUNCTIONS

To select other functions turn the setting knob on the control panel until the other function settings are reached.

The remote LED will be lit when using a foot pedal or torch mounted current control.

When the tungsten electrode LED is lit you can use the selection knob on the control panel to set the tungsten size you are using.

The parameter alarm will be lit when the current you set is out of the recommended range for the tungsten selection. This will not stop the welding process.




WELDING PARAMETERS SETTING



Press rotary encoder potentiometer to adjust welding parameters based on actual demands. The parameters' setting can be done during no load or in the middle of welding without affecting welding.

Welding mode	Torch switch mode	Pre-flow	Initial current	Up slope time	Peak current	Background current	AC frequency	Balance
MMA	NO	x	x	x	•	x	x	x
DC TIG	2T	•	•	•	•	x	x	x
	4T	•	•	•	•	x	x	x
	Spot welding	•	•	•	•	•	x	x
DC Pulse TIG	2T	•	•	•	•	•	x	x
	4T	•	•	•	•	•	x	x
	Spot welding	•	•	•	•	•	x	x
AC TIG	2T	•	•	•	•	•	•	•
	4T	•	•	•	•	•	•	•
	Spot welding	•	•	•	•	•	•	•
AC Pulse TIG	2T	•	•	•	•	•	•	•
	4T	•	•	•	•	•	•	•
	Spot welding	•	•	•	•	•	•	•



Welding mode	Torch switch mode	Arc force current	Spot weld time	Down slope time	Pulse frequency	Pulse width	Pilot arc current	Post-flow	Tungsten electrodes or electrodes selection
MMA	NO	●	×	×	×	×	×	×	●
DC TIG	2T	×	×	●	×	×	●	●	●
	4T	×	×	●	×	×	●	●	●
	Spot welding	×	×	●	●	●	●	●	●
DC Pulse TIG	2T	×	×	●	●	●	●	●	●
	4T	×	×	●	●	●	●	●	●
	Spot welding	×	●	●	●	●	●	●	●
AC TIG	2T	×	×	●	×	×	●	●	●
	4T	×	×	●	×	×	●	●	●
	Spot welding	×	●	●	●	●	●	●	●
AC Pulse TIG	2T	×	×	●	●	●	●	●	●
	4T	×	×	●	●	●	●	●	●
	Spot welding	×	●	●	●	●	●	●	●
Adjusting direction									

WELDING MODE DESCRIPTION

MMA



Note: t0—Standby: No welding current; output voltage is the no-load voltage.

t1—Arc ignition: Welding current is arc ignition current (I1).

t3—Arc burning: Welding current is the preset current (I2).

t4—Short-circuit transfer: Welding current is the short-circuit transfer current (I3).

In MMA mode, 4 parameters that can be adjusted directly and 1 parameter that can only be adjusted through programming are available for this machine. These are described below.

Current (I2): This is the welding current when arc is burning, and users can set it according to their own technical requirements.

Arc force: It refers to the ascending slope of the current in short circuit, and it is set as the amperage increased per millisecond in this machine. The current will ascend from the preset value by this slope after short circuit occurs. (E.g. When the preset current is 100A and the arc force is 20, the current will be 200A 5ms after short circuit occurs.) If it is still under short circuit when the current increases to the allowable maximum value 250A, the current will not ascend any more. If the short circuit status lasts for 0.8s or more, the machine will enter into electrode sticking process: to wait the disconnection of the electrode under low current. Arc force should be set according to the electrode diameter, preset current and the technical requirement. If the arc force is big, the molten drop can be transferred quickly, and electrode sticking seldom occurs. However, too big arc force may lead to excessive spatter. If the arc force is small, there will be little spatter, and the weld bead will be shaped well. However, too small arc force may lead to soft arc and electrode sticking. Therefore, the arc force should be increased when welding with thick electrode under low current. In general welding, the arc force may be set at 5~50.

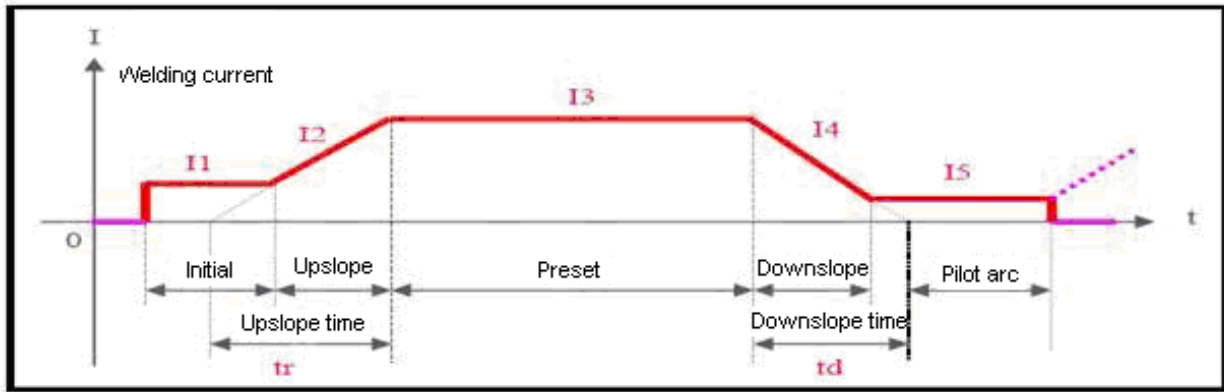
Arc ignition current (I1) and arc ignition time (T1): Arc ignition current is the output current of the machine when the arc is ignited. Arc ignition time is the time the arc ignition current lasts. When in non-contact ignition mode, neither parameter makes sense. When in high current ignition mode, the arc ignition current is generally 1.5~3 times the welding current, and the arc ignition time is 0.02~0.05s. When in low current ignition mode, the arc ignition current is generally 0.2~0.5 times the welding current, and the arc ignition time is 0.02~0.1s.

∅ Operation hints	Arc ignition modes in SMAW
<p>Low current arc ignition: This can be also called lift/soft arc ignition. Set the arc ignition current (I1) to be a value lower than I2 and the machine will enter into low current arc ignition mode. Touch the workpiece with the electrode, and lift the electrode to the normal position to weld after arc is ignited.</p> <p>High current arc ignition: This can be also called contact/thermal arc ignition. Set the arc ignition current (I1) to be a value not lower than I2 and the machine will enter into high current arc ignition mode. Touch the workpiece with the electrode, and normal welding can be carried out without lifting the electrode.</p>	

Electrode Selection Reference Table

Electrode Dia (mm)	Recommended Welding Current (A)	Recommended Welding Voltage (V)
1.6	30~60	21~23
2.0	50~90	22~24
2.5	80~120	23~25
3.2	100~140	24~26
4.0	140~160	26~28

DC TIG WELDING



DC TIG Current Change Waveform

Current (I3): This parameter can be set according to users' own technical requirements.

Initial current (I1): It is the current when arc is ignited by pushing the torch trigger, and it should be set according to users' own technical requirements. If the initial current is high enough, arc is easier to ignite. However, it should not be too high when welding thin plate, so as to avoid burn through the workpiece during arc ignition. In some operation modes, the current does not rise but stay at the initial current value to preheat the workpiece or illuminate.

Pilot arc current (I5): In some operation modes, the arc does not stop after current downslope but stay in the pilot arc state. The working current in this state is called pilot arc current, and it should be set according to users' technical requirements.

Pre-flow time: It indicates the time from the torch trigger being pushed to arc being ignited in non-contact mode. Commonly it should be longer than 0.5s to make sure that the gas has been delivered to the welding torch in normal flow before arc ignition. The pre-flow time should be increased if the gas hose is long.

Post-flow time: It indicates the time from the welding current being cut off to the gas valve inside the machine being closed. If it is too long, it will lead to a waste of argon gas; if it is too short, it will result in the oxidation of weld bead. When in AC TIG or for special materials, the time should be longer.

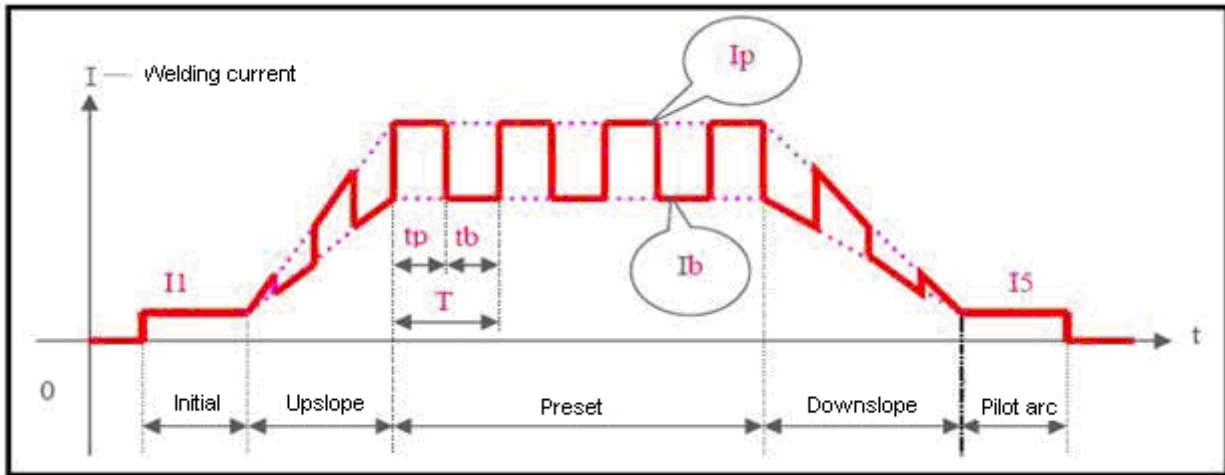
Upslope time (tr): It indicates the time spent on current rising from 0 to the preset value, and it should be set according to users' technical requirements.

Downslope time (td): It indicates the time spent on current dropping from the preset value to 0, and it should be set according to users' technical requirements.

Tungsten Electrodes Selection

Electrode Dia (mm)	Recommended Welding Current (A)
1.0	5~30
1.6	20~90
2.0	45~135
2.5	70~180
3.2	130~200

DC PULSED TIG WELDING



DC Pulse TIG Current Change Waveform

In pulsed TIG mode, all DC TIG parameters except current (I_3) and another 4 adjustable parameters are available for this machine. They are described as below.

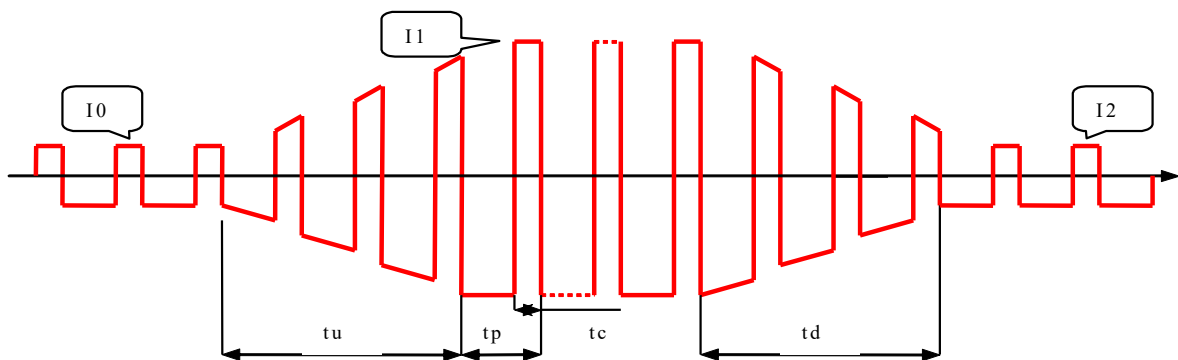
Peak current (I_p): It should be adjusted according to users' technical requirements.

Base current (I_b): It should be adjusted according to users' technical requirements.

Pulsed frequency ($1/T$): $T = t_p + t_b$. It should be adjusted according to users' technical requirements.

Pulse duration ratio ($100\% \cdot t_p/T$): The percentage peak current time holding in pulse period. It should be adjusted according to users' technical requirements.

AC TIG WELDING



I_0 -Initial current, I_1 -Welding current, I_2 -Pilot arc current,
 t_u -Upslope time, t_d -Downslope time
 t_p -AC period, t_c -Cathode current time

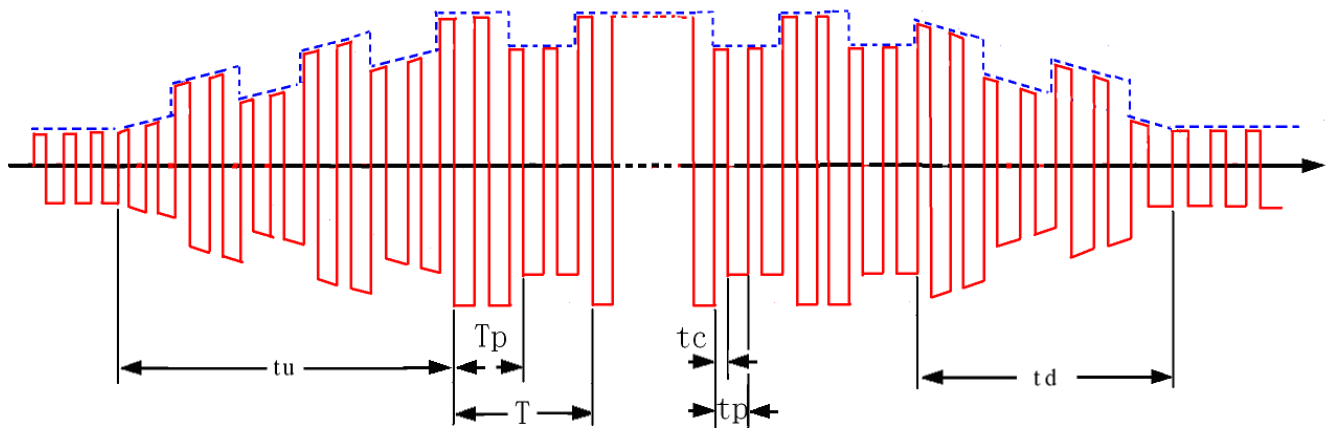
In AC square wave TIG welding, the pre-flow time and post-flow time are the same with those in DC TIG welding, and others are described as below.

Initial current (I_0), welding current (I_1) & pilot arc current (I_2): The preset value of the three parameters is approximately the absolute average of the practical welding current, and can be adjusted according to users' technical requirements.

Pulse frequency ($1/t_p$): It can be adjusted according to users' technical requirements.

Cleaning strength ($100\% \cdot t_c/t_p$): Generally, in AC welding, when taking the electrode as anode, the current is called cathode current. Its main function is to break up the oxidized layer of the workpiece, and the cleaning strength is the percentage cathode current holding in the AC period. This parameter is 10~40% commonly. When the value is smaller, arc is concentrative, molten pool is narrow and deep, and when it is bigger, arc is dispersive, molten pool is wide and shallow.

AC TIG WELDING



t_c -Cathode current time, t_p -AC period

T_p -Pulsed peak current time, T -Pulse period

AC Pulse TIG Current Change Waveform

AC pulsed TIG welding is almost the same as AC square wave TIG welding, and what makes them different is that in AC pulsed TIG welding, the welding current varies with the pulse and peak current and base current are generated because the welding current is controlled by a low frequency pulse. The preset peak current and base current are the low frequency pulse peak value (average value) and base value (average value) respectively. For the AC square wave parameter selecting and setting, please refer to the corresponding contents in AC square wave TIG welding. For the pulse frequency and pulse duration ratio, users may refer to the corresponding contents in DC pulsed TIG welding. The pulse frequency ($1/T$) is a little low, and it can be adjusted between 0.5Hz and 5Hz. The pulse duration ratio (T_p/T) can be adjusted between 10% and 90%.

TIG OPERATION MODE

TIG operation mode is a kind of special stipulation, which stipulates the modes to control welding current through different operation of the torch trigger in TIG (DC TIG, pulsed TIG and AC TIG) welding. The introduction of TIG operation mode strengthens the application of remote control function of the torch trigger, so that users can get practical remote controls for welding machines without further investment.

TIG operation mode should be selected according to users' technical requirements and operating habits. All the TIG operation modes for this machine are listed in the table *TIG operation modes* below.

Torch trigger operation notes			
↓	Push the torch trigger.	↑	Release the torch trigger.
↓↑	Push the torch trigger and then release it at any time.	↑↓	Release the torch trigger and then push it at any time.

TIG operation modes

Mode no.	Operation	Torch trigger operation and current curve
1	<p>1T/Spot welding mode:</p> <p>Push the torch trigger: arc is ignited and current rises to the preset value.</p> <p>When the spot welding time is up, current drops gradually, and arc stops.</p> <p>Note: Spot welding time is 1/10 of the upslope time.</p>	
2	<p>Standard 2T mode:</p> <p>Push the torch trigger: arc is ignited and current rises gradually.</p> <p>Release the torch trigger: current drops gradually, and arc stops.</p> <p>If push the torch trigger again before arc stops, the current will gradually rise again, and then turn to ②.</p>	
3	<p>Standard 4T mode:</p> <p>Push the torch trigger: arc is ignited and current reaches the initial value.</p> <p>Release it: current rises gradually.</p> <p>Push it again: current drops to pilot arc current value.</p> <p>Release it: arc stops.</p>	

When reading the above table, please note:

Whether arc ignited by HF or by striking the electrode, and no matter what kind of operation mode is selected, after arc ignited successfully, it enters into initial current, and later into operational mode control.

Some operation modes adopt the exit mode by pushing the torch trigger. The operator should release it after exiting welding. In this way, another welding operation can be entered by pushing the torch trigger.

Current curves in all operation modes are drawn on the assumption that the machine works in DC TIG mode. If the machine works in pulsed TIG mode, the current curve appears a pulse shape; if the machine works in AC TIG mode, the current curve appears a variable polarity pulse shape.

Customarily, the TIG operation modes most widely used are 2T and 4T, which exactly correspond to operation mode 2 and 4 for

INSTALLATION

Notice: Please install the machine strictly according to the following steps. Turn off the power supply before any electric connection operation. IP21 enclosure protection grade, and please do not operate it in rain.

INSTALLATION

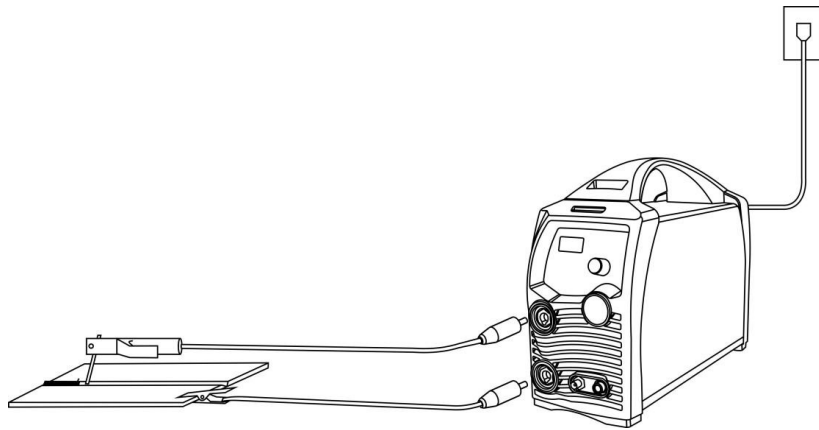
MMA

Connect the primary power line to suitable power supply.

Insert the electrode holder cable plug into the front panel's "+" socket, and screw tightly clockwise.

Insert the earth clamp cable plug into the front panel's "-" socket and screw tightly clockwise.

Always check the electrode instruction to ensure the correct polarity



INSTALLATION

TIG

Connect the primary power line to suitable power supply.

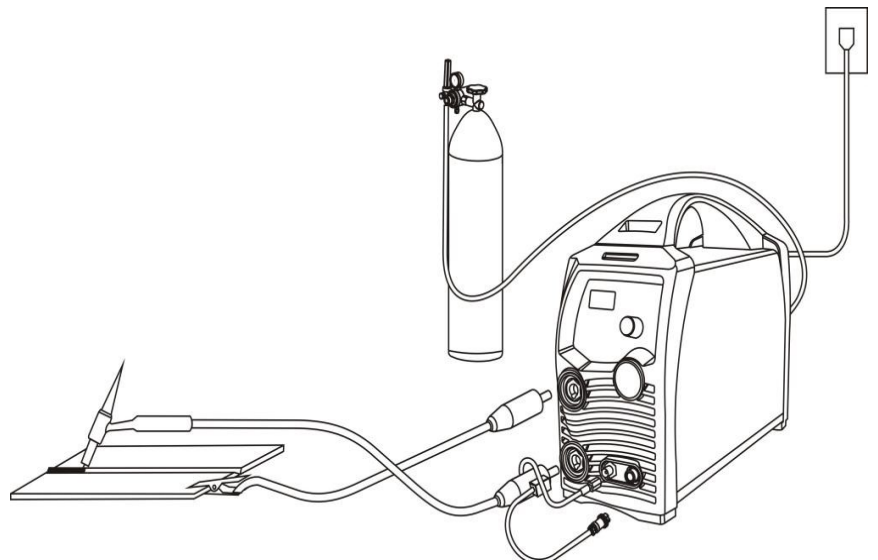
Insert the TIG torch cable plug into the front panel's "-" socket, and screw tightly clockwise.

Connect the torch gas connection to the gas outlet on the front of the machine.

Connect the switch into the switch socket

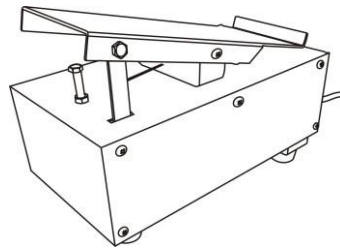
Insert the earth clamp cable plug into the front panel's "+" socket and screw tightly clockwise.

Connect the argon gas supply from the regulator to the rear of the machine. The gas flow rate should be around 8-12 lpm



REMOTE CONTROL

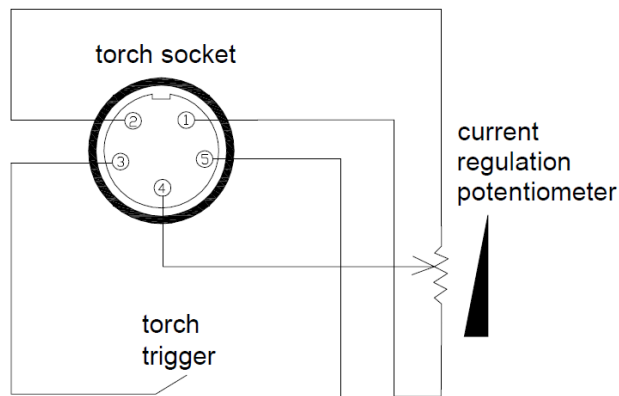
Pedal remote control internal structure is composed of a switch and sliding potentiometer, as shown in below




Pedal Remote Control

Pedal controlling function is used in the TIG mode.

- connect the pedal remote to the welder front panel 5 pin socket.

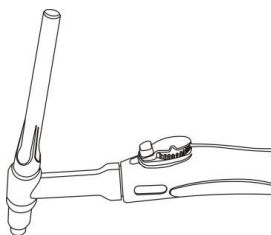


- Press the pedal for 5 seconds while under idle load mode; the front panel remote control indicator will light up after 3 beep. Release the pedal and enter the pedal remote control mode.

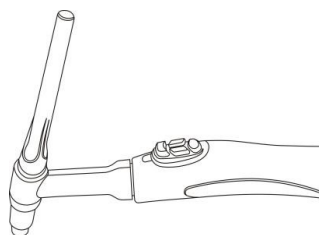
- The torch switch mode  needs being set to 2T when using the pedal remote control function. Preset the max welding current through front panel and start welding.

Press the pedal control and start arc ignition. Non-contact arc ignition is the mostly applied method. Welding current will be control by pedal remote after successful arc ignition. Max output current is the preset current.

There are both digital control type and analog control type TIG torches.

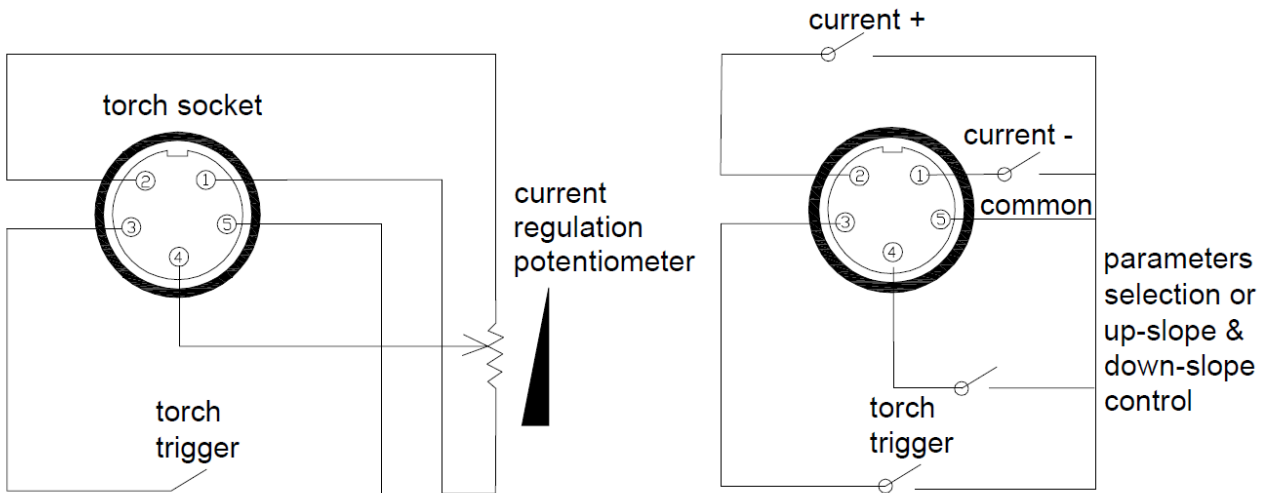


Analog Regulation Type



Digital Regulation Type

- connect the wire-drive torch to the welder front panel pedal controller connection aviation socket through dedicated cable. See Fig below:



Analog Regulation Type Torch Socket Interface

Digital Regulation Type Torch Socket Interface

- Push the torch switch for 5 seconds while under idle load mode; the front panel remote control indicator will light up after 3 beep and enter the peel remote control mode.




- The torch switch mode needs being set to 2T when using analog regulation torch function. Preset the max welding current through front panel and start welding. The welding current can be adjusted through torch potentiometer. The allowable max current is the preset peak current value.

- The functions can be divided into 2 parts when using the digital regulation torch: 1) when it's under no load mode, can set welding parameters through "Parameters Selection or Up-slope &Down-slope" bottom on the torch. "Parameters +" and "Parameters -" can set the value. 2) Torch switch only controls ON/OFF. In the middle of welding, "Parameters Selection or Up-slope & Down-slope" can only regulate welding current up-slope or down-slope. "Parameters +" and "Parameters -" can set the value.

Note. Welders with digital regulation torch cannot have pedal remote controller; welders with analog regulation torch can have pedal control.

MAINTENANCE

<p>WARNING</p> 	<p>The following operation requires professional knowledge on electric application and comprehensive safety knowledge. Operators should be licensed with related qualification certificates (still in validation) which can prove their skills and knowledge. Make sure the power supply is cut off before uncovering the welding machine.</p>
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MMA COMMON MALFUNCTIONS

Malfunction		Cause analysis	Solutions
Fan doesn't work or has abnormal revolving speed after power on		Temperature is too low or fan is broken.	When the temperature is too low, please operate welder for a while and wait till the internal temperature is increased; if the fan is still not
M M A	Difficult arc ignition	Low arc ignition current or short ignition time.	Adjust (increase) the arc ignition current and time.
	Over arc ignition or over-size molten pool	Ignition current is too big or ignition time is too long.	Adjust (decrease) the arc ignition current and time.
	Abnormal arc	Poor power cable connection	Make sure the well connection of power cable.
	Sticking electrode	Low arc force current	Adjust(increase) the arc force current
	Burning electrode holder	Electrode holder rated current is too low	Change a larger current electrode holder.
	Easy arc breaking	Network voltage is too low	Please operate when network voltage is back to normal.
Other failures		Please contact Jasic service department	

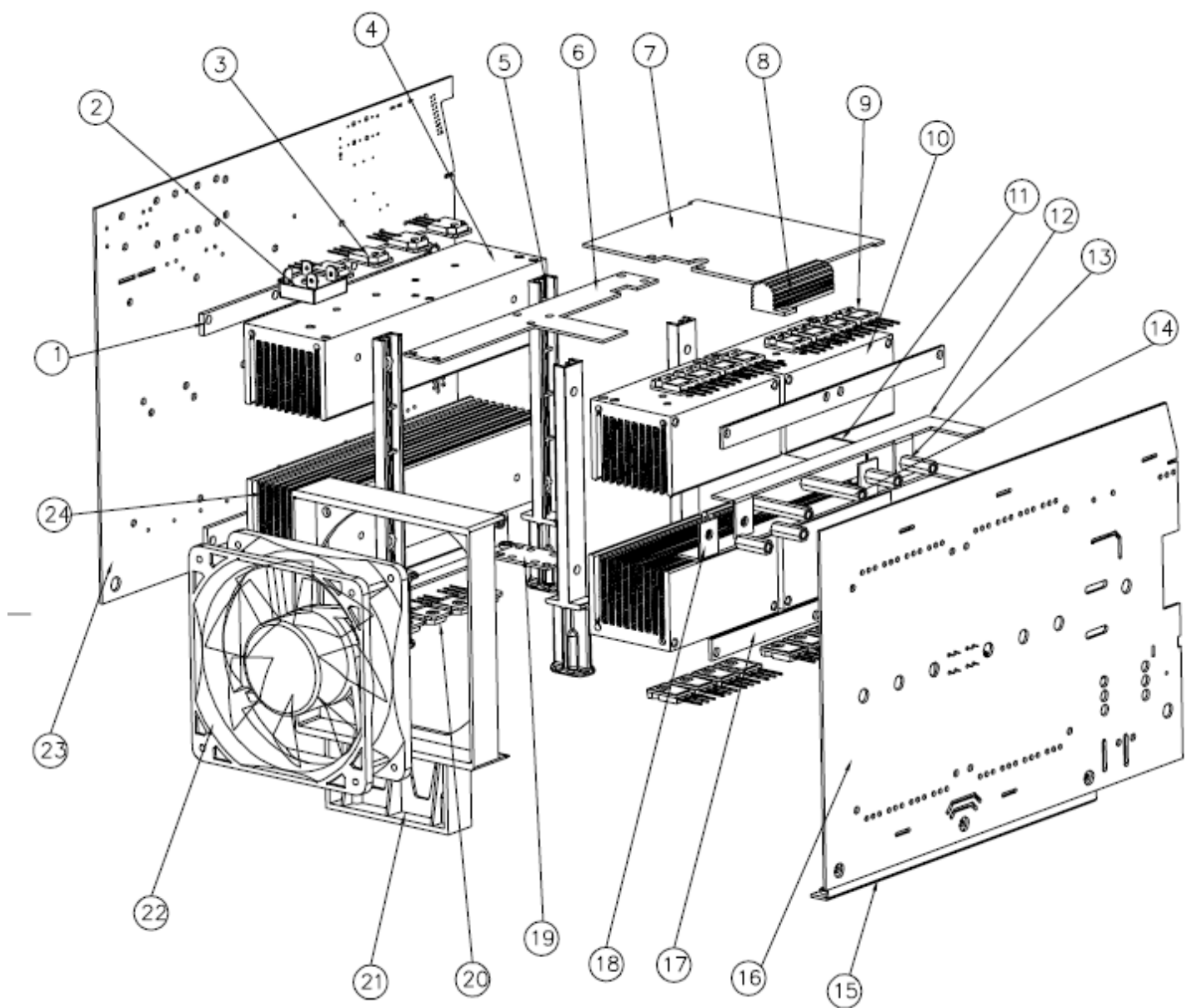
TIG COMMON MALFUNCTIONS

Malfunction phenomena		Cause analysis	Solutions
Fan doesn't work or has abnormal revolving speed after power on		Temperature is too low or fan is broken.	When the temperature is too low, please operate welder for a while and wait till the internal temperature is increased; if the fan is still not working, change the fan.
T I G	No output current when torch switch is on.	Some TIG function allows welding ending while torch switch is still on.	Release torch switch and restart welding
		Welding circuit disconnection	Check the circuit and reconnect
	when it's under HF arc ignition mode, no arc ignition when turn on the torch switch.	Poor connection of welding torch switch.	Reconnect and tighten the welding torch
		Over-wide spark gap.	Adjust the spark gap (about 0.8mm)
	Over burning of tungsten electrode.	Reverse connection of welding torch and ground cable	Exchange the two plugs' position
		Clearing intensity is too big	Decrease the clearing intensity
Black welding bead.	Welding bead is poorly protected and has oxidation	<ol style="list-style-type: none"> 1. make sure the argon cylinder valve is open and has enough pressure. If the internal pressure is lower than 0.5Mpa, please refill the gas. 2. please check if the argon flow is normal or not. You may choose different flow according to different welding current. But under-volume gas flow may result in incomplete coverage of welding bead. We suggest the min argon flow of 5L/min no matter how small the welding current is. 3. Please make sure the well sealing of all gas circuit as well as gas purity. 4. Please check if there is strong airflow in the working environment. 	
T I G	Difficult arc ignition, easy arc breaking	Poor quality tungsten electrode or severe oxidation of tungsten electrodes	<ol style="list-style-type: none"> 1. change good quality tungsten electrodes 2. remove the oxidation layer. 3. prolong the post-flow time so that to avoid tungsten oxidation 4. adjust the spark gap (around 0.8mm)
	Unstable welding current during welding	<p>Big fluctuation of network voltage or poor connection with power grid.</p> <p>Interference from other equipment</p>	<ol style="list-style-type: none"> 1. make sure the power grid is normal and well connection of power source connector. 2. use different power cables for those severe interference equipments
Other failures			Please contact with Jasic service department.

ERROR CODES

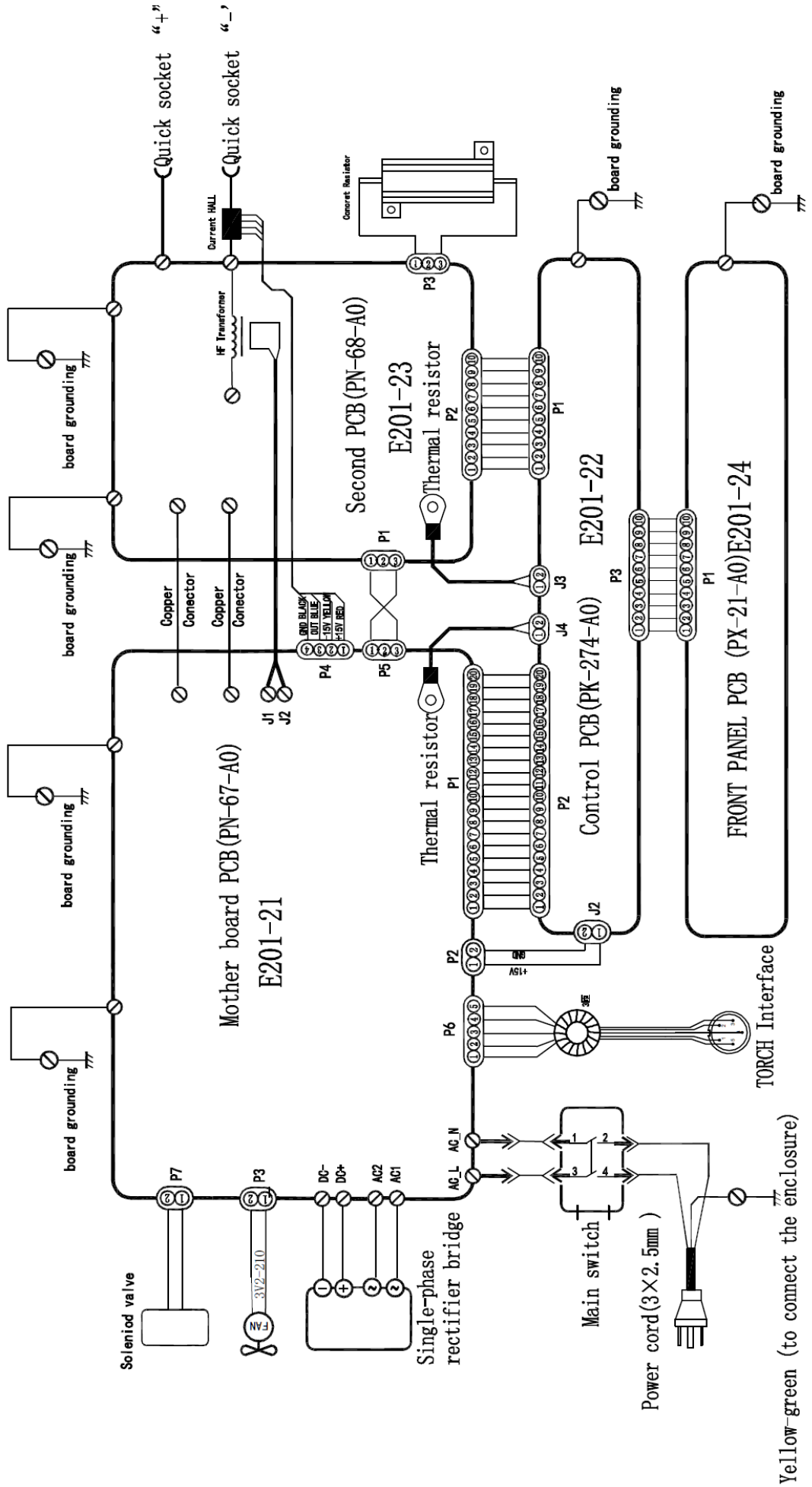
Type	Alarm	Error code	Welder reaction	Reason	Solutions
Over heat	Overheat indicator lights up and there is alarm sound	E - 1	Temporary close of main circuit	Over-working of main circuit	Do not power off; restart welding when the overheat indicator stop lighting up.
Under voltage	Display error code and there is alarm sound	E - 2	Permanently close main circuit and need to restart the machine	Power grid under-voltage (lower than 160VAC)	Please restart the welder; if warning still remains, If there is a continuous power grid undervoltage, please wait and restart welder when the power grid is back to normal. If power grid voltage is normal but with undervoltage warning, please contact professional maintenance personnel.
Over voltage	Display error code and there is alarm sound	E - 3	Permanently close main circuit and need to restart the machine	Power grid overvoltage (more than 270VAC)	Please shut off the welder and restart. If there is a continuous power grid overvoltage, please wait and restart welder when the power grid is back to normal. If power grid voltage is normal but with overvoltage warning, please contact professional maintenance personnel.
Abnormal internal circuit	Display error code and there is alarm sound	E - 4	Permanently close main circuit	Load current is too big or main power device is under over-current protection.	Pleas restart welder. If the warning still remains, please contact professional maintenance personnel.◦

No.	Part number	Description	No.	Part number	Description
1	10042887	Louver	12	10052413	Base
2	10052412	Display panel fixed	13	10040667	Solenoid valve
3	10052407	Display panel PCB	14	10042328	Solenoid valve holder
4	10052403	Cover	15	10006800	Current sensor
5	10041724	Handle	16	10052414	Connector
6	10048680	Back plastic panel	17	10052415	Connector
7	10052420	Panel adapting piece	18	10052460	Front panel
8	10052404	Front and back foot	19	10041712	Trademark cover
9	10052417	Rear screen	20	10004685	Socket
10	10041723	Gas inlet	21	10042337	Hose connector
11	10052500	Inverter	22	10045432	Quick socket



No	Part number	Description	No	Part number	Description
1	10052419	Insulating plate	13	10052512	Spacer
2	10052479	Rectifier bridge	14	10052436	Spacer
3	10029693	IGBT	15	10052418	Supporting seat
4	10052422	Heatsink	16	10052525	Second inverter PCB
5	10052430	Stand column	17	10052411	Insulating plate
6	10052389	Wind screen	18	10052511	Copper connector
7	10052444	PCB	19	10052402	Copper connector
8	10051552	Aluminum cover resistance	20	10006248	Fast recovery diode
9	10051625	Transistor	21	10052428	Fan cover
10	10052462	Heatsink	22	10045661	Fan
11	10052416	Copper connector	23	10052500	Main PCB
12	10052409	Connector	24	10052461	Heatsink

WIRING DIAGRAM



JT 200 DS Inverter TIG / MMA machine

Order code JT-200DS



Wilkinson Star Limited

Issue 1 July 2015

Product is subject to change without notice