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TIG 200P

DC Pulse TIG / MMA Welding - Dual voltage
Order code JT-200PDV



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)

Please note products are subject to continual development and may be subject to change without notice

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Safety Precautions



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.

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.

Always secure the cylinder safely

Never deface or alter any cylinder

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Product Overview

The unique electronic structure and air channel design in this series of machines provides efficient cooling of the power devices as well as improving the duty cycles of the machines. The design of the forced air-cooling system channel can effectively prevent the power devices and control circuits from being damaged by the dust introduced into the machine by the fan. The reliability of the machine is greatly improved as a result.

The streamline design means front and rear panels are naturally integrated via large-radian transition. The front and rear panels of the machine and the handle are coated with rubber oil*, giving the machine a very tactile and comfortable grip with an excellent appearance.

Product functions

- DC TIG, Pulsed TIG and MMA modes are available.
- Easy to use intuitive digital control panel for setting of parameters.
- LED display
- Rotary encoder control
- Hot start arc ignition function.
- Arc force current control
- 2T/4T and spot function.
- Upslope, Downslope, pre and post-flow gas function all adjustable
- Full control of pulse parameters
- Self-adaptive arc force technology improves the performance of the machine when using long-cable welding.
- Excellent HF arc ignition: High reliability arc striking.
- Advanced arc ignition by lift arc: TIG welding without HF arc ignition circuit.
- Over current, under-voltage and overheating protection functions are standard.
- Fault memory display
- Memory function



Product performance characteristics

- Advanced IGBT inverter technology
- Inverting frequency of 33~43 kHz greatly reduces the size and weight of the welder.
- Great reduction in magnetic and resistance loss enhances the welding efficiency and energy saving effect.
- Working frequency is beyond the audio range, which almost eliminates noise pollution.
- Industry leading control system
- Advanced control technology meets the various welding applications and provides excellent welding performance.
- It can be used with a wide range of welding electrodes.
- Easy arc starting, less spatter, stable current and good weld bead shaping.
- Modern high tech design
- Streamline design of front and rear panels.
- Front and rear panels made of high-intensity plastics suitable for working in severe conditions.
- Excellent insulating property.
- Water-resistant, antistatic and anticorrosion design.

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Technical data

Technical Parameter		Unit	Model			
			TIG180P (JT-180PDV)		TIG200P (JT-200PDV)	
Rated input voltage		V	AC110V±15%; 50/60HZ	AC230V±15%; 50/60HZ	AC110V±15%; 50/60HZ	AC230V±15%; 50/60HZ
Rated input power	MMA	KVA	3.8	6.5	5	8.2
	TIG		2.1	5.2	4	6.0
Welding current range	MMA	A	19~90	10~150	10~100	10~180
	TIG		10~110	10~180	10~130	10~200
Rated duty cycle ^①		%	35			
No-load voltage	MMA	V	60			
	TIG		65			
Pre-flow time		s	0~15			
Upslope time		s	0~60			
Downslope time		s	0~60			
Post-flow time		s	0~20			
Pulse duty		s	20~70			
Pulse frequency		Hz	0.5~200			
Overall efficiency		%	85			
Power factor		cosφ	0.7			
Arc ignition mode			HF arc ignition			
Housing protection grade		IP	21S			
Insulation grade			F			
Size	without handle	mm	365*135*235			
	with handle ^②		365*135*277			
Weight		kg	5.94		6.125	

①- Tested at the environment temperature of 40⁰ C

②- Product design may vary due to customer requirements.

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Controls

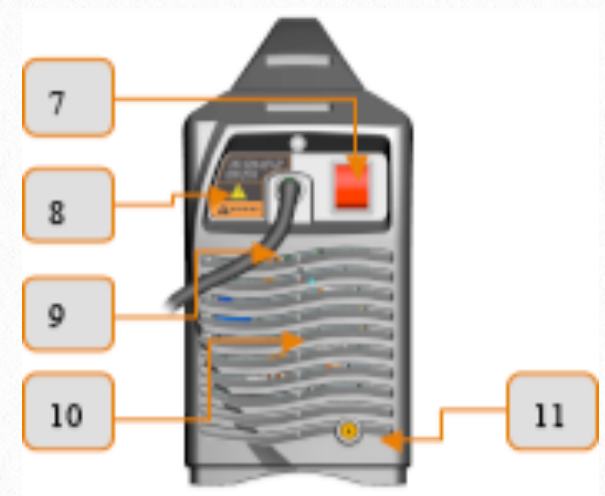
Front view

1. Operating panel: To set the parameters.
2. “+” output terminal
3. “-” output terminal
4. Control terminal: To connect the signal wire of the TIG torch trigger.
5. Gas terminal: To connect the gas hose of the TIG torch.
6. Handle



Rear view

7. Power switch: Power ON/OFF switch.
8. Warning sign
9. Power input: Power input cable.
10. Cooling fan
11. Gas inlet: For shield gas input.

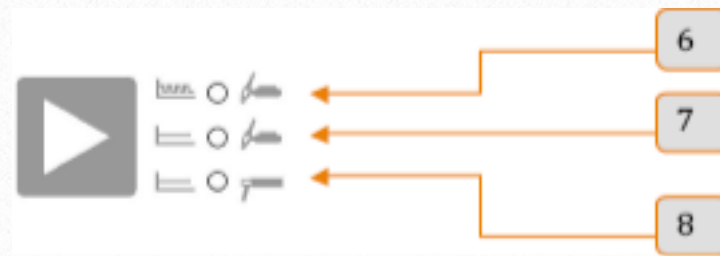


Control Panel

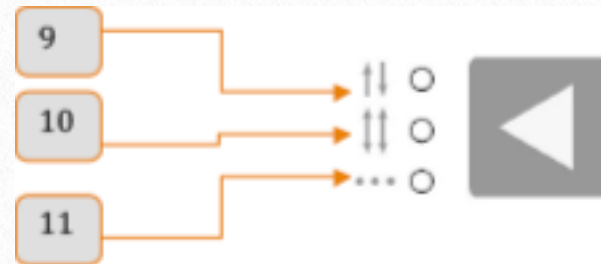
1. Display screen
2. Welding parameter selecting key
3. Operation mode selecting key
4. Welding parameter adjusting knob: The parameter adjusting encoder is used to adjust the parameters, and parameters can be adjusted by turning the knob clockwise or counterclockwise.
5. Welding mode selecting key



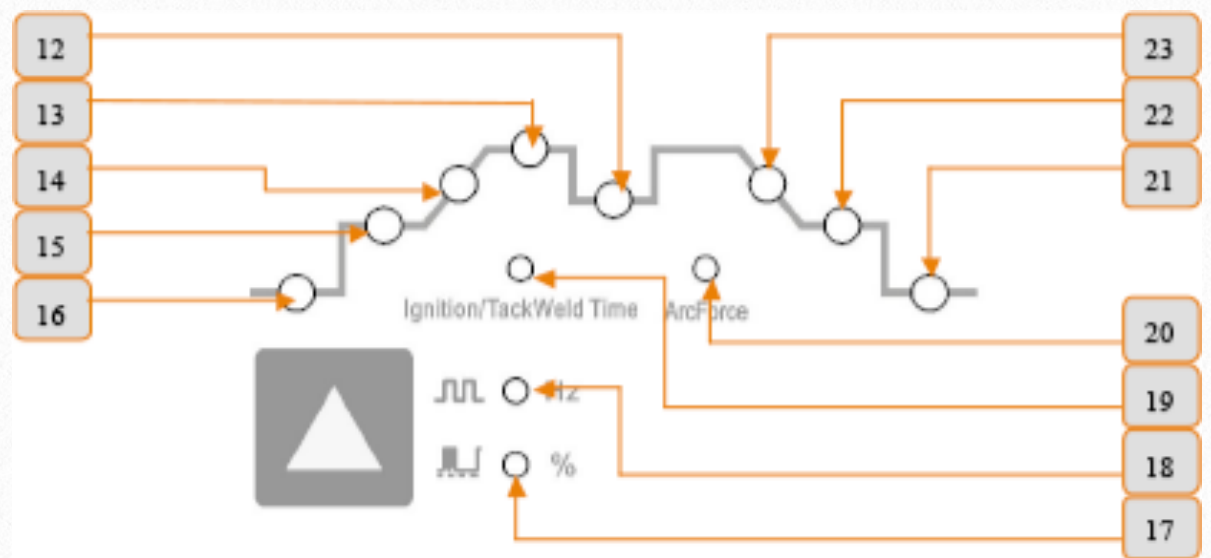
- 6. Indicator for pulsed TIG
- 7. Indicator for DC TIG
- 8. Indicator for MMA



- 9. Indicator for 2T
- 10. Indicator for 4T
- 11. Indicator for spot welding



- 12. Indicator for base current
- 13. Indicator for welding current
- 14. Indicator for upslope
- 15. Indicator for initial current
- 16. Indicator for pre-flow
- 17. Indicator for pulse duration ratio
- 18. Indicator for frequency
- 19. Indicator for arc ignition/spot welding time



- 20. Indicator for arc force current
- 21. Indicator for post-flow
- 22. Indicator for pilot arc current
- 23. Indicator for downslope
- 24. Protection indicator
- 25. Indicator for output voltage

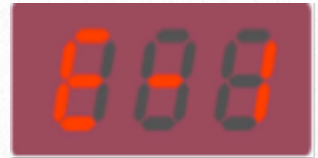


Parameter autosaving

The parameters having been adjusted will be autosaved in the parameter group currently used (no autosaving will be done in the case that no operation is done after parameters are adjusted and the machine was turned off in 5s' time). When the machine is turned on next time, the parameters in each parameter group are the parameters used during the last operation.

Protection Function

When the over current indicator illuminates and the digital meter displays "E-1", it indicates that over current occurs. Restart the machine, and welding can be continued.



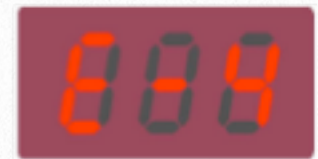
When the under-voltage indicator illuminates and the digital meter displays "E-2", it indicates that the mains voltage is too low, and welding can be recovered when the mains voltage goes into normal operating range.



When the overheating indicator illuminates and the digital meter displays "E-3", it indicates that welding is forced to stop because the main circuit of the machine gets overheated. In this condition, it is unnecessary to turn off the machine, but just wait until the unit cools, and then welding can be continued.



When the current sensor fails and the digital meter displays "E-4", welding may still be carried out. However, the current value at this time is inaccurate.



Foot control option

This machine can identify the foot control automatically. The machine will enter into foot control mode automatically after the plug of the foot control is connected to the welding machine and the machine is powered on again. In foot control mode, the maximum current is the preset current and the minimum current is 10A.

Voltage indicator

When this indicator illuminates, it indicates that there is voltage output at the output terminals of the welding machine. When TIG is selected as the welding mode, there will be voltage output only when the torch trigger is pressed continuously and after arc is ignited successfully. When MMA is selected as the welding mode, there will be voltage output whether arc is ignited or not.

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Installation

Unpacking

Check the packaging for any signs of damage.

Carefully remove the machine and retain the packaging until the installation is complete.

Location

The machine should be located in a suitable position and environment. Care should be taken to avoid moisture, dust, steam, oil or corrosive gases

Place on a secure level surface and ensure that there is adequate clearance around the machine to ensure natural airflow.

Input connection

Before connecting the machine you should ensure that the correct supply is available. Details of the machine requirements can be found on the data plate of the machine or in the technical parameters shown in the manual.

The equipment should be connected by a suitably qualified competent person. Always ensure the equipment has a proper grounding.

Never connect the machine to the mains supply with the panels removed.

Output connections

Electrode polarity

In general when using manual arc welding electrodes the electrode holder is connected to the positive terminal and the work return to the negative terminal. Always consult the electrode manufacturer's data sheet if you have any doubts.

When using the machine for TIG welding the TIG torch should be connected to the negative terminal and the work return to the positive terminal

MMA welding

Insert the cable plug with electrode holder into the "+" socket on the front panel of the welding machine, and tighten it clockwise.

Insert the cable plug of the work return lead into the "-" socket on the front panel of the welding machine, and tighten it clockwise



TIG Welding

Insert the cable plug with the work clamp into the "+" socket on the front panel of the welding machine, and tighten it clockwise.

Insert the cables plug of the TIG torch into the "-" socket on the front panel of the machine and tighten clockwise.

Connect the TIG torch control switch into the socket on the machine front panel.



Connect the gas hose to the regulator / flowmeter located on the shield gas cylinder and connect the other end to the machine.

Operation

Before starting any welding activity ensure that you have suitable eye protection and protective clothing. Also take the necessary steps to protect any persons within the area.

MMA

After connecting the welding leads as detailed you will need to switch the power switch on the back panel to “ON”

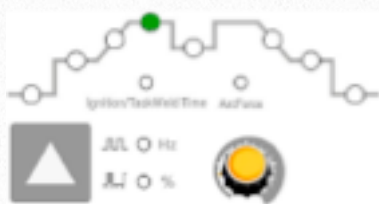
Select MMA mode by pressing the welding mode selecting key, and MMA can be carried out. There is voltage output at both output terminals.



At this time, the voltage indicator illuminates, and welding can be carried out.

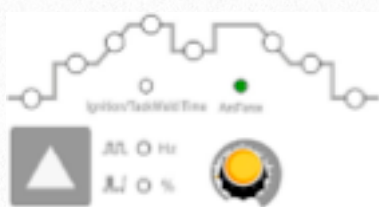


Set the amperage on the machine suitable for the electrode being used. Please see below a guide to amperages required. Ensure you check that you have the electrode polarity correct.



Electrode Diameter (mm)	Recommended Welding Current (A)
1.0	20~60
1.6	44~84
2.0	60~100
2.5	80~120
3.2	108~148
4.0	140~180
5.0	180~220
6.0	220~260

Select arc ignition time setting function (This function changes into spot welding time setting function in TIG spot welding mode.) by pressing the welding parameter selecting key, and arc ignition time in MMA can be set. This sets the arc ignition time.



Standard TIG mode

Connect the TIG torch leads as detailed above. Ensure that a suitable inert gas supply is connected.

Switch the power switch on the back panel to “ON”

Select the TIG welding mode using the selector switch.



Select the TIG operating mode (2T, 4T or Spot) using the selector switch.



2T:

Press the torch trigger, gas valve opens, and HF arc ignition starts; Keep the torch 2~4mm away from the work piece to ignite the arc. When the arc is established the HF stops, and current rises to the preset value; Release the torch trigger, current decreases to the minimum value, and then arc stops; Gas keeps flowing for the post-flow time, and welding ends.



4T:

Press the torch trigger, gas valve opens, and HF arc ignition starts; Keep the torch 2~4mm away from the work piece to ignite the arc. When the arc is established the HF stops, and current rises to the preset value; Release the torch trigger, and welding continues at the preset current level. Press the torch trigger again and release it, current begins to decrease to the minimum value, and then arc stops; Gas keeps flowing for the post-flow time, and welding ends.



After the parameters are set appropriately (For control keys see below), open the gas valve of the cylinder, and adjust the gas regulator to obtain the desired flow rate.

Keep the torch 2~4mm away from the work piece, and then press the torch trigger.

The gas solenoid valve operates. The gas will flow, and then HF output will start.

After arc is ignited, the HF discharge will cease, the current rises up to the preset value, and welding can be carried out. After releasing the torch trigger, the current begins to decrease as determined by the downslope setting to the pilot arc value. Then, arc stops with gas kept flowing for the post-flow time, and welding ends.

Spot TIG mode

Select the spot welding mode by pressing the operation mode selecting key.



Select the spot welding time setting function by pressing the welding parameter selecting key, and set the spot welding time. Operation steps in spot welding:



Press the torch trigger, gas valve opens, and HF arc ignition starts; Keep the torch 2~4mm away from the work piece to ignite the arc. When the arc is ignited the HF stops, and current rises to the preset value. Welding begins, and it ends when the preset spot welding time is reached. There is no current upslope and downslope in spot welding mode.

TIG guides

The recommended size of tungsten to be used can be selected from the table below

The welding current reference for different electrode diameter				
Electrode diameter /mm	1.6	2.0	2.5	3.2
Welding current /A	25-40	40-60	50-80	100-130

Electrode type

Type	Mode	Colour
Thoriated 2%	DC welding of steel, stainless steel and copper	Red
Ceriated	DC welding of steel, stainless steel and copper	Grey
Lanthanated	DC welding of steel, stainless steel and copper	Black

The corresponding relationship between gas nozzle diameter and electrode diameter

Gas nozzle diameter/mm	Electrode diameter/mm
6.4	0.5
8	1.0
9.5	1.6 or 2.4
11.1	3.2

For welder training please visit our Academy website at

www.wilkinson-welding-academy.com

Control keys

Standard TIG Mode

Select the pre-flow time setting function by pressing the welding parameter selecting key, and then set the pre-flow time.



Select the initial current setting function by pressing the welding parameter selecting key, and set the initial current.



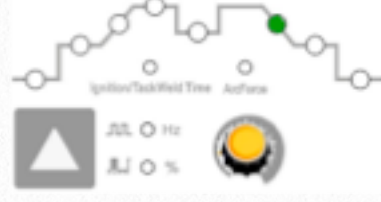
Select the upslope time setting function by pressing the welding parameter selecting key, and set the upslope time.



Select the welding current setting function by pressing the welding parameter selecting key, and set the welding current.



Select the downslope time setting function by pressing the welding parameter selecting key, and set the downslope time.



Select the pilot arc current setting function by pressing the welding parameter selecting key, and set the pilot arc current.



Select the post-flow time setting function by pressing the welding parameter selecting key, and set the post-flow time.



Pulsed TIG mode

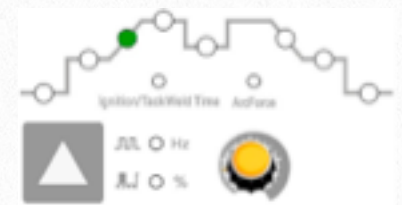
Select the pre-flow time setting function by pressing the welding parameter selecting key, and then set the pre-flow time.



Select the initial current setting function by pressing the welding parameter selecting key, and set the initial current.



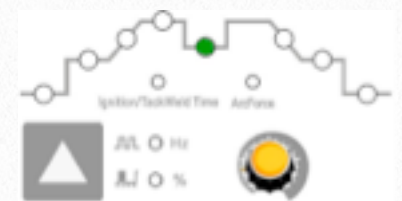
Select the upslope time setting function by pressing the welding parameter selecting key, and set the upslope time.



Select the welding current setting function by pressing the welding parameter selecting key, and set the welding current.



Select the base current setting function by pressing the welding parameter selecting key, and set the base current.



Select the downslope time setting function by pressing the welding parameter selecting key, and set the downslope time.



Select the pilot arc current setting function by pressing the welding parameter selecting key, and set the pilot arc current.



Select the post-flow time setting function by pressing the welding parameter selecting key, and set the post-flow time.



Select the pulse duration ratio setting function by pressing the welding parameter selecting key, and set the pulse duration ratio.



Select pulse frequency setting function by pressing the welding parameter selecting key, and set the pulse frequency.



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Maintenance and troubleshooting

The following operation requires sufficient professional knowledge on electric aspects and comprehensive safety knowledge. Make sure the input cable of the machine is disconnected from the electricity supply and wait for 5 minutes before removing the machine covers.

In order to guarantee that the arc welding machine works efficiently and in safety, it must be maintained regularly. Operators should understand the maintenance methods and means of arc welding machine operation. This guide should enable customers to carry on simple examination and safeguarding by oneself, try to reduce the fault rate and repair times of the arc welding machine, so as to lengthen service life of arc welding machine

Period	Maintenance item
Daily examination	Carry out a full visual inspection. Check for any damage to the machine, leads, cables and connections. Replace where necessary. Switch on the machine and check for any warning Led's and general operation
Monthly examination	Using the dry compressed air to clean the inside of arc welding machine. Especially check for build up of dust / debris on intake grills, main voltage transformer, inductance, IGBT module, the fast recover diode and PCB, etc. Take care when blowing electronic components and do not dislodge any wiring connections Check the security of output connections and plugs. Replace if signs of overheating.
Yearly examination	Carry out an annual service. Check earth continuity and insulation resistance of the machine at the relevant points. PLEASE NOTE THIS WORK SHOULD BE CARRIED OUT BY A TRAINED COMPETENT PERSON.

Troubleshooting

Before arc welding machines are dispatched from the factory, they have already been checked thoroughly. The machine should not be tampered with or altered.

Maintenance must be carried out carefully. If any wire becomes loose or is misplaced, it maybe potential danger to user!

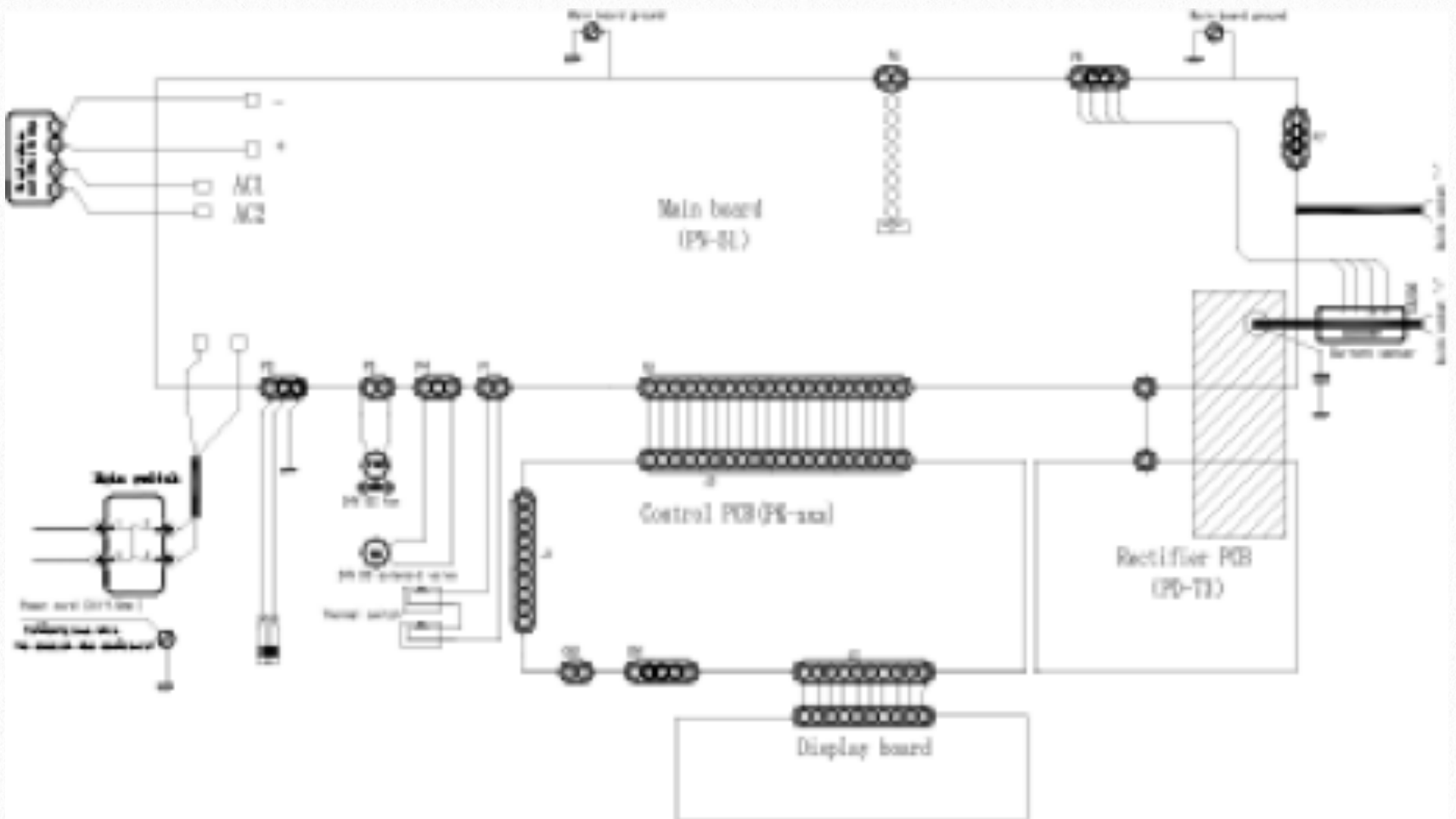
Only professional maintenance personnel should repair the machine!

Ensure the power is disconnected before working on the machine. Always wait 5 minutes after power switch off before opening the case.

Malfunction symptom	Causes and Solutions
Turn on the machine, the power LED is off, the fan doesn't work, and no welding output.	1 Check if the power switch is closed. 2 No input power.
Turn on the machine, the fan works, but the output current is unstable and can't be controlled by potentiometer when welding.	1 The current potentiometer fails. Replace it. 2 Check if any loose contact exists inside the machine. If any, reconnect.
Turn on the machine,, the fan works, but no welding output.	1 Check if any loose contact exists inside the machine. 2 Open circuit or loose contact occurs at the joint of output terminal. 3 The overheating LED is on. The machine is under over-heating protection status. It can recover automatically after the welding machine is cooled. 4 Check if the thermal switch is ok. Replace it if damaged. 5 Check if the thermal switch is loosely connected, and reconnect it if necessary.
The electrode holder becomes very hot.	The rated current of the electrode holder is smaller than its actual working current. Replace it with a higher rated current capacity.
Excessive spatter in MMA welding.	The output polarity connection is incorrect. Exchange the polarity.

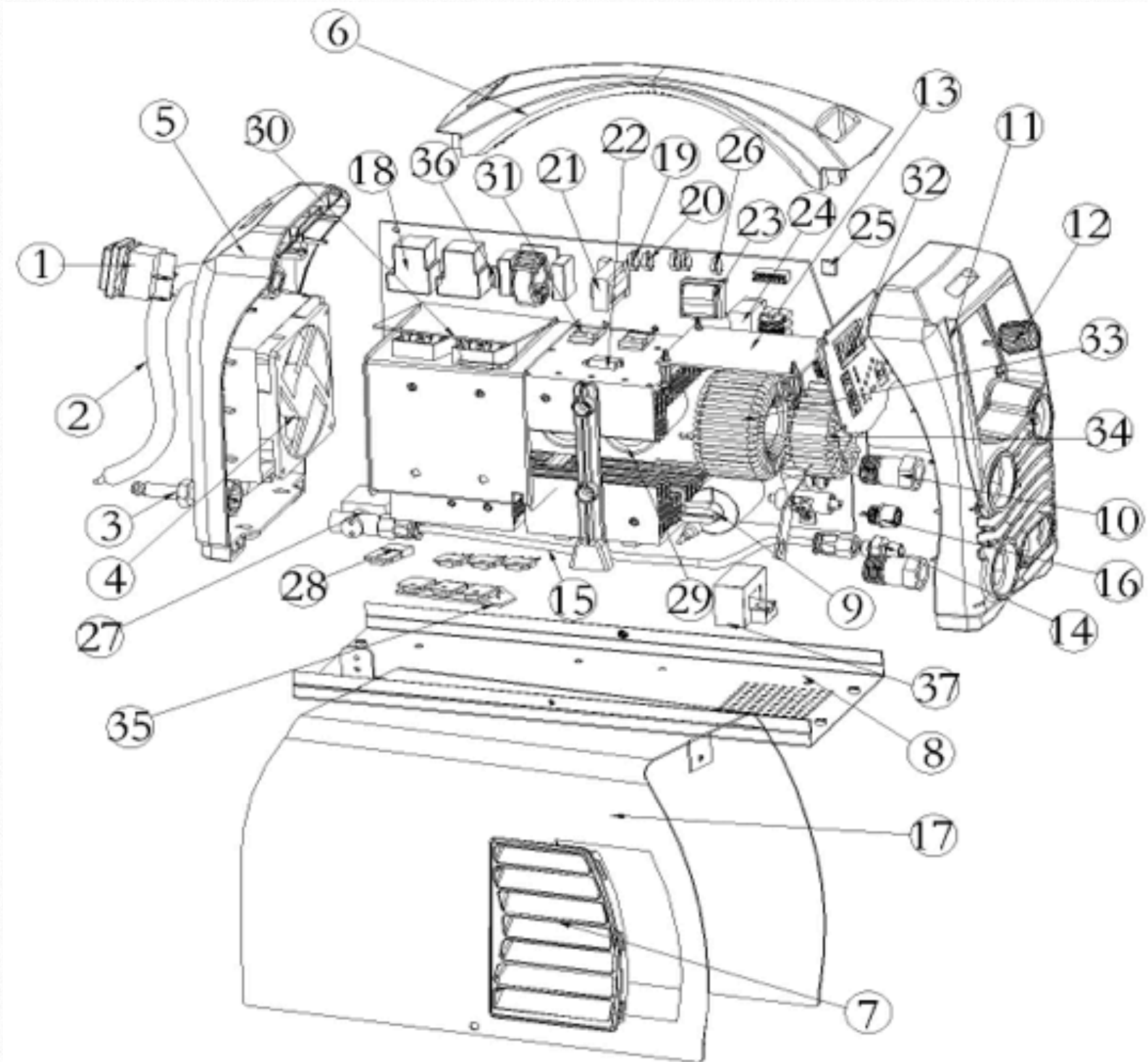
7

Electrical schematic



8

Parts list



No.	Part no	Description	No.	Part no	Description
1	10004949	Power switch	19	10006282	IRF9Z24N
2	10041432	Power line	20	10006282	IRFZ24N
3	10042342	Connector for input gas	21	10037135	Driver transformer
4	10044009	TIG200P Dual voltage fan	22	10041436	Thermal switch
5	10043460	Back Panel	23	10037134	Switching mode power supply transformer
6	10043476	Handle	24	10006477	12V Electric relay
7	10043689	Louver	25	10037146	TOP266KG
8	10042320	Bottom panel	26	10006673	KA7915
9	10041327	Isolation transformer	27	10040667	Solenoid valve
10	10021853	Quick socket	28	10037078	Pin insulation cover
11	10043469	Front Panel	29	10038719	TIG200P Dual voltage electrolytic capacitor
12	10042335	Knob	30	10037485	TIG200P Dual voltage silicon bridge board
13	10042994	Display panel	31	10029693	TIG200P Dual voltage IGBT
14	10040688	EPC connection between hose and gas connector	32	10042989	TIG200P Dual voltage control board
15	10040709	Hose	33	10041725	TIG200P Dual voltage high frequency transformer
16	10004684	Air socket	34	10041326	Arc Coil
17	10042323	Machine Cover	35	10037431	Rectifier board
18	10006474	Electric Relay	36	10041436	Thermal resistor

TIG 200PDV DC TIG/MMA WELDING MACHINE

Part number JT-200PDV

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Issue 1 January 2014

Product is subject to change without notice

JT-200 DC Pulsed TIG Series DC TIG/MMA WELDING MACHINE

Order code JT-200PDV (TIG 200PDV)

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