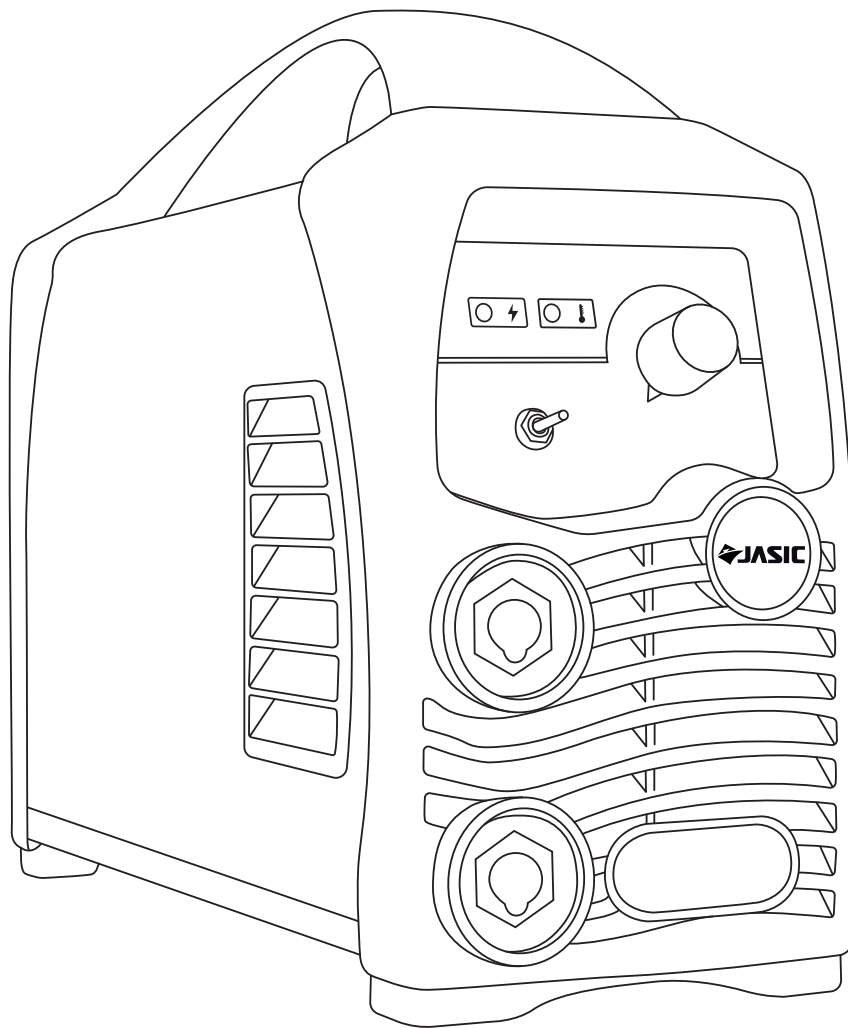


Power Arc Series

| Power Arc 160 PFC (JPA-160PFC) | Power Arc 180 (JPA-180SE) |



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 top or underside of the machine)

Disclaimer

Whilst every effort has been made to ensure that the information contained within this manual is complete and accurate, no liability can be accepted for any errors or omissions. Please note products are subject to continual development and may be subject to change without notice.

This manual should not be copied or reproduced without the written permission of Wilkinson Star Limited

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.

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

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

- Hot start arc ignition functions: ensure the arc ignition in MMA welding easier and more reliable.
- Wide input voltage range on the PFC models
- Anti-sticking function: Reduces the welding current if a short circuit occurs during welding.
- Self-adaptive arc force technology: Maintains the optimum arc conditions during welding even with long cables.
- Advanced scratch start arc ignition: supports TIG welding without HF arc ignition circuit.
- Optional VRD function: Provides additional safety keep the operator safe when the machine is idle.

Product performance characteristics

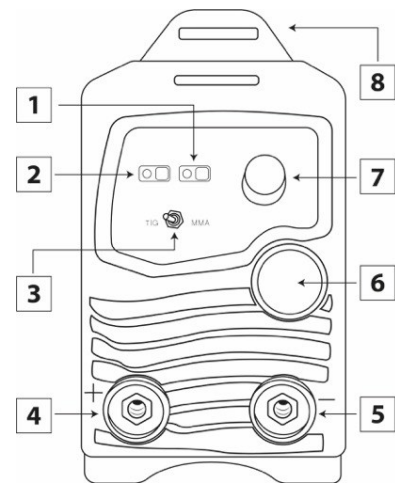
- Advanced IGBT inverter technology
- Inverting frequency of 33~43 kHz greatly reduces the size and weight of the welder.
- Great reduction in magnetic and resistance loss enhances the welding efficiency and energy saving effect.

- 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.

CONTROLS

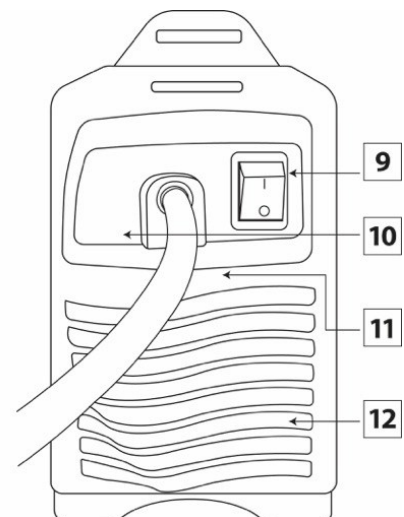
Front view

1. Overheating LED: Overheating LED on indicates that the temperature inside the machine is too high and the machine is under overheating protection status.
2. Power LED: Power LED on indicates that the power switch of the machine is on.
3. MMA/TIG switch: To toggle between MMA and TIG.
4. "+" Output terminal: To connect the electrode holder.
5. "-" Output terminal: To connect the work clamp.
6. Trademark
7. Welding current knob: To adjust the output current.
8. Handle



Rear view

- 9 Power switch
- 10 Warning label
- 11 Input cable gland
- 12 Cooling fan



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

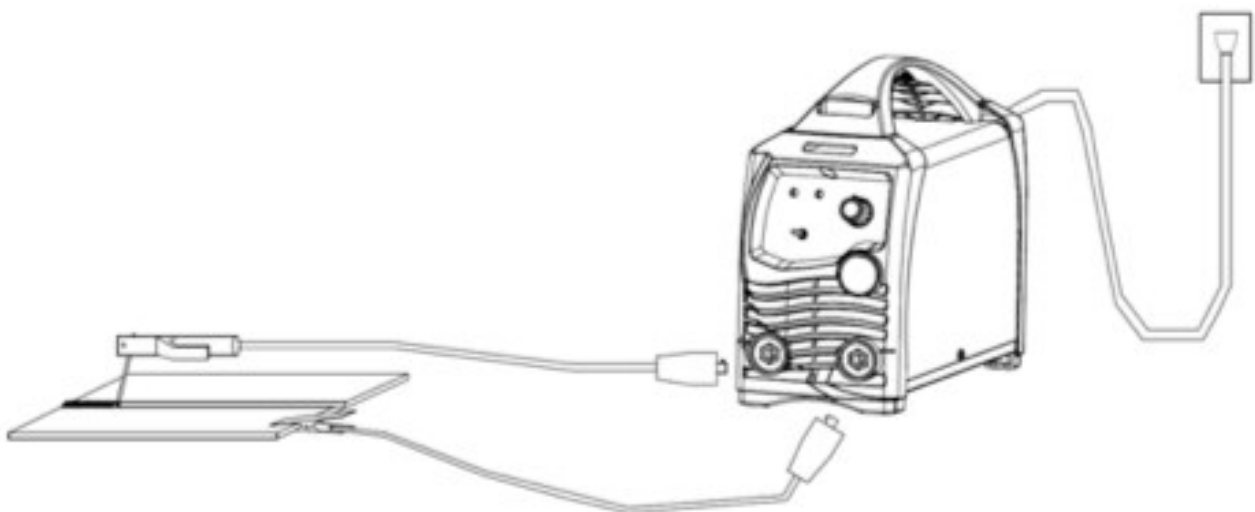
Electrode polarity

In general when using manual arc welding electrodes the electrode holder is connected 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.

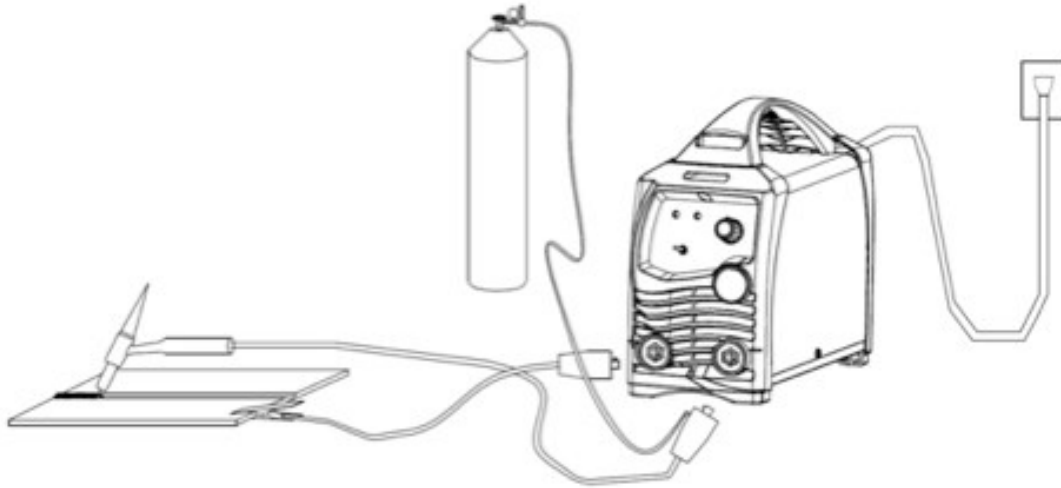
MMA welding

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 "-"ve 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 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 by switching to the MMA welding mode. There is voltage output at both output terminals. 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 |

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. There is voltage output at both output terminals.

After the parameters are set appropriately, open the gas valve of the cylinder, the gas valve on the torch and adjust the gas regulator to obtain the desired flow rate. The arc will start when the tungsten electrode touches the work piece and is lifted off after touching by between 2-4mm The arc will cease when the electrode (torch) is moved away from the work area.

TIG guides

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

| | | | | |
|------------------------|-------|--------|---------|---------|
| Electrode diameter /mm | 1.0 | 1.6 | 2.4 | 3.2 |
| Welding current /A | 15-80 | 70-150 | 150-250 | 250-400 |

Electrode types

| Type | Material to be welded | 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 |

Gas nozzle sizes

| Gas nozzle diameter/mm | Electrode diameter/mm |
|------------------------|-----------------------|
| 8 | 1.0 |
| 9.5 | 1.6 / 2.4 |
| 11.1 | 3.2 |

For welder training please contact our welding academy at

www.wilkinson-welding-academy.com

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 | Check the condition of the machine, mains cables, welding cables and connections. Check for any warnings LEDs and machine operation. |
| Monthly examination | Disconnect from the mains supply and wait for at least 5 minutes before removing the cover. Check internal connections and tighten if required. Clean the inside of the machine with a soft brush and vacuum cleaner. Take care not to remove any cables or cause damage to components. Ensure that ventilation grills are clear. Carefully replace the covers and test the unit. This work should be carried out by a suitably qualified competent person. |
| Yearly examination | Carry out an annual service to include safety check in accordance with the manufacturers standard (EN 60974-1). This work should be carried out by a suitably qualified 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.

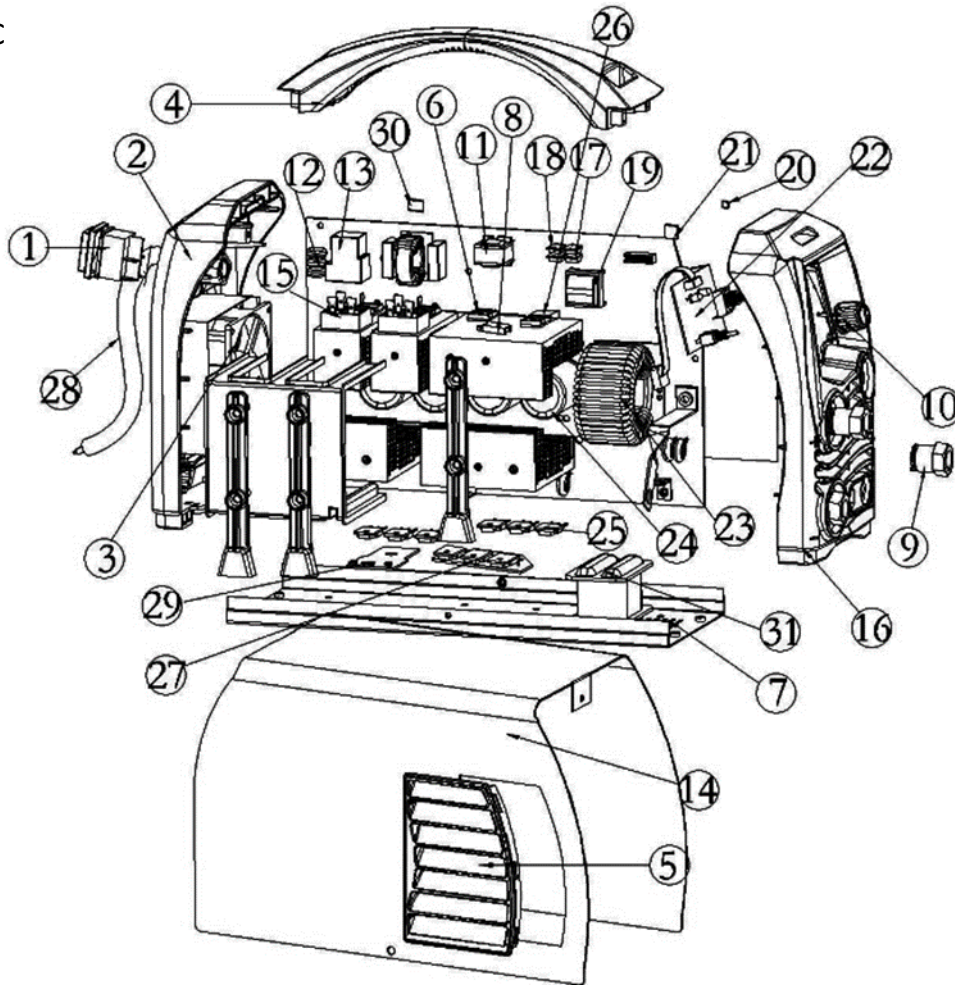
| | |
|------------------|---|
| Overheat LED lit | Machine operated outside duty cycle. Allow the machine to cool and the unit will reset automatically. Fan not working—Contact the Jasic service centre |
| No power | Mains LED lit — Contact the Jasic service centre Mains LED not Lit—Check the mains supply |

TECHNICAL PARAMETERS

| Technical Parameter | Unit | Model | | |
|----------------------------|------|-------------------------|---------|-----------------------|
| | | ARC160-PFC (JPA-160PFC) | | ARC180SE (JPA-180) |
| Rated input voltage | V | 95-230 +/- 15% 50/60HZ | | 230 +/- 15% 50/60 Hz |
| | | AC110V | AC2230V | AC230V |
| Rated input power | KVA | 3.71 | 5.02 | 8 |
| Welding current range | A | 10~125 | 10~160 | 10~180 |
| Rated duty cycle (40°C) | % | 35 | 35 | 35 |
| No-load voltage | V | 9/68 | 9/68 | 9/68 |
| Overall efficiency | % | 85 | | |
| Housing protection grade | IP | 21S | | |
| Power factor | cosφ | 0.998 | | 0.7 |
| Size without handle | mm | 365*135*235 | | 313*130*206 |
| Size with handle | | 365*135*277 | | 313*130*250 |
| Weight | Kg | 6.4 | | 4.7 |
| Applicable electrode sizes | mm | 1.0—3.2 | | 1.0—4.0 |
| Insulation grade | | F | | |
| Standard | | IEC60974-1 | | |
| Noise | db | <70 | | |

PARTS LIST

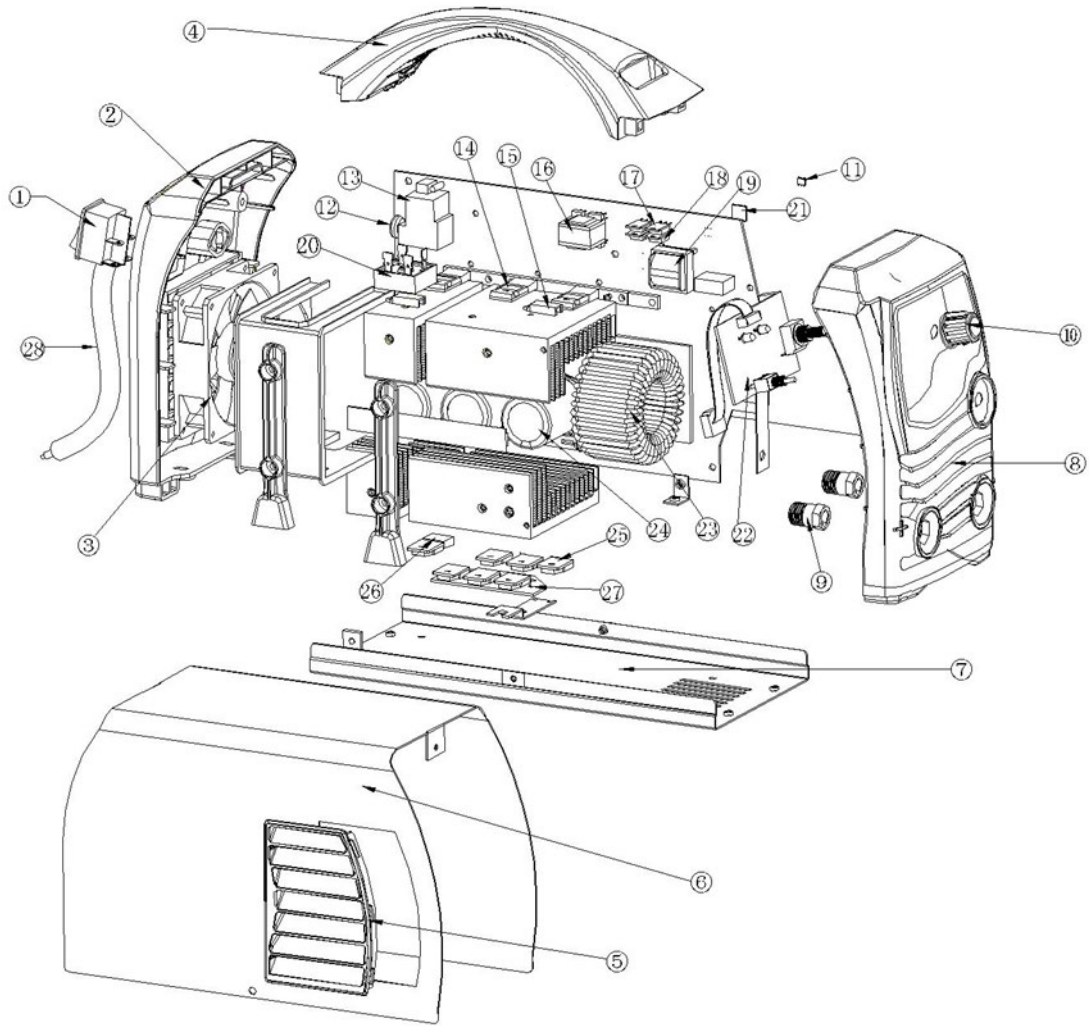
JPA-160PFC



| No. | Part no. | Part name | No. | Part no. | Part name |
|-----|----------|-------------------|-----|----------|-----------------------------|
| 1 | 10004949 | Power switch | 17 | 10006284 | |
| 2 | 10042343 | Back panel | 18 | 10006282 | |
| 3 | 10044009 | Fan | 19 | 10043392 | Switching power transformer |
| 4 | 10043476 | Handle | 20 | 10037147 | |
| 5 | 10043689 | Louver | 21 | 10037146 | |
| 6 | 10007251 | IGBT | 22 | 10059223 | Control PCB |
| 7 | 10059606 | Base | 23 | 10043393 | Main transformer |
| 8 | 10044032 | Thermal switch | 24 | 10005833 | Electrolytic capacitor |
| 9 | 10021853 | Quick socket | 25 | 10006248 | Rectifier diode |
| 10 | 10040930 | Knob | 26 | 10037078 | Pin insulation cover |
| 11 | 10037135 | Drive transformer | 27 | 10037431 | Rectifying PCB |
| 12 | 10006431 | Thermal resistor | 28 | 10044526 | Power cord |
| 13 | 10006474 | Relay | 29 | 10043331 | Rectifying PCB for PFC |
| 14 | 10059115 | Cover | 30 | 10033180 | |
| 15 | 10006650 | Silicon bridge 1 | 31 | 10006545 | Inductor |
| 16 | 10043469 | Front panel | | | |

PARTS LIST

JPA



| No. | Part no. | Part name | No. | Part no. | Part name |
|-----|-----------------|------------------|-----|----------|-----------------------------|
| 1 | 10047746 | Power switch | 15 | 10037859 | Thermal switch |
| 2 | 10037125 | Back panel | 16 | 10037135 | Drive transformer |
| 3 | 10044817 | Fan | 17 | 10006284 | |
| 4 | 10043477 | Handle | 18 | 10006282 | |
| 5 | 10043689 | Louver | 19 | 10037134 | Switching power transformer |
| 6 | 10059116 | Cover | 20 | 10006650 | Bridge rectifier |
| 7 | 10037113 | Base | 21 | 10037146 | |
| 8 | 10043405 | Front panel | 22 | 10043914 | Control PCB |
| 9 | 10044030 | Quick socket | 23 | 10054243 | Main transformer |
| 10 | 10040930 | Knob | 24 | 10037138 | Electrolytic capacitor |
| 11 | <u>10037147</u> | | 25 | 10006248 | Rectifier diode |
| 12 | <u>10006431</u> | Thermal resistor | 26 | 10037078 | Pin insulation cover |
| 13 | 10006474 | Relay | 27 | 10037431 | Rectifying PCB |
| 14 | 10007251 | IGBT | 28 | 10037858 | Power cord |

MACHINE DISPOSAL

Please do not dispose of electrical waste with normal waste products.

In accordance with the European directive 2002/96/EC regarding waste electrical and electronic equipment and its implementation into national law any electrical or electronic which has reached its end of life must be collected separately and disposed of via a suitable recycling facility.

The owner of the equipment is required to return the equipment to a suitable recycling facility or to Wilkinson Star Limited for the correct recycling of the product.

JPA Series

Arc 160 PFC Order code JPA-160PFC

Arc 180 SE Order code JPA-180SE

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