JASIC

www.jasic.co.uk

TIG Series

| TIG 300P DC Digital (JT-300P) |

Operator Manual

CE

RoHS 2002/95/EC

Intertek

WILKINSON STAR

wilkinsonstar.com

Your new product

Thank you for selecting this Jasic 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.

Please call Jasic 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 top or underside of the machine. This will start with AA*****)

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.

CONTENTS

SAFETY INSTRUCTION

These general safety norms cover both arc welding machines and plasma cutting machines unless otherwise noted.
It is important that users of this equipment protect yourselves and others from harm or even death.
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.
Pacemaker wearers should consult your doctor prior to using this equipment.
PPE and workplace safety equipment must be compatible for the application of work involved.

Always carry out a risk assessment before undertaking any welding or cutting activity

General electrical safety

The equipment should be installed by a qualified person and in accordance with current standards 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. 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.
In the case of abnormal behaviour of the equipment, the equipment should be checked by a suitably qualified service engineer.
If earth bonding of the work piece is required, bond it directly with a separate cable with a current carrying capacity capable of carrying the maximum capacity of the machine current.
Cables (both primary supply and welding) should be regularly checked for damage and overheating.
Never use worn, damaged, under sized or poorly jointed cables.
Insulate yourself from work and earth using dry insulating mats or covers big enough to prevent any physical contact.
Never touch the electrode if you are in contact with the work piece return.
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.
The EMC classification of this product is class A in accordance with electromagnetic compatibility standards CISPR 11 and IEC 60974-10 and therefore the product is designed to be used in industrial environment only.
WARNING: This class A equipment is not intended for use in residential locations where the electrical power is provided by a public low-voltage supply system. In those locations it may be difficult to ensure the electromagnetic compatibility due to conducted and radiated disturbances.

General operating safety

Never carry the equipment or suspend it by the carrying strap or handles during welding.
Never pull or lift the machine by the welding torch or other cables. Always use the correct lift points or handles. Always use the transport under gear as recommended by the manufacturer.
Never lift a machine with the gas cylinder mounted on it.
If the operating environment is classified as dangerous, only use S-marked welding equipment with a safe idle voltage level. Such environments may be for example: humid, hot or restricted accessibility spaces.

SAFETY INSTRUCTION

Use of Personal Protective Equipment (PPE)

Welding arc rays from all welding processes produce intense, visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin.

- Wear an approved welding helmet fitted with an appropriate 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, gloves and footwear.
- Check and be sure the area is safe and clear of inflammable material before carrying out any welding.

Some welding and cutting operations may produce noise. Wear safety ear protection to protect your hearing if the ambient noise level exceeds the local allowable limit (e.g: 85 dB).

Welding and Cutting Lens Shade Selector Guide

CURRENT	MMA ELECTRODES	MIG LIGHT ALLOYS	MIG HEAVY METALS	MAG	TIG ON ALL METALS	PLASMA CUTTING	PLASMA WELDING	GOUGING ARC/AIR
10	8							
15					9		10	
20								
30	9	10	10	10	10			
40						11	11	
60	10							10
80					11			
100				11			12	
125	11	11						
150			11	12	12			
175								
200							13	11
225		12			13	12		
250	12		12	13				12
275		13						
300								13
350					14		14	
400	13	14	13	14		13		14
450								
500	14	15	14	15				15

SAFETY INSTRUCTION

Safety against fumes and welding gases

The HSE have identified welders as being an 'at risk' group for occupational diseases arising from exposure to dusts, gases, vapours and welding fumes. The main identified health effects are pneumonia, asthma, chronic obstructive pulmonary disease (COPD), lung and kidney cancer, metal fume fever (MFF) and lung function changes.
During welding and hot cutting 'hot work' operations, fumes are produced which are collectively known as welding fume. Depending upon the type of welding process being performed, the resultant fume generated is a complex and highly variable mixture of gases and particulates.
Regardless of the length of welding being carried out, all welding fume, including mild steel welding requires suitable engineering controls to be in place which is usually Local Exhaust Ventilation (LEV) extraction to reduce the exposure to welding fume indoors and where LEV does not adequately control exposure it should also be enhanced by using suitable respiratory protective equipment (RPE) to assist with protecting against residual fume.
When welding outdoors appropriate RPE should be used.


An example of personal fume protection

Prior to undertaking any welding tasks an appropriate risk assessment should be carried out to ensure expected control measures are in place.

Locate the equipment in a well-ventilated position and keep your head out of the welding fume.
Do not breathe the welding fume.
Ensure the welding zone is well-ventilated and provision should be made for suitable local fume extraction system to be in place.
If ventilation is poor, wear an approved airfed welding helmet or 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.

<u>For further information please refer to the HSE website www.hse.gov.uk for related documentation.</u>

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 welding and cutting area.
Remove all flammable and combustible materials from the welding, cutting and surrounding areas.

Do not weld or cut fuel and lubricant containers, even if empty. These must be carefully cleaned before they can be welded or cut.
Always allow the welded or cut 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.
Take care to avoid accidental contact of electrode to metal objects. This could cause arcs, explosion, overheating or fire.

<u>Understand your fire extinguishers</u>

SAFETY INSTRUCTION

The working environment

Ensure the machine is mounted in a safe and stable position allowing for cooling air circulation.
Do not operate equipment in an environment outside the laid down operating parameters.
The welding power source is not suitable for use in rain or snow.
Always store the machine in a clean, dry space.
Ensure the equipment is kept clean from dust build up.
Always use the machine in an upright position.

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 towards your body.
Always ensure machine covers and protective devices are in operation.

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.
Keep the torch cable and work return cable as close to each other as possible throughout their length.
This can help minimise your exposure to harmful magnetic fields.
Do not wrap the cables around the body.

Handling of compressed gas cylinders and regulators

Mishandling gas cylinders can lead to rupture and the release of high pressure gas

Always check the gas cylinder is the correct type for the welding to be carried out.
Always store and use cylinders in an upright and secure position.
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 and never move with regulator and hoses connected.
Use a suitable trolley for moving cylinders.
Regularly check all connections and joints for leaks.
Full and empty cylinders should be stored separately.

Never deface or alter any cylinder

SAFETY INSTRUCTION

RF Declaration

Equipment that complies with directive 2014/30/EU 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

Welding equipment is manufactured with BSI published standards meeting CE requirements materials which do not contain any toxic or poisonous materials dangerous to the operator.
Do not dispose of the equipment with normal waste. The European Directive 2012/19/EU 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 for disposal.

For more detailed information please refer to the HSE website www.hse.gov.uk

PRODUCT OVERVIEW

This is a digital DC inverter welder with complete functions, high performance and advanced technology. It is a multi-function welder with DC TIG welding, DC pulsed TIG welding, coated electrode manual welding and TIG spot welding. It can be widely used in the fine welding operations of various types of metal materials except aluminum and aluminum alloy.

The unique electrical structure and air duct design inside the machine can accelerate the dissipating of the heat generated by the power devices, thus increasing the duty cycle of the machine. The unique air duct is designed to be “air tight” and can provide an effective dust proof and waterproof performance, thus greatly improving the reliability of the machine.

The overall shape of the machine is streamlined and the front and rear panels use a large arc of transition to make the panels natural and seamless. The front and rear panels and handle of the main unit are coated with rubber oil which makes the texture of the machine handle easy to hold and provides a good grip.

The TIG 300P provides excellent welding performance, rich function integration, high efficiency, small size, light weight and many other features make it able to meet the welding requirements of all types of welding applications.

Jasic TIG 300P Product Features:

- A variety of welding modes: DC TIG welding, DC pulsed TIG welding and shielded metal arc welding (MMA).
- Multiple remote current control options: Foot pedal remote control, digital torch remote control and analog torch remote control.
- Real-time display of output current: Displays the output status of the welder.
- Operating status is displayed by LED indicators dynamically and the current operating status is displayed constantly.
- Hot start for manual welding: Enables the arc striking during manual welding to be easier and more reliable starts.
- VRD function: Ensures the personal safety of the operator and prevents electric shock due to high voltage in MMA mode.
- Anti-sticking function: Prevents the welding electrode from sticking to the work piece during welding.
- Auto-adaptive arc force: Improves significantly the welder’s performance in extended length welding

and makes long distance welding possible.

- Advanced arc striking function: TIG welding supports contact arc ignition and non-contact arc ignition. A high-voltage arc ignition circuit improves the success rate of high-frequency arc striking.
- Intelligent fan control: Energy efficiency and noise is reduced as the fan runs “on demand”. This reduces the amount of dust that is deposited inside the machine, thus increasing the service.
- Parameter storage: This is the function to save parameters through multiple channels and keep the parameters saved ready for recall at any time.
- Cooling tank interface: Enables the intelligent control on water system so the unit only operates “on demand”.
- Diagnosis and protection system based on ARM enables the machine to conduct a power-on self-test and detect any problems instantly. Multiple protection systems including phase loss protection, over-current protection, over and under voltage protection, overheat protection etc. helps to enhance the service life of the machine.

TECHNICAL SPECIFICATIONS

Item name		Unit	Parameters
Output	Supply voltage	V	AC400V±15%
	Input frequency	Hz	50/60
	Rated input current	A	16.0@TIG 14.0@MMA
	Power capacity	KVA	9.5@TIG 8.5@MMA
MMA output	Output current	A	20~210
	Arc force current	A	0~60
	Hot start current	A	0~60
	No-load voltage	V	60
	VRD voltage	V	11.8
	Duty cycle	%	50
TIG welding output	Output current	A	5~300
	No-load voltage	V	60
	Initial current range	A	5~300
	Crater current range	A	5~300
	Peak current range	A	5~300
	Base current range	A	5~300
	Pulse frequency range	Hz	0.5~200
	Pulse duty cycle	%	10~90
	Pre flow time	s	0~15
	Post flow time	s	0.5~15
	Upslope time	s	0~10
	Downslope time	s	0~10
	Spot welding time	s	0.1~10
	Duty cycle	%	20
	Arc ignition methods		High-frequency arc start, lift arc start
Efficiency		%	85
Power factor		Cos	0.84
Insulation class			F
Cooling system			Fan
Enclosure protection level			IP23S
Operating temperature range		^{0}C	-10^0 to $+40^0$
Storage temperature range		^{0}C	-25^0 to $+55^0$
Humidity		%	≤90 (No condensation of water drops)
Welder dimensions		mm	566 x 223.5 x 405
Weight		kg	19.4

Please Note

Due to variations in manufactured products all claimed performance ratings, capacities, measurements, dimensions and weights quoted are approximate only. Achievable performance and ratings when in use can depend upon correct installation, applications and use along with regular maintenance and service.

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

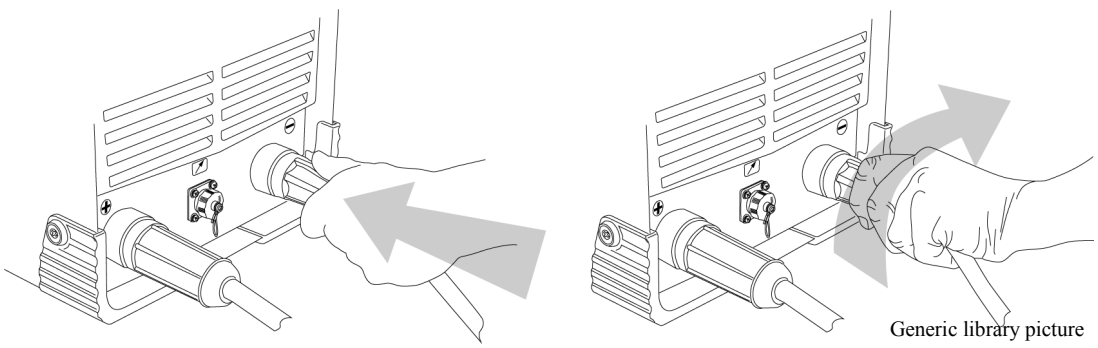
In general when using manual arc welding electrodes the electrode holder is connected to the positive terminal and the work return to the negative terminal.
"+" output terminal: For MMA connect the electrode holder
"-" output terminal: For MMA connect the work return lead
Always consult the electrode 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.
"+" output terminal: For TIG connect the work return lead
"-" output terminal: For TIG connect the TIG torch

Gas connections

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

Please Note:
Check these power connections daily to ensure they have not become loose otherwise arcing may occur when used under load.



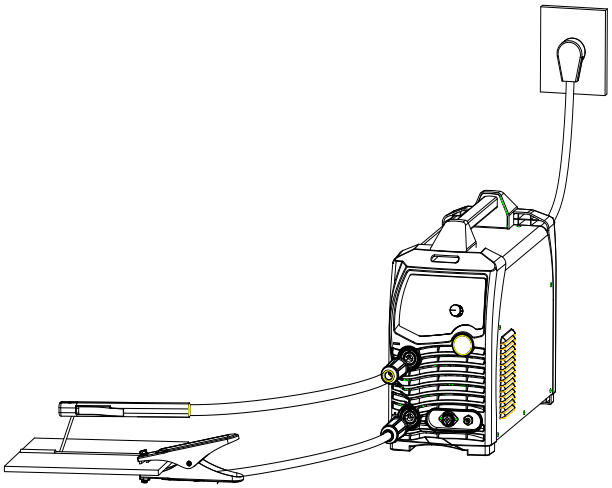
Generic library picture

INSTALLATION

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. Example shown below:



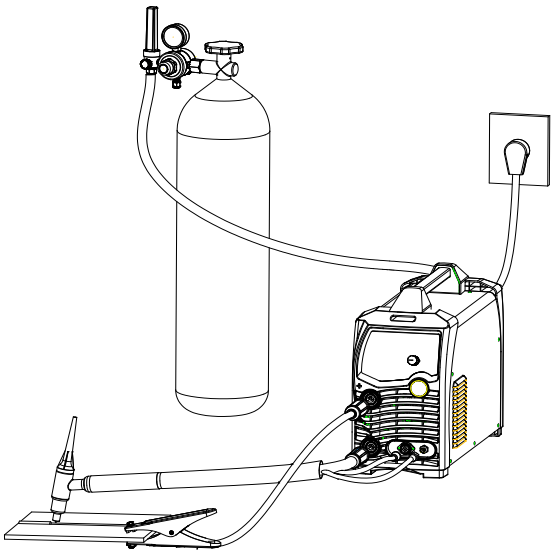
TIG welding

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 quick connector into the outlet on the machine front.

Connect the torch switch plug into the socket on the front panel. Example shown below:

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

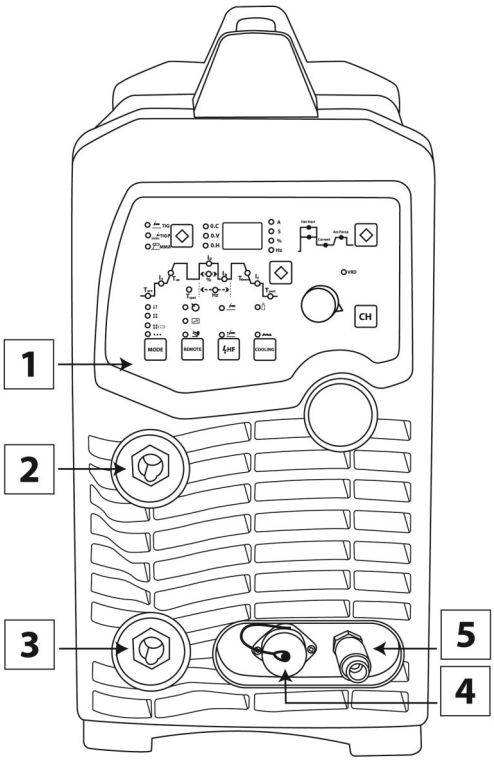


Before starting any welding activity ensure that you have suitable eye protection, protective clothing and all required PPE. Also take the necessary steps to protect any persons within the area.

CONTROLS

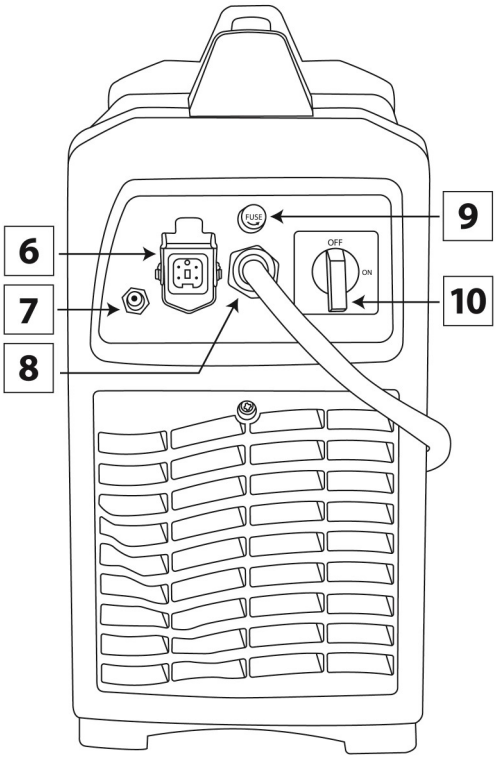
Front view Jasic TIG 300P

1. Control panel
2. "+" output terminal: To connect the work
3. "-" output terminal: To connect the TIG torch
4. Remote control socket
5. Gas terminal: To connect the gas hose of the TIG torch

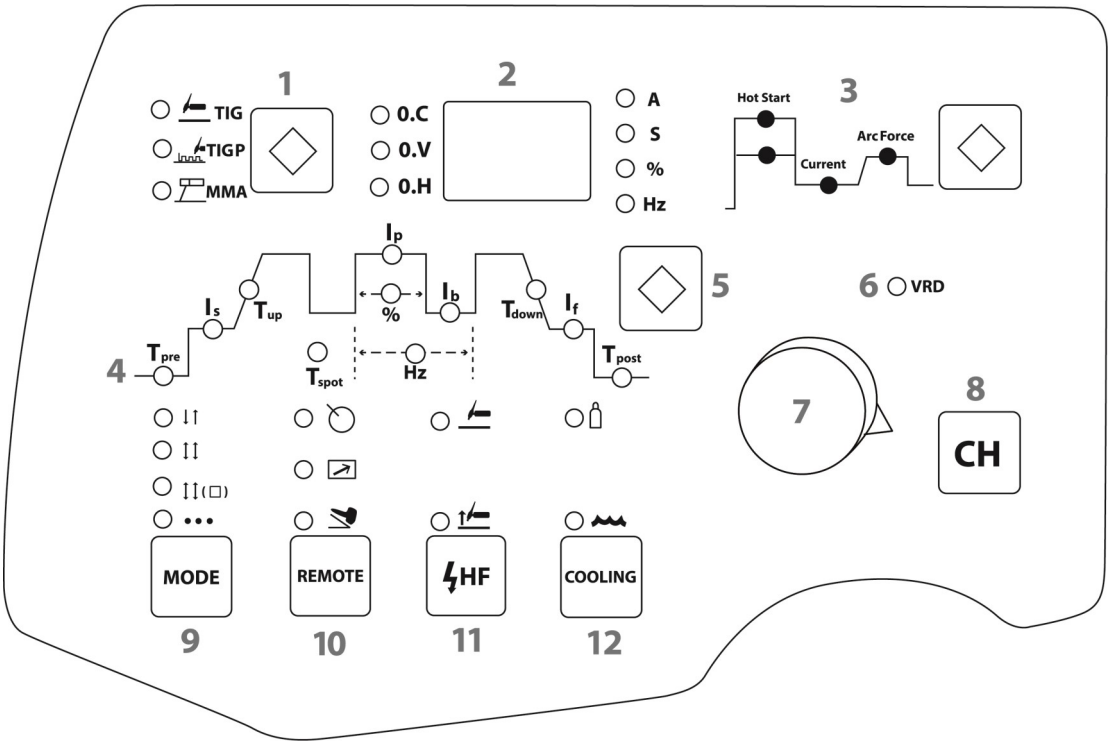


Rear view Jasic TIG 300P

6. Cooler supply connector
7. Gas inlet connector
8. Mains power cable
9. Fuse for cooler unit
10. Mains power switch



Control panel Jasic TIG 300P



1. Welding mode selection area
2. Data/alarm display
3. MMA parameter selection area
4. TIG parameter selection area
5. Selector button
6. VRD (voltage reduction device) indicator
7. Adjustment knob
8. Storage channel selector
9. TIG switch mode selection area
10. Remote current control mode selection area
11. TIG starting mode selection area (contact or non contact ignition)
12. Cooling selector switch (water or air)

Control panel features

1 Welding mode selection

Mode selector switch

There are DC TIG welding mode, DC pulse TIG welding modes and MMA mode available for selection by the operator. Selection takes place as below:

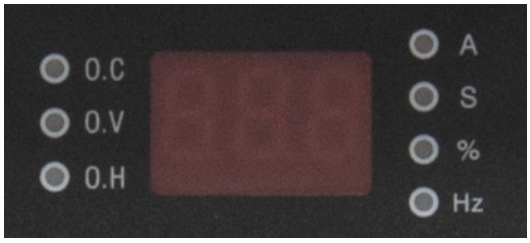
Press the selector button until the LED lights on the selected mode.

TIG MODE

PULSE TIG MODE

MMA

2 Data/alarm display



Overcurrent protection indicator

Voltage anomaly indicator

Overheat protection indicator

Current unit indicator (A)

Time unit indicator (T)

Pulse duty indicator (%)

Pulse frequency indicator (Hz)

The display indicates: 1 Current
2 Time
3 Frequency
4 Percentage
5 Storage channel number
6 Error code number

The “A” indicator lights up when current is displayed.

The “S” indicator lights up when time is displayed.

The “Hz” indicator lights up when frequency is displayed.

The “%” indicator lights up when percentage is displayed.

The “O.C” indicator lights up and the segment display shows “E-1” when overcurrent protection is enabled.

The “O.V” indicator lights up and the segment display shows “E-4” when voltage abnormality occurs.

The “O.H” indicator lights up and the segment display shows “E-3” when overheat protection is enabled.

3 MMA welding mode selection

Mode selector switch

Press the selector button until the LED lights on the selected mode MMA.

TIG MODE

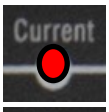
PULSE TIG MODE

MMA

Press the selector button until the LED lights on the selected parameter you wish to adjust.

Hot start - When lit the hot start current can be adjusted by turning the adjustment knob to the required setting.

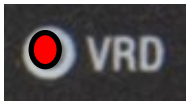
Current - When lit the welding current can be adjusted by turning the adjustment knob to the required setting.



Arc force - When lit the arc force current can be adjusted by turning the adjustment knob to the required setting.

Adjustment knob

VRD - When lit the VRD means that the no-load voltage is reduced to 11.8VDC. When the arc is struck operation is as normal. The default setting of VRD from the factory is OFF.



4 TIG parameter selection area

Press the selector button until the LED lights on the selected mode TIG mode.

TIG MODE 

PULSE TIG MODE 

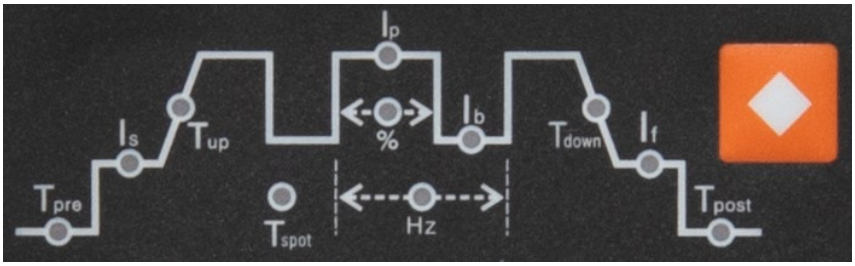
MMA 

Press the selector button in the parameter selection area until the LED lights on the selected parameter you wish to adjust. When lit use the adjustment knob to adjust the parameter.

Selector button

Adjustment knob

TIG PARAMETER SELECTION AREA



DC TIG mode

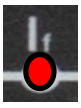
Pre flow gas parameter - Seconds. The gas will flow for the set time before arc striking commences.

Start current parameter - Amps. The value of current at which the arc will strike.

Upslope parameter - Seconds. The time taken for the current to rise from the start current value to the welding current value.

Welding current - Amps. This is the value of the welding current (or peak welding current in Pulse TIG mode).

Downslope parameter - Seconds. The time taken for the current to fall from the welding current value to the finish current value.



Finish current parameter - Amps. This is the value of current at the end of the downslope time and will remain until the torch trigger is released.

Post flow gas parameter - Seconds. The gas will flow for the set time after the arc is extinguished. This is to shield the weld zone as it cools.

DC Pulse TIG mode

Press the selector button until the LED lights on the selected mode TIG Pulse mode.

TIG MODE 

PULSE TIG MODE 

MMA 

Selection of the parameters in the Pulse TIG mode will be as in standard TIG with the following additional parameters.

Background current parameter - Amps. The value of background current when welding in the pulse mode (this will be lower than the welding or peak current).

Pulse duty parameter - %. The value of welding/peak current on time when welding in the pulse mode.

Pulse frequency parameter - Hz. The value of pulse frequency when welding in the pulse mode (number of pulse per second). One pulse includes both peak and background time.

5 Selector switch

This button is used to navigate around the control panel.

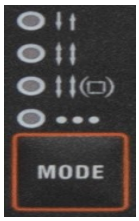
6 VRD Indicator

This will be lit when the machine is in MMA mode and the VRD function is enabled.

7 Adjustment knob

This knob is used to adjust parameter values by rotation.

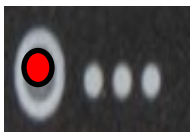
8 TIG switch mode selection area



By pressing the mode switch when in either TIG or TIG Pulse mode the method of switching can be selected.

2T mode
Press the torch to start and release to end the welding process.

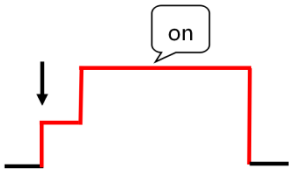
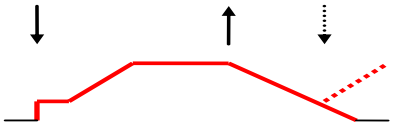
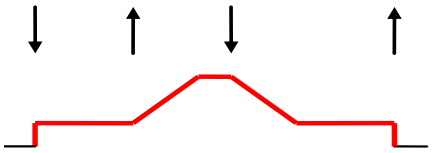
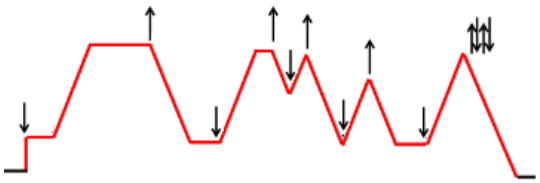
4T mode
Press the torch to start at the preset start current. Release the trigger to upslope to the welding current and weld. Press and hold the trigger to slope down to the final current. Release the trigger to end the arc and enter the post flow gas time.



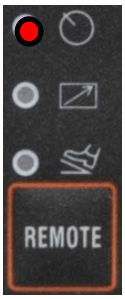
Spot mode
Press the torch to start the process. The process will end when the spot time that was set is reached even if the trigger is held down. To rest the spot time release the trigger and re operate the trigger again.

Cycle mode
Press the torch to start at the preset start current. Release the trigger to upslope to the welding current and weld. Press and hold the trigger to slope down to the final current. Release the trigger to restart the cycle. To end the process press and release the trigger consecutively within 300 milliseconds.

Diagram of commonly used torch switch operations			
↓	Press the torch switch	↑	Release the torch switch

Mode No.	Conventional operations	Torch switch operation and typical DC TIG arc current curve
1	Spot welding: Press the torch switch to strike an arc . Arc terminates after the set time of spot welding. Arc will terminate if the torch switch is released even during the set time of spot welding.	
2	Standard two-step (2T) method: 1. After preflow, the arc will be struck and the current will slope up to the set weld/peak current. 2. When the torch switch is released, the current will slope down to the finish/crater current and gas valve will be shut off after post flow. 3. If the torch switch is pressed again before arc termination, it goes upslope to the peak current.	
3	Standard four-step (4T) method: 1. The arc will be struck when the torch switch is pressed down with current rising to the initial value. 2. The current will slope up to the peak value when the torch switch is released. 3. The current will downslope to the crater current when the torch switch is pressed down. 4. The arc will be terminated when the torch switch is released.	
4	Cycle mode: 1. The current will slope up to the welding current when the torch switch is pressed down. 2. The current will downslope to the crater current when the torch switch is released. 3. The current will go upslope to the welding current when the torch switch is pressed down again. 4. It then enters into the cycling mode and cycles between step 2 and step 3. 5. Press the torch switch twice consecutively within 300 milliseconds to exit the cycle mode.	

9 Remote current control mode selection area



To select the appropriate remote current control press the remote button until the LED is lit alongside your chosen preference.

Without welding press the remote until the LED is lit and this indicates that the machine is ready for digital (up/down button) torch control.

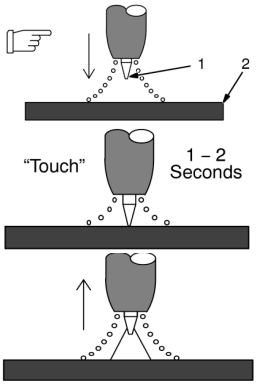
Without welding press the remote until the LED is lit and this indicates that the machine is ready for analog (potentiometer type) torch control.

Without welding press the remote until the LED is lit and this indicates that the machine is ready for foot pedal control.

10 TIG starting mode selection area (contact or non contact ignition)

To select the appropriate starting mode press the HF button until the LED is lit alongside your chosen preference.

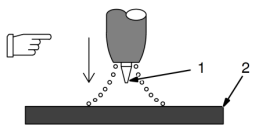
When the LED is lit in this position the machine is in contact mode ignition. There are two ways of operation in this mode.



Contact ignition - Option 1
Hold the torch above the workpiece (2) and operate the trigger, gas will flow. Move the torch down so that the tungsten (1) touches the workpiece for 1-2 seconds. Lift the torch so the tungsten moves away from the workpiece and the arc will establish.

Contact ignition - Option 2
Touch the tungsten to the workpiece. Press the torch trigger and withdraw the tungsten away from the workpiece to start the arc.

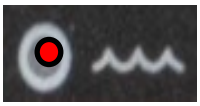
When the LED is lit in this position the machine is in HF/non contact mode ignition.



HF/Non contact ignition
Hold the torch above the workpiece (2) at a gap of around 8mm and operate the trigger, gas will flow and high frequency (HF) will cross the gap to start the arc without contact.

11 Cooling selector switch (water or air)

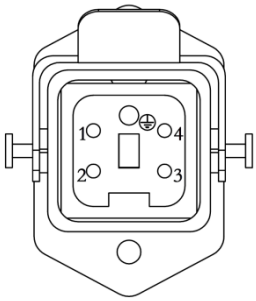
Press the water tank control button to turn on/off water cooling mode.



When this indicator is lit it shows the machine is in water cooling mode. When a welding arc is established the cooler unit will start and stop automatically after welding is complete. When the cooler runs and no welding is carried out it will automatically turn of after 15 minutes.

When this indicator is lit it shows the machine is in air cooling mode. The cooler will not start and if a water cooled torch is used then this will likely fail.

Note: Connect the water tank only after the welder is powered off.



Water cooler connector

1. Pin1 and Pin2 are the 230V AC output terminals of the water tank.
2. Pin3 and Pin4 are the error signal input terminals of the water cooler.

ERROR CODES

Removing covers is dangerous and checks should be carried out by qualified persons only. Always wait for at least 5 minutes after the power is switched off before removing any covers

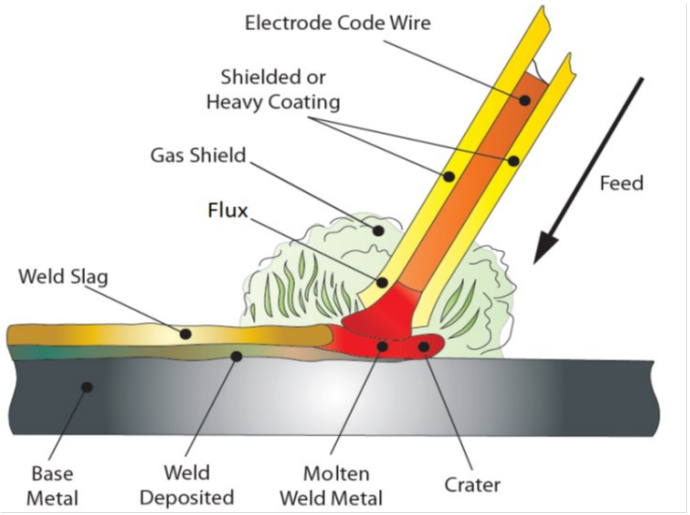
Error code	Category	Symptom	Causes	User measures
E10	Overcurrent	Permanently turns off the main circuit;	Current-sensing circuit is damaged or overcurrent protection of main power components is triggered.	Please power off the machine and restart it. If the failure cannot be solved, contact the service department for assistance.
E34	Undervoltage	Permanently turns off the main circuit;	Auxiliary power supply is abnormal.	Please power off the machine and check if the auxiliary power supply cable is connected properly. If the problem cannot be solved, contact the service department for assistance.
E60	Overheated	Temporarily turns off the main circuit.	The main circuit has been working for too long to the extent that exceeds its duty cycle.	Do not power off the machine. Wait until the main circuit cools down and then resume the welding.
E30	Overvoltage/ undervoltage/ phase loss	Permanently turns off the main circuit.	Phase loss may be caused by phase loss of the input power supply. The voltage of input power supply is not within the specified voltage range. The input power is not sufficient.	Please check if normal input power supply is provided or not.
E71	Lack of water supply	Temporarily turns off the main circuit.	There is insufficient coolant in the tank. The coolant path is blocked.	Check if the coolant level in the tank is within the required range. Check the coolant path for blockages, kinks etc..
E13	Current feedback is abnormal.	Permanently turns off the main circuit.	The current feedback line has a poor connection. The processing circuit for current feedback is abnormal or the Hall current sensor doesn't work normally.	Please power off the machine and check the connection of the current feedback line. Contact the service department for assistance. .
E33	Voltage feedback is abnormal.	Permanently turns off the main circuit.	The voltage feedback line has a poor connection. The processing circuit for voltage feedback is abnormal.	Please power off the machine and check the connection of the voltage feedback line. Contact the service department for assistance.

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 welding area.

MMA welding mode

MMA (Manual Metal Arc), SMAW (Shielded Metal Arc Welding) or just Stick Welding.

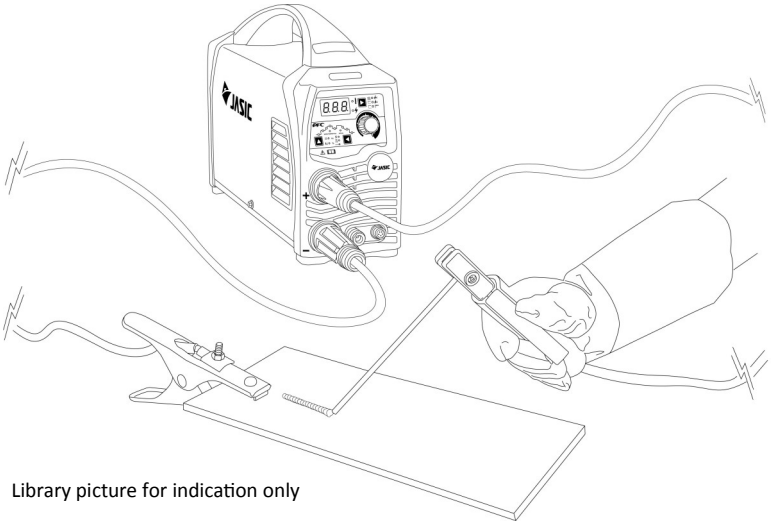


Stick welding is an arc welding process which melts and joins metals by heating them with an arc between a covered metal electrode and the work.

Shielding is obtained from the electrode outer coating, often called flux. Filler metal is primarily obtained from the electrode core.

The electrodes outer coating called flux assists in creating the arc and provides a shielding gas and on cooling forms a slag covering to protect the weld from contamination.

When the electrode is moved along the work piece at the correct speed the metal core deposits a uniformed layer called the weld bead.



Library picture for indication only

After connecting the welding leads as detailed you will need to switch the power switch on the back panel to “ON”, the machines power LED comes on and the fan is working.

Select MMA by switching to the MMA welding mode. There is voltage output at both output terminals.

Ensure you check that you have the electrode polarity correct.

Set the amperage on the machine suitable for the electrode being used.

Please see the guide below to amperages required, although this MMA welding electrode guide can vary depending on material, work piece thickness, welding position and joint form.

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

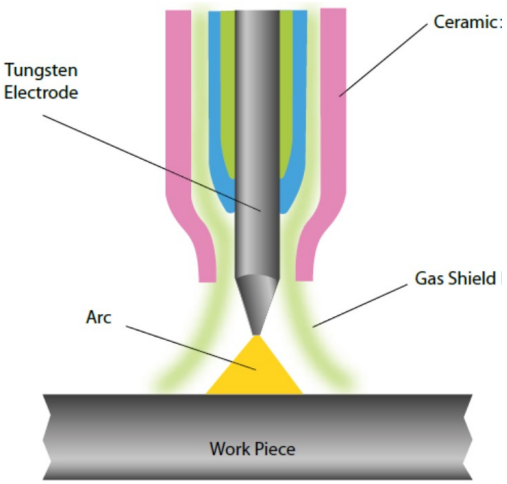
OPERATION

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 welding area.

TIG welding mode

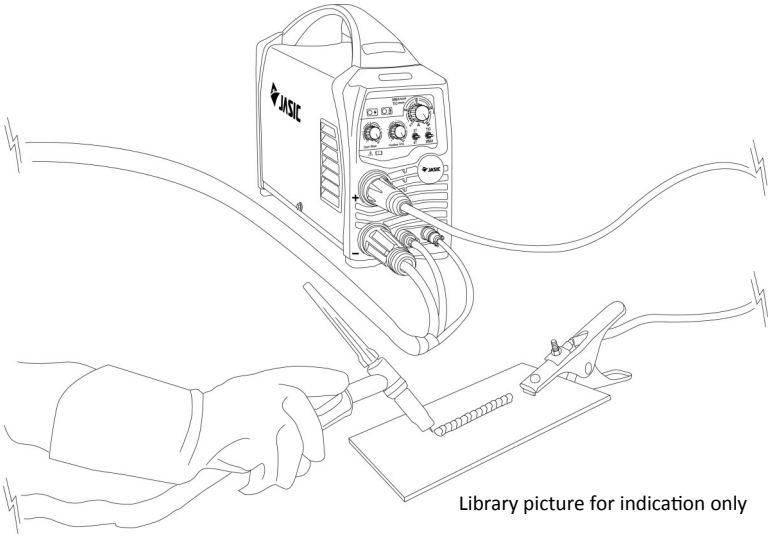
Terms used: TIG – Tungsten Inert Gas, GTAW – Gas Tungsten Arc Welding.

TIG welding is an arc welding process that uses a non-consumable tungsten electrode to produce the heat for welding.



The weld area is protected from atmospheric contamination by a shielding gas (usually an inert gas such as argon or helium) and a filler rod matching the base material is normally used, though some welds, known as autogenous welds, are carried out without the need for filler wire.

TIG Process can be either DC or AC modes:
DC - Direct current for welding steel, stainless steel, copper etc.
AC - Alternating current for welding aluminium and it's alloys.



Library picture for indication only

Connect the TIG torch leads as shown.

Ensure that a suitable inert gas supply is connected.

Switch the power switch on the back panel to "ON" the machine is started with the power LED on and the fan working.

Switch the MMA/TIG switch to TIG mode.

Open the gas valve of the cylinder and adjust the gas regulator to obtain the desired flow rate.

Press the torch trigger briefly, the solenoid valve will operate and gas will flow.

Adjust the welding current according to the thickness of the work piece to be welded (for a guide to welding parameters, please refer to the table below).

Hold the torch 2-4mm away from the work piece then press the torch trigger. After the arc is ignited, the HF discharge will cease, the current will maintain the preset value and welding can be carried out.

After releasing the torch trigger, the welding arc stops but gas continues flowing for the post flow time and welding ends.

Adjust the downslope time potentiometer to change the time according to the welding process requirements.

The amperage guide for TIG welding tungsten sizes can vary depending on material, work piece thickness, welding position and joint form.

Tungsten Size	DC – Electrode Negative
1.0mm	15 – 80A
1.6mm	70 – 150A
2.4mm	150 – 250A
3.2mm	250A – 400A
4.0mm	400A – 500A
6.0mm	750A – 1000A

GUIDE TO MMA WELDING

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 welding area.

Notes for the welding beginner

This section is designed to give the beginner who has not yet done any welding some information to get them going. The simplest way to start is to practice by running weld beads on a piece of scrap plate. Start by using mild steel (paint free) plate of 6.0mm thick and using 3.2mm electrodes. Clean any grease, oil and loose scale from the plate and fix firmly to your work bench so that welding can be carried out. Make sure that the work return clamp is secure and making good electrical contact with the mild steel plate, either directly or through the work table. For best results always clamp the work lead directly to the material being welding, otherwise a poor electrical circuit may create itself.

Welding position

When welding, ensure you place yourself in a comfortable position for welding and your welding application before you begin to weld. This maybe by sitting at a suitable height which is often the best way to weld ensuring you're relaxed and not tense. A relaxed posture will ensure the welding task becomes much easier.
Please ensure you always wear suitable PPE and use suitable fume extraction when welding.
Place the work so that the direction of welding is across, rather than to or from your body. The electrode holder lead should always be clear of any obstruction so that you can move your arm freely along as the electrode burns down. Some elders prefer to have the welding lead over their shoulder, this allows greater freedom of movement and can reduce the weight from your hand.
Always inspect your welding equipment, welding cables and electrode holder before each use to ensure it's not faulty or worn as you may be at risk of an electric shock.

MMA process features and benefits

The versatility of the process and the skill level required to learn, basic simplicity of the equipment make the MMA process one of the most common used throughout the world.

The MMA process can be used to weld a wide variety of materials and is normally used in the horizontal position but can be used in vertical or overhead with the correct selection of electrode and current. In addition, it can be used to weld at long distances from the power source subject to the correct cable sizing. The self shielding effect of the electrode coating makes the process suitable for welding in external environments. It is the dominant process used in maintenance and repair industries and is used extensively in structural and fabrication work.
The process is well able to cope with less than ideal material conditions such as dirty or rusty material. Disadvantages of the process are the short welds, slag removal and stop starts which lead to poor weld efficiency which is in the region of 25%. The weld quality is also highly dependent on the skill of the operator and many welding problems can exist.

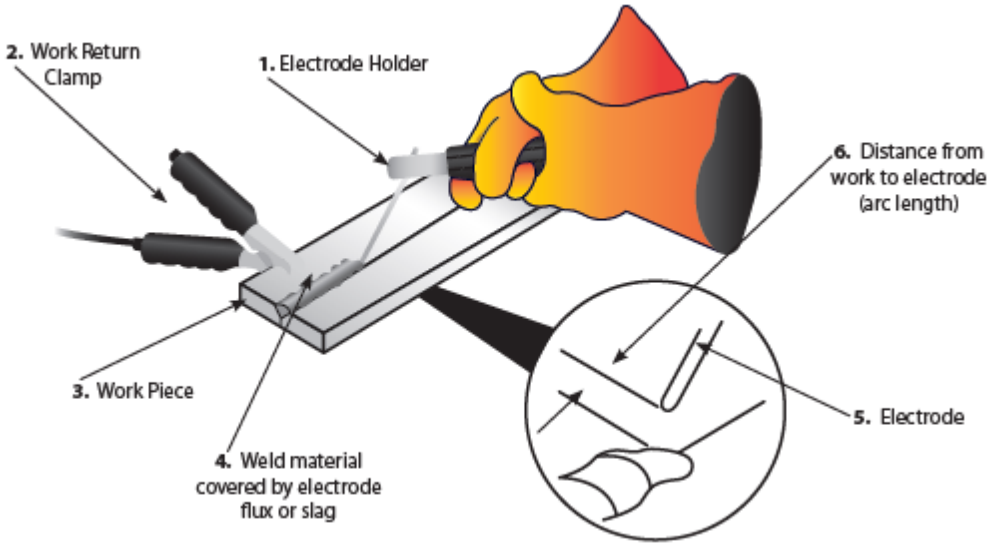
GUIDE TO MMA WELDING

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 welding area.

MMA process tips and guides

Typical welder set up

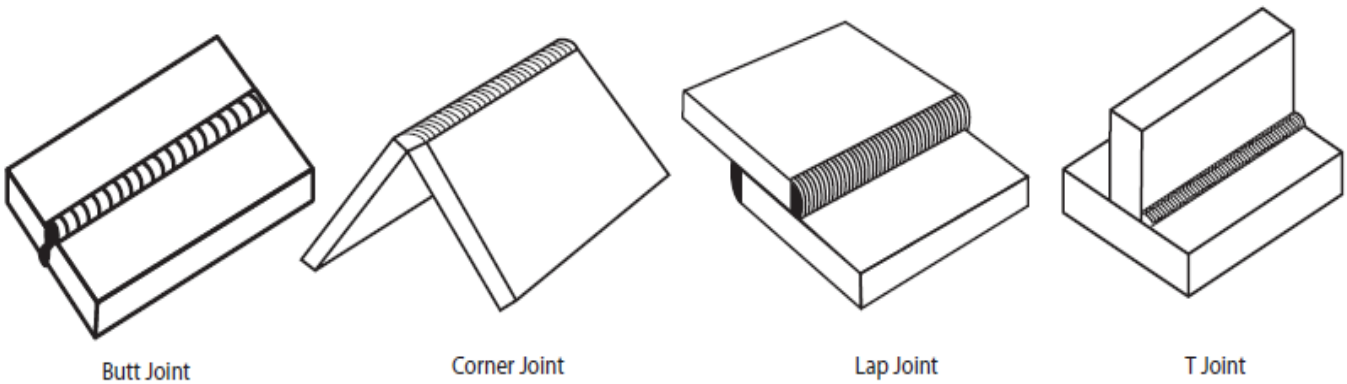
1. Electrode holder
2. Work return clamp
3. Work piece
4. Weld material covered by electrode flux or slag
5. Electrode
6. Distance from work to electrode (arc Length)



Welding current will flow in the circuit as soon as the electrode contacts the work piece. The welder should always ensure a good connection of the work clamp. The nearer the clamp is placed to the welding area the better.
When the arc is struck the distance between the end of the electrode and the work will determine the arc voltage and also affect the weld characteristic. As a guide the arc length for electrodes up to 3.2mm diameter should be around 1.6mm and over 3.2mm around 3mm.
Upon completion of the weld the welding flux or slag will need to be removed usually with a chipping hammer and wire brush.

Joint form in MMA

In MMA welding, the common basic joint forms are: butt joint, corner joint, lap joint & T joint.

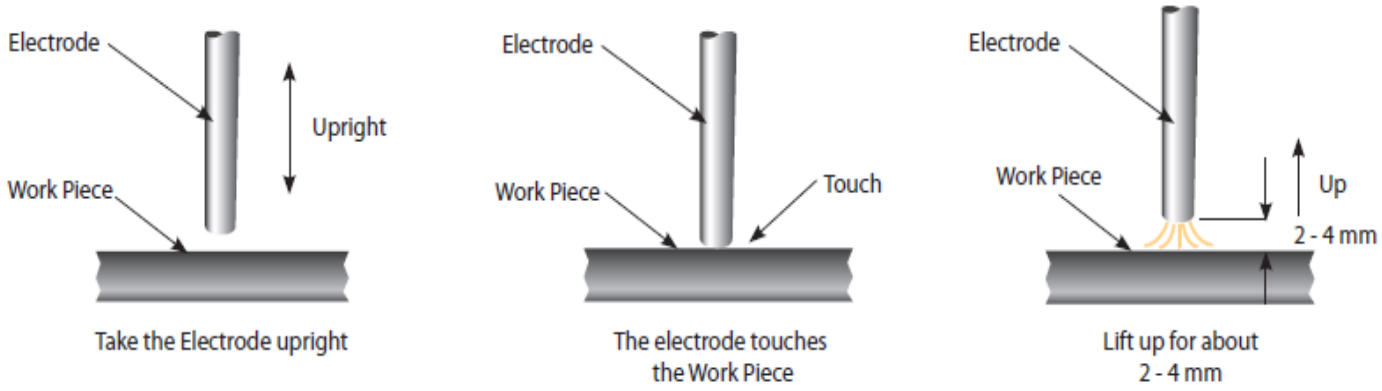


GUIDE TO MMA WELDING

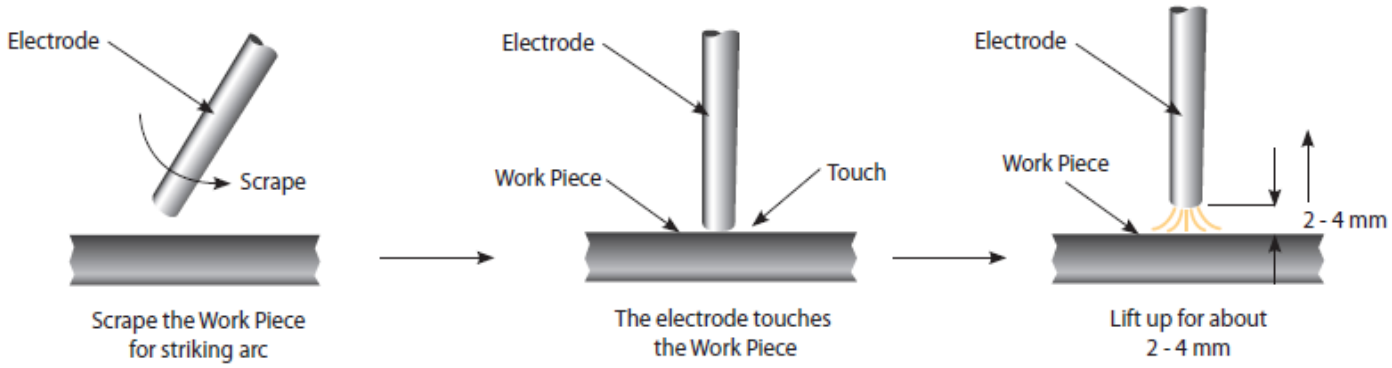
Before starting any welding activity ensure that you have suitable eye protection and protective clothing. Also take the necessary steps to protect any persons within the welding area.

MMA arc striking

Tap technique - Lift the electrode upright and bring it down to strike the work piece. After forming short circuit, quickly lift up about 2~4mm and arc will be ignited. This method is difficult to master.



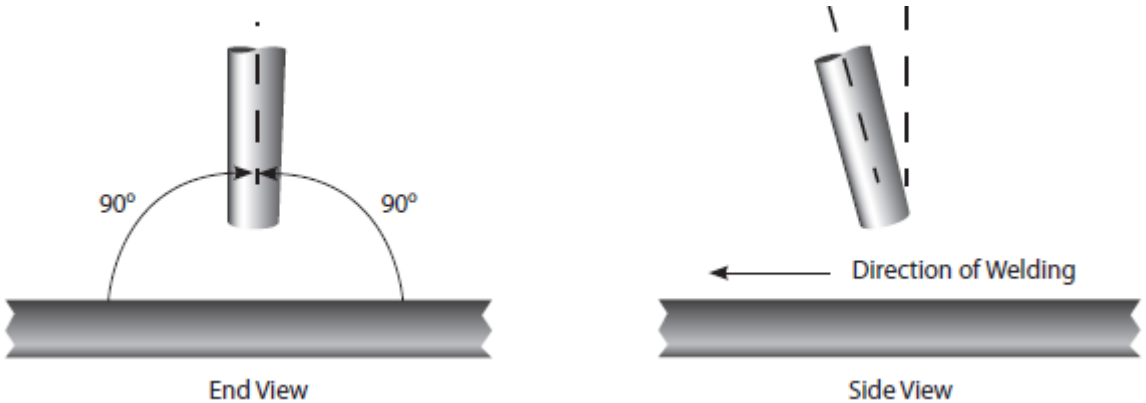
Scratch technique - Drag the electrode and scratch the work piece as if striking a match. Scratching the electrode may cause the arc to burn along the scratch path, so care should be taken to scratch in the weld zone. When the arc is struck adopt the correct welding position.



Electrode positioning

Horizontal or flat position

The electrode should be positioned at right angles to the plate and inclined in the direction of travel at around 10º-30º.

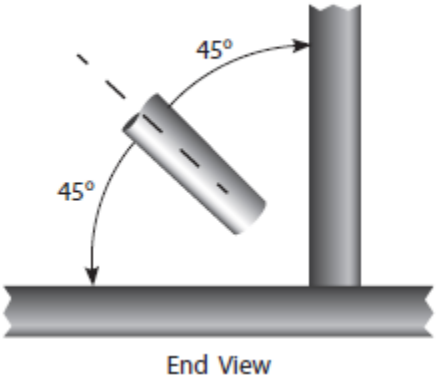


GUIDE TO MMA WELDING

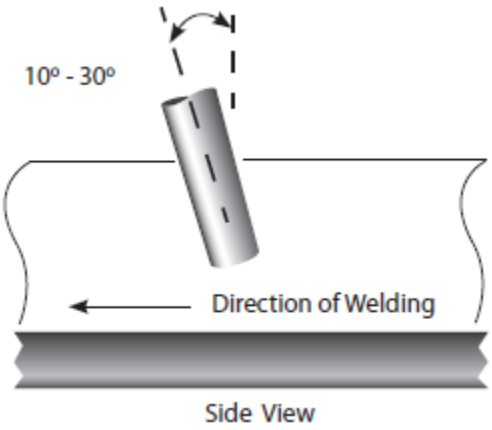
Before starting any welding activity ensure that you have suitable eye protection and protective clothing. Also take the necessary steps to protect any persons within the welding area.

Fillet welding

The electrode should be positioned to split the angle i.e. 45º. Again the electrode should be inclined in the direction of travel at around 10º-30º.



End View

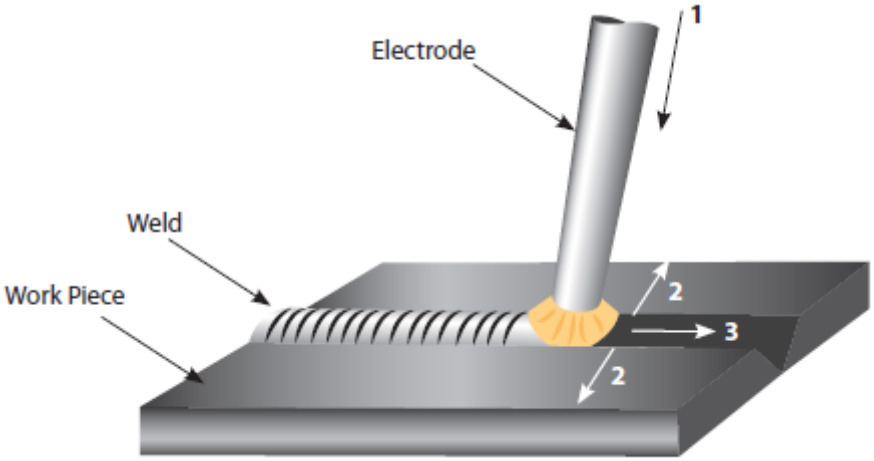


Side View

Manipulation of electrode

In MMA welding there are three motions used at the end of electrode:

1. The electrode feeding to the molten pool along axes
2. The electrode swing right and left
3. The electrode moving in the weld direction



The operator can choose the manipulation of electrode based on welding joint, welding position, electrode spec, welding current and operation skill etc.

Weld characteristics

A good weld bead should exhibit the following characteristics:

1. Uniform weld bead
2. Good penetration into the base material
3. No overlap
4. Fine spatter level

A poor weld bead should exhibit the following characteristics:

1. Uneven and erratic bead
2. Poor penetration into the base material
3. Bad overlap
4. Excessive spatter levels
5. Weld crater

MMA WELDING PROBLEMS

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 welding area.

Arc welding defects and prevention methods

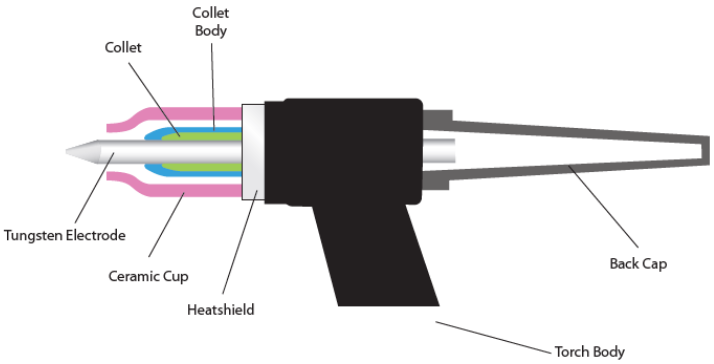
Defect	Possible cause	Action
Excessive spatter (beads of metal scattered around the weld area)	Amperage too high for the selected electrode	Reduce amperage or utilise larger diameter electrode
	Voltage too high or arc length too long	Reduce arc length or voltage
Uneven and erratic weld bead and direction	Weld bead is inconsistent and misses joint due to operator	Operator training required
Lack of penetration – The weld bead fails to create complete fusion between material to be welded, often surface appears okay but weld depth is shallow	Poor joint preparation	Joint design must allow for full access to the root of the weld
	Insufficient heat input	Material too thick Increase the amperage or increase the electrode size and amperage
	Poor weld technique	Reduce travel speed Ensure the arc is on the leading edge of the weld puddle
Porosity – Small holes or cavities on the surface or within the weld material	Work piece dirty	Remove all contaminant from the material i.e. oil, grease, rust, moisture prior to welding
	Electrode is damp	Replace or dry the electrode
	Arc length is excessive	Reduce the arc length
Excessive penetration – The weld metal is below the surface level of the material and hangs below	Heat input too high	Reduce the amperage or use a smaller electrode and lower amperage
	Poor weld technique	Use correct welding travel speed
Burning through – Holes within the material where no weld exists	Heat input too high	Use lower amperage or smaller electrode Use correct welding travel speed
Poor fusion – Failing of weld material to fuse either with the material to be welded or previous weld beads	Insufficient heat level	Increase the amperage or increase the electrode size and amperage
	Poor welding technique	Joint design must allow for full access to the root of the weld Alter welding technique to ensure penetration such as weaving, arc positioning or stringer bead technique
	Work piece dirty	Remove all contaminant from the material i.e. oil, grease, rust, moisture prior to welding

GUIDE TO TIG WELDING

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 welding area.

TIG torch body and components

The torch body holds the various welding consumables in place as shown and is covered by a either a rigid phenolic or rubberised covering.



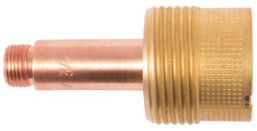
Collet body

The collet body screws into the torch body. It is replaceable and is changed to accommodate the different sizes of tungsten's and their respective collets.

Collets

The welding electrode (tungsten) is held in the torch by the collet. The collet is usually made of copper or a copper alloy. The collet's grip on the electrode is secured when the torch back cap is tightened in place. Good electrical contact between the collet and tungsten electrode is essential for good welding current transfer.

Gas lens body



A gas lens is a device that can be used in place of the normal collet body. It screws into the torch body and is used to reduce turbulence in the flow of shield gas and produce a stiff column of undisturbed flow of shielding gas. A gas lens will allow the welder to move the nozzle further away from the joint allowing increased visibility of the arc. A much larger diameter nozzle can be used which will produce a large blanket of shielding gas. This can be very useful in welding material like titanium. The gas lens will also enable the welder to reach joints with limited access such as inside corners.

Ceramic cups

Gas cups are made of various types of heat resistant materials in different shapes, diameters and lengths. The cups are either screwed onto the collet body or gas lens body or in some cases pushed in place. Cups can be made of ceramic, metal, metal-jacketed ceramic, glass or other materials. The ceramic type is quite easily broken so take care when putting the torch down.

Gas cups must be large enough to provide adequate shielding gas coverage to the weld pool and surrounding area. A cup of a given size will allow only a given amount of gas to flow before the gas flow becomes disturbed due to the speed of flow. Should this condition exist the size of cup should be increased to allow the flow speed to reduce and once again establish an effective regular shield.

Back cap

The back cap screws into the rear on the torch head and applies pressure to the back end of the collet which in turn forces up against the collet body, the resulting pressure holds the tungsten in place to ensure it does not move during the welding process.
Back caps are made from a rigid phenolic material and generally come in 3 sizes, short, medium and long.

GUIDE TO TIG WELDING

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 welding area.

TIG welding electrodes

TIG welding electrodes are a 'non consumable' as it is not melted into the weld pool and great care should be taken not to let the electrode contact the welding pool to avoid weld contamination. This would be referred to as tungsten inclusion and may result in weld failure.
Electrodes will often contain small quantities of metallic oxides which can offer the following benefits:

- Assist in arc starting
- Improve current carrying capacity of the electrode
- Reduce the risk of weld contamination
- Increase electrode life
- Increase arc stability

Oxides used are primarily zirconium, thorium, lanthanum or cerium. These are added usually 1% - 4%.

Tungsten Electrode Colour Chart - DC

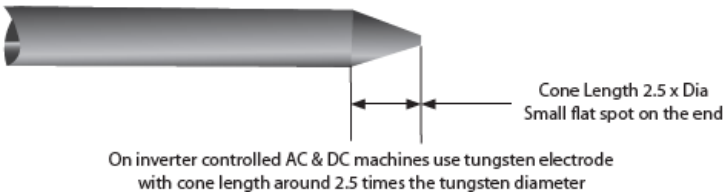
Welding Mode	Tungsten Type	Colour
DC or AC/DC	Ceriated 2%	Grey
DC or AC/DC	Lanthanated 1%	Black
DC or AC/DC	Lanthanated 1.5%	Gold
DC or AC/DC	Lanthanated 2%	Blue
DC	Thoriated 1%	Yellow
DC	Thoriated 2%	Red

Tungsten Electrode Current Ranges

Tungsten Electrode Size	DC Current Amp
1.0mm	30 - 60
1.6mm	60 - 115
2.4mm	100 - 165
3.2mm	135 - 200
4.0mm	190 - 280
4.8mm	250 - 340

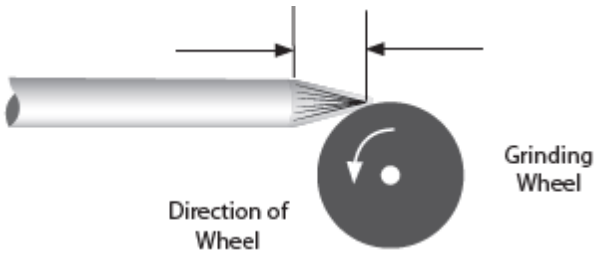
Tungsten electrode preparation - DC

When welding at low current the electrode can be ground to a point. At higher current a small flat on the end of the electrode is preferable as this helps with arc stability.



Electrode grinding

It is important when grinding the electrode to take all necessary precautions such as wearing eye protection and ensuring adequate protection against breathing in any grinding dust.



Tungsten electrodes should always be ground lengthwise (as shown) and not in a radial operation. Electrodes ground in a radial operation tend to contribute to arc wander due to the arc transfer from the grinding pattern. Always use a grinder solely for grinding electrodes to avoid contamination.

GUIDE TO TIG WELDING

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 welding area.

TIG welding consumables

The consumables of the TIG welding process are filler wires and shield gas.

Filler wires

Filler wires come in many different material types and usually as cut lengths, unless some automated feeding is required where it will be in reel form. Filler wire is generally fed in by hand.
Always consult the manufacturer's data and welding requirements.

Filler Wire Diameter	DC Current Range (Amps)
1.0mm	20-90
2.4mm	65-115
3.2mm	100-165
4.8mm	200-350

Filler Wire Selection Guide

Gases

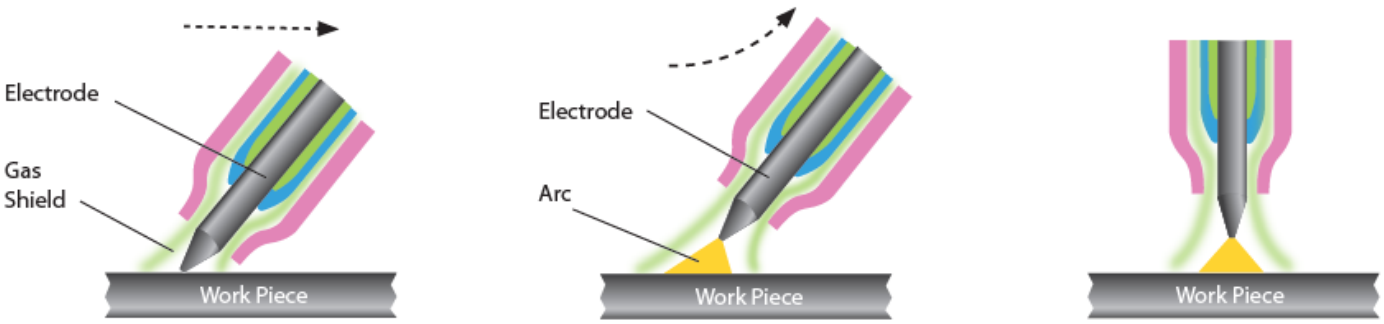
Shielding gas is required when welding to keep the weld pool free of oxygen. Whether you are welding mild steel or stainless steel the most commonly used shielding gas used in TIG welding is argon, for more specialised applications an argon helium mix or pure helium maybe used.

TIG welding - arc starting

The TIG process can use both non contact and contact methods to provide arc starting. Depending on the Jasic model, the options are indicated on a selector switch on the front control panel of the power source. The most common method of arc starting is 'HF' start. This term is often used for a variety of starting methods and covers many different types of start.

Arc starting - scratch start

This system is where the electrode is scratched along the work piece like striking a match. This is a basic way of turning any DC stick welder into a TIG welder without much work.
It is not considered suitable for high integrity welding due to the fact that the tungsten can be melted on the work piece thereby contaminating the weld.



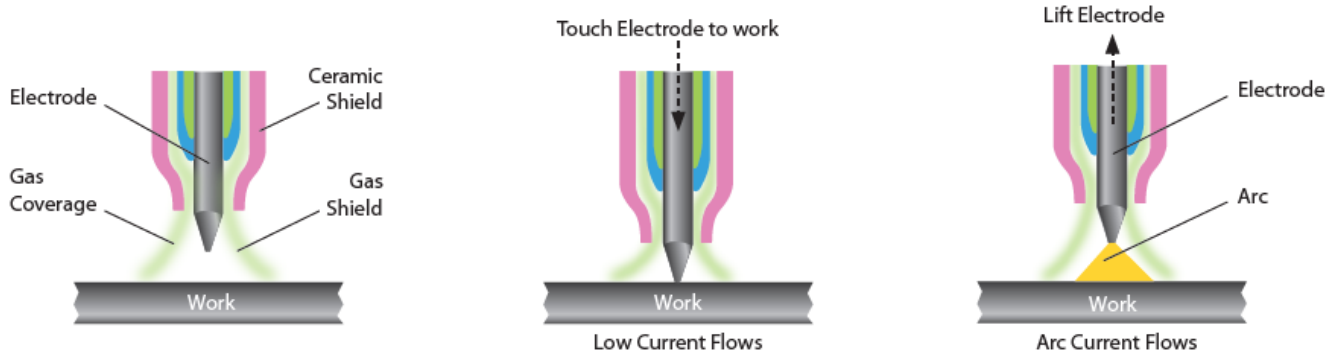
The main challenge with scratch start TIG welding is keeping your electrode clean. While a quick strike with the electrode on the metal is essential and then not lifting it more than 3mm away to create the arc will help, you also need to ensure your metal is completely clean.

GUIDE TO TIG WELDING

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 welding area.

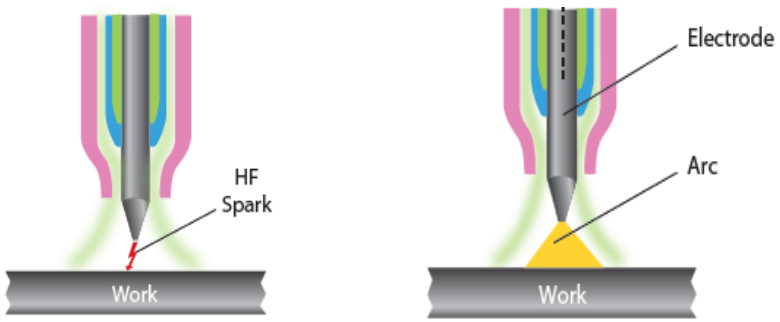
Arc starting - lift TIG (lift arc)

Not to be confused with scratch start, this arc starting method allows the tungsten to be in direct contact with the work piece first but with minimal current so as not to leave a tungsten deposit when the tungsten is lifted and an arc is established.
With **lift start** is the open circuit voltage (OCV) of the welder folds back to a very low voltage output when the unit senses it has made continuity with the work piece. Once the torch is lifted the unit increases output as the tungsten leaves the surface. This creates little contamination and preserves the point on the tungsten although this is still not a 100% clean process. The tungsten still can get contaminated but lift TIG is still a much better option than scratch starting, for mild and stainless steel although these



methods of arc starting are not a good option when welding aluminium.
Arc starting - HF start

Non contact high frequency (HF) start method is a high voltage and low amperage generated using a spark gap assembly and is the most popular and generally considered best TIG arc starting method. The high frequency (HF) start generates a high frequency arc that ionizes the gas bridging the gap between the tungsten point and the work piece. This touch-less method creates almost no contamination unless the tungsten has been over sharpened or the start amperage is too high. It is an excellent choice for all material being welded especially aluminium although unless you need to weld aluminium, you don't have to use HF start steel/stainless.
The HF frequency varies with the spark gap and can be around 16000 Hz to 100000 Hz depending on spark gap width so consideration should be given with this method as it can cause electrical interference to nearby electrical equipment such as computers, CNC controls and phone systems.
If the spark gap is widened, the HF can become erratic.



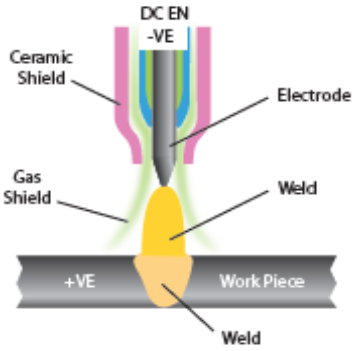
GUIDE TO TIG WELDING

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 welding area.

DC welding

Direct current welding is when the current flows in one direction only. Compared with AC welding the current once flowing will not go to zero until welding has ended.

The Jasic TIG series polarity should generally be set up for Direct Current - Electrode Negative (DCEN) as this method of welding can be used for a wide range of materials.



The TIG welding torch is connected to the negative output of the machine and the work return cable to the positive output.

When the arc is established the current flows in the circuit and the heat distribution in the arc is around 33% in the negative side of the arc (the welding torch) and 67% in the positive side of the arc (the work piece). This balance gives deep arc penetration of the arc into the work piece and reduces heat in the electrode.
This reduced heat in the electrode allows more current to be carried by smaller electrodes compared to other polarity connections. This method of connection is often referred to as straight polarity and is the most common connection used in DC welding.

TIG welding techniques

- Before welding (especially with mild steel) you should ensure all material being welded are clean, as particulates can weaken the weld.
- The torch angle is best kept at 15-20 degrees (from vertical) away from the direction of travel. This assists with visibility of the weld area and allows easier access for the filler material.
- The filler metal should be fed in at a low angle to help avoid touching the tungsten electrode and contaminating it.
- The TIG welding arc melts the base material and the molten puddle melts the filler rod, it is important you resist the urge to melt the filler material directly into the welding arc.
- For thinner sheet materials, a filler material may not be needed.
- Prepare the tungsten correctly, using a diamond grinding wheel will give you the best results for a sharp point.
- For welding stainless steel, be careful of applying too much heat. If the colour is dark grey and looks dirty and heavily oxidized then too much heat has been applied, this could also cause the material to warp. Reducing the amperage and increase travel speed may correct this problem, you could also consider using a smaller diameter filler material, as that will require less energy to melt.

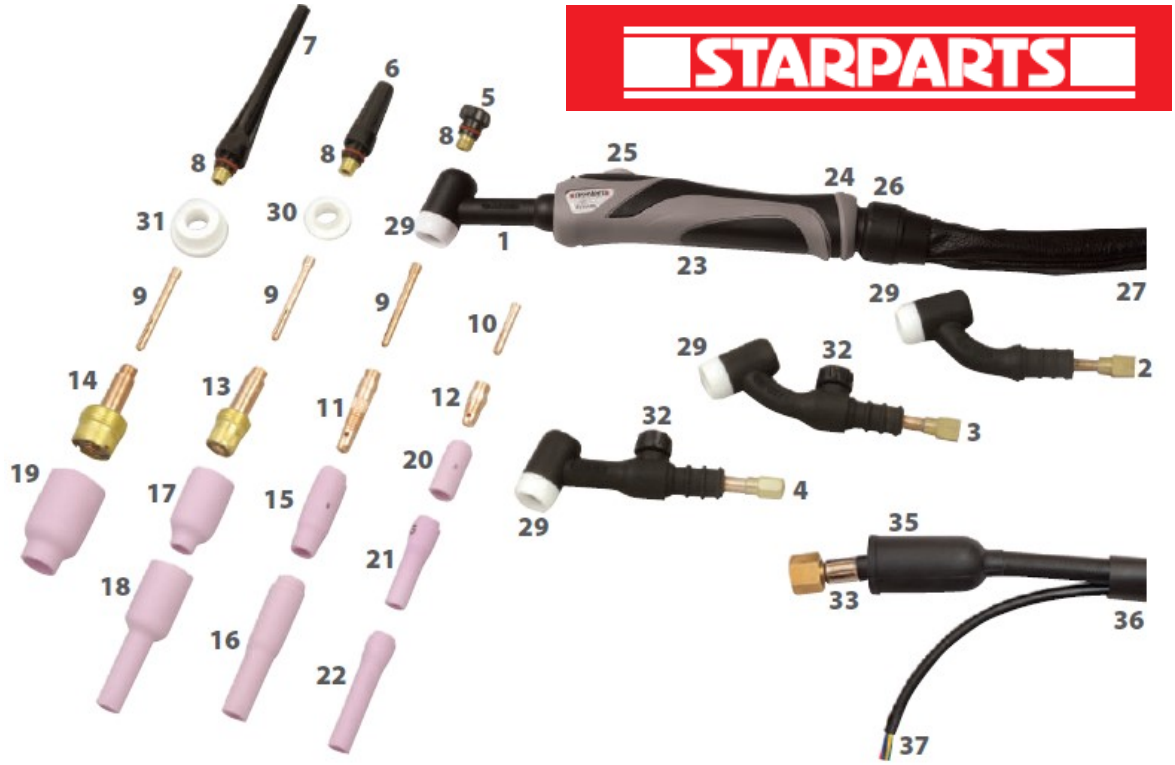
TIG welding amperage guide

Base Metal Thickness	Mild Steel DC Current	Stainless Steel DC Current	Tungsten Electrode Diameter	Filler Wire Diameter (If required)	Argon Gas Flow Rate (Litres/Min)	Joint Types
1.0mm	40-50	25-35	1.0mm	1.6mm	5-7	Butt/Corner/Fillet/Lap
1.2mm	50-60	35-50	1.0mm	1.6mm	5-7	Butt/Corner/Fillet/Lap
1.6mm	70-90	50-70	1.6mm	1.6mm	6-8	Butt/Corner/Fillet/Lap
3.2mm	90-115	90-110	1.6mm	2.4mm	7-9	Butt/Corner/Fillet/Lap
4.8mm	140-165	125-150	2.4mm	3.2mm	10-12	Butt/Corner/Fillet/Lap
6.4mm	170-200	160-180	3.2mm	4.0mm	10-12	Butt/Corner/Fillet/Lap

GUIDE TO TIG WELDING

TIG Welding Torch Air Cooled - Model TIG37ERGO

Rating 150A DC, 115A AC @ 60% Duty Cycle EN60974-7 • 0.5mm to 3.2mm Electrodes



Main Consumables

No	Code	Description
1	WP17	Rigid Torch Body
2	WP17F	Flexible Torch Body
3	WP17FV	Flexible Torch Body c/w Valve
4	WP17V	Torch Body c/w Argon Valve
5	57Y04	Short Back Cap
6	300M	Medium Back Cap
7	57Y02	Long Back Cap
8	98W18	Back Cap 'O' Ring

Collets

9	10N21	Standard .020" (0.5mm)
	10N22	Standard .040" (1.0mm)
	10N23	Standard 1/16" (1.6mm)
	10N26	Standard 5/64" (2.0mm)
	10N24	Standard 3/32" (2.4mm)
	10N25	Standard 1/8" (3.2mm)
10	10N21S	Stubby .020" (0.5mm)
	10N22S	Stubby .040" (1.0mm)
	10N23S	Stubby 1/16" (1.6mm)
	10N24S	Stubby 3/32" (2.4mm)
	10N25S	Stubby 1/8" (3.2mm)

Collet Bodies

11	10N29	Standard .020" (0.5mm)
	10N30	Standard .040" (1.0mm)
	10N31	Standard 1/16" (1.6mm)
	10N31M	Standard 5/64" (2.0mm)
	10N32	Standard 3/32" (2.4mm)
	10N28	Standard 1/8" (3.2mm)
12	17CB20	Stubby .020"- 1/8" (0.5 - 3.2mm)

Gas Lens Bodies

13	45V29	Standard .020" (0.5mm)
	45V24	Standard .040" (1.0mm)
	45V25	Standard 1/16" (1.6mm)
	45V25M	Standard 5/64" (2.0mm)
	45V26	Standard 3/32" (2.4mm)
	45V27	Standard 1/8" (3.2mm)

Gas Lens Bodies

No	Code	Description
14	45V0204	Large Dia .020"-.040" (0.5 - 1.0mm)
	45V116	Large Dia 1/16" (1.6mm)
	45V64	Large Dia 3/32" (2.4mm)
	995795	Large Dia 1/8" (3.2mm)

Ceramic Cups

15	10N50	Standard Cup 1/4" Bore
	10N49	Standard Cup 5/16" Bore
	10N48	Standard Cup 3/8" Bore
	10N47	Standard Cup 7/16" Bore
	10N46	Standard Cup 1/2" Bore
	10N45	Standard Cup 5/8" Bore
	10N44	Standard Cup 3/4" Bore
16	10N50L	Long Cup 1/4" Bore
	10N49L	Long Cup 5/16" Bore
	10N48L	Long Cup 3/8" Bore
	10N47L	Long Cup 7/16" Bore

Gas Lens Cups

17	54N18	Standard Cup 1/4" Bore
	54N17	Standard Cup 5/16" Bore
	54N16	Standard Cup 3/8" Bore
	54N15	Standard Cup 7/16" Bore
	54N14	Standard Cup 1/2" Bore
	54N19	Standard Cup 11/16" Bore
18	54N17L	Long Cup 5/16" Bore
	54N16L	Long Cup 3/8" Bore
	54N15L	Long Cup 7/16" Bore
	54N14L	Long Cup 1/2" Bore
19	57N75	Large Dia Cup 3/8" Bore
	57N74	Large Dia Cup 1/2" Bore
	53N88	Large Dia Cup 5/8" Bore
	53N87	Large Dia Cup 3/4" Bore

Ceramic Cups for use with item 12

No	Code	Description
20	13N08	Standard Cup 1/4" Bore
	13N09	Standard Cup 5/16" Bore
	13N10	Standard Cup 3/8" Bore
	13N11	Standard Cup 7/16" Bore
	13N12	Standard Cup 1/2" Bore
	13N13	Standard Cup 5/8" Bore
21	796F70	Long Cup 3/16" Bore
	796F71	Long Cup 1/4" Bore
	796F72	Long Cup 5/16" Bore
	796F73	Long Cup 3/8" Bore
22	796F74	X - Long Cup 3/16" Bore
	796F75	X - Long Cup 1/4" Bore
	796F76	X - Long Cup 5/16" Bore
	796F77	X - Long Cup 3/8" Bore

Secondary Consumables

23	SP9110	LH & RH Handle Shell
24	SP9111	Handle Screw
25	SP9120	Single Button Switch
	SP9121	2 Button Switch
	SP9122	5K Potentiometer Switch
	SP9123	10K Potentiometer Switch
	SP9128	47K Potentiometer Switch
	SP9129	4 Button Switch
26	SP9113	Handle Ball Joint
27	SP9116	Leather Cover 800mm
28	SP9118	Cable Cover Joint (not illustrated)
29	18CG	Standard Heat Shield
30	54N01	Gas Lens Heat Shield
31	54N63	Large Gas Lens Insulator
32	VS-2	Valve Stem WP17V & WP17FV
33	57Y01	Mono Power Cable 12.5ft - 3/8"
	57Y03	Mono Power Cable 25ft - 3/8" Bsp
34	57Y01-2D	2 Piece Power Cable Assy 12.5ft
	57Y03-2D	2 Piece Power Cable Assy 25ft
35	0315071	Insulation Boot
36	SP9002	Neoprene Protective Cover 1m
37	SP9126	4m Switch Cable
	SP9127	8m Switch Cable

TIG WELDING PROBLEMS

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 welding area.

TIG welding defects and prevention methods

Defect	Possible cause	Action
Excessive tungsten use	Set up for DCEP	Change to DCEN
	Insufficient shield gas flow	Check for gas restriction and correct flow rates. Check for drafts in the weld area.
	Electrode size too small	Select correct size
	Electrode contamination during cooling time	Extend post flow gas time
Porosity / weld contamination	Loose torch or hose fitting	Check and tighten all fittings
	Inadequate shield gas flow	Adjust flow rate - normally 8-12L/m
	Incorrect shield gas	Use correct shield gas
	Gas hose damaged	Check and repair any damaged hoses
	Base material contaminated	Clean material properly
	Incorrect filler material	Check correct filler wire for grade of use
No operation when torch switch is operated	Torch switch or cable faulty	Check the torch switch continuity and repair or replace as required
	ON/OFF switch turned off	Check position of ON/OFF switch
	Mains fuses blown	Check fuses and replace as required
	Fault inside the machine	Call for a repair technician
Low output current	Loose or defective work clamp	Tighten/replace clamp
	Loose cable plug	Check and tighten all plugs
	Power source faulty	Call a repair technician
High frequency will not strike the arc	Weld/power cable open circuit	Check all cables and connections for continuity, especially the torch cables
	No shield gas flowing	Check cylinder contents, regulator and valves, also check the power source
Unstable arc when welding in DC	Tungsten contaminated	Break off contaminated end and regrind the tungsten
	Arc length incorrect	Arc length should be between 3-6mm
	Material contaminated	Clean all base and filler material
	Electrode connected to the wrong polarity	Reconnect to correct polarity
Arc is difficult to start	Incorrect tungsten type	Check and fit correct tungsten
	Incorrect shield gas	Use argon shield gas

TIG WELDING PROBLEMS

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 welding area.

TIG welding defects and prevention methods

Defect	Possible cause	Action
Excessive bead build up, poor penetration or poor fusion at the edges of the weld	Weld current too low	Increase the welding amperage Poor material prep
Weld bead flat and too wide or undercut at the weld edge or burning through	Weld current too high	Decrease the welding amperage
Weld bead too small or insufficient penetration	Welding travel speed too fast	Reduce your welding travel speed
Weld bead too wide or excessive bead build up	Welding travel speed too slow	Increase your welding travel speed
Uneven leg length in fillet joint	Wrong placement of filler rod	Re-position filler rod
Tungsten melts or oxidises when welding arc is made	TIG torch lead connected to + Little or no gas flow to weld pool Gas cylinder or hoses contain impurities The tungsten is too small for the weld current TIG/MMA selector set to MMA	Connect to - polarity Check gas apparatus as well as torch and hoses for breaks or restrictions Change gas cylinder and blow out torch and gas hoses Increase the size of the tungsten Ensure you have the power source set to TIG function

MAINTENANCE

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 out 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 machines.

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**

⇒ Ensure the power is disconnected before working on the machine

⇒ Always wait 5 minutes after power switch off before opening the case

SERVICE SCHEDULE RECORD

Date	Type of service and work carried out	Serviced by	Due date for next check

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.

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 potentially dangerous to the 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.

Description of fault	**Possible cause**
The power LED is OFF and the fan is not functioning	The primary supply voltage has not been switched ON or input fuse has blown
	The welding power source input switch is switched OFF
	Loose connections internally
The fault LED is ON and the fan is running	The machine is under over-heating protection status. It will recover automatically after the welding machine is cooled Check incoming mains supply to ensure it is within 230V +/- 15%
No high frequency is produced	Process selection switch is set to manual metal arc (MMA)
	Torch trigger switch lead is disconnected or switch/ lead is faulty
	High frequency spark gap too wide or short circuited
Welding current reduces when welding	Poor work lead connection to the work piece
TIG electrode melts when arc is struck	TIG torch is connected to the (+) VE terminal
No gas flow when the TIG torch trigger switch is depressed	Empty gas cylinder Gas regulator is turned off Gas hose is blocked or cut Torch trigger switch lead is disconnected or switch/ lead is faulty
Difficult to ignite the arc	The arc ignition current is too low or the arc ignition time is too short
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
Other malfunction	Contact your supplier

EC Declaration of Conformity

The manufacturer, or its legal representative supplier in the European Community Jasic, declares that the equipment described below is designed and produced according to following EU - Directives:

- Low Voltage Directive No: 2014/35/EU
- EMC Directive No: 2014/30/EU with their amendments

Inspected according to following EU - Norms:
- EN 60 974-1
- EN 60 974-10

Type: Jasic TIG 300P

Any alteration or change to these machines by any unauthorized person makes this declaration invalid.

WEEE 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.
Jasic has a relevant recycling system which is compliant and registered in the UK with the environment agency. Our registration reference is WEEMM3813AA.
In order to comply with WEEE regulations outside the UK you should contact your supplier.

RoHS Compliance Declaration

We herewith confirm, that the above mentioned product does not contain any of the restricted substances as listed in EU Directive 2011/65/EC in concentrations above the limits as specified therein.

Disclaimer:
Please note that this confirmation is given to the best of our present knowledge and belief.
Nothing herein represents and/or may be interpreted as warranty within the meaning of the applicable warranty law.

STATEMENT OF WARRANTY

All new JASIC welders, plasma cutters and multi-process units sold through our partner Wilkinson Star Limited within the United Kingdom and Ireland shall be warrantied to the original owner, non transferable, against failure due to defective materials or production. The warranty period is 2 years following the date of purchase or 5 years if you register online within 28 days of purchase.
The original invoice is documentation for the standard warranty period. The warranty period is based on a single shift pattern. Units purchased for rental or hire are subject to separate warranty terms and conditions.

Defective units shall be repaired or replaced by the company at our workshop. The company may opt to refund the purchase price (less any costs and depreciation due to use and wear). The company reserves the right to alter the warranty conditions at any time with effect for the future.

A prerequisite for the full warranty is that products are operated in accordance with the operating instructions supplied, observing the relevant installation and any legal requirements recommendations and guidelines and carrying out the maintenance instructions shown in the operator manual. This should be carried out by a suitably qualified competent person.

In the unlikely event of problem, this should be reported to Jasic technical support team to review the claim.

The customer has no claim to loan or replacement products whilst repairs are being performed.

The following falls outside the scope of the warranty:

- Defects due to natural wear and tear
- Failure to observe the operating and maintenance instructions
- Connection to an incorrect or faulty mains supply
- Overloading during use
- Any modifications that are made to the product without the prior written consent
- Software errors due to incorrect operation
- Any repairs that are carried out using non-approved spare parts
- Any transport or storage damage
- Direct or indirect damage as well as any loss of earnings are not covered under the warranty
- External damage such as fire or damage due to natural causes e.g. flooding

NOTE: Under the terms of the warranty, welding torches, their consumable parts, wire feed unit drive rolls and guide tubes, work return cables and clamps, electrode holders, connection and extension cables, mains and control leads, plugs, wheels, coolant etc. are covered with a 3 month warranty.

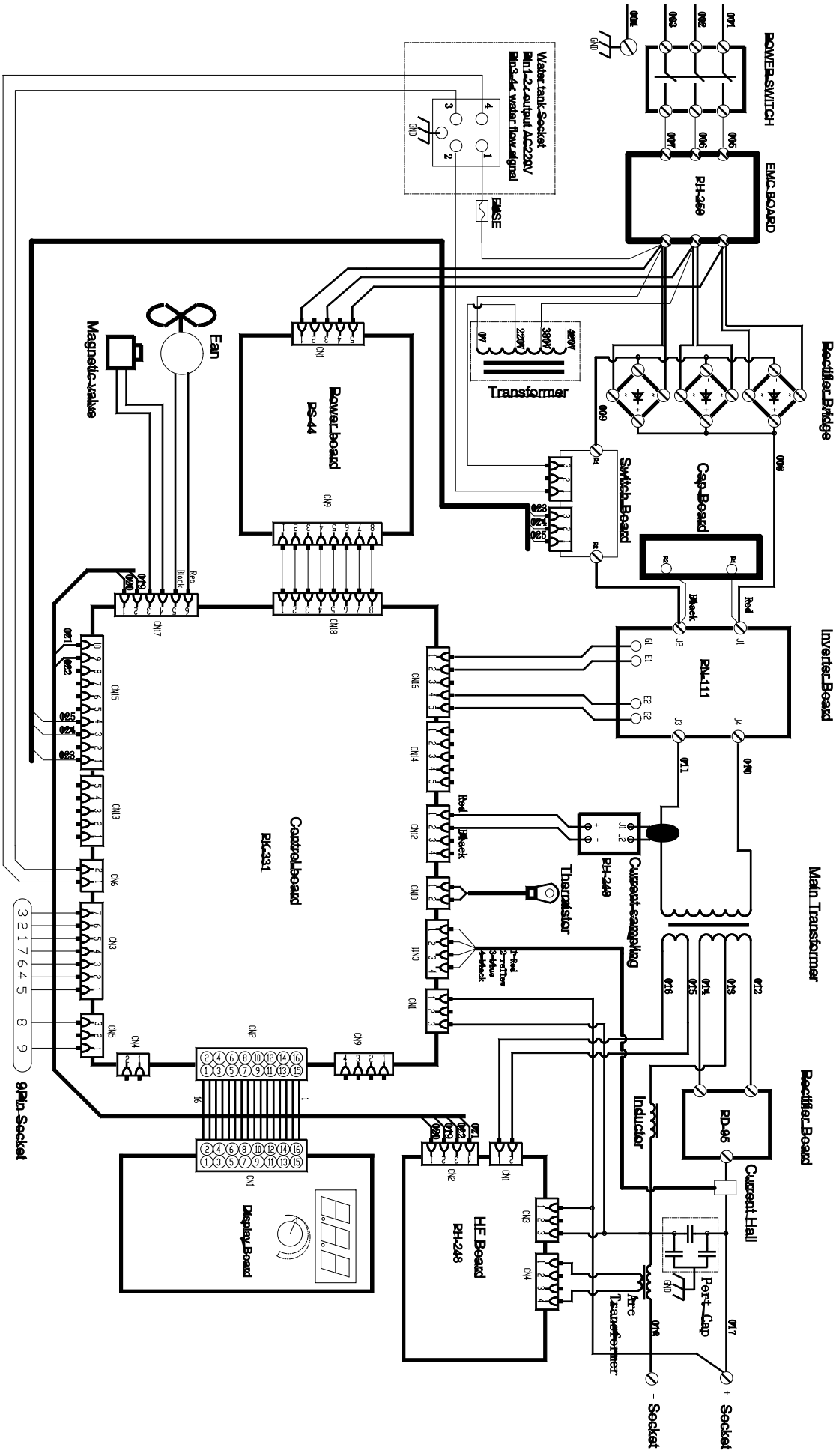
Jasic shall in no event be responsible for any third party expenses or expenses/costs or any indirect or consequential expenses/costs.

Jasic will submit an invoice for any repair work performed outside the scope of the warranty. A quotation for any non warranty will be raised prior to any repairs being carried out.

The decision about repair or replacement of the defective part(s) is made by Jasic. The replaced part(s) remain(s) Jasic property.

Warranty extends only to the machine, its accessories and parts contained inside. No other warranty is expressed or implied. No warranty is expressed or implied in regards to the fitness of the product for any particular application or use.

Schematic


POWER SWITCH
EMC BOARD
PH-269
Water tank Socket
Pin1-2 output AC220V
Pin3-4 water flow signal
FUSE
Transformer
Rectifier Bridge
Power board
PS-44
Fan
Magnetic valve
Switch Board
Cap Board
Inverter Board
PH-111
Control board
PK-331
Current sampling
PH-249
Thermistor
Main Transformer
Rectifier Board
RD-95
Inductor
Current Hall
Port Cap
Arc Transformer
HF Board
PH-248
Display Board
9Pin Socket
+ Socket
- Socket

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