

wilkinsonstar.com



# MIG Series

MIG/MAG/MMA Compact welding machines  
Order code JM-200CS



## OPERATOR MANUAL

# Your new product

---

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

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

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

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

Date purchased \_\_\_\_\_

From where \_\_\_\_\_

Serial Number \_\_\_\_\_

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

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

# 1

## Safety Precautions

---



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

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

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



### Prevention against electric shock

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

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

Do not use the equipment with the covers removed.

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

Turn off all equipment when not in use.

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

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

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

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

Do not wrap cables over your body.

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

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



### Safety against fumes and welding gases

Locate the equipment in a well-ventilated position.

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

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

If ventilation is poor, wear an approved respirator.

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

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



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



### **Prevention against burns and radiation**

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

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

Wear approved safety glasses with side shields under your helmet.

Never use broken or faulty welding helmets.

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

Wear suitable protective flame resistant clothing.

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

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

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

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



### **Protection against noise**

Some welding and cutting operations may produce noise.

Wear safety ear protection to protect your hearing.



### **Protection from moving parts**

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

Protections and coverings may be removed for maintenance and controls only by qualified personnel, after first disconnecting the power supply cable.

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

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

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

Always ensure machine covers and protective devices are in operation.



### **Precautions against fire and explosion**

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

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

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

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

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

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

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



### **Risks due to magnetic fields**

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

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

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

## RF Declaration

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

In the case of electromagnetic problems, it is the responsibility of the user to resolve the situation. It may be necessary to shield the equipment and fit suitable filters on the mains supply.

## LF Declaration

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

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

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



## Materials and their disposal



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

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

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



## Handling of Compressed gas cylinders and regulators

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

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

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

Always secure the cylinder safely

## Never deface or alter any cylinder



# 2

## 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.

Note: \*Designs may vary due to customer specific requirements

### **Product functions**

- MMA, TIG and MIG function are available.
- Simple adjusting function: four groups of MIG parameters for CO<sub>2</sub>, and mixed gas, using  $\Phi 0.8$  and  $\Phi 1.0$  wires are provided.
- 2T / 4T mode
- Hot start arc ignition function: make the arc ignition in MMA welding easier and more reliable.
- VRD function: keep the operator safe when the machine is idle.
- Self-adaptive arc force technology: improves the performance of the machine when using long welding cables.
- Advanced Lift arc ignition in TIG mode.
- Manual wire feeding function.
- Self-adaptive crater filling function: manual adjusting is unnecessary.
- Burn-back control function: improves the crater filling quality and welding quality.

### **Product performance characteristics**

- Advanced IGBT inverter technology
- Inverting frequency of 33~43 kHz greatly reduces the size and weight of the welder.

- 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.



# 3

## Technical data

Parameter	Unit	MIG 200CS
Rated input voltage	V	230V AC +/- 15%
Rated input power	KVA	9.4 MMA
Recommended fuse	A	30
Welding current range	A	MMA 10 - 200    MIG 30 - 200
	V	MMA 20.4 -28    MIG 15.5 - 24
Rated duty cycle	%	200A @ 35%
No load voltage	V	53
Overall efficiency	%	85
Housing protection grade		IP21S
Power factor	Cos	0.7
Insulation grade		F
Standard		EN60974-1
Noise	db	<80
Size (without handle)	mm	485 x 185 315
Size (with handle)		485 x 185 370
Weight	kg	12.8
Applicable electrodes	mm	MMA - 1.6~5.0
		MIG - 0.6/0.8/0.9/1.0

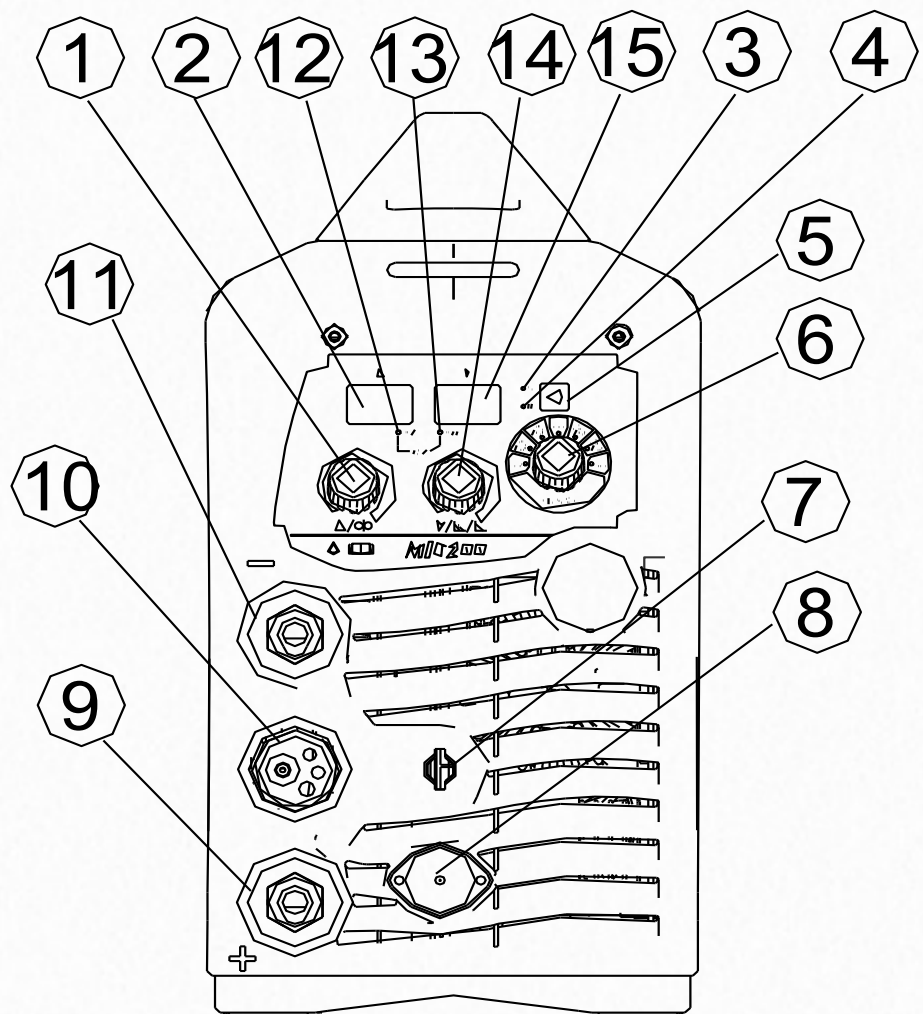
① Tested at the environment temperature of 40° C

# 4

## Controls

### Front view

1. Current/wire feed speed control knob
2. Current display window
3. 2T indicator
4. 4T indicator
5. 2T/4T switch key
6. Welding mode selecting switch
7. Gas/no gas switch
8. Socket for spool gun torch (optional)
9. "+" output terminal
10. Euro connector for torch
11. "-" output terminal
12. VRD ON
13. VRD OFF
14. Voltage/arc force/downslope time control knob
15. Voltage display window



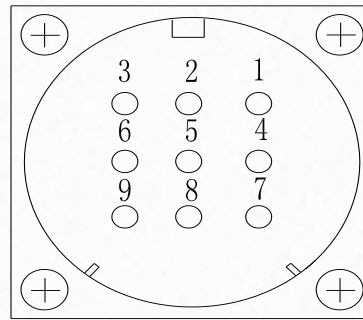


### Optional spool gun socket

Socket 1: Push-pull torch power source "+"

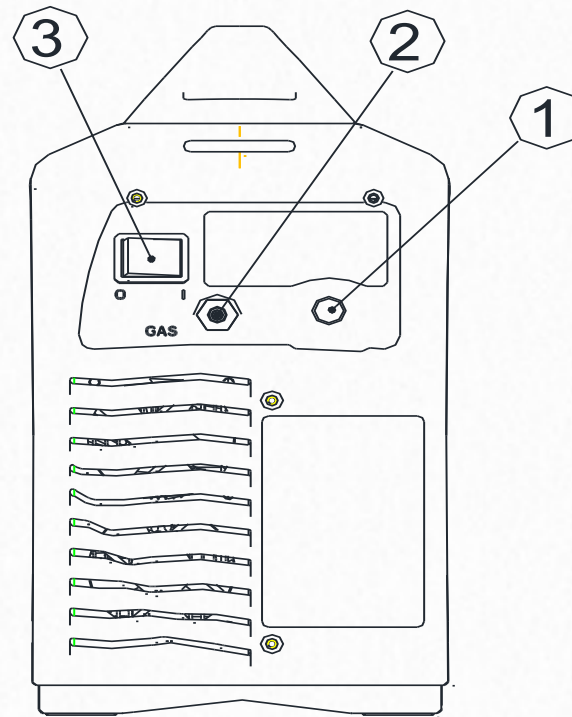
Socket 2: Push-pull torch power source "-"

Socket 3~9: Null



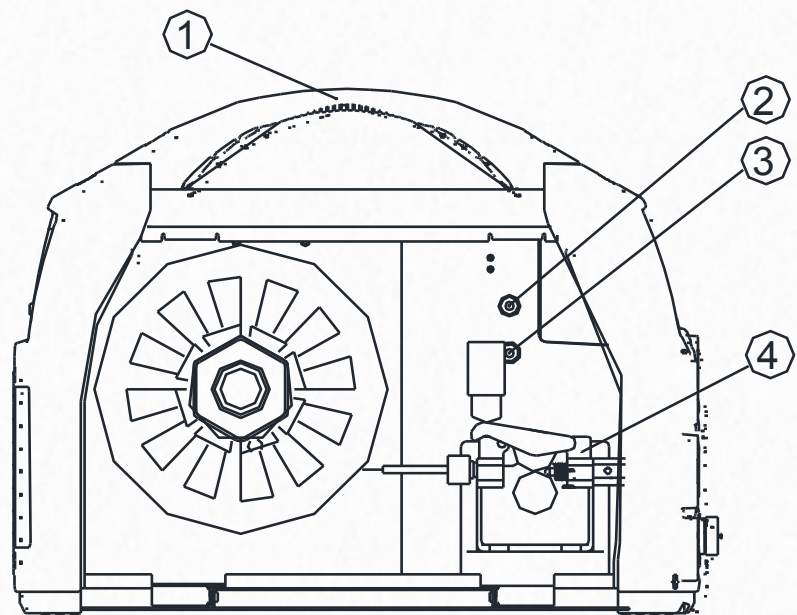
### Rear view

- 1 Input power cord
- 2. Gas inlet
- 3 Power switch



### Side view

- 1. Handle
- 2. Wire-inch button
- 3. Gas-check button
- 4 Wire feed system



# 5

## Installation

### Unpacking

Check the packaging for any signs of damage.

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

### Location

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

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

### Input connection

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

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

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

### Output connections

#### *Electrode polarity*

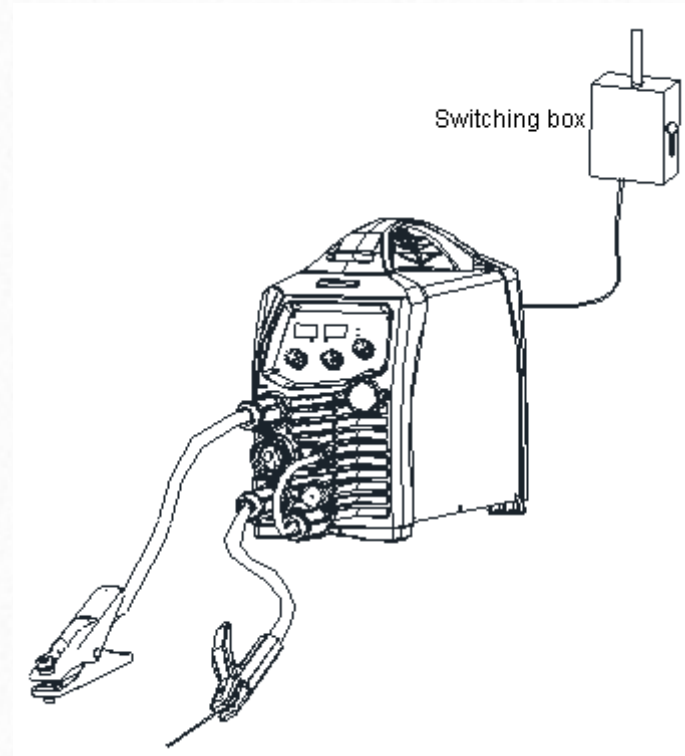
In general when using manual arc welding electrodes the electrode holder is connected to the positive terminal and the work return to the negative terminal. Always consult the electrode manufacturer's data sheet if you have any doubts.

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

### MMA welding

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

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



### MIG Welding

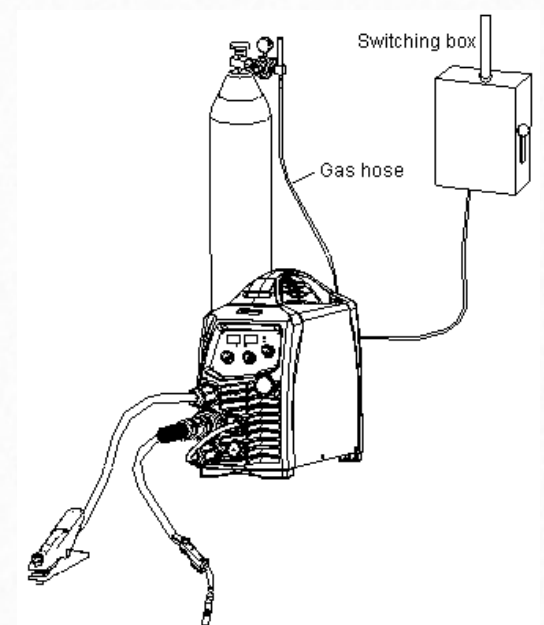
Insert the welding torch into the "Euro connector for torch in MIG" output socket on the front panel of the machine, and tighten it.

Install the wire spool on the spindle adapter.

Connect the cylinder equipped with the gas regulator to the gas inlet on the back panel of the machine with a gas hose.

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

Insert the quick plug of the gas / no gas



selector into the “+” output terminal of the welding machine, and tighten it clockwise.

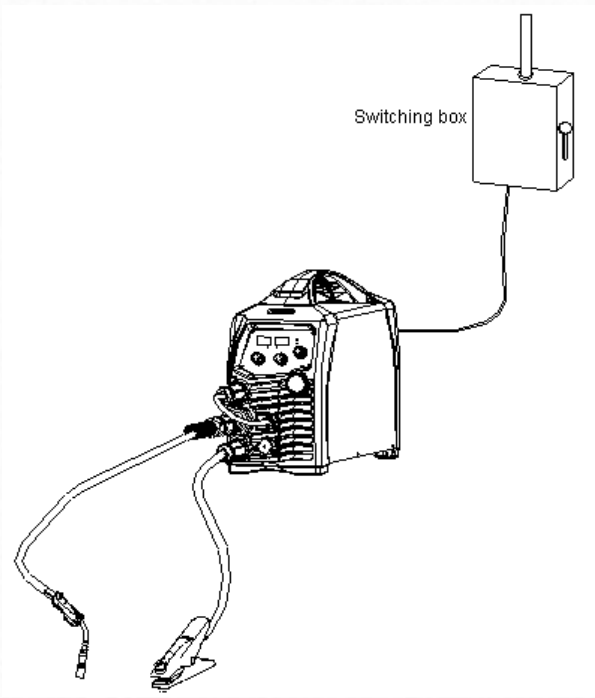
Ensuring that the groove size in the feeding position on the drive roll matches the contact tip size of the welding torch and the wire size being used. Release the pressure arm of the wire feeder to thread the wire through the guide tube, and into the drive roll groove. Adjust the pressure arm, ensuring no sliding of the wire. Too high pressure will lead to wire distortion, which will affect wire feeding. Press the wire inch button to thread the wire out of the torch contact tip.

### Gas less Self Shielded Welding

Insert the welding torch into the “Euro connector for torch in MIG” output socket on the front panel of the machine, and tighten it.

Insert the cable plug with work clamp into the “+” output terminal on the front panel of the welding machine, and tighten it clockwise.

Insert the quick plug of the gas / no gas selector into the “-” output terminal on the middle plate of the welding machine, and tighten it clockwise.



Install the wire spool on the spindle adapter, ensuring that the groove size in the feeding position on the drive roll matches the contact tip size of the welding torch and the wire size being used. Release the pressure arm of the wire feeder to thread the wire through the guide tube, and into the drive roll groove.

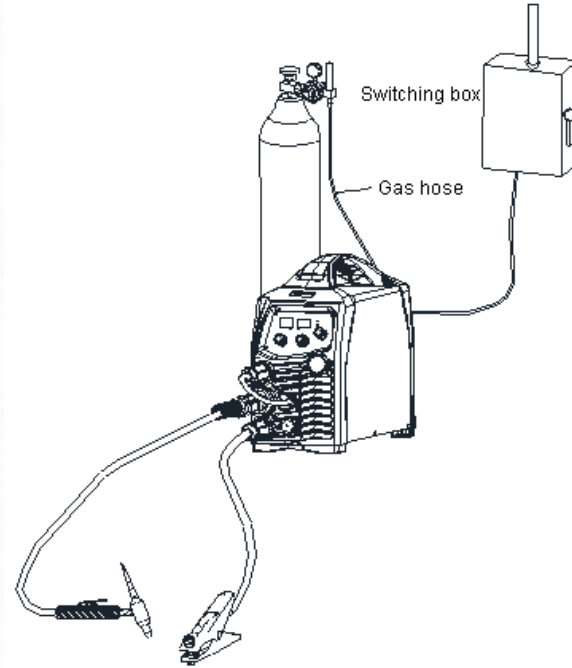
Adjust the pressure arm, ensuring no sliding of the wire. Too high pressure will lead to wire distortion, which will affect wire feeding. Press the wire inch button to thread the wire out of the torch contact tip.

### TIG Welding

Using the optional Euro TIG torch

1) Connect the TIG torch and the work clamp respectively. Connect the TIG torch to the Euro connector on the machine and connect the workpiece to the “+” output terminal on the front panel, and tighten the plugs clockwise.

2) Connect the cylinder to the gas inlet on the back panel of the machine, adjust the gas flow to the appropriate value, and open the gas valve. Please note that the joint should be tightened to prevent gas leakage.



Using valve type torch - No trigger

1) Connect the TIG torch and the work clamp respectively. Connect the TIG torch to the “-” output terminal on the front panel, and connect the workpiece to the “+” output terminal on the front panel, and tighten the quick plugs clockwise.

2) Connect the cylinder to the gas inlet on the back panel of the machine, adjust the gas flow to the appropriate value, and open the gas valve. Please note that the joint should be tightened to prevent gas leakage.



# 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
5.0	180~220
6.0	220~260

## MIG/MAG

Connect the MIG torch leads as detailed above. 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/MIG switch to MIG mode.

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

Adjust the “voltage control knob in MIG” and “wire feed speed control knob in MIG” on the front panel of the machine to get the correct welding voltage and welding current.

Operate the torch trigger, and welding can be carried out.

Where required adjust the burn-back time potentiometer (above the feed unit inside the machine) to get the proper electrode stick-out.

One second after the arc stops, the gas supply will be cut off.

## Gas less MIG

The operation method is the same to MIG operation except that there are no gas options.

## TIG Welding

1) After being installed correctly as shown in the installation section, switch the power switch on the back panel to “ON”, the machine is started and the fan operates. The display window displays the rated capacity and software version firstly, and then displays the relevant parameters after several seconds.

### Using the Euro TIG torch

2) Switch the welding mode selection switch to “TIG”.

3) Select the desired operating mode using the 2T/4T switch key.

2T: After pressing down the torch trigger, gas flows for the pre-flow time, and then welding begins. Initially, the arc is ignited by touch and lift at low current. The current rises to the initial current, and then it increases gradually (according to the upslope time) to the preset current. After releasing the torch trigger, the current drops gradually (according to the downslope time) to “0”, and welding ends.

4T: After pressing down the torch trigger, gas flows for the pre-flow time, and then welding begins. Initially, the arc is ignited by touch and lift at low current. The current rises to the initial current, and then it increases gradually (according to the upslope time) to the preset current. The torch trigger can be released during welding. When pressing down the torch trigger again, the current drops gradually (according to the downslope time) to the pilot arc current. After the torch trigger is released, gas keeps flowing for the post-flow time, and welding ends.

4) Select the correct welding current using the current control knob according to the thickness of the workpiece, and the current display window displays this preset value. Set the downslope time through the downslope time control knob.

### Using valve type torch with no trigger

Arc ignition mode:

This mode adopts contact arc ignition in TIG. The operator should bring the tungsten electrode into contact with the workpiece. When there is current, lift the electrode a little immediately to enter into normal welding. Using this torch there is no 2T or 4T operation and no downslope

## Multifunctional display window

During welding, the current display window displays the practical welding current value, and the voltage display window displays the practical welding voltage value. In standby mode, the windows display as follows.

Welding mode	Current display window	Voltage display window
MMA	Preset current (A)	VRD voltage (V)/ arc force (A/MS)*
MIG (including unified adjusting)	Preset wire feed speed (m/min)	Preset voltage (V)
TIG	Preset current (A)	Downslope time (s)

\*-It displays VRD voltage when not turning the voltage control knob, and displays the arc force when turning the voltage control knob.

## System parameters setting

This machine uses a group of welding parameters in common use as default. If the user wants to alter these parameters, he or she can realize this by altering the system parameters.

The method to alter the system parameter is as follows:

- 1) Press the 2T/4T switch key on the panel and do not release it. Then, turn on the power switch of the welding machine.
- 2) When the display window displays “--- ---“, release the 2T/4T switch key to enter into the system parameter adjusting interface.
- 3) Select the welding mode which needs adjusting by turning the welding mode select switch, select the parameter number through the current control knob, and select the parameter value through the voltage control knob.

Please refer to the table below for the contents of system parameters.

	MMA	MIG	TIG
P1	Ignition current (A)	Crater filling speed (m/min)	Initial current (A)
P2	Ignition time (s)	Crater filling voltage (V)	Pilot arc current (A)
P3	Capacity setting (A)	Downslope time (s)	Upslope time (s)
P4	Return to the default parameter (0: No; 1: Yes)	Pre-flow time (s)	Pre-flow time (s)
P5		Post-flow time (s)	Post-flow time (s)

- 4) After the parameter adjustment is done, press the 2T/4T switch key again to store the system parameters. Then, the machine enters into standby mode.

For welder training please visit our Academy website at

[www.wilkinson-welding-academy.com](http://www.wilkinson-welding-academy.com)



# 6

## Maintenance and troubleshooting

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

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

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

### Troubleshooting

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

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

Only professional maintenance personnel should repair the machine!

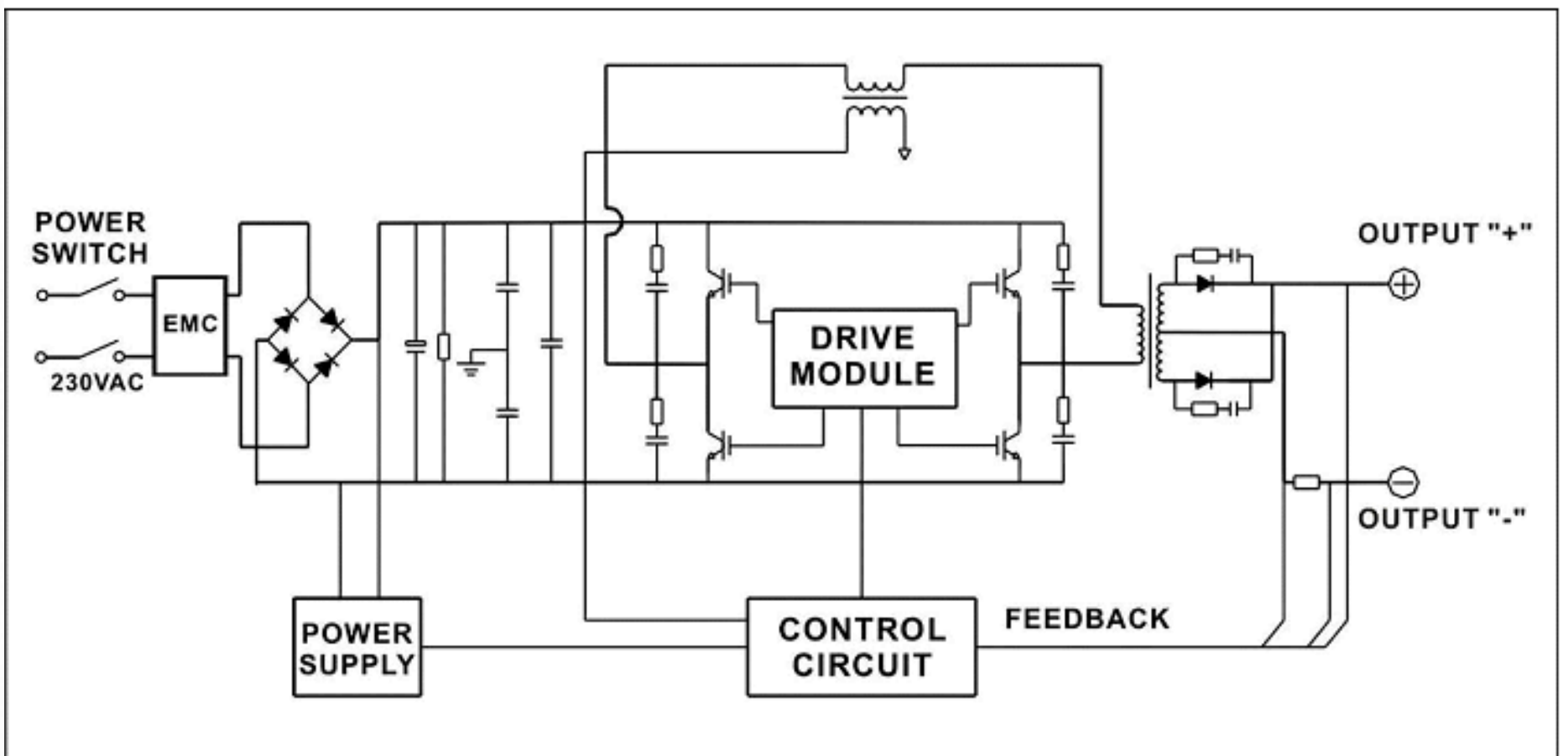
Ensure the power is disconnected before working on the machine. Always wait 5 minutes after power switch off before opening the case.

Symptom	Possible cause	Possible solution
There is no current after turning on the machine.	The power cord is not connected.	Reconnect the power cord.
	The welding machine fails.	Contact the service department
The fan does not work during welding.	The fan supply is not connected.	Reconnect the supply for the fan.
	Auxiliary power or the fan fails.	Contact the service department
The window displays "Err 0".	The power device is under over current or is damaged.	Contact the service department
The window displays "Err 1".	The mains voltage is too low.	Disconnect the machine with the mains power supply, and reconnect it after the mains voltage recovers.
	The auxiliary power fails	Replace the auxiliary power PCB.
The window displays "Err 2".	Overheating protection occurs.	It will recover automatically after the machine is cooled down.
The window displays "Err 3".	Overload protection occurs.	Restart the machine. If the problem remains, contact the service department.
The overheating LED is on.	The overheating protection circuit works.	It will recover after the machine cools down.



# 7

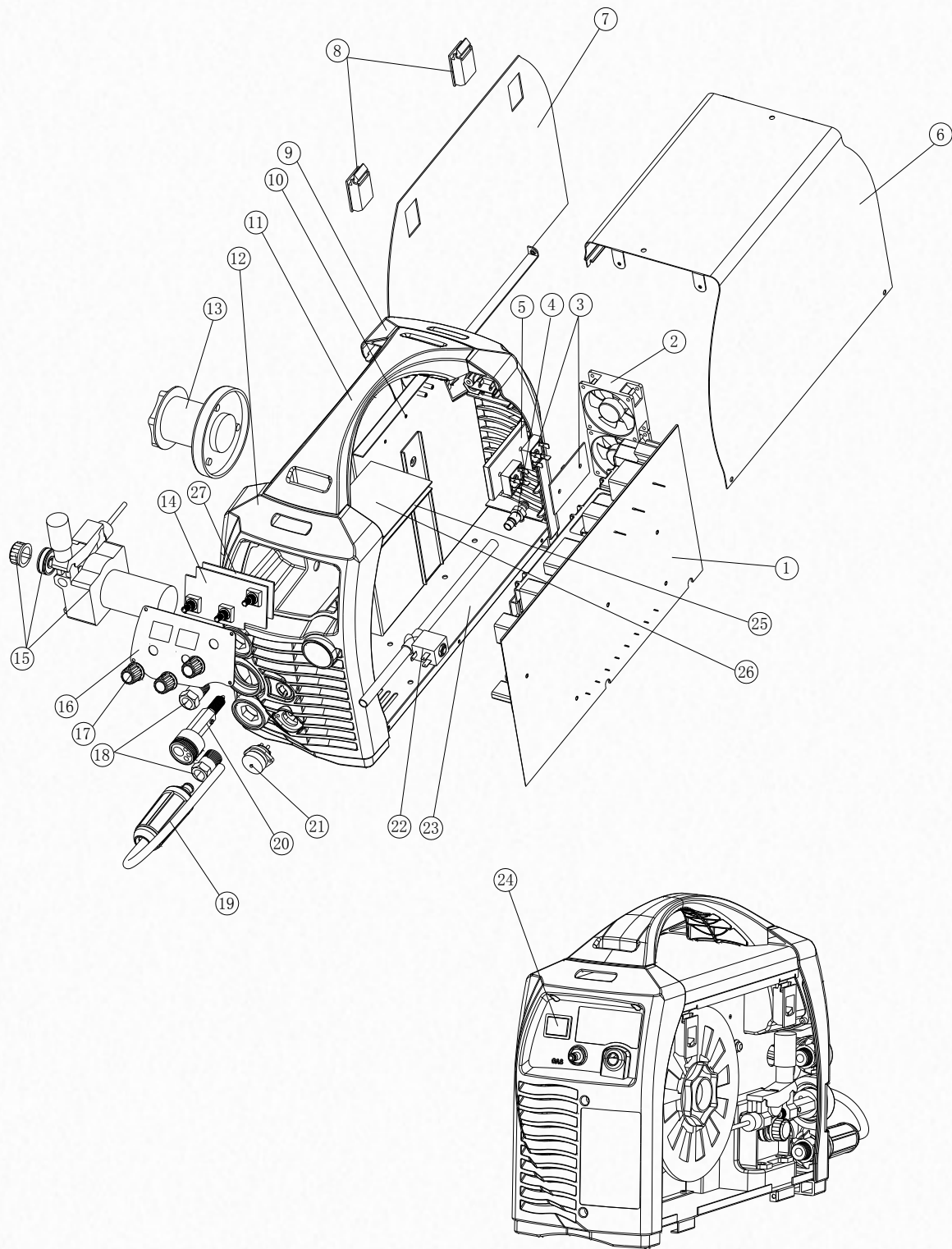
## Electrical schematic



# 8

## Parts list

---



No.	Part no	Description	No.	Part no	Description
1	10045881	Inverter	15	10041421	Wire feed system
2	10041446	Fan	16	10045805	Display panel mounting
3	10037485	Rectifier board	17	10043904	Knob
4	10041723	Gas Connector	18	10037151	Quick Socket
5	10041721	Silicon bridge heat sink	19	10041427	Handle Line
6	10046146	Machine Cover	20	10041419	Torch connector body
7	10046145	Side cover	21	10041400	Spool gun connector (optional)
8	10016524	Door catch	22	10040667	Solenoid valve
9	10041711	Back Panel	23	10041708	Bottom Panel
10	10045740	Central panel	24	10004949	Power switch
11	10041724	Handle	25	10045705	Bracket
12	10041715	Front Panel	26	10045878	Control board
13	10041449	Wire hub assembly	27	10045882	Voltage sampling board
14	10045879	Display panel			



**JM MIG Series MIG/MAG/MMA WELDING MACHINE**  
**Order code JM-200CS (MIG 200CS)**

© Wilkinson Star Limited

Issue 1 May 2014

Product is subject to change without notice