

# SifWELD®



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## SifWeld Evolution MTS200 SYN



# Operation Manual



## TSXE1D200MTS

## DECLARATION OF CONFORMITY

The Low voltage Directive 2006/95/EC of 12 December 2006, entering into force 16 January 2007  
The EMC Directive 2004/108/EC, entering into force 20 July 2007  
The RoSH Directive 2011/65/EC, entering into force 2 January 2013

**Type of Equipment**

Welding power source for MIG/MAG, TIG/TAG, MMA welding

**Brand name or trade mark**

SifWeld® Evolution

**Type designation etc.**

MTS200 SYN

**Manufacturer or his authorised representative established within the EEA****Name, address, telephone no, fax no**

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**The following harmonised standard in force with the EEA has been used in the design:**

EN60974-1- Arc welding equipment- Part 1: Welding power sources  
EN60974-10 Arc welding equipment - Part 10: Electromagnetic Compatibility (EMC) requirements

Additional information: restrictive use, Class A equipment, intended for use in locations other than residential

**By signing this document, the undersigned declares as manufacturer, or the manufacturer's authorised representative established within the EEA, that the equipment in question complies with the safety requirements stated above.**

Place and Date  
Letchworth, UK  
01-04-2015

Signature



Keith Mullan

Position  
Quality Manager  
Weldability Sif

**WEEE Directive & Product Disposal**

*At the end of its serviceable life, this product should not be treated as household or general waste. It should be handed over to the applicable collection point for the recycling of electrical and electronic equipment, or returned to the supplier for disposal.*



# Safety Guidelines

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 user's 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 manufacturer's 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 absorbcency 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.



**The following signs and explanations are to remind the user of the potential risks involved and the dangers of misuse or mistreatment of the welding machine.**



**RUNNING PARTS MAY BE DANGEROUS!**

Keep away from running components, including the fan.



**ELECTRIC SHOCKS CAN KILL!**

Never touch electrical parts. Keep the equipment in good condition, replace damaged parts, undertake regular maintenance according to the instructions.



**BE AWARE OF SPARKS AND SPATTER**

Wear protective clothing, such as leather gloves, Flame retardant overalls, boots and eyewear.



**DO NOT TOUCH THERMAL COMPONENTS!**

Thermal components may cause severe burns when in contact with unprotected skin.

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# 1. Preface

## 1.1 General

### **Congratulations on choosing your SifWeld Evolution MTS200 welding machine.**

Used correctly, SifWeld products can significantly increase the productivity of your welding, and provide years of economical service. This operating manual contains important information on the use, maintenance and safety of your SifWeld product. Please read the manual carefully before using the equipment for the first time. For your own safety and that of your working environment, pay particular attention to the safety instructions in the manual.

For more information on SifWeld products, consult an authorised SifWeld dealer, or visit the SifWeld web site at [www.sifweld.com](http://www.sifweld.com). The specifications presented in this manual are subject to change without prior notice.

### **Important notes**

Items in the manual that require particular attention in order to minimise damage and personal harm are indicated with the **'NOTE!'** notation. Read these sections carefully and follow their instructions.

### **Disclaimer**

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. We reserve the right to change the specification of the product described at any time without prior notice. Do not copy, record, reproduce or transmit the contents of this guide without prior permission.

## 1.2 Introduction

The SifWELD MTS200SYN is a professional, digital controlled inverter welding powersource for MIG, MMA & Lift-TIG applications.

Using the built in Synergic facility the machine will automatically give the optimum welding parameters for the specific material, wire size and shielding gas. featuring IGBT technology and providing a lightweight, multi-process machine. An integral wire feed system accommodates 5kg wire spools.

### Features

- Full Digital Control with large Colour LCD Screen for showing and changing all welding parameters
- Active PFC technology for increased duty cycle and energy efficiency.
- Multi voltage input, can use with long extension lead, 230V or 110V
- MIG/MAG with Synergic programs for aluminum, mill steel, stainless steel and CuSi
- 2T /4T/S4T/Spot Weld welding mode
- function parameter adjustment
- MMA function (Stick electrode)
- Hot start (improves electrode starting)
- Adjustable Arc Force
- DC TIG
- Lift Arc ignition (prevents tungsten sticking during arc ignition)
- 2T /4T Trigger Control
- Adjustable Down slope
- Gas/air cooling mode
- Internal wire feeder, gear driven for up to 5kg Ø spool.
- Euro style MIG torch connection.
- IP21S rating for environmental/safety protection.
- Spool Gun Connection.



## 1.3 Technical Specifications

### SifWeldEvolution MTS200 SYN

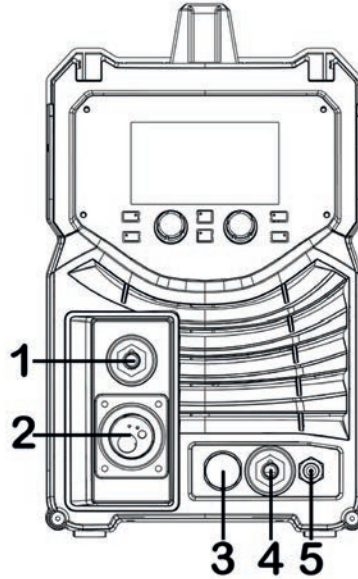
Input Voltage (V)	1~110/120/130±10%			1~220/230/240±10%		
Frequency (HZ)	50/60					
	MIG	TIG	MIG	MIG	TIG	MIG
Input Current (A)	36.6	27.6	27.9	25.6	20.2	30.4
Input Power (KW)	4.0	3.0	3.1	5.9	4.6	7.0
Welding Current (A)	25~140	10~140	10~100	25-200	10~200	
No-load Voltage (V)	67.5	66.7	67.4	67.5	66.7	67.4
Duty cycle (40°C)	40% 140A		40% 100A		40% 200A	
	60% 115A		60% 85A		60% 165A	
	100% 90A		100% 65A		100% 130A	
Diameter (mm)	Fe: 0.6/0.8/0.9/1.0					
	SS: 0.8/1.0					
	Flux-Cored: 0.6/0.8/0.9/1.0					
	Al: 1.2					
Protection class	IP21S					
Circuit breaker	JD03-A1 30A					
Dimensions (mm)	540*245*390					
Weight (Kg)	17.8					
Power Factor	0.99					

## 1.4 Overview of Machine

### Front View

Power Source Front Panel Layout

1. Positive (+) welding power output connection socket.
2. MIG torch euro connector.
3. Remote connection plug.
4. Negative (-) welding power output connection socket.
5. TIG torch gas connector.
6. Power switch.
7. Gas inlet connector.
8. Input power cable.

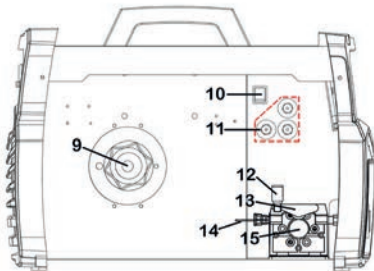
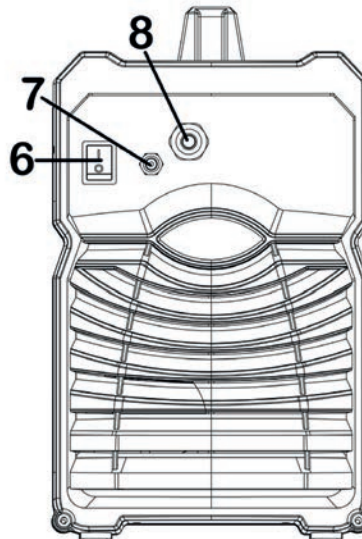


### Rear View

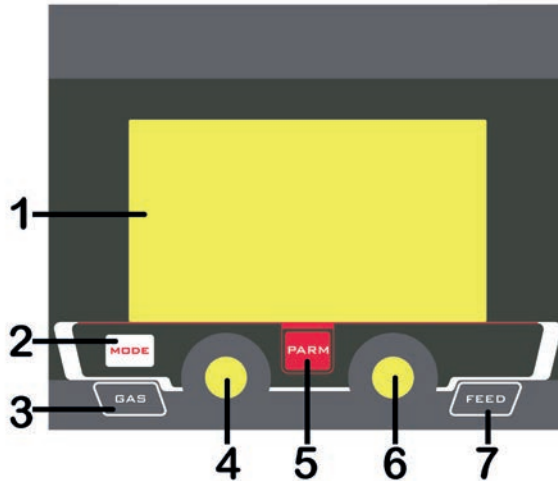
6. Power switch.
7. Gas inlet connector.
8. Input power cable.

### Wire Feeder of machine

9. Spool holder.
10. Spool Gun Switch.
11. MIG Torch Polarity Change Power Connection.
12. Wire feed tension adjustment.
13. Wire feed tension arm.
14. Wire feeder inlet guide.
15. Wire drive roller.



## 2. Control Panels



### 1. Screen

It displays welding current and welding voltage or other parameters, error codes.

### 2. Welding mode button

Press it to select MMA/ TIG Lift/ MIG Manual/ MIG Synergic and Spool Gun welding mode.

### 3. Gas check button

Press it to check whether the machine isn't air-connected or the gas passage isn't smooth.

### 4. Left parameter knob

Press it to select parameters and rotate it to adjust values, such as welding current. In function interface, rotate it to select parameters.

### 5. Function button

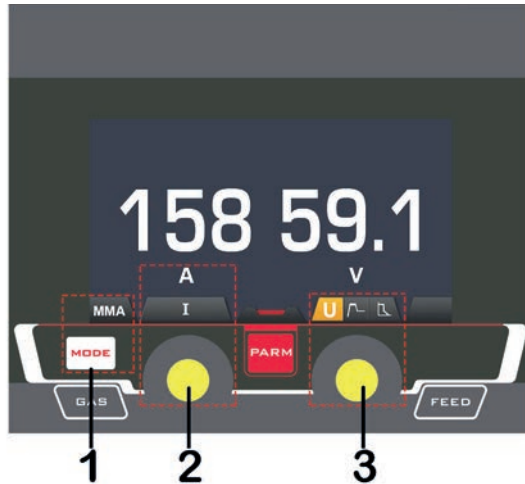
Press it to select parameters or enter the function interface.

### 6. Right parameter knob

Press it to select parameters and rotate it to adjust values.

### 7. Manual wire feed button.

## 2.1 MMA Display



### 1. Welding mode button

Press it to enter MMA welding mode.

### 2. Left parameter knob

Rotate it to welding current.

### 3. Right parameter knob

Press it to select Hot Start or Arc Force and rotate it to adjust values.

### Hot start

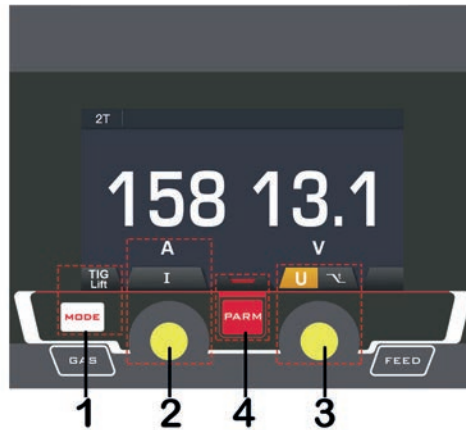
Hot start provides extra power when the weld starts to counteract the high resistance of the electrode and workpiece as the arc is started. Setting range: 0~10.

### Arc force

An MMA welding power source is designed to produce constant output current. This means with different types of electrode and arc length; the welding voltage varies to keep the current constant. This can cause instability in some welding conditions as MMA welding electrodes will have a minimum voltage they can operate with and still have a stable arc.

Arc Force control boosts the welding power if it senses the welding voltage is getting too low. The higher the arc force adjustment, the higher the minimum voltage that the power source will allow. This effect will also cause the welding current to increase. 0 is Arc Force off, 10 is maximum Arc Force. This is practically useful for electrode types that have a higher operating voltage requirement or joint types that require a short arc length such as out of position welds.

## 2.2 LIFT TIG display



### 1. Welding mode button

Press it to enter Lift TIG welding mode.

### 2. Left parameter knob

Rotate it to adjust welding current. In function interface, rotate it to select parameters, such as trigger mode and Post Flow time.

### 3. Right parameter knob

Rotate it to adjust Down Slope time or other parameters.

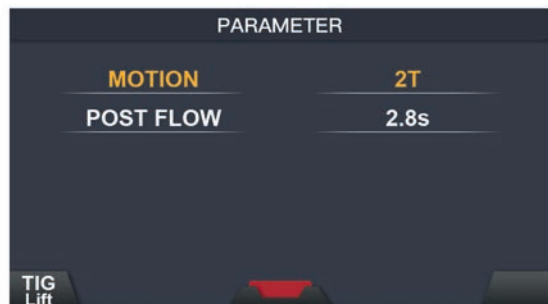
### 4. Function button

Press it to enter the function interface that require a short arc length such as out of position welds.

## FUNCTION INTERFACE

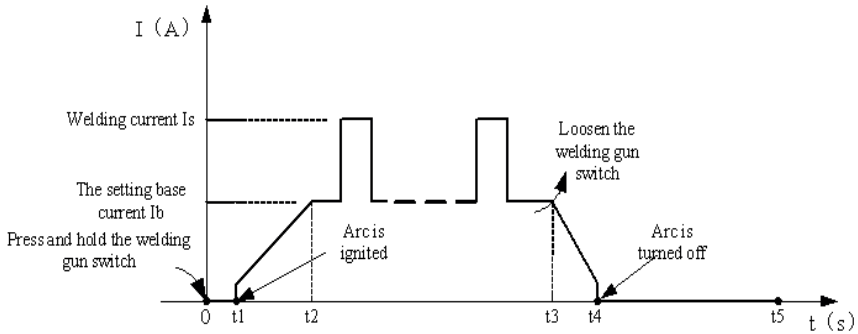
1. Motion: Trigger mode 2T/ 4T/ Spot weld.

2. Post Flow 0-10s.



## 2T MODE

The trigger is pulled and held on to activate the welding circuit, when the trigger is released, the welding circuit stops. This function without the adjustment of start current and crater current is suitable for the Re-tack welding, transient welding, thin plate welding and so on.



### Introduction

**1. 0:** Press the gun switch and hold it. Electromagnetic gas valve is turned on. The shielding gas starts to flow.

**2. 0~t1:** Pre-gas time (0.1~2.0s)

**3. t1~t2:** Arc is ignited and the output current rises to the setting welding current ( $I_w$  or  $I_b$ ) from the min welding current.

**4. t2~t3:** During the whole welding process, the gun switch is pressed and held without releasing.

**Note:** Select the pulsed output, the base current and welding current will be outputted alternately; otherwise, output the setting value of welding current.

**5. t3:** Release the gun switch, the welding current will drop in accordance with the selected down-slope time.

**6. t3~t4:** The current drops to the minimum welding current from the setting current ( $I_w$  or  $I_b$ ), and then arc is turned off.

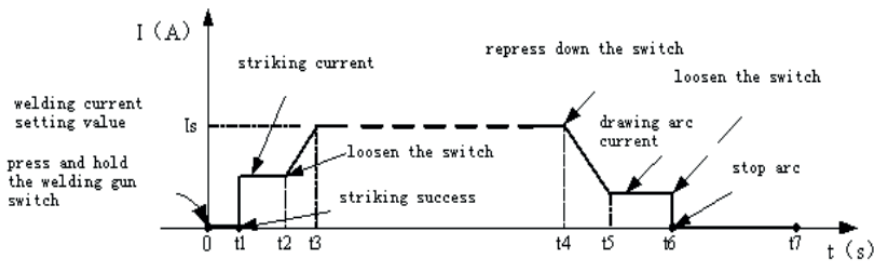
**7. t4~t5:** Post-gas time, after the arc is turned off. You can adjust it (0.0~10s) through turning the knob on the front panel.

**8. t5:** Electromagnetic gas valve turned off, the shield gas stops to flow, and welding is finished.

## 4T MODE

This is known as 'latching' mode. The trigger is pulled once and released to activate the welding circuit, pulled and released again to stop the welding circuit. This function is useful for longer welds as the trigger is not required to be held on continuously. TIG series of welding machines also has more current control options that can be used in 4T mode.

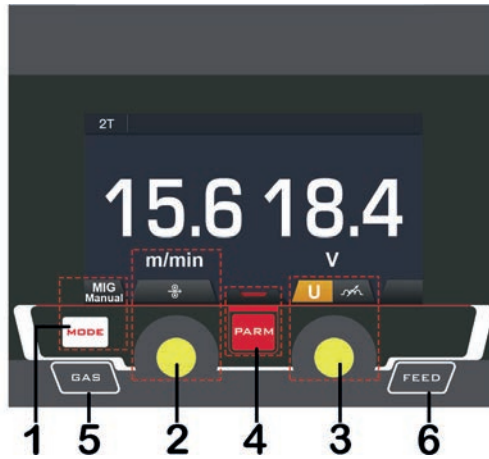
The start current and crater current can be pre-set. This function can compensate the possible crater that appears at the beginning and end of the welding. Thus, 4T is suitable for the welding of medium thickness plates.



### Introduction

1. **0:** Press and hold the gun switch, Electromagnetic gas valve is turned on. The shielding gas starts to flow.
2. **0~t1:** Pre-gas time (0.1~2.0S);
3. **t1~t2:** Arc is ignited at t1 and then output the setting value of start current;
4. **t2:** Loosen the gun switch, the output current slopes up from the start current;
5. **t2~t3:** The output current rises to the setting value ( $I_w$  or  $I_b$ ), the upslope time can be adjusted;
6. **t3~t4:** Welding process. During this period, the gun switch is loosen;
- Note:** Select the pulsed output, the base current and welding current will be outputted alternately; otherwise, output the setting value of welding current;
7. **t4:** Press the torch switch again, the welding current will drop in accordance with the selected down-slope time.
8. **t4~t5:** The output current slopes down to the crater current. The downslope time can be adjusted;
9. **t5~t6:** The crater current time;
10. **t6:** Loosen the gun switch, stop arc and keep on argon flowing;
11. **t6~t7:** Post-gas time can be set by the post-gas time adjustment knob on the front

## 2.3 MIG Manual Display



### 1. Welding mode button

Press it to enter MIG Manual welding mode.

### 2. Left parameter knob

Rotate it to adjust wire feeding speed. In function interface, rotate it to select parameters.

### 3. Right parameter knob

rotate it to adjust Inductance or other parameters.

### 4. Function button

Press it to enter the function interface.

### 5. Gas check button.

### 6. Manual wire feed button.

## FUNCTION INTERFACE

1. Motion: Trigger mode: 2T/ 4T/ Spot weld.
2. Pre Flow: 0-10s.
3. Post Flow: 0-10s.
4. Burnback: 0-10.
5. Slow Feed: 0-10s.

PARAMETER	
MOTION	2T
PRE FLOW	10.0s
POST FLOW	10.0s
BURNBACK	10
SLOW FEED	10s

MIG Manual



**Burnback**

Short-circuit between welding wire and molten pool leads to the increase of current, which leads to the melting speed of welding wire too fast, and the wire feeding speed cannot keep up with, which makes the welding wire and workpiece disconnected. This phenomenon is called "burn back". This function is to ensure the welding seam is not constant after welding. Range: 0-10.

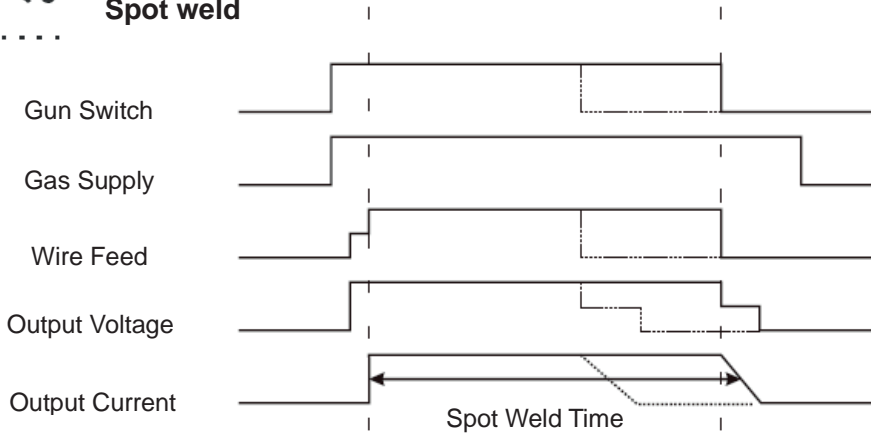
**Slow feed**

This function is used to regulate the start speed of wire feeding increasing. Range: 0-10s.

**Spot Weld trigger mode**

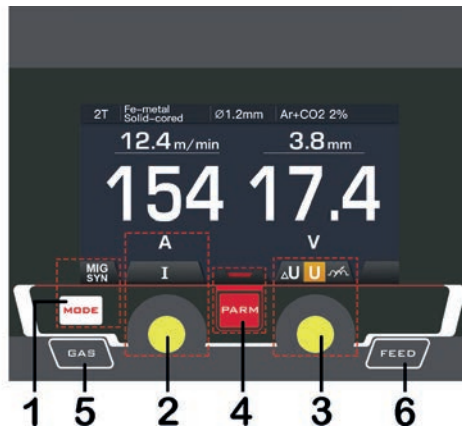


**Spot weld**



## 2.4 MIG SYN Display

The operator simply sets the welding current like MIG welding and the machine calculates the optimal voltage and wire speed for the material type, wire type and size and shielding gas being used. Obviously other variables such as welding joint type and thickness, air temperature affect the optimal voltage and wire feed setting, so the program provides a voltage fine tuning function for the synergic program selected. Once the voltage is adjusted in a synergic program, it will stay fixed at this variation when the current setting is changed. To reset the voltage for a synergic program back to factory default, change to another program and back again.



### 1. Welding mode button

Press it to select MIG SYN welding mode.

### 2. Left parameter knob

Rotate it to adjust wire feeding speed. In functional parameter interface, rotate it to select parameters.

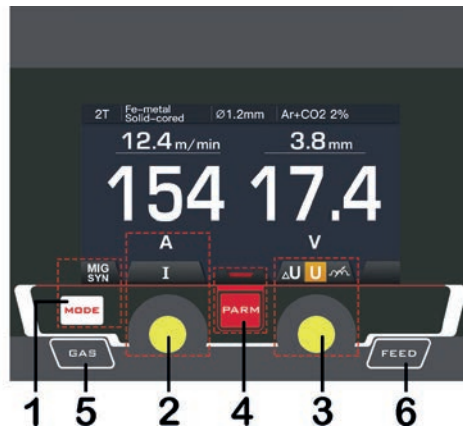
### 3. Right parameter knob

Rotate it to adjust parameters.

### 4. Functional button.

### 5. Manual shield gas check button.

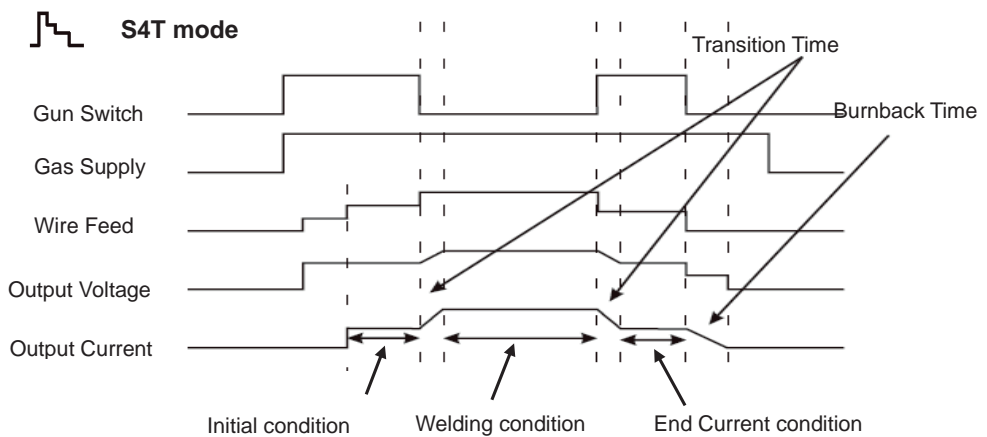
### 6. Manual wire feed button.



**FUNCTION INTERFACE**

- 1. **Trigger mode:** 2T/ 4T/ S4T/ Spot weld. (No Spot weld in MIG Dual Pulse.)
- 2. **Wire material:** SS solid-cored/ Fe solid-cored/ Fe flux-cored/ Al-Mg solid-cored/ CuSi.
- 3. **Wire diameter:** 0.6~1.6mm.
- 4. **Shield gas:** CO2 and Ar+CO2 20%.
- 5. **Pre flow time:** 0~10s.

**S4T trigger mode:**



## 2.5 Spool Gun Display



### 1. Welding mode button

Press it to select Spool Gun welding mode.

### 2. Left parameter knob

Rotate it to adjust wire feeding speed. In functional parameter interface, rotate it to select parameters.

### 3. Right parameter knob

Rotate it to adjust parameters.

### 4. Functional parameter button.

### 5. Manual shield gas check button.

### 6. Manual wire feed button.

## FUNCTION INTERFACE

1. **Trigger mode:** 2T/ 4T/ Spot weld.
2. **Pre flow time:** 0~10s.
3. **Post flow time:** 0~10s.
4. **Burnback:** 0~10.
5. **Slow feed time:** 0~10s.

PARAMETER	
<b>MOTION</b>	<b>2T</b>
PRE FLOW	10.0s
POST FLOW	10.0s
BURNBACK	10
SLOW FEED	10s

MIG Manual

## 2.6 System Setting Panel



Press the functional parameter key and hold it for 3s to enter the system interface. Here you can adjust the language, the unit and the brightness setting by L parameter knob and R parameter knob.

## 3. 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 rating 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**

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.

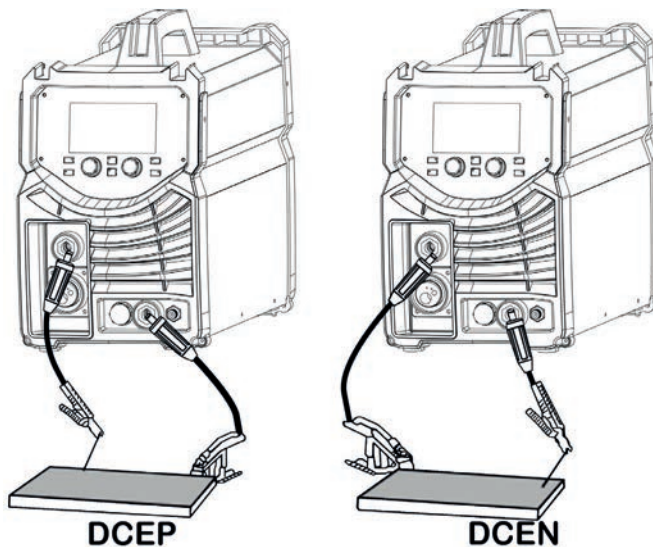
### MMA Welding

Two sockets are available on this welding machine, One Positive (+) and one Negative (-) polarity, to connect MMA/Electrode holder cable and earth clamp cable. Various electrodes require different polarity for optimum results and careful attention should be paid to the polarity, refer to the electrode manufacturers information for the correct polarity.

DCEP: Electrode connected to Positive (+) output socket.

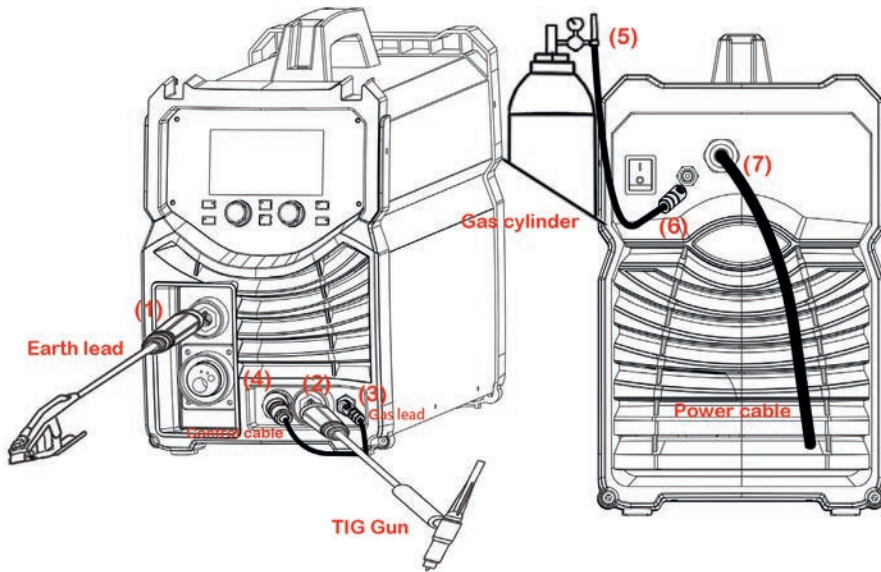
DCEN: Electrode connected to Negative (-) output socket.

1. Turn the power source on and press the welding mode key to MMA welding mode.
2. Set the welding current relevant to the electrode type and size being used as recommended by the electrode manufacturer.
3. Set the Hot Start and Arc Force as required using the right parameter knob.
4. Place the electrode into the electrode holder and clamp tight.
5. Strike the electrode against the work piece to create an arc and hold the electrode steady to maintain the arc.



**TIG Welding**

1. Insert earth cable plug into the positive socket on the front of the machine and twist to lock in place.
2. Plug the welding torch into the negative socket on the front panel and twist to lock.
3. Connect the gas line of TIG torch to outlet gas connector on the front of the machine.
4. Connect the control cable of torch switch to 9-pin socket on the front of the machine.
5. Connect the gas regulator to the gas cylinder and the gas line to the gas regulator.
6. Connect the gas line to the machine inlet gas connector located on the rear panel.
7. Connect the power cable of welding machine to the electrical outlet.
8. Carefully open the valve of the gas cylinder, set the required gas flow rate.
9. Select TIG function on the front panel.
10. Set torch operation for 2T, 4T or Spot trigger mode.
11. Select welding current as required. The selected welding current will show on display. Set down slope time as required. The down slope time will show on the digital display.



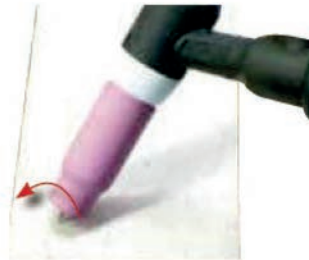




**12.** Assemble front end parts of the TIG torch, fitting a sharpened tungsten suitable for the material to be welded.



**13.** Lay the outside edge of the cup on work piece with the tungsten Electrode 1-2mm from the work piece. Press and hold the trigger button on TIG torch to start the gas flow.



**14.** With a small movement rotate the gas cup forward so that the tungsten electrode touches the work piece.



**15.** Now rotate the Gas Cup in the reverse direction to lift the Tungsten electrode from the work piece to create the arc.

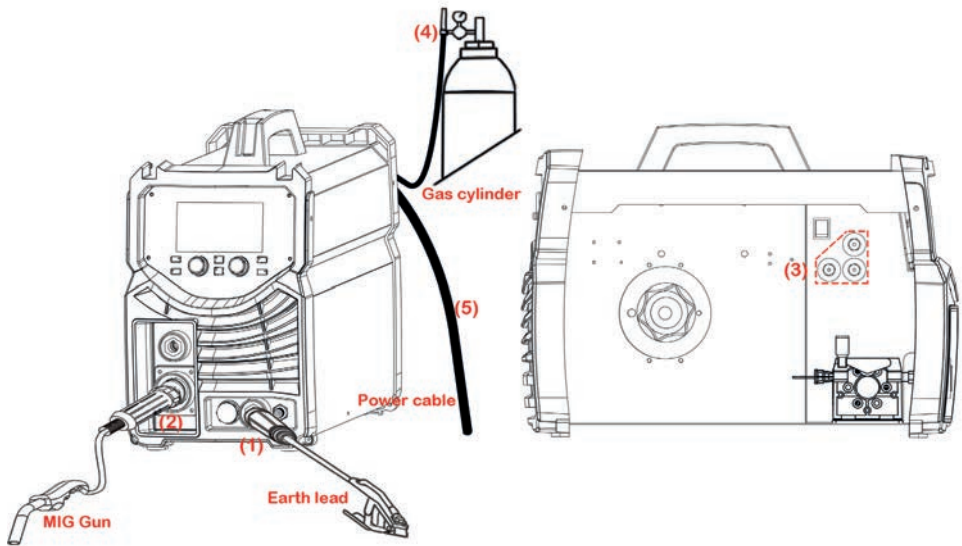


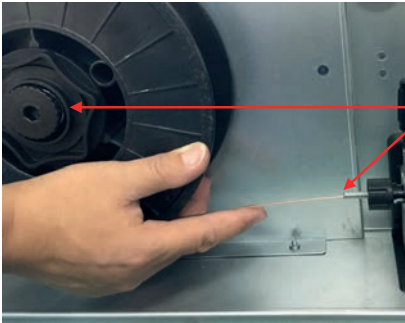
**16.** Release the trigger to stop the welding.

**IMPORTANT!** – It is recommended that you check for gas leaks prior to operation and that the operator close the cylinder valve when the machine is not in use.

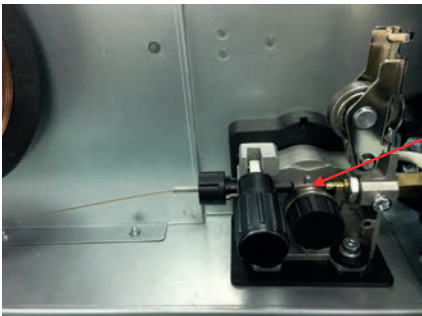
## MIG Welding

1. Insert the earth cable plug into the Negative (-) socket and twist to tighten.
2. Plug the MIG welding gun into MIG torch euro-connector on the front panel and tighten locking nut securely.
3. Connect the MIG polarity change power connection lead to the positive power socket.
4. Connect the gas line to gas connector on the rear panel.
5. Connect the power cord of welding machine with the outlet on electrical box.

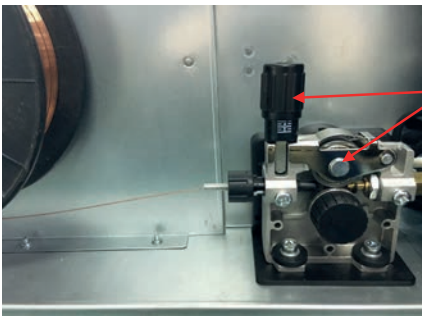




**6.** Place wire onto spool holder - (spool retaining nut is left hand thread) Feed wire through the inlet guide tube on to the drive roller.



**7.** Feed wire over the drive roller into the outlet guide tube, push the wire through approx 150mm.



**8.** Close down the top roller bracket and clip the pressure arm into place with a medium amount of pressure applied.

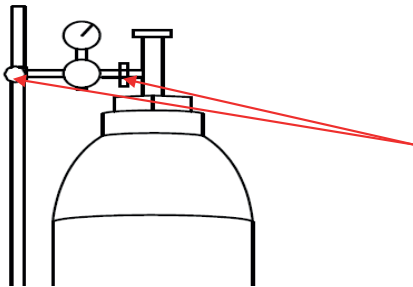
**9.** Press and hold the manual wire button to feed the wire through to the torch neck, release the manual wire button when the wire exits the torch neck.



**11.** Fit the correct sized contact tip and feed the wire through it, screw the contact tip into the tip holder of the torch head and nip it up tightly.



**12.** Fit the gas nozzle to the torch head.



**12.** Carefully open the gas cylinder valve and set the required gas flow rate.

**14.** Select the desired MIG function, Select program number to suit the wire diameter and gas type being used as shown on the display.

**15.** Select torch switch mode: 2T/ 4T/ S4T/ Spot weld.

**16.** Set the required welding parameters to suit the material thickness being welded.

## 3.1 Wire Feed Roller

The importance of smooth consistent wire feeding during MIG welding cannot be emphasized enough. Simply put the smoother the wire feed then the better the weld.

Feed rollers or drive rollers are used to feed the wire mechanically through the length of the welding gun cable. Feed rollers are designed to be used for certain types of welding wire and they have different types of grooves machined in them to accommodate the different types of wire. The wire is held in the groove by the top roller of the wire drive unit and is referred to as the pressure roller, pressure is applied by a tension arm that can be adjusted to increase or decrease the pressure as required. The type of wire will determine how much pressure can be applied and what type of drive roller is best suited to obtain optimum wire feed.

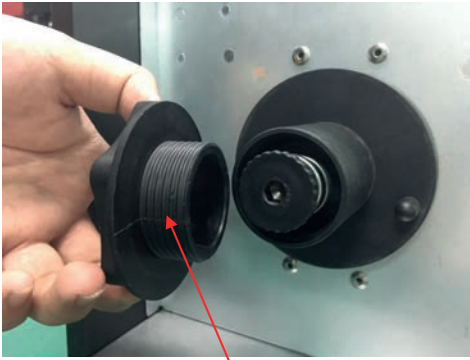
**Solid Hard Wire** - Such as steel, stainless steel requires a drive roller with a "V" shape groove for optimum grip and drive capability. Solid wires can have more tension applied to the wire from the top pressure roller that holds the wire in the groove and the "V" shape groove is more suited for this. Solid wires are more forgiving to feed due to their higher cross-sectional column strength, they are stiffer and don't deflect so easily.

**Soft Wire** – Such as aluminum, require a "U" shape groove. Aluminum wire has a lot less column strength, can bend easily and is therefore more difficult to feed. Soft wires can easily buckle at the wire feeder where the wire is fed into inlet guide tube of the torch. The U-shaped roller offers more surface area grip and traction to help feed the softer wire. Softer wires also require less tension from the top pressure roller to avoid deforming the shape of the wire, too much tension will push the wire out of shape and cause it to catch in the contact tip.

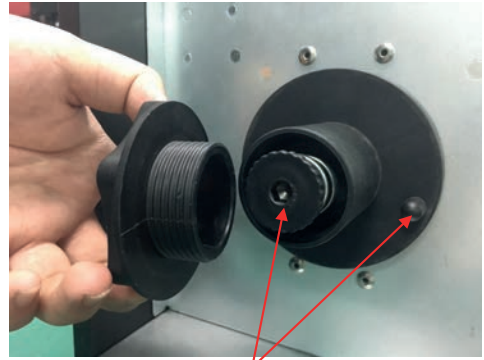
**Flux Core / Gasless Wire** - These wires are made up of a thin metal sheath that has flux and metal compounds layered onto the surface and then rolled into a cylinder to form the finished wire. The wire cannot take too much pressure from the top roller as it can be crushed and deformed if too much pressure is applied. A knurled-V drive roller has been developed and it has small serrations in the groove, the serrations grip the wire and assist to drive it without too much pressure from the top roller. The down side to the knurled wire feed roller on flux cored wire is it will slowly over time bit by bit eat away at the surface of the welding wire, and these small pieces will eventually go down into the liner. This will cause clogging in the liner and added friction that will lead to welding wire feed problems. A U groove wire can also be used for flux core wire without the wire particles coming off the wire surface. However, it is considered that the knurled roller will give a more positive feed of flux core wire without any deformation of the wire shape.

## 3.2 Wire Installation & Setup

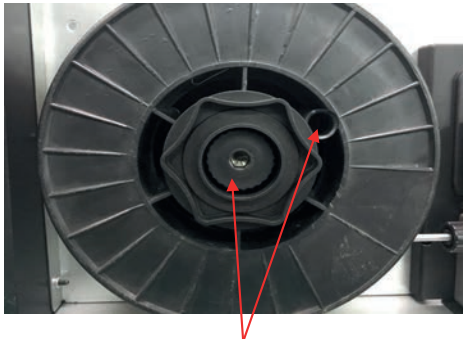
The importance of smooth consistent wire feeding during MIG welding cannot be emphasized enough. The correct installation of the wire spool and the wire into the wire feed unit is critical to achieving an even and consistent wire feed. A high percentage of faults with MIG welders emanate from poor set up of the wire into the wire feeder. The guide below will assist in the correct setup of your wire feeder.



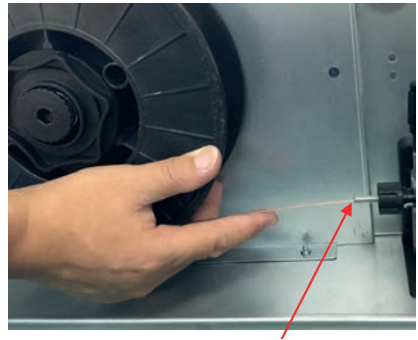
**1.** Remove the spool retaining nut.



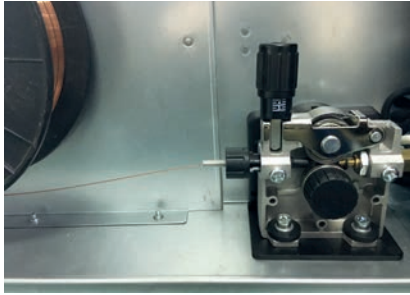
**2.** Note the tension spring adjuster and spool locating pin.



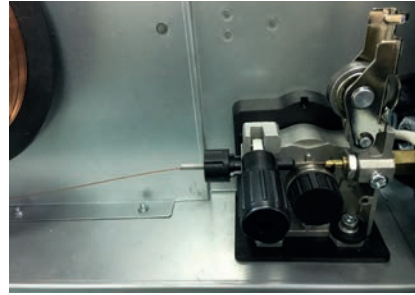
**3.** Fit the wire spool onto the spool holder fitting the locating pin into the location hole on the spool. Replace the spool retaining nut tightly.



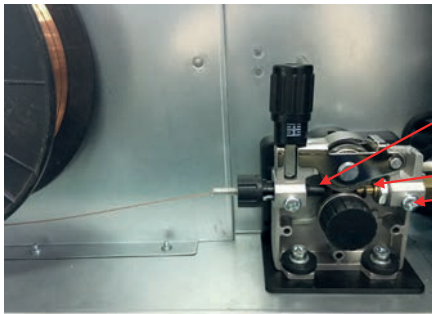
**4.** Snip the wire carefully, be sure to hold the wire to prevent the spool uncoiling. Carefully feed the wire into the inlet guide tube of the wire feed unit.



**5.** Feed the wire through the drive roller and into the outlet guide tube of the wire feeder.



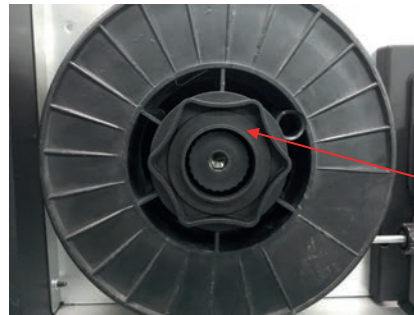
**6.** Lock down the top pressure roller and apply a medium amount of pressure using the tension adjustment knob.



**7.** Check that the wire passes through the center of the outlet guide tube without touching the sides. Loosen the locking screw and then loosen the outlet guide tube retaining nut too make adjustment if required. Carefully retighten the locking nut and screw to hold the new position.



**8.** A simple check for the correct drive tension is to bend the end of the wire over hold it about 100mm from your hand and let it run into your hand, it should coil round in your hand without stopping and slipping at the drive rollers, increase the tension if it slips.



**9.** The weight and speed of the wire spool turning creates an inertia that can cause the spool to run on and the wire loop over the side of the spool and tangle. If this happens increase the pressure on the tension spring inside the spool holder assembly using the tension adjustment screw.

## 3.3 MIG Torch liner Types

### MIG Torch Liners

The liner is both one of the simplest and most important components of a MIG gun. Its sole purpose is to guide the welding wire from the wire feeder, through the gun cable and up to the contact tip.

### Steel Liners

Most MIG gun liners are made from coiled steel wire also known as piano wire, which provides the liner with good rigidity and flexibility and allows it to guide the welding wire smoothly through the welding cable as it bends and flex during operational use. Steel liners are primarily used for feeding of solid steel wire, other wires such as Aluminum, Silicon Bronze, Etc. will perform better using a Teflon or Polyamide line. The internal diameter of the liner is important and relative to the wire diameter being used. The correct inside diameter and will assist in smooth feeding and prevention of the wire kinking and bird-nesting at the drive rollers. Also bending the cable too tightly during welding increases the friction between the liner and the welding wire making it more difficult to push the wire through the liner resulting in poor wire feeding, premature liner wear and bird-nesting. Dust, grime and metal particles can accumulate inside the liner over time and cause friction and blockages, it is recommended to periodically blow out the liner with compressed air. Small diameter welding wires, 0.6mm through 1.0mm have relatively low columnar strength, and if matched with an oversized liner, can cause the wire to wander or drift within the liner. This in turn leads to poor wire feeding and premature liner failure due to excessive wear. By contrast, larger diameter welding wires, 1.2mm through 2.4mm have much higher columnar strength but it is important to make sure the liner has enough internal diameter clearance. Most manufacturers will produce liners sized to match wire diameters and length of welding torch cable and most are color coded to suit.

### Teflon and Polyamide (PA) Liners

Teflon liners are well suited for feeding soft wires with poor column strength like aluminum wires. The interiors of these liners are smooth and provide stable feeding, especially on small diameter welding wire Teflon can be good for higher heat applications that utilize water-cooled torches and brass neck liners. Teflon has good abrasion resistance characteristics and can be used with a variety of wire types such as silicon bronze, stainless steel as well as aluminum. A note of caution to carefully inspect the end of the welding wire prior to feeding it down the liner. Sharp edges and burrs can score the inside of the liner and lead to blockages and accelerated wear. Polyamide Liners (PA) are made of carbon infused nylon and are ideal for softer aluminum, copper alloy welding wires and push pull torch applications. These liners are generally fitted with a floating collet to allow the liner to be inserted all the way to the feed rollers.

### Copper - Brass Neck Liners

For high heat applications fitting brass or copper wound jumper or neck liner on the end of the liner at the neck end will increase the working temperature of the liner as well as improve the electrical conductivity of the welding power transfer to the wire. It is recommended for all Aluminum and Silicone Bronze welding applications.



# 4. 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.

### Wire types and sizes

Use the correct wire type for the base metal being welded. Use stainless steel wire for stainless steel, aluminum for aluminum and steel wires for steel.

Use a smaller diameter wire for thin base metals. For thicker materials use a larger wire diameter and larger machine, check the recommended welding capability of your machine. As a guide refer to the “Welding Wire Thickness Chart” below.

Material Thickness	Recommended Wire Diameters				
	0.6	0.8	1.0	1.2	1.6
0.8mm	Yellow				
0.9mm	Yellow				
1.0mm	Yellow	Yellow			
1.2mm	Yellow	Yellow			
1.6mm	Yellow	Yellow			
2.0mm	Yellow		Yellow		
2.5mm	Yellow		Yellow	Yellow	
3.0mm	Yellow		Yellow	Yellow	Yellow
4.0mm	Yellow		Yellow	Yellow	Yellow
5.0mm	Yellow		Yellow	Yellow	Yellow
6.0mm	Yellow		Yellow	Yellow	Yellow
8.0mm		Yellow	Yellow	Yellow	Yellow
10.0mm			Yellow	Yellow	Yellow
14.0mm				Yellow	Yellow
18.0mm					Yellow
22.0mm					Yellow

For material thickness of 5.0mm and greater, multi-pass runs or a beveled joint design may be required depending on the amperage capability of your machine.

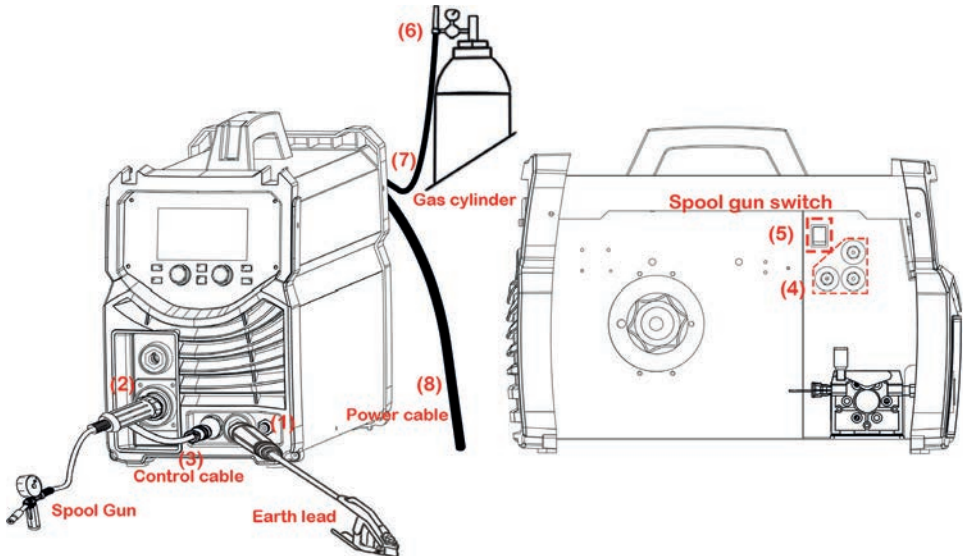
## 4.1 Spool Gun

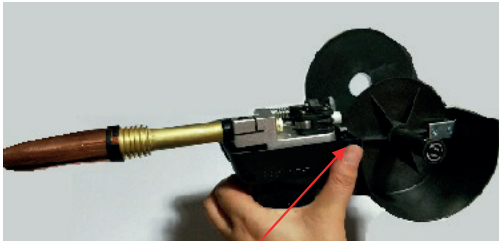
### Set up installation for Spool Gun

1. Insert the earth cable plug into the negative (-) socket on the front of the machine and twist to tighten.
2. Plug the Spool Gun into the euro-connect socket on the front panel and tighten.

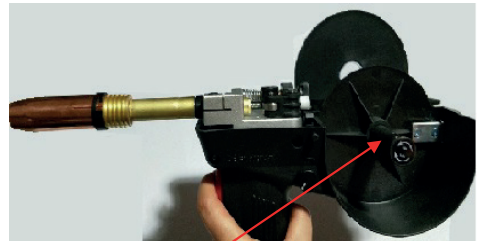
**IMPORTANT!** When connecting the torch be sure to tighten the adaptor nut completely tight. A loose connection can result in arcing between the gun and machine connector and that causes serious damage to both the torch and machine connections.

3. Connect the MIG polarity change power connection lead to the positive power socket.
4. Insert the polarity switching cable plug into the positive socket on the front of the machine and tighten it.
5. Press the Spool gun switch to open Spool Gun welding mode.
6. Connect the gas regulator to the gas cylinder and connect the gas line to the regulator.
7. Connect the gas line to gas connector on the rear panel.
8. Connect the power cord of welding machine with the outlet on electrical box.

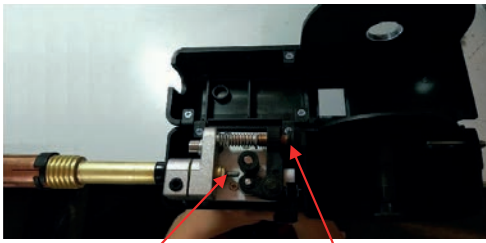




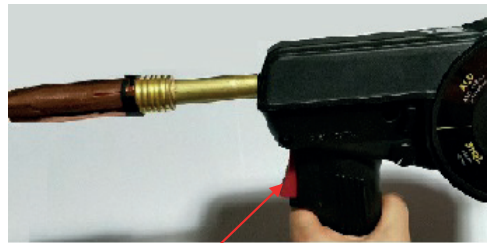
**9.** Remove the spool cover by pressing button and lifting off the cover.



**10.** Place a spool of wire inside the spool holder on post.



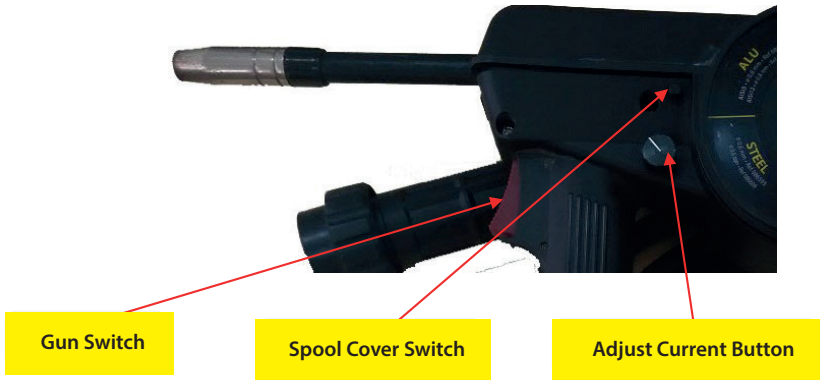
**11.** Feed the wire through the drive rolls and into the inlet guide tube. Tighten the wire tension swing arm.



**12.** Pull the trigger to drive the wire down the neck until it exits the contact tip.

**13.** Carefully open the gas cylinder valve and set the required gas flow rate.

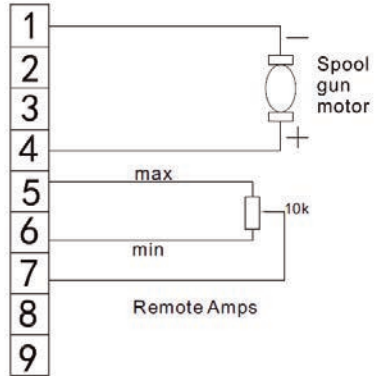
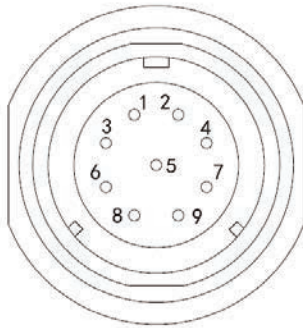
**14.** Set welding parameters using the knobs as shown on digital displays.



**Gun Switch**

**Spool Cover Switch**

**Adjust Current Button**



**Remote Control Socket**

Socket Pin	Function
1	Spool gun motor
2	Not connected
3	Not connected
4	Spool gun motor
5	10k ohm (maximum) connection to 10k ohm remote control potentiometer.
6	Zero ohm (minimum) connection to 10k ohm remote control potentiometer.
7	Wiper arm connection to 10k ohm remote control potentiometer.
8	Not connected
9	Not connected

# 5. Troubleshooting

Error Type	Code	Description
Thermal relay	E01	Over-heating (1st thermal relay)
	E02	Over-heating (2nd thermal relay)
	E03	Over-heating (3rd thermal relay)
	E04	Over-heating (4th thermal relay)
	E09	Over-heating (Program default)
Welding machine	E10	Phase loss
	E11	N/A
	E12	No gas
	E13	Under voltage
	E14	Over voltage
	E15	Over current
	E16	Wire feeder over load
Switch	E20	Button fault on operating panel when switch on the machine
	E21	Other faults on operating panel when switch on the machine
	E22	Torch fault when switch on the machine
	E23	Torch fault during normal working process
Accessory	E30	Cutting torch disconnection
	E31	N/A
Communication	E40	Connection problem between wire feeder and power source
	E41	Communication error)

## 6. Maintenance

The utilisation level of the power source and its working environment should be taken into consideration in planning the frequency of maintenance of the machine. Appropriate use and preventive maintenance guarantee the best trouble-free use of the equipment. This allows you to avoid interruptions in use and increases the productivity of the machine.

### 5.1 Cables

Check the condition of welding and mains cables daily. Do not use damaged cables. Also make sure that all extension cables used in the mains connection are in proper condition and compliant with regulations.

**NOTE! The mains cables may be repaired and installed only by electrical contractors and installers authorised to perform such operations.**

### 5.2 Power source

Make sure the machine is placed away from any grinding area.

1. Clean the exterior of the machine and the fan grills net of any dust and stains – for example, with a soft brush and vacuum cleaner.
  - Do not use pressurised air. The stain may become compressed into the grooves of the coolers.
  - Do not use a pressure-washing device.
2. Check the electrical connections of the machine. Clean any oxidised connections, and tighten the loosened ones.
  - Check for the right tension before you start repairing the connections.

**NOTE! Remember that the machine may be repaired only by an electrical contractor or installer authorised to perform such operations.**

### 5.3 Regular maintenance

Authorised service agents perform regular maintenance by agreement. Tasks included in regular maintenance:

- Cleaning of equipment.
- Inspection and maintenance of the welding gun.
- Checking of connectors, switches, and control knobs.
- Checking of electrical connections.
- Checking of the mains cable and plug.
- Replacement of damaged or worn parts.
- Calibration testing, with adjustment of the functions and operational values of the machine, if necessary.

## 7. Warranty

Weldability Sif warrants its customers that all new SifWeld manual welding and cutting equipment purchased shall be free of failure from defective materials or production for a period of 2 Years from the date of purchase.

This warranty period can be extended to 5 Years from the date of purchase (including the standard warranty period) for customers in the United Kingdom and Republic Of Ireland; or to 3 Years from date of purchase for customers in all other countries, subject to registration of the product at [www.sifweld.com](http://www.sifweld.com) within the first year of purchase, and undergoing annual preventative maintenance servicing with effect from the second year of ownership.

All warranty periods start from the date of purchase from Weldability Sif or an approved SifWeld distributor to the original end user. The date on the sales invoice is considered the date of purchase for the purpose of the warranty period, or the date of manufacture is used if proof of purchase is not available. Equipment is warranted to the original owner/user customer, and is not transferable.

Subject to the underlying purchase contract, or, failing such, the Weldability Sif general terms and conditions of sale, both the cost of replacement parts and Weldability Sif's labour expense in correcting defects covered by the warranty, will be assumed by Weldability Sif during the warranty period. Weldability Sif shall in no event be responsible for any direct or indirect damages, third party expenses, as well as any loss of income/revenue, all of which are specifically excluded under this warranty.

The warranty does not cover : Any defects resulting from normal wear and tear; Improper use; Failure to observe the operating and maintenance instructions; Connection to an incorrect or faulty mains supply; Overloading during use; Any transport or storage damage; External damage such as fire, impact or damage due to natural causes, e.g flooding; Use of unapproved spare or wear parts or replacement parts not supplied by or approved by Weldability Sif; Any modification or alteration of the equipment; or any other circumstances beyond the control of Weldability Sif. The warranty period is based on a single 8-hour 5-day shift pattern and the extended warranty is not applicable to units that are purchased for rental or hire. Weldability Sif will submit an invoice for any repair work performed outside the scope of the warranty.

Any warranty repair must be performed by Weldability Sif or an Authorised SifWeld Service Centre. The customer is responsible for all shipping costs and risk associated with items that are returned covered under warranty. Weldability Sif may opt to refund the purchase price (less any costs and depreciation due to use and wear). Faults/defects found under warranty should be reported to the Weldability Sif Technical team for review. A warranty claim reference number will be issued and details of the most appropriate Authorised SifWeld Service Centre will be advised, if appropriate. The customer has no claim to any loan or replacement products whilst repairs are being performed or replacements are being provided.

The decision about repair or replacement of any defective part(s) is made by Weldability Sif. The replaced part(s) remain(s) property of Weldability Sif. The warranty extends only to the machine power-source, wire-feed unit and parts contained inside. No other warranty is expressed or implied, including with regard to the fitness of the equipment for any particular application.

Under the terms of the warranty, welding torches, their consumable parts, wire-feed 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 not covered.

The extended warranty is only valid where products have been used strictly in accordance with the operating instructions, all installation guidelines have been implemented, all legal requirements have been observed, regular preventative maintenance has been undertaken and a continuous history of annual servicing has been completed and recorded. Failure to register the equipment online within 1 year of purchase, or to complete the required annual servicing cycle from year 2, will invalidate the extended warranty period.

Annual preventative maintenance servicing must be arranged and paid-for by the equipment owner/user and carried out by Weldability Sif or an Authorised SifWeld Service Centre, in order to maintain validity of the extended warranty. Service visits can be booked online at [www.sifweld.com](http://www.sifweld.com) or by calling 0870 330 7757 and will be charged at an average of £65 net per hour of travel/ servicing time. Please allow an average of 2 hours servicing per machine and one hour each way of travel.

Warranty support is facilitated by our network of Authorised SifWeld Service Centres that provide highly experienced capability and carry-out the professional repair, service and calibration of SifWeld equipment.



**Weldability sif**

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