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SIP Weldmate 180A Cordless Battery Inverter Welder

SIP Code 05712



For help or advice please contact your distributor, or sip directly on: Tel.: 01509 500400
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www.sip-group.com

SIP INDUSTRIAL

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SAFETY INSTRUCTIONS



Danger / Caution: This image indicates risk of personal injury and/or the possibility of damage.



Warning: This image indicates risk of electrical injury or damage!



Note: This image indicates supplementary information.



Important: Please read the following instructions carefully, failure to do so could lead to serious personal injury and / or damage to the item.

Before using your Inverter Welder it is in your own interest to read and pay attention to the following safety rules.
When using your inverter welder, basic safety precautions should always be followed to reduce the risk of personal injury and / or damage to the welder.
Read all of these instructions before operating the welder and save this user manual for future reference.
The welder should not be modified or used for any application other than that for which it was designed. This welder was designed to supply electric current for MMA (Arc) or TIG welding.
If you are unsure of its relative applications do not hesitate to contact us and we will be more than happy to advise you.
Before each use of the welder always check no parts are broken and that no parts are missing. Always operate the welder safely and correctly.

1. KNOW YOUR WELDER: Read and understand the owner's manual and labels affixed to the welder. Learn its applications and limitations, as well as the potential hazards specific to it.
2. KEEP WORK AREA CLEAN AND WELL LIT: Cluttered work benches and dark areas invite accidents. Floors must not be slippery due to oil, water or sawdust etc.
3. DO NOT USE THE WELDER IN DANGEROUS ENVIRONMENTS: Do not use the welder in damp or wet locations, or expose it to rain. Provide adequate space

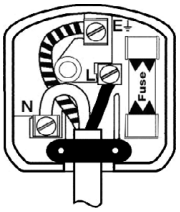
surrounding the work area. Do not use in environments with a potentially explosive atmosphere.

4. KEEP CHILDREN AND UNTRAINED PERSONNEL AWAY FROM THE WORK AREA: All visitors should be kept at a safe distance from the work area.
5. STORE THE WELDER SAFELY WHEN NOT IN USE: The welder should be stored in a dry location and disconnected from the charger, and out of the reach of children.
6. USE SAFETY CLOTHING / EQUIPMENT: Use a CE approved welding mask at all times with the correct shade of filter lens. A fume extractor should be used particularly where there is little or no ventilation.
7. PROTECT YOURSELF FROM ELECTRIC SHOCK: When working with the welder, avoid contact with any earthed items (e.g. pipes, radiators, hobs and refrigerators, etc.).
8. STAY ALERT: Always watch what you are doing and use common sense. Do not operate the welder when you are tired or under the influence of alcohol or drugs.
9. AVOID UNINTENTIONAL STRIKING: Make sure the switch is in the OFF position after and before use.
10. NEVER LEAVE THE WELDER CONNECTED WHILST UNATTENDED: Turn the welder off between jobs. Do not leave the welder ON if no more welding is to be done.
11. CHECK FOR DAMAGED PARTS: Before every use of the welder, any damage found should be carefully checked to determine that it will operate correctly, safely and perform its intended function. Any damaged, split or missing parts that may affect its operation should be correctly repaired or replaced by an authorised service centre unless otherwise indicated in this instruction manual.
12. KEEP ALL PANELS IN PLACE: Never operate the welder with the panels removed, this is extremely dangerous.
13. MAINTAIN THE WELDER WITH CARE: Keep the earth clamp, mig tip & shroud clean for the best and safest performance.
14. USE ONLY RECOMMENDED ACCESSORIES: Consult this user manual, your distributor or SIP directly for recommended accessories. Follow the instructions that accompany the accessories. The use of improper accessories may cause hazards and will invalidate any warranty you may have.
15. SECURE THE WORK-PIECE: Always use welding clamps to secure the work piece. This frees up both hands to operate the welder correctly.
16. DO NOT OVERREACH: Keep proper footing and balance at all times.
17. DO NOT OPERATE THE WELDER IN EXPLOSIVE ATMOSPHERES: Do not use the welder in the presence of flammable liquids, gases, dust or other combustible sources. Welding will create sparks which can ignite the dust or fumes.
18. HAVE YOUR WELDER REPAIRED BY A QUALIFIED PERSON: Repairs should be carried out by a qualified person using original spare parts, otherwise this may result in considerable danger to the user.

Lithium Battery

- Always charge the product indoors and store in a cool dry place out of the reach of children. Do not use the charger outdoors.
- Use only the charger provided with your unit. The use of any other charger could permanently damage the battery.
- Do not abuse the charger or charger cord. Do not use the charger if the charger or charger cord is damaged.
- Do not charge the battery or use the unit in an explosive or corrosive environment. Avoid areas where flammable liquids or gases are present to avoid creating a fire or explosion.
- Do not incinerate or mutilate the battery. Batteries contain hazardous chemicals. Dispose of properly.
- Do not leave the unit unattended while charging.
- Lithium batteries must be used with common sense avoiding any misuse or extreme conditions.
- Do not expose battery to water or salt water, or allow the battery to get wet.
- Do not pierce the battery, step on it or allow any direct impact.
- Do not disassemble or modify the battery. The battery contains safety and protection devices, which, if damaged, may cause the battery to generate heat, explode or ignite.
- Immediately disconnect the battery if, while using, charging or storing it starts to emit any smell, feels hot, changes color or shape.
- If the battery leaks and fluid gets in your eye, do not rub your eye. Rinse well with water and seek medical care.
- If the plug of the charger has to be changed because of damage, it must be removed and a replacement fitted, following the wiring instructions stated below.

Blue = neutral / Brown = live / Yellow and Green = earth



GUARANTEE

This item is covered by a 24 month parts and labour warranty covering failure due to manufacturers defects. This does not cover failure due to misuse or operating the item outside the scope of this manual - any claims deemed to be outside the scope of the warranty may be subject to charges Including, but not limited to parts, labour and carriage costs, failure to regularly clean your item will shorten its working life and reduce performance.

Consumable items such as welding leads are not covered by the warranty.

NOTE: The battery is covered by a 12 month warranty and must be regularly charged.

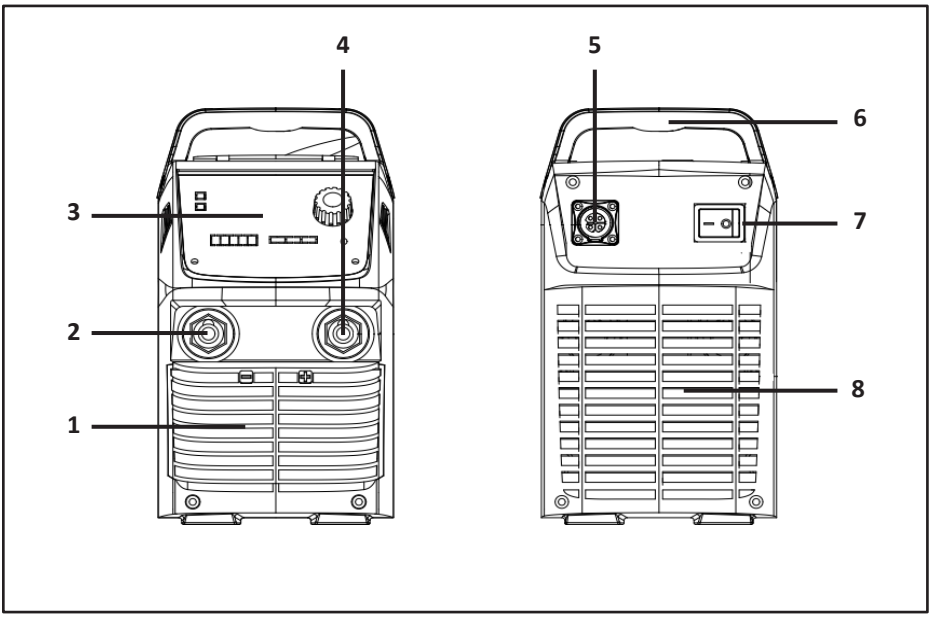


NOTE: Proof of purchase will be required before any warranty can be honoured.

Battery information

Over 500 charge / discharge life cycles achievable.
Always keep the battery charge level over 50%.
Battery can be left on charge for long periods using the charger provided.
Welding on lower current @ 100A will increase battery life and capacity.
Avoid using at low temperatures ; 5C or lower.

Before long term storage:
Ensure battery charge level is > 50%.
Charge & discharge every 3 months.



Item No.	Description	Item No.	Description
1.	Air Outlet	5.	Charging port
2.	Negative Output Socket	6.	Handle
3.	Control Panel	7.	On/Off Switch
4.	Positive Output Socket	8.	Fan / Air Inlet

TECHNICAL SPECIFICATION

Model No.	05712	
Battery Type	Lithium Ion	
Battery Capacity	740 Wh	
AC Charging voltage	230V ± 10%	
Charging Time	1.5h	
Rated Voltage of battery	74V	
Charging current	8A	
Welding Mode	MMA & TIG	
Welding Current Range	10~180A : Battery Power >40%	10~150A : Battery Power ≤40%
Duty Cycle	10% 180A 20% 130A 100% 60A	
Protection class	IP21S	
Cooling System	Fan	
Dimensions	440 x 150 x 280	
Weight	11.57Kg	

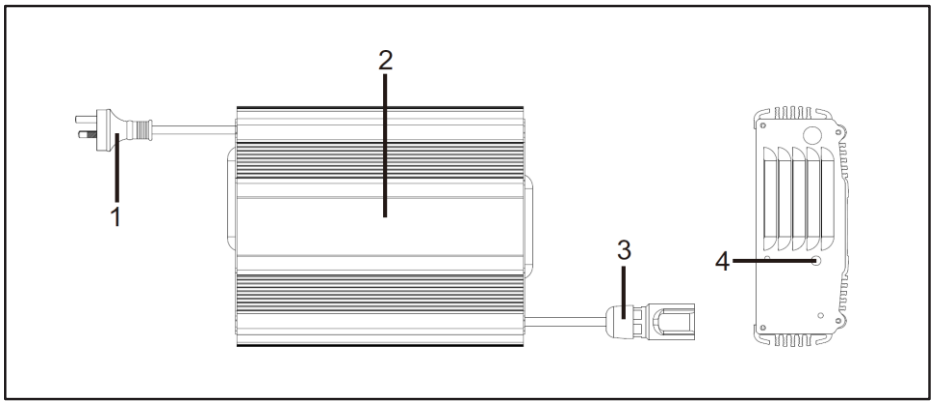
Welding capability			
Electrode (mm)	Φ2.5 x 300	Φ3.2 x 350	Φ4.0 x 350
Number of rods (units)	20 rods	14 rods	6 rods
Welding current (A)	85A	120A	160A

*The above parameters are indicative and may vary depending on different welding conditions.

Overview

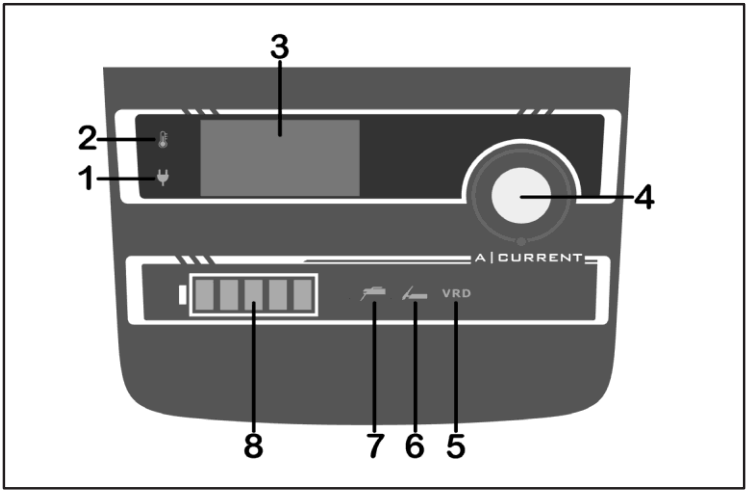
1. Built in high-performance lithium-ion battery, convenient for use in various environments.
2. Extremely low weight and versatile.
3. MMA, VRD and TIG welding modes are available to meet different welding requirements.

Charger Layout



Item No.	Description	Item No.	Description
1.	Mains Lead	3.	Charger socket
2.	Charger	4.	Status Indicator

Control Panel Layout



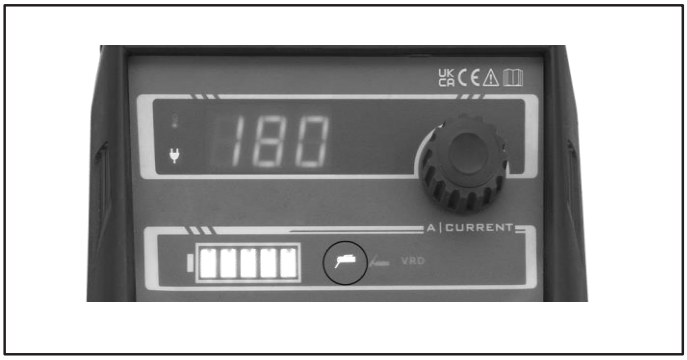
Item No.	Description	Item No.	Description
1.	Power Indicator	5.	VRD Welding Mode Indicator
2.	Alarm Indicator	6.	TIG Welding Mode Indicator
3.	Display	7.	MMA Welding Mode Indicator
4.	Control Knob	8.	Battery Indicator

Danger / Caution: Items being welded generate and hold high heat and can cause severe burns. Do not touch hot parts. Allow a cooling period before working on the welding gun and welded area.

NOTE: Ensure all protective equipment is worn and bystanders are not in the vicinity.

MMA Welding Process

Select either MMA or MMA with VRD by pressing the control knob until "MMA" or "VRD" is illuminated.





MMA Welding Process

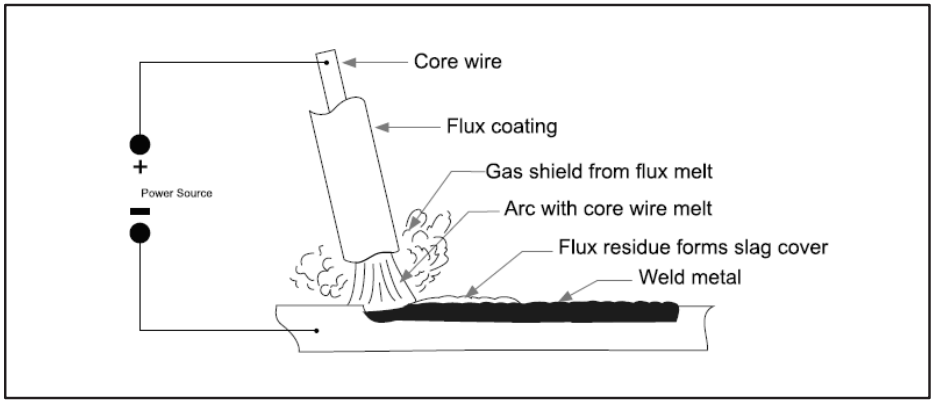
VRD is an added safety feature. In this mode the Open Circuit Voltage (OCV) is reduced to less than 20V DC. This prevents accidental arc striking. You will need to short the electrode to the workpiece then strike to initiate an arc.
After welding the display will briefly show the OCV.

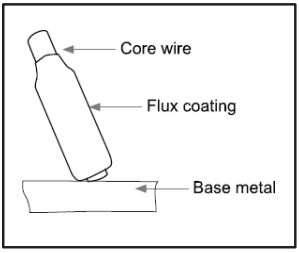
MMA Welding Process

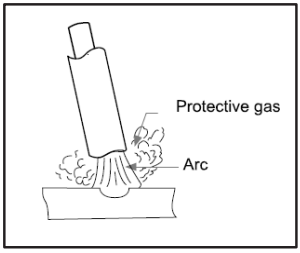
1. Turn the power switch to the on position only to check the battery level. If it is low, charge it as soon as possible, if it is good turn the welder off.
2. Make sure the On/Off Switch is **OFF**.
3. Connect the earth lead to the negative (-) socket. Tighten it clockwise.
4. Connect the electrode holder lead to the positive (+) socket. Tighten it clockwise.
5. Select the MMA/ARC welding mode by pressing the control knob.
6. Select the welding current in accordance with the electrode type and size.
7. Clamp the earth, place the electrode on the electrode holder and strike it against the work piece.
8. After use, the machine should be left on for 2/3 minutes. This will allow the fan to cool down internal components.
9. Switch the machine off.

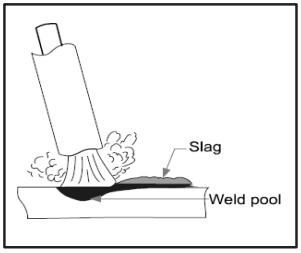
MMA Welding Technique

The electrode rod is made of a material that is compatible with the base material being welded and is covered with a flux that gives off gaseous vapours that serve as a shielding gas and providing a layer of slag, both of which protect the weld area from atmospheric contamination. The electrode core itself acts as filler material the residue from the flux that forms slag covering over the weld metal must be chipped away after welding.









Electrode Size	Material Thickness	Welding current
1.6 mm	1.2 - 1.6 mm	20 - 45 A
2.4 mm	1.6 - 3.5 mm	40 - 90 A
3.2 mm	3.0 - 6.0 mm	80 - 130 A
4.0 mm	5.0 - 8.5 mm	105 - 180 A

Danger / Caution: Be aware that the electrode is live, simply touching any part of the work-piece will create a spark.

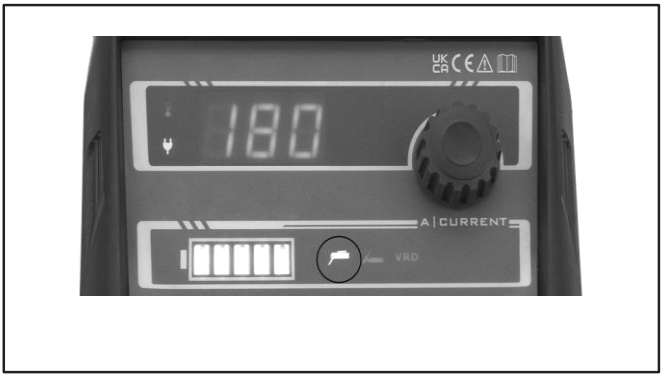
TIG Welding Process

NOTE: In order to use the TIG mode, you will need to purchase a TIG Torch (05035), Argon gas and a gas regulator suitable for the type of welding required.

Select TIG mode by pressing the control until the TIG torch icon illuminates.
See pages 17, 18 & 19 for how prepare you TIG Tungsten and recommended welding current range.

1. Fit the gas regulator to the Argon gas bottle.
2. Connect the TIG torch gas inlet hose to the Argon regulator. Make sure the hose, joints and fittings are correctly tightened and the valves are closed.
3. Turn the power switch to the on position only to check the battery level. If it is low charge it as soon as possible.

4. With the On/Off Switch in the OFF position:-
5. Connect the earth lead to the positive (+) socket. Turn the electrical plug clockwise
6. Connect the TIG Torch to the negative (-) socket. Turn the electrical plug clockwise.
7. Connect the earth clamp on the workpiece, place your torch in position and switch the machine on.
8. Select TIG welding mode by pressing the control knob.
9. Open the Argon bottle valve, set the gas flow on the regulator & slowly open the valve on the TIG torch until gas flows.
10. Get your material ready (if necessary) and start to weld.
11. After use, the machine should be left on for 2/3 minutes. This will allow the fan to cool down internal components.
12. Switch the machine off.



TIG Welding Technique

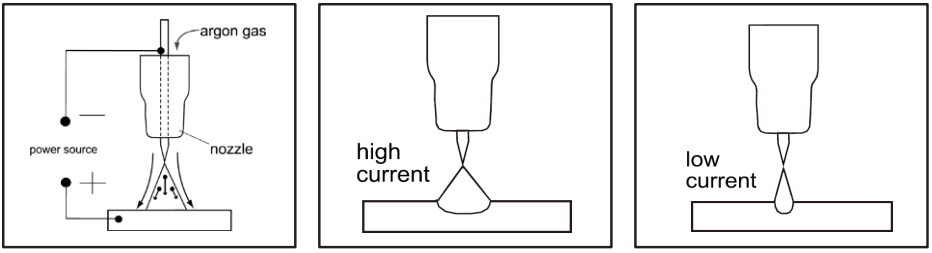
The DC power source uses what is known as DC (direct current) in which the main electrical component known as electrons flow in only one direction from the negative pole (terminal) to the positive pole (terminal).

In the DC electrical circuit there is an electrical principle at work which should always be taken into account when using any DC circuit. With a DC circuit 70% of the energy (heat) is always on the positive side. This needs to be understood because it determines what terminal the TIG torch will be connected to.

DC TIG welding is a process in which an arc is struck between a TUNGSTEN electrode and the metal work piece. The weld area is shielded by an inert gas flow to prevent contamination of the tungsten, molten pool and weld area. When the TIG arc is

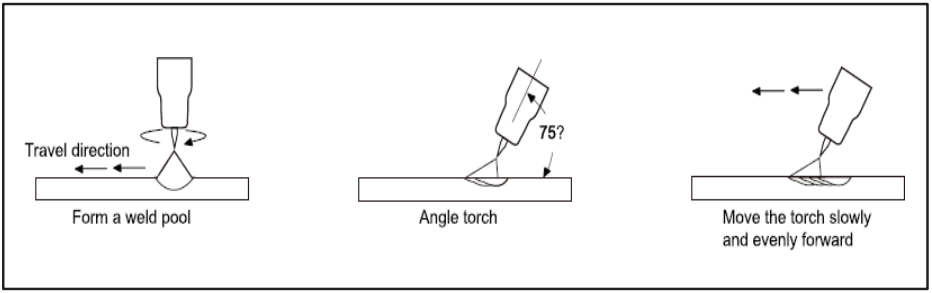
struck the inert gas is ionized and superheated changing its molecular structure which converts it into a plasma stream. This plasma stream flowing between the tungsten and the work piece is the TIG arc and can be as hot as 19,000°C. It is a very pure and concentrated arc which provides the controlled melting of most metals into a weld pool. TIG welding offers the user the greatest amount of flexibility to weld the widest range of material and thickness and types. DC TIG welding is also the cleanest weld with no sparks or spatter.

The intensity of the arc is proportional to the current that flows from the tungsten. The welder regulates the welding current to adjust the power of the arc. Typically thin material requires a less powerful arc with less heat to melt the material so less current (A) is required, thicker material requires a more powerful arc with more heat so more current (A) are necessary to melt the material.



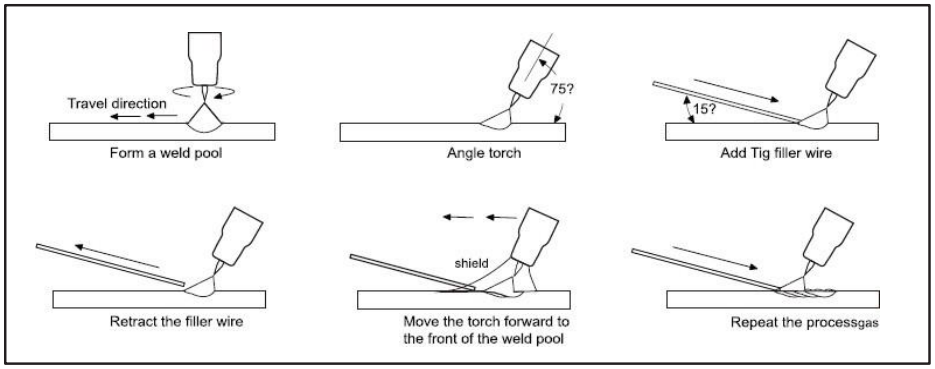
TIG Welding Fusion Technique

This is known as Fusion welding where the edges of the metal pieces are melted together using only the heat and arc force generated by the TIG arc. Once the arc is started the torch tungsten is held in place until a weld pool is created, a circular movement of the tungsten will assist is creating a weld pool of the desired size. Once the weld pool is established tilt the torch at about a 75° angle and move smoothly and evenly along the joint while fusing the materials together.



TIG Welding Filler Wire Technique

Once the weld pool is established tilt the torch at about a 75° angle and move smoothly and evenly along the joint. The filler metal is introduced to the leading edge of the weld pool. The filler wire is usually held at about a 15° angle and fed into the leading edge of the molten pool, the arc will melt the filler wire into the weld pool as the torch is moved forward. Also a dabbing technique can be used to control the amount of filler wire added, the wire is fed into the molten pool and retracted in a repeating sequence as the torch is moved slowly and evenly forward.



TIG Tungsten Preparation

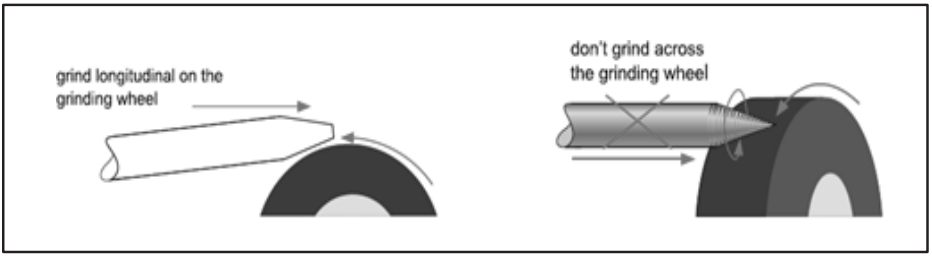
Tungsten is a rare metallic element used for manufacturing TIG welding electrodes. The TIG process relies on tungsten's hardness and high-temperature resistance to carry the welding current to the arc. Tungsten has the highest melting point of any metal, 3410 °C. Tungsten electrodes are non-consumable and come in a variety of sizes, they are made from pure tungsten or an alloy of tungsten and other rare earth elements. Choosing the correct tungsten depends on the material being welded, amps required and whether you are using AC or DC welding current.

Always use diamond wheels when grinding and cutting. While tungsten is a very hard material, the surface of a diamond wheel is harder, and this makes for smooth grinding. Grinding without diamond wheels, such as Aluminium oxide wheels, can lead to jagged edges, imperfections, or poor surface finishes not visible to the eye that will contribute to weld inconsistency and weld defects.

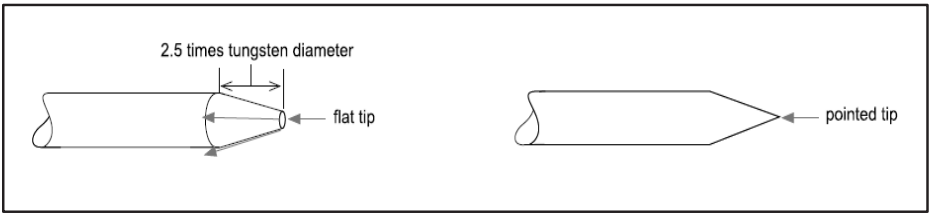
Always ensure to grind the tungsten in a longitudinal direction on the grinding wheel. Tungsten electrodes are manufactured with the molecular structure of the

grain running lengthwise and thus grinding crosswise is “grinding against the grain.” If electrodes are ground crosswise, the electrons have to jump across the grinding marks and the arc can start before the tip and wander. Grinding longitudinally with the grain, the electrons flow steadily and easily to the end of the tungsten tip. The arc starts straight and remains narrow, concentrated, and stable.

The shape of the tungsten electrode tip is an important process variable in precision arc welding. The bigger the flat, the more likely arc wander will occur and the more difficult it will be to arc start. However, increasing the flat to the maximum level that still allows arc start and eliminates arc wonder will improve the weld penetration and increase the electrode life. Some welders still grind electrodes to a sharp point, which makes arc starting easier. However, they risk decreased welding performance from melting at the tip and the possibility of the point falling off into the weld pool.



Tungsten Diameter	DC Current Torch Negative 2% Thoriated
1.0mm	15~80 A
1.6mm	70~150 A
2.4mm	150~250 A
3.2mm	250~400 A
4.0mm	400~500 A



Tungsten Diameter	Diameter at the Tip	Constant Included Angle - Degrees	Current Range	Current Range Pulsed
1.0 mm	0.250 mm	20°C	5~30 A	5~60 A
1.6 mm	0.500 mm	25°C	8~50 A	5~100 A
1.6 mm	0.800 mm	30°C	10~70 A	10~140 A
2.4 mm	0.800 mm	35°C	12~90 A	12~180 A
2.4 mm	1.100 mm	45°C	15~150 A	15~250 A
3.2 mm	1.100 mm	60°C	20~200 A	20~300 A
3.2 mm	1.500 mm	90°C	25~250 A	25~350 A

NOTE: The above is a guide only; always try a short weld test at the setting selected. It is normal to make minor adjustments to achieve the required weld.

NOTE: In order to use the TIG mode, you will need to purchase Argon gas and a gas regulator suitable for the type of welding required.

Danger / Caution: Ensure all protective equipment is worn and bystanders are not in the vicinity.

MAINTENANCE

In order to guarantee safe and proper operation of welding machines, they must be maintained regularly. Good understanding of the maintenance procedure of welding machines will enable customers to carry on simple examination and inspections. Do your best to reduce the fault rate and repair times of welding machines to lengthen service life of arc welding machine.



Danger / Caution: For safety whilst undertaking maintaining of the machine, please switch off the main on/off switch and wait for 5 minutes, until capacitors voltage drops to a safe voltage 36V!

Date	Maintenance Description
Daily examination	Observe that the that all knobs and switches are not damaged and are working correctly. In case of damage replace immediately and test. Once the machine has been turned on listen for any unusual noises such as arcing, and any unusual smells including burning. if any are discovered investigate further. Observe that the display value of LED is intact. If the display numbers are damaged, please replace the damaged LED. If it still doesn't work, please replace the display PCB. Observe that the min./max. Values on LED agree with the set value. If there is any difference and it has affected the normal welding results, please adjust it. Check whether the fan is damaged and operates normally. If the fan is damaged, please change immediately. If the fan does not rotate after the machine is overheated, observe if there is something blocking the blade. If it is blocked, please clear the problem. If the fan rotates normally, the start capacity should be replaced. If not, change the fan. Observe whether the fast connector is loose or overheated. If the arc-welding machine has the above problems, it should be fastened or changed. Observe whether the current output cable is damaged. If it is damaged, it should be insulated or changed.
Monthly examination	Use the dry compressed air to clear the inside of arc welding machine. Especially for clearing up the dusts on heatsinks, main voltage transformer, inductors, IGBT modules, fast recover diodes, PCB's, etc. Check screws and bolts in machine. If loose, then tighten. If it is damaged please replace. If it is rusty, please remove rust on all bolts to ensure it works well.

Quarter-yearly examination	Check whether the actual current displayed is actually the same as the achieved output. If not, contact SIP Customer Service.
Yearly examination	Measure the insulating impedance among the main circuit, PCB and case, if it below 1MΩ, insulation is thought to be damaged and need to change, and need to change or strengthen insulation.



Warning: Maintenance should only be carried out by competent or qualified personnel. Never tamper with the sealed battery pack - risk of fire or electrocution.

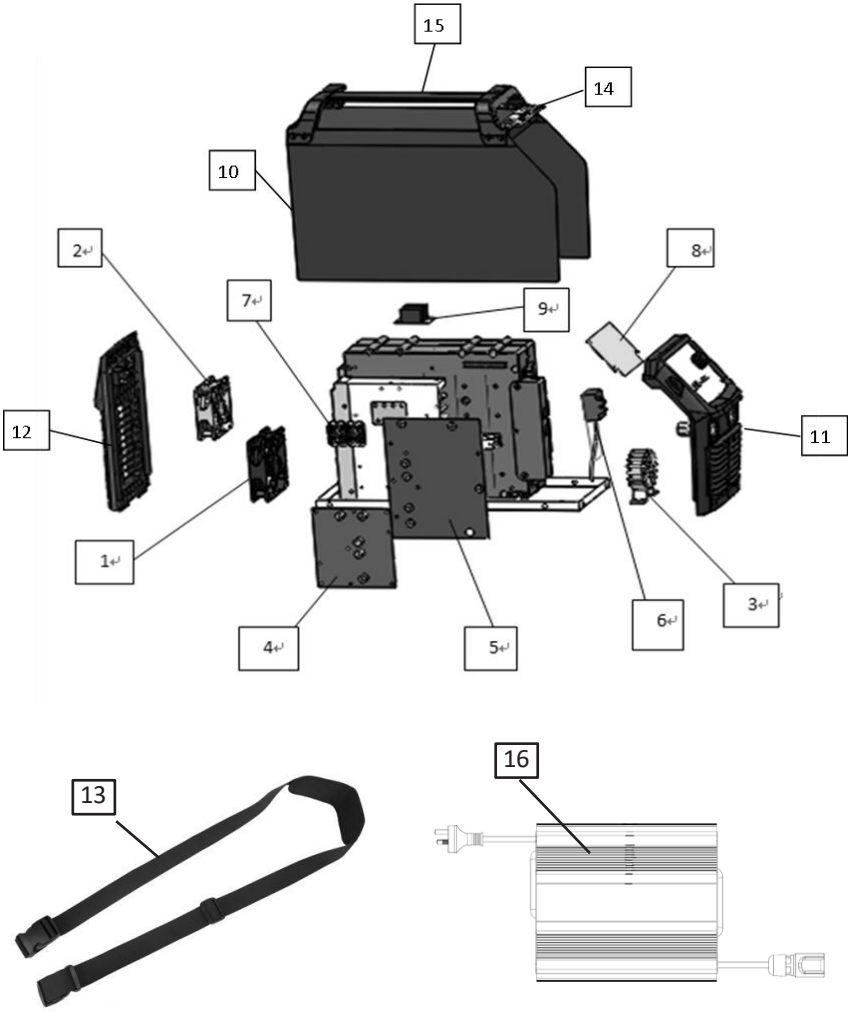
TROUBLESHOOTING

If there are some simple troubles with the welding machine, you can consult the following Chart.

S/N	Troubles	Reasons	Solutions
1.	Turn on the power source, and fan works, but the power light is not on.	The power light damaged or connection is not good.	Test and repair the inside circuit of power light.
		Power PCB failures.	Repair or change power PCB Pr2.
2.	Turn on the power source, and the power light is on, but fan doesn't work.	There is something in the fan.	Clear out.
		The fan motor damaged.	Change fan motor.
3.	Turn on the power source, and the power light is not on, and fan doesn't work.	No input voltage.	Check whether the battery is fully charged.
4.	No no-load voltage output.	There is trouble inside the machine.	Check the main circuit, Pr1 and Pr2.
5.	No current output in the welding	Welding cable is not connected with the two output of the welder.	Connect the welding cable to the welder's output.
		Welding cable is broken.	Wrap, repair or change the welding cable.
		Earth cable is not connected or loosen.	Check the earth clamp.
6.	Not easy to start arc in the welding, or easy to cause sticking.	The plug loosen or connect not well.	Check and tighten the plug.
		Oil or dust covered the work-piece.	Check and clear out.
		Wrong mode selected.	Check the MMA selector switch is selected.
7.	The arc is not stable in the welding process.	The arc force is too small.	Increase the arc force.
8.	The welding current cannot be adjusted.	Welding current potentiometer in the front panel connection not so good or damaged.	Repair or change the potentiometer.

9.	The penetration of molten pool is not enough (MMA).	The welding current adjusted too low.	Increase the welding current.
		The arc force adjusted too small.	Increase the arc force.
10.	Arc blow	Airflow disturbance	Use the shelter from airflow
		The electrode eccentricity	Adjust the electrode angle
			Change the electrode
		Magnetic effect	Incline the electrode to the opposite way of the magnetic blow
			Change the position of earth clamp or add earth cable in the two side of work-piece
			Use the short arc operation
11.	The alarm light is on	Over heat protection - Over welding current	Induce the welding current output
		Over heat protection - Working time too long	Induce the duty cycle (interval work)
		Over current protection - Unusual current in the main circuit	Test and repair the main circuit and drive PCB (Pr1)
12.	E0P Error displayed	Battery voltage too low	Recharge welder

EXPLODED DRAWING



PART LIST

Item No.	Description	Q.
1	05712 Fan 1 - Top	1
2	05712 Fan 2 - Bottom	1
3	05712 Output inductor	1
4	05712 Main PCB	1
5	05712 Power PCB	1
6	05712 Hall current sensor	1
7	05712 Diode module	2
8	05712 Control PCB	1
9	05712 Charging socket isolation PCB	1
10	05712 Metal casing	1
11	05712 Front Plastic cover	1
12	05712 Back Plastic cover	1
13	05712 Strap	1
14	05712 Short Handle	1
15	05712 Long Handle	1
16.	05712 Charger	1

UK - DECLARATION OF CONFORMITY

Declaration of Conformity

We

SIP (Industrial Products) Ltd
Gelders Hall Road Shepshed
Loughborough
Leicestershire LE12
9NH
England

As the manufacturer within the UK, England, Scotland & Wales,
declare that the

SIP Weldmate 180A Battery Powered Inverter Welder - SIP Part. No. 05712

Conforms to the requirements of the following regulation(s), as indicated.

Electrical Equipment (Safety) Regulations 2016

Electromagnetic Compatibility - Directive 2014/30/EUThe Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

And the relevant harmonised standard(s), including

BS EN IEC 60974-1:2018
BS EN 60974-10:2014+A1:2015 BS
EN 61000-3-11:2001
BS EN 61000-3-12:2011 BS EN
ISO IEC 17065:2012

And Regulation EU 2023/1542

Signed: 

Mr P. Ippaso - Managing Director - SIP (Industrial Products)
Ltd Date: 16/08/2024

UK CA

EU - DECLARATION OF CONFORMITY

Declaration of Conformity

We

SIP (Machinery Europe) Ltd
ASM Chartered Accountants
First Floor Block One Quayside
Business Park Dundalk
County Louth
Republic of Ireland

As the manufacturer's authorised representative within the EC declare that the

SIP Weldmate 180A Battery Powered Inverter Welder - SIP Part. No. 05712

Conforms to the requirements of the following directive(s), as indicated.

2014/35/EU - Low Voltage Directive
2014/30/EU - EMC Directive
2011/65/EU - RoHS Directive

And the relevant harmonised standard(s), including

EN IEC 60974-1:2018
EN 60974-10:2014+A1:2015 EN
61000-3-11:2001
EN 61000-3-12:2011

And Regulation EU 2023/1542

Signed: 

Mr P. Ippaso - Managing Director - SIP (SIP Machinery Europe) Ltd Date: 16/08/2024

CE





Please dispose of packaging for the product in a responsible manner. It is suitable for recycling. Help to protect the environment, take the packaging to the local amenity tip and place into the appropriate recycling bin.

Never dispose of electrical equipment or batteries in with your domestic waste. If your supplier offers a disposal facility please use it or alternatively use a recognised recycling agent. This will allow the recycling of raw materials and help protect the environment.

FOR HELP OR ADVICE ON THIS PRODUCT PLEASE CONTACT YOUR DISTRIBUTOR, OR SIP DIRECTLY ON:
TEL: 01509 500400
EMAIL: sales@sip-group.com or customerservice@sip-group.com
www.sip-group.com