PoWer MIG Series

GeKaMac®



POWER MIG GS 3500

Users Manual

Please Read and Understand This Manual
Before Operating The Welding Machine

www.gedikwelding.com

This machine is for internal use only.

It complies with the WEEE Directive.

This machine has been designed in accordance with the EN 60974-1 and EN 60974-10 standards.

The machine is safe when installation, operation, and maintenance are performed in accordance with the user manual and regulations. The operator and machine owner are responsible for adhering to safety rules.

Gedik Kaynak San. Ve Tic. A.Ş. assumes no responsibility for safety or CE compliance if any modifications are made to the machine or if safety rules are not followed.

CE



This Class A equipment is not suitable for use in homes and similar residential areas where the power supply is provided by the low-voltage public electricity network.



This machine is not household waste and cannot be disposed of in the trash.

When the machine reaches the end of its service life or becomes obsolete, it must be disposed of in accordance with regulations.

COMPLIES WITH THE WEEE DIRECTIVE.

Eco Design Statement

This machine has been designed and manufactured in accordance with the requirements of the 2009/125/EC Eco Design Directive concerning the environmentally friendly design of energy-related products.

Accordingly, machines with an idle mode are as follows.

	Idle Mode
MMA	**X**
MIG	√
TIG	√
Plazma	√
SAW	**Out of Scope**

Efficiency measurements should be conducted only on the power unit. The water cooling system should be disabled. For more information on measurements and machine settings, Gedik Kaynak Sanayi ve Ticaret A.Ş. should be consulted.

AT UYGUNLUK BEYANI

EU DECLARATION OF CONFORMITY

Bu uygunluk beyanı yalnızca imalatçının sorumluluğu altında düzenlenir.

This declaration of conformity is issued under the sole responsibility of the manufacturer.

İstanbul, Turkey, 08.03.2024

İmalatçı / Manufacturer

GEDİK KAYNAK SANAYİ ve TİCARET A.Ş.

Ankara Cad. No.306 Seyhli Pendik ISTANBUL TURKIYE

Ürün / Product	ARC WELDING MACHINE
Marka-Model / Brand- Model	POWER MIG GS 3500

Yukarıda tanımlanan beyanın nesnesi ilgili uyumlaştırılmış AB mevzuatı ile uyumludur.

The object of the declaration described above, is in conformity with the relevant union harmonisation legislation.

Direktifler / Directives 2014/30/EU & 2014/35/EU & 2009/125/EC

Uyumlaştırılmış standartlar ve uygunluğun deklare edilmesiyle ilişkili diğer referanslar.

References to the relevant harmonised standarts used and references to the other technical specifications in relation to which conformity is declared.

EN IEC 60974-1:2018-A1:2019
EN 60974-10:2014+A1:2015

Bu ekipman, talimatlara uygun kurulduğunda, bakımı yapıldığında ve kullanıldığında belirtilen standartlara uygundur. Makine üzerinde bir değişiklik yapıldığında veya yanlış kullanımda deklarasyon geçersiz olur.

The equipment is in compliance with pertinent legislation when installed, utilized, and maintained in accordance with the enclosed instructions. This declaration will be invalid under any modification or improper use.

İmalatçı Adına imzalayan / Signed for and on behalf of:

Hatice Özel, Equipment Business Unit Director

Dear Customer

This instruction manual will help you get to know your new machine. Read the manual carefully and you will soon be familiar with all the many great features of your new product. Meanwhile, please remember well safety rules and operate as instruction.

If you treat your product carefully, this definitely helps to prolong its enduring quality and reliability–things which are both essential prerequisites for getting outstanding results.

Production specification may change without advance notice.

The model you purchase is for:

☐ POWER MIG GS 3500/ 5000

Please find corresponding models from the "Contents".

Important:

Please take special note of safety rules and operate as instruction in case of damage and serious injury.

Safety Rules



“Danger” indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



“Warning!” indicates a possible hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are explained in the text.



“Caution” indicates a possible hazardous situation which, if not avoided, may result in slight or moderate injury.



“Note!” indicates a situation which implies a risk of impaired welding result and damage to the equipment.

“Important!” indicates practical tips and other useful special-message. It is no signal word for a harmful or dangerous situation.



Utilization for intended purpose only

- The machine may only be used for jobs as defined by the “Intended purpose”.
- Utilization for any other purpose, or in any other manner, shall be deemed to be “not in accordance with the intended purpose”. The manufacturer shall not be liable for any damage resulting from such improper use.



Safety signs

- All the safety instructions and danger warnings on the machine must be kept in legible condition, not removed, not be covered, pasted or painted cover.



Safety inspection

- The owner/operator is obliged to perform safety inspection at regular intervals.
- The manufacturer also recommends every 3-6 months for regular maintenance of power sources.



Electric shock can kill

- Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In MIG/MAG welding, the wire, drive rollers, wire feed housing and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.
- Do not touch live electrical parts of the welding circuit, electrodes and wires with your bare skin or wet clothing.
- The operator must wear dry hole-free insulating welding gloves and body protection while performs the welding.
- Insulate yourself from work and ground using dry insulating protection which is large enough to prevent you full area of physical contact with the work or ground.
- Connect the primary input cable according to rules. Disconnect input power or stop machine before installing or maintenance.
- If welding must be performed under electrically hazardous conditions as follow: in damp locations or wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or in occasion when there is a high risk of unavoidable or

accidental contact with the work piece or ground. Must use additional safety precautions: semiautomatic DC constant voltage (wire) welder, DC manual (Stick) welder and AC welder with reduced open-load voltage.

- Maintain the electrode holder, ground clamp, welding cable and welding machine in good, safe operating condition. Replace damaged part immediately.



Electric and magnetic fields (EMF) may be dangerous

- If electromagnetic interference is found to be occurring, the operator is obliged to examine any possible electromagnetic problems that may occur on equipment as follow:

- minas, signal and data-transmission leads

- IT and telecoms equipment

- measurement and calibration devices

- Wearers of pacemakers

- Measures for minimizing or preventing EMC problems:

– Mains supply

If electromagnetic interference still occurs, despite the fact that the mains connection in accordance with the regulations, take additional measures

– Welding cables

Keep these as short as possible

Connect the work cable to the work piece as close as possible to the area being welded.

Lay tem well away from other cables.

Do not place your body between your electrode and work cables.

– Equipotential bonding

– Work piece grounding (earthing)

– Shielding

Shield the entire welding equipment and other equipment nearby.



ARC rays can burn

- Visible and invisible rays can burn eyes and skin.

- Wear an approved welding helmet or suitable clothing made from durable flame-resistant material (leather, heavy cotton, or wool) to protect your eyes and skin from arc rays and sparks when welding or watching.

- Use protective screens or barriers to protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or material.



Fumes and gases can be dangerous

- Welding may produce fumes and gases, breathing these fumes and gases can be hazardous to your health.

- When welding, keep your head out of the fume. If inside, ventilate the area at the arc to keep fumes and gases away from the breathing zone. If ventilation is not good, wear an approved air-supplied respirator.

- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator.
- Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.



Welding and cutting sparks can cause fire or explosion

- When not welding, make sure the electrode circuit is not touching the work or ground. Accidental contact can cause sparks, explosion, overheating, or fire. Make sure the area is safe before doing any welding.
- Welding and cutting on closed containers, such as tanks, drums, or containers, can cause them to blow up. Make sure proper steps have been taken.
- When pressure gas is used at the work site, special precautions are required to prevent hazardous situations.
- Connect work cable to the work as close to the welding zone as practical to prevent welding current from passing too long and creating fire hazards or overheat.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- Be attention that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas and start a fire. Remove fire hazardous from the welding area, if not possible, cover them thoroughly. Do not weld where flying sparks can strike flammable material and where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Protect yourself and others from flying sparks and hot metal. Remove any combustibles from operator before perform any welding.
- Keep a fire extinguisher readily available.
- Empty containers, tanks, drums, or pipes which have combustibles before perform welding.
- Remove stick electrode from electrode holder or cut off welding wire at contact tip when not in use.
- Apply correct fuses or circuit breakers. Do not oversize or bypass them.



Cylinder can explode if damaged

- Pressure gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.
- Cylinders should be located away from areas where they may be struck or subjected to physical damage. Use proper equipment, procedures, and sufficient number of persons to lift and move cylinders.
- Always install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling over or tipping.
- Keep a safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- No touching cylinder by welding electrode, electrode holder or any other electrically “hot” parts. Do not drape welding cables or welding torches over a gas cylinder.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the process used; maintain them and associated parts in good condition.
- Use only compressed gas cylinders containing the correct shielding gas for the and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

- Open the cylinder valve slowly and keep your head and face away from the cylinder valve outlet.
- Valve protection caps should be kept in place over valve expect when the cylinder is in use or connected for use.



Hot parts can burn

- Do not touch hot parts with bare hand or skin.
- Ensure equipment is cooled down before perform any work.
- If touching hot parts is needed, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



Flying metal or dirt can injure eyes

- When welding, chipping, wire brushing, and grinding can cause sparks and flying metal. It can hurt your eyes.
- Remember wear appropriate safety glasses with side shields when in welding zone, even under your welding helmet.



Noise can damage hearing

- Noise from some processes or equipment can damage hearing.
- Remember wear approved ear protection to protect ears if noise level is high.



Moving parts can injure

- Stay away from moving parts such as fans.
- Stay away from pinch points such as drive rolls.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for servicing and maintenance.
- Reinstall doors, panels, covers, or guards when servicing and maintenance is finished and before reconnecting input power.



Overuse can cause overheating

- Use machine follow duty cycle. Reduce current or reduce duty cycle before starting to weld again.
- Allow cooling period.
- Do not block or filter airflow to unit.



Static can damage PCB

- Always wear wrist straps before touching PCB or parts.
- Use proper static-proof bags and package to store or move PCB.



Safety markings

- Equipment with CE-markings fulfils the basic requirements of the Low-Voltage and Electromagnetic Compatibility Guideline (e.g. relevant product standards according to EN 60 974).



Safety markings

- The equipment with the CCC mark meets the basic requirements stipulated in the Chinese standards

GB / T15579.1-2013 and GB / T8118.



Safety markings

- This marking means that the product is certified for both the U.S. and Canadian markets, to the applicable U.S. and Canadian standards. The preferred location of the indicators is as shown.

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1-GENERAL REMARKS

This series of power sources apply IGBT soft switch inverter technology. Its internal control system applies digital signal processor which ensures quick response to any change during the welding process so as to achieve precise control of welding process and ensure optimal welding results.

1-1 Power source features

This series of power sources are microprocessor controlled and apply MCU + DSP control technology to improve the control precision. The strong ability of arc self-adjustment ensures a highly stable welding current against grid fluctuation and arc length change to get optimal results.

Highlights as follows:

- User friendly interface, synergic, easily control;
- Embedded welding expert database, automatic intelligent combination of parameters
- To achieve beautiful ripple pattern of welding seam with the function of double pulse MIG
- Store 100 sets of user-defined parameters, save the operator's time
- Perfect functions of starting arc and reducing melting ball while stopping arc
- Special 4-step mode is suitable for welding metal with good thermal conductivity, with perfect welding quality when starting arc and stopping arc
- Multiple protection functions
- Fully digitalized wire feeding control system to ensure stable and precise wire feeding
- Fan-on demand cooling system operates when needed to extend the service life of fan
- Advanced digital communication interfaces for robotic system and automation system
- Digital torch with quick and convenient adjustment

1-2 Functional principle

This series of power sources adopt IGBT soft switch inverter technology to improve the dynamic response rate and make the machines with small size and light weight. The control circuit's closed-loop control makes the power source enjoy strong ability against power grid fluctuation and perfect welding performance. The schematic diagram is as shown in Fig. 1-2-1:



Fig.1-2-1: Schematic diagram

1-3 Output characteristics

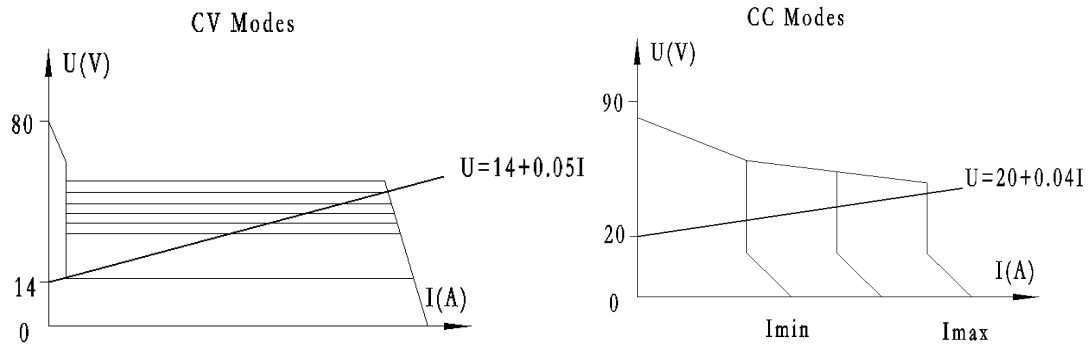


Fig.1-3-1: Output characteristics

1-4 Duty cycle

Duty cycle is percentage of 10 minutes that a machine can weld at rated load without overheating. If overheats, thermostat(s) will open, output stops. Wait for fifteen minutes for the machine to cool down. Reduce amperage or duty cycle before welding.

Note! Exceeding duty cycle can damage the machine and greatly reduce its lifespan

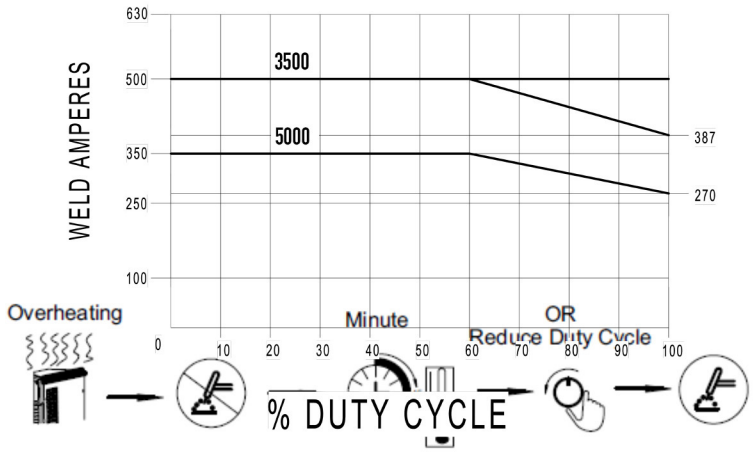


Fig.1-4-1: Duty cycle

1-5 Applications

This series of machines have many welding processes and can weld most of the metal materials, including carbon steel, stainless steel, aluminum and Al-Mg alloy, copper and alloy, etc.

Recommended areas of use as follows:

- Automobile and car manufacture industry
- Chemical structure and engineering
- Boiler pressure vessel manufacture
- Shipbuilding and offshore engineering
- Electric power construction
- Vehicle manufacturing
- Mechanical industry
- Other industries

1-6 Warning label

The warning label is affixed on the top of machine.

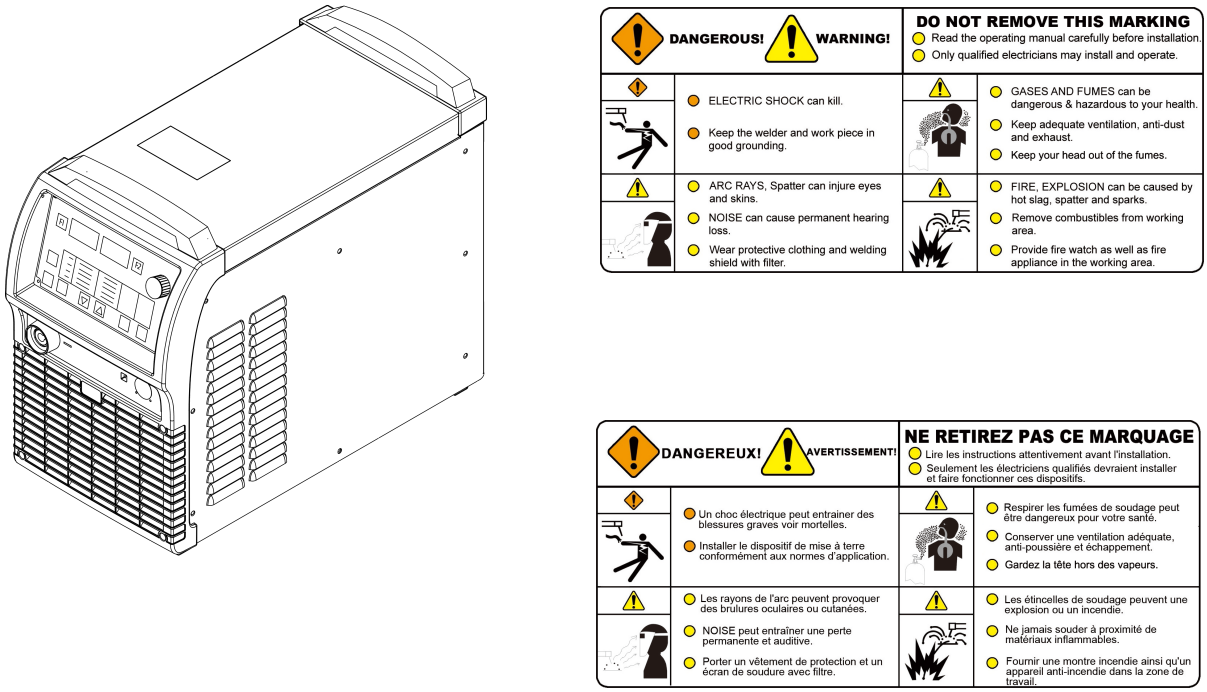


Fig. 1-6-1: Warning label

2-VERSIONS BRIEFS

Professional welding of special materials requires special welding parameters. Different models of the power sources are matched to different weldings.

- **POWER MIG GS 3500**

  POWER MIG GS 3500 apply the industrial standard design, have Double pulse MIG, Pulse MIG ,MIG,STICK,LIFT TIG and GOUGING welding processes, the output current is 350A .

- **POWER MIG GS 5000**

  POWER MIG GS 5000 apply the industrial standard design, have Double pulse MIG, Pulse MIG ,MIG,STICK,LIFT TIG and GOUGING welding processes, the output current is 500A.

3-BEFORE COMMISSIONING

Warning! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood “safety rules”.

3-1 Utilization for intended purpose only

The power source may only be used for pulse MIG, MIG, STICK, LIFT TIG and GOUGING(optional). Utilization for other purposes, or in any other manner, shall be deemed to be "not in accordance with the intended purpose". The manufacturer shall not be liable for any damage resulting from such improper use. Operate, inspect and maintain should follow all the instructions given in this manual.

3-2 Machine installation rules

According to test, protection degree of this power source is IP21S (optional IP23S). However, the internal key components must be protected from direct soaking.

Warning! A machine that topples over or falls from its stand can cause injury. Place equipment on an even, firm floor in such a way that it stands firmly.

The venting duct is very important for safety protections. When choosing the machine location, make sure it is possible for the cooling air to freely enter and exit through the louvers on the front and back of machine. Any electro conductive metallic dust like drillings must not be allowed to get sucked into the machine.

3-3 Power source connection

- The power source is designed to run on the voltage given on the nameplate.

- The mains cables and plugs must be mounted in accordance with the relevant technical standards.

- The power supply sockets that come with power source are designed to use strictly according to the marked voltages.

Note! Inadequately dimensioned electrical installations can lead to serious damage. The mains lead, and its fuse protection, must be dimensioned in accordance with the local power supply. The technical data shown on the nameplate shall apply.

3-4 Welding cables instruction

When welding, please pay attention to the followings:

a. The welding cables should be kept as short as possible;

b. If extended cable is used, please do as shown in Fig. 3-4-1.

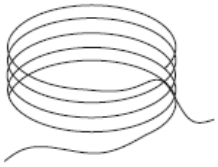
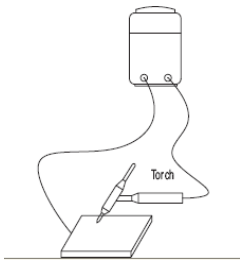
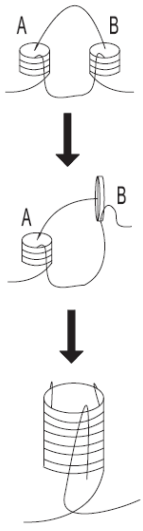
Wrong Coil the excess ground cable and welding cable in same direction respectively.	
Correct Straighten the ground cable and welding cable and make them close to each other. Bundle the ground cable and welding cable together, running the wires close to the ground.	
Correct When the excess cables are only be used by rolling up, coil the cables to two windings in reverse direction and overlap them. The number of turns for A is same as the number for B. Handle the welding cable and ground cable according to above-mentioned method.	

Fig. 3-4-1: Welding cables instruction

4- POWER MIG GS 3500/ 5000

4-1 System components

POWER MIG GS 3500/ 5000 welding machine can be equipped with many different accessories and can be used in different special sites with different configurations.

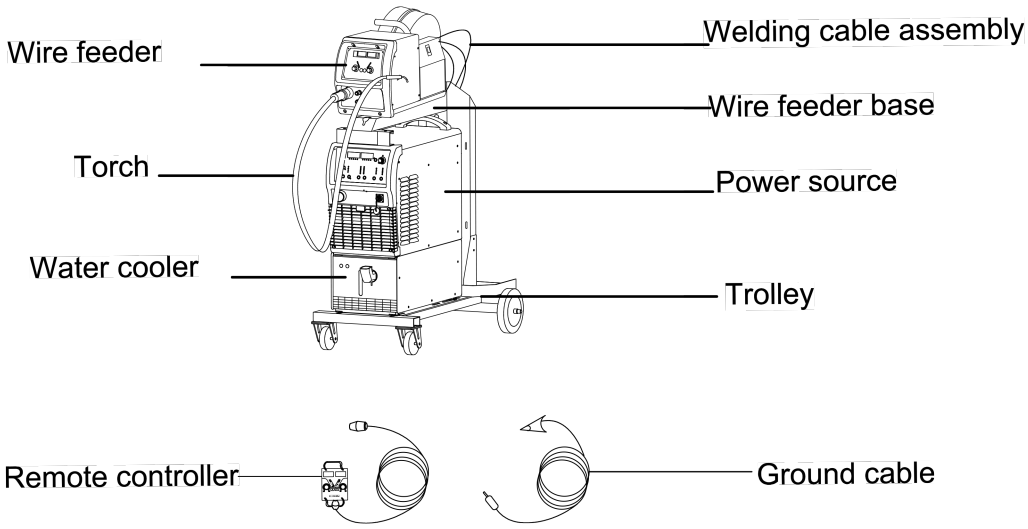


Fig. 4-1-1: System components

4-2 Basic equipments for welding

Only be equipped with the necessary accessories, can the power source POWER MIG GS 3500/ 5000 operate well. The following is the needed accessories list.

MIG/P-MIG welding

- Power source
- Ground cable
- Welding torch
- gas regulator, gas hose, gas cylinder (to supply the machine with shielding gas)
- Wire feeder
- Welding wire

TIG welding

- Power source
- Ground cable
- TIG welding torch with air valve switch
- Gas regulator, gas hose, gas cylinder (to supply the machine with shielding gas)
- Welding wire

STICK welding

- Power source
- Ground cable
- Electrode holder
- Electrode

4-3 Control panel

The functions on the control panels are all arranged in a very logical way. The various modes and parameters needed for welding are easy to select by pressing the appropriate button; parameters are easy to be adjusted by rotating encoder. Synergic adjustment makes the complicated operation much easier.



Note! Some described parameters in this manual may be slightly different from the power source, some identification may be slightly different from power source identification, but the manner of working is the same.

Warning! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood all content of this manual.

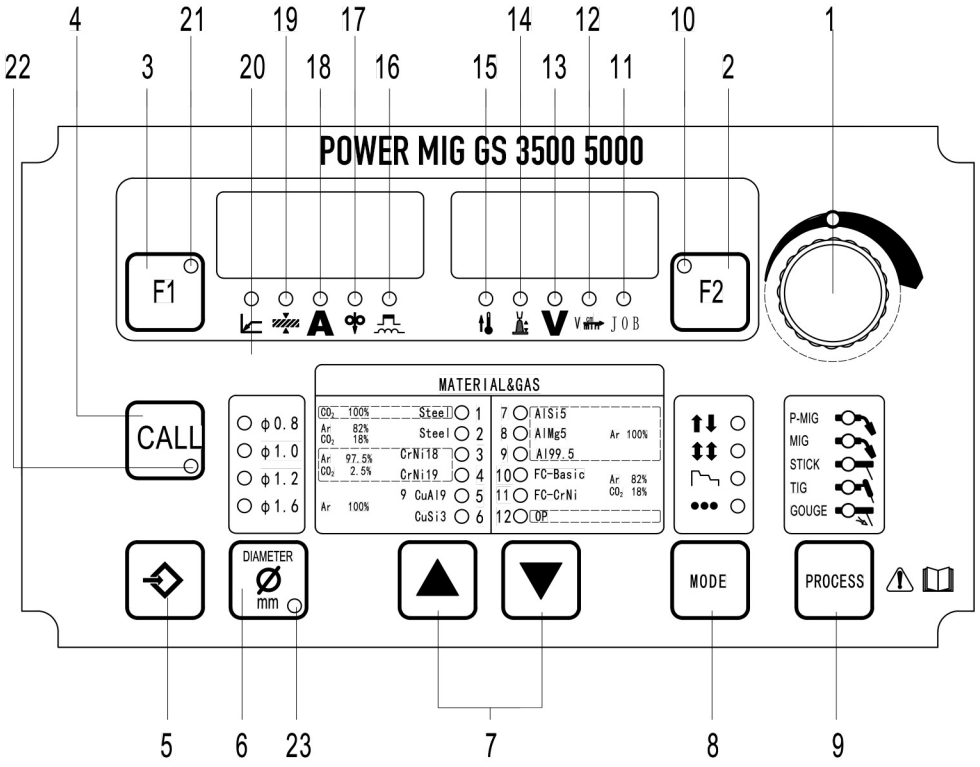


Fig. 4-3-1: Control panel

(1) Adjustment knob

Adjust the parameters. When the light is on, this knob can be used to adjust parameters of selected item.

Reset to factory setting: Press and hold adjustment knob (1) for about 5 seconds, it comes back to factory setting.

Important! Values increase in clockwise direction while values decrease in anti-clockwise rotation. To turn the knob left or right while pressing it will achieve quick adjustment.

(2) Parameters selection button F2

Press this button, one parameter indicator light is on, the corresponding parameter is chosen; keep pressing this button can switch among the following parameters:

- Arc length adjustment
- Welding voltage
- Job (Channel) No.

If both the indicators of parameter selection button and the adjustment knob (1) are on, the indicated/ selected parameter can be altered with the adjustment knob (1).

(3) Parameters selection button F1

Press this button, one parameter indicator light is on and the corresponding parameter is chosen; keep pressing this button can switch among the following parameters:

- “a” dimension
- Sheet thickness
- Welding current
- Welding speed
- Peak current/inductance

Important! On Panel control mode, press F1 to choose one of the above parameters, and value of the parameter can be adjusted by the knob (1).

If Remote control mode, press F1 to choose one of the above parameters, and value of the parameter can be adjusted by the current potentiometer knob on analog wire feeder.

(4) CALL button

Load stored set of parameters

(5) STORE button

- For accessing the sub-menu parameter set-up menu or (in job mode) for storing parameter settings.

- During creating or correcting a job, store parameter settings.

(6) Wire diameter button

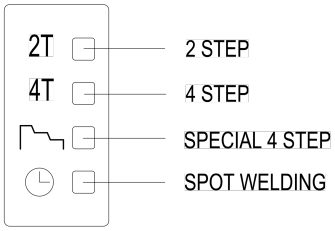
For selecting wire diameter.

(7) Wire material selection button(s)

For selecting the filler metal and shielding gas type. OP is used for upgrade.

(8) MODE button(s)

For selecting the operating mode of the torch.



Operating mode of welding torch

Graphic symbol

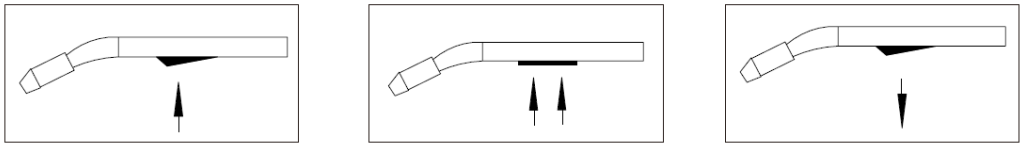


Fig. 4-3-2 Press torch trigger Fig. 4-3-3 Hold torch trigger Fig. 4-3-4 Release torch trigger

P03……Pre-gas time

P05……Initial parameter: The base metal can be heated up rapidly, despite the fast thermal dissipation at the start of welding.

P07……Down-slope time: The time from welding current to crater-filler current.

I……..Welding current: Uniform thermal input for the preheated base metals.

P06……Crater-filler parameter: Prevent burn-through caused by too much heat at the welding ends.

P08……Spot welding time

P04……Post-gas time

P01……Burn back time

- 2-step mode

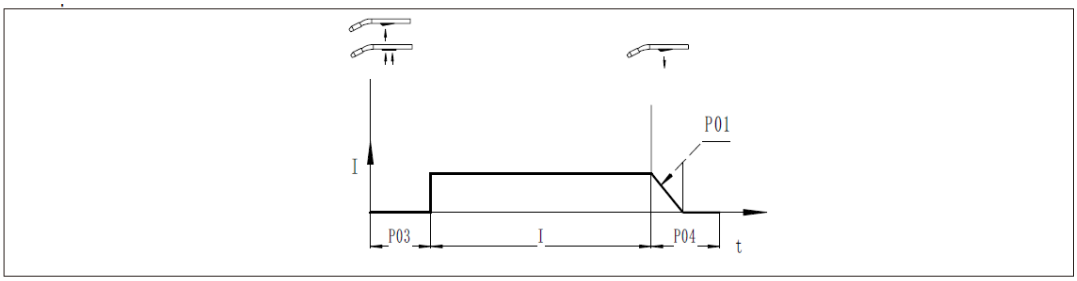


Fig. 4-3-5: 2-step mode

- 4-step mode

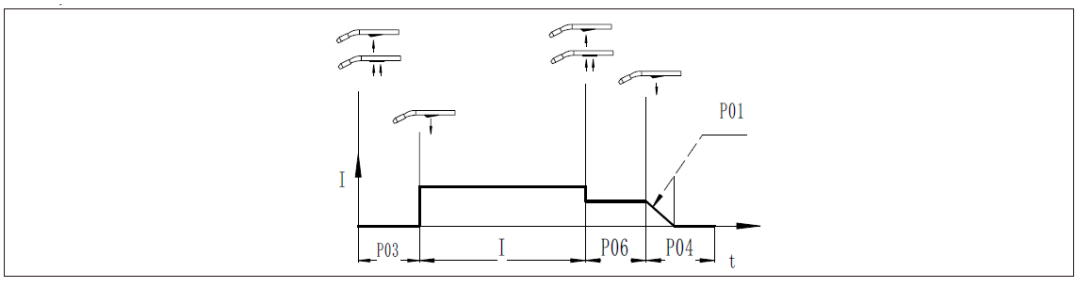


Fig. 4-3-6: 4-step mode

- Special 4-step mode (initial parameters and crater filler parameters are adjustable)

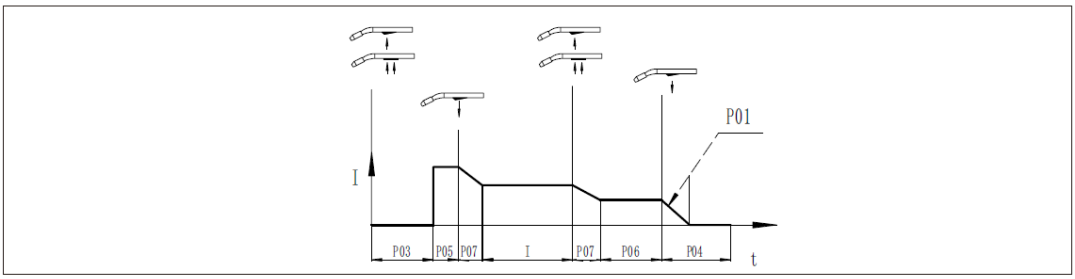


Fig. 4-3-7: Special 4-step mode

- Spot welding mode

.

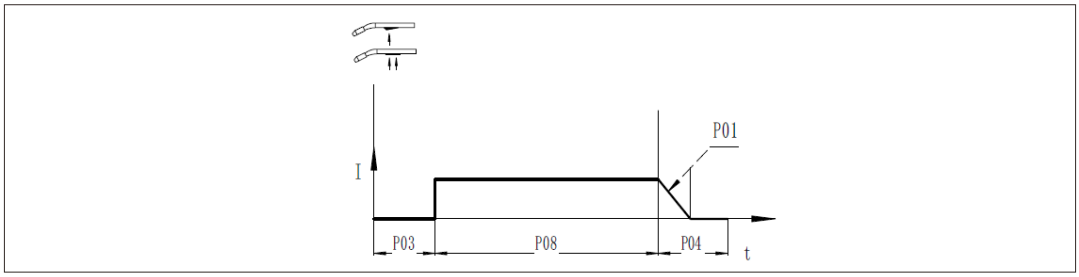
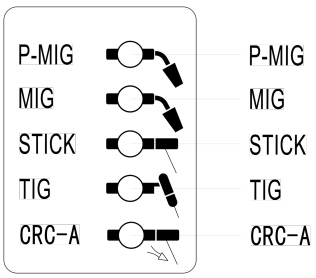
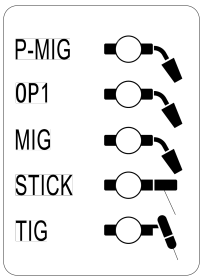


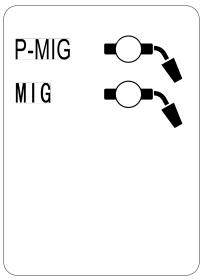
Fig. 4-3-8: Spot welding mode

(9) PROCESS button

.For select welding process(Please refer to the actual product).







NOTE: POWER MIG GS 3500/ 5000 welding machine only have P-MIG and MIG welding process.

(10) F2 selection button indicator

When the indicator lights up, F2 works

(11) "JOB" No.

For receiving parameter records/job numbers that were previously saved with "Store" button.

(12) Welding speed indicator

When the light is on, the right-hand displayer shows the preset welding speed (in/min) , and the wire speed and welding current & voltage are calculated as a function of the "a"-dimension parameter (20)

(13) Welding voltage indicator

When the indicator lights up, the right-hand displayer shows the preset or actual welding voltage.

Important! Power source open circuit voltage is variable. In STICK mode, open circuit voltage displayed is about 23V before welding; after starting arc, it increases as the real situation, and may be up to 79V, so as to get ideal arcing characteristic.

(14) Arc-length correction parameter

For correcting the arc length (-5.0-+5.0) by adjustment knob (1) when indicator is on, the right-hand displayer shows the arc length value when the indicator lights up.

- \- shorter arc length
- 0 neutral arc length
- \+ longer arc length

Important! The range (-5.0-+5.0) means that, when preset welding current, the arc length value is -50％～+50％ of the corresponding welding voltage.

(15) Temperature Indicator

This is reserved function, cannot operate right now.

(16) Peak current/Inductance parameter

For adjusting the peak current during the P-MIG/MAG welding process, values range (-5.0-+5.0)

- \- shorter arc length

0 neutral arc length

\+ longer arc length

For synergic MIG, the inductance value when changing short circuiting transfer (-5.0-+5.0).

- \- harder, stable arc

0 neutral arc

\+ soft, low spatter arc

In electrode (MMA) welding mode, for influencing the short-circuiting amperage at the instant of droplet transfer

0 soft, low-spatter arc

100 harder, more stable arc

(17) Wire feeding speed indicator

When the indicator is on, the left-hand displayer shows the wire feeding speed (M/min), when adjust this button, the relevant parameters will change automatically

(18) Welding current indicator

When the indicator is on, the left-hand displayer shows the preset or real welding current values

(19) Sheet thickness indicator

When the indicator is on, the left-hand displayer shows the preset sheet thickness (mm). The relevant parameters will change automatically when this value is changed.

(20) “a” dimension indicator

When the indictor is on, the left-hand displayer shows “a” dimension (mm). Wire speed and welding current & voltage are calculated as a function of the “a”-dimension parameter

(21) F1 selection button indicator

When the indicator lights up, F1 button works.

(22) JOB program mode indicator

When the indictor is on, power source is in call program mode.

(23) Sub-menu parameters regulation indicator

This indictor is on when in sub-menu parameters adjustment.

4-4 Sub-menu

In order to achieve an optimum welding result, it is necessary in some cases to make corrections of the arc-length, arc force as well as parameters like pre-gas time, post-gas time and slow wire feeding. For details of how to set the Sub-menu parameters, please refer to “Fig 4-4-3 Sub-menu parameter setting”.

● Sub-menu parameters for MIG/P-MIG

Item	Parameters	Setting Range	Min. Value	Factory Setting
P01	Burn back time	0.01～2.00s	0.01s	0.08s
P02	Slow wire feeding	1.0～22.0M/min	0.1 M/min	3.0 M/min
P03	Gas pre-flow time	0.1～10.0s	0.1s	0.20s
P04	Gas post-flow time	0.1～ON	0.1s	1.0s
P05	Initial period	1～200％	1％	135％
P06	Crater filler period	1～200％	1％	50％
P07	Transitional period	0.1～10.0s	0.1s	1.0s
P08	Spot welding time	0.01～9.99s	0.01s	2.0s
P09	Digital/Analog signal selection	OFF/ON	——	OFF
P10	Water cooling selection	OFF/ON	——	ON
P11	Double pulse frequency	0.5～5.0Hz	0.1Hz	OFF
P12	High pulse group arc length adjustment	-50～+50	1	20
P13	Double pulse speed offset	0～2m	0.1m	2m
P14	High pulse group duty cycle	10～90%	1%	50%

P15	Pulse mode	OFF/UI/II/UU	——	OFF
P16	Fan-on demand cooling time	5～15min	5min	15min
P17	Special 2-step arc start time	0～10s	0.1s	OFF
P18	Special 2-step arc stop time	0～10s	0.1s	OFF
P19	Separate adjustment mode	OFF/ON	——	OFF

Table4-4-1: Sub-menu parameter for MIG/P-MIG

Note! P11-P14 is available on double pulse function; P20-P21 is available on twin wire welding mode.

- **P01 Burn back time**

If too long time, the wire will burn back too much with too large melting ball at the end of wire; if too short time, the wire will stick with the work piece.

- **P02 Slow wire feeding**

With too quick feeding speed, the wire will be easily exploding with failed arc-starting; if the feeding speed is slower than the melting speed, the long arc will cause conductive tip burned.

- **P03 Gas pre-flow time**

Longer time will cause waste of gas and low efficiency; shorter time will cause air hole during arc-starting.

- **P04 Gas post-flow time**

Longer time will cause waste of gas; shorter time will cause air hole during crater filler period.

- **P05 Initial period**

Special 4-step mode and set the percentage between initial period and pre-set parameters. When adjust the initial period, press F2 and then adjust dial (1), make correction of the arc length of the initial period. Press F2 again to exit.

- **P06 Crater filler period**

4-sept or special 4-stepmode, set the percentage between crater filler period and pre-set parameters. When adjust the crater filler, press F2 and then adjust dial (1), make correction of arc length of the crater filler. Press F2 again to exit.

- **P07 Transition period**

During the special 4-step mode, the time cost from starting current to normal welding current and then to post current.

- **P08 Spot welding time**

Choose spot welding process and set the welding time.

- **P09 Digital/Analog signal selection**

In ON mode, welding parameters can be adjusted by welding machine control panel, digital wire feeder control panel, digital welding torch and digital remote controller; in OFF mode, welding parameters can be adjusted by analog wire feeder.

- **P10 Water cooling selection**

In OFF mode, without water cooler or the water cooler do not work, no water cooling protection; In ON mode, the water cooler works, and has water cooling protection if in wrong situation.

- **P11 Double pulse frequency**

The double pulse welding is added modulated by low frequency pulse and the low frequency pulse between 0.5-5.0 Hz. Compared with single pulse, double pulse has more advantages: no need to swing, welding seam become fish-scaly automatically, the depth and density of the fish-scale welding seam is adjustable; precise control of heat input. In low-current, cool the melting pool, reduce the deformation of the work piece and the hot cracking tendency. The melting pool can be periodically stirred; grain refinement, hydrogen and other gases are easily precipitated from the pool to reduce the porosity and the welding defects.

Double pulse reference wave form as shown in Fig. 4-4-1.

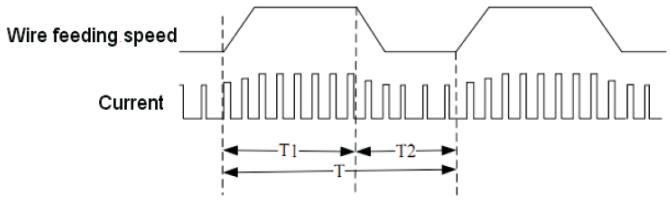


Fig. 4-4-1: Double pulse reference wave form

Choose OFF mode, there is no double pulse, but single pulse mode. If ON, it is double pulse mode, at the same time, you can set low frequency pulse rate. The density and depth of ripple pattern in welding seam can be changed by adjusting low frequency pulse frequency, which is similar to adjustment of T value in Fig.4-4-1.

- **P12 High pulse group arc length adjustment**

In double pulse mode, set high pulse group arc length adjustment to adjust the width of ripple pattern welding seam.

Important! The base arc-length correction with low frequency pulse is controlled by the voltage adjustment knob in the control panel of wire feeder.

- **P13 Double pulse speed offset**

Set the wire feeding in double pulse, the changing arrange of wire feeding means adjusting the depth of ripple pattern.

- **P14 High pulse group duty cycle**

Set ratio between the high pulse group time T1 and low frequency period T in double pulse mode, to adjust the ratio of ledge and groove in the whole ripple pattern.

- **P15 Pulse mode**

In OFF mode, non-fixed frequency mode; in UI mode, fixed frequency mode; in II mode, current control mode；in UU mode, voltage control mode.

- **P16 Fan-on demand cooling time**

Set the time that fan continues to work after power source stops welding.

- **P17 Special 2-step arc starting time**

On special 2-step mode, time for start period. When choose at number, it is time for start period, when reach to this time, will turn to welding standard; when choose at OFF, the function closes.

- **P18 Special 2 step arc stopping time**

On special 2-step mode, time for crater filler time. When choose at number, it is time for crater filler, when reach to this time, will turn to stop welding standard; when choose at OFF, the function closes.

- **P19 Separate adjustment mode**

Analog wire feeder: in ON mode, current and voltage can adjust and display separately; in OFF mode, current and voltage is synergic adjusted, that means voltage will automatically match with current if current is changed.

Digital wire feeder: in ON mode, rotate current adjustment knob to adjust current; rotate voltage adjustment knob to adjust arc length, but voltage is not changed; in OFF mode, current and voltage is synergic adjusted.

● Sub-menu parameters for STICK

In order to obtain optimum welding results, it is necessary to set or adjust parameters like the Hot-Start current, please refer to Table 4-4-2 for detailed sub-menu parameters

Item	Parameter	Range	Min. value	Factory setting
H01	Hot start current	1-100％	1％	50％
H02	Hot start time	0.0-2.0s	0.1s	0.5s
H03	Anti-stick function	OFF/ON	——	ON

Table 4-4-2: Sub-menu parameters for STICK

Hot start function

Setting hot start function includes adjusting hot start current and hot start time (please refer to “Sub-menu parameters for stick” as follows)

Advantages:

- Improve ignition, even when using electrodes with poor ignition properties
- Better fusion of the base metal in the start-up phase, meaning fewer cold crack defects

- Greatly prevents slag inclusions

During the specified hot arc-starting time (H02), the welding current is increased to a certain value. This value (H01) is 1-100% higher than the pre-set welding current.

Graphic symbolic……Preset welding current

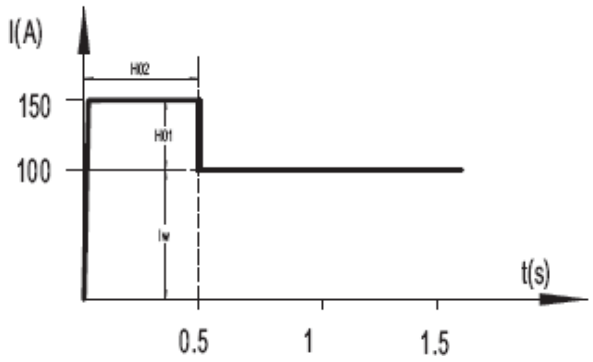


Fig. 4-4-2: Graphic symbol

As shown in Fig. 4-4-2, welding current is set as 100A. Hot arc-starting current (H01) is 50%. During the hot arc-starting time (H02, such as 0.5s), the actual welding current is 100A+ (50% of 100A)=150A.

Anti-stick function

In ON mode, power source has anti-stick function automatically. (Please refer to the below “sub-menu parameters setting” for specific method).

As the arc becomes shorter, the welding voltage may drop too much that the electrode will “stick”. This may also cause “burn-out” of the electrode.

Electrode burn-out can be prevented if the anti-stick function is activated. If the electrode begins to stick, the power source will immediately cut the welding current off. After the electrode has been detached from the work piece, welding can be continued without difficulty.

● Sub-menu parameter setting

Enter and exit from the sub-menu and parameters adjustment as Fig. 4-4-2:

1. Press and hold the save key and the wire diameter selection key at the same time, the submenu indicator lights, and enter the submenu.

Important! The last parameter to be selected is displayed! The first-time enter shows “P01”.

2. Press wire diameter selection button (6) to select parameters; Note! Also can use wire material selection button(s) (7)

to select.

3.Use the adjusting knob to adjust the parameter value;

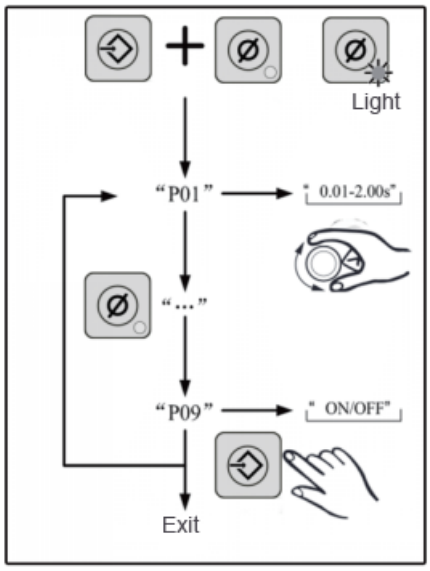


Fig.4-4-3 Sub-menu parameters setting

Important! Adjust the parameters of current percent and arc-length correction firstly before select the parameters of initial standard (P05) and arc stopping standard (P06). Press F2 to choose the desired one and then changes the parameters by adjusting knob (1).

4. Press store button (5) again and then exit from the sub-menu mode. The indicator (23) is off meaning the exiting from the sub-menu.

4-5 JOB mode-CALL& STORE function

"Job Mode" enhances the quality of welding, both in semi-automatic and fully automated operation. Traditionally, technical parameters of some repeated operations need to be written down for record. In Job Mode, it is now possible to store and retrieve up to 100 different jobs.

The following symbols are used in Job Mode, on the left-hand displayer:

---……..No job in this program location (only when you try to retrieve a job from this location, otherwise nPG)

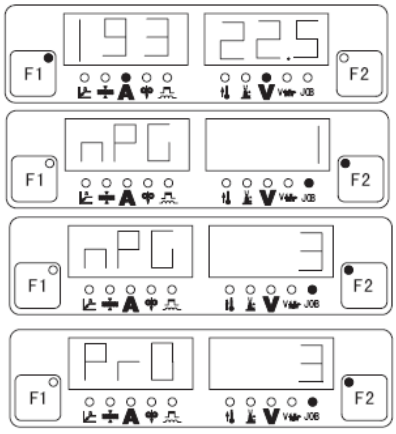
nPG……No job in this program location

PrG……There is a job in this program location

Pro…….Job is being created /copied in this program location

Creating a job

The machine comes with no jobs pre-programmed. A job has to be created before it can be retrieved. To create a job, proceed as follows:



1.Set the welding parameters that you want to store as a “Job”

2.Briefly press the Store button (5) to change to the job menu. The first vacant program location for the job is now indicated.

3.Select the program location with the adjustment dial (1), or else leave the suggested program location unchanged.

4.Press and hold the Store button (5). The left-hand displayer reads “Pro” –the job is stored in the program location you have just selected

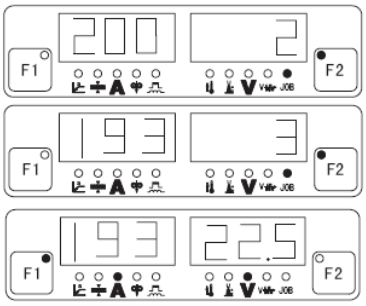
5.“PrG” appears on the left-hand displayer to indicate that the job is now stored.

6.Briefly press the Store button (5) to exit from the job menu

Important! If the selected program location already has a job stored in it, then this existing job will be replaced by the new job.

Retrieving a job

You can copy a job that has already been stored in one program location to any other program location. To copy a job, proceed as described below:

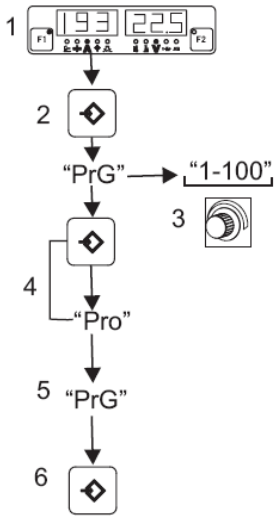


1.With the “CALL” button (4), indicator is on (22)-the last job used is displayed. To view settings programmed in this job, use the “Parameter selection” buttons (2) and (3). The process and operating mode of the stored

2.With the adjustment dial (1), select the desired job

3.With the “CALL” button (4), indicator (22) is off. Exit from the retrieving mode.

Job correction



1.Set the welding parameters that you want to store as a “Job”

2.Briefly press the Store button (5) to change to the job menu. The first vacant program location for the job is now indicated

3.Select the program location with the adjustment dial (1), or else leave the suggested program location unchanged.

4.Press and hold the Store button (5). The left-hand displayer reads “Pro” –the job is stored in the program location you have just selected

5.“PrG” appears on the left-hand displayer to indicate that the job is now stored. Release the Store button (5). If the selected program location already has a job stored in it, then this existing job will be replaced by the new job.

6.Briefly press the Store button (5) to exit from the job menu.

4-6 Interface

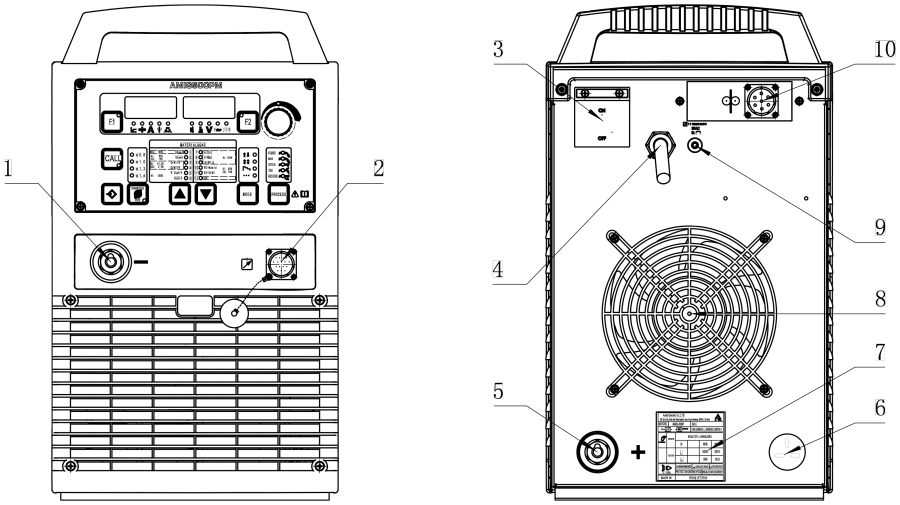


Fig. 4-6-1: interface

1. Quick socket (-)

In Pulse MIG/MAG :Connect ground cable .

In LIFT TIG :Connect the torch cable .

In MMA : Connect ground cable .

2.Reserved socket

3.Main circuit breaker

The function of circuit breaker is to protect welding machine and operator by automatic trip to turn-off power supply when overload or short circuit happens to the power source. Normally, the switch flipped to upward means power-on. To start or stop the welding machine is done by the mains switch in the distribution box. Please do not take this circuit breaker as the power switch.

4.Power cord

Three-phase four-wire system, yellow-green wire connection ground(PE wire).

5.Quick socket (+)

In Pulse MIG/MIG: it is used to connect with welding cable of wire feeding cable.

In Lift TIG : it is used to connect with ground cable.

In MMA : it is used to connect with electrode holder.

6.Power supply socket for gas heater (AV36V)

It is used to connect the heater coil of the gas regulator.

7.Nameplate

Please refer to the nameplate for the technical parameters of the welding machine.

8.Fan

9.Overlaod protector

Used for overload protection of wire feeder.

10.Wire feeder control socket

For connecting with the control cable of wire feeder.

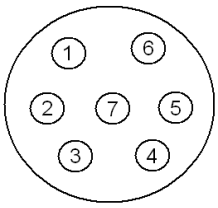
	PIN NO.	Description
	1	Power supply for wire feeder,AC30~41V
	2	
	3	RS422 communication interface
	4	
	5	
	6	
	7	Arc voltage feedback

Table. 4-6-1: Wire feeder control socket

4-7 Installation

Warning! An electric shock can be fatal. If the machine is plugged into he mains electricity supply during installation, there is high risk of very serious injury and damage. Do not use the functions described here until you have read and completely understood “safety rules” in the beginning. Only carry out work on the machine when

- the mains switch is on turn-off position,
- the machine is unplugged from the mains.

● Installation of the system components

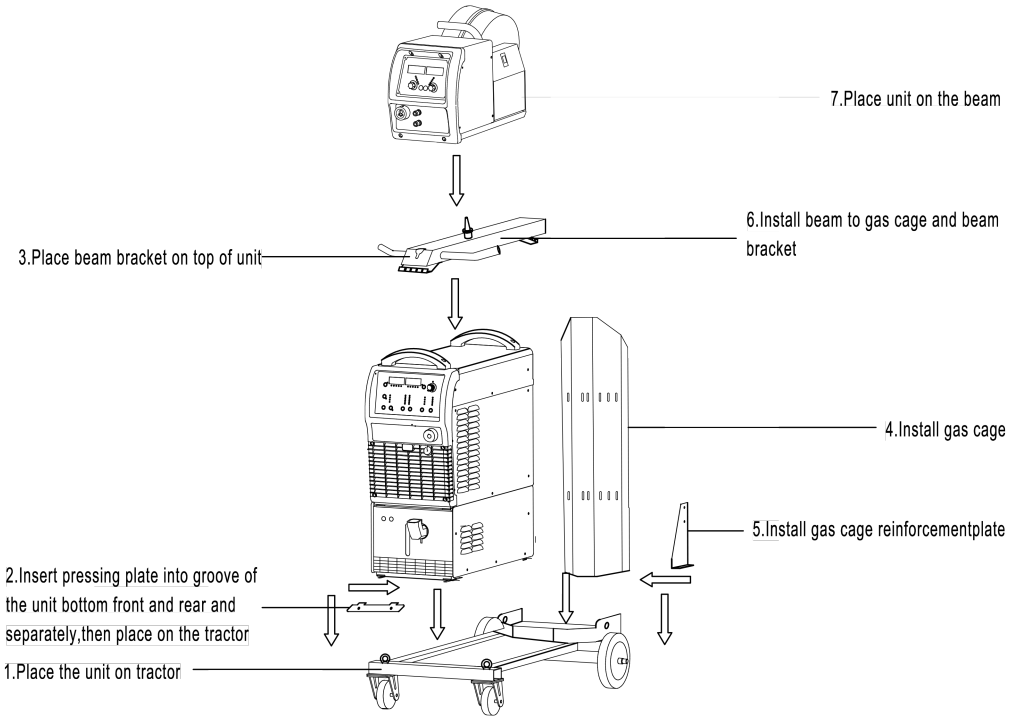


Fig. 4-7-1: Installation of the system components

● **Welding cable components assembly**

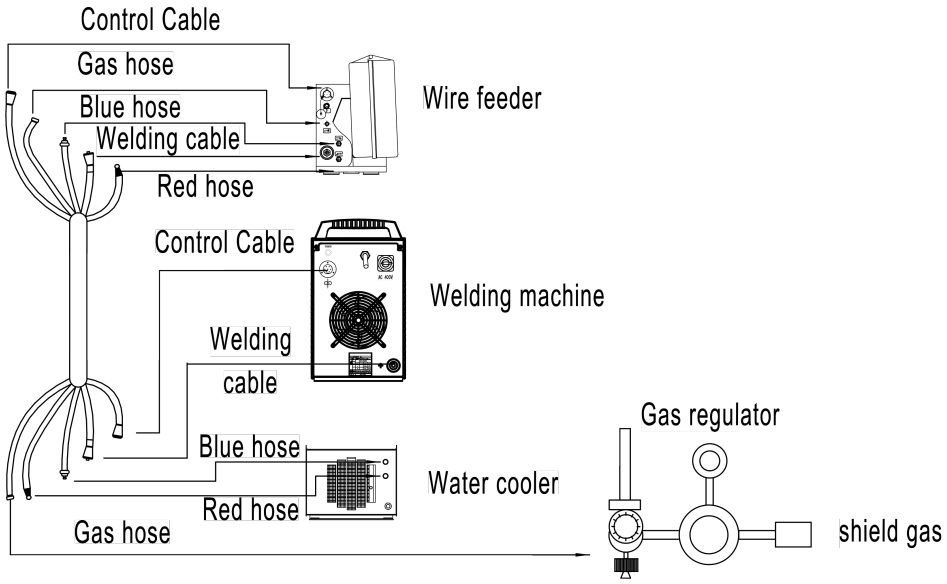
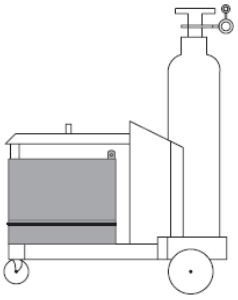


Fig. 4-7-2: Welding cable components assembly

●**Gas cylinder installation**



1. Stand the gas cylinder on the trolley and secure it by fixing the cylinder strap around a point in the top third of the cylinder-but never around the neck of the cylinder.
2. Take the protective cap off the gas cylinder.
3. Gently turn the gas-cylinder value anticlockwise, and blow off any dust and dirt.
4. Screw the pressure regulator onto the gas cylinder and tighten it.
5. Connect the shielding-gas connector to the pressure regulator.

Fig. 4-7-3: Gas cylinder installation

● **Making an earth connection**

(1) Plug one end of the ground cable to the output socket (-) of power source and turn it to fasten it;

(2) Connect the other end of the ground cable to the work piece.

● **Mounting the welding torch**

To ensure normal welding, please make sure that the wire diameter, contact tip, welding torch, welding wire tube are matched to each other.. Choose wire feeding tubes according to wires of different diameters and materials.

- Steel wire hose is suitable for hard wire, such as carbon steel wire, stainless steel wire.

- Teflon wire hose is suitable for soft wire, such as Aluminum and Aluminum alloys, also for copper and copper alloy wire.

Installation guide for Teflon wire hose

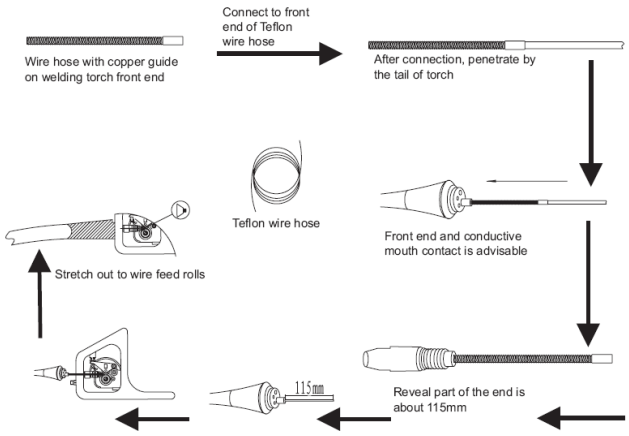


Fig. 4-7-4: Installation guide for Teflon wire hose

For installation of steel wire feed hose

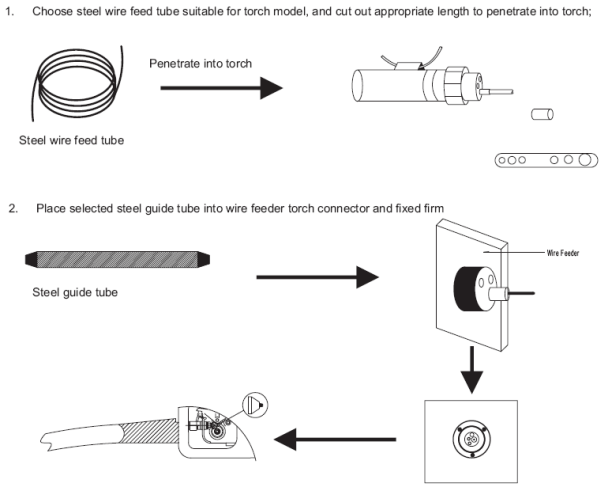


Fig. 4-7-5: Installation for steel wire feed tube

Note! If the wire hose is too tight or too loose, it will increase resistance for wire feeding and cause wire feeding instable.

● Installation environment requirements

1. It should be placed indoors without direct sunlight, rainproof, low humidity and less dust. The ambient air temperature range is -10℃~+40℃.

2. The inclination to the ground should not exceed 10°.

3. There should be no wind in the welding station, if any, it should be covered.

4. The welding machine is more than 20cm away from the wall, and the distance between the welding machine is more than 10cm.

5. When using water-cooled welding torch, pay attention to anti-freezing.

● Power supply and cable requirement

Please note the size of fuse and circuit breaker in the table below are for reference only.

Model		3500	5000
Power supply		3 phase, AC380V ±10%, 50/60Hz	
Electricity grid min. power (KVA)	Power grid	22	31
	Generator	30	48
Input protection(A)	Fuse	30	50
	Circuit breaker	32	63
Cable size (mm²)	Power cord	≥4	≥6
	Welding cable	50	70
	Protective GND wire	≥4	≥6

Table4-7-1: Power supply and cable requirement

Note! Welding machine must be taken special design if it is powered by generator, please contact with manufacturer if you have such needs.

● **Connections of power cord and distribution box**

Warning! -Avoid hot-line work

- Operating by professional electrician

- Avoid connecting two power sources to one breaker

- Please refer to Table 4-7-1 to check if standard of input voltage, breaker and input cable is suitable

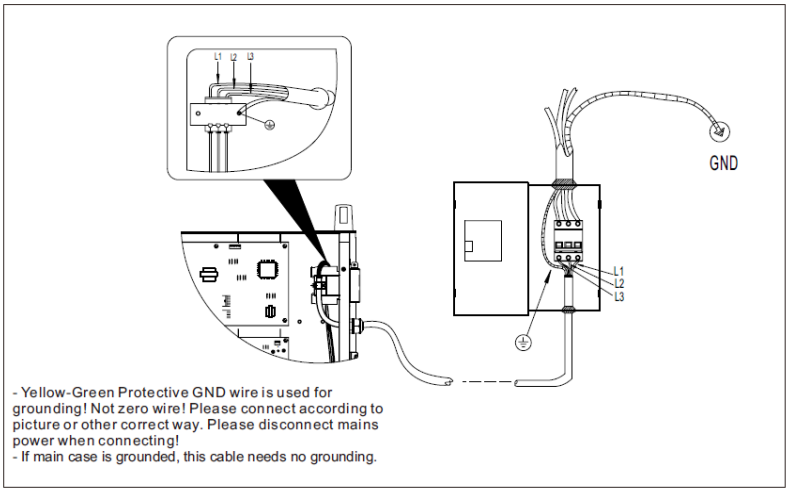


Fig. 4-7-6: Connections of power cord and distribution box

4-8 welding process installation

Warning! Operating the equipment incorrectly can cause serious injury and damage. This part is about operating. Do not use the functions until you have read and completely understood content of this manual.

●MIG/P-MIG welding process installation:

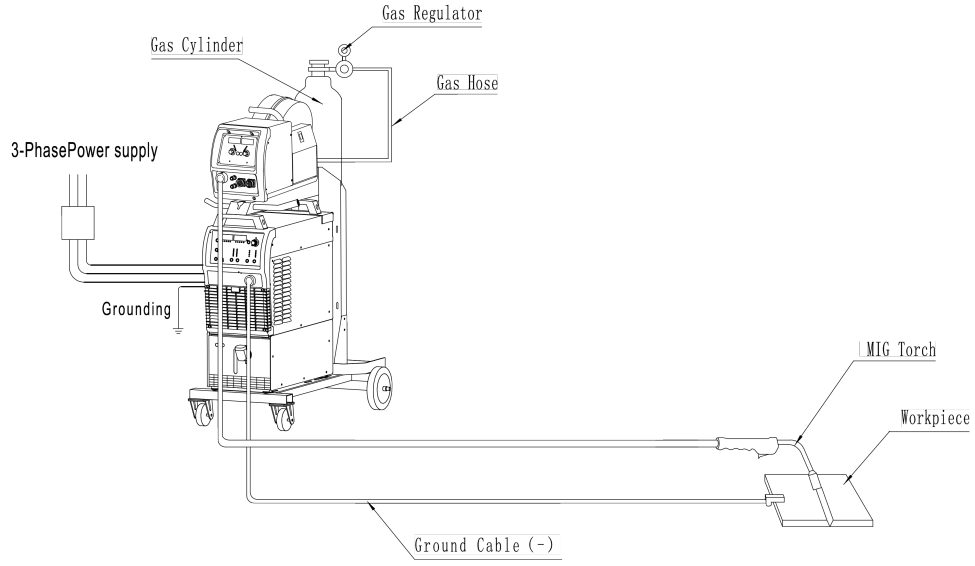


Fig. 4-8-1: Installation for MIG/P-MIG

● STICK welding process installation:

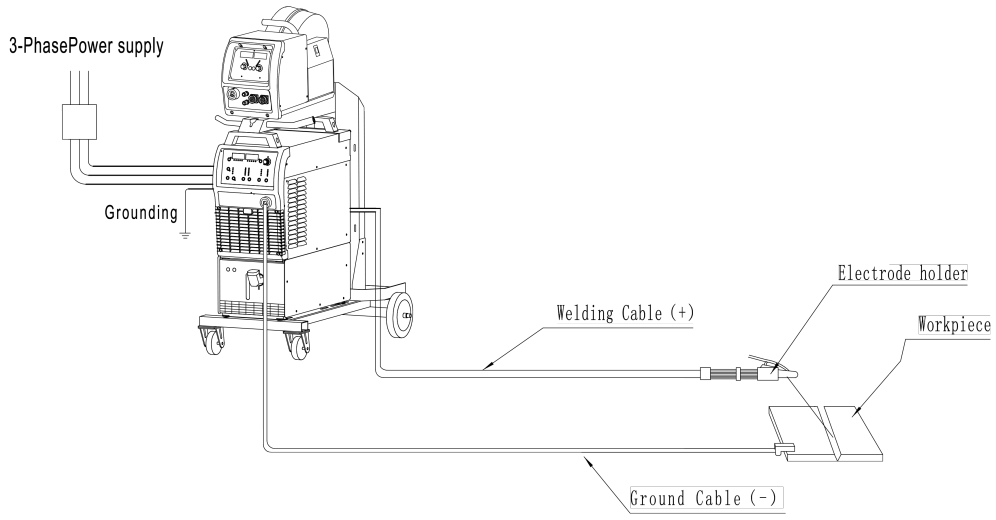


Fig. 4-8-2: Installation for STICK

● **TIG welding process installation:**

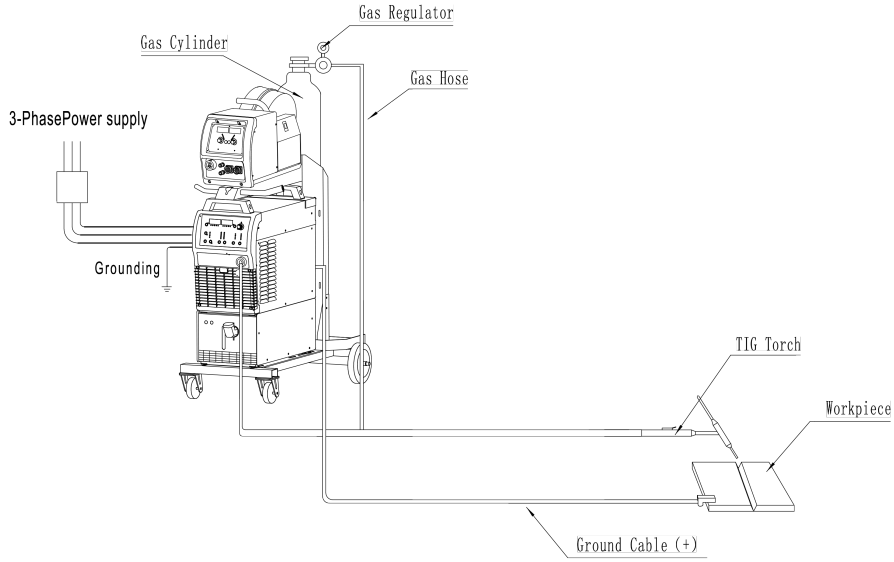


Fig. 4-8-3: Installation for TIG

4-9 Technical data

Single voltage

Model	3500	5000
Voltage/Frequency (3~)	380/400/415/V±10％,50/60Hz	
Rated input capacity (KVA)	14.4	25
Rated input current(A)	25/23.6/22.9	46/43.7/42
Range of welding current(A)	60～350	60-500
Range of welding voltage(V)	14～40	14-50
OCV(V)	96~106	101~111
Duty cycle (%)	60	
Full-load efficiency(%)	≥87	
Power factor	≥0.95	
Wire diameter (mm)	Φ0.8、Φ1.0、Φ1.2、Φ1.6	
Gas flow(L/min)	15～25	
Dimension(mm^3)	670*330*572	

Weight (Kg)	45	55
Insulation class	H	
IP class	IP21S or IP23S	

Table 4-9-1: technical data of single voltage

Multi voltage

Model	3500	5000
Voltage/Frequency (3~)	220/380/440V±10％,50/60Hz	
Rated input capacity (KVA)	14.5	25
Rated input current(A)	32.5/28/24	32.5/42/36
Range of welding current(A)	60～350	60-500
Range of welding voltage(V)	14～40	14-50
OCV(V)	103	106
Duty cycle (%)	220V input, 320A/30V 60% 440V input, 350A/31.5V 60%	220V input, 320A/30V 60% 440V input, 500A/39V 60%
Full-load efficiency(%)	≥87	
Power factor	≥0.95	
Wire diameter (mm)	Φ0.8、Φ1.0、Φ1.2、Φ1.6	
Gas flow(L/min)	15～25	
Dimension(mm^3)	670*330*572	
Weight (Kg)	45	55
Insulation class	H	
IP class	IP21S(or IP23S)	

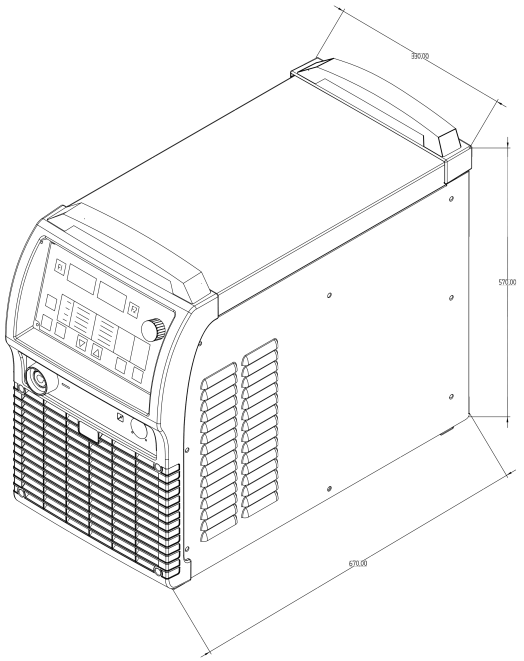
Table 4-9-2: technical data of multi voltage

Model	350	500
Voltage/Frequency (3~)	380/525V±10％,50/60Hz	
Rated input capacity (KVA)	14.5	25
Rated input current(A)	26	38/27.5

Range of welding current(A)	60～350	60-500
Range of welding voltage(V)	14～40	14-50
OCV(V)	96~106	95~106
Duty cycle (%)	380V input, 320A/30V 60% 525V input, 350A/31.5V 60%	380V input, 400A/34V 60% 525V input, 500A/39V 60%
Full-load efficiency(%)	≥87	
Power factor	≥0.95	
Wire diameter (mm)	Φ0.8、Φ1.0、Φ1.2、Φ1.6	
Gas flow(L/min)	15～25	
Dimension(mm^3)	670*330*572	
Weight (Kg)	45	55
Insulation class	H	
IP class	IP21S(or IP23S)	

Table 4-9-3: technical data of multi voltage

4-10 Dimension



NO.	Item	Unit(mm)	Unit(inches)
1	length	670	26.4
2	Width	330	13
3	Height	572	22.5

Fig. 4-10-1: Dimension

Table. 4-10-1: Dimension

4-11 Disassembly and reassembly

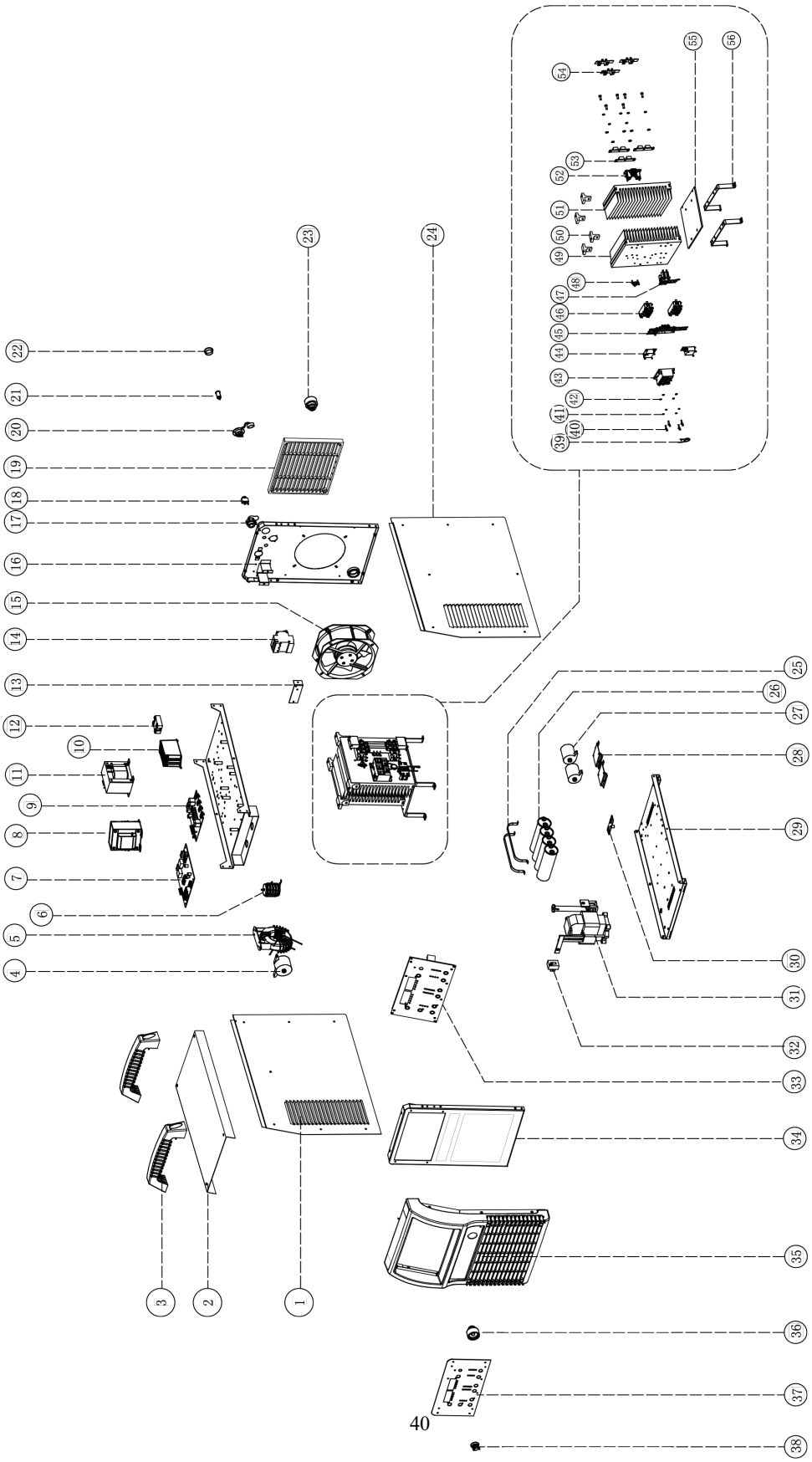


Fig. 4-11-1: Disassemble and reassembly

No.	Item	Stock No.for 3500	Stock No.for 5000	Remarks
1	Left plate	262017-00632	262017-00632	
2	Top plate	262029-00477	262029-00477	
3	Handle	766003-02388	766003-02388	
4	Resonance capacitor	722001-00074	722001-00074	
		722001-00073 722001-00074	722001-00074 722001-00075	220~440V
5	Main transformer	220629-00007	220629-00088	
		220629-00205	220629-00207	220~440V
6	Resonance inductor	220521-00007	220521-00004	
		220521-00057	220521-00055	220~440V
7	Main control board	210580-00083	210580-00083	single row socket
		210580-00941	210580-00941	Dual row socket
8	Power transformer I	763001-00068	763001-00068	
		763001-00048	763001-00048	400V
		763001-00292	763001-00292	415V
		763001-00174	763001-00174	220~440V
9	Drive board	210310-00020	210310-00032	single row socket
		210310-00118	210310-00118	Dual row socket
		210310-00088	210310-00095	220~440V
10	Filter	752004-00017	752004-00017	400V CE
11	Power transformer II	763001-00062	763001-00062	

		763001-00049	763001-00049	400V
		763001-00308	763001-00308	415V
		763001-00170	763001-00170	220~440V
12	Solid state relay	715004-00003	715004-00003	
13	Main circuit breaker bracket	766003-00088	766003-00088	
14	Main circuit breaker	745011-00022	745011-00022	
15	Fan	746001-00017	746001-00017	220/380/440V
		746001-00087	746001-00087	400V CE
		746001-00019	746001-00019	415V
16	Rear plate	262011-00943	262011-00943	
17	Cable	769001-00289	769001-00289	
		769001-00028	769001-00028	400V CE
18	Recoverable overload protector	745013-00044	745013-00044	
19	Fan cover	766003-02403	766003-02403	
20	Control socket	740001-00047	740001-00047	
21	Fuse holders	740007-00004	740007-00004	
22	Hole plug	773007-00002	773007-00002	
23	Quick socket	740002-00027	740002-00027	
24	Right plate	262023-00617	262023-00617	
25	Filter capacitor clamp	766003-00247	766003-00248	
26	Filter capacitor	722001-00062	722001-00062	
27	Polypropylene	722001-00070	722001-00070	
28	Input capacitor holder	766002-00104	766002-00104	
29	Bottom plate	262065-00066	262065-00066	
30	Rack capacitor board	220293-00005	220293-00005	
31	CD iron core output reactor	763004-00149	763004-00149	

32	Current sensor	753001-00020	753001-00020	
33	Display board	220503-00 011	220503-00011	single row socket
		220503-00189	220503-00189	Dual row socket
34	Front panel	262005-01039	262005-01039	
35	Plastic front panel	262005-01040	262005-01040	
36	Quick socket	740002-00027	740002-00027	
37	Control panel	262035-00317	262035-00317	
38	Potentiometer knob	720031-00144	720031-00144	
39	Varistor	720021-00017	720021-00017	
		720021-00021	720021-00021	415V
		720021-00001	720021-00001	220~440V
40	Screw	779001-00051	779001-00051	
41	Spring washer	779007-00008	779007-00008	
42	Flat washer	779007-00019	779007-00019	
43	Three phase rectifier module	735005-00002	735005-00003	
44	Polypropylene	722001-00067	722001-00067	
45	IGBT protection board	220005-00115	220005-00135	Ordinary air duct
		220005-00136	220005-00136	Semi-enclosed air duct
		220005-00102	220005-00135	220~440V
46	IGBT module	735007-00038	735007-00038	
47	Input filter inductance	220479-00002	220479-00002	
48	Temperature relay	745008-00006	745008-00006	
49	IGBT radiator	264005-00028	264005-00090	
50	Radiator support	766002-00091	766002-00090	
51	Output diode radiator	264011-00121	264011-00025	
52	Current exchange inductor	220281-00008	220281-00008	

		220281-00005	220281-00005	220~440V
53	Fast recovery diode module	735006-00029	735006-00029	
		735006-00019	735006-00019	220~440V
54	Diode protection board	220455-00002	220455-00002	
		220455-00004	220455-00004	220~440V
55	Radiator junction plate	775004-00033	775004-00027	
53	Radiator support frame	766002-01112	766002-00078	

Table4-11-1: Main components list

Note: This table is for reference only, and the detail of actual product shall prevail. If no special remarks, the input voltage mentioned in above table is three phase.

5-WF-P WIREFEEDER

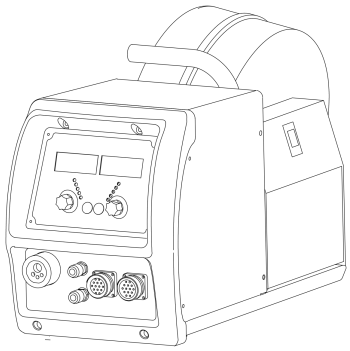


Fig. 5-1: Wire feeder

WF-P Wire Feeder series is a wire feeding device designed for AMIG3500@AMIG5000PM welding machine. The wire feeding device has the characteristics of large torque, small size, light weight, easy operation, etc. The structure of the device is convenient for wire installation and adjustment.

5-1 Features

Highlights as follows:

-MCU control, digital and analog display options;

-4-wheel drive, stable wire feeding speed;

-Wire feed motor with encoder feedback, high wire feed control accuracy, little influence by voltage, and fast adjustment speed;

-Enclosed wire reel box, improve IP grade, suitable for harsh use environment;

-Adjustable damping device to adjust resistance to welding wire of different weight;

-Reliable insulation design, suitable for trolley and ground placement;

-With over current protection device to prevent overload and short circuit;

-Fault self-diagnosis function;

-Suitable for the use of air-cooled and water-cooled welding torches;

-Optional different control systems, suitable for push welding torch, push wire welding torch and relay device;

-Optional wheel design to facilitate the independent movement of the trolley;

5-2 Interface

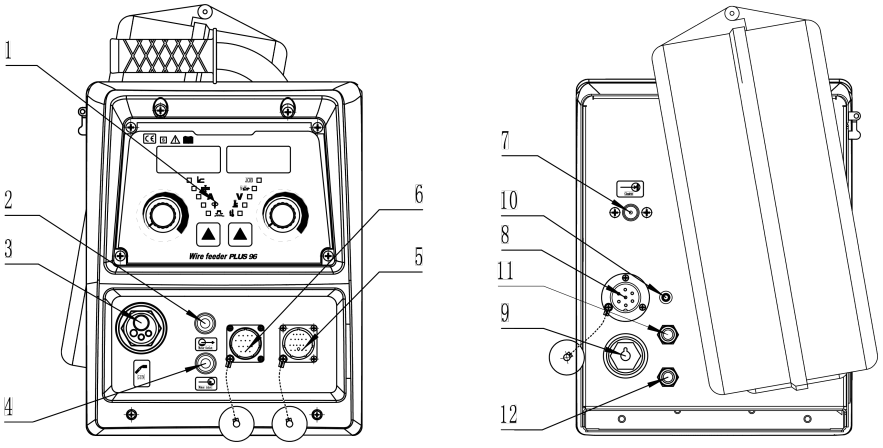


Fig. 5-2-1: Wire feeder interface

1.Control panel

2.Torch connector

For air-cooled or water-cooled European type.

3. Water outlet

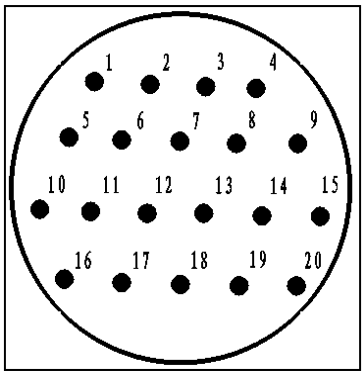
For connecting water inlet of water cooled torch (blue).

4.Water inlet

For connecting water outlet of water cooled torch (red).

5.Special control socket

For automation or remote controller connection.

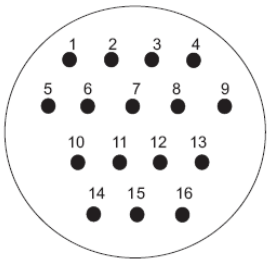


NO.	Description
1~4	485 serial communications
5	Voltage preset signal
6	Current preset signal
7	Manual wire feed switching signal
8	Gas test switching signal
9	Start and stop switching signal
10	+15V
11	GND
12, 13	Current with/without contact signal
14, 15	External urgent stop signal
19, 20	AC current 31V

Table 5-2-1: Digital communication socket

6.Control socket for digital welding torch

For connecting the control plug of digital torch.



NO.	Description
1	Welding torch switching signal
2	Welding torch right-hand button signal
3	Welding torch bottom button signal
4	Welding torch left-hand button signal
5	Welding torch upper button signal
6	GND
7	Digital welding torch selection signal
8	Motor negative pole of spool torch
9	Motor positive pole of spool torch
10-16	Null

Table 5-2-2: Control socket of digital welding torch

7.Gas inlet

For connecting with the gas cylinder via gas hose.

8..Control socket of wire feeder

For connecting the power source through the control cable.

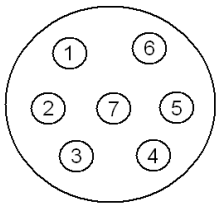
	PIN NO.	Description
	1	Power supply for wire feeder AC31-40V
	2	
	3	RS422 communication wire
	4	
	5	
	6	
	7	Arc voltage feedback wire

Table 5-2-3: Control socket of wire feeder

9..Welding cable socket

For connecting with the output terminal (+) of power source via welding cable

10.Overlaod protector

Used for overload protection of wire feeder.

11.Water inlet

For connecting water inlet of water cooling machine(blue).

12.Water outlet

For connecting water outlet of water cooling machine(red).

5-3 Control panel

There are two options for the control panel: digital and analog. The digital is more intuitive to use and the analog is simple to operate.

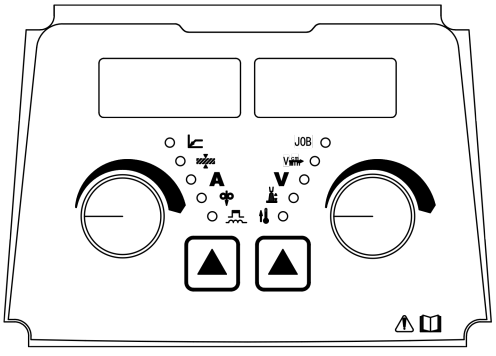


Fig. 5-3-1: digital type

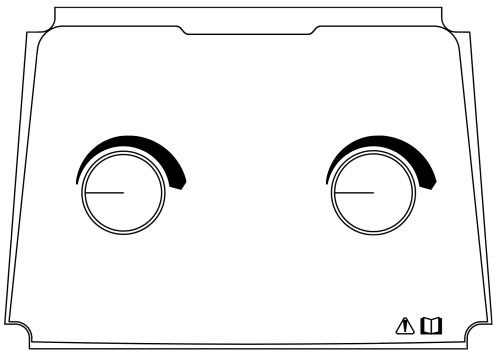


Fig. 5-3-2: Analog type

Note! Some described parameters in this manual may be slightly different from the wire feeder, some identification may be slightly different from power source identification, but the manner of working is the same.

Warning! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood all content of this manual.

Digital type control panel

The functions on the control panels are all arranged in a very logical way. The various modes and parameters needed for welding are easy to select by pressing the appropriate button; parameters are easy to be adjusted by rotating encoder. Synergic adjustment makes the complicated operation much easier.

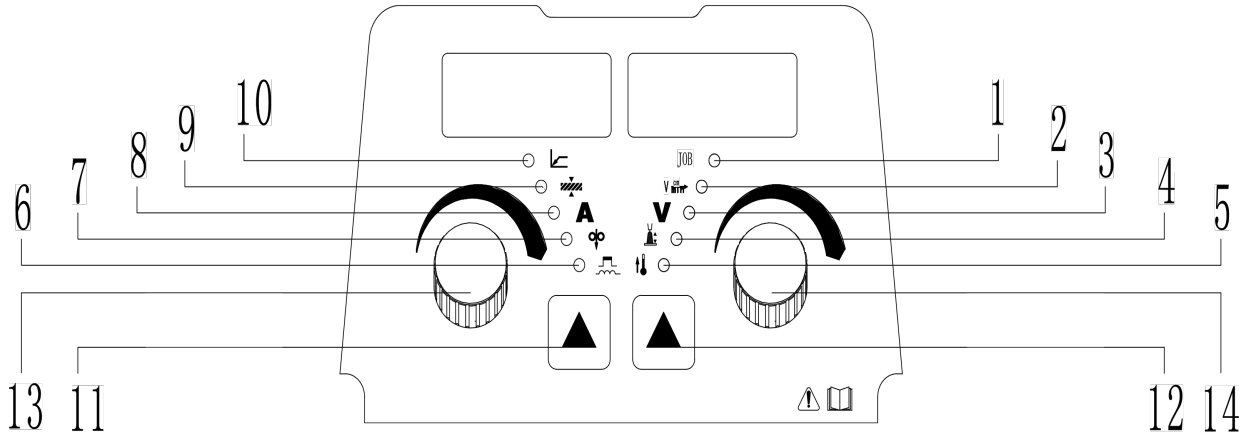


Fig.5-3-3: Control panel

1. JOB No. Indicator

For retrieving parameter records/job numbers that were previously saved with the “Store” button.

2. Welding speed indicator

When the light is on, the welding speed (cm/min) is on the right-hand displayer.

3. Welding voltage indicator

When the light is on, the preset or actual welding voltage is on the right-hand displayer.

4. Arc-length correction indicators

For correcting the arc length, when the light is on, the right-hand displayer shows the arc length value.

- shorter arc length

0 neutral arc length

+ longer arc length

5. Inner temperature indicators

This is reserved function, cannot operate right now.

6. Peak current/ Inductance

For adjusting the peak current during the P-MIG/MAG welding process, values range (-5.0-+5.0).

- shorter arc length

0 neutral arc length

+ longer arc length

For synergic MIG, change the inductance when short circuiting transfer (-5.0-+5.0).

- harder, stable arc

0 neutral arc

+ soft, low spatter arc

7. Wire feeding speed indicator

When the indicator lights up, the left-hand displayer shows the wire feeding speed (M/min).

8. Welding current indicator

When the indicator lights up, the left-hand displayer shows the preset or actual welding current values.

9. Sheet thickness indicator

When the indicator lights up, the left-hand displayer shows the preset sheet thickness.

10. “a” dimension indicator

When the indicator lights up, the left-hand displayer shows “a” dimension.

11. Parameters selection button 1

Select parameters from following for adjustment:

- “a” dimension
- Sheet thickness
- Welding current
- Wire feeding speed
- Peak current/Inductance

12.Parameters selection button 2

Select parameters from following for adjustment:

- Temperature indicator for the mains
- Arc length adjustment

- Welding voltage
- Welding speed
- Job (Channel) No

13.Parameter adjustment knob 1

Adjust values of “a” dimension, sheet thickness, preset current peak current and inductance.

14.Parameter adjustment knob 2

Adjust values of preset voltage, arc length, Job No.

5-4 Structure

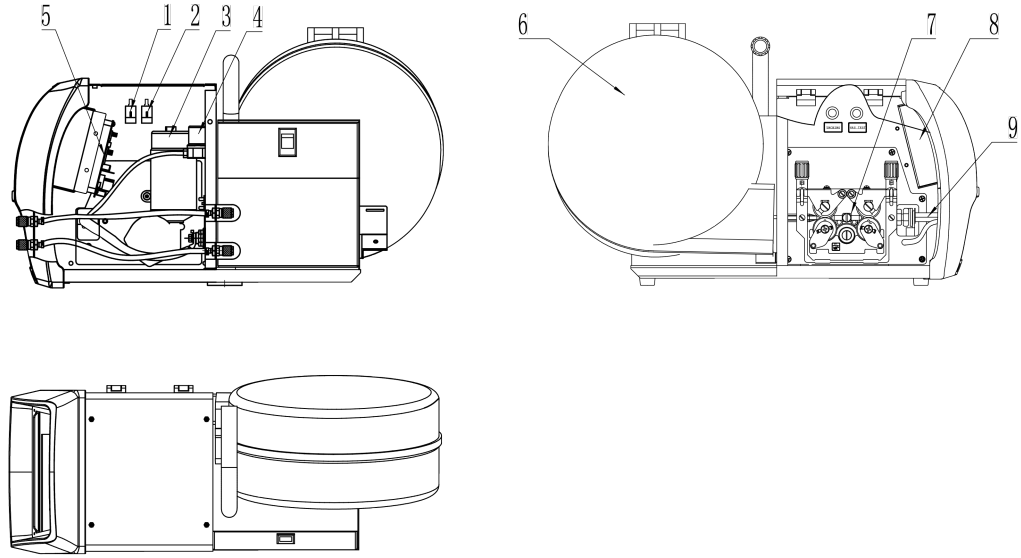


Fig. 5-4-1: Wire feeder

1.INCHING button

Press the button to launch the manual wire feeding, wire feed motor works and start feeding wire. Turn current adjustment knob to adjust the wire feed speed. Release the button and manual wire feeding will stop.

2.GAS TEST button

3.wirefeeder motor

4.The electromagnetic valve

5.Main control board

6.Wire box

7.Wirefeeder

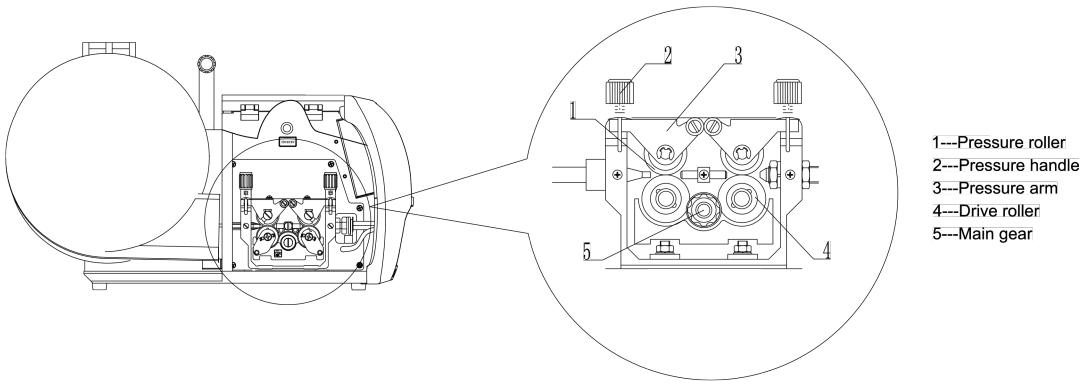


Fig. 5-4-2: Wire feeder structure

8.Display board

9.European torch connector

5-5 Installation and operation

●Installation of wire feed rollers

The proper wire feed rolls must be chosen according to the size and material of the wire.

Type 1: for hard wire, such as carbon steel wire, stainless steel wire.

Type 2: for soft wire, such as Aluminum and Aluminum alloys, also for copper and copper alloy wire.

Type 3: for flux-cored wire

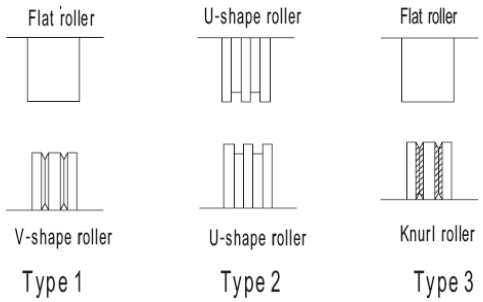
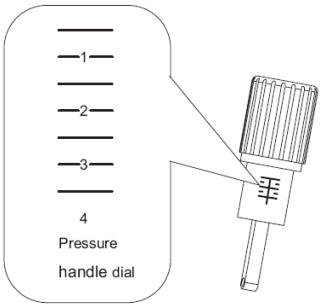


Fig. 5-5-1: Wire feed rollers

Important! When use pressure device to adjust wire feed roll pressure, too much pressure will cause wire crushed, and the wire coating be damaged, and it will cause the wearing out of feed rollers and increase the wire feeding resistance. Suitable pressures for wires of different materials and diameters are as shown in Fig. 4-7-7.



Type \ Diameter / Pressure Value	ϕ0.8	ϕ1.0	ϕ1.2	ϕ1.6
V-shape roller	1.5~2.5	1.5~2.5	1.5~2.5	1.5~2.5
U-shape roller	0.5~1.5	0.5~1.5	0.5~1.5	0.5~1.5
Knurl roller	——	——	1.0~2.0	1.0~2.0

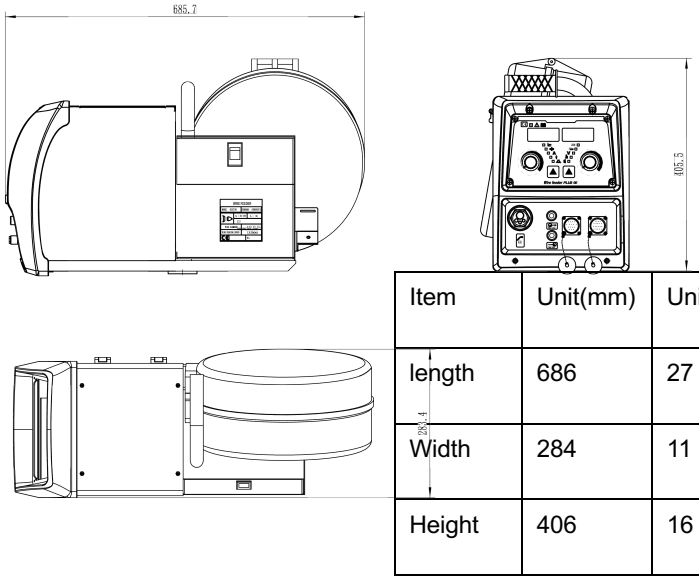
Fig. 5-5-2: Wire feed rollers installation parameter

5-6 Technical data

Model	WF
Motor Voltage(V)	DC24
Rated current(A)	5
Range of welding current(A)	350/500
Duty cycle (%)	60
Wire diamter(mm)	Φ0.8,Φ1.0,Φ1.2,Φ1.6
Spindle diameter(mm)	50
Gas flow(L/min)	10~25
Dimension(mm^3)	686×284×406
Weight (Kg)	15

Table. 5-6-1: Technical data

5-7 Dimension



Item	Unit(mm)	Unit(inches)
length	686	27
Width	284	11
Height	406	16

Fig. 5-7-1: Wire feeder dimension

Table. 5-7-1: Dimension

5-8 Disassembly and reassembly

5-8-1. Wire feeder

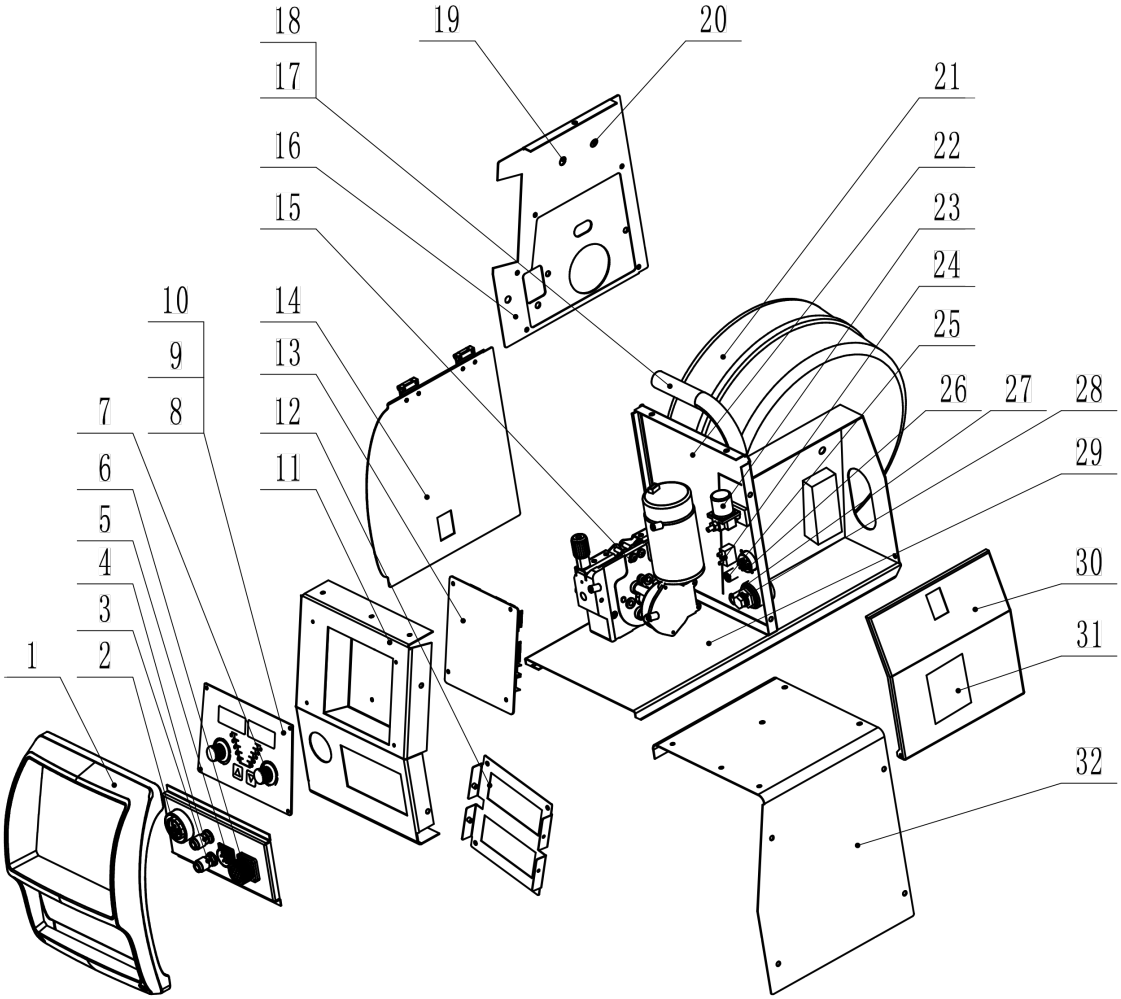


Fig. 5-8-1: Wire feeder

No.	Item	Stock No.	Qty	Remarks
1	Plastic front panel	764006-00108	1	
2	European style copper interface	322017-00014	1	
3	Water inlet socket	740002-00022	1	Blue
4	Water outlet socket	740002-00020	1	Red
5	Aerial socket	740001-00045	1	
6	Aerial socket	740001-00046	1	
7	Knob	720031-00144	2	
8	Control panel	262035-00330	1	
9	Control panel PC	771001-01351	1	
10	Display board	220503-00003	1	single row socket
		220503-00220	1	Dual row socket
		220503-00342	1	Push-pull
11	Front panel	--	--	
12	Main control board bracket	766002-01194	1	
13	Main control board	210580-00015	1	single row socket
		210580-00931	1	Dual row socket
		210580-01386	1	Push-pull
14	Left panel	--	--	
15	Wire feeding mechanism	321017-00003	1	
16	Vertical plate	--	--	
17	Handle	--	--	
18	Handle jacket	328005-00002	1	
19	Button switch	328005-00039	1	Green
20	Button switch	328005-00038	1	Red

21	European style spool box	324047-00001	1	
22	Real panel	--	--	
23	Solenoid valve	780999-02202	1	
24	Resettable over load protector	745013-00044	1	
25	Water inlet socket	740002-00022	1	
26	Aerial socket	740001-00047	1	
27	Water outlet socket	740002-00020	1	
28	Quick socket	740002-00028	1	
29	Bottom plate	--	--	
30	Real	--	--	
31	Nameplate	771002-02811	1	
32	Right panel	--	--	

Table. 5-8-1: Wire feeder spare parts list

5-8-2 Wire feeder

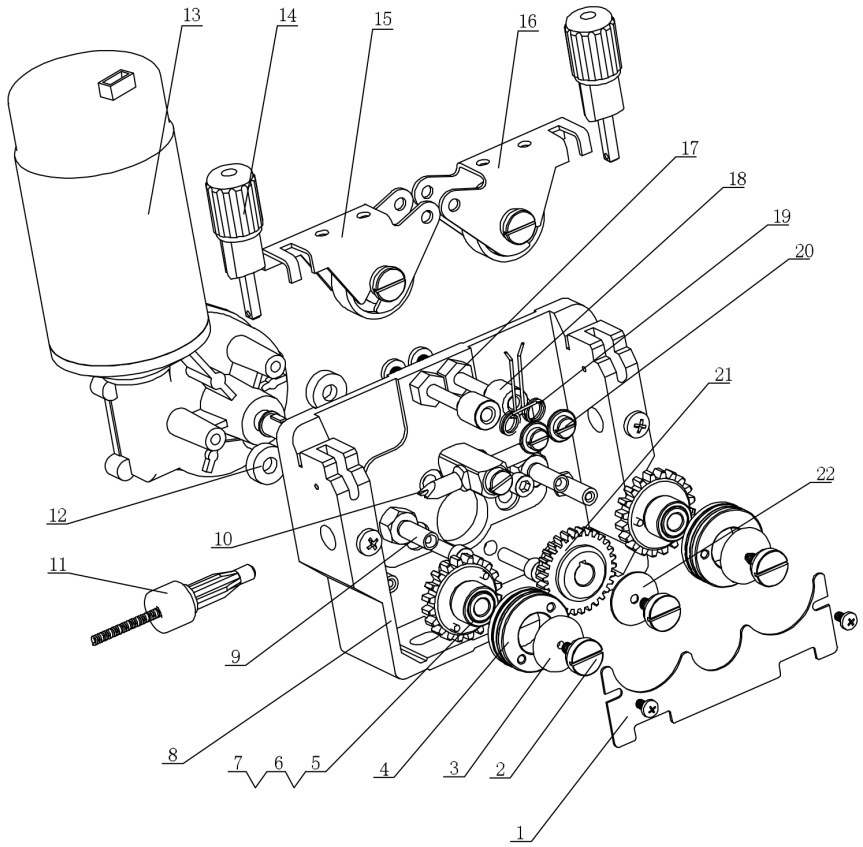


Fig. 5-8-2: Wire feeder

No.	Item	Stock No.	Qty	Remarks
1	Cover	780999-01983	1	
2	Wire feed axle screw	328005-00053	2	
3	Wire feed wheel washer	776020-00018	2	
4	Wire feed wheel	327011-00001	4	Φ0.8-Φ1.0 U
		327011-00005	4	Φ1.0-Φ1.2 U
		327011-00033	4	φ1.2-φ1.6 U
		327011-00003	2	Φ0.8-Φ1.0 V
		327011-00022	2	Φ1.0-Φ1.2 V
		327011-00012	2	Φ1.2-Φ1.6 V
5	Passive gear	321005-00004	4	
6				
7				
8	Aluminum body	326005-00014	1	
9	Wire feed axle	328005-00045	2	
10	Intermediate wire feed tube	324017-00010	1	
11	Wire guide tube	324017-00011	1	
		324017-00017	1	Special for AL
12	Motor feet	323017-00003	3	
13	Motor	321011-00020	1	
14	Pressure handle	328005-00058	2	
15	Left pressure wheel frame	328005-00209	1	
16	Right pressure wheel frame	328005-00208	1	
17	Roller axis	321035-00002	2	

18	Roller frame bushing	328005-00056	2	
19	Spring	327047-00012	2	
20	Roller screw	328005-00055	2	
21	Driving gear	321005-00005	1	
22	Large washer	779007-00067	1	

Table. 5-8-2:Wirefeeder spare parts list

6-TROUBLE SHOOTING



Warning! An electric shock can be fatal. Before doing any work on the machine:

-Switch it off and unplug it from the mains

-Put up a clearly legible and easy-to-understand warning sign to stop anybody inadvertently switching it on again

-Check to make sure the electrically charged components (e.g. capacitors) have been discharged.

-Bolts in machine case also work for ground connection. Never use other bolt that cannot work for ground connection.

● Error code display

This series of machines have automatic protection and error code display function. Relevant Cause & Remedy can be found according to below Error codes, as shown in Table 6-1

code	Trouble	Cause	Remedy
E03	Communication between the display board and main control board of wire feeder is abnormal	PCB damage; power supply abnormal; wire broken.	Check and replace
E10	Torch trigger fault	No current output after pressing torch trigger for 2s	Release torch trigger
E15	Torch fault when turn on the machine	The torch trigger is OFF when machine is ON	Turn off the machine, reset the torch trigger

E17	Over-current protection	Short circuit of Output; Current Sensor fault	Check output cable and replace Current Sensor
E18	Voltage feedback is unusual	Voltage Feedback Wire is broken; or Main Control Board is damaged	Check Voltage Feedback Wire ; or replace Main Control Board
E19	Over-heat protection	The welding machine is over heat; or Temperature Relay fault	Shut down the welding machine and wait for cooling; or replace Temperature Relay
E30	Wire feeding is abnormal	The current of Wire Feeder Motor is too high	Check and repair wire feeder
E40	Communication between the display board and main control board is abnormal	Main control board does not get the signal from the display board	Check and repair the wire between them
E42	Communication between the welding machine and wire feeder is abnormal	Welding machine does not get the signal from the wire feeder	Check the control cable between them
E0A	Water-cooling is abnormal	No circulating water in water cooling system	Check and repair

Table 6-1: Displayed error code

Important! If any error message that is not described here appears on the displays, then the fault is one that can only be put right by a service technical. Make a note of the error message shown in the display, and the serial number and configuration of the power source, and get in touch with our after-sale service, giving them a detailed description of the error.

● Power source trouble shooting



Note! The flowing troubles and causes are uncertain. However, during the process of MIG Pulse and the normal using conditions, that might happen.

Trouble	Remedy
Power source cannot work	• Check the mains supply lead, make sure that the mains plug is plugged in • Check whether the air switch is on • Check the fuse and breaker • Check whether the junction cable and connectors between power source and wire feeder are correctly fixed.

	• Check whether the ground cable is connected
Dirty welding face, poor welding seam	• Check whether shielding gas is provided • Check and set shielding gas flow • Check whether shielding gas is correct • Check whether polarity of welding torch is correct
Unstable welding performance	• Check whether wire feeder correctly operate • Check whether wire feed rollers correctly installed • Check whether correctly adjust the braking force of wire spool • Check whether the guide tube of welding torch is blocked, replace whether necessary • Check whether the size and material of filling metal and the guide tube is suitable • Check the size, type and wear patterns of tip • Check whether the welding torch is too hot • Check whether the cables and ground cable are firmly connected • Check whether the setting parameters are correct
Filler wire cannot feed in	• Check the wire feeder • Check ON-OFF function of welding torch • Check whether guide tube of welding torch is blocked • Check the size, type and wear patterns of tip
Too much spatter	• Check whether the setting parameters are correct • Check the setting of arc force • Check the length of the cables • Check the type and flow rate of the shielding gas • Check whether welding cable is correctly connected • Check the filing metal • Check whether the feeding of wire is unobstructed • Check whether default phase

Table6-2: Trouble shooting

7-CARE AND MAINTENANCE

- **Before open the machine**



Warning! An electric shock can be fatal. Before doing any work on the machine:

-Switch it off and unplug it from the mains

-Put up a clearly legible and easy-to-understand warning sign to stop anybody inadvertently switching it on again

-Check to make sure the electrically charged components (e.g. capacitors) have been discharged.

-Bolts in machine case also work for ground connection. Never use other bolt that cannot work for ground connection.

Maintenance

- Please follow the instructions as below to ensure normal lifespan of power source.
- Conduct safety check at regular intervals (see “Safety rules”)
- Dismantle machine side panels and clean machine inside with clean and low-pressure compressed air by professional technician, not less than twice per year. Clean the components at a certain distance only;
- If a lot of dust has accumulated, clean the cooling-air ducts.

- **Maintenance of water-cooled welding torch**

For water-cooled welding torch:

- Check the connections of water cooling system
- Check the coolant level and cleanliness(clean coolant only)
- Frequently check coolant’s backflow state

- **Daily maintenance**

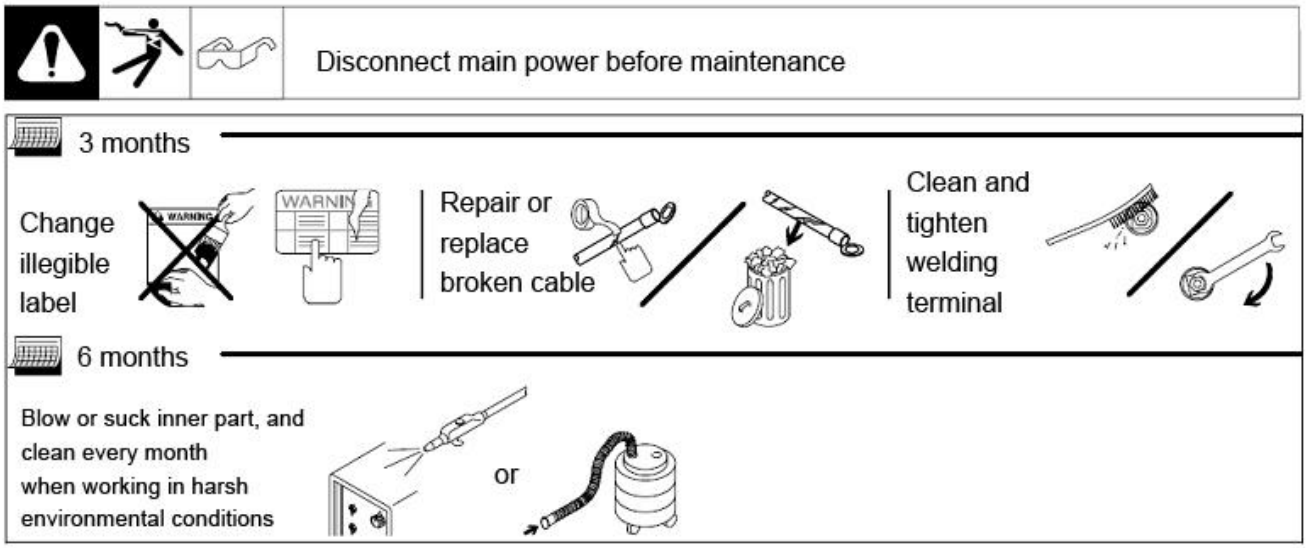
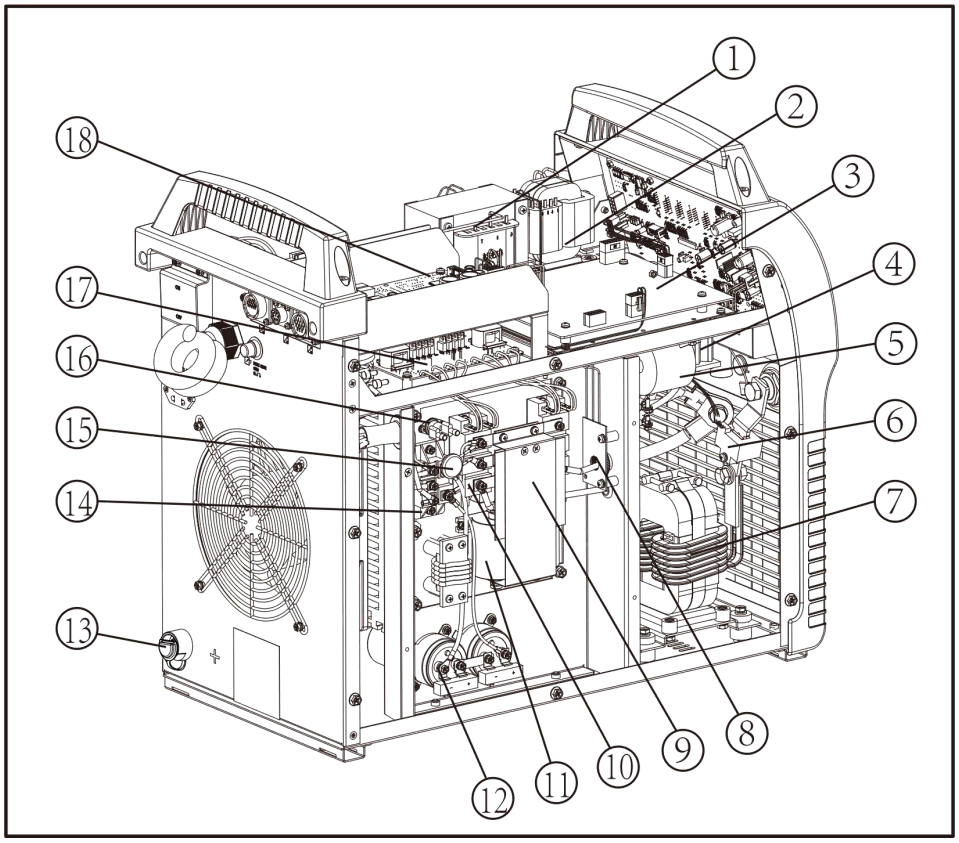
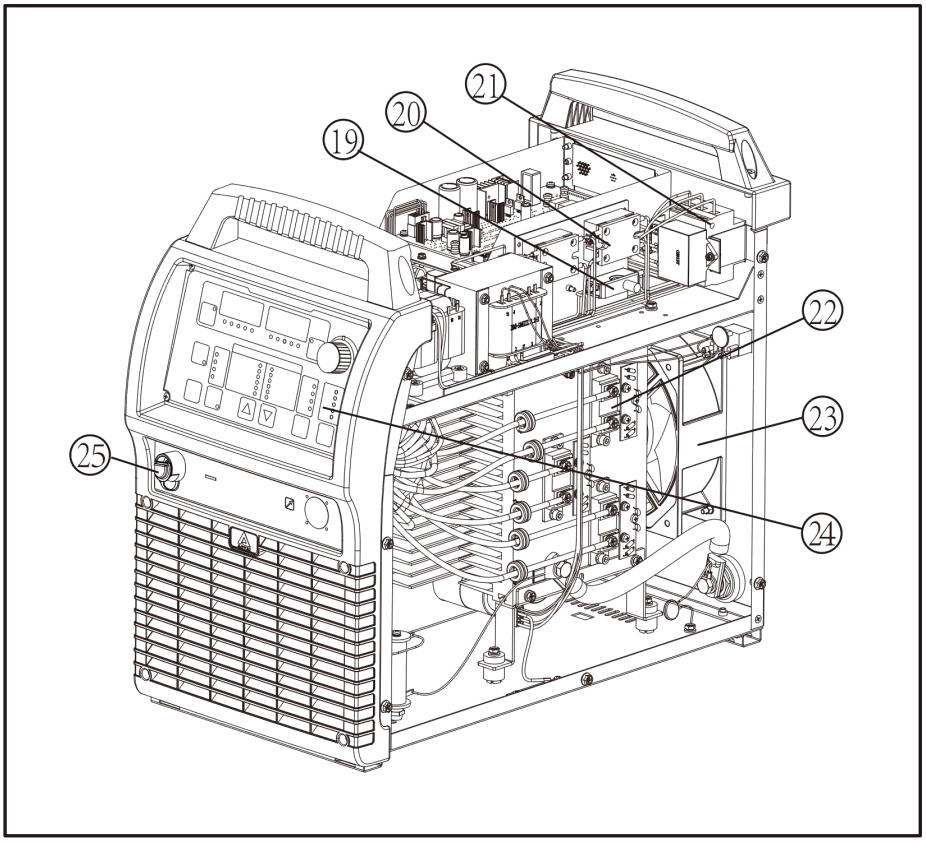


Fig. 7-1: Daily maintenance


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No.	Item	Stock No.for 3500	Stock No.for 5000	SAP KODU Stock No.for 3500	SAP KODU Stock No.for 5000
1	Power transformer II	763001-00048	763001-00048	**6064000403**	**6064000403**
2	Power transformer I	763001-00049	763001-00049	**6064100514**	**6064100514**
3	Main control board	210580-01609	210580-01609		
4	Current exchange inductor	220281-00008	220281-00008	**6064100227**	**6064100227**
5	Polypropylene capacitor	722001-00074	722001-00074	**6064100154**	**6064100154**
6	Current sensor	753001-00020	753001-00020	**6064100165**	**6064100165**
7	Output reactor	763004-00174	763004-00174		
8	Current transformer	220149-00136	220149-00136	**6064000415**	**6064000415**
9	IGBT protection board	220005-00172	220005-00171		
10	IGBT module	735007-00038	735007-00038	**6064100175**	**6064100175**
11	Polypropylene capacitor	722001-00070	722001-00070	**6064100163**	**6064100163**
12	Aluminum electrolytic capacitors	722004-00162	722004-00162		
13	Cable socket(red)	740002-00027	740002-00027	**6064200534**	**6064200534**
14	Three phase rectifier module	735005-00002	735005-00002	**6064100220**	**6064100220**
15	Varistor	720021-00017	720021-00017	**6064100167**	**6064100167**
16	Temperature relay	745008-00042	745008-00042	**6064100613**	**6064100613**
17	Drive board	210310-00118	210310-00118	**6064000406**	**6064000406**
18	Wire feeder control box	210580-00822	210580-00822	**6064000409**	**6064000409**
19	Fuse	745007-00011	745007-00011	**6064100190**	**6064100190**
20	Solid state relay	715004-00014	715004-00014	**6064100394**	**6064100394**
21	Main circuit breaker	745011-00022	745011-00022	**6064200131**	**6064200131**
22	Fast recovery diode module	735006-00029	735006-00029	**6064100173**	**6064100173**
23	Fan	746001-00087	746001-00087	**6064100525**	**6064100525**
24	Display board	220503-00250	220503-00261		
25	Cable socket	740002-00027	740002-00027	**6064200534**	**6064200534**
	Filter	752004-00017	752004-00017	**6064000421**	**6064000421**

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