PoWer MIG Series

GeKaMac®

# PoWer MIG 210 Pulse

## 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.

**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.

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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 210 PULSE |

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 60974-1:2018-A1:2019
EN 60974-10:2014+A1:2015
EN 60974-5:2019

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 210 Pulse

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.

**Utilisation for intended purpose only**

- The machine may only be used for jobs as defined by the “Intended purpose”.
- Utilisation 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
- Workpiece 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.

**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.

**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 60974).

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# 1-GENERAL REMARKS

## 1-1 Features

PoWer MIG 210 Pulse multi function inverter welding machine can use for pusle MIG and CV MIG. Also it possesses STICK, Lift TIG function. This series welding machine enjoys reasonable static characteristic and sound dynamic characteristic.

**Features and benefits:**

☑Inverter technology ensures stable welding voltage when network voltage fluctuates and arc length changes. Arc has high self-adjustment ability, welding process is stable.

☑ Easy to operate, fast welding, and easy arc-starting with minimal spatter.

☑ Synergic adjustment function

☑ Double pulse mode

☑ Deep penetration, minimal spatter, low welding distortion, excellent welding seam.

☑ Current and voltage are continuously adjustable with wide adjustment range.

☑ Energy-saving, low expense.

☑ Built-in wire feeder,15kg wire spool,small size, light weight, more portable, convenient to use.

☑ Thin plate welding expert, especially suitable for 0.7-4mm aluminum alloy thin plate welding.

## 1-2 Functional principle

This series welding machine applies HF inverter technology. 1- phase input volt is rectified by rectifier, inverted into HF AC, reduced by HF transformer, rectified and filtered by HF rectifier, then output DC power suitable for welding. After this process, the welding machine’s dynamical responsive speed has been greatly increased, so the welding machine size and weight are reduced noticeably.

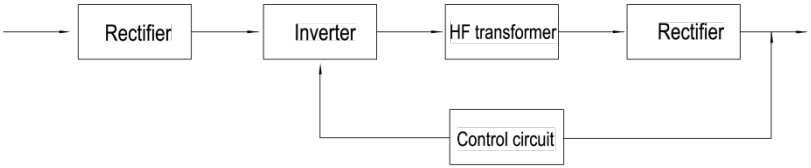



Fig. 1-2-1: Schematic diagram

## 1-3 Output characteristics

MIG/MAG mode STICK mode LIFT TIG mode

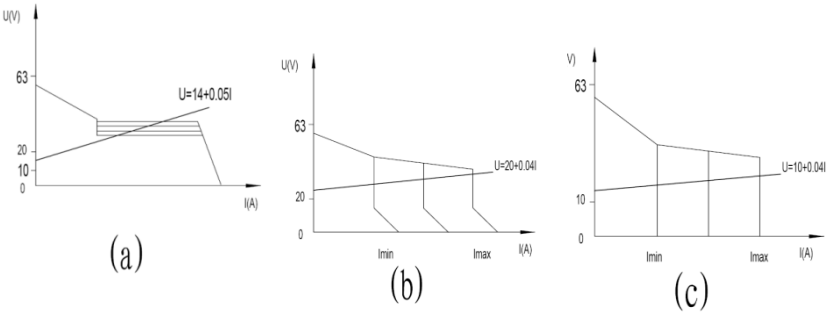
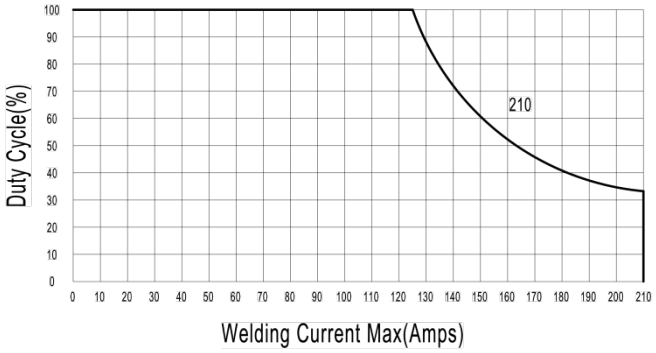



Fig. 1-3-1: Output characteristics

## 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 close, output stops. Wait for fifteen minutes for the machine to cool down. Reduce amperage or duty cycle before welding.

Exceeding duty cycle can damage unit and void warranty.



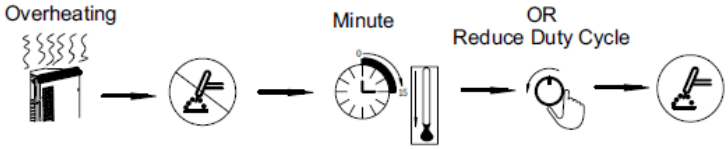




Fig. 1-4-1: Duty cycle

## 1-5 Applications

This series power source can use for carbon steel, stainless steel, aluminum and al-mg alloy welding with wire (Φ0.8, Φ1.0, Φ1.0mm).

The power source is designed for the following recommend areas:

☑ Automobile

☑ Steel door and window

☑ Furniture

☑ Decoration

☑ Fitness equipment manufacture

☑ Maintenance and repair

## 1-6 Warning label

The warning label is affixed onto the top of the power source, and it must not be removed or painted over.

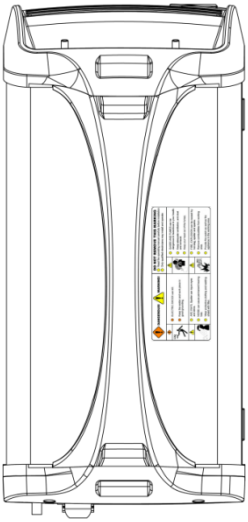


Fig. 1-6-1: Warning label

# 2-VERSIONS BRIEFS

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

■ **PoWer MIG 210 Pulse**

It is multi function inverter welding machine, can use for MIG/MAG, FCAW-S, STICK and Lift TIG function. Built-in wire feeder with 15kg wire spool, closed type, small size, light weight and easy to start arc, enjoy stable arc length, pretty welding seam formation and welding current continuous adjustment capability.

# 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 the safety rules.

## 3-1 Utilization for intended purpose only

The power source may only be used for MIG/MAG, FCAW-S, STICK and Lift TIG. Utilisation 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.

Utilisation in accordance with the “intended purpose” also comprises:

- following all the instructions given in this manual

- performing all stipulated inspection and servicing work

## 3-2 Machines set-up regulations

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 can easily cause harm to people. Please firmly install the machine on a stable place.

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.

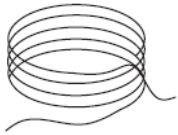
**Note!** Inadequately dimensioned electrical installations can lead to serious damage. The mains lead, and its fuse protection, must be dimensioned in accordance with the local power supply. The technical data shown on the nameplate shall apply.

## 3-4 Welding cables instruction

When welding, please pay attention to the followings:

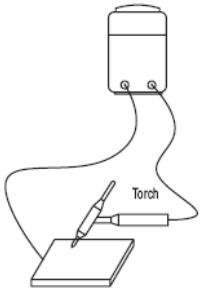
The welding cables should be kept as short as possible;

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



**Wrong**

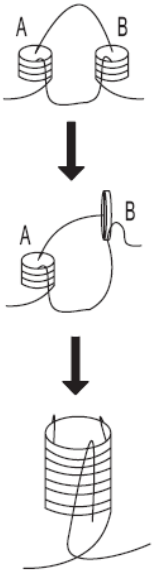
Coil the excess ground cable and welding cable in same direction respectively.




**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, coiling the cables to two windings in reverse direction and overlap them.

The number of turns for A is same as the number of turns for B.

Handle the welding cable and ground cable

Fig. 3-4-1: Welding cables instructio

# 4-PoWer MIG 210 Pulse

## 4-1 System components

This machine can be equipped with many different accessories and can be used in various special sites with different configurations.

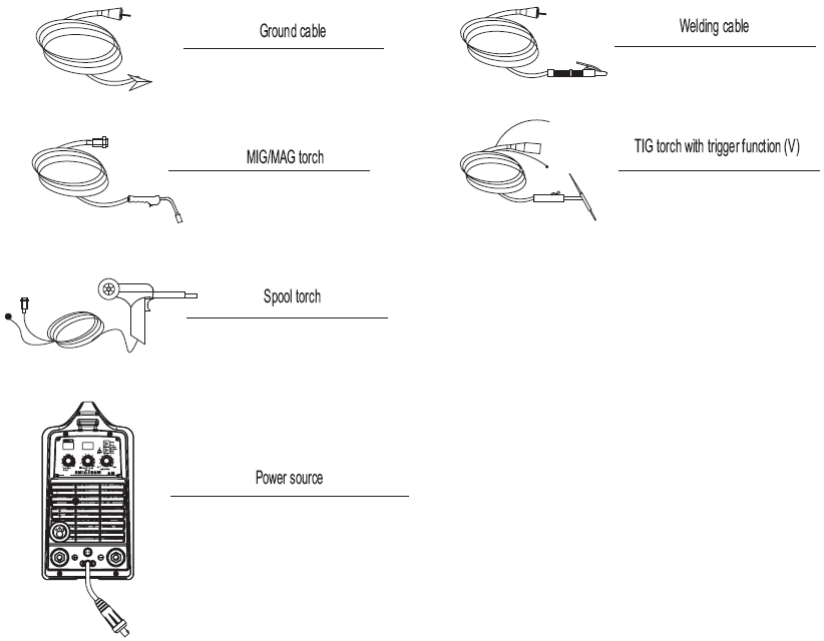



Fig. 4-1-1: System components

## 4-2 Basic equipments for welding

Basic equipments are needed for normal welding. Below are the lists:

MIG/MAG

- Power source

- Ground cable
- MIG/MAG welding torch
- CO2 gas regulator, gas hose, gas cylinder (to supply the machine with shielding gas)

FCAW-S

- Power source
- Ground cable
- MIG/MAG welding torch

STICK

- Power source
- Ground cable
- Electrode holder
- Electrode

Lift TIG

- Power source
- Ground cable
- TIG torch
- Gas regulator, gas hose, gas cylinder (to supply the machine with shielding gas)

# 4-3 Interface

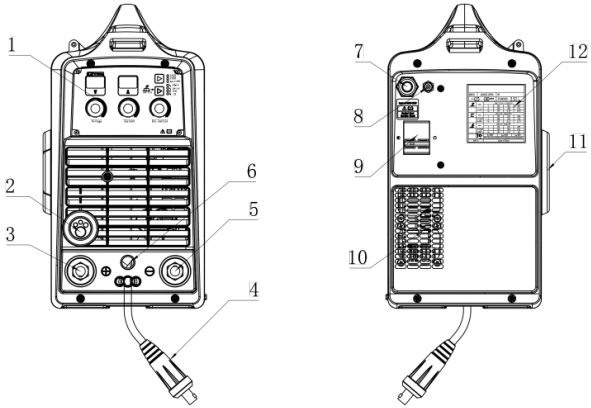



Fig. 4-3-1: Interface

1.Control panel

2.Torch connector

Euro-type connector, connect to the MIG torch.

3.Welding machine output terminal (+)

MIG/MAG: connect with Transfer cable;

FCAW-S/Lift TIG: connect with work piece via ground cable;

STICK: connect with electrode holder.

4.Transfer cable

MIG/MAG: connect to output terminal (+);

FCAW-S: connect to output terminal (-);

5.Welding machine output terminal (-)

MIG/MAG, STICK: connect with work piece via ground cable;

FCAW-S:connect with Transfer cable;

Lift TIG: connect with welding torch.

6. Control socket

Control interface of wire drawing torch.

7.Power cord

The mixed-colored wire must be firmly grounded; the rest 2 wires connect to one phase AC power supply.

8.Gas inlet

Connect to gas regulator with gas hose (MIG/MAG ONLY)

9.Main circuit breaker

Main circuit breaker for one phase AC power supply.

Turn on this switch (on the position: “ON”), then displayers on control panel light up, and the fan runs..

10. Fan

Cool down the heat components inside welding machine.

11. Observation window

12.Nameplate

**Side panel**

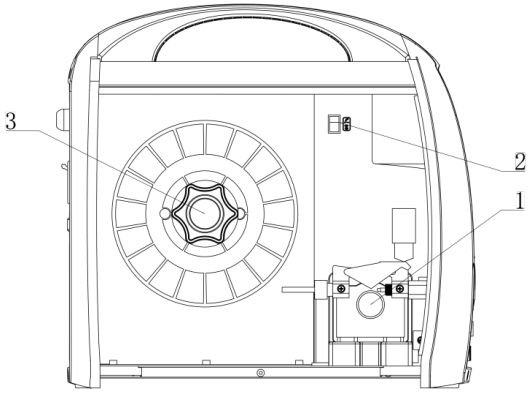



Fig. 4-3-4: Side panel

1.Wire feeding system

Single drive wire feeder, can weld solid wire and flux cored wire;

2.Wire pushing/wire pulling selection switch

In wire pushing, wire feeder power supply will provide power to wire feeding system inside of welding machine;

In wire pulling, wire feeder power supply will provide power to spool torch by front panel control socket. Wire pulling torch is Euro type connector.

3.Wire spool

Suitable for diameter 200mm, 300mm wire spool .

## 4-4 Control panel

**Note!** You may find that your machine has certain functions or some parameters

that are not described in this operating manual. Also, certain illustrations may be very slightly different from the actual controls on your machine. However, these controls function in exactly the same way.

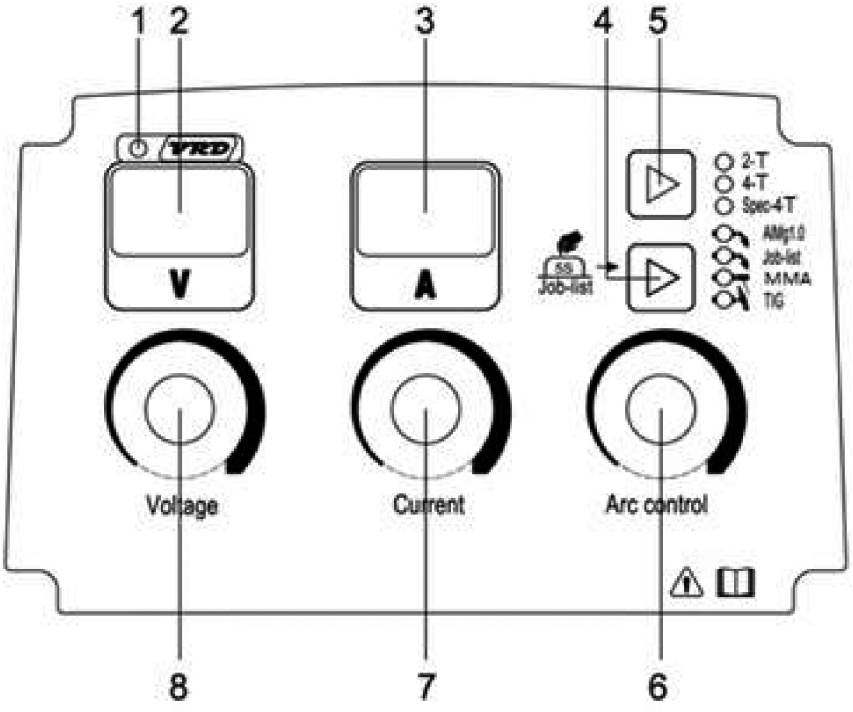



Fig. 4-4-1: Control panel

1.VRD indicator

On STICK mode, open load mode, VRD indicator lights up, means VRD is on. Output voltage is reduced to about 15V, so it reduces electric short hazard.

**Note!**VRD is anti-electric shock device on STICK mode, but should also pay attention to safe operation requirements in this manual.

2.Voltage displayer

On open load mode, display preset voltage (Manual MIG/ Synergic MIG mode ONLY); display actual welding voltage during welding.

3.Current/job list code displayer

On open load, display preset welding current;

On open load, JOB list mode, display job list code ;

Display actual welding current when welding

4.Welding mode selection button

Change welding modes between ALmg 1.0/JOB LIST// STICK/ LIFT TIG, corresponding indicator lights up;

ALmg 1.0 mode: aluminum Φ 1.0 welding material job code;

Job-list mode : MIG expert library mode, in this mode, welding material job codes can be called, and welding of carbon steel, aluminum, stainless steel and self-shielded flux cored wire can be performed ,please refer to 4-5 Job list.

STICK: SMAW welding mode;

LIFT TIG: Lift TIG welding mode.

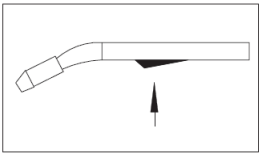
5.2-STEP/4-STEP/special 4-STEP button

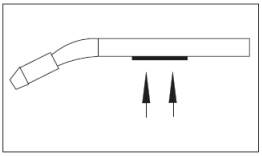
2-STEP mode suits for short welding seam welding:

4-STEP mode suits for long welding seam welding:

Special 4-STEP mode:With adjustable initial specifications and adjustable crater filler specifications.

Graphic symbol





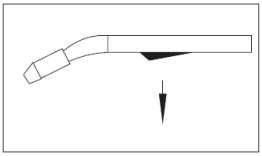


Fig. 4-4-2: Press trigger Fig. 4-4-3: Hold trigger Fig. 4-4-4: Release trigger

2- STEP mode

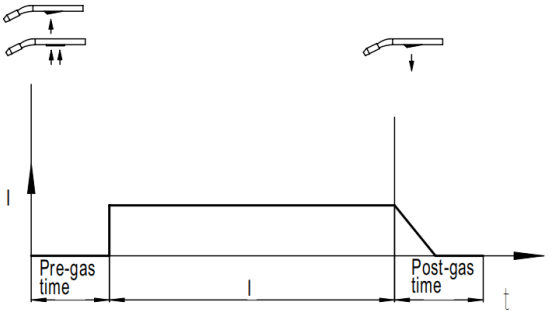



Fig. 4-4-5: 2-STEP mode

4- STEP mode

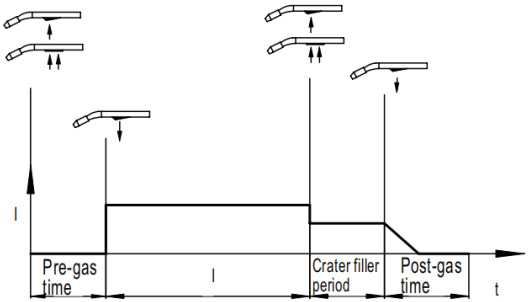


Fig. 4-4-6: 4-STEP mode

Special 4-STEP mode

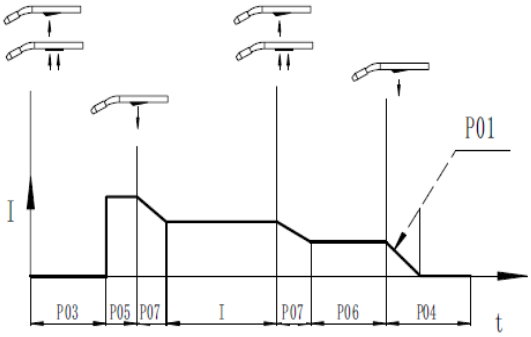



Fig. 4-3-7: Special 4-step mode

6.Voltage adjustment knob

On MIG mode, it is used for adjusting preset welding voltage;Turn left to decrease the voltage value, turn right to increase the voltage value; press the knob and turn left to decrease the voltage value quickly, turn to the right to increase the voltage value quickly.

On Job list mode, select Job-list code,please refer 4-5 JOB list.

7.Current adjustment knob

It is used for adjusting preset welding current.Turn left to decrease the current value, turn right to increase the current value; press the knob and turn left to decrease the current value quickly, turn to the right to increase the current value quickly.

On Job list mode, select Job-list code,please refer 4-5 JOB list.

8.Inductance adjustment knob

Pulse MIG: can be used to adjust the arc force.

The smaller the value. Arc concentration

The larger the value, the softer arc and less splash.

MIG (CV) mode: It can be used to adjust the arc stiffness during short-circuit transition.

The smaller the value. Arc concentration

The larger the value, the softer arc and less splash.

STICK mode: It can be used to adjust the thrust current, the larger the value, the greater the thrust current, "0" means no thrust current.

## 4-5 Job list

The JOB list expert library contains the program codes of pulse MIG and CV MIG weldable materials, the voltage display shows "Cod", the current display shows the code such as: "101"; the program code is a 3-digit table,The meaning of each digit is as follows:

Bit 1: represents the welding wire material, the value is 0~8.

Bit 2: represents pulse/constant pressure gas shielded welding, value: 0 represents PUSLE MIG, 1 represents CV MIG;

When welding carbon steel, 1 represents CV MIG and shielding gas is mixed gas, 2 represents CV MIG welding and shielding gas is CO2, 100%.

Bit 3: represents the diameter of the welding wire, the value is: 1 represents 0.8mm, 2 represents 1.0mm, and 3 represents 1.2mm.

---: It means that there is no program and is used for upgrading.

| Material-Code | Weld mode | Wire diameter | Code | Shield gas |
|---|---|---|---|---|
| | PULSE | 0.8/1.0/1.2 | 001/002/003 | Ar82%+CO218% |

| | | | | |
|---|---|---|---|---|
| CS-0 | CV | 0.8/1.0/1.2 | 011/012/013 | Ar82%+CO218% |
| | CV | 0.8/1.0/1.2 | 021/022/023 | CO2100% |
| SS-1 | PUSLE | 0.8/1.0/1.2 | 101/102/103 | Ar97.5%+CO22.5% |
| | CV | 0.8/1.0/1.2 | 111/112/113 | |
| CuAL-2 | PUSLE | 0.8/1.0/1.2 | 201/202/203 | Ar100% |
| | CV | 0.8/1.0/1.2 | 211/212/213 | |
| CuSi-3 | PUSLE | 0.8/1.0/1.2 | 301/302/303 | |
| | CV | 0.8/1.0/1.2 | 311/312/313 | |
| ALSi-4 | PUSLE | 0.8/1.0/1.2 | 401/402/403 | |
| | CV | 0.8/1.0/1.2 | 411/412/413 | |
| ALMg-5 | PUSLE | 0.8/1.0/1.2 | 501/502/503 | |
| | CV | 0.8/1.0/1.2 | 511/512/513 | |
| AL-6 | PUSLE | 0.8/1.0/1.2 | 601/602/603 | |
| | CV | 0.8/1.0/1.2 | 611/612/613 | |
| CS-7 Flux core | PUSLE | 0.8/1.0/1.2 | 701/702/703 | Ar82%+$CO_2$18% |
| | CV | 0.8/1.0/1.2 | 711/712/713 | |
| SS-8 Flux core | PUSLE | 0.8/1.0/1.2 | 801/802/803 | |
| | CV | 0.8/1.0/1.2 | 811/812/813 | |

Table. 4-5-1 JOB list

1. Press the mode selection button to make the Job-list indicator light on, and adjust the voltage setting knob to the standard area;

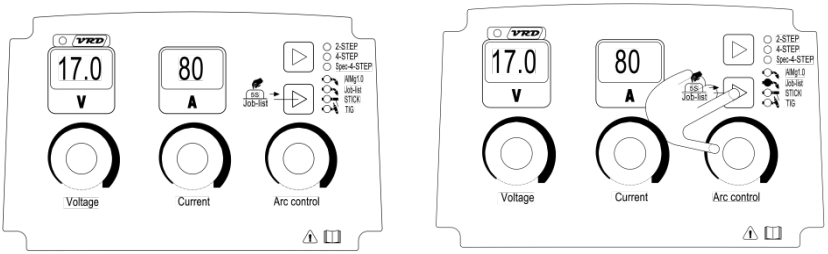



Fig. 4-5-1: Enter Job list menu

2.Press and hold the mode selection button 5S to enter the job list menu. At this time, the voltage displayer shows “Job” and the current displayer shows the previously set job code. Adjust the voltage knob to adjust the value of the first digit of the code, from 0-8.

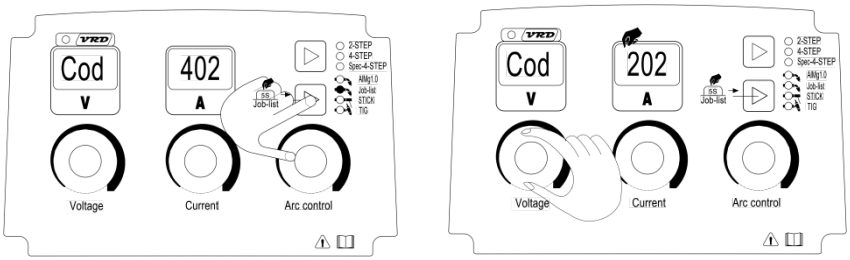



Fig. 4-5-2: adjustment Job list parameter

3. Adjust the current knob to adjust the value of the 2nd and 3rd digits of the code;Press and hold the mode selection button 5S to exit the job list menu.

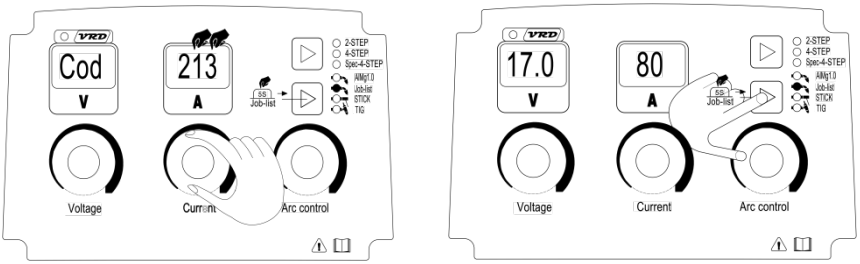



Fig. 4-5-3: adjustment Job list parameter

## 4-6 Sub menu

1.In the standby state, often press the " 2-Step/4-step" button for 5s until the digital tube displays "P01", which means it has entered the sub-menu adjustment mode.

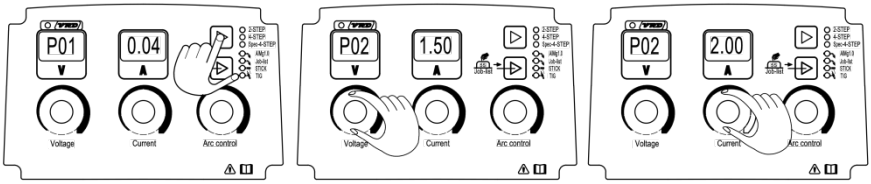



Fig. 4-6-1: Enter submenu

Fig. 4-6-2:adjust parameter value

2.Adjust the "voltage"knob to select the item to be modified, from P01-P19;Adjust the "Current"knob to modify the parameter value of the selected item.

3.Wait for 5s after the adjustment is completed, and then automatically exit the submenu.

| Item | Parameters | Setting Range | Min. Value | Factory Setting |
|---|---|---|---|---|
| P01 | Burn back time | 0.01～2.00s | 0.01s | 0.04s |
| P02 | Slow wire feeding | 1.0～21.0 m/min | 0.1 m/min | 1.5 m/min |
| P03 | Gas pre-flow time | 0.1～10.0s | 0.1s | 0.20s |
| P04 | Gas post-flow time | 0.1～10 | 0.1s | 1.0s |
| P05 | Initial period | 1～200％ | 1％ | 135％ |
| P06 | Crater fillerperiod | 1～200％ | 1％ | 50％ |
| P07 | Transitional period | 0.1～10.0s | 0.1s | 1.0s |
| P08 | Spot welding time | -- | -- | -- |
| P09 | Digital mode | ON | -- | ON |
| P10 | Water cooling selection | -- | -- | -- |
| P11 | Double pulse frequency | 0.5～5.0Hz | 0.1Hz | OFF |
| P12 | High pulse group arc length adjustment | -50%～+50% | 1 | 0% |
| P13 | Double pulse speed offset | 0～2m | 0.1m | 2m |
| P14 | High pulse group duty cycle | 10～90% | 1% | 50% |
| P15 | Pulse mode | -- | -- | -- |

| | | | | |
|---|---|---|---|---|
| P16 | Fan-on demand cooling time | -- | -- | -- |
| P17 | Special 2-step arc start time | OFF/0.1～10s | 0.1s | OFF |
| P18 | Special 2-step arc stop time | OFF/0.1～10s | 0.1s | OFF |
| P19 | Separate adjustment mode | OFF/ON | —— | OFF |

Table4-6-1: Sub-menu parameter for MIG/P-MIG

**Note!** P11-P14 is available on double pulse function

- **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 workpiece.

- **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.

- **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 workpiece and the hot cracking tendency. The melting pool can be periodically stirred; grain refinement, hydrogen and other gases are easilyprecipitated from the pool to reduce the porosity and the welding defects.

Double pulse reference wave form as shown in Fig. 4-6-1.

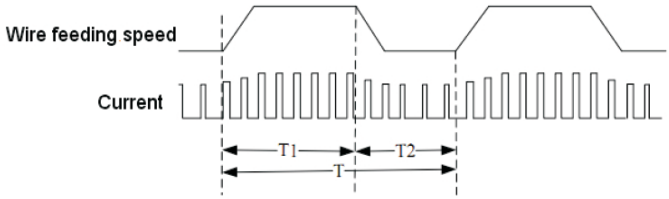



Fig. 4-6-1: Double pulse reference wave form

- **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 adjustmentknob in the control panel of wire feeder.

- **P13Double 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.

- **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 issynergic 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 adjustarc length, but voltage is not changed; in OFF mode, current and voltage is synergic adjusted.

## 4-7 Reset Factory setting

Press and hold the Arc control knob 5S to reset the factory setting.

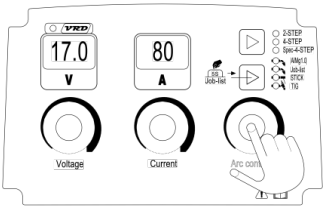
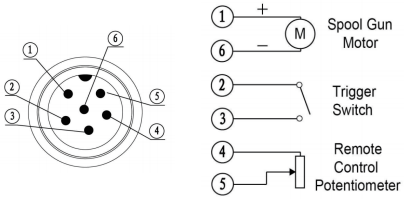



Fig. 4-7-1 Reset factory settng

## 4-8 Contorl socket




| Pin NO. | Description |
|---|---|
| 1 | Connect motor (+24VDC) positive of spool gun |
| 2, 3 | Connect torch trigger cable |
| 4 | Connect 0 Ω end of remote control potentiometer (4.7 KΩ) |
| 5 | Connect wiper end of remote control potentiometer (4.7 KΩ) |
| 6 | Connect motor (+24VDC) negative of spool torch |

Note: when use spool torch, should place wire pushing/wire pulling selection switch on side panel on wire pulling position, then wire feeding power supply of pin 1, 6 is connected.

When pin 4, 5 external connect 4.7KΩ potentiometer, then welding machine enters into remote control mode. On MIG mode, can adjust wire feeding speed remotely; on Lift TIG and STICK mode, can adjust current .

Table 4-8-1: Control socket connections

## 4-9 Installation and operation

**Warning!** Electric shock is very dangerous. If the machine is plugged into the mains ity supply during installation, there is a high risk of very serious injury and damage. Only carry out work on the machine when

- the mains switch is in the “OFF” position,
- the machine is unplugged from the mains.

● Power supply and cable requirement

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

| Model | | PoWer MIG 210 Pulse |
|---|---|---|
| Power supply(1-phase) | | AC 220/230V±15%, 50/60Hz |
| Min. power capacity (KVA) | | 9 |
| Input protection (A) | Fuse | 50 |
| | Circuit breaker | 60 |
| Cable size (mm²) | Input cable | 2.5 |
| | Output cable | 16 |
| | Protective GND wire | 2.5 |

Table 4-9-1: Input power supply cable installation

**The connection between input power supply cable and switch box (Fig. 4-5-1).**

**Warning!**

- Never connection when equipment is power on!
- The connection must be carried out by a qualified electrician!
- Do not connect two units of power sources to the same circuit breaker!

- Connected to the correct input voltage, circuit breaker, input cable as per the specification on Table 4-9-1.

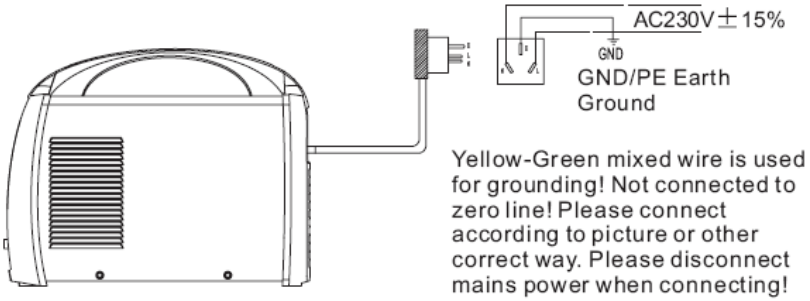



Fig. 4-9-1: Connection between input power supply cable and switch box

**Warning!** Operating the welding machine incorrectly can cause serious injury and damage.Do not use the functions described here until you have read and completely understand all the following documents:

- “safety rules”
- “before commissioning”

**Warning!** Electric shock is very dangerous. As soon as press the torch trigger, the welding wire is power on. Make sure that the welding wire does not touch any person or conductor or earthed parts (e.g. lifting appliance etc).

MIG/MAG, FCAW-S welding

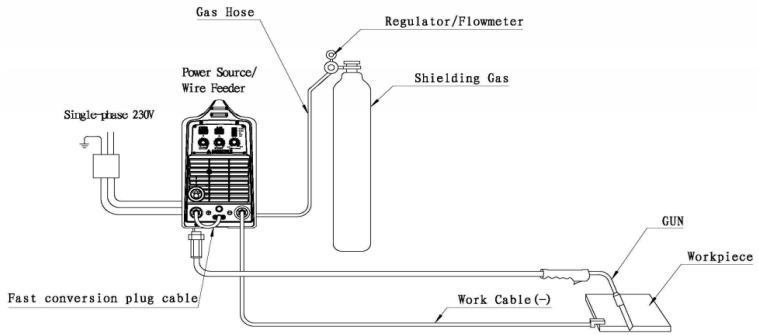



Fig. 4-9-2: Installation - MIG/MAG wire welding with push torch

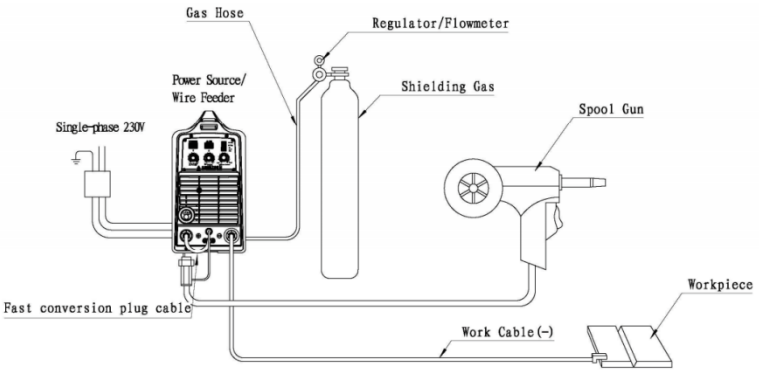



Fig. 4-9-3: Installation - MIG/MAG welding with pull torch

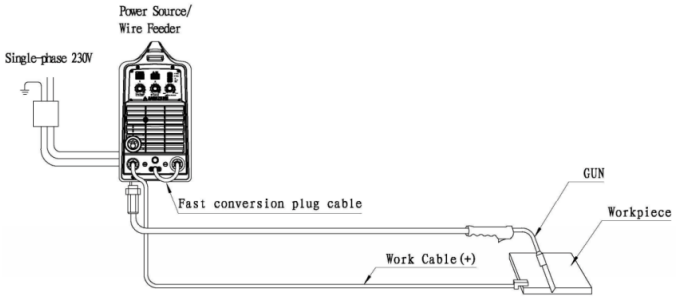


Fig. 4-9-4: Installation – FCAW welding with wire push type torch

Stick welding

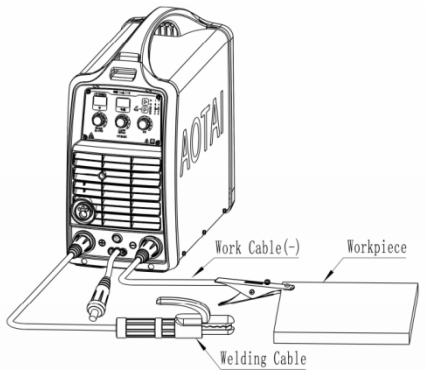



Fig. 4-9-5: Installation – stick welding

Lift TIG welding

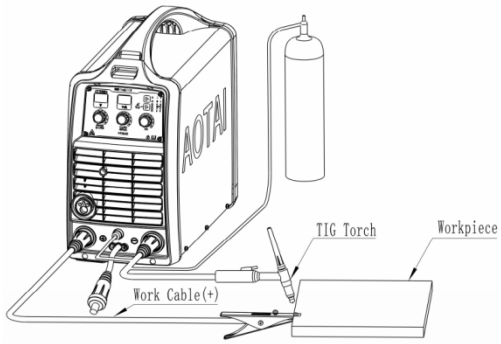


Fig. 4-9-6: Installation-TIG welding

## 4-10 Technical data

**Note!** Please use the machine under the allowed power supply voltage range marked in the nameplate. The technical data with the basic input voltage are listed as the Table 4-10-1.

| Model | | PoWer MIG 210 Pulse |
|---|---|---|
| Rated input voltage/frequency(1 phase) | | AC220/230V±15%, 50/60Hz |
| Rated input power (KVA) | | 11.5 |
| Rated input current (A) | | 42 |
| Range of output current (A) | MIG | 25-210 |
| | STICK | 25-200 |
| | LIFT TIG | 25-210 |
| Range of output voltage (V) | MIG | 15-26 |
| Rated duty cycle (%,@40℃) | | 35 |
| Open circuit voltage (V) | | 63 |

| | |
|---|---|
| Shielding gas | CO2, Ar+CO2, Ar |
| Step | 2-Step/4-Step/Special 4-step |
| Protection class | IP21S |
| Insulation grade | F |
| Cooling way | Air cooled |
| Wire spool diameter (mm) | 200,300 |
| Wire feeding system type | Built-in |
| Dimension (W×D×H) (mm3) | 530×220×440 |
| Weight (Kg) | 17 |

Table 4-10-1: PoWer MIG 210 Pulse technical data

## 4-11 Dimension

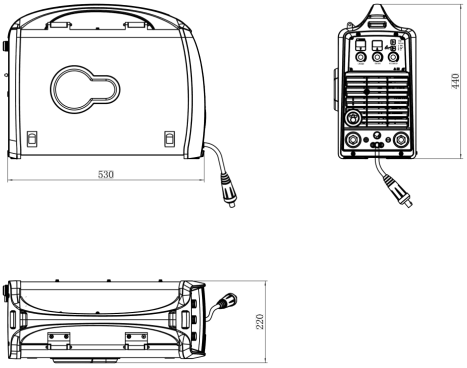
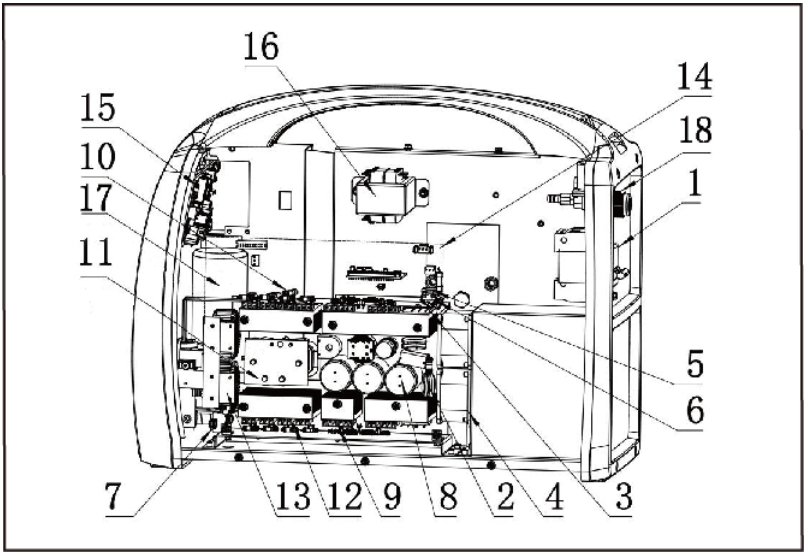



Fig. 4-11-1: Dimension

| NO. | Item | unit |
|---|---|---|
| 1 | length | 530mm |
| 2 | Width | 220mm |
| 3 | Height | 440mm |

Table. 4-11-1: Dimension

## 4-12 Disassembly and reassembly



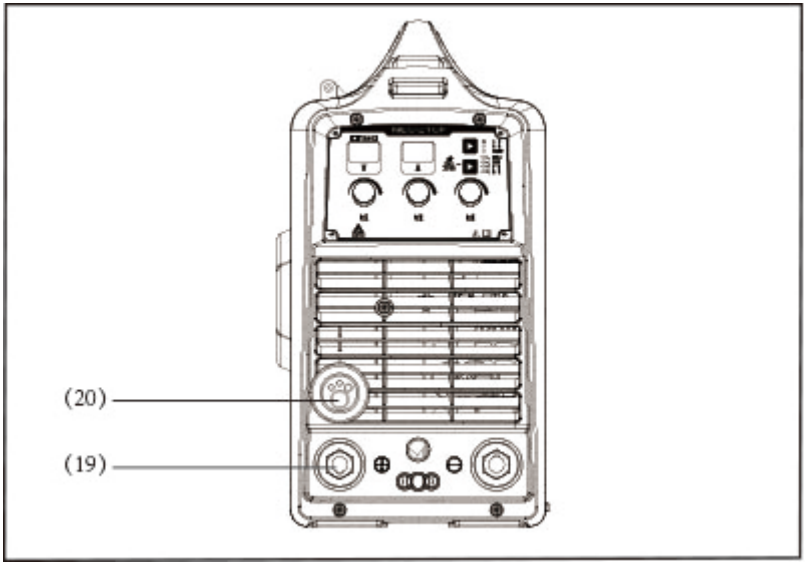



Fig. 4-12-1: PoWer MIG 210 Pulse

| No. | Item | Stock no. | Qty | Remarks |
|---|---|---|---|---|
| 1 | Circuit breaker | 745011-00068 | 1 | |
| 2 | Thermostor | 720022-00013 | 4 | |
| 3 | Rectifier | 735004-00006 | 2 | |
| 4 | Fan | 746002-00049 | 2 | |

| | | | | |
|---|---|---|---|---|
| 5 | Varistor | 720021-00020 | 1 | |
| 6 | Polypropylene capacitor | 722001-00023 | 1 | |
| 7 | Polypropylene capacitor | 722001-00011 | 2 | |
| 8 | Aluminum electrolytic capacitor | 722004-00105 | 3 | |
| 9 | IGBT tube | 735003-00013 | 8 | |
| 10 | Temperature relay | 745008-00032 | 1 | |
| 11 | Main transformer | 763002-00026 | 1 | |
| 12 | Diode | 730001-00007 | 8 | |
| 13 | Output reactor | 763005-00023 | 2 | |
| 14 | Main control drive board | 210580-01256 | 1 | |
| 15 | Display board | 220503-00318 | 1 | |
| 16 | Power transformer | 220179-01025 | 1 | |
| 17 | Wirefeeder | 321017-00037 | 1 | |
| 18 | Quick socket | 740002-00080 | 2 | |
| 19 | Solenoid valve | 752001-00045 | 1 | |
| 20 | European torch connector | 766003-02545 | 1 | |

Table 4-12-1: Main components list

Note: If no special remarks, the input voltage mentioned in above table is one phase.

# 5-TROUBLE SHOOTING

**Warning!** An electric shock can be fatal. Before opening the machine:

-Switch it off and unplug it from the mains

-Unplug machine from the mains

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

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

-Bolts in outer case also work for ground connection. Never use other bolt, which can not work for ground connection.

**Error code**

This series welding machine will be on protected mode if machine has any problem, and display error code. Please refer to below table:

| Error code | Fault | Cause |
|---|---|---|
| E10 | Torch switch failure | 1. The torch switch is damaged<br>2. The torch switch is pressed by mistake for a long time, and the output is no current |

| | | |
|---|---|---|
| | | 3. Circuit failure<br>-Short circuit of torch signal wire<br>-Display control board failure |
| E15 | Abnormal Start | The torch trigger is normal closed when power on |
| E17 | Over current | 1. Welding specification is too large<br>2. Circuit failure<br>-Welder output short circuit<br>-Current sensor failure<br>-Display control board failure |
| E19 | Over heat/fan does not work | 1. Environmental reasons<br>-The ambient temperature is higher than 40 degrees<br>-The air inlet of the welder is too close to the wall<br>-The air inlet of the welder is blocked<br>-The radiator is too dusty and has not been cleaned for a long time<br>2. Reason for use<br>-The use of the welding machine exceeds the rated load rate<br>-Welding specification is greater than rated output<br>3. Circuit failure<br>-Fan failure<br>-Fan control solid state relay failure<br>-Relay signal wire is broken |

| | | |
|---|---|---|
| | | -Temperature relay failure<br><br>-Display control board failure |
| E40 | Communication abnormal | Display board communication circuit failure |

Table 5-1: Error code

Important! If an error code excluded in above table is displayed, please supply the fault phenomenon, error code, together with machine serial no. and machine model to the manufacturer after-service department.

**Machine problem, cause and remedy**

**Note!** The following troubles and causes are uncertain. However, during the normal welding, that might happen.

| No. | TROUBLE | CAUSES | REMEDY |
|---|---|---|---|
| 1 | Power on, LED does not light up, fan does not run, no output when machine switches on | 1) Power switch is damaged<br><br>2) No electricity on the electricity grid<br><br>3) Short circuit in the power supply cable<br><br>4) Input/output cable of power transformer is bad connected or power transformer is damaged<br><br>5) Fuse is damaged | 1) Check power switch and the fan<br><br>2) Check power supply on the the electricity grid<br><br>3) Check the connection of power supply cable<br><br>4) Check input/output cable of power transformer, or replace power transformer<br><br>5) Replace |

| | | | |
|---|---|---|---|
| 2 | Circuit breaker on the switch board or power switch on welding machine trips while in welding | 1) Rated current of circuit breaker on the switch board is too small<br>2) The following devices may be damaged: input rectifier bridge, electrolytic capacitor, IGBT | 1) Change workplace, use proper switch board<br>2) Check and replace |
| 3 | Welding current/voltage is not adjustable | 1) -Poor input (see No. 1)<br>2) -Poor contact of output cable<br>3) -Welding gun is folded and bent excessively<br>4) -Wrong welding specification<br>5) -There are oil stains, impurities or paint coating on the surface of the base material<br>6) -Display control board is damaged<br>7) -Current sensor is damaged | 1) Replace<br>2) Replace<br>3) Connect well |
| 4 | No response from the welding machine after pressing the torch switch | 1) -Torch trigger is damaged<br>2) -Display board is damaged | Replace |
| 5 | Welding parameters are not adjustable | 1) -Display board components are damaged<br>2) -Poor contact at various connections | 1) Replace<br>2) Repair or replace |
| 6 | No display on panel | 1) -The power transformer is broken<br>2) -Display board is damaged | Check and replace |
| 7 | Fan not run | 1) -The fan is damaged<br>2) -The power supply harness of the fan is not touching<br>3) -The power transformer is damaged<br>4) -Damaged insurance tube | Check and replace |

| | | | |
|---|---|---|---|
| 8 | Abnormal gas protection | 1) -Incorrect adjustment of gas flow<br>2) -The remaining amount of gas is insufficient<br>3) -Air leak in trachea<br>4) -The gas regulator is damaged<br>5) -The solenoid valve is damaged<br>6) -Display control board is damaged | Check and replace |

Table 5-2: Trouble shooting

# 6-CARE AND MAINTENANCE

- **Before open the machine**

**Warning!** An electric shock can be fatal. Before opening 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 back on again

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

-Bolts in outer case also work for ground connection. Never use other bolt that can not work for ground connection

- **Maintenance of welding power source**

Please follow the instructions as below to ensure normal use 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

- **Daily maintenance**

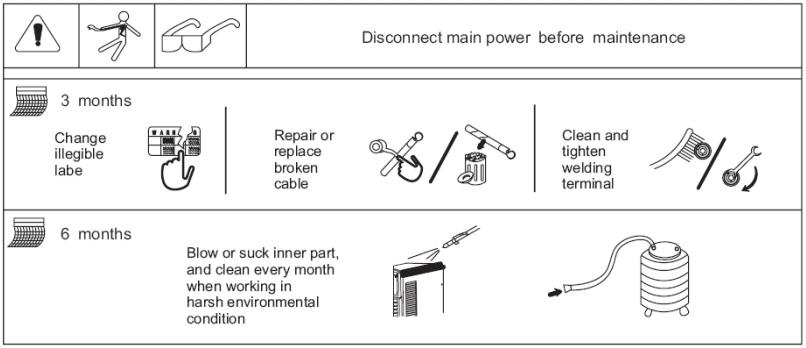
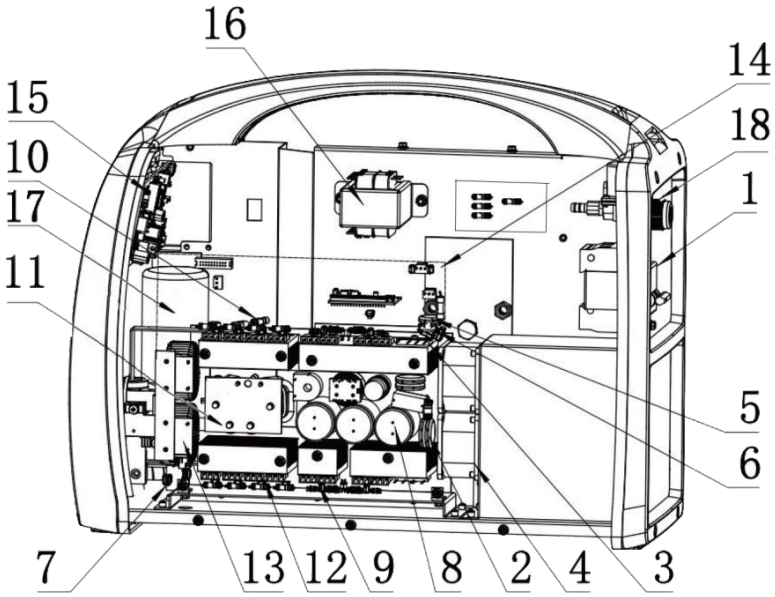
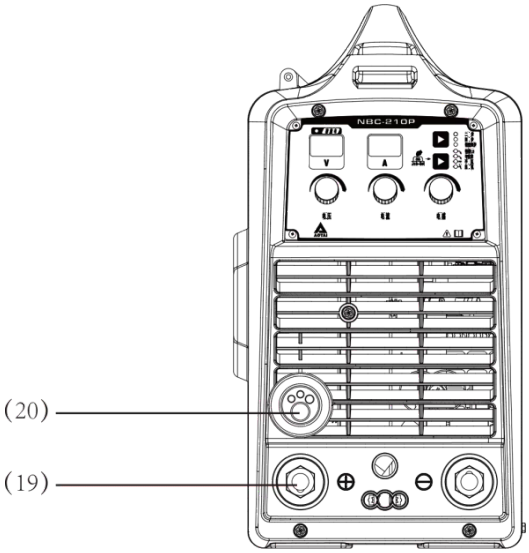



Fig. 6-1: Daily maintenance




| No. | Item | Stock no. | Qty | SAP KODU |
|---|---|---|---|---|
| 1 | Circuit breaker | 745011-00068 | 1 | 6064100259 |
| 2 | Thermostor | 720022-00013 | 4 | |
| 3 | Rectifier | 735004-00006 | 2 | 6064100393 |
| 4 | Fan | 746002-00049 | 2 | 6064100500 |
| 5 | Varistor | 720021-00020 | 1 | 6064100351 |
| 6 | Polypropylene capacitor | 722001-00023 | 1 | 6064100353 |
| 7 | Polypropylene capacitor | 722001-00011 | 2 | |
| 8 | Aluminum electrolytic capacitor | 722004-00105 | 3 | 6064100355 |
| 9 | IGBT tube | 735003-00013 | 8 | 6064200439 |
| 10 | Temperature relay | 745008-00032 | 1 | 6064100501 |
| 11 | Main transformer | 763002-00026 | 1 | 6064100358 |

| | | | | |
|---|---|---|---|---|
| 12 | Diode | 730001-00007 | 8 | 6064100359 |
| 13 | Output reactor | 763005-00023 | 2 | 6064100360 |
| 14 | Main control drive board | 210580-01451 | 1 | |
| 15 | Display board | 220503-00318 | 1 | 6064000403 |
| 16 | Power transformer | 220179-01025 | 1 | 6064100503 |
| 17 | Wire feeder | 321017-00037 | 1 | |
| 18 | Quick socket | 740002-00080 | 2 | 6064200217 |
| 19 | Solenoid valve | 752001-00045 | 1 | 6064100487 |
| 20 | European torch connector | 766003-02545 | 1 | 6064200495 |
| 21 | Filter board | 220900-00473 | 1 | 6064000404 |

**Manufacturer**

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