

# PoWer MIG 500 / 630



# GeKaMac®



## PoWer MIG 500 / 630

### Users Manual

Please Read and Understand This Manual  
Before Operating The Welding Machine

[www.gedikwelding.com](http://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.

	<b>Idle Mode</b>
<b>MMA</b>	<b>X</b>
<b>MIG</b>	√
<b>TIG</b>	√
<b>Plazma</b>	√
<b>SAW</b>	<b>Out of Scope</b>

**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.**

## **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:

- MIG 500-630

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.

**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 İSTANBUL TÜRKİYE

**Ürün / Product**

ARC WELDING MACHINE

**Marka-Model / Brand- Model**

POWER MIG 500

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 standards used and references to the other technical specifications in relation to which conformity is declared.

EN IEC 60974-1:2018+A1:2019

EN IEC 60974-10:2021

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



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## Safety Rules


Danger!		“ <b>Danger</b> ” indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
Warning!		“ <b>Warning!</b> ” 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!		“ <b>Caution</b> ” indicates a possible hazardous situation which, if not avoided, may result in slight or moderate injury.
Note!		“ <b>Note!</b> ” indicates a situation which implies a risk of impaired welding result and damage to the equipment.
Important!		“ <b>Important!</b> ” indicates practical tips and other useful special-message. It is no signal word for a harmful or dangerous situation.
Utilisation for intended purpose only		<ul style="list-style-type: none"> <li>•The machine may only be used for jobs as defined by the “Intended purpose” .</li> <li>•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.</li> </ul>
Safety signs		<ul style="list-style-type: none"> <li>•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.</li> </ul>
Safety inspection		<ul style="list-style-type: none"> <li>•The owner/operator is obliged to perform safety inspection at regular intervals.</li> </ul>


		<ul style="list-style-type: none"> <li>•The manufacturer also recommends every 3–6 months for regular maintenance of power sources.</li> </ul>
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).
		Equipment with CCC markings meets the requirements of implementations rules for China compulsory certification.
Electric shock can kill		<ul style="list-style-type: none"> <li>•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.</li> <li>•Do not touch live electrical parts of the welding circuit, electrodes and wires with your bare skin or wet clothing.</li> <li>•The operator must wear dry hole-free insulating welding gloves and body protection while performs the welding.</li> <li>•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.</li> <li>•Connect the primary input cable according to rules. Disconnect input power or stop machine before installing or maintenance.</li> </ul>





		<ul style="list-style-type: none"> <li>• 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.</li> <li>• Maintain the electrode holder, ground clamp, welding cable and welding machine in good, safe operating condition. Replace damaged part immediately.</li> </ul>
<p><b>Electric and magnetic fields (EMF) may be dangerous</b></p>		<ul style="list-style-type: none"> <li>• 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: <ul style="list-style-type: none"> <li>- minas, signal and data-transmission leads</li> <li>- IT and telecoms equipment</li> <li>- measurement and calibration devices</li> <li>- Wearers of pacemakers</li> </ul> </li> <li>• Measures for minimizing or preventing EMC problems: <ul style="list-style-type: none"> <li>- Mains supply</li> </ul> <p>If electromagnetic interference still occurs, despite the fact that the mains connection in accordance with the regulations, take additional measures</p> <ul style="list-style-type: none"> <li>- Welding cables</li> </ul> <p>Keep these as short as possible</p> <p>Connect the work cable to the work piece as close as possible to the area being welded.</p> </li> </ul>




		<p>Lay tem well away from other cables.</p> <p>Do not place your body between your electrode and work cables.</p> <ul style="list-style-type: none"> <li>- Equipotential bonding</li> <li>- Workpiece grounding (earthing)</li> <li>- Shielding</li> </ul> <p>Shield the entire welding equipment and other equipment nearby.</p>
<p><b>ARC rays can burn.</b></p>		<ul style="list-style-type: none"> <li>• Visible and invisible rays can burn eyes and skin.</li> <li>• 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.</li> <li>• 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.</li> </ul>
<p><b>Fumes and gases can be dangerous</b></p>		<ul style="list-style-type: none"> <li>• Welding may produce fumes and gases, breathing these fumes and gases can be hazardous to your health.</li> <li>• 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.</li> <li>• Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator.</li> <li>• Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Always use enough ventilation,</li> </ul>

		<p>especially in confined areas, to insure breathing air is safe.</p>
<p><b>Welding and cutting sparks can cause fire or explosion.</b></p>		<ul style="list-style-type: none"> <li>•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.</li> <li>•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.</li> <li>•When pressure gas is used at the work site, special precautions are required to prevent hazardous situations.</li> <li>•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.</li> <li>•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.</li> <li>•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).</li> <li>•Protect yourself and others from flying sparks and hot metal. Remove any combustibles from</li> </ul>

		<p>operator before perform any welding.</p> <ul style="list-style-type: none"> <li>•Keep a fire extinguisher readily available.</li> <li>•Empty containers, tanks, drums, or pipes which have combustibles before perform welding.</li> <li>•Remove stick electrode from electrode holder or cut off welding wire at contact tip when not in use.</li> <li>•Apply correct fuses or circuit breakers. Do not oversize or bypass them.</li> </ul>
<p><b>Cylinder can explode if damaged.</b></p>		<ul style="list-style-type: none"> <li>•Pressure gas cylinders contain gas under highpressure. If damaged, a cylinder can explode. Sincegas cylinders are normally part of the welding process, be sure to treat them carefully.</li> <li>•Cylinders should be located away from areas where they may be struck or subjected to physical damage. Use proper equipment, procedures, and sufficient numberof persons to lift and move cylinders.</li> <li>•Always install cylinders in an upright position by securing to a stationarysupport or cylinder rack to prevent falling over or tipping.</li> <li>•Keep a safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.</li> <li>•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.</li> <li>•Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the process used; maintain themand associated parts in good condition.</li> <li>•Use only compressed gas cylinders containing</li> </ul>

		<p>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.</p> <ul style="list-style-type: none"> <li>•Open the cylinder valve slowly and keep your head and face away from the cylinder valve outlet.</li> <li>•Valve protection caps should be kept in place over valve expect when the cylinder is in use or connected for use.</li> </ul>
<b>Hot parts can burn</b>		<ul style="list-style-type: none"> <li>•Do not touch hot parts with bare hand or skin.</li> <li>•Ensure equipment is cooled down before perform any work.</li> <li>•If touching hot parts is needed, use proper tools and/orwear heavy, insulated welding gloves andclothing to prevent burns.</li> </ul>
<b>Flying metal or dirt can injure eyes</b>		<ul style="list-style-type: none"> <li>•When welding, chipping, wire brushing, and grinding can cause sparks and flying metal. It can hurt your eyes.</li> <li>•Remember wear appropriate safety glasses with sideshields when in welding zone, even under your welding helmet.</li> </ul>
<b>Noise can damage hearing</b>		<ul style="list-style-type: none"> <li>•Noise from some processes or equipment candamage hearing.</li> <li>•Remember wear approved ear protection to protect ears if noise level ishigh.</li> </ul>
<b>Moving parts can injure</b>		<ul style="list-style-type: none"> <li>•Stay away from moving parts such as fans.</li> <li>•Stay away from pinch points such as driverolls.</li> <li>•Keep all doors, panels, covers, and guardsclosed and securely in place.</li> <li>•Have only qualified persons remove doors,</li> </ul>

		<p>panels, covers, orguards for servicing and maintenance.</p> <ul style="list-style-type: none"> <li>• Reinstall doors, panels, covers, or guards when servicing and maintenance is finished and before reconnecting input power.</li> </ul>
<p><b>Overuse can cause overheating</b></p>		<ul style="list-style-type: none"> <li>• Use machine follow duty cycle. Reduce current or reduce duty cycle before starting to weld again.</li> <li>• Allow cooling period.</li> <li>• Do not block or filter airflow to unit.</li> </ul>

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## **1-GENERAL REMARKS**

### **1-1 Power source features**

This series of welding machines apply IGBT soft switch inverter technology; the power source enjoys highly stable welding voltage against the voltage fluctuation of power grid and arc length change. The internal control system achieves precise control of welding process to ensure optimal welding results.

#### **Features and benefits:**

- Enjoy reasonable static characteristic and sound dynamic characteristic
- Less spatter due to the advanced waveform control technology
- Continuous adjustment of welding current and voltage with wide range
- 2 step / 4 step
- Perfect functions of starting arc and reducing melting ball while stopping arc
- Multiple security functions
- Stable wire feeding due to the highly stable power supply from wire feeding circuit
- Light weight, small size, ideal for portable applications
- Capable of operation with extended 50 meters long welding cable

## 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:

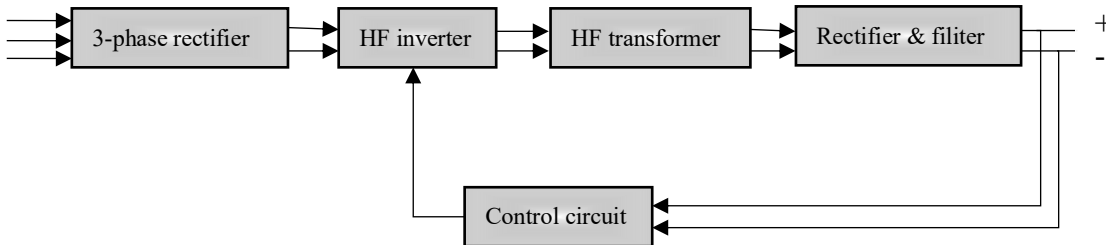


Fig. 1-2-1: Schematic diagram

## 1-3 Output characteristics

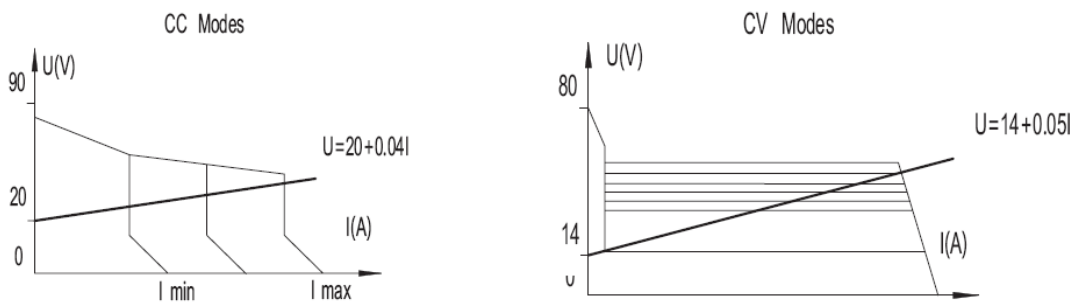


Fig. 1-3-1: Output characteristics

## 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 unit and void warranty.

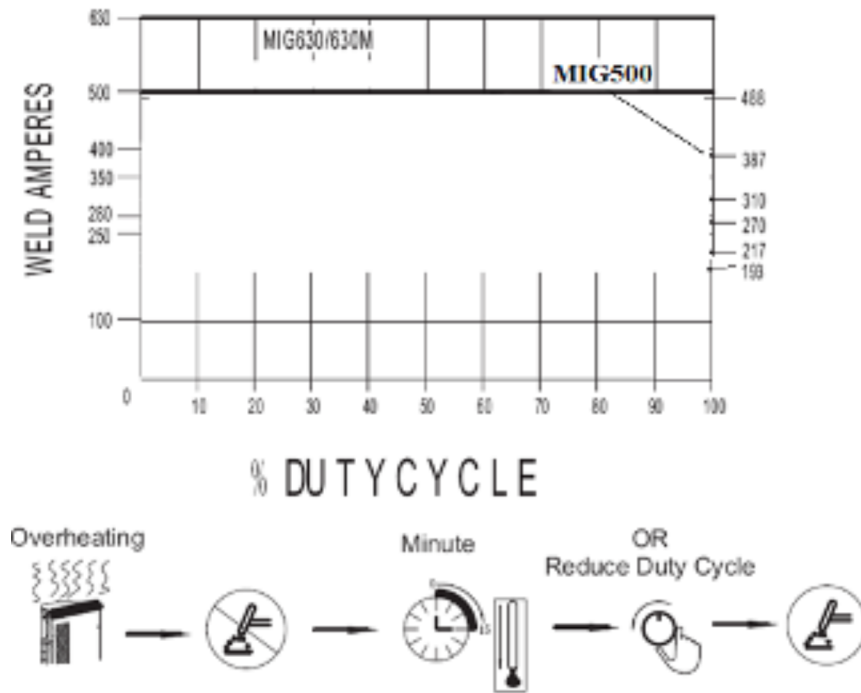


Fig.1-4-1: Duty cycle

## 1-5 Applications

The MIG power source can be used with solid and flux-cored welding wires for welding carbon steel, alloy steel, etc. The power source is designed for following recommended areas:

- Automobile and components supply industry
- Chemical plant construction
- Boiler and pressure vessel
- Shipyards
- Power plant construction
- Vehicle manufacturing
- Machinery industry
- Others

## 1-6 Warning label

The warning label is affixed onto the top of the power source.

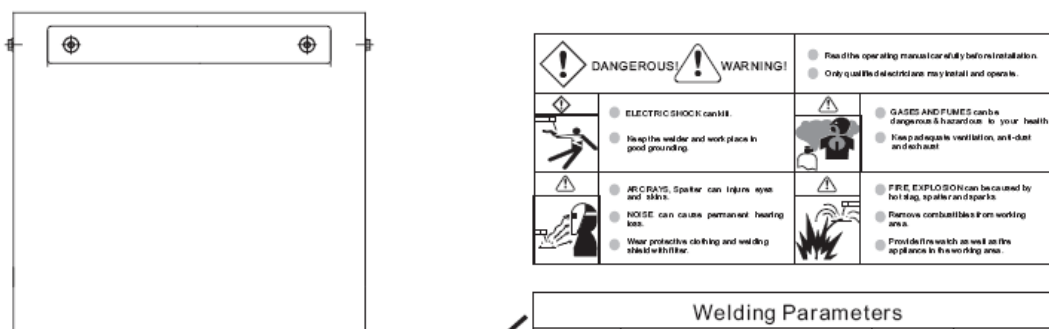




Fig. 1-6-1: Warning label

## **2-VERSIONS BRIEFS**

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

### **■ MIG 500/630**

MIG 630 are designed in accordance with the industrial standards. The welding current and voltage can be adjusted separately. The rated welding current degree is 630A for this series.

### 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

This power source may only be used for CO<sub>2</sub>/MAG, FCAW, Gouging. 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 Machine installation rules

According to test, protection degree of this power source is 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.



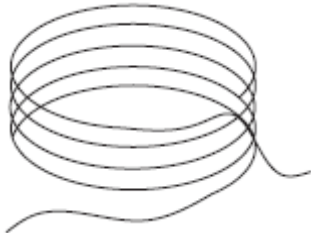
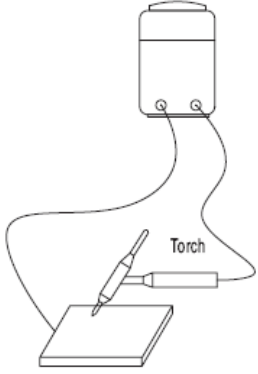
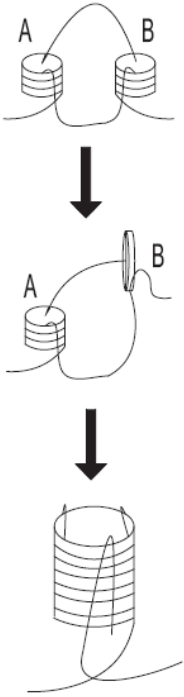
**Note!** Inadequately dimensioned electrical installations can lead to serious damage. The mains lead, and its

fuse protection, must be dimensioned in accordance with the local power supply. The technical data shown on the rating plate 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.

	<p style="text-align: center;"><b>Wrong</b></p> <p>Coil the excess ground cable and welding cable in same direction respectively.</p>
	<p style="text-align: center;"><b>Correct</b></p> <p>Straighten the ground cable and welding cable and make them close to each other.</p> <p>Bundle the ground cable and welding cable together, running the wires close to the ground.</p>
	<p style="text-align: center;"><b>Correct</b></p> <p>When the excess cables are only be used by rolling up, coil the cables to two widings in reverse direction and overlap them.</p> <p>The number of turns for A is same as the number of turns for B.</p> <p>Handle the welding cable and ground cable according to the above-mentioned method.</p>

## 4-MIG 500/ 630

Fig. 3-4-1: Welding cables instruction

### 4-1 System components

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

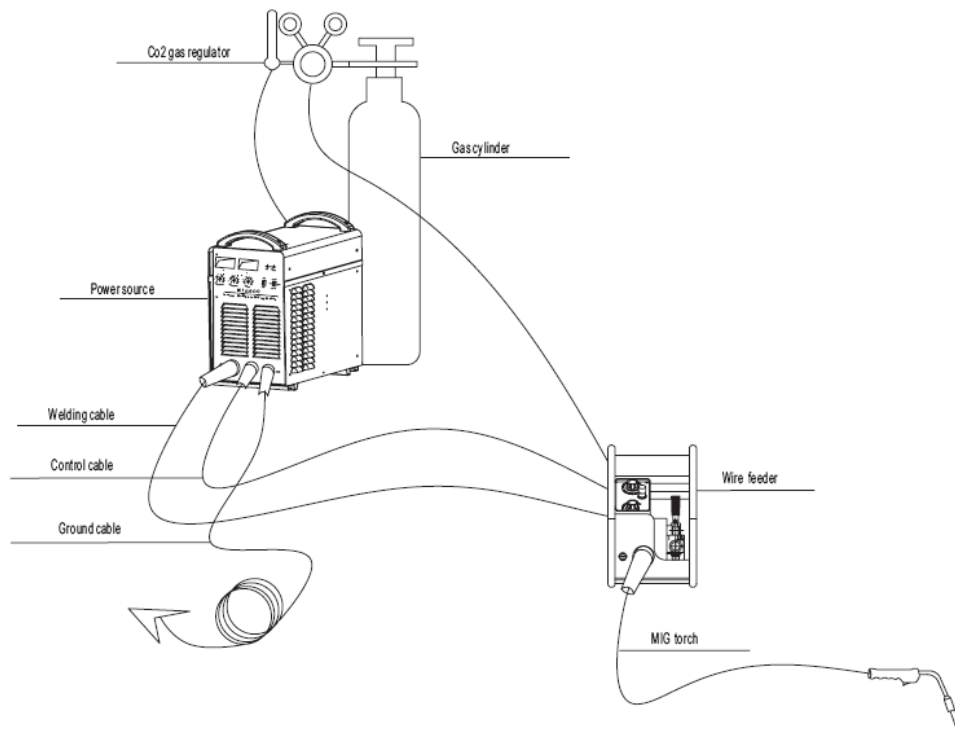


Fig. 4-1-1: System components

### 4-2 Basic equipment for welding

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

#### MIG/MAG welding

- Power source
- Ground cable
- MIG/MAG welding torch
- Gas gas regulator, gas cylinder (to supply the machine with shielding gas)
- Wire feeder
- Welding cable
- Control cable
- Welding wire

### 4-3 Control panel

The control panel is easy to operate. Operators can select various processes by control switch and adjust welding parameters by potentiometer.

**Notes!** 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 slightly different from the actual controls on your machine. However, these controls function are in exactly the same way.

**Important!** On the “MIG series” control panel, only the MIG/MAG welding process is available. The following processes and functions are not available:

- STICK
- TIG
- GOUGING
- FCAW

#### ● Front panel

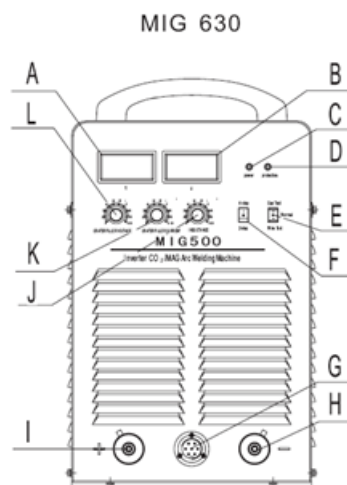


Fig. 4-3-1: Front panel

#### A、Welding voltage displayer

When in standby, display preset voltage value: 14-50

When press torch switch or on wire test mode, display open load voltage  $50\sim 80V \pm 10\%$  (open circuit voltage varies with different ampere rating)

During welding, display actual voltage value

When disconnected from control cable of wire feeder, displayed value will be higher: 70-90;

#### B、Welding current displayer

When in standby, display preset current value: 3-100

During welding, display actual current value

When disconnected from control cable of wire feeder, displayed value will be higher: 150-180

#### C、Power indicator

Indicate whether the welding machine is power on or not.

#### D、Protection indicator

During normal welding, the indicator is off;

Indicator lights up and machine will automatically stop working if the power source overheats. Do not cut off the power supply if machine come into overheat protection mode. Keep the fan running until the machine inner temperature recovers to normal and the overheat protection indicator is off, and then start welding after 20 minutes later.

#### E、Status selection switch

**Gas test:** when in “GAS TEST” status, the solenoid valve will open, and you can check the gas circuit and alter CO<sub>2</sub> gas flow rate at the pressure regulator;.

**Wire test:** when in “WIRE TEST” status, the function is the same as pressing the torch switch; you can check the wire feeding and gas feeding; at this time, welding machine outputs open load voltage, arc will start when wire contacts with workpiece.

**Normal:** Can start the normal welding.

#### F、Torch trigger switch (2T/4T)

##### **2 - STEP**

It is mainly used for spot welding or short seam welding.

## 4 - STEP

This mode is mainly used for long seam welding and process that needs crater filling welding.

### Symbols

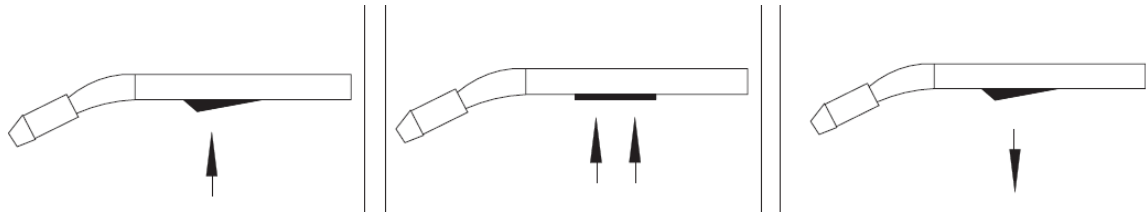


Fig. 4-3-2: Press torch switch      Fig. 4-3-3: Hold torch switch      Fig. 4-3-4: Release torch switch

**P03.....Pre-gas time**(this parameter is not adjustable)

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

**P06.....Crater-filling:**Prevent burn-through caused by too much heat at the welding ends.

**P04.....Post-gas time** (this parameter is not adjustable)

**P01.....Burn-back time**(this parameter is not adjustable)

### ●2-step mode

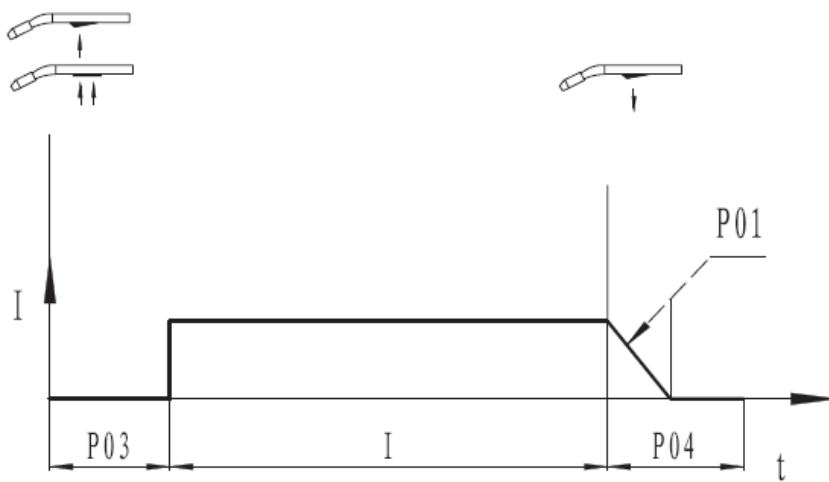


Fig. 4-3-5: 2-step mode

### ●4-step mode

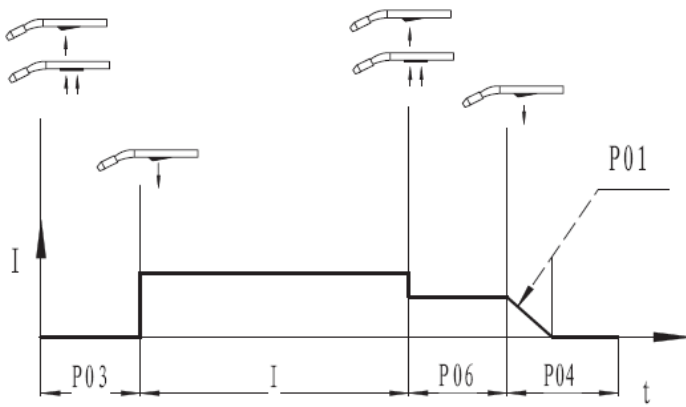


Fig. 4-3-6: 4-step mode

G、 Wire feeder control socket

Connect with control cable of wire feeder.

H、 Negative welding terminal (-)

Connect with work piece via ground cable.

I、 Positive welding terminal (+)

Connect with the wire feeder welding cable.

J、 Inductance control knob

To change the welding stability, penetration and spatter.

When inductance is decreased, there will be stiff and stable arc, smaller penetration and more spatter;

When inductance is increased, there will be soft arc, bigger penetration, less spatter.

K、 Crater-filler current control knob

In 4-step mode, it is used to preset the crater filler current.

**Important!** The digital meter does not display the crater-filling current value when presetting. When in crater filler status, it will display the real crater filler current value.

L、 Crater-filler voltage control knob

In 4-step mode, it is used to preset the crater filler voltage.

**Important!** The digital meter does not display the crater filler voltage value when presetting. When in crater



filler status, it will display the real crater filler voltage value.

- Rear Panel

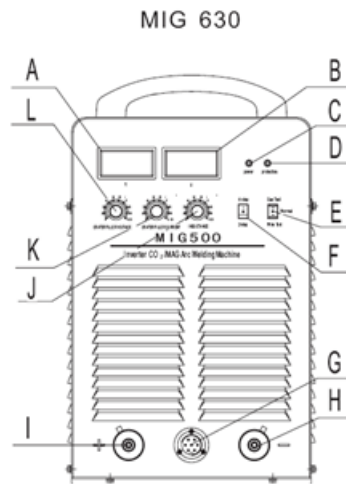



Fig. 4-3-7: Rear panel

M、 Fan cover


N、 Power supply socket for gas heater

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

 **Note!** The voltage degree of gas regulator must match with the voltage supplied by the gas heater socket.

O、 Nameplate

P、 Automatic circuit breaker

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

Q、 Junction box

It is used to connect with the power supply cable.

## R、Earthing bolt

It is used to connect with the ground cable.



**Warning!** To ensure the operator's safety and welding machine's normal use, please make sure the ground wire in power supply cable is firmly grounded, or make sure the earthing bolt is firmly connected to earth.

## S、Power supply cable

### 4-4 Connections

Wire feeder control socket	Socket Pin	Description
	1	Connect with wire feeder motor
	2	+24V connect to solenoid valve
	3	Torch switch
	4	Current/ Voltage preset signal
	5	Switch/ Given signal GND
	6	Common GND for motor and solenoid valve
	7	Welding arc voltage feedback cable (+)
	AC36V (standard)	
	AC110V(optional)	
	AC220V(optional)	

Table 4-4-1: Connections

### Output socket

The output socket of this power source has two types: one is fast plug-in type, another one is compression type. Make sure the plug match your power source socket.

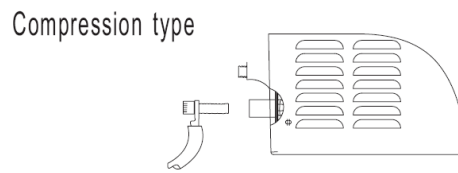
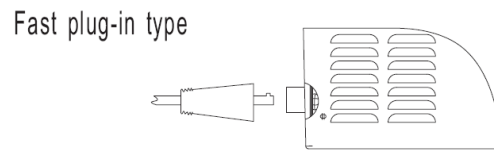


Fig. 4-4-2: Output socket

## 4-5 Wire feeder

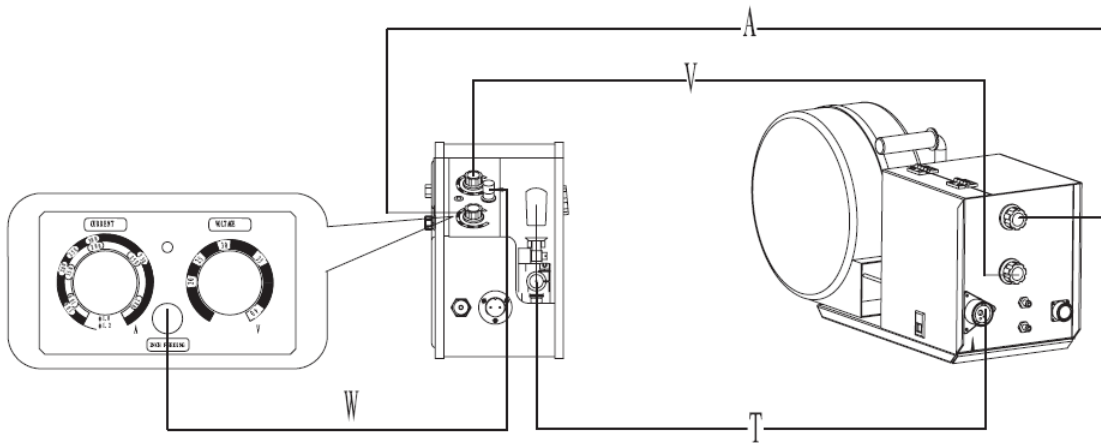


Fig. 4-5-1: Wire feeder

### T、 Torch connector

The photo above is European type. And this connector can be American or Panasonic type according to customer requirement.

### U、 Welding current control knob

When standby, it is used to preset wire feeding speed (0-100). During welding, it is used to adjust the actual welding current.

### V、 Welding voltage control knob

When standby, it is used to preset welding voltage (V). During welding, it is used to adjust the actual

welding voltage.

#### W、 Inch feeding button


Press this button, welding wire will quickly be fed in. When changing the welding wire, it is very time saving for wire feeding.

### 4-6 Water cooling system

There are two types of water cooling systems:

**Integrated type:** The welding power source and water cooling system is integrated type, the cooling unit is powered by the power source. As soon as the mains switch of power source is switched to the ON position, the cooling unit will be ready for use.

**Separated type:** The water cooling system is an independent unit, whose power supply is not the welding power source, but another device.

 **Note!** Before starting up the cooling unit, check the level and purity of coolant. When the temperature is very low, please take necessary anti-freeze measurements to avoid any broken.

The water cooling system interfaces are described as Fig. 4-6-1.

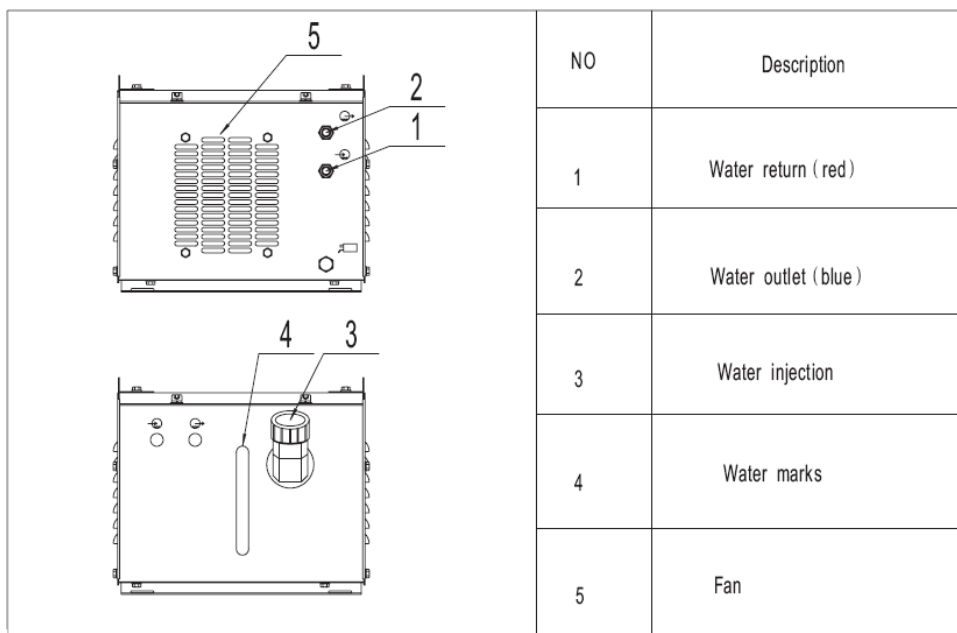


Fig. 4-6-1: Water cooling system connection

## 4-7 Installation and operation



**Warning!** An electric shock can be fatal. If the machine is plugged into the mains electricity 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.

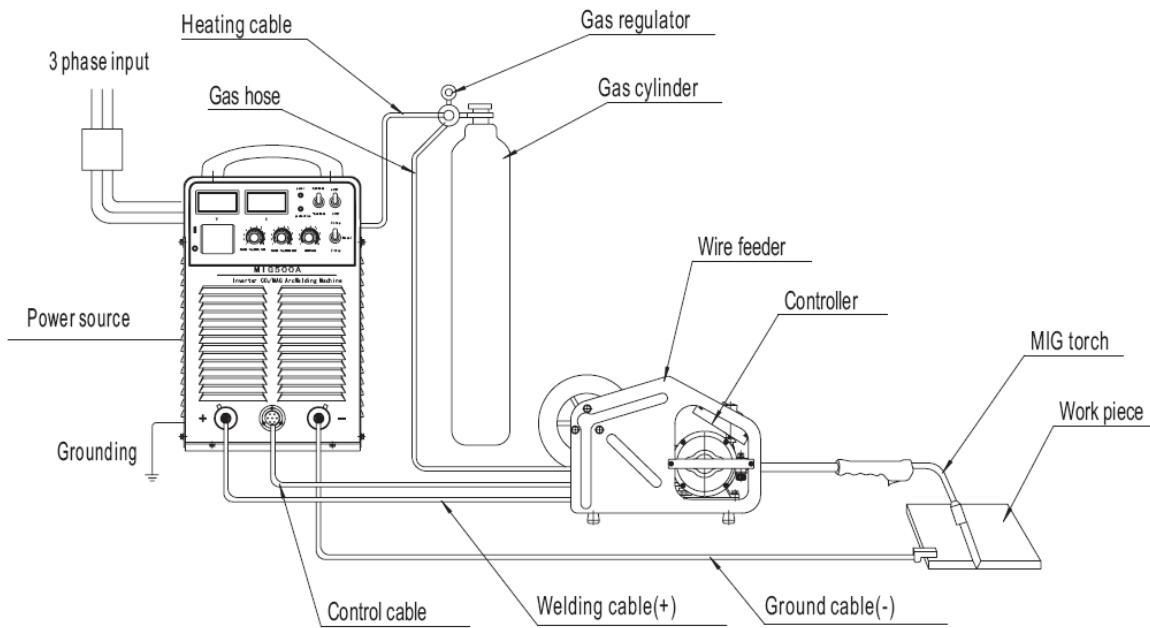


Fig. 4-7-1: Installation

### ● Input power supply cable installation

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

Model		630
Power supply		3 phase, AC380V/±10%, 50/60Hz
Min. power (KVA)	Power network	54
	Generator	70
Input protection (A)	Fuse	60
	Circuit breaker	100
Cable size (mm <sup>2</sup> )	Input cable	≥10
	Output cable	95
	Protective GND wire	≥10

Table 4-7-1:

#### Input power supply cable installation-single voltage

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

The connection between input power supply cable and switch box (Fig. 4-7-2 and Fig. 4-7-3).



**Warning!**

- Never connecting when equipment is power on!
- The connection must be carried out by a qualified electrician!
- Do not connect two units of power source to a circuit breaker!
- Connected to the correct input voltage, circuit breaker, input cable as per the specification on table 4-7-1~4-7-2.

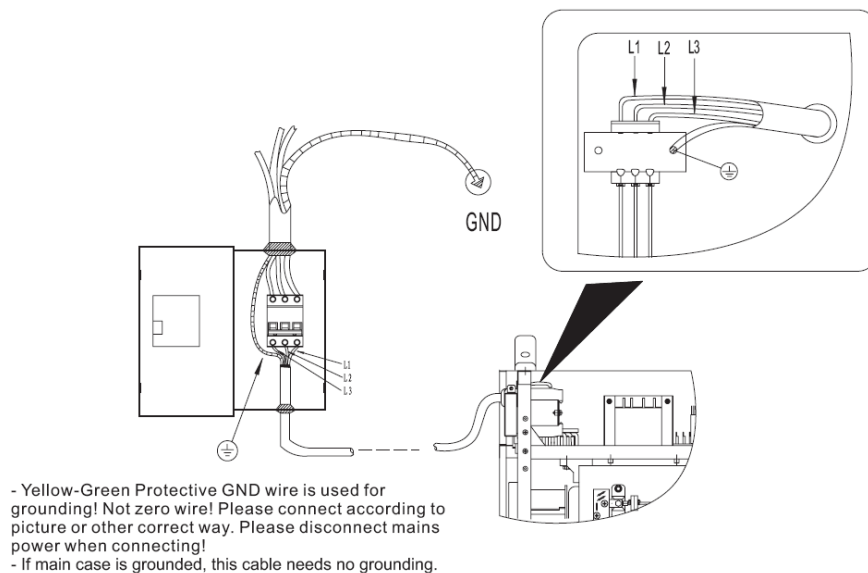


Fig. 4-7-2: Connection between input power supply cable and switch box

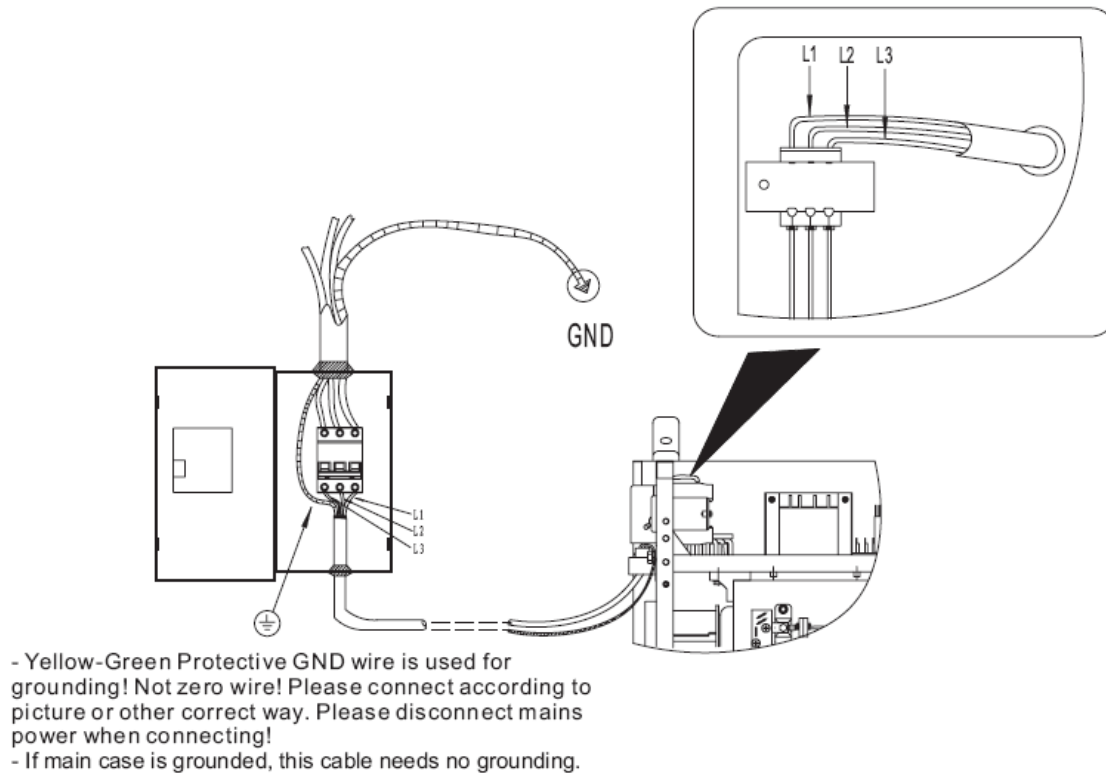


Fig. 4-7-3: Connection between input power supply cable and switch box (MIG 630)

● **Shielding gas regulator installation**

1. Take the protective cap off the gas cylinder;
2. Gently turn the gas-cylinder valve anticlockwise to open it, and blow off any dust and dirt;
3. Install the gas regulator and screw up;
4. If pure CO<sub>2</sub> is chosen as the shielding gas, you should connect the CO<sub>2</sub> gas regulator's heating cable to the gas heating socket on rear panel of power source.

● **Connection of work piece and ground cable**

1. Plug the ground cable into the negative welding terminal (-) and turn it to fasten it;
2. Connect the other end of the ground cable with the work piece.

- **Wire feeder cable connection**

1. Connect the wire feeder control cable with the power source control socket (G);
2. Connect the wirefeeder welding cable plug with the power source positive welding terminal socket (I);
3. Connect the wire feeder gas hose with the gas outlet of the gas pressure regulator.

- **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.

### Installation of steel wire hose

Choose suitable steel wire hose for the torch type, cut off suitable length and then insert into the torch.

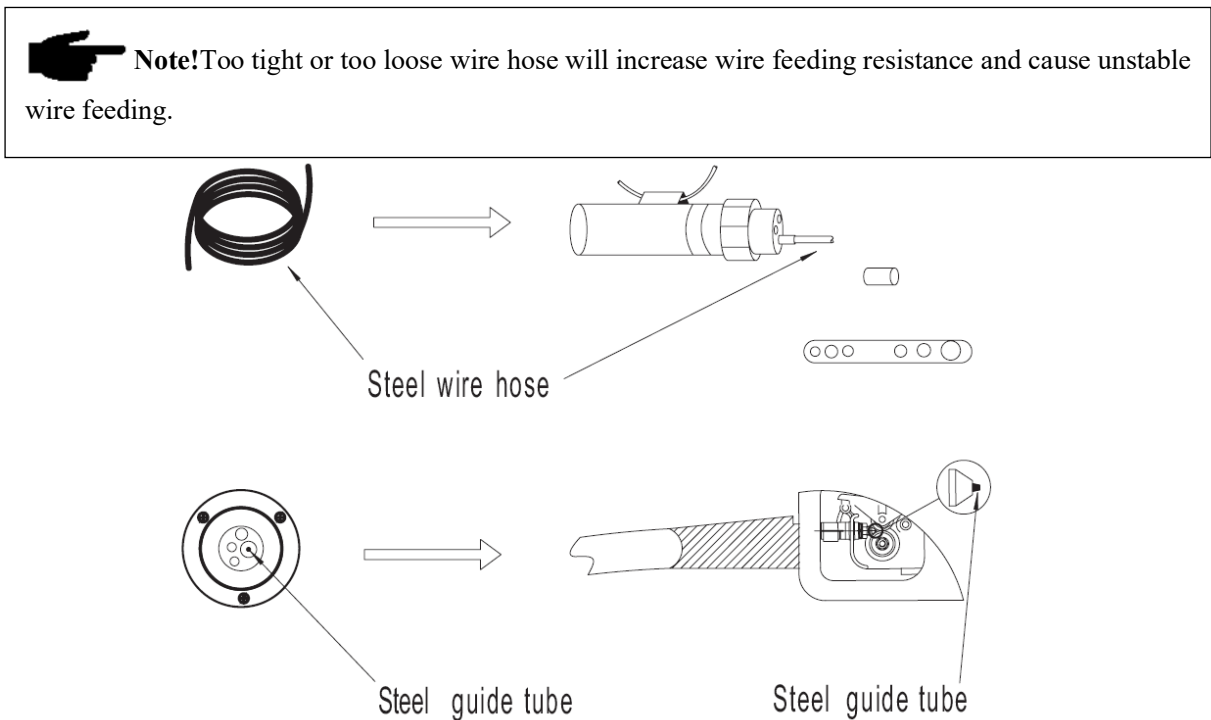
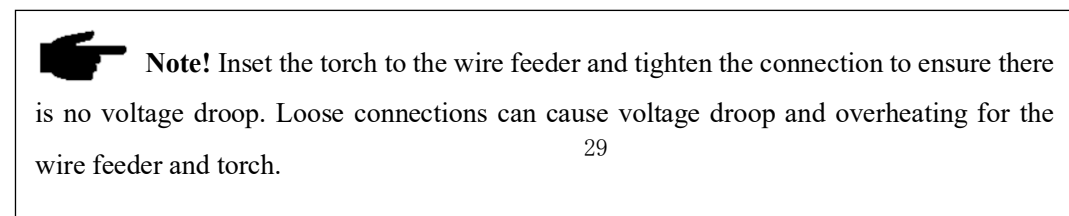


Fig. 4-7-4: Installation of steel wire hose

### Mounting the welding torch to wire feeder

1. Switch the main switch to the OFF position;
2. Check whether the torch is well matched. Inset the torch to the wire feeder's torch connector (T);
3. Tighten the swivel nut to fix the torch in place;
4. When water cooling machine and water-cooled torch are used, insert the torch water flow and return port to the water cooling system. (Red to red, blue to blue)





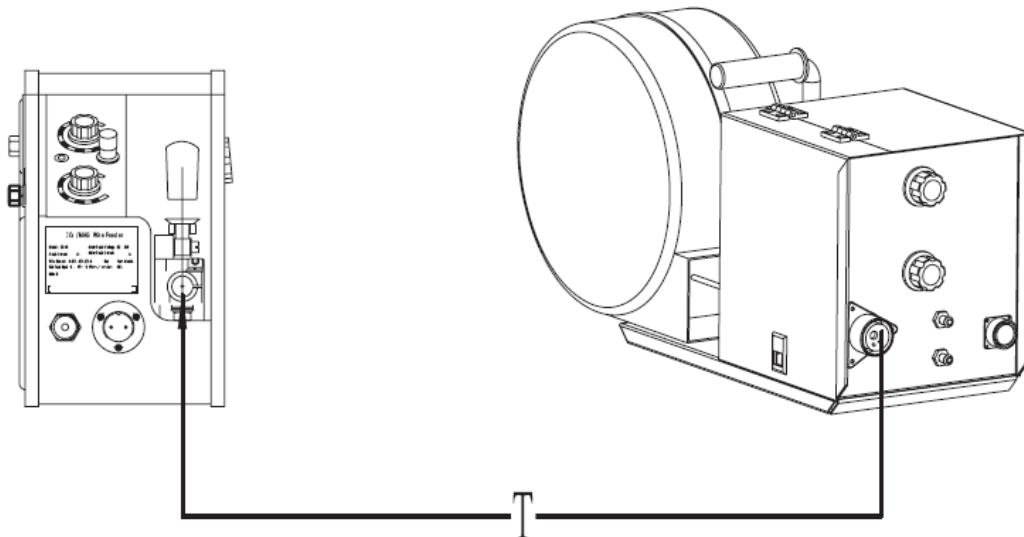


Fig. 4-7-5: Torch connector

● **Installation of wire feeding rollers**

The MIG series welding machine can work with different types of wire feeders. When welding wires of different materials and diameters are used, different types of wire feeding rollers need to be chosen.

● **Types of wire feeder rollers:**

- **Type 1** for hard wire, such as solid carbon steel wire, stainless steel wire.
- **Type 2** for soft wire, such as Aluminum wire and AL alloys wire, copper wire and copper alloy wire.
- **Type 3** for flux cored wire.

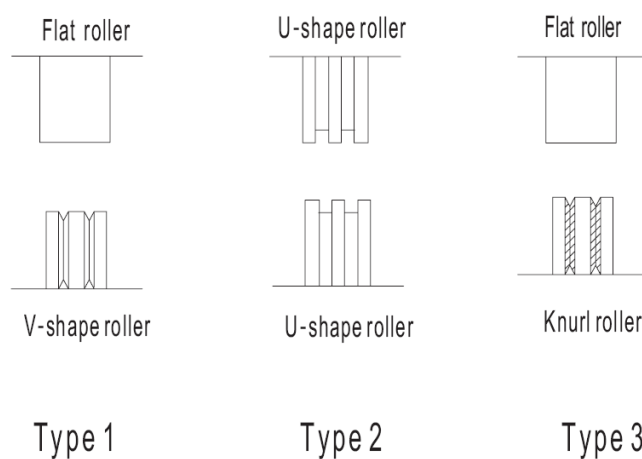


Fig. 4-7-6: Types of wire feeder roller

● **Type of wire feeders**

Type I---Close type double drive wire feeder (Fig. 4-7-7)

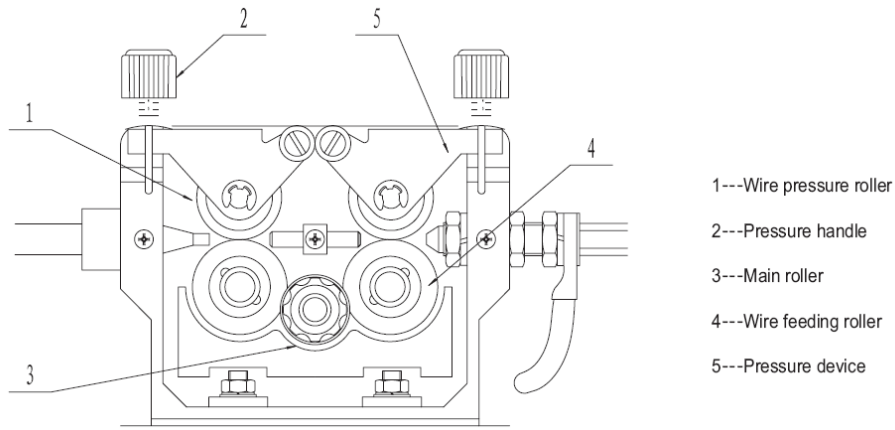


Fig. 4-7-7: Close type double drive wire feeder

1. Put the power switch on “OFF” position;
2. Open the side panel of wire feeder;
3. Push down the pressure handle;
4. Lift up the pressure device;
5. With screw driver to take off the screw that fix the wire pressure roller or wire feeding roller;
6. Replace suitable wire pressure roller or wire feeding roller;
7. Tighten the screw to fasten the wire pressure roller or wire feeding roller.

Type II--- Open type double drive wire feeder (Fig. 4-7-9)

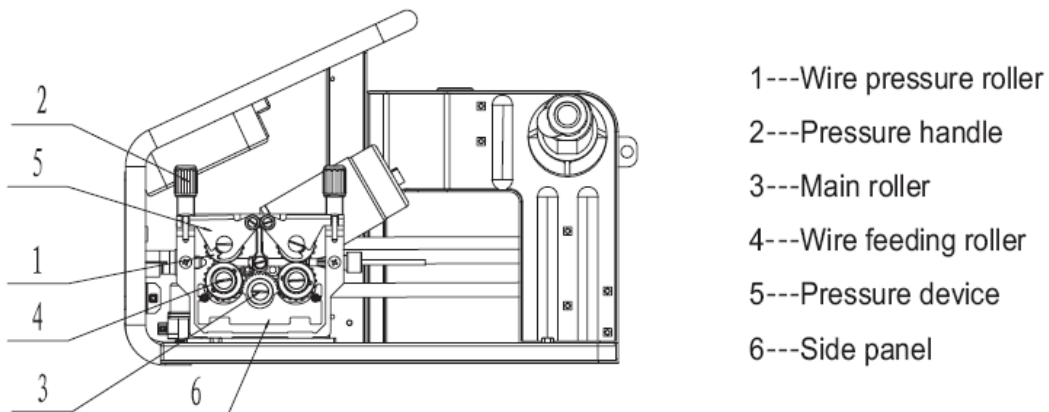
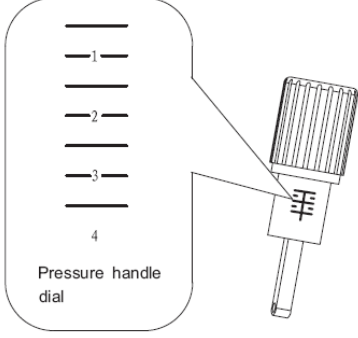


Fig. 4-7-9: Open type double drivewire feeder

1. Put the power switch on “OFF” position;
2. Open the side panel of wire feeder;
3. Lift up the pressure handle;
4. Open the pressure device;
5. Take off the screw that fix the wire pressure roller or wire feeding roller;

6. Replace suitable wire pressure roller or wire feeding roller;
7. Tighten the screw to fasten the wire pressure roller or wire feeding roller;


**Important!** Too much pressure will cause wire being crushed, wire coating being damaged, and fast wearing out of wire feeding rollers and increasing wire feeding resistance. Pressures on wires of different materials and diameters are as follows (Fig. 4-7-10):




Wire feeding roller type	Wire diameter			
	Φ0.8	Φ1.0	Φ1.2	Φ1.6
	Pressure scale mark			
V type	1.5~2.5	1.5~2.5	1.5~2.5	1.5~2.5
U type	0.5~1.5	0.5~1.5	0.5~1.5	0.5~1.5
Knurl type	—	—	1.0~2.0	1.0~2.0

Fig. 4-7-10: Wire diameter & wire feeding pressure

● **Installation of wire spool**

 **Attention!** Coiled wire may cause danger. During installation, clench the wire end to prevent any damage.

 **Notice!** The drop of wire spool will cause danger! Make sure that the wire spool is well fixed on the bracket.

Type I---Close type wire feeder

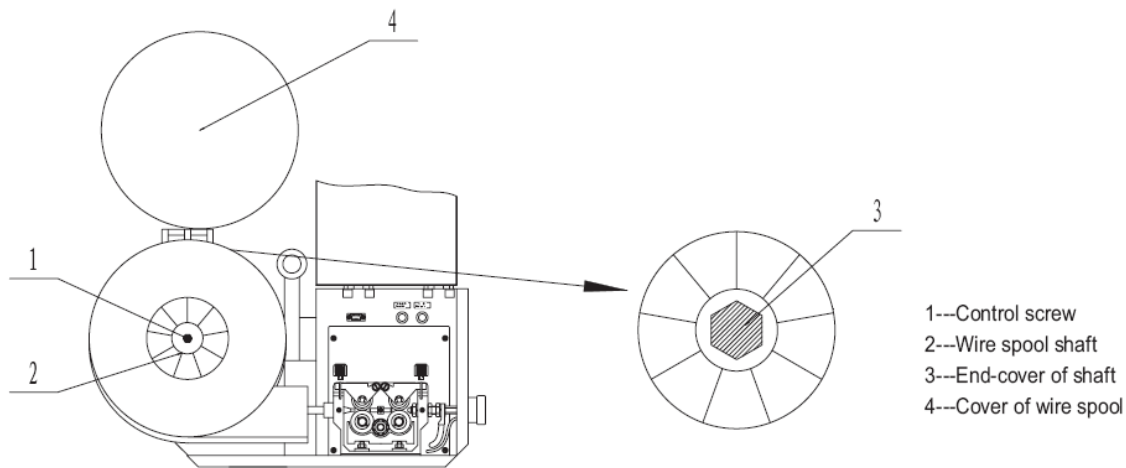


Fig. 4-7-11: Close type wire feeding system

1. Switch off the power source;
2. Open the cover of wire spool;
3. Screw off the end-cover of the shaft;
4. Fix the wire spool into the shaft and make sure of the correct direction;
5. Insert driving lever into reserved hold of wire spool;
6. Adjust the force by adjusting control screw (1);
7. Close the cover of the wire spool;
8. Twist the end-cover of the shaft.



**Note:** To twist control screw (1) by screw wrench can adjust braking force. Proper force should be ensured to avoid wire scatter when wire spool stops running. But the force cannot be too strong so as to avoid motor overload.

#### Type II---Open type double drive wire feeder

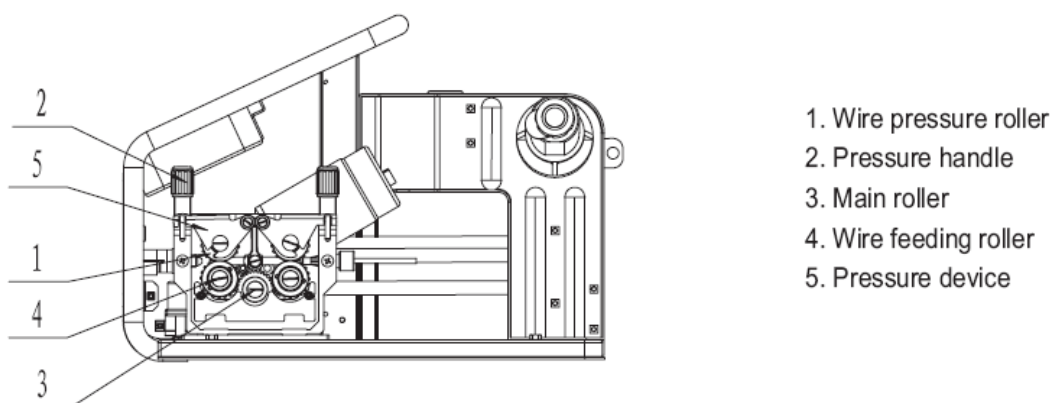


Fig. 4-7-15: Open type double drive wire feeder

1. Switch off the power source;
2. Pull up the pressure handle;
3. Pull up the pressure device;

4. Draw out the welding wire from the wire spool fixed orifice, and hold the part about 20cm to the end of the wire and cut off the curve part;
5. Straighten the front 15cm part of the wire;
6. Make the welding wire go through the guide tube and enter the torch's wire feeding hose about 5cm;
7. Pull down the pressure device;
8. Put the pressure handle back to the original horizontal position;
9. Adjust the pressure force;
10. Straighten the welding torch and take off the nozzle and contact tip;
11. Switch on the power source;
12. Press the “inch feed ing”button until the wire coming out of the torch;



**Warning!** The quick coming out of the wire from the torch is dangerous! Please hold the torch to prevent it away from people’s face or body.

13. Release the “inch feeding” button;
14. Switch off the power source;
15. Screw up the contact tip and put the nozzle back.

● **MIG welding**



**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 understood all the following guides:

- “safety rules”
- “before commissioning”



**Warning!** An electric shock can be fatal. If the machine is plugged into the mains electricity 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

1. Plug the ground cable into welding machine’s output terminal (-);
2. Connect the other end of the ground cable to the work piece;
3. Plug the torch into the torch connector on the wire feeder; (see “welding torch installation”)
4. Only when a cooling unit and water-cooled torch are used, plug the water hoses of the welding torch to the correct connectors on the wire feeder;
5. Fix the selected wire (see “wire feed-in”);
6. Switch on the power source;



**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.)



**Note!** Insufficient coolant will cause damage to the equipment. Please regularly check the coolant flow while welding – it must be able to see that the coolant can flow freely.

7. Open the gas cylinder valve;
8. Set the gas flow rate:
  - Select the “gas test” with status selection switch;
  - Turn the knob on the pressure regulator until suitable gas flow rate is on display.
9. Select “Wire test” mode by status selection switch, and check if there is wire feeding;
10. Select “Normal” mode by status selection switch;
11. Select “2 step” or “4 step” by the trigger mode selection switch;
12. The crater filler voltage and crater filler current can only be adjusted in “4 step” mode;
13. Adjust the inductance value according to the welding requirement;

**Important!** Parameters that have been set on one control panel (e.g. wire feeder or remote controller) might not be able to be changed on other control panels (e.g. power source).

14. Set the below welding parameters on the wire feeder control panel according to welding process requirement:
  - welding current (wire feeding speed);
  - welding voltage;
15. Press the torch trigger to start welding;

## 4-8 Technical data



**Attention!** Please use the machine under the allowed power supply voltage marked on the nameplate. The technical data with the basic input voltage are listed in the Table 4-8-1~Table 4-8-6.

### Single voltage

Model	MIG500				
Voltage/Frequency (3~)	220V ± 10%, 60Hz	380V ± 10%, 50 /60Hz	400V ± 10%, 50Hz	415V ± 10%, 50Hz	440V ± 10%, 60Hz
Rated input power(KVA)	13.6	25			
Rated input current (A)	34	38	36.1	34.8	32.8

Range of welding current (A)	60~320	60~500
Range of welding voltage (V)	15~30	15~50
Rated duty cycle (%)	60	
Full-load efficiency (%)	≥87	
Power factor	≥0.95	
Wire size (mm)	Φ 1.0~ Φ 1.6	
CO2 gas flow rate (L/min)	10~25	
Dimensions (mm)	636×322×584	
Weight (Kg)	50	
Insulation class	Main transformer /Output reactor	H

Table 4-8-4: MIG500 technical data-single voltage

Model	MIG630			
Voltage/Frequency (3~)	380V±10%, 50 /60Hz	400V±10%, 50Hz	415V±10%, 50Hz	440V±10%, 60Hz
Rated input power (KVA)	36			
Rated input current (A)	54	51.3	49.4	46.6
Range of welding current (A)	60~630			
Range of welding voltage (V)	15~50			
Rated duty cycle (%)	100			
Full-load efficiency (%)	≥87			
Power factor	≥0.95			
Wire size (mm)	Φ1.0~Φ1.6			
CO2 gas flow rate (L/min)	10~25			
Dimensions (mm)	686×322×584			
Weight (Kg)	60			
Insulation class	Main transformer/ Output reactor	H		

Table 4-8-5: MIG630 technical data-single voltage

## 4-9 Main components list

MIG500

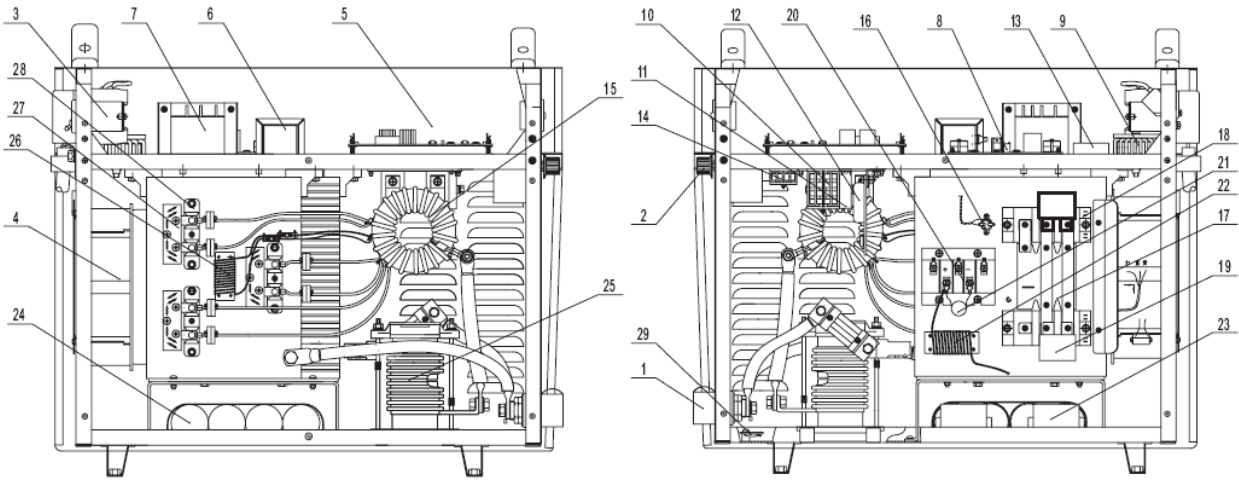


Fig. 4-9-3: Inner structure

No.	Item	Stock Number	Remarks
1	Assembly type cable socket	740004-00053	Red, 380V/50Hz
		740004-00052	Black, 380V/50Hz
2	Potentiometer knob	720031-00066	380V/50Hz
3	Circuit breaker	745011-00022	380V/50Hz
4	Fan	746001-00017	380V/50Hz
		746001-00019	415V/50Hz
5	Main control board	210580-00406	380V/50Hz
6	Power transformer I	220179-00199	380V/50Hz
		220179-00388	415V/50Hz
7	Power transformer II	220179-00148	380V/50Hz
		220179-00389	415V/50Hz
8	Drive board	210310-00032	380V/50Hz
9	Input anti-common-mode inductor	--	380V/50Hz
10	Resonant inductor	220521-00004	380V/50Hz
11	Polypropylene capacitor 5uf 500VAC	722001-00074	380V/50Hz
12	Current transformer	220149-00010	380V/50Hz
13	Capacitor	722001-00015	380V/50Hz
14	Current feedback inductor	220131-00010	380V/50Hz



15	Main transformer	220629-00015	380V/50Hz
16	Temperature relay	745008-00006	380V/50Hz
17	IGBT protection board	220005-00007	380V/50Hz
18	IGBT module	735007-00038	380V/50Hz
19	Polypropylene capacitor 0.47uf,1200VAC	722001-00067	380V/50Hz
20	Three phase rectifier module	735005-00003	380V/50Hz
21	Varistor	720021-00017	380V/50Hz
		720021-00021	415V/50Hz
22	Input filter inductor	220479-00002	380V/50Hz
23	Polypropylene capacitor 20uf 1400V	722001-00070	380V/50Hz
24	Polypropylene capacitor CBB65 50uf 500VAC	722001-00062	380V/50Hz
25	Output reactor	763004-00146	380V/50Hz
26	Current exchange inductor	220281-00008	380V/50Hz
27	Diode protection board	220455-00002	380V/50Hz
28	Output diode module	735006-00029	380V/50Hz
29	Rack capacitor board	220293-00008	380V/50Hz

Table 4-9-3: Main components list

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

MIG630

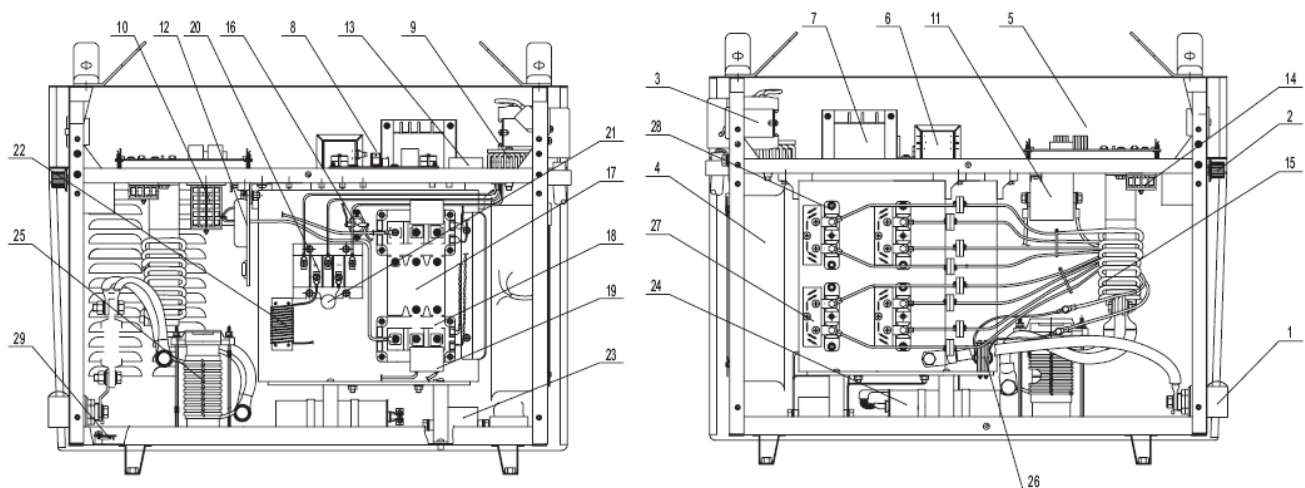


Fig. 4-9-3: Inner structure

No.	Item	Stock Number	Remarks
-----	------	--------------	---------

1	Assembly type cable socket	740004-00053	Red, 380V/50Hz
		740004-00052	Black, 380V/50Hz
2	Potentiometer knob	720031-00066	380V/50Hz, 415V/50Hz
		720031-00071	CE module
3	Circuit breaker	745011-00026	380V/50Hz
4	Fan	746001-00017	380V/50Hz
		746001-00032	415V/50Hz
5	Main control board	746001-00035	CE module
6	Power transformer I	210580-00406	380V/50Hz
		220179-00199	380V/50Hz
7	Power transformer II	220179-00388	415V/50Hz
		220179-00320	CE module
8	Drive board	220179-00148	380V/50Hz
9	Input anti-common-mode inductor	220179-00389	415V/50Hz
10	Resonant inductor	220179-00321	CE module
11	Polypropylene capacitor 6uf 500VAC	210310-00032	380V/50Hz
12	Current transformer	--	380V/50Hz
13	Capacitor	220521-00005	380V/50Hz
		722001-00075	380V/50Hz
14	Current feedback inductor	220149-00007	380V/50Hz
15	Main transformer	722001-00015	380V/50Hz, 415V/50Hz
16	Temperature relay	--	CE module
17	IGBT protection board	220131-00010	380V/50Hz
18	IGBT module	220629-00016	380V/50Hz
19	Polypropylene capacitor 0.47uf,1200VAC	745008-00008	380V/50Hz
20	Three phase rectifier module	735005-00003	380V/50Hz
21	Varistor	720021-00017	380V/50Hz CE module
		720021-00021	415V/50Hz
22	Input filter inductor	220155-00004	380V/50Hz
23	Polypropylene capacitor 20uf 1400V	722001-00070	380V/50Hz
24	Polypropylene capacitor CBB65	722001-00062	380V/50Hz

	50uf 500VAC		
25	Output reactor	763004-00116	380V/50Hz
26	Current exchange inductor	220281-00012	380V/50Hz
27	Diode protection board	220455-00002	380V/50Hz
28	Output diode module	735006-00029	380V/50Hz
29	Rack capacitor board	220293-00008	380V/50Hz

Table 4-9-4: Main components list

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



## 5-TROUBLE SHOOTING



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


№	FAULT	CAUSE & REMEDY
01	Main switch is ON, but indicators are not lit up.	Cause: Input is default phase Remedy: Stop work  Cause: Circuit breaker is damaged Remedy: Replace  Cause: Fuse (2A) is fusing Remedy: Replace
02	After power on, the air switch on rear panel automatically tripped	Cause: Circuit breaker is damaged Remedy: Replace  Cause: IGBT module is damaged Remedy: Replace IGBT and drive board  Cause: Three phase rectifier bridge is damaged Remedy: Replace or repair
03	During welding, the automatic air switch on rear panel is tripped.	Cause: Overloading, the duty cycle has been exceed Remedy: Do not exceed the duty cycle  Cause: Circuit breaker is damaged Remedy: Replace
04	Can not adjust welding current value	Cause: Wire feeder control cable is broken Remedy: Reconnect  Cause: Check main control board is damaged or not Remedy: Check and replace  Cause: Main control board is damaged Remedy: Fix or replace board  Cause: Power source interconnector is loose or break Remedy: Check and reconnect
05	Arc is not stable, spatter is higher	Cause: Incorrect welding parameters Remedy: Check the settings  Cause: Contact tip is worn out Remedy: Change the contact tip
06	CO2 gas regulator heater des not work	Cause: CO2 gas regulator is damaged Remedy: Replace  Cause: Heater cable is brokn or short circuit Remedy: Replace or reconnect  Cause: Thermistor of heater is damaged Remedy: Replace

07	When torch trigger is pressed, wire feeding is ok, while no shielding gas	<p>Cause: main control board is damaged Remedy: Fix or replace main control board</p> <p>Cause: The solenoid valve is damaged Remedy: Change the solenoid valve</p>
08	When torch trigger is pressed, wire feeder does not work, and no open load voltage on displayer.	<p>Cause: Torch trigger is damaged Remedy: Replace or fix</p> <p>Cause: Control cable for wire feeder is broken Remedy: Reconnect</p> <p>Cause: Main control board in power source is damaged Remedy: Replace or fix</p>
09	Fault indicator is lit up	<p>Cause: Temperature relay is damaged Remedy: Replace</p> <p>Cause: Wires connected to temperature relay maybe broken Remedy: Reconnect</p> <p>Cause: Overloading, the duty cycle has been exceeded Remedy: Do not exceed the duty cycle. Wait several minutes for cooling down and it will return to normal.</p>

Table 5-1: 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 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 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 first.

### ● 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 back flow state

### ● Daily maintenance










			Disconnect main power before maintenance <sup>+</sup>				
 3 months <sup>+</sup>	Change illegible label <sup>+</sup>		Repair or replace broken cable <sup>+</sup>	or		Clean and tighten welding terminal <sup>+</sup>	
 6 months <sup>+</sup>	Blow or suck inner part, and clean every month when working in harsh environmental conditions <sup>+</sup>			or			

Fig. 6-1: Daily maintenance

## 7- WELDING TECHNIQUE GUIDE



**Note!** This section being general welding technique guide is for reference only. Specific functions of your machine please refer to previous chapters.

### 11-1 MIG (GMAW/FCAW) basic welding technique

Two different welding processes are covered in this section (GMAW and FCAW), with the intention of providing the very basic concepts in using the Mig mode of welding, where a welding gun is hand held, and the electrode (welding wire) is fed into a weld puddle, and the arc is shielded by an inert welding grade shielding gas or inert welding grade shielding gas mixture.

**GAS METAL ARC WELDING (GMAW):** This process, also known as MIG welding, CO<sub>2</sub> welding, Micro WireWelding, short arc welding, dip transfer welding, wire welding etc., is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a solid continuous, consumable electrode and the work. Shielding is obtained from an externally supplied welding grade shielding gas or welding grade shielding gas mixture. The process is normally applied semi automatically; however the process may be operated automatically and can be machine operated. The process can be used to weld thin and fairly thick steels, and some non-ferrous metals in all positions.

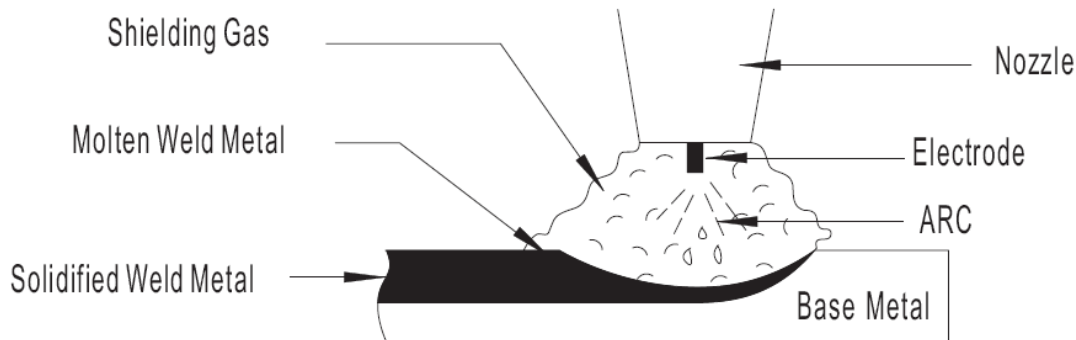


Fig. 7-1-1: GMAW process

**FLUX CORED ARC WELDING (FCAW):** This is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a continuous flux filled electrode wire and the work. Shielding is obtained through decomposition of the flux within the tubular wire. Additional shielding may or may not be obtained from an externally supplied gas or gas mixture. The process is normally applied semi automatically; however the process may be applied automatically or by machine. It is commonly used to weld large diameter electrodes in the flat and horizontal position and small electrode diameters in all positions. The process is used to a lesser degree for welding stainless steel and for overlay work.



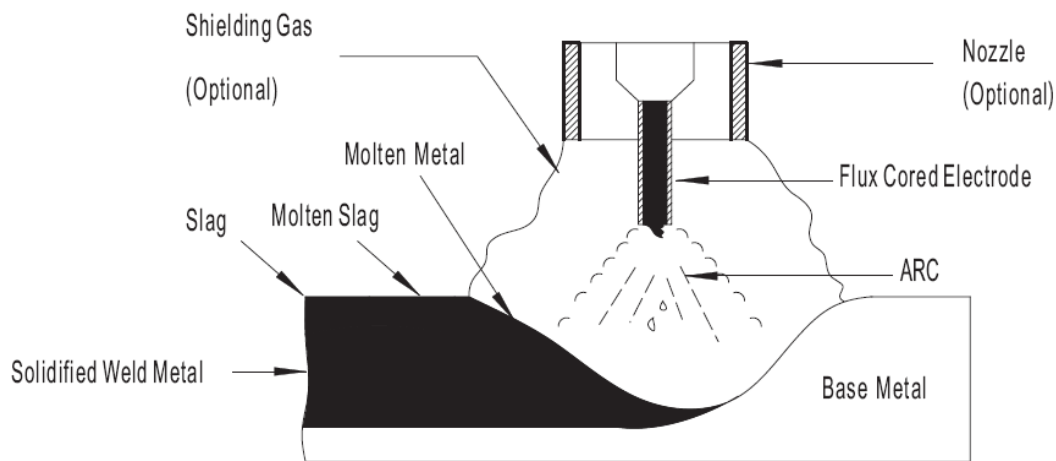


Fig. 7-1-2: FCAW process

### Position of MIG torch

The angle of MIG torch to the weld has an effect on the width of the weld.

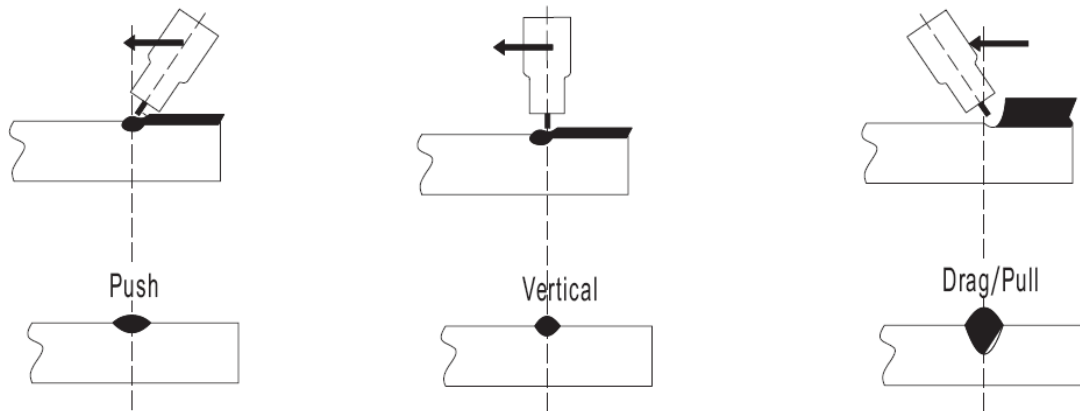


Fig. 7-1-3: Position of TIG torch

The welding gun should be held at an angle to the weld joint. (see Secondary Adjustment Variables below)  
 Hold the gun so that the welding seam is viewed at all times. Always wear the welding helmet with proper filter lenses and use the proper safety equipment.



Note! Do not pull the welding gun back when the arc is established. This will create excessive wire extension (stick-out) and make a very poor weld.

The electrode wire is not energized until the gun trigger switch is depressed. The wire may therefore be placed on the seam or joint prior to lowering the helmet.

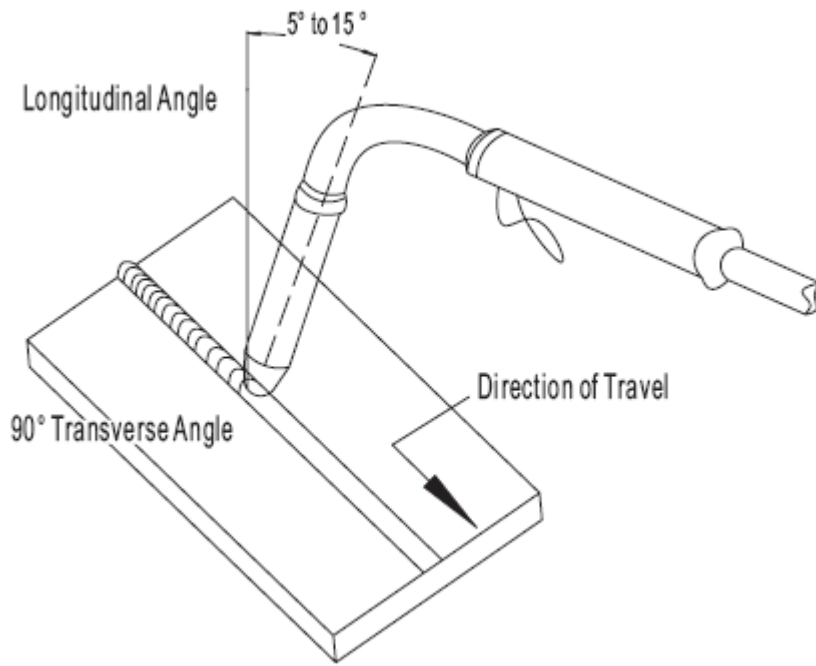


Fig. 7-1-4: Butt & horizontal welds

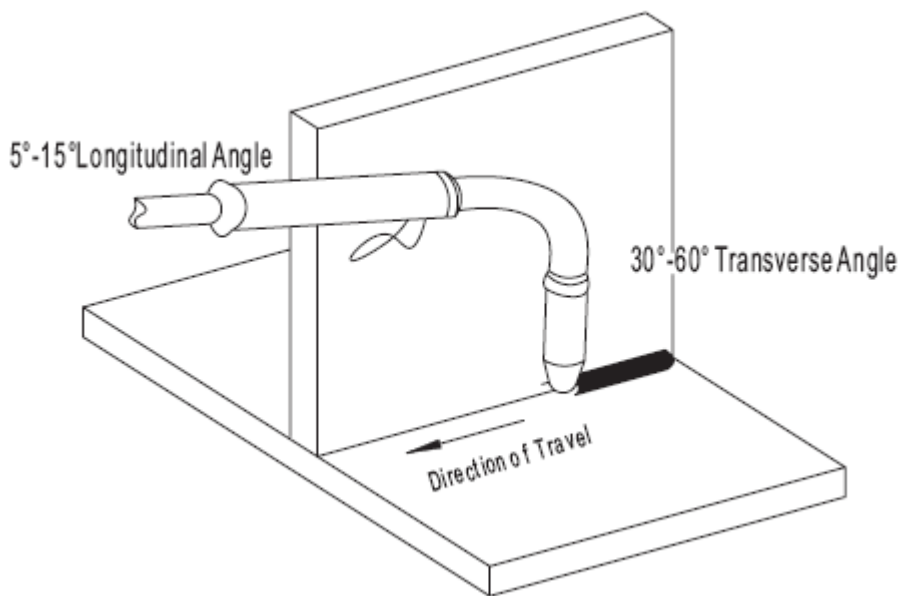


Fig. 7-1-5: Horizontal fillet weld

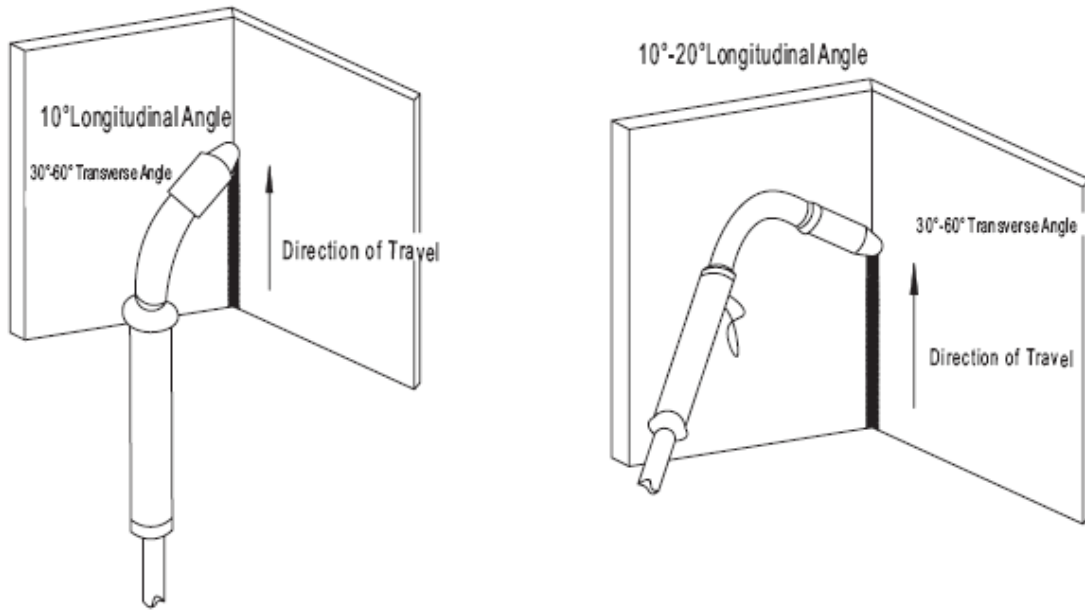


Fig. 7-1-6: Vertical fillet welds

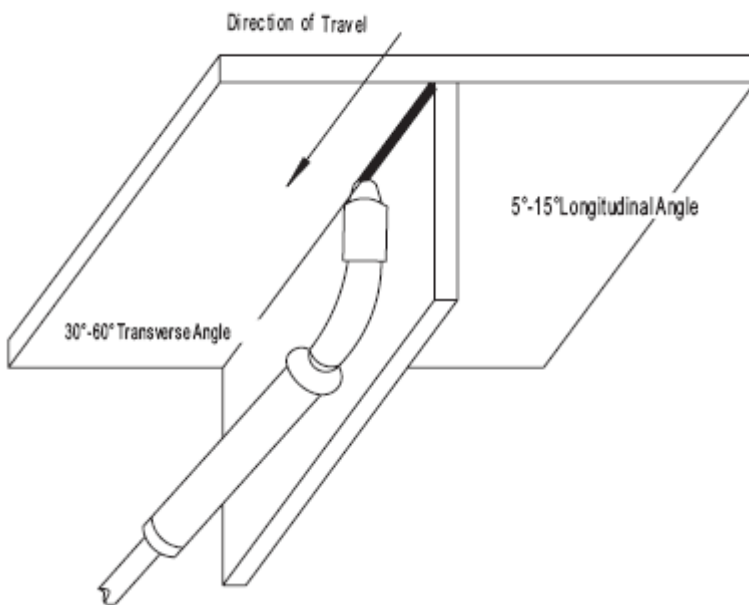


Fig. 7-1-7: Overhead weld

Distance from the MIG torch nozzle to the work piece

The electrode wire stick out from the MIG Torch nozzle should be between 10mm to 20.0mm. This distance may vary depending on the type of joint that is being welded.

Travel speed

The speed at which the molten pool travels influences the width of the weld and penetration of the welding run.

MIG welding (GMAW) variables

Most of the welding done by all processes is on carbon steel. The items below describe the welding variables in

short-arc welding of 24gauge (0.024", 0.6mm) to 1/4" (6.4mm) mild sheet or plate. The applied techniques and end results in the GMAW process are controlled by these variables.

#### Preselected variables

Preselected variables depend upon the type of material being welded, the thickness of the material, the welding position, the deposition rate and the mechanical properties. These variables are:

- Type of electrode wire
- Size of electrode wire
- Type of gas (not applicable to self shielding wires FCAW)
- Gas flow rate (not applicable to self shielding wires FCAW)

#### Primary adjustable variables

These control the process after preselected variables have been found. They control the penetration, bead width, bead height, arc stability, deposition rate and weld soundness. They are:

- Arc Voltage
- Welding current (wire feed speed)
- Travel speed

#### Secondary adjustable variables

These variables cause changes in primary adjustable variables which in turn cause the desired change in the bead formation. They are:

1. Stick-out (distance between the end of the contact tube (tip) and the end of the electrode wire). Maintain at about 10mm stick-out
2. Wire Feed Speed. Increase in wire feed speed increases weld current. Decrease in wire feed speed decreases weld current.

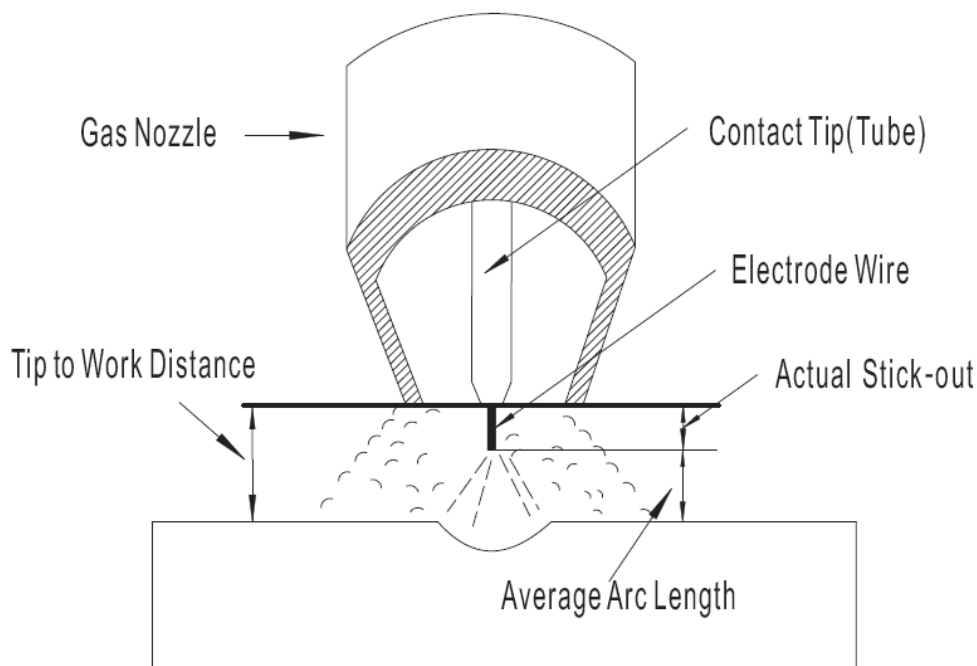


Fig. 7-1-8: Electrode stick-out

3. Nozzle Angle. This refers to the position of the welding gun in relation to the joint. The transverse angle is usually one half the included angle between plates forming the joint. The longitudinal angle is the angle between

the center line of the welding gun and a line perpendicular to the axis of the weld. The longitudinal angle is generally called the Nozzle Angle and can be either trailing (pulling) or leading (pushing). Whether the operator is left handed or right handed has to be considered to realize the effects of each angle in relation to the direction of travel.

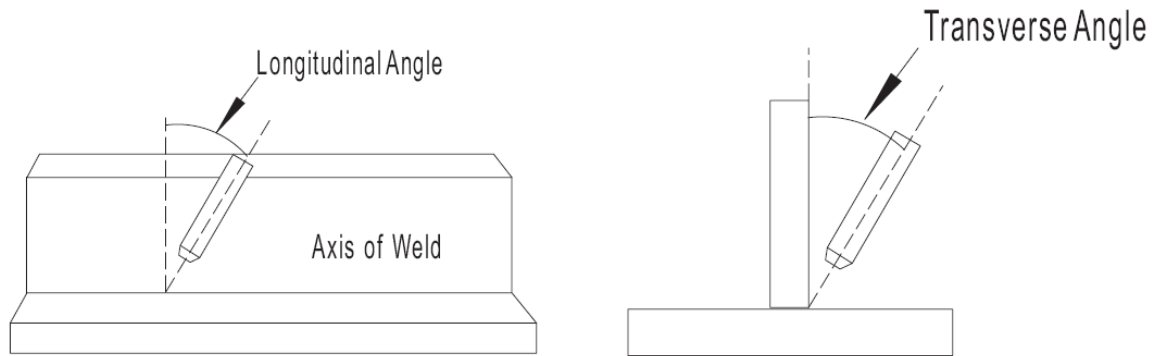


Fig. 7-1-9: Transverse and Longitudinal

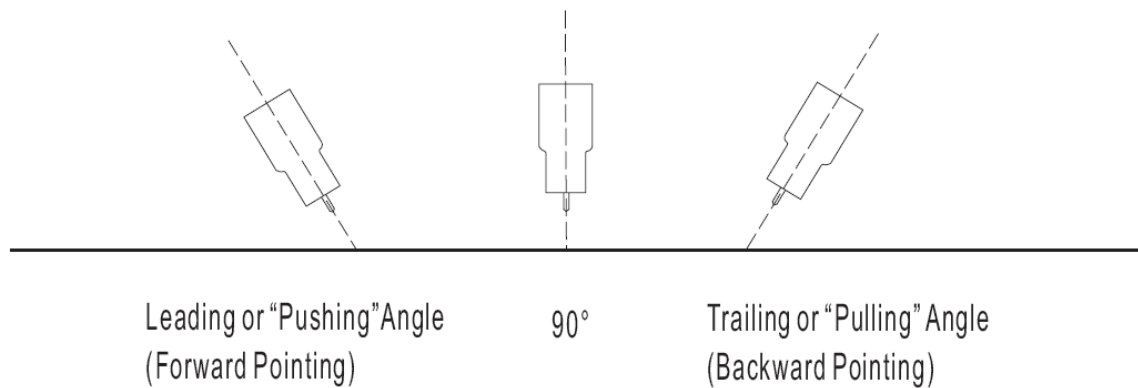


Fig. 7-1-10: Nozzle Angle Right Handed Operator

#### Establishing the Arc and Making Weld Beads

Before attempting to weld on a finished piece of work, it is recommended that practice welds be made on a sample metal of the same material as that of the finished piece.

The easiest welding procedure for the beginner to experiment with MIG welding is the flat position. The equipment is capable of flat, vertical and overhead positions.

For practicing MIG welding, secure some pieces of 16 or 18 gauge (0.06" 1.5mm or 0.08" 2.0mm) mild steel plate 6" x 6" (150 x 150mm). Use 0.030" (0.8mm) flux cored gasless wire or a solid wire with shielding gas.

#### Setting of the power source

Power source and Wirefeeder setting requires some practice by the operator, as the welding plant has two control settings that have to balance. These are the Wirespeed control and the welding Voltage Control. The welding current is determined by the Wirespeed control, the current will increase with increased Wirespeed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with a little change in current level.

When changing to a different electrode wire diameter, different control settings are required. A thinner electrode

wire needs more Wirespeed to achieve the same current level.

A satisfactory weld cannot be obtained if the Wirespeed and Voltage settings are not adjusted to suit the electrode wire diameter and the dimensions of the work piece.

If the Wirespeed is too high for the welding voltage, “stubbying” will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and Wirespeed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound. Refer to the Weld Guide located on the inside of the wirefeed compartment door for setup information.

#### Electrode wire size selection

The choice of Electrode wire size and shielding gas used depends on the following

- Thickness of the metal to be welded
- Type of joint
- Capacity of the wire feed unit and Power Source
- The amount of penetration required
- The deposition rate required
- The bead profile desired
- The position of welding
- Cost of the wire

No.	Item	Stock No. 400	Stock No. 500	Stock No. 630	MIG 400	MIG 500	Stock No. 630
1	Left plate	262017-00557	262017-00579	262017-00629		6064200480	
2	Top plate	262029-00387	262029-00412	262029-00467		6064200481	
3	Handle	766003-00138	766003-00138	766003-00138	6064200129	6064200129	6064200129
4	Resonance capacitor	722001-00073	722001-00074	722001-00075	6064100180	6064100154	
5	Main transformer	220629-00023	220629-00015	220629-00016	6064100254	6064100187	6064100373
6	Resonance inductor	220521-00007	220521-00004	220521-00005	6064100179	6064100156	6064100371
7	Main control board	220580-01906	220580-01699	220580-01144			
8	Drive board	210310-00108	210310-00096	210310-00096	6064000473	6064000451	6064000451
9	Power transformer I	763001-00048	763001-00048	763001-00048	6064100513	6064100513	6064100513
10	Power transformer II	763001-00049	763001-00049	763001-00049	6064100514	6064100514	6064100514
11	Filter	752004-00017	752004-00017	752004-00017	6064000421	6064000421	6064000421
12	Current transformer	220149-00016	220149-00010	220149-00007	6064100198	6064100185	6064100372
13	Circuit breaker Pressure plate	766003-00187	766003-00187	766003-00195	6064200482	6064200482	
14	Circuit breaker	745011-00021	745011-00022	745011-00026	6064200438	6064200131	6064100365
15	Fan	746001-00087	746001-00087	746001-00035	6064100525	6064100525	6064000358
16	Rear plate	262011-01126	262011-00813	262011-00803			
17	Cable	769001-00026	769001-00028	769001-00093			
18	Heating socket	740004-00358	740004-00358	740004-00039			
19	Fan cover	746003-00024	746003-00024	766003-02403			
20	Right plate	262023-00544	262023-00565	262023-00614			
21	Filter capacitor	722001-00070	722001-00070	722001-00070	6064100163	6064100163	6064100163
22	Input capacitor bracket	766002-00103	766002-00103	766002-00103			
23	Bottom plate	263065-00242	263065-00170	263065-00127			
24	Rack Capacitor Board	220293-00008	220293-00008	220293-00008	6064000207	6064000207	6064000207
25	capacitor	722001-00062	722001-00062	722001-00062	6064100162	6064100162	6064100162
26	Filter capacitor clip	766003-00247	766003-00248	766003-00248			
27	output reactor	763004-001158	763004-00228	763004-00116			
28	Shunt	720041-00008	720041-00010	720041-00010			
29	Potentiometer	720031-00041	720031-00041	720031-00041			
30	Potentiometer	720031-00042	720031-00042	720031-00042			
31	Potentiometer	720031-00158	720031-00158	--			
32	Front panel	262005-01261	262005-01212	262005-01089			
33	Light (red)	715002-00026	715002-00026	715002-00026	6064200486	6064200486	6064200486
34	Light (yellow)	715002-00025	715002-00025	715002-00025	6064200487	6064200487	6064200487
35	Digital display	755001-00023	755001-00023	755001-00023	6064000461	6064000461	6064000461
36	Potentiometer knob	720031-00138	720031-00138	720031-00138	6064200488	6064200488	6064200488
37	Potentiometer knob	720031-00138	720031-00138	--			
38	Rocker switch	745002-00002	745002-00002	745002-00002	6064200489	6064200489	6064200489
39	Rocker switch	745002-00003	745002-00003	745002-00003	6064200490	6064200490	6064200490
40	Assembly type cable socket	740002-00027	740002-00027	740002-00027	6064200534	6064200534	6064200534
41	Control socket	740001-00047	740001-00047	740003-00047	6064200137	6064200137	6064200137
42	Varistor	720021-00017	720021-00017	720021-00017	6064100167	6064100167	6064100167
43	Three phase rectifier module	735005-00002	735005-00003	735005-00003	6064100220	6064100168	6064100168
44	Polypropylene capacitor	722001-00067	722001-00067	722001-00014	6064100169	6064100169	
45	IGBT protection board	220005-00022	220005-00135	220005-00008	6064000205	6064100612	

46	IGBT module	735007-00048	735007-00038	735007-00073	6064100170	6064100175	6064100604
47	Temperature relay	745008-00042	745008-00045	745008-00044	6064100613	6064100578	
48	Input filter inductor	220479-00002	220479-00002	220479-00004	6064100171	6064100171	
49	Radiator bracket	766002-00090	766002-00090	766002-00090	6064200149	6064200149	6064200149
50	IGBT Radiator	264005-00028	264005-00090	264005-00088		6064200148	
51	Diode Radiator	264011-00121	264011-00116	264011-00027		6064200491	
52	Current exchange inductor	220281-00008	220281-00008	220281-00012	6064100227	6064100227	6064100378
53	Fast recovery diode module	735006-00029	735006-00029	735006-00029	6064100173	6064100173	6064100173
54	Diode protection board	220455-00002	220455-00002	220455-00002	6064000200	6064000200	6064000200
55	Radiator connecting plate	775004-00033	775004-00027	775004-00009			
56	Radiator support frame	766002-00091	766002-00078	766002-00079			

