

THANKS FOR PURCASHING OUR PRODUCT

WM – 500SI

CO2/MIG/MAG AUTOMATIC WELDING MACHINE



WEIRO

OPERATION MANUAL

(Read the manual carefully before installation, operation and maintenace)

Safety Depends on You

WEIRO are welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation... and thoughtful operation in your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

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This operating manual can be fit for MIG, MIG500A, MIG500B, MIC-C, and MIG-M series welding machines. The technical data are measured with power supply 3 phase 380V, the data will be changed when you use different voltage such as 400V and 415V, etc.

MIG Series Block diagram of principle shown as Figure 1

Input (3~380V/50Hz)

Output

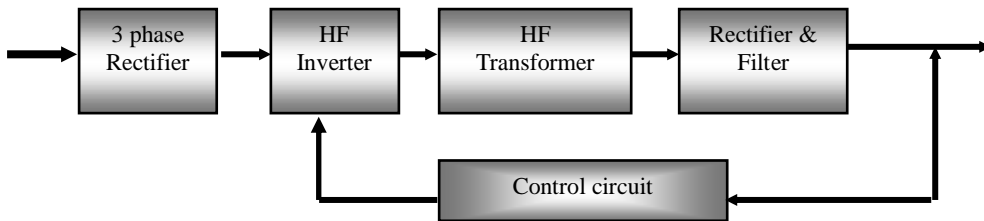


Figure 1: Block diagram of principle

This series welding machines apply IGBT soft switch inverter technology. 3-phase input volt 380V are 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 welder's dynamically responsive speed has been greatly increased, so the welder size and weight are reduced noticeably. Power source enjoys good anti-fluctuating ability and high-quality performance.

MIG Series Volt-Ampere Curve as shown in Figure 2:

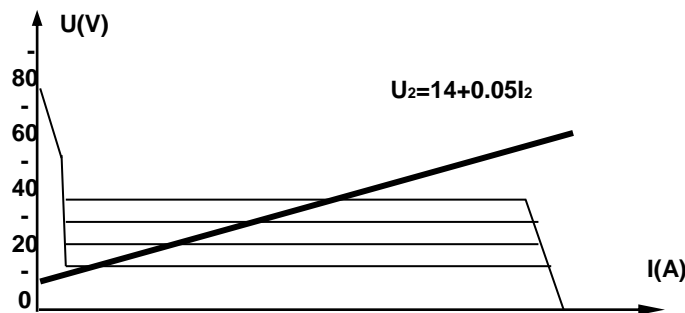


Figure 2: MIG Series Volt-Ampere Curve

1. Main technical parameters

Items	MIG250	MIG280	MIG350	MIG500	MIG500B	MIG630
Input voltage	3-phase 380V \pm 10% /50Hz					
Rated input power (KVA)	8	9	14	25	25	36
Rated input current (A)	12	14	21	38	38	54
Rated duty cycle	60%				100%	
Output current range (A)	40~250	40~280	60~350	60~500		60~630
Output voltage range (V)	14~30		15~40	15~50		
Output open voltage	51		72	81	91	
Power factor	≥ 0.95		≥ 0.87			
Wire diameter (mm)	0.8~1.0		0.8~1.2	1.0~1.6		
Weight (Kg)	20	30	40	50	60	
Dimensions (mm ³)	495×232×495	527×272×491	576×297×574	636×322×584	686×322×584	
CO ₂ gas flow rate (L/min)	10~20	10~25	15~25			
Insulation class	H (Main Transformer)					
	B (Output Reactor)					

Table 1: Parameter Specification (MIG series)

2. Main circuit diagram

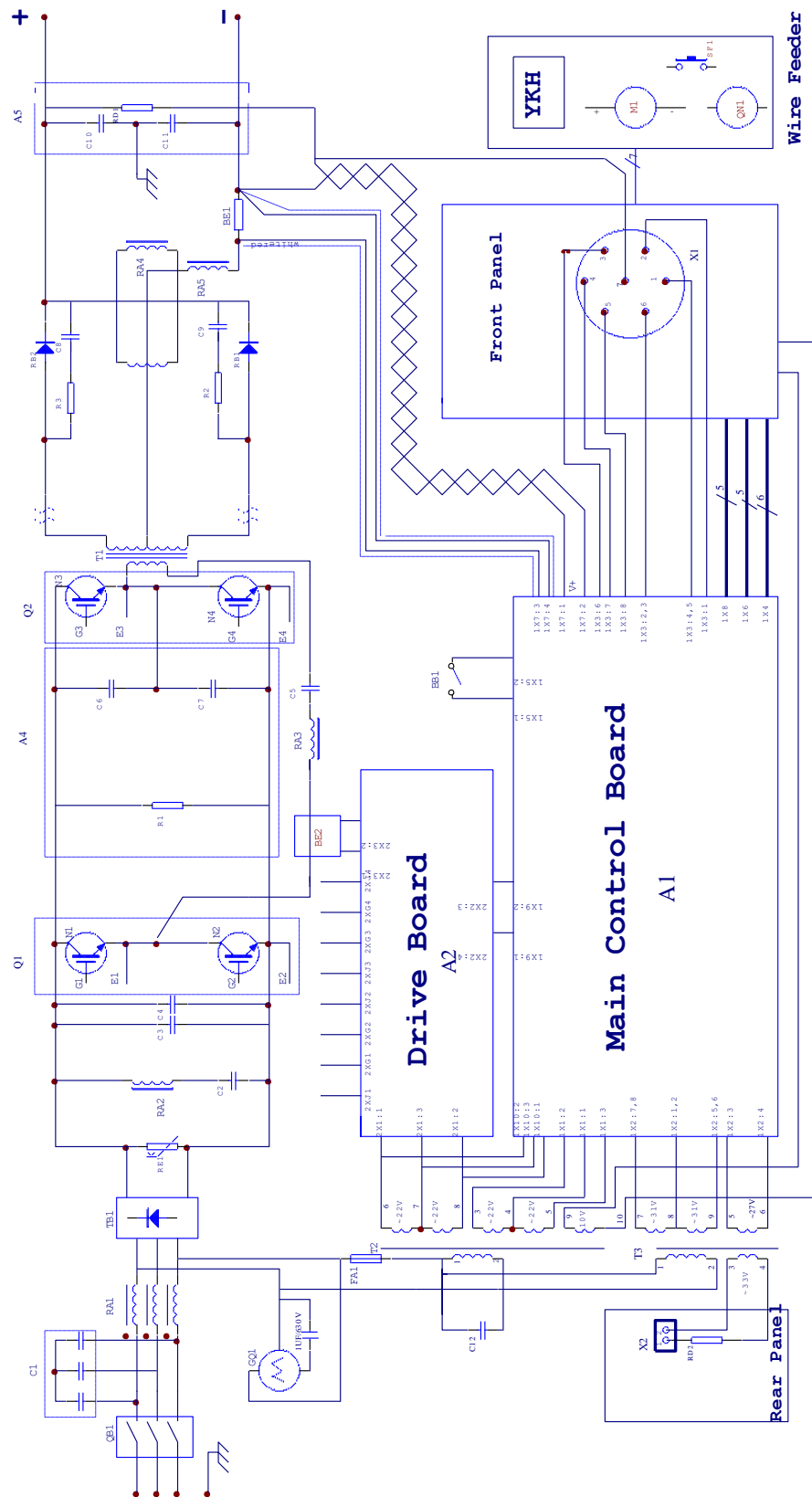


Figure 3: Circuit Diagram (MIG series)

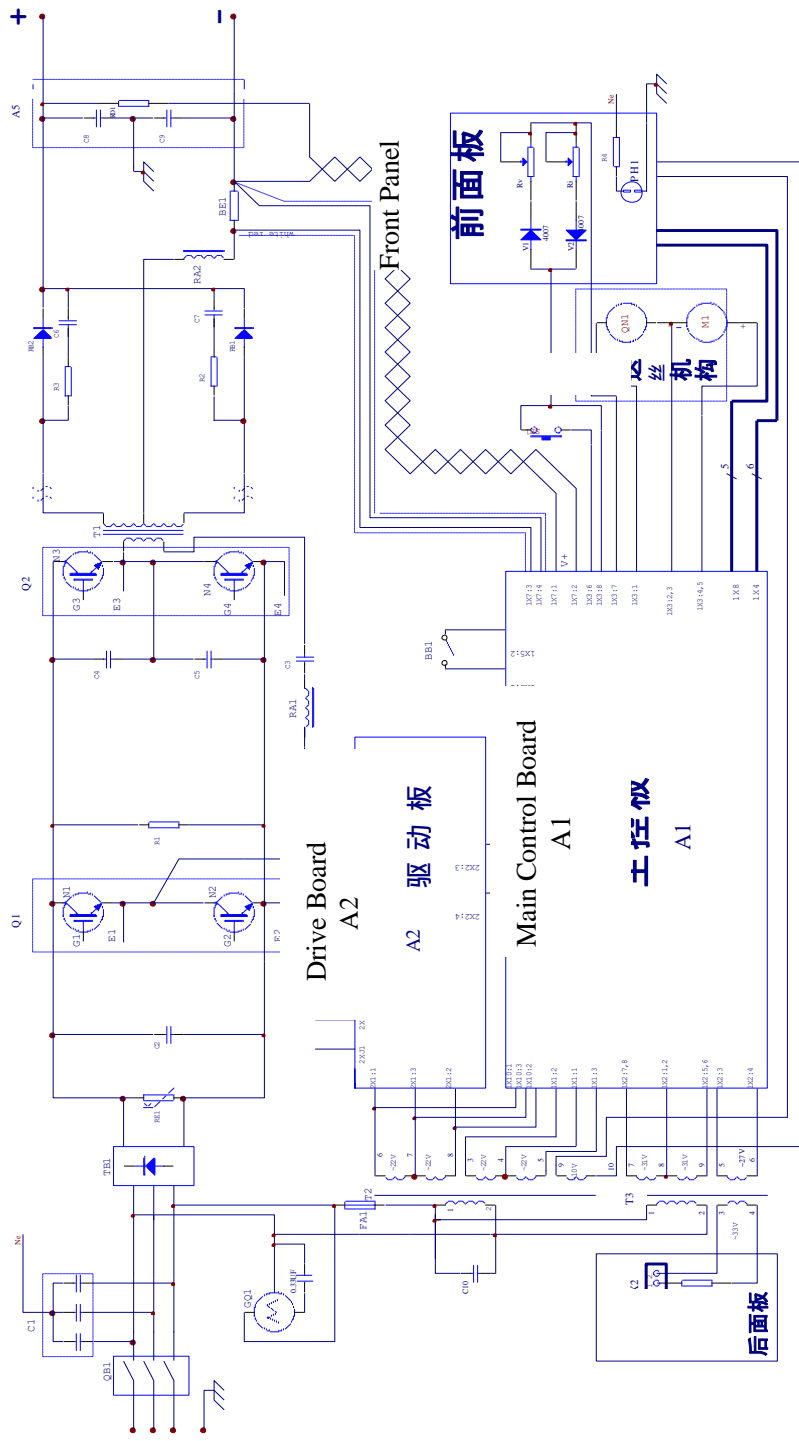


Figure 4: Circuit Diagram (MIG-C series)

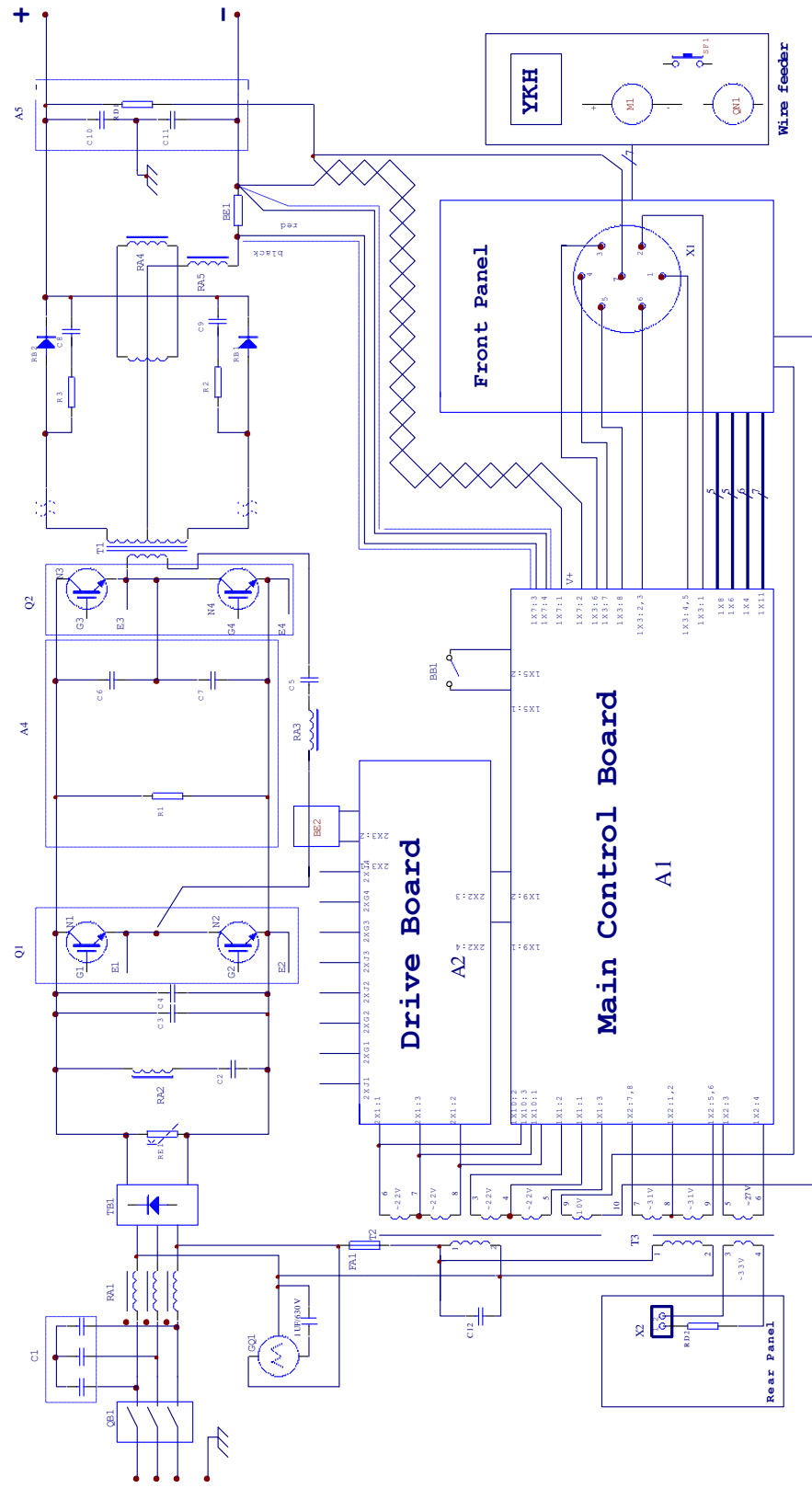


Figure 5: Circuit Diagram (MIG-M series)

3. Main components list

No.	Tab	Item	Stock Number	Quantit	Remark
1	QB1	Circuit breaker	745011-00019	1	MIG250
			745011-00021	1	MIG350
			745011-00022	1	MIG500
			745011-00026	1	MIG630
2	TB1	3-phase rectifier module	735005-00009	1	MIG250
			735005-00002	1	MIG350
			735005-00003	1	MIG630, MIGC500
3	C3	Polypropylene capacitor	722001-00070	2	MIG630, MIG500
				1	MIG350, MIG250
4	Q1/Q2	IGBT module	735007-00046	2	MIG350, MIG250
			735007-00037	2	MIG500
			735007-00042	2	MIG630, MIG500B
5	C5	Polypropylene capacitor	722001-00071	1	MIG250
			722001-00073	1	MIG350
			722001-00074	1	MIG500
			722001-00075	1	MIG630
6	T1	Main transformer	220629-00012	1	MIG250
			220629-00013	1	MIG350
			220629-00015	1	MIG500
			220629-00016	1	MIG630, MIG500B
7	RB1/R B2	Fast recovery diode module	735006-00029	2	MIG350, MIG250
			735006-00029	3	MIG500
			735006-00019	4	MIG630, MIG500B
8	T2	Transformer for ZKB/QDB I	763001-00067	1	All purpose
9	T3	Transformer for ZKB/QDB II	763001-00062	1	All purpose
10	FA1	Fuse	745007-00022	1	All purpose
11	GQ1	Fan	746001-00005	1	MIG250
			746001-00011	1	MIG350
			746001-00017	1	MIG500
			746001-00027	1	MIG630, MIG500B
12	BB1	Thermal switch	745008-00006	1	MIG350, MIG500
			745008-00008	1	MIG630, MIG500B
13	A4	IGBT protection board	220005-00013	1	MIG350
			220005-00005	1	MIG500
			220005-00008		MIG630
14	A2	Drive board	764002-00011	1	All purpose
15	A1	Main control board	210580-00057	1	MIG350, MIG250
			210580-00065	1	MIG500, MIG630, MIG500B

Table 2: Key Spare Parts (MIG series)

No.	Tab	Item	Stock No.	Quantity	Remark
1	QB1	Circuit breaker	745011-00023	1	
2	TB1	3-phase rectifier module	735005-00003	1	
3	C3	Polypropylene capacitor	722001-00070	2	
4	Q1/Q2	IGBT module	735007-00037	2	
5	C5	Polypropylene capacitor	722001-00074	1	
6	T1	Main transformer	220629-00015	1	
7	RB1/RB2	Fast recovery diode module	735006-00019	3	
8	T2	Transformer for ZKB/QDB I	763001-00067	1	
9	T3	Transformer for ZKB/QDB II	763001-00062	1	
10	FA1	Fuse	745007-00022	1	
11	GQ1	Fan	746001-00017	1	
12	BB1	Thermal switch	745008-00006	1	
13	A4	IGBT protection board	220005-00007	1	
14	A2	Drive board	764002-00011	1	
15	A1	Main control board	210580-00069	1	

Table 3: Key Spare Parts (MIG 500A)

This inverter CO₂ /MAG welders are high-quality performers that can be used for all-purpose, semi-automatic CO₂ gas shield welding with solid or flux-cored wire (Φ 1.2- Φ 2.0mm)for welding mild steel and low alloy steel work pieces. This series welder enjoys reasonable static characteristic and sound dynamic characteristic.

Features and benefits:

- ◆ Inverter technology can ensure fairly good stability of output volt when fluctuation occurs in input primary volt or arc length changes, as well as startling arc self-adjustability and stable welding process.
- ◆ Less spatter, high deposit efficiency.
- ◆ Less weld distortion, good weld formation.
- ◆ High success rate of arc-starting due to stronger pulse strike.
- ◆ Reducing molten ball while stopping arc.
- ◆ Reducing labor intensity while welding long weld by using auto-lock function.
- ◆ Stable wire feeding due to consistent output of power circuit.
- ◆ Small, light and portable.
- ◆ Energy-saving, low expense and flexible to various input primary quality.
- ◆ **A type machine can provide long distance welding (up to 50m).**
- ◆ **B type machine enjoys 100% duty cycle.**
- ◆ **C type machine is compact design with built-in wire feeder.**
- ◆ **M type machines is multi-process with MMA /FCAW /CO₂ /MAG /Simple TIG / Gouging.**

1. Pre-installation

1.1 Installation Environment

The MIG series welding machines are designed for use in adverse environments. Examples of environments with increased adverse conditions are

- In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts;
- In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator;
- In wet or damp hot locations where humidity or perspiration considerably reduces the skin resistance of the human body and the insulation properties of accessories;
- Environments with adverse conditions do not include places where electrically conductive parts, in the near vicinity of the operator, which can cause increased hazard, have been insulated;

1.2 Installation Location

Be sure to locate the welder according to the following guidelines:

- In areas, free from moisture and dust.
- Ambient temperature between 0 degrees C to 40 degrees C.
- In areas, free from oil, steam and corrosive gases.
- In areas, not subjected to abnormal vibration or shock.
- In areas, not exposed to direct sunlight or rain.
- Place at a distance of 12" (304.79mm) or more from walls or similar boundaries that could restrict natural airflow for cooling.

1.3 Power Source Connections

Warning

Thermal Arc advises that this equipment be electrically connected by a qualified electrician. ELECTRIC SHOCK can kill; SIGNIFICANT DC VOLTAGE is present after removal of input power.

DO NOT TOUCH live electrical parts.

- SHUT DOWN welding power source, disconnect input power employing lockout/tagging procedures.

- Lockout/tagging procedures consist of padlocking line disconnect switch in open position.
- Removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

1.4 Power Supplier Requirements

- Input volt must be standard sine wave, effective value 380V, frequency 50Hz.
- Unbalance degree of 3-phase volt must be no more than 5%.
- Power supply:

Table 8:
Power supply
connection
Note: The
size of fuse
and breaker
in the table
are for
reference
only.

Product type		MIG250	MIG250C	MIG350	MIG500 (A/B)	MIG630
Power supply		3 phase AC 380V /50Hz				
Min. capacity	Power network	12KVA	12KVA	26KVA	45KVA	63KVA
	Generator	16KVA	16KVA	34KVA	60KVA	84KVA
Input volt protection	Fuse	20A	20A	30A	50A	80A
	Circuit breaker	20A	20A	32A	63A	100A
Cable size (cross-section)	Input volt	$\geq 1.5\text{mm}^2$	$\geq 2.5\text{mm}^2$	$\geq 2.5\text{mm}^2$	$\geq 6\text{mm}^2$	$\geq 10\text{mm}^2$
	Output volt	25mm^2	25mm^2	35mm^2	50mm^2	70mm^2
	Ground lead	$\geq 1.5\text{mm}^2$	$\geq 2.5\text{mm}^2$	$\geq 2.5\text{mm}^2$	$\geq 6\text{mm}^2$	$\geq 10\text{mm}^2$

1.5. Machine Assembling Guide:

This series welder is small, light and portable. They will be more convenient if place them on the trolleys. Ensure the location where to place the welder is even.

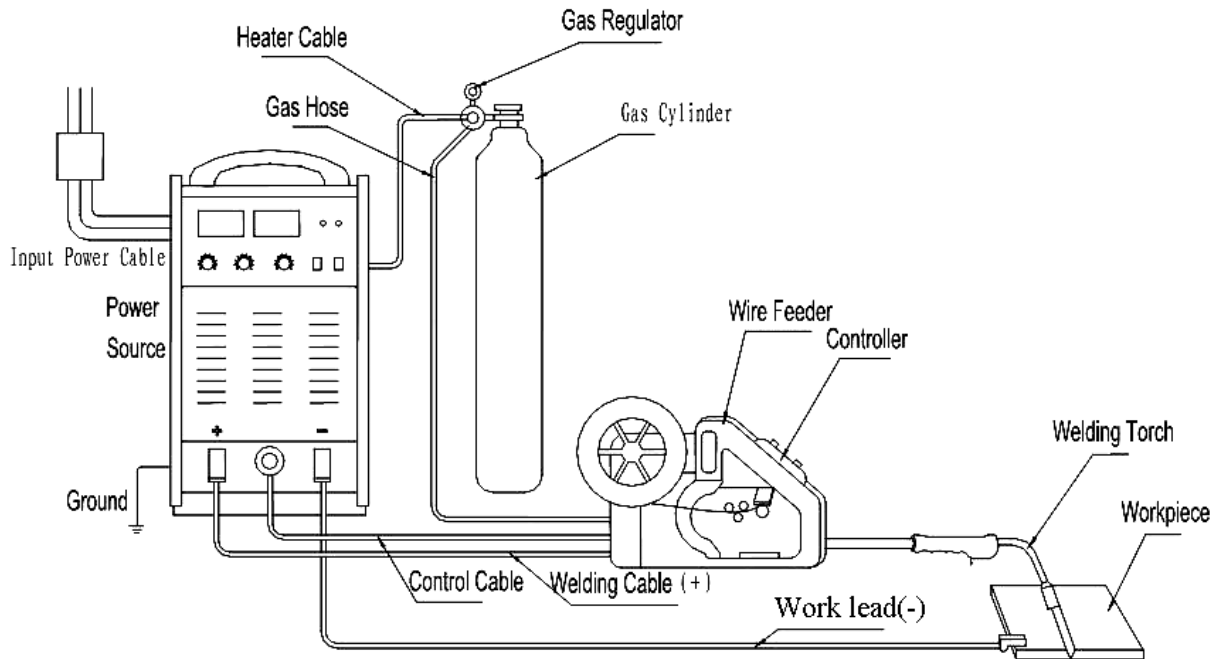


Figure 6: Connection Chart for MIG Series

Operation Guide for Connection:

- (1) Connect the welder's terminal plug (-) to the work piece by work lead.
- (2) Connect the welder's terminal plug (+) to the wire feeder by welding cable.
- (3) Connect the welder's control cable socket to the wire feeder by control cable.
- (4) Connect feeder's gas hose to the regulator.
- (5) Connect the regulator's heater cable to the welder's "gas heater power" cable socket. (on the rear panel).
- (6) Connect the welder's power cable to the disconnection switchboard, while grounds the lead safely.
- (7) Reset the circuit breaker on the welder's rear panel.

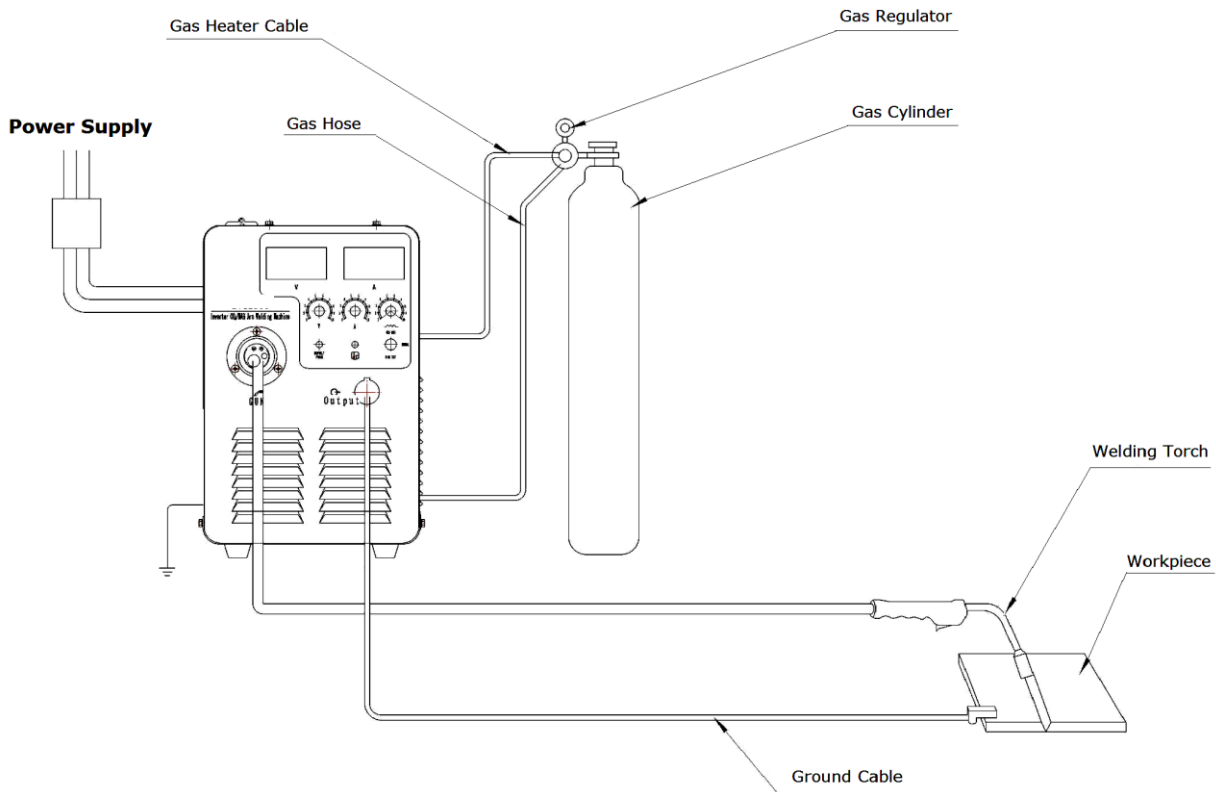


Figure 7: Connection Chart for MIG-C series

Operating Guide for connection:

- (1) According to the wire diameter, choose suitable wire feeding tube and contact tip.
- (2) Choose suitable wire feeding roller according to wire type, adjust the pressure value by the pressure handle.
- (3) Install wire spool, feeding wire to the torch via wire feeding rollers.
- (4) Press “wire test” button, make the wire outside of torch to 10mm.
- (5) Connect the work piece by ground cable.
- (6) Connect the torch to welding machine’s torch connection.
- (7) Connect gas hose of welding machine to gas regulator.
- (8) Use heating power output socket on rear panel (AC36V) to supply power to heater of CO₂.
- (9) Connect 3-phase power supply, and ensure good grounding.
- (10) Turn on the circuit breaker that is on rear panel.

2. Operating procedure:

Reset the circuit breaker on the switchboard, then the welder's indicator lamp will turn on, and the cooling fan will spin. Press on the "Inch feeding" button on the feeder's controller, the feeder begin to feed wire. Preset the process parameters by regulating the controller, tuning the knob, and flipping the switch to proper location on the front panel of the welder. When the torch switch is pulled, the feeder start to feed wire, and CO₂ will blow out of the nozzle, therefore it can be used for welding. Operators can select parameters from table listed below. Be sure to turn off the valve of gas bottle and unplug the power cord while stop welding.

Welding current (A)	Welding voltage (V)	Suitable wire (mm)
60~80	17~18	Φ0.8、Φ1.0
80~130	18~21	Φ1.0、Φ1.2
130~200	20~24	Φ1.0、Φ1.2
200~250	24~27	Φ1.0、Φ1.2
250~350	26~32	Φ1.2、Φ1.6
350~500	31~39	Φ1.6
500~630	39~44	Φ1.6

Table 5: Suggest welding parameters for selected wire

Work piece thickness (mm)	< 1	2	3	4 ~ 5	6 ~ 12	≥13
Electrode diameter (mm)	1.5	2	3.2	3.2 ~ 4	4 ~ 5	5 ~ 6
Welding current (A)	20 ~ 40	40 ~ 50	90~110	90~130	160~250	250~400

Table 6: MMA welding parameters

Work piece thickness (mm)	Welding current (A)	Tungsten electrode diameter (mm)	Max Argon gas flow rate (L/min)
1 ~ 3	40 ~ 50 50 ~ 80	1 ~ 2	4 6
3 ~ 6	80 ~ 120 120 ~ 160 160 ~ 200 200 ~ 300	2 ~ 4	7 8 9 10
6 ~ 9	300 ~ 400	4 ~ 6	12

Table 7: TIG welding parameters

Attention: On MMA, when welding current is low and cable length of electrode holder is short (no more than 40m), arc force current should be adjusted in the range of 1-7. As to large welding current and long cable of electrode holder, where volt potential difference is very high between the two ends of cable, arc force current should be adjusted in the range of 7- 10.

1. MIG Series Panel I illustration and parts number reference

1. 1 MIG series Front panel and parts number reference

Front panel is illustrated below, other models are little different from this.

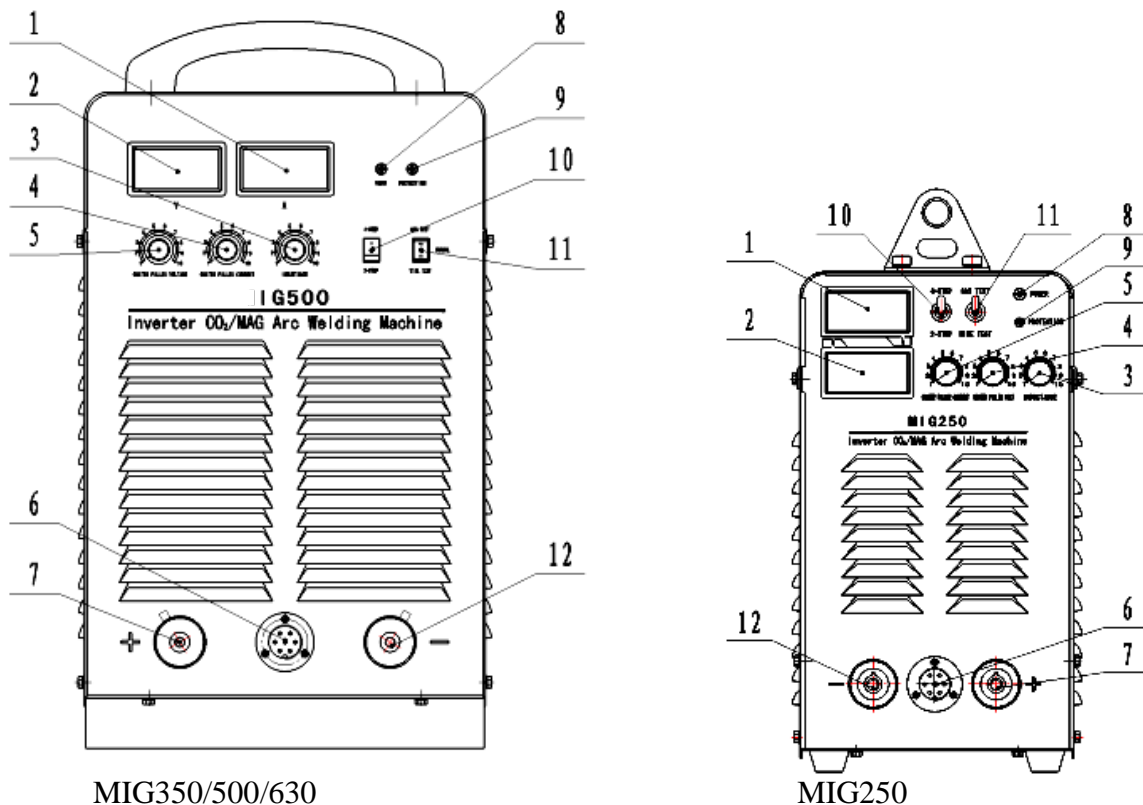


Figure 8: Front Panel (MIG series)

(1) “Output Amp” meter

Display relative feeding speed while in open load, and display practical value of current while in welding.

(2) “Output volt” meter

Display preset value of volt while in open load, and display practical value while in welding.

(3) “Inductance” regulation knob

Altering welding stability, penetration and spatter volume.

(4) “Crater filling Amp” regulation knob

Adjusting current value in 4-step mode

(5) “Crater filling volt” regulation knob

Adjusting volt value in 4-step mode

(6) Wire feeder's control cable socket

Connect to wire feeder's control cable

(7) Terminal lug (+)

Connect to wire feeder's welding cable

(8) "Power" indication lamp

Lamp indicating whether power source is effectively connected to power supply.

(9) "Protection" indicator lamp

Welding machine will automatically stop working when it is overheat, and the lamp will be light on.

(10) "4-step /2-step" mode switch

Switch to "2-step", perform welding when push torch switch, stop welding when release the switch. This mode is suitable for short weld. To "4-step", after successfully starting arc by push torch switch, then you can perform welding by release the switch, when you push torch switch again, torch will turn into crater-filling situation which was preset by stop- arc knobs on the front panel. The welder will stop welding when release the switch. This mode is suitable for welding long weld.

(11) Mode selection switch

When the switch is on "Gas test", the electromagnetic valve will be opened, you can check if the airflow is normal. When on "Wire test", you can check up the welding machine's state, it is the same function as to push the weld torch switch. When on "normal", the welding machine is on normal working state.

(12) Terminal lug (-)

Wire work piece by work lead

1.2 MIG series rear panel & parts number

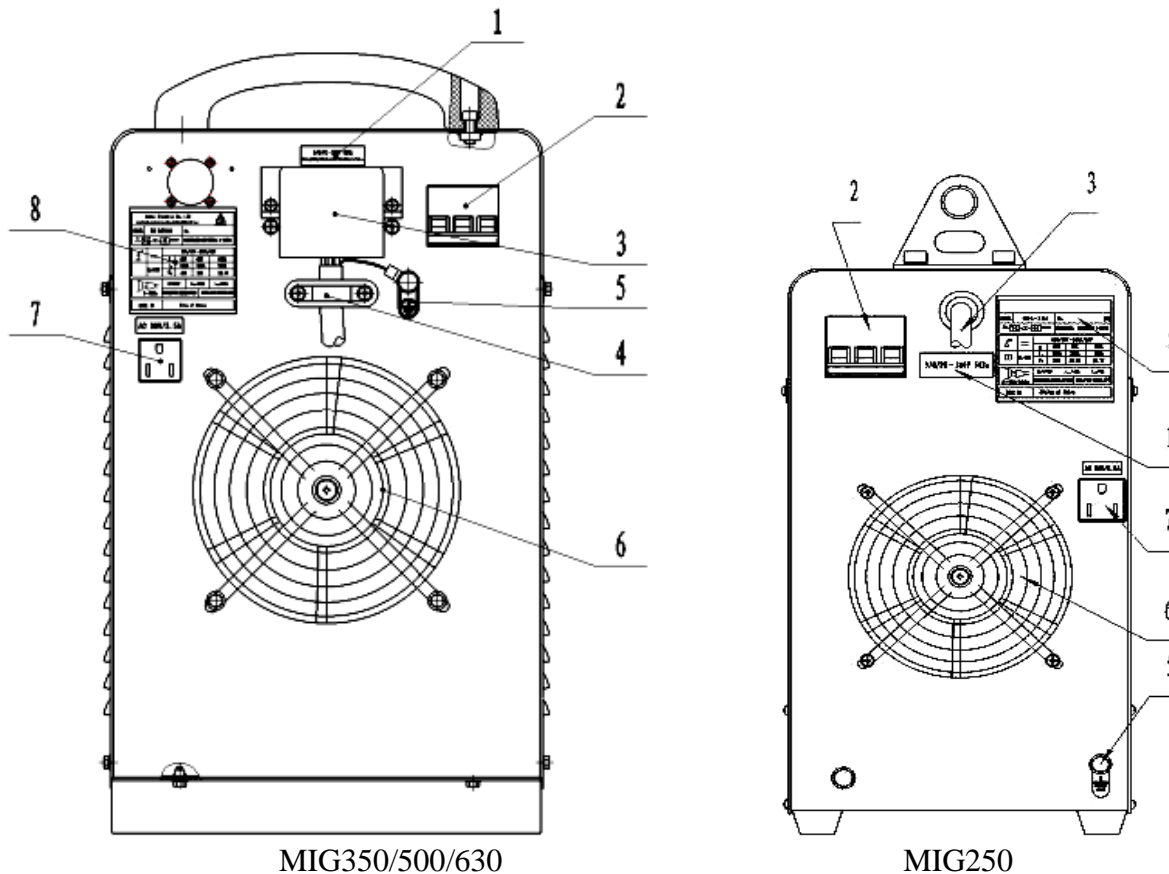


Figure 9: Rear panel (MIG series)

- (1) Input warning sign
- (2) Circuit breaker

The function of circuit breaker is to protect welding machine by automatic trip to turn-off power supply while in machine overload or failure. Normally, the switch flipped to upward which means power-on. Use switch on the disconnected switchboard or switchbox (customers prepare by them) to start or stop welding machine, avoiding using the circuit breaker.

- (3) Input power cable

The mixed-colored wire must be firmly grounded, the rest wires connect to 3-phase power (380V/50Hz) respectively.

- (4) Plastic cable clamp
- (5) Ground bolt

To ensure operators not to be harmed and welding machine to be working normally, make sure the ground bolt grounded firmly by ground lead specified in the table 8, or ground wire (mixed-colored) of the input power cord grounded firmly.

- (6) Cooling fan

Cool down the heat components in the welding machine.

(7) Gas Heater power cable socket (AC36V)

Connect to CO₂ regulator's heating coil.

(8) Specification Plate

2. MIG500A Panel I illustration and parts number reference

2.1 MIG500A Front panel and parts number reference

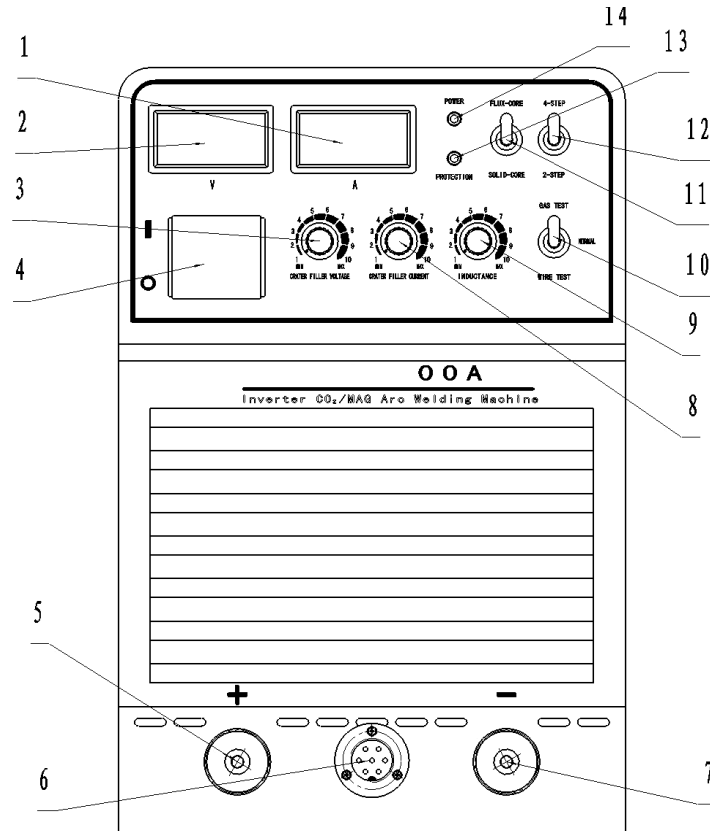


Figure 10: Front Panel (MIG500A)

(1) “Output Amp” meter

Display relative feeding speed while in open load, and display practical value of current while in welding.

(2) “Output volt” meter

Display preset value of volt while in open load, and display practical value while in welding.

(3) “Crater filling volt” regulation knob

Adjusting volt value in 4-step mode

(4) Circuit breaker

The function of circuit breaker is to protect welding machine by automatic trip to turn-off power supply while in machine overload or failure. Normally, the switch flipped to upward which means power-on. Use switch on the disconnected switchboard or switchbox (customers prepare by them)

to start or stop welding machine, avoiding using the circuit breaker.

(5) Terminal lug (+)

Connect to wire feeder's welding cable

(6) Wire feeder's control cable socket

Connect to wire feeder's control cable

(7) Terminal lug (-)

Wire work piece by work lead

(8) "Crater filling Amp" regulation knob

Adjusting current value in 4-step mode

(9) "Inductance" regulation knob

Altering welding stability, penetration and spatter volume.

(10) Mode selection switch

When the switch is on "Gas test", the electromagnetic valve will be opened, you can check if the airflow is normal. When on "Wire test", you can check up the welding machine's state, it is the same function as to push the weld torch trigger. When on "normal", the welding machine is on normal working state.

(11) Wire selection switch

To select flux-core or solid-core

(12) "4-step/ 2-step" mode switch

Switch to "2-step", perform welding when push torch trigger, stop welding when release the trigger. This mode is suitable for short weld. To "4-step", after successfully starting arc by push torch trigger, then you can perform welding by release the trigger, when you push torch trigger again, torch will turn into crater-filling situation which was preset by stop- arc knobs on the front panel. The welder will stop welding when release the trigger. This mode is suitable for welding long weld.

(13) "Protection" indicator lamp

Welding machine will automatically stop working when it is overheat, and the lamp will be light on.

(14) "Power" indication lamp

Lamp indicating whether power source is effectively connected to power supply.

2.2 MIG500A rear panel & parts number

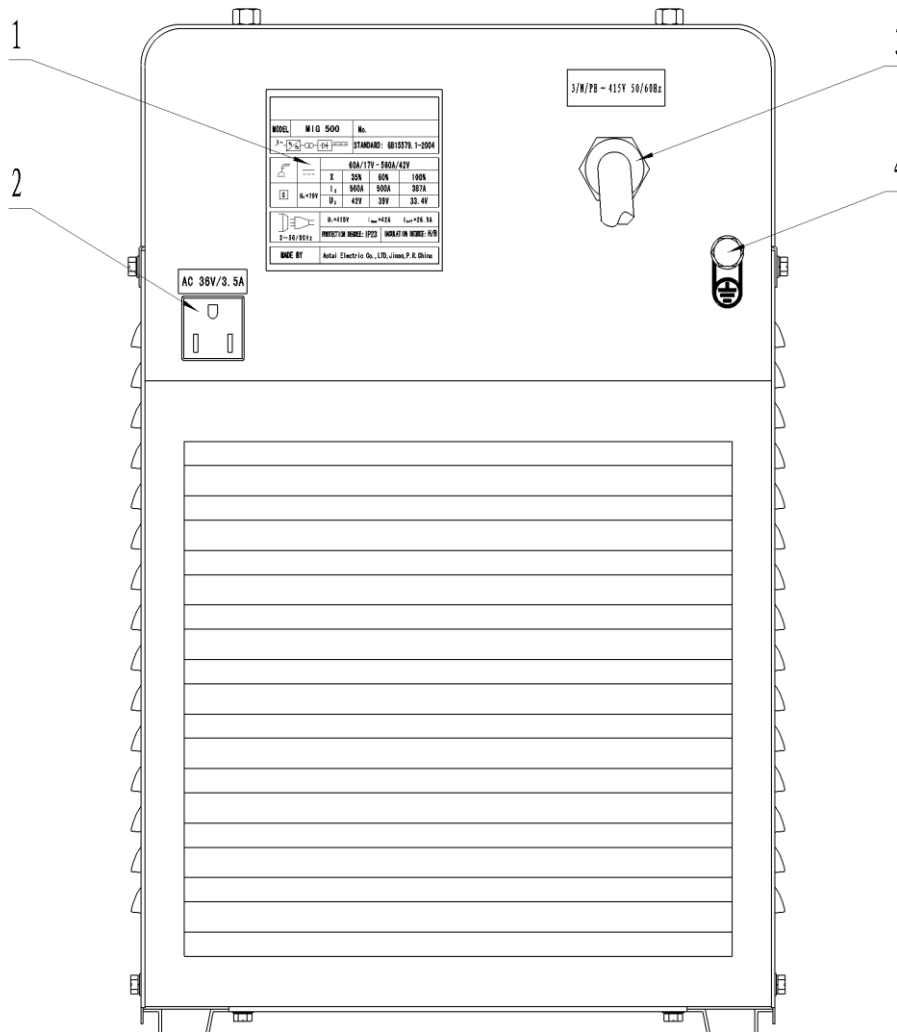


Figure 11: Rear Panel (MIG500A)

- (1) Specification plate
- (2) Gas Heater power cable socket (AC36V)
Connect to CO₂ regulator's heating coil
- (3) Input power cable
The mixed-colored wire must be firmly grounded, the rest wires connect to 3-phase power (380V/50Hz) respectively.
- (4) Ground bolt
To ensure operators not to be harmed and welding machine to be working normally, make sure the ground bolt grounded firmly by ground lead specified in the table 6, or ground wire (mixed-colored) of the input power cord grounded firmly.

3. MIG-C Series Panel I illustration and parts number reference

3.1 MIG-C series front panel and reference number

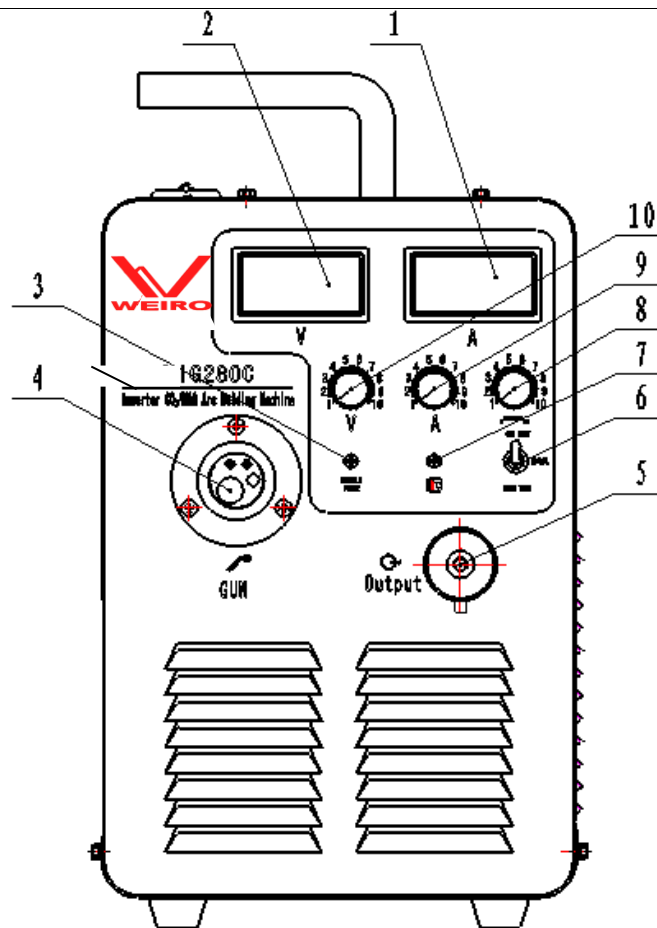


Figure 12: Front Panel (MIG-C series)

(1) “Output Amp” meter

Display relative feeding speed while in open load, and display practical value of current while in welding.

(2) “Output Volt” meter

Display preset value of volt while in open load; display true value while in welding.

(3) “Default phase” indicator

Light on when defaultphase

(4) Torch connection

Europe connection, connect to the torch

(5) Output terminal (-)

Connect to the work piece by ground cable

(6) Mode selection switch

When the switch is on “Gas test”, the electromagnetic valve will be opened, you can check if the airflow is normal. When on “Wire test”, you can check up the welding machine’s state, it is the same function as to push the weld torch switch. When on “normal”, the welding machine is on normal working state.

(7) “Over heat” protection indicator

Light on and stops welding automatically while in overheat, but will not light up when normally welding.

(8) “Inductance” regulation knob

Altering welding stability, penetration and spatter volume.

(9) Welding current adjustment knob

Used for adjusting current value.

(10) Welding voltage adjustment knob

Used for adjusting voltage value.

3.2 MIG-C rear panel and parts number reference

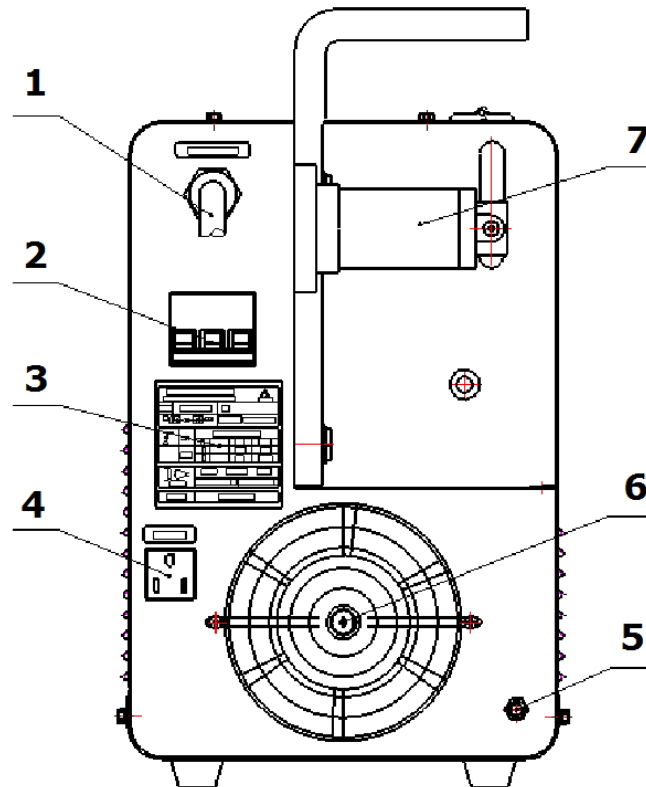


Figure 13: Rear panel (MIG-C series)

(1) Input power cable

The mixed-colored wire must be firmly grounded, the rest wires connect to 3-phase power (380V/50Hz) respectively.

(2) Circuit breaker

The function of circuit breaker is to protect welding machine by automatic trip to turn-off power supply while in machine overload or failure. Normally, the switch flipped to upward which means power-on. Use switch on the disconnected switchboard or switchbox (customers prepare by them) to start or stop welding machine, avoiding using the circuit breaker.

(3) Specification Plate

(4) Gas Heater power cable socket (AC36V)

Connect to CO₂ regulator's heating coil.

(5) Gas inlet

Connect to gas regulator with gas hose.

(6) Cooling fan

Cool down the heat components in the welding machine.

4. MIG-M Series Panel I illustration and parts number reference

4.1 MIG-M series front panel and reference number

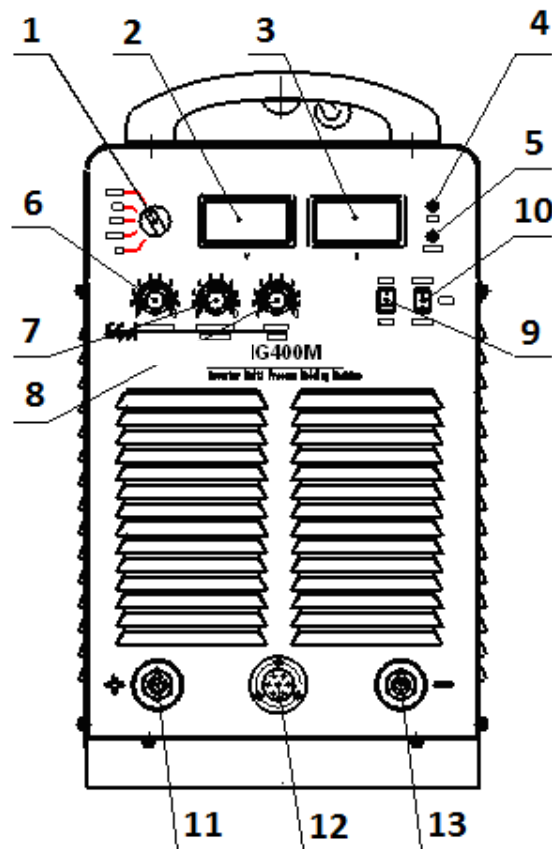


Figure 14: Front Panel (MIG-M series)

(1) Transfer Switch for welding process

Presetting the different welding process such as CO₂/MAG, FCAW (flux –cored wire welding), Stick, Gouging, Simple TIG.

(2) “Output volt” meter

In MAG, FCAW: display preset value of volt while in open load, and display practical value while in welding.

In Stick, TIG, Gouging: display practical value in open load and during welding.

(3) “Output Amp” meter

In MAG, FCAW: display relative feeding speed while in open load, and display practical value of current while in welding.

In Stick, TIG, Gouging: display preset value of current while in open load, and display practical value during welding.

(4) “Power” indication lamp

Lamp indicating whether power source is effectively connected to power supply.

(5) “Protection” indicator lamp

Welding machine will automatically stop working when it is overheat, and the lamp will be light

on.

(6) “Crater filling volt” regulation knob

Adjusting volt value in 4-step mode

(7) “Crater filling Amp” & “welding current” regulation knob

In MIG and FCAW mode, adjusting current value in 4-step mode

In MMA, TIG, Gouging mode, adjusting the welding current value

(8) “Inductance” & “ARC FORCE” regulation knob

In MIG and FCAW mode, altering welding stability, penetration and spatter volume;

In MMA mode, adjusting the arc force current value;

In Gouging, this knob has no function.

(9) “4-step/ 2-step” mode switch

Switch to “2-step”, perform welding when push torch trigger, stop welding when release the trigger. This mode is suitable for short weld. To “4-step”, after successfully starting arc by push torch trigger, then you can perform welding by release the trigger, when you push torch trigger again, torch will turn into crater-filling situation which was preset by stop- arc knobs on the front panel. The welder will stop welding when release the trigger. This mode is suitable for welding long weld.

(10) Mode selection switch

When the switch is on “Gas test”, the electromagnetic valve will be opened, you can check if the airflow is normal. When on “Wire test”, you can check up the welding machine’s state, it is the same function as to push the weld torch trigger. When on “normal”, the welding machine is on normal working state.

(11) Quick socket (+)

In CO₂ /MAG mode, connect to terminal plug of wire feeder (+).

In FCAW/Simple TIG mode, connect to work lead.

In MMA, connect to the work lead or electrode holder according to the electrode type.

In Gouging mode, connect to the gouging torch.

(12) Control cable socket 1

Connect to wire feeder’s control cable.

(13) Quick socket (-)

In CO₂/MAG/Gouging mode, connect to work lead.

In FCAW / TIG mode, connect to welding torch.

In MMA, connect to the work lead or electrode holder according to the electrode type.

4.2 MIG-M series rear panel and parts number reference

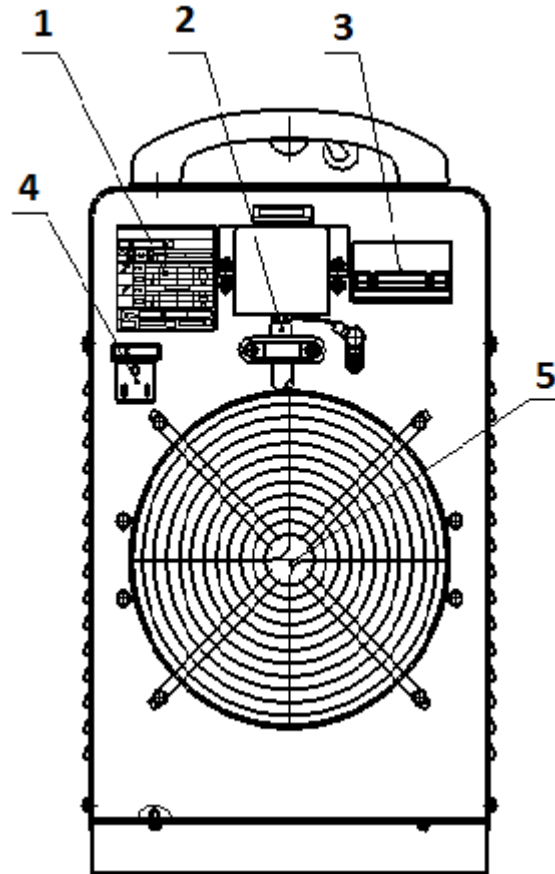


Figure 15: Rear panel (MIG-M series)

(1) Specification plate

(2) Input power cable

The mixed-colored wire must be firmly grounded, the rest wires connect to 3-phase power (380V) respectively.

(3) Circuit breaker

The function of circuit breaker is to protect welding machine by automatic trip to turn-off power supply while in machine overload or failure. Normally, the switch flipped to upward means power-on. Use switch on the switch box to start or stop welding machine. Don't use this air switch as power switch.

(4) Gas Heater power cable socket (AC36V)

Connect to CO₂ regulator's heating coil.

(5) Fan

5. Controller

This controller is fixed on the panel of wire feeder.

Panel illustration and parts number reference

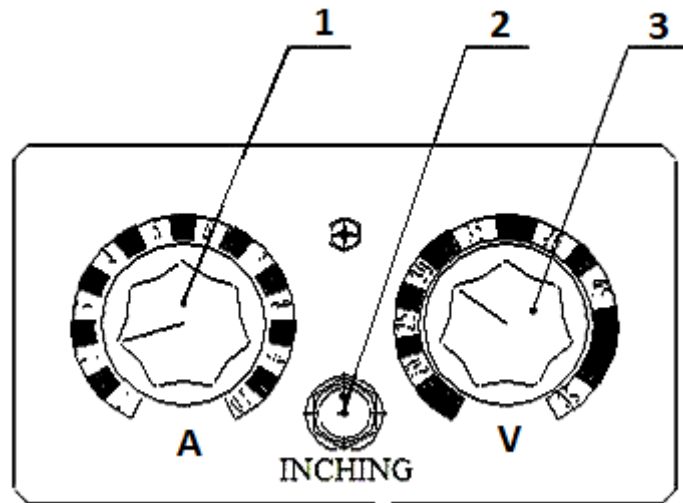


Figure 16: Panel of wire feeder controller

- (1) Current regulation knob
Adjusting welding current
- (2) “Inching” button
Used for quick wire feeding
- (3) Volt regulation knob
Adjusting welding volt

Repair & Maintenance

WARNING: Have a qualified electrician do the maintenance and troubleshooting work. Turn the input power off, using the disconnect switch at the fuse box before working inside the machine.

1. Cautions:

- Rivet equipment name tag on the specified area of the case, otherwise the inside parts will possibly be damaged.
- Connect welding cable to terminals firmly, otherwise the terminals will be burn out which will cause the instability of welding process.
- Avoid welding cable and control cable being broken, and prevent welding machine from being short circuit.
- Never let welding machine be bumped into or stacked up by heavy objects.
- Ensure good ventilation.
- Under high temperature, if work with large current for long period, welder may shut down automatically due to thermal protection acts .At this point, let the machine runs under open-load for a few minutes, and it will be automatically recover.
- Under high temperature, if work with large current for long period, welder may shut down automatically due to circuit breaker trips. Cut off the power supply to the electricity switchboard on frame, and wait for 5 minutes to turn on the circuit breaker on the power source fist then connect the power supply to the electricity switchboard on frame. And leave the machine runs under open-load condition for a while.
- After welding, cut off the gas supply and the power supply.

2. General maintenance

- Remove dust from power resource with pressure air by qualified individuals every 3-6 months. Check if the jointers are loose.
- Check regularly if cables are worn out, knobs are loose, and components of panel are damaged.
- Check regularly if cables are tightly connected to cable connecting terminals in case of terminals being burnt out.
- Clean and replace Contact Tip in time.

3. Procedure for regular checking prior to maintenance

- Check if all front panel switches are on the proper positions.
- Check if the input volt has the phase missing, and range are between 340~420V.
- Check if the input cable is connected correctly and firmly with the power source.
- Check if the ground lead is connected correctly and firmly.
- Check if the welding cables are connected correctly and firmly.
- Check if gas regulator is in good situation and gas flows out normally.

WARNING: Have a qualified electrician do the maintenance and trouble shooting work. Turn the input power off, using the disconnect switch at the fuse box before working inside the machine. Don't open up case uninstructed, the max volt inside machine is 600V. Never discharge high voltage to welder case with welding torch! Shut down power source before changing or repairing welding cable or torch.

No	Trouble	Probable cause	Remedy
01	Indicator lamp does not light on when machine switches on.	(1)Phase missing (2)Circuit breaker is damaged (3)Fuse is broken	(1)Check power supply (2)Replace (3)Replace
02	Circuit breaker trips immediately after the machine is switched on.	(1)Circuit breaker is collapsed. (2)IGBT module is damaged (3)3-phase rectifier bridge is damaged. (4)Varistor is damaged (5)Welder's control board is damaged	(1)Replace (2)Replace IGBT module and drive board (3) Replace (4) Replace (5) Replace main control board
03	Circuit breaker trips while in welding	(1)Welding machine operates in long term overload (2)Circuit breaker is damaged	(1)Operating machine in rated duty cycle (2) Replace
04	Welding current can not be adjusted	(1)Wire feeder's control cable is broken or controller is damaged (2)Control board is damaged (3)Conductive wire connected the rectifier is broken	(1)Change control cable or controller (2)Replace (3)Reconnect the broken wires
05	Instable arc welding, more spatter	(1)Incorrect welding parameters (2>Contact tip is worn out severely	(1)Fine tune parameters (2)Replace
06	CO ₂ gas regulator can't heat	(1)CO ₂ regulator is damaged (2)Heater cable is broken or shorten (3)Thermistor in power source is damaged	(1)Replace (2)Check and repair (3)Replace
07	Push welding torch switch, wire feeding is normal but airflow is blocked	(1)Control board is damaged (2)Electromagnet valve is damaged	(1)Replace (2)Replace
08	Push welding torch switch, wire feeder do not work and there is no open load volt display	(1)Torch switch is damaged (2) Feeder's control cable is broken (3)Control board is damaged	(1)Replace welding torch (2)Repair control cable (3)Replace main control board

Table 12: Trouble Shooting Table

1. General

The user is responsible for installing and using the arc welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected, then it shall be the responsibility of the user of the arc welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit, see note. In other cases it could involve constructing an electromagnetic screen enclosing the welding power source and the word complete with associated input filters. In all cases electromagnetic disturbances shall be reduced to the point, where they are no longer troublesome.

NOTE: The welding circuit may not be earthed for safety reasons. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes will increase the risk of injury.

2. Assessment of area

Before installing arc welding equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account:

- 1) Other supply cables, control cables, signaling and telephone cables, above, below and adjacent to the arc welding equipment;
- 2) Radio and television transmitters and receivers;
- 3) Computer and other control equipment;
- 4) Safety critical equipment, for example guarding of industrial equipment;
- 5) The health of the people around, for example the use of pacemakers and hearing aids;
- 6) Equipment used for calibration or measurement;
- 7) The immunity of other equipment in the environment is compatible. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;
- 8) The time of day that welding or other activities are to be carried out.

3. Methods of reducing emissions

1) Public supply system

Arc welding equipment should be connected to the public supply system according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the public supply system. Consideration should be given to shielding the supply cable of permanently installed arc welding equipment, in metallic conduit or equivalent.

Shielding should be electrically continuous its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

2) Maintenance of the arc welding equipment

The arc welding equipment should be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the arc welding equipment is in operation. The arc welding equipment should not be modified in any way, except for those changes and adjustments covered in the manufacturer's instructions. In particular, the spark gaps of arc striking and stabilizing devices should be adjusted and maintained according to the manufacturer's recommendations.

3) Welding cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

4) Equipotent bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive an electric shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

5) Earthling of the work piece

Where the work piece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, for example ships hull or building steelwork, a connection bonding the work piece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthling of the work piece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the work piece to earth should be made by a direct connection to the work piece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

6) Screening and shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.

Feedback Form

Name of Company			
Address			
Contact person		Title	
Telephone No		Fax No.	
Email Address			
Company's filed of business			
Comments:			

Thank you for taking the time to share your feedback. Your comments and suggestions will help us to serve you better.