



INVERTER WELDER

OPERATOR'S MANUAL

MODEL:MIG500(N398)/MIG400(N396)/MIG350(N397)

N398B011 SC A0

Preface

Thank you for choosing Jasic inverter welder. In order to ensure your safety and correct operation, please read this manual carefully. Keep this manual properly for future references.

This product is designed and manufactured according to relevant national and international standards, conforming to GB15579, ICE60974, EN60974, AS60974, UL60974, etc.

This product conforms to electromagnetic compatibility requirements for A category equipment.

Relevant design plans and manufacturing technologies of this product are patented.

All products purchased from Jasic are covered for one-year defect liability period, starting from the purchasing day on the contract, provided with complete technical supports and after sales maintenance. Users can contact nearby Jasic office ,customer service center, or Jasic headquarters, if there is anything needed.

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1 SAFETY GUIDANCE

1.1 Precautions for Installation

	<p>Beware of electric shock!</p> <ul style="list-style-type: none">● Install grounding device according to relevant standard.● Do not touch live parts with naked skin, wet gloves or wet clothes.● Make sure you are insulated from ground and workpiece.● Close the cover plate of the machine before power on to avoid any electric shock.● Confirm the safety of your working position.
	<p>Beware of fire hazard!</p> <ul style="list-style-type: none">● Please install the machine in dry indoor working environments; please make sure there is over 30cm distance between the machine and wall/ other objects.● Make sure there are no inflammables near the welding position, or there might be danger of fire hazard
	<p>Beware of explosion!</p> <ul style="list-style-type: none">● This machine can be installed in normal environment where there is exhaust gas or dust which are resulted from normal welding processing. But please do not install the machine in an environment with explosive gas, or metal dust environment, which could have direct contact with spatters; or there might be danger of explosion.

 **Carrying or moving the machine can be dangerous.**






- Cut off the power supply via the switching box before moving the welding machine.
- Make sure that the hanging rings are tightened, and that the machine enclosure and cover are fixed when moving the welding machine with a crane.
- Two lifting belts should be used when lifting the welding machine, and the angle formed by the lifting belt and the vertical direction should be smaller than 15°.
- Do not lift the machine together with other objects.
- Do not apply any stress on the operation panel and cover when moving the welding machine. Otherwise, personal injury or property damage may be caused by a drop.
- Please make sure the wheels are fixed tightly when using a forklift to move the machine.
- Do not install or run the welding machine when the machine is damaged or lacks any components. Otherwise, fire hazard or personal injury may be caused.







Replacing the components can be dangerous.

- Only professionals can replace the machine components. Make sure there are no foreign bodies such as wire leads, screws, gaskets and metal bars falling into the machine inside when replacing the components.
- Make sure the connecting wires inside the machine are correctly connected after replacing the PCBs, and then the machine can be operated. Otherwise, there is a risk of damage to property.

1.2 Precautions for operation

	<p>Only qualified professional is allowed to operate this machine.</p> <ul style="list-style-type: none"> ● Please use national safety supervision department authorized labor protection appliance. ● Operators must be valid and certified welding & cutting special work personnel. ● Do not maintain or fix machines when machine is powered on.
	<p>Smoke-may be harmful to your health!</p> <ul style="list-style-type: none"> ● Welding might generate harmful smoke and gas; please avoid inhalation of waste gas in welding. ● Keep your head away from the smoke during welding. Make sure the working environment is well ventilated with exhaust or ventilation equipment.
	<p>Arc radiation-may hurt your eyes and burn your skin!</p> <ul style="list-style-type: none"> ● Use proper mask and wear protective clothing to protect your eyes and body. ● Use proper mask or curtain to protect onlookers from being injured.
	<p>Magnetic field can make cardiac pacemaker a bit wonky.</p> <ul style="list-style-type: none"> ● People with cardiac pacemaker should consult the doctor before carrying out welding. ● Stay away from the power source to reduce the interference of magnetic field.
	<p>Improper use and operation may result in a fire or an explosion.</p> <ul style="list-style-type: none"> ● Welding spark may result in a fire, so please make sure there are no inflammables near the welding position, and pay attention to fire safety. ● Ensure there is fire extinguisher nearby, and make sure someone has been trained to operate the fire extinguisher. ● Do not cut sealed container. ● Do not use this machine for pipe unfreezing

	<p>Hot workpiece can cause severe scald.</p> <ul style="list-style-type: none"> ● Do not touch hot workpiece with bare hands. ● Cool the welding torch for a while after continuously working.
	<p>Excessive noise does great harm to people's hearing.</p> <ul style="list-style-type: none"> ● Wear ear covers or other hearing protectors when welding. ● Give warning to onlookers that noise may be potentially hazardous to hearing.
	<p>Moving parts may injure your body.</p> <ul style="list-style-type: none"> ● Please keep away from moving parts (like fan). ● Each door, panel, cover, baffle plate, and protective device the like should be closed and located correctly.
	<p>Seek professional supports when trouble strikes.</p> <ul style="list-style-type: none"> ● When trouble strikes in installation and operation, please inspect according to related contents in this manual. ● If you still cannot understand fully, or you still cannot solve the problem, please contact the dealer or the service center for professional supports.

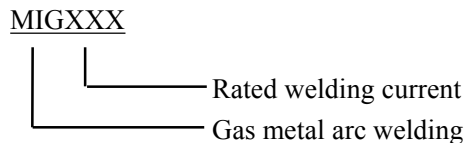
1.3 Precautions for scrapping

Pay attention to the following when discarding the welding machine:

- Burning the electrolytic capacitors in the main circuit or on the PCBs may cause an explosion.
- Dispose the machine as industrial waste.

2 Product overview

2.1 Model name description



2.2 Product features

This digital DC MIG machine is of excellent welding performance, multiple functions, abundant interfaces, convenient operation, high reliability and easy upgrade.

A. Excellent welding performance

Mature IGBT inverter technology: this machine main circuit adopts international cutting-edge high frequency IGBT full bridge inverter technology, which largely reduces machine size and improves power supply conversion rate. High inverter frequency is beyond audio range, which almost eliminates noise pollution, contributing easily controlled welding current, as well as more smooth and stable welding processing.

Brand-new digital control method: the control circuit is dominated by high performance processor, which realizes procedure control of the welding processing, and guarantees stable transition of the whole processing from arc start, welding,crater. Highly successful arc start, fast crater and molten drop elimination. Welding machine can use wires of different material, sizes also different protective gases. Fine control ensures stable welding, less spatter, high wire using efficiency, neat metal welding bead, elegant shape.

B. Powerful functions: digital control with high performance processor equips this machine extra functions which traditional welding machines do not possess. These functions are of vital importance in modern automation and semi-automation welding application.

C. High reliability: this product is carefully designed and has gone through a whole series of lab testing, not only in enclosure, but also internal components. eg. This product external structure is anti-vibration, anti-dust, even anti-metal dust. All electric components, PCB are with special protection treatment, and can be used in damp environment for a long time. Meanwhile, this machine is of over-heat protection, over-current protection, under-voltage protection, lack of water protection, communication failure warning,etc. These protection can guarantee all external and internal failures will not do damage to welding machine and other equipments.

D. Convenient upgrade: this machine adopts high performance processor as its main control chip. Special customized demands can be realized by upgrading software. There is reserved software download interface in the back of the machine, which saves the procedure of open the machine.

3 Technical parameters

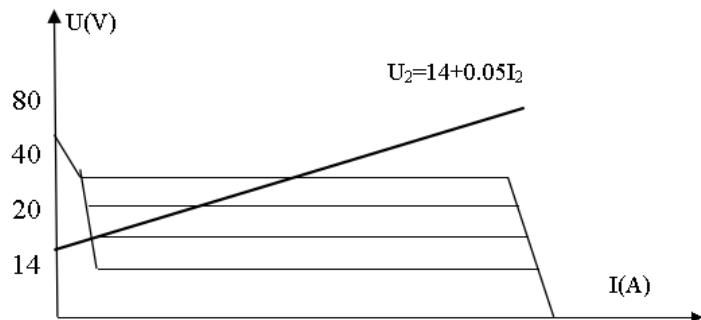
3.1 Technical parameters

model		MIG500(N398)	MIG400(N396)	MIG350(N397)
Input	Power supply	3 phase AC415V±20% 50/60Hz		
	Rated input (KVA)	24.2	16.62	13.67
	Power factor	0.92	0.90	0.89

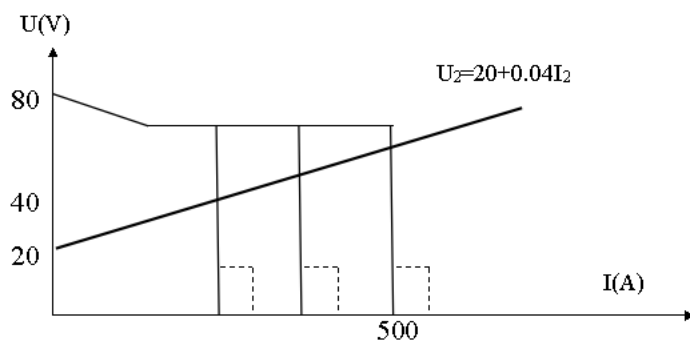
Output	MMA Rated VRD (V)	15	15	-
	MMA Rated max output (A/V)	500A/40V	400A/36V	350A/34V
	MIG rated OCV (V)	80	71	71
	MIG rated max output (A/V)	500A/39V	400A/34V	350A/31.5V
	Welding voltage (V)	10 -50	10-44	10-40
	Welding current (A)	30-500	30-400	30-350
	Wire feed speed (m/min)	1.5-22.0	2.0-22.0	2.0-22.0
	Regulator heater voltage (V)	AC36V(120W)		
	Output characteristics	MMA:CC MIG/MAG:CV		
Environment	Working temperature (°C)	-10~+40		
	Storage temperature (°C)	-25~+55		
	IP class	IP23		
	Cooling type	Air-cooled		
Rated duty circle (%)		50%	60%	60%
Efficiency (%)		91%	90%	90%
Insulation grade		F	F	F
Dimension (mm)		785×330×666	630x300x540	630x300x540
Weight		59	45	43

3.2 Output characteristics

MIG is of CV characteristics
Output external characteristics
curve is as shown on the right.



MMA is of CC characteristics
Output external characteristics
curve is as shown on the right.



4 Installation

4.1 Installation Requirements

4.1.1 Working environment

Please pay attention to the following items when choosing the installation environment:

- Avoid installation in places filled with dusts or metal powder.
- Avoid installation in places filled with corrosive and explosive gases.
- Please make sure the working environment is within $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$; extra forced heat dissipation or derating operation is required if the temperature is more than 40°C
- Humidity has to be below 90% and of no condensed water drop
- Make sure there is no wind in the welding site; please use wind screen if necessary, or else the welding performances may be affected.
- Please consult and confirm with Jasic qualified personnel first if there is any special installation requirements.

4.1.2 Installation space requirements

Keep the welder more than 30cm distant from the wall or any other equipment.

4.2 Electrical Connection

Attention :

- All electrical connection has to be carried out by qualified and licensed operators.
- Please turn off the distribution box switch and make sure safety before any electric connection.
- Please use required standard cables.
- Don't touch with wet hands.
- Tap water pipe, house rebar may be in poor ground condition. Please don't use them as safe ground lead.
- Every welder is equipped with an air switch or fuse.

4.3 Front& back panel introduction

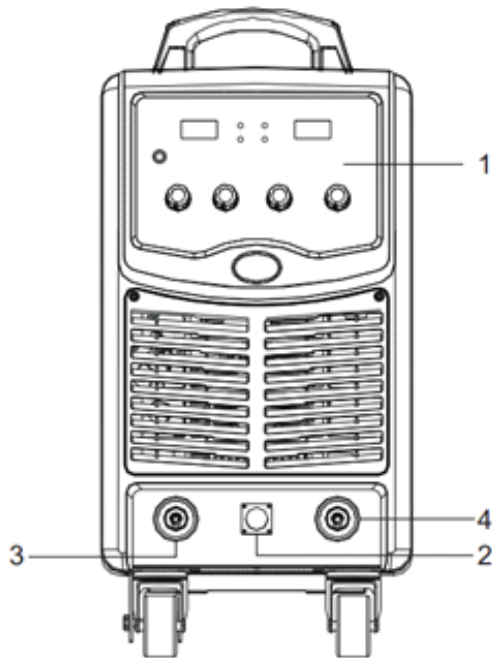


Fig 4.1 Front panel

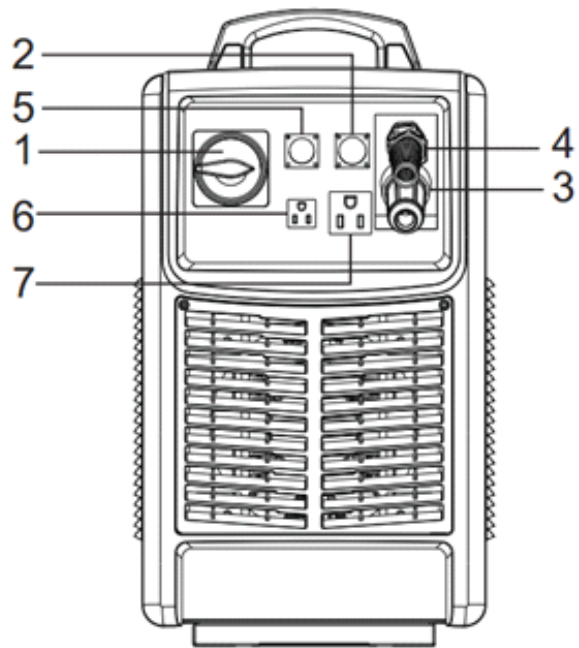


Fig 4.2 Back panel

Front panel description:

1. Analog front panel(parameters selection, setting and display.)
2. Wire feeder control cable connector
3. Quick socket for positive output (connect wire feeder or MMA electrode holder)
4. Quick socket for positive output(connect MMA earth clamp)

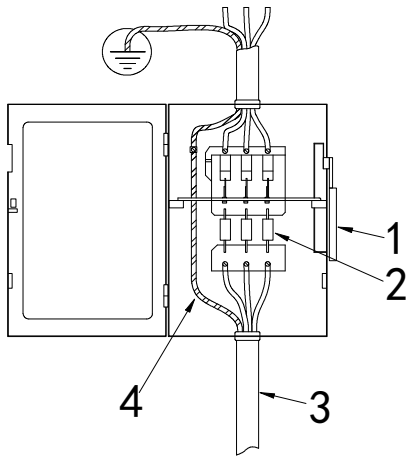
Back panel description:

1. Breaker (air switch)
2. Wire feeder control cable connector
3. Quick socket for positive output(connect wire feeder)
4. 3 phase power cable ($4\times 6\text{mm}^2/4\times 4\text{mm}^2$)
5. Software upgrade interface
6. Socket for gas heater (Not for any other use except heating gas.)
7. Socket for water cooler

4.4 Power supply input cable connection

- Make sure the switch is turned off in the distribution box before install the power supply input cable.
- Connect the welder's input cable to the output port of distribution box switch's. The cable connection is completed.

Connection of the distribution box



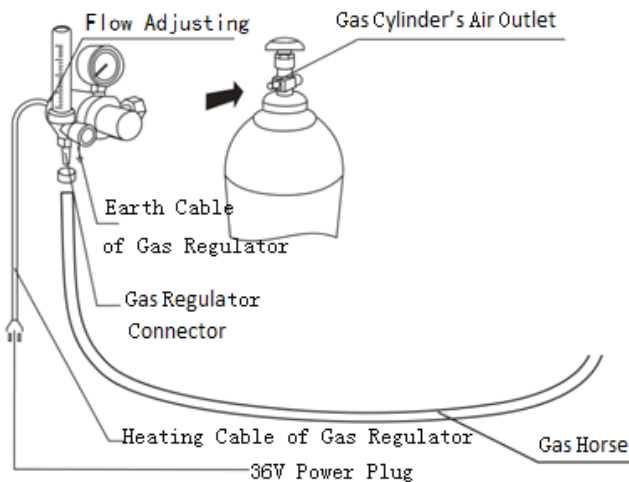
1. Distribution box power switch.
2. Fuse ($\geq 60A$)
3. Welder Cable ($4 \times 6\text{mm}^2$ for MIG500, $4 \times 6\text{mm}^2$ for MIG400 and MIG350)
4. Olivine Ground Cable (Ground connection! NOT Zero Line Connection)

Please connect per the wiring map or other correct wiring way. Please turn off the power supply during connection.

Warning: Power Off during Connection!

- ▲ All connection has to be done by qualified operators.
- ▲ Don't connect two welders in the same fuse-box.
- ▲ If the cover of the machine is grounded, no ground connection of no. # 4 cable.

4.5 Gas cylinder connection

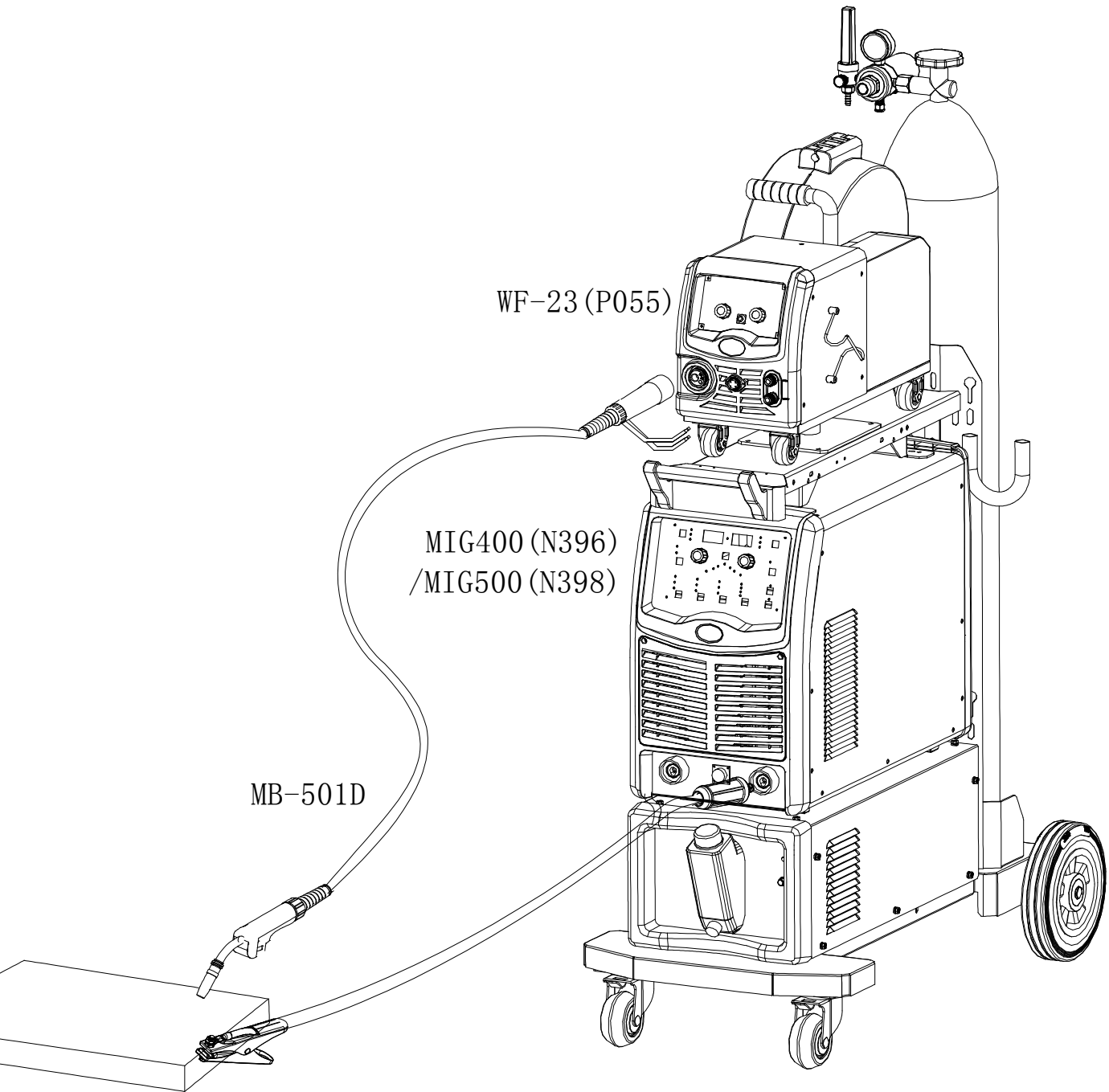


Attention:

1. Connection has to be done by qualified and licensed operators.
2. Please read CO₂ heating gas meter's manual carefully before connection.

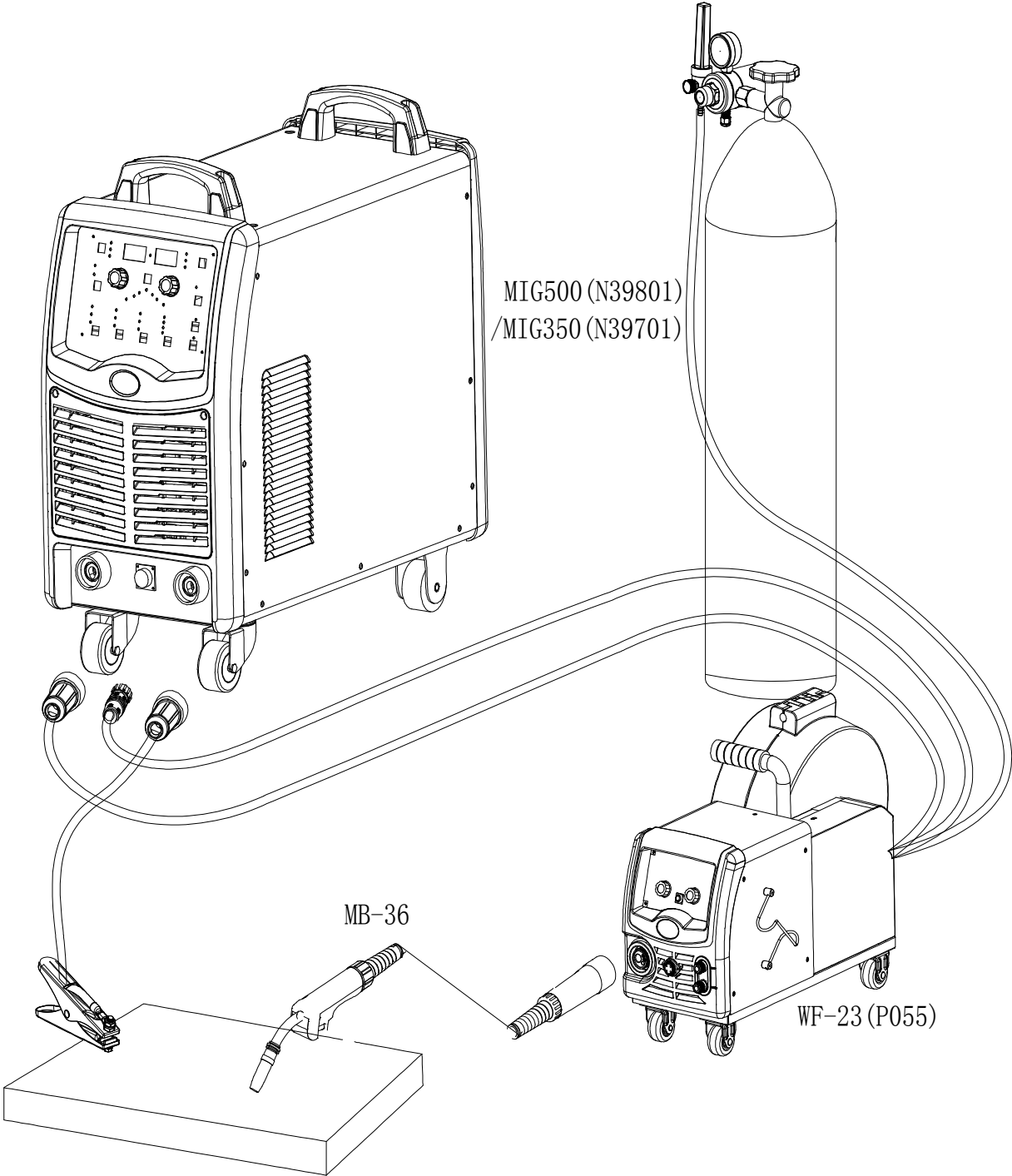
4.6 Machine installation

4.6.1 Compact machine installation



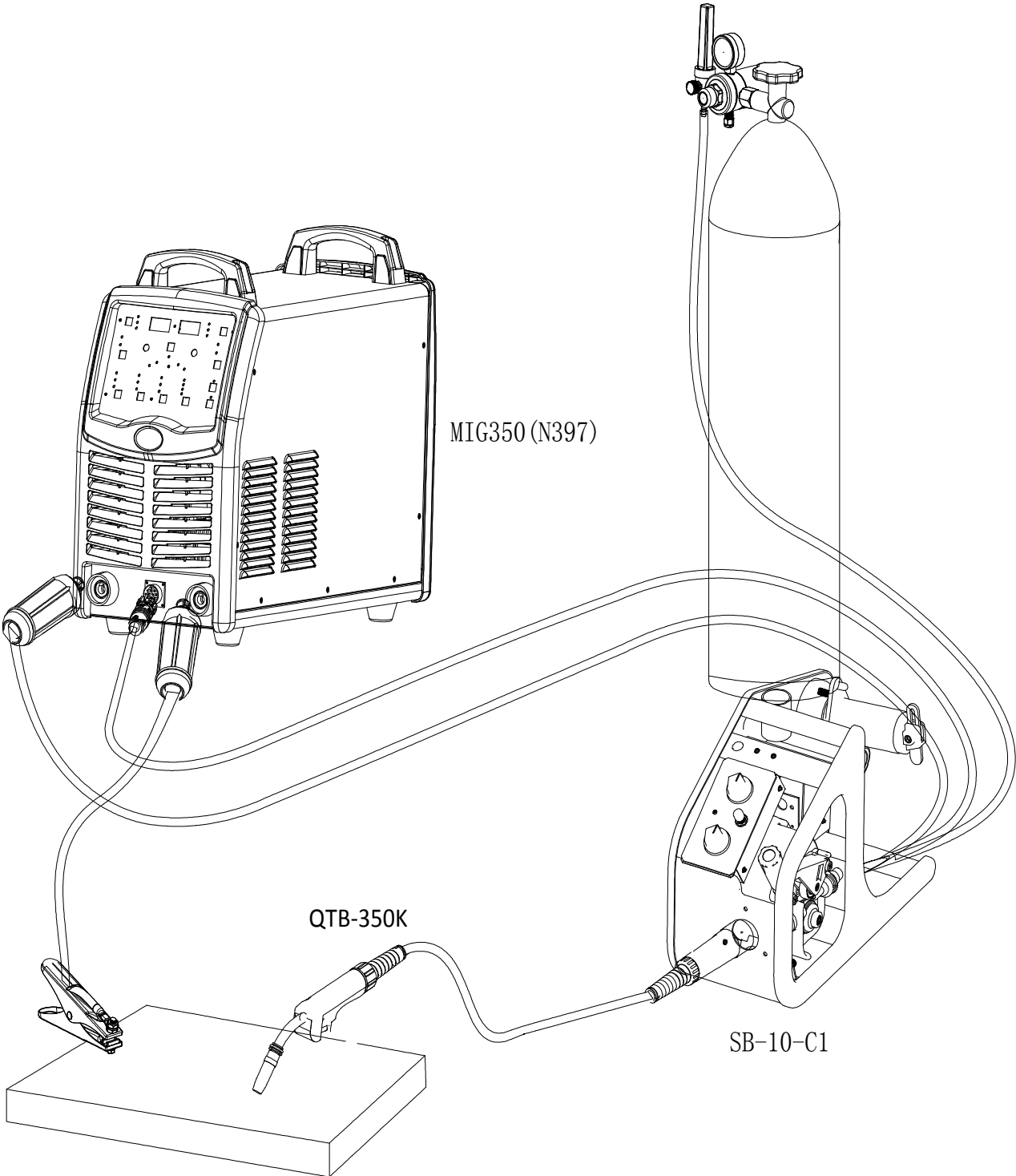
MIG400(N396)/MIG500(N398)

4.6.2 Separated machine installation I



MIG350(N39701)/MIG500(N39801)

4.6.3 Separated machine installation II



MIG350(N397)

5 Functions and operation

5.1 Weld controls and displays

5.1.1 Power source front panel

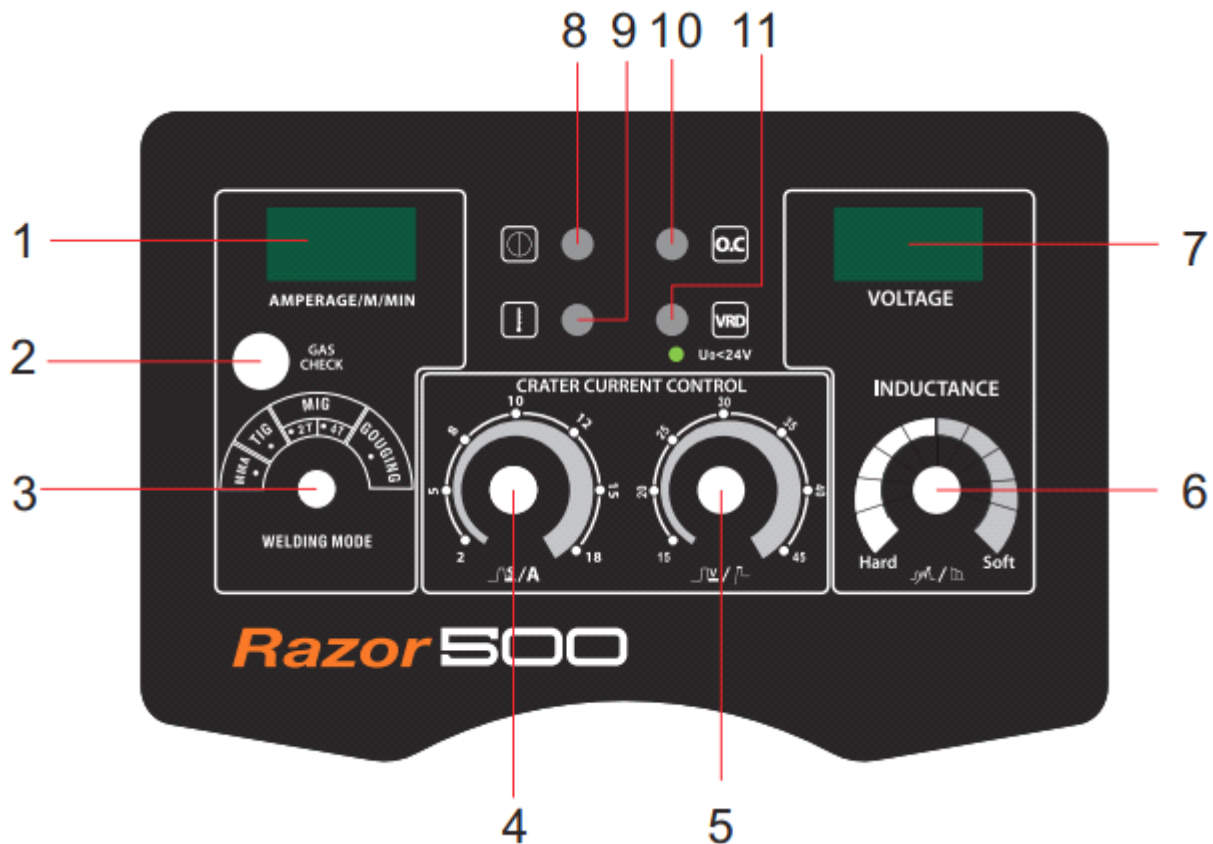


Table 5.1 Power source front panel functions table

1	Amperage Meter	Before MIG operation(current flow), the meter displays preset wire feed speed value, before other modes operation, the meter displays preset current value. During welding, this meter displays actual average amps.
2	Gas Check Switch	Self-locking gas detection: one press and there is gas, it will stop sending automatically after 20s. If press again within 20s, it will stop sending gas.
3	Welding Mode Select Switch	5 Position switch used to select the welding mode.
4	Crater Current /Welding Current	It regulates the crater current under MIG mode, and sets the welding current under the other welding modes.

5	Crater Voltage/Hot Start	It regulates the crater voltage under MIG mode, and adjusts the starting current at arc initiation in MMA and GOUGING modes. Not used in TIG mode.
6	Inductance /Arc Force	It's used to adjust the inductance under MIG mode, and under MMA and GOUGING modes, it's used to adjust the arc force. Not used in TIG mode.
7	Voltage Meter	Before MIG operation (current flow), the meter displays preset voltage value, before the other modes operation, the meter displays the VRD Voltage. During welding, this meter displays actual average volts.
8	Power LED	This LED lights up indicates the welder has been turned on.
9	Over Heat LED	This LED lights up indicates the welder gets into over heat protection and no output for the welder to work.
10	Over Current LED	This LED lights up indicates the welder gets into over current protection and no output for the welder to work.
11	VRD LED Indicator	It is green when the VRD works. The VRD function is unsuitable for MIG mode.

5.1.2 Wire feeder front panel

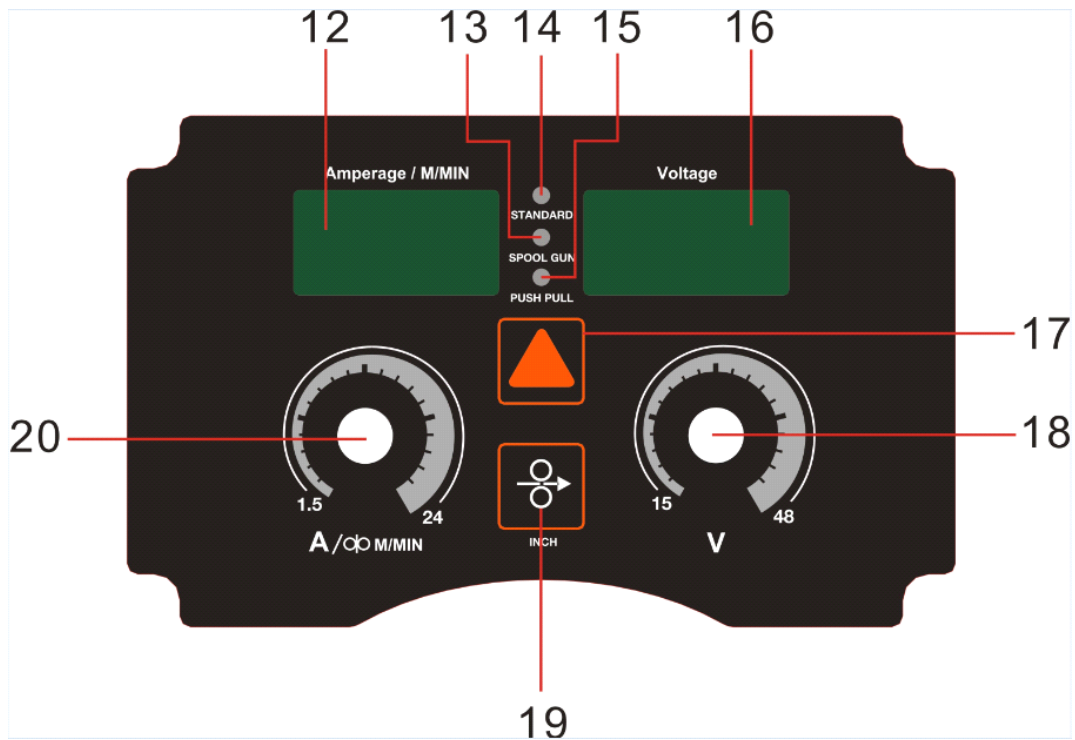


Table 5.2 Wire feeder front panel functions table

12	Amperage Meter	Under MIG mode, the meter displays preset wire feed speed before operation (current flow), and it displays actual average amps during welding. It displays three dashes under other modes.
13	Standard LED	This LED lights up indicates a common welding torch should be used.
14	Spool Gun LED	This LED lights up indicates a spool gun should be used.
15	Push Pull LED	This LED lights up indicates a push-pull welding torch should be used.
16	Voltage Meter	the meter displays preset voltage before operation under MIG mode, and it displays actual average volts during welding. It displays three dashes under other modes.
17	Welding Torch Select Button	Press this button to select Standard ,Spool Gun or Push Pull.
18	Voltage Control	It's used to adjust the voltage under MIG mode, and not used to other welding modes.
19	Wire Feeding Button	Press this button to feeding wire, and release it to stop feeding wire.
20	Current/Wire Feed Speed Control	It's used to adjust the wire feed speed under MIG mode, and not used to other welding modes.

5.2 Basic modes of operation

5.2.1 MMA&GOUGING

This welding mode has constant current feature and can be continuously adjusted range from 30 to500 Amps.

Hot Start [5] - It is used to adjust the arcing current, and it does has no effect on TIG mode. Generally, it is recommended to set the arcing current at a higher value to arcing easily. However, it can be adjusted to a lower value to reduce spatter during arcing or to avoid workpiece burn-through when the workpiece is very thin.

Arc Force [6] - The Arc Force used to adjust the short circuit current and it should be adjusted to an appropriate value, for overly low arc force current(soft arc) would lead to electrode sticking and overly high arc force current(hard arc) would cause excessive spatter. when thin-electrode low-current welding or all-position welding, the selecting of arc force current is even more important. Please set it according to the requirement of the welding process.

Welding Current [4] - The Welding Current can be setted range from30 to500 Amps.

Amperage Display [1] - The Amperage Meter displays preset current value in the idle state and actual average amps in welding.

Voltage Display [7] - The Voltage Meter displays the VRD Voltage in the idle state and actual average volts in welding.

5.2.2 TIG

This welding mode has constant current feature and can be continuously adjusted range from 30 to 500 Amps.

Welding Current [4] - The Welding Current can be setted range from 30 to 500 Amps.

Amperage Display [1] - The Amperage Meter displays preset current value in the idle state and actual average amps in welding.

Voltage Display [7] - The Voltage Meter displays the VRD Voltage in the idle state and actual average volts in welding.

5.2.3 MIG

This welding mode has constant voltage feature and can be continuously adjusted range from 10 to 50V.

Crater Voltage [5] - The Crater Voltage used to adjust the crater voltage in MIG mode.

Inductance - The Inductance used to adjust pinch effect. minimum setting results in soft arc. maximum setting results in a hard arc.

Crater Current [4] - The Crater Current used to adjust the crater current in MIG mode.

Amperage Display [1] [12] - The Amperage Meter displays preset wire feed speed value in the idle state and actual average amps in welding.

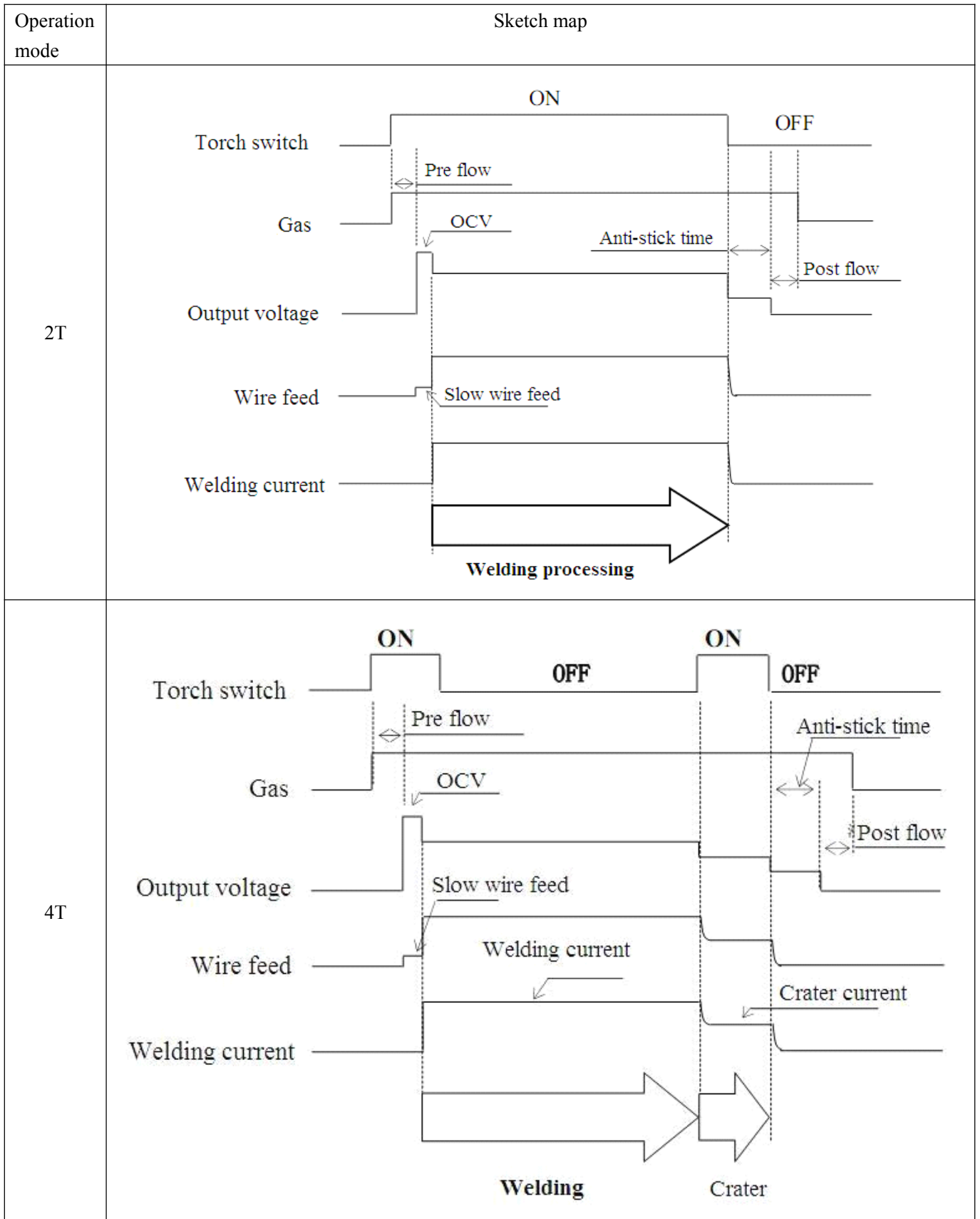
Voltage Display [7] [16] - The Voltage Meter displays the preset voltage value in the idle state and actual average volts in welding.

Current/Wire Feed Speed Control [20] - The Current/Wire Feed Speed Control used to adjust the wire feed speed in MIG mode.

Voltage Control [18] - The Voltage Control used to adjust the welding voltage in MIG mode.

There are two kinds of operation modes in MIG mode, like 2T and 4T. Table 5.3 shows the sketch maps respectively.

Table 5.3 MIG operation modes



6 Operation precautions

6.1 Precautions

- Machine lifting: use fork lift truck or crane for machine lifting. This machine has no hanging rings; please pay attention to the fixture when lift the machine with crane.
- Input cable specs: To connect distribution box and machine, the cable has to be 4×6 mm² for MIG500 and 4×4 mm² for MIG350/400. The breaker or fuse in distribution box has to be bigger than 60A for MIG500 and 40A for MIG350/400.
- Grounding: please connect machine input cables yellow-green wire to PGND.
- Cooling type: air cooling. Please make sure machine is well ventilated and there is nothing on the way of inlet and outlet.
- IP class: IP23.
- Duty circle: Machine will stop welding output when under over-heat protection.
- Power source inclination angle: less than 15° or machine can easily topple over.
- Working environment: should meet the following requirements:
 - a. Temperature : During welding -10℃～+40℃ ,
During transportation and storage -25℃～+55℃
- **Remark:** When using the radiator, please avoid using or storage under coolant's solidification temperature. Please make sure there is no coolant left in the radiator for storage under low temperature.
- b. Relative air humidity: less than 50% when under 40℃; less than 90% when under 20℃.
- c. The dust, acid and corrosive gas and matters in the air can not exceed normal standard, excluding those matters generated from normal welding.
- Do not use this machine for pipe unfreezing.
- Don't let hand, hair or other tools to contact live parts when machine is powered on, eg, fan, so that to avoid any injury or machine damage.
- Avoid water or vapour entering machine inside; in case it happens, please dry the machine internal structure. Then use a mega-meter to test machine's insulation (including wire to wire connection and wire to machine enclosure connection.). welding can be resumed only after the confirmation of no abnormality.
- There are rated duty circle for both machine and torch. Please do not over-load them.
- Please use proper welding cable: when cable size is too small, there will be insufficient current, therefore, unstable arc; there is no output rating and cable can be easily burned.
- Please guarantee the connection is correct; please pay attention to polarity during connection.
- Water cooling torch: please make sure coolant pressure and water flow is under 1-2kg/cm² so that to avoid burning the torch. Even under low current welding, the torch needs to be water-cooled, or else no welding can be carried out.
- Unblocked gas pipe and water pipe: torch burnt and welding defect might be caused if there are heavy items being placed on water pipe or gas pipe, or the pipes are bent and there is no gas flow and water flow.
- Take good care of the torch: inappropriate torch operation can cause wire disconnection, water-leak, gas leak or nozzle failure.
- There might be gas leak or lack of gas flow on torch nozzle if flowmeter or gas pipe connection is not tight enough, which might affect gas protection effects and cause weld porosity. Please check if there is any gas detection with soap-suds.
- Reliable grounding: please make sure the ground connection between machine and power supply, machine

and torch, electrode holder, wire feeder, ground cable; all control cables have to be well connected. If there is any poor connection, failure might be caused, which in return brings machine abnormality, burnt or other failures.

- Connection with workpiece: if people use steel plate and steel bar to replace the cable which connecting the workpiece, the resistance is large and welding current is not stable; moreover, over-heat can easily cause fire hazard. Please use correct insulation cable and workpiece for reliable connection.
- Please pay attention to anti-wind measure if there is wind in the working environment. Or protective gas can be blew away and weld porosity can be caused.
- Welding workpiece surface has grease, rust, paint, water or other items or pollution. please remove them, or else weld porosity and crack can be cause and it will affect welding effects.

6.2 Maintenance

- Periodical cleaning of internal dust: too much dust will lower the machine's insulation performance and can have direct threats to human safety and machine safety. Please have at least twice cleaning each year. if the machine is working in dense smoke and heavily polluted environment, please dedust the machine every day. please cut off power supply before cleaning; remove side cover and top cover, and use dry compressed air to remove the dust following the direction of top to below. The compressed air pressure should be reasonable so that to avoid any damage on machine's small components. Please use a cloth to remove the oil.
- Periodical check on machine's internal circuit connection and make sure they are correct and tightly connected (especially those inserting connectors or components) if there is any rust or loosening parts, please use a sandpaper to remove the rust layer or oxidation layer and connect them tightly.
- Periodical check on cables and check if there is any worn cable insulation skin; if yes, please fix them or replace the cable with new ones.
- Periodical check on machine's insulation resistance: mainly checking machine's insulation resistance between power input and output, also between power input and enclosure, which should be bigger than $10\text{M}\Omega$.
- Please store the machine in the original packing box and place it in dry environment if the machine will not be used for a long time.

6.3 Troubleshooting

Remark: the following operation has to be carried out by qualified personnel who have enough knowledge on electric field and safety. operators has to be equipped with valid certificates which can prove his or her capability and knowledge.

- Please make sure the machine input cable and power grid is cut off before opening the machine.
- The below examples might be related with the components, gas, working environment, and power supply conditions. Please try your best to improve them so that to avoid the similar problems.

Table 6-1 common problems and troubleshooting

phenomenon		Reasons	Suggested solutions
No display when power on the machine		<ul style="list-style-type: none"> Power cable is not well connected Machine failure 	<ul style="list-style-type: none"> connect well the power supply ask for professional help
Fan is not working or abnormal rotating speed during welding		<ul style="list-style-type: none"> 3 phase power cable is well connected phase loss input voltage is too low 	<ul style="list-style-type: none"> connect well the 3 phase power cable solve the power input phase loss resume operation after input voltage is back to normal
The left display shows“Err”, and right display shows“00X”	002	<ul style="list-style-type: none"> overheat protection (thermoswitch) 	<ul style="list-style-type: none"> auto recovery after machine is cooled down.
	003	<ul style="list-style-type: none"> over-heat protection (temperature probe) 	<ul style="list-style-type: none"> auto recovery after machine is cooled down
	001	<ul style="list-style-type: none"> low supply voltage failure on auxiliary power supply 	<ul style="list-style-type: none"> machine can resume to work when power grid input voltage is back to normal. replace the new control board or industrial frequency transformer
	000	<ul style="list-style-type: none"> Over current or failed power components 	<ul style="list-style-type: none"> restart the machine; if over-current still exists, please contact Jasic service man.
	004	<ul style="list-style-type: none"> Failure on water flow 	<ul style="list-style-type: none"> please check if there is not enough water in the radiator and check if water flow is under good condition.
	005	<ul style="list-style-type: none"> Water cooler over-heat The radiator is not well connected to the welder 	<ul style="list-style-type: none"> radiator is over-heated; stop welding until the radiator is cooled off and problem is solved. please do checking after turn off the machine; or there might be danger of electric shock hazard.
	008	<ul style="list-style-type: none"> Wire feeder communication failure 	<ul style="list-style-type: none"> connect tight the control cable; if the problem still can not be solved, please contact Jasic service center.
	009	<ul style="list-style-type: none"> Auxiliary control board communication failure 	<ul style="list-style-type: none"> Please contact Jasic service center

Table 6-2 MIG problems and troubleshooting.

Failures or problems	Analysis	Solutions suggested
Machine has no current output and no failure	<ul style="list-style-type: none"> failure on welding loop failed current feedback inside the machine 	<ul style="list-style-type: none"> please check welding loop and fix the according problem please contact Jasic service center for professional solutions.

There is gas and current output when push torch trigger, but no wire feed.	<ul style="list-style-type: none"> · worn wire feeder control cable · stuck wire feeder · failure on wire feeder · failed machine control board. 	<ul style="list-style-type: none"> · replace or fix the worn wire feeder control cable. · make sure wire feeder is not stuck · fix wire feeder · replace control board
Welding current is unstable	<ul style="list-style-type: none"> · inappropriate wire feeder moment knob adjustment · unmatched wire feed rolls and wire size · seriously worn contact tip · seriously worn wire guide tube in the torch · poor quality wire 	<ul style="list-style-type: none"> · please adjust the suitable wire feeder moment force · please make sure wire feed rolls and wire match · replace torch contact tip · replace the torch's wire guide tube · change a better quality wire
Regulator heater is not working	<ul style="list-style-type: none"> · heater connector is not well connected. · shorted circuit in the heater · machine auto-protection failure heating appliance inside the heater 	<ul style="list-style-type: none"> · connect well the heater · fix heater electric wire · restart the machine back panel over-current protector · replace regulator

6.4 Welding processing reference

When under standard welding conditions, operators can take reference of the following table welding parameters, including CO₂ welding (solid wire),MAG welding (solid wire, Ar 80%+CO₂20%) ,fluxed-cored wire,etc. In actual operation, users can do some adjustment according to workpiece material, shape and welding positions,etc.. if there are strict requirements on welding quality, please obtain the best welding processing parameters by experiments.

Table 6-3 CO₂ welding (solid wire)

type	Workpiece thickness(mm)	Wire dia Φ(mm)	Root gap g(mm)	Welding current (A)	Welding voltage (V)	Welding speed (cm/min)	Distance between contact tip and workpiece (mm)	Gas flow (L/min)
I type butt welding (low speed)	0.8	0.8	0	60-70	16-16.5	50-60	10	10
	1.0	0.8	0	75-85	17-17.5	50-60	10	10-15
	1.2	0.8	0	80-90	17-18	50-60	10	10-15
	1.6	0.8	0	95-105	18-19	45-50	10	10-15

condition)		1.0	0-0.5	120-130	19-20	50-60	10	10-20
	2.0	1.0 1.2	0-0.5	110-120	19-19.5	45-50	10	10-15
	2.3	1.0 1.2	0.5-1.0	120-130	19.5-20	45-50	10	10-15
		1.2	0.8-1.0	130-150	20-21	45-55	10	10-20
	3.2	1.0 1.2	1.0-1.2	140-150	20-21	45-50	10-15	10-15
		1.2	1.0-1.5	130-150	20-23	30-40	10-15	10-20
	4.5	1.0-1.2	1.0-1.2	170-185	22-23	45-50	15	15
		1.2	1.0-1.5	150-180	21-23	30-35	10-15	10-20
	6	1.2	1.2-1.5	230-260	24-26	45-50	15	15-20
			1.2-1.5	200-230	24-25	30-35	10-15	10-20
	8	1.2	0-1.2	300-350	30-35	30-40	15-20	10-20
1.6		0-0.8	380-420	37-38	40-50	15-20	10-20	
9	1.2	1.2-1.5	320-340	32-34	45-50	15-20	10-20	
12	1.6	0-1.2	420-480	38-41	50-60	20-25	10-20	
I type butt welding (high speed condition)	0.8	0.8	0	85-95	16-17	115-125	10	15
	1.0	0.8	0	95-105	16-18	115-125	10	15
	1.2	0.8	0	105-115	17-19	115-125	10	15
	1.6	1.0 1.2	0	155-165	18-20	115-125	10	15
	2.0	1.0 1.2	0	170-190	19-21	75-85	15	15
	2.3	1.0 1.2	0	190-210	21-23	95-105	15	20
	3.2	1.2	0	230-250	24-26	95-105	15	20

Type	Work piece thickn ess (mm)	Wire dia Φ (mm)	Root gap g(mm)	trunca ted edge	Welding layer welding current (A)		Welding voltage (V)	Welding speed (m/min)	Gas flow (L/mi n)	
V type butt welding	12	1.2	0-0.5	4-6	outer 1	300-350	32-35	30-40	20-25	
					inner1	300-350		45-50		
		outer 1			380-420	36-39	35-40			
		inner1			380-420		45-50			
	16	1.2		0-0.5	4-6	outer 1	300-350	32-35	25-30	20-25
						inner1	300-350		30-35	
		outer 1				380-420	36-39	30-35		
		inner1				380-420		35-40		
X type butt welding	16	1.2	0	4-6	outer 1	300-350	32-35	30-50	20-25	
		inner1			300-350					
		1.6			outer 1	380-420	36-39	35-40		
					inner1	380-420				
	19	1.6		0	5-7	outer 1	400-450	36-42	25-30	20-25
						inner1	400-450		25-30	

					outer 1	400-420	36-39	45-50	20-25
					Inner2	400-420		35-40	
	25	1.6	0	5-7	outer 1	400-420	36-39	40-45	20-25
					Inner2	420-450	39-42	30-35	

Type	Workpiece thickness (mm)	Wire diameter Φ (mm)	Leg size(mm)	Welding current (A)	Welding voltage V	Welding speed cm/min	The distance between contact tip and workpiece (mm)	Gas flow L/min	Welding angle
T type flat fillet welding (low speed condition)	1.0	0.8	2.5-3	70-80	17-18	50-60	10	10-15	45°
	1.2	1.0	3-3.5	85-90	18-19	50-60	10	10-15	45°
	1.6	1.0 1.2	3-3.5	100-110	18-19.5	50-60	10	10-15	45°
	2.0	1.0 1.2	3-3.5	115-125	19.5-20	50-60	10	10-15	45°
	2.3	1.0 1.2	3-3.5	130-140	19.5-21	50-60	10	10-15	45°
	3.2	1.0 1.2	3.5-4	150-170	21-22	45-50	15	15-20	45°
	4.5	1.0 1.2	4.5-5	180-220	21-23	40-45	15	15-20	45°
		1.2	5-5.5	200-250	24-26	40-50	10-15	10-20	45°
	6	1.2	5-5.5	230-260	25-27	40-45	20	15-20	45°
			6	220-250	25-27	40-45	13-18	10-20	45°
			4-4.5	270-300	28-31	60-70	13-18	10-20	45°
	8, 9	1.2 1.6	6-7	270-380	29-35	40-45	25	20-25	50°
	8	1.2	5-6	270-300	28-31	55-60	13-18	10-20	45°
		1.2	7-8	260-300	26-32	25-35	15-20	10-20	50°
		1.6	6.5-7	300-330	30-34	30-35	15-20	10-20	50°
12	1.2 1.6	7-8	270-380	27-35	27-40	20-25	20-25	50°	
	1.2	7-8	260-300	26-32	25-35	15-20	10-20	50°	
	1.6	6.5-7	300-330	30-34	30-35	15-20	10-20	50°	
T type flat fillet welding (high speed condition)	1.0	0.8	2-2.5	130-150	19-20	140-145	10	15	45°
	1.2	1.0	3	130-150	19-20	105-115	10	15	45°
	1.6	1.0 1.2	3	170-190	22-23	105-115	10	15-20	45°
	2.0	1.2	3.5	200-220	23-25	105-115	15	20	45°
	2.3	1.2	3.5	220-240	24-26	95-105	20	25	45°
	3.2	1.2	3.5	250-270	26-28	95-105	20	25	45°
	4.5	1.2	4.5	270-290	29-31	75-85	20	25	50°
6	1.2	5.5	290-310	32-34	65-75	25	25	50°	

Table 6-4 MAG welding (solid wire, Ar 80% + CO₂ 20%)

type	Work piece thickness(mm)	Wire dia Φ(mm)	Width of welding seam g(mm)	Welding current (A)	Welding voltage (V)	Welding speed (cm/min)	The distance between contact tip and workpiece(mm)	Gas flow (L/min)
I type butt welding	1.2	0.8	0	60-70	15-16	30-50	10	10-15
	1.6	0.8	0	100-110	16-17	40-60	10	10-15
	3.2	0.8 1.2	1.0-1.5	120-140	16-17	25-30	15	10-15
	4.0	1.0 1.2	1.5-2.5	150-160	17-18	20-30	15	10-15
T type flat fillet welding	0.6	0.8	2	70-80	17-18	50-60	10	10-15
	1.0	1.0	2-2.5	85-90	18-19	50-60	10	10-15
	1.6	1.0 1.2	3	100-110	18-19.5	50-60	10	10-15
	2.4	1.0 1.2	3.5	115-125	19.5-20	50-60	10	10-15
	3.2	1.0 1.2	4	130-140	19.5-21	50-60	15	10-15

Table 6-5 flux-cored wire parameters

Flux type	Welding position	Wire dia Φ(mm)	Leg size(mm)	Welding beads	Welding current (A)	Welding voltage (V)	Welding speed (cm/min)	Swing
Metal		1.2	4	1	240-260	26-28	48-53	N
		1.4		1	320-340	28-30	95-105	N
		1.6		1	340-360	30-32	100-110	N
		1.2	5	1	260-280	28-30	48-53	N
		1.4		1	330-340	29-31	85-95	N
		1.6		1	360-380	32-34	85-95	N
		1.2	6	1	260-280	27-29	40-45	N
		1.4		1	320-340	30-32	75-85	N
		1.6		1	370-390	33-35	75-85	N
		1.2	7	1	270-180	29-31	38-43	N
		1.4		1	340-360	31-33	48-53	N
		1.6		1	370-390	33-35	60-70	N
		1.4	9	1	260-280	27-26	22-26	Y
		1.4	12	1	320-340	30-32	38-42	N

				2	320-340	30-32	40-44	N	
				3	320-340	29-31	48-52	N	
		1.2	9	1	260-280	22-29	23-27	N	
			12	1	290-310	30-32	33-37	N	
Titanium calcium		1.2		2	290-310	30-32	27-31	Y	
			4	-	210-230	26-28	68-72	-	
			6	-	260-280	28-30	48-52	-	
			8	-	290-310	29-31	33-37	-	
		1.4	4	-	250-270	27-29	68-72	-	
			6	-	310-330	30-32	48-52	-	
			8	-	340-360	32-34	33-37	-	
		Vertica l angle weldin g	1.2	4	-	170-190	21-23	48-52	-
				6	-	190-210	22-24	48-52	-
				8	-	210-230	22-24	43-47	-

If welding conditions are not suitable, problems in table 6-6 will happen.

Table 6-6

Inappropriate welding conditions	effects	Inappropriate welding conditions	effects
Long wire extension	Arc is long	Arc voltage is too high	Arc is too long
	Weld bead is wide		Weld bead is wide
	Gas shielding effects will be poor		Bigger penetration and excess weld metal
Short wire extension	Arc is short	Arc voltage is too low	Sticking, spatter
	spatter		Weld bead is narrow
			Smaller penetration and excess weld metal
Welding current is too big	Weld bead is wide	Welding speed is too high	Weld bead is narrow
	Bigger penetration and excess weld metal		Smaller penetration and excess weld metal
Wire extension: the distance between torch contact tip and workpiece.			

6.5 After sales service

Warranty card

There is a warranty card in every machine. Please fill in the according information on the card. Please read carefully the content and keep the card well.

Maintenance

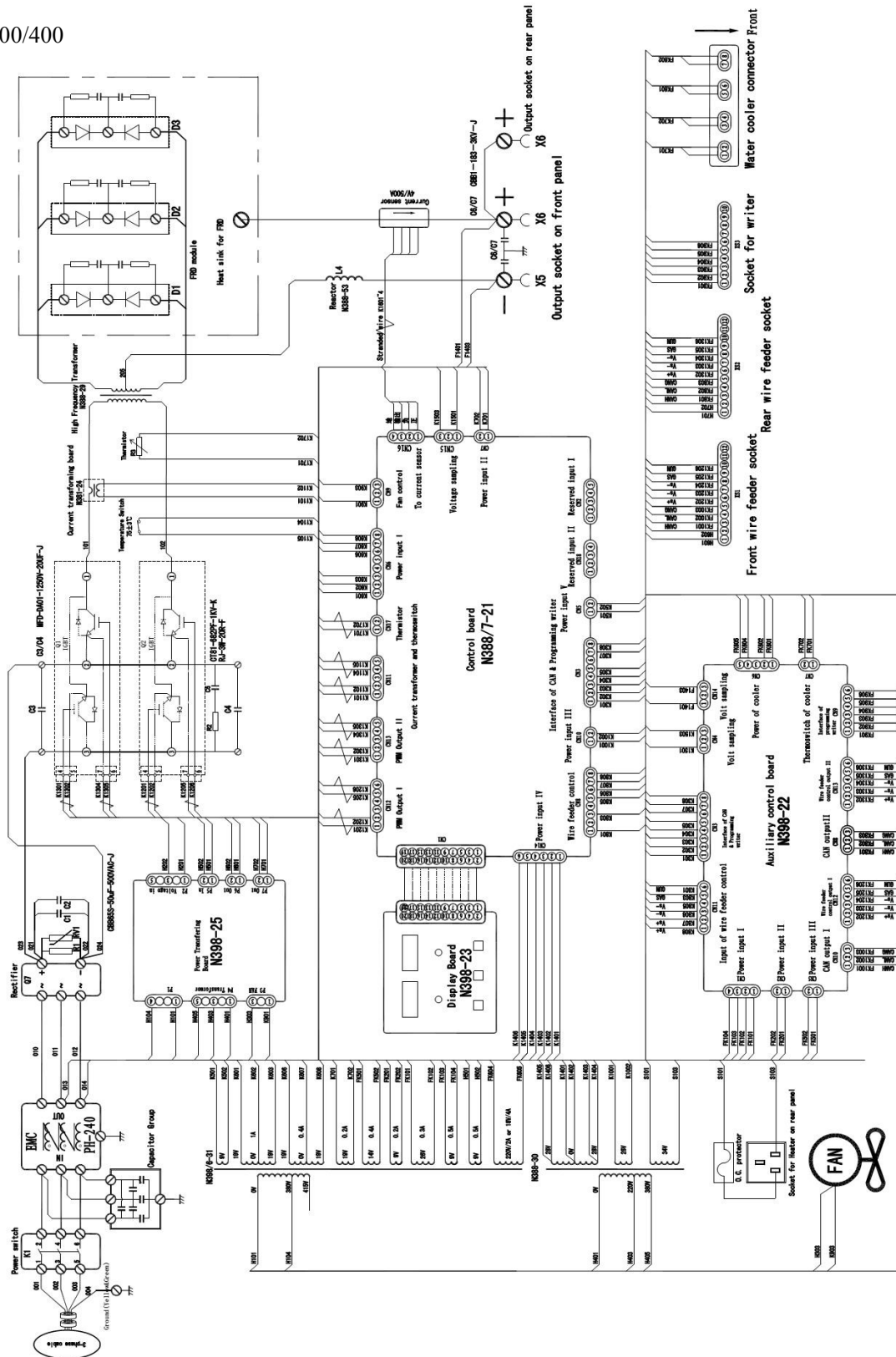
Please do the preliminary troubleshooting or record the according failure information according to common problems analysis and troubleshooting solutions in table 6-1 and 6-2.

If there is any fixture or components replacement needed, please contact local distributors. Please use those accessories or spare parts which are recommended by Shenzhen Jasic Technologies Co.,Ltd.

This machine is covered for one year defect liability period, starting from the purchasing day on the warranty card or purchasing contract. Any machine failure which are caused by abnormal and inappropriate usage are not included in the free warranty scope, but can be fixed with extra charge.

Appendix: Wiring Diagram

MIG500/400





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