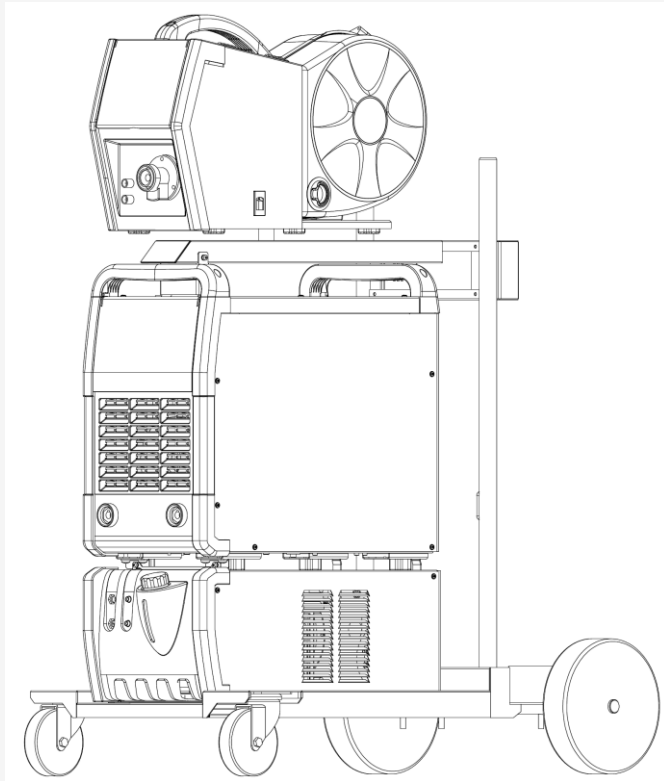


TYN 5000CFY MIG/MAG WELDING MACHINE



Maintenance Manual

V 1.0

Beijing TIME Technologies Co., Ltd

CONTENTS

1. SAFETY PRECAUTIONS	1
1.1 Description of safety signs	1
1.2 Safety signs.....	1
1.3 Electromagnetic field	5
1.4 Electromagnetic compatibility.....	5
2. STRUCTURE AND NAMES OF MAIN COMPONENTS FOR TDN 5000Y.....	8
2.1 Structure of TDN 5000Y Power source	8
2.2 Front case parts	9
2.3. Intermediate parts	10
2.4 Rear case parts.....	11
2.5 IGBT Radiator parts.....	12
2.6 Diode radiator components.....	13
2.7 Fan parts	14
3 Circuit principle	15
3.1 FUNCTIONAL BLOCK DIAGRAM.....	15
3.2 MAIN CIRCUIT	16
3.3 CONTROL MODULE	20
3.4 DISPLAY MODULE	31
3.5 WIRE FEEDER CONTROL MODULE	33
4. FAULT AND ELIMINATION	35
4.1 Fault code	35
4.2 Inspection items during welding failure	39
5. TFN 6000F WIRE FEEDER	41
5.1 Structure	41
5.3 Schematic	42
5.4 Installation of Wire Reel.....	43
5.5 Installation of wire feeder roller	43
5.6 Mounting wire	43
5.7 Replacement of wire guide /outlet of European torch holder	43
5.8. Precautions.....	44
6 TFN 5000C water cooler.....	45
6.1 Structure	45
6.3 Wiring Diagram	46
6.4. Troubleshooting.....	47

1. Safety precautions

Before installing, adjusting and operating machine, it shall ensure to learn all safety regulations.

Although all safety performances have been evaluated during design and production, still be sure to observe safety regulations because welding operation involves in high voltage, electric arc, smoke dust, poisonous gas, metal dust and splashing.

1.1 Description of safety signs



Warning sign shows sudden injury possibly occurs. Linked signs indicate injuries possibly occur.



This group of signs indicates: be careful of danger like personal injury caused by electric shock, movable components and hot objects.

Please refer to safety signs and corresponding safety regulations to avoid injury.

1.2 Safety signs

Following safety signs used in this manual intend to remind the danger to catch attention. When you see safety signs, you shall be careful and observe corresponding safety regulations to avoid injury.

Only professionals can adjust, maintain, care and repair this machine.

During maintenance, other unconcerned persons, especially for children, shall be far away from it.

Injury caused by electric shock



- Do not touch components with voltage.
- Turn off the switch of machine and use breaker and cut off switch to shut off the power or pull out of wiring plug.
- During operation, stand on dry insulation cushion so that operator self is insulated from the ground. Wear dry insulated gloves. Please not use wet or damaged gloves.
- If it requires operating the machine under the voltage, only professionals

familiar with safety regulations can operate it.

- During inspecting the machine under the voltage, it shall observe regulation of “one-hand operation”. Do not stretch your hands into the machine. It shall keep the other hand outside of machine.

- Before moving the machine, it shall cut off the power.
- If it requires opening the housing, please cut off the power firstly and wait for at least one minute and carry out operation.
- Be sure to use the cables whose the cross section is more than that of input end to ground the housing reliably.

- **After the power of inverter welding machine is cut off, there is still DC high voltage.**

Before touching components, please turn off the inverter welding machine, cut off the power and discharge capacitance according to regulations related to part 7: maintenance.

Static electricity damages circuit board



- Before moving circuit board and components, be sure to wear anti-static wristlet (ring) that is grounded reliably.
- Use proper anti-static bag (box) to store, move and transport circuit board.

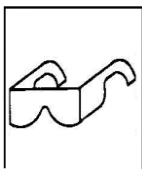
Fire/explosion danger



- Please not place the machine on or near flammable surface.
- Please let combustibles be far away from the site. Do not weld near combustibles.
- Do not weld in closed vessel.

Prohibit using machine for defrosting of the pipe

Splashed metal damages possible eye



Please wear glasses with side mask and mask during maintenance and test.

Wear weld cap and use proper filter glass



Wear helmet, safety gloves, safety shoe and earplug, buckle collar, wear weld cap, select proper filter glass and wear full set of protective clothing.

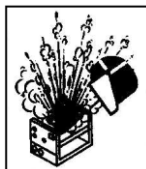
Hot work pieces can cause severe scald



Do not touch hot work pieces with bare hands.

During using welding gun continuously, it shall have a period of cooling time interval.

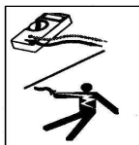
Component explosion can cause injury



When inverter-welding machine is power up, failure components explode possibly or cause other components to explode.

During maintaining inverter-welding machine, it shall wear mask and clothes with long sleeve.

Possibly be subject to electric shock during test

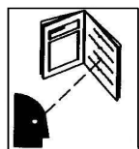


Before measuring lead wire, it shall shut off the power of welding machine firstly.

Use the instrument whose at least one lead wire is with retaining clip (e.g. spring clamp) to measure it.

Read operation instruction of test equipment.

Reference notes



Refer to safety precautions related to welding safety.

Only use quality goods during replacing components.

Magnetic field influences cardiac pacemaker



Before seeing the doctor, operator of cardiac pacemaker shall be far away from the welding machine site.

Falling objects cause possibly machine damage and personal injury



Support the machine by the equipment with enough loads;

If the machine is placed on the inclined plane, pay attention to preventing it from being tilted.

It must use proper trolley to move the machine.

The handle must be used to lift the machine.

Movable components cause possibly personal injury



It shall avoid movable components (e.g. fan).

All guard devices like doors, panels, covers and baffles etc shall be closed tightly and placed in position.

Excessive operation causes overheating of machine



It shall cool down the machine for a period of time and observe regulation of rated duty cycle.

Before restarting welding machine and beginning welding, it requires reducing welding current and working time.

Please not block airflow entering into the machine. Do not air flow resistance due to filtering of airflow.

High-frequency radiation causes interference



High frequency interferes possibly radar navigation, computer and communication equipment.

Installing, adjusting and maintaining high frequency generating components shall be carried out by professionals familiar with electronic equipment.

If the interference problem occurs due to the installation, the customers shall be responsible for solving it. The problem shall be solved by means of qualified professionals.

If government department informs of communication interference, it shall stop operation at once.

It shall detect and maintain equipment regularly.

Minimize possibility of interference with grounding and shielding device

Smoke dust endangers possibly person health



Let the head be far away from smoke dust;

Remove smoke dust with forced ventilation and smoke suction device;

Remove smoke dust with ventilation fan;

During removing smoke dust, it shall observe relevant regulations of protecting environment.

Arc light injures possibly eyes and skin



Wear cap and safety glasses, use earplug and buckle collar tightly. Wear weld cap and use proper filter glass. Wear a full set of protective clothing and helmet.

1.3 Electromagnetic field

Pay attention to influence of welding and low frequency electromagnetic field. When welding current is through cable, electromagnetic field is produced. International blue-collar committee cannot still judge exposing to power electromagnetic field will harm personal health after research of more than 500 cases in past 17 years. But it still keeps on research. Before drawing final conclusion, it had better reduce the time of exposing to this electromagnetic field during welding and cutting.

It shall use following methods to reduce electromagnetic field at job site:

1. Centralize cable as far as possible not to scatter it by wrapping or binding tapes;
2. During routing, lay cable on the side that is far away from operators as far as possible;
3. Do not wind cable on the body or drop it from the body;
4. Welding power and cable are far away from operators as far as possible;
5. The ground clip is clamped on the place that is near the welding point as far as possible.

About cardiac pacemaker:

Operators of cardiac pacemaker shall consult with the doctor firstly. If doctor considers it is harmless, it suggests observing above methods to reduce the influence of electromagnetic field.

1.4 Electromagnetic compatibility

This welding machine meets the requirements of the electromagnetic compatibility in GB15579.10 and IEC.



This welding machine is the A-class machine and not applicable for the resident environment where the power is provided by the public low-voltage power supply system. Because of the conduction and radiation harassment, the electromagnetic compatibility is difficult to be ensured.



This welding machine does not meet the requirements in IEC61000-3-12. If it requires connecting this welding machine with the public low-voltage power supply system, the installers or users of this welding machine shall contact with Electric Power Company (if necessary) to confirm that this welding machine can be connected.

1.4.1 Environmental assessment

Before installing the arc welding equipment, the users shall assess the potential problem of the electromagnetic harassment in the ambient environment. The matters

to be considered are as follows:

- a) Other power supply cables, control cables, signal & telephone wires and others around the arc welding equipment;
- b) Radio and TV transmitting and receiving equipment;
- c) Computer and other control devices;
- d) Critical safety equipment, for example, the security monitoring equipment in the industrial equipment;
- e) The health of the operators around the above equipment, for example, if there are the persons with the hearing aids and the cardiac pacemaker;
- f) The equipment used for the calibration or detection;
- g) Pay attention to the noise immunity the other surrounding equipment; the users shall ensure that the other surrounding equipment is compatible each other, which may require additional protective measures;
- h) The welding time or other activities' execution time in one day;

The considered environmental field depends on the structure of the building and other activities that are possible to be carried out. This field is possible to be beyond the building itself.

1.4.2 The method to reduce the emission

1.4.2.1 Public power supply system

The arc welding equipment shall be connected into the public power supply system according to the method recommended in this operation instruction. If the interference occurs, the additional preventive measures shall be taken, for example, the filter of the public power supply system. For the arc welding equipment that is installed fixedly, the problem that its power cable is shielded shall be considered by using the metal conduit or other equivalent methods. The electrical continuity shall be maintained after being shielded. The shielding layer shall be connected with the housing of the welding power to ensure good electrical contact.

1.4.2.2 Maintenance of arc welding equipment

The arc welding equipment shall be maintained regularly according to the recommendation in this operation instruction. When the arc welding equipment runs, it shall close tightly all ports, the access doors and the covers. The arc welding equipment shall not be changed in any form unless the appropriate change and adjustment are allowed in this operation instruction. Especially for the gap of the spark plug on the arc striking and stabilizing devices, it shall be adjusted and maintained according to the method specified in this operation instruction.

1.4.2.3 Welding cable

The welding cable shall be kept as short as possible and close to each other, abut against or cling to the ground.

1.4.2.4 Equipotential lapping

The lapping problem of all metal objects in the ambient environment shall be noticed. When the metal objects are lapped with the work pieces, the risk of the work will be increased so that the operators may be subjected to the electric shock if they touch these metal objects and electrodes at the same time. The operators shall be insulated from the metal objects.

1.4.2.5 The grounding of the work piece

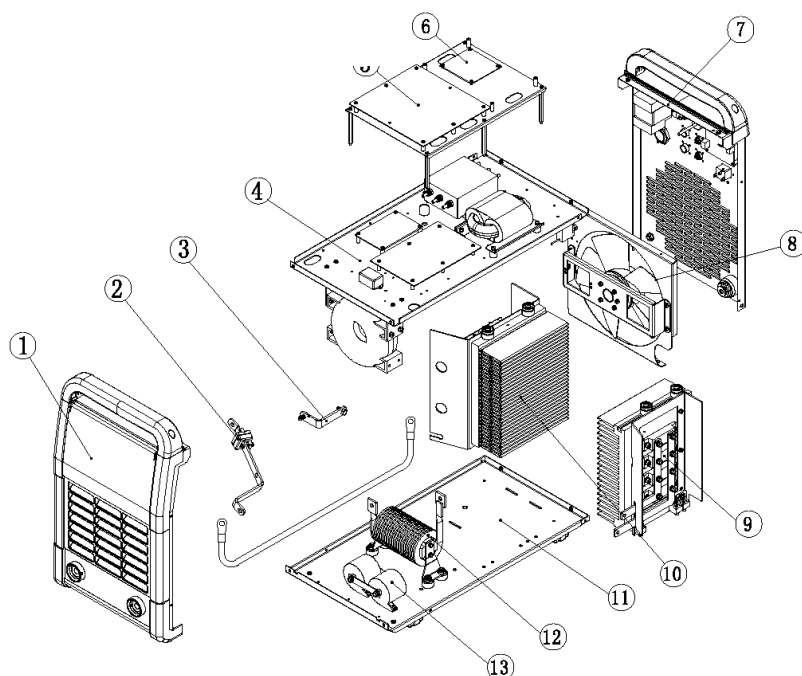
For the reasons like the safe power utilization or the positions, sizes and others of the work pieces, the work pieces may not be grounded, for example, the hull or the structural steel-frame. When the work piece is grounded, sometimes, the emission will be reduced, but not always. Therefore, we must prevent that the risk that the users are subjected to the electric shock is increased and other electrical equipment is damaged because the work piece is grounded. If necessary, the work piece shall be connected directly with the ground, however, the direct connection is not allowed in some countries and the work piece is connected with the ground only by the selected proper capacitance according to the regulations in local country.

1.4.2.6 Shielding

The surrounding equipment and other cables are shielded selectively so as to reduce the electromagnetic interference. In special applications, shielding the whole welding zone can be considered.

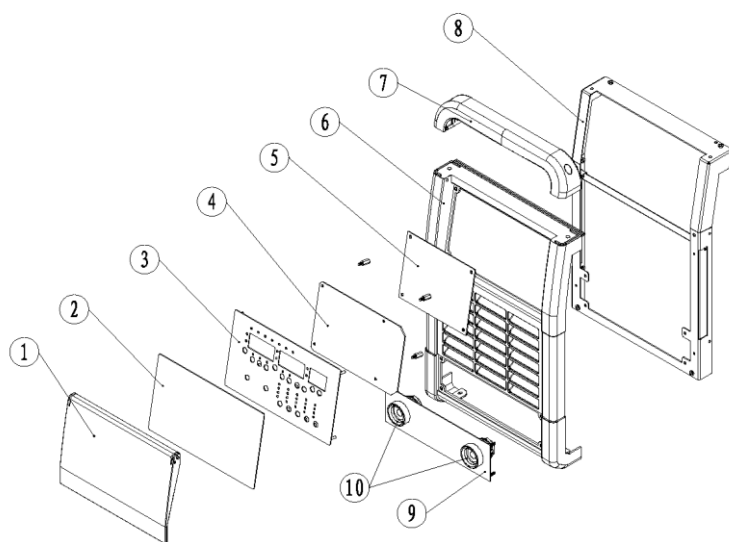
2. Structure and names of main components for TDN 5000Y

2.1 Structure of TDN 5000Y Power source



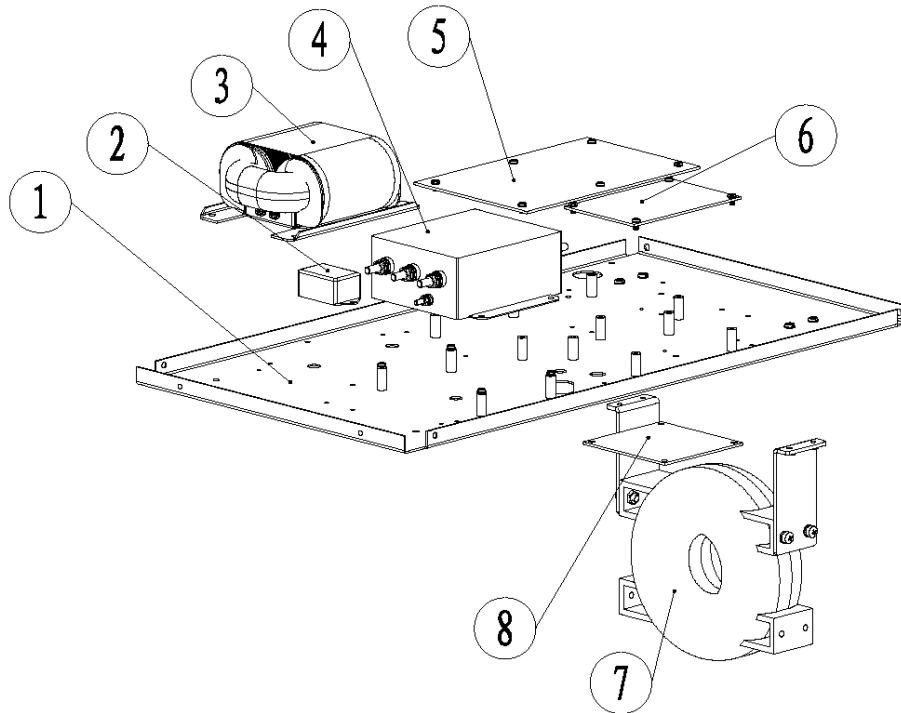
NO.	Code	Name of parts
1	2ZH3250110	Front case parts\H325-01.1
2	7330HAS500	Current sensor \HAS500-S
3	6EMM050107	Copper strip 5\MM05-00-40\copper δ 4
4	2ZH3290130	Intermediate parts\H329-03
5	21MS01B017	Main control part 8\MS01-01.8
6	2ZME040150	I/O module\ME04-15
7	2ZH3250140	Rear case parts\H325-01.4
8	2ZMM050121	Fan parts\MM05-12Y
9	2ZH3290210	Diode radiator components\H329-02.1
10	2ZH3251210	IGBT Radiator parts\H325-01.2.1
11	28MM058100	Floor components\MM05-08\Q235
12	6CME052101	<input checked="" type="checkbox"/> Reactor\ME05-02
13	7110F106J1	Capacitor\MFD-DA01-800V-10 μ \pm 5%

2.2 Front case parts



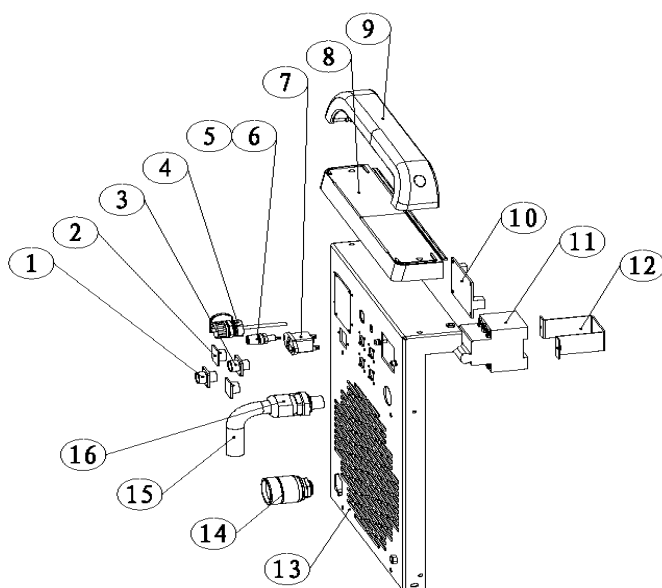
NO.	Code	Part Name	Remark
1	61MM050102	Transparent cover \ MM05-00-02	
2	68MM050119	Film\MM05-00-16YA	For Digital tube
	68MM050114	Film\MM05-00-17A	For LCD
3	28MM0501N0	Panel\ MM05-00-22	For Digital tube
	28MM0501M0	Panel\MM05-00-21	For LCD
4	2ZMS010350	Display Board 5\ MS01-03.5	For Digital tube
	7349XRDT30	5.6' LCD\XRDT320234056M1	For LCD
	21MS01B032	Display Board 7\MS01-03.7	
5	21MS01B02D	Communication control board 14\ MS01-02.14	
	21MS01B02Z		For Russia
6	61MM050103	Front case\ MM05-00-06	
7	61MM050101	Handel\ MM05-00-01	
8	28MM051100	Fabricated frame MM05-01\	
9	28MM053100	Front panel (MMA) \ MM05-03	
10	7513070011	Socket\DKJ70-1\Black	

2.3. Intermediate parts



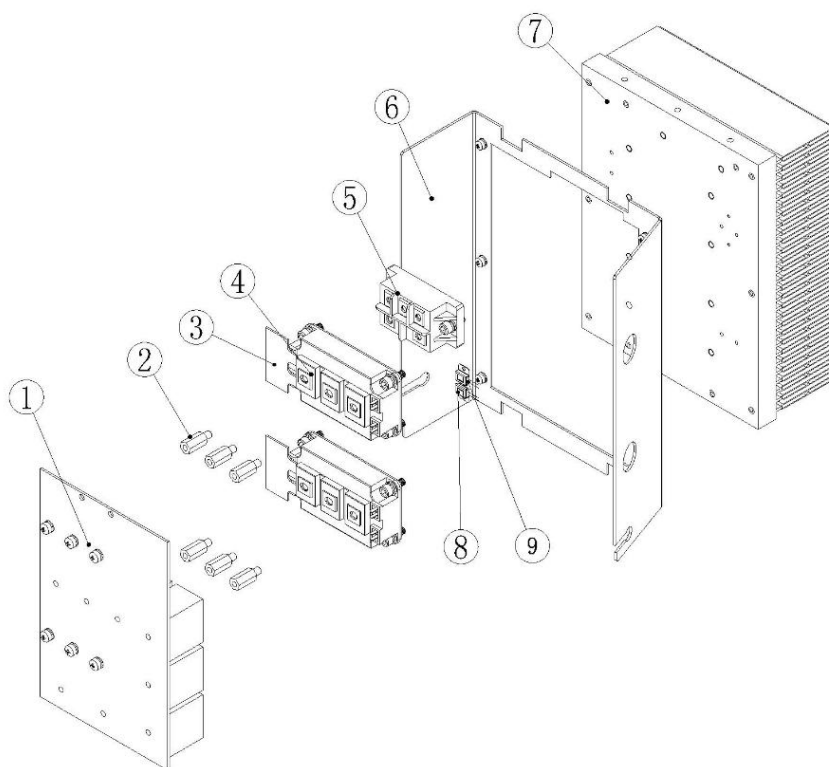
NO.	Code	Part Name
1	28MM0501R0	Intermediate plate\MM05-00-25\Q235 δ 1.5
2	7328HT2310	Filter\HT2310D-1-W5-D4
3	6BH0908100	Transformer\H090-08\RT260
4	7328HT5351	Three-phase input filter\HT535-40-M6-G3
5	21H225B010	Auxiliary power board PCB1 \H225-01
6	21ME04B080	M57959 Module\ME04-08
7	2ZME050030	HF transformer (380V/500A)\ME05-03
8	2ZME040130	Voltage sampling board \ME04-13

2.4 Rear case parts



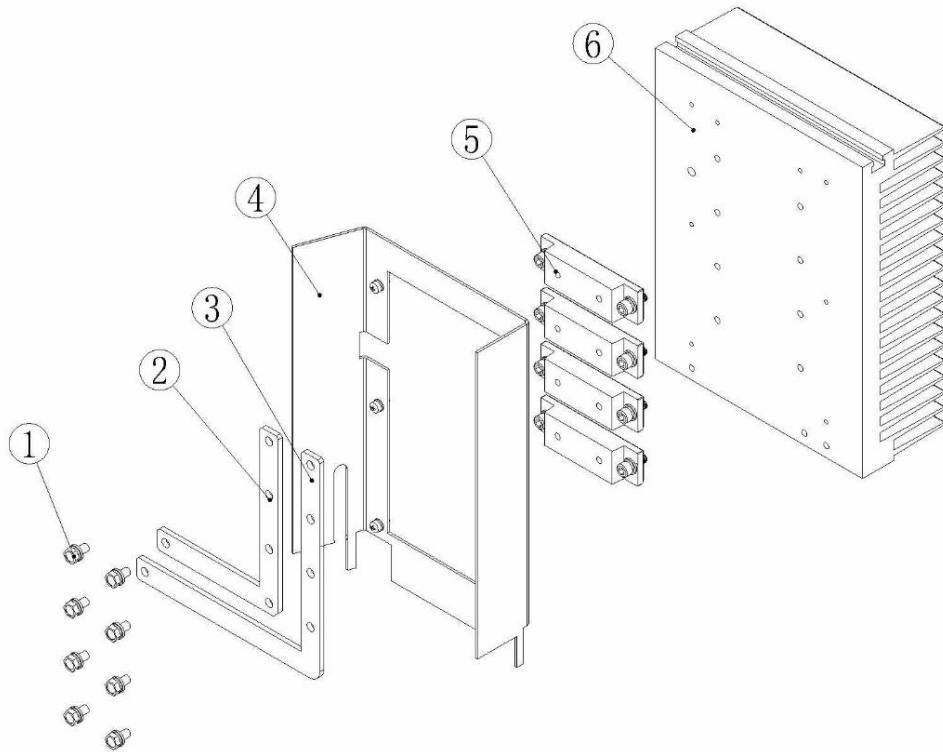
N0.	Code	Part Name
1	751AS16070	Socket\AS16K7Z
2	61MM040107	plug\MM04-00-47
3	751AS16071	Socket\AS16J7Z
4	7511USB000	USB socket
5	7322010002	Fuse holder\ MF528
6	7322010000	Fuse\10A(5×20)
7	7519AC0120	Power socket\ AC-12 250V /10A
8	61MM050104	Decorative pieces\ MM05-00-07
9	61MM050101	Handle\ MM05-00-01
10	2ZME040160	CAN output board \ME04-16
11	73210GSB20	Breaker\ CD6S-D63-3P
12	28MM040177	Breaker support MM04-00-77
13	28MM059121	Rear case\ MM05-09-01D
14	7513070011	Socket\DKJ70-1\black
15	7711040400	Cable\ YC4×4mm
16	7804000270	Tighter\ M27(GN)

2.5 IGBT Radiator parts



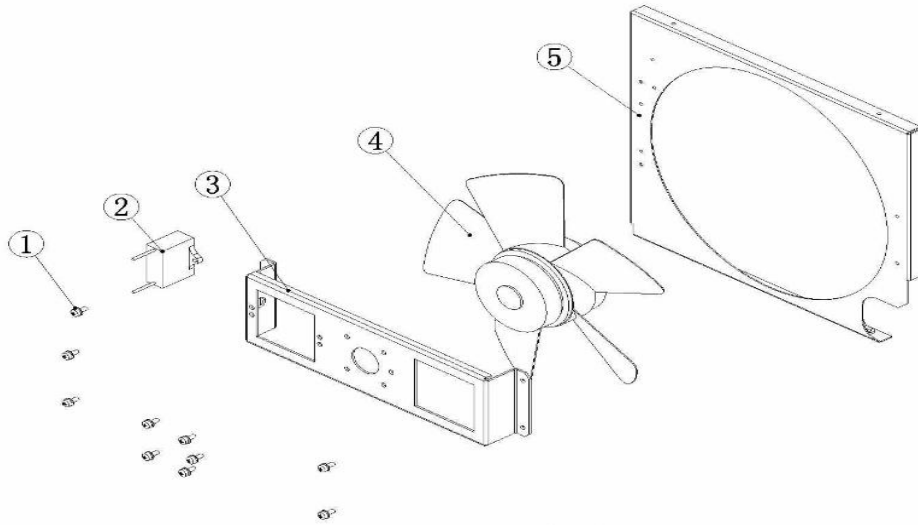
NO.	Code	Part Name
1	21ME05B010	IGBT absorbing board (380V/500A) \ME05-01
2	76Z0062000	Studs\M6×10×20
3	21TB514C20	IGBT Door polar plate\TB-514C2
4	7311BG1500	IGBT Module\BG150B12LY2-I
5	7310100121	Three-phase rectifier\MDS100(B)-12
6	61MM050105	IGBT Radiator windshield 1\MM05-00-28\PC
7	6DMM050101	IGBT Radiator \MM05-00-30\6063
8	28MM040134	Tighten block\MM04-00-34\
9	7323KSD972	Temperature relay\KSD9700\45 °C \ Normally
	7323KSD974	Temperature relay\KSD9700\85 °C \ Normally

2.6 Diode radiator components



N0.	Code	Part Name
1	7621060120	Bolts\GB/T9074.13\M6X12
2	6EMM050104	Copper bar 1\MM05-00-37\copper δ 4
3	6EMM050105	Copper bar 2\MM05-00-38\copper δ 4
4	61MM050109	Diode radiator windshield \MM05-00-32Y
5	7312DH2F10	Diode module\DH2F160N4SE
6	6DMM050103	Diode radiator \MM05-00-41

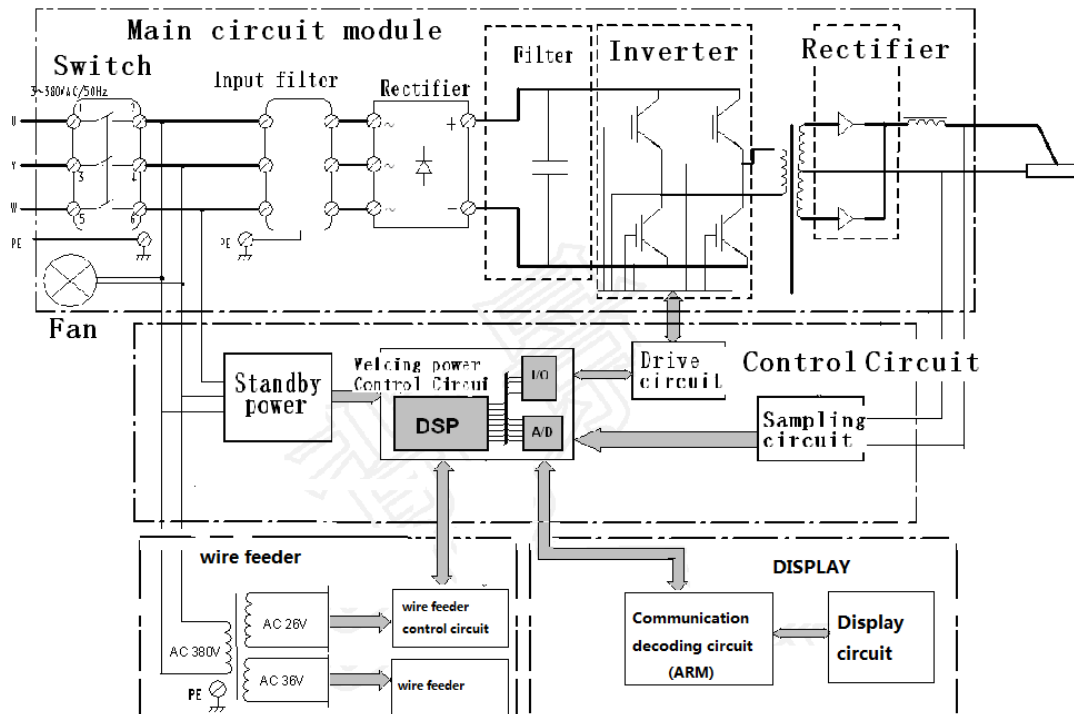
2.7 Fan parts



N0.	Code	Part Name
1	7620040100	Screws\GB9074. 4\M4×10
		Capacitor for Fan
3	28MM050190	Fan mounting bracket \MM05-00-09\Q235 δ 2
4	7370250F20	FAN\250FZL8-7P\1-380V\
5	28MM0501A1	Fan mounting plate \MM05-00-10Y\Q235

3 Circuit principle

3.1 Functional Block Diagram

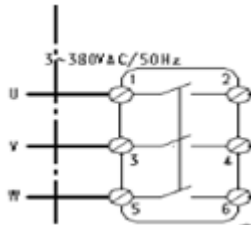


- It is divided into four modules, namely main circuit, control circuit, wire feeder control circuit and display circuit;
- The main circuit module: Three-phase input is subject to re-filtration via input filtration and full-bridge rectification and outputted through inversion, transformation and re-rectification;
- Control Circuit Module: The analog values of input and output are sent to DSP via the sampling circuit, and PWM+PFM pulse is emitted after analysis and calculation to control the work of the inversion module and finally get the desired output value. The powerful protection function can ensure the reliable operation of the power supply;
- Wire feeder control circuit module: Optimized wire feed performance and reliability
- Display Circuit Module: People-oriented human-computer interface makes the operation more convenient and effective, and anti-jamming capability is enhanced.

- All modules are accordant and become the respective systems so as to be convenient for upgrading and maintaining the product ;

3.2 Main circuit

3.2.1 Switch input voltage AC 380V

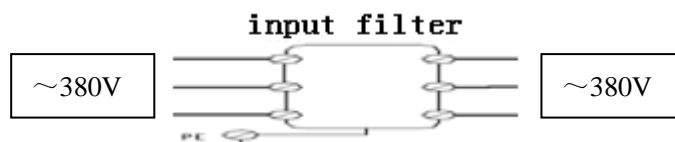


The three-phase AC power supply shall be correct, voltage: $380V_{\pm 15\%}$.

3.2.2 Power filter

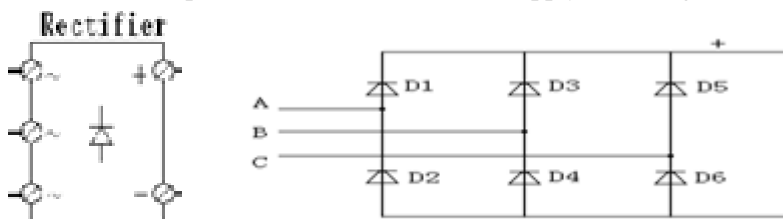
380V AC power supply is fed via the filter and the circuit breaker. The filter is used for filtering of the grid, outputting 380V AC power, connected with the AC terminal of the rectifier.

If the 380V AC power supply after the circuit breaker is normal but the AC input of the input rectifier is abnormal, the filter is faulty.



3.2.3 Pre-rectifier circuit

The three-phase $\sim 380V$ AC power is connected with the AC input terminal of the rectifier, rectified to DC 540V through six D1-D6 diodes. Fault of the rectifier may cause trip after power on, mainly due to diode breakdown or open circuit, or leakage current of certain diode. To maintain the welder, measure the rectifier in cold state. It is OK if there is no breakdown or open circuit for D1-D6 diode. Apply thermal grease evenly before mounting.

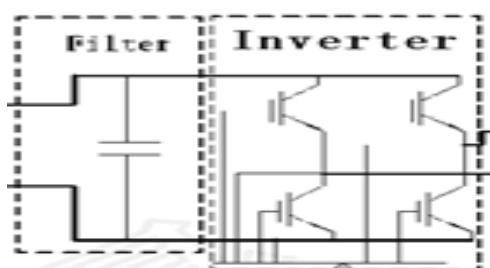


3. 2.4 Filter circuit

540V pulse DC power is output from the three-phase rectifier, which becomes line DC power via the filter circuit, supplying the IGBT module. The IGBT absorption module is mainly used for the full bridge topology filtering and absorption of IGBT switch transient voltage peaks.

Test of IGBT absorption module:

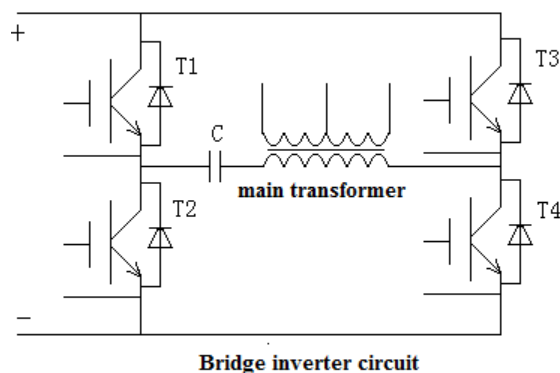
- 1, Check if the positive/negative terminals are open circuit: Measure if the IGBT3-2 is open with a multimeter. If it is short-connected, check if there is short-circuit for the welded PCB.
- 2, Check if the transformer primary is short-connected: measure if mark 1 of IGBT1 and IGBT2 is open with a multimeter.
- 3, Measure the capacitance: measure the capacitance between mark 3 and mark 2 of IGBT and check if it is $240 \pm 10\% \mu\text{F}$. After shutdown, check if the voltage of IGBT absorption module can reduce below the safety value, so as to ensure personnel safety and device safety during maintenance of welder.



3.2.5 Inverter (IGBT)

The 540V DC power will be converted into 20KHz intermediate frequency AC power via the IGBT inverter, which is stepped down via the high frequency transformer.

As the welder displays alarm code 014, the collector of IGBT will feed back the overcurrent protection signal. The drive circuit will analyze and process the overcurrent protection signal. Make sure the control circuit may turn off the inverter circuit.



Measure the IGBT: Measure it with the diode grades of multimeter

Measure the device online or after removing it.

1. Measure IGBT:

Diode characteristics between C and E;

Capacitance characteristics between G and E (Do not measure in general, otherwise IGBT may be damaged).

2. Installation of IGBT:

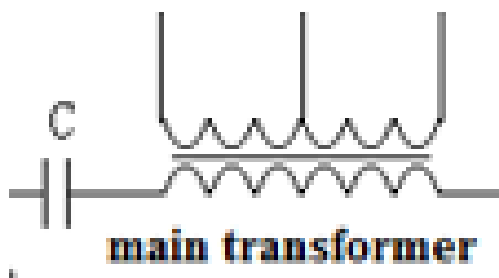
- (1) The surface of heat sink is smooth with rough salvation less than $6.3\mu\text{m}$ and flatness less than $50\mu\text{m}$.
- (2) Apply thermal grease between IGBT and the heat sink uniformly with thickness of 150Mm .
- (3) Mount the bolts with uniform force. Do not apply too high force at one side, otherwise the insulating layer of module may be damaged.

3. Note:

- (1) Anti-static. The IGBT gate input impedance is very high (relative insulating) to avoid damage to the oxide layer of insulated gate by electrostatic voltage, causing damage or injury. The static electricity is caused by accumulation of external (operating) charges and charges of internal gate oxide layer. Keep the current path between G and E ON. Make the G and E short-circuited to avoid electrostatic damage.
- (2) To avoid open gate, as G and E is open and voltage between C and E exists, C and E power is out of control. The wiring between G and E shall be firm, correct to avoid false connection. Check the filter capacitor for any electricity during operating to prevent charging of C and E.
- (3) The drive wire shall be stranded.
- (4) The two IGBTs shall have same model, same size and same manufacturer.

3.2.6 High frequency transformer (Main transformer)

The control circuit drives the ON/OFF of IGBT at 20KHz frequency. 20KHz AC power is received at the main transformer, and output from the secondary side after step-down.



3.2.7 Rectifier (secondary rectification)

After secondary rectification at the secondary side of high frequency transformer after step-down, 70V DC power is output.

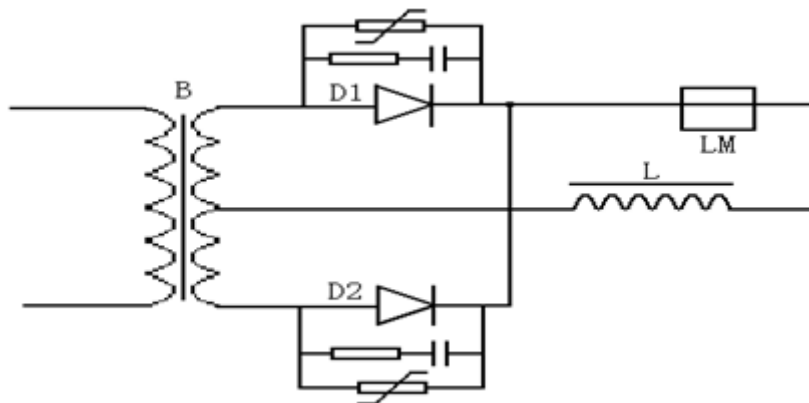
The inverted AC power is stepped down by the main transformer, rectified via D1 and D2, and DC power is output. The D1, D2 cathode and anode are in parallel with the resistor, capacitor and varistor absorption circuit.

Fault analysis:

- 1, The varistor is open as the voltage at both ends are low; the resistance is normal as the voltage at both ends are high; so as to release the peak voltage (protect the diode).
- 2, Any damaged RC snubber can cause high zero-load voltage;
- 3, Any broken down diode may cause overcurrent protection;
- 4, any open diode may cause low zero-load voltage.

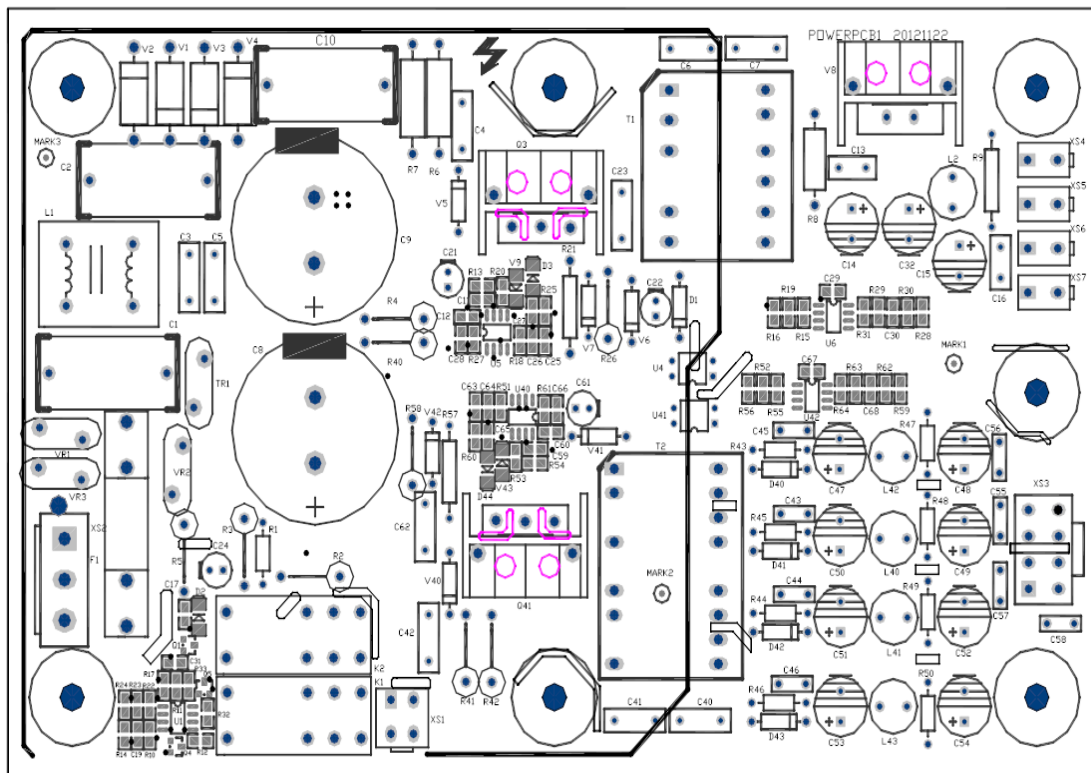
3.2.8 Inductor filter and feedback circuit

The rectifier diode will conduct secondary rectification, inductor filtering and feedback, outputting the welding current as required under realtime accurate control of the control circuit.



3.3 Control module

3.3.1 PCB1 board (H225-01) (21H225B010)



3.3.1.1 XS1 (PCB1 board)

xs1 (power board)	xs20 (main control board MS01-01. 8)	Comment
1	1	As the input voltage is lower than $280 \pm 20V$, Pin 1 and 3 of XS1 is ON, causing undervoltage alarm, alarm code: 004.
3	9	
2	2	As the input voltage is higher than $480 \pm 20V$, Pin 2 and 4 of XS1 is ON, causing overvoltage alarm, alarm code: 003.
4	10	

Pin 1 of xs1 (power board) is connected with Pin 1 of xs20 (main control board) via signal wire 0211(see wiring diagram);

Pin 3 of xs1 (power board) is connected with Pin 9 of xs20 (main control board) via signal wire 0213 (see wiring diagram);

Pin 2 of xs1 (power board) is connected with Pin 2 of xs20 (main control board) via signal wire 0212 (see wiring diagram);

Pin 4 (power board) is connected with Pin 10 of xs20 (main control board) via signal wire 0214 (see wiring diagram);

3.3.1.2 XS2 (PCB1 board)

xs2 (power board)	EMI (filter)	Comment
1	2	~380V power is supplied to the power board via filter.
2	4	
3	6	

3.3.1.3 XS3 (PCB1 board)

xs3 (power board)	2CN2 (drive board M404-08)	Comment
1	1	<p>xs3 (power board) supplies +24V power to 2CN2 (drive board);</p> <p>1, Pin 1- 2 of xs3 (power board) is connected with Pin 1- 2 of 2CN2 (drive board) via signal wire 0231 and 0232, supply +24V power;</p> <p>2, Pin 3-4 of xs3 (power board) is connected with Pin 3-4 of 2CN2 (drive board) via signal wire 0237 and 0238, supply +24V power;</p> <p>3, Pin 5-6 of xs3 (power board) is connected with Pin 5-6 of 2CN2 (drive board) via signal wire 0235 and 0236, supply +24V power;</p> <p>4, Pin 7-8 (power board) is connected with Pin 7-8 of 2CN2 (drive board) via signal wire 0233 and 0234, supply +24V power.</p>
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	

3.3.1.4 XS4 (PCB1 board)

xs4 (power board)	xs13 (main control board MS01-01. 8)	Comment
1	1	<p>xs4 (power board) supplies +24V power to xs13 (main control board);</p> <p>Pin 1- 2 of xs4 (power board) is connected with Pin 1-2 of xs13 (main control board) via signal wire 0241 and 0242, supply +24V power.</p>
2	2	

3.3.1.5 XS5 (PCB1 board)

xs5 (power board)	xs12 (communication board MS01-2. 14)	Comment
1	1	xs5 (power board) supplies +24V power to xs12 (communication board); Pin 1-2 of xs5 (power board) is connected with Pin 1-2 of xs12 (communication board) via signal wire 0251 and 0252, supply +24V power.
2	2	

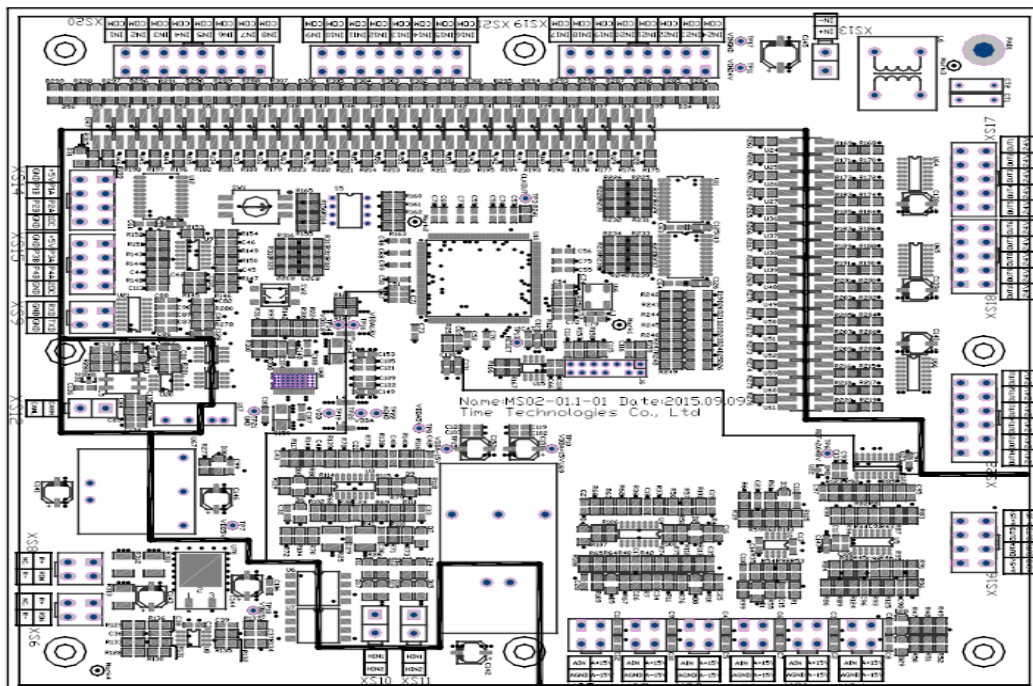
3.3.1.6 XS6 (PCB1 board)

xs6 (power board)	xs3 (I/O module ME04-15)	Comment
1	1	xs6 (power board) supplies +24V power to xs3 (MIG interface board); Pin 1-2 of xs6 (power board) is connected with Pin 1-2 of xs13 (main control board) via signal wire 0241 and 0242, supply +24V power.
2	2	

3.3.1.7 XS7 (power board)

xs7 (power board)	xs13 (CAN module ME04-16)	Comment
1	1	xs7 (power board) supplies +24V power to xs13 (control board); Pin 1-2 of xs7 (power board) is connected with Pin 1-2 of xs13 (main control board)
2	2	

3.3.2 Main control board MS01-01.8 (21MS01B017)



3.3.2.1 XS13 (main control board)

xs13 (main control board)	xs4 (PCB1 board)	Comment
1	1	xs4 (power board) supplies +24V power to xs13 (main control board); Pin 1-2 of xs4 (power board) is connected with Pin 1-2 of xs13 (main control board) via signal wire 0241 and 0242, supply +24V power.
2	2	

3.3.2.2 XS20 (main control board)

xs20 (main control board)	xs1 (PCB1 board)	Comment
1	1	As the input voltage is lower than $280 \pm 20V$, Pin 1 and 3 of XS1 is ON, causing undervoltage alarm, alarm code: 004.
9	3	
2	2	As the input voltage is higher than $480 \pm 20V$, Pin 2 and 4 of XS1 is ON, causing overvoltage alarm, alarm code: 003.
10	4	

Pin 1 of xs1 (power board) is connected with Pin 1 of xs20 (main control board) via signal wire 0211(see wiring diagram);

Pin 3 of xs1 (power board) is connected with Pin 9 of xs20 (main control board) via signal wire 0213 (see wiring diagram);

Pin 2 of xs1 (power board) is connected with Pin 2 of xs20 (main control board) via signal wire 0212 (see wiring diagram);

Pin 4 (power board) is connected with Pin 10 of xs20 (main control board) via signal wire 0214 (see wiring diagram);

xs20 (main control board)	Temperature relay	Comment
7(91207)	RT2	For temperature control. As the temperature rises to $45^{\circ}C$, the fan starts to work (Pin 7 and 2 of xs17 (main control board) have output), and stops after the temperature reduces to $35^{\circ}C$ (Pin 7 and 2 of xs17 (main control board) have no output)
15(92015)		
5(91205)	RT1	As the temperature rises to $85^{\circ}C$, giving overheat alarm, alarm code: 002.
13(92013)		

Fault analysis:

1, The fan does not rotate. Check RT1 temperature relay. Measure the fan;

2, Overheat alarm, alarm code: 002. Check RT2 temperature relay.

xs20 (main control board)	out3 (wire feeder control outlet)	Comment
6	6	Pin 6-16 of xs20 (main control board) is connected with Pin 6-7 of out3 (wire feeder control outlet) via signal wire 91206-92016, to receive dot feed signal from the feeder control box; Pin 8-16 of xs20 (main control board) is connected with Pin 5-7 of out3 (wire feeder control outlet) via signal wire 91208-92016, to receive the feeder switch signal.
8	5	
16	7	

3.3.2.3 XS14 (main control board)

xs14 (main control board)	2cn2 (drive board ME04-08)	Comment
1	1	+5V (connect via signal wire 0321)
2	2	P1A (connect via signal wire 0322)
4	4	Protection signal (connect via signal wire 0324)
6	7	P2A (connect via signal wire 0327)
8	9	+5V (connect via signal wire 0329)

3.3.2.4 XS5 (main control board)

xs5 (main control board)	BA1 (current sensor)	Comment
1	3	Feedback signal (connect via signal wire 9151)
2	1	+15V (connect via signal wire 9152)
3	4	-15V (connect via signal wire 9153)
4	2	GND (connect via signal wire 9154)

3.3.2.5 XS4 (main control board)

xs4 (main control board)	xs4 (voltage sampling board ME04-13)	Comment
1	1	0V-4V (connect via signal wire 1341)
2	2	+15V (connect via signal wire 1342)
3	3	-15V (connect via signal wire 1343)
4	4	GND (connect via signal wire 1344)

3.3.2.6 XS17 (main control board)

xs17 (main control board)	xs2 (voltage sampling board ME04-13)	Comment	
9	3	+24V	Voltage sampling board supply power.
4	6	GND	

xs17 (main control board)	xs1 (voltage sampling board ME04-13)	Comment	
7	1	GND	When the welder temperature rises to 45°C, 24V power is supplied, the fan starts to work, and stops working after the temperature reduces to 35°C.
2	2	+24V	

xs17 (main control board)	OUT3	Comment	
6	3	+24V	Voltage is output after the solenoid valve works.
1	4	GND	

3.3.2.7 XS1 (main control board)

xs1 (main control board)	xs1 (I/O module ME04-15)	Comment	
1	1	0V--4V	Welding voltage feedback
2	2	+15V	
3	3	GND	
4	4	-15V	

3.3.2.8 XS12 (main control board)

xs12 (main control board)	Xs9 (Communication control MS01-02.14)	Comment
1	1	CAN interface CAN H
2	3	CAN interface CAN L

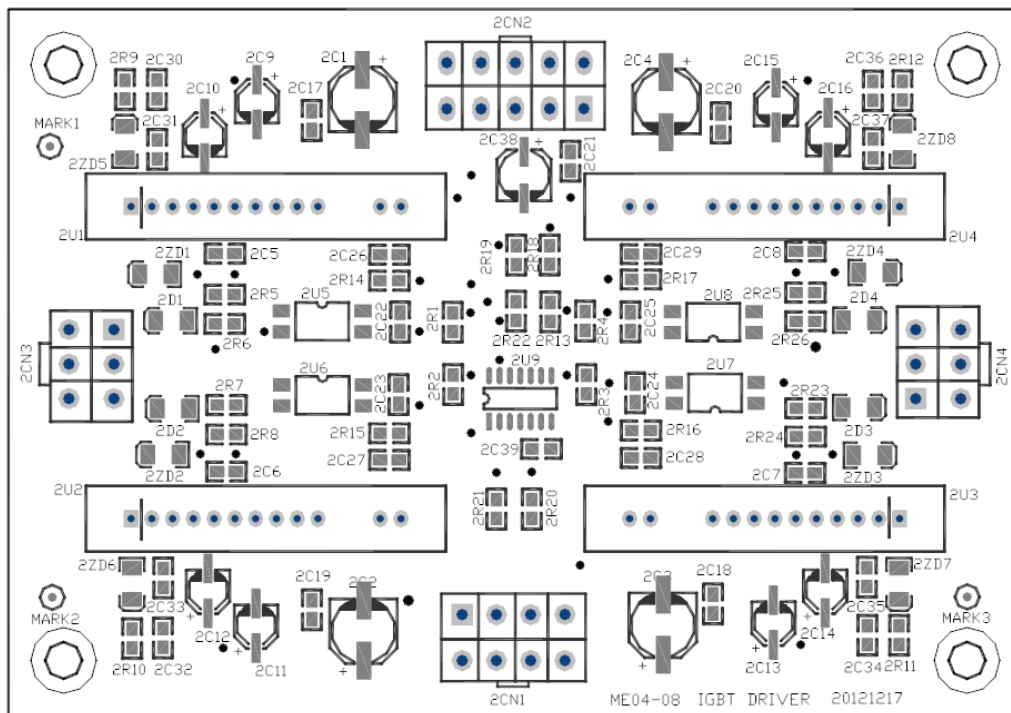
3.3.2.9 XS18 (main control board)

xs18 (main control board)	xs3 (automatic welding interface)	Comment
1	4	Current detection, low for successful ignition
2	5	Power state, low for normal power
6	6	+24V\0.5A

3.3.2.10 XS21 (main control board)

xs18 (main control board)	xs3 (automatic welding interface)	Comment
1	1	Air pressure detection +24V/0.5A
2	2	Water pressure detection +24V/0.5A
3	3	Emergency stop +24V/0.5A
9	7	GND

3.3.3 M57959 Driver board (ME04-08) (21ME040800)



3.3.3.1 2CN3 (drive board)

2cn3 (drive board)	xsg1 (gate board)	Comment
1	1	IGBT gate (connect via signal wire 0331)
2	2	IGBT emitter (connect via signal wire 0332)
3	3	IGBT collector (connect via signal wire 0333)
4	4	IGBT gate (connect via signal wire 0334)
5	5	IGBT emitter (connect via signal wire 0335)
6	6	IGBT collector (connect via signal wire 0336)

3.3.3.2 2CN4 (drive board)

2cn4 (drive board)	xsg2 (gate board)	Comment
1	1	IGBT gate (connect via signal wire 0341)
2	2	IGBT emitter (connect via signal wire 0342)
3	3	IGBT collector (connect via signal wire 0343)
4	4	IGBT gate (connect via signal wire 0344)
5	5	IGBT emitter (connect via signal wire 0345)
6	6	IGBT collector (connect via signal wire 0346)

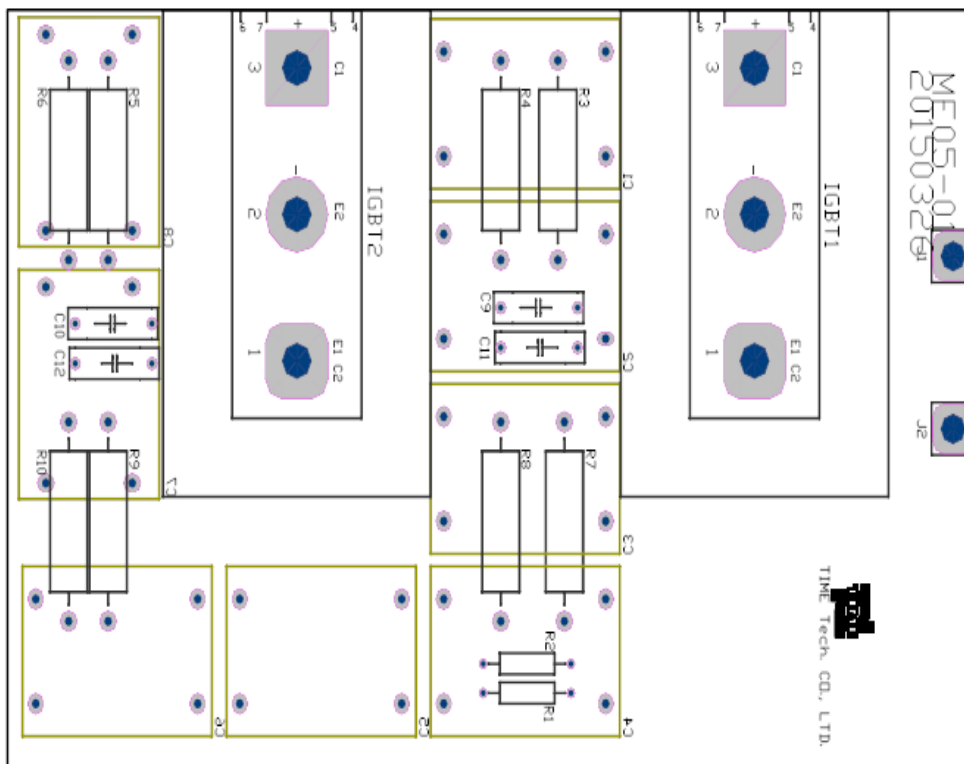
3.3.3.3 2CN1 (drive board)

See 3.3.1.3 **XS3 (PCB1 board)**

3.3.3.4 2CN2 (drive board)

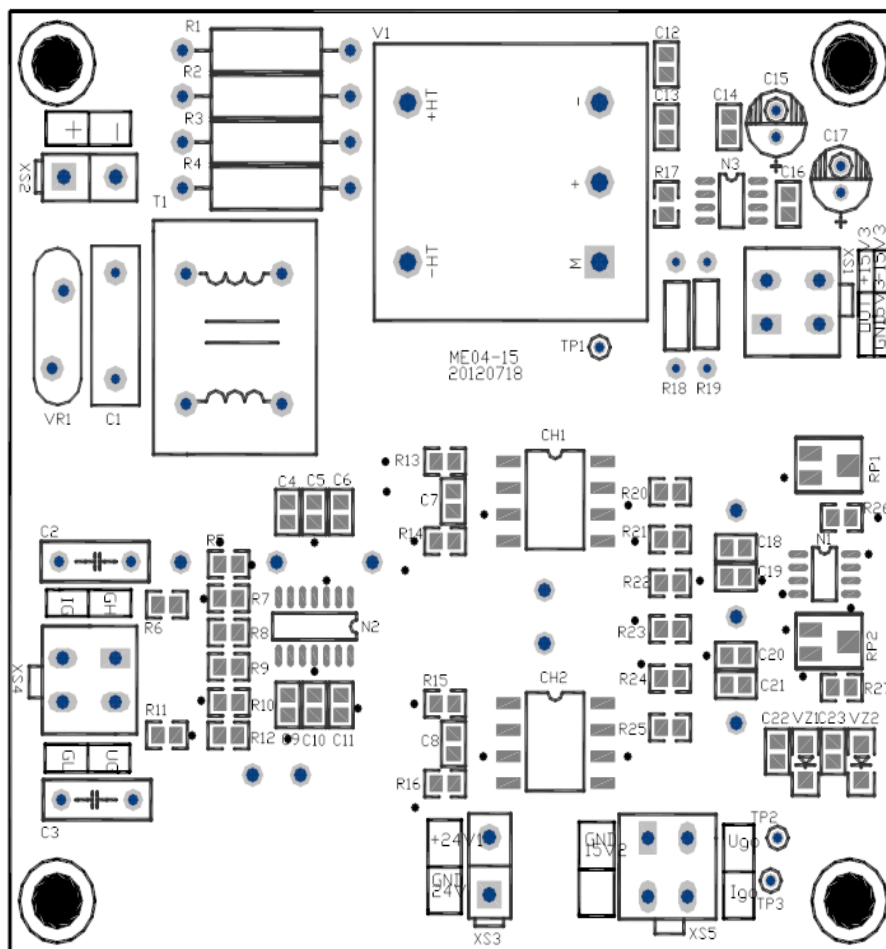
See 3.3.2.3 **XS14 (main control board)**

3.3.4 ME05-01 (IGBT absorption module) (21ME05B010)



ME05-01 (Pin 2 of IGBT2, IGBT1)	VC1 (three-phase rectifier) - terminal	connect via signal wire 032	Three-phase rectifier output terminal
ME05-01 (Pin 3 of IGBT2, IGBT1)	VC1 (three-phase rectifier)+ terminal	connect via signal wire 031	
ME05-01 (Pin 1 of IGBT1)	T1 (high frequency transformer)	connect via signal wire 061	High frequency transformer input terminal
ME05-01 (Pin 1 of IGBT2)	T1 (high frequency transformer)	connect via signal wire 062	

3.3.5 ME04-15 (MIG interface board) (2ZME040150)



3.3.5.1 XS2 (MIG interface board)

xs2 (MIG interface board)	OUT3 OUT1	Comment
1	OUT3 (outlet)16	Feeder conductive copper and power output (-) terminal feedback signal
2	OUT2 (-)	

3.3.5.2 XS4 (MIG interface board)

xs4 (MIG interface board)	OUT3 (outlet)	Comment
1	10	To Pin 3 of feeder potentiometer 1, 2
2	14	To Pin 2 of feeder potentiometer 1
3	11	To Pin 2 of feeder potentiometer 2
4	15	To Pin 1 of feeder potentiometer 1, 2

The feeder potentiometer V1 is used for adjustment of voltage, and feeder potentiometer V2 is used for adjustment of current.

3.3.5.3 XS1 (MIG interface board)

See 3.3.2.7 XS1 (main control board)

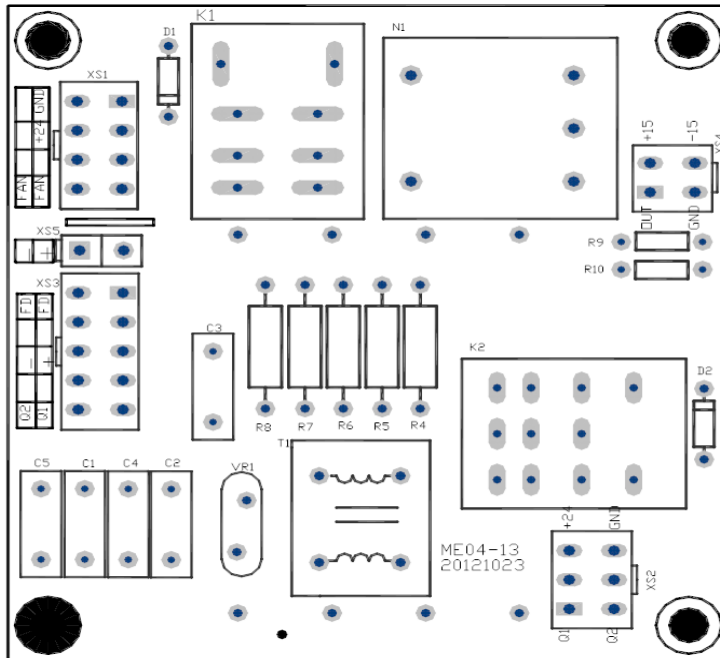
3.3.5.4 XS3 (MIG interface board)

See 6.3.1.6 XS6 (PCB1 board)

3.3.5.5 XS5 (MIG interface board)

See 6.3.5.2 XS4 (communication board)

3.3.6 ME04-13 (voltage sampling board) (2ZME040130)



3.3.6.1 XS3 (voltage sampling board)

xs3 (voltage sampling board)	OUT1 OUT2	Comment
3	OUT1	Output voltage
8	OUT2	

3.3.6.2 XS1 (voltage sampling board)

xs1 (voltage sampling board)	FAN EMI	Comment
4	FAN	Power supply for fan
8	EMI	

3.3.6.3 XS2 (voltage sampling board)

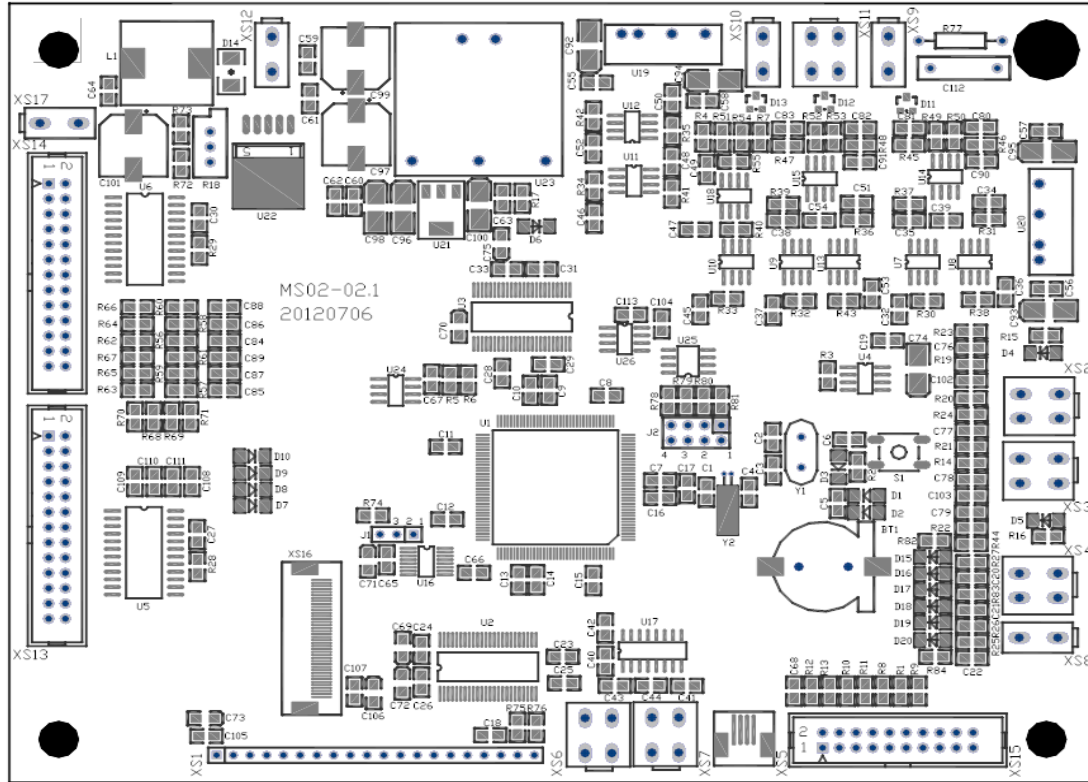
See 3.3.2.6 XS17 (main control board)

3.3.6.4 XS4 (voltage sampling board)

See 3.3.2.5 XS4 (main control board)

3.4 Display module

3.4.1 MS01-02.14 (display communication board) (21MS01B02Z)



3.4.1.1 XS9 (communication board)

xs9 (communication board)	xs5 (feeder control board)	Comment
1	2	CAN interface CAN H
2	4	CAN interface CAN L

3.4.1.2 XS4 (communication board)

xs4 (communication board)	xs5 (MIG interface board)	Comment
1	1	GND
2	2	0.4V-3V
4	4	0.4V-3V

Panel control set signal

3.4.1.3 XS11 (communication board)

xs4 (communication board)	4XS11 (control board)	Comment
1	1	Panel control set signal
2	2	
3	3	

3.4.1.4 XS12 (communication board)

See 3.3.1.5 XS5 (power board)

3.4.1.5 XS13 (communication board)

xs13 (communication board)	xs2 (display board)	Comment
1-26	1-26	Keyboard interface (with digital interface)

3.4.1.6 XS14 (communication board)

xs14 (communication board)	xs1 (display board)	Comment
1-26	1-26	Encoder interface (including light-emitting diode interface)

3.4.2 MS01-03.7 (display board) (21MS01B032)

3.4.2.1 XS1 (display board)

See 3.4.1.6 XS14 (communication board)

3.4.2.2 XS2 (display board)

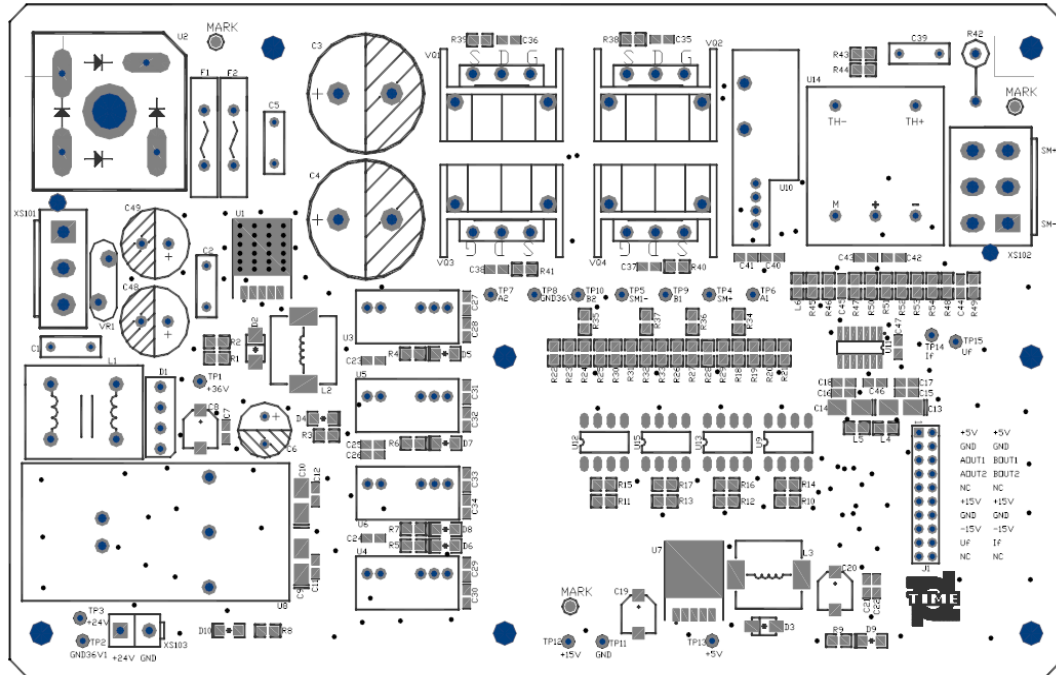
See 3.4.1.5 XS13 (communication board)

The display board works coordinating the communication board, and the communication board works coordinating the main control board.

This TDN series gas shielded welder has three specifications: 350A, 500A and 630A. The difference is the ranges of current, voltage and other parameters are different. The panel arrangement, function and operation are the same.

3.5 Wire feeder control module

3.5.1 ME04-20 (feeder control board) (21ME04B021)



3.5.1.1 XS101 (feeder control board)

xs101 (feeder control board)	T2 (feeder transformer)	Comment
1	Blue	~36V
3	Green	~36V

3.5.1.2 XS102 (feeder control board)

xs102 (feeder control board)	OUT3 (outlet)	Comment
4	2	Connect via signal wire 2024, to feed motor + terminal
6	1	Connect via signal wire 2024, to feed motor - terminal




3.5.1.3 XS3 (feeder control board)

xs3 (feeder control board)	OUT3 (outlet)	Comment	
3	13	Connect via signal wire 2033, to feed motor encoder Terminal-B	The feeder encoder interface is used to measure the speed of motor.
4	12	Connect via signal wire 2034, to feed motor encoder Terminal-A	
5	9	Connect via signal wire 2035, +15V	
6	8	Connect via signal wire 2036, GND	

3.5.1.4 XS5 (feeder control board)

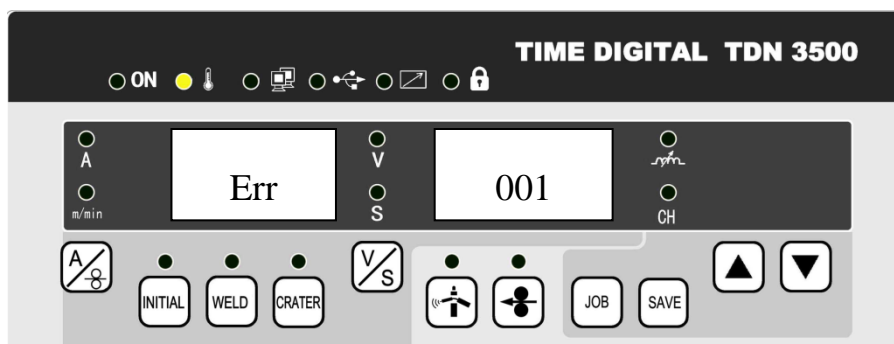
See 3.4.1.1 XS9 (communication board); 3.3.2.8 XS12 (main control board)

4. Fault and elimination

 Warning		<p>Any contact with live parts can cause fatal electric shock or serious burns. To avoid the electric shock, burns and other personal injury, please observe the following matters.</p>
<ul style="list-style-type: none"> •The fault elimination need be carried out by the person who possesses the professional qualification or is familiar with the circuit of the welding machine. •Before operation, it shall ensure that the power switch of this product, the distribution box and relevant devices (those connected with the welding machine) has been turned off. • Because there is the capacitor discharge inside the arc welding power, please carry out the operation 5 minutes later after turning off the power. 		
 Notice	<p>When the power switch is automatically turned off, do not turn on the power switch again and contact with the dealer or after-sales service of our company. The power switch is the breaker and will be automatically opened if the over-current is caused for whatever reason. If the power switch is turned on again before eliminating the fault of the over-current, the accident will be expanded.</p>	

4.1 Fault code

A. If the fault that can be self-identified by the equipment occurs, the fault code will be shown on the control panel.



The content shown in the display window when Err 001 fault occurs

B. Classification of the fault types:

Symbol Δ : It need not turn on the power again (after the fault elimination, the

fault code display will be cleared automatically.)

Symbol ▲: It must turn on the power again (even if the fault is eliminated, the fault code will not be cleared automatically and can be cleared only after turning on the power again.).

C. After turning on the power, the reasons that the display window on the control panel cannot work normally include the following several points:

- The display control board (MS01-02.14) is damaged and the fault can be eliminated by replacing the display control board;
- The display board (MS01-03.5) is damaged and the fault can be eliminated by replacing the display board ;
- The power of the display control board is abnormal and the reason of abnormal power supply for the display board is checked so as to eliminate the fault (possibly caused by the faulty circuit or control power board H225-01) ;

Error Code	Content of Error	Type of Error	Reasons and Countermeasures
000	Unknown		The reason is unknown. Please contact our after-sales service department.
001	Primary Side Overcurrent	▲	Internal component failure: Power off and check IGBT, fast recovery rectifier diode module, high-frequency transformer and primary side current inductor, etc. Switch on after replacement.
002	Temperature Anomalies	△	Internal overheating: Before the product's internal temperature falls to a normal level, do not turn off the power; clarify the reason of overheating (use beyond the rated duty cycle, blocked vents and damaged relay).
003	Input Overvoltage	△	The input voltage exceeds the permissive range: Turn off the power, adjust the input voltage to the range of the rated input voltage $\pm 15\%$ and turn on the input power.
004	Input Undervoltage	△	The input voltage exceeds the permissive range: Turn off the power, adjust the input voltage to the range of the rated input voltage $\pm 15\%$ and turn on the input power.
005	Input Out-phase	△	Input power outphase: Disconnect input power, check the reasons (input line failure, input switch failure, etc.) of outphase, and turn on the input power after the exclusion.

006	Cooling Water Pressure Anomaly	△	Cooling water tank circulating water pressure signal abnormality (for optional water cooling power supply): Check whether the cooling water tank is working properly (For details, please read the manual of cooling water tank).
007	Protective Gas Pressure Anomaly	△	Protective gas pressure signal abnormality: Check protective gas pressure signal, and after troubleshooting automatically restore to the normal.
008	External Emergency Stop Signal	△	Connect to automatic welding port terminals to receive the emergency stop: automatically restore to the normal status after the lift of the emergency stop signal.
009	Torch Signal Abnormality	△	When turning on the input power, detect torch close signal: Automatically restore after torch close signal is eliminated.
010	Abnormal Arc	△	Arc current output is overtime and there is no arc success signal: Check whether current sensor is working properly; check whether the output current feedback signal is normal; check whether the main control panel (MS01-01) is working properly.
011	Abnormal Current Feedback	△	When turning on the input power, detect current feedback signal: Check whether the current sensor is working properly; check whether the output current feedback signal is normal; check whether the main control panel (MS01-01) is working properly.
012	Abnormal Voltage Feedback	△	When turning on the input power, detect voltage feedback signal: Check whether the welding circuit exits interference signal (interference signal may come from nearby AC welder and other equipment); check whether the internal output voltage feedback loop is abnormal; Check if the voltage sampling panel (ME04-13) is working properly; check whether the main control panel (MS01-01) is working properly.
013	Abnormal Wire Feeder	△	Check whether the wire feeder and welding power source are connected properly; check whether the wire feeder control panel (ME04-20) is working properly; check the connection cable.
014	IGBT Overcurrent	▲	Internal component failure: Power off and check IGBT, fast recovery rectifier diode module, high-frequency transformer and primary side current inductor, etc. Switch on after replacement.

015	Abnormal Initialization of Main Control Panel	△	Initialization of main control panel fails: Check whether the display control panel (MS01-03) matches with the main control panel (MS01-01) in term of model, try to restart the power; if appearing again, replace the display control panel or main control panel.
016	Abnormal External Memory of Main Control Panel	△	Reading and writing failure of the external memory of main control panel: Try to turn on the power, and if again, replace the control panel.
017	Transformer Secondary Side Overcurrent	▲	Power load exceeds the rated value: Check whether the power supply output has short circuit or welding current exceeds the rated value for a long time; try to turn on the power.
021	Abnormal Communications Response	△	The main control panel does no respond to the request of the display panel: Check the communication line between display control panel (MS01-03) and the main control board (MS01-01); switch on power again after replacing display control panel or main control panel.
022	Abnormal Slave Response	△	The slave device connected with arc Welding Power Source does not make normal response to the request of arc Welding Power Source: Check whether the communication line is normal; confirm whether the communication protocols between master and slave machines match.
023	Master Protocol Anomaly	△	The main control panel receives abnormal data: Confirm whether the communication protocols between master and slave machines match. Try to switch on power.

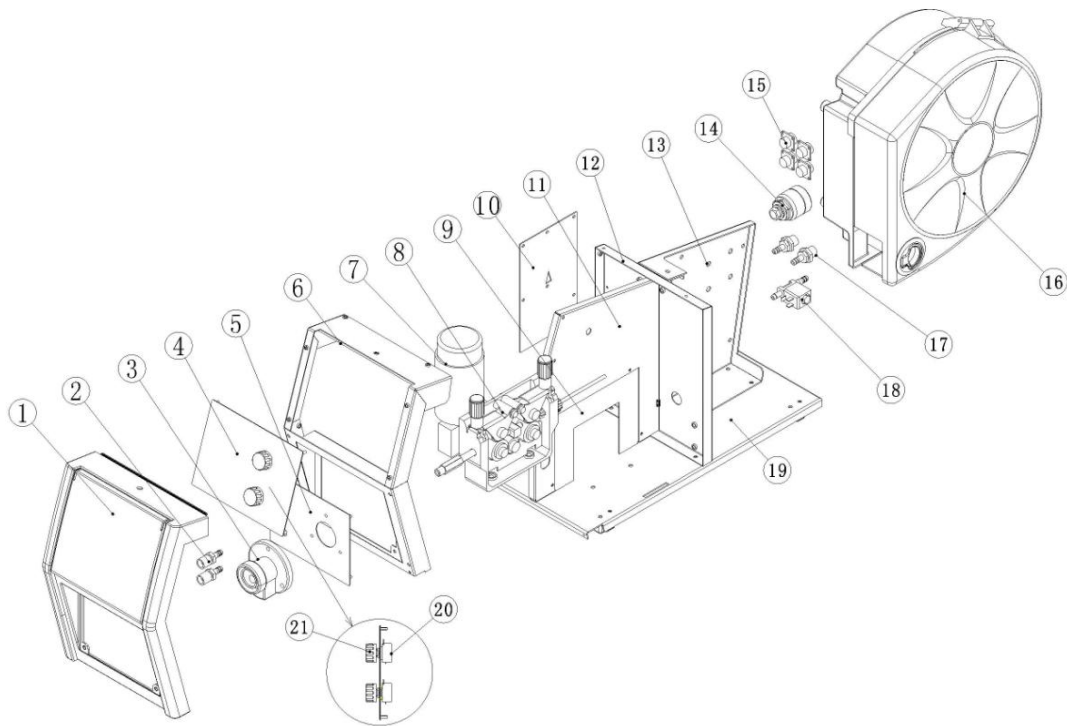
4.2 Inspection items during welding failure

Phenomena of Welding Failure		Arc strike failure	Gas feeding failure	Wire feeding failure	Poor arc strike	Unstable electric arc	Unsmooth weld joint	Wire and base metal adhesion	Wire and Tip Adhesion	Welding Produces Pores
Welding Power Source	Distribution Box	<ul style="list-style-type: none"> ● Switch trip or disconnection or blown fuse ● Input out-phase ● Loosen switch joint, etc. 	▲	▲	▲					
	Input Cable	<ul style="list-style-type: none"> ● Input cable break ● Poor input cable connection 	▲	▲	▲					
	Power body	<ul style="list-style-type: none"> ● Input switch trip or disconnection ● Blown wire feeding circuit fuse (rear panel) 	▲	▲	▲					
Gas	Cylinder Gas Regulator	<ul style="list-style-type: none"> ● Cylinder main valve is not open ● Gas pressure is insufficient ● Regulator flow is not set correctly ● Loose connection 		▲			▲			▲
	Air Tube	<ul style="list-style-type: none"> ● Air tube damage or loose joint caused leakage 		▲						▲
Wire Feeder		<ul style="list-style-type: none"> ● Wire wheel or wire guide tube does not match the wire specification ● Wire wheel is damaged or groove is blocked ● wire guide tube inlet is blocked by dust ● lever clamping force is not enough 			▲	▲	▲	▲	▲	

Torch Cable	<ul style="list-style-type: none"> •Welding cable or gun switch cable breaks • The connection with wire feeder is loose • Torch cable is damaged 	▲	▲	▲		▲		▲		
	<ul style="list-style-type: none"> •Torch cable is over bent 				▲	▲	▲		▲	
Control Cable	<ul style="list-style-type: none"> •Break and short circuit 	▲	▲	▲						
Torch	<ul style="list-style-type: none"> • Tip or wire guide tube does not match the wire specification • Tip is badly worn •Wire guide tube is obstructed by foreign matter 				▲	▲	▲		▲	
	<ul style="list-style-type: none"> • Tip installation is loose • Torch and wire feeder connection is loose 						▲			▲
Base Metal Side Cable	<ul style="list-style-type: none"> •The cable cross-section is not enough or cable connection is loose • Poor conduction of base metal 				▲	▲	▲			
Welding Conditions	<ul style="list-style-type: none"> • Welding specifications setting is inappropriate • Torch angle, welding speed or stem elongation is inappropriate • Waveform control settings is inappropriate 				▲	▲	▲	▲	▲	
Base Metal Surface	<ul style="list-style-type: none"> •Oil, impurities or paint coating exist on the surface 				▲	▲	▲	▲		▲

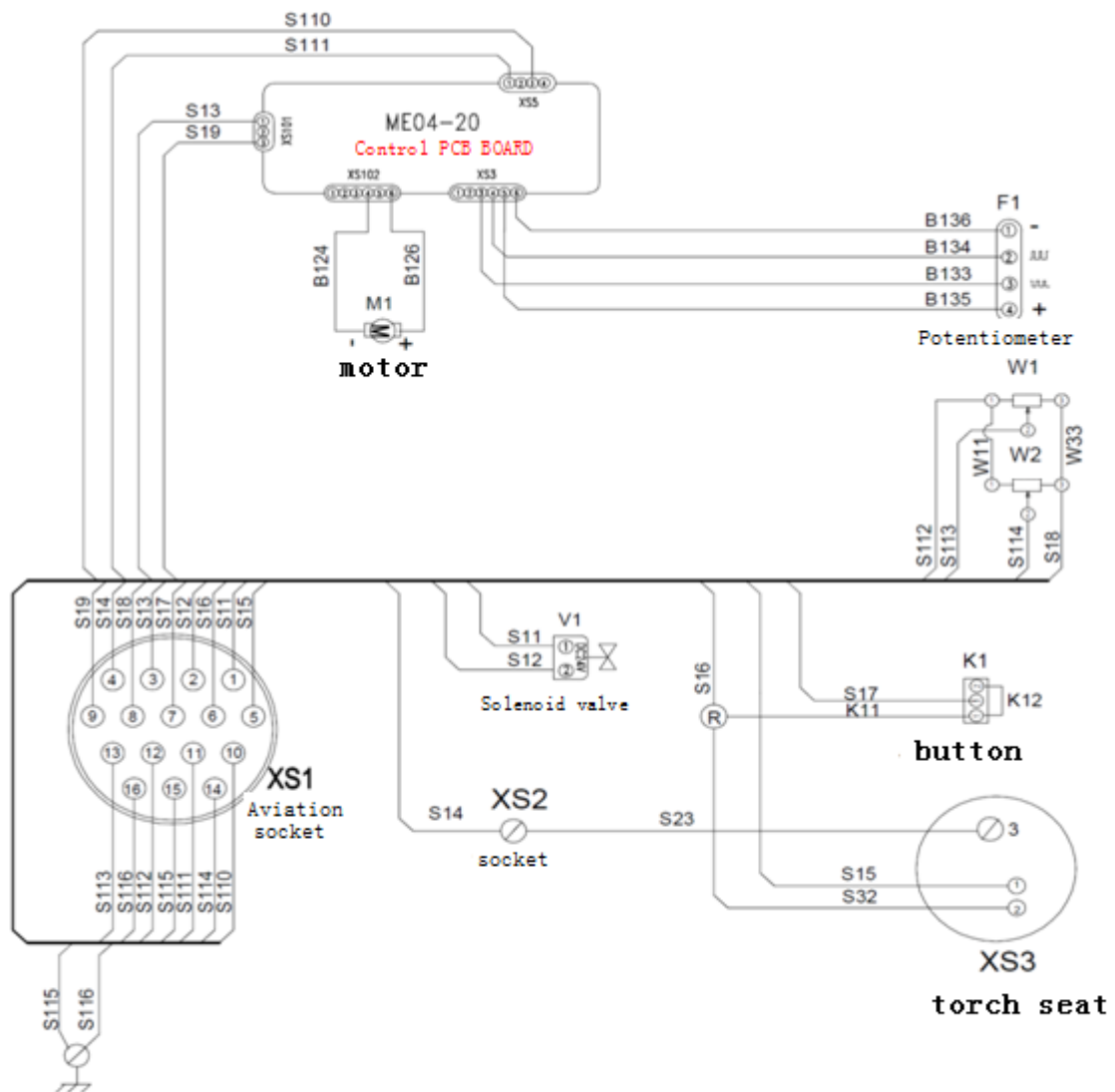
5. TFN 6000F WIRE FEEDER

5.1 Structure



N0.	Code	Part Name	N0.	Code	Part Name
1	28H3070107	Front case with transparent cover	12	28H3073110	Rear Case
3	7504510010	plug	13	28H3070050	Wire reel bracket
3	7513501001	European socket copper head	14	7513070011	Output socket
4	28H3072110	Operation panel components	15	750AS28160	Aviation socket
5	28H3070107	Front panel	16	61H3076102	Wire reel cover
6	28H3070010	<input checked="" type="checkbox"/> Front frame	17	63H1560190	<input checked="" type="checkbox"/> Water cooler connector 1
7	78BSSJ11C0	Wire feeding mechanism	18	73511YG2T0	Solenoid valve
8	28H3070109	clapboard	19	28H3070040	Bottom parts
9	21ME04B021	Control PCB	20	72K6315001	<input checked="" type="checkbox"/> Potentiometer
10	28H3070108	<input checked="" type="checkbox"/> intermediate clapboard	21	7801KN2811	Knob

5.3 Schematic



5.4 Installation of Wire Reel

5.4.1 Turn the tail flap until it is concentric with the mounting shaft.

5.4.2 Push the wire reel onto the mounting shaft. Insert the damping rod on the sleeve into the side hole in the reel.

5.4.3 Return the flap perpendicular with the mounting shaft to prevent runout of the reel.

5.5 Installation of wire feeder roller

Rotate the devices carefully to prevent squeezing fingers.

Choose proper wire feeder roller and wire press slot (with identification at the side, e.g., $\phi 0.8$, $\phi 1.0$, $\phi 1.4$, $\phi 1.2$ and $\phi 1.6$ etc).

Note: The deviation of the axis line of the outlet to the centerline of the wire press slot shall not exceed $\phi 0.1$ mm. The outlet shall be free of dust, iron etc.

	Steel wire	Wire (Al)	Gas shielded flux cored wire
Recommended wire feeder roller	V-type	U-type	U-type

5.6 Mounting wire

Rotate the devices carefully to prevent squeezing fingers.

a. Rotate the handle of pressing bar anticlockwise and turn the pressing bar downward to keep it level;

b. Move the left/right press rollers away from the wire feeder roller;

c. Pull the wire through the inlet, middle mouth and the conductive copper head until to the wire feeder conduit;

d. After pressing the wire with the press roller, turn the pressing bar upward to keep it vertical;

e. Rotate the handle of pressing bar clockwise to add proper force (observe the scale on the handle).

5.7 Replacement of wire guide /outlet of European torch holder

5.7.1 Remove the wire guide/outlet

a. Remove the welding torch and the European torch holder;

b. Get out the outlet from the side of the torch holder.

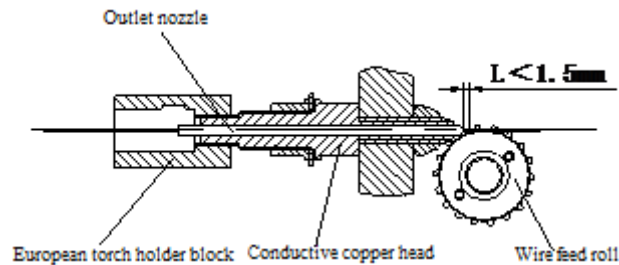


Figure 3.9 Installation of outlet

5.7.2 Mount the wire guide/outlet

Insert the outlet into one side of the torch holder (for solid wire of $\phi 0.8$ and $\phi 1.0$, select $\phi 2.0$ outlet). Keep the distance between the outlet and wire feeder roller within 1.5mm;

Mount the European torch holder;

After completing the above steps, mount the torch on the wire feeder with care.

5.8. Precautions

a. Never touch live electrics and/or moving parts during operation of the wire feeder, such as wire feeder, tip, wire feeder roller etc;

b. Wear a helmet and protective gloves during welding. Wear protective shoes, earplugs and close the collar. Wear a protective mask, glasses and full protective clothing;

c. Use forced ventilation and smoking devices to remove smoke during welding;

d. Wear full protective clothing in environment with high risk of electric shock. Keep away from flammable and explosive materials during welding. Take necessary ventilation measures for welding in enclosed container. Fix the wire feeder and the wire reel for overhead operation, and nobody shall stand under it within two meters;

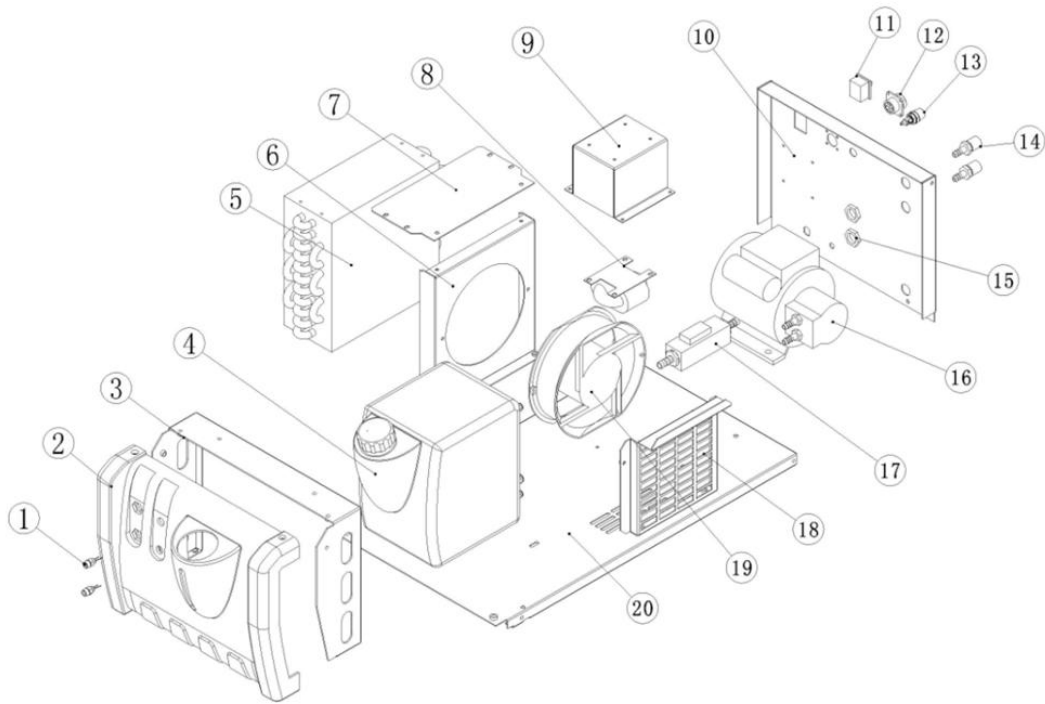
e. Unless required specially, never place the wire feeder on the slope exceed 15° during welding. Take necessary measures to fix the wire feeder and the wire reel firmly as required;

f. Don't wear gloves to guide the wire or replace the wire reel; handle with bare hands;

g. To hand up the wire feeder during welding, the hanger shall be electrically insulated with the house of the wire feeder. For example, support the wire feeder to ensure the electrical insulation between the wire feeder and the support.

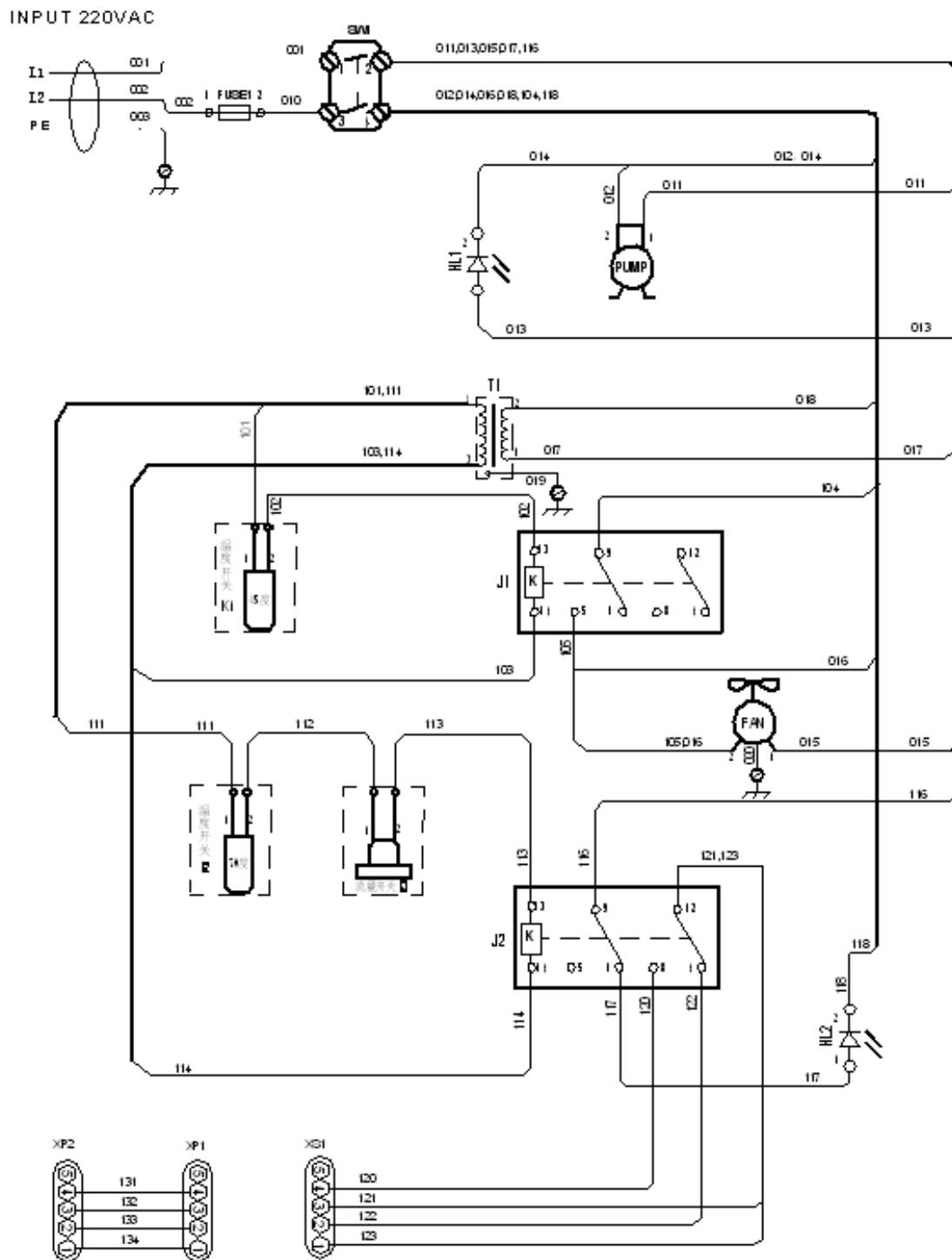
6 TFN 5000C water cooler

6.1 Structure





NO.	Code	Part Name	NO.	Code	Part Name
1	7343SYG220	Alarm light	11	7327202001	switch
2	28H3085110	Front panel	12	751AS16051	Aero plug
3	28H3080130	Front support of tank	13	732201000A	Fuse holder
4	61H3080101	Pot	14	63H1560190	Water tank connector
5	6DH3084101	radiator	15	63H15601B0	Nut
6	28H3084110	Fan cover	16	2ZH3080020	Pump
7	28H3084130	Radiator mounting plate	17	73270FP540	Flow switch
8	6BH3087101	Transformer	18	28H3086110	Pipe Management board
9	28H3087120	Transformer hanger	19	7370200200	Fan
10	28H3083110	Rear panel	20	28H3080170	Bottom plate

6.3 Wiring Diagram



6.4. Troubleshooting

		<p>To avoid electric shock, burns and other personal injury, please observe the following.</p>
<p>Warning</p>		
<ul style="list-style-type: none"> • Conduct troubleshooting by professionals or those familiar with welder circuit. • Before inspection, be sure to turn off the power supply of the product and the device (equipments connected with the welder). 		

Inspection items in case of faults

Faults		Fail to work	Red alarm light on	Water leakage	Power LED fault	High noise
Check item						
External	Power line	Loosen connection	▲	▲	▲	▲
	Fuse	Fuse burnt	▲			
	Inlet/outlet	Connection of inlet/outlet loosen			▲	
	Discharge	Discharge not sealed			▲	
Internal		Pump failure	▲	▲		▲
		Fan failure				▲
		Tank level low		▲		▲
		Insufficient coolant pump		▲		▲
		Water pipes blocked	▲		▲	
		Water pipe connection loosen		▲	▲	▲
		Water hose broken		▲	▲	
		Radiator water leakage		▲	▲	
		Flow valve water leakage		▲	▲	
		Wire fallen	▲	▲		▲
	Solenoid valve failure	▲				

Appendix: Schematic of welding power source

