NB-630HK pro

MIG/MAG/CO_2 WELDING MACHINE

MANUAL INSTRUCTION

(PLEASE READ CAREFULLY BEFORE OPERATION)

Safety Depends on You

Huayuan arc welding and cutting equipment are designed and built with safety in mind. However, your overall safety can be increased by proper installation.

DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT. And, most importantly, think before you act and be careful.

Special Attention (Very Important):

- **AVOID FALLING DOWN WHEN THE WELDING MACHINE IS PLACED ON THE INCLINED PLANE.**
- **IT'S CAN NOT BE USED FOR UNFREEZING PIPELINES.**
- **THE SHIELD RANK OF THIS SERIES OF WELDING MACHINE IS IP21S, AND IT IS NOT SUTABLE FOR WORKING IN THE RAIN.**
- **THE EMC CLASSIFICATION OF THIS WELDING MACHINE IS A.**

Purchase Date：_____

Serial Number：_____

Machine Type：_____

Purchase Place：_____

Cautions	Arc and arc rays may harm health.

Arc welding can be hazardous. All performing welding workers ought to have health qualification that provided by authority organization. Protect yourself and others from possible serious injury or death. Keep children away. Pacemaker wearers should consult with their doctor before operating. Be sure that all installation, operation, maintenance and repair procedures are performed only by qualified individuals.

1 **Electric shock can kill**: The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing, Wear dry, hole-free gloves to insulate hands. Users need to follow the below items to avoid electric shocks:

- Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground. Otherwise, use automatic or semiautomatic welding machines, DC welding machines as possible as you can.
- In semiautomatic or automatic wire welding, the electrode,electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically"hot".
- Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- Ground the work or metal to be welded to a good electrical(earth) ground.
- Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- Never dip the electrode in water for cooling.
- Never simultaneously touch electrically"hot"parts of electrode holders connected to two welders, because voltage between the two can be the total of the open circuit voltage of both welders.
- When working above floor level, please do wear safety belt to avoid falling or losing balance on electric shock.

2 **Arc rays can burn**: Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Head shield and filter lens should conform to nation standards.

- Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

3 **Fumes and Gases can be dangerous**: Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. While working in limited room, use enough ventilation and/or exhaust to keep fumes and gases away from the breathing zone, or use the respirator.

- Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation,especially in confined areas, to insure breathing air is safe.
- Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations.The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. Make sure they are asepsis and innocuity.

4 **Spatter**: Welding or cutting spatter can cause fire or explosion.

- Remove fire hazards from the welding area.If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- Where compressed gases are to be used in the field, special precautions should be used to prevent explosion.
- When not welding, make certain that no electriferous part is touching the work piece or the work stage. Accidental contact can create a fire hazard.
- Do not weld containers or lines, which are not proved to be innocuity.
- Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been"cleaned".
- Spatter might cause burn. Wear leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair to prevent from burning by spatter. Wear the ear shield when performing sideways or face up welding. Always wear safety glasses with side shields when being in a welding area.
- The welding cables should be as close to the welding area as possible, and the short, the better. Avoid welding cables going through the building framework, lifting chains, AC or DC cables of other welding machines and appliances. The welding current is strong enough to damage them while having short circuit with them.

5 **Cylinder may explode if damaged.**

- Make sure that the gas in the storage cylinder is qualified for welding, and the decompression flow-meter, the adapter and the pipe are all in good condition.
- Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- Be sure to put the cylinder in the working space with no crash or shake, and far from welding area.
- Never allow the electrode, electrode holder or any other electrically“hot”parts to touch a cylinder.
- Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

6 **Power**: (For electrically powered welding and cutting equipment) Turn off input power before installation, maintenance and repair to avoid accidents.

- Huayuan welding equipment is I class safeguard equipment; please install the equipment in accordance with the manufacturer’s recommendations by specific persons.
- Ground the equipment perfectly in accordance with the manufacturer’s recommendations.

7 **Power**:(For engine driven welding and cutting equipment)

- Work in ventilated place or outdoors.

- Do not add fuel near to fire or during engine starting or welding. When not working, add fuel after engine is cooling down; otherwise, the evaporation of hot fuel would result in dangers. Do not splash fuel out of the fuel tank, and do not start the engine until complete evaporation of the outside fuel.

- Make sure that all the safeguard equipments, machine cover and devices are all in a good condition. Be sure that arms, clothes and all the tools do not touch all the moving and rotating components including V belt, gear and fan etc.
- Sometimes some parts of the equipment have to be dismantled during maintenance, but you still have to keep the strongest safety awareness .
- Do not put your hand close to fans and do not move the brake handle while operating.
- Please remove the connection between the engine and the welding equipment to avoid sudden starting during maintenances.
- When engine is hot, it is forbidden to open the airtight cover of the radiator water tank to avoid hurt by the hot vapor.

8 **Electromagnetic**: Welding current going though any area can generate electromagnetic, as well as the welding equipment itself.

- Electromagnetic would affect cardiac pacemaker, the cardiac pacemaker users should consult one’s doctor first.
- The effect of electromagnetic to one’s health is not confirmed, and it might have some negative effect to one’s health.
- Welders may use following method to reduce the hazardous of electromagnetic:

a. Bundle the cable connected to the work piece and the welding cable together.
b. Do not enwind partially or entirely your body with the cable.
c. Do not place yourself between the welding cable and the ground (work piece) cable, if the welding cable is by your left side, then the ground cable should be by your left side too.
d. The Welding cable and the ground cable are as short as possible.
e. Do not work near to the welding power source.

9 **Lifting equipment**: carton or wooden boxes package the welding machines supplied by Huayuan. There is no lifting equipment in its wrapper. Users can move it to the prospective area by a fork-lift truck, then open the box.

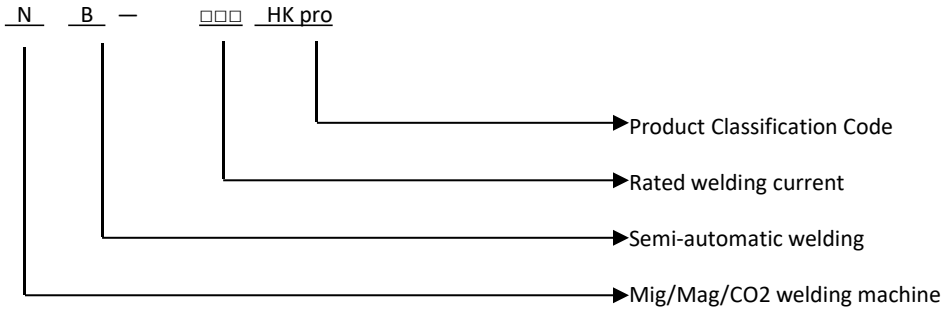
- If there are rings, the machine can be transited by rings. While Huayuan Welding Machine Manufacture reminds users, there is potential risk to damage the welding machine. So it is better to push the welding machine by its rollers unless special situations.
- Be sure that the appurtenances are all removed off when lifting.
- When lifting, make sure that there is no person below the welding machine, and remind people passing by at any moment.
  Do not move the hoist too fast.

10 **Noise**: Huayuan Welding Machine Manufacture reminds users: Noise beyond the limit (over 80 db) can cause injury to vision, heart and audition depending on oneself. Please consult local medical institution. Use the equipment after doctor’s permission would help to keep healthy.

CONTENT

1. Summary

1.1 Model instruction



1.2 Main features

- Panel simple, easier parameters set and operation.
- Arc characteristic function is adjustable, suitable different welding condition.
- Crater current, crater voltage can be separately set, suitable different type welding.
- With gas checking function, easy to set the gas flow.
- With protection function of over-heating and lack-voltage, get more stable operation.

1.3 Usage

Suitable for carbon steel industries which use CO2/MAG welding process, specially used in building, bridge steel structure, project machinery, etc.

1.4 Working condition and environment

If the following conditions are not met, the welding performance may not meet the specifications of the technical specifications, and even damage the welder!

- Ambient temperature range

  When welding: -10℃～40℃；

  Transport and store : -20～＋55℃；

- Relative humidity：40℃≤50%； 20℃≤90%
- Ingress protection IP21S, not suitable use or store under raining or snowing.
- The dust, corrosive and acid air or material should be within normal range, except the air come from the welding process.
- The distance between the power source and wall or other close things should be more than 30cm. The distance between two machines should be more than 30cm.
- It should be stored in a dry and windy place to prevent the sunshine and rain.
- The elevation should be less than 1000m；

1.5 Symbol instruction

Symbol list as follows:

	Please read manual		Ground connect
	Positive		Negative
	Current		Voltage
	MIG/MAG		

Table 1 Symbol instruction

2. Technical Specifications

Item	Unit	Model
		NB-630HK pro
Input power	V／Hz	3～380±15%　50／60
Rated input capacity	kVA	36
Rated input current	A	55
Rated output current	A	630
Rated output voltage	V	44
Rated open circuit voltage	V	85
Rated duty cycle	-	100%（40℃）
Efficiency	-	90.8%
Power factor	-	0.86
Energy efficiency grade	-	3
Output current range	A	60～630
Output voltage range	V	15-55
Wire feeding speed adjust range	m/min	1.5～30
Crater current	A	60～630
Crater voltage	V	17～45

Suitable wire diameter	mm	ϕ1.0、ϕ1.2、ϕ1.6
Cooling mode	-	Air cooling
Insulation grade	-	F
Ingress protection	-	IP23S
Dimension(L*W*H)	mm	640×290×580
Net weight	kg	39

3. Panel and function

3.1 Front panel function

Up panel function as follows figure.1

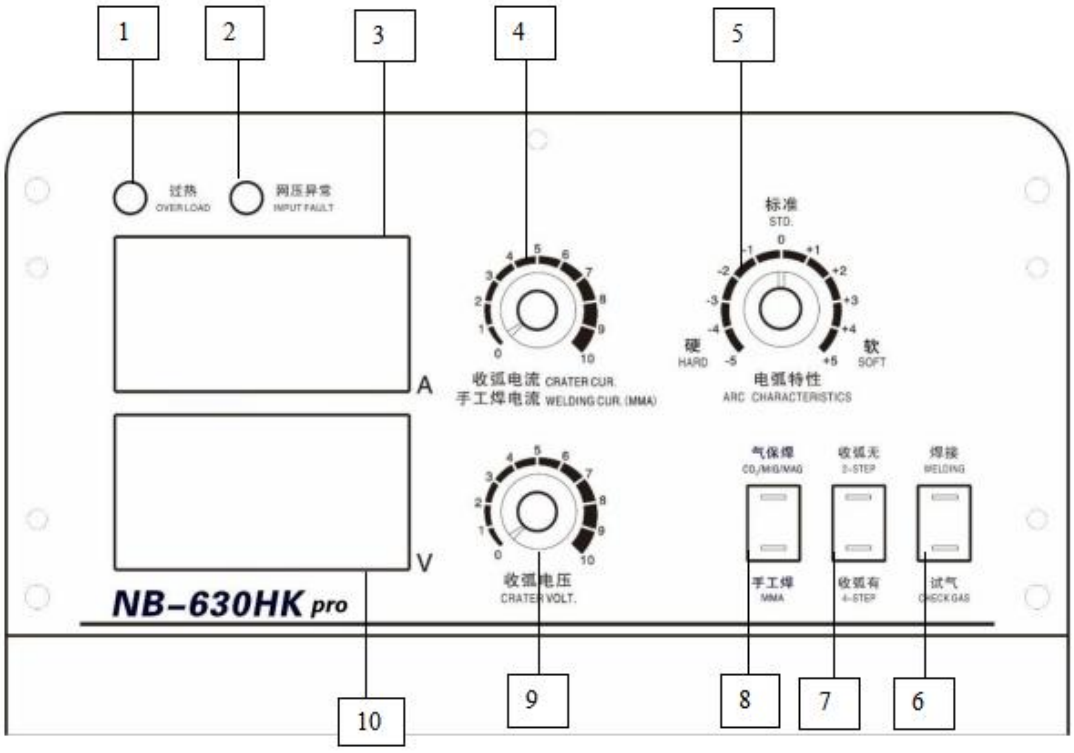


Fig.1 Up front panel

（1）Overheat indicator: When the temperature inside the machine is too high, this indicator will light, and the welder will turn off the output;

If the air inlet or outlet or the air duct is blocked, the fan rotates abnormally, the ambient temperature is too high, and the welding machine is overloaded and used continuously, etc., the internal temperature will be too high;

When the temperature in the standby falls below the temperature protection point, the indicator will go out and the welder will automatically return to standby.

（2）Input fault: When the power supply of the welder is lower than 300V, this indicator will light and the welder will turn off the output.

（3）Current meter: When the welding torch switch is not pressed, the relative value of the wire feeding speed is displayed;

The actual welding current value is displayed when the torch switch is pressed.

（4）Crater current: used for crater current adjustment.

（5）Electric arc characteristic knob: used to adjust the rate of current change during the droplet transfer during welding. This knob adjustment will directly affect the softness and hardness of the arc, the size of the splash, the formation of the weld and the stability of the arc combustion. It is in the standard state at the “0” position and meets the needs of most normal welding. The left-hand adjustment knob is scaled from “0” to “-5”, the arc is gradually hardened, suitable for small gauge welding, the right-hand rotation adjustment is from “0” to “+5” scale, the arc is gradually softened, suitable for medium specification and large specification welding. .

Note: The arc hard splash is slightly larger, and the arc soft splash is small;

（6）“welding/check gas”: When switching to the "check gas”, set or check the flow rate of the shielding gas before welding, and after the requirements are met, switch to the "welding" position, the gas is automatically controlled;

（7）Crater switch: Used to switch “2-step/4-step”function switch.

（8） MMA and CO2/MIG/MAG exchange knob.

（9） Crater voltage: used for crater voltage adjustment.

（10）Voltage meter: The preset welding voltage value is displayed when the welding torch switch is not pressed;

The actual welding voltage value is displayed when the torch switch is pressed.

3.2 Down front panel

Down panel function as follows fig.2

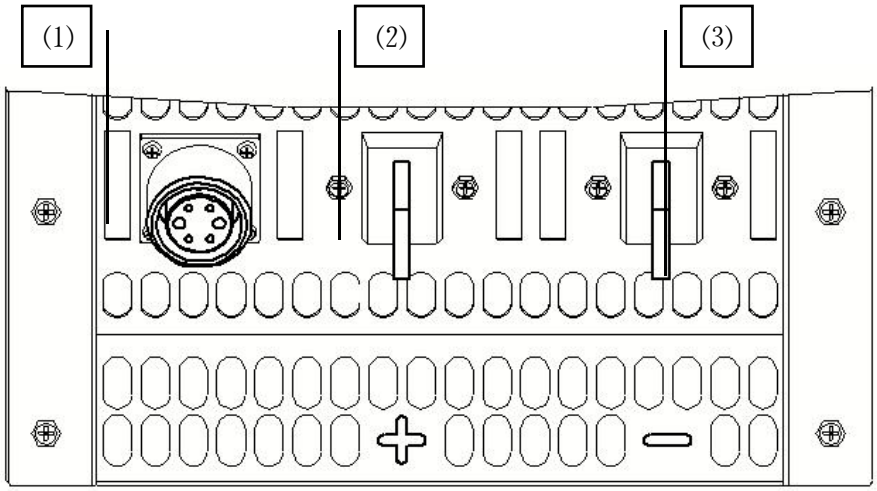


Fig.2 Front panel function

(1) Control cable socket: Used to connect the wire feeder control cable.

(2) Welder output positive pole: used to connect the wire feeder welding cable.

(3) Welder output negative: used to connect the work-piece connection cable.

3.3 Rear panel instruction

Rear panel instruction as follow Fig.3:

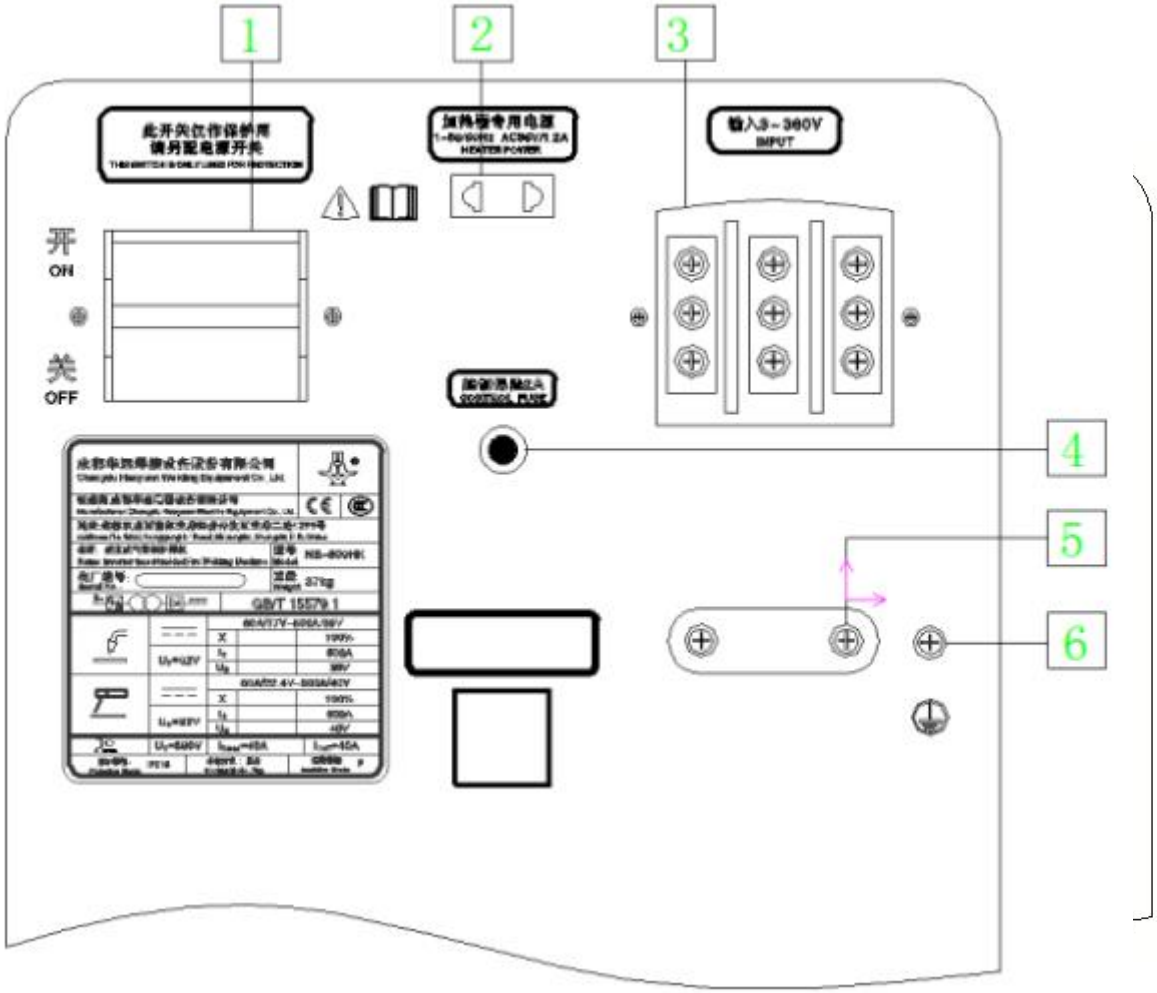


Fig.3 Rear panel function

(1) Power over-current protection switch: When the welder has abnormal input over-current, disconnect the power supply to protect it. This switch is for protection only. Please install a power switch when the welder is installed.

(2) Heater power connector: The power socket of the gas heater, the output voltage is AC36V/1.2A.

(3) Three-phase power cable junction box: The three-phase power cable of the welder is connected to the connection end.

(4) Control fuse nut: used to short circuit protection, 2A

(5) Three-phase power cable fixed clamp: used to fix the three-phase power input line.

(6) Grounding nut: used to connect the welder to the earth.

4. Installation

4.1 Power supply requirement

（1）Power supply: 3～50/60Hz 380VAC.

（2）Grid voltage fluctuation range: ＜±15%.

（3）Frequency fluctuation range: ＜±1%.

（4）Three-phase voltage imbalance rate:＜±5%.

（5） When using the engine generator: The generator output power is required to be more than twice the rated input power of the welding power source, and the compensation coil is provided.

4.2 Power cable connection

Please refer to Figure 4 to connect the power supply cable of the welder:

(1) Installation must comply with national and local standards - only by professionals;

(2) The user must turn off the power switch in the power distribution box before connecting, and start connecting after ensuring that the power is turned off;

(3) The power supply for this product is three-phase 380V AC 50/60Hz. Users should use the corresponding distribution box, air switch (circuit breaker) and power cord. The selected distribution box and power cord must meet the relevant national standards.

The conditions for the user's power supply should be as follows:

Air breaker capacity (A)	Fuse capacity (A)	Power cable cross-sectional area(mm^2)	Ground cable cross-sectional area(mm^2)
63	40	≥6	≥6

Table 3 Switchboard parameter requirements table

（1） Power cable connection

The connection must be made by a licensed electrician using cables and plugs that comply with local and national electrical standards.

（2） Ground cable connection

Use a wire to connect the grounding screw on the backplane of the power supply to the ground. The cross-sectional area of the wire must meet the requirements of Table 3. The grounding method is implemented in accordance with relevant national standards.

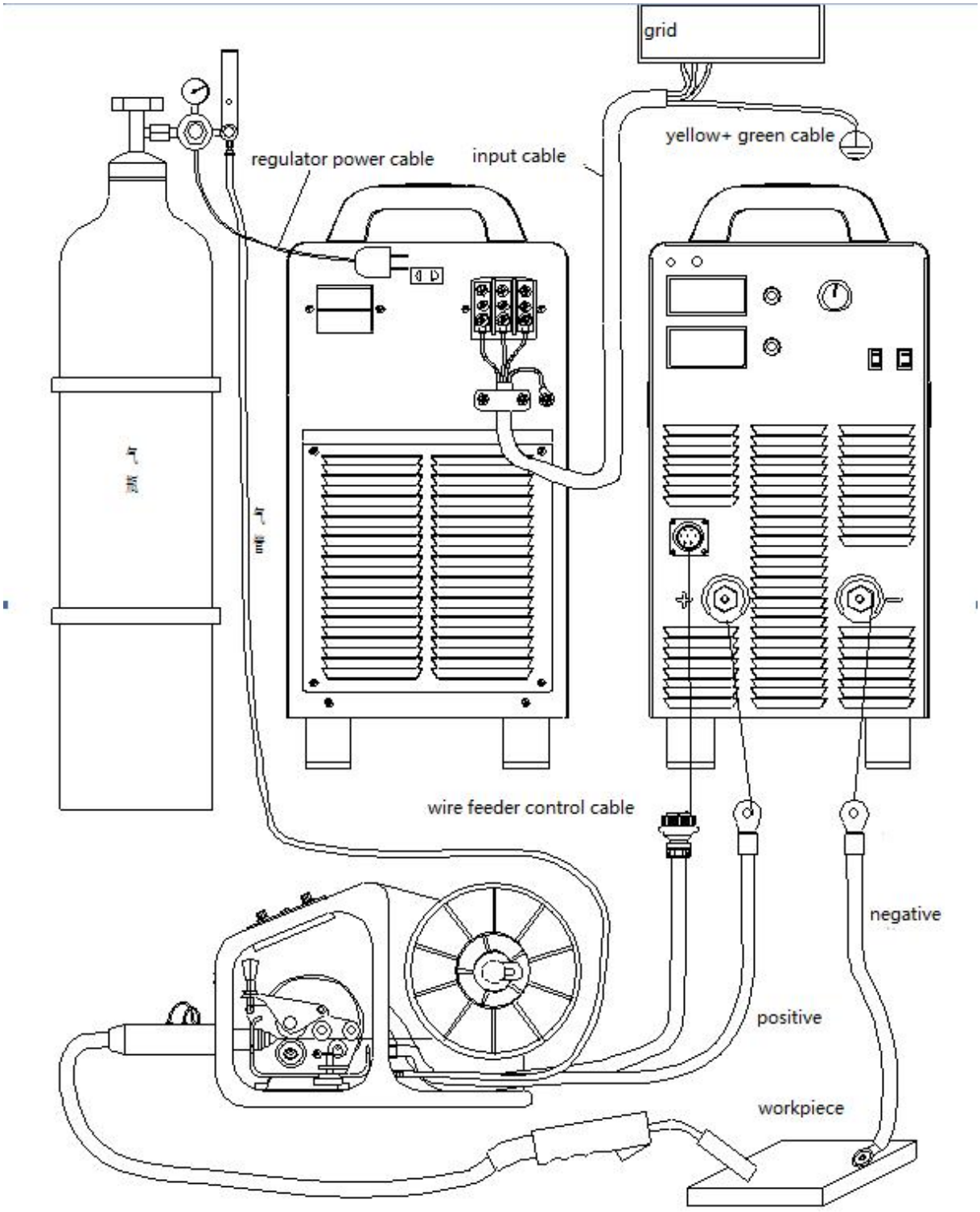


Fig.4 Welder installation

4.3 Welder and wire feeder connection

Please refer to fig.4 to connect:

(1) Connect one end of the negative output cable to the "-" output terminal block of the welder and the other end to the work-piece.

(2) Connect one end of the positive output cable to the "+" output terminal block of the welder and the other end to the wire feeder connector.

(3) Connect the air plug (six-core) of the wire feeder control cable to the welder end control cable socket (six-core), and tighten the ring nut to connect the other end of the control cable to the wire feeder.

(4) The torch connector is fully inserted into the guide groove, rotate 90° clockwise after insertion, and then tighten the fastening screw; connect the gas pipe of the torch to the gas outlet connector of the wire feeder, and tighten the crimp nut; Insert the control plug into the guide slot and insert it into the wire feeder control socket (two cores) and tighten the ring nut.

4.4 Gas cylinder and gas regulator connection

The connection between the gas cylinder and the gas regulator is shown in Figure 4:

(1) Install the gas regulator on the cylinder and tighten the mounting nut.

(2) Connect the plug of the gas heater to the heater power socket on the rear panel of the welder.

(3) Connect the gas supply pipe of the wire feeder to the gas output connector of the gas heater and press it with the hose clamp.

5. Operation

5.1 Pr-operation and inspection confirmed items and methods and requirements

（1） Preparation of safety equipment

Safety equipment as the follows Fig .5 :

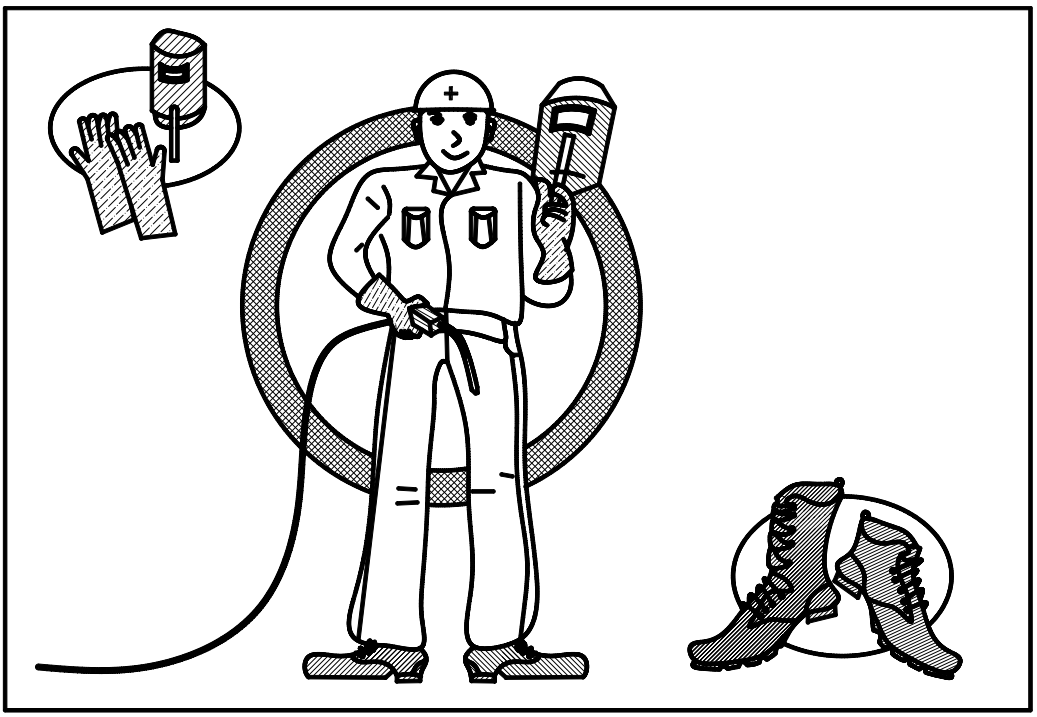


Figure 5

● Wear fur gloves and safety shoes to protect the skin and bare parts;

● Wear a shield filter glass that match with different welding current to protect eyes;

● There should be ventilation in the welding place to prevent breathing in deleterious gas.

Welding current	Under 100A	100A～300A	300A and above
Photo protection degree	No.09 , No.10	No.11, No.12	No.13 , No.14

Table 4 The selection principal and reference of filtering glass

（2） Checking after connection

All items specified in the “Installation” in item 5 of this manual are checked one by one and confirmed without errors.

（3） Switch operation and gas flow adjustment

Step 1: Turn on the power switch of distribution box;

Step 2: Press “weld/check gas” knob to check gas position.

Step 3: After unscrewing the gas cylinder switch, slowly unscrew and adjust the flow adjustment knob switch of the gas flow meter so that the indication value on the flow-meter is the welding required value.(Refer to table 6.)

Step 4: Press “weld/check gas” to “weld” position.

（4） Wire installation

Each parts name as the Fig.6 as follows:

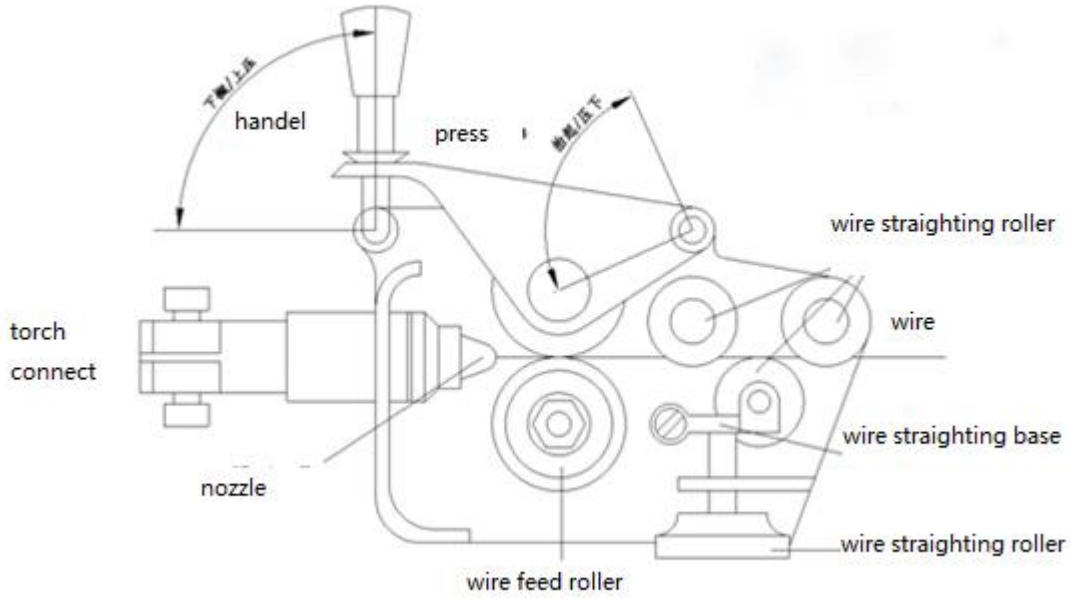


Fig.6 Wire installation

Pr-operation and inspection, confirmed items and methods, requirements:

Step 1: Confirm that the wire feeding groove diameter of the wire feeding wheel is the diameter of the welding wire. Otherwise, the wire feeding wheel must be removed to select the wire feeding wheel diameter which is the same as the diameter of the welding wire, and the groove is outside. Installed

Step 2: Pull down the handle of the wire feeder and lift the pressure arm;

Step 3: the wire spool is mounted on the wire spool, the wire spool of the wire is adjusted to extend, and the manual nut is tightened. When the welding wire is out, the wire spool rotates clockwise when the wire is out;

Step 4: the welding wire passes through the correcting wheel (or guiding tube), the wire feeding wheel slot, and then the guiding nozzle is inserted;

Step 5: pressing the pressing arm to press the welding wire, then lifting the handle to press the pressing arm, and rotating the handle to a moderate pressure;

Step 6: Check the welding nozzle of the welding torch. The hole diameter should be the same as the diameter of the wire used.

Step 7: Press the “manual wire feed” button of the wire feeder control box and adjust the “welding current adjustment knob” to make the wire feed speed suitable until the 15-20 mm wire is exposed at the torch head. (Manual wire feed switch is shown in Figure 7)

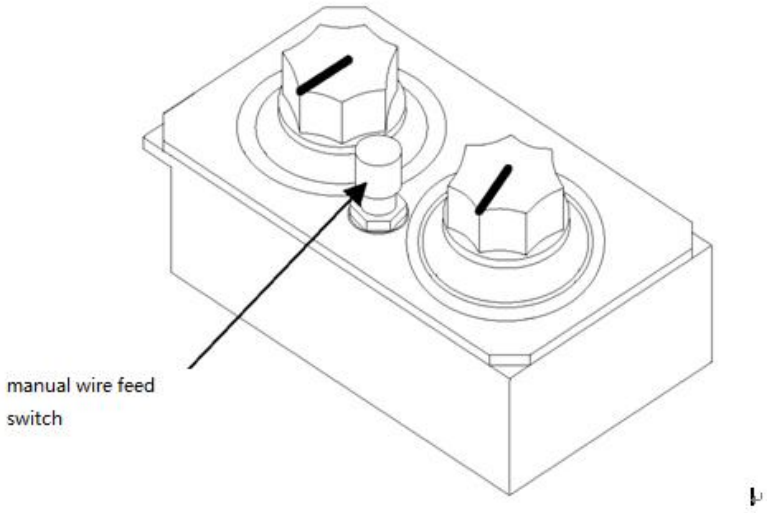


Fig.7 Wire feeder control box

Step 8: Adjust the screw sleeve of the wire handle to make the pressing force appropriate. The ideal pressing force is that the wire can be transported normally. It is not suitable for slipping on the wire feeding wheel. Please adjust according to the diameter of the wire marked on the adjusting handle.

DANGER! When jogging the wire, do not bring the end of the torch close to the face, eyes, or body. If the wire suddenly jumps out into the face, eyes, or body, it will cause injury.

Note! Do not put your hands, fingers, hair, sleeves, clothes, etc. close to the rotating part of the wire feed wheel when you feed the wire. If it is caught, it will cause injury.

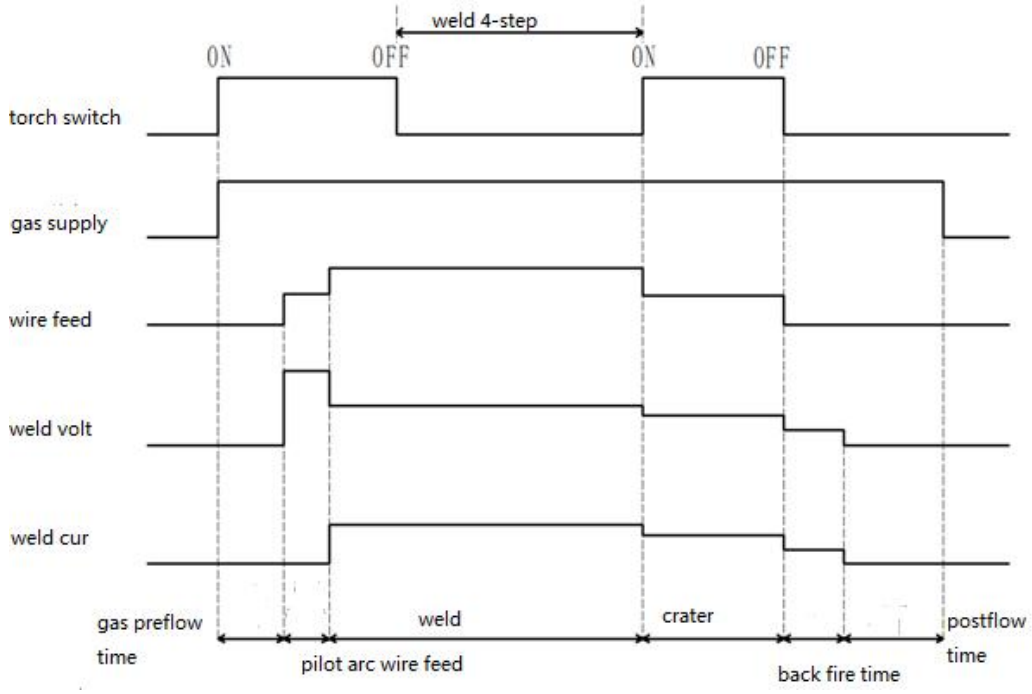
5.2 Welding operation

（1） 4-Step weld operation(Non initial)

● Suitable for welding long seam or medium thick plates

● The filling of the arc pit at the end of the welding can be achieved by welding with the arc;

● During the welding process, when the continuous arc breaking occurs for more than 0.5 seconds, the self-locking is automatically released and the welding is completed.

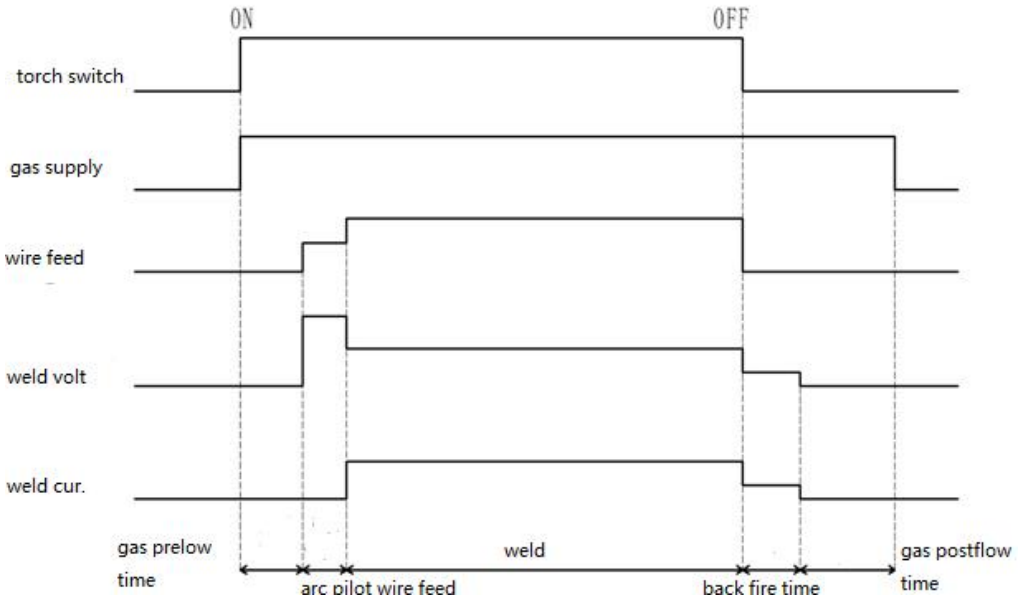


● Enter the welding preparation state, and put the "2-step/4-step" switch of the welder panel to "4-step". Press the torch switch and start to supply air and enter the pre-air supply state. Waiting for a period of time, the welding voltage appears, and the slow wire feeding starts to enter the arcing state. After the arc is successfully turned on, the wire feeding speed becomes a normal speed and a welding current is formed. At this time, the torch switch can be released and the welding enters a self-locking state. At the same time, the "welding voltage adjustment knob" and "welding current adjustment knob" of the wire feeder must be adjusted to achieve the best welding effect.

When welding to the end point, press the torch switch again to enter the arc adjustment state; at this time, adjust the arcing voltage by adjusting the “arc voltage adjustment knob” and “arc current adjustment knob” on the front panel of the welder. The current (or adjusted to the required value in advance, generally adjusted to 60 to 70% of the normal welding current), so that the depression at the end of the welding can be filled. When the welding torch switch is released again, the wire is immediately braked to stop, and the ignition state is reduced to the burn-in voltage. When the welding current is zero, the arc-breaking is completed, the gas supply is stopped, and the welding process is completed.

（2） 2-Step weld operation (Non initial and crater)

● Mainly used for spot welding, repeated short welding, thin plate welding.
● Press the button“2-step/4-step”to “2-step”, Turn on the torch(ON) and start welding, OFF torch then end welding.



6 .Weld Sample

The reference value values of the standard conditions are provided in Tables 6 and 7, which facilitates quick setting of parameters. In actual welding, please correct it according to the material to be welded and the welding position to find suitable welding conditions.

Table 6 Angle weld

Item		Thickness (mm)	Angle weld length (mm)	Wire diameter (mm)	Weld current (A)	Weld voltage (V)	Weld speed (cm/min)	elongation (mm)	Gas flow (L/ min)
Flat weld T type connector	Low speed condition	1.0	2.5～3	0.8	70～80	17～18	50～60	10	10～15
		1.2	3～3.5	1.0	85～90	18～19	50～60	10	10～15
		1.6	3～3.5	1.0、1.2	100～110	18～19.5	50～60	10	10～15
		2.0	3～3.5	1.0、1.2	115～125	19.5～20	50～60	10	10～15
		2.3	3～3.5	1.0、1.2	130～140	19.5～21	50～60	10	10～15
		3.2	3.5～4	1.0、1.2	150～170	21～22	45～50	15	15～20
		4.5	4.5～5	1.0、1.2	180～200	23～24	40～45	15	15～20
		6	5～5.5	1.2	230～260	25～27	40～45	20	15～20
		8, 9	6～7	1.2、1.6	270～380	29～35	40～45	25	20～25
		12	7～8	1.2、1.6	300～380	32～35	35～40	25	20～25
	spee d cond	1.0	2～2.5	0.8	140	19～20	150	10	15

Item		Thickness (mm)	Angle weld length (mm)	Wire diameter (mm)	Weld current (A)	Weld voltage (V)	Weld speed (cm/min)	elongation (mm)	Gas flow (L/ min)
		1.2	3	0.8	140	19～20	110	10	15
		1.6	3	1.0、1.2	180	22～23	110	10	15～20
		2.0	3.5	1.2	210	24	110	15	20
		2.3	3.5	1.2	230	25	100	20	25
		3.2	3.5	1.2	260	27	100	20	25
		4.5	4.5	1.2	280	30	80	20	25
		6	5.5	1.2	300	33	70	25	25
Flat angle weld lap joint (Thin plate)	Low speed condition	0.8		0.8	60～70	16～17	40～45	10	10～15
		1.2		0.8	80～90	18～19	45～50	10	10～15
		1.6		0.8	90～100	19～20	45～50	10	10～15
		2.3		0.8	100～130	20～21	45～50	10	10～15
				1.0、1.2	120～150	20～21	45～50	10	10～15
		3.2		1.0、1.2	150～180	20～22	35～45	10～15	10～15
		4.5		1.2	200～250	24～26	40～50	10～15	10～15
	High Speed	2.3～3.2		1.2	220	24	150	15	25
					300	26	250	15	25
Angle connector thin plate	Low speed	1.6		0.8	65～75	16～17	40～45	10	10～15
		2.3		0.8	80～100	19～20	40～45	10	10～15
		3.2		1.0、1.2	130～150	20～22	35～40	15	10～15
		4.5		1.0、1.2	150～180	21～23	30～35	15	10～15

Table 7 I type butt welding

Item		Thickness（mm）		Wire dia.（mm）	Gap G（mm）	Weld current（A）	Weld voltage（V）	Weld speed (cm/min)	elongation(mm）	Gas flow (L/min）
I type butt welding	Low speed condition	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
		2.0		1、1.2	0～0.5	110～120	19～19.5	45～50	10	10～15
		2.3		1、1.2	0.5～1	120～130	19.5～20	45～50	10	10～15
		3.2		1、1.2	1～1.2	140～150	20～21	45～50	10～15	10～15
		4.5		1、1.2	1～1.5	170～185	22～23	40～50	15	15
		6	Display	1.2	1.2～1.5	230～260	24～26	40～50	15	15～20
			Inside	1.2	1.2～1.5	230～260	24～26	40～50	15	15～20
		9	Display	1.2	1.2～1.5	320～340	32～34	40～50	15	15～20
			Inside	1.2	1.2～1.5	320～340	32～34	40～50	15	15～20
	High speed condition	0.8		0.8	0	89	16.5	120	10	15
		1.0		0.8	0	100	17	120	10	15
		1.2		0.8	0	110	18	120	10	15
		1.6		1、1.2	0	160	19	120	10	15
		2.0		1、1.2	0	180	20	80	15	15
		2.3		1、1.2	0	200	22	100	15	20
		3.2		1.2	0	240	25	100	15	20

7. Working principle

7.1 Working principle

NB-HK gas shield welding machine adopts the latest electron device----IGBT is the key inverter device. The three phase AC power is transformer into 20KHz high frequency voltage after bridge rectified. The high frequency voltage output welding voltage after transforming, rectifying and filtering.

7.2 Theory drawing

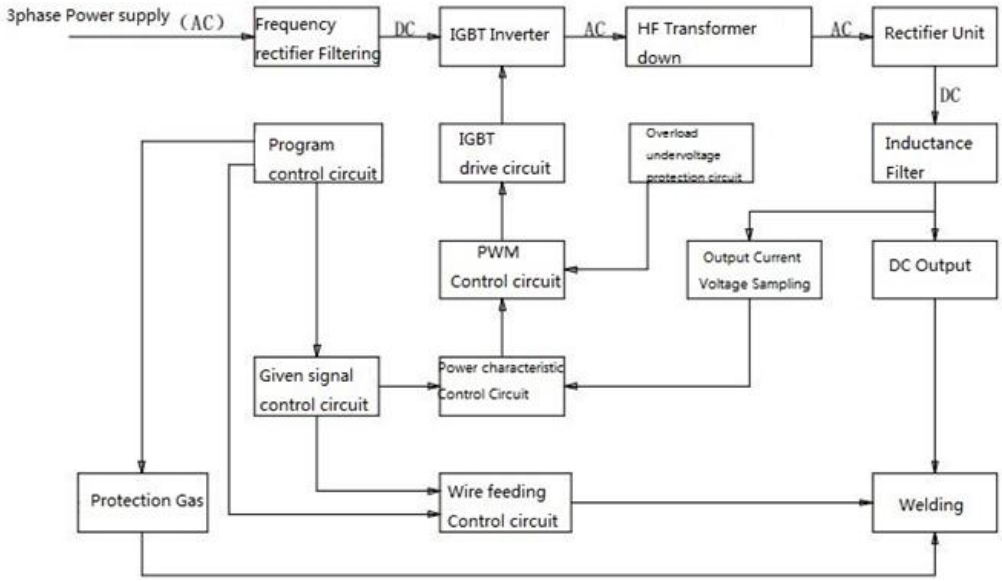
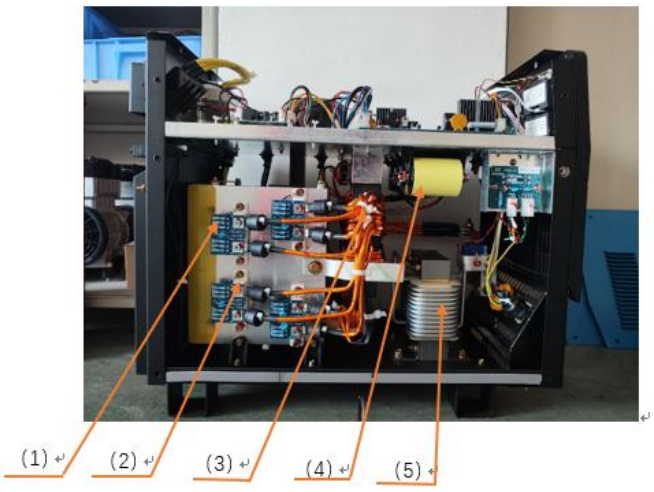
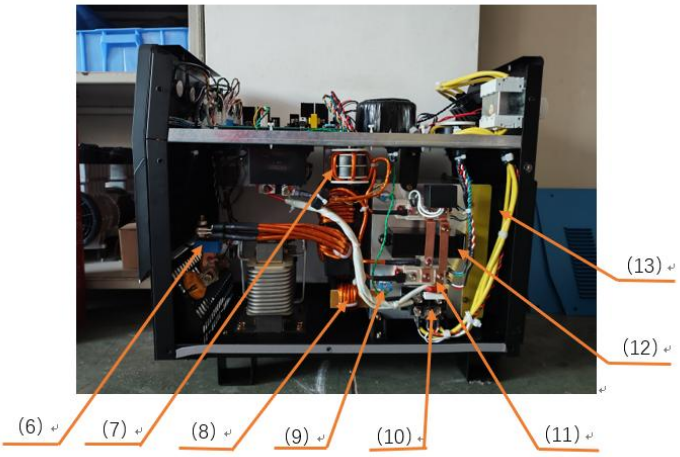


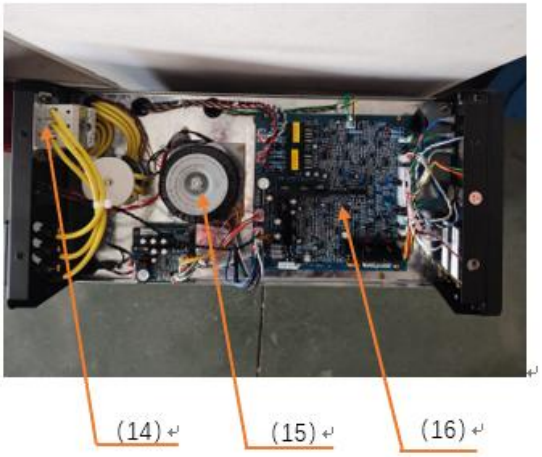
Fig.8 Drawing

7.3 Main parts list

NB-630HK pro







No.	Item	Code	Model	QTY	Note
1	PCB	AP6、AP7、AP8、AP9	202980002	4	
2	Diode	V4、V5、V6、V7	102070200171	4	
3	Inverter transformer	TM1	201092305	1	
4	Filter capacitor	C1、C2、C3、	102020500004	3	
5	Reactor	L1	201092308	1	
6	Hall sensor	TA1	102060300106	1	
7	Saturation inductance	L3	201092307	1	
8	Chock inductance	L2	2011121405	1	
9	Temperature sensor	KT1	102010400031	1	
10	Bridge rectifier	V1	102070300161	1	

11	IGBT	V2、V3	102070100196	2	
12	Capacitor	C5	102020504001	1	
13	Cooling fan	EV1、EV2	103020000078	2	
14	Air breaker	QF1	102010200063	1	
15	Control transformer	TC1	105010000260	1	
16	PCB	AP1	202090086	1	

8. Maintenance and repairing

Note: When maintain or repair, the power must be cut off.

8.1 Maintenance

- User should open the case regularly according to the usage and environmental conditions (at least once a year) to clean the internal dust with dry compressed air to prevent the dust from being damp and cause short circuit in the machine to cause malfunction;
- User should check the installation connection regularly, ensure reliable connection.

8.2 Repairing

- Only the person holding the electrician's operation permit can repair the welder
- Before opening the welding machine, first check the three-phase voltage of the incoming power of the welder, which should meet the national standards. After the three-phase voltage is normal, check whether the fuse inside the machine is blown, and then check the welding cable to ensure the connection is reliable and correct.

9. Common faults and eliminating methods

If there some problems that can not be judged or solved, please do not hesitate to contact our company to get some technical assistance. Please do not repair or open the machine arbitrarily. There is high voltage after cutting power for 10 minutes, only qualified electrician can operate!

Common faults and eliminating methods: (see below sheet)

Table 9 Common faults and eliminating methods

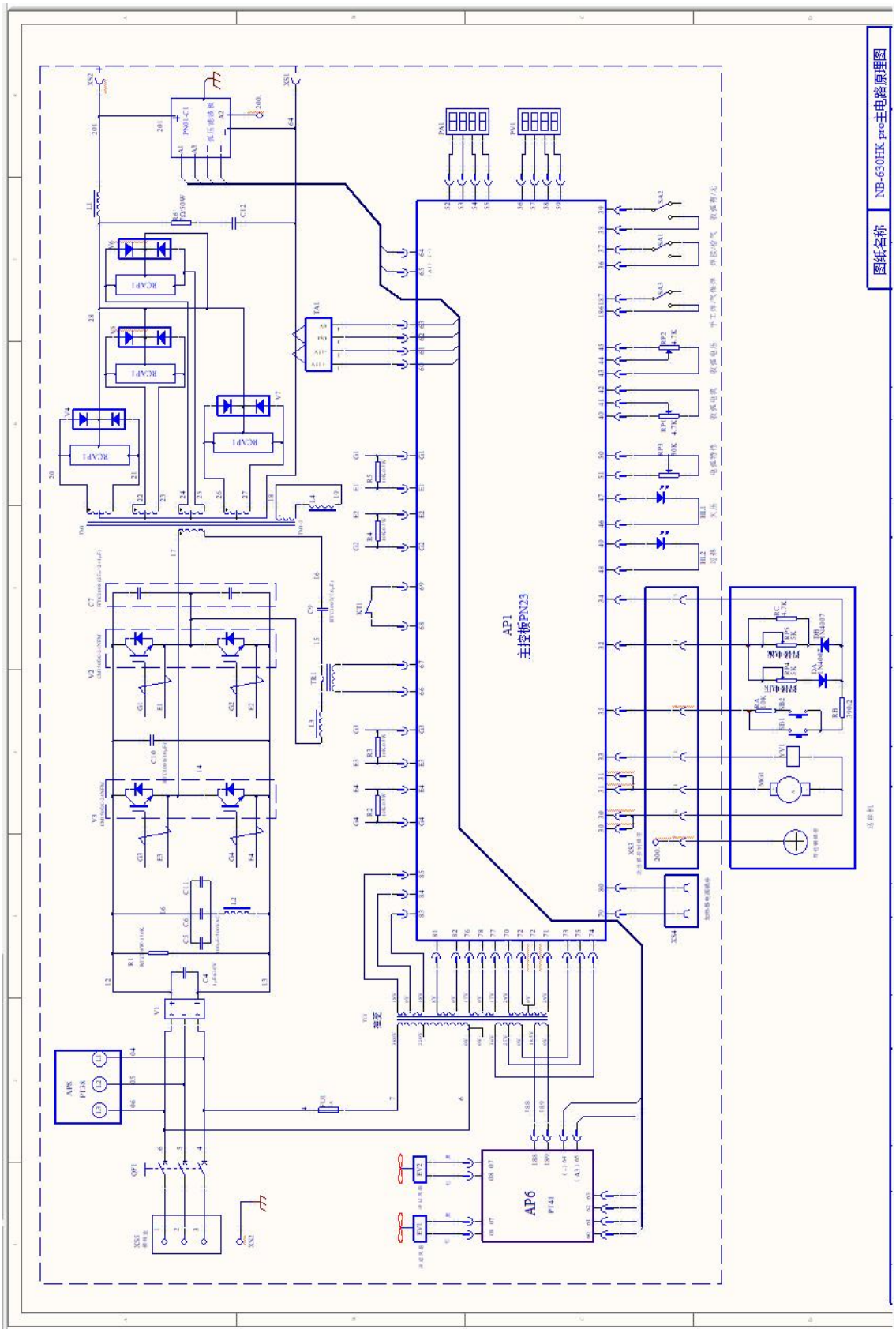
Faults	Reasons	Eliminating methods
1．Put power on, the power indicator do not light, digital display meter don't work	1.Open phase of three phase power; 2.The power switch is old and damaged; 3.The 1.5A fuse of power control is melt;	1.Check the three phase power switch; 2.Replace power switch; 3.Replace the fuse;
2．Welding machine do not work, under	1．Open phase on three phase power; 2．Under voltage on three phase power;	Check three phase supply power, make sure supply voltage fit the required voltage;
3．Welding machine do not work, the over-heating indicator lights	1.The environment temperature is too high; 2.There is something wrong with the cooling fan; 3.The temperature relay is damaged;	1.Make welding machine rest for a moment; 2.Check the power of cooling fan or replace cooling fan; 3.Replace the temperature relay;
4. There is wire feeding, but no current spark, or there is noise in machine	1.The fast recovery diode is damaged; 2.IGBT is damaged; 3.Circuit or other components are damaged;	1.Check and replace the damaged fast recovery diode; 2.Replace IGBT or PCB; 3.Check and replace the damaged parts;

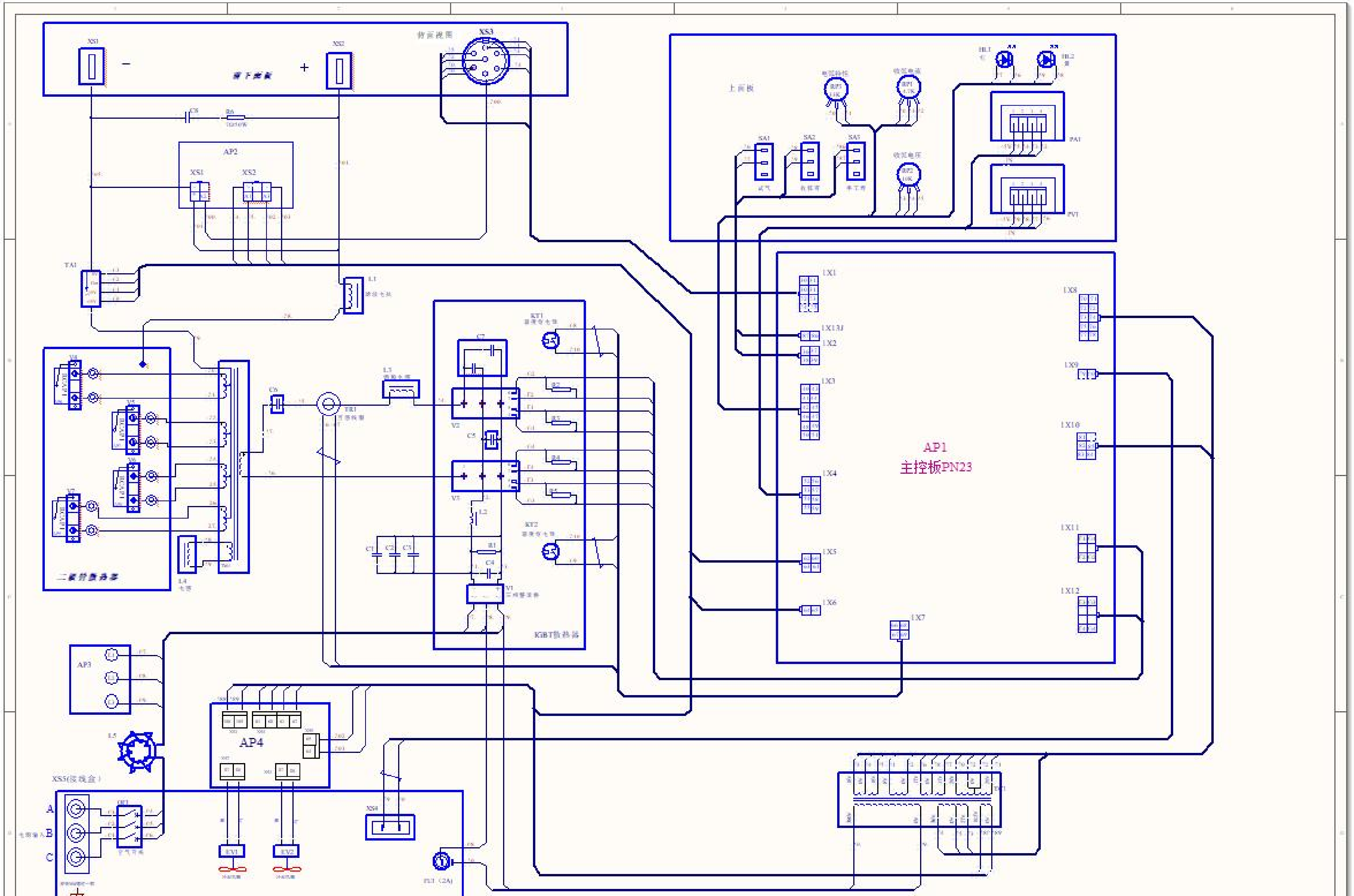
5． Press torch switch, wire wheel moves, but there is no wire sending out from torch, or the wire feeding is unstable	1.The wire wheel is not tighten; 2.The diameter of wire slot is not same as electrode wire; 3.The contact tip is blocked by spatter; 4.The wire reel slog is abraded; 5.The wire feeding pipe of torch is blocked; 6.The torch cable is excessive bended;	1.Fasten the wire wheel; 2.Replace wire slot; 3.Eliminate the spatter on contact tip; 4.Replace wire feeding wheel; 5.Clean the dirty or dust in wire feeding pipe by dry compressed air or replace it with a new one; 6.Make the bending diameter of torch cable larger than 300mm;
6． Press torch switch, the wire feeding wheel do not move or there is no no-load voltage	1． Control cable of wire feeder is damaged; 2． Open circuit on control cable of welding torch switch; 3． The PCB is damaged; 4. The wire feeding motor is damaged;	1． Check the control cable; 2. Repair the wire feeding motor or replace it with a new one; 3． 4. Repair or replace motor; 5. Repair or replace PCB;
7． There are too many air holes on welding seam;	1.CO_2 gas is not pure; 2.The gas flow is not enough; 3.There is grease dirt or rust on welding seam; 4.The wind in the welding place is too heavy; 5.CO_2 gas circuit is blocked or blab; 6.Gas valve doen`t actuate; 7.Deformation on nozzle;	1.Use high purity CO_2 gas; 2.Adjust the gas flow; 3.Eliminate the grease dirt or rust on welding seam; 4.Do something to reduce the wind in welding place; 5.Check the gas circuit, dredge it or block it; 6.Replace the nozzle of welding torch;
8. Current and voltage can not be adjusted	1.The potentiometer of current and voltage is damaged; 2.The PCB is damaged.	1.Replace potentiometer; 2.Repair or replace the PCB;
9． Wire is feed without pressing torch	1.Short circuit on switch; 2.Manual wire feeding button is damaged;	1.Repair or replace welding torch; 2.Replace manual wire feeding button;
Faults	**Reasons**	**Eliminating methods**
10. The gas heater frosts	1.Poor contact on heater plug seat; 2.Open circuit on heater resistance wire;	1.Check the plug and socket of heater; 2.Repair or replace heater;
11． There is too much spatter or the welding current is not stable	1.Open circuit on three phase power; 2.Wrong welding standard; 3.Bad electrode wire quality; 4.There is grease dirt or rust on work piece or electrode wire; 5.The distribution voltage fluctuates heavily; 6.The electrode wire sticks out too long; 7.The diameter of wire slot is not same as electrode wire; 8.Something wrong with the shield gas; 9.Wrong model of contact tip or the tip hole is damaged; 10.Too much dirt in wire feed pipe; 11.Ground wire gets flexible;	1.Check three phase supply power, make sure supply voltage fit the required voltage; 2.Adjust the welding standard; 3.Replace electrode wire; 4.Clean the grease dirt or rust; 5.Make sure the fluctuation range of distribution voltage is in 380 VAC±15%; 6.The stick out length should be 10 times more than wire diameter; 7.Replace the wire slot; 8.Use high purity gas; 9.Replace contact tip; 10.Clean the wire feeding pipe; 11.Fasten the ground wire;

10. Packing List

1. NB-HK Power source	1pc
2.Wire feeder	1pc
3.Heater	1pc
4.Composite cable	1pc
5.Earth cable	1pc
6.Torch	1pc
7.Documents: operation manual, certificate, warranty	1 pc for each

11. Appendix drawing





图纸名称	NB630HK pro 接线图1
图号	HYNB630HK pro-06-001	共2张 第1张

设计	张同金	时间	2024.07.03	修改		时间		审核		时间		批准		时间	

The final explanation right is reserved to Huayuan Company!

If there is any change in the manual, please forgive not to inform separately!

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