



Operator's Manual

NB Inverted Gas shielded welder



Save for future reference.

Date Purchased

Code:(ex: NB-500)

Serial:(ex: D1234567)

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THANK YOU FOR SELECTING A QUALITY PRODUCT BY HYWD.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

HYWD arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part.

DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.

And, most importantly, think before you act and be careful.

WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.

CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.



WEAR CORRECT EYE, EAR & BODY PROTECTION



PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate.

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition. Also, wear

safety glasses in work area **AT ALL TIMES.**

SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.





SECTION A: WARNINGS



- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

ARC WELDING CAN BE HAZARDOUS. 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. PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS

Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF).

Welding current creates EMF fields around welding cables and welding machines.

EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

Exposure to EMF fields in welding may have other health effects which are now not known.

All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

Route the electrode and work cables together - Secure them with tape when possible.

Never coil the electrode lead around your body.

Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

Connect the work cable to the workpiece as close as possible to the area being welded.

Do not work next to welding power source.

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.

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.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.

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, use a safety belt to protect yourself from a fall should you get a shock.

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.

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.



FUMES AND GASES CAN BE DANGEROUS.

Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation

and/or exhaust at the arc to keep

fumes and gases away from the

breathing zone. When welding

hardfacing (see instructions on

container or SDS) or on lead or

cadmium plated steel and other metals

or coatings which produce highly toxic

fumes, keep exposure as low as

possible and within applicable OSHA

PEL and ACGIH TLV limits using local exhaust or mechanical

ventilation unless exposure assessments indicate otherwise. In

confined spaces or in some circumstances, outdoors, a respirator

may also be required.

Additional precautions are also required when welding

on galvanized steel.

The operation of welding fume control equipment is affected by

various factors including proper use and positioning of the equipment,

maintenance of the equipment and the specific welding procedure

and application involved. Worker exposure level should be checked

upon installation and periodically thereafter to be certain it is within

applicable OSHA PEL and ACGIH TLV limits.

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.

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.

Read and understand the manufacturer's instructions for this

equipment and the consumables to be used, including the Safety

Data Sheet (SDS) and follow your employer's safety practices. SDS

forms are available from your welding distributor or from the

manufacturer.



**WELDING AND CUTTING SPARKS
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.

CYLINDER MAY EXPLODE IF DAMAGED.

Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

SAFETY

Have a fire extinguisher readily available.

Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" and the operating information for the equipment being used.

When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

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". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances",

Vent hollow castings or containers before heating, cutting or welding. They may explode.

Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

Do not use a welding power source for pipe thawing.

**CYLINDER MAY EXPLODE IF DAMAGED.**

Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

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. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1.



**FOR ELECTRICALLY POWERED
EQUIPMENT.**

Turn off input power using the disconnect switch at the fuse box before working on the equipment.

Install equipment in accordance with the National Electrical Code, all local codes and the manufacturer's recommendations.

Ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations.



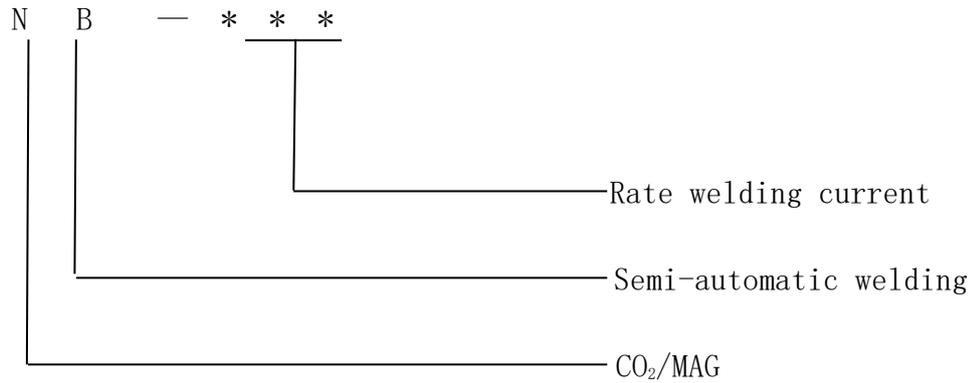
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1. Introduction

NB Series Inverter gas shielded welder adopt advanced inverter principle and the electronic circuit control method. This product absorbs the advanced technology of other similar equipment's in the world, and we design a new, efficient, energy-saving mechatronic welding equipment for both our new and old customers. The device has excellent welding performance. The effect of welding could change with the welder habits and the actual welding requirements. Our product has the following advantages: stable welding arc, little spatter, good and deep penetration weld molding, light weight, small size, easy operation, etc. Mainly used for low-carbon steel and low alloy steel and other ferrous metals, welding of stainless steel, copper, aluminum, and other nonferrous metals. Our products are widely used in petroleum, chemical, electric power construction, boilers, containers, machinery, shipbuilding, military, aviation, and other industries.

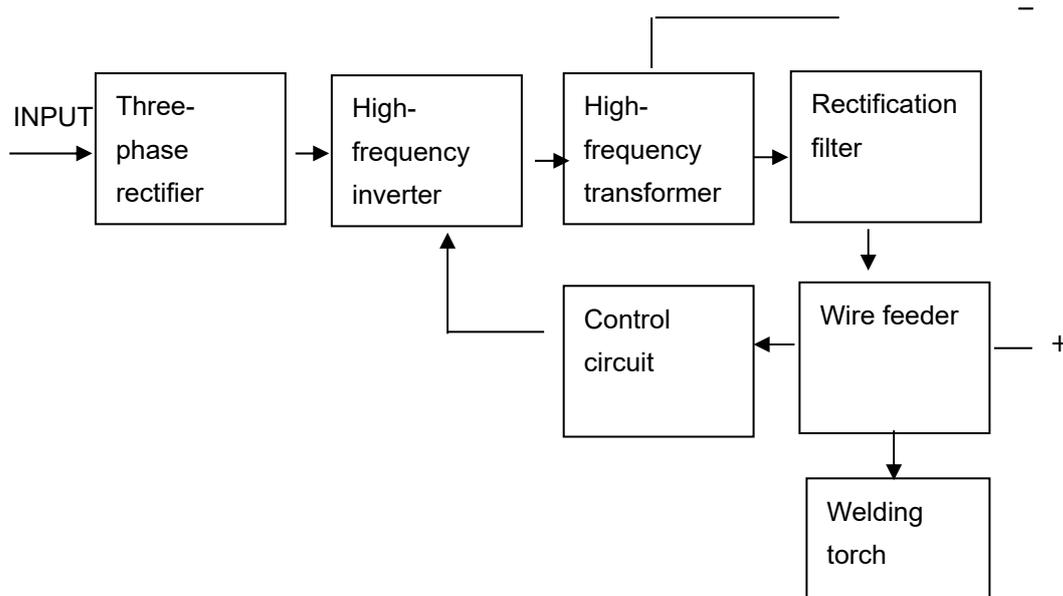
2. Model preparation instructions



3. Technical Parameters and Working principle

Model	NB—350	NB—500	NB—630
Voltage input	3P 380V±10% 50HZ/60HZ		
Rated input capacity	13.7KVA	24.4KVA	34.6KVA
Welding current range	60—350A	60—500A	80—630A
Welding voltage range	16—36V	17—45V	18—45V
Rated duty cycle	60%		
Dimension	620×300×530	620×300×530	620×300×530
Weight	41Kg	43Kg	45Kg
Wire type	Solid/flux core		
Plate thickness	1—10	2—35	3—45
Wire diameter	0.8/1.0/1.2	1.0/1.2	1.0/1.2/1.6
Cooling mode	Forced air cooling		
Protection class	IP21		
Implement standard	GB15579.1-2013		

Working principle



This welding machine adopts the half-bridge hard-switching or the full-bridge soft-switching inverter technology. Input three-phase 380V working frequency power by three-phase bridge rectifier to high voltage, then through the IGBT inverter transform it into a high frequency AC, after from high-frequency step-down transformer to the high-frequency rectifier, the machine output direct current is suitable for welding. Through this process, to improve the dynamic response speed of the welding machine and reduce the volume and weight of the welder.

The control circuit select the by-pulse limit width modulation, using the voltage and current double closed loop control. Through adjusting the welding output to adjust the pulse width modulator and adjust output pulse width smoothly. Meanwhile, welding effect adjustment function effectively improved static and dynamic characteristics of the welding machine, the welding feels good, and owns beautiful shape, excellent welding performance.

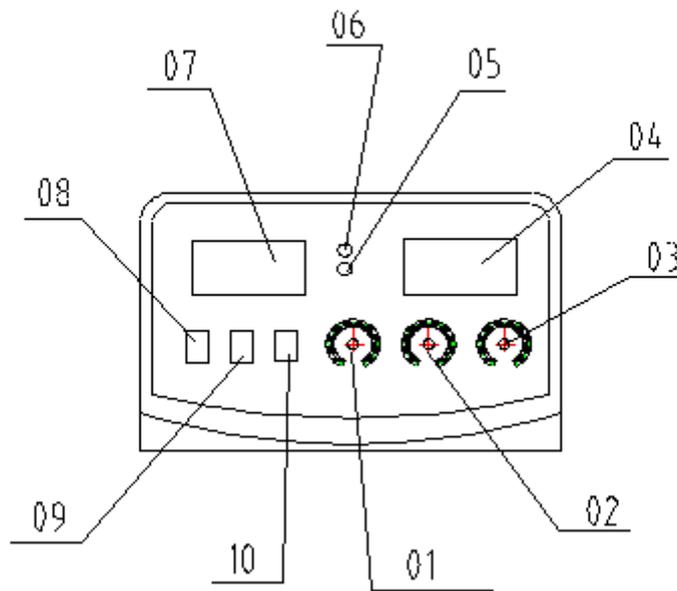
Using high-frequency inverter technology, not only to reduce the weight of the welding machine, but also improving the welding performance. At the same time significantly improve the welding machine energy saving effect. Efficiency of 20% to 30%, compared with the tradition of the same type of SCR welder, and our product is worth the user's preference.

4. Main components

No	Material name	Model		
		NB-350	NB-500	NB-630
1	Temperature relay	75°C	75°C	75°C
2	Air switch	DZ47-C63	DZ47-C63	DZ47-C63
3	Rectifier module	MDS100/1200	MDS100/1200	MDS100/1200
4	IGBT model	MMG75D120B6HN	MMG100D120B6HN	MMG150D120B6HN
5	Fast diodes	MMF300Y060DK1	MMF300Y060DK1	MMF300Y060DK1
6	Axial flow fan	200FZY7-D	200FZY7-D	200FZY7-D

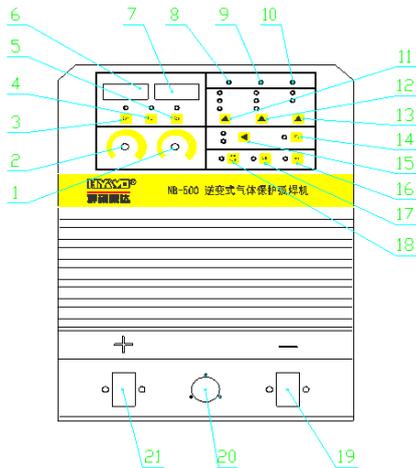
5. Function Introduction

5.1. Introduction to Analog Front Panel Functions



- 1) End arc voltage regulator
- 2) End arc current regulator
- 3) Welding effect adjustment
- 4) Current indicator
- 5) Fault indicator
- 6) Power indicator
- 7) Voltage indicator
- 8) Gas check
- 9) Wire inspection, welding selection
- 10) Self-locking is or no options

5.2. Introduction to Digital Front Panel Functions



1. Voltage regulation: arc ending voltage regulation and initial voltage regulation (press button 11 to select whether arc ending is present or initial is present, and then press the arc ending or initial key to do so).
2. Current regulation: arc stopping current regulation and initial current regulation (press button 11 to select whether arc stopping is present or initial, and then press the arc stopping or initial key to do so).
3. Initial button: Press this button to set the initial current and voltage.
4. Welding button: Press this button to display welding current and welding voltage.
5. Arc stopping button: Press this button to set the arc stopping current and voltage.
6. Ammeter: current display.
7. Voltmeter: voltage display.
8. Power indicator light: Power indicator.
9. Overheat indicator light: When the light is on, it indicates that the temperature of the welding machine is too high.
10. Abnormal indicator light: When the light is on, it indicates that the welding machine is faulty and has been stopped from use.
11. Function button: Press this button to select functions such as arc ending with, arc ending without, and initial with.
12. Wire diameter button: Press this button to select the size of the welding wire.
13. Welding method button: Press this button to select welding methods such as gas shielded welding or manual welding.
14. Gas detection button: Press this button to check the gas flow rate.
15. Welding wire material button: Press this button to select the material of the welding wire (solid core or flux core).
16. Storage button: Press this button to store parameters.

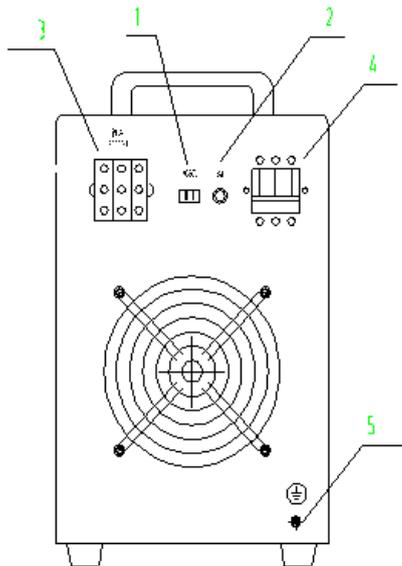
17. Call button: Press this button to call parameters.
18. Channel selection button: Press this button to select the channel (0-9) for storing welding parameters.
19. Welding machine output negative: connected to the welding workpiece.
20. Control socket interface: control cable for wire feeder.
21. Welding machine output positive: connected to the welding gun of the wire feeder;

Parameter settings

Advance air supply: Press the call button for 5 seconds without releasing it to enter the setting state. Adjust the current adjustment knob on the welding machine panel to display the number 4 on the ammeter. Press the storage button once, and the number displayed on the ammeter will be the advance air supply time. Adjust the current adjustment knob again to adjust the length of time, and then press the storage button to exit.

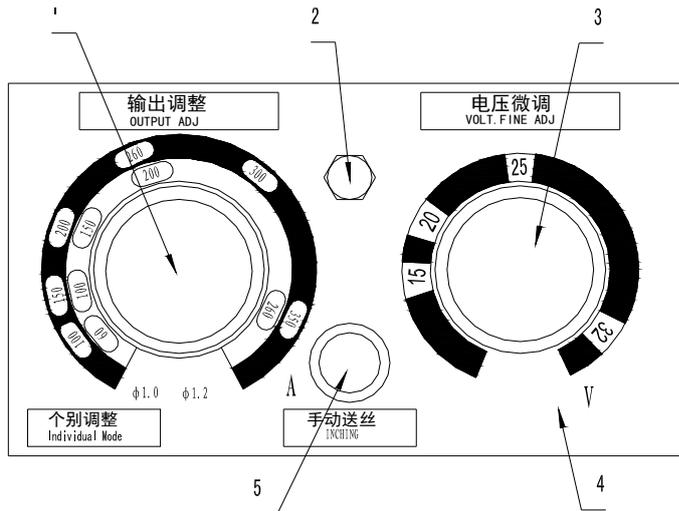
Delayed gas cutoff: Press and hold the call button for 5 seconds to enter the setting state. Adjust the current adjustment knob on the welding machine panel to display the number 5 on the ammeter. Press the storage button once, and the number displayed on the ammeter will be the delayed gas cutoff time. Adjust the current adjustment knob again to adjust the length of time, and then press the storage button to exit.

5.3. Brief introduction of back-panel



1. AC36V Heating outlet
2. 8A Heating insurance
3. AC380V Into line cable
4. Air switch
5. Grounding screw

5.4. Introduction of the remote control on the wire feeder



- 1)The welding current adjustment knob: adjust it can change the current value.
- 2)Fixed the scale plate with bolts
- 3)Welding voltage adjustment knob: adjust it can change the voltage value
- 4)The scale plate: The scale on-board inscribed with the current and voltage parameters
- 5)Manual wire feeding switch: press this switch, you can send the wire. Wire feed speed can be adjusted by the welding current adjustment knob.

5.5. The welder load switch, fuse, and wire cross-section configuration table

Welding specification	NB-350	NB-500	NB-630
Switch capacity	50	60	80
Fuse capacity (A)	30	50	60
Input cable cross-sectional area (mm ²)	4	6	10
Output cable cross-sectional area (mm ²)	50	70	95

5.6. Note

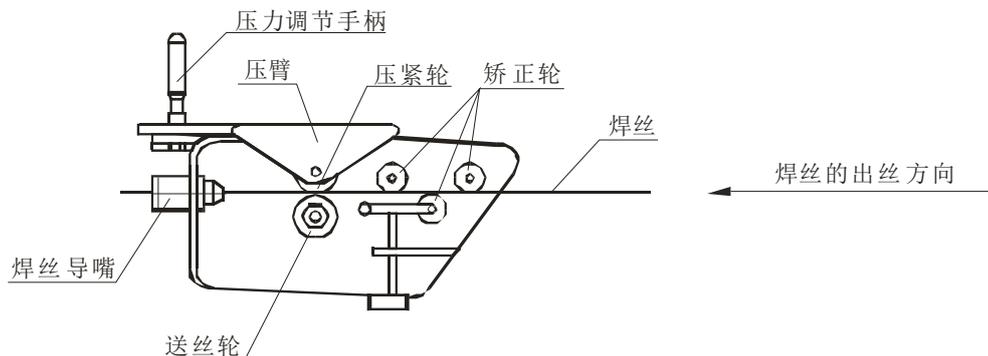
- 5.6.1. In the three-phase and four-wire system, the yellow and green one is ground wire, which should be well-grounded in the process of using. Meanwhile, making the grounding screw which behind the wilder panel below grounded, to prevent the bad insulation of welding machine causing the electric shock.
- 5.6.2. The input three-phase power supply imbalance rate is less than or equal to 5%. Each welder should be equipped with electric box and use the required size of the insurance (leakage protection or uninsured breaker)
- 5.6.3. In the process of welding, the welders, wire feeders, cylinders shall have the fix devices to prevent the tilting ground tilted. The mobile power should be lifted in the right method, such as using the forklift or crane, try to keep the power being upright ,not to being inverted, meanwhile, ensuring no severe vibration and bumps
- 5.6.4. The current which is exceed the maximum allowable load current (relative to the

selected duty cycle) is prohibited, the current overload will be greatly shortened the the welder life, and may even burned welder

- 5.6.5. The overheat protection circuit is installed in the welding machine, when the standard duty cycle is exceeded, the welder may suddenly enter the protection status to stop operating. At this time, the panel fault lights will light up, do not turn off the power, so that the cooling fan is sustainable to cool the Welder, When the yellow light goes out, the welder could start to work again.
- 5.6.6. The normal temperature for welder operation is between $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$
- 5.6.7. The welder protection class is IP21, so the welder should not be used in the rainy day.

6. Use and operation.

- 6.1. Strictly according to the whole wiring diagram and welder-load switches, fuses and Crosswicks-sectional area of configuration table to connect, each connection point must be tightened.
- 6.2. The installation of the wire reel: Put the entire qualified volume wire into the wire feeder shaft, pay attention to the direction of the output wire, and tighten the shaft end knob.
- 6.3. Welder adjustment schemes



Penetrate the wire according to the figured direction, the wire should be into the slot of the wire feed wheel, compressed the pressure arm to adjust the compression handle to the appropriate location.

- 6.4. Boot: Checking the three-phase 380V voltage is normal, and the ground connection is secure. Check the welding power source, wire feeder, gun control boxes, cylinders, decompression flow meter connection is correct. And then place the front panel with gas / wire inspection / conversion switch to the normal position (do not placed in other locations, in case of damaging the module), closed the welder power switch, indicator

lights, cooling fan rotation.

- 6.5. Check the gas flow: Adjust the flow meter switch down to the loose position, and then open the valve at the top of the CO2 gas cylinder (and vice versa can damage the flow meter), then place the air check / wire inspection / normal change-over switch in the front panel of welding power supply to the "gas check" position, and adjust the gas flow switches to the appropriate location, namely, the gas emitted from the torch at the end of the exit.
- 6.6. Manual wire feeding: Push the manual button of the wire feeder, the manually wire feeding can be achieved. Adjust the welding current knob of the remote-control box can change the feeding speed. When the wire of welding torch contact tip is sanded into 0-15mm, release the button immediately, and to stop the wire feeding.
- 6.7. To close the arc with or without place the closing arc to the "yes" position, after pressing the welding torch switch, you can release the switch and welding anomaly. When the torch switch is pressed again and hold, transferred to the fixed income arc specification set by the front panel, release the switch to stop the welding; When the closing arc in the "no" position, press the torch switch and hold to the normal welding, release the torch switch to stop welding.
- 6.8. According to the size of the welding current adjust the welding current, welding voltage, the arc current closing, the arc voltage closing, welding machine effect.
- 6.9. When the above processes ready, you can welding
- 6.10. When the welding finished, following the processes to close the welder.
 - 1) To close the cylinder r switch.
 - 2) To place the gas-check switch to the "check" position, the flowmeter pressure indicator to "0" position, and adjust the flowmeter knob to the right position.
 - 3) close the welder power.

7. Maintenance

The qualified personnel are responsible for the maintenance of welder. When encountering the failure, please timely contact with the company service department and the designated repair point.

1, the daily inspection matters

* Whether the power supply voltage is consistent with the requirements.

* Whether the input cable connection of welding power is correct and reliable.

* Whether the welding ground connection is reliable.

2, regular maintenance

Every six months by a professional maintenance staff on a regular basis with compressed air to clear the dust in the welder and paying attention to the inspect the machine fasteners and wiring, problems should be immediately solved. Sandstorm-hit areas should be on a dust processing for every 1-2 months.

Note:

The maximum voltage of machine is 600V, to ensure the security, open the cabinet is forbidden. Welding power must be cut off 10 minutes before the maintenance and make the security measures to prevent the occurrence of the electric shock. After the disassembly, the wiring and damage components should not be moved freely.

8. Troubleshooting

Failure phenomenon	Causes	Exclusion method
When turned on, the indicator does not light	(1) Power supply lack of phase (2) automatic air switch on the rear panel damage	(1) Check the power (2) the replacement of the automatic air switch
Connected to the welding Power, the automatic air switch on the rear of panel is trip	(1) automatic air switch failure (2) the IGBT module is damaged (3) three-phase rectifier bridge is damaged (4) the main control board is damaged	(1) the replacement of the air switch (2) Replace the IGBT module, and replace the drive circuit board (3) the replacement of three-phase rectifier bridge (4) replace the control board
In the process of welding, the automatic air switch on the rear of panel is trip	(1) long-term overload operation (2) air switch is damaged (3) the IGBT module is damaged	(1) Using in accordance with the welder load rate (2) The replacement of the air switch (3) The replacement of the IGBT module
Press and hold the torch switch, wire feeder does not work, and No-load voltage has no indication	(1) Torch switch is damaged (2) wire feeder control cable is broken (3) the main control board is damaged.	(1) replace the torch (2) repair the wire feeder control cable (3) Replace the control board
Hold the torch switch, wire feed normally, but the gas line blocked.	(1) the main control board is damaged (2) electromagnetic valve is damaged	(1) to replace the main control board (2) the replacement of the electromagnetic valve
Can not adjust the welding current	(1) wire feeder main control cable is broken (2) welding machine control board is bad (3) the potentiometer is damaged	(1) the replacement of the wire feeder control cable (2) to replace the control board (3) Replace the potentiometer
CO2 gas regulator is not heating	(1) CO2 gas regulator is damaged (2) Heaters insurance burn	(1) the replacement of the CO2 gas regulator (2) the replacement of insurance
Arc is unstable and spatter is large	(1) welding standard is wrong (2) conductive mouth is serious wear	(1) fine tuning the welding machine specification (2) the replacement of the contact tip

If the problems could not be solved by the above way, or you encounter other problems, please contact the after-sale service department of our company or the vendors

9. Configuration list

1	Power source	1	9	Conductive nozzle	3
2	Wire feeder	1	10	Insurance tube	3
3	windpipe	6m	11	Hex wrench	1
4	Positive cable	5m	12	User manual	1copy
5	Welding torch	1	13	certificate	1copy
6	Flow meters	1	14	Warranty card	1copy
7	negative electrode cable	3m	15	Packing list	1copy
8	Control cable	5m			

(The above configuration is limited to the standard configuration, they can be customized in accordance with their requirement)

Sketch 1 NB Series power source wiring

