

The Drive & Control

www.prolinecnc.ir



NG80

High performance
current vector
inverter

PROLINECNC

OPERATION
INSTRUCTIONS

02133391418-19

09197745159-09207745159

Contents

Preface	1
Introduction	2
Chapter 1 Safety and Precautions	5
1.1 Safety Precautions	5
1.2 Precautions	7
Chapter 2 Product Information	10
2.1 Model Description	10
2.2 Description of Nameplate	10
2.3 Selection Guide	11
2.4 Technical Specifications	14
2.5 Outline Drawing & Installation Hole Dimension	17
2.6 Optional Accessories	21
2.7 Routine Maintenance of Inverter	22
2.8 Instructions on Warranty of Inverter	23
2.9 Selecting Guide for Brake Components	23
Chapter 3 Mechanical and Electrical Installation	27
3.1 Mechanical Installation	27
3.2 Electrical Installation	29
Chapter 4 Operation and Display	43
4.1 Keypad Description	43
4.2 Function Code Checking and Modification Methods Description	45
4.3 Parameter Display Method	45
4.4 User Customization Parameter Operation Method	47
4.5 Viewing Methods for Status Parameters	47
4.6 Password Setting	47
4.7 Motor Parameters Autotuning	48
Chapter 5 Function Parameter List	49
Chapter 6 EMC (Electromagnetic Compatibility)	89
6.1 Definition	89
6.2 EMC Standard Description	89
6.3 EMC Guide	89
Chapter 7 Trouble Shooting	92
7.1 Fault and Trouble Shooting	92
7.2 Common Faults and Solutions	99
Chapter 8 MODBUS Communication Protocol	101
8.1 About Protocol	101
8.2 Application Method	101
8.3 Bus Structure	101
8.4 Protocol Description	101
8.5 Communication Data Structure	101
8.6 Command Code and Communication Data Description	102
8.7 PD Group Communication Parameter Description	109
Appendix: Quick Guide to Frequency Converter Applications	111

Preface

Thank you for purchasing NG80 series inverters.

This manual describes how to use NG80 series inverter properly. Please read it carefully before installation, operation, maintenance and inspection. Besides, please use the product after understanding the safety precautions.

Precautions

- In order to describe the product's details, the drawings presented in this instruction are sometimes shown without covers or protective guards. When using the product, please make sure to install the cover or protective guard as specified firstly, and operate the products in accordance with the instructions.
- Since the drawings in this manual are represented examples, some are subject to differ from delivered products.
- This manual may be modified when necessary because of improvement of the product, modification or changes in specifications. Such modifications are denoted by a revised manual No..
- If you want to order the manual due to loss or damage, please contact our company agents in each region or our company customer service center directly.
- If there is still any problem during using the products, please contact our company customer service center directly.

Introduction

1) Rich voltage levels

Supports six voltage levels: single-phase 220V, three-phase 220V, three-phase 380V, three-phase 480V, three-phase 690V, and three-phase 1140V.

2) Rich motor variety support

Support vector control of three-phase AC asynchronous motors and three-phase AC permanent magnet synchronous motors.

3) Rich control methods

It enables V/F separation control in addition to vector control with speed sensor, vector control without speed sensor, and V/F control.

4) Rich fieldbus

Supports Modbus-RTU.

5) Rich encoder types

Differential encoder, open collector encoder, resolver, UVW encoder, and other devices are supported.

6) New speed sensorless vector control algorithm

The new SVC (speed sensorless vector control) inverter outperforms the previous inverter in terms of low-speed stability, low-frequency carrying capacity, and torque control.

7) Support user programmable

Users can realize the secondary development feature and create the program using ladder diagrams and other methods using the NG80 user programmable card. Our H1u PLC is completely compatible with the programming environment.

8) Powerful background software

Background program can do uploading, downloading, and real-time oscilloscope of inverter parameters.

9) More diverse features

The table below summarizes the functionalities added to the NG80 based on the original product.

Functions	Description
Virtual input/output IO	Flexibly implementing various simple logical functions
Motor overheat protection	A13 can accept motor temperature sensor input (PT100, PT1000) using the NG80 expansion card, triggering motor overheating protection.
Fast current limiting	Avoiding inverters frequent overcurrent faults
Multiple motor switching	Equipped with four sets of motor parameters, can achieve switching control of four motors
Restore user parameters	User can save or restore their own configured parameters using this method.
Higher precision AIAO	By factory calibration (and also field calibration), AIAO accuracy may be within 20mV.
User customization parameter display	The function parameters that are presented can be altered by the user.
User changed parameter display	The updated function parameters are visible to the user.
Optional fault handling methods	The user can choose between free stop, deceleration stop, and continuing operation when an inverter malfunction occurs. When continuing operation, the frequency can also be chosen.
PID parameter switching	There are two accessible sets of PID settings, which may be changed manually or automatically based on deviations.

Functions	Description
PID feedback loss detection	When PID is operating, set the PID feedback loss detection setting to achieve protection.
DIDO positive and negative logic	The positive and negative logic of DIDO can be individually adjusted by the user.
DIDO response delay	The DIDO response delay time is independently controlled by the user.
Instantaneous stop does not stop	When an inverter experiences a brief power outage or unexpected voltage decrease, it makes sure that it can keep running for a short while.
Timed operation	Supports maximum 6500 minutes of timed operation

Unpacking and inspection:

When unpacking, please check the following information seriously. Whether the model number and inverter rating on the nameplate of this machine are consistent with your order. The box contains the machine you ordered, the product certificate of conformity, the user operation manual and the warranty sheet.

Whether the product has been damaged during transportation. If some kind of omission or damage is found, please contact our company or your supplier to solve it quickly.

First time use:

You should carefully read this manual before using this product if you're a first-time user. Please contact our technical support staff for assistance if you need clarification on any function or performance-related information. It will help you utilize this product properly if you do this.

The information given by our firm may change at any time without prior notification due to our commitment to ongoing improvement on inverter.



The NG80 series inverter meets the following international standards, and some products have passed CE certification.

IEC/EN 61800-5-1: 2003 Safety requirements for adjustable speed electrical transmission systems;

IEC/EN 61800-3: 2004 Adjustable speed electrical transmission systems; Part III: Electromagnetic compatibility standards of products and their specific test methods.

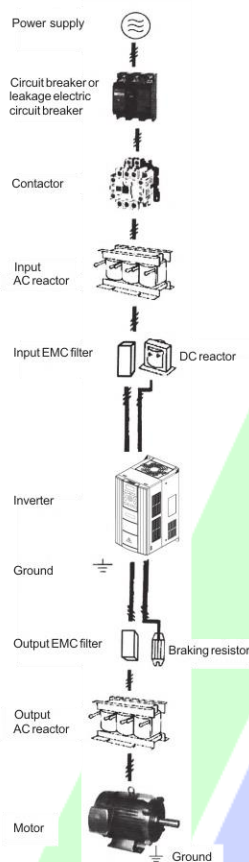



Diagram of the connection to peripheral devices


- Do not install the capacitor or surge suppressor at the output side of the inverter, otherwise it may cause inverter failure or capacitor or surge suppressor damaged.
- The Inverter input / output (main circuit) contains harmonic components, it may interfere with inverter accessories communications equipment. Therefore, please install anti-interference filter to minimize interference.
- The details of external devices and accessories selection refer to the manual of external devices.

Chapter 1 Safety and Precautions

Safety definition:

In this manual, safety precautions are classified as follows:



 **Danger:** Operations which are not performed according to requirements may cause serious equipment loss or personnel injury.

 **Caution:** Operations which are not performed according to requirements may cause medium hurt or light hurt or material loss.



During the installation, commissioning and maintenance of the system, please make sure to follow the safety and precautions of this chapter. In case of a result of illegal operations, caused any harm and losses is nothing to do with the company.

1.1 Safety Precautions



1.1.1 Before Installation:

 Danger	<ul style="list-style-type: none"> ● Carefully handled when loading, otherwise it may damage the inverter. ● Please don't use the damaged driver or inverter with missing parts, there may be risk of injury. ● Do not touch the electronic parts and components; otherwise it will cause static electricity.
 Caution	<ul style="list-style-type: none"> ● Do not use the water-logged inverter, damaged inverter or inverter with missing parts. Otherwise, there may be risk of injury. ● Please do not install when the packing list does not match the physical name!



1.1.2 During Installation:

 Danger	<ul style="list-style-type: none"> ● Install the inverter on incombustible surface such as metal, and keep away from flammable substances. Otherwise it may cause fire. ● Do not loose the set screw of the equipment, especially the screws marked in RED.
 Caution	<ul style="list-style-type: none"> ● Do not drop the cable residual or screw in the inverter. Otherwise it may damage the inverter. ● Please install the driver in the place where there is no direct sunlight or less vibratory. ● When more than two inverters are to be installed in one cabinet, due attention should be paid to the installation locations to ensure the heat sinking effect.


1.1.3 During Wiring:


 Danger	<ul style="list-style-type: none"> Operation should be performed by the professional engineering technician. Otherwise there will be danger of electric shock! There should be circuit breaker between the inverter and power supply. Otherwise, there may be fire! Make sure the power is disconnected prior to the connection. Otherwise there will be danger of electric shock! The ground terminal should be earthed reliably. Otherwise there may be danger of electric shock.
 Caution	<ul style="list-style-type: none"> Never connect AC power to output UVW terminals. Please note the remark of the wiring terminals, connect them correctly. Otherwise may cause inverter damaged. Ensure the wiring circuit can meet the requirement of EMC and the area safety standard. Please follow the instructions in the manual before wiring. Otherwise may cause injury or electric shock. Never connect the braking resistor between DC bus (+), (-) terminals. Otherwise may cause fire. Encoder must be used together with shielded wire, and ensure the single terminal of the shielded lay is connected with ground well.

1.1.4 Before Power-on:



 Danger	<ul style="list-style-type: none"> The cover must be well closed prior to the inverter power-on. Otherwise electric shock may be caused! Whether all the external fittings are connected correctly in accordance with the circuit provided in this manual. Otherwise accident may occur!
 Caution	<ul style="list-style-type: none"> Please confirm whether the power voltage class is consistent with the rated voltage of the inverter and whether the wiring positions on the power input terminals (R, S, T) and output terminals (U, V, W) are correct whether the external circuit is short circuited and whether the connecting line is firm. Otherwise it may damage the inverter. The inverter is free from dielectric test because this test is performed prior to the delivery. Otherwise accident may occur.

1.1.5 After Power-on:


 Danger	<ul style="list-style-type: none"> Do not open the cover of the inverter upon power-on. Otherwise there will be danger of electric shock! Do not touch the inverter and its surrounding circuit with wet hand. Otherwise there will be danger of electric shock! Do not touch the inverter terminals (including control terminal). Otherwise there will be danger of electric shock! At power-on, the inverter will perform the security check of the external heavy-current circuit automatically. Thus, at the moment please do not touch the terminals U, V and W, or the terminals of motor, otherwise there will be danger of electric shock!
---	--

 Caution	<ul style="list-style-type: none"> If parameter identification is required, due attention should be paid to the danger of injury arising from the rotating motor. Otherwise accident may occur! Do not change the factory settings at will. Otherwise it may damage the equipment!
--	--

1.1.6 During Operation:

 Danger	<ul style="list-style-type: none"> Do not touch the fan or discharge resistor to sense the temperature. Otherwise, you may get burnt! Detection of signals during the operation should only be conducted by qualified technician. Otherwise, personal injury or equipment damage may be caused!
 Caution	<ul style="list-style-type: none"> During the operation of the inverter, keep items from falling into the equipment. Otherwise, it may damage the equipment! Do not start and shut down the inverter by connecting and disconnecting the contactor. Otherwise, it may damage the equipment!

1.1.7 During Maintenance:

 Danger	<ul style="list-style-type: none"> Do not repair and maintain the equipment with power connection. Otherwise there will be danger of electric shock! Confirm that maintenance and repair of the drive can only be carried out when the voltage of the frequency converter is lower than AC36V, two minutes after the power outage. Otherwise, the residual charge on the capacitor may cause personal injury! The inverter should be repaired and maintained only by the qualified person who has received professional training. Otherwise, it may cause personal injury or equipment damage! Carry out parameter setting after replacing the inverter, all the plug-ins must be plug and play when power outage.
---	--

1.2 Precautions

1.2.1 Motor Insulation Inspection

When the motor is used for the first time, or when the motor is reused after being kept, or when periodical inspection is performed, it should conduct motor insulation inspection so as to avoid damaging the inverter because of the insulation failure of the motor windings. The motor wires must be disconnected from the inverter during the insulation inspection. It is recommended to use the 500V megameter, and the insulating resistance measured should be at least 5MΩ.

1.2.2 Thermal Protection of the Motor

If the ratings of the motor does not match those of the inverter, especially when the rated power of the inverter is higher than the rated power of the motor, the relevant motor protection parameters in the in the inverter should be adjusted, or thermal relay should be mounted to protect the motor.

1.2.3 Running with Frequency higher than Standard Frequency

This inverter can provide output frequency of 0Hz to 5000Hz. If the user needs to run the inverter with frequency of more than 50Hz, please take the resistant pressure of the mechanical devices into consideration.

1.2.4 Vibration of Mechanical Device

The inverter may encounter the mechanical resonance point at certain output frequencies, which can be avoided by setting the skip frequency parameters in the inverter.

1.2.5 Motor Heat and Noise

Since the output voltage of inverter is PWM wave and contains certain harmonics, the temperature rise, noise and vibration of the motor will be higher than those at power frequency.

1.2.6 Voltage-sensitive Device or Capacitor Improving Power Factor at the Output Side

Since the inverter output is PWM wave, if the capacitor for improving the power factor or voltage-sensitive resistor for lightning protection is mounted at the output side, it is easy to cause instantaneous over current in the inverter, which may damage the inverter. It is recommended that such devices not be used.

1.2.7 Switching Devices like Contactors Used at the Input and Output terminal

If a contactor is installed between the power supply and the input terminal of the inverter, it is not allowed to use the contactor to control the startup/stop of the inverter. If such contactor is unavoidable, it should be used with interval of at least one hour. Frequent charge and discharge will reduce the service life of the capacitor inside the inverter. If switching devices like contactor are installed between the output end of the inverter and the motor, it should ensure that the on/off operation is conducted when the inverter has no output. Otherwise the modules in the inverter may be damaged.

1.2.8 Use under voltage rather than rated voltage

If the NG80 series inverter is used outside the allowable working voltage range as specified in this manual, it is easy to damage the devices in the inverter. When necessary, use the corresponding step-up or step-down instruments to change the voltage.

1.2.9 Change Three-phase Input to Two-phase Input

It is not allowed to change the NG80 series three-phase inverter into two-phase one. Otherwise, it may cause fault or damage to the inverter.

1.2.10 Lightning Impulse Protection

The series inverter has lightning over current protection device, and has certain self-protection capacity against the lightning. In applications where lightning occurs frequently, the user should install additional protection devices at the front-end of the inverter.

1.2.11 Altitude and Derating

In areas with altitude of more than 1,000 meters, the heat sinking effect of the inverter may turn poorer due to rare air. Therefore, it needs to derate the inverter for use. Please contact our company for technical consulting in case of such condition.

1.2.12 Certain Special Use

If the user needs to use the inverter with the methods other than the recommended wiring diagram in this manual, such as shared DC bus, please consult our company.

1.2.13 Note of Inverter Disposal

The electrolytic capacitors on the main circuit and the PCB may explode when they are burnt. Emission of toxic gas may be generated when the plastic parts are burnt. Please dispose the inverter as industrial wastes.

1.2.14 Adaptable Motor

1) The standard adaptable motor is four-pole squirrel-cage asynchronous induction motor. If such motor is not available, be sure to select adaptable motors in according to the rated current of the motor. In applications where drive permanent magnetic synchronous motor is required, please consult our company;

2) The cooling fan and the rotor shaft of the non-variable-frequency motor adopt coaxial connection. When the rotating speed is reduced, the cooling effect will be poorer. Therefore, a powerful exhaust fan should be installed, or the motor should be replaced with variable frequency motor to avoid the over heat of the motor.

3) Since the inverter has built-in standard parameters of the adaptable motors, it is necessary to perform motor parameter identification or modify the default values so as to comply with the actual values as much as possible, or it may affect the running effect and protection performance;

4) The short circuit of the cable or motor may cause alarm or explosion of the inverter. Therefore, please conduct insulation and short circuit test on the newly installed motor and cable. Such test should also be conducted during routine maintenance. Please note that the inverter and the test part should be completely disconnected during the test.

Chapter 2 Product Information

2.1 Model Description

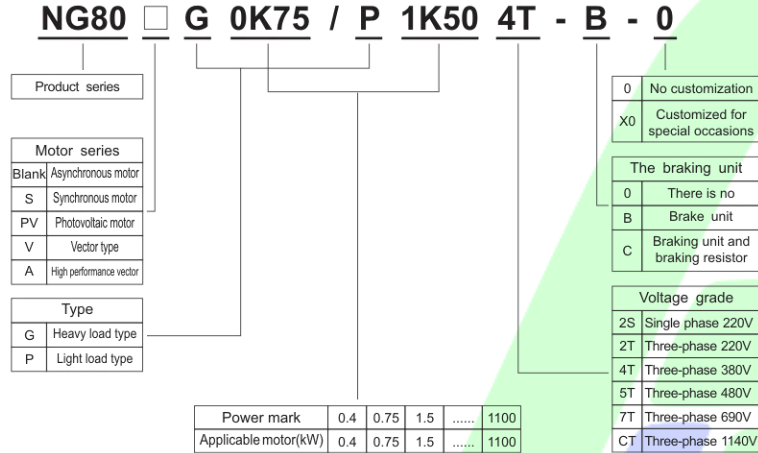


Figure2-1 Naming meaning

2.2 Description of Nameplate



Figure 2-2 Nameplate

2.3 Selection Guide

Table 2-1 NG80 Series Inverter Model and Technical Data

Inverter Model	Motor		Rated Input Current (A)	Rated Output Current (A)	Power Capacity (kVA)
	kW	HP			
Single-phase power: 2S 220V 50/60Hz					
NG80-G 0K40 2S-B-0	0.4	0.5	5.4	2.3	1
NG80-G 0K75 2S-B-0	0.75	1	8.2	4	1.5
NG80-G 1K50 2S-B-0	1.5	2	14	7	3
NG80-G 2K20 2S-B-0	2.2	3	23	9.6	4
NG80-G 4K00 2S-B-0	4	5	39	19.2	5.9
Three-phase power: 2T 220V 50/60Hz					
NG80-G 0K40 2T-B-0	0.4	0.5	3.4	2.1	1.5
NG80-G 0K75 2T-B-0	0.75	1	5	3.8	3
NG80-G 1K50 2T-B-0	1.5	2	5.8	5.1	4
NG80-G 2K20 2T-B-0	2.2	3	10.5	9	5.9
NG80-G 4K00 2T-B-0	4	5	14.6	13	8.9
NG80-G 5K50 2T-B-0	5.5	7.5	26	25	17
NG80-G 7K50 2T-B-0	7.5	10	35	32	21
NG80-G 11K0 2T-B-0	11	15	46.5	45	30
NG80-G 15K0 2T-B-0	15	20	62	60	40
NG80-G 18K5 2T-0-0	18.5	25	76	75	57
NG80-G 22K0 2T-0-0	22	30	92	91	69
NG80-G 30K0 2T-0-0	30	40	113	112	85
NG80-G 37K0 2T-0-0	37	50	157	150	114
NG80-G 45K0 2T-0-0	45	60	180	176	134
NG80-G 55K0 2T-0-0	55	70	214	210	160
NG80-G 75K0 2T-0-0	75	100	307	304	231
Three-phase power: 4T 380V 50/60Hz					
NG80-G 0K75/P 1K50 4T-B-0	0.75	1	3.4	2.1	1.5
NG80-G 1K50/P 2K20 4T-B-0	1.5	2	5	3.8	3
NG80-G 2K20/P 4K00 4T-B-0	2.2	3	5.8	5.1	4
NG80-G 4K00/P 5K50 4T-B-0	4	5	10.5	9	5.9
NG80-G 5K50/P 7K50 4T-B-0	5.5	7.5	14.6	13	8.9
NG80-G 7K50/P 11K0 4T-B-0	7.5	10	20.5	17	11
NG80-G 11K0/P 15K0 4T-B-0	11	15	26	25	17
NG80-G 15K0/P 18K5 4T-B-0	15	20	35	32	21
NG80-G 18K5/P 22K0 4T-B-0	18.5	25	38.5	37	24
NG80-G 22K0/P 30K0 4T-B-0	22	30	46.5	45	30
NG80-G 30K0/P 37K0 4T-B-0	30	40	62	60	40
NG80-G 37K0/P 45K0 4T-0-0	37	50	76	75	57
NG80-G 45K0/P 55K0 4T-0-0	45	60	92	91	69
NG80-G 55K0/P 75K0 4T-0-0	55	70	113	112	85
NG80-G 75K0/P 90K0 4T-0-0	75	100	157	150	114
NG80-G 90K0/P 110K 4T-0-0	90	125	180	176	134

Inverter Model	Motor		Rated Input Current (A)	Rated Output Current (A)	Power Capacity (kVA)
	kW	HP			
NG80-G 110K/P 132K 4T-0-0	110	150	214	210	160
NG80-G 132K/P 160K 4T-0-0	132	175	256	253	192
NG80-G 160K/P 185K 4T-0-0	160	210	307	304	231
NG80-G 185K/P 200K 4T-0-0	185	245	330	340	240
NG80-G 200K/P 220K 4T-0-0	200	260	385	377	250
NG80-G 220K/P 250K 4T-0-0	220	300	430	426	280
NG80-G 250K/P 280K 4T-0-0	250	350	468	465	355
NG80-G 280K/P 315K 4T-0-0	280	370	525	520	396
NG80-G 315K/P 350K 4T-0-0	315	420	590	585	445
NG80-G 350K/P 400K 4T-0-0	350	470	665	650	500
NG80-G 400K/P 450K 4T-0-0	400	530	785	725	565
NG80-G 450K/P 500K 4T-0-0	450	600	883	820	630
NG80-G 500K/P 560K 4T-0-0	500	667	920	860	714
NG80-G 560K/P 630K 4T-0-0	560	767	1050	950	800
NG80-G 630K/P 710K 4T-0-0	630	840	1160	1100	900
NG80-G 710K/P 800K 4T-0-0	710	947	1320	1260	1015
NG80-G 800K/P 900K 4T-0-0	800	1067	1500	1440	1145
Three-phase power: 5T 480V 50/60Hz					
NG80-G 0K75/P 1K50 5T-B-0	0.75	1	3.4	2.1	1.5
NG80-G 1K50/P 2K20 5T-B-0	1.5	2	5	3.8	3
NG80-G 2K20/P 4K00 5T-B-0	2.2	3	5.8	5.1	4
NG80-G 4K00/P 5K50 5T-B-0	4	5	10.5	9	5.9
NG80-G 5K50/P 7K50 5T-B-0	5.5	7.5	14.6	13	8.9
NG80-G 7K50/P 11K0 5T-B-0	7.5	10	20.5	17	11
NG80-G 11K0/P 15K0 5T-B-0	11	15	26	25	17
NG80-G 15K0/P 18K5 5T-B-0	15	20	35	32	21
NG80-G 18K5/P 22K0 5T-B-0	18.5	25	38.5	37	24
NG80-G 22K0/P 30K0 5T-B-0	22	30	46.5	45	30
NG80-G 30K0/P 37K0 5T-B-0	30	40	62	60	40
NG80-G 37K0/P 45K0 5T-0-0	37	50	76	75	57
NG80-G 45K0/P 55K0 5T-0-0	45	60	92	91	69
NG80-G 55K0/P 75K0 5T-0-0	55	70	113	112	85
NG80-G 75K0/P 90K0 5T-0-0	75	100	157	150	114
NG80-G 90K0/P 110K 5T-0-0	90	125	180	176	134
NG80-G 110K/P 132K 5T-0-0	110	150	214	210	160
NG80-G 132K/P 160K 5T-0-0	132	175	256	253	192
NG80-G 160K/P 185K 5T-0-0	160	210	307	304	231
NG80-G 185K/P 200K 5T-0-0	185	245	330	340	240
NG80-G 200K/P 220K 5T-0-0	200	260	385	377	250
NG80-G 220K/P 250K 5T-0-0	220	300	430	426	280
NG80-G 250K/P 280K 5T-0-0	250	350	468	465	355
NG80-G 280K/P 315K 5T-0-0	280	370	525	520	396

Inverter Model	Motor		Rated Input Current (A)	Rated Output Current (A)	Power Capacity (kVA)
	kW	HP			
NG80-G 315K/P 350K 5T-0-0	315	420	590	585	445
NG80-G 350K/P 400K 5T-0-0	350	470	665	650	500
NG80-G 400K/P 450K 5T-0-0	400	530	785	725	565
NG80-G 450K/P 500K 5T-0-0	450	600	883	820	630
NG80-G 500K/P 560K 5T-0-0	500	667	920	860	714
NG80-G 560K/P 630K 5T-0-0	560	767	1050	950	800
NG80-G 630K/P 710K 5T-0-0	630	840	1160	1100	900
NG80-G 710K/P 800K 5T-0-0	710	947	1320	1260	1015
NG80-G 800K/P 900K 5T-0-0	800	1067	1500	1440	1145
Three-phase power: 7T 690V 50/60Hz					
NG80-G 55K0/P 75K0 7T-0-0	55	70	70	65	84
NG80-G 75K0/P 90K0 7T-0-0	75	100	90	86	107
NG80-G 90K0/P 110K 7T-0-0	90	125	105	100	125
NG80-G 110K/P 132K 7T-0-0	110	150	130	120	155
NG80-G 132K/P 160K 7T-0-0	132	175	170	150	192
NG80-G 160K/P 185K 7T-0-0	160	210	200	175	231
NG80-G 185K/P 200K 7T-0-0	185	260	235	215	250
NG80-G 200K/P 220K 7T-0-0	200	260	235	215	250
NG80-G 220K/P 250K 7T-0-0	220	300	247	245	280
NG80-G 250K/P 280K 7T-0-0	250	350	265	260	355
NG80-G 280K/P 315K 7T-0-0	280	370	305	299	396
NG80-G 315K/P 350K 7T-0-0	315	420	350	330	445
NG80-G 350K/P 400K 7T-0-0	350	470	382	374	500
NG80-G 400K/P 450K 7T-0-0	400	530	435	410	565
NG80-G 450K/P 500K 7T-0-0	450	600	490	465	630
NG80-G 500K/P 560K 7T-0-0	500	660	595	550	700

2.4 Technical Specifications

Table 2-2 NG80 Series Inverter Technical Specifications

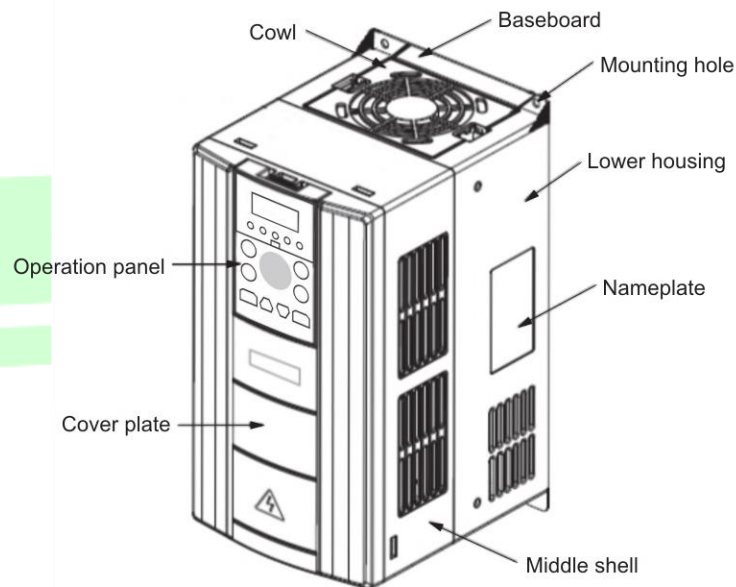
Item		Specification
Basic function	Maximum frequency	Vector control: 0 ~ 300Hz V/F control: 0 ~ 3200Hz
	Carrier frequency	0.5kHz ~ 16kHz The carrier frequency can be automatically adjusted according to the load characteristics.
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency × 0.025%
	Control mode	Open-loop vector control (SVC) Closed-loop vector control (FVC) V/F control
	Starting torque	G model: 0.5Hz/150%(SVC); 0Hz/180%(FVC) P model: 0.5Hz/100%
	Speed regulation range	1: 100(SVC) 1: 1000(FVC)
	Steady speed accuracy	± 0.5%(SVC) ± 0.02%(FVC)
	Torque control accuracy	± 5%(FVC)
	Overload capacity	G model: 150% rated current 60s; 180% rated current 3s P model: 120% rated current 60s; 150% rated current 3s
	Torque boost	Automatically torque boost; manually torque boost: 0.1%~30.0%
	V/F curve	Three ways: linear; multi-point; Nth power type V/F curve (1.2 power, 1.4 power, 1.6 power, 1.8 power, 2 power)
	V/F separation	2 method: full separation, semi-separation.
	Acceleration and deceleration curve	Straight line/S curve; four kinds of acceleration/deceleration time, range: 0.0s ~ 6500.0s
	DC braking	DC braking frequency: 0.0Hz ~ maximum frequency Braking time: 0.0s ~ 36.0s Braking action current value: 0.0% ~ 100.0%
	Jog control	Jog frequency range: 0.00Hz ~ 50.00Hz Jog acceleration and deceleration time: 0.0s ~ 6500.0s
	Simple PLC & multi-step speed operation	It can realize a maximum of 16 segments speed running via the built-in PLC or control terminal.
	Built-in PID	A closed-loop control system for process control can be easily implemented.
	Automatic voltage regulation (AVR)	It can automatically maintain the output voltage constant when the grid voltage varies.
	Overvoltage, over-current, stall control	To avoid frequent over-current and over-voltage trips, the current and voltage are automatically restricted when the device is in use.

Item		Specification
Personal function	Quick current limiting function	Minimize overcurrent faults and protect the normal operation of the inverter.
	Torque limitation and control	"Rooster" characteristics, limit the torque automatically and prevent frequent over-current tripping during the running process
	Excellent performance	Utilize high-performance current vector control technique to achieve synchronous and asynchronous motor control.
	Instantaneous stop does not stop	When there is a temporary power outage, the load return energy balances the voltage drop and the inverter keeps running for a brief amount of time.
	Fast current limiting	Avoid frequent overcurrent failures of the inverter
	Virtual IO	Five groups of virtual DIO for simple logic control
	Timing control	Timing control function: setting time range 0.0min ~ 6500.0min.
	Multiple motor switching	Four groups of motor parameters. Four motor switching control can be realized.
	Multi threaded bus support	Supports four types of fieldbuses: RS485
	Motor overheat protection	Optional IO expansion card 1, analog input AI3 can accept motor temperature sensor input.
	Multi encoder support	Supports differential, open collector, UVW, resolver, sine and cosine encoders.
	User programmable	Optional user programmable card allows development.
	Powerful backend software	Support inverter parameter operation and virtual oscilloscope function. The virtual oscilloscope can realize the graphic monitoring of the internal state of the inverter.
	Command source	The operation panel is preset, the control terminal is preset, and the serial communication port is preset. It can be switched by various ways.
Operation	Frequency source	10 kinds of frequency sources: digital has been preset, analog voltage has been preset, analog current has been preset, pulse has been preset, and serial port has been preset. It can be switched in many ways.
	Auxiliary frequency source	10 kinds of auxiliary frequency sources. Auxiliary frequency trimming and frequency synthesis can be realized flexibly.
	Input terminal	Standard: 7 digital input terminals, one of which supports high-speed pulse input up to 100kHz 2 analog input terminals, one supporting only 0 ~ 10V voltage input 1 supporting 0 ~ 10V voltage input or 4 ~ 20mA current input
	Output terminal	Standard: 1 high-speed pulse output terminal (optional open collector type), supporting square wave signal output of 0 ~ 100kHz 1 digital output terminal 1 relay output terminal 1 analog output terminal, supporting 0 ~ 20mA current output or 0 ~ 10V voltage output

Item		Specification
Display and keyboard operation	LED display	Display parameters
	LCD display	Optional pieces; Chinese/English prompts for operating details.
	Parameter copy	Quick copy of parameters can be realized by LCD operation panel option.
	Key locking and function selection	Realize partial or full locking of keys and define the scope of action of some keys to prevent misoperation.
	Protection function	Power-on motor short-circuit detection, input and output phase loss protection, over-current protection, over-voltage protection, under-voltage protection, overheat protection, overload protection, etc.
	Optional accessories	LCD operation panel, brake assembly, IO expansion card 1, IO expansion card 2, user programmable card, RS485 communication card, Profibus-DP communication card, CANlink communication card, CANopen communication card, differential input PG card, UVW differential input PG card, resolver PG card, OC input PG card.
Environment	Using place	Indoor, not exposed to direct sunlight, free from dust, corrosive gases, flammable gases, oil mist, water vapor, dripping water or salt, etc
	Altitude	≤ 1000m
	Ambient temperature	-10℃ ~ +40℃ (The ambient temperature is between 40℃ and 50℃, please reduce the rating for use)
	Humidity	Less than 95% RH, no condensation of water droplets
	Vibration	Less than 5.9m/s ² (0.6g)
	Storage temperature	-20℃ ~ +60℃
	Protection grade	IP=20 (Open type)

2.5 Outline Drawing & Installation Hole Dimension

2.5.1 Outline drawing



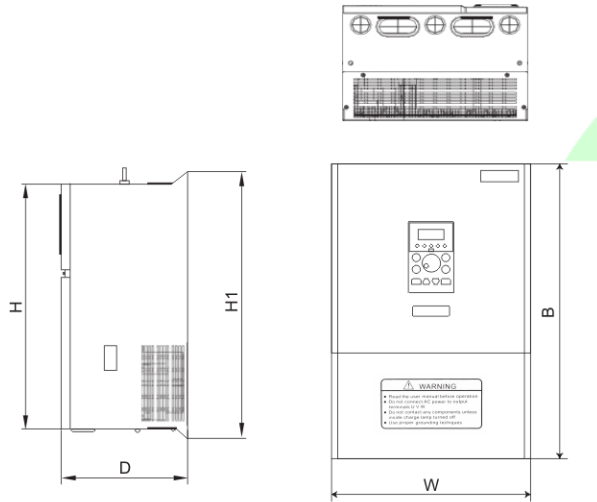


Figure 2-3 Outline and installation dimension diagram of NG80 series sheet metal structure

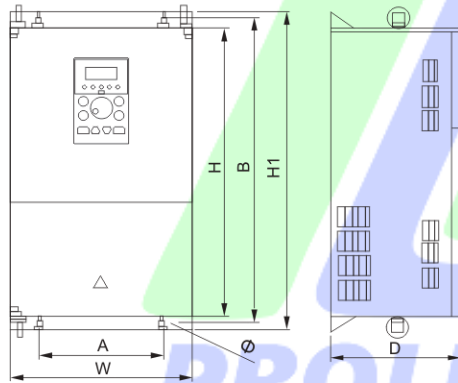


Figure 2-3-1 Outline and installation dimensions diagram of NG80 series

The shell structure of each NG80 model is as follows

Model	Housing type
Single phase 220V	
0.4kW ~ 2.2kW	Plastic structure
Three phase 220V	
0.4kW ~ 4kW	Plastic structure
7.5kW ~ 75kW	Sheet metal structure
Three phase 380V	
0.75kW ~ 11kW	Plastic structure
15kW ~ 800kW	Sheet metal structure
Three phase 480V	
0.75kW ~ 11kW	Plastic structure
15kW ~ 800kW	Sheet metal structure
Three phase 690V	
55kW ~ 800kW	Sheet metal structure

2.5.2 Outline and installation hole dimension of NG80 series

Table 2-3 Outline and Installation Dimension of NG80 Series Inverter

Inverter Model	Installation Hole (mm)		Outline Dimension (mm)			Installation Hole Diameter (mm)	Weight (kg)
	A	B	H	W	D		
Single phase 2S 220V							
NG80-G 0K75 2S-B-0	65	153	166	83	131	Φ5	1.15
NG80-G 1K50 2S-B-0							
NG80-G 2K20 2S-B-0							
NG80-G 4K00 2S-B-0	80	233	245	120	173	Φ5	2.7
Three phase 4T 380V							
NG80-G 0K75/P 1K50 4T-B-0	65	153	166	83	131	Φ5	1.15
NG80-G 1K50/P 2K20 4T-B-0							
NG80-G 2K20/P 4K00 4T-B-0							
NG80-G 4K00/P 5K50 4T-B-0	80	233	245	120	173	Φ5	2.7
NG80-G 5K50/P 7K50 4T-B-0							2.9
NG80-G 7K50/P 11K0 4T-B-0							3.9
NG80-G 11K0/P 15K0 4T-B-0	125.5	267.5	281	145	185	Φ6	3.9
NG80-G 15K0/P 18K5 4T-B-0	187	305	320	203	205	Φ6	7.0
NG80-G 18K5/P 22K0 4T-B-0							7.2
NG80-G 22K0/P 30K0 4T-B-0							7.4
NG80-G 30K0/P 37K0 4T-B-0							

Inverter Model	Installation Hole (mm)		Outline Dimension (mm)			Installation Hole Diameter (mm)	Weight (kg)
	A	B	H	W	D		
NG80-G 37K0/P 45K0 4T-B-0	200	422	440	256	220	Φ 8	14.8
NG80-G 45K0/P 55K0 4T-0-0							25.2
NG80-G 55K0/P 75K0 4T-0-0							26
NG80-G 75K0/P 90K0 4T-0-0	237	465	490	330	263	Φ 8	43
NG80-G 90K0/P 110K 4T-0-0							57.5
NG80-G 110K/P 132K 4T-0-0	240	575	600	397	263	Φ 8	89
NG80-G 122K/P 160K 4T-0-0							90.8
NG80-G 160K/P 185K 4T-0-0							152.7
NG80-G-185K/P 200K 4T-0-0	380	720	750	460	360	Φ 10	155
NG80-G 200K/P 220K 4T-0-0							
NG80-G 220K/P 250K 4T-0-0							
NG80-G 250K/P 280K 4T-0-0	560	1020	1055	638	410	Φ 10	
NG80-G 280K/P 315K 4T-0-0							
NG80-G 315K/P 350K 4T-0-0							
NG80-G 350K/P 400K 4T-0-0							

2.5.3 Outline and installation hole dimension of external keyboard

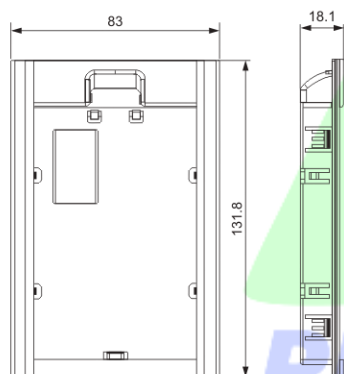


Figure 2-4 Outline and installation dimension of external keyboard

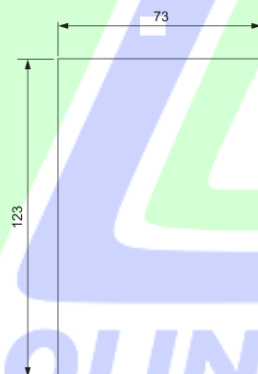


Figure 2-5 Installation hole dimension of external keyboard

2.6 Optional Accessories

If you need the following options, please specify them when ordering.

Table 2-4 NG80 Inverter Optional Accessories

Name	Model	Function	Note
Built-in brake unit	Product model followed by "B"	Single-phase from 0.4kW to 2.2kW, three-phase from 0.75kW to 15kW, with built-in brake unit as default.	18.5kW ~ 30kW built-in brake unit optional
External brake unit	GBU	37kW and above external brake unit	Multiple parallel units are used for 75kW and above
Energy feedback unit	GFB	Energy-saving product that feeds back power from the inverter to the AC grid.	
Rectifying unit	GRU	The inverter has an energy-saving function when used with a common bus.	
I/O expansion card 1	NG80IO1	It can add five digital inputs, an analog voltage input AI3 for isolated analog can be connected to PT100, PT1000. It can also add a relay output, a digital output, an analog output, with RS485/CAN.	Applicable to models of 4.0kW and above
I/O expansion card 2 -Size B	NG80IO2	Add three digital inputs	All series models available
MODBUS communication card	1) NG8032-232	RS232 communication interface without isolation	RJ45 and terminal interface compatible, available for all models
	2) NG80TX1	RS485 communication adapter card with isolation	All series models available
CANlink communication expansion card	NG80CAN1	CANlink communication adapter card	All series models available
CANopen communication expansion card	NG80CAN2	CANopen communication adapter card	All series models available
Profibus-DP communication card	NG80DP	Profibus-DP communication card	Applicable to models of 4.0kW and above
User programmable card	NG80PC1	User programmable expansion card	Applicable to models of 4.0kW and above
Differential encoder interface card	NG80PG1	Differential rotary encoder interface card, suitable for 5V power supply	All series models available
UVW encoder interface card	NG80PG3	Suitable for UVW differential encoder, suitable for synchronous motors, suitable for 5V power supply	All series models available
Resolver interface card	NG80PG4	Suitable for rotary encoders, excitation frequency 10kHz, DB9 interface	All series models available
Open collector electrode encoder interface card	NG80PG5	Open collector encoder interface card with 1:1 split output, adaptable to 15V power supply.	All series models available
External LED operation panel	GKE	External LED display and operation keyboard	NG80 series universal RJ45 interface
Extension cable		Standard 8-core network cable	Standard configuration 3 meters

2.7 Routine Maintenance of Inverter

2.7.1 Routine Maintenance

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the devices in the inverter, which may cause potential fault of the inverter or reduce the service life of the inverter. Therefore, it is necessary to carry out routine and periodical maintenance on the inverter.

Routine inspection Items include:

- 1) Whether there is any abnormal change in the running sound of the motor;
- 2) Whether the motor has vibration during the running;
- 3) Whether there is any change to the installation environment of the inverter;
- 4) Whether the inverter cooling fan works normally;
- 5) Whether the inverter has over temperature.

Routine cleaning:

- 1) The inverter should be kept clean all the time.
- 2) The dust on the surface of the inverter should be effectively removed, so as to prevent the dust entering the inverter. Especially the metal dust is not allowed.
- 3) The oil stain on the inverter cooling fan should be effectively removed.

2.7.2 Periodic Inspection

Please perform periodic inspection on the places where the inspection is a difficult thing.

Periodic inspection items include:

- 1) Check and clean the air duct periodically;
- 2) Check if the screws are loose;
- 3) Check if the inverter is corroded;
- 4) Check if the wire connector has arc signs;
- 5) Main circuit insulation test.

Remainder: When using the megameter (DC 500V megameter recommended) to measure the insulating resistance, the main circuit should be disconnected with the inverter. Do not use the insulating resistance meter to test the insulation of control circuit. It is not necessary to conduct the high voltage test (which has been completed upon delivery).

2.7.3 Replacement of Vulnerable Parts for Inverter

The vulnerable parts of the inverter include cooling fan and filter electrolytic capacitor, whose service life depends on the operating environment and maintenance status. General service life is shown as follows:

Part Name	Service Life
Fan	2~3 years
Electrolytic capacitor	4~5 years

The user can determine the year of replacement according to the operating time.

- 1) Cooling fan

Possible reason for damage: Bearing is worn and blade is aging.

Judging criteria: Whether there is crack on the blade and whether there is abnormal vibration noise upon startup.

- 2) Filter electrolytic capacitor

Possible reason for damage: Input power supply in poor quality, high ambient temperature, frequent load jumping, and electrolyte aging.

Judging criteria: Whether there is liquid leakage and whether the safe valve has projected, and measure the static capacitance, and the insulating resistance.

2.7.4 Storage of Inverter

Upon acquiring the inverter, the user should pay attention to the following points regarding the temporary and long-term storage of the inverter:

- 1) Pack the inverter with original package and place back into the packing box of our company.
- 2) Long-term storage will degrade the electrolytic capacitor. Thus, the product should be powered up once every 2 years, each time lasting at least five hours. The input voltage should be increased slowly to the rated value with the regulator.

2.8 Instructions on Warranty of Inverter

Free warranty only applies to the inverter itself.

- 1) Company provides 12 month warranty (starting from the date of original shipment as indicated on the barcode) for the failure or damage under normal use conditions. If the equipment has been used for over 12 months, reasonable repair expenses will be charged;
- 2) Reasonable repair expenses will be charged for the following situations within 12 months;
 - a) The equipment is damaged because the user fails to comply with the requirements of the user's manual;
 - b) Damage caused by fire, flood and abnormal voltage;
 - 3) Damage caused when the inverter is used for abnormal function.

The service expenses will be calculated according to the standard of the manufacturer. If there is any agreement, the agreement should prevail.

2.9 Selecting Guide for Brake Components

(*): Table 2-5 is the guideline data. Depending on the scenario, the user may select a different resistor resistance and power, but the resistance value must not be less than the suggested value in the table and the power may be more. The power generated by the motor in the real application system, which is correlated with the system's inertia, deceleration time, and energy of the bit energy load, needs to be taken into account while choosing the brake resistor. The consumer must make their choice based on the circumstances at hand. The system's inertia increases with system size, reducing the amount of time needed to decelerate and increasing the frequency of braking. The brake resistor must therefore be chosen with a bigger power and lower resistance value.

2.9.1 Selection of Resistance Value

When braking, almost all of the regenerative energy of the motor is consumed in the braking resistor.

It can be based on the formula: $U^2/R = P_b$

The formula U - system stability braking brake voltage

(For different systems, it is not the same. For 380VAC system generally take 700V.)

P_b —braking power

2.9.2 Power Selection of Braking Resistor

In theory, the power of the braking resistor is the same as the braking power, but with a derating of 70%.

It can be based on the formula: $0.7^2 P_r = P_b^2 D$

P_r —power of the resistor

D—braking frequency (regeneration process accounted for the proportion of the entire work process)

Elevators—20% ~ 30% Uncoiling and coiling—20 ~ 30% Centrifuge—50% ~ 60% Accidental braking load -5%

Generally 10%

Table 2-5 Selection Table for Braking Components of NG80 Series Inverter

Inverter Model	Recommended Power of Braking Resistor	Recommended Resistance Value of Braking Resistor	Braking Unit	Note
Single phase 2S 220V				
NG80-G 0K75 2S-B-0	80W	≥ 200Ω	Standard built-in	No special instructions
NG80-G 1K50 2S-B-0	80W	≥ 150Ω		
NG80-G 2K20 2S-B-0	100W	≥ 100Ω		
NG80-G 4K00 2S-B-0	100W	≥ 70Ω		
Three phase 2T 220V				
NG80-G 0K40 2T-B-0	150W	≥ 150Ω	Standard built-in	No special instructions
NG80-G 0K75 2T-B-0	150W	≥ 110 Ω		
NG80-G 1K50 2T-B-0	250W	≥ 100Ω		
NG80-G 2K20 2T-B-0	300W	≥ 65Ω		
NG80-G 4K00 2T-B-0	400W	≥ 45 Ω		
NG80-G 5K50 2T-B-0	800W	≥ 22Ω		
NG80-G 7K50 2T-B-0	1000W	≥ 16 Ω		
NG80-G 11K0 2T-B-0	1500W	≥ 11Ω	Built-in optional	Add "B" after the inverter model
NG80-G 15K0 2T-B-0	2500W	≥ 8Ω		
NG80-G 18K5 2T-0-0	3.7kW	≥ 8.0 Ω	External	
NG80-G 22K0 2T-0-0	4.5kW	≥ 8Ω	External	
NG80-G 30K0 2T-0-0	5.5kW	≥ 4Ω	External	
NG80-G 37K0 2T-0-0	7.5kW	≥ 4Ω	External	
NG80-G 45K0 2T-0-0	4.5kW×2	≥ 4Ω×2	External	
NG80-G 55K0 2T-0-0	5.5kW×2	≥ 4Ω×2	External	
NG80-G 75K0 2T-0-0	16kW	≥ 1.2 Ω	External	
Three phase 4T 380V				
NG80-G 0K75/P 1K50 4T-B-0	150W	≥ 300Ω	Standard built-in	No special instructions
NG80-G 1K50/P 2K20 4T-B-0	150W	≥ 220Ω		
NG80-G 2K20/P 4K00 4T-B-0	250W	≥ 200Ω		
NG80-G 4K00/P 5K50 4T-B-0	300W	≥ 130Ω		
NG80-G 5K50/P 7K50 4T-B-0	400W	≥ 90Ω		
NG80-G 7K50/P 11K0 4T-B-0	500W	≥ 65Ω		
NG80-G 11K0/P 15K0 4T-B-0	800W	≥ 43Ω		
NG80-G 15K0/P 18K5 4T-B-0	1000W	≥ 32Ω		
NG80-G 18K5/P 22K0 4T-B-0	1300W	≥ 25Ω		
NG80-G 22K0/P 30K0 4T-B-0	1500W	≥ 22Ω		
NG80-G 30K0/P 37K0 4T-B-0	2500W	≥ 16Ω	Built-in optional	Add "B" after the inverter model
NG80-G 37K0/P 45K0 4T-0-0	3.7kW	≥ 16Ω		
NG80-G 45K0/P 55K0 4T-0-0	4.5kW	≥ 16Ω	External	
NG80-G 55K0/P 75K0 4T-0-0	5.5kW	≥ 8Ω	External	
NG80-G 75K0/P 90K0 4T-0-0	7.5kW	≥ 8Ω	External	
NG80-G 90K0/P 110K 4T-0-0	4.5kW×2	≥ 8Ω×2	External	
NG80-G 110K/P 132K 4T-0-0	5.5kW×2	≥ 8Ω×2	External	
NG80-G 132K/P 160K 4T-0-0	6.5kW×2	≥ 8Ω×2	External	
NG80-G 160K/P 185K 4T-0-0	16kW	≥ 2.5 Ω	External	
NG80-G 185K/P 200K 4T-0-0	20kW	≥ 2.5Ω	External	
NG80-G 200K/P 220K 4T-0-0	20kW	≥ 2.5Ω	External	
NG80-G 220K/P 250K 4T-0-0	22kW	≥ 2.5Ω	External	

Inverter Model	Recommended Power of Braking Resistor	Recommended Resistance Value of Braking Resistor	Braking Unit	Note
NG80-G 185K/P 200K 4T-0-0	20kW	$\geq 2.5\Omega$	External	
NG80-G 200K/P 220K 4T-0-0	20kW	$\geq 2.5\Omega$	External	
NG80-G 220K/P 250K 4T-0-0	22kW	$\geq 2.5\Omega$	External	
NG80-G 250K/P 280K 4T-0-0	12.5kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 280K/P 315K 4T-0-0	14kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 315K/P 350K 4T-0-0	16kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 350K/P 400K 4T-0-0	17kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 400K/P 450K 4T-0-0	14kW×3	$\geq 2.5\Omega\times 3$	External	
NG80-G 450K/P 500K 4T-0-0	15kW×3	$\geq 2.5\Omega\times 3$	External	
NG80-G 500K/P 560K 4T-0-0	25kW×2	$\geq 2.2\Omega\times 2$	External	
NG80-G 560K/P 630K 4T-0-0	28kW×2	$\geq 2.2\Omega\times 2$	External	
NG80-G 630K/P 710K 4T-0-0	22kW×3	$\geq 2.2\Omega\times 3$	External	
NG80-G 710K/P 800K 4T-0-0	25kW×3	$\geq 2.2\Omega\times 3$	External	
NG80-G 800K/P 900K 4T-0-0	28kW×3	$\geq 2.2\Omega\times 3$	External	
Three phase 5T 480V				
NG80-G 0K75/P 1K50 5T-B-0	150W	$\geq 300\Omega$	Standard built-in	No special instructions
NG80-G 1K50/P 2K20 5T-B-0	150W	$\geq 220\Omega$		
NG80-G 2K20/P 4K00 5T-B-0	250W	$\geq 200\Omega$		
NG80-G 4K00/P 5K50 5T-B-0	300W	$\geq 130\Omega$		
NG80-G 5K50/P 7K50 5T-B-0	400W	$\geq 90\Omega$		
NG80-G 7K50/P 11K0 5T-B-0	500W	$\geq 65\Omega$		
NG80-G 11K0/P 15K0 5T-B-0	800W	$\geq 43\Omega$		
NG80-G 15K0/P 18K5 5T-B-0	1000W	$\geq 32\Omega$	Built-in optional	Add "B" after the inverter model
NG80-G 18K5/P 22K0 5T-B-0	1300W	$\geq 25\Omega$		
NG80-G 22K0/P 30K0 5T-B-0	1500W	$\geq 22\Omega$	Standard built-in	No special instructions
NG80-G 30K0/P 37K0 5T-B-0	2500W	$\geq 16\Omega$		
NG80-G 37K0/P 45K0 5T-0-0	3.7kW	$\geq 16\Omega$	External	
NG80-G 45K0/P 55K0 5T-0-0	4.5kW	$\geq 16\Omega$	External	
NG80-G 55K0/P 75K0 5T-0-0	5.5kW	$\geq 8\Omega$	External	
NG80-G 75K0/P 90K0 5T-0-0	7.5kW	$\geq 8\Omega$	External	
NG80-G 90K0/P 110K 5T-0-0	4.5kW×2	$\geq 8\Omega\times 2$	External	
NG80-G 110K/P 132K 5T-0-0	5.5kW×2	$\geq 8\Omega\times 2$	External	
NG80-G 132K/P 160K 5T-0-0	6.5kW×2	$\geq 8\Omega\times 2$	External	
NG80-G 160K/P 185K 5T-0-0	16kW	$\geq 2.5\Omega$	External	
NG80-G 185K/P 200K 5T-0-0	20kW	$\geq 2.5\Omega$	External	
NG80-G 200K/P 220K 5T-0-0	20kW	$\geq 2.5\Omega$	External	
NG80-G 220K/P 250K 5T-0-0	22kW	$\geq 2.5\Omega$	External	
NG80-G 250K/P 280K 5T-0-0	12.5kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 280K/P 315K 5T-0-0	14kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 315K/P 350K 5T-0-0	16kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 350K/P 400K 5T-0-0	17kW×2	$\geq 2.5\Omega\times 2$	External	
NG80-G 400K/P 450K 5T-0-0	14kW×3	$\geq 2.5\Omega\times 3$	External	

Inverter Model	Recommended Power of Braking Resistor	Recommended Resistance Value of Braking Resistor	Braking Unit	Note
NG80-G 450K/P 500K 5T-0-0	15kW × 3	≥ 2.5 Ω × 3	External	
NG80-G 500K/P 560K 5T-0-0	25kW × 2	≥ 2.2 Ω × 2	External	
NG80-G 560K/P 630K 5T-0-0	28kW × 2	≥ 2.2 Ω × 2	External	
NG80-G 630K/P 710K 5T-0-0	22kW × 3	≥ 2.2 Ω × 3	External	
NG80-G 710K/P 800K 5T-0-0	25kW × 3	≥ 2.2 Ω × 3	External	
NG80-G 800K/P 900K 5T-0-0	28kW × 3	≥ 2.2 Ω × 3	External	

Note: × 2 means two braking units with their respective braking resistors used in parallel, × 3 meaning the same as × 2.

Chapter 3 Mechanical and Electrical Installation

3.1 Mechanical Installation

3.1.1 Installation environment

- 1) Ambient temperature: The ambient temperature exerts great influences on the service life of the inverter and is not allowed to exceed the allowable temperature range (-10℃ to 50℃).
- 2) The inverter should be mounted on the surface of incombustible articles, with sufficient spaces nearby for heat sinking. The inverter is easy to generate large amount of heat during the operation. The inverter should be mounted vertically on the base with screws.
- 3) The inverter should be mounted in the place without vibration or with vibration of less than 0.6G, and should be kept away from such equipment as punching machine.
- 4) The inverter should be mounted in locations free from direct sunlight, high humidity and condensate.
- 5) The inverter should be mounted in locations free from corrosive gas, explosive gas or combustible gas.
- 6) The inverter should be mounted in locations free from oil dirt, dust, and metal powder.

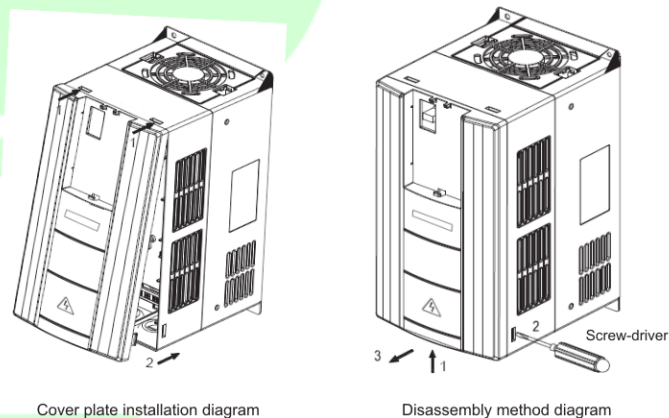


Figure 3-1 Installation diagram

Single Unit Installation: When the inverter power is not higher than 22kW, the A size can be omitted. When the inverter power is higher than 22kW, the A size should be higher than 50mm.

Installation of Upper and Lower Parts: When installing the upper and lower parts of the inverter, the insulating splitter is required.

Power Rating	Mounting Dimension	
	B	A
≤15kW	≥100mm	It is not required
18.5~30kW	≥200mm	≥50mm
≥37kW	≥300mm	≥50mm

3.1.2 Heat dissipation should be taken into account during the mechanical installation. Please pay attention the following items:

- 1) Install the inverter vertically so that the heat may be expelled from the top. However, the equipment cannot be installed upside down. If there are multiple inverters, parallel installation is a better choice. In applications where the upper and lower inverters need to be installed, please refer to Figure 3-1 "NG80 Series Inverter Installation Diagram" and install an insulating splitter.
- 2) The mounting space should be as indicated as Figure 3-1, so as to ensure the heat dissipation space of the inverter. However, the heat dissipation of other devices in the cabinet should also be taken into account.
- 3) The installation bracket must be flame retardant.
- 4) In the applications where there are metal dusts, it is recommended to mount the radiator outside the cabinet. In this case, the space in the sealed cabinet should be large enough.

3.1.3 Disassembly and Installation of the Lower Cover Plate

For instructions on removing the lower cover of the plastic shell from the inverter series under 15kW, see Figure 3-2.

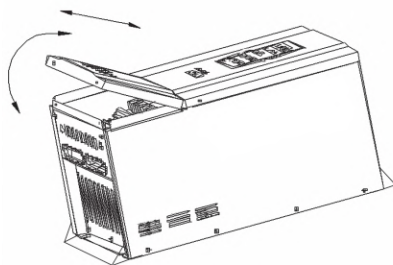


Figure 3-2 Dismantling diagram of the lower cover plate of the sheet metal shell

For inverter series exceeding 11kW, sheet metal housing is used; with a tool, the lower cover screws may be easily removed.

! Danger

● Avoid the potential harm that may come to the person or the equipment if the bottom cover plate were to fall off when removing it.

3.2 Electrical Installation

3.2.1 Guide to the external electrical parts

Table 3-1 Selection Guide of External Electrical Parts of NG80 Series Inverter

Inverter Model	Circuit Breaker (MCCB) A	Recommended Contactor A	Recommended Conducting Wire of Main Circuit at Input Side mm ²	Recommended Conducting Wire of Main Circuit at Output Side mm ²	Recommended Conducting Wire of Control Circuit mm ²
Single phase 2S 220V					
NG80-G 0K75 2S-B-0	16	10	2.5	2.5	1.0
NG80-G 1K50 2S-B-0	16	10	2.5	2.5	1.0
NG80-G 2K20 2S-B-0	20	16	4.0	2.5	1.0
NG80-G 4K00 2S-B-0	32	20	6.0	4.0	1.0
Three phase 2T 220V					
NG80-G 0K40 2T-B-0	10	10	2.5	2.5	1.0
NG80-G 0K75 2T-B-0	16	10	2.5	2.5	1.0
NG80-G 1K50 2T-B-0	16	10	2.5	2.5	1.0
NG80-G 2K20 2T-B-0	25	16	4.0	4.0	1.0
NG80-G 4K00 2T-B-0	32	25	4.0	4.0	1.0
NG80-G 5K50 2T-B-0	63	40	4.0	4.0	1.0
NG80-G 7K50 2T-B-0	63	40	6.0	6.0	1.0
NG80-G 11K0 2T-B-0	100	63	10	10	1.5
NG80-G 15K0 2T-B-0	125	100	16	10	1.5
NG80-G 18K5 2T-0-0	160	100	16	16	1.5
NG80-G 22K0 2T-0-0	200	125	25	25	1.5
NG80-G 30K0 2T-0-0	200	125	35	25	1.5
NG80-G 37K0 2T-0-0	250	160	50	35	1.5
NG80-G 45K0 2T-0-0	250	160	70	35	1.5
NG80-G 55K0 2T-0-0	350	350	120	120	1.5
NG80-G 75K0 2T-0-0	500	400	185	185	1.5

Inverter Model	Circuit Breaker (MCCB) A	Recommended Contactor A	Recommended Conducting Wire of Main Circuit at Input Side mm ²	Recommended Conducting Wire of Main Circuit at Output Side mm ²	Recommended Conducting Wire of Control Circuit mm ²
Three phase 4T 380V/5T 480V					
NG80-G 0K75/P 1K50 4T-B-0	10	10	2.5	2.5	1.0
NG80-G 1K50/P 2K20 4T-B-0	16	10	2.5	2.5	1.0
NG80-G 2K20/P 4K00 4T-B-0	16	10	2.5	2.5	1.0
NG80-G 4K00/P 5K50 4T-B-0	25	16	4.0	4.0	1.0
NG80-G 5K50/P 7K50 4T-B-0	32	25	4.0	4.0	1.0
NG80-G 7K50/P 11K0 4T-B-0	40	32	4.0	4.0	1.0
NG80-G 11K0/P 15K0 4T-B-0	63	40	4.0	4.0	1.0
NG80-G 15K0/P 18K5 4T-B-0	63	40	6.0	6.0	1.0
NG80-G 18K5/P 22K0 4T-B-0	100	63	6.0	6.0	1.5
NG80-G 22K0/P 30K0 4T-B-0	100	63	10	10	1.5
NG80-G 30K0/P 37K0 4T-B-0	125	100	16	10	1.5
NG80-G 37K0/P 45K0 4T-0-0	160	100	16	16	1.5
NG80-G 45K0/P 55K0 4T-0-0	200	125	25	25	1.5
NG80-G 55K0/P 75K0 4T-0-0	200	125	35	25	1.5
NG80-G 75K0/P 90K0 4T-0-0	250	160	50	35	1.5
NG80-G 90K0/P 110K 4T-0-0	250	160	70	35	1.5
NG80-G 110K/P 132K 4T-0-0	350	350	120	120	1.5
NG80-G 132K/P 160K 4T-0-0	400	400	150	150	1.5
NG80-G 160K/P 185K 4T-0-0	500	400	185	185	1.5
NG80-G 185K/P 200K 4T-0-0	600	600	150*2	150*2	1.5
NG80-G 200K/P 220K 4T-0-0	600	600	150*2	150*2	1.5
NG80-G 220K/P 250K 4T-0-0	600	600	150*2	150*2	1.5
NG80-G 250K/P 280K 4T-0-0	800	600	185*2	185*2	1.5
NG80-G 280K/P 315K 4T-0-0	800	800	185*2	185*2	1.5
NG80-G 315K/P 350K 4T-0-0	800	800	150*3	150*3	1.5
NG80-G 350K/P 400K 4T-0-0	800	800	150*4	150*4	1.5
NG80-G 400K/P 450K 4T-0-0	1000	1000	150*4	150*4	1.5
NG80-G 450K/P 500K 4T-0-0	1250	1250	185*4	185*4	1.5
NG80-G 500K/P 560K 4T-0-0	1250	1250	185*4	185*4	1.5
NG80-G 560K/P 630K 4T-0-0	1600	1600	185*4	185*4	1.5
NG80-G 630K/P 710K 4T-0-0	1600	1600	185*5	185*5	1.5
NG80-G 710K/P 800K 4T-0-0	2000	2000	185*6	185*6	1.5
NG80-G 800K/P 900K 4T-0-0	2500	2500	185*6	185*6	1.5

3.2.2 Using instruction of the external electrical parts

Table 3-2 Using Instruction of the External Electrical Parts

Part Name	Installing Location	Function Description
Circuit breaker	Front end of input circuit	Disconnect the power supply when the equipment at the lower part is over current.
Contactor	Between the circuit breaker and the inverter input side	During the power on/off operation of the inverter, frequent power on/off operations (less than twice per minute) should be avoided through contactors or direct startup operations.
AC input reactor	Input side of the inverter	Improve the power factor of the input side; Eliminate the higher harmonics of the input side effectively and prevent other equipment from damaging due to distortion of voltage wave. Eliminate the input current unbalance due to unbalance between the power phases.
EMC input filter	Input side of the inverter	Reduce the external conduction and radiation interference of the inverter. Decrease the conduction interference flowing from the power end to the inverter and improve the anti-interference capacity of the inverter.
DC reactor	DC reactor is optional for inverters above 7.5G	Improve the power factor of the input side; Improve the whole efficiency and thermal stability of the inverter. Eliminate the impact of higher harmonics of the input side on the inverter and reduce the external conduction and radiation interference.
AC output reactor	Between the inverter output side and the motor, close to the inverter	The inverter output side generally has higher harmonics. When the motor is far from the inverter, since there are many distributed capacitors in the circuit, certain harmonics may cause resonance in the circuit and bring about the following two impacts: Degrade the motor insulation performance and damage the motor for the long run. Generate large leakage current and cause frequent inverter protection. In general, the distance between the inverter and the motor exceeds 100 meters. Installation of output AC reactor is recommended.



Expansion card: differential encoder PG card (optional)



Expansion card: Current detection card (optional)

3.2.3 Wiring diagram

Typical wiring diagram of single-phase 220V inverter

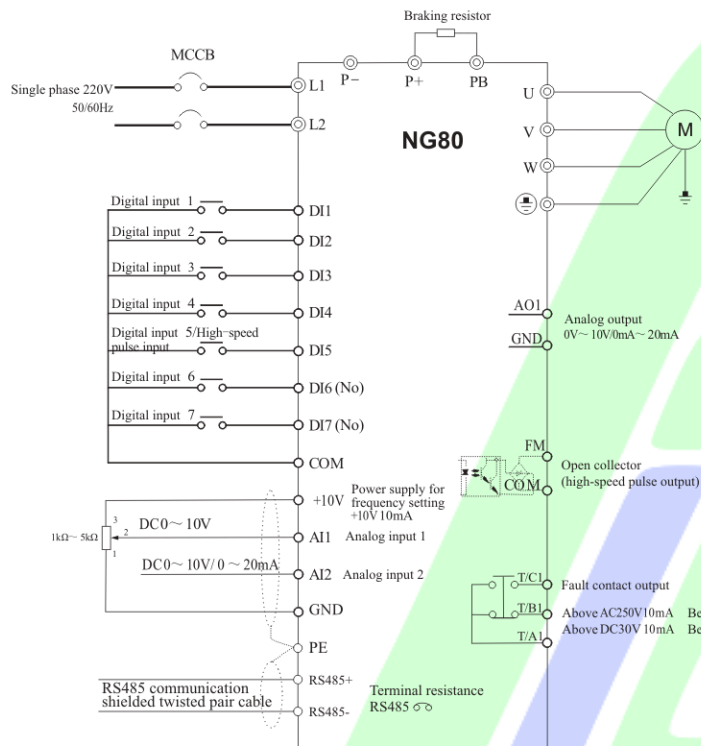


Figure 3-3 Typical wiring diagram of single-phase inverter

Note:

1. Terminal \odot represents the main circuit terminal, and \circ represents the control circuit terminal.
2. Single phase 220V 0.4kW ~ 2.2kW built-in brake unit is standard configuration.
3. The product model with a "B" after it indicates the built-in brake unit.
4. The braking resistor is selected according to the user's needs, as detailed in the selection guide for braking resistors.
5. Cables for power and signal must be routed separately. If the power and control cables intersect, they should do so as nearly as a 90-degree angle as practicable. The user manual for the inverter should be followed, or it is preferable to use shielded twisted pair for analog signal lines and shielded three-core cable for power cables (whose specifications should be one grade higher than those of regular motor cable).

Wiring diagram of three-phase 380V inverter

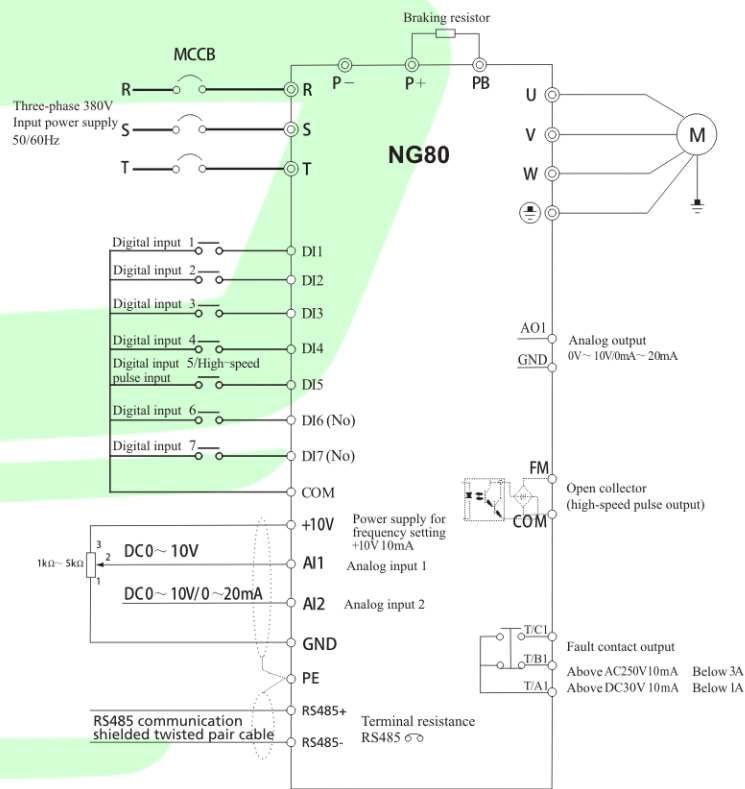


Figure 3-4 0.4 ~ 132kW Wiring diagram of three-phase 380V inverter

Note:

1. Terminal \odot refers to the main circuit terminal, terminal \circ refers to the control circuit terminal.
2. The 0.4 ~ 30kW built-in brake unit is standard and does not require additional installation.
3. The braking resistor is selected according to the user's needs, as detailed in the selection guide for braking resistors.

Wiring diagram of three-phase 380V inverter

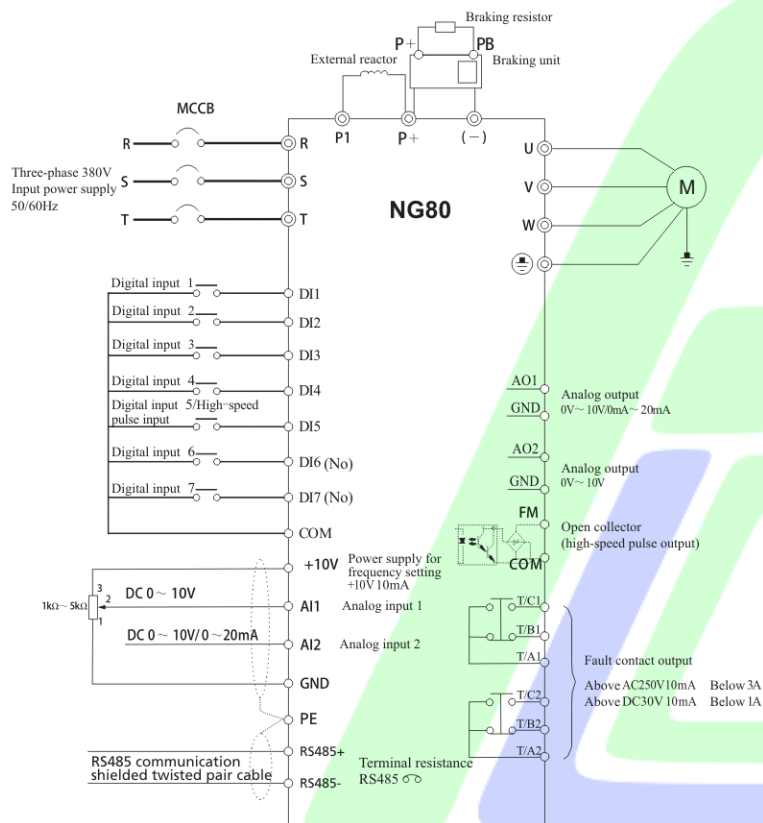


Figure 3-5 Wiring diagram of three-phase 380V inverter above 160kW

3.2.4 Main circuit terminals and connections



Danger

- Make sure that the power switch is at OFF status prior to perform wiring connection. Otherwise there may be danger of electric shock!
- Only the qualified and trained personnel can perform wiring connection. Otherwise it may cause equipment and human injuries!
- It should be earthed reliably. Otherwise there may be danger of electric shock or fire!



Caution

- Make sure that the rated value of the input power supply is consistent with that of the inverter. Otherwise it may damage the inverter!
- Make sure that the motor matches the inverter. Otherwise it may damage the motor or generate inverter protection!
- Do not connect the power supply to the terminals of U, V and W. Otherwise it may damage the inverter!
- Do not directly connect the brake resistor between the DC bus terminals (+) and (-). Otherwise it may cause fire!

1) Description of the main circuit terminals of single-phase inverters

Terminal	Name	Description
L1, L2	Input terminal of single phase power supply	Connect to single-phase 220V AC power
P+, P-	Negative and positive terminals of DC bus	Common DC bus input point
P+, PB	Connection terminal of brake resistor	Connecting the braking resistor
U, V, W	Output terminal of inverter	Connect to the three phase motor
PE	Earth terminal	Earth connection terminal

2) Description of the main circuit terminals of three-phase inverters

Terminal	Name	Description
R, S, T	Input terminal of three phase power supply	Connect to three-phase AC power
P+, P-	Negative and positive terminals of DC bus	Common DC bus input point (connection points for external braking units with voltage levels of 220V/18.5kW and above, and other voltage levels of 37kW and above)
P+, PB	Connection terminal of brake resistor	Connection point of brake resistor of the inverter below 15kW (220V) & the inverter below 30kW (other voltages)
P, P1	Connection terminal of external DC reactor	Connection point of external DC reactor
U, V, W	Output terminal of inverter	Connect to the three phase motor
PE	Earth terminal	Earth connection terminal

Precautions on Wiring:

a) Input power L1, L2 or R, S and T:

There is no phase sequence requirement for the cable connection at the input side of the inverter.

b) DC bus P+ and P- terminals:

Note that the P+ and P- terminals of DC bus have residual voltage right after power-on. It needs to wait until the CHARGE indicator is OFF and make sure that the voltage is less than 36V prior to wiring connection. Otherwise there may be danger of electric shock.

When using external brake components with voltage levels of 220V/18.5kW and above, and other voltage levels of 37kW and above, be careful not to reverse the polarity of P+ and P-, otherwise it may cause damage to the frequency converter or even fire.

The wiring length of the brake unit should not exceed 10 meters. Twisted wires or pair wires should be used and connected in parallel.

Do not connect the brake resistor directly to the DC bus, or it may damage the inverter and even cause fire.

c) Connecting terminals P+ and PB of brake resistor:

Only models with 220V voltage below 15kW and other voltage levels below 30kW and confirmed to have built -in braking units can have effective braking resistor connection terminals.

The prototype of brake resistor can refer to the recommended value and the wiring length should be less than 5 meters. Otherwise it may damage the inverter.

d) Connecting terminals P1 and (+) of external DC reactor:

220V/37kW and above, inverters and reactors with other voltage levels of 75kW power and above are externally installed. During assembly, remove the connecting pieces between the P1 and (+) terminals, and connect the reactors between the two terminals.

e) Terminals U, V, W at the output side of the inverter:

The inverter output side cannot connect to the capacitor or surge absorber. Otherwise, it may cause frequent inverter protection and even damage the inverter.

In case the motor cable is too long, it may generate electrical resonance easily due to the impact of distributed capacitance, thus damaging the motor insulation or generating higher leakage current to invoke over current protection of the inverter. When the length of motor cable is longer than 100 meters, it needs to install a AC output reactor.

f) Earth terminal PE (⊕) :

This terminal should be earthed reliably, with resistance of earth cable of less than 0.1Ω. Otherwise, it may cause fault or damage the inverter.

Do not share the earth terminal (⊕) and zero line of the power supply.

3.2.5 Control terminals and connections

1) Control circuit terminals

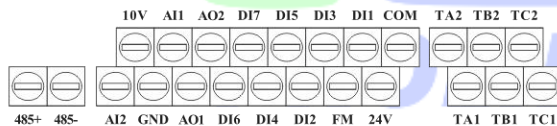


Figure 3-8 Terminal layout of control circuit (JZ0100-01-07)

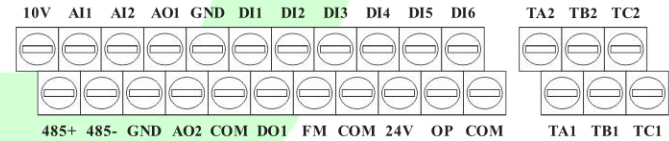


Figure 3-8-1 Terminal layout of 600SCB series control circuit
(This control board is an optional product)

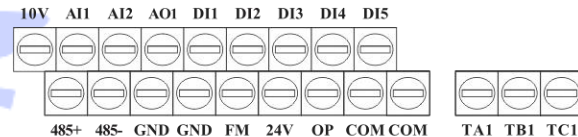


Figure 3-8-2 Terminal layout of 500MCB series control circuit

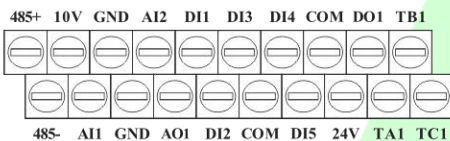
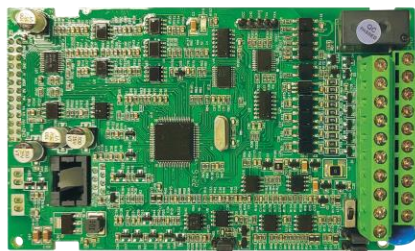


Figure 3-8-3 Terminal layout of 500SCB series control circuit
(Special motherboard for minicomputer)

2) Function description of control terminal

Table 3-3 Description of Control Terminal Function

Type	Terminal Symbol	Terminal Name	Function Description
Power Supply	+10V~GND	External +10V power	Provide +10V power supply for external units, and the maximum output current is 10mA. It is generally used as the operating power supply for the external potentiometer. The potentiometer resistance range is 1kΩ~5kΩ.
	+24V~COM	External +24V power	Provide +24V power supply for external units. It is generally used as the operating power supply for digital input/output terminals and the external sensor. The maximum output current is 200mA.
Analog Input	AI1~GND	Analog input terminal 1	1. Input range: DC 0V~10V/0mA~20mA, determined by AI1 jumper on the control board. 2. Input impedance: 22kΩ
	AI2~GND	Analog input terminal 2	1. Input range: DC 0V~10V/0mA~20mA, determined by AI2 jumper on the control board. 2. Input impedance: 22kΩ (voltage); 500Ω (current)
Digital Input	DI1~COM	Digital input 1	1. Optical coupling isolation, compatible with dual polarity input 2. Input impedance: 2.4kΩ 3. Voltage range for level input: 9V~30V
	DI2~COM	Digital input 2	
	DI3~COM	Digital input 3	
	DI4~COM	Digital input 4	
Analog Output	DI5~COM	High-speed pulse input terminal	In addition to the characteristics of DI1 to DI4, it can also be used as the high speed pulse input channel. Maximum input frequency is 100kHz
	AO1~GND	Analog output 1	The voltage or current output is determined by AO1 jumper on the control board. Output voltage range: 0V ~ 10V. Output current range: 0mA ~ 20mA.
Digital Output	DO1~COM	Digital output 1	Open collector output: Optical coupling isolation, dual polarity. Output voltage range: 0V~24V. Output current range: 0mA~50mA
	FM~COM	High speed pulse output	It can be used as high speed pulse output or open collector output which is determined by function code P5-00. High speed pulse output: maximum frequency is 100kHz. When used as open collector output, the specification is the same as that of DO1.
Relay Output	T/A~T/B	Normally closed terminal	Driving capacity: AC 250V, 3A, COSØ=0.4 DC 30V, 1A
	T/A~T/C	Normally open terminal	
Auxiliary interface	J12	Function expansion card interface	28 core terminal, interface with optional cards (such as I/O expansion cards, PLC cards, various bus cards, etc.)
	J3	PG card interface	Optional: OC, differential, UVW, resolver and other interfaces
	J7	External keyboard interface	External keyboard

3) Description of connection of control terminals

a) Analog input terminal

Since the weak analog voltage signal is easy to suffer external interferences, it needs to employ shielded cable generally and the length should be no longer than 20 meters, as shown in Figure 3-9. In case the analog signal is subject to severe interference, and filter capacitor or ferrite magnetic core should be installed at analog signal source side, as shown in Figure 3-10.

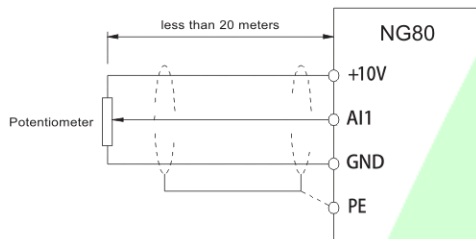


Figure 3-9 Wiring diagram of analog input terminal

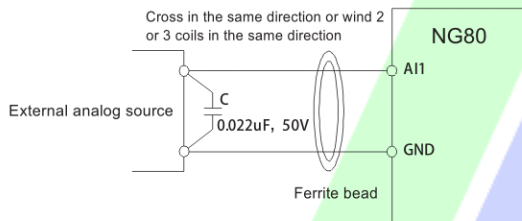


Figure 3-10 Processing wiring diagram of analog input terminal

b) Digital input terminal

It needs to employ shielded cable generally, with cable length of no more than 20 meters. When active driving is adopted, necessary filtering measures should be taken to prevent the interference to the power supply.

It is recommended to use the contact control mode.

c) DI terminal connection

Drain wiring

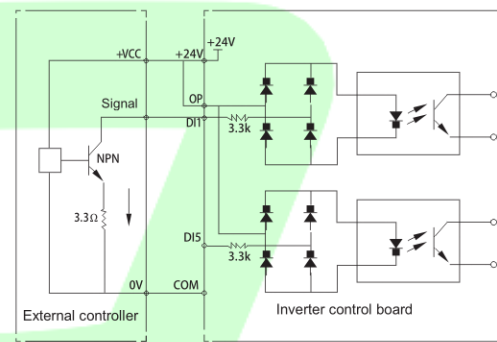


Figure 3-11 Drain wiring

One of the most popular wiring techniques is this one. In the event that an external power source is utilized, the positive terminal of the external power supply must be connected to +24V and the negative terminal to COM.

Source wiring

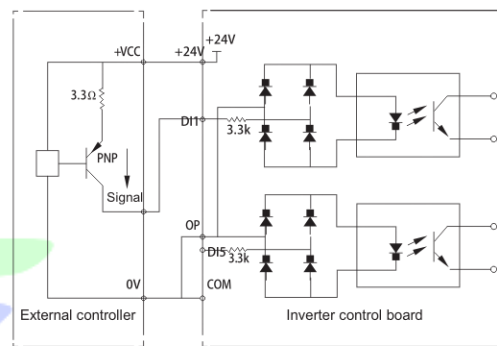


Figure 3-12 Source type wiring

The common terminal of +24V and the external controller must be linked together, and the OP of jumper J9 must be jumped to COM in this wiring approach together. The negative terminal of the external power supply must likewise be connected to OP if an external power source is being used.

d) Digital output terminal

An absorption diode should be placed to both ends of the relay coil whenever the digital output terminal needs to drive the relay. The 24V DC power supply is easily damaged if this is not the case.

Note: Make sure that the absorption diode's polarity is installed appropriately. Otherwise, the DC 24V power source will instantly burn out once the digital output terminal starts to output.

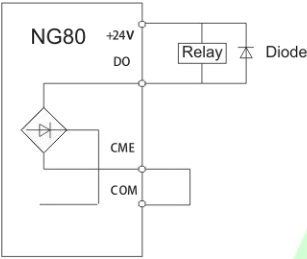


Figure 3-13 Schematic diagram of digital output terminal wiring

Chapter 4 Operation and Display

4.1 Keypad Description

With the operation keypad, it can perform such operations on the inverter as function parameter modification, working status monitor and running control (start and stop). Its appearance and functional area are shown in the following figure:

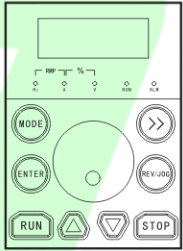
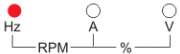

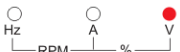




Figure 4-1 Schematic diagram of NG80 series operation panel

- 1) Function indicator light instructions:
- RUN: when the light is out, the inverter is down, and when the light is on, the inverter is in operation.
 - LOCAL/REMOTE: Indicator light for keyboard operation, terminal operation, and remote operation (communication control). When the light is off, it indicates the keyboard operation control status, when the light is on, it indicates the terminal operation control status, and when the light is flashing, it indicates that it is in remote operation control status.
 - FWD/REV: Forward and reverse indicator light, light on indicates that it is in a forward rotating state.
 - TUNE/TC: Tune/torque control/fault indicator light, light on indicates torque control mode, slow flashing light indicates tuning state, and fast flashing light indicates fault state.
- 2) Unit indicator lamp:
- | Hz | frequency unit | A | current unit | V | voltage unit |
|--------------|----------------|-----------|--------------|---|--------------|
| RMP (Hz + A) | speed per unit | % (A + V) | percentage | | |
- 3) Digital display area
- The 5-bit LED display, which can display the set frequency, output frequency, various monitoring data and alarm code, etc.
- 4) Keyboard button description table

Table 4-1 Keyboard Menu

Key	Name	Function
MODE	Programming key	Level 1 menu to enter or exit
ENTER	Confirm key	Enter the menu screen step by step to confirm the setting parameters
▲	Incremental key	Increasing number of the data and function codes
▼	Decremental key	Decreasing number of the data and functional codes
▶▶	Shift key	In the case of running the shutdown display interface and running the display interface, the display parameter can be selected periodically, and when modifying the parameter, the modification bit of the parameter can be selected.
RUN	Run key	In keyboard operation mode, used for running operations
STOP/RESET	Stop/reset	In the running state, press this key can be used to stop the running operation, when the fault alarm state, it is used to reset the operation.
REV/JOG	Multifunctional selection key	Function function selection according to P7-01

Name		Description				
Status indicator	RUN	When the lamp is on, the inverter is in operation, and when the lamp is out, the inverter is down.				
	LOCAL	○ LOCAL: Extinguish	Indicates that the inverter is in a shutdown state.			
		● LOCAL: Constantly light	Indicates the terminal start stop control method.			
		◐ LOCAL: Flicker	Indicates the communication start stop control method.			
Unit indicator lamp	Represents the unit currently displayed on the keyboard.					
	Hz		Frequency unit			
	A		Current unit			
	V		Voltage unit			
	RPM		Speed per unit			
	%		Percentage			
Digital display area	There are 5-bit 5-segment LED Nixie tube on the inverter operation panel, which display various monitoring data such as set frequency, output frequency and alarm code.					
	Digital display	Corresponding letter	Digital display	Corresponding letter	Digital display	Corresponding letter
	0	0	1	1	2	2
	3	3	4	4	5	5
	6	6	7	7	8	8
	9	9	A	A	b	b
	C	C	d	d	E	E
	F	F	H	H	I	I
	L	L	N	N	n	n
	O	O	P	P	r	r
	S	S	t	t	U	U
	v	v	.	.	—	—

4.2 Function Code Checking and Modification Methods Description

The operation keypad of the NG80 series inverter adopts three-level menu structure to carry out operations such as parameter setting.

The three-level menu includes function parameter group (level 1 menu) → Function code (level 2 menu) → Function code setting value (level 3 menu). Refer to Figure 4-2 for the operation procedure.

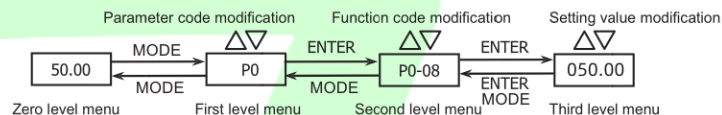
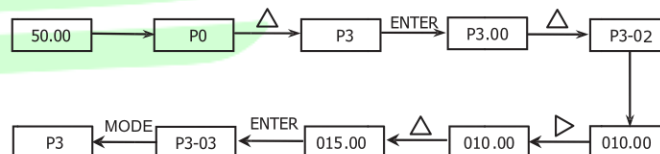


Figure 4-2 Operation Procedure of Three-level Menu

Description: When operating on level 3 menu, press MODE key or ENTER key to return to level 2 menu. The difference between MODE key and ENTER key is described as follows: Pressing ENTER key will save the setup parameter and return to the level 2 menu and then automatically shift to the next function code, while pressing MODE key will directly return to level 2 menu without saving the parameter, and it will return to the current function code.

Example: Modify the function code P3-02 from 10.00Hz to 15.00Hz. (The bold-type word indicates the flashing bit.)



In level 3 menu, if there is no flashing bit, it indicates that the function code cannot be modified. The possible reasons include:

- 1) The function code is an unchangeable parameter, such as actual detection parameter, running record parameter, etc.
- 2) The function code cannot be modified in running status. It can be modified only after the unit is stopped.

4.3 Parameter Display Method

The purpose of the parameter display mode, which has three options, is to enable users to examine the function parameters in various arrangement formats in accordance with their real demands.

Name	Description
Functional parameter mode	P0 ~ PF, AO ~ AF, and U0 ~ UF function parameter groups are used in the orderly presentation of inverter function parameters.
User customization parameter mode	The user chooses which functional parameters should be displayed through the PE group and may modify the presentation of up to 32 functional parameters.
User changing parameter mode	Functional parameters that do not match those set by the factory.

The relevant functional parameters are PP-02, PP-03, as follows:

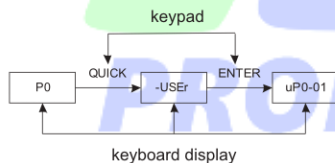
PP-02	Display properties in functional parameter mode		Factory default	11
	Setting range	Units place	U group display selection	
		0	No display	
		1	Display	
		Tens place	A group display selection	
		0	No display	
1	Display			
PP-03	Personality parameter display selection		Factory default	0
	Setting range	Units place	User customized parameter display selection	
		0	No display	
		1	Display	
		Tens place	User changes parameter display selection	
		0	No display	
	1	Display		

When one of the personality parameter mode display options (PP-03) exists for display. At this time, you can switch into different parameter display mode by QUICK key. The display code of each parameter display mode is:

Parameter display method	Display
Functional parameter mode	-bASE
User customization parameter mode	-USER
User changing parameter mode	--C--

Switching mode is as follows:

The current is the function parameter mode, and the switch is the user customized parameter mode.



4.4 User Customization Parameter Operation Method

The user customization menu is designed to make it easy for the user to inspect and change the common functional settings rapidly. The parameter's display form is "uP3-02" in the user customization menu. It refers to the function parameter P3-02, and changing the value there has the same result as changing the corresponding parameter in the regular programming state.

The PE group, which chooses the function parameters, is where the function parameters for the user customization menu originate from. P0-00 can be set to signal that nothing is selected, up to 30 can be set. The user customization menu is empty if "NULL" is shown while accessing the menu.

For the convenience of users, the user customization menu was initially saved in the 16 most often used parameters:

P0-01: Control method	P0-02: Command source selection
P0-03: Main frequency source selection	P0-07: Frequency source selection
P0-08: Preset frequency	P0-17: Acceleration time
P0-18: Deceleration time	P3-00: V/F curve setting
P3-01: Torque increase	P4-00: DI1 terminal function selection
P4-01: DI2 terminal function selection	P4-02: DI3 terminal function selection
P5-04: DO1 output selection	P5-07: AO1 output selection
P6-00: Starting method	P6-10: Shutdown method

Users can modify the user customization according to their specific needs.

4.5 Viewing Methods for Status Parameters

A variety of status parameters can be displayed by the shift key ">" in the stop or running state respectively. The function codes P7-03 (operation parameter 1), P7-04 (operation parameter 2) and P7-05 (shutdown parameter) are used to select whether the parameter is displayed by binary bits.

In the stop state, there are sixteen stop state parameters that can be selected for display or not. They are set frequency, bus voltage, DI input status, DO output status, analog input AI1 voltage, analog input AI2 voltage, analog input AI3 voltage, actual count value, actual length value, PLC running step, load speed display, PID setting, PULSE input pulse frequency and 3 reserved parameters. The display of selected parameters can be switched according to the key sequence.

In the operating state, there are five operating status parameters, including operating frequency, set frequency, bus voltage, output voltage, and output current are displayed by default. Other display parameters include output power, output torque, DI input status, DO output status, analog input AI1 voltage, analog input AI2 voltage, analog input AI3 voltage, actual count value, actual length value, line speed, PID setting, PID feedback, etc. Whether or not to display is selected by function codes P7-03 and P7-04 by bit (converted to binary). The display of selected parameters can be switched according to the key sequence.

When the inverter is powered off and then powered on again, the displayed parameters are defaulted to the parameters selected before the inverter was powered off.

4.6 Password Setting

The inverter provides user password protection function. When PP-00 is set to non-zero value, it indicates the user password, and the password protection turns valid after exiting the function code editing status. When pressing MODE key again, "-----" will be displayed, and common menu cannot be entered until user password is input correctly.

To cancel the password protection function, enter with password and set PP-00 to "0".