NIETZ

NL1000 PLUS Series

User Manual

Micro Universal-Purpose Drives

NIETZ ELECTRIC CO.,LTD

• Thank you very much for your buying NL1000 (PLUS) series High- performance Vector Control Inverter.

• Before use, please read this manual thoroughly to ensure proper usage. Keep this manual at an easily accessible place so that can refer anytime as necessary.

1. Safety Precautions

Please read this operation manual carefully before installation, operation, maintenance or inspection In this manual, the safety precautions were sorted to - "WARNING" or "CAUTION".

WARNING — Indicates a potentially dangerous situation which, if can not avoid will result in death or serious injury.

CAUTION — Indicates a potentially dangerous situation which, if can not avoid will cause minor or moderate injury and damage the device. This Symbol is also used for warning any un-safety operation.
In some cases, even the contents of "CAUTION" still can cause serious accident. Please follow these important precautions in any situation.

In some cases, even the contents of "CAUTION' still can cause serious accident. Please follow these important precautions in any situation.

In some cases, even the contents of "CAUTION" still can cause serious accident. Please follow these important precautions in any situation.

★ NOTE indicate the necessary operation to ensure the device run properly.

Warning Marks are placed on the front cover of the inverter. Please follow these indications when using the inverter.

WARNING

DANGER
• Risk of Injury and electric shock. • Read the manual and follow the safety instruction before use. • Isolate from supply and wait 10minutes before removing this cover. • Ensure proper earth connection. • Mount the inverter on a non-combustible surface.

2. Inspection

⚠ CAUTION
• Do not install or use any inverter that is damaged or have fault part; otherwise may cause injury.

Check the following items when unpacking the inverter

① Inspect the entire exterior of the inverter to ensure there are no scratches or other damage caused by the transportation.

② Ensure there is operation manual and warranty card in the packing box.

③ Inspect the nameplate and ensure it is what you ordered.

④ Ensure the optional parts are what you need if have ordered any optional parts.

Please contact the local agent if there is any damage in the inverter or optional parts.

3. Disassemble and installation warning

⚡ **WARNING**

- The person without passing the training manipulate the device or any rule in the "Warning" being violated, will cause severe injury or property loss. Only the person, who has passed the training on the design, installation, is permitted to operate this equipment.
- Input power cable must be connected tightly, and the equipment must be grounded securely.
- Even if the inverter is not running, the following terminals still have dangerous voltage:
- Power terminals R, S,T
- Motor connection terminals U, V, W
- When power off, should not install the inverter until 10 minutes after, which can ensure the device discharge completely.
- The section area of grounding conductor must no less than 10mm², Or according to below data, select the maximum value of the two as the grounding conductor area :

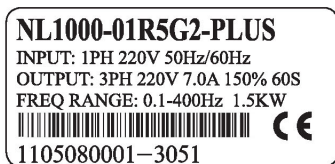| Power supply cable area of conductor Smm²	Area of grounding conductor
S≤16	S
16<S≤35	16
35<S	S/2

⚠ **CAUTION**

- When moving the inverter please lift by its base and don't lift by the panel, otherwise may cause the main unit fall off which may result in personal injury.
- Install the inverter on the fireproofing material (such as metal) to prevent fire.
- When need install two or more inverters in one cabinet, cooling fan should be provided to make sure that the air temperature is lower than 40°C, otherwise it could cause fire or damage the device.

1. Preface

Thank you for choosing the NL1000 Series of high performance, simple inverter. Diagram of operating instructions, is to facilitate the description, may be slightly different with the product.

Please note that this manual will be handed the hands of end users, and retain for future maintenance, use and if in doubt, we will be happy to serve you.

2. Nameplate Description

NL1000-01R5G2-PLUS
INPUT: 1PH 220V 50Hz/60Hz
OUTPUT: 3PH 220V 7.0A 150% 60S
FREQ RANGE: 0.1-400Hz 1.5KW
‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖ **CE**
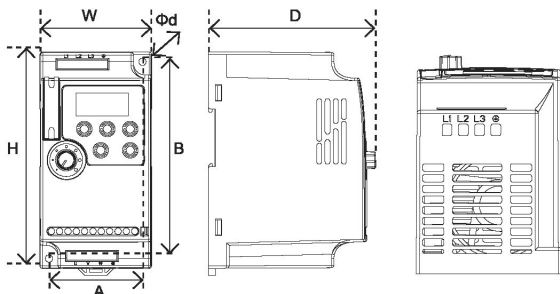1105080001−3051

Model: NL1000 - 01R5G 2-PLUS

Voltage range :
2: 1PH AC220V INPUT
4: 3PH AC 380V INPUT

Inverter capacity:
01R5G means 1.5kW

NL1000 PLUS Series

3. Dimensions

SIZE A: 0.4kW--37kW

Note: Support for standard 35mm rail mounting(below 5.5kW)
Unit:mm

Model	W	H	D	A	B	Φd
NL1000-00R4G2-PLUS— NL1000-01R5G2-PLUS	68	132	102	57	120	4.5
NL1000-02R2G2-PLUS NL1000-00R4G4-PLUS— NL1000-02R2G4-PLUS	72	142	112.2	61	130	4.5
NL1000-03R7G4-PLUS— NL1000-05R5G4-PLUS	85	180	116	72	167	5.5
NL1000-07R5G4-PLUS— NL1000-11G4-PLUS	106	240	153	96	230	4.5
NL1000-15G4-PLUS – NL1000-22G4-PLUS	151	332	165.5	137	318	7
NL1000-30G4-PLUS— NL1000-37G4-PLUS	217	400	201	202	385	7

SIZE B: 45kW--450kW
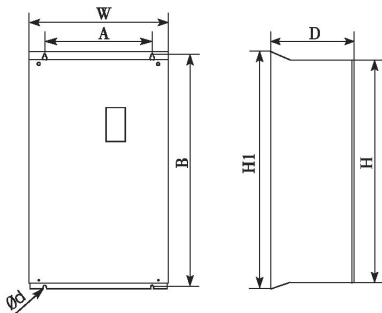
Model	W	H	D	A	B	Φd
NL1000-45G4-PLUS—NL1000-55G4-PLUS	300	473	240	200	455	9
NL1000-75G4-PLUS—NL1000-110G4-PLUS	275	630	311.5	200	612	9
NL1000-132G4-PLUS—NL1000-160G4-PLUS	400	715	311.5	320	695	11
NL1000-185G4-PLUS—NL1000-220G4-PLUS	400	790	320	160+160	810	11
NL1000-250G4-PLUS—NL1000-315G4-PLUS	530	920	350	215+215	950	11
NL1000-350G4-PLUS—NL1000-450G4-PLUS	550	1120	400	230+230	1150	13

4. Keyboard Description

Display area: displays:
set frequency, operating frequency,
current, and abnormal values for
each parameter setting content

RUN/FWD/REV/STOP:
Status indictor:Various
operation status

Shift / Enter / switch display button: shift to another digit or switch to another display by short-pressing,confirm a setting by long-pressing

RUN

STOP

FWD

REV

ENTER
DISP

Digital modifier key

RUN
STOP

PRG
RESET

Turn to another
frequency by rotating
the potentiometer
when the frequency
is set to be controlled
by the manipulator
potentiometer

Run / Stop button: Click
Run, and then
click Stop

Programming key / fault reset button: short press
for programming key, press
2 seconds for the fault reset
button

9
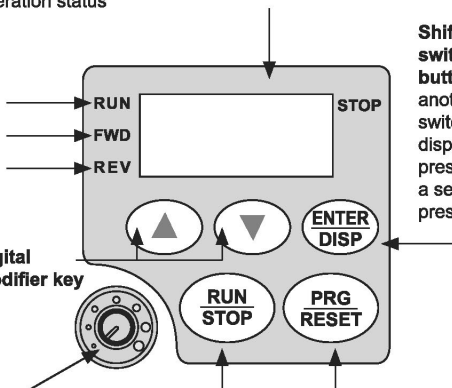
5.Product Specifications

| Items		NL1000
Power Supply	Rated voltage, Frequency	1PH/3PH AC 220V 50/60Hz;3PH AC 380V 50/60Hz
	Voltage Range	220V: 170~240V; 380V:330V~440V
Output	Voltage Range	220V: 0~220V; 380V: 0~380V
	Frequency Range	0.10~400.00Hz
Control method		V/F control, Space vector control.
Indication		Operating status/Alarm definition/interactive guidance: eg , frequency setting, the output frequency/ current, DC bus voltage, the temperature and so on.
Control Specifications	Output Frequency Range	0.10Hz~400.00Hz
	Frequency Setting Resolution	Digital input: 0.1Hz, analog input: 0.1% of maximum output frequency
	Output Frequency Accuracy	0.1Hz
	V/F Control	Setting V/F curve to satisfy various load Requirements.
	Torque Control	Auto increase: auto raise torque by loading Condition; Manual increase: enable to set 0.0~20.0% of raising torque.
	Multifunctional Input Terminal	Four multi-function input terminals, realizing functions including fifteen section speed control, Program running, four-section acceleration/deceleration speed switch, UP/DOWN function and emergency stop and other functions
	Multifunctional Output Terminal	1 multi-function output terminals for displaying of running, zero speed, counter, external abnormity, program operation and other Information and warnings.
	Acceleration/ deceleration Time Setting	0~999.9s acceleration/deceleration time can be set individually.

	Items	NL1000
Other Functions	PID Control	Built-in PID control
	RS485	Standard RS485 communication function(MODBUS)
	Frequency Setting	Analog input: 0 to 10 V, 0 to 20mA can be selected; Digital input:Input using the setting dial of the operation panel or RS485 or UP/DOWN. Note: AVI terminals can be used to select an Analog voltage input (0-10V) and analog current Input(4-20mAI) through the switch J2.
	Multi-speed	Four multifunction input terminals, 15 section speed can be set
	Automatic voltage regulation	Automatic voltage regulation function can be Selected
	Counter	Built-in 2 group of counters
Protection/ Warning Function	Overload	150%, 60 second(Constant torque)
	Over Voltage	Over voltage protection can be set.
	Under Voltage	Under voltage protection can be set
	Other Protections	output short circuit,over current, and Parameter lock and so on.
Environment	Ambient Temperature	-10°C to 40°C(non-freezing)
	Ambient Humidity	Max. 95% (non-condensing)
	Altitude	Lower than 1000m
	Vibration	Max.0.5G
Structure	Cooling Mode	Forced air cooling
	Protective Structure	IP 20
Installation	Mode	Wall-mounted or standard 35MM rail mounting (Below 5.5kW)

6.Wiring

a.0.4kW-37kW

Note: When using a single-phase power supply,
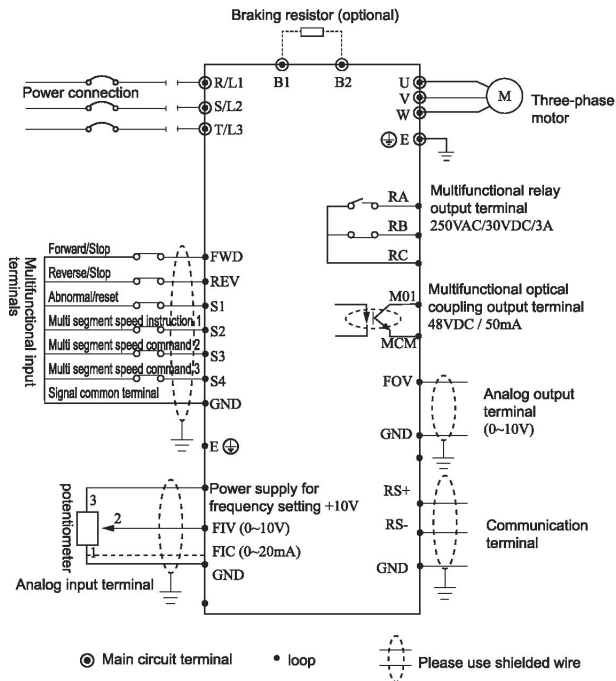Please access from terminals L1 and L2
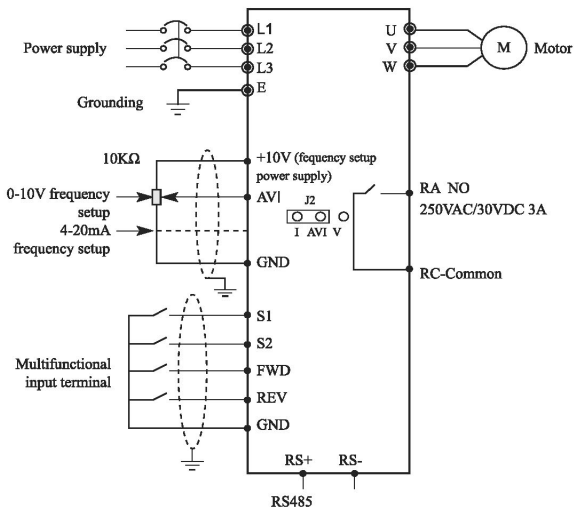
Note: AVI terminals can be used to select an analog voltage input(0-10V) and analog current input (4-20mA) through the switch J2.

FWD	REV	S1	S2	S3	S4	10V	FIV	FIC	GND	FOV	MCM	MO1	GND	RS-	RS+

RA	RB	RC

12

b.45kW-450kW

Braking resistor (optional)

Power connection

R/L1   B1   B2   U
S/L2   V   M   Three-phase motor
T/L3   W
E

Multifunctional input terminals

Forward/Stop — FWD
Reverse/Stop — REV
Abnormal/reset — S1
Multi segment speed instruction1 — S2
Multi segment speed command2 — S3
Multi segment speed command3 — S4
Signal common terminal — GND
E

RA
RB   Multifunctional relay output terminal
RC   250VAC/30VDC/3A

M01   Multifunctional optical coupling output terminal
MCM   48VDC / 50mA

FOV   Analog output terminal
GND   (0~10V)

RS+
RS-   Communication terminal
GND

Power supply for frequency setting +10V
potentiometer
FIV (0~10V)
FIC (0~20mA)
GND
Analog input terminal

◉ Main circuit terminal   • loop   Please use shielded wire

Note: The AVI terminal can select analog voltage input (0-10V) and analog current input (4-20mA) by switching switch J2. When I is turned on, it is current input, and when V is turned on,

it is voltage input.

Note 2: The arrangement of terminals above 45KW is as follows:

FWD	REV	S1	S2	S3	S4	10V	FIV	FIC	GND	FOV	MCM	MO1	GND	RS-	RS+

RA	RB	RC

7.Selection Guide

Model	Rated output power (kW)	Rated input current (A)	Rated output current (A)	Adapted Motor (kW)
Input Voltage: 1PHAC 220V±15%				
NL1000 PLUS-0R4G-2	0.4	5.4	2.5	0.4
NL1000 PLUS-0R75G-2	0.75	7.2	5.0	0.75
NL1000 PLUS-1R5G-2	1.5	10.0	7.0	1.5
NL1000 PLUS-2R2G-2	2.2	16	11	2.2
Input Voltage: 3PHAC 380V±15%				
NL1000 PLUS-0R4G-4	0.4	3.4	2.0	0.4
NL1000 PLUS-0R75G-4	0.75	3.8	2.7	0.75
NL1000 PLUS-1R5G-4	1.5	5.0	4.0	1.5
NL1000 PLUS-2R2G-4	2.2	5.8	5.0	2.2
NL1000 PLUS-3R7G/5R5P-4	3.7/5.5	10/15	8.6/12.5	3.7/5.5
NL1000 PLUS-5R5G/7R5P-4	5.5/7.5	15/20	12.5/17.5	5.5/7.5
NL1000 PLUS-7R5G/11P-4	7.5/11	20/26	17.5/24	7.5/11
NL1000 PLUS-11G/15P-4	11/15	26/35	24/33	11/15
NL1000 PLUS-15G/18.5P-4	15/18.5	35/42	33/40	15/18.5
NL1000 PLUS-18.5G/22P-4	18.5/22	42/49	40/47	18.5/22
NL1000 PLUS-22G/30P-4	22/30	49/69	47/65	22/30
NL1000 PLUS-30G/37P-4	30/37	69/85	65/80	30/37

Model	Rated output power (kW)	Rated input current (A)	Rated output current (A)	Adapted Motor (kW)
NL1000 PLUS-37G/45P-4	37/45	85/92	80/90	37/45
NL1000 PLUS-45G/55P-4	45/55	92/113	90/110	45/55
NL1000 PLUS-55G-4	55	113	110	55
NL1000 PLUS-75P-4	75	157	152	75
NL1000 PLUS-75G/90P-4	75/90	157/180	152/176	75/90
NL1000 PLUS-90G/110P-4	90/110	180/213	176/210	90/110
NL1000 PLUS-110G/132P-4	110/132	213/256	210/255	110/132
NL1000 PLUS-132G/160P-4	132/160	256/307	255/305	132/160
NL1000 PLUS-160G/185P-4	160/185	307/355	305/340	160/185
NL1000 PLUS-185G/200P-4	185/200	355/385	340/380	185/200
NL1000 PLUS-200G/220P-4	200/220	385/430	380/425	200/220
NL1000 PLUS-220G/250P-4	220/250	430/485	425/480	220/250
NL1000 PLUS-250G/280P-4	250/280	485/536	480/530	250/280
NL1000 PLUS-280G/315P-4	280/315	536/610	530/600	280/315
NL1000 PLUS-315G/350P-4	315/350	610/657	600/650	315/350
NL1000 PLUS-350G/400P-4	350/400	657/728	650/720	350/400
NL1000 PLUS-400G/450P-4	400/450	728/800	720/790	400/450
NL1000 PLUS-450G/500P-4	450/500	800/865	790/860	450/500

8. Parameter list

" ☆ ": The parameter can be modified when the AC drive is in either stop or running state.

" ★ ": The parameter cannot be modified when the AC drive is in the running state.

"●": The parameter is the actually measured value and cannot be modified.

"*": The parameter is factory parameter and can be set only by

the manufacturer.

Parameters	Name	Setting Range	Default	Property
Group P0 Monitor functions				
P000	Main display data selection	0: Setting frequency; 1:Running frequency; 2:Output current; 3: Rotate speed; 4: Bus voltage; 5: Output voltage; 6: Reserved; 7: Display PID setting feedback; 8: PID setting	0	☆
P001	Display the set frequency	Unit: 0.1Hz		●
P002	Display the output frequency	Unit: 0.1Hz		●
P003	Display the output current	Unit: 0.01A		●
P004	Display the motor speed	Unit: RMP		●
P005	Display the DC bus voltage value	Unit: 0.1V		●
P006	reserve			
P007	Display PID	Unit: 0.01		●
P008	Power on time	Accumulate power on time, unit: hour		●
P009	Output voltage	AC drive Output voltage, unit: 1V		●

Parameters	Name	Setting Range	Default	Property
P010	Alarm record 1	0: No fault 2:Over-current during		●
P011	Alarm record 2	acceleration 3:Over-current during deceleration 4:Over-current at constant speed 5:Over-voltage during acceleration		●
P012	Alarm record 3	6:Over-voltage during deceleration 7:Over-voltage at constant speed 8: Resisitor overload 9: Undervoltage 10: AC drive overload 11: Motor overload 14: Module overheat 15: External fault		●
P013	Reserved	16: Abnormal communication 24: Water supply low pressure 27: Water supply high pressure 28: No water warning 29: Power on time reached 31: PID feedback lost during running		●
P014	The frequency setting in the last alarm.	Unit: 0.1Hz		●

Parameters	Name	Setting Range	Default	Property
P015	The output frequency in last alarm.	Unit: 0.1Hz		●
P016	The output voltage in last alarm.	Unit: 0.0A		●
P017	The output voltage in last alarm.	Unit: 0.1V		●
P021	Input terminal	Bit0-fwd; Bit1-rev; Bit2-S1; Bit3-S2;		●
P022	Output terminal	Bit1: 1- Ra Rc action ;0- Ra Rc no action		●
P023	AVI voltage	0.00~10.00V		●

Parameters	Name	Setting Range	Default	Property
P027	Fault state	0: No fault 2:Over-current during acceleration 3:Over-current during deceleration 4:Over-current at constant speed 5:Over-voltage during acceleration 6:Over-voltage during deceleration 7:Over-voltage at constant speed 8: Resisitor overload 9: Undervoltage 10: AC drive overload 11: Motor overload 14: Module overheat 15: External fault 16: Abnormal communication 24: Water supply low pressure 27: Water supply high pressure 28: No water warning 29: Power on time reached 31: PID feedback lost during running		●
P028	Running state	0: Stop 1: Forwarder 2: Reverse		●
Group P1 Basic functions				

Parameters	Name	Setting Range	Default	Property
P100	Digital frequency setting	0.0~P105	0.0 Hz	☆
P101	Main frequency source X selection	0:Digital frequency setting(Can modify the UP/DOWN, power lost memory) 1:AVI analog input 2: Remote keypad potentiometer setting mode 3: Local keypad potentiometer setting mode 4: UP/DOWN Frequency setting 5: RS485 communication frequency setting 6: Multi-speed reference 7: Simple PLC 8: PID	3	★
P102	Start signal selection	0: Operation panel (FWD/REV/STOP) 1: I/O terminal 2:Communication(RS485)	0	★
P104	Reverse rotation Prevention selection	0: Reverse rotation disallowed 1: Reverse rotation allowed	1	☆
P105	Maximum frequency	Minimum operate frequency~999.9Hz	50.0 Hz	☆
P106	Minimum frequency	0.00~maximum frequency	0.0 Hz	☆

Parameters	Name	Setting Range	Default	Property
P107	Acceleration Time 1	0~6000.0s	Changing	☆
P108	Deceleration	0~6000.0s	Changing	☆
P109	V/F maximum voltage	V/F intermediate Voltage~500.0V	Changing (380.0 or 220.0)	★
P110	V/F frequency	V/F intermediate frequency ~ max. frequency	50.0Hz	★
P111	V/F intermediate Voltage	V/F minimum voltage ~ V/F maximum voltage	Changing	★
P112	V/F intermediate frequency	V/F minimum Frequency ~ V/F base frequency	2.5 Hz	★
P113	V/F minimum voltage	0~V/F intermediate voltage	Changing	★
P114	V/F minimum frequency	0~V/F intermediate voltage	1.2 Hz	★
P115	Carrier frequency	1.0K-15.0K	Changing	☆
P116	Reserved	Reserved		
P117	Initialization of parameters	8: Initialization of Factory Setting	0	★
P118	Parameter lock	0:Unlock parameters 1:Lock up parameters	0	★
P119	Rotation direction	0: Same direction 1: Reverse direction	0	☆

21

Parameters	Name	Setting Range	Default	Property
P120	Auxiliary frequency source Y selection	0:Digital frequency setting(Can modify the UP/DOWN, power lost memory) 1:AVI analog input 2: Remote keypad potentiometer setting mode 3: Local keypad potentiometer setting mode 4: UP/DOWN Frequency setting 5: RS485 communication frequency setting 6: Multi-speed reference 7: Simple PLC 8: PID	0	★
P121	Frequency source selection	Unit's digit:Frequency source selection 0: Main frequency source X 1: X and Y operation(operation relationship determined by ten's digit) 2: Switchover between X and Y 3: Switchover between X and "X and Y operation" 4: Switchover between Y and "X and Y operation" Ten's digit (X and Y operation) 0: X+Y 1: X-Y 2: Both the maximum 3: Both the minimum	0	☆

Parameters	Name	Setting Range	Default	Property
P122	Auxiliary frequency source Y selection	0: Relative to the maximum frequency 1: Relative to the frequency source X	0	☆
P123	Auxiliary frequency source Y range	0%~150%	100%	☆
P124	Frequency offset of auxiliary frequency source for X and Y operation	0.0Hz~Maximum frequency P1.05	0.0Hz	☆
P125	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Set frequency	1	★
P126	Upper limit frequency	Frequency lower limit P1.06~Maximum frequency P1.05	50.0 Hz	☆
P127	Acceleration/ Deceleration time base frequency	0:Maximum frequency 1:Set frequency 2:100Hz	0	★
Group P2 Basic functions				
P200	Start mode selection	0: Regular start	0	☆
P201	Stop mode selection	0: deceleration to a stop 1: coast to stop	0	☆

Parameters	Name	Setting Range	Default	Property
P202	Starting frequency	0.0~50.00Hz	0.5 Hz	☆
P203	Stopping frequency	0.0~50.00Hz	0.5 Hz	☆
P204	Startup DC braking voltage	0~7.0% rated motor voltage	0.0%	★
P205	Startup DC braking operation time(start)	0~100.0s	0.0	☆
P206	Stop DC braking voltage	0~7.0% rated motor voltage	0.0%	☆
P207	Stop DC braking operation time	0~100.0s	0.0	☆
P208	Torque boost	0~20.0%	3.0%	☆
P209	Rated motor voltage	0~500.0V	380.0V	☆
P210	Rated motor current	0~999.9A	Changing	☆
P211	No load current Ratio of the speed	0~100%	50%	☆
P212	Rated motor rotation speed	0~6000r/min	1460	☆
P213	Number of motor poles	0~20	4	☆

Parameters	Name	Setting Range	Default	Property
P214	Rated motor slip	0~10.00Hz	2.50 Hz	☆
P215	Rated motor frequency	0~400.00Hz	50.00 Hz	☆
P216	Resistance of stator	0~ 100.00Ω	Changing	☆
P217	Resistance of rotor	0~100.00Ω	Changing	☆
P218	Self inductance of rotor	0~100.00H	Changing	☆
P219	Mutual inductance of rotor	0~100.00H	Changing	☆
Group P3 I/O functions				
P300	AVI minimum voltage input	0.00V~P301	0.00V	☆
P301	AVI maximum voltage input	P301~10.00V	10.00V	☆
P302	AVI input filter time	0.00~10.00S	0.10S	☆
P310	Frequency of low analog	0~999.9Hz	0.0Hz	☆
P311	Direction of low analog	0/1: Forward/Reverse	0	☆
P312	Frequency of high analog	0~999.9Hz	50.0Hz	☆
P313	Direction of high analog	0/1: Forward/Reverse	0	☆

Parameters	Name	Setting Range	Default	Property
P315	FWD	0:Invalid 1:Jog 2: Jog Forward 3:Jog reverse 4: Forward /reverse 5:Run 6: Forward	6	★
P316	REV	7: Reverse 8:stop 9: Multi -speed 1 10:Multi -Speed2 11:Multi -speed -3 12:Multi-speed4 13:Accleration/ Deceleration terminal 1	7	★
P317	S1	14:Acceleration/Deceleration terminal 2 15:Terminal (UP) 16: Terminal (DOWN) 17:Coast to stop 18:Fault reset 19:PID in running 20:PLC in running 21:Start signal for timer1	18	★
P318	S2	22: Start signal for timer 2 23: Counter pulse signal 24:Counter reset signal 25: Run pause 26: Switchover between frequency source X and Y	9	★

Parameters	Name	Setting Range	Default	Property
P325	RA,RC	0: Invalid 1:In running 2:frequency reached 3:Alarm (stop) 4:Zero speed(Valid when stop) 5:frequency 1 reached 6: frequency 2 reached 7: Acceleration 8: Deceleration 9: Indication for under voltage 10: Timer 1 reached 11: Timer 2 reached 12: Indication for completion for completion of procedure 13:Indication of procedure 14:PID maximum 15:PID minimum 16:4-20mA disconnection 17:Motor Overload pre-warning 18: AC driveoverload pre-warning 27:Counter pulse setting value reached 28:Intermediate pulse setting value reached 29:Water supply by constant voltage "1" turn on"0" turn off 30: READY	3	☆
P328	S filter time	0.000s~1.000s	0.010s	☆

Parameters	Name	Setting Range	Default	Property
P329	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	★
P330	Terminal UP/DOWN rate	0.01Hz/s~99.99Hz/s	1.00Hz/s	☆
P331	DO Output terminal valid mode selection	0: Positive logic 1: Negative logic Unit's digit: Reserved Ten's digit: RA-RC	00000	☆
P332	FWD output delay time	0.0s~999.9s	0.0s	☆
P333	REV output delay time	0.0s~999.9s	0.0s	☆
P334	S1 output delay time	0.0s~999.9s	0.0s	☆
P335	X valid mode selection 1	0: High level valid 1: Low level valid Unit's digit: FWD Ten's digit: REV Hundred's digit: S1 Thousand's digit: S2	00000	★
Group P4 Secondary application functions				
P400	Jog frequency setting	0.00~maximum frequency	5.0Hz	☆
P401	Acceleration time2	0~999.9s	10.0s	☆
P402	Deceleration time2	0~999.9s	10.0s	☆

Parameters	Name	Setting Range	Default	Property
P403	Acceleration time3	0~999.9s	10.0s	☆
P404	Deceleration time3	0~999.9s	10.0s	☆
P405	Acceleration time4/jog acceleration time	0~999.9s	10.0s	☆
P406	Deceleration time4/Jog deceleration time	0~999.0s	10.0s	☆
P407	Designated value of counter	0~9999	100	☆
P408	Intermediate value of counter	0~9999	50	☆
P409	Limitation of acceleration torque	50~200%	150%	☆
P410	Over-current stall suppression gain	0~100%	20%	☆
P411	Over voltage stall enabled	0: Invalid 1: Valid	1	☆
P412	V/F over-excitation gain	0~100%	10	☆

Parameters	Name	Setting Range	Default	Property
P413	Over-voltage stall suppression gain	0~200%	50%	☆
P414	Braking action voltage	400V: 700.0V 220V: 370.0V	Changing	☆
P416	Startup protection	0: Yes 1: No Set P416=0 when connect FWD and GND, after power off, when power on again, AC drive don't work	1	☆
P417	Action selection at instantaneous power failuret	0: Invalid 1: Decelerate 2: Decelerate to stop	0	☆
P420	Fault restart times	0~20	0	☆
P421	Time interval of fault auto reset	0.1s~100.0s	1.0s	☆
P423	Over current detection level	0~200%	0.0%	☆
P424	Over current detection time	0~999.9s	10.0S	☆
P425	Reaching frequency 1 (FDT1)	0.00Hz~,maximum frequency	0.0Hz	☆

Parameters	Name	Setting Range	Default	Property
P426	Reaching frequency 2 (FDT2)	0.00~maximum frequency	0.0Hz	☆
P427	Timer 1 setting	0.0S~999.9S	10.0S	☆
P428	Timer 2 setting	0.0S~999.9S	20.0S	☆
P430	Frequency detection hysteresis (FDT2)	0.0%~100.0% (FDT1 or FDT2) level)	5.0%	☆
P431	Jump frequency 1	0.00Hz~maximum frequency	0.00Hz	☆
P432	Jump frequency 2	0.00Hz~maximum frequency	0.00Hz	☆
P433	Jump frequency hysteresis loop width	0.00Hz~maximum frequency	0.00Hz	☆
Group P5 PLC operation				
P500	Simple PLC retentive selection	Unit's digit: Retentive upon power stop selection 0: No 1: Yes Ten's digit: Retentive upon power failure selection 0: No 1: Yes	00	☆
P501	PLC starting mode	0:If P101=7, PLC valid 1: PLC start		

Parameters	Name	Setting Range	Default	Property
P502	Simple PLC running mode	0: Stop after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Repeat after the AC drive runs one cycle	0	☆
P503	Multi-speed 1	0.00~maximum frequency	5.0 Hz	☆
P504	Multi-speed 2	0.00~maximum frequency	10.0 Hz	☆
P505	Multi-speed 3	0.00~maximum frequency	20.0 Hz	☆
P506	Multi-speed 4	0.00~maximum frequency	25.0 Hz	☆
P507	Multi-speed 5	0.00~maximum frequency	30.0 Hz	☆
P508	multi-speed 6	0.00~maximum frequency	35.0 Hz	☆
P509	Multi-speed 7	0.00-maximum frequency	40.0 Hz	☆
P510	Multi-speed 8	0.00~ maximum frequency	45.0 Hz	☆
P511	Multi-speed 9	0.00~maximum Frequency	50.0 Hz	☆
P512	Milti-speed10	0.00~maximum	10.0 Hz	☆
P513	Multi-speed 11	0.00~maximum frequency	10.0 Hz	☆
P514	Multi-speed 12	0.00~maximum frequency	10.0 Hz	☆
P515	Multi-speed 13	0.00~maximum frequency	10.0 Hz	☆
P516	Multi-speed 14	0.00~maximum frequency	10.0 Hz	☆
P517	Multi-speed 15	0.00~maximum frequency	10.0 Hz	☆
P518	PLC Operation time1	00s(h)~9999s(h)	3s (h)	☆
P519	PLC Operation time2	00s(h)~9999s(h)	4s (h)	☆
P520	PLC operation time3	00s(h)~9999s(h)	5s (h)	☆
P521	PLC operation time4	00s(h)~9999s(h)	0s (h)	☆

Parameters	Name	Setting Range	Default	Property
P522	PLC operation time5	00s(h)~9999s(h)	0s (h)	☆
P523	PLC operation time6	00s(h)~9999s(h)	0s (h)	☆
P524	PLC operation time7	00s(h)~9999s(h)	0s (h)	☆
P525	PLC operation time 8	00s(h)~9999s(h)	0s (h)	☆
P526	PLC operation time9	00s(h)~9999s(h)	0s (h)	☆
P527	PLC operation time10	00s(h)~9999s(h)	0s (h)	☆
P528	PLC operation time11	00s(h)~9999s(h)	0s (h)	☆
P529	PLC operation time12	00s(h)~9999s(h)	0s (h)	☆
P530	PLC operation time13	00s(h)~9999s(h)	0s (h)	☆
P531	PLC operation time14	00s(h)~9999s(h)	0s (h)	☆
P532	PLC operation time15	00s(h)~9999s(h)	0s (h)	☆
P533	PLC operation direction	0~9999s	0	☆
P534	reserve			
P535	reserve			
P536	PLC running direction high level	0~6	0	☆

Parameters	Name	Setting Range	Default	Property
P537	PLC running time unit	0:s 1:h	0	☆
P538	Multi-speed 1 selection	0:P5.03	0	☆
P539	Acceleration/ deceleration time of simple PLC reference 1	0~3	0	☆
P540	Acceleration/ deceleration time of simple PLC reference 2	0~3	0	☆
P541	Acceleration/ deceleration time of simple PLC reference 3	0~3	0	☆
P542	Acceleration/ deceleration time of simple PLC reference 4	0~3	0	☆
P543	Acceleration/ deceleration time of simple PLC reference 5	0~3	0	☆

Parameters	Name	Setting Range	Default	Property
P544	Acceleration/ deceleration time of simple PLC reference 6	0~3	0	☆
P545	Acceleration/ deceleration time of simple PLC reference 7	0~3	0	☆
P546	Acceleration/ deceleration time of simple PLC reference 8	0~3	0	☆
P547	Acceleration/ deceleration time of simple PLC reference 9	0~3	0	☆
P548	Acceleration/ deceleration time of simple PLC reference 10	0~3	0	☆
P549	Acceleration/ deceleration time of simple PLC reference 11	0~3	0	☆

Parameters	Name	Setting Range	Default	Property
P550	Acceleration/ deceleration time of simple PLC reference 12	0~3	0	☆
P551	Acceleration/ deceleration time of simple PLC reference 13	0~3	0	☆
P552	Acceleration/ deceleration time of simple PLC reference 14	0~3	0	☆
P553	Acceleration/ deceleration time of simple PLC reference 15	0~3	0	☆
P554	Swing frequency setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0	☆
P555	Swing frequency amplitude	0.0%~100.0%	0.0%	☆
P556	Jump frequency amplitude	0.0%~50.0%	0.0%	☆

Parameters	Name	Setting Range	Default	Property
P557	Swing frequency cycle	0.1s~999.9s	10.0s	☆
P558	Triangular wave rising time coefficient	0.1%~100.0%	50.0%	☆
Group P6 PID operation				
P600	PID running mode	0: If 101=8, PID enable, otherwise PID disable 1:PID enable 2:PID start by external terminal	0	☆
P601	PID running mode	0:Negative feedback mode 1: Positive feedback mode	0	☆
P602	PID action set point	0: Digital setting (P6.04) 1:AVI setting 2~5: Reserved	0	☆
P603	PID feedback selection	0:AVI feedback Choose I: 4-20mA (P3.00=1.00V; P3.01=5.00V) Choose V: 0-10V (P3.00=0.00V; P3.01=10.00V)	0	☆
P604	PID value setting	0.0Bar ~ P614	2.50Bar	☆
P605	PID upper limit	P6.06~P614	10.00Bar	☆
P606	PID lower limit	0.0Bar~P6.05	0.00Bar	☆
P607	PID-P	0.0~600.0%	100.0%	☆
P608	PID-I	0.0~10.00S	2.00S	☆
P609	PID-D	0.0~9.999S	0.000S	☆

Parameters	Name	Setting Range	Default	Property
P610	Forward maximum value of 2 times output	0.00%~100.00%	2.00%	☆
P611	Sleep frequency	0.00~maximum frequency 0 Means sleep function is closed	25.0HZ	☆
P612	Sleep time	0~9999s	10S	☆
P613	Wake-up percent	Target value's 0.0~100.0%	90.0%	☆
P614	Scale	0.00~50.00bar	10.00bar	☆
P615	PID digit of display	1~5	4	☆
P616	PID decimal digits of display	0~4	2	☆
P617	PID upper limit frequency		48.0Hz	☆
P618	PID lower limit frequency		20.0 Hz	☆
P619	PID detection time		20.0S	☆
P620	PID deviation limit		0.1%	☆
P621	PID feedback loss warning mode	0: No warning 1: Warning no stop, warning code "20" 2: Warning stop, fault code "20"	0	☆

Parameters	Name	Setting Range	Default	Property
P622	PID feedback loss detection value	Range: 0-10.00V (If choose 4~20mA, disconnect when less than 2mA, Set P622=2mA*250Ω=0.50V)	0.50V	☆
P623	PID feedback loss detection time	0.0s~20.0s	1.0s	☆
P624	Cut-off frequency of PID reverse	0.00~maximum frequency	0.00Hz	☆
P625	PID differential limit	0.00%~99.99%	0.10%	☆
P626	PID setting change time	0.00~99.99s	0.00s	☆
P627	PID feedback filter time	0.00~60.00s	0.00s	☆
P628	PID output filter time	0.00~60.00s	0.00s	☆
P630	PID proportional gain P2	0.0~600.0%	200.0%	☆
P631	PID proportional gain I2	0.0~10.00S	0.50S	☆
P632	PID proportional gain D2	0.0~9.999S	0.000S	☆
P633	PID parameter switchover condition	0: No switch 1: Switch through X 2: Auto switch	0	☆

Parameters	Name	Setting Range	Default	Property
P634	PID parameter switchover deviation 1	0.0%~PA.20	5.0%	☆
P635	PID parameter switchover deviation 2	PA.19~100.0%	10.0%	☆
P636	PID initial value	0.0%~100.0%	0.0%	☆
P637	PID initial value hold time	0.00~99.99s	0.00s	☆
P639	PID integral time	Unit's digit: integral separated 0: Invalid	00	☆
P640	PID stop operation	0: No PID operation at stop 1: PID operation at stop	0	☆
P641	Pressure detection value when short of water	0.00 bar ~ PA.01 (set as 0.00bar, no detection)	0.50bar	☆
P642	When AC drive display high/low pressure warning, delay P642, high/low pressure fault is auto reset	1) When AC drive display high pressure warning, after pressure return to normal, delay P642, high pressure fault is auto reset. 2) When AC drive display low pressure warning, delay P642, low pressure fault is auto reset. If set P642=0, when AC drive display high/low pressure warning, it will not reset, range: 0~9999s	10S	☆

Parameters	Name	Setting Range	Default	Property
P643	Low pressure warning detection time	Pressure lower than P606 and keep P643 when running, it will stop. Display low pressure fault, range: 0~9999S	10S	☆
P644	Short of water warning detection time	0~9999S	100S	☆
P645	Delay time setting of auto running when power on	0: Invalid 1: Valid	0	☆
P646	First 10 times interval time of short of water auto reset	0~9999s	600S	☆
P647	Interval time of first 10 times short of water pressure auto reset	0~1000mins	60 mins	☆
P648	Anti-freeze enable	1: Valid 0: Invalid	0	☆
P649	Anti-freeze waiting time while sleeping	0~9999s	900s	☆
P650	Anti-freeze running time while sleeping	0~9999s	30s	☆

Parameters	Name	Setting Range	Default	Property
P651	Anti-freeze running frequency while sleeping	0~50.0Hz	15.0Hz	☆
P652	Sleep operate level : operate when frequency <P652/s	0~10.0Hz	0.5Hz	☆
P653	Sleep operate level: pressure allowed of frequency reduction	0.0~10.0%	0.60%	☆
P654	Sleep operate level: frequency reduction per second	0~10.0Hz	0.3Hz	☆
P655	Sleep operate level : times of frequency reduction	0~1000	10 times	☆
P656	Sleep operate level : frequency > P6.56, no operate	0~maximum P1.05	42.0Hz	☆
P657	PID sample time	0~1000ms	4ms	☆
Group P7 RS-485 Communication				

42

Parameters	Name	Setting Range	Default	Property
P700	Baud rate	0:4800bps 1:9600bps	1	☆
P701	Data format	0: No check (8-N-1)for ASC 1: Even parity check 8-E-1)for ASC 2: Odd Parity check (8-O-1) for ASC 3: No check (8-N-1) for RTU 4: Even parity check (8-E-1) for RTU 5: Odd Parity check (8-O-1) for RTU	3	☆
P702	Local address	1~247, 0: Broadcast address	1	☆
P703	Communication error processing	0: No warning 1: Warning, display Co 2: Display Co and stop	0	☆
P704	communication timeout	0.0(invalid),0.1s ~60.0s	0.0	☆
Group P8 Advanced appliction				
P800	User password	0:Locked 1:Unlocked	1	☆
P802	Model selection	0: G type 1: P type	Changing	☆
P803	Over-voltage protection level setting	400V (220V level) 810V (380V level)	Changing	☆
P804	Under-voltage protection level setting	150V (220V level) 310V (380V level)	Changing	☆

Parameters	Name	Setting Range	Default	Property
P805	Temperature alarm value		Changing	☆
P812	Digital setting frequency stop memory selection	0: No memory 1:Memory	0	☆
P814	Motor overload coefficient	0.20~10.00	1.00	☆
P815	PWM switch frequency	0.0~100.0Hz	12.0 Hz	☆
P816	Motor overload protection selection	0: Prohibit 1: Permit	0	☆

8. Fault

Fault Name	Operate panel display	Fault NO.
Over current during acceleration	OC1	2
Over current during deceleration	OC2	3
Over current during constant speed	OC3	4
Over voltage during acceleration	OU1	5
Over voltage during deceleration	OU2	6
Over voltage during constant speed	OU3	7
Resistor overload (Continue entering into under voltage state)	POF	8
Under voltage	LU	9
AC drive overload	OL2	10
Motor overload	OL1	11
Module over heat	OH	14
External equipment fault	EF	15
Communication faul	CO	16
Power on time reached	TE	29
Low water pressure warning	LP	24
High water pressure warning	HP	27
Short of water warning	LL	28
PID feedback lose during running (pressure sensor disconnect detection)	20	31
Tips	Operate panel display	

Fault Name	Operate panel display	Fault NO.
AC drive sleeping	SLP	
Power on time reached	TE	

9. Troubleshooting

The NL1000 series frequency converters have relatively complete protection functions, including under voltage, over voltage, over current, overload, phase to phase short circuit, etc. When the frequency converter fails, there must be a cause of the failure. Please identify the cause and eliminate the fault, and perform the restart after handling it. If there are any difficulties, please contact our company in a timely manner.

Fault Code	Fault content	Possible causes of failure	Treatment scheme
OC1(2)	Overcurrent during acceleration	1:Acceleration time is too short 2:Unreasonable setting of V/F curve 3:Motor, motor line short circuit to ground 4:Excessive torque boost setting 5:Grid voltage too low 6:Directly start the motor in operation move 7:The frequency converter configuration is unqualified 8:Inverter fault	1: Extend acceleration time 2: Set the V/F curve correctly 3: Check the motor and motor wire insulation Marginal condition 4: Reduce the torque increase setting value 5: Check the power grid condition 6: Check the load 7: Set tracking start 8: Increase the capacity of frequency converter 9: Send for repair

Fault Code	Fault content	Possible causes of failure	Treatment scheme
OC3(4)	Overcurrent during operation	1:Poor insulation of motor and motor output line 2: Large load fluctuation or slight jamming 3:The power grid fluctuates and the power grid voltage is low by 4: Improper configuration of frequency converter capacity 5: Is there a high-power motor in the system that starts, causing a drop in grid voltage 6: Is there any interference source that interferes with the frequency converter	1:Check the insulation of the motor and its output line 2: Check whether the load condition is actually changed or stuck, poor lubrication, etc 3: Check the grid voltage 4 : Whether the frequency converter is set slightly less and the amplification capacity 5: Solve transformer capacity 6: Solving interference sources
OC2(3)	Overcurrent during deceleration	1: The deceleration time is too short 2. Improper configuration of frequency converter capacity 3. Whether there is interference	1: Extend deceleration time 2: Increase the capacity of the frequency converter 3: Solving interference sources

Fault Code	Fault content	Possible causes of failure	Treatment scheme
OU1(5)	Overvoltage during converter acceleration	1: Power supply abnormality 2: Improper peripheral line setting(such as using air switch to control start and stop, etc.) 3: Inverter fault	1: Check the power supply voltage 2: Do not use the power supply air switch to control the start and stop of the inverter 3: Send for repair
OU3(7)	Converter operation overvoltage	1: Abnormal power supply voltage 2: Energy feedback load 3: Improper configuration of braking resistor	1: Check the power supply voltage 2: Install the braking unit and braking resistor 3: Reconfirm the resistance configuration
OU2(6)	Overvoltage during deceleration	1: The deceleration time is too short 2: Abnormal power supply voltage 3: Large load inertia 4: Improper brake resistor configuration 5: Unreasonable braking parameter setting	1: Extend deceleration time 2: Check the power supply 3: Add braking unit and braking resistor 4: Reconfigure the braking resistor 5: Set parameters correctly, such as brake pipe action voltage, etc

Fault Code	Fault content	Possible causes of failure	Treatment scheme
LU(9)	Low voltage undervoltage during standby of frequency converter	1: Abnormal power supply voltage 2: Phase loss	1: Check the power supply voltage 2: Check whether there is a phase loss in the power supply, air switch, etc
OL1(11)	Frequency converter overload	1: Excessive load 2: Acceleration time is too short	1: Reduce the load or replace the frequency converter with larger capacitance
OL2(12)	Type A machine: 150% 60S	3: Excessive torque increase 4: Unreasonable V/F curve setting 5: Grid voltage too low 6: The motor does not stop stably, and the frequency converter starts directly 7: Load fluctuates or gets stuck	2: Extend acceleration time 3: Reduce torque increase 4: Reset the V/F curve 5: Check the grid voltage and increase the capacity of the frequency converter 6: Use tracking startup method 7: Check the load situation

Fault Code	Fault content	Possible causes of failure	Treatment scheme
OH(14)	Module overheating	1: The ambient temperature is too high 2: Air duct blocked 3: The fan is damaged 4: The thermistor is damaged 5: The inverter module is damaged	1: Reduce ambient temperature 2: Clean the air duct 3: Replace the fan 4: Replace the thermistor 5: Replace the inverter module
EF(15)	External fault	1: Input external fault signal through multi-function terminal	1:Reset operation
CO(16)	Communication timeout	1:The upper computer is not working properly 2: The communication line is abnormal 3: Communication parameter PD group setting is incorrect	1: Check the upper computer wiring 2: Check the communication connection line of the frequency converter 3: Set communication parameters correctly
TE(29)	Power on time arrival	1:The cumulative power-on time reaches the set value	1:Contact the manufacturer
LP(24)	Low water pressure alarm	1: Pressure sensor wiring error 2: Unreasonable parameter setting	1:Check the pressure sensor wiring 2: Set the parameters correctly
HP(27)	High water pressure alarm		

Fault Code	Fault content	Possible causes of failure	Treatment scheme
LL(28)	Water shortage alarm	1; Pressure sensor wiring error 2: Unreasonable parameter setting 3:no water in pipes	1:Check the pressure sensor wiring 2: Set the parameters correctly 3:Check the pipeline
20(31)	Loss of operation PID feedback (pressure Force sensor disconnection detection)	1:Pressure sensor problem 2: Pressure sensor wiring error 3: Unreasonable parameter setting	1:Replace the pressure sensor 2: Check the pressure sensor wiring 3: Set parameters correctly
SLP	Frequency conversion sleep		

Note: The appearance and parameters of the product are subject to the actual object. The content is subject to change without notice.

NIETZ ELECTRIC CO.,LTD
TEL:+86 21 33634649
www.nietz.cn
E-mail: info@nietz.cn

NIETZ

Room 626, 9th Floor, No.583 Lingling Road, Xuhui District, Shanghai, China

We reserve the right of this manual contained information change without prior notice 2023