RENLE

RNB5000 SERIES

FREQUENCY INVERTER

RENLE

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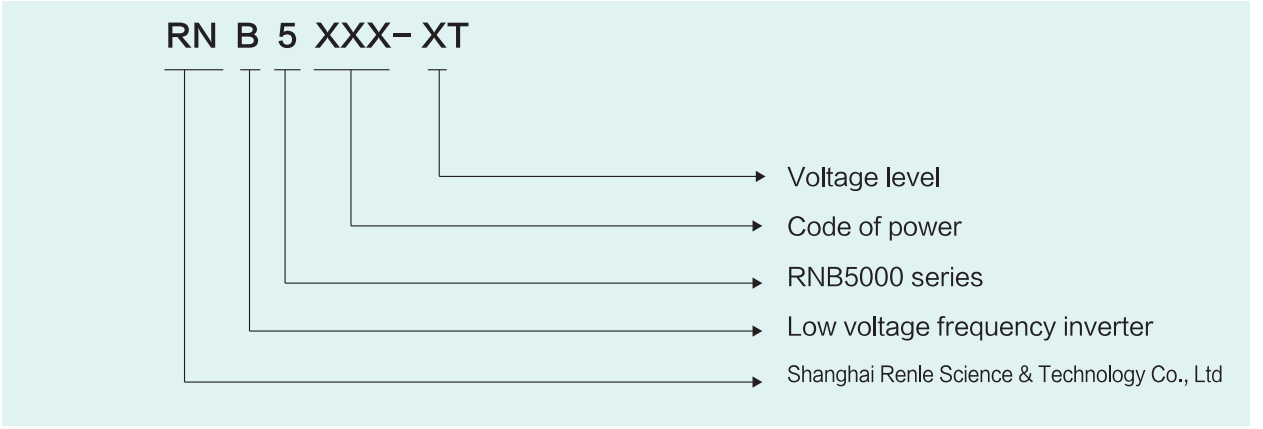
FREQUENCY INVERTER

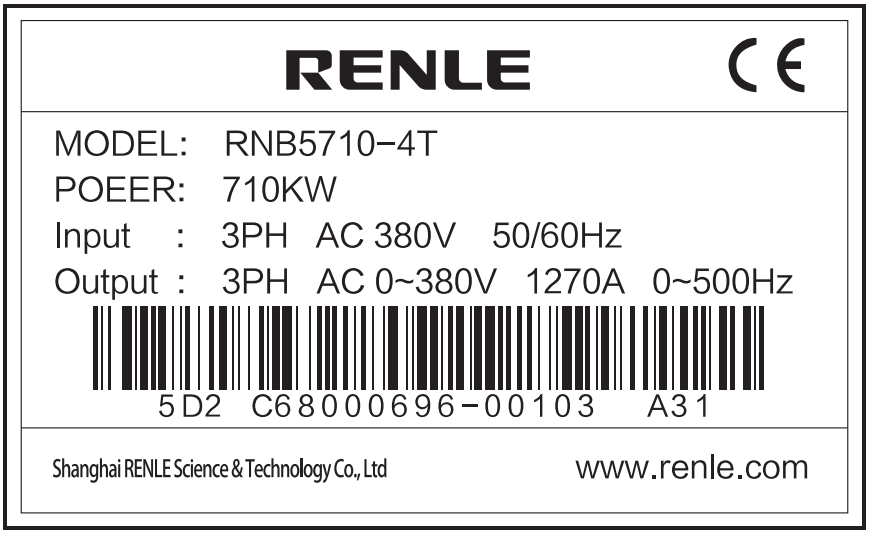
Model description

Nomenclature



Character	Description
RN	Shanghai Renle Science & Technology Co., Ltd
B	Low voltage frequency inverter
5	RNB5000 series
XXX	Code of power: such as, 0.37: 37kW, 110: 110kW, 1000:1000kW
-XT	Voltage level: 4T: 3-phase, 380V; 6T: 3-phase, 690V; 11T: 3-phase, 1140V

Nameplate of inverter



Features

RNB5000 series inverter is a low voltage (large) power and medium voltage inverter developed for common usage. It is not only applicable for universal fan and pump load driving, but also widely used forindustrial automation equipment control of many industries, such as textile, stone sawing, air compressor, oil field, coal mine etc. It can also provide solutions for ball mill, injection molding, intelligent motor and other professional applications.

Technical features

Using high-performance current vector control. High starting torque can be realized also for induction motors.

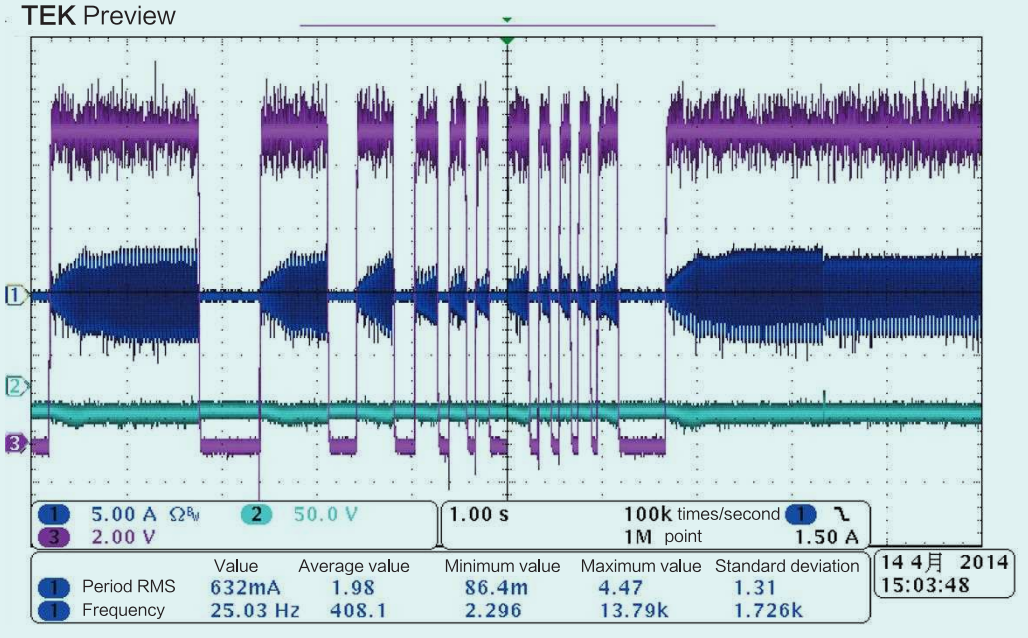
V/F control	1Hz, 150% torque (speed control range - 60:1)
Open loop vector control	0.5Hz, 150% torque (speed control range - 100:1)
Closed loop vector control	0Hz, 180% torque (speed control range - 1000:1)

Equipped with abundant parameter tuning method

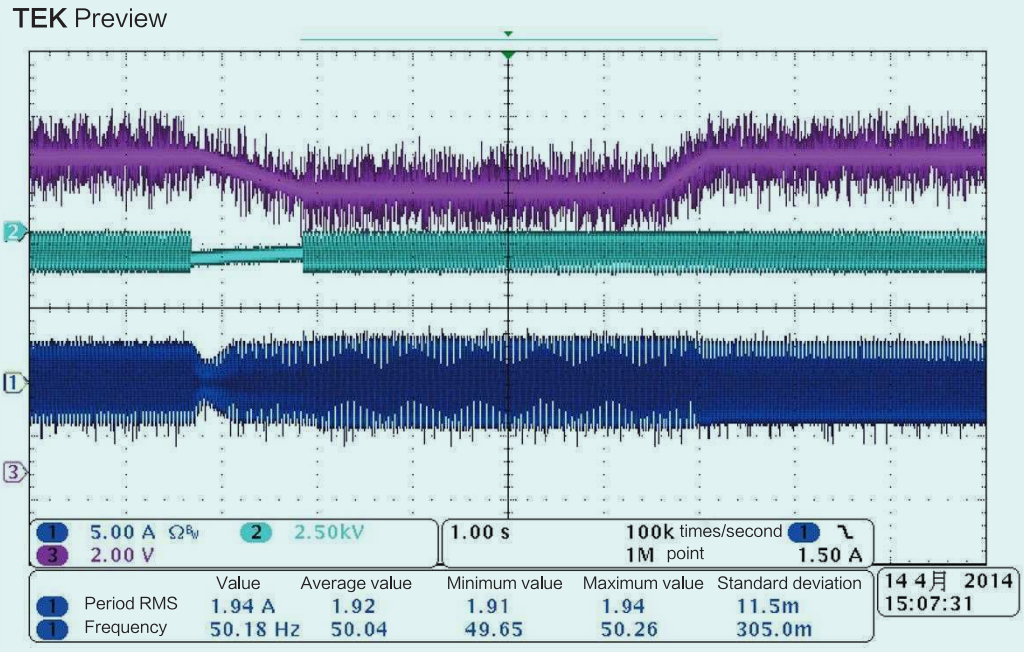
Static self-tuning	Most suitable for for debugging purposes under the state of connection to motor and handling machinery.
Rotation self-tuning	Most suitable for the application of high starting torque, high speed, high control precision;
Online parameter self-tuning	During operation, the change of the motor characteristics can be detected and the high-precision speed control can be performed.

Instantaneous power outage measures in accord with the application

Speed tracking function is most applicable for fluid machinery with rotating body, such as fans and blowers.In-stantaneous non-stop function andpower outage measures for film production line can leave out the UPS and other special equipment. Automatic instantaneous power failure compensation is performed whenlow power is detected.



Speed tracking function



Instantaneous non-stop function

- **Easy debugging**

Application selection function: Just select the mechanical application, you can have the automatically set and the most appropriate parameters, without cumbersome parameter settings. So the trial run time can be shortened.

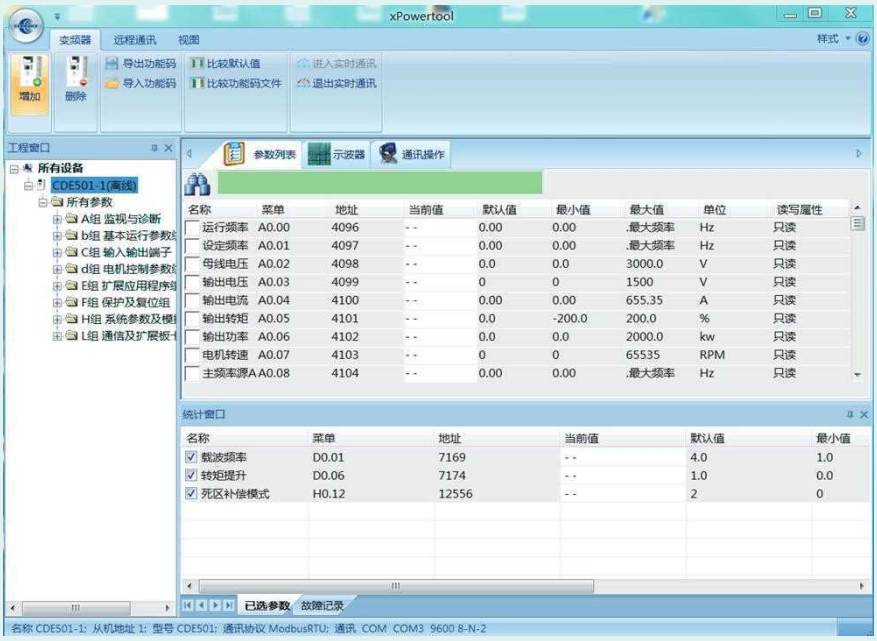
- **Standard keyboard has parameter copy function. The parameters can be uploaded or downloaded.**

- **Support of tools of xPowerTooL and xLoaderTool**

xPowerTool can monitor real-time status of the inverter, configure the inverter’s parameters, control inverter’s operation. Using a computer, you can manage parameters of several inverters.

（1）Equipped with a variety of monitoring, parameter editing, curve operation, oscilloscope and other functions, so that the debugging and maintenance of the inverter becomes more convenient. The drive replacement function, which automatically converts parameters from previous products, eliminates the need to set parameters duringre-placement of the inverter or when the inverter has fault..

（2）xLoaderTooL can upgrade inverter’s software online for quick and easy maintenance.



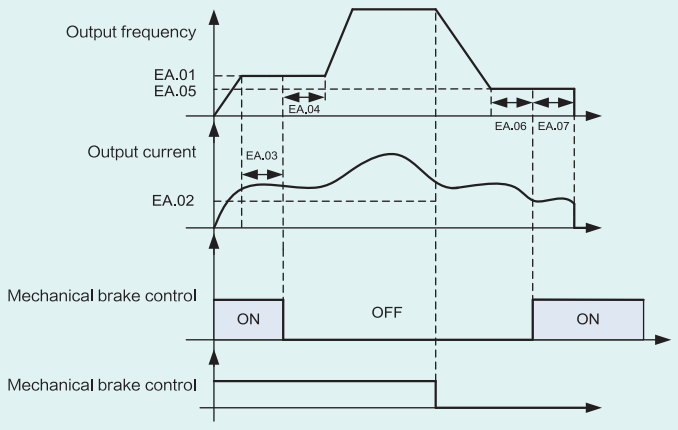
Support master-slave control

xPowerTool can monitor the inverter status in real time, configure the inverter parameters and control the inverter operation. Using a computer, you can manage several inverter parameters.

The inverter itself can be set as master or slave.	
Set as master	You can select the synchronized reference value for reference of frequency, operating frequency or torque.
Set as slave	You can set whether the slave will follow the host’s command.
The inverter supports drooping control, which can realize load distribution control during drive of the same load by multiple motors.	

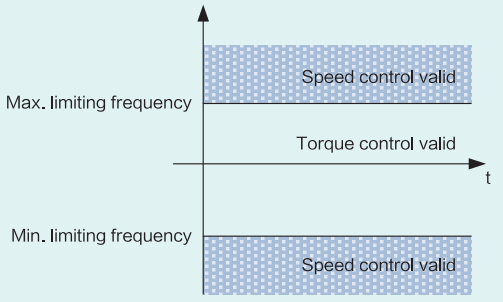
Support standard brake logic and other safety shutdown functions

Inverter demonstrates outstanding performance in construction lifting, tower crane, bridge and other applications.

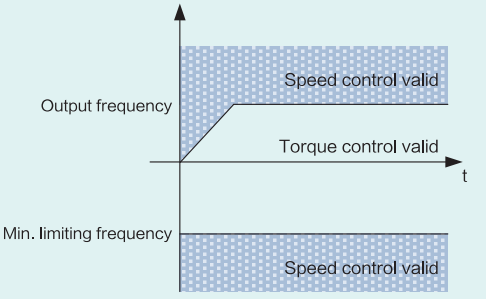


• Support speed limiting mode under a variety of torque control. The inverter can be used in many torque control circumstances.

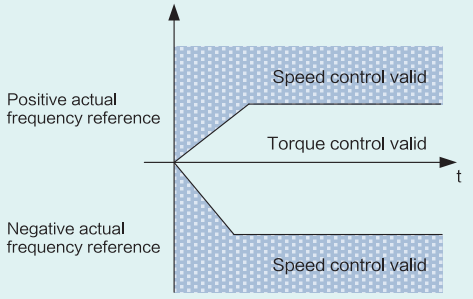
Inverter demonstrates outstanding performance in construction lifting, tower crane, bridge and other applications.



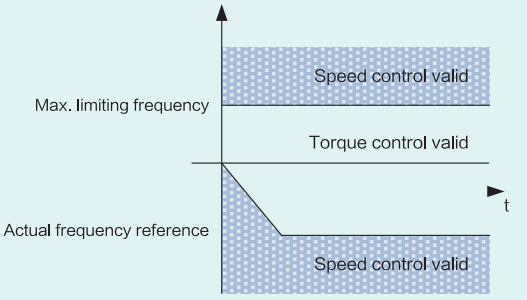
Pic. 1: Speed limiting mode 0: Diagram of setting from min. limiting frequency to max. limiting frequency



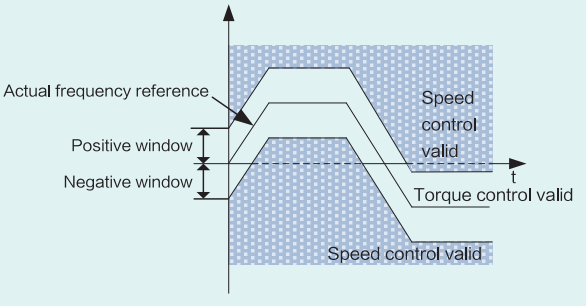
Pic. 2: Speed limiting mode 1: Diagram of setting from min. limiting frequency to output frequency



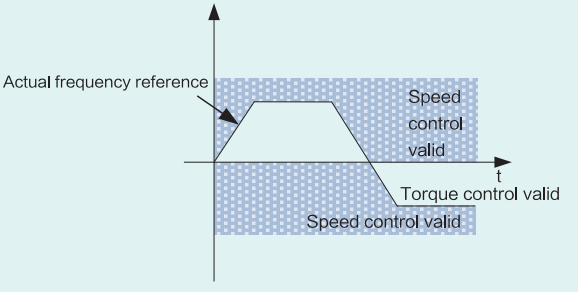
Pic. 3: Speed limiting mode 2: Diagram of setting from negativeoutput frequency to positive output frequency



Pic. 4: Speed limiting mode 3: Diagram of setting from output frequency to max. limiting frequency



Pic. 5: Speed limiting mode 4: Diagram of setting of output frequency +window



Pic. 6: Speed limiting mode 5: Diagram of setting from 0 Hz to output frequency

Technical parameters

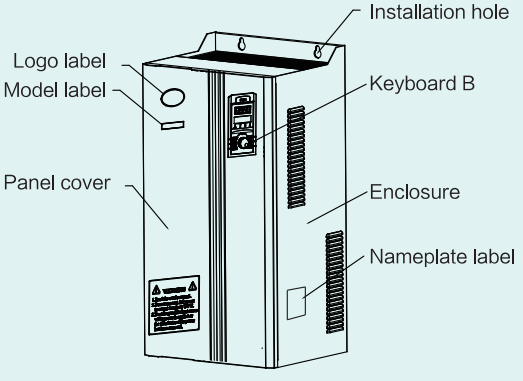
ITEM		DESCRIPTION
Basic features	Rated input	380V/690V/1140V; 50/60Hz
	Rated voltage range	Fluctuation: −15% ~ +10%; Unbalance: <3%; Frequency: 47~63Hz
	Control mode	VF control: open loop vector control, closed loop vector control
	Frequency resolution	Digital setting: 0.01Hz; Analog input: 0.5% X max. frequency
	Maximum output	V/F control: 3000Hz; Vector control: 300Hz
	Speed control range	VF control: 1:60; vector control: 1:100
	Carrier frequency	0.5 ~ 12.0KHz (maximum value is determined by the type of the inverter), automatically adjustable according to the temperature of the heat radiator.
	Start torque	0.5Hz/150% of rated torque of the motor
	Overload capacity	150% of rated output current for 60s, 180% of rated output current for 3s
Basic function	Operation mode	Keyboard: terminal (two wires, three wires); Communication (RS485); Switching of different modes is available at will through the switching amount input terminal.
	V/F curve	Straight line, multistage, multiple powers.
	Acceleration/ deceleration curve	Straight line or S curve; four sets of acceleration/deceleration time (range: 0.1 ~6000.0s)
	Torque boost	Automatic torque boost, manual torque boost
	Speed tracking	Speed tracking function is available over all power ratings
	Motor braking	DC braking, energy consumption braking, flux braking
	DC braking	Braking frequency: 0.00Hz ~ maximum frequency: Braking time: 0.0 ~ 100.0s; Braking current: 0.0 ~ 100% of rated current of the motor
	Flux braking	Applicable for circumstances where rapid stop and energy regeneration is required to prevent frequent occurrence of overvoltage protection.
	Wave−by−wave current limiting	For reducing the overcurrent fault to maximum and protect normal operation of the inverter.
	Overcurrent and overvoltage control	For automatic limiting of current and voltage during operation to prevent frequent occurrence of overcurrent overvoltage protection.
Special function	Terminal delay	Response delay (0.0 ~3000.0s) can be set to input/output terminals of switching amount.
	Jog control	Control mode: keyboard, terminal; Communication frequency: 0.00Hz ~ maximum frequency; Acceleration/deceleration time: 0.1 ~ 6000.0s.
	Multistage speed, simple PLC	Maximum 16−stage speed operation can be realized through built−in smple PLC or switching input terminal.
	Built−in two groups of PID	When used as normal PID, they can conveniently realize process control closed loop system.
	Fixed length and counting	Counting value can be changed to length for display or for fixed length control.
	Swing frequency prevention	Fixed swing frequency, sudden change and period output at any frequency can be realized.
	Timing control	Inverter’s timing stop control is available (0 ~ 65000h)

> To be continued

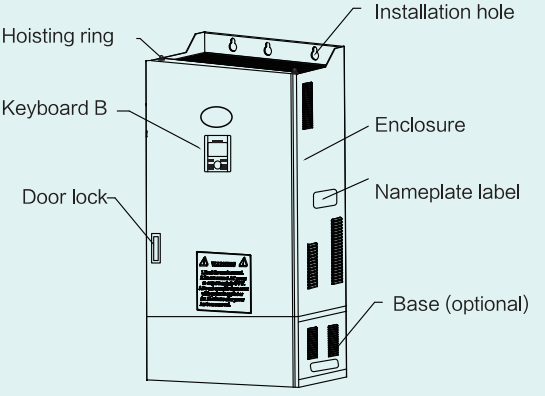
> Continuing

ITEM		DESCRIPTION
Special function	Non-stop during instantaneous power failure	When instantaneous power failure occurs, inverter can reduce frequency for operation so that load feedback energy compensates the reduction of bus voltage and the inverter does not stop in short time.
	Multifunction of jog key	Jog key is used for jog, direction switching and command source switching etc.
Peripheral terminal	Reference power supply	10V/30mA. Normally used for power supply of analog input signal.
	Control power	24V/200mA. Normally used for power supply of switching amount input/output terminal signal.
	Analog input	Two routes of analog input terminals, Voltage or current signal input is selectable. Each route supports three signal ranges: 0~10V, 0~20mA, -10-10V, all of which are programmable.
	Analog output	Two routes of analog output terminals, Voltage or current signal output is selectable. Each route supports two signal ranges: 0~10V, 0~20mA, all of which are programmable.
	Switching amount input	6 multifunctional switching amount input terminals, with both active PNP and NPN input modes. Among the terminals, X6 can be used for input of high speed pulse (0~100KHz), and programmable.
	Switching amount output	2 open collector output terminals, among which, Y2 can be used for output of high speed pulse (0~100KHz), and programmable. 2 relay output terminals.
Fault protection	Common type	Input/output phase failure, undervoltage, overvoltage, overcurrent, overload, short circuit, module fault, peripheral fault, self-defined fault etc.
Basic function	Site	Indoors, no exposure to direct sunshine, no dust, water drop, salt, oil mist, vapor, inflammable gas, erosive gas etc.
	Altitude	When altitude ≤ 1000m, the inverter works normally under rated conditions; When altitude > 1000m,the inverter is derated by 1% for each rise of 100 m in height. When altitude > 3000m, please consult the manufacturer for technical support.
	Temperature	-10 ~ +40° C; When the environmental temperature is within 40℃ ~50℃, please keep good ventilation and use the inverter by derating. The inverter is derated by 3% for each rise of 1 ℃ in temperature.
	Humidity	<95%RH, no condensed water
	Vibration	<0.6g
	Storage	Storage: -25° C ~ +65° C

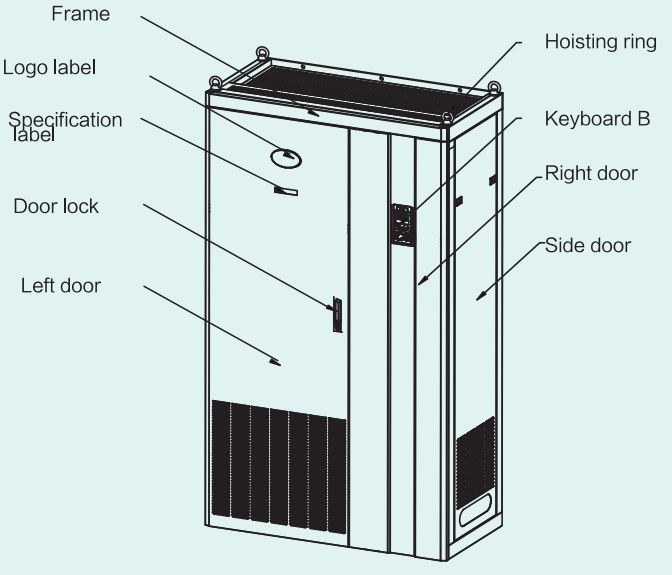
Product outer view diagram



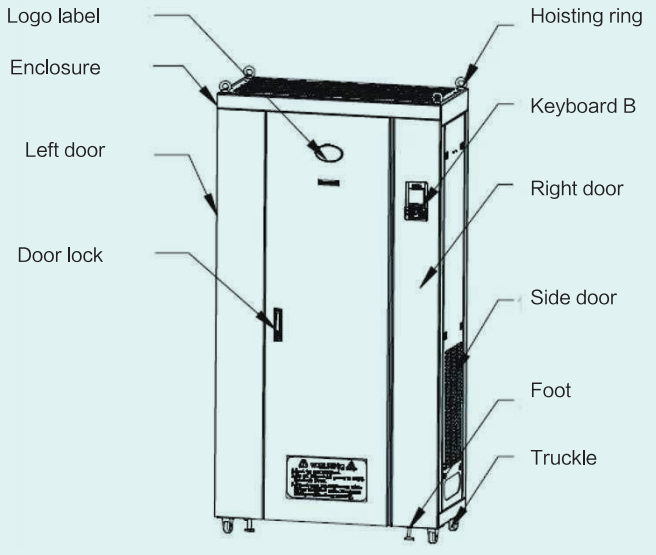
Metal W04



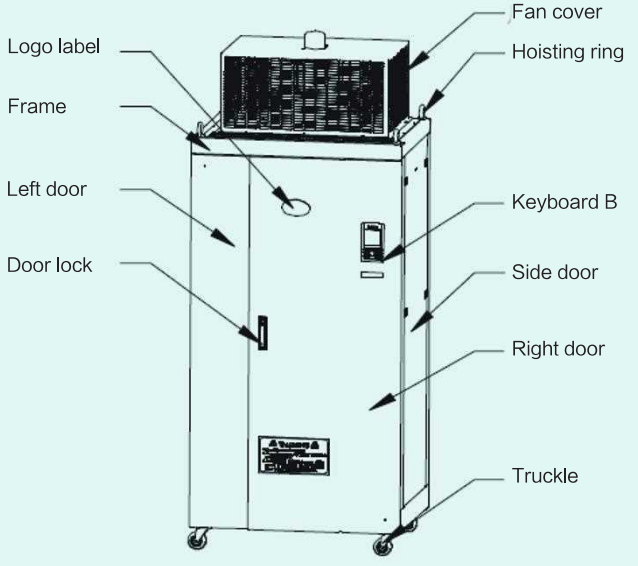
Metal W06



Metal WG02



Metal WG03



Metal WG04

Type and specifications

3-phase, 380V input

Model of inverter	Power (KW)	Power capacity (KV/A)	Input current (A)	Output current (A)	Braking unit	DC reactor	Keypad
RNB5630-4T	630	840	1155	1120	Optional External	Standard Built-in	Standard LED+LCD dual
RNB5710-4T	710	947	1310	1270			
RNB5800-4T	800	1067	1475	1430			
RNB5900-4T	900	1200	1668	1610			
RNB51000-4T	1000	1334	1850	1790			

3-phase, 690V input

Model of inverter	Power (KW)	Power capacity (KV/A)	Input current (A)	Output current (A)	Braking unit	DC reactor	Keypad
RNB5037-6T	37	60	50	45	Optional External	Optional External	Standard LED+LCD dual
RNB5045-6T	45	66	55	52			
RNB5055-6T	55	79	66	63			
RNB5075-6T	75	108	90	86			
RNB5090-6T	90	122	102	98		Standard External	
RNB5110-6T	110	150	125	121			
RNB5132-6T	132	190	158	150			
RNB5160-6T	160	220	185	175			
RNB5185-6T	185	250	205	198			
RNB5200-6T	200	276	230	218			
RNB5220-6T	220	300	250	240			
RNB5250-6T	250	340	284	270			
RNB5280-6T	280	384	320	305			
RNB5315-6T	315	440	368	350			
RNB5355-6T	355	480	400	380			
RNB5400-6T	400	540	450	430		Standard Built-in	
RNB5450-6T	450	588	490	490			
RNB5500-6T	500	684	570	570			
RNB5560-6T	560	756	630	630			
RNB5630-6T	630	850	715	715			
RNB5710-6T	710	950	799	799			
RNB5800-6T	800	1050	883	883			

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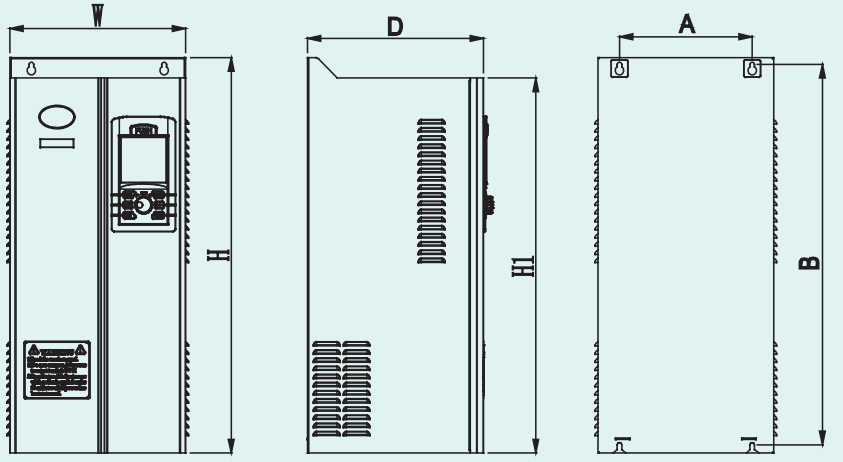
- 3-phase, 1140V input

Model of inverter	Power (KW)	Power capacity (KV/A)	Input current (A)	Output current (A)	Braking unit	DC reactor	Keypad
RNB5075-11T	75	108	55	52	Optional External	Standard Built-in	标配 LED +LCD 双显 键盘
RNB5090-11T	90	123	62	59			
RNB5110-11T	110	152	77	73			
RNB5132-11T	132	183	93	88			
RNB5160-11T	160	216	109	104			
RNB5185-11T	185	254	128	122			
RNB5200-11T	200	274	139	132			
RNB5220-11T	220	308	156	148			
RNB5250-11T	250	337	171	162			
RNB5280-11T	280	376	191	181			
RNB5315-11T	315	432	219	208			
RNB5355-11T	355	470	238	226			
RNB5400-11T	400	540	274	260			
RNB5450-11T	450	609	308	293			
RNB5500-11T	500	678	343	326			
RNB5560-11T	560	738	374	355			
RNB5630-11T	630	831	421	400			
RNB5710-11T	710	935	474	450			

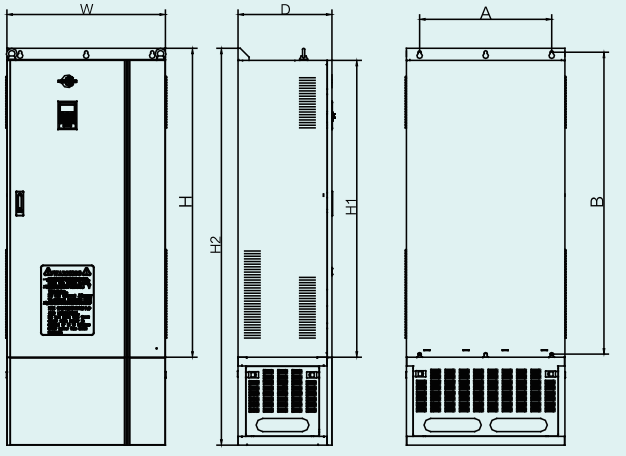
Note: Models in the tables are single machines, vertical cabinet type.

Outer dimensions and installation dimensions

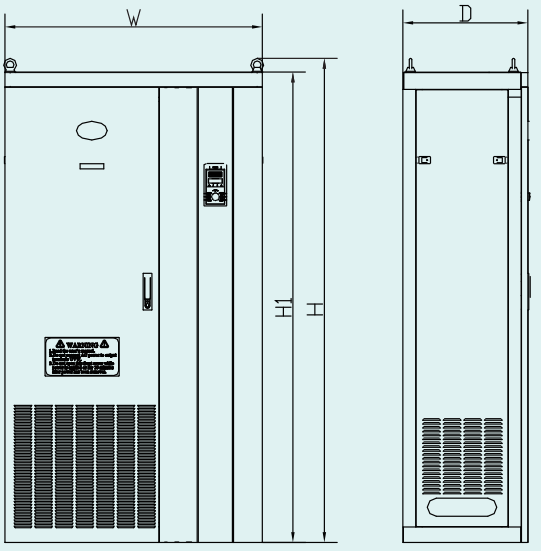
Product’s outer dimensions diagram



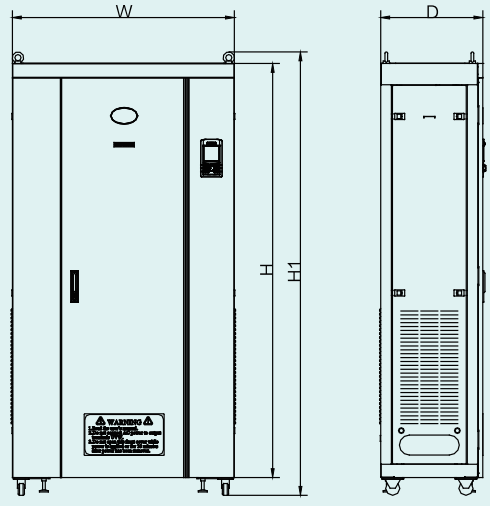
Dimension diagram C02



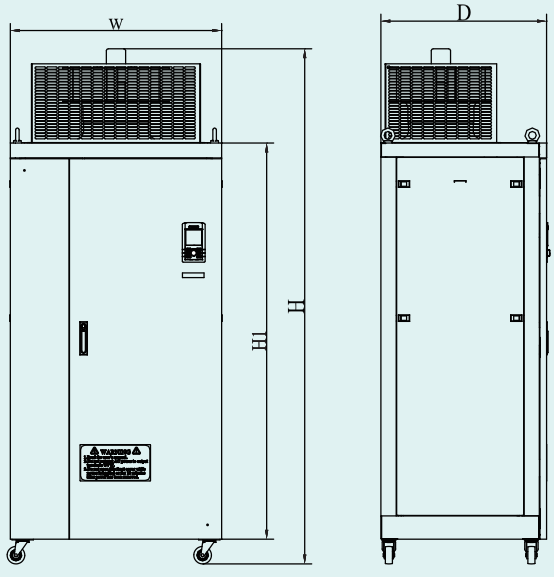
Dimension diagram C04



Dimension diagram CG02



Dimension diagram CG03



Dimension diagram CG04

Table of outer installation dimension data

Outer diagram	Model of inverter	Outer dimensions (mm)				Installation dimensions (mm)			Dimension diagram
		H	H1	W	D	A	B	Hole diameter	
3-phase, 380V									
WG02	RNB5630-4T	2060	2000	1200	620	/	/	/	CG02
	RNB5710-4T								
	RNB5800-4T	2160	2100	1250	635	/	/	/	
	RNB5900-4T	2260	2200	1500	650	/	/	/	
	RNB51000-4T								
3-phase, 690V									
W04	RNB5018-6T	582	552	265	265	200	560	Φ7	C02
	RNB5022-6T								
	RNB5030-6T								
	RNB5037-6T	760	720	330	320	200	733	Φ9	
	RNB5045-6T								
	RNB5055-6T								
	RNB5075-6T								
W06	RNB5090-6T	1030	980/ H2：1350	480	352	320	998	Φ12	C04
	RNB5110-6T								
	RNB5132-6T								
	RNB5160-6T	1210	1160/ H2：1590	640	400	420	1178	Φ12	
	RNB5185-6T								
	RNB5200-6T								
	RNB5220-6T								
	RNB5250-6T								
	RNB5280-6T	1405	1350/ H2：1805	720	426	600	1373	Φ14	
	RNB5315-6T								
	RNB5355-6T								
W06	RNB5400-6T	1870	2020	1000	500	/	/	/	CG03
	RNB5450-6T								
	RNB5500-6T								
	RNB5560-6T								
	RNB5630-6T								
	RNB5710-6T	2200	1350	1250	635	/	/	/	
	RNB5800-6T								
3-phase, 1140V									
WG03	RNB5075-11T	1200	1360	680	450	/	/	/	CG03
	RNB5090-11T								
	RNB5110-11T								
	RNB5132-11T								

> To be continued

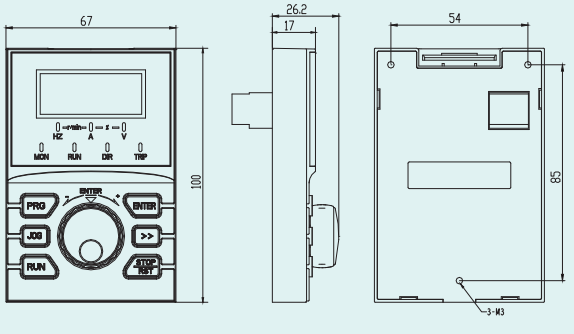
> Continued

Outer diagram	Model of inverter	Outer dimensions (mm)				Installation dimensions (mm)			Dimension diagram
		H	H1	W	D	A	B	Hole diameter	
3-phase, 1140V									
WG03	RNB5160-11T	1500	1660	800	500	/	/	/	
	RNB5185-11T								
	RNB5200-11T								
	RNB5220-11T								
	RNB5250-11T								
WG04	RNB5280-11T	2150	1700	900	570	/	/	/	CG04
	RNB5315-11T								
	RNB5355-11T								
	RNB5400-11T								
	RNB5450-11T	2355	1900	1100	700	/	/	/	
	RNB5500-11T								
	RNB5560-11T								
	RNB5630-11T								
	RNB5710-11T								

Outer shape and dimensions of keypad of RNB5000

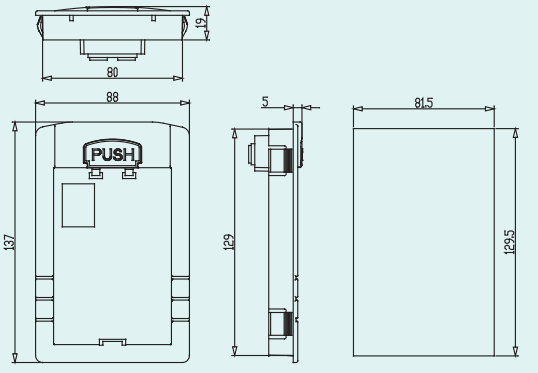
Keypad A (LED)

4 digit LED display. See the following diagram for outer appearance and dimensions:



Picture of keypad A

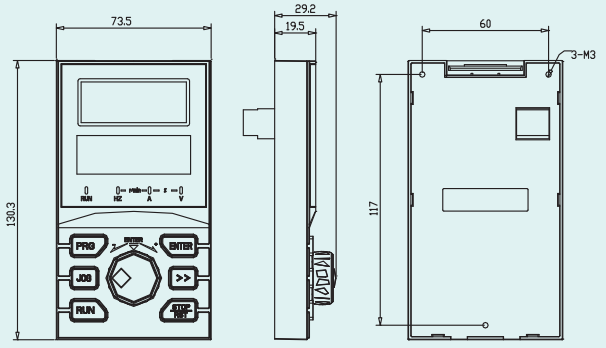
Keyboard A together with its baseis used for the sheet metal structure or user’s add-on. See the following diagram for outer appearance and dimensions:



Picture of base of keypad A

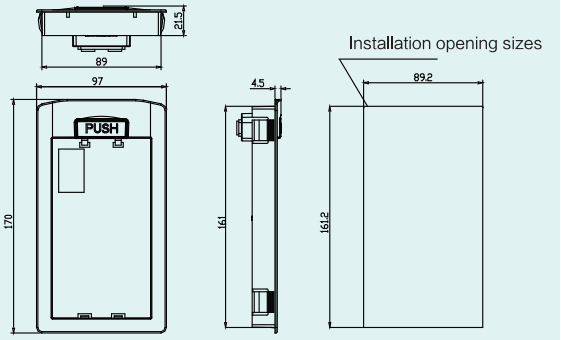
Keypad B (LED+LCD dual displays)

4 digit LED+LCD dual displays. See the following diagram for outer shape and dimensions:



Picture of keypad B

Keyboard B together with its base is used for the sheet metal structure or user’s add-on. See the following diagram for outer shape and dimensions:

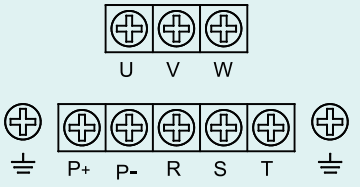


Picture of base of keypad B

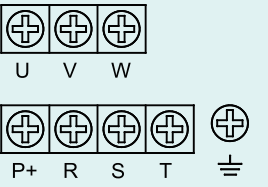
Basic wiring diagram

Terminals of the main circuit

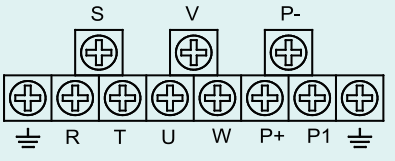
Pic.7 RNB5560-4T



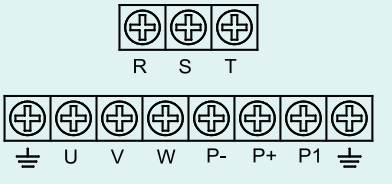
Pic.8 RNB5630-4T~RNB5710-4T



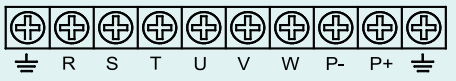
Pic.9 RNB5800-4T ~ RNB51000-4T



Pic.11 RNB5037-6T ~ RNB5075-6T



Pic.12 RNB5090-6T ~ RNB5355-6T



Pic.13 RNB5400-6T ~ RNB5800-6T

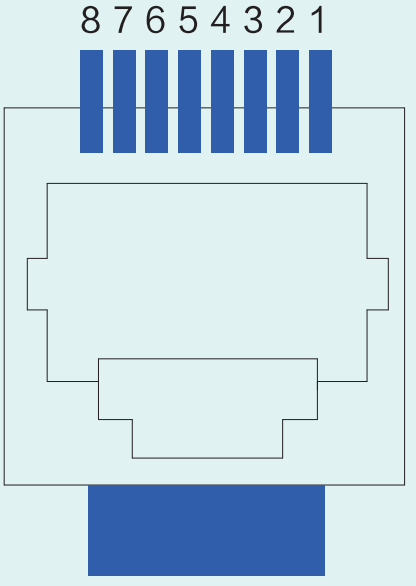
Pic.14 RNB5075-11T ~ RNB5710-11T

Description of the terminals of the main circuit for the inverter

Code of the terminal	Name	Description
R、S、T	3-phase power supply input terminal	Connection point of AC input 3-phase power supply
P+、P-	Positive/negative terminal of the DC bus	Input point of common DC bus
P+、PB	Connection terminal of braking resistor	Connection point of braking resistor
P1、P+	Connection terminal of outer reactor	Connection point of external reactor
U、V、W	Output terminal of the inverter	Connected to 3-phase motor
⏚	Grounding terminal	Grounding terminal

Description of control terminal and wiring

The layout of the control terminals are as follows:



Foot 1: Empty

Foot 2: +15V

Foot 3: +15V

Foot 4: 485-

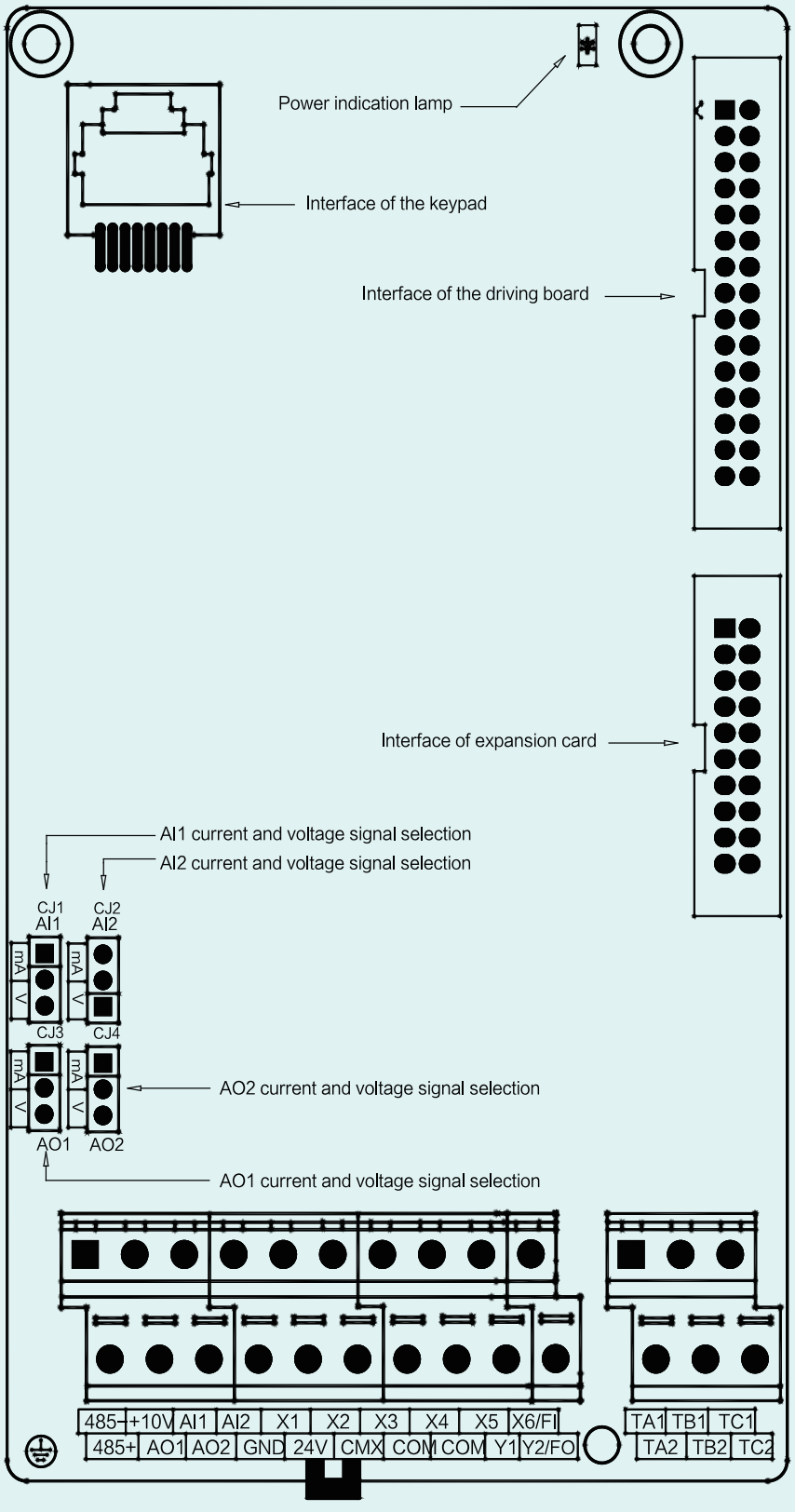
Foot 5: 485+

Foot 6: GND

Foot 7: GND

Foot 8: Empty

Pic. 15: Diagram of connection foot of the keypad



Pic. 16: Layout diagram of control terminals of RNB5000 vector frequency inverter

Note: The default connection is short connection of 24V and CMX. The jumpers of AI1, A01and A02 is “V” (voltage), and jumper of AI2 is “mA” (current).

External appearance of the keypad

Keypad A (pure LED)

Keypad B (LED+LCD dual displays)

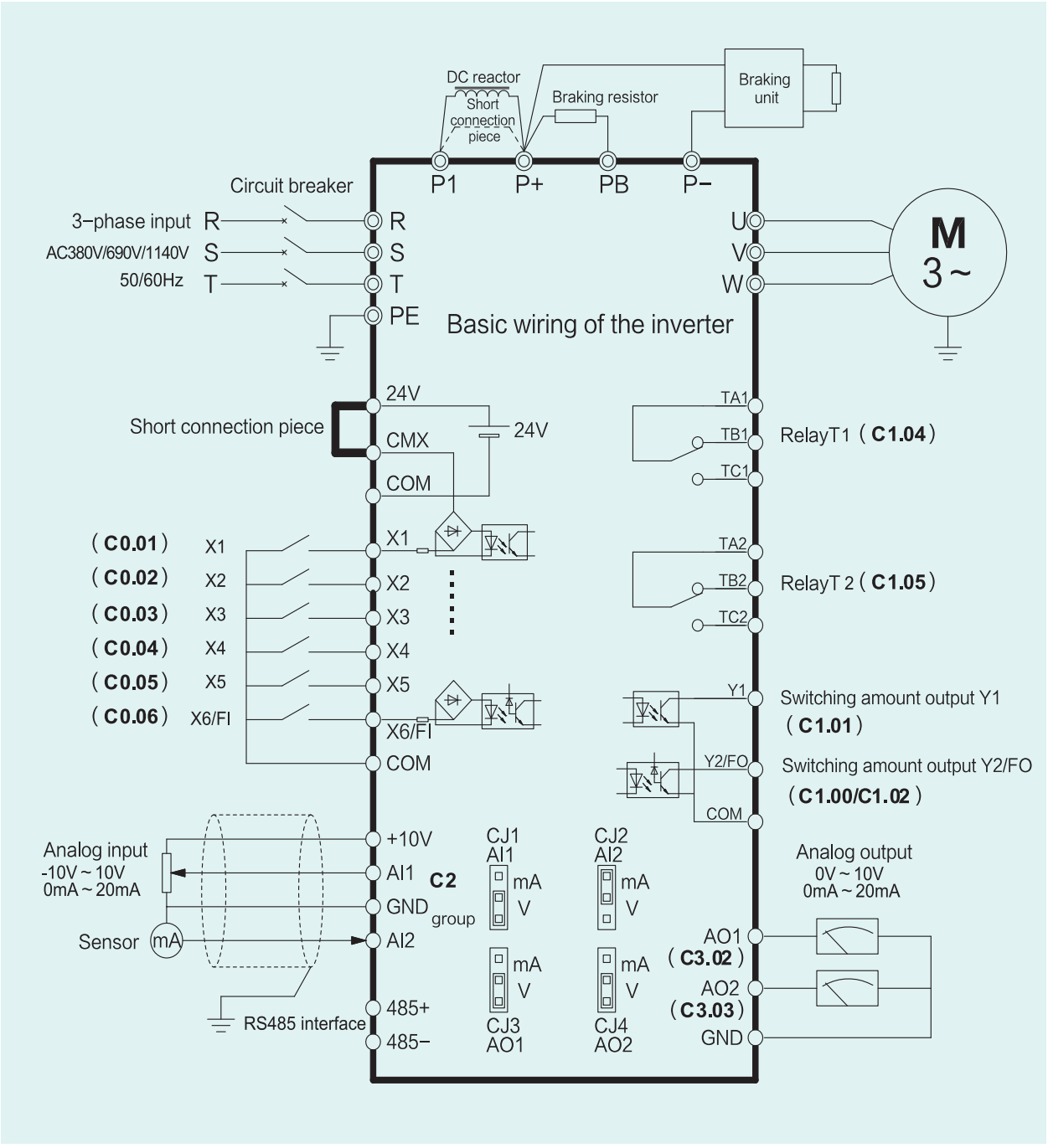
Keypad indication lamp

Description of the keypad lamps of the RNB5000 series frequency inverter

Lamp		Name	Meaning
Unit indication	Hz	Frequency indication	The unit of the currently displayed parameter is Hz.
	A	Current indication lamp	The unit of the currently displayed parameter is A.
	V	Voltage indication lamp	The unit of the currently displayed parameter is V.
	Hz + A	Speed indication lamp	The unit of the currently displayed parameter is R/MIN (rotation/minute)
	A + V	Percentage indication lamp	The unit of the currently displayed parameter is % (percentage).
	Hz + V	MPa indication lamp	The unit of the currently displayed parameter isMPa.
	(MON)	Command source indication lamp	Off: Keypad control; On: Terminal control; Blink: Communication control
State indication	RUN	Operation/stop indication lamp	On: Operation state; Off: Stop state; Blink: Deceleration state
	(DIR)	Direction indication lamp	Off: There is forward command during stop or in the forward operation. On: There is reverse command during stop or in the reverse operation.
	(TRIP)	Fault state indication lamp	The frequency inverter is in alarming or fault state

Note: The lamp with brackets "( )" exists only in keypad A; Indication lamps RUN and TRIP are red, and others are green.

Basic wiring diagram



Note:

- Terminal ◎ means terminal of the main circuit, and ○ means terminal of the control circuit.
- Both the inverter and the motor should be reliably grounded.
- If neither the motor nor the inverter can be grounded, please connect the grounding terminal of the motor and the PE terminal of the inverter.