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Preface

The MA 510 product is an inverter designed to control a three   -phase induction motor. Please read this manual carefully to ensure correct operation   , safety and to become familiar with the inverter functions.

The MA 510 inverter is an electrical / electronic product and must be installed and handled by qualified service personnel.

Improper handling may result in incorrect operation, shorter life cycle, or failure of this product as well as the motor.

All MA 510 documentation is subject to change without notice . Be sure to obtain the latest editions for use or visit our website at www.tetaelectric.com

Available Documentation   :

1.   MA510   Start-up and Installation Manual

2. MA10 Instruction Manual

Read this instruction manual thoroughly before proceeding with installation, connections(wiring), operation, or maintenance and inspection.

Ensure you have sound knowledge of the inverter and familiarize yourself with all

safety information and precautions before proceeding to operate the inverter.

Please pay close attention to the safety precautions indicated by the

warning ⚡ and caution ⚠ symbol.

⚡ **Warning**	Failure to ignore the information indicated by the warning symbol may result in death or serious injury.
⚠ **Caution**	Failure to ignore the information indicated by the caution symbol may result in minor or moderate injury and/or substantial property damage.

Chapter 1 Safety Precautions

1.1 Before Supplying Power to the Inverter

<table>
<tr><td align="center">⚠ Warning</td></tr>
<tr><td>

The main circuit must be correctly wired . For single phase supply use input terminals (R/L1,

T/L3) and for three phase supply use input terminals (R/L1, S/L2, T/L3). Terminals U /T1,

V/T2, W/T3 must only be used to connect the motor . Connecting the input supply to any of

the U/T1, V/T2 or W/T3 terminals will cause damage to the inverter.

</td></tr>
</table>

<table>
<tr><td align="center">⚠ Caution</td></tr>
<tr><td>

To avoid the front cover from disengaging or other physical damage, do not carry the inverter
by its cover. Support the unit by its heat sink when transporting. Improper handling can
damage the inverter or injure personnel, and should be avoided.

   To avoid the risk of fire, do not install the inverter on or near flammable objects.   Install
on nonflammable objects such as metal surfaces.

   If several inverters are placed inside the same control panel, provide adequate
ventilation to maintain the temperature below 40°C/104°F (50°C/122°F without a   dust
cover) to avoid overheating or fire.

   When removing or installing the digital operator, turn off the power first, and then follow
the instructions in this manual to avoid operator error or loss of display   caused by faulty
connections.

</td></tr>
</table>

<table>
<tr><td align="center">⚠ Warning</td></tr>
<tr><td>

   This product is sold subject to IEC 61800-3. In a domestic environment this   product

may cause radio interference in which case the user may need to apply corrective measures   .

   Over temperature protection function on motor is disabled.

</td></tr>
</table>

1.2 Wiring

Warning
Always turn OFF the power supply before attempting inverter installation and wiring of the user terminals.
Wiring must be performed by a qualified personnel / certified electrician.
Make sure the inverter is properly grounded. (200V Class: Grounding impedance shall be less than 100Ω. 400V Class: Grounding impedance shall be less than 10Ω.) It is required to disconnect the ground wire in the control board to avoid the sudden surge causing damage on electronic parts if it is improperly grounded.
Please check and test emergency stop circuits after wiring. (Installer is responsible for the correct wiring.)
Never touch any of the input or output power lines directly or allow any input or output power lines to come in contact with the inverter case.
Do not perform a dielectric voltage withstand test (megger) on the inverter or this will result in inverter damage to the semiconductor components.

| **Caution** |
| --- |
| The line voltage applied must comply with the inverter's specified input voltage. |
| Connect braking resistor and braking unit to the designated terminals. |
| Do not connect a braking resistor directly to the DC terminals P(+) and N(-), otherwise fire may result. |
| Use wire gauge recommendations and torque specifications. |
| Never connect input power to the inverter output terminals U/T1, V/T2, W/T3. |
| Do not connect a contactor or switch in series with the inverter and the motor. |
| Do not connect a power factor correction capacitor or surge suppressor to the inverter output。 |
| Ensure the interference generated by the inverter and motor does not affect peripheral devices. |

1.3 Before Operation

Warning
Reduce the carrier frequency (parameter P0-14) If the cable from the inverter to the motor is over 80 ft (25m). A high-frequency current can be generated by stray capacitance between the cables and result in an overcurrent trip of the inverter, an increase in leakage current, or an inaccurate current readout. Be sure to install all covers before turning on power. Do not remove any of the covers while power to the inverter is on, otherwise electric shock may occur. Do not operate switches with wet hands, otherwise electric shock may result. Do not touch inverter terminals when energized even if inverter has stopped, otherwise electric shock may result.

1.4 Parameter Setting

Caution
Do not connect a load to the motor while performing an auto-tune. Make sure the motor can freely run and there is sufficient space around the motor when performing a rotational auto-tune.

1.5 Operation

| **Warning** |
| --- |
| Do not connect or disconnect the motor during operation. This will cause the inverter to trip and may cause damage to the inverter.

 Operations may start suddenly if an alarm or fault is reset with a run command active. Confirm that no run command is active upon resetting the alarm or fault, otherwise accidents may occur.

 If automatic restart after power recovery (parameter P1-14) is enabled, the inverter will start automatically after power is restored.

 Make sure it is safe to operate the inverter and motor before performing a rotational auto-tune.

 Do not check signals on circuit boards while the inverter is running.

 After the power is turned off, the cooling fan may continue to run for some time. |

Caution
Do not touch heat-generating components such as heat sinks and braking resistors.   Carefully check the performance of motor or machine before operating at high speed, otherwise Injury may result.   Note the parameter settings related to the braking unit when applicable.   Do not use the inverter braking function for mechanical holding, otherwise injury may result.   Do not check signals on circuit boards while the inverter is running.

1.6 Maintenance, Inspection and Replacement

 Warning

Wait a minimum of 5 minutes after power has been turned OFF before starting an

inspection. Also confirm that the charge light is OFF and that the DC bus voltage has

dropped below 25Vdc. Wait a minimum of 15 minutes while inverter is over 20HP.

Never touch high voltage terminals in the inverter.

Make sure power to the inverter is disconnected before disassembling the inverter.

Only authorized personnel should perform maintenance, inspection, and replacement

operations. (Take off metal jewelry such as watches and rings and use insulated tools.)

 Caution

The Inverter can be used in an environment with a temperature range from 14° -104°F (-10

~ 40°C) and relative humidity of 95% non-condensing.

The inverter must be operated in a dust, gas, mist and moisture free environment.

1.7 Disposal of the Inverter

 Caution

Please dispose of this unit with care as an industrial waste and according to your required

local regulations.

The capacitors of inverter main circuit and printed circuit board are considered as

hazardous waste and must not be burned.

The Plastic enclosure and parts of the inverter such as the top cover board will

release harmful gases if burned.

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Chapter 2 Model Description

2.1 Nameplate Data

It is essential to verify the MA510 inverter nameplate and make sure that the MA510 inverter

has the correct rating so it can be used in your application with the proper sized AC motor.

Unpack the MA510 inverter and check the following:

(1) The MA510 inverter and quick setting guide are contained in the package.

(2) The MA510 inverter has not been damaged during transportation there should be no dents

or parts missing.

(3) The MA510 inverter is the type you ordered. You can check the type and specifications

on the main nameplate.

(4) Check that the input voltage range meets the input power requirements.

(5) Ensure that the motor HP matches the motor rating of the inverter.

Model Identification

TETA Electric

MODEL : MA510 - 4025 - G
MOTOR RATING : 18.5 Kw
INPUT : AC 3PH 380-480V (+10%,-15%) 50/60Hz 38A
OUTPUT : AC 3PH 380-480V 0-600Hz 37A
IP20/NEMA1

(S/N)

CE

www.tetaelectric.com   MADE IN CHINA

MA510 - 4 025

MA510 series	Voltage Rating:	Motor Rating:
	2 : 220 v	001 : 1HP
	4 : 380 v	025 : 25HP
		050 : 50HP
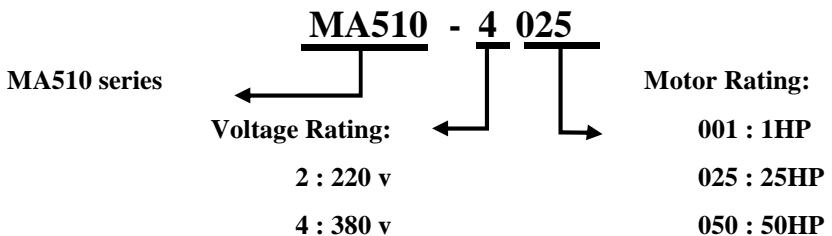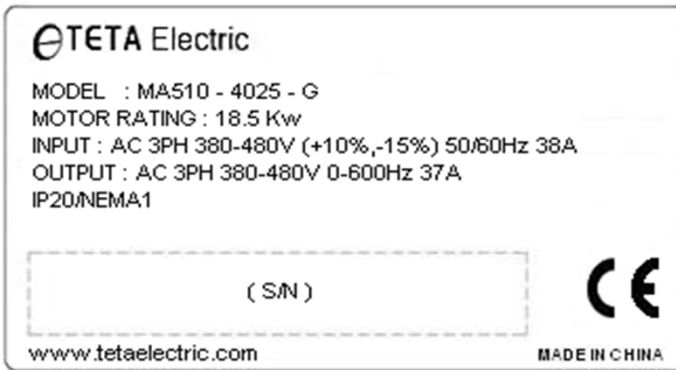
2.2 Inverter Models-Motor Power Rating

Model Number	Input Voltage	Rated Power (kw)	Rated input current (A)	Rated output current (A)	Compatible Motor (HP)
MA510-2001	3-phase 220V -+ 15%	0.75	5	4.5	1
MA510-2002		1.5	7.7	7	2
MA510-2003		2.2	11	10	3
MA510-2005		4	17	16	5
MA510-2008		5.5	21	20	7.5
MA510-2010		7.5	31	30	10
MA510-2015		11	43	42	15
MA510-2020		15	56	55	20
MA510-2025		18.5	71	70	25
MA510-2030		22	81	80	30
MA510-2040		30	112	110	40
MA510-2050		37	132	130	50
MA510-2060		45	163	160	60
MA510-2075		55	181	190	75
MA510-4001	3-phase 380V -+ 15%	0.75	3.4	2.5	1
MA510-4002		1.5	5	3.7	2
MA510-4003		2.2	5.8	5	3
MA510-4005		4	10	9	5
MA510-4008		5.5	15	13	7.5
MA510-4010		7.5	20	17	10
MA510-4015		11	26	25	15
MA510-4020		15	35	32	20
MA510-4025		18.5	38	37	25
MA510-4030		22	46	45	30

Model Number	Input Voltage	Rated Power	Rated input current	Rated output current	Compatible Motor
MA510-4040	3-phase 380V -+ 15%	30	62	60	40
MA510-4050		37	76	75	50
MA510-4060		45	90	90	60
MA510-4075		55	105	110	75
MA510-4100		75	140	150	100
MA510-4125		90	160	176	125
MA510-4150		110	210	210	150
MA510-4175		132	240	250	175
MA510-4215		160	290	300	215
MA510-4250		185	330	340	250

Chapter 3 Environment and Installation

3.1 Environment

The installing environment of the inverter directly affects its functions and the service life.

Therefore, the installation environment must meet the following conditions:

Applicable environment	
Operating Temperature	(-10~40° C) (With the dust-protection cover open, the applicable operation temperature (-10~50° C) (full load) can reach maximum of 60° C) . But it is required to de-rating 2% of the rated current for increasing one degree. For multiple inverters installed side by side in the plate, please pay attention to the placement to facilitate heat radiating.
Storage Temperature	(-20~70C)
Humidity	RH should be 5% to 95%, free of condensation or water droplets.
Shock	Maximum acceleration:1.2G (12m/s2), from 49.84 to 150 Hz Displacement amplitude : 0.3mm (peak value), from 10 to 49.84 Hz

3.2 Installation

Installation site

The product shall be installed in the environment for easy operation, avoiding to be exposed to the following environments:

Avoid direct sunlight

Avoid rain drops or wet environment

Avoid oil mist and salt erosion

Avoid corrosive liquid and gas

Avoid dust, lint fibers, and small metal filings.

Avoid electromagnetic interference (soldering machine, power machine)

Keep away from radioactive and flammable materials

Avoid vibration (punch). Please add a vibration-proof pad to reduce vibration if it can not be avoided

3.2.1 Installation Spaces

Please install the MA510 inverter in vertical direction, leaving enough space to ensure the

cooling effect, shown in below Figure. Avoid the upside-down or horizontal installation.

The temperature of inverter's radiator cooling may reach 90 ° C in operation. Therefore, the contact surface for the inverter installation shall be made by the hightemperature-resistant material.

When the inverter is operating in the power distribution box, the environment must be ventilated and the environmental temperature must be less than +40 ° C.
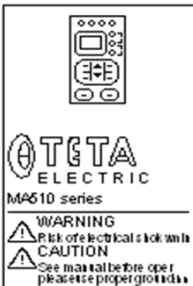

Up / Down	please leave 150mm
Left Right side	for the inverter capacity of 18.5kW (including the smaller Kw),the minimum width recommended is 100mm. for the inverter capacity of 22 kW (including the higher Kw), the minimum width recommended is 200mm.

3.2.2 External View and part description

cover

cover bracket

Air vent
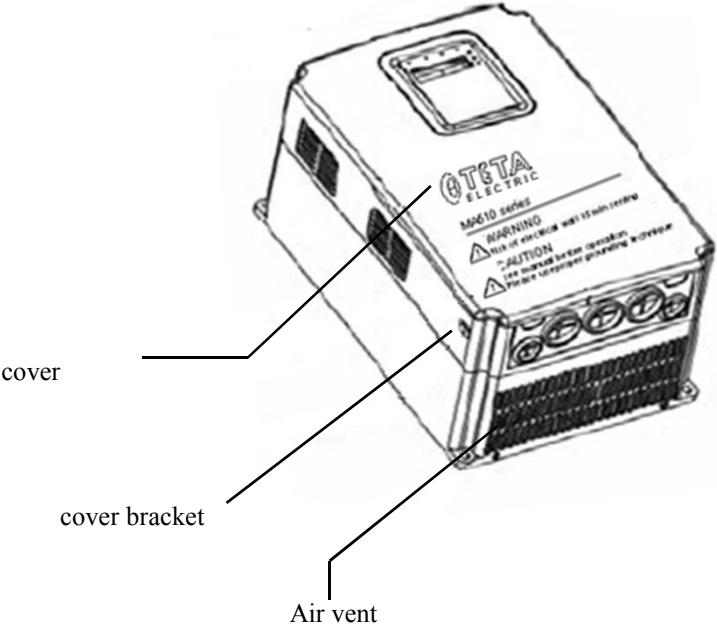
for capacities below 25 HP

The keypad bracket

The keypad

shield plate

Control board

terminals of the main circuit

Control terminals

inlet of the control cable

Installation holes

Cover

Installation holes of the cover

Air vent
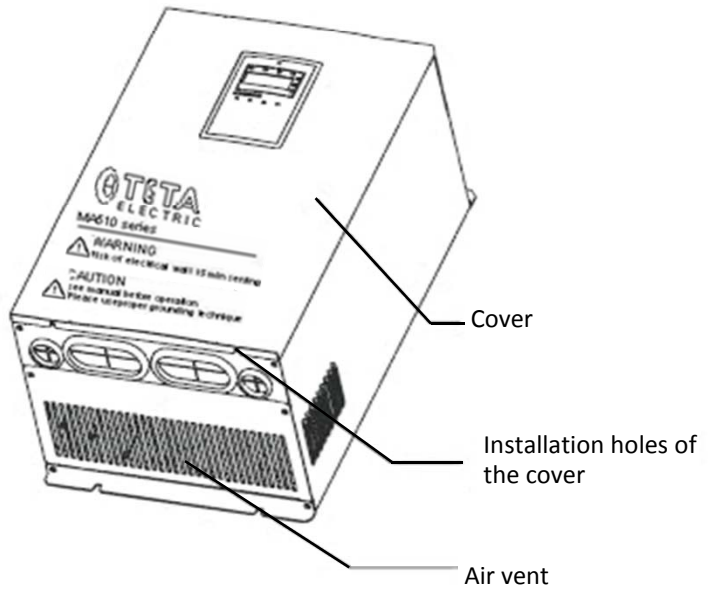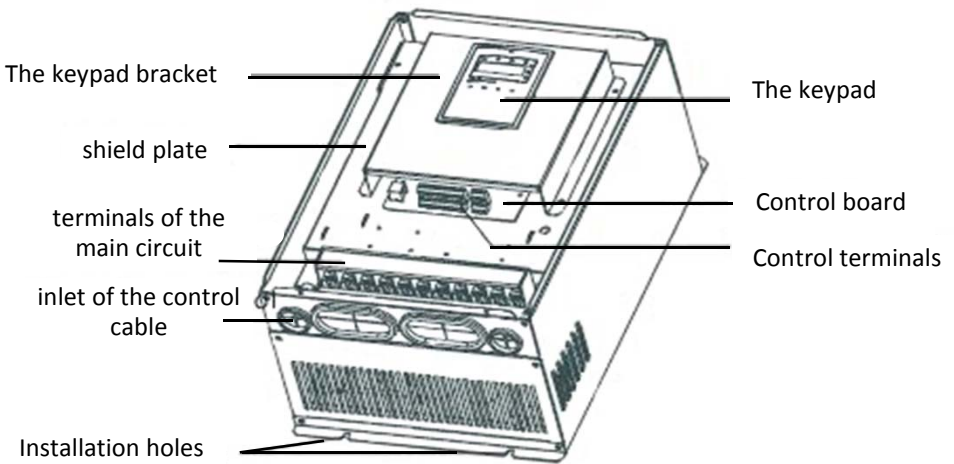
for capacities above(and include) 25 HP

3.2.3 Unpacking inspection

<table>
<tr><td style="text-align:center">! Caution</td></tr>
<tr><td>

Don't install or use any inverter that is damaged or has fault parts, otherwise physical

injury may occur.

check the following items after unpacking the inverter

1. Inspect the entire exterior of the inverter and motor to ensure there are no scratches or

other damage caused by the transportation

2. Ensure there is operation manual in the packing box

3. Inspect the name plate and ensure it is what you ordered.

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

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

</td></tr>
</table>

3.2.4 Disassemble and installation

<table>
<tr><td style="text-align:center">! Caution</td></tr>
<tr><td>

The dropping of the main part may cause physical injury .   The

inverter is fixed on a non-flammable wall such as metal and away from heat and flammable

materials to avoid the fire.

If more than two drives are installed in a cabinet , the temperature should be lower than 40

by means of cooling fan. Overheat may cause fire or damage to the drive.

</td></tr>
</table>

⚠️	**Warning**

Only qualified people are allowed to operate on the drive device/system. Ignoring the instructions in "warning" may cause serious physical injury or death or property loss.

1 . After the power is cut off, while the "CHARGE" indicator of the inverter is still on, it means the discharge of the capacitor has not been completed. Don't touch the circuit or replace components at this time.

2. Never wire or disassemble/assemble internal connectors of inverter when the power is supplied.

3. Prohibit connecting U,V and W of inverter output terminals to AC power.

4. Terminal E of the inverter must be well grounded.

5. Since semiconductor components are easily damaged by high voltage, do not carry out the high voltage withstand test on internal components of MA510 inverter.

6. CMOS IC of the inverter control board is easily affected and damaged by static electricity, thus, do not touch the control board.   7. connect the input power lines tightly and permanently.

3.3 Inverter Wiring

3.3.1 Wiring Peripheral Power Devices

Examples for wiring the periphery devices of MA510 are shown in the following:

Power supply

Circuit breaker

Electromagnetic contactor

AC reactor

Fast acting fuse

Input noise filter

Inverter

Zero-phase noise fil

3-phase induction m

Electromagnetic contactor : It can not add for general use. However for the application requiring external sequence control or automatic restart function power cut, is required. Please avoid using it for the start/stop control of the inverter as possible.

AC reactor : In case of further improving the power factor or suppress the external surge , an AC reactor can be additionally equipped.

Fast acting fuse: To protect interface devices.

Input noise filter: The surrounding device may be disturbed when inverter is working.EMC filter can minimize the interface

Inverter : Terminal R,S,T at input side have no phase requirement, thus they can be arbitrarily exchanged. Terminal E must be well grounded

Zero-phase noise filter : Adding this at the output side of the inverter can be decrease the radiated interface and induced noise.
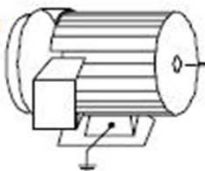
Motor : If an inverter drives multiple motors, the rated current of the inverter must be greater than the total current that all motors operate at the same time. Motor and inverter must be grounded respectively.

3.3.2 General Wiring Diagram

The following is the standard wiring diagram for the MA510 inverter.Locations and symbols of the wiring terminal block might be different due to different models.
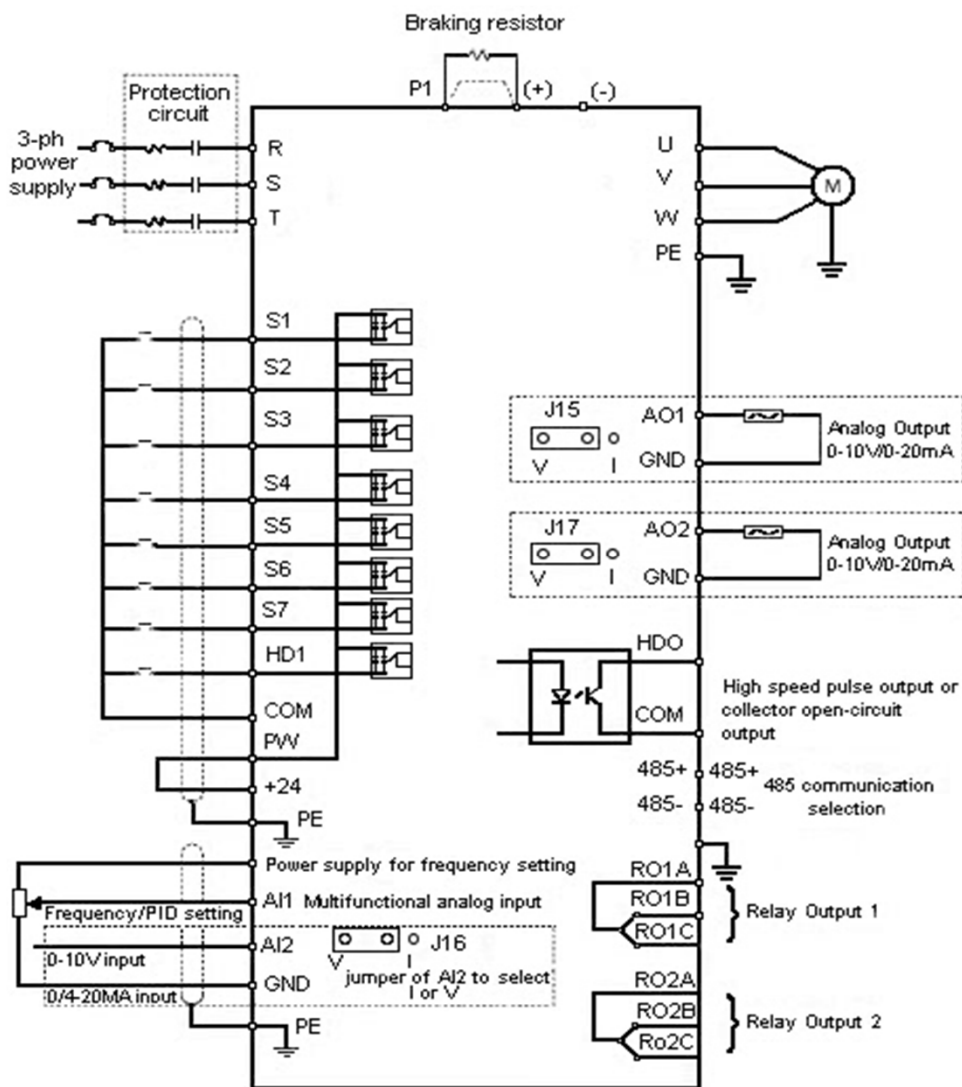
For Inverters≥18.5 Kw

*1 : Only the master circuit of 380 V 1~20HP (included) or models of lower capacity with built-in braking resistor provide terminal PB.The braking resistor can be connected directly between (+) and PB.

The wire length of the braking resistor should be less than 5m.

Please pay attention to safty prevention and smooth ventilation when installing braking

resistors because the temperature will rise for the heat releasing.

The (+) and (-) terminals of the braking units corresponds to the (+) and (-) terminals of the

inverter when the external braking unit is connected.

The wiring length between the (+) and (-) terminals of the inerter and the (+), (-) of the

braking units should not be more than 5m and the distributing length among BR1 and BR2

and the braking resistor terminals should not be more than 10m.

⚠ **Caution**
Be sure that the electric polarity of (+) (-) terminals is right; it is not allowed to
connect (+) with (-) terminals directly , otherwise damage or fire may occur.

3.3.3 Terminal description

Major Circuit Terminals

Terminal	function discription
R S T	Terminals of 3phase AC input
(+) (-)	spare terminals of external braking unit
(+) PB	spare terminals of external braking resistor
P1 (+)	spare terminals of external DC reactor
(-)	terminal of negative DC bus
(+)	terminal of positive DC bus
U V W	Terminals of 3phase AC output
⏚	terminal of ground

2 ~ 3 HP , 380 V

(+)	PB	R	S	T	U	V	W	⏚
		POWER			MOTOR			

5 ~ 7.5 HP , 220 / 380 V

(+)	PB	(-)	R	S	T	U	V	W	⏚
			POWER			MOTOR			
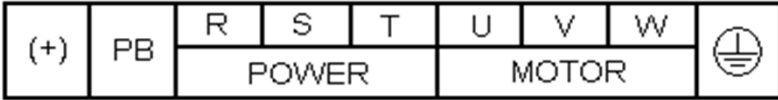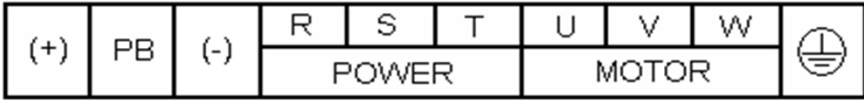
10 ~ 20 HP , 380 V / 10HP 220 V

⏚	(+)	PB	(-)	R	S	T	U	V	W	⏚
				POWER			MOTOR			
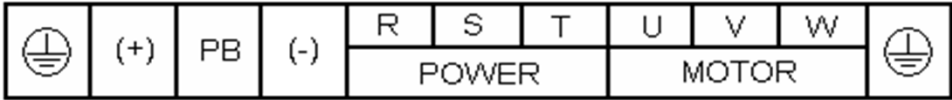
25 ~ 150 HP , 380 V / 15 ~ 20 HP 220V

⏚	R	S	T	P1	(+)	(-)	U	V	W	⏚
	POWER						MOTOR			

175 ~ 250 HP , 380 V

R	S	T	U	V	W
POWER			MOTOR		

⏚	P1	(+)	(-)	⏚
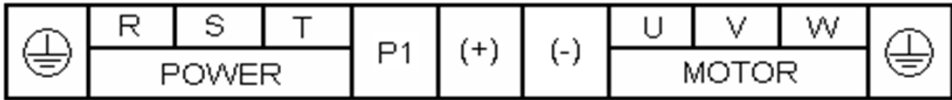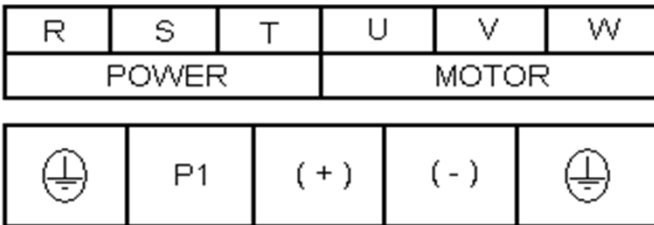
Control Circuit Terminals

485+	485-	+10V	GND	S1	S2	S3	S4	S5	S6	S7		RO1A	RO1B	RO1C
	GND	AI1	AI2	AO1	AO2	COM	PW	+24V	COM	HDI	HDO	RO2A	RO2B	RO2C
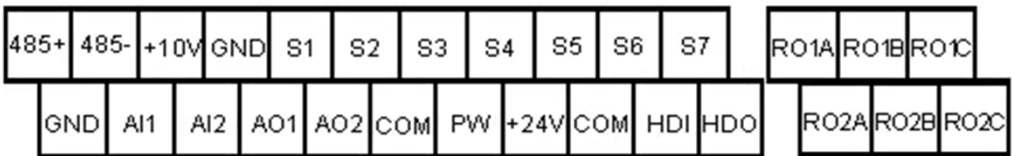
Type	Terminal	Terminal function	Signal level
Digital Input	S1~S7	ON-OFF signal input, optical coupling with PW and COM	24VDC,8mAoptocoupler isolation (maximum voltage of 30Vdc, input impedance of 3.3kΩ)
24V Power supply	(+24v)	Digital signal SOURCE sharing point (PW switched to SOURCE)	±15%, Maximum output current: 150mA (the sum of all load)
	COM	Common terminal of Digital signals (PW switched to SINK)	
External power supply	PW**	(+24v) terminal is connected to PW terminal as default*	default (+24v)
Pulse input signal	HDI	Pulse or ON-OFFinput ,optical coupling with PW and COM	frequency range:0~50kHz Input voltage:9~30V Input impedence:1.1KΩ
Analog input signal	AI1	Voltage speed command	(-10v~+10v)Input impedance:20KΩ
	AI2	Multi-function analog input terminal switched by J16	From 0V ~ +10V / 0 ~ 20mA Input impedance: 10KΩ(voltage) / 250Ω(current)
	(+10v)	Power for speed setting	
	GND	Analog signals sharing terminal	
Pulse output signal	HDO	high speed pulse or open collector output. The corresponding common terminal is COM	Output frequency range: 0 ~ 50kHz
Analog output signal	AO1	analog output terminals above 5HP: AO1 by J15 and AO2 by J17 2 ~3HP: AO1 by J15 and AO2 by J14 can be selected	Output range : Voltage (0 ~ 10v) current (0 ~ 20mA)
	AO2		
RS-485 port	+485	RS-485 / MODBUS***	Opto-coupler isolation, differential input and output
	-485		

Type	Terminal	Terminal function	Signal level
Relay Output	RO1A	RO1 common	Contact capacity : AC 250V / 3A DC 30V / 1A
	RO1B	RO1 normally close(NC)	
	RO1C	RO1 normally open(NO)	
	RO2A	RO2 common	
	RO2B	RO2 normally close(NC)	
	RO2C	RO2 normally open(NO)	

*If the external power supply is needed , disconnect (+24v) with PW terminal and connect external power supply

**Using of PW to set sink or source mode

sink mode   source mode
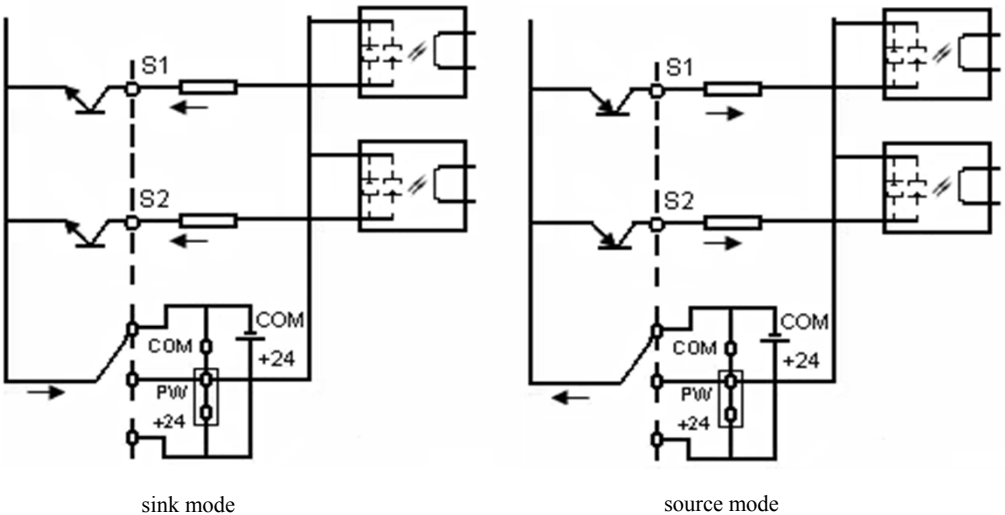
***Please use twisted pairs and shield cables on the standard communication port

20

| Jumper	Description
J2 , J4	It is porhibited to be connected together , otherwise it will cause inverter malufanction.
J16	switch between 0~10v and 0~20mA Input V connect to GND means voltage input I connect to GND means current input
J15 and J17 above 5HP	switch between 0~10v and 0~20mA Output V connect to GND means voltage output I connect to GND means current output
J14 and J15 2HP~3HP	switch between 0~10v and 0~20mA Output V connect to GND means voltage output I connect to GND means current output
SW1	Switch of terminal resistor for RS-485 communication , dialing to ON means connecting to terminal resistor while dialing to OFF means disconnecting to terminal resistor.(only valid for 5HP and above)
J7	RS-485 communication jumper
J17 and J18 2HP~3HP	Switch of terminal resistor for RS-485 communication. Jumper enable: connect terminal resistor Jumper disable: Disconnect terminal resistor

3.3.4 Wiring Precautions

For the external wiring of the control terminal, please attention to the followings:

Use shield or twisted-pair cables to connect control terminals.

The cable connected to the control terminal should be left away from the main circuit and

strong current circuits (including power supply cable, motor cable, relay and contactor

connecting cable) at least 20cm , and parallel wiring should be avoided. It is suggested to

apply perpendicular wiring to prevent inverter malfanction caused by external interference.

Contact output terminal R1A, R1B, R1C (or R2A,R2B, R2C) must be isolated from

terminal 1～7, A01, A02, GND, HDO, COM, +10V, AI1, AI2, HD1 when wiring.

In order to avoid the electrical noise interference, the control circuit wiring must

adopt shielding isolation twisted wire, please refer to the following diagram; the

wiring distance should not exceed 50m.

Connect the ground terminal(PE) with shield wire.
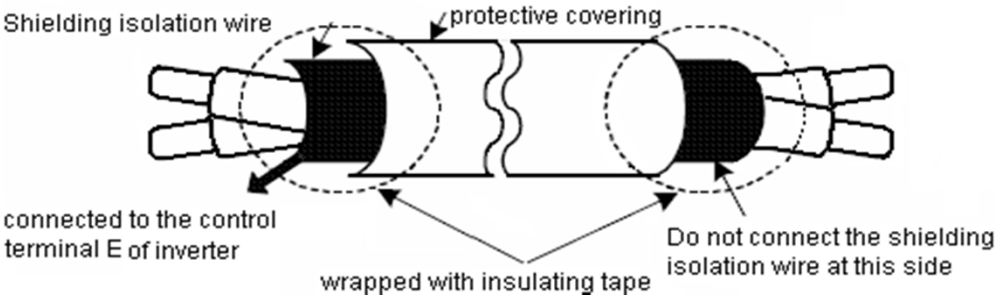
When connecting the output contact of the multi-function optocoupler to the relay, it is
necessary to add flywheel diode in parallel to both sides of the relay coil, as shown in the
following diagram.
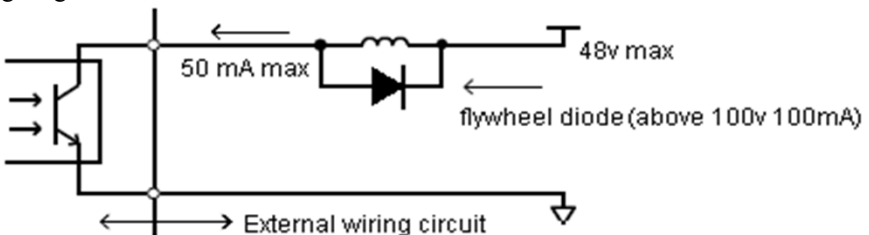
For the wiring of the main circuit terminal, please attention to the followings:

It doesn't need to consider the phase sequence for input power R, S, T.

Prohibit connecting U,V and W of inverter output terminals to AC power.

Inverter output terminal U, V and W are connected to the motor terminal U, V, W. If the inverter executes forward rotation instruction while the motor rotates in reversal direction, simply exchange any two wires of U, V, W is enough.

Never connect the inverter output terminal to the capacitor or LC,RC noise filter of improving the power factor.

Grounding terminal (E) is grounded to the earth by the third type grounding way. (grounding resistance of 100Ω or less)

Inverter grounding wire can not be grounded together with high - current loads such as welding machines and high-powered motors and so on. They must be grounded respectively.

Grounding wire size follows the specification of electrical equipment technical basisThe shorter grounding wire is, the better it is.

If several inverters are grounded jointly , please refer to the following diagrams for grounding. Do not form a circuit in grounding.

(a) GOOD   (b) GOOD   (c) NOT GOOD
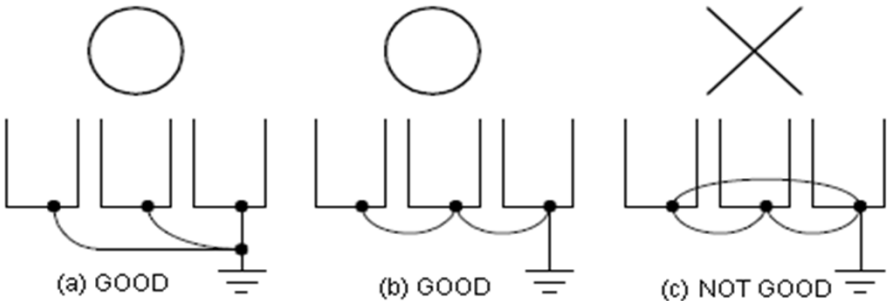
Determine wire size:

When choosing wire, a consideration of the voltage drop caused by the wire is a must.

Voltage drop is calculated as shown below. In general, the voltage drop shall be controlled below 2% of the rated voltage. Voltage drop between wires (V) = × wire resistance (Ω / km) × wiring length (m) × current (A) × 10-3

AC reactor for parallel power coordination:

If the capacity exceeds 600kVA, please add AC reactor to the input side of the inverter in series. AC power can be used for power coordination and power factor improvement.

Wiring length between the inverter and the motor:
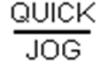
If the total length between the inverter and the motor, the inverter itself and other peripheral devices will be affected because the high-frequency carrier frequency(the IGBT ON / OFF switching frequency) of the inverter will increase the leakage current between wiring and the ground. As a result, if the wiring length between the inverter and the motor is very long, please modestly reduce the carrier frequency, as shown below.

Wiring distance between the inverter and the motor	＜30m	30m ~ 50m	50m~100m	≥ 100m
Allowable carrier frequency (set values of P0-14)	15kHz(max)	10kHz(max)	5kHz(max)	2kHz(max)

Chapter 4 Keypad and Programming Functions
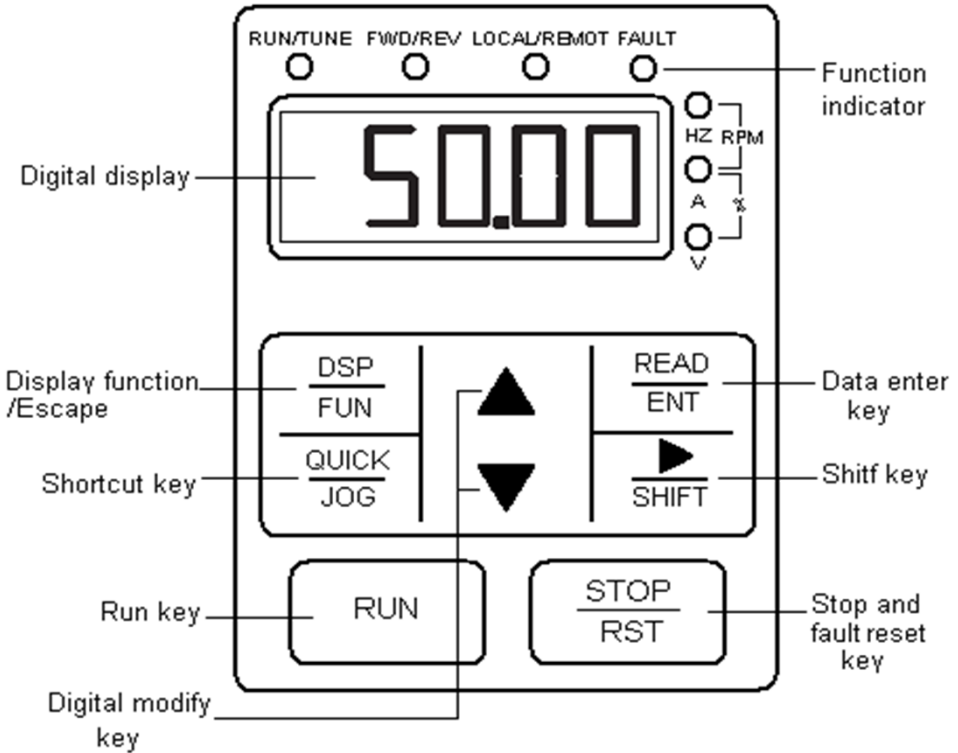
Key	Name	Function Description
$\dfrac{\text{DSP}}{\text{FUN}}$	Display function/Escape	Enter or escape from the first level menu
$\dfrac{\text{READ}}{\text{ENT}}$	Read enter key	Progressively enter menu and confirm parameter
▲	Digital modify key	Progressively increase data or function codes
▼	Digital modify key	Progressively decrease data or function codes
$\dfrac{\blacktriangleright}{\text{SHIFT}}$	shift key	In parameter setting mode , press this button to select the bit to be modified in in other modes cyclically displays parameters by right shift

Key	Name	Function Description
RUN	Run key	Start to run the inverter in keypad control mode
STOP/RST	Stop / Reset key	In running status, registered by P7.04, can be used to stop the inverter. When fault alarm, can be used to reset the inverter without any restriction
QUICK/JOG	Shortcut key	Determined by function code P7.03 : 0 : Display status switching 1 : Jog operation 2 : Switch between forward and reverse 3 : Clear the UP/DOWN terminals settings 4 : Quick debugging mode
RUN + STOP/RST	Combination key	Pressing the RUN and STOP/RST the same time can achieve inverter coast to stop

Function indicator	Description
RUN/TUNE ○	Extinguished : Stop status Flickering : Parameter auto tuning status Light on : Operating status
FWD/REV ○	Extinguished : Forward operation Light on : Reverse operation
LOCAL/REMOT ○	Extinguished : Keypad control Flickering : Terminal control Light on : Communication control

Function indicator	Description
FAULT ⬡	Extinguished : Normal operation status Flickering : Over load pre-warning status Light on : Fault of the inverter
HZ	Frequency unit
A	Current Unit
V	Voltage unit
RPM	Rotating speed unit
%	Percentage

4.4.1 Keypad Operation Description

4.4.1.1 Parameter setting

Press either the PRG/ESC or the DATA/ENT can return to the second - level menu from the third-level menu. The difference is: pressing DATA/ENT ve the set parameters in to the control panel,and then return to the second-level menu with shifting to the next function code automatically.While pressing PRG/ESC will return to the second-level menu without saving parameters,and keep staying at the current function code.
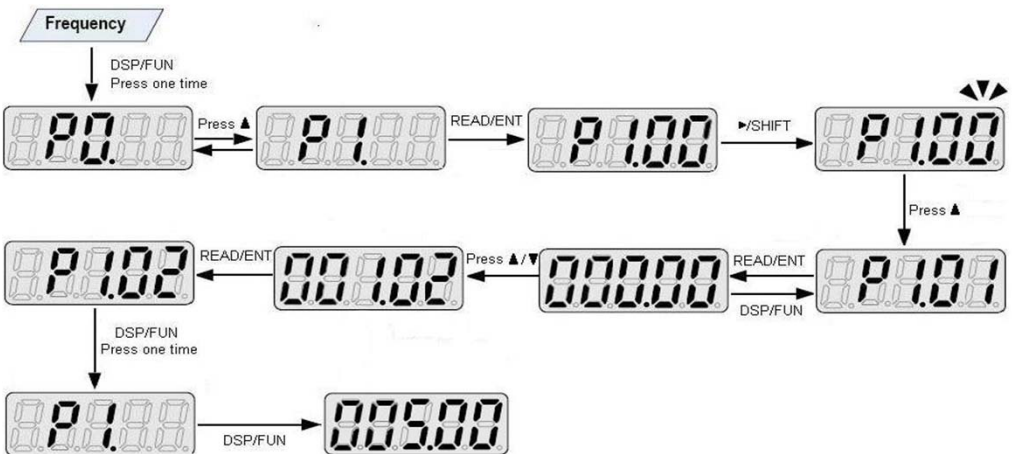
Under the third - level menu , if the parameter has no flickering bit, it means the function code can not be modified. The possible reasons could be:

this function is not modifiable parameter, such as actual detected parameter operation records and so on.

this function is not modifiable in running mode.

Short cut menu   QUICK/JOG

Short cut menu provides a quick way to view and modify function parameters.

set the P7.03 to 4,then press   QUICK/JOG   inverter will search the

 which is different from the factory setting , save these data beyond 32,parameter

it can not display the overlength part . Press   QUICK/JOG   be   shortcut

debugging mode. If the   QUICK/JOG   plays "NULLP",it means the parameters

are the same with the factory setting.

If want to return to last display , press   QUICK/JOG

Fault reset

If fault occurs to the inverter , it will inform the related fault information . User can use STOP/RST or according terminals determined by P5 group to reset fault. After fault reset, the inverter is in stand - by state. If user does not reset the fault the inverter will be in operation protection state, and can not run.

Chapter 5 Overall Dimension drawing

Standard model

(a) 380V : 20HP ~ 40HP
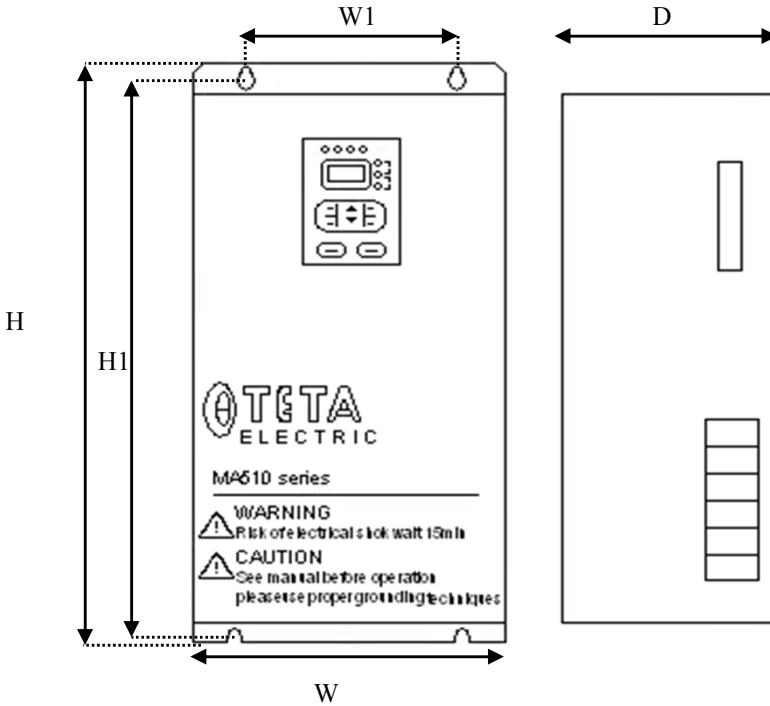
Inverter Model	Dimension (mm)					
	W	H	D	W1	H1	GW(kg)
MA510 4025	290	470	215	175	460	12
MA510 4030	290	470	215	175	460	12
MA510 4040	290	470	215	175	460	12

(b) 380V : 50HP ~ 75HP
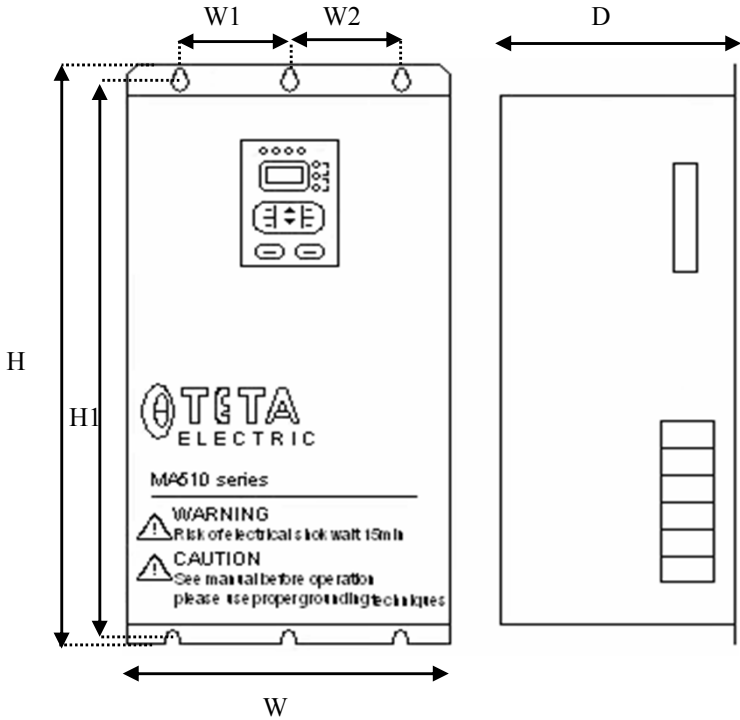
Inverter Model	Dimension (mm)					
	W	H	D	W1/W2	H1	GW(kg)
MA510 4050	375	585	270	115	665	36
MA510 4060	375	585	270	115	665	36
MA510 4075	375	585	270	115	665	36

(c) 380V : 100HP ~ 150HP
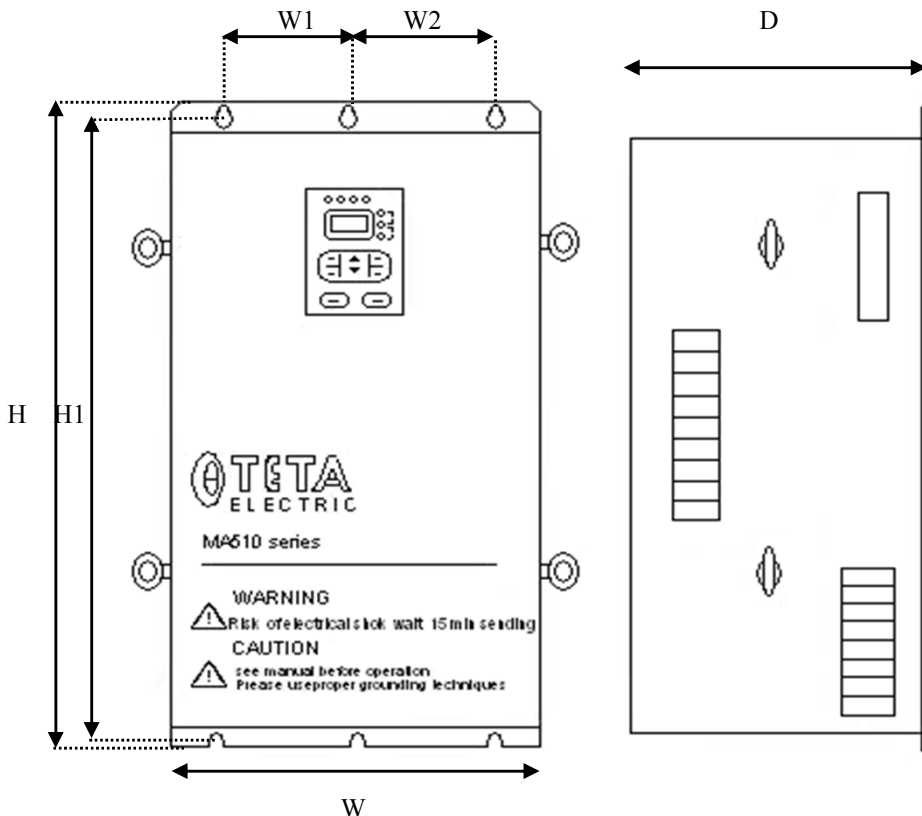
Inverter Model	Dimension (mm)					
	W	H	D	W1/W2	H1	GW(kg)
MA510 4100	460	755	330	160	735	48
MA510 4125	460	755	330	160	735	48
MA510 4150	460	755	330	160	735	50

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Keypad Dimension
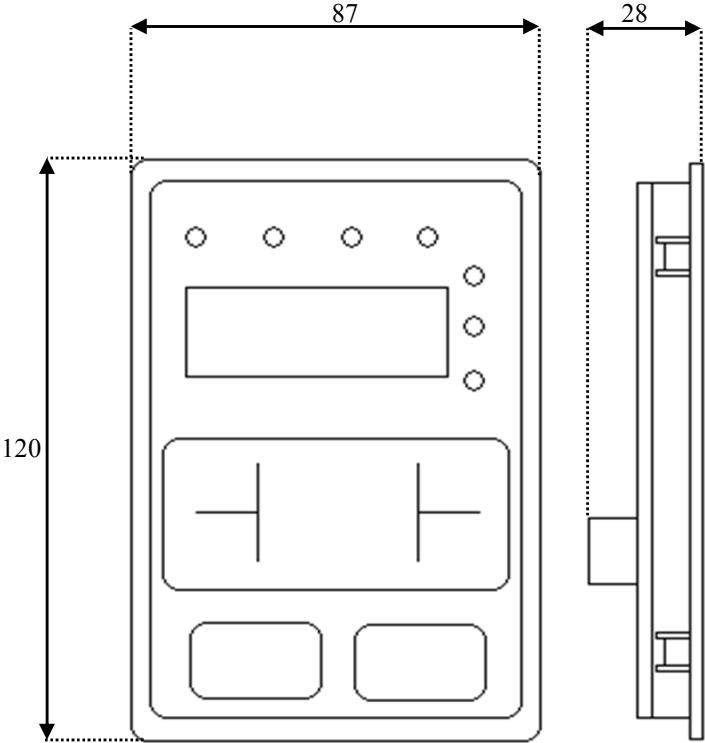
Chapter 6 Braking resistor

Model Number	Input Voltage	Braking Resistor	used number	Braking Unit	used number
MA510-2002	3-phase 220V -+ 15%	260W/130Ω	1	----	0
MA510-2003		260W/80Ω	1	----	0
MA510-2005		400W/48Ω	1	----	0
MA510-2008		550W/35Ω	1	----	0
MA510-2010		780W/26Ω	1	----	0
MA510-2015		1100W/17Ω	1	----	0
MA510-2020		1800W/13Ω	1	----	0
MA510-2025		2000W/10Ω	1	70	1
MA510-2030		2500W/8Ω	1	80	1
MA510-2040		1800W/13Ω	2	110	2
MA510-2050		2000W/10Ω	2	130	2
MA510-2060		2500W/8Ω	2	160	2
MA510-2075		3000W/6.5Ω	2	190	2
MA510-4002	3-phase 380V -+ 15%	260W/400Ω	1	----	0
MA510-4003		390W/150Ω	1	----	0
MA510-4005		390W/150Ω	1	----	0
MA510-4008		520W/100Ω	1	----	0
MA510-4010		1040W/50Ω	1	----	0
MA510-4015		1040W/50Ω	1	----	0
MA510-4020		1560W/40Ω	1	----	0
MA510-4025		6000W/20Ω	1	37	1
MA510-4030		6000W/20Ω	1	45	1
MA510-4040		6000W/20Ω	1	60	1
MA510-4050		9600W/13.6Ω	1	75	1
MA510-4060		9600W/13.6Ω	1	90	1
MA510-4075		9600W/13.6Ω	1	110	1

Model Number	Input Voltage	Rated Power	Rated input current	Rated output current	Compatible Motor
MA510-4100		9600W/13.6Ω	2	150	2
MA510-4125		9600W/13.6Ω	2	176	2
MA510-4150		9600W/13.6Ω	2	210	2
MA510-4175		3000W/4Ω	1	250	1
MA510-4215		3000W/4Ω	1	300	1
MA510-4250		4000W/3Ω	1	340	1

In the installation of braking module and braking resistor, you needs to keep an appropriate

distance from the inverter, and maintain a good ventilation of the installation environment.

select the resistor and power of the braking unit according to the data our company provided.
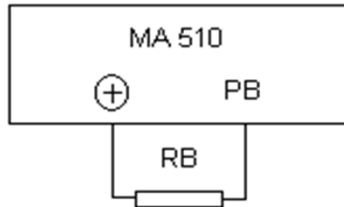
External braking resistor
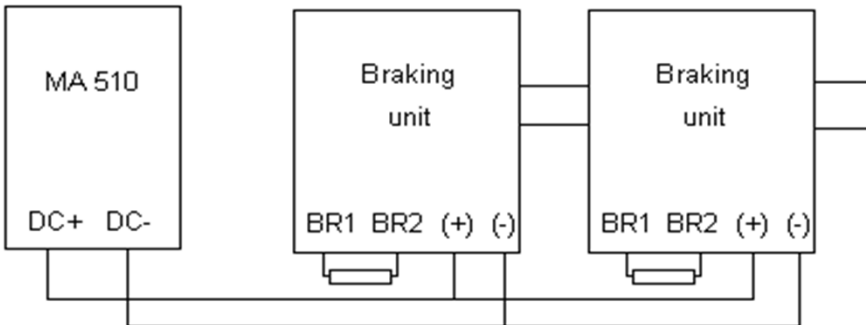
External braking unit
Parallel

Chapter 7 Parameters List

Parameter group	Name
P0 Group	Basic function
P1 Group	Start and Stop Control
P2 Group	Motor Parameters
P3 Group	Vector Control
P4 Group	V/F Control
P5 Group	Input Terminals
P6 Group	Output Terminals
P7 Group	Human and Machine Interface
P8 Group	Enhanced Function
P9 Group	PID Control
PA Group	Simple PLC and Multi-step Speed Control
PB Group	Protection Function
PC Group	serial communication
PD Group	Supplementary Function
PE Group	Factory Setting

P0 Group：Basic function				
Function Code	Name	Description	Setting Range	Default
P0.00	Control	0: V/F control 1: Sensorless vector control 2:Torque control (sensorless vector control)	0~2	0
P0.01	Run command source	0: Keypad (LED extinguished) 1: Terminal (LED flickering) 2: Communication(LED lights on)	0~2	0
P0.02	Keypad and Terminal UP/DOWN setting	0:Valid, save UP/DOWN value when Power off 1: Valid, do not save UP/DOWN value when power off 2: Invalid 3: valid during running, clear when stop.	0~3	0
P0.03	Maximum frequency	10.00~400.00Hz	10.00 ~ 400.00Hz	50.00Hz
P0.04	Upper frequency Limit	P0.05~P0.03　　　　(the Maximum frequency)	P0.05 ~ P0.03	50.00Hz
P0.05	Lower frequency Limit	0.00~P0.04　　　　(Lower frequency Limit)	P0.05 ~ P0.04	0.00Hz
P0.06	Keypad Reference Frequency	0.00~P0.03　　　　(the Maximum frequency)	0.00 ~ P0.03	50.00Hz

Function Code	Name	Description	Setting Range	Default
P0.07	Frequency A command source	0: keypad 1: AI1 2: AI2 3: HDI 4: simple PLC 5: Multi-stage speed 6: PID 7: Remote communication	0~7	0
P0.08	Frequency B command Source	0: AI1 1: AI2 2: HDI	0~2	0
P0.09	of frequency B command	0: maximum frequency 1: Frequency A command	0~1	0
P0.10	Frequency command selection	0: A 1: B 2: A+B 3: Max(A and B)	0~3	0
P0.11	Acceleration time 0	0.1~3600.0s	0.1 ~ 3600.0s	Depend 0n model
P0.12	Deceleration time 0	0.1~3600.0s	0.1 ~ 3600.0s	Depend 0n model
P0.13	Running direction selection	0: forward 1: reverse 2: forbid reverse	0~2	0
P0.14	Carrier frequency	1.0~15.0kHz	1.0 ~ 15.0kHz	Depend 0n model

Function Code	Name	Description	Setting Range	Default
P0.15	AVR function	0: Invalid 1: valid all the time 2: only valid in deceleration	0~2	1
P0.16	Motor parameters autotuning	0: No action 1: Rotation autotuning 2: static autotuning	0~3	2
P0.17	Restore parameters	0: No action 1: Restore factory setting 2: Clear fault records	P0.17	P0.17
P1 Group: Start and Stop Control				
P1.00	Start Mode	0: Start directly 1:DC braking and start 2:Speed tracking and start	0.2	0
P1.01	Starting frequency	0.00~10.00Hz	0.00 ~ 10.00	0.00Hz
P1.02	Hold time of starting frequency	0.0~50.0s	0.0~50.0	0.0s
P1.03	DC Braking Current Before start	0.0~150.0%	0.0~150.0	0
P1.04	DC Braking time before start	0.0~50.0s	0.0~50.0	0.0s
P1.05	Acceleration	0: Linear	0~1	0

Function Code	Name	Description	Setting Range	Default
	Deceleration mode	1: reserved		
P1.06	Stop mode	0: Decelerate to stop 1: Coast to stop	0~1	0
P1.07	Starting frequency of DC braking	0.00~P0.03	0.00 ~ P0.03	0.00Hz
P1.08	Waiting time before DC braking	0.0~50.0s	0.0~50.0	0.0s
P1.09	DC braking current	0.0~150.0s	0.0~150.0	0
P1.10	DC braking time	0.0~50.0s	0.0~50.0	0.0s
P1.11	Dead time of FWD/REV	0.0~3600.0s	0.0 ~ 3600.0	0.0s
P1.12	Action when running frequency is less than lower frequency limit (valid when lower frequency limit is above 0)	0: Running at the lower frequency limit 1: stop 2: stand-by	0~2	0

Function Code	Name	Description	Setting Range	Default
P1.13	Delay time for restart	0.0~3600.0s (valid when P1.12=2)	0.0 ~ 3600.0	0
P1.14	Restart after power off	0: Disabled 1: Enabled	0~1	0
P1.15	Waiting time of restart	0.0~3600.0s (valid when P1.14=1)	0.0 ~ 3600.0	0.0s
P1.16	Terminal detection selection when power is on	0: Disabled 1: Enabled	0~1	0
P1.17	Reserved			
P1.18	Reserved			
P1.19	Reserved			
P2 Group: Motor Parameters				
P2.00	Inverter model	0: G model 1: P model	0~1	Depend on model
P2.01	Motor rated power	0.4~900.0kW	0.4 ~ 3000.0	Depend on model
P2.02	Motor rated frequency	0.01Hz~P0.03	10.00 ~ P0.0	50.00Hz
P2.03	Motor rated speed	0~36000pm	0.0 ~ 3600.0	Depend on model
P2.04	Motor rated voltage	0~800V	0~800	Depend on model
P2.05	Motor rated current	0.8~6000.0A	0.8 ~ 6000.0	Depend on model

Function Code	Name	Description	Setting Range	Default
P2.06	Motor stator resistance	0.001~65.535Ω	0.001 ~ 65.535	Depend on model
P2.07	Motor rotor resistance	0.001~65.535Ω	0.001 ~ 65.535	Depend on model
P2.08	Motor leakage inductance	0.1~6553.5mH	0.1 ~ 6553.5	Depend on model
P2.09	Motor leakage inductance	0.1~6553.5mH	0.1 ~ 6553.5	Depend on model
P2.10	Current without load	0.1~6553.5A	0.1 ~ 6553.5	Depend on model
P3 Group: Vector Control				
P3.00	ASR proportional gain Kp1	0~100	0~100	20
P3.01	ASR integral time Kp1	0.01~10.00s	0.01 ~ 10.00	0.50S
P3.02	ASR switching point 1	0.00Hz~P3.05	0.00 ~ P3.05	5.00Hz
P3.03	ASR proportional gain Kp2	0~100	0~100	25
P3.04	ASR integral time Kp2	0.01~10.00s	0.01 ~ 10.00	1.00s

Function Code	Name	Description	Setting Range	Default
P3.05	ASR switching point 2	P3.02~P0.03　　　　　(the Maximum frequency)	P3.02 ~ P0.03	10.00Hz
P3.06	Slip compensation rate of VC	50.0%~200.0%	50~200	100%
P3.07	Torque upper limit	0.0~200%　　　　　(the rated current of the inveter)	0.0~200.0	G model: 150.00% P model: 120.00%
P3.08	Torque setting source	0: Keypad (corresponds to P3.09) 1: AI1 2: AI2 3: HDI 4: Multi-step speed 5:Remote communication (1~5: 100% corresponds to 2 times of the rated current of the inverter)	0~5	0
P3.09	Keypad torque setting	(-200.0%~200.0%)　　　　(the rated current of the inverter)	(-200.0% ~200.0%)	50.00%
P3.10	Upper frequency setting source	0: Keypad (P0.04) 1: AI1 2: AI2 3: HDI 4: Multi-step 5:Remote communication　　　(1~4: 100% corresponds to the max. Frequency)	0~5	0

P4 Group: V/F Control				
Function Code	Name	Description	Setting Range	Default
P4.00	V/F curve selection	0: Linear curve 1: Multidots curve 2: torque_stepdown curve (1.3 order) 3: Torque_stepdown curve (1.77 order) 4: Torque_stepdown curve (2.0 order)	0~4	0
P4.01	Torque boost	0.0%: (auto) 0.1%~10.0%	0.0 ~ 10.0	0.00%
P4.02	Torque boost cut-off	0.0%~50.0% (motor rated frequency)	0.0 ~ 50.0	20.00%
P4.03	V/F frequency 1	0.00Hz~P4.05	0.00 ~ P4.05	0.00Hz
P4.04	V/F voltage 1	0.0%~100.0% (the rated voltage of the motor)	0.0 ~ 100.0	0.00%
P4.05	V/F frequency 2	P4.03~P4.07	P4.03 ~ P4.7	0.00Hz
P4.06	V/F voltage 2	0.0%~100.0% (the rated voltage of the motor)	0.0 ~ 100.0	0.00%
P4.07	V/F frequency 3	P4.05~ P2.02 (the rated frequency of the motor)	P4.05 ~ P2.02	00.00Hz
P4.08	V/F voltage 3	0.0%~100.0% (the rated voltage of the motor)	0.0 ~ 100.0	0.00%
P4.09	Slip compensation limit	0.00~200.0%	0.0~200	0.00%

Function Code	Name	Description	Setting Range	Default
P4.10	Auto energy saving selection	0: Disabled 1: Enabled	0~1	0
P4.11	Low-frequency threshold of restraining oscillation	0~10	0~10	2
P4.12	High-frequency threshold of restraining oscillation	0~10	0~10	0
P4.13	Boundary of restraining oscillation	0.0~P3.03	0.00 ~ P0.03	30.00Hz
P5 Group: Input Terminals				
P5.00	HDI selection	0: High speed pulse input 1: ON-OFF input	0~1	0
P5.01	S1 Terminal function	0: Invalid 1:Forward	0~39	1
P5.02	S2 Terminal function	2: Reverse 3: 3-wire control	0~39	4
P5.03	S3 Terminal function	4: Jog forward 5: Jog reverse	0~39	7
P5.04	S4 Terminal function	6: Coast to stop 7: Reset fault	0~39	0
P5.05	S5 Terminal function	8: Pause running 9: External fault input	0~39	0

Function Code	Name	Description	Setting Range	Default
P5.06	S6 Terminal function	10: UP command 11: DOWN command	0~39	0
P5.07	S6 Terminal function	12: Clear UP/DOWN 13: Switch between A and B	0~39	0
P5.08	HDI Terminal function	14: Switch between A and A+B 15: Switch between B and A+B 16: Multi-step speed reference1 17: Multi-step speed reference2 18: Multi-step speed reference3 19: Multi-step speed reference4 20: Multi-step speed pause 21: ACC/DEC time selection 1 22: ACC/DEC time selection 2 23: Reset simple PLC when stop 24: Pause simple PLC 25: Pause PID 26: Pause traverse operation 27: Pause traverse operation 28: Reset counter 29: reset length 30: ACC/DEC ramp hold 31: Counter input 32: UP/DOWN invalid temporarily 33-39: Reserved	0~39	0
P5.09	ON-OFF filter times	1~10	1~10	5

Function Code	Name	Description	Setting Range	Default
P5.10	Terminal control mode	0: 2-wire control mode 1 1: 2-wire control mode 2 2: 3-wire control mode 1 3: 3-wire control mode 2	0~3	0
P5.11	UP/DOWN setting change rate	0.01~50.00Hz/s	0.01~50.00	0.50Hz/s
P5.12	Al1 lower limit	0.00V~10.00V	-10.00~10.	0.00V
P5.13	Al1 lower limit corresponding setting	-100.0%~100.0%	-100.0~100	0.00%
P5.14	Al1 lower limit	0.00V~10.00V	-10.00~10.	10.00V
P5.15	Al1 lower limit corresponding setting	-100.0%~100.0%	-100.0~100	100.00%
P5.16	Al1 filter time constant	0.00s~10.00s	0.00~10.00	0.10s
P5.17	Al2 lower limit	0.00V~10.00V	0.00~10.00	0.00V
P5.18	Al2 lower limit corresponding setting	-100.0%~100.0%	-100.0~100	0.00%

Function Code	Name	Description	Setting Range	Default
P5.19	Al2 upper limit	0.00V~10.00	0.000~10.0	10
P5.20	Al2 upper limit corresponding setting	-100.0%~100.0%	-100.0~100	100.00%
P5.21	Al2 filter time constant	0.00s~10.00s	0.00~10.00	0.10s
P5.22	HDI lower limit	0.0kHz	0.00~50.00	0.00kHz
P5.23	HDI lower limit corresponding setting	-100.0%~100.0%	-100.0~100	0.00%
P5.24	HDI upper limit	0.0kHz~50.0kHz	0.00~50.00	50.00kHz
P5.25	HDI lower limit setting	-100.0%~100.0%	-100.0~100	100%
P5.26	HDI filter time constant	0.00s~10.00s	0.00~10.00	0.10s
P6 Group: Output Terminals				
P6.00	HDO selection	0: No output 1: Running	0~1	0
P6.01	HDO ON-OFF Output selection	2: Run forward 3: Run reverse 4: Fault output	0~20	1

Function Code	Name	Description	Setting Range	Default
		5: FDT reached		
		6: Frequency reached		
		7: Zero speed running		
		8: Preset count value reached		
		9: Specified count value reached		
		10: Length reached		
		11: Simple PLC step completed		
		12: PLCcycle completed		
		13: Running time reached		
P6.02	Relay 1 output selection	14: Upper frequency limit reached 15: Lower frequency limit reached 16: Read	0~20	4
P6.03	Relay 2 output selection	17: Auxiliary motor 1 started 18: Auxiliary motor 2 started 19~20: Reserved	0~20	0
P6.04	AO1 function selection	0: Running frequency 1: Reference frequency 2: Rotation speed	0-10	0
P6.05	AO2 function selection	3: Output current 4: Output voltage	0-10	0
P6.06	HDO function selection	5: Output power 6: Output torque 7: Al1 voltage 8: Al2 voltage/current 9: HDI frequency	0-10	0
P6.07	AO1 lower limit	0.0%~100%	0.0~100.0	0.00%

Function Code	Name	Description	Setting Range	Default
P6.08	AO1 lower limit corresponding output	0.00V~10.00V	0.00~10.00	0.00V
P6.09	AO1 upper limit	0.00V~10.00V	0.0~100.0	100.00%
P6.10	AO1 upper limit corresponding output	0.00V~10.00V	0.00~10.00	10.00V
P6.11	AO2 lower limit	0.0~100.0%	0.0~100.0	0.00%
P6.12	AO2 lower limit corresponding output	1~10.00V	0.00~10.00	0.00V
P6.13	AO2 upper limit	0.0~100.0%	0.0~100.0	100.00%
P6.14	AO2 upper limit corresponding output	0.00~10.00V	0.00~10.00	10.00V
P6.15	HDO lower limit	0.00%~100.00%	0.00~100.0	0.00%
P6.16	HDO lower limit corresponding output	0.000~50.000KHz	0.000~50.0	0.00KHz

Function Code	Name	Description	Setting Range	Default
P6.17	HDO upper limit	0.00%~100.00%	0.000~100.	100.00%
P6.18	HDO upper limit corresponding output	0.0~50.0KHz	0.000~50.0	50.00KHz
P7 Group: Human and Machine Interfaces				
P7.00	User password	0~65535	0~65535	0
P7.01	Reserve		Reserved	Reserved
P7.02	Reserve		Reserved	Reserved
P7.03	QUICK/JOG function selection	0: Display status switching 1: Jog 2: FWD/REV switching 3: Clear UP/DOWN setting 4: QUICK set mode	0~4	0
P7.04	STOP/RST function selection	0: Valid when keypad control (P0.03=0) 1: Valid when keypad or terminal control (P0.03=0 or1) 2: Valid when keypad or communication control (P0.03=0 or 2) 3: Always valid	0~3	0
P7.05	Keypad display selection	0: Preferential to external keypad 1: Both display, only external key valid. 2: Both display, only local key valid.	0~3	0

Function Code	Name	Description	Setting Range	Default
		3: Both display and key valid.		
P7.06	Running status display selection 1	0~0XFFFF BIT0: running frequency BIT1: reference frequency BIT2: DC bus voltage BIT3: Output voltage BIT4: Output current BIT5: Rotation speed BIT6: Line speed BIT7: Output power BIT8: Output torque BIT9: PID preset BIT10: PID feedback BIT11: Input terminal status BIT12: Output terminal status BIT13: Torque setting value BIT14: Count value	0~0XFFFF	0X07FF
P7.07	Running status display selection 2	0~0XFFFF BIT0: AI1 BIT1: AI2 BIT2: HDI frequency BIT3: Load percentage of motor BIT4: Load percentage of inverter BIT5~15: Reserved	0~0XFFFF	0

Function Code	Name	Description	Setting Range	Default
P7.08	Stop status display selection	0~0XFFFFF BIT0: Reference frequency BIT1: DC bus voltage BIT2: Input terminal status BIT3: Output terminal status BIT4: PID preset BIT5: PID feedback BIT6: AI1 BIT7: AI2 BIT8: HDI frequency BIT9: Step No.of PLC or multi-step BIT10: Torque setting value BIT11~ BIT15: Reserved	0~0XFFFF	0x00ff
P7.09	Coefficient of rotation speed	0.0~999.9% Actual mechanical speed = 120 * output frequency * P7.09 / Number of poles of motor	0.1~999.9	100.00%
P7.10	Coefficient of line speed	0.0~999.9% Line speed = actual mechanical speed * P7.10	0.1~999.9	1.00%
P7.11	Rectify module temperature	0~100.0		
P7.12	IGBT module temperature	0~100.0		

Function Code	Name	Description	Setting Range	Default
P7.13	Software version			
P7.14	Inverter rated power	0.4~3000.0KW	0.4~3000.0	Depend on model
P7.15	Inverter rated current	0.0~6000.0A	0.0~6000.0	Depend on model
P7.16	Accumulated running time	0~65535h		
P7.17	Third latest fault type	0: Not fault 1: IGBT Ph-U fault(OUT1)		
P7.18	Second latest fault type	2: IGBT Ph-V fault(OUT1) 3: IGBT Ph-W fault(OUT1) 4: Over-current when acceleration(OC1)		
P7.19	Latest fault type	5: Over-current when deceleration(OC2) 6: Over-current when constant speed running(OC3) 7: Over-current when acceleration (OV1) 8: Over-current when deceleration (OV2) 9: Over-current when constant speed running(OV3) 10: DC bus under-voltage(UV) 11: Motor overload (OL1) 12: Inverter overload (OL2)		

Function Code	Name	Description	Setting Range	Default
		13: Input phase failure failure(SPO)		
		14: Output phase failure(SPO)		
		15: Rectify overheat (OH1)		
		16: IGBT overheat (OH2)		
		17: External fault (EF)		
		18: Communication fault(CE)		
		19: Current detection fault(ITE)		
		20: Autotuning fault (TE)		
		21: EEPROM fault (EEP)		
		22: PID feedback fault (PIDE)		
		23: Braking unit fault (BCE)		
		24: Running time arrival (END)		
		25: Overtorque fault （OL3）		
P7.20	Output frequency at current fault			
P7.21	Output current at current fault			
P7.22	DC bus voltage at current fault			
P7.23	Input terminal status at current fault			
P7.24	Output terminal status at current fault			

P8 Group: Enhanced Function				
Function Code	Name	Description	Setting Range	Default
P8.00	Acceleration time 1	0.1~3600.0s	0.1~3600.0	Depend on model
P8.01	Deceleration time 1	0.1~3600.0s	0.1~3600.0	Depend on model
P8.02	Acceleration time 2	0.1~3600.0s	0.1~3600.0	Depend on model
P8.03	Deceleration time 2	0.1~3600.0s	0.1~3600.0	Depend on model
P8.04	Acceleration time 3	0.1~3600.0s	0.1~3600.0	Depend on model
P8.05	Deceleration time 3	0.1~3600.0s	0.1~3600.0	Depend on model
P8.06	Jog reference	0.0~P0.03	0.00~P0.03	5.00Hz
P8.07	Jog acceleration time	0.1~3600.0s	0.1~3600.0	Depend on model
P8.08	Jog deceleration time	0.1~3600.0s	0.00~P0.03	Depend on model
P8.09	Skip Frequency1	0.00~P0.03	0.00~P0.03	0.00Hz
P8.10	Skip Frequency2	0.00~P0.03	0.00~P0.03	0.00Hz
P8.11	Skip Frequency bandwidth	0.00~P0.03	0.00~P0.03	0.00Hz
P8.12	Traverse amplitude	0.0~100.0%	0.0~100.0	0.00%

Function Code	Name	Description	Setting Range	Default
P8.13	Jitter frequency	0.0~50.0%	0.0~50.0	1.00%
P8.14	Rise time of traverse	0.1~3600.0s	0.1~3600.0	5.0s
P8.15	Fall time of traverse	0.1~3600.0s	0.1~3600.0	5.0s
P8.16	Auto reset times	0~3	0~3	0
P8.17	Reset interval	0.1~100.0s	0.1~100.0	1.0s
P8.18	Preset count value	P8.19~65535	P8.19~655	0
P8.19	Specified count value	0~P8.18	0~P8.18	0
P8.20	Preset running time	0~65535	0~65535	65535h
P8.21	FDT level	0.00~P0.03	0.00~P0.03	50.00Hz
P8.22	FDT lag	0.0~100.0%	0.0~100.0	5.00%
P8.23	Frequency arrive detecting range	0.0~100.0% (maximum frequency)	0.0~100.0	0.00%
P8.24	Droop control	0.00~10.00Hz	0.00~10.00	0.00Hz
P8.25	Brake threshold voltage	115.0~140.0%	115.0~140	130.00%
P8.26	Cooling fan control	0: Auto stop mode 1: Always working	115.0~140	120.00%

Function Code	Name	Description	Setting Range	Default
P8.27	Overmodulation	0: Enabled 1: Disabled	0~1	0
P8.28	PWM mode	0: PWM mode 1 1: PWM mode 2 2: PWM mode 3	0~1	0
P9 Group: PID Control				
P9.00	PID preset source selection	0: Keypad 1: AI1 2: AI2 3: HDI 4: Multi-step 5: Remote communication	0~5	0
P9.01	Keypad PID preset	0.0%~100.0%	0.0~100.0	0.00%
P9.02	PID feedback source selection	0: AI1 1: AI2 2: AI1+AI2 3: HDI 4: Communication	0~3	0
P9.03	PID output characteristic	0: Positive 1: Negative	0~1	0
P9.04	Proportional gain (KP)	0.00~100.00	0.00~100.0	0.10s
P9.05	Integral time (Ti)	0.00~10.00s	0.01~10.00	0.10s
P9.06	Differential time (Td)	0.00~10.00s	0.00~100.0	0.01s

Function Code	Name	Description	Setting Range	Default
P9.07	Sampling cycle (T)	0.01~100.00s	0.00~100.0	0.00%
P9.08	Bias limit	0.0~100.0%	0.0~100.0	0.00%
P9.09	Feedback lost detecting value	0.0~100.0%	0.0~100.0%	0.00%
P9.10	Feedback lost detecting time	0.0~3600.0s	0.0~3600.0	1.0s
PA Group: Simple PLC and Multi-step Speed Control				
PA.00	Simple PLC	0: Stop after one cycle 1: Hold last frequency after one cycle 2: Circular run	0~2	0
PA.01	Simple PLC status saving after power off	0: Disabled 1: Enabled	0~1	0
PA.02	Multi-step speed 0	-100.0~100.0%	-100.0~100	0.00%
PA.03	0th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.04	Multi-step speed 1	-100.0~100.0%	-100.0~100	0.00%
PA.05	1st Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s

Function Code	Name	Description	Setting Range	Default
PA.06	Multi-step speed2	-100.0~100.0%	-100.0~100	0.00%
PA.07	2nd step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.08	Multi-step speed 3	-100.0~100.0%	-100.0~100	0.00%
PA.09	3rd step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.10	Multi-step speed 4	-100.0~100.0%	-100.0~100	0.00%
PA.11	4th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.12	Multi-step speed 5	-100.0~100.0%	-100.0~100	0.00%
PA.13	5th Step running time speed 6	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.14	Multi-step	-100.0~100.0%	-100.0~100	0.00%
PA.15	6th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.16	Multi-step speed 7	-100.0~100.0%	-100.0~100	0.00%
PA.17	7th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.18	Multi-step speed 8	-100.0~100.0%	-100.0~100	0.00%
PA.19	8th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s

Function Code	Name	Description	Setting Range	Default
PA.20	Multi-step speed 9	-100.0~100.0%	-100.0~100	0.00%
PA.21	9th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.22	Multi-step speed 10	-100.0~100.0%	-100.0~100	0.00%
PA.23	10th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.24	Multi-step speed 11	-100.0~100.0%	-100.0~100	0.00%
PA.25	11th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.26	Multi-step speed 12	-100.0~100.0%	-100.0~100	0.00%
PA.27	12th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.28	Multi-step speed 13	-100.0~100.0%	-100.0~100	0.00%
PA.29	13th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.30	Multi-step speed 14	-100.0~100.0%	-100.0~100	0.00%
PA.31	14th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.32	Multi-step speed 15	-100.0~100.0%	-100.0~100	0.00%

Function Code	Name	Description	Setting Range	Default
PA.33	15th Step running time	0.0~6553.5s(h)	0.0~6553.5	0.0s
PA.34	ACC/DEC time selection for step 0~7	0~0XFFFF	0~0XFFFF	0
PA.35	ACC/DEC time selection for step 8~15	0~0XFFFF	0~0XFFFF	0
PA.36	Simple PLC restart selection	0: restart from step 0 1: Continue from paused step	0~1	0
PA.37	Time unit	0: Second 1: Minute	0~1	0
PB Group: Protection Function				
Pb.00	Input phase-failure protection	0: Disabled 1: Enabled	0~1	1
Pb.01	Output phase-failure protection	0: Disabled 1: Enabled	0~1	1
Pb.02	Motor overload protection	0: Disabled 1: Normal motor(with low speed compensation) 2: Variable frequency motor (without low speed compensation)	0~2	2

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Function Code	Name	Description	Setting Range	Default
Pb.03	Motor overload protection current	20.0%~120.0% (rated current of the motor)	20.0~120.0	100.00%
Pb.04	Threshold of trip-free	70.0.0~110.0% (standard bus voltage)	70.0~110.0	80.00%
Pb.05	Decrease rate of trip-free	0.00~P0.03 (the Max. frequency)	0.00~P0.03	0.00Hz/s
Pb.06	Over-voltage stall protection	0: Disabled 1: Enabled	0~1	1
Pb.07	Over-voltage stall protection point	110~150%	110~150	120%
Pb.08	Auto current limiting threshold	50~200%	50~200	G model : 150.00% P model : 160.00%
Pb.09	Frequency decrease rate when current limiting	0.00~100.00Hz/s	0.00~100.0	10.00Hz/s
Pb.10	Auto current limiting selection	0: Enabled 1: Disabled when constant speed	0~1	0

Function Code	Name	Description	Setting Range	Default
Pb.11	Selection of overtorque (OL3)	0: No detection 1: Valid detection of overtorque during running,then continue running 2: Valid detection of overtorque during running,then warning and stop 3: Valid detection of overtorque during constant speed running , then continue running 4: Valid detection of overtorque during constant speed running, then warning and stop.	0~4	1
Pb.12	Detection level of overtorque	10.0%~200.0%(relative to the rated curent of the motor)	1.0~200.0	G model :150.0% P model :120%
Pb.13	Detection time of overtorque	0.1~60.0s	0.0~60.0	0.1s
Pb.14	reserved			
Pb.15	reserved			
PC Group: serial communication				
PC.00	Local address	0~247, 0 stands for the broadcast address	0~247	1

Function Code	Name	Description	Setting Range	Default
PC.01	Baud rate selection	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS	0~5	4
PC.02	Data format	0: RTU, 1 start bit, 8 data bits, no parity check, 1 stop bit. 1: RTU, 1 start bit, 8 data bits, even parity check, 1 stop bit. 2: RTU, 1 start bit, 8 data bits, odd parity check, 1 stop bit. 3: RTU, 1 start bit, 8 data bits, no parity check, 2 stop bit. 4: RTU, 1 start bit, 8 data bits, even parity check, 2 stop bit. 5: RTU, 1 start bit, 8 data bits, odd parity check, 2 stop bit.	0~5	1
PC.03	Communicatino delay time	0~200ms	0~200	5ms
PC.04	Communicatino timeout delay	0.0: Disabled 0.0~100.0s	0.0~100.0	0.0s
PC.05	Communicatino error action	0: Alarm and coast to stop 1: No alarm and continue to run 2: No alarm but stop	0~3	1

Function Code	Name	Description	Setting Range	Default
		according to P1.06(if P0.03=2) 3: No alarm but stop according to P1.06		
PC.06	Response action	Unit`s place of LED 0: Response to writing 1: No response to writing Ten`s place of LED 0: Reference not saved when power off 1: Reference saved when power off	00~11	0

Pd Group: Supplementary Function

PE Group: Factory Setting

8-TROUBLE SHOOTING

fault messages including the possible cause and corrective actions.This

chapter tells how to reset faults and view fault history.It also lists all alarm and

8.1 Fault and Trouble shooting

Fault Code	Fault Type	Reason	Solution
Out1	IGBT fault	1. Acc time is too short. 2. IGBT module fault. 3.Malfunction caused by interference. 4.Grounding is not properly	1. Increase Acc time. 2. Ask for support. 3. Inspect external equipment and eliminate interference.
OC1	Over-current when acceleration	1. Acc time is too short. 2.The voltage of the grid is too low. 3.The power of the inverter is too low.	1. Increase Acc time. 2. Check the input power 3. Select bigger capacity inverter.
OC2	Over-current when deceleration	1. Dec time is too short. 2. The torque of the load inertia is big 3. The power of the inverter is too low.	1. Increase Dec time. 2.Install a proper energy consumption braking components 3. Select bigger capacity inverter.
OC3	Over-current when constant speed running	1 The load transients or is abnormal. 2.The voltage of the grid is too low. 3.The power of the inverter is	1. Check the load or reduce the transient of the load 2. Check the input power supply 3. Select bigger capacity inverter.
OV1	Over-voltage when	1. The input voltage is Abnormal	1. Check the input power

Fault Code	Fault Type	Reason	Solution
	acceleration	2. Restart the running motor after sudden power loss.	2.Avoid restart-up after stopping
OV2	Over-voltage when deceleration	1. Dec time is too short. 2.The inertia of the load is big. 3.The input voltage is abnormal	1.Increase the Dec time 2.Increase the energy-consuming components 3. Check the input power
OV3	Over-voltage when constant speed running	1. The input voltage changes Abnormally. 2. The inertia of the load is big.	1. Install the input reactor 2.Add proper energy-consuming components
UV	DC bus Under-voltage	1. The voltage of the grid is low	1.Check the input power supply of the grid
OL1	Motor overload	1. The voltage of the power supply is 2. The motor setting rated current is incorrect. 3. The motor stall or load transients is too strong. 4.The power of the motor is too big.	1. Check the power of the supply Line 2. Reset the rated current of the motor 3. Check the load and adjust the torque lift 4. Select a proper motor.
OL2	Inverter overload	1. The acceleration is too fast 2. Reset the rotating motor 3. The voltage of the power supply is too low. 4. The load is too heavy.	1. Increase the ACC time 2. Avoid the restarting after stopping. 3. Check the power of the supply line 4. Select an inverter with bigger power

Fault Code	Fault Type	Reason	Solution
SPI	Input phase loss	Phase loss or fluctuation of input R,S,T	1. Check input power 2. Check installation distribution
SPO	Output phase loss	U, V, W phase loss input(or serious asymmetrical three phase of the load)	1. Check the output distribution 2. Check the motor and cable
OH1	Rectify IGBT overheat	1.Sudden overcurrent of the inverter 2.There is direct or indirect short circuit between output 3 phase 3.Air duct jam or fan damage 4.Ambient temperature is too high.	1. Refer to the overcurrent solution 2. Redistribute 3. Dredge the wind channel or 4. Low the ambient temperature
OH2	Inverter IGBT overheat	5.The wiring of the control panel or plug-ins are loose 6.The assistant power supply is damaged and the drive voltage is undervoltage 7.The bridge arm of the power module is switched on 8.The control panel is abnormal1. Refer to the overcurrent solution	5. Check and reconnect 6. Ask for service 7. Ask for service 8. Ask for service
EF	External fault	S1: External fault input terminal take effect	1. Check the external device input

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Fault Code	Fault Type	Reason	Solution
CE	Communication	1. The baud rate setting is incorrect. 2.Communication fault	1. Set proper baud rate 2. Press STOP/RST to reset and ask for help 3. Check the communication
		3.The communication is off for a long time.	connection distribution
ItE	Current detection fault	1. The connection of the control board is not good Assistant power is bad 2. Assistant power is damaged 3. Hoare components is broken 4. The modifying circuit is abnormal.	1. Check and reconnect 2. Ask for service 3. Ask for service 4. Ask for service
tE	Autotuning fault	1. The motor capacity does not comply with the inverter capability 2. The rated parameter of the motor	1.Change the inverter model 2.Set the rating parameters according to the nameplate of the motor
EEP	EEPROM fault	1. Error of controlling the write and read of the parameters 2. Damage to EEPROM	1.Press STOP/RST to reset 2. Ask for service
PIDE	PID feedback fault	1. PID feedback offline 2. PID feedback source disappear	1.Check the PID feedback signal wires 2.Check PID feedback source

Fault Code	Fault Type	Reason	Solution
bE	Braking unit fault	1. Braking circuit fault or damage to the braking pipes 2. The external braking resisitor is a little low	1.Check the braking unit and change new braking pipes 2.Increase the braking resistor
END	Time reach of factory setting	1. Trial time arrival	1. Ask for service
OL3	Overtorque	1. The acceleration is too fast 2. Reset the rotating motor 3. The voltage of the power supply is too low. 4. The load is too heavy.	1. Increase the ACC time 2. Avoid the restarting after stopping. 3.Check the power of the supply line 4. Select an inverter with bigger power 5. Adjust PB.11 to a proper value