TECO

Microprocessor Controlled
I G B T Driven
AC Motor Driver
Simple Instruction Manual

S310+ Series

380V Class

0.75~3.7kW
(1.7~6.7kVA)

Thank you for purchasing S310+ series inverter.
This manual helps you use the inverter quickly. For details, please visit the official website of Taian Technology (Wuxi) Co., Ltd. (http://www.taian-technology.com) and download the detailed instruction manual.

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S310+ Instruction Manual

Contents

Chapter 0 Preface

0.1 Preface

Please read the operation manual carefully to make the inverter fully functional and ensure safety of users.

In case of problems during use, please contact local dealer or technician of Taian Technology. Our professionals are glad to serve you.

※General instruction to users

The inverter is a precise electric and electronic product. To ensure your life and property safety, the manual provides「Danger」,「Caution」and other notes to remind you of the safety precautions to which you should pay attention and abide by during handling, installation, use and inspection.

Danger	Serious personal injury may be caused in case of improper operation.

Caution	Damage to the inverter or mechanical system may be caused in case of improper operation.

Danger

- Avoid electric shock, The DC container inside the inverter can be discharged 5 minutes after the power is removed. Please wait for 5 minutes after the power is removed. Do not touch the circuit board after power-off of the inverter and before the power indicator is off;
- Never perform wiring during power transmission or check the circuit board when the inverter is running;
- Do not change internal wiring, line and parts of the inverter without approval;
- Be sure to ground the grounding terminal of the inverter correctly.

Caution

- Do not perform withstand voltage test of internal parts and components of the inverter, as the semi-conductor parts may be damaged under high voltage;
- New connect the inverter output terminals U, V and W to AC power supply;
- Do not touch main circuit board of the inverter, as the CMOS integrated circuit may be affected and damaged by electrostatic discharge.

Chapter 1 Safety Precautions

1.1 Before power transmission

Danger

- Main circuit terminals must be correctly connected; specifically, terminals **L1**, **L2** and **L3** should never be mixed with **U**, **V** and **W** to avoid damage to the inverter during power transmission.

Caution

- The used supply voltage must be matched with input voltage of the inverter.
- Do not directly fetch the front cover, but hold the inverter cooling base during handling so as to prevent the front cover from falling off and avoid personal injury or damage to the inverter.
- Please mount the inverter on metallic and other non-flammable materials. Do not mount it on or near flammable materials to avoid fire.
- If multiple inverters are placed in a control cabinet, a cooling fan should be provided to control temperature inside the cabinet below 40℃ and prevent overheat or fire.
- Mount or remove the operation panel after the inverter is completely powered off; fix the panel as instructed in the drawing to avoid panel or display failure caused by poor contact.
- The provided 10V power supply is for internal contacts only, and should not be used for other external parts, such as sensor and electronic parts, so as to avoid impact on use of the product.

Warning

- The product series has passed IEC 61800-3 certification for use in restricted areas. As electromagnetic interference may be caused when the product is used under certain environment, proper tests should be performed before use, and attention should be paid to grounding.
- The function of motor overtemperature protection is not available.

Caution

- The product can only be installed and used by the qualified electrical professional only.
- Permanent wiring is required for installation of the product.

1.2 During power transmission

Danger

- The inverter still has control power supply in case of short time of interruption; therefore, whether the inverter starts up automatically after power recovery depends on setting of parameter 04-03.
- Whether the inverter runs after power-on depends on setting of parameters 00-03 and 04-09, as well as state of power switch/ operation switch (FWD/REV switch) (but not related to 04-03):

  1. When 00-03=0, the inverter will not start automatically after power-on again.
  2. When 00-03=1 and power switch or operation switch (FWD/REV switch) is turned off, the inverter will not start automatically after power-on again.
  3. When 00-03=1, power switch and operation switch are turned on and 04-09=0, the inverter will start automatically after power-on again.

  For safety consideration, please turn off power switch and operation switch after power outage to avoid damage to machine and personal injury in case of sudden power recovery.
- When 04-09=0, please refer to 04-09 instructions and suggestions to ensure personal and machinery safety.

1.3 Before operation

Danger

- Please check the used inverter capacity is the same with the setting of internal function parameter 12-00 before power transmission.

  Caution: The inverter will flicker for 2s under the supply voltage of 05-03 setting when power supply is turned on.

1.4 During operation

Danger

- Do not turn off or cut off the motor unit during operation to avoid overcurrent trip of the inverter and damage to main circuit under serious circumstance.

Danger

- Electric shock! Do not remove the front cover during power transmission.
- The motor will restart automatically after stop of operation when the function of auto restart is set; do not get close to the machine to avoid danger.
- The function of stop switch is effective only after setting. Please note that the stop switch is different from the emergency stop switch in use.
- Please check power supply is cut off prior to assembly/disassembly or inspection.

Caution

- Do not touch the cooling base, brake resistor and other hot parts.
- The inverter can easily speed up the motor; please check the allowable range of motor and machine.
- Please pay attention to relevant settings of brake unit and other optional parts.
- Do not check signal of circuit board during operation of the inverter.

Danger

- Please check power supply is cut off and the charging LED is off before assembly/disassembly or inspection.

1.5 During inspection and maintenance

Caution

- The inverter should be used in a -10℃~+50℃ (-10℃~+40℃ inside switchboard), 95%RH environment free of condensing, dropping water and metal dust.

Precautions for inverter scrapping

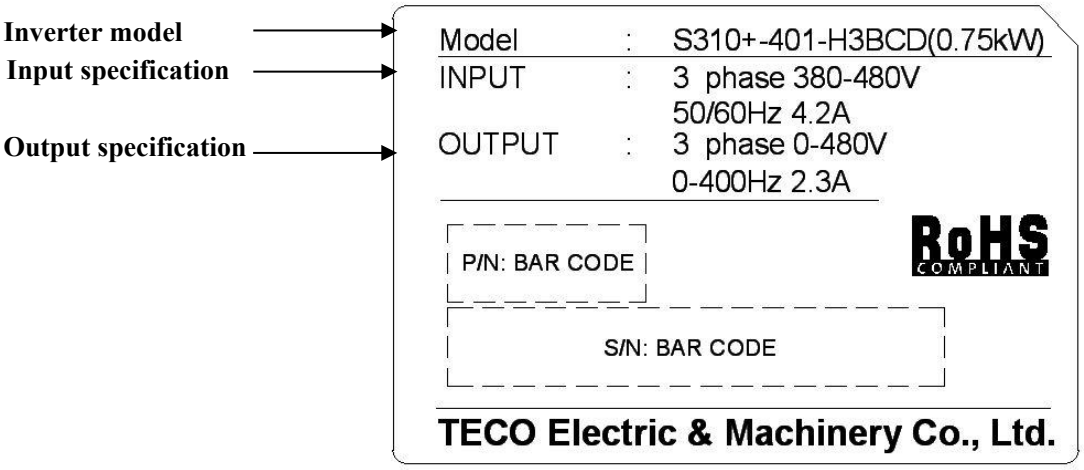
Caution

Please dispose the inverter as industrial waste and pay attention to the following:

- The electrolytic capacitor in main circuit and on the printed circuit board of the inverter may give rise to explosion during incineration;
- Poisonous gas may be generated during incineration of the inverter housing and other plastic parts.

Chapter 2 Model Explanation

2.1 Inverter nameplate



2.2 Model

S310+- 4 01- H 3 B C D

S310+ series

Input voltage:
4: 380V

Maximum applicable motor capacity
380V: 01: 1 HP
02: 2 HP
∫
05: 5 HP

Specification
H: Standard type

Power input
3: 3-phase input

B: Brake

C: RS485 communication

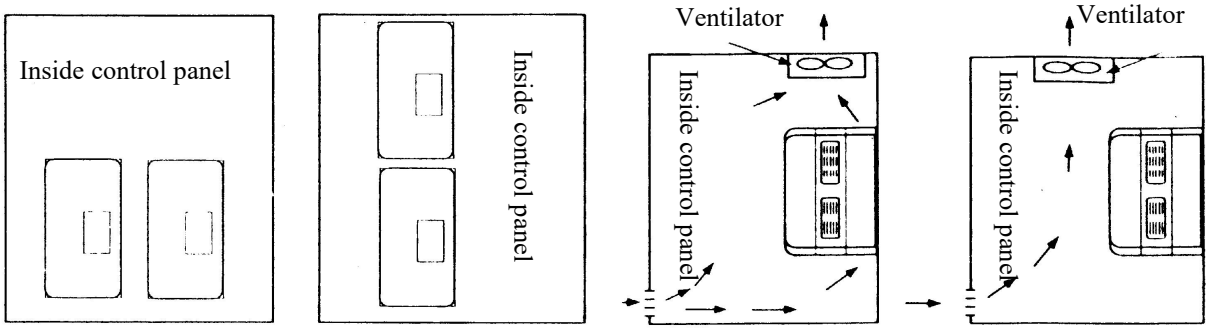
D: Operation panel

Chapter 3 Ambient Environment and Installation

3.1 Operating environment

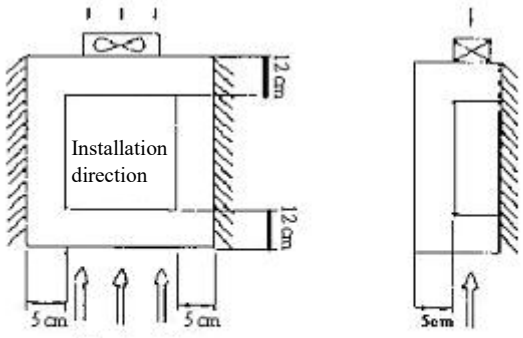
The installation environment has direct effect on normal function and service life of inverter. Therefore, the inverter installation environment must meet the following conditions:

- Ambient temperature: -10℃~+50℃ (-10℃~+40℃ inside switchboard)
- Protected from rainwater or moisture
- Protected from direct sunlight
- Protected from oil moist and salt erosion
- Protected from corrosive liquid and gas
- Protected from dust, cotton batting and metal debris intrusion
- Kept away from radioactive and inflammable materials
- Protected from electromagnetic interference (welding machine, power machine)
- Protected from vibration (punching machine); please mount anti-vibration pad to reduce vibration if it is unavoidable.
- When multiple inverters are installed in the control panel, the inverters should be properly positioned for heat dissipation, and cooling fan should be provided to control ambient temperature below 40℃.



(Correct installation) (Wrong installation) (Correct installation) (Wrong installation)

- The front side of inverter should face forward and top upward for heat dissipation.



Ventilation and convection

-10℃~+40℃

(a) Front (b) Side

3.2 Specification

3.2.1 Individual product specification

Three-phase, 380～480V machine type

Model: S310+-□□□-XXX	**401**	**402**	**403**	**405**
Horsepower (HP)	1	2	3	5
Applicable motor capacity (kW)	0.75	1.5	2.2	3.7
Rated current (A)	2.3	3.8	5.2	8.8
Rated capacity (kVA)	1.7	2.9	4.0	6.7
Max. input voltage	Three-phase 380～480V +10%-15%, 50/60Hz± 5%			
Max. output voltage	Three-phase 380～480V			
Input current (A)	4.2	5.6	7.3	11.6
Net weight (kg)	1.1	1.2	2.0	2.0
Allowable time of instantaneous outage (sec)	1.0	2.0	2.0	2.0

3.2.2 Common product specification

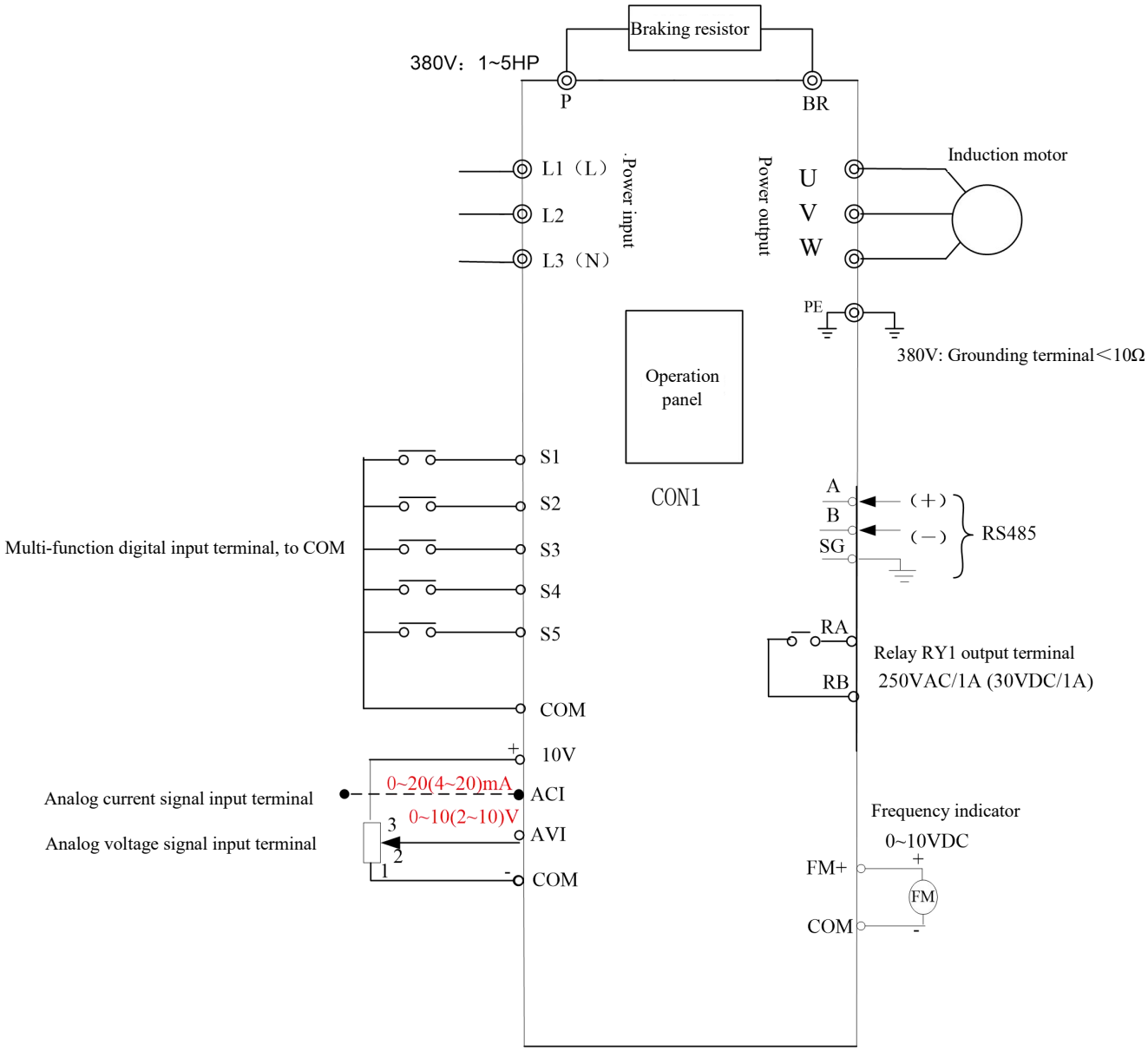
Item		S310+ series
Control mode		V/F or vector control
Frequency control	Range	0.01～400.00 Hz (setting range of upper and lower limits of panel frequency)
	Starting torque	140%/1Hz (vector mode)
	Speed control range	1: 50 (vector mode)
	Speed control accuracy	±1% (vector mode)
	Set resolution	Digital: 0.01Hz; analog: 0.02Hz/ 60Hz (12bit)
	Operation panel setting method	Use the keys ▲▼ or potentiometer knob on keypad for setting
	Display function	Five-digit LED and status LED; display of frequency/inverter parameters/fault record/program version etc.
	External signal setting method	1. External variable resistor input 0-10V/0-20mA (2-10V/4-20mA) 2. Multi-function contact on TM2 terminal block can be used for increase/decrease of frequency, segment speed control or automatic program running.
	Frequency limit	Upper/lower limit of frequency
General control	Carrier frequency	1 ～ 12 kHz
	V/F mode	6 fixed curves, 1 arbitrary curve
	Speed control	Acceleration/deceleration time (0.1-3600 s) and 4-segment S curve
	Multi-function analog output	5 functions (refer to 2-12 description)
	Multi-function input	16 functions (refer to 1-00~1-04, group 2 description)
	Multi-function output	6 functions (refer to 1-09 description)

	Other functions	Restart after instantaneous outage, overload detection, 8-segment speed, S curve acceleration/deceleration, 2/3-wire control, torque compensation, slip compensation, upper/low frequency limit, communication control (Modbus slave station connection and PC/PDA connection), abnormality reset

Item		S310+ series
Communication control		1. RS232 or RS485 control 2. One-to-one or one-to-many (for RS485 communication only) control 3. Setting of baud rate/stop bit/ check bit/data bit
Braking torque		About 20%, or over 100% if brake transistor and braking resistor are used in standard machine type
Operating temperature		-10℃~+50℃ (-10℃~+40℃ inside switchboard）
Storage temperature		-20～60℃
Humidity		Relative humidity 0 – 95% (no condensing)
Vibration resistance		1G (9.8m/s^2)
Protection grade		IP20
	FUSE protection	Motor stop after fuse burn-out
	Overvoltage	380V class: DC voltage＞820V
	Undervoltage	380V class: DC voltage＜380V
	Restart after instantaneous outage	Restart in the mode of speed tracking after instantaneous outage
	Stall prevention	Stall prevention during acceleration/ deceleration/ operation
	Other functions	Fault contact control, reversal limit, direct start after power-on, fault reset limit, parameter lock

3.3 Standard wiring diagram

Machine type/ model: S310+-401-H3/402-H3/403-H3/405-H3



※ Notes 1: Refer to description of main circuit terminals (P, BR) for use, and braking resistor specification for selection of resistance value.

2: Please avoid output grounding.

3.4 Description of inverter terminals

Main circuit terminals

Terminal symbol	Function description
L1	Main power input　Machine type 401/402/403/405: L1 / L2 / L3
L2	
L3	
BR	Braking resistor or connecting terminal: used in case of overvoltage trip of inverter caused by high load inertia or short deceleration time (refer to braking resistor specification), 380V: 1~5HP
P	
U	inverter output
V	
W	

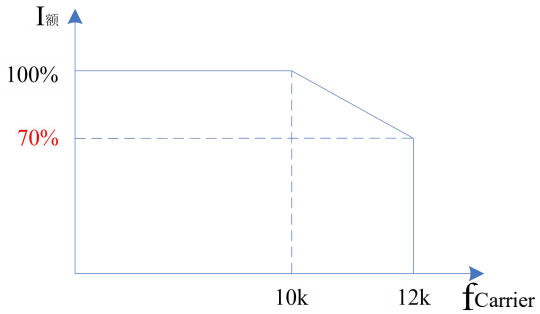
S310+ control circuit terminals

Terminal symbol	Terminal function description		
RB	Common terminal	Multi-function output terminal	Rated capacity of contact: (250VAC/1A or 30VDC/1A) Contact instruction: (refer to 01-09 description)
RA	Normally open contact		
10V	Potentiometer power terminal for frequency setting (third pin)		
AVI	Analog input terminal 0~10 (2~10) VDC (S310+-401/402/403/405-H3)		
ACI	Analog input terminal 0~20 (4~20) mA (S310+-401/402/403/405-H3)		
COM	S1～S5 common digital input terminals		
FM+	Multi-function analog output positive terminal (refer to 2-12 description), output terminal signal 0-10VDC (below 2mA)		
S1	Multi-function input terminal (refer to description of 1-00 ～ 1-05)		
S2			
S3			
S4			
S5			
A	(＋) (RS485 for communication)		
B	(－) (RS485 for communication)		
SG	To shielding ground (RS485 for communication)		

Derating curve as per carrier frequency

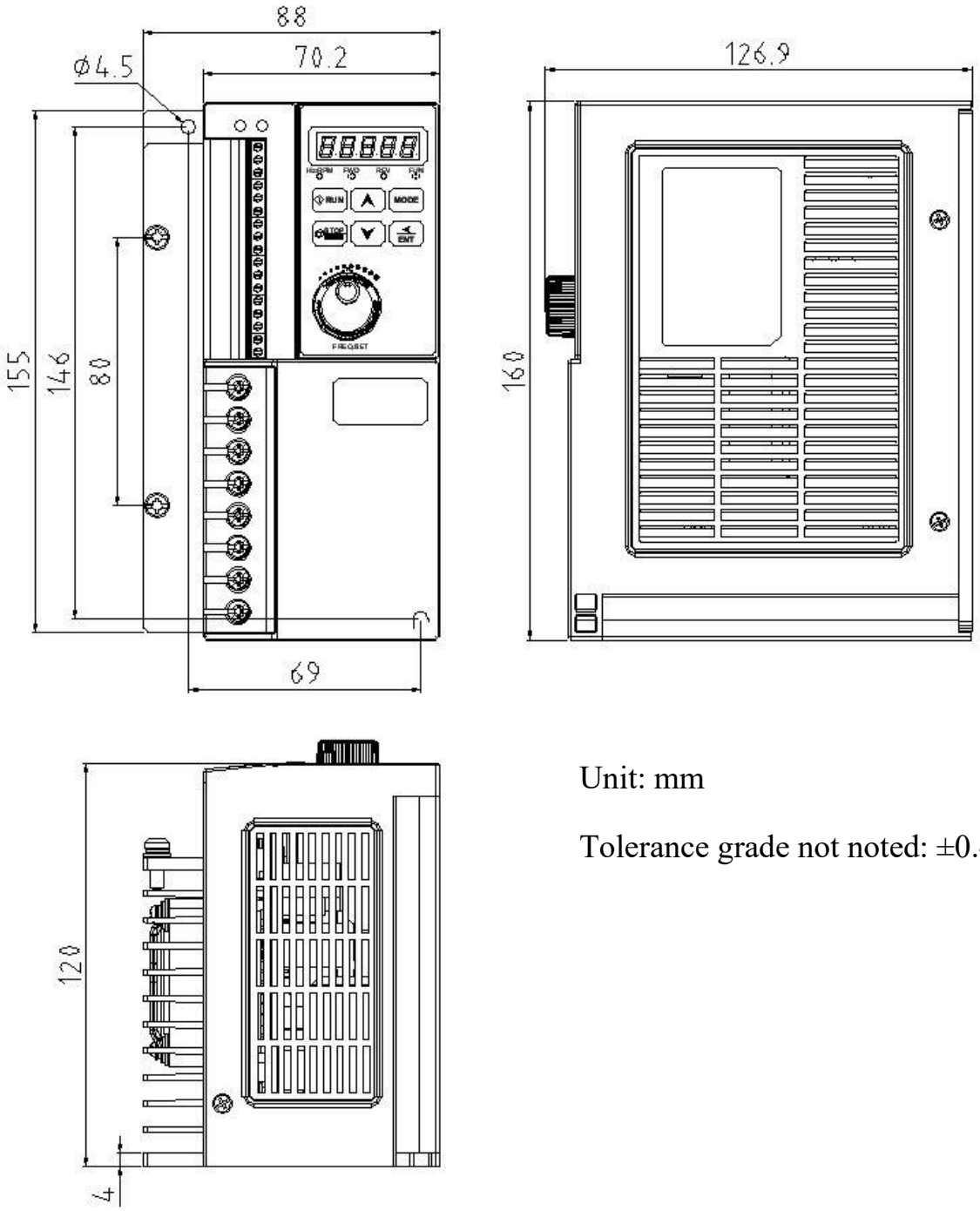
401/402/405 Derating not required

403 Derating as per the following curve



3.5 Outline drawing

(1) Type 1: Three-phase S310+-401-H3 (without fan);
Three-phase S310+-402-H3 (with fan);

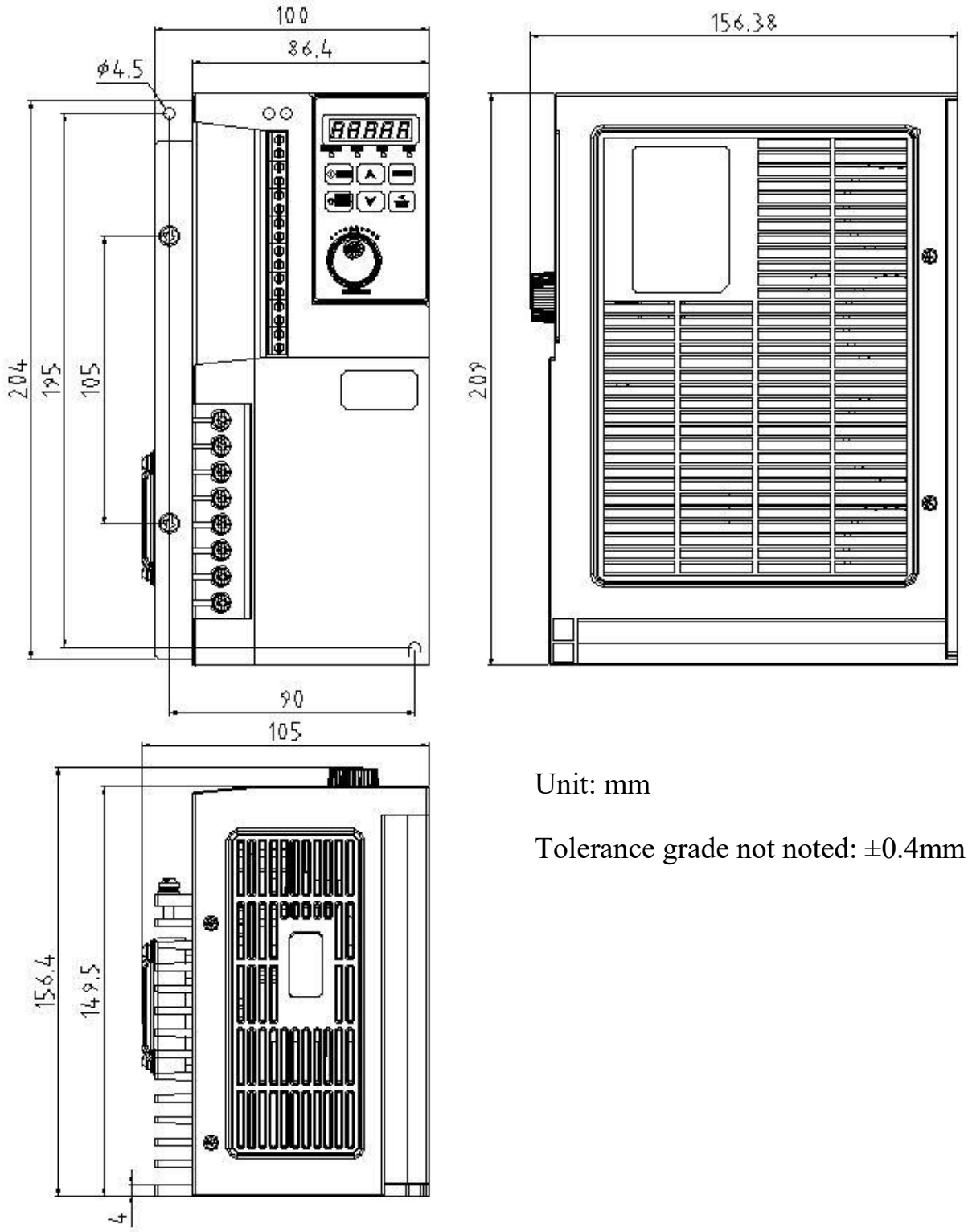


Unit: mm

Tolerance grade not noted: ±0.4mm

Machine type: S310+-401-H3
S310+-402-H3

(2) Type 2: Three-phase: S310+-403-H3 (without fan);
Three-phase: S310+-405-H3 (with fan)



Unit: mm

Tolerance grade not noted: ±0.4mm

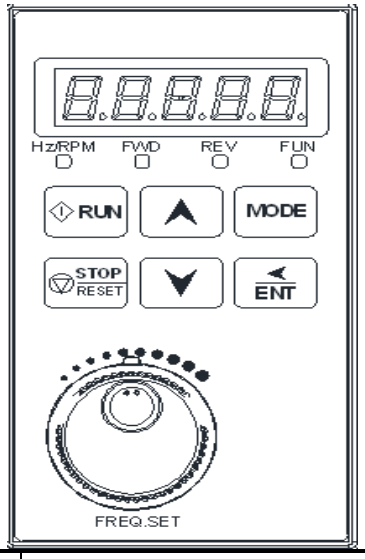
Machine type: S310+-403-H3
S310+-405-H3

Chapter 4 Software Index

4.1 Keypad Description

4.1.1 Keypad Display and Keys

401/402/403/405 models:

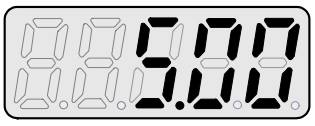
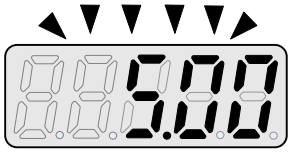
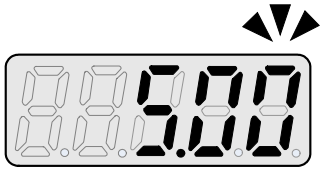


type	name	Description
DISPLAY	5 Digit LED Display	Monitor inverter signals, view / edit parameters, fault / alarm display.
		Hz/RPM: Frequency / Rotational Speed LED **FWD:** LED ON when inverter is running in forward direction, flashing when stopping. **REV:** LED ON when inverter is running in reverse direction, flashing when stopping. **FUN:** LED ON when keypad view parameters.
Potentiometer	Potentiometer on Keypad	**FREQ.SET** : Frequency can setting by knob.
6 KEYS	RUN	**RUN:** RUN Inverter in Local Mode
	STOP/RESET	**STOP:** STOP Inverter **RESET:** Used to reset fault condition.
	▲	Parameter navigation Up, Increase parameter or reference value.
	▼	Parameter navigation down, decrease parameter or reference value.
	MODE	
	</ ENT (Short press for <; long press for ENT)	**<:** Selects active seven segment digit for editing with the ▲▼ keys **ENT:** Used to read and save the value of the active parameter.

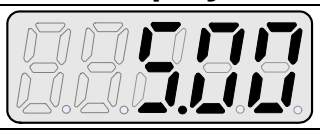
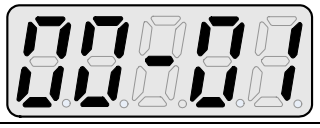
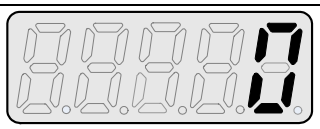
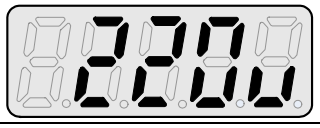
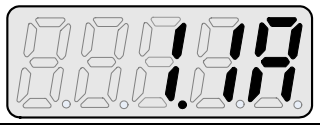
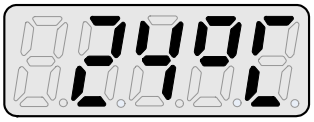
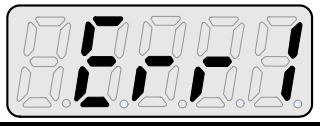
4.1.2 Display Description

Eight Segment Display Description

Actual	Display	Actual	Display	Actual	Display	Actual	Display
0		A		L		Y	
1		b		n		-	
2		C		o		°	
3		d		P		_	
4		E		q		.	
5		F		r			
6		G		S			
7		H		t			
8		I		u			
9		J		V			

Display output frequency	Set Frequency Reference	
LED lights on	LED flashes	Selected flashes
		

LED Digital tube display

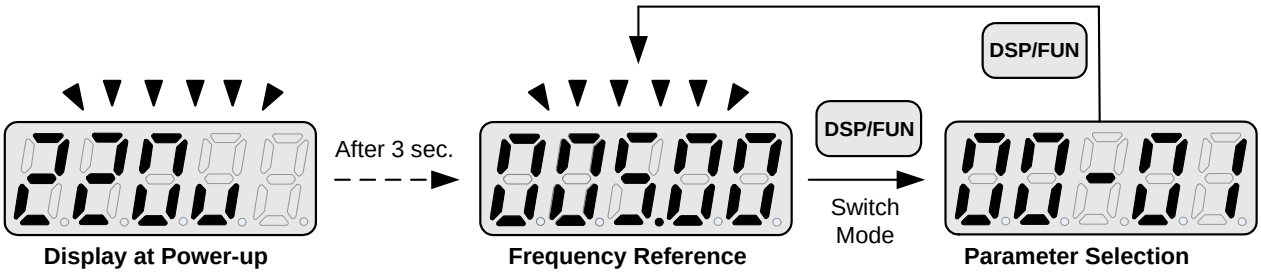
Display	Description
	1. Displays the frequency reference at stop operation. 2. Displays the actual output frequency during run operation.
	Displays parameter code.
	Displays the setting value of parameter.
	Displays input voltage.
	Displays inverter current.
	Displays DC Bus Voltage.
	Displays temperature.
	Error display, refer to chapter 5 Troubleshooting and Maintenance.

LED Indicator Description

	LED Illuminated		LED flashing	
	Display		**Display**	
Frequency / Rotational Speed LED	Hz/RPM	Illuminated when display frequency or rotational Speed.		
Display mode LED	FUN	Illuminated when not display frequency or rotational Speed.	FUN	Flashing :Starting fire mode when display frequency.
Forward LED	FWD	Illuminated when Inverter is running in forward direction.	FWD	Flashing when forward direction active, no run command.
Reverse LED	REV	Illuminated when Inverter is running in reverse direction.	REV	Flashing when reverse direction active, no run command.

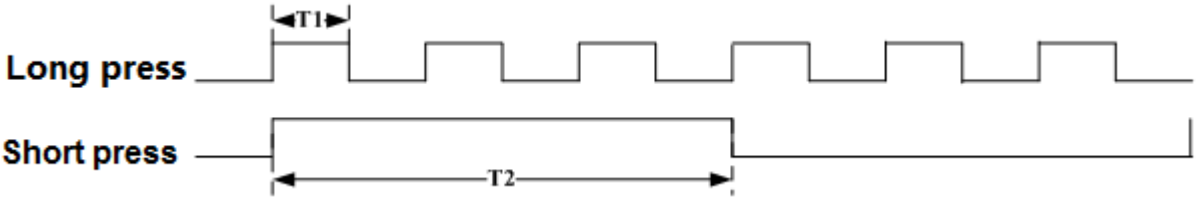
4.1.3 Function of digital tube display

Basic display:



Special keys：

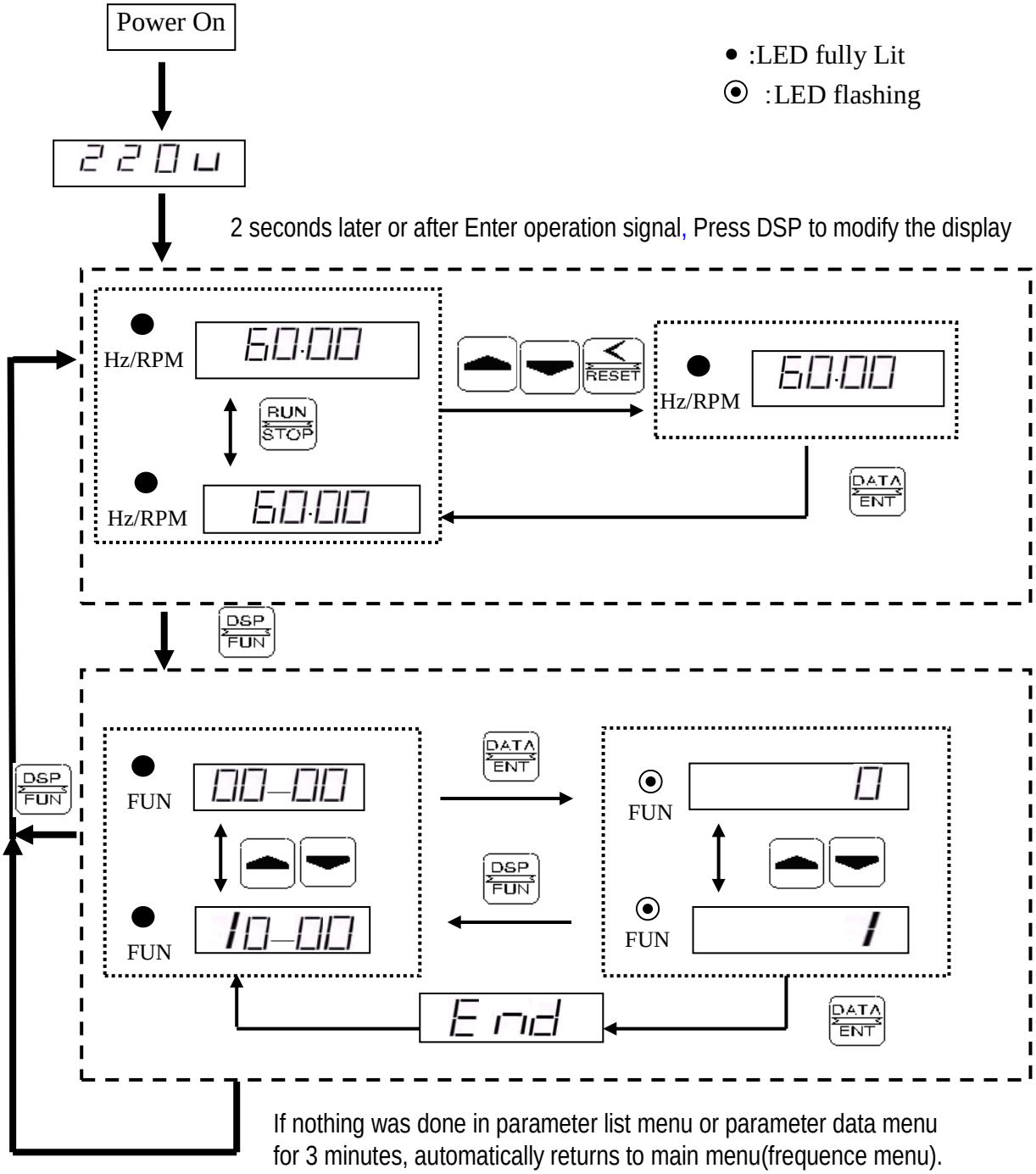
▲/ ▼ :



The digits can be selected by short press and can only change one unit；the select digits can be changed continuously by long press.

4.1.4 Operational examples of Keypad

Operation Instruction of the LED keypad



The instructions for the Power and Alarm LED of the inverter are as follows:

Power indicator light:

On power up, Power LED action, otherwise Power LED Turn off

Alarm indicator light:（note1:）

a. When the inverter have mistakes which cannot be reseted, such as:

CTER,EPR,OH,LV,OV,OC，the Alarm LED flashes quickly

b. When the inverter have mistakes which can be reseted, such as:

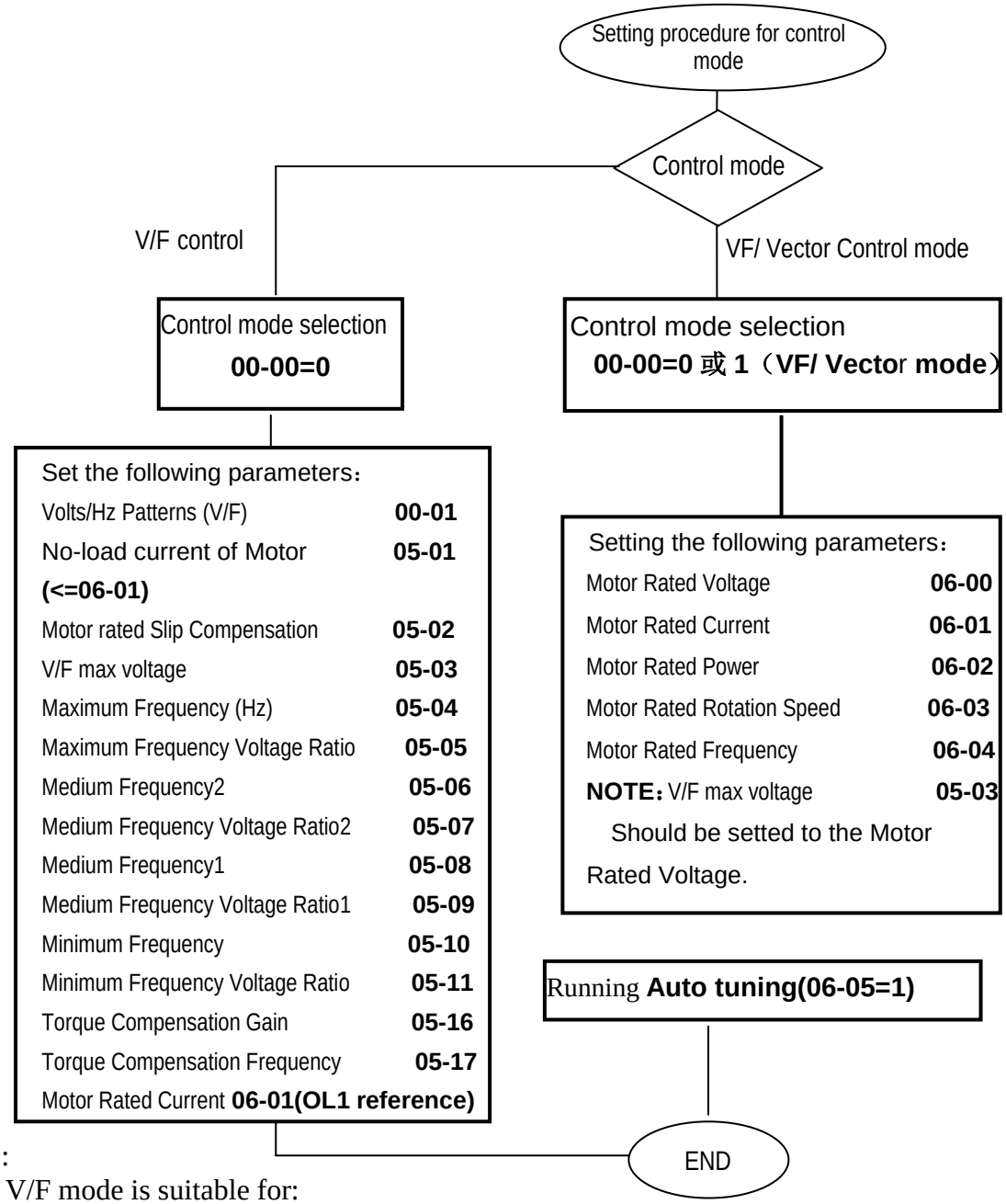
OH-C, OV-C, OC-S, OC-d, OC-C, OC-a, OL2, OL1, the Alarm LED flashes slowly

4.1.5 Control Mode Selection

The inverter provides two control modes:

1、V/F mode 2、General Vector Control Mode

2、 Users can set the control mode according to their own application.The inverter default Value is V/F mode. Please set control mode and motor related parameters according to the following procedure before using(The Vector control mode mode only suitable for the motors with the same power rating as the inverter, or one size bigger or smaller, only suitable for the motors with the same power rating as the inverter).



※ NOTE:

1. The V/F mode is suitable for:

(1) A inverter loads multiple motors at the same time.

(2) The motor nameplate is unknown，Or the motor specification is special causing Auto-tuning fail。

(3) The inverter and the horsepower of the motor differ more than one level.

2. If a inverter loads multiple motors, only V/F mode can be chosen,and should follow these principles:

(1) Motor rated current (06-01)will add up all the rated current of the motors。

(2) The others set the appropriate V/F curve parameters (05-04 ~ 05-09).

3. When the motor nameplate is unknown，the inverter will be setted to the internal value of TECO standard motor parameters.

4.2 S310+ Programmable Functions List

Parameter group	**Parameter group** description
Group 00	Basic Parameters
Group 01	External terminal digital signal input function group
Group 02	External terminal analog signal input function group
Group 03	Preset Frequency function group
Group 04	Start/Stop command group
Group 05	V/F command group
Group 06	Motor parameters group
Group 07	Protection function group
Group 08	Communication function group
Group 09	Reserved
Group 10	Assistant function group
Group 11	Keypad display group
Group 12	User parameter group
Group 13	Auto Run(Auto Sequencer) function group

Parameter Attribute	
***1**	**Parameters can be changed during run operation.**
***2**	**Parameters can not be changed during** communication.
***3**	**Parameters will not reset to default during a factory reset (initialization).**
***4**	**Parameters will be changed in reset mode.**
***5**	**Only used for V/F control mode.**

Group 00: Basic Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
00-00	Control Mode Selection	0:V/F mode 1: SLV mode	**0**	**-**	
00-01	Volts/Hz Patterns (V/F)	1～7	**1/4**	**-**	***5**
00-02	Motor rotation	0: Forward 1: Reverse	**0**	**-**	***1**
00-03	Main Run Command Source Selection	0: Keypad 1: External Run/Stop Control 2: Communication	**0**	**-**	
00-04 Reserved					
00-05	Main Frequency Command Source Selection	0: Keypad 1: Potentiometer on Keypad 2: External AVI Analog Signal Input 3: Communication Control 4: Pulse Input 5: Terminal Command UP/DOWN	**0**	**-**	
00-06 Reserved					
00-07	Frequency Upper Limit (Hz)	0.01~400.00	**50.00/60.00**	**Hz**	
00-08	Frequency Lower Limit (Hz)	0.00~399.99	**0.00**	**Hz**	
00-09	Acceleration Time 1(S)	0.1~3600.0	**10.0**	**Sec**	***1**
00-10	Deceleration Time 1(S)	0.1~3600.0	**10.0**	**Sec**	***1**
00-11	Operation modes for external terminals	0: Forward/Stop-Reverse/Stop 1: Run/Stop-Forward/Reverse 2: 3-Wire Control Mode-Run/Stop 3: 4 –Wire pulse Control Mode-Run/Stop	**0**		
00-12	Jog Frequency (Hz)	1.00~25.00	**2.00**	**Hz**	***1**
00-13	Jog Acceleration Time (MFIT) (Seconds)	0.1~25.5	**0.5**	**Sec**	***1**
00-14	Jog Deceleration Time (MFIT) (Seconds)	0.1~25.5	**0.5**	**Sec**	***1**
00-15	**Communication Frequency Command**	**0~400.0**		**Hz**	**Read only**
00-16	**Frequency Command Memory Mode**	**0：Communication Frequency Command before Power-off not Memorized 1：Communication Frequency Command before Power-off Memorized**	**0**		
00-17	**Acceleration Time 2**	**0.1~3600.0**	**10.0**	**Sec**	***1**
00-18	**Deceleration Time 2**	**0.1~3600.0**	**10.0**	**Sec**	***1**
00-19	**Acceleration/ Deceleration Switching Frequency**	**0.00~400.00**	**0.00**	**Hz**	
00-20	**Parameter Storage Selection**	**0：Multi-speed，acceleration and deceleration times are not stored EEPROM 1：Multi-speed，acceleration and deceleration times are stored EEPROM**	**1**		

Group 01- External terminal digital signal input function group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
01-00	Multifunction Input Term. S1	**0:** Forward/Stop Command	**0**	**-**	
01-01	Multifunction Input Term. S2	**1:** Reverse/Stop Command	**1**	**-**	
01-02	Multifunction Input Term. S3	**2:** Preset Speed unit 0 (3-02)	**5**	**-**	
01-03	Multifunction Input Term. S4	**3:** Preset Speed unit 1 (3-03)	**6**	**-**	
01-04	Multifunction Input Term. S5	**4:** Preset Speed unit 2 (3-05)	**8**	**-**	
		5: Jog Command			
		6: Emergency Stop**(**decelerate to zero and stop)			
		7: Base Block (rotation freely to stop)			
		8: Fault Reset (RESET)			
		9: Auto Running Mode			
		10: Speed up			
		11: Slow Down			
		12: Pulse input - Pulse width measurement (S5)			
		13: Pulse input - Frequency measurement (S5)			
		14: UP Frequency Increasing Command			
		15: DOWN Frequency Decreasing Command			
01-05	Speed up / Slow Down Value	**0～ 100**	**20**	**%**	
01-06	Multifunction terminal S1~ S5 confirm the scan times	**1~200**	**10**	**2mS**	
01-07	UP/DOWN Frequency Detection Width	**0.00~5.00**	**0.00**	**Hz**	
01-08	UP/DOWN Frequency Hold/Adjust Selection	When an increase/decrease frequency command is used, when the converter stops running, the set frequency will be maintained.	**0**	**-**	
		1: The setting frequency will be normalized to 0 Hz			
		2: The setting frequency will be maintained, and the increase/decrease frequency function will be effective when the machine stops.			
01-09	Output Relay RY1 Operation mode	0: Run	**0**	**-**	
		1: Frequency Reached (Running Frequency Reached setting value)			
		2: Fault			

		3: Any Frequency matches (1-11±1-12)			
		4: Frequency Threshold Level (> 1-11) - Frequency Reached 1			
		5: Frequency Threshold Level (> 1-11) - Frequency Reached 2			
		6: Setting value reached			
		7: Current value reached			
01-10	Relay output contact mode	0:A contact (Normal open) 1:B contact (Normal close)	**0**		
01-11	Frequency Output Setting (Hz)	**0.00~400.00**	**0.00**	**Hz**	***1**
01-12	Frequency Detection Range	**0.00~30.0040**	**2.00**	**Hz**	***1**
01-13	S1~ S5 switch type select NO(Normal open) NC(Normal close)	xxxx0: s1 NO xxxx1: s1 NC xxx0x: s2 NO xxx1x: s2 NC xx0xx: s3 NO xx1xx: s3 NC x0xxx: s4 NO x1xxx: s4 NC 0xxxx: s5 NO 1xxxx: s5 NC	**00000**		
01-14	Input pulse frequency (Pulse width measurement)	**0.01~0.20**	**0.1**	**kHz**	

Group 01- External terminal digital signal input function group

Code	Parameter Name	Setting Range	Default	Unit	Attribute
01-15	Pulse frequency multiple	**0.01~9.99**	**1.00**		
01-16	Pulse input filtering coefficient	**0~100**	**5**		
01-17	Count value reaches the setting value	**0~9999**	**0**		
01-18	Pulse input counting filtering coefficient	**1~100**	**1**		
01-19	Current reaches the alignment	**0.1~15.0**	**0.1**	**A**	
01-20	Current arrives to detect the delay time	**0.1~15.0**	**0.1**	**Sec**	

Group 02- External terminal analog signal input function group

Code	Parameter Name	Setting Range			Default	Unit	Attribute
02-00	AVI(AIN) and ACI analog Input signal type select	value	AVI(AIN)	ACI	**0**	**-**	
		0	0~10V or(0~20mA)	0~20mA			
		1	0~10V or(0~20mA)	4~20mA			
		2	2~10V or(4~20mA)	0~20mA			
		3	2~10V or(4~20mA)	4~20mA			
02-01	AVI(AIN) signal scanning and filtering time	**1~200**			**100**	**2mSec**	
02-02	AVI(AIN) Gain	**0 ~ 200**			**100**	**%**	***1**
02-03	AVI(AIN) Bias	**0 ~ 100**			**0**	**%**	***1**
02-04	AVI(AIN) Bias Selection	0: Positive 1: Negative			**0**	**-**	***1**
02-05	AVI(AIN) signal directional control selection	0: Positive 1: Negative			**0**	**-**	***1**
02-06	ACI Function selection	0:PID feedback signal (terminal ACI) 1:ACI deviation signal input (terminal ACI)			**0**		
02-07	ACI signal scanning	**1~200**			**100**	**2mSec**	

	and filtering time				
02-08	ACI Gain	**0 ~ 200**	**100**	**%**	***1**
02-09	ACI Bias	**0 ~ 100**	**0**	**%**	***1**
02-10	ACI Bias Selection	0: Positive 1: Negative	**0**	**-**	***1**
02-11	ACI signal directional control selection	0: Positive 1: Negative	**0**	**-**	***1**
02-12	Analog Output mode(FM+)	0: Output Frequency 1: Frequency Setting 2: Output Voltage 3: DC Bus Voltage 4: Output Current 5:AVI analog input value 6:AVI analog Input calibration value 7:ACI analog input value 8:ACI analog Input calibration value	**0**	**-**	***1**
02-13	Analog Output Gain	**0 ~ 200**	**100**	**%**	***1**
02-14	Analog Output filtering coefficient	**0 ~ 100**	**5**	**%**	***1**

Group 03- Multi-Speed Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
03-00	Acceleration and Deceleration Selection of Multi-Speed	0: Part acceleration and deceleration time are set by acceleration and deceleration time1 1: Part acceleration and deceleration time are set by independently	**0**	**-**	
03-01	Frequency Setting of Speed-Stage 0	**0.00 ~ 400.00**	**5.00**	**Hz**	***1**
03-02	Frequency Setting of Speed-Stage 1	**0.00 ~ 400.00**	**5.00**	**Hz**	***1**
03-03	Frequency Setting of Speed-Stage 2	**0.00 ~ 400.00**	**10.00**	**Hz**	***1**
03-04	Frequency Setting of Speed-Stage 3	**0.00 ~ 400.00**	**15.00**	**Hz**	***1**
03-05	Frequency Setting of Speed-Stage 4	**0.00 ~ 400.00**	**20.00**	**Hz**	***1**
03-06	Frequency Setting of Speed-Stage 5	**0.00 ~ 400.00**	**25.00**	**Hz**	***1**
03-07	Frequency Setting of Speed-Stage 6	**0.00 ~ 400.00**	**30.00**	**Hz**	***1**
03-08	Frequency Setting of Speed-Stage 7	**0.00 ~ 400.00**	**35.00**	**Hz**	***1**
03-09~03-16 Reserved					
03-17	Acceleration Time Setting of Multi Speed 0	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-18	Deceleration Time Setting of Multi Speed 0	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-19	Acceleration Time Setting of Multi Speed 1	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-20	Deceleration Time Setting of Multi Speed 1	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-21	Acceleration Time Setting of Multi Speed 2	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**

03-22	Deceleration Time Setting of Multi Speed 2	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-23	Acceleration Time Setting of Multi Speed 3	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-24	Deceleration Time Setting of Multi Speed 3	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-25	Acceleration Time Setting of Multi Speed 4	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-26	Deceleration Time Setting of Multi Speed 4	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-27	Acceleration Time Setting of Multi Speed 5	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-28	Deceleration Time Setting of Multi Speed 5	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-29	Acceleration Time Setting of Multi Speed 6	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-30	Deceleration Time Setting of Multi Speed 6	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**

Group 03- Multi-Speed Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
03-31	Acceleration Time Setting of Multi Speed 7	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-32	Deceleration Time Setting of Multi Speed 7	**0.1 ~ 3600.0**	**10.0**	**Sec**	***1**
03-33~03-48 Reserved					

Group 04- Start/stop command group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
04-01	Stopping Method Selection	0: Enhanced braking capacity 1: Coast to stop	**0**	**-**	
04-02 Reserved					
04-03	Momentary Power Loss and Restart	0: Momentary Power Loss and Restart disable 1: Momentary power loss and restart enable	**0**	**-**	
04-04~04-07 Reserved					
04-08	Reset Mode Setting	0: Enable Reset Only when Run Command is Off 1: Enable Reset when Run Command is On or Off	**0**	**-**	
04-09	Direct Running After Power Up	0: Enable Direct running after power up 1: Disable Direct running after power up	**1**	**-**	
04-10~04-14 Reserved					
04-15	DC Injection Brake Start Frequency @stopped	**0.10 ~ 10.00**	**1.5**	**Hz**	
04-16	DC Injection Brake Level @stopped	**0 ~ 20**	**5**	**%**	
04-17	DC Injection Brake Time@stopped	**0.0 ~ 25.5**	**0.5**	**Sec**	
04-18	DC Injection Brake@running	0：DC Injection Brake @running enable 1：DC Injection Brake @ running disable	**0**	**-**	
04-19	Brake chopper enable alignment	**400V：550.0~800.0**	**690**	**V**	
04-20	STP2 enable	0：enable 1：disable	**1**		

Group 05- V/F command group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
05-00	Reserved				
05-01	No-load Current of Motor	-----		Amps	***5**
05-02	Motor rated Slip Compensation	**0.0 ~100.0**	**0.0**	**%**	***5**
05-03	V/f max voltage	**400.0V:323.0~528.0**	**380.0**	**Vac**	
05-04	Maximum Frequency	**0.20 ~ 400.00**	**50.00/60.00**	**Hz**	***5**
05-05	Maximum Frequency Voltage	**400V:0.0 ~ 528.0**	**380.0**	**Vac**	***5**
05-06	Medium Frequency2	**0.10 ~ 400.00**	**2.50/3.00**	**Hz**	***5**
05-07	Medium Frequency Voltage 2	**400V:0.0 ~ 528.0**	**30.4**	**Vac**	***5**
05-08	Medium Frequency1	**0.10 ~ 400.00**	**2.50/3.00**	**Hz**	***5**
05-09	Medium Frequency Voltage 1	**400V:0.0 ~ 528.0**	**30.4**	**Vac**	***5**
Group 05- V/F command group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
05-10	Minimum Frequency	**0.10 ~400.00**	**1.50**	**Hz**	***5**
05-11	Minimum Frequency Voltage	**400V:0.0 ~ 528.0**	**22.8**	**Vac**	***5**
05-12	Reserved				
05-13	Slip compensation Low-pass Filter time	**0.05 ~10.00**	**0.10**	**mS**	***5**
05-14	Reserved				
05-15	Auto-Torque compensation Filter time coefficient	**0.1~1000.0**	**0.1**	**-**	***1*5**
05-16	Auto-Torque compensation gain	**0~200**	**35**	**%**	***1*5**
05-17	Auto-Torque compensation frequency	**1.00~5.00**	**1.00**	**Hz**	***1**
05-18	**Dehunt Filter Coefficient**	**1~8192**	**800**	**-**	
05-19	**Dehunt Gain**	**0~100**	**0**	**%**	
05-20	**Dehunt Restriction**	**0~100.0**	**5.0**	**%**	
05-21	**No-load Oscillation Suppression Gain**	**0~200.0**	**0**	**%**	***1**

Group 06- Motor Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
06-00	Motor rated voltage	-----		**Vac**	***4**
06-01	Motor rated current	-----		**A**	***4**
06-02	Motor rated power	-----		**kW**	***4**
06-03	Motor rated Speed	-----		**RPM**	***4**
06-04	Motor rated Frequency	-----		**Hz**	***4**
06-05	Motor parameters automatic tuning	0: Disable 1: Perform static self-learning of motor parameters	**0**		
06-06	Stator resistance gain	-----		**Rs**	***4**
06-07	Rotor resistance gain	-----		**Rr**	***4**
06-08	Equivalent inductance gain	-----		**1kg**	***4**
06-09	Magnetizing current gain	-----		**imag**	***4**

06-10	Iron loss conductance gain	-----		**gm**	***4**
06-11	Deadtime gain	**0~100**	**100**		***4**

Group 07- Protection Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
07-00	Stall Prevention Function	xxxx0: Stall prevention is enabled in acceleration xxxx1: Stall prevention is disabled in acceleration. xxx0x: Stall prevention is enabled in deceleration. xxx1x: Stall prevention is enabled in deceleration. xx0xx: Stall prevention is enabled in operation xx1xx: Stall prevention is disabled in operation x0xxx: Enable over voltage Prevention in deceleration x1xxx: Disable over voltage Prevention in deceleration	**00000**	-	***1**
07-01	Stall Prevention Level During Acceleration (%)	**50 ~ 200**	**160**	**%**	
07-02	Stall Prevention Level During deceleration (%)	**50 ~ 200**	**160**	**%**	
Group 07- Protection Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
07-03	Stall Prevention Level In Run Mode (%)	**50 ~ 200**	**160**	**%**	
07-04	over voltage Prevention Level in Run Mode (%)	**80~100 （OV %）**	**100**	**%**	
07-05	Electronic Motor Overload Protection Operation Mode OL1	0: Enable motor Protect by relay 1: Disable motor Protect by relay	**1**	-	
07-06~07-12 Reserved					
07-13	OH over heat Protection (cooling fan control)	0: Auto (Depends on temp.) 1: Operate while in RUN mode 2: Always Run 3: Disabled	**1**	-	
07-14	**Motor Overload Protection OL3**	**0： Motor overload protection OL3 is effective** **1： Motor overload protection OL3 is not effective**	**1**		
07-15	**OL3 manual reset time**	**0.0~5.0min**	**0**	**min**	
07-18	OL2 protection reset time	**1.0~10.0**	**5.0**		

Group 08- Communication function group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
08-00	Assigned Communication Station Number	**1~ 32**	**1**	**-**	***2*3**
08-01	RTU/ASCII slection	**0：RTU code** **1：ASCII code**	**0**		***2*3**
08-02	Baud Rate Setting (bps)	**0:2400** **1:4800** **2:9600** **3:19200** **4:38400**	**3**	**bps**	***2*3**
08-03	Stop Bit Selection	0: 1 Stop Bit 1: 2 Stop Bits	**0**	**-**	***2*3**
08-04	Parity Selection	0: Without Parity	**0**	**-**	***2*3**

		1: With Even Parity 2: With Odd Parity			
08-05	Data Format Selection	0: 8-Bits Data 1: 7-Bits Data 1: 7-Bits Data	**0**	**-**	***2*3**
08-06	Communication time-out detection time	**0.0~25.5**	**0.0**	**Sec**	
08-07	Communication time-out operation selection	0: Deceleration to stop 1: Coast to stop 2: continue operating.	**0**	**-**	
08-08	Err6 fault tolerance times	**1~20**	**3**		

Group 09- PID Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
09-00	PID mode selection	0: Disable 1: Bias D Control (Fwd/Rev,positive Characteristics) 2: Feedback D Control (Fwd/Rev ,positive Characteristics) 3.Bias D Control (Fwd/Rev, Reversed Characteristics)	**0**		
Group 09- PID Parameters					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
09-00	PID mode selection	4: Feedback D Control (Fwd/Rev, Reversed Characteristics)	**0**		
09-01	Feedback Gain coefficient	**0.00 ~ 10.00**	**1.00**		*1
09-02	Proportional Gain	**0.0 ~ 10.0**	**1.0**	**%**	
09-03	Integral Time	**0.0 ~ 100.0**	**10.0**	**Sec**	
09-04	Differential Time	**0.00 ~ 10.00**	**0.00**	**Sec**	
09-05	PID Offset	0: Positive 1: Negative	**0**		
09-06	PID Offset Adjust	**0 ~109**	**0**	**%**	
09-07	PID Output Lag Filter Time	**0.0 ~ 2.5**	**0.0**	**Sec**	
09-08	Feedback Loss Detection Mode	**0**: Disabled **1**: Enabled - Drive Continues to Operate After Feedback Loss **2**: Enabled - Drive "STOPS" After Feedback Loss	**0**		
09-09	Feedback Loss Detection Level	**0 ~ 100**	**0**		
09-10	Feedback Loss Detection Delay Time	**0.0 ~25.5**	**1.0**	**Sec**	
09-11	Integration Limit Value	**0 ~ 109**	**100**		
09-12~09-13 Reserved					
09-14	Sleep Frequency Level	**0.00~400.00**	**0.00**	**Hz**	
09-15	Sleep Function Delay Time	**0.0 ~25.5**	**0.0**	**Sec**	
09-16	Wake up frequency Level	**0.00 ~ 400.00**	**0.00**	**Hz**	
09-17	Wake up function Delay Time	**0.0 ~ 25.5**	**0.0**	**Sec**	

Group 10- Assistant function group

Code	Parameter Name	Setting Range	Default	Unit	Attribute
10-01	Reverse operation control	0: Reverse command is enabled 1: Reverse command is disabled	0		
10-02 Reserved					
10-03	Carrier Frequency	1~12	5	kHz	
10-04	Carrier mode Selection	0: Carrier mode 0 1: Carrier mode 1	1		
10-05~10-06 Reserved					
10-07	S-Curve Acc/Dec 1	0.0 ~4.0	0.0	Sec	
10-08	S-Curve Acc/Dec	0.0 ~ 4.0	0.0	Sec	
10-09	S-Curve Acc/Dec 3	0.0 ~ 4.0	0.0	Sec	
10-10	S-Curve Acc/Dec 4	0.0 ~ 4.0	0.0	Sec	
10-11~10-15 Reserved					
10-16	Automatic Voltage Regulation (AVR)	0: Enable 1: Disable	0		
10-17	Carrier Output Tuning with temperature	0: Enable 1: Disable	0		

Group 11- Keypad display group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
11-00	Display Mode	xxxx0: Disable Motor Current Display xxxx1: Enable Motor Current Display xxx0x: Disable Motor Voltage Display xxx1x: Enable Motor Voltage Display xx0xx: Disable Bus Voltage Display xx1xx: Enable Bus Voltage Display x0xxx: Disable temperature Display x1xxx: Enable temperature Display	**00000**		***1**
11-01	Custom Units (Line Speed) Value	**0 ~ 65535**	**1500/ 1800**		***1**
11-02	Custom Units (Line Speed) Display Mode	0: Drive Output Frequency is Displayed 1: Line Speed is Displayed in Integer (xxxxx) 2: Line Speed is Displayed with One Decimal Place (xxxx.x) 3: Line Speed is Displayed with Two Decimal Places (xxx.xx) 4: Line Speed is Displayed with Three Decimal Places (xx.xxx)	**0**		***1**
11-03~11-07 Reserved					
11-08	**Keypad frequency flashing when stop**	0: Enable 1: Disable	**0**		

Group 12- User parameter group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
12-00	Drive Horsepower Code		**----**		***3**

12-01	Software Version	----	**----**		***3**
12-02	Fault Log		**----**		***3**
12-03	Accumulated Operation Time1	**0~23**	**----**	hour	***3**
12-04	Accumulated Operation Time2	**0~65535**	**----**	day	***3**
12-05	Accumulated Operation Time Mode	0: Time Under Power 1: Run Mode Time Only	**0**		***3**
12-06	Reset Drive to Factory Settings	1150: Reset to the 50Hz factory setting 1160: Reset to the 60Hz factory setting	**----**		
12-07	Parameter Lock	0: Enable all Functions 1: 03-01~03-16 cannot be changed 2: All Functions cannot be changed Except 03-01~ 03-16 3: Disable All Function	**0**		

Group 13- Auto Run function group					
Code	**Parameter Name**	**Setting Range**	**Default**	**Unit**	**Attribute**
13-00	Auto Run(sequencer) mode selection	0: Disabled. 1: Single cycle.(Continues to run from the Unfinished step if restarted). 2: Periodic cycle. (Continues to run from the unfinished step if restarted). 3: Single cycle, then holds the speed Of final step to run. (Continues to run from the unfinished step if restarted). 4: Single cycle. (Starts a new cycle if restarted). 5: Periodic cycle. (Starts a new cycle if restarted). 6: Single cycle, then hold the speed of final step to run. (Starts a new cycle if restarted).	**0**		
13-01	Auto _ Run Mode Frequency Command 1	**0.00~400.00**	**0.00**	**Hz**	***1**
13-02	Auto _ Run Mode Frequency Command 2				
13-03	Auto _ Run Mode Frequency Command 3				
13-04	Auto _ Run Mode Frequency Command 4				
13-05	Auto _ Run Mode Frequency Command 5				
13-06	Auto _ Run Mode Frequency Command 6				
13-07	Auto _ Run Mode Frequency Command 7				
13-08~13-15 Reserved					
13-16	Auto_ Run Mode Running Time Setting 0	**0.0~3600.0**	**0.0**	**Sec**	***1**
13-17	Auto_ Run Mode Running Time Setting 1				
13-18	Auto_ Run Mode Running Time Setting 2				
13-19	Auto_ Run Mode Running Time Setting 3				
13-20	Auto_ Run Mode Running Time Setting 4				
13-21	Auto_ Run Mode Running Time Setting 5				
13-22	Auto_ Run Mode Running Time Setting 6				

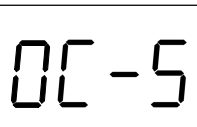
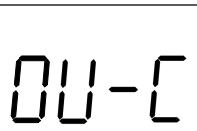
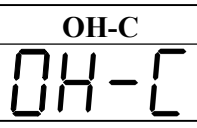
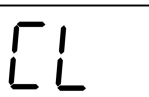
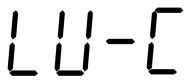
13-23	Auto_ Run Mode Running Time Setting 7				
13-24~13-31 Reserved					
13-32	Auto_ Run Mode Running Direction 0	0: stop 1: forward 2: reverse	**0**		
13-33	Auto_ Run Mode Running Direction 1				
13-34	Auto_ Run Mode Running Direction 2				
13-35	Auto_ Run Mode Running Direction 3				
13-36	Auto_ Run Mode Running Direction 4				
13-37	Auto_ Run Mode Running Direction 5				
13-38	Auto_ Run Mode Running Direction 6				
13-39	Auto_ Run Mode Running Direction 7				

Chapter 5 Abnormality Diagnosis and Maintenance

5.1 Fault display and remedies

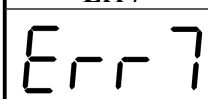
5.1.1Manual reset and automatic reset

Faults not available for manual and automatic reset			
Display	**Content**	**Causes**	**Remedies**
-OV- -OU-	Overvoltage after stop	Detection line fault	Inverter repair
-LV- -LU-	Under voltage after stop	**1.** Too low supply voltage **2.** Current-limiting resistor **(R1)** or fuse burnout **3.** Detection line fault	**1.** Check whether supply voltage is normal **2.** Replace or repair the current-limiting resistor or fuse **3.** Inverter repair
-OH- -OH-	Inverter overheat after stop	**1.** High ambient temperature or poor ventilation **2.** Detection line fault	**1.** Improve ventilation **2.** Inverter repair
EPr EPr	**EEPROM** abnormality	**EEPROM** fault	Replace **EEPROM**
COt COt	Communication abnormality	Communication interruption	Check communication line
cder CdEr	Current detection circuit abnormality after power-on	Current detection circuit fault	Inverter repair
Err0 Err0	IGBT active level judgment abnormality	IGBT active level judgment abnormality	Inverter repair
Err4 Err4	CPU abnormality	External noise interference	Contact our company in case of frequent noise interference
Faults available for manual and automatic reset			
Display	**Content**	**Causes**	**Remedies**
OC-A OC-A	Over current during acceleration	**1.** Too short acceleration time **2.** Used motor capacity higher than inverter capacity **3.** Motor winding short-circuited with housing **4.** Motor wire short-circuited with ground **5. IGBT** module damaged	**1.** Set a longer acceleration time **2.** Replace with a inverter of equal capacity **3.** Check the motor **4.** Check wires **5.** Replace **IGBT** module
OC-C OC-C	Over current during constant speed	1. Instantaneous change of load 2. Instantaneous change of power supply	1. Increase inverter capacity 2. Mount a reactor on power input side
OC-d OC-d	Over current during deceleration	Too short deceleration time	Set a longer deceleration time
OC-S	Over current at	**1.** Motor winding	**1.** Check the motor

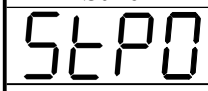
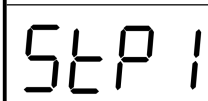
	startup	short-circuited with housing **2.** Motor wire short-circuited with ground **3.** IGBT module damaged	**2.** Check wires **3.** Replace IGBT module
OV-C 	Overvoltage during running/ deceleration	**1.** Too short deceleration time **2.** High load inertia **3.** Excessive variation of supply voltage	**1.** Set a longer deceleration time **2.** Add braking resistor or module **3.** Mount a reactor on power input side
OH-C 	Cooling fin overheat during running	**1.**Too heavy load **2.** High ambient temperature or poor ventilation	**1.** Check load is normal **2.** Increase inverter capacity **3.** Improve ventilation
Faults available for manual reset but not available for automatic reset			
Display	**Content**	**Causes**	**Remedies**
OC 	Over current after stop	**1.** Detection line fault	**1.** Inverter repair
OL1 	Motor overload	**1.** Too heavy load **2.** Improper **07-05** setting	**1.** Increase inverter capacity **2.** Set **07-05** as instructed
OL2 	Inverter overload	**1.** Too heavy load	**1.** Increase inverter capacity
CL 	Inverter over current	**1.** Inverter over current warning: inverter current up to the level of current protection	**1.** Check load size and running cycle time
LV-C 	Under voltage during operation	**1.**Too low supply voltage **2.** Excessive variation of supply voltage	**1.** Improve power supply quality **2.**Set a longer acceleration time **3.** Mount a reactor on power input side **4.** Increase inverter capacity

5.1.2 Key operation errors

Display	**Content**	**Causes**	**Remedies**
Err1 	Operating mode error	**1.** Set frequency source as non-panel source **(00- 05>0)**, or press Up/Down key on the panel during segment speed operation. **2.** Intend to modify the parameter unchangeable in operation during running (refer to the list of parameters)	**1.** Set frequency source as panel **(00- 05=0)** for modifying frequency by Up/Down key. 2. Modify the parameter after stop.
Err2 	Parameter setting error	**1.** Parameter setting exceeds actual allowable range	**1.** Reset parameter in the limited range
Err5 	Parameter modification ineffective during communication	**1.** Control command is prohibited during communication **2.** Modify parameters **08- 02**～	**1.** Enabling command must be issued prior to communication. **2.** Set the parameters before communication.

		08- 05 prohibited for change during communication	
Err6 	Communication failure	**1.** Wiring error **2.** Communication parameter setting error **3. Sum-check** error **4.** Communication format error	**1.** Check hardware and wires. **2.** Check the setting of communication parameters **(08-02～08- 05)**
Err7 	Parameter setting error	**1.** Intend to modify **12-00** or **12-06**. **2.** Voltage/ current detection line fault	Reset inverter, or repair if it is still faulty.

5.1.3 Special instructions

Display	Content	Instruction
StP0 	Zero-speed stop	Happening when set frequency is **<0.1Hz**
StP1 	Direct start failure	**1.** The inverter is set as external operation **(00-03=1)**; if direct start function fails **(04-09=1)**, power supply is connected and running switch is turned on, the inverter can not be started, when **STP1** flickers (refer to **04-09** description). **2.** The inverter can be started directly when **04-09=0**.
StP2 	Keyboard emergency stop	**1.** When the inverter is set as external operation **(00-03=1)**, **STOP** key setting is effective and **STOP** key on the keyboard is pressed during operation, the inverter stops as per **04-01** setting; **STP2** flickers after stop, and the inverter can restart only after the running switch is turned off and then turned on. **2.** When the inverter is under communication state, **STOP** key setting is effective and **STOP** key on the keyboard is pressed during operation, the inverter stops as per **04-01** setting; **STP2** flickers after stop, and the inverter can restart only after **PC** sends **STOP** command and then running command.
E.S. 	External emergency stop	When external emergency stop signal is input through multi-function input terminal, the inverter stops in a decelerating manner, and **E.S** flickers after stop.
b.b. 	External blocking **BASE BLOCK**	When external blocking signal is input through multi-function input terminal, the inverter stops input immediately, and **b.b** flickers.

5.1.4 Inverter body LED instruction (Alarm LED functioning)

1. In case of **CTER**, **EPR**, **OH**, **LV**,**OV** or **OC** resetting error, the **Alarm** LED flickers quickly, when the inverter should be powered off and then powered on; if the **Alarm** LED flickers under the same frequency still, the inverter should be failed and submitted for repair. (There is a short-time LV process during power-on and power-off of inverter, when the **Alarm** LED follows the corresponding flickering process, which is normal)

2. In case of **OH-C**, **OV-C**, **OC-S**, **OC-d**, **OC-C** ,**OC-a**, **OL2**, or **OL1** error, the **Alarm** LED flickers slowly, when the inverter may be reset or powered off and then powered on for alarm reset.

5.2 General troubleshooting methods

Phenomenon	Check point	Remedies
Motor runs in reverse direction	Is output terminal wired correctly?	Match with **U**, **V** and **W** phases of motor
	Is forward or reverse running signal connected correctly?	Check and correct connection
Motor is unable to speed up or down	Is analog frequency input connected correctly?	Check and correct connection
	Is running mode set correctly?	Check the setting of manipulator running mode
	Is load too heavy?	Reduce load
Motor running speed is too high or low	Is motor specification (number of poles and voltage) correct?	Check motor specification
	Is gear ratio correct?	Check gear ratio
	Is the maximum output frequency set correctly?	Check the maximum output frequency
Abnormal speed variation during motor running	Is load too heavy?	Reduce load
	Does load vary significantly?	Mitigate load variation, and increase inverter and motor capacity
	Is input power subject to phase failure?	**1.** Mount **AC** reactor on input power side in case of single phase
		2. Check wiring in case of three-phase input
Motor failure	Is supply voltage normally connected to inverter input terminal (is charging LED lit)?	**1.** Check power supply is connected **2.** Turn off power supply, and then turn on **3.** Check supply voltage class **4.** Check terminal screws are tightened
	Does the inverter have voltage output?	Turn off power supply, and then turn on
	Is motor blocked due to heavy load?	Reduce load to make the motor running
	Does the inverter have any abnormality?	Refer to fault handling instructions, and check wiring
	Is forward/reverse running command sent to the inverter?	
	Is analog frequency set value already input?	**1.** Check the set voltage of frequency input is correct **2.** Check analog frequency input signal is correctly connected
	Is running mode set value correct?	Use the operation panel for setting

Appendix 1

Name and Content of Hazardous Substances Contained in the Product

Component name		Hazardous substance or element					
		Lead and its compound (Pb)	Mercury and its compound (Hg)	Cadmium and its compound (Cd)	Chromium VI compound (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Electronics	Electronic component	X	O	O	O	O	O
	Electromagnetic contactor	O	O	X	O	O	O
Display		O	O	O	O	O	O
Wire and cable	Terminal	X	O	O	O	O	O
	Wire	O	O	O	O	O	O
	Insulated component	O	O	O	O	O	O
Mechanical parts	Conductive copper column, fan, temperature controlled switch	X	O	O	O	O	O
	Others	O	O	O	O	O	O

This form is prepared according to SJ/T 11364.

O: Content of the hazardous substance in all homogeneous materials of the component is below the limit specified in GB/T 26572.

X: Content of the hazardous substance in at least one homogeneous material of the component is higher than the limit specified in GB/T 26572.

Definitions of main component names:

Electronics—Including electronic component, welded printed circuit board.

Display—Including display unit, electronic components or touch screen.

Wire and cable—Including terminal, wire, shielded wire, sheath and electronics.

Mechanical parts—The parts other than electronics, display, wire and cable as defined.

Over-limit instructions:

Electronics: Lead content of some electronic components is over 1000 ppm but conforming to exemption rules of EU RoHS directive.

7(a) : Lead in welding flux of high melting temperature (for example: lead content in lead base alloy≥85 %) ;

7(c) -I : Lead in glass or ceramic material of electronic and electrical components (except dielectric ceramics of capacitor), or lead in glass or ceramic composite material (such as piezoelectric ceramic component)

Electromagnetic contactor: Cadmium content in some electromagnetic contactors is over 100 ppm but conforming to exemption rules of EU RoHS directive.

8(b) cadmium and its compound, used for electronic contact

Terminal, conductive copper column, fan and temperature controlled switch: Lead content in wire, cable and some mechanical parts may be over 1000 ppm but conforming to exemption rules of EU RoHS directive.

6(a) The content of lead as an alloy element in steel and galvanized steel for processing should be below 0.35% (Wt);

6(b) Maximum allowable concentration of lead in aluminum alloy is 0.4%;

6 (c) Maximum allowable concentration of lead in copper alloy is 4%;

Environment-friendly use period instruction:

Within the environment-friendly use period, the product is free of hazardous substance leakage, precipitation and other problems harmful to consumer health during normal use, and can be used safely.

The environment-friendly use period of our product is 10 years, which is effective only when the product is used under normal conditions as instructed in this specification. Disclaimer: The information regarding content of substances in product provided by **the company** only represents our understanding and knowledge of the product at the time when the information is provided. The understanding and knowledge are based on information sourced from third parties, while **the company** is unable to promise and guarantee accuracy of such third-party information. **The company** may have not performed destructive test or chemical analysis of the materials or chemicals used. Use of the above-mentioned product and relevant liability of **the company** are governed by standard contract terms and conditions of **the company**.