Shihlin

Shihlin Electric SS2 Series AC Drive
Installation Guide

V1.04-01

Compact Design Vector control AC Drive

SS2-021-0.4K ~ 2.2K
SS2-023-0.4K ~ 3.7K
SS2-043-0.4K ~ 5.5K

Thank you for choosing Shihlin SS2 series AC Drive.
The instruction will describe on the use and points for attention of products. Before installing, please be sure to carefully read the Instruction, so that the inverter can be used in proper and safe way.

1) Safety Instructions

Safety Instructions
✓ Installation, operation, maintenance and inspection must be performed by qualified personnel.
✓ In this instruction, the safety instruction levels are classified into "Warning" and "Caution".
⚠Warning: Incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠Caution: Incorrect handling may cause hazardous conditions, resulting in medium or slight injury, or may cause only material damage.

⚠Warning
- ✓ While the inverter power is ON, do not open the front cover or the wiring cover. Do not run the inverter with the front cover or the wiring cover removed. Otherwise you may access the exposed high voltage terminals or the charging part of the circuitry and get an electric shock.
- ✓ It is crucial to turn off the motor drive power before any wiring installation or inspection is made. Even if power supply was cut off, residual voltage is in the internal capacitor. After the power cut off, waiting time should be no shorter than the time in inverter logo.
- ✓ The inverter must be connected to the ground properly.
- ✓ Do not operate or touch the radiator or handle the cables with wet hands. Otherwise you may get an electric shock.
- ✓ Do not change the cooling fan while power is ON. It is dangerous to change the cooling fan while power is ON.

⚠Caution
- ✓ The voltage applied to each terminal must be the ones specified in the Instruction Manual. Otherwise burst, damage, etc. may occur.
- ✓ Don't conduct a pressure test on components inside inverter, for semiconductor of inverter is easily to be broke down and damaged by high voltage.
- ✓ While power is ON or for some time after power-OFF, do not touch the inverter as it will be extremely hot. Touching these devices may cause a burn.
- ✓ The cables must be connected to the correct terminals. Otherwise burst, damage, etc. may occur.
- ✓ The polarity (+ and -) must be correct. Otherwise burst, damage, etc. may occur.
- ✓ Inverter must be installed on a nonflammable wall without holes (so that nobody touches the inverter heat sink on the rear side, etc.). Mounting it to or near flammable material may cause a fire.
- ✓ If the inverter has become faulty, the inverter power must be switched OFF. A continuous flow of large current may cause a fire.

### 2) Description of Product Model Number

SS2 - 043 - 0.75K - **

Series category	Voltage level	Capacity	Others
SS2 series	-043 : 440V three-phase	0.75kW	None : General model
	-023 : 220V three-phase		-** : Customer motor or dedicated motor or region difference
	-021 : 220V single-phase		

3) Installation Environment

Ambient temperature	-10 ~ +50℃ (non-freezing).
Ambient humidity	Below 90%Rh (non-condensing).
Storage temperature	-20 ~ +65℃.
Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable powder.
Altitude	Altitude below 1000 meters
Vibration	Below 5.9m/s² (0.6G).
Grade of protection	IP20
The degree of pollution	2

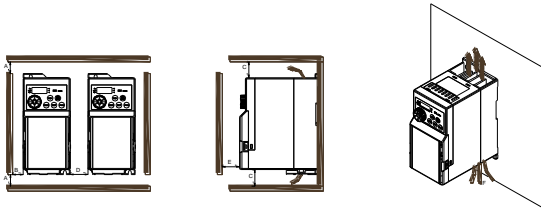### 4) Installation and Wiring

➤ Please ensure vertical arrangement to keep the cooling effect:
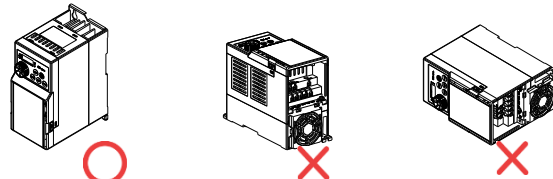
(a) Vertical arrangement   (b)Horizontal arrangement   (c) Level arrangement

➤ Please comply with installation conditions shown below to ensure enough ventilation space and wiring space for inverter cooling
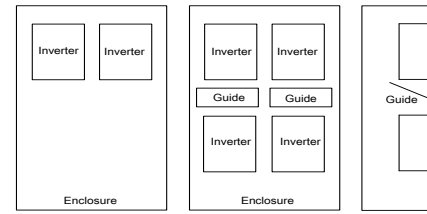
• Arrangement of single or paralleling inverter:

Unit :mm

| Size	Frame A	Frame B
A	50	50
B	50	50
C	100	100
D	50	50
E	50	50
F	ventilation direction	

• Arrangement of multiple inverters:

(a)Horizontal arrangement   (b)Vertical arrangement

Note1: When mounting inverters of different sizes in parallel, please align the clearance below each inverter to install, which is easy to change the cooling fan.
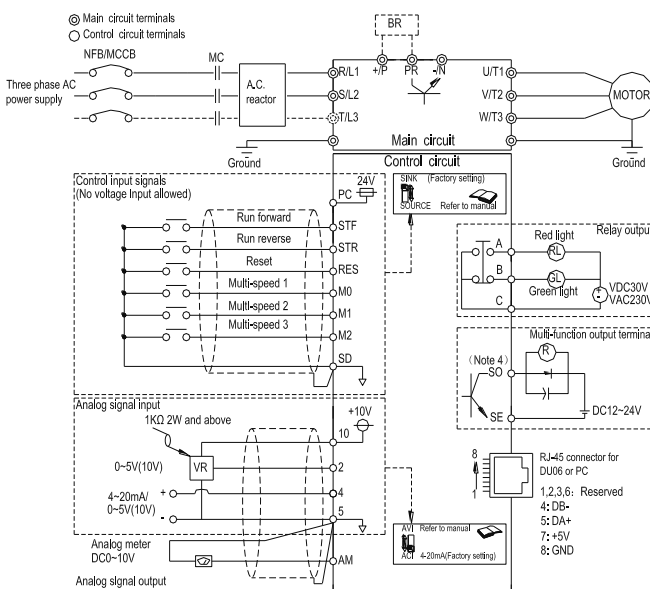
Note2: When it is inevitable to arrange inverters vertically to minimize space , take such measures as to provide guides since heat from the bottom inverters can increase the temperatures in the top inverters, causing inverter failures.

• Installation of DIN rail：
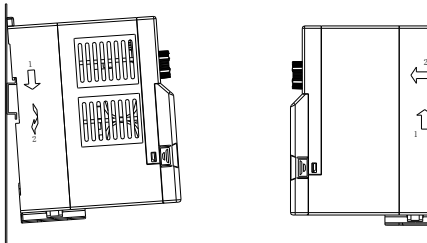
(a) installation   (b) disassembly

5) Terminal Connection Diagrams

6) Main Circuit Wiring and Terminal Specification

The inverter model	Terminal screw specifications	Tightening torque (Kgf.cm)	Recommended wiring specification(mm²)				Recommended wiring specification (AWG)			
			R、S、T	U、V、W	+/P、PR	Grounding Cable	R、S、T	U、V、W	+/P、PR	Grounding Cable
SS2-043-0.4K	M3.5	12.2	1.5	1.5	1.5	1.5	16	16	16	16
SS2-021-0.4K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-023-0.4K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-043-0.75K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-021-0.75K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-023-0.75K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-043-1.5K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-023-1.5K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-021-1.5K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-043-2.2K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-021-2.2K			4	4	4	4	12	12	12	12
SS2-023-2.2K	M4	18	4	4	4	4	12	12	12	12
SS2-043-3.7K			2.5	2.5	2.5	2.5	10	14	14	14
SS2-043-5.5K			2.5	2.5	2.5	2.5	14	14	14	14
SS2-023-3.7K			4	4	4	4	12	12	12	12

7) Control Terminal

➤ Arrangement of control terminal
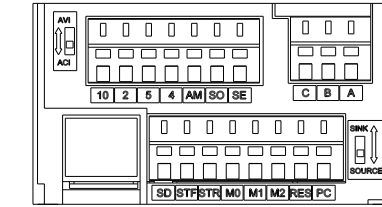
➤ Control terminal description

Terminal type	Terminal name	Function instructions	Terminal specifications
Digital signal input	STF	There are totally eight multi-function control terminals, which can switch the mode of SINK/SOURCE.	Input impedance: 4.7 kΩ Action current:5mA (when 24VDC) Voltage range: 10~28VDC Maximum frequency: 1kHz
	STR		
	M0		
	M1		
	M2		
	RES		
	SD	Digital signal ground	---
	PC	In Source mode, digital signal power.	The voltage is +24V, the allowable load current is 50mA
Analog signal input	10	The terminal inside with +12v power is allowable load current with 5 mA..	Maximum current:10mA
	2	Voltage is 0~5v or 0~10v or 4~20mA input point, to set the target frequency.	Input impedance:10 kΩ
	4		
	5	common reference of 10, 2, 4, and AM terminal	---
Relay output	A	Multi-function relay output terminals. A-C is the normally open contact, B-C is the normally close contact.	Contact ability VDC30V/VAC230V-0.3A
	B		
	C		
Communication terminal	RJ45	The communication interface of frequency converter and the upper machine/DU06.	Highest rate:19200bps Longest distance:500m
Analog output terminals	AM	External simulation table, indicating the output frequency or output current。Note: output voltage of AM is PWM pulse form, therefore the analog voltage only is suitable for external moving coil type header, not suitable for connect to the digital meter header or as A/D conversion signal to PLC and controller use.	Output signal: DC 0~10V Load current : 1mA
Collector output	SO	This terminal is also known as the "multi-function output terminal".	Contact ability VDC 24V-0.1A
	SE	Reference to the open collector output	

Note1 : When connecting control terminal with external devices, please pay attention to the voltage and current specifications of terminals, avoiding damaging the inverter.

Note2 : The function of the control terminal is decided by inverter parameters, please refer to Instruction Manual for setting.

Note3 : Please pay attention to polarity when connecting external power and devices.

➤ Wiring method

• Power supply connection

For the control circuit wiring, strip off the sheath of a cable, and use it with a blade terminal. For a single wire, strip off the sheath of the wire and apply directly.

Insert the blade terminal or the single wire into a socket of the terminal.

(1) Strip off the sheath for the below length. If the length of the sheath peeled is too long, a short circuit may occur with neighboring wires. If the length is too short, wires might come off.

Wire the stripped cable after twisting it to prevent it from becoming loose. In addition, do not solder it.

7mm

(2) Crimp the blade terminal.

Insert wires to a blade terminal, and check that the wires come out for about 0 to 0.5 mm from a sleeve.

Check the condition of the blade terminal after crimping. Do not use a blade terminal of which the crimping is inappropriate, or the face is damaged.

0~0.5mm
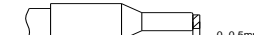
• Please do use blade terminals with insulation sleeve. Blade terminals commercially available:

Cable gauge (mm²)	Blade terminals model	L (mm)	d1 (mm)	d2 (mm)	Manufacturer	Crimping tool product number
0.3	AI 0,25-6 WH	10.5	0.8	2	Phoenix Contact Co., Ltd.	CRIMPFOX 6
0.5	AI 0,5-6 WH	12	1.1	2.5		
0.75	AI 0,75-6 GY	12	1.3	2.8		
0.75(for two wires)	AI-TWIN 2×0,75-6 GY	12	1.3	2.8		
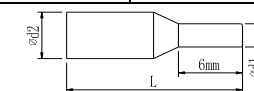
Note1: Please Use a small flat head screw driver (tip thickness: 0.6 mm, width: 3.0mm). If a flat head screw driver with a narrow tip is used, terminal block may be damaged.

Note2: Tightening torque is 3.2~4.8kgf.cm, too large tightening torque can cause screw slip, too little tightening torque can cause a short circuit or malfunction.

➤ Wiring Precautions

• After wiring, wire offcuts must not be left in the inverter.

  Wire offcuts can cause an alarm, failure or malfunction. Always keep the inverter clean.

  When drilling holes in a controller, please take caution not to allow chip powder to enter the inverter.

• To prevent a malfunction due to noise, keep the signal cables 10 cm (3.94 inches) or more away from the power cables. Also, Separate the main circuit cables at the input side from the main circuit cables at the output side.

• Set the voltage/current input switch correctly. Incorrect setting may cause a fault, failure or malfunction.

8) Appearance and Dimensions

➢ Frame A
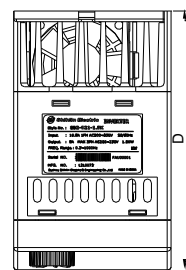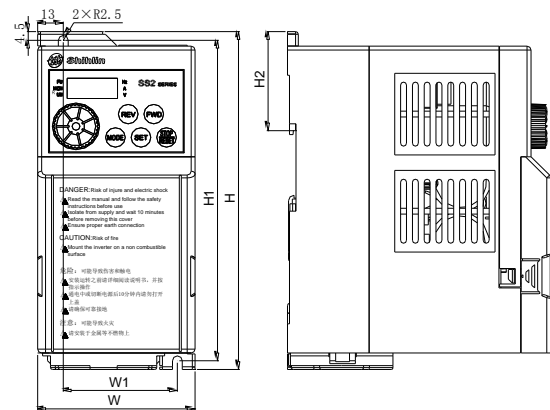
Unit: mm

Type	W	W1	H	H1	H2	D
SS2-021-0.4K	80	58	174	165	51.5	134
SS2-021-0.75K						
SS2-023-0.4K						
SS2-023-0.75K						
SS2-023-1.5K						
SS2-043-0.4K						
SS2-043-0.75K						
SS2-043-1.5K						

➢ Frame B

Unit: mm

Type	W	W1	H	H1	H2	D
SS2-021-1.5K	110.5	58	174	165	51.5	134
SS2-021-2.2K						
SS2-023-2.2K						
SS2-023-3.7K						
SS2-043-2.2K						
SS2-043-3.7K						
SS2-043-5.5K						

9) Optional Equipment

Category	Name	Description	Order code
Manipulator	DU06	LED Manipulator	SNKDU06

10) Parameter table

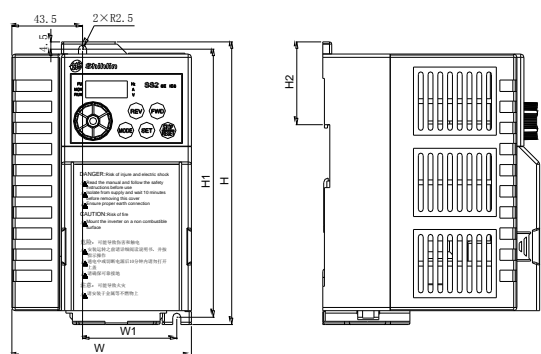| Parameter number	Name	Setting range	Default	User setting
P.0	Torque boost	0~30%	6%(0.4kW~0.75kW) 4%(1.5kW~3.7kW) 3%(5.5kW)	
P.1	Maximum frequency	0~120Hz	120Hz	
P.2	Minimum frequency	0~120Hz	0Hz	
P.3	Base frequency	0~650Hz	50Hz/60Hz(Note)	
P.4	Speed 1 (high speed)	0~650Hz	60Hz	
P.5	Speed 2 (medium speed)	0~650Hz	30Hz	
P.6	Speed 3 (low speed)	0~650Hz	10Hz	
P.7	Acceleration time	0~360.00s/0~3600.0s	5s（3.7KW and below） 10s（5.5KW）	
P.8	Deceleration time	0~360.00s/0~3600.0s	5s（3.7KW and below） 10s（5.5KW）	
P.9	Electronic thermal relay capacity	0~500A	0A	
P.10	DC injection brake operation frequency	0~120Hz	3Hz	
P.11	DC injection brake operation time	0~60s	0.5s	
P.12	DC injection brake operation voltage	0~30%	4%	
P.13	Starting frequency	0~60Hz	0.5Hz	
P.14	Load pattern selection	0:Applicable to constant torque loads(convey belt, etc.) 1:Applicable to variable torque loads (fans and pumps, etc.) 2, 3: Applicable to ascending / descending loads. 4: Multipoint VF curve. 5 ~ 13:Special two-point VF curve.	0	
P.15	JOG frequency	0~650Hz	5Hz	
P.16	JOG acceleration/deceleration time	0~360.00s/0~3600.0s	0.5s	
P.17	Input signal across terminal 4-5 selection	0：Current signal valid 1:0~10V voltage signals across terminal 2:0~5V voltage signals across terminal	0	
P.18	High-speed maximum frequency	120~650Hz	120Hz	
P.19	Base frequency voltage	0~1000V, 9999	9999	
P.20	Acceleration/deceleration reference frequency	1~650Hz	50Hz/60Hz(Note)	
P.21	Acceleration/deceleration time increments	0：Minimum setting increment:0.01s 1：Minimum setting increment:0.1s	0	
P.22	Stall prevention operation level	0~250%	200%	
P.23	Compensation factor at level reduction	0~200%, 9999	9999	
P.24	Speed 4	0~650Hz, 9999	9999	
P.25	Speed 5	0~650Hz, 9999	9999	
P.26	Speed 6	0~650Hz, 9999	9999	
P.27	Speed 7	0~650Hz, 9999	9999	
P.28	Output frequency filter constant	0~31	0	
P.29	Acceleration/deceleration curve selection	0: Linear acceleration /deceleration curve 1: S pattern acceleration /deceleration curve 1 2: S pattern acceleration /deceleration curve 2 3: S pattern acceleration /deceleration curve 3	0	
P.30	Regenerative brake function selection	0：If regenerative brake duty is 3% fixed, the value of parameter 70 is invalid. 1：The regenerative brake duty is the value of parameter 70 setting	0	
P.31	Soft-PWM selection	0~2	0	
P.32	Serial communication Baud rate selection	0：Baud rate: 4800bps 1：Baud rate: 9600bps 2：Baud rate: 19200bps 3：Reserved	1	
P.33	Communication protocol selection	0: Modbus protocol 1: Shihlin protocol	1	
P.34	Communication EEPROM writing selection	0: Write parameters in communication mode, write into RAM and EEPROM. 1: Write parameters in communication mode, write into only RAM.	0	
P.35	Communication Running and Speed Command Selection	0: In communication mode, operating instruction and setting frequency is set by communication. 1: In communication mode, operating instruction and setting frequency is set by external.	0	
P.36	Inverter station number	0~254	0	
P.37	Speed display	0~5000.0r/min, 0~9999r/min	0 r/min	
P.38	The maximum operation frequency (the target frequency is set by the input signal of terminal 2-5)	1~650Hz	50Hz/60Hz(Note)	
P.39	The maximum operation frequency (the target frequency is set by the input signal of terminal 4-5)	1~650Hz	50Hz/60Hz(Note)	
P.40	Multi-function output terminal pattern	0：RUN (Inverter running): Signal will be output when the output frequency is equal to or higher than the starting frequency. 1：SU (Up to frequency): Signal will be output once the output frequency has reached the set region of frequency. 2：FU (Output frequency detection): Signal will be output once the output frequency has reached or exceeded the detection frequency set 3：OL (Overload detection): Signal will be output once the current limit function is triggered. (About OL2 detection, please refer to over torque detection selection P.260) 4：OMD (Zero current detection): If the output current percentage of the inverter is less than the set value of P.62, and lasts for the pre-defined time (the setting value of P.63), OMD will output signal 5：ALARM (Alarm detection): Alarm detection 6：PO1 (Section detection): At the programmed operation mode, PO1 signal will be output in the end of each section 7：PO2 (Periodical detection): At the programmed operation mode, PO2 signal will be output at the end of each cycle.	0	

Parameter number	Name	Setting range	Default	User setting
P.40	Multi-function output terminal pattern	8：PO3 (Pause detection): At the programmed operation mode, PO3 signal will be output when the inverter pauses 9 :BP (Inverter output): Switch between the inverter operation and commercial power-supply operation function. During the inverter operation, BP will output signals 10：GP (Commercial power-supply output): Switch between the inverter operation and commercial power-supply operation function. During the commercial power-supply operation, GP will output signals 11：OMD1(zero current detection): When the output frequency of inverters reach to the target frequency and the percentage of the output current is lower than the set value of P.62, OMD1 will output signal after a certain time set by P.63 12 :OL2 (Over torque alarm output): Please refer to over torque detection selection P.260 17：RY (the inverter running preparation accomplishment): RY signal will be sendout if inverter is in the state of being able to run 18：Maintenance Alarm detection 19~40:Reserved 41: Output when PID feedback signal disconnect:. (refer to P.254 Analog signal feedback loss action selection)	0	
P.41	Up-to-frequency sensitivity	0~100%	10%	
P.42	Output frequency detection for forward rotation	0~650Hz	6Hz	
P.43	Output frequency detection for reverse rotation	0~650Hz, 9999	9999	
P.44	The second acceleration time	0~360.00s/0~3600.0s,9999	9999	
P.45	The second deceleration time	0~360.00s/0~3600.0s,9999	9999	
P.46	The second torque boost	0~30%,9999	9999	
P.47	The second base frequency	0~650Hz, 9999	9999	
P.48	Data length	0：8bit 1：7bit	0	
P.49	Stop bit length	0：1bit 1：2bit	0	
P.50	Parity check selection	0: No parity verification 1: Odd 2: Even	0	
P.51	CR & LF selection	1: CR only 2: Both CR and LF	1	
P.52	Number of communication reties	0~10	1	
P.53	Communication check time interval	0~999.8s, 9999	9999	
P.54	AM terminal function selection	0: Output frequency, frequency display reference (P.55) is 100%. 1: Output current, use 02-52 (P.56) value as 100%." 2: Output DC bus voltage, the OV level is 100% 3: Output the temperature rising accumulation rate of inverter, the NTC level is 100% 4: Output the electronic thermal rate of the inverter, the electronic thermal relay running (06-00(P.9)≠0) or the electronic thermal relay of the inverter's IGBT module running (06-00(P.9)=0) is 100% 5：The output corresponding to a set frequency	0	
P.55	Frequency display reference	0~650Hz	50Hz/60Hz(Note)	
P.56	Current monitoring reference	0~500A	Rated output current	
P.57	Restart coasting time	0~30s, 9999	9999	
P.58	Restart cushion time	0~60s	10s	
P.59	The choice of locking operation keyboard knob setting	XXX0: the default value, reserved XXX1: The knob on the DU08 set frequency effectively XX0X: No shuttle knob SET function XX1X: The shuttle knob as a function of the SET X0XX: Changing frequency and automatic storage within 30 s X1XX: Changing frequency and automatic storage within 10 s X2XX: After changing the frequency,doesn't storge automatically Setting Range 0XXX: After to shuttle set frequency, the frequency of changes take effect immediately 1XXX: After to shuttle set frequency and the set key run , the frequency of change take effect	0	
P.60	Input signal filtering constant	0~31	31	
P.61	Remote setting function selection	0: No remote setting function. X1: Remote setting function, frequency setup storage is available. X2: Remote setting function, frequency setup storage is not available. X3: Remote setting function, frequency setup storage is not available, the remote setting frequency is cleared by STF/STR "turn off". X4: Remote control function, frequency save in memory every 5s 1X:Frequency command range P.2~P.1, frequency command value from RH,RM setting	0	
P.62	Zero current detection level	0~200%, 9999	5%	
P.63	Zero current detection time	0.05~60s, 9999	0.5s	
P.64	Pulse output selection	0：SO function 1：FM/1OX function	0	
P.65	Retry selection	0: Retry is invalid. 1: Over-voltage occurs, the AC Drive will perform the retry function. 2: Over-current occurs, the AC Drive will perform the retry function. 3: Over-voltage or over-current occurs, the AC Drive will perform the retry function. 4: All the alarms have the retry function.	0	
P.66	Stall prevention operation reduction starting frequency	0~650Hz	50Hz/60Hz(Note)	
P.67	Number of retries at alarm occurrence	0~10	0	
P.68	Retry waiting time	0~360s	6s	
P.69	Retry accumulation time at alarm	0	0	
P.70	Special regenerative brake duty	0~30%	0	
P.71	Idling braking and linear braking selection	0：Idling brake 1：Dc brake	1	
P.72	Carrier frequency	1~15	5	

Table 1

Parameter number	Name	Setting range	Default	User setting
P.73	Voltage signal selection	0: The range for the input voltage signal (terminal 2-5) is 0~5V / 1 : The range for the input voltage signal (terminal 2-5) is 0~10V	1	
P.74	10X output selection	0~10	0	
P.75	Stop or Reset function selection	0: Press STOP button and stop the operation only in PU and H2 mode / 1: Press STOP button and stop the operation in all mode.	1	
P.76	Reserve	---	---	
P.77	Parameters write protection	0: Parameters can be written only when the motor stops. / 1: Parameters cannot be written. / 2: Parameters can also be written when the motor is running. / 4: Parameters cannot be written in password protection.	0	
P.78	Forward/reverse rotation prevention selection	0, 1, 2	0	
P.79	Operation mode selection	0~8	0	
P.80	Multi-function terminal M0 function selection	0: STF(the AC Drive runs forward) / 1: STR(the AC Drive runs reverse) / 2: RL(Multi-speed low speed) / 3: RM(Multi-speed medium speed) / 4: RH(multi-speed high speed) / 5 : AU / 6 : OH / 7 : MRS / 8 : RT / 9 : EXT / 10: STF+EXJ / 11: STR+EXJ / 12: STF+RT / 13: STR+RT / 14: STF+RL / 15: STR+RL / 16: STF+RM / 17: STR+RM / 18: STF+RH / 19: STR+RH / 20: STF+RL+RM / 21: STR+RL+RM / 22: STF+RT+RL / 23: STR+RT+RL / 24: STF+RT+RM / 25: STR+RT+RM / 26: STF+RT+RL+RM / 27: STR+RT+RL+RM / 28: RUN(the AC Drive runs forward) / 29: STF/STR(it is used with RUN, when STF/STR is "on", AC Drive runs reverse ; when STF/STR is "off", the AC Drive runs forward) / 30: RES(external reset function) / 31: STOP(it can be used as a three-wire mode with the RUN signal or the STF-STR terminal) / 32: REX(multi-speed set (16 levels)) / 33: PO(in "external mode", programmed operation mode is chosen) / 34: RES_E (external reset become valid only when the alarm goes off.) / 35: MPO (in "external mode" manually operation cycle mode is chosen.) / 36: TRI(triangle wave function is chosen) / 37: GP_BP / 38 : CS / 39: STF/STR +STOP (The motor has a reverse rotation when the RUN signal is on. When it is off, stop the motor and then run the motor for forward rotation.) / 40: P_MRS (the AC Drive instantaneously stops, The MRS is pulse signal input) / 43: RUN_EN (the digital input terminal running enable) / 44: PID_OFF (digital input terminal stopping PID enable) / 45: The second mode	2	
P.81	Multi-function terminal M1 function selection	Same as P.80	3	
P.82	Multi-function terminal M2 function selection	Same as P.80	4	
P.83	Multi-function terminal STF function selection	Same as P.80	0	
P.84	Multi-function terminal STR function selection	Same as P.80	1	
P.85	Function selection for multi-function relay	0: RUN(AC Drive running) / 1: SU(reaching the output frequency) / 2: FU(output frequency detection) / 3: OL(overload detection) / 4: OMD(zero current detection) / 5 : ALARM (Alarm detection) / 6 : PO1 (Section detection) / 7: PO2 / 8:PO3 / 9 : BP (Inverter output) / 10 : GP / 11 : OMD1(zero current detection) / 12 : OL2(Over torque alarm output) / 13 ~ 16: Reserve / 17: RY(the accomplishment of AC Drive running preparation) / 18: Maintenance alarm detection / 19~40:Reserved / 41: Output when PID feedback signal disconnect : (refer to P.254 Analog signal feedback loss action selection)	5	
P.86	Multi-function terminal RES function selection	Same as P.80	30	
P.87	Multi-Function control terminal input positive/negative logic selection	0~63	0	
P.88	Multi-function output terminal positive/negative logic selection	0~3	0	
P.89	Slip compensation coefficient	0~10	0	
P.90	The inverter model	---	---	
P.91	Frequency jump 1A	0~650Hz, 9999	9999	
P.92	Frequency jump 1B	0~650Hz, 9999	9999	
P.93	Frequency jump 2A	0~650Hz, 9999	9999	

Table 2

Parameter number	Name	Setting range	Default	User setting
P.94	Frequency jump 2B	0~650Hz, 9999	9999	
P.95	Frequency jump 3A	0~650Hz, 9999	9999	
P.96	Frequency jump 3B	0~650Hz, 9999	9999	
P.97	The second frequency source	0 : Frequency is given by operation panel PU / 1 : Frequency is given by communication / 2 : Frequency is given by external terminal	0	
P.98	Middle frequency 1	0~650Hz	3Hz	
P.99	Output voltage 1 of middle frequency	0~100%	10	
P.100	Minute/second selection	0: The minimum increment of run time is 1 minute. / 1: The minimum increment of run time is 1 second.	1	
P.101	Runtime of section 1 in programmed operation mode	0~6000s	0s	
P.102	Runtime of section 2 in programmed operation mode	0~6000s	0s	
P.103	Runtime of section 3 in programmed operation mode	0~6000s	0s	
P.104	Runtime of section 4 in programmed operation mode	0~6000s	0s	
P.105	Runtime of section 5 in programmed operation mode	0~6000s	0s	
P.106	Runtime of section 6 in programmed operation mode	0~6000s	0s	
P.107	Runtime of section 7 in programmed operation mode	0~6000s	0s	
P.108	Runtime of section 8 in programmed operation mode	0~6000s	0s	
P.110	Operation panel monitoring selection	0: When AC Drive starts, the operation panel enters the monitoring mode automatically, and the screen displays the output frequency.(this frequency for slip compensation) / 1: When the AC Drive starts, the screen of the operation panel displays the target frequency. / 2: When AC Drive starts, operation panel enters monitoring mode automatically, and screen displays current output frequency. / 3 : When inverter starts, built-in keypad enters monitor mode automatically, screen displays current pressure and feedback pressure of the constant pressure system in percentage (note) / 4: When AC Drive starts, operation panel doesn't enter monitoring mode automatically, and screen displays the mode of starting. / 5 : When inverter starts, built-in keypad enters monitor mode automatically, screen displays current pressure and feedback pressure of the constant pressure system (Only valid on built-in keypad)	0	
P.111	Acceleration/deceleration time of section 1	0~600s/0~6000s	0s	
P.112	Acceleration/deceleration time of section 2	0~600s/0~6000s	0s	
P.113	Acceleration/deceleration time of section 3	0~600s/0~6000s	0s	
P.114	Acceleration/deceleration time of section 4	0~600s/0~6000s	0s	
P.115	Acceleration/deceleration time of section 5	0~600s/0~6000s	0s	
P.116	Acceleration/deceleration time of section 6	0~600s/0~6000s	0s	
P.117	Acceleration/deceleration time of section 7	0~600s/0~6000s	0s	
P.118	Acceleration/deceleration time of section 8	0~600s/0~6000s	0s	
P.119	The dead time of positive and reverse rotation	0~3000s	0s	
P.120	Output signal delay time	0 ~ 3600s	0s	
P.121	Run direction in each section	0~255	0	
P.122	Cycle selection	0~8	0	
P.123	Acceleration/deceleration time setting selection	0: The acceleration time is determined by P.7the deceleration time is determined by P.8. / 1: The acceleration time and deceleration time are both determined by P.111~P.118.	0	
P.131	Frequency of section 1	0~650Hz	0Hz	
P.132	Frequency of section 2	0~650Hz	0Hz	
P.133	Frequency of section 3	0~650Hz	0Hz	
P.134	Frequency of section 4	0~650Hz	0Hz	
P.135	Frequency of section 5	0~650Hz	0Hz	
P.136	Frequency of section 6	0~650Hz	0Hz	
P.137	Frequency of section 7	0~650Hz	0Hz	
P.138	Frequency of section 8	0~650Hz	0Hz	
P.139	Voltage signal bias	0%~100%	0%	
P.140	Voltage signal gain	0.1%~200%	100%	
P.141	Voltage signal bias direction and rotational direction setup	0~11	0	
P.142	Speed 8	0~650Hz	0Hz	
P.143	Speed 9	0~650Hz, 9999	9999	
P.144	Speed 10	0~650Hz, 9999	9999	
P.145	Speed 11	0~650Hz, 9999	9999	
P.146	Speed 12	0~650Hz, 9999	9999	
P.147	Speed 13	0~650Hz, 9999	9999	
P.148	Speed 14	0~650Hz, 9999	9999	
P.149	Speed 15	0~650Hz, 9999	9999	
P.150	Restart mode selection	XXX0 : No frequency search / XXX1 : Reserve / XX2 : Reduced voltage way / XX0X: Electricity once / XX1X: Every time I start / XX2X: Only the instantaneous stop to rev.	0	
P.151	Zero-speed control function selection	0, 1	0	
P.152	Voltage instruction at zero-speed control	0~30%	5%	
P.153	Communication error handling	0: Wam and call to stop / 1: Don't alarm and continue running	0	
P.154	Modbus communication data format	0 : 1, 7, N, 2 (Modbus, ASCII) / 1 : 1, 7, E, 1 (Modbus, ASCII) / 2 : 1, 7, O, 1 (Modbus, ASCII) / 3 : 1, 8, N, 2 (Modbus, RTU) / 4 : 1, 8, E, 1 (Modbus, RTU) / 5 : 1, 8, O, 1 (Modbus, RTU)	4	
P.155	Over torque detection level	0~200%	0%	
P.156	Over torque detection time	0~60s	1s	
P.157	External terminals filter adjusting function	0~200ms	4ms	

Table 3

Parameter number	Name	Setting range	Default	User setting
P.158	External terminal power enable	0: Digital input terminal power unable / 1: Digital input terminal power enable	0	
P.159	energy-saving control function	0: Normal running mode. / 1: Energy-saving running mode.	0	
P.160	Reserve	---	---	
P.161	Multi-function display selection	0~9, 11~13, 19~21	0	
P.162	Middle frequency 2	0~650Hz, 9999	9999	
P.163	Output voltage 2 of middle frequency	0~100%	0	
P.164	Middle frequency 3	0~650Hz, 9999	9999	
P.165	Output voltage 3 of middle frequency	0~100%	0	
P.166	Middle frequency 4	0~650Hz, 9999	9999	
P.167	Output voltage 4 of middle frequency	0~100%	0	
P.168	Middle frequency 5	0~650Hz, 9999	9999	
P.169	Output voltage 5 of middle frequency	0~100%	0	
P.170	PID function selection	0 : PID function non-selected / 1 : The target value is determined by P.225. The feedback value is determined by the voltage of terminal 2-5. / 2 : The target value is determined by P.225. The feedback value is determined by the voltage of terminal 4-5.	0	
P.171	PID feedback control method selection	0 : Negative feedback control / 1 : Positive feedback control	0	
P.172	PID proportion gain	1~100	20	
P.173	PID integration gain	0~100s	1s	
P.174	PID differential gain	0~1000ms	0 ms	
P.175	Abnormal deviation level	0~100%	0	
P.176	Exception duration time	0~600s	0s	
P.177	Exception handling mode	0: Free stop / 1 : Decelerate and stop / 2: Continue to run when the alarm goes off	0	
P.178	Sleep detects deviation	0~100%	0	
P.179	Sleep detects duration time	0~255s	1s	
P.180	Revival level	0~100%	90%	
P.181	Outage level	0~120Hz	40Hz	
P.182	Integral upper limit frequency	0~120Hz	50Hz/60Hz(Note)	
P.183	Deceleration step length with stable pressure	0~10Hz	0.5Hz	
P.184	4-5 terminal disconnection handling	0: No disconnection selection is available. / 1: Decelerate to 0Hz, the digital output terminal will set off the alarm / 2: AC Drive will stop immediately, and the panel will display "AErr" alarm. / 3: AC Drive will run continuously according to frequency reference before disconnection. The digital output terminal will set off alarm.	0	
P.185	Proportion linkage gain	0~100%	0	
P.187	FM calibration parameter	0~9998	220	
P.188	Firmware version	---	---	
P.189	Factory setting function	0: The frequency parameter default value is 60Hz system. / 1: The frequency parameter default value is 50Hz system.	60Hz / 50Hz	
P.190	AM output bias	0~8192	0	
P.191	AM output gain	0~8192	600	
P.192	2-5 terminal minimum input voltage	0~10	0	
P.193	2-5 terminal maximum input voltage	0~10	0	
P.194	Frequency corresponds to the minimum input voltage of terminal 2-5	0~60Hz	0Hz	
P.195	Frequency corresponds to the maximum input voltage of terminal 2-5	0~650Hz	50Hz/60Hz (Note)	
P.196	Frequency corresponds to the minimum input current/voltage across terminal 4-5	0~60Hz	0Hz	
P.197	Frequency corresponds to the maximum input current /voltage across terminal 4-5	0~650Hz	50Hz/60Hz (Note)	
P.198	Minimum input current/voltage across terminal 4-5	0~20	0	
P.199	Maximum input current/voltage across terminal 4-5	0~20	0	
P.219	Remote function acc/dec time selection	0 : Use default acc/dec time (same as regular mode) / 1 : Use second acc/dec time	0	
P.223	Analog feedback bias pressure	0~100%	0%	
P.224	Analog feedback gain pressure	0~100%	100%	
P.225	Panel command	0~P.251 , 9999	20%	
P.226	The paver function selection	0 : Reciprocating mechanical function is invalid / 1 : Reciprocating mechanical function effectively	0	
P.227	The limit time of positive rotation	0~3600s	0	
P.228	The limit time of reverse rotation	0~3600s	0	
P.229	Backlash compensation and acceleration/deceleration interrupted for waiting function selection	0: None. / 1: Backlash compensation function. / 2: Acceleration and deceleration interrupt waiting function.	0	
P.230	The acceleration interrupt frequency	0~650Hz	1Hz	
P.231	The acceleration interrupt time	0~360s	0.5s	
P.232	The deceleration interrupt frequency	0~650Hz	1Hz	
P.233	The deceleration interrupt time	0~360 s	0.5s	
P.234	Triangular wave function selection	0: None. / 1: External TRI is turned on, triangular wave function will be valid. / 2: The triangular wave function is effective at any given time.	0	
P.235	Maximum amplitude	0~25%	10%	
P.236	Amplitude compensation for deceleration	0~50%	10%	
P.237	Amplitude compensation for acceleration	0~50%	10%	
P.238	Amplitude acceleration time	0~360s/0~3600 s	10 s	
P.239	Amplitude deceleration time	0~360s/0~3600 s	10s	
P.240	Auxiliary frequency function selection	0:Auxiliary frequency function is not selected / 1: operation frequency = basic frequency + auxiliary frequency (2-5) / 2: operation frequency = basic frequency + auxiliary frequency (4-5) / 3: operation frequency = basic frequency - auxiliary frequency (2-5) / 4: operation frequency = basic frequency - auxiliary frequency (4-5) / 5: 2-5 terminals given as a proportion linkage signal / 6: 4-5 terminals given as a proportion linkage signal.	0	

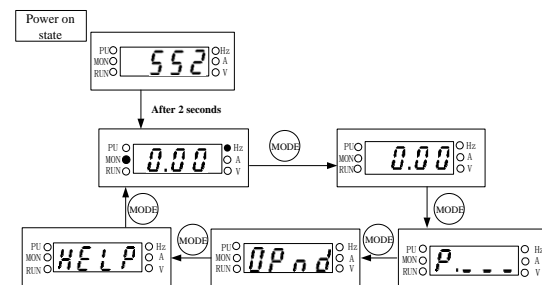| Parameter number	Name	Setting range	Default	User setting
P.242	DC injection brake function before starting selection	0: DC injection brake function is not available before starting.	0	
		1: DC brake injection function is selected before starting.		
P.243	DC injection brake time before starting	0~60s	0.5s	
P.244	DC injection brake voltage before starting	0~30%	4%	
P.245	Cooling fan operation selection	0 : The fan will be turned on when running. The fan will be turned off 30 seconds after inverter stops.	1	
		1 : Turning on the power will turn on the fan. When the power is turned off, the fan will be off, too.		
P.245	Cooling fan operation selection	2 : The fan will be turned on if the temperature of the heat sink is higher than 40℃. When the power is turned off, the fan will be turned off, too.	1	
		3 : The fan will be turned on when the temperature of the heat sink is higher than 60℃. When it is lower than 40℃, the fan will be turned off.		
P.247	MC switchover interlock time	0.1~100s	1s	
P.248	Start waiting time	0.1~100s	0.5s	
P.249	Automatic switchover frequency from inverter to commercial power supply frequency	0~60Hz,9999	9999	
P.250	Automatic switchover frequency range from commercial power supply to inverter	0~10Hz,9999	9999	
P.251	PID target value from keypad	1.0~100.0	100.0	
P.253	Analog signal feedback loss detection time	0~600.0s	0.0s	
P.254	Analog signal feedback loss action selection	0 : Alarm AErr and inverter stop freely	0	
		1 : Slow down to stop then alarm AErr		
		2 : Alarm AErr and continue operation		
P.255	S pattern time at the beginning of acceleration	0~25s	0.2s	
P.256	S pattern time at the end of acceleration	0~25s,9999	9999	
P.257	S pattern time at the beginning of deceleration	0~25s,9999	9999	
P.258	S pattern time at the end of deceleration	0~25s,9999	9999	
P.259	Speed unit selection	0: Speed display selection unit is 1	1	
		1: Speed display selection unit is 0.1		
P.260	Over torque detection selection	0: The OL2 alarm is not reported after the over torque detection, and the inverters continue to running.	1	
		1: The OL2 alarm is reported after the over torque detection, and the inverters stop.		
P.261	Maintenance alarm time	0~9998day	0	
P.268	Voltage stall level	220V :155~410V	380V	
		440V : 310~820V	760V	
P.286	High frequency vibration inhibition factor	0~15	0	
P.287	Short circuit protection function selection	0: No output short-circuit protection function	1	
		1: if the output end is short, the operation panel will display the "SCP" abnormal alarm and the inverter will stop the output.		
P.288	Alarm code display option	0~12	0	
P.289	Alarm code	---	0	
P.290	The latest alarm status selection	0~6	0	
P.291	The latest alarm message	---	0	
P.292	Accumulative motor operation time (minutes)	0~1439min	0 min	
P.293	Accumulative motor operation time (days)	0~9998day	0 day	
P.294	Decryption parameter	0~9998	0	
P.295	Password setup	2~9998	0	
P.300	Motor control mode selection	0: Induction motor V/F control	0	
		1: Reserve		
		2: General flux vector control		
P.301	Motor parameter auto-tuning function selection	0: No motor parameter auto-tuning function	0	
		1: Motor parameter auto-tuning measuring the running motor		
		2: Motor parameter auto-tuning measuring the stopped motor		
		3: Online auto measurement function		
P.302	Motor rated power	0~160	0	
P.303	Motor poles	0~8	4	
P.304	Motor rated voltage	0~440V	220/440V	
P.305	Motor rated frequency	0~650Hz	50Hz/60Hz (Note)	
P.306	Motor rated current	0~500A	Horsepower-based	
P.307	Motor rated rotation speed	0~9998 r/min	1410/1710 r/min (Note)	
P.308	Motor excitation current	0~500A	Horsepower-based	
P.309	Stator resistance	0~99.98Ω	Horsepower-based	
P.320	Sliding compensation gain	0~200%	80%	
P.321	Torque compensation filter coefficient	0~32	16	
P.996	Alarm history clear	---	---	
P.997	Inverter reset	---	---	
P.998	Restoring all parameters to default values	---	---	
P.999	Restoring some parameters to default values	---	---	

Note: The default value is determined by the set value of P.189. When P.189=0, the default value is 60Hz, which is applicable to 60Hz systems. When P.189=1, the default value is 50Hz, which is applicable to 50Hz systems.
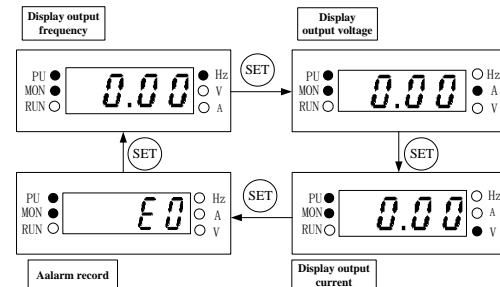
11) Parameter setting process

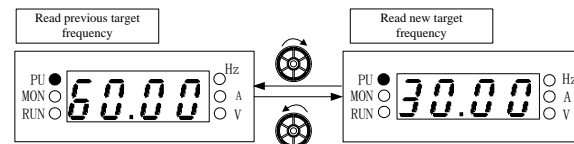➤The flow chart for transferring operation modes with operation panel:

P. 79=0
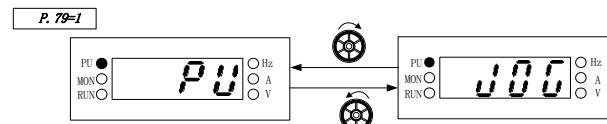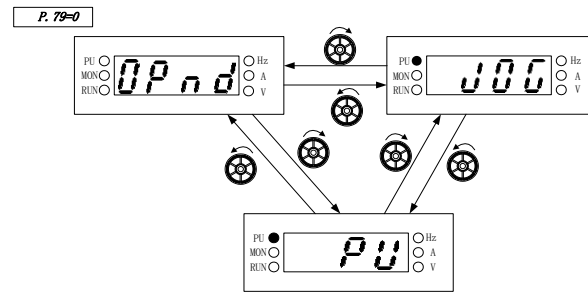
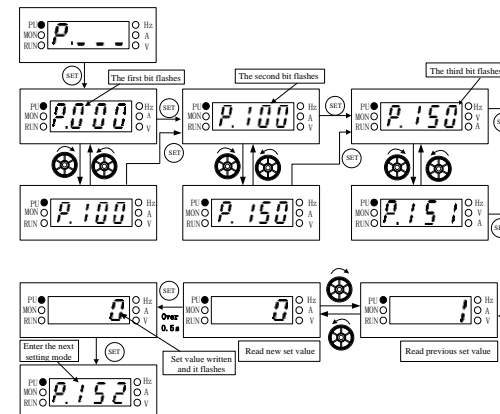➤The flow chart for transferring working modes with operation panel:

Power on state

After 2 seconds

➤Operation flow chart for the monitoring mode with operation panel:

Display output frequency

Display output voltage

Aalarm record

Display output current

➤Operating flow chart for the frequency setting mode with operation panel:

Read previous target frequency

Read new target frequency

➤Operating flow chart for the parameter setting mode with operation panel:

The first bit flashes

The second bit flashes

The third bit flashes

Enter the next setting mode

Set value written and it flashes

Read new set value

Read previous set value

➤Operating flow chart for the HELP mode with operation panel: