INSTRUCTION MANUAL
使用說明書

TECO INVERTER

200V class

IP20 3phase 3.7~132KW
5~175HP

400V class

IP20 3 phase 3.7~315KW
5~425HP

IP55 3 phase 3.7~75KW
5~100HP

TECO INVERTER

F510 Series

Table of Contents

Chapter 1 Safety Precautions

1.1 Before Supplying Power

Warning

- The main circuit must be correctly wired. For single phase supply use terminals (R/L1,T/L3)/for three phase supply use terminals (R/L1,S/L2,T/L3). Terminals U/T1,V/T2,W/T3 must only be used for motor connection. Any connection to supply will cause inverter damage.

Caution

- The power voltage must be the same as the input voltage of the inverter.
- When handling the inverter, do not carry it by its front cover as this may brake off, causing it to drop, resulting damage or injury.
- To avoid risk of fire mount the inverter on a noncombustible surface. Avoid installation near flammable materials.
- When several inverters are installed inside a control panel provide the necessary additional cooling to maintain the required operation temperature of 40 ℃ (50 ℃ without dust cover)
- To avoid any damage to the operator keypad, turn power off before assembly or disassembly.

Warning

- This product complies with IEC 61800-3 for use in second environment, restricted use. Category C3 appropriate measures have to be taken to ensure that the overall system compliance with the required EMC standards.

Caution

- Installation and use of this product must be carried out by a qualified professional electrician.
- The product installation must be applied by the means of fixed wiring.

1.2 Wiring

Warning

- Always turn OFF the input power supply before inverter installation and wiring the terminals.
- Wiring must be performed by qualified electrician.
- Make sure the ground terminal is correctly grounded. (220 V class: Grounding impedance shall be less than 100Ω, 460 V class: Grounding impedance shall be less than 10Ω)
- Always test the operation of any emergency stop circuits after wiring. (Correct wiring is the responsibility of the installer.)
- Never touch the input/output power lines directly with your hands or allow any line to contact the Inverter case.
- Do not carry out the dielectric voltage withstand test on the inverter, this will cause the failure of semiconductor components.

Caution

- Make sure the input power meets that of the inverter, in order to avoid injury or fire.
- Please connect the braking resistor and braking unit according to the related wiring diagram.
- Please fasten the terminal screws based on specified torque so as to avoid fire.
- Do not connect the input power supply line to the output terminal of the inverter.
- Do not connect the magnetic contactor and solenoid switch contacts to the output terminal.
- Do not connect the phase advancing capacitor or LC / RC filter to the output circuit.
- Ensure the interference generated by the inverter and motor will not affect peripheral sensors or devices.

1.3 Before Operation

Warning

- Make sure the inverter capacity is the same as the capacity pre-set in parameters 13—00 before supplying power.
- If the motor cable is longer than 25 meters, reduce the carrier frequency (Parameter 11-01) and / or install an output filter to reduce dv/dt (high voltage rises) which could result in damage to motor or reduce its life expectancy. .

1.4 Parameters Setting

Caution

- When carrying out the auto-tune with rotation, do not connect the motor to the load (mechanical device).
- When carry out the rotatable automatic tuning and the motor will rotate, make sure around space of the motor is enough in order to avoid danger.

1.5 Operation

Warning

- Make sure the front external cover is in place prior to power on.
- Do not connect or disconnect the motor while in operation, otherwise this will cause the inverter to trip because of over-current. In worse case it will cause damage to the main circuit of the inverter.
- When the reset function is operated, consider all safety implications as the machine may restart - when fault is cleared.
- Do not operate the machine with wet hands.
- It provides a independent emergency stop switch. This switch will be enabled when the parameter is being set (see 08-55).
- It provides an independent external hardware emergency switch, which emergently shuts down the inverter output in the case of danger.
- Make sure the operation order is closed before reset warning.
- If choose to automatically restart after power recovery (07-00), the inverter will start automatically after power is restored.
- Before operating the auto-tune with rotation make sure that all safety implication to the connected machine or operator are considered.
- Never touch related terminals regardless of inverter in operation or in stop status to avoid any danger.
- After the power is cut off, the fan might continue to rotate for some time.

Caution

- Do not touch the hot surfaces such as heat sink, braking resistor, etc.
- The inverter enables easily the motor rotation from low speed to high speed. Please make sure that the allowable range of the motor and the machine is not exceeded.
- When the product is supported by the use of the braking module, please pay attention to related settings for its operation.
- Inspecting the circuit board signal should be avoided when the inverter is in operation.

Warning

- Avoid electrical shock! Since the DC capacitors inside the inverter discharges completely in 5 minutes after the power supply is removed, when necessary to do any inspection, wait at least for 5 minutes after power down. It needs 15 minutes if over 20Hp (include).

1.6 Maintenance, Inspection and Replacement

Warning

- Before the maintenance and inspection, make sure the power is cut off and the indicator light of the power is off (make sure the DC voltage does not exceed 25 V).
- Since there are high voltage terminals in the inverter, do not touch any terminals.
- Prior to disassembly ensure that the power is removed from the inverter.
- Only the designated professional can carry out the maintenance or parts replacement.

Caution

- Ensure that the inverter is installed in an environment with ambient temperature -10℃~+40℃ and 95% relative humidity, non-condensing.
- The environment must be free from water drops or vapor.

Disposal caution for the inverter

Caution

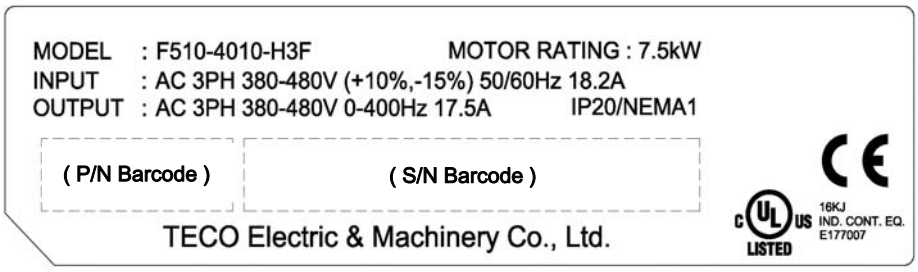
Please dispose of this unit with care as an industrial waste and according to your required local regulations.

- The capacitors of inverter main circuit and printed circuit board are considered as hazardous waste and must not be burnt.
- The Plastic enclosure and parts of the inverter such as the cover board will release harmful gases if burnt.

Chapter 2 Model Description

F510 Series

2.1 Nameplate Data



2.2 Model Designation

F510 - 4 010 – H 3 F N4

F510 Series

Voltage Rating:
2：220V
4：440V

Motor Rating:
005：5HP
008：8HP
∫
150：150HP
175：175HP
215：215HP
∫
535：535HP
800：800HP

Type:
H: Standard (LED Display)
C: Graphic (LCD Display)

Power Source Phase:
3 : For Three phase

Noise Filter:
Blank: None
F: Built-in

Enclosure:
Blank: IP00/IP20
N4: IP55

Model list:

Inverter model (Model for standard products)	Voltage (Vac)	Applied frequency (Hz)	Horse Power (Hp)	Applied Motor (KW)	Filter Built-in		Keypad		IP55
					with	without	LED	LCD	
F510-2005-H3	3ph 200~240V +10%/-15%	50/60Hz	5	3.7		◎	◎		
F510-2005-C3			5	3.7		◎		◎	
F510-2008-H3			7.5	5.5		◎	◎		
F510-2008-C3			7.5	5.5		◎		◎	
F510-2010-H3			10	7.5		◎	◎		
F510-2010-C3			10	7.5		◎		◎	
F510-2015-H3			15	11		◎	◎		
F510-2015-C3			15	11		◎		◎	
F510-2020-H3			20	15		◎	◎		
F510-2020-C3			20	15		◎		◎	
F510-2025-H3			25	18.5		◎	◎		
F510-2025-C3			25	18.5		◎		◎	
F510-2030-H3			30	22		◎	◎		
F510-2030-C3			30	22		◎		◎	
F510-2040-H3			40	30		◎	◎		
F510-2040-C3			40	30		◎		◎	
F510-2050-H3			50	37		◎	◎		
F510-2050-C3			50	37		◎		◎	
F510-2060-H3			60	45		◎	◎		
F510-2060-C3			60	45		◎		◎	
F510-2075-H3			75	55		◎	◎		
F510-2075-C3			75	55		◎		◎	
F510-2100-H3			100	75		◎	◎		
F510-2100-C3			100	75		◎		◎	
F510-2125-H3			125	94		◎	◎		
F510-2125-C3			125	94		◎		◎	
F510-2150-H3			150	112		◎	◎		
F510-2150-C3			150	112		◎		◎	
F510-2175-H3			175	130		◎	◎		
F510-2175-C3			175	130		◎		◎	
F510-4005-H3	3ph 380~480V +10%/-15%		5	3.7		◎	◎		
F510-4005-H3F			5	3.7	◎		◎		
F510-4005-C3			5	3.7		◎		◎	
F510-4005-C3F			5	3.7	◎			◎	
F510-4005-C3FN4			5	3.7	◎			◎	◎

Inverter model (Model for standard products)	Voltage (Vac)	Applied frequency (Hz)	Horse Power (Hp)	Applied Motor (KW)	Filter Built-in		Keypad		IP55
					with	without	LED	LCD	
F510-4008-H3	3ph 380~480V +10%/-15%	50/60Hz	7.5	5.5		◎	◎		
F510-4008-H3F			7.5	5.5	◎		◎		
F510-4008-C3			7.5	5.5		◎		◎	
F510-4008-C3F			7.5	5.5	◎			◎	
F510-4008-C3FN4			7.5	5.5	◎			◎	◎
F510-4010-H3			10	7.5		◎	◎		
F510-4010-H3F			10	7.5	◎		◎		
F510-4010-C3			10	7.5		◎		◎	
F510-4010-C3F			10	7.5	◎			◎	
F510-4010-C3FN4			10	7.5	◎			◎	◎
F510-4015-H3			15	11		◎	◎		
F510-4015-H3F			15	11	◎		◎		
F510-4015-C3			15	11		◎		◎	
F510-4015-C3F			15	11	◎			◎	
F510-4015-C3FN4			15	11	◎			◎	◎
F510-4020-H3			20	15		◎	◎		
F510-4020-H3F			20	15	◎		◎		
F510-4020-C3			20	15		◎		◎	
F510-4020-C3F			20	15	◎			◎	
F510-4020-C3FN4			20	15	◎			◎	◎
F510-4025-H3			25	18.5		◎	◎		
F510-4025-H3F			25	18.5	◎		◎		
F510-4025-C3			25	18.5		◎		◎	
F510-4025-C3F			25	18.5	◎			◎	
F510-4025-C3FN4			25	18.5	◎			◎	◎
F510-4030-H3			30	22		◎	◎		
F510-4030-H3F			30	22	◎		◎		
F510-4030-C3			30	22		◎		◎	
F510-4030-C3F			30	22	◎			◎	
F510-4030-C3FN4			30	22	◎			◎	◎
F510-4040-H3			40	30		◎	◎		
F510-4040-H3F			40	30	◎		◎		
F510-4040-C3			40	30		◎		◎	
F510-4040-C3F			40	30	◎			◎	
F510-4040-C3FN4			40	30	◎			◎	◎

Inverter model (Model for standard products)	Voltage (Vac)	Applied frequency (Hz)	Horse Power (Hp)	Applied Motor (KW)	Filter Built-in		Keypad		IP55
					with	without	LED	LCD	
F510-4050-H3	3ph 380~480V +10%/-15%	50/60Hz	50	37		◎	◎		
F510-4050-H3F			50	37	◎		◎		
F510-4050-C3			50	37		◎		◎	
F510-4050-C3F			50	37	◎			◎	
F510-4050-C3FN4			50	37	◎			◎	◎
F510-4060-H3			60	45		◎	◎		
F510-4060-H3F			60	45	◎		◎		
F510-4060-C3			60	45		◎		◎	
F510-4060-C3F			60	45	◎			◎	
F510-4060-C3FN4			60	45	◎			◎	◎
F510-4075-H3			75	55		◎	◎		
F510-4075-H3F			75	55	◎		◎		
F510-4075-C3			75	55		◎		◎	
F510-4075-C3F			75	55	◎			◎	
F510-4075-C3N4			75	55		◎		◎	◎
F510-4100-H3			100	75		◎	◎		
F510-4100-C3			100	75		◎		◎	
F510-4100-C3N4			100	75		◎		◎	◎
F510-4125-H3			125	94		◎	◎		
F510-4125-C3			125	94		◎		◎	
F510-4150-H3			150	112		◎	◎		
F510-4150-C3			150	112		◎		◎	
F510-4175-H3			175	130		◎	◎		
F510-4175-C3			175	130		◎		◎	
F510-4215-H3			215	160		◎	◎		
F510-4215-C3			215	160		◎		◎	

Inverter model (Model for standard products)	Voltage (Vac)	Applied frequency (Hz)	Horse Power (Hp)	Applied Motor (KW)	Filter Built-in		Keypad		IP55
					with	without	LED	LCD	
F510-4250-H3	3ph 380~480V +10%/-15%	50/60Hz	250	185		◎	◎		
F510-4250-C3			250	185		◎		◎	
F510-4300-H3			300	220		◎	◎		
F510-4300-C3			300	220		◎		◎	
F510-4375-H3			375	280		◎	◎		
F510-4375-C3			375	280		◎		◎	
F510-4425-H3			425	317		◎	◎		
F510-4425-C3			425	317		◎		◎	
F510-4535-H3			535	400		◎	◎		
F510-4535-C3			535	400		◎		◎	
F510-4670-H3			670	500		◎	◎		
F510-4670-C3			670	500		◎		◎	
F510-4800-H3			800	600		◎	◎		
F510-4800-C3			800	600		◎		◎	

*1. The short-circuit capacity of the inverter is below 5000A/240V or 5000A/480V, 220V for model of 200~240V; 440V for model of 380~480V.

*2. IP20 220V 150HP (112KW) and 440V 300HP (220KW) or above are under development.

Chapter 3 Ambient Environment and Installation

3.1 Screw Torques for Terminals

To comply with UL standards, you shall use UL approved copper wires (rated 75 ° C) and round crimp terminals (UL Listed products) in the following table when connecting the main circuit terminal. TECO recommends using crimp terminals manufactured by NICHIFU Terminal Industry Co., Ltd and the terminal crimping tool recommended by the manufacturer for crimping terminals and the insulating sleeve.

Wire size mm^2 (AWG)	Terminal screw size	Model of the round crimp terminal	Fastening torque kgf.cm (in.lbs)	Model of insulating sleeve	Model of crimp tool
0.75 (18)	M3.5	R1.25-3.5	8.2 to 10 (7.1 to 8.7)	TIC 1.25	NH 1
	M4	R1.25-4	12.2 to 14 (10.4 to 12.1)	TIC 1.25	NH 1
1.25 (16)	M3.5	R1.25-3.5	8.2 to 10 (7.1 to 8.7)	TIC 1.25	NH 1
	M4	R1.25-4	12.2 to 14 (10.4 to 12.1)	TIC 1.25	NH 1
2 (14)	M3.5	R2-3.5	8.2 to 10 (7.1 to 8.7)	TIC 2	NH 1 / 9
	M4	R2-4	12.2 to 14 (10.4 to 12.1)	TIC 2	NH 1 / 9
	M5	R2-5	22.1 to 24 (17.7 to 20.8)	TIC 2	NH 1 / 9
	M6	R2-6	25.5 to 30.0 (22.1 to 26.0)	TIC 2	NH 1 / 9
3.5/5.5 (12/10)	M4	R5.5-4	12.2 to 14 (10.4 to 12.1)	TIC 3.5/5.5	NH 1 / 9
	M5	R5.5-5	20.4 to 24 (17.7 to 20.8)	TIC 3.5/5.5	NH 1 / 9
	M6	R5.5-6	25.5 to 30.0 (22.1 to 26.0)	TIC 3.5/5.5	NH 1 / 9
	M8	R5.5-8	61.2 to 66.0 (53.0 to 57.2)	TIC 3.5/5.5	NH 1 / 9
8 (8)	M4	R8-4	12.2 to 14 (10.4 to 12.1)	TIC 8	NOP 60
	M5	R8-5	20.4 to 24 (17.7 to 20.8)	TIC 8	NOP 60
	M6	R8-6	25.5 to 30.0 (22.1 to 26.0)	TIC 8	NOP 60
	M8	R8-8	61.2 to 66.0 (53.0 to 57.2)	TIC 8	NOP 60
14 (6)	M4	R14-4	12.2 to 14 (10.4 to 12.1)	TIC 14	NH 1 / 9
	M5	R14-5	20.4 to 24 (17.7 to 20.8)	TIC 14	NH 1 / 9
	M6	R14-6	25.5 to 30.0 (22.1 to 26.0)	TIC 14	NH 1 / 9
	M8	R14-8	61.2 to 66.0 (53.0 to 57.2)	TIC 14	NH 1 / 9
22 (4)	M6	R22-6	25.5 to 30.0 (22.1 to 26.0)	TIC 22	NOP 60/ 150H
	M8	R22-8	61.2 to 66.0 (53.0 to 57.2)	TIC 22	NOP 60/ 150H
30/38 (3 / 2)	M6	R38-6	25.5 to 30.0 (22.1 to 26.0)	TIC 38	NOP 60/ 150H
	M8	R38-8	61.2 to 66.0 (53.0 to 57.2)	TIC 38	NOP 60/ 150H
50 / 60 (1 / 1/ 0)	M8	R60-8	61.2 to 66.0 (53.0 to 57.2)	TIC 60	NOP 60/ 150H
	M10	R60-10	102 to 120 (88.5 to 104)	TIC 60	NOP 150H
70 (2/0)	M8	R70-8	61.2 to 66.0 (53.0 to 57.2)	TIC 60	NOP 150H
	M10	R70-10	102 to 120 (88.5 to 104)	TIC 60	NOP 150H
80 (3/0)	M10	R80-10	102 to 120 (88.5 to 104)	TIC 80	NOP 150H
	M16	R80-16	255 to 280 (221 to 243)	TIC 80	NOP 150H
100 (4/0)	M10	R100-10	102 to 120 (88.5 to 104)	TIC 100	NOP 150H
	M12	R100-12	143 to 157 (124 to 136)	TIC 100	NOP 150H
	M16	R80-16	255 to 280 (221 to 243)	TIC 80	NOP 150H

3.2 Wiring Peripheral Power Devices

Cautions

- After the power is cut off, while the “CHARGE” indicator of the inverter is still on, it means the discharge of the capacitor has not been completed. Don’t touch the circuit or replace components at this time.
- Never wire or disassemble/assemble internal connectors of inverter when the power is supplied.
- Avoid connecting U, V and W of inverter output terminals to AC power, this will result in serious damage to the inverter.
- Terminal E of the inverter must be correctly grounded. Comply with your local electrical standards.
- Since semiconductor components are easily damaged by high voltage, do not carry out the high voltage withstand test on internal components of F510 inverter.
- CMOS IC of the inverter control board is easily affected and damaged by static electricity, thus, do not touch the control board.

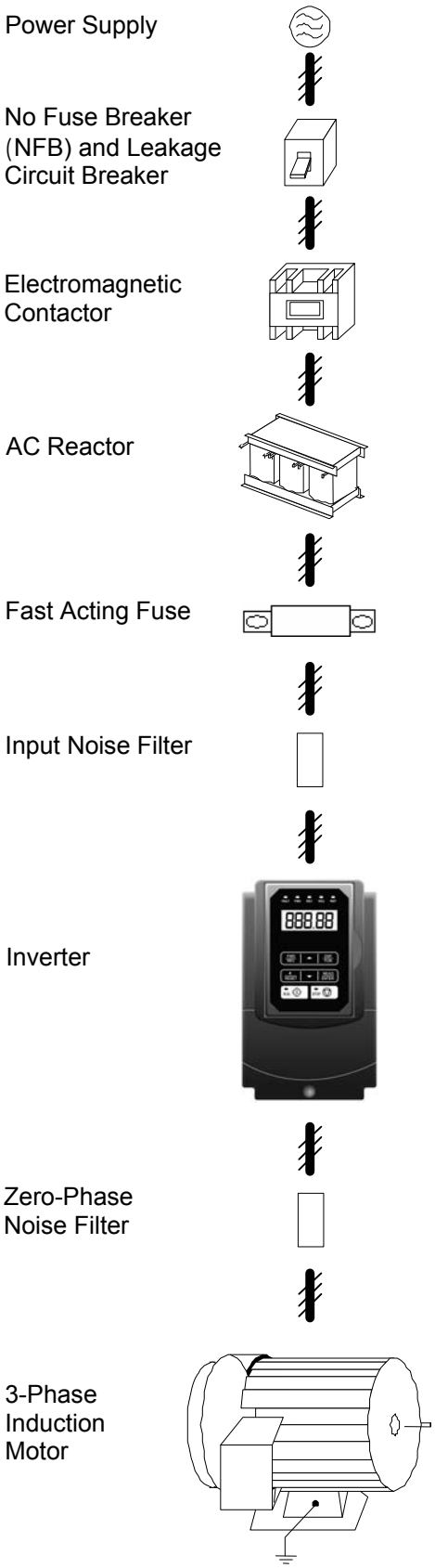
Cautions

- When wiring, please refer to the table for choosing appropriate wire diameter. If the power cable is too long, pay attention to the voltage drop which can not exceed 2% of the rated voltage.
  Phase voltage drop $\triangle V = \sqrt{3}$ ×wire resistance (Ω/km)×wiring distance (m)×current (A)×10-3
- In case of a long wire between the inverter and the motor, please reduce the carrier frequency appropriately Manual-(parameters 11-01).

Cautions

- To ensure the security of the interface device, it is recommended that a fast-acting fuse be added at the input side of the inverter, especially for high-power systems. The specification of applied fast-acting fuse can be referred to Manual-Section 6.6.

Examples for wiring the peripheral devices of F510 are shown in the following:



■ No fuse breaker (NFB) and Leakage Circuit Breaker

- Please refer to table 3 for choosing NFB of appropriate current.
- Do not use NFB to control the start/stop of the inverter.
- If a leakage circuit breaker is added for leakage protection, its current sensitivity shall be more than 200mA and action time more than 0.1 (V-TYPE), so as to avoid high-frequency malfunction.

■ Magnetic contactor

- Normally a magnetic contactor is not needed. A contactor can be used to perform functions such as external control and auto restart after power failure. Do not use the magnetic contactor as the run/stop switch for the inverter.

■ AC reactor

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

■ Fast acting fuse

- To protect interface devices, it is necessary to add a fast acting fuse (fuse specification will be referred to Manual-Section 6.6).

■ Input Noise filter

- F510 is matched with TECO special filter, meeting the EN55011 class A, category C3.
- The selection of input noise filter can be referred to Manual-Section 6.4

■ Inverter

- Terminal R,S,T at input side have no phase sequence requirement, thus they can be arbitrarily exchanged.
- Terminal E must be correctly grounded.

■ Zero-phase noise filter

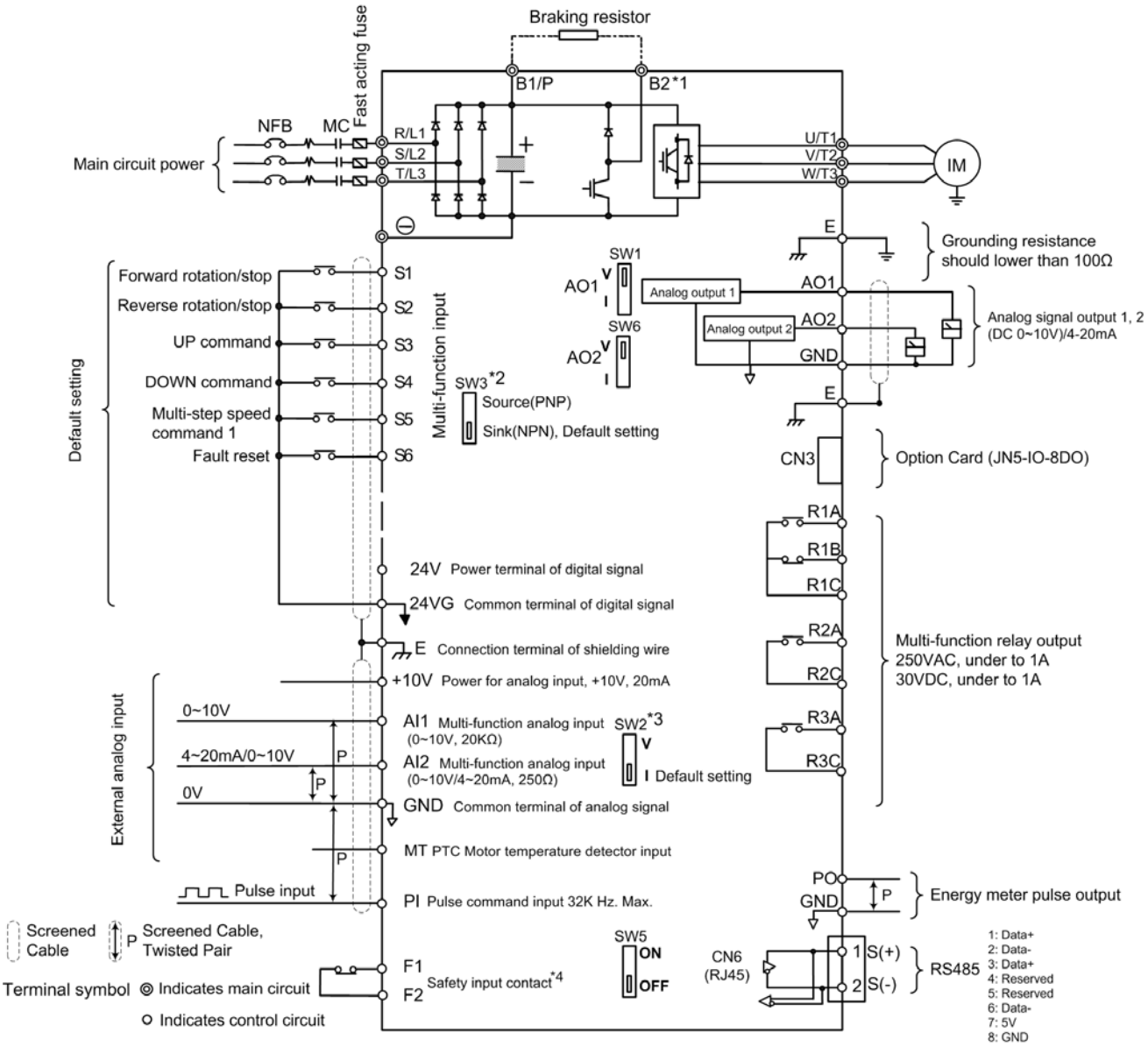
- Adding a zero-phase noise filter at the output side of the inverter. This can decrease the radiated interference and induced noise.
- Please refer to Manual-Section 6.5

■ Motor

- If an inverter drives multiple motors, the rated current of the inverter must be greater than the total current that all motors operate at the same time.
- Motor and inverter must be grounded respectively.

3.3 General Wiring Diagram

The following is the standard wiring diagram for the F510 inverter (◎ indicates main circuit terminal ，○ indicates control circuit terminal). Locations and symbols of the wiring terminal block might be different due to different models of F510. The description of main circuit terminal and control circuit terminal can be referred to table 3-1, 3-2 and 3-3.



Remark:

*1: Only the main circuit of IP20 220V 5~30HP, 440V 5~40HP (included) and IP55 440V 5~25HP with built-in braking transistor provide terminal B2. The braking transistor can be connected directly between B1 and B2.

*2: The multi-function digital input terminals S1~S6 can be set to Source (PNP) or Sink (NPN) mode by SW3.

*3: The multi-function analog input 2 (AI2) can be set to the voltage command input (0~10v) or the current command input (4~20mA) through the SW2.

*4: When integrated safety function is NOT used, connect a link across terminals F1 & F2 for the inverter output to function. External safety circuits can be interfaced with inverter using terminals F1 and F2.

3.4 Inverter Specifications

Basic Specification

(a) 220V Class

Inverter Capacity (HP)			5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175
Output Rated	**Rated Output Capacity (KVA)**		5.5	8	11.4	15.2	21.3	26.2	30	41.9	52.5	64.3	76.2	95.2	119	152	171
	Rated Output Current (A)		14.5	21	30	40	56	69	79	110	138	169	200	250	312	400	450
	Maximum Applicable Motor	**(HP)**	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175
		(KW)	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	130
	Maximum Output Voltage (V)		Three Phase, 200V~240V														
	Maximum Output Frequency (Hz)		Based on parameter setting 0.1~400.0 Hz[*3]														
Input Power	**Rated Voltage, Frequency**		Three Phase, 380V ~ 480V, 50/60Hz														
	Allowable Voltage Fluctuation		-15% ~ +10%														
	Allowable Frequency Fluctuation		±5%														

(b) 440V Class

Inverter Capacity (HP)			5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175	215	250	300	375	425	535[*2]	670[*2]	800[*2]
Output Rated	**Rated Output Capacity (KVA)**		7	8.4	13	18	24	29	34	41	55	67	78	110	125	158	190	225	250	331	392	445	525	640	731
	Rated Output Current (A)		9.2	11	18	23	31	38	44	54	72	88	103	145	165	208	250	296	328	435	515	585	690	840	960
	Maximum Applicable Motor	**(HP)**	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175	215	250	300	375	425	535	670	800
		(KW)	4	5.5	7.5	11	15	19	22	30	37	45	55	75	90	110	132	160	185	220	280	315	400	500	600
	Maximum Output Voltage (V)		Three Phase, 380V~480V																						
	Maximum Output Frequency (Hz)		Based on parameter setting 0.1~400.0Hz[*3]																						
Input Power	**Rated Voltage Frequency**		Three Phase, 380V ~ 480V, 50/60Hz																						
	Allowable Voltage Fluctuation		-15% ~ +10%																						
	Allowable Frequency Fluctuation		±5%																						

*1. Based on the standard 4-pole induction motor, selecting inverter must have a higher output current rating than motor.

*2. F510 model is designed to be used in normal load condition and the overload capacity is 120%/1min.

*3. 440V 535HP model or above are under development.

*4. If the carrier frequency is higher than factory setting, it needs to adjust the load current based on the de-rating curve.

220V Class	Carrier Freq Factory Setting	Carrier Freq Range	440V Class	Carrier Freq Factory Setting	Carrier Freq Range
5~25HP	2KHz	2~16KHz	5~30HP	4KHz	2~16KHz
30HP	2KHz	2~12KHz	40HP	2KHz	2~16KHz
40~50HP	2KHz	2~12KHz (*5)	50~60HP	4KHz	2~12KHz (*5)
60~125HP	2KHz	2~10KHz (*5)	75~215HP	4KHz	2~10KHz (*5)
-	-	-	250HP	2KHz	2~8KHz
150~175HP	2KHz	2~5KHz	300~375HP	4KHz	2~5KHz
-	-	-	425HP	2KHz	2~5KHz
-	-	-	535~800HP	4KHz	2~5KHz

*5. Control mode (00-00) is set to 2 (SLV mode) and maximum frequency (01-02) is larger than 80Hz, the carrier frequency range is 2~8KHz.

The following shows maximum frequencies under different control modes.

Control Mode	Other Settings	Maximum Frequency
V/F	Unlimited	400Hz
SLV	220V 5~15HP, 440V 5~20HP	150Hz
	220V 20~30HP, 440V 25HP	110Hz
	440V 30~40HP	100Hz
	220V 40~125HP, 440V 50~215HP, carrier freq (11-01) is set as 8K or below 8K.	100Hz
	220V 40~125HP, 440V 50~215HP, carrier freq (11-01) is set above 8K.	80Hz
	220V 150~175HP, 440V 250~800HP	100Hz
PMSLV	Unlimited	400Hz

General Specifications

Control Characteristics	**Display**	LED keypad with 5-digits seven-segment display or LCD keypad (HOA LCD keypad option)all LCD keypad with parameter copy function
	Control Modes	V/F, SLV, PMSLV with Space Vector PWM Mode
	Output Frequency	0.1Hz ~ 400.0Hz
	Frequency Accuracy	Digital references : ±0.01%(-10 ~ +40℃) · Analog references : ±0.1% (25℃ ±10℃)
	Speed Control Accuracy	±0.5%(Sensorless Vector Control Mode)
	Frequency Setting Resolution	Digital references : 0.01Hz · Analog references : 0.06Hz/60Hz
	Output Frequency Resolution	0.01Hz
	Overload Tolerance	120%/1 min
	Frequency Setting Signal	DC 0 ~ +10V / -10V~+10V or 4 ~ 20mA
	Acceleration / Deceleration Time	0.0 ~ 6000.0 second (separately set acceleration and deceleration time)
	Voltage / Frequency Characteristics	Can arbitrarily set V / F curve based on parameters
	Braking Torque	About 20%
	Main Control Functions	Auto Tuning, Soft-PWM, Over-Voltage Protection, Dynamic Braking, Speed Search, Momentary Power Loss Restart, 2 Sets of PID Control, Slide Difference Compensation, RS-485 Communication Standard, Simple PLC Function, 2 Sets of Analog Output, Safety Switch
	Other Functions	Records of Power On and Operation Time, 4 Fault History Records and Latest Fault Record State, Energy-Saving Function, Phase Loss protection, Smart Braking, DC Braking, Dwell, S Curve Acceleration and Deceleration, Up / Down Operation, MODBUS, BACNet MS/TP, and MetaSys N2 Communication Protocol, Display of Multi- Engineering Unit, Local / Remote Switch, SINK / SOURCE Input Selection, User Parameter Settings
Protection Functions	**Stall Protection**	Current level can be set (in acceleration or constant speed, it can be set separately. In deceleration, it can be set with or without protection)
	Over Current (OC) and Output Short-circuit (SC) Protection	It stops when the current exceeds 160% of the inverter rated current
	Inverter Overload Protection (OL2)	Inverter will be stopped when the output higher than 120% rated current for 1 min, Carrier frequency is 2~4KHZ
	Motor Overload Protection (OL1)	Electrical overload protection curve
	Over Voltage Protection (OV)	If the main circuit DC voltage is over 410V (220V class) / 820V (440V class), the motor stops running
	Under Voltage Protection (UV)	If the main circuit DC voltage is under 190V (220V class) / 380V (440V class), the motor stops running
	Momentary Power Loss Restart	Power loss exceeds 15ms. You can set the function of momentary power loss restart up to 2sec
	Overheat Protection(OH)	Thermistor sensor on heatsink
	Ground Fault Protection(GF)	Protection by current detection circuit
	Charge Indicator	When main circuit DC voltage ≧50V, the CHARGE LED is on
	Output Phase Loss Protection (OPL)	If the OPL function acts, the motor stops rotation automatically
Environment Specification	**Location**	Indoor (protected from corrosive gases and dust)
	Ambient Temperature	-10 ~ +40 ℃ (IP20/NEMA1), -10 ~ +50 ℃ (IP00), with de-rating, maximum operation temperature is 60℃
	Storage Temperature	-20 ~ +70℃
	Humidity	95%RH or less (no condensation)
	Altitude and Vibration	Altitude of 1000 meters or lower, below 5.9m/s^2(0.6G)
Communication Function		Built-in RS-485 as standard (Modbus protocol with RJ45 / BACnet / Metasys N2)
PLC Function		Built-in
Electromagnetic Interference (EMI)		Meet EN61800-3 Standard, IP20 400V 75HP or below and IP55 400V 60HP can be built in
Electromagnetic Susceptibility (EMS)		Meet EN61800-3 Standard
Certification	**CE**	Meet EN61800-3(CE & RE) and EN61800-5-1(LVD)
	UL	UL508C
Option Card		1 to 8 Pump card, HOA LCD keypad, Profibus card

3.5 Terminal Description

Table 3-1 Main Circuit Terminals for IP00/IP20 Model

<table>
<tr><th>Terminal Symbols</th><th>220V：5~30HP
440V：5~40HP</th><th>220V: 40~175HP
440V: 50~800HP</th></tr>
<tr><td>R/L1</td><td colspan="2" rowspan="3">Power supply of the main terminal</td></tr>
<tr><td>S/L2</td></tr>
<tr><td>T/L3</td></tr>
<tr><td>B1／P</td><td rowspan="3">• B1 / P－⊖: DC power supply
• B1 / P－B2: externally connected braking resistor</td><td rowspan="2">-</td></tr>
<tr><td>B2</td></tr>
<tr><td>⊖</td><td rowspan="2">• ⊕ -⊖: DC power supply or connect braking detection module</td></tr>
<tr><td>⊕</td><td>-</td></tr>
<tr><td>U/T1</td><td colspan="2" rowspan="3">Inverter output</td></tr>
<tr><td>V/T2</td></tr>
<tr><td>W/T3</td></tr>
<tr><td>E</td><td colspan="2">Ground terminal</td></tr>
</table>

Table 3-2 Main Circuit Terminals for IP55 Model

Terminal Symbols	440V： 5 - 100HP
R/L1	Power supply of the main terminal
S/L2	
T/L3	
B1, B2	externally connected braking resistor
⊕1, ⊕2	DC reactor terminal
B1, B2, ⊖	DC power supply (DC+, DC-) for braking module
U/T1	Inverter output
V/T2	
W/T3	
⏚ (PE)	Ground terminal

*1. 440V models below 25HP (18.5KW) (included) are built-in braking transistor.

*2. For installing DC reactor, please remove the short circuit pin between ⊕1, ⊕2 in advance.

Table 3-3 Control Circuit Terminals

Type	Terminal	Terminal Function	Signal Level
Digital Input Signal	S1	Forward rotation─ stop command (default), multi-function input terminals * 1	24 VDC, 8 mA optocoupler isolation (maximum voltage of 30 Vdc, input impedance of 4.22kΩ optocoupler)
	S2	Reversal rotation- stop command (default), multi-function input terminals * 1	
	S3	UP command(default), multi-function input terminals * 1	
	S4	DOWN command(default), multi-function input terminals * 1	
	S5	Multi-step speed frequency command 1, multi-function input terminal* 1	
	S6	fault reset input, multi-function input terminal * 1	
24V Power Supply	24V	Digital signal SOURCE point (SW3 switched to SOURCE)	±15%, Maximum output current: 250mA (the sum of all load)
	24VG	Common terminal of Digital signals Common point of digital signal SINK (SW3 switched to SINK)	
Analog Input Signal	+10V	Power for external speed potentiometer	+10V (Maximum current , 20mA)
	MT	PTC motor temperature detector input	Start at 1330Ω, Recovery at 550Ω
	AI1	Multi-function analog input for speed reference (0-10V input)	From 0 to +10V, (Input impedance : 20KΩ) (12bit resolution)
	AI2	Multi-function analog input terminals *2, can use SW2 to switch voltage or current input (0~10V)/(4-20mA)	From 0 to +10V, (Input impedance : 20KΩ) From 4 to 20 mA (Input impedance : 250KΩ) (12bit resolution)
	GND	Analog signal ground terminal	----
	E	Shielding wire's connecting terminal (Ground)	----
Analog output signal	AO1	Multi-function analog output terminals *3 (0~10V)/(4-20mA) output	From 0 to 10V, (Maximum current, 20mA) From 4 to 20 mA
	AO2	Multi-function analog output terminals *3 (0~10V)/(4-20mA) output	
	GND	Analog signals ground terminal	
Pulse output signal	PO	Pulse output, band width 32KHz	32KHz(max), Open Collector output
	GND	Analog signals ground terminal	----
Pulse input signal	PI	Pulse command input band width 32KHz	L: from 0.0 to 0.5V H: from 4.0 to 13.2V 0 - 32 KHz(max) (impedance:3.89 KΩ)
	GND	Analog signals ground terminal	----

Type	Terminal	Terminal Function	Signal Level
Relay Output	R1A R1B R1C	Relay A contact (multi-function output terminal) Relay B contact (multi-function output terminal) Relay contact common terminal. it can be refer to the manual.	Terminal capacity: at 250Vac, 10 mA~1A at 30Vdc, 10 mA~1A
	R2A-R2C	With the same functions as R1A/R1B/R1C	Terminal capacity: at 250Vac, 10 mA~1A at 30Vdc, 10 mA~1A
	R3A-R3C	With the same functions as R1A/R1B/R1C	
Safety Input	F1	on: emergency stop. off: normal operation (The short circuit pin.must be removed, when using external safety switch to stop,)	24Vdc, 8mA, pull-high
	F2	Safety command common terminal	24V Ground
RS-485 Port	S (+)	RS485/MODBUS	Differential input and output
	S (-)		
Grounding	E (G)	Grounding to earth Shield the connecting terminal	----

*1:Multi-function digital input can be referred to the manual.

*2:Multi-function analog input can be referred to the manual.

*3:Multi-function analog output can be referred to the manual.

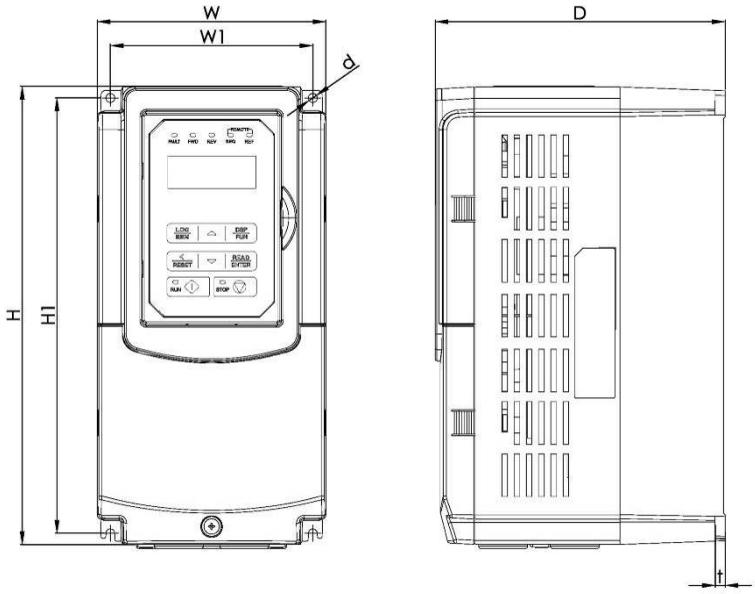
Caution

- Maximum output current capacity of the terminal 10V is 20mA.
- Multi-function analog output AO1 and AO2 are special for the analog output of meter. Don't use them to the analog signal output of feedback control.
- The 24V & ±12V power supply of control board is only for internal control, don't connect to other external devices.

3.6 Overall Dimension Drawing

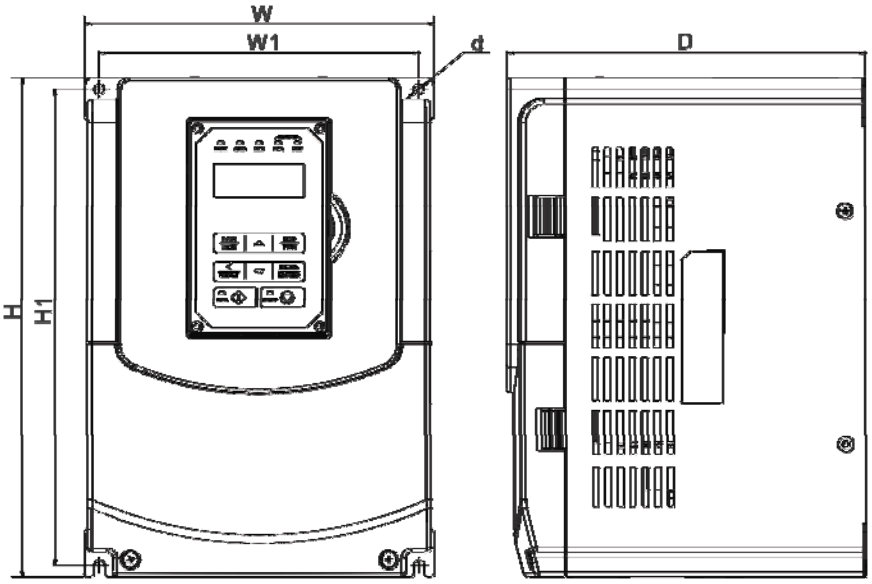
3.6.1 Standard Model (IP00/IP20)

(a) 220V: 5-7.5HP/440V :5-10HP



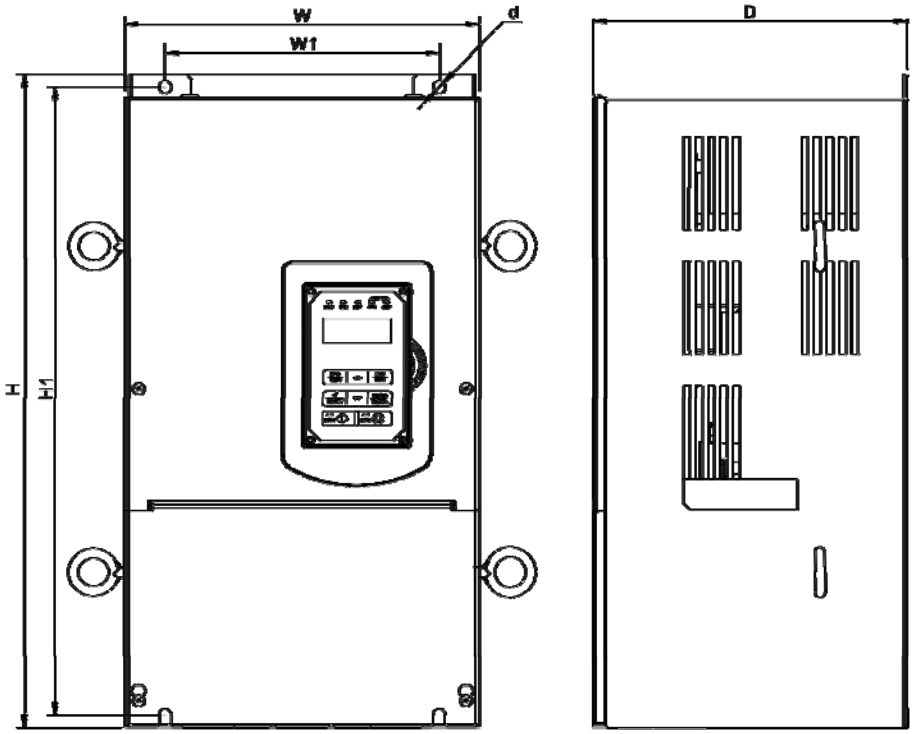
Inverter Model	Dimension (mm)								
	W	H	D	W1	H1	t	d	GW(kg)	Notes
F510-2005-H3	140	279	177	122	267	7	M6	3.8	
F510-2008-H3	140	279	177	122	267	7	M6	3.8	
F510-4005-H3	140	279	177	122	267	7	M6	3.8	
F510-4008-H3	140	279	177	122	267	7	M6	3.8	
F510-4010-H3	140	279	177	122	267	7	M6	3.8	

(b) 220V: 10-30HP/440V :15-40HP



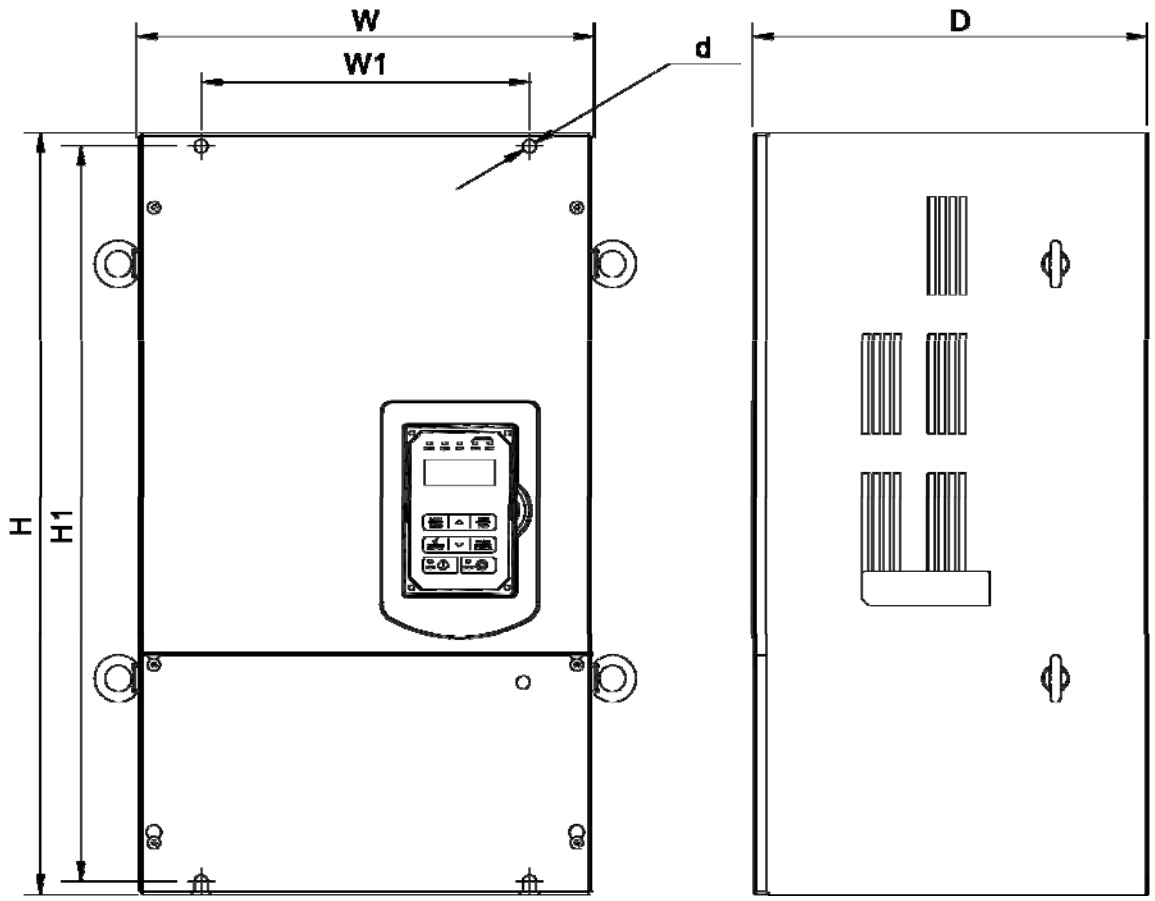
Inverter Model	Dimension (mm)								
	W	H	D	W1	H1	t	d	GW(kg)	Notes
F510-2010-H3	210	300	215	192	286	1.6	M6	6.2	
F510-2015-H3	210	300	215	192	286	1.6	M6	6.2	
F510-2020-H3	265	360	225	245	340	1.6	M8	10	
F510-2025-H3	265	360	225	245	340	1.6	M8	10	
F510-2030-H3	265	360	225	245	340	1.6	M8	10	
F510-4015-H3	210	300	215	192	286	1.6	M6	6.2	
F510-4020-H3	210	300	215	192	286	1.6	M6	6.2	
F510-4025-H3	265	360	225	245	340	1.6	M8	10	
F510-4030-H3	265	360	225	245	340	1.6	M8	10	
F510-4040-H3	265	360	225	245	340	1.6	M8	10	

(c) 220V :40-50HP/440V :50-75HP



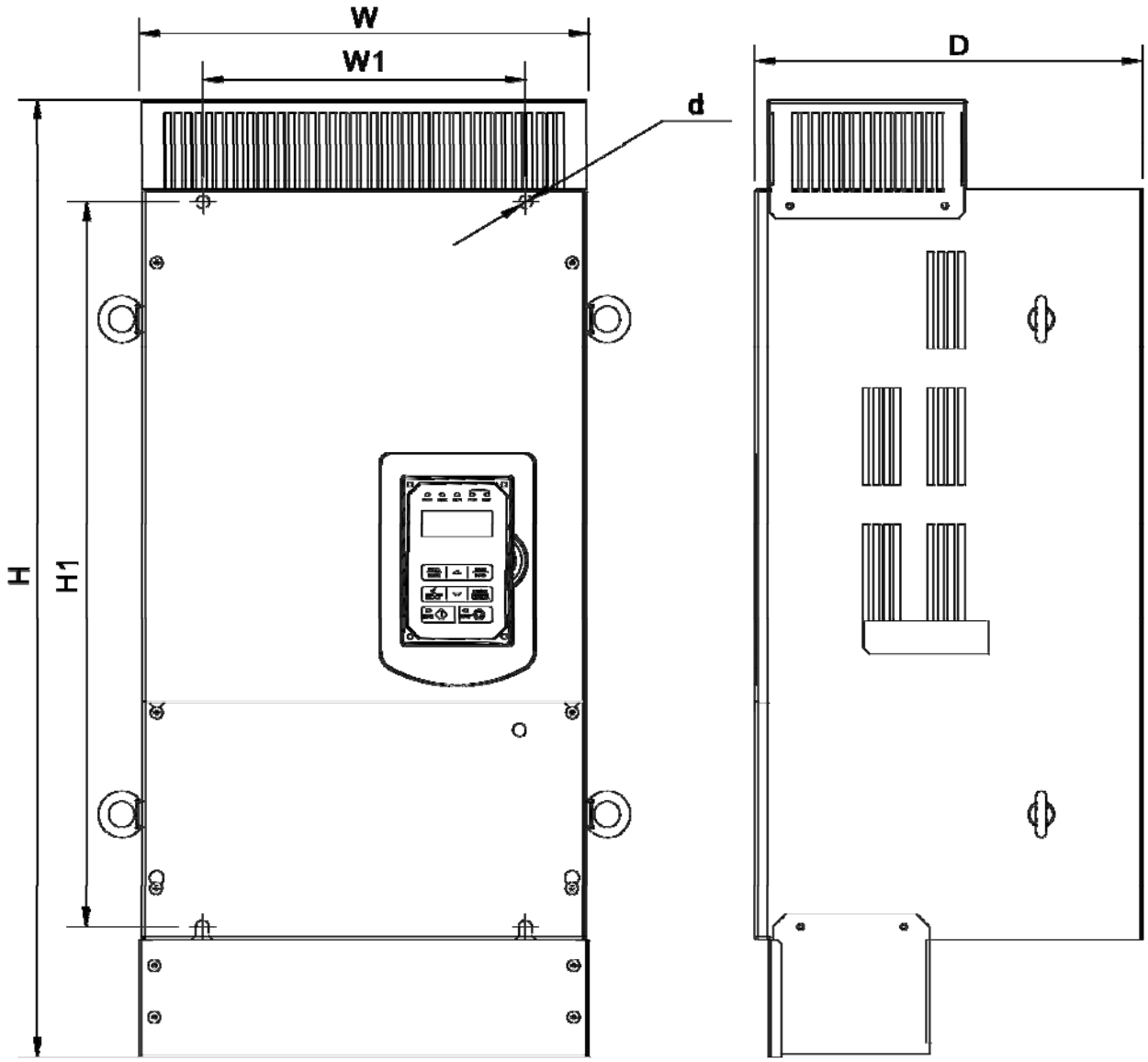
Inverter Model	Dimension (mm)								
	W	H	D	W1	H1	t	d	GW(kg)	Notes
F510-2040-H3	284	525	252	220	505	1.6	M8	30	
F510-2050-H3	284	525	252	220	505	1.6	M8	30	
F510-4050-H3	284	525	252	220	505	1.6	M8	30	
F510-4060-H3	284	525	252	220	505	1.6	M8	30	
F510-4075-H3	284	525	252	220	505	1.6	M8	30	

(d) 220V: 60-125HP/440V :100-250HP (IP00)



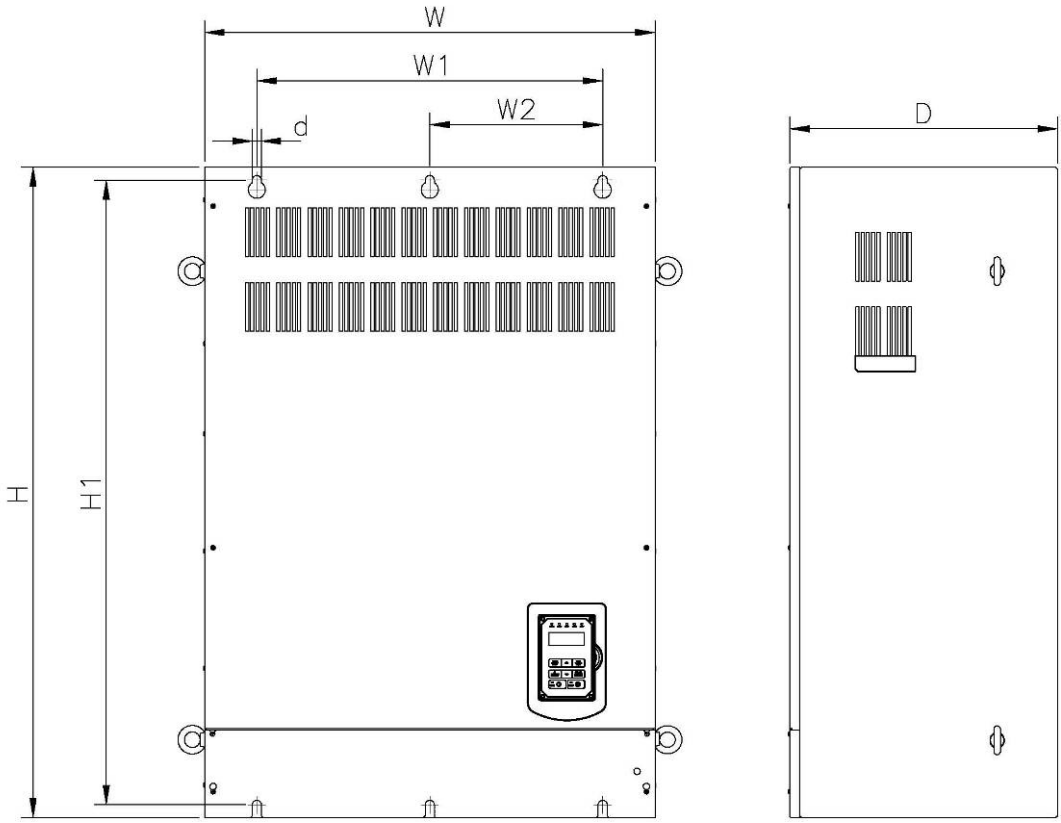
Inverter Model	Dimension (mm)								
	W	H	D	W1	H1	t	d	GW(kg)	Notes
F510-2060-H3	344	580	300	250	560	1.6	M10	40.5	
F510-2075-H3	344	580	300	250	560	1.6	M10	40.5	
F510-2100-H3	459	790	324.5	320	760	1.6	M10	74	
F510-2125-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4100-H3	344	580	300	250	560	1.6	M10	40.5	
F510-4125-H3	344	580	300	250	560	1.6	M10	40.5	
F510-4150-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4175-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4215-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4250-H3	459	790	324.5	320	760	1.6	M10	74	

(e) 220V :60-125HP/440V :100-250HP (IP20)



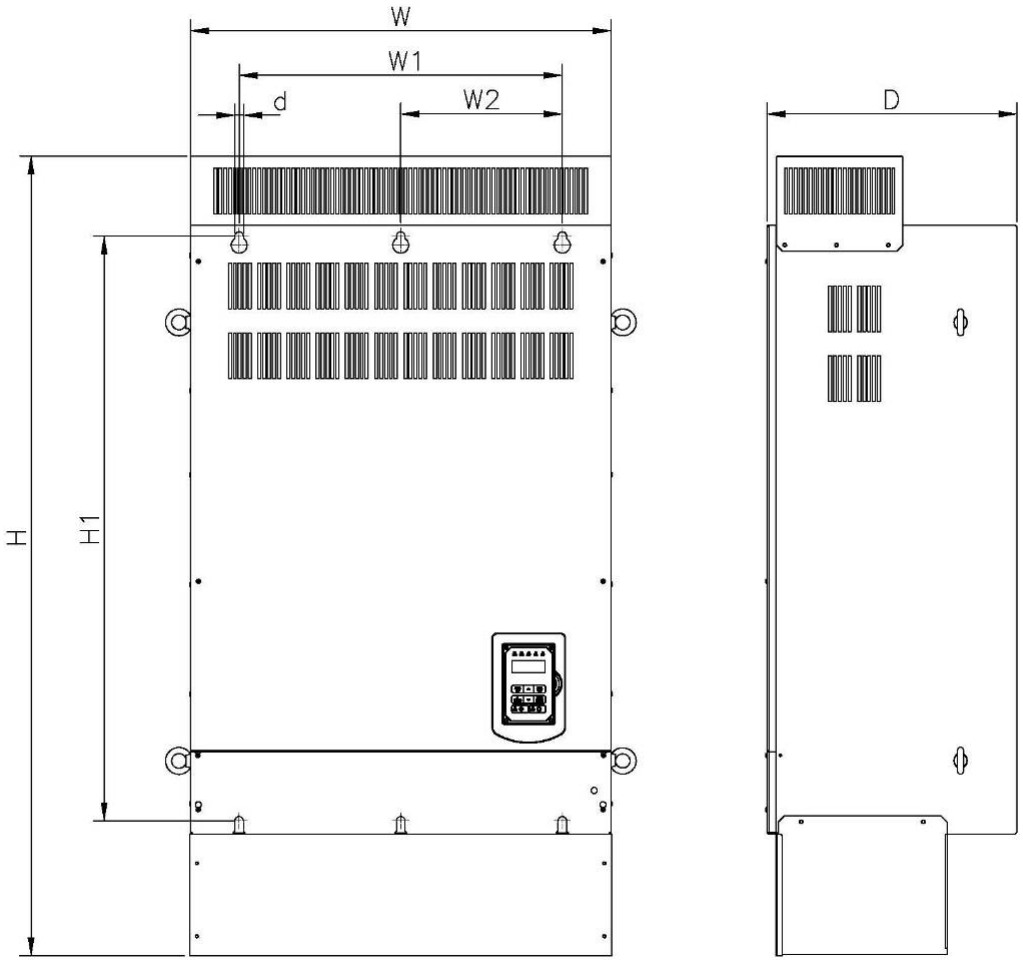
Inverter Model	Dimension (mm)								
	W	H	D	W1	H1	t	d	GW(kg)	Notes
F510-2060-H3	348.5	740	300	250	560	1.6	M10	44	
F510-2075-H3	348.5	740	300	250	560	1.6	M10	44	
F510-2100-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-2125-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4100-H3	348.5	740	300	250	560	1.6	M10	44	
F510-4125-H3	348.5	740	300	250	560	1.6	M10	44	
F510-4150-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4175-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4215-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4250-H3	463.5	1105	324.5	320	760	1.6	M10	81	

(f) 220V:150-175HP/440V:300-425HP (IP00)



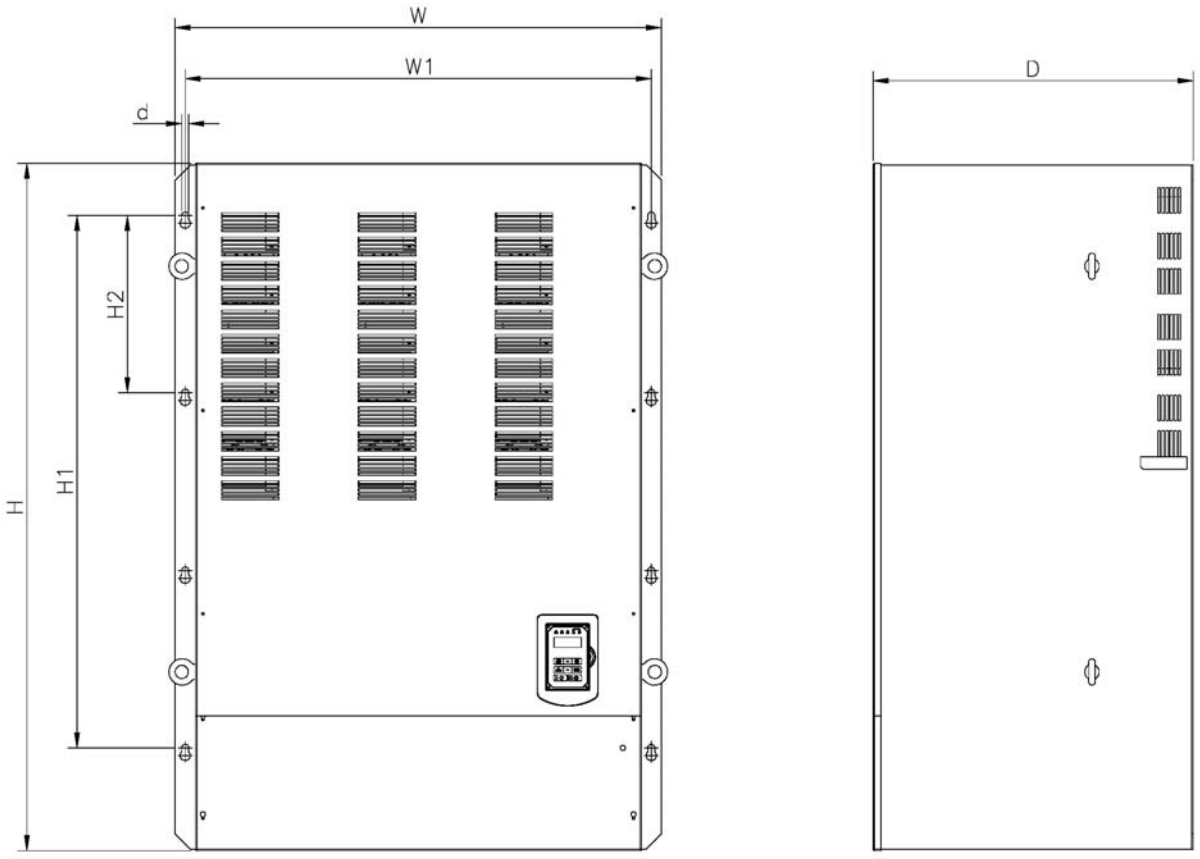
Inverter Model	Dimension (mm)									
	W	H	D	W1	W2	H1	t	d	GW(kg)	Notes
F510-2150-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-2175-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-4300-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-4375-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-4425-H3	690	1000	410	530	265	960	1.6	M12	184	

(g) 220V:150-175HP/440V :300-425HP (IP20)



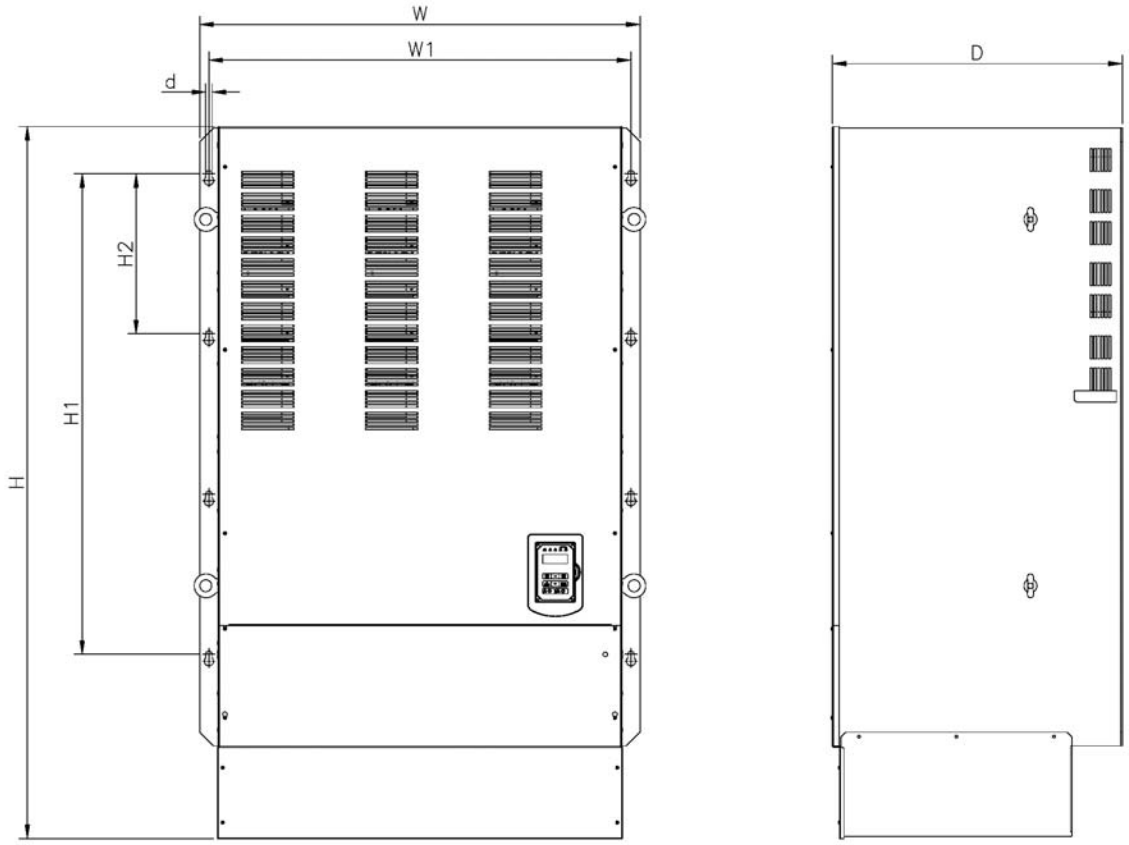
Inverter Model	Dimension (mm)									
	W	H	D	W1	W2	H1	t	d	GW(kg)	Notes
F510-2150-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-2175-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-4300-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-4375-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-4425-H3	690	1313	410	530	265	960	1.6	M12	194	

(h) 440V 535-800HP (IP00)



Inverter Model	Dimension (mm)									
	W	H	D	W1	H1	H2	t	d	GW(kg)	Notes
F510-4535-H3	960	1556	632	920	1050	350	3	M12	290	
F510-4670-H3	960	1556	632	920	1050	350	3	M12	290	
F510-4800-H3	960	1356	632	920	1050	350	3	M12	290	

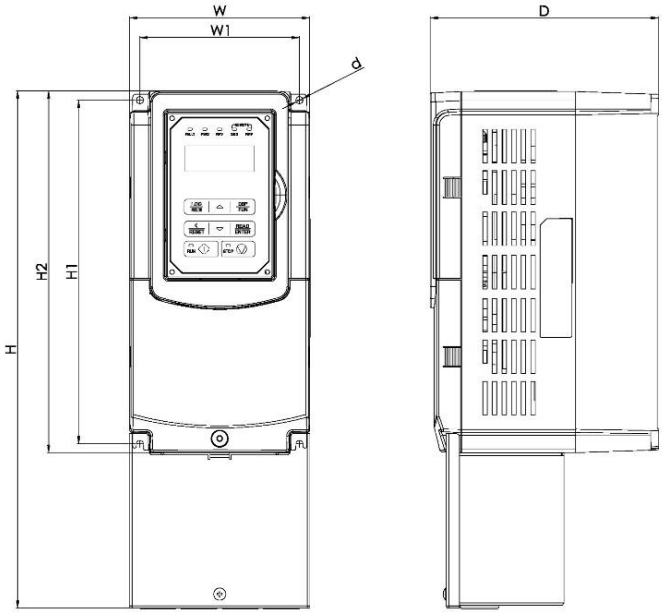
(i) 440V 535-800HP (IP20)



Inverter Model	Dimension (mm)									
	W	H	D	W1	H1	H2	t	d	GW(kg)	Notes
F510-4535-H3	960	1556	632	920	1050	350	3	M12	300	
F510-4670-H3	960	1556	632	920	1050	350	3	M12	300	
F510-4800-H3	960	1556	632	920	1050	350	3	M12	300	

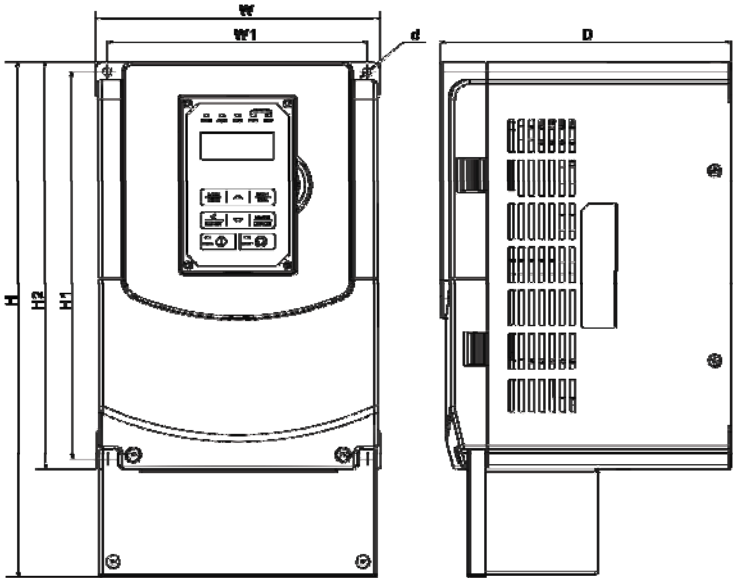
3.6.2 Standard Built-in Filter Model (IP00/IP20)

(a) 440V :5-10HP



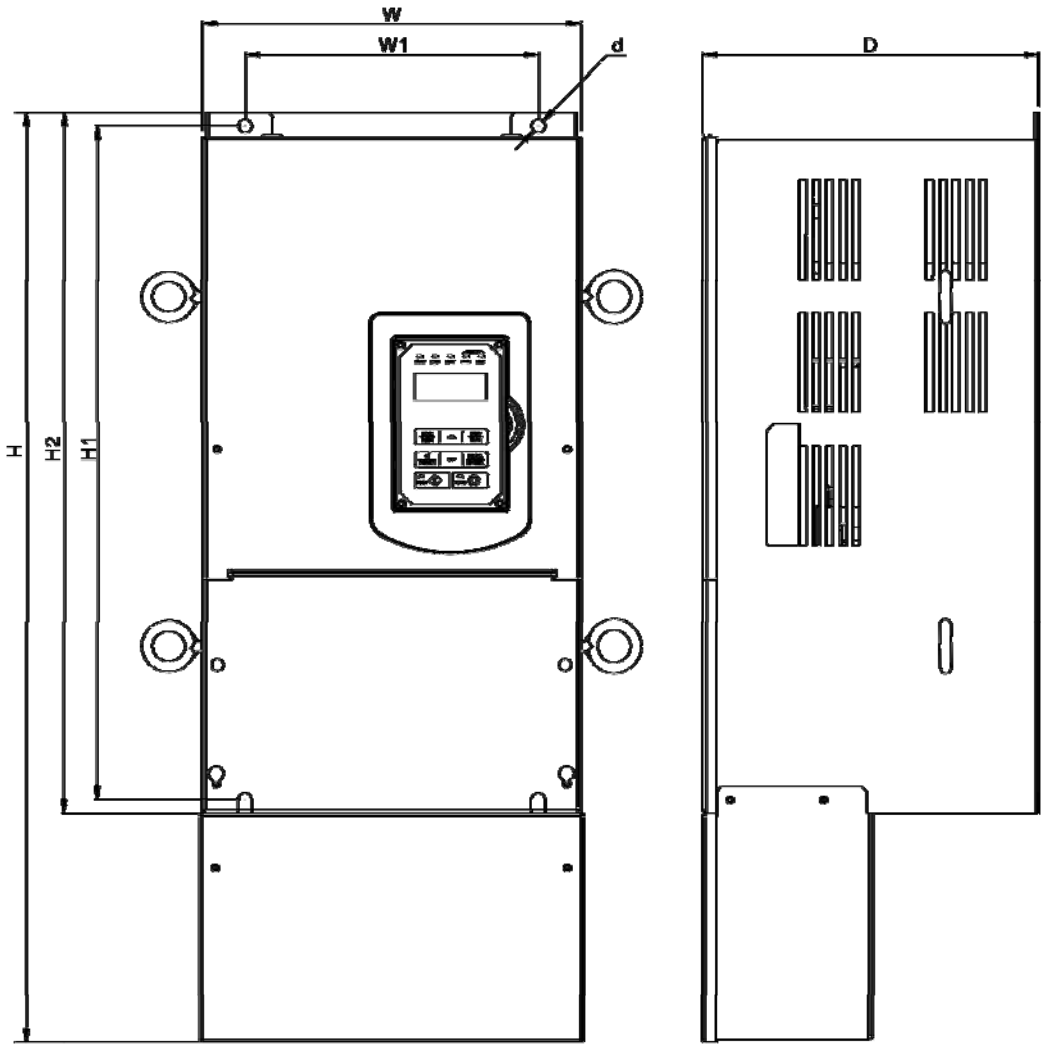
Inverter Model	Dimension (mm)									
	W	H	D	W1	H1	H2	t	d	GW(kg)	Notes
F510-4005-H3F	140	400	177	122	267	279	7	M6	5.5	
F510-4008-H3F	140	400	177	122	267	279	7	M6	5.5	
F510-4010-H3F	140	400	177	122	267	279	7	M6	5.5	

(b) 440V :15-40HP



Inverter Model	Dimension (mm)									
	W	H	D	W1	H1	H2	t	d	GW(kg)	Notes
F510-4015-H3F	210	416.5	215	192	286	300	1.6	M6	8.0	
F510-4020-H3F	210	416.5	215	192	286	300	1.6	M6	8.0	
F510-4025-H3F	265	500	225	245	340	360	1.6	M8	12.5	
F510-4030-H3F	265	500	225	245	340	360	1.6	M8	12.5	
F510-4040-H3F	265	500	225	245	340	360	1.6	M8	12.5	

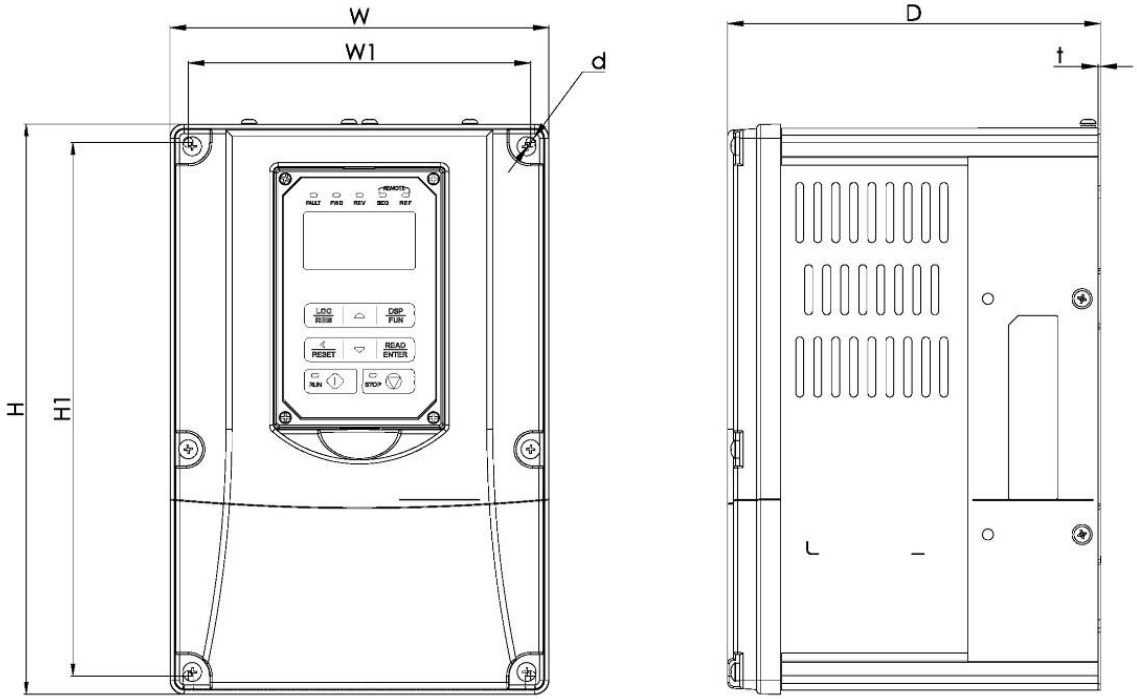
(c) 440V :50-75HP



Inverter Model	Dimension (mm)									
	W	H	D	W1	H1	H2	t	d	GW(kg)	Notes
F510-4050-H3F	284	679	252	220	505	525	1.6	M8	32.5	
F510-4060-H3F	284	679	252	220	505	525	1.6	M8	32.5	
F510-4075-H3F	284	679	252	220	505	525	1.6	M8	32.5	

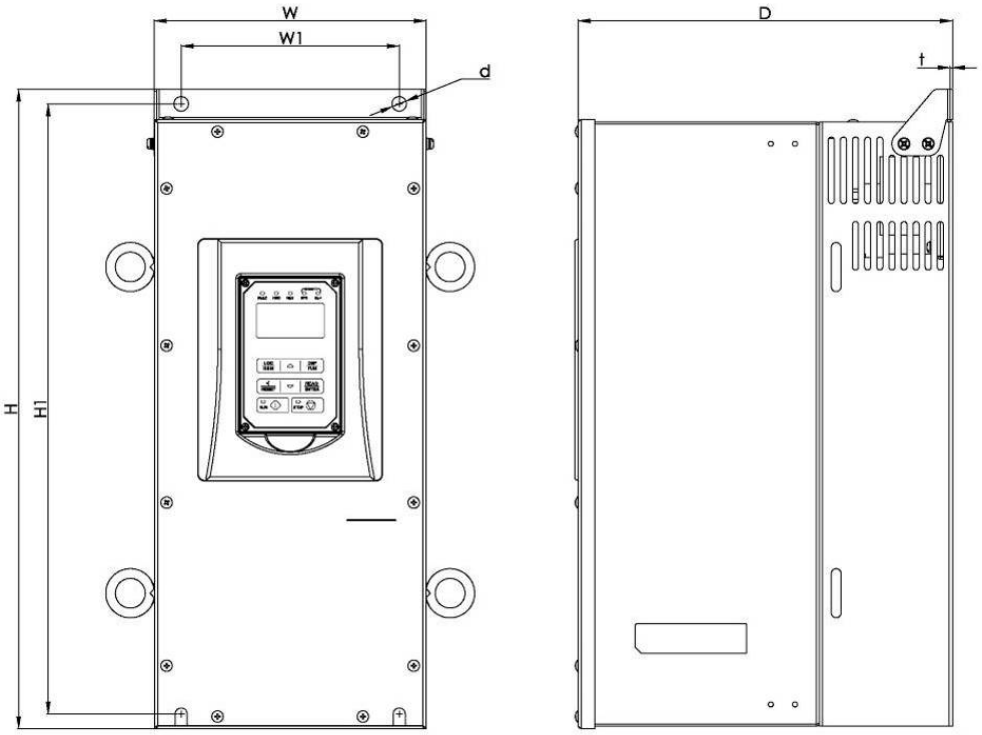
3.6.3 IP55 Built-in Filter Model

(a) 440V : 5-25HP



Inverter Model	Dimension (mm)								
	W	H	D	W1	H1	t	d	GW(kg)	Notes
F510-4005-C3FN4	189	284	186	171	266	1.2	M5	7	
F510-4008-C3FN4	189	284	186	171	266	1.2	M5	7	
F510-4010-C3FN4	230	320	210	210	305	2	M5	10.5	
F510-4015-C3FN4	230	320	210	210	305	2	M5	10.5	
F510-4020-C3FN4	265	396	227	249	380	2	M5	17	
F510-4025-C3FN4	265	396	227	249	380	2	M5	17	

(b) 440V : 30-60HP (75~100HP, External noise filter only)



Inverter Model	Dimension (mm)								
	W	H	D	W1	H1	t	d	GW(kg)	Notes
F510-4030-C3FN4	224	527	311	180	505	2	M10	32.5	
F510-4040-C3FN4	224	527	311	180	505	2	M10	32.5	
F510-4050-C3FN4	224	527	311	180	505	2	M10	32.5	
F510-4060-C3FN4	326	695	343	276	671	2.3	M10	55	
F510-4075-C3N4	326	695	343	276	671	2.3	M10	55	
F510-4100-C3N4	326	695	343	276	671	2.3	M10	55	

Chapter 4 Software Index

4.1 Keypad Description

4.1.1 Panel Functions

Type	Name	Functions
Display	Main display area	Display frequency, parameter voltage, current, temperature and abnormity and ect.
	LED status display	**FAULT:** When the inverter has a warning or fault message, the indicator lights up. **FWD:** When the inverter is in forward rotation status, the indicator lights up. (long bright light while inverter running, flicker while inverter stopping) **REV:** When the inverter is in reversal rotation status, the indicator lights up. (long bright light while inverter running, flicker while inverter stopping) **SEQ:** When inverter's run command source is set to external control, the indicator lights up. **REF:** When inverter's frequency command source is set to external control, the indicator lights up.
Keys （8 keys）	RUN	**RUN:** Enable the inverter run operation.
	STOP	**STOP:** Enable the inverter stop operation.
	▲	It is used for frequency and parameter setting.
	▼	It is used for frequency and parameter setting.
	LOC/REM	The source of switching frequency and run command: **REMOTE mode:** set by parameters and controlled by control circuit terminals, communication, or other ways. **LOCAL mode:** Controlled by operator. It will be set to REMOTE mode since power on. Switching to LOCAL mode or REMOTE mode by pressing LOC/REM button when the power is off. LOC/REM button can be set as Enable or Disable by parameters 23~41.
	DSP/FUN	It is used for switching dispay interface, based on the loop of frequency screen →function selection→monitor parameter→ frequency screen.
	</RESET	**"<"** is left shift key. It is used for changing parameter or value. RESET key：When a fault is detected, it plays reset function.
	READ/ENTER	Switch to enter the functions and set internal value, as well as modify parameter setting and confirm the writing.

4.1.2 External View of LCD Keypad (Option)

LCD keypad (JN5-OP-F02) is built-in internal memory. It can be used to update parameters setting from LCD keypad to inverter or download parameters setting from inverter to LCD keypad.The features and functions of JN5-OP-F02 LCD as shown in the figure below:

Figure 4-1 LCD keypad

Status indicator lighting

FAULT：When the inverter has a warning or fault message, this indicator lights up.

.**FWD**：When the inverter is in forward rotation status, this indicator lights up.

.**REV**：When the inverter is in reversal rotation status, this indicator lights up.

.**SEQ**：When inverter's run command source is set to external control or RS-485, this indicator lights up.

.**REF**：When inverter's frequency command source is set to external control or RS-485, this indicator lights up.

LCD Display

(2-line x 16-character)

. Display the monitored data , parameter, and setting

. Mode display (shows on the upper-left of LCD screen)

Monitor ：Display when in operating mode

Group ：Display when in all group setting mode

PARA ：Display when in parameter setting mode

Edit ：Display when in edit mode or auto-tune mode

4.2 Parameters List

Parameter group	Name
Group00	Basic Function Group
Group01	**V/F** Control Function Group
Group02	**IM** Motor Parameter Group
Group03	External Terminals Digital Input/Output Function Group
Group04	External Terminal Analog Input /Output Function Group
Group05	Multi-Speed Function Group
Group06	Auto-running Function Group
Group07	Run /Stop Function Group
Group08	Protection Function Group
Group09	Communication Function Group
Group10	**PID** Function Group
Group11	Auxiliary Function Group
Group12	Monitoring Function Group
Group13	Maintenance Function Group
Group14	**PLC** Setting Group*
Group15	**PLC** Monitoring Group*
Group16	**LCM** Function Group
Group17	IM Motor Auto-tuning Function Group
Group18	Slip Compensation Function Group
Group19	Reserved
Group20	Speed Control Function Group
Group21	Torque Control Function Group
Group22	**PM** Motor Parameter Group
Group23	Pump and **HVAC** Group
Group24	1 to 8 Pump Card Function Group

Parameter Attribute	
*1	Modifiable parameters in operation
*2	Unmodifiable parameters in communication
*3	This parameter value (set by users) will not be return to factory setting after restoring the factory setting,
*4	Readable and unmodifiable parameter
*5	Only display when using LCD keypad

Group 00 Basic Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
00-00	Control mode Selection	0: V/F 1: Reserved 2: SLV 3: Reserved 4: Reserved 5: PM SLV	0	-	O	O	O	*3
00-01	Motor's rotation direction	0: forward direction 1: reversal direction	0	-	O	O	O	*1
00-02	RUN Command Selection	0: keypad control 1: external control 2: Communication control 3: PLC 4: RTC	0*note 1	-	O	O	O	
00-03 ~ 00-04	Reserved							
00-05	Main Frequency Command Source Selection	0: keypad 1: external control (Analog) 2:Terminal UP/DOWN 3: Communication control 4: Reserved 5:PID 6:RTC	0*note 1	-	O	O	O	
00-06	Alternative Frequency Source Selection	0: keypad 1: external control (Analog) 2:Terminal UP/DOWN 3: Communication control 4: Reserved 5:PID 6:RTC	3	-	O	O	O	
00-07	Main and Alternative Frequency Command modes	0: Main Frequency 1: Main frequency Alternative Frequency	0	-	O	O	O	
00-08	Communication frequency command	0.00-400.00	0.00	Hz	O	O	O	
00-09	Frequency command memory mode	0:Don't save when power supply is cut. 1: Save when power is off.	0	-	O	O	O	
00-10 ~ 00-11	Reserved							
00-12	Upper frequency limit	0.1~109.0	100.0	%	O	O	O	
00-13	Lower frequency limit	0.0~109.0	0.0	%	O	O	O	
00-14	Acceleration time 1	0.1~6000.0	-	s	O	O	O	*1
00-15	Deceleration time 1	0.1~6000.0	-	s	O	O	O	*1
00-16	Acceleration time 2	0.1~6000.0	-	s	O	O	O	*1
00-17	Deceleration time 2	0.1~6000.0	-	s	O	O	O	*1
00-18	Jog frequency	0.00~400.00	6.00	Hz	O	O	O	*1
00-19	Jog acceleration time	0.1~0600.0	-	s	O	O	O	*1
00-20	Jog deceleration time	0.1~0600.0	-	s	O	O	O	*1

Group 00 Basic Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
00-21	Acceleration time 3	0.1~6000.0	-	s	O	O	O	*1
00-22	Deceleration time 3	0.1~6000.0	-	s	O	O	O	*1
00-23	Acceleration time 4	0.1~6000.0	-	s	O	O	O	*1
00-24	Deceleration time 4	0.1~6000.0	-	s	O	O	O	*1
00-25	Switching frequency of acceleration and deceleration	0.0~400.0	0.0	Hz	O	O	O	
00-26	Emergency stop time	0.1~6000.0	5.0	s	O	O	O	
00-27	Reserved							
00-28	Command characteristic selection of master frequency	0: positive characteristic (0~10V/4~20mA is corresponding to 0~100%) 1: negative characteristic (0~10V/4~20mA is corresponding to 100~0%)	0	-	O	O	O	
00-29 ~ 00-31	Reserved							
00-32	Application Selection	0: Disable 1: Water supply pump 2: Reserved 3: Exhaust fan 4: HVAC 5: Reserved 6: Reserve 7: Reserve	-					
00-33 ~ 00-40	Reserved							
00-41	User parameter 0	Choosing 13-06 = 1 to turn on user parameter function. Setting range：01-00 ~24-06 (Only used in LCD keypad)	-		O	O	O	*1
00-42	User parameter 1		-		O	O	O	*1
00-43	User parameter 2		-		O	O	O	*1
00-44	User parameter 3		-		O	O	O	*1
00-45	User parameter 4		-		O	O	O	*1
00-46	User parameter 5		-		O	O	O	*1
00-47	User parameter 6		-		O	O	O	*1
00-48	User parameter 7		-		O	O	O	*1
00-49	User parameter 8		-		O	O	O	*1
00-50	User parameter 9		-		O	O	O	*1
00-51	User parameter 10		-		O	O	O	*1
00-52	User parameter 11		-		O	O	O	*1
00-53	User parameter 12		-		O	O	O	*1
00-54	User parameter 13		-		O	O	O	*1
00-55	User parameter 14		-		O	O	O	*1
00-56	User parameter 15		-		O	O	O	*1

Note 1: The default value is”1” while software version is in the previous V1.1 (included) (external control).

The default value is”0” while software version is in the subsequent V1.2 (included) (keypad).

Group 01 V/F Control Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
01-00	V/F curve selection	0~FF	6	-	O	X	X	*3
01-01	Reserved							
01-02	Maximum output frequency	40.0~400.0	60.0	Hz	O	O	O	
01-03	Maximum output voltage	200V: 0.1~255.0 400V: 0.2~510.0	220.0 440.0	V	O	X	X	
01-04	Middle Output frequency 2	0.0~400.0	0.0	Hz	O	X	X	
01-05	Middle Output voltage 2	200V: 0.0~255.0 400V: 0.0~510.0	0.0	V	O	X	X	
01-06	Middle Output frequency 1	0.0~400.0	3.0	Hz	O	X	X	
01-07	Middle Output voltage 1	200V: 0.0~255.0 400V: 0.0~510.0	14.0 28.0	V	O	X	X	
01-08	Minimum output frequency	0.0~400.0	1.5	Hz	O	O	O	
01-09	Minimum output voltage	200V: 0.0~255.0 400V: 0.0~510.0	6.6 13.2	V	O	X	X	
01-10	Torque compensation gain	0.0~2.0	1.0	-	O	X	X	*1
01-11	Reserved							
01-12	Base frequency	10.0~400.0	60.0	Hz	O	O	O	
01-13	Base output voltage	200V: 0.0~255.0 400V: 0.0~510.0	220.0 440.0	V	O	X	X	
01-14	Input voltage setting	200V: 155.0~255.0 400V: 310.0~510.0	220.0 440.0	V	O	O	O	
01-15	Torque compensation time	0~10000	200	ms	O	X	X	

Group 02 IM Motor Parameter Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
02-00	No-Load current	0.01~600.00	KVA	A	O	X	X	
02-01	Rated current	V/F modes are 10%~200% of inverter's rated current. SLV modes are 25%~200% of inverter's rated current.	KVA	A	O	O	X	
02-02	Reserved							
02-03	Rated rotation speed	0~60000	KVA	Rpm	O	O	X	
02-04	Rated voltage	200V: 50.0~240.0 400V: 100.0~480.0	220.0 440.0	V	O	O	X	
02-05	Rated power	0.01~600.00	KVA	kW	O	O	X	
02-06	Rated frequency	10.0~400.0	60.0	Hz	O	O	X	
02-07	Poles	2,4,6,8	4	-	O	O	X	
02-08	Reserved							
02-09	Excitation current	10.0~100.0	KVA	%	X	O	X	
02-10	Core saturation coefficient 1	0~100	KVA	%	X	O	X	
02-11	Core saturation coefficient 2	0~100	KVA	%	X	O	X	
02-12	Core saturation coefficient 3	80~300	KVA	%	X	O	X	

Group 02 IM Motor Parameter Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
02-13	Core loss	0.0~15.0	KVA	%	O	X	X	
02-14	Reserved							
02-15	Resistance between wires	0.001~60.000	KVA	Ω	O	O	X	
02-16	Rotor résistance	0.001~60.000	KVA	Ω	X	O	X	
02-17	Leakage inductance	0.01~200.00	KVA	mH	X	O	X	
02-18	Mutual inductance	0.1~6553.5	KVA	mH	X	O	X	
02-19	No-Load Voltage	200V: 50~240 400V: 100~480	KVA	V	X	O	X	

Group 03 External Terminal Digital Input /Output Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
03-00	Multi-function terminal Function setting-S1	0: 2-Wire sequence (ON : Forward run command). 1: 2-Wire sequence (ON : Reverse run command). 2: Multi-speed setting command 1 3: Multi-speed setting command 2 4: Multi-speed setting command 3 5: Multi-speed setting command 4 6 : Forward jog run command 7 : Reverse jog run command 8 : UP frequency increasing command 9 : DOWN frequency decreasing command 10: Acceleration/deceleration setting command 1 11: Inhibit Acceleration/ deceleration Command 12: Reserved 13: Reserved 14: Emergency stop (decelerate to zero and stop) 15: External Base block Command (rotation freely to stop) 16: PID control disable 17: Fault reset (RESET) 18: Reserved 19: Speed Search 1(from the maximum frequency) 20: Manual energy saving function 21: PID integral reset 22: Reserved 23: Reserved 24: PLC input 25: External fault 26: 3-Wire sequence	0	-	O	O	O	
03-01	Multi-function terminal Function setting-S2		1		O	O	O	
03-02	Multi-function terminal Function setting-S3		8		O	O	O	
03-03	Multi-function terminal Function setting-S4		9		O	O	O	
03-04	Multi-function terminal Function setting-S5		2		O	O	O	
03-05	Multi-function terminal Function setting-S6		17		O	O	O	

Group 03 External Terminal Digital Input /Output Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			
					V/F	SLV	PM SLV	Attribute
		(Forward/Reverse command). 27: Local/Remote selection 28: Remote mode selection 29: Jog frequency selection 30: Acceleration/deceleration setting command 2 31: Inverter overheating warning 32: Reserved 33: DC braking 34: Speed Search 2 (from the frequency command) 35: Timing function input 36: PID Soft start Disable 37: Reserved 38: Reserved 39: Reserved 40: Reserved 41: Reserved 42: Reserved 43: Reserved 44: Reserved 45: Reserved 46: Reserve 47: Fire Mode 48: KEB acceleration 49: Parameters writing allowable 50 : Unattended Start Protection (USP) 51: Reserved 52: Reserved 53: 2-Wire Stop (2-Wire Self Holding Mode) 54: Mode switching between PID1/PID2 55: RTC time enable 56: RTC offset enable 57: Force frequency operation 58: Safety function						
03-06 ~ 03-07	Reserved							
03-08	(S1~S8)DI Scan time	0: Scan time 4ms 1: Scan time 8ms	1	-	O	O	O	
03-09	Multi-function terminal S1-S4 type selection	xxx0b: S1 A contact xxx1b: S1 B contact xx0xb: S2 A contact xx1xb: S2 B contact x0xxb: S3 A contact x1xxb: S3 B contact 0xxxb: S4 A contact 1xxxb: S4 B contact	0000b	-	O	O	O	
03-10	Multi-function terminal S5-S8 type selection	xxx0b: S5 A contact xxx1b: S5 B contact xx0xb: S6 A contact xx1xb: S6 B contact x0xxb: Reserved x1xxb: Reserved	0000b	-	O	O	O	

Group 03 External Terminal Digital Input /Output Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
		0xxxb: Reserved 1xxxb: Reserved						
03-11	Relay (R1A-R1C) output	0: Durning Running 1: Fault contact output	1	-	O	O	O	
03-12	Relay (R2A-R2C) output	2: Frequency Agree 3: Setting Frequency Agree 4: Frequency detection 1 (> 03-13) 5: Frequency detection 2 (< 03-13) 6: Automatic restart 7: Reserved 8: Reserved 9: Baseblock 10: Reserved 11: Reserved 12: Over torque detection 13: Reserved 14: Reserved 15: Reserved 16: Reserved 17: Reserved 18: PLC status 19: PLC control contact 20: Zero speed 21: Inverter Standby 22: Under Voltage Detection 23: Source of operation command 24: Source of frequency command 25: Low torque detection 26: Frequency Reference missing 27: Timing function output 28: Reserved 29: Reserved 30: Reserved 31: Reserved 32: Communication control contacts 33: RTC timer 1 34: RTC timer 2 35: RTC timer 3 36: RTC timer 4	20	-	O	O	O	
03-13	Frequency detection Level	0.0~400.0	0.0	Hz	O	O	O	
03-14	Frequency detection width	0.1~25.5	2.0	Hz	O	O	O	
03-15 ~ 03-18	Reserved							
03-19	Relay (R1A-R3C) type	xxx0b: R1 A contact xxx1b: R1 B contact xx0xb: R2 A contact xx1xb: R2 B contact x0xxb: R3 A contact x1xxb: R3 B contact	0000b	-	O	O	O	
03-20	Reserved							

Group 03 External Terminal Digital Input /Output Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
~ 03-26								
03-27	UP/DOWN frequency maintaining selection	0: maintain UP/DOWN frequency when stopping 1: clear UP/DOWN frequency when stopping 2: allow UP/DOWN frequency when stopping	0	-	O	O	O	
03-28 ~ 03-30	Reserved							
03-31	Scale of pulse input	50~32000	1000	Hz	O	O	O	*1
03-32	Gain of pulse input	0.0~1000.0	100	%	O	O	O	*1
03-33	Bias voltage of pulse input	-100.0~100.0	0.0	%	O	O	O	*1
03-34	Filter time of pulse input	0.00~2.00	0.1	Sec	O	O	O	*1
03-35 ~ 03-36	Reserved							
03-37	Timer ON delay (DI/DO)	0.0~6000.0	0.0	s	O	O	O	
03-38	Timer OFF delay (DI/DO)	0.0~6000.0	0.0	s	O	O	O	
03-39	Relay (R3A-R3C) output	With the same range and definition as 03-11, 03-12	0	-	O	O	O	

Group 04 External Terminal Analog Input/ Output Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
04-00	AI input signal type	0: AI2: 0~10V 1: AI2: 4~20mA	1	-	O	O	O	
04-01	AI1 signal scanning and filtering time	0.00~2.00	0.03	s	O	O	O	
04-02	AI1gain value	0.0~1000.0	100.0	%	O	O	O	*1
04-03	AI1bias voltage value	-100.0~100.0	0	%	O	O	O	*1
04-04	Reserved							
04-05	AI2 function setting	0: Auxiliary Frequency 1: Frequency Reference Gain 2: Frequency Reference Bias 3: Output Voltage Bias 4: Coefficient of acceleration and deceleration reduction 5: DC braking current 6: Over-torque detection level 7: Stall prevention Level During Running 8: Frequency lower limit 9: Jump frequency 4 10: Added to AI1 11: Positive torque limit 12: Negative torque limit	10	-	O	O	O	

Group 04 External Terminal Analog Input/ Output Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
		13: Regenerative Torque Limit						
		14: Positive / negative torque limit						
		15: Reserved						
		16: Torque compensation						
		17: Reserved						
04-06	AI2 signal scanning and filtering time	0.00~2.00	0.03	s	O	O	O	
04-07	AI2 gain value	0.0~1000.0	100.0	%	O	O	O	*1
04-08	AI2 bias voltage value	-100.0~100.0	0	%	O	O	O	*1
04-09 ~ 04-10	Reserved							
04-11	AO1 function setting	0: Output frequency	0	-	O	O	O	
		1: Frequency command						
		2: Output voltage						
		3: DC voltage						
		4: Output current						
		5: Output power						
		6: Motor Speed						
		7: Output power factor						
		8: AI1 input						
		9: AI2 input						
		10: Torque command						
		11: q-axis current						
		12: d-axis current						
		13: Reserved						
		14: Reserved						
		15: ASR output						
		16: Reserved						
		17: q-axis voltage						
		18: d-axis voltage						
		19: Reserved						
		20: Reserved						
		21: PID input						
		22: PID output						
		23: PID target value						
		24: PID feedback value						
		25: Output frequency of the soft starter						
		26: Reserved						
		27: Reserved						
04-12	AO1 gain value	0.0~1000.0	100.0	%	O	O	O	*1
04-13	AO1 bias-voltage value	-100.0~100.0	0	%	O	O	O	*1
04-14 ~ 04-15	Reserved							
04-16	AO2 function setting	Range and definition are the same as 04-11	3	-	O	O	O	
04-17	AO2 gain value	0.0~1000.0	100.0	%	O	O	O	*1
04-18	AO2 bias-voltage value	-100.0~100.0	0	%	O	O	O	*1

Group 04 External Terminal Analog Input/ Output Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
04-19	AO output signal type	0: AO1:0~10V AO2:0~10V 1: AO1:0~10V AO2:4~20mA 2: AO1:4~20mA AO2:0~10V 3: AO1:4~20mA AO2: 4~20mA	0		O	O	O	

Group 05 Multi-Speed Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
05-00	Acceleration and deceleration selection of multi-speed	0: acceleration time is set by deceleration time 1~4 1: Acceleration and deceleration time setting respectively	0	-	O	O	O	
05-01	Frequency setting of speed-stage 0	0.00~400.00	5.00	Hz	O	O	O	*1
05-02 ~ 05-16	Reserved							
05-17	Acceleration time setting of multi speed 0	0.1~6000.0	10.0	s	O	O	O	
05-18	Deceleration time setting of multi speed 0	0.1~6000.0	10.0	s	O	O	O	
05-19	Acceleration time setting of multi speed 1	0.1~6000.0	10.0	s	O	O	O	
05-20	Deceleration time setting of multi speed 1	0.1~6000.0	10.0	s	O	O	O	
05-21	Acceleration time setting of multi speed 2	0.1~6000.0	10.0	s	O	O	O	
05-22	Deceleration time setting of multi speed 2	0.1~6000.0	10.0	s	O	O	O	
05-23	Acceleration time setting of multi speed 3	0.1~6000.0	10.0	s	O	O	O	
05-24	Deceleration time setting of multi speed 3	0.1~6000.0	10.0	s	O	O	O	
05-25	Acceleration time setting of multi speed 4	0.1~6000.0	10.0	s	O	O	O	
05-26	Deceleration time setting of multi speed 4	0.1~6000.0	10.0	s	O	O	O	
05-27	Acceleration time setting of multi speed 5	0.1~6000.0	10.0	s	O	O	O	
05-28	Deceleration time setting of multi speed 5	0.1~6000.0	10.0	s	O	O	O	
05-29	Acceleration time setting of multi	0.1~6000.0	10.0	s	O	O	O	

Group 05 Multi-Speed Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
	speed 6							
05-30	Deceleration time setting of multi speed 6	0.1~6000.0	10.0	s	O	O	O	
05-31	Acceleration time setting of multi speed 7	0.1~6000.0	10.0	s	O	O	O	
05-32	Deceleration time setting of multi speed 7	0.1~6000.0	10.0	s	O	O	O	
05-33	Acceleration time setting of multi speed 8	0.1~6000.0	10.0	s	O	O	O	
05-34	Deceleration time setting of multi speed 8	0.1~6000.0	10.0	s	O	O	O	
05-35	Acceleration time setting of multi speed 9	0.1~6000.0	10.0	s	O	O	O	
05-36	Deceleration time setting of multi speed 9	0.1~6000.0	10.0	s	O	O	O	
05-37	Acceleration time setting of multi speed 10	0.1~6000.0	10.0	s	O	O	O	
05-38	Deceleration time setting of multi speed 10	0.1~6000.0	10.0	s	O	O	O	
05-39	Acceleration time setting of multi speed 11	0.1~6000.0	10.0	s	O	O	O	
05-40	Deceleration time setting of multi speed 11	0.1~6000.0	10.0	s	O	O	O	
05-41	Acceleration time setting of multi speed 12	0.1~6000.0	10.0	s	O	O	O	
05-42	Deceleration time setting of multi speed 12	0.1~6000.0	10.0	s	O	O	O	
05-43	Acceleration time setting of multi speed 13	0.1~6000.0	10.0	s	O	O	O	
05-44	Deceleration time setting of multi speed 13	0.1~6000.0	10.0	s	O	O	O	
05-45	Acceleration time setting of multi speed 14	0.1~6000.0	10.0	s	O	O	O	
05-46	Deceleration time setting of multi speed 14	0.1~6000.0	10.0	s	O	O	O	
05-47	Acceleration time setting of multi speed 15	0.1~6000.0	10.0	s	O	O	O	
05-48	Deceleration time setting of multi speed 15	0.1~6000.0	10.0	s	O	O	O	

Group 06 Auto-running Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
06-00	Auto-running mode selection	0: Disable 1: Execute a single cycle operation mode. Restart speed is based on the previous stopped speed. 2: Execute continuous cycle operation mode. Restart speed is based on the previous stopped speed. 3: After the completion of a single cycle, the on-going operation speed is based on the speed of the last stage. Restart speed is based on the previous stopped speed. 4: Execute a single cycle operation mode. Restart speed will be based on the speed of stage 1. 5: Execute continuous cycle operation mode. Restart speed will be based on the speed of stage 1. 6: After the completion of a single cycle, the on-going operation speed is based on the speed of the last stage. Restart speed is based on the previous stopped speed.	0	-	O	O	X	
06-01	Frequency setting of speed-stage 1	0.00~400.00	5.00	Hz	O	O	O	*1
06-02	Frequency setting of speed-stage 2	0.00~400.00	10.00	Hz	O	O	O	*1
06-03	Frequency setting of speed-stage 3	0.00~400.00	20.00	Hz	O	O	O	*1
06-04	Frequency setting of speed-stage 4	0.00~400.00	30.00	Hz	O	O	O	*1
06-05	Frequency setting of speed-stage 5	0.00~400.00	40.00	Hz	O	O	O	*1
06-06	Frequency setting of speed-stage 6	0.00~400.00	50.00	Hz	O	O	O	*1
06-07	Frequency setting of speed-stage 7	0.00~400.00	50.00	Hz	O	O	O	*1
06-08	Frequency setting of speed-stage 8	0.00~400.00	5.00	Hz	O	O	O	*1
06-09	Frequency setting of speed-stage 9	0.00~400.00	5.00	Hz	O	O	O	*1
06-10	Frequency setting of speed-stage 10	0.00~400.00	5.00	Hz	O	O	O	*1
06-11	Frequency setting of speed-stage 11	0.00~400.00	5.00	Hz	O	O	O	*1
06-12	Frequency setting of speed-stage12	0.00~400.00	5.00	Hz	O	O	O	*1
06-13	Frequency setting of speed-stage 13	0.00~400.00	5.00	Hz	O	O	O	*1
06-14	Frequency setting of speed-stage 14	0.00~400.00	5.00	Hz	O	O	O	*1
06-15	Frequency setting of	0.00~400.00	5.00	Hz	O	O	O	*1

Group 06 Auto-running Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
	speed-stage 15							
06-16	Operation time setting of speed-stage 0	0.0~6000.0	0.0	s	O	O	X	*1
06-17	Operation time setting of speed-stage 1	0.0~6000.0	0.0	s	O	O	X	*1
06-18	Operation time setting of speed-stage 2	0.0~6000.0	0.0	s	O	O	X	*1
06-19	Operation time setting of speed-stage 3	0.0~6000.0	0.0	s	O	O	X	*1
06-20	Operation time setting of speed-stage 4	0.0~6000.0	0.0	s	O	O	X	*1
06-21	Operation time setting of speed-stage 5	0.0~6000.0	0.0	s	O	O	X	*1
06-22	Operation time setting of speed-stage 6	0.0~6000.0	0.0	s	O	O	X	*1
06-23	Operation time setting of speed-stage 7	0.0~6000.0	0.0	s	O	O	X	*1
06-24	Operation time setting of speed-stage 8	0.0~6000.0	0.0	s	O	O	X	*1
06-25	Operation time setting of speed-stage 9	0.0~6000.0	0.0	s	O	O	X	*1
06-26	Operation time setting of speed-stage 10	0.0~6000.0	0.0	s	O	O	X	*1
06-27	Operation time setting of speed-stage 11	0.0~6000.0	0.0	s	O	O	X	*1
06-28	Operation time setting of speed-stage 12	0.0~6000.0	0.0	s	O	O	X	*1
06-29	Operation time setting of speed-stage 13	0.0~6000.0	0.0	s	O	O	X	*1
06-30	Operation time setting of speed-stage 14	0.0~6000.0	0.0	s	O	O	X	*1
06-31	Operation time setting of speed-stage 15	0.0~6000.0	0.0	s	O	O	X	*1
06-32	Operation direction selection of speed-stage 0	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-33	Operation direction selection of speed-stage 1	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-34	Operation direction selection of speed-stage2	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-35	Operation direction	0: Stop	0	-	O	O	X	

Group 06 Auto-running Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
	selection of speed-stage 3	1: Forward 2: Reversal						
06-36	Operation direction selection of speed-stage 4	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-37	Operation direction selection of speed-stage 5	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-38	Operation direction selection of speed-stage 6	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-39	Operation direction selection of speed-stage 7	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-40	Operation direction selection of speed-stage 8	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-41	Operation direction selection of speed-stage 9	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-42	Operation direction selection of speed-stage 10	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-43	Operation direction selection of speed-stage 11	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-44	Operation direction selection of speed-stage 12	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-45	Operation direction selection of speed-stage13	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-46	Operation direction selection of speed-stage 14	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	
06-47	Operation direction selection of speed-stage 15	0: Stop 1: Forward 2: Reversal	0	-	O	O	X	

Group 07 Run /Stop Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
07-00	Momentary stop and restart selection	0:Disable 1:Enable	0	-	O	O	O	
07-01	Restart time of automatic reset	0~7200	0	s	O	O	O	
07-02	Times of automatic reset	0~10	0	-	O	O	O	
07-03 ~ 07-05	Reserved							
07-06	DC Injection Braking Starting Frequency	0.0~10.0	0.5	Hz	O	O	X	
07-07	DC Injection Braking Current	0~100	50	%	O	O	X	
07-08	DC Injection Braking Time at Stop	0.00~10.00	0.50	s	O	O	X	
07-09	Stop mode selection	0: Deceleration to stop 1: Coast to stop 2: DC braking stop in all fields 3: Coast to stop with timer	0	-	O	O	O	
07-10 ~ 07-12	Reserved							
07-13	Low voltage Detection Level	200V: 150~210 400V: 300~420	190 380	V	O	O	O	
07-14	Pre-excitation time	0.00~10.00	2.00	s	X	O	X	
07-15	Pre-excitation Level	100~200	100	%	X	O	X	
07-16	DC Injection Braking Time at Start	0.00~10.00	0.00	s	O	O	X	
07-17	Reserved							
07-18	Minimum Base block Time	0.1~5.0	-	Sec	O	O	O	
07-19	Speed Direction Search Operating Current	0~100	50	%	O	O	O	
07-20	Speed Search Operating Current	0~100	20	%	O	O	O	
07-21	Integral time of speed searching	0.1~10.0	2.0	s	O	O	O	
07-22	Delay time of speed searching	0.0~20.0	0.2	s	O	O	O	
07-23	Voltage Recovery Time	0.1~5.0	2.0	s	O	O	O	
07-24	Bidirection Speed Search Selection	0:Disable 1:Enable	0		O	O	O	
07-25	Low voltage Detection Time	0.00~1.00	0.00	s	O	O	O	

Group 07 Run /Stop Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
07-26	Mechanical braking selection	0: Disable 1: Enable	0	-	X	O	O	
07-27	Start selection after fault at SLV mode	0: Start with speed search 1: Normal start	0	-	X	O	O	
07-28	Start selection after external base block	0: Start with speed search 1: Normal start	0	-	O	O	X	

Group 08 Protection Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
08-00	Stall prevention function	xxx0b: Stall prevention is enabled in acceleration. xxx1b: Stall prevention is disabled in acceleration. xx0xb: Stall prevention is enabled in decceleration. xx1xb: Stall prevention is disabled in decceleration. x0xxb: Stall prevention is enabled in operation x1xxb: Stall prevention is disabled in operation 0xxxb: Stall prevention in operation is based on deceleration time of speed-stage 1. 1xxxb: Stall prevention in operation is based on deceleration time of speed-stage 2.	0000b	-	O	O	O	
08-01	Stall prevention level in acceleration	30~200	120	%	O	O	O	
08-02	Stall prevention level in deceleration	200V: 330~410 400V: 660~820	395 790	V	O	O	O	
08-03	Stall prevention level in operation	30~200	120	%	O	O	O	
08-04	Reserved							
08-05	Selection for motor overload protection (OL1)	xxx0b: Motor overload is disabled. xxx1b: Motor overload is enabled. xx0xb: Cold start of motor overload xx1xb: Hot start of motor overload x0xxb: Standard motor x1xxb: Inverter motor 0xxxb: Reserved 1xxxb: Reserved	0001b	-	O	O	O	
08-06	Start-up mode of overload protection operation (OL1)	0: Stop output after overload protection 1: Continuous operation after overload protection.	0	-	O	O	O	
08-07	Reserved							
08-08	Automatic voltage	0: Enable	0	-	O	O	O	

Group 08 Protection Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
	regulation (AVR)	1: Disable						
08-09	Selection of input phase loss protection	0: Disable 1: Enable	0	-	O	O	O	
08-10	Selection of output phase loss protection	0: Disable 1: Enable	0	-	O	O	O	
08-11 ~ 08-12	Reserved							
08-13	Selection of over-torque detection	0: Over-torque detection is disabled. 1: Start to detect when reaching the set frequency. 2: Detection during running.	0	-	O	O	O	
08-14	Selection of over-torque operation	0: Deceleration to stop when over torque is detected. 1: Display warning when over torque is detected and keeps operating. 2: Coast to stop when over torque is detected	0	-	O	O	O	
08-15	Level of over-torque detection	0~300	150	%	O	O	O	
08-16	Time of over-torque detection	0.0~10.0	0.1	Sec	O	O	O	
08-17	Selection of low-torque detection	0: Low-torque detection is disabled. 1: Start to detect when reaching the set frequency. 2: Detection during running.	0	-	O	O	O	
08-18	Selection of low-torque operation	0: Deceleration to stop when low torque is detected. 1: Display warning when over torque is detected and keeps operating. 2: Coast to stop when low torque is detected	0	-	O	O	O	
08-19	Level of low-torque detection	0~300	30	%	O	O	O	
08-20	Time of low-torque detection	0.0~10.0	0.1	Sec	O	O	O	
08-21	Limit of stall prevention in acceleration	0~100	50	%	O	O	O	
08-22	Stall prevention detection time in operation	2~100	100	ms	O	O	O	
08-23	Ground Fault (GF) Selection	0: Disable 1: Enable	0	-	O	O	O	
08-24	Selection of external fault operation	0: Deceleration to stop 1: Coast to stop 2: Continuous operation	0	-	O	O	O	
08-25	Selection of external fault detection	0: Immediately detect when the power is supplied. 1: Start to detect when the operation is started.	0	-	O	O	O	
08-26	Reserved							
08-27	Reserved							
08-28	Reserved							

Group 08 Protection Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
08-29	Reserved							
08-30	Selection of safety functions	0: Deceleration to stop 1: Coast to stop	0	-	O	O	O	
08-31	Reserved							
08-32	Reserved							
08-33	Reserved							
08-34	Reserved							
08-35	Selection when motor overheat fault	0: Disable 1: Deceleration to stop 2: Coast to stop	0		O	O	O	
08-36	PTC input filter time constant	0.00 ~ 5.00	0.20	Sec	O	O	O	
08-37	Fan control functions	0: Start during running. 1: Start all the time 2: Start at high temparature	0		O	O	O	
08-38	Delay time of fan shutdown	0~600	60	Sec	O	O	O	
08-39	Delay time of motor overheat protection	0~300	60	Sec	O	O	O	

Group 09 Communication Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
09-00	NV Communication Station Address	1~31	1	-	O	O	O	*2
09-01	Communication protocol selection	0: MODBUS 1: BACNET 2: METASYS 3: Mutiple pump control	0		O	O	O	
09-02	Baud rate setting(bps)	0: 1200 1: 2400 2: 4800 3: 9600 4: 19200 5: 38400	3	-	O	O	O	*2
09-03	Stop bit selection	0: 1stop bit 1: 2 stop bit	0	-	O	O	O	*2
09-04	Parity selection	0: No Parity 1: even bit 2: odd bit	0	-	O	O	O	*2
09-05	Reserved							
09-06	Communication error detection time	0.0~25.5	0.0	S	O	O	O	
09-07	Fault stop selection	0: Deceleration to stop based on deceleration time 1 when communication fault occurs. 1: Coast to stop when communication fault occurs. 2: Deceleration to stop based on deceleration time 2 when communication fault occurs. 3: Keep operating when communication fault occurs.	3	-	O	O	O	
09-08	Common Fault Tolerance Count	1~20	1	-	O	O	O	
09-09	Waiting time	5~65	5	ms	O	O	O	
09-10	Device Instance Number	1 ~ 254	1		O	O	O	

Group 10 PID Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
10-00	PID target value source setting	0:Operator given 1:AI1 given 2:AI2 given 3:Reserve 4:10-02 given 5: RTC	1	-	O	O	O	
10-01	PID feedback value source setting	1:AI1 given 2:AI2 given 3:Reserve	2	-	O	O	O	
10-02	PID target value	0.0~100.0	0.0	%	O	O	O	
10-03	PID control mode	xxx0b: PID Disable xxx1b: PID Enable xx0xb: PID positive characteristic xx1xb: PID negative characteristic x0xxb: PID error value of D control x1xxb: PID feedback value of D control 0xxxb: PID output 1xxxb: PID output + target value	0000b	-	O	O	O	
10-04	Feedback gain	0.01~10.00	1.00	-	O	O	O	*1
10-05	Proportional gain (P)	0.00~10.00	3.00	-	O	O	O	*1
10-06	Integral time (I)	0.00~100.00	0.50	s	O	O	O	*1
10-07	Differential time(D)	0.00~10.00	0.00	s	O	O	O	*1
10-08	Reserved							
10-09	PID bias voltage	-100.0~100.0	0	%	O	O	O	*1
10-10	PID Primary Delay Time	0.00~10.00	0.00	s	O	O	O	*1
10-11	PID Feedback Loss Detection Selection	0: Disable 1: Warning 2: Fault	0	-	O	O	O	
10-12	PID Feedback Loss Detection Level	0~100	0	%	O	O	O	
10-13	PID Feedback Loss Detection Time	0.0~10.0	1.0	s	O	O	O	
10-14	PID integral limit	0.0~100.0	100.0	%	O	O	O	*1
10-15 ~ 10-16	Reserved							
10-16	Reserved							
10-17	Sleep start frequency of PID	0.00~180.00	30.00	Hz	O	O	O	
10-18	Sleep delay time of PID	0.0~255.5	0.0	s	O	O	O	
10-19	Wake-up frequency of PID	0.00~180.00	0.00	Hz	O	O	O	
10-20	Wake-up delay time of PID	0.0~255.5	0.0	s	O	O	O	
10-21 ~ 10-22	Reserved							
10-23	PID limitation	0.00~100.0	100.0	%	O	O	O	*1
10-24	PID output gain	0.0~25.0	1.0	-	O	O	O	
10-25	PID reversal output selection	0: No allowing reversal output 1: Allow reversal output	0	-	O	O	O	

Group 10 PID Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
10-26	PID target acceleration/deceleration time	0.0~25.5	0.0	s	O	O	O	
10-27	PID feedback display bias	-99.99~99.99	0.00	-	O	O	O	
10-28	PID feedback display gain	0.00~100.00	1.00	-	O	O	O	
10-29	PID sleep selection	0: Disable 1: Enable 2: set by DI	1	-	O	O	O	
10-30	PID target upper limit	0.0 ~ 100.0	100.0	%	O	O	O	
10-31	PID target lower limit	0.0 ~ 100.0	0.0	%	O	O	O	
10-32	PID switching function	0: PID1 1: PID2 2: Set by DI 3: Switch to PID2 when RTC is active	0		O	O	O	
10-33 ~ 10-35	Reserved							
10-36	PID2 Proportional gain (P)	0.00~10.00	3.00	-	O	O	O	*1
10-37	PID2 Integral time (I)	0.0~100.0	0.50	s	O	O	O	*1
10-38	PID2 Differential time(D)	0.00~10.00	0.00	s	O	O	O	*1

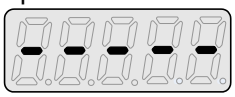
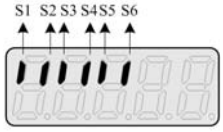
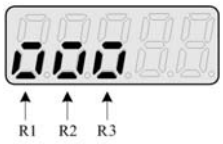
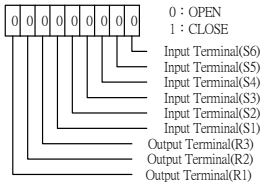
Group 11 Auxiliary Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
11-00	Direction Lock Selection	0: Allow forward and reverse rotation 1: Only allow forward rotation 2:Only allow reverse rotation	1	-	O	O	O	
11-01	Carrier frequency	0: carrier output frequency tuning 1: Reserved 2~16:2~16KHz	Determined by horse power (HP)	-	O	O	X	
11-02	Soft PWM Function Selection	0: Disable 1: Enable	1(V/f) 0(others)	-	O	O	O	
11-03	Automatic carrier lowering selection	0: Disable 1: Enable	0	-	O	X	X	
11-04	S curve time setting at the start of acceleration	0.00~2.50	0.20	s	O	O	O	
11-05	S curve time setting at the end of acceleration	0.00~2.50	0.20	s	O	O	O	
11-06	S curve time setting at the start of deceleration	0.00~2.50	0.20	s	O	O	O	
11-07	S curve time setting at the end of deceleration	0.00~2.50	0.20	s	O	O	O	
11-08	Jump frequency 1	0.0~400.0	0.0	Hz	O	O	O	
11-09	Jump frequency 2	0.0~400.0	0.0	Hz	O	O	O	
11-10	Jump frequency 3	0.0~400.0	0.0	Hz	O	O	O	

Group 11 Auxiliary Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
11-11	Jump frequency width	0.0~25.5	1.0	Hz	O	O	O	
11-12	Manual energy saving gain	0~100	80	%	O	X	X	
11-13 ~ 11-17	Reserved							
11-18	Manual energy saving frequency	0.00~400.00	0.00	Hz	O	X	X	
11-19	Automatic energy saving function	0: Automatic energy saving is disabled 1: Automatic energy saving is enabled	0	-	O	X	X	
11-20	Filter time of automatic energy saving	0~200	140	ms	O	X	X	
11-21	Voltage upper limit of energy saving tuning	0~100	100	%	O	X	X	
11-22	Adjustment time of automatic energy saving	0~5000	20	ms	O	X	X	*1
11-23	Detection level of automatic energy saving	0~100	10	%	O	X	X	
11-24	Coefficient of automatic energy saving	0.00~655.35	KVA	-	O	X	X	
11-25 ~ 11-28	Reserved							
11-29	Auto De-rating Selection	0: Disable 1: Enable	0	-	O	X	X	
11-30	Variable Carrier Frequency Max. Limit	2~16	KVA	KHz	O	X	X	
11-31	Variable Carrier Frequency Min. Limit	2~16	KVA	KHz	O	X	X	
11-32	Variable Carrier Frequency Proportional Gain	00~99	00	-	O	X	X	
11-33 ~ 11-40	Reserved							
11-41	Selection of detecting the disappearance of reference frequency	0: When referring to frequency disappears, the deceleration stops 1: When referring to frequency disappears, operation will be based on the proportion of reference frequency x 11-42	0	-	O	O	O	
11-42	Disappearance level of reference frequency	0.0~100.0	80.0	%	O	O	O	
11-43	Hold Frequency at Start	0.0~400.0	0.0	Hz	O	O	O	
11-44	Frequency hold Time at Start	0.0~10.0	0.0	s	O	O	O	

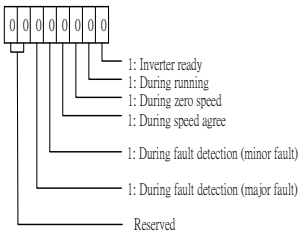
Group 11 Auxiliary Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
11-45	Hold Frequency at Stop	0.0~400.0	0.0	Hz	O	O	O	
11-46	Frequency hold Time at Stop	0.0~10.0	0.0	s	O	O	O	
11-47	KEB deceleration time	0.0~25.5	0.0	s	O	X	X	*1
11-48	KEB detection Level	200V: 190~210	200	V	O	X	X	
		400V: 380~420	400					
11-49 ~ 11-50	Reserved							
11-51	Braking selection of zero speed	0: Disable 1: Enable	0	-	O	X	X	
11-52 ~ 11-53	Reserved							
11-54	Output KWHr initialization	0: Do not clear output KWHr 1: Clear output KWHr	0	-	O	O	O	*1
11-55	STOP key selection	0: Stop key is disabled when the operation command is not provided by operator. 1: Stop key is enabled when the operation command is not provided by operator.	1	-	O	O	O	
11-56	UP/DOWN selection	0: When operator's UP/DOWN is disabled, it will be enabled if pressing ENTER after frequency modification. 1: When operator's UP/DOWN is enabled, it will be enabled after frequency modification.	0	-	O	O	O	
11-57	Reserved							
11-58	Record reference frequency	0: Disable 1: Enable	0	-	O	O	O	*1

*KVA: This parameter will be changed by different capacities of inverter.

Group 12 Monitoring Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
12-00	Display screen selection (LED)	00000~77777 From the leftmost bit, it displays the screen when press DSP key in order. 0:no display 1: Output current 2: Output voltage 3: DC bus voltage 4: Heatsink temperature 5: PID feedback 6: AI1 value	00000	-	O	O	O	*5

Group 12 Monitoring Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
		7: AI2 value						
12-01	PID feedback display mode (LED)	0: Display the feedback value by integer (xxx) 1: Display the feedback value by the value with one decimal place (xx.x) 2: Display the feedback value by the value with two decimal places (x.xx)	0		O	O	O	*5
12-02	PID feedback display unit setting (LED)	0:xxxxx (no unit) 1:xxxPb(pressure) 2:xxxFL(flow)	0		O	O	O	*5
12-03	Custom Units (Line Speed) Value	0~65535	0		O	O	O	*5
12-04	Custom Units (Line Speed) Display Mode	0: Drive Output Frequency is Displayed 1: Line Speed.Integer.(xxxxx) 2: Line Speed.One Decimal Place. (xxxx.x) 3: Line Speed.Two Decimal Places. (xxx.xx) 4: Line Speed.Three Decimal Places. (xx.xxx)	0		O	O	O	*5
12-05	Status display of digital input terminal (LED / LCD)	LED display is shown as below no input  correspondences to input and output   LCM display is shown as below 	-	-	O	O	O	
12-06 ~ 12-10	Reserved							
12-11	Output current of current fault	Display the output current of current fault	-	A	O	O	O	
12-12	Output voltage of	Display the output voltage	-	V	O	O	O	

Group 12 Monitoring Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
	current fault	of current fault						
12-13	Output frequency of current fault	Display the output frequency of current fault	-	Hz	O	O	O	
12-14	DC voltage of current fault	Display the DC voltage of current fault	-	V	O	O	O	
12-15	Frequency command of current fault	Display the frequency command of current fault	-	Hz	O	O	O	
12-16	Frequency command	If LED enters this parameter, it only allows monitoring frequency command.	-	Hz	O	O	O	
12-17	Output frequency	Display the current output frequency	-	Hz	O	O	O	
12-18	Output current	Display the current output current	-	A	O	O	O	
12-19	Output voltage	Display the current output voltage	-	V	O	O	O	
12-20	DC voltage (Vdc)	Display the current DC voltage	-	V	O	O	O	
12-21	Output power(kw)	Display the current output power	-	kW	O	O	O	
12-22	Motor's rotation speed (rpm)	Display motor's current rotation speed in VF/SLV mode Motor's rotation speed = output power x(120/motor's pole number) In PG/SV mode, motor's rotation speed is calculated by feedback frequency. Max limit is 65535	-	rpm	O	O	O	
12-23	Output power factor (Pfo)	Display the current output power factor	-	-	O	O	O	
12-24	Control mode	Display control mode 0 : VF 2 : SLV 5 : PM SLV	-	-	O	O	O	
12-25	AI1 input	Display the current AI1 input (0V corresponds to 0%, 10V corresponds to 100%,)	-	%	O	O	O	
12-26	AI2 input	Display the current AI2 input (0V or 4mA corresponds to 0%, 10V or 20mA corresponds to 100%)	-	%	O	O	O	
12-27	Torque command	Display the current torque command (100% corresponds to motor torque)	-	%	X	O	O	
12-28	Motor torque current (Iq)	Display the current q-axis current	-	%	X	O	O	
12-29	Motor excitation current (Id)	Display the current d-axis current	-	%	X	O	O	
12-30	Reserved							

Group 12 Monitoring Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
~ 12-35								
12-36	PID input	Display input error of the PID controller (PID target value - PID feedback) (100% corresponds to the maximum frequency set by 01-02 or 01-16)	0.01	%	O	O	O	
12-37	PID output	Display output of the PID controller (100% corresponds to the maximum frequency set by 01-02 or 01-16)	-	%	O	O	O	
12-38	PID setting	Display the target value of the PID controller (100% corresponds to the maximum frequency set by 01-02 or 01-16)	-	%	O	O	O	
12-39	PID feedback	Display the feedback value of the PID controller (100% corresponds to the maximum frequency set by 01-02 or 01-16)	-	%	O	O	O	
12-40	Reserved							
12-41	Heatsink temperature	Display the heatsink temperature of IGBT temperature.	-	℃	O	O	O	
12-42	Reserved							
12-43	Inverter status		-	-	O	O	O	
12-44	Reserved							
12-45	Recent fault message	Display current fault message	-	-	O	O	O	
12-46	Previous fault message	Display previous fault message	-	-	O	O	O	
12-47	Previous two fault messages	Display previous two fault messages	-	-	O	O	O	
12-48	Previous three fault messages	Display previous three fault messages	-	-	O	O	O	
12-49	Previous four fault messages	Display previous four fault messages	-	-	O	O	O	
12-50	DIO status of current fault	Display the DI/DO status of current fault Description is similar to 12-05	-	-	O	O	O	
12-51	Inverter status of current fault	Display the inverter status of current fault Description is similar to 12-43	-	-	O	O	O	
12-52	Trip time 1 of current fault	Display the operation time of current fault,12-53 is the days, while 12-52 is the ahemeral hours .	-	Hr	O	O	O	
12-53	Trip time 2 of current fault		-	day	O	O	O	

Group 12 Monitoring Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
12-54	Frequency command of previous fault	Display frequency command of previous fault	-	Hz	O	O	O	
12-55	Output frequency of previous fault	Display output frequency of previous fault	-	Hz	O	O	O	
12-56	Output current of previous fault	Display output current of previous fault	-	A	O	O	O	
12-57	Output voltage of previous fault	Display output voltage of previous fault	-	V	O	O	O	
12-58	DC voltage of previous fault	Display DC voltage of previous fault	-	V	O	O	O	
12-59	DIO status of previous fault	Display DI/DO status of previous fault Description is similar to 12-05	-	-	O	O	O	
12-60	Inverter status of previous fault	Display inverter status of previous fault Description is similar to 12-43	-	-	O	O	O	
12-61	Trip time 1 of last fault	Display the operation time of last time's fault,12-62 is the days, while 12-61 is the ahemeral hours .	-	Hr	O	O	O	
12-62	Trip time 2 of last fault		-	day	O	O	O	
12-63	Recent warning messages	Display the recent warning messages	-	-	O	O	O	
12-64	Previous warning message	Display the previous warning message	-	-	O	O	O	
12-65 ~ 12-66	Reserved							
12-67	Accumulative energy (kWHr)	0.0 ~ 999.9		kWHr	O	O	O	
12-68	Accumulative energy (MWHr)	0 ~ 60000		MWHr	O	O	O	
12-69	Accumulative energy price ($)	0 ~ 9999		$	O	O	O	
12-70	Accumulative energy price (10000$)	0 ~ 60000		$	O	O	O	
12-71	Flow rate meter	1 ~ 50000		GPM	O	O	O	
12-72	RTC date	12.01.01 ~ 99.12.31	12.01.01		O	O	O	
12-73	RTC time	00:00 ~ 23:59	00:00		O	O	O	
12-74	Operating pressure setting	0.01 ~ 25.50	2.00	PSI	O	X	X	
12-75	Max pressure setting	0.01 ~ 25.50	10.00	PSI	O	X	X	

*The maximum upper limit of motor speed (rpm) in parameter 12-22 is 65535.

Group 13 Maintenance Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
13-00	Inverter Capacity Selection	----	-	-	O	O	O	*4
13-01	Software Version	0.0-9.9	-	-	O	O	O	*4
13-02	Reserved							
13-03	Cumulative operation hours 1	0~23	-	hr	O	O	O	*4
13-04	Cumulative operation hours 2	0~65535	-	day	O	O	O	*4
13-05	Selection of accumulative operation time	0: Accumulative time in power on 1: Accumulative time in operation	0	-	O	O	O	*1
13-06	Parameters locked	0: Parameters out of 13-06 are unwritable. 1: Only user parameter usable 2: All parameters are writable	2	-	O	O	O	*1
13-07	Parameter password function	0~9999	0	-	O	O	O	
13-08	Restore factory setting	0: no initialization 2: 2 wire initialization(230/460V) 3: 3 wire initialization(230/460V) 4: 2 wire initialization(200/415V) 5: 3 wire initialization(200/415V) 6: 2 wire initialization(200/380V) 7: 3 wire initialization(200/380V) 8: PLC initialization* Others : Reserve	0	-	O	O	O	
13-09	Fault history clearance function	0: Do not clear fault history 1: Clear fault history	0	-	O	O	O	*1
13-10	Password function 2	0 ~ 9999	0		O	O	O	

Group 14 PLC Setting Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
14-00	T1 set value 1	0~9999	0	-	O	O	O	
14-01	T1 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-02	T2 set value 1	0~9999	0	-	O	O	O	
14-03	T2 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-04	T3 set value 1	0~9999	0	-	O	O	O	
14-05	T3 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-06	T4 set value 1	0~9999	0	-	O	O	O	
14-07	T4 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-08	T5 set value 1	0~9999	0	-	O	O	O	
14-09	T5 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-10	T6 set value 1	0~9999	0	-	O	O	O	
14-11	T6 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-12	T7 set value 1	0~9999	0	-	O	O	O	
14-13	T7 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-14	T8 set value 1	0~9999	0	-	O	O	O	
14-15	T8 set value 2 (mode 7)	0~9999	0	-	O	O	O	
14-16	C1 set value	0~65535	0	-	O	O	O	
14-17	C2 set value	0~65535	0	-	O	O	O	
14-18	C3 set value	0~65535	0	-	O	O	O	
14-19	C4 set value	0~65535	0	-	O	O	O	
14-20	C5 set value	0~65535	0	-	O	O	O	
14-21	C6 set value	0~65535	0	-	O	O	O	
14-22	C7 set value	0~65535	0	-	O	O	O	
14-23	C8 set value	0~65535	0	-	O	O	O	
14-24	AS1 set value 1	0~65535	0	-	O	O	O	
14-25	AS1 set value 2	0~65535	0	-	O	O	O	
14-26	AS1 set value 3	0~65535	0	-	O	O	O	
14-27	AS2 set value 1	0~65535	0	-	O	O	O	
14-28	AS2 set value 2	0~65535	0	-	O	O	O	
14-29	AS2 set value 3	0~65535	0	-	O	O	O	
14-30	AS3 set value 1	0~65535	0	-	O	O	O	
14-31	AS3 set value 2	0~65535	0	-	O	O	O	
14-32	AS3 set value 3	0~65535	0	-	O	O	O	
14-33	AS4 set value 1	0~65535	0	-	O	O	O	
14-34	AS4 set value 2	0~65535	0	-	O	O	O	
14-35	AS4 set value 3	0~65535	0	-	O	O	O	
14-36	MD1 set value 1	0~65535	1	-	O	O	O	
14-37	MD1 set value 2	0~65535	1	-	O	O	O	
14-38	MD1 set value 3	0~65535	1	-	O	O	O	
14-39	MD2 set value 1	0~65535	1	-	O	O	O	
14-40	MD2 set value 2	0~65535	1	-	O	O	O	
14-41	MD2 set value 3	0~65535	1	-	O	O	O	
14-42	MD3 set value 1	0~65535	1	-	O	O	O	
14-43	MD3 set value 2	0~65535	1	-	O	O	O	
14-44	MD3 set value 3	0~65535	1	-	O	O	O	
14-45	MD4 set value 1	0~65535	1	-	O	O	O	
14-46	MD4 set value 2	0~65535	1	-	O	O	O	
14-47	MD4 set value 3	0~65535	1	-	O	O	O	

Group 15 PLC Monitoring Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PM SLV	
15-00	T1 current value1	0~9999	0	-	O	O	O	
15-01	T1 current value2 (mode7)	0~9999	0	-	O	O	O	
15-02	T2 current value1	0~9999	0	-	O	O	O	
15-03	T2 current value2 (mode7)	0~9999	0	-	O	O	O	
15-04	T3 current value1	0~9999	0	-	O	O	O	
15-05	T3 current value2 (mode7)	0~9999	0	-	O	O	O	
15-06	T4 current value1	0~9999	0	-	O	O	O	
15-07	T4 current value2 (mode7)	0~9999	0	-	O	O	O	
15-08	T5 current value1	0~9999	0	-	O	O	O	
15-09	T5 current value2 (mode7)	0~9999	0	-	O	O	O	
15-10	T6 current value1	0~9999	0	-	O	O	O	
15-11	T6 current value2 (mode7)	0~9999	0	-	O	O	O	
15-12	T7 current value1	0~9999	0	-	O	O	O	
15-13	T7 current value2 (mode7)	0~9999	0	-	O	O	O	
15-14	T8 current value1	0~9999	0	-	O	O	O	
15-15	T8 current value2 (mode7)	0~9999	0	-	O	O	O	
15-16	C1 current value	0~65535	0	-	O	O	O	
15-17	C2 current value	0~65535	0	-	O	O	O	
15-18	C3 current value	0~65535	0	-	O	O	O	
15-19	C4 current value	0~65535	0	-	O	O	O	
15-20	C5 current value	0~65535	0	-	O	O	O	
15-21	C6 current value	0~65535	0	-	O	O	O	
15-22	C7 current value	0~65535	0	-	O	O	O	
15-23	C8 current value	0~65535	0	-	O	O	O	
15-24	AS1 current value	0~65535	0	-	O	O	O	
15-25	AS2 current value	0~65535	0	-	O	O	O	
15-26	AS3 current value	0~65535	0	-	O	O	O	
15-27	AS4 current value	0~65535	0	-	O	O	O	
15-28	MD1 current value	0~65535	0	-	O	O	O	
15-29	MD2 current value	0~65535	0	-	O	O	O	
15-30	MD3 current value	0~65535	0	-	O	O	O	
15-31	MD4 current value	0~65535	0	-	O	O	O	
15-32	TD current value	0~65535	0	-	O	O	O	

Group 16 LCM Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
16-00	Main screen monitoring	5~75 when using LCM to operate, the monitored item displays in the first line. (default is frequency command)	16	-	O	O	O	*1
16-01	Sub-screen monitoring 1	5~75 when using LCM to operate, the monitored item displays in the second line.(default is output frequency)	17	-	O	O	O	*1
16-02	Sub-screen monitoring 2	5~75 when using LCM to operate, the monitored item displays in the third line.(default is output current)	18	-	O	O	O	*1
16-03	Display unit	0~39999 determine the display way and unit of frequency command 0: Frequency display unit is 0.01Hz 1: Frequency display unit 0.01% 2~38: rpm, the set number represents the pole number of motor 40~9999: Users specify the format, Inputing 0XXXX represents the display of XXXX at 100%. 10001~19999: Users specify the format, Inputting 1XXXX represents the display of XXX.X at 100%. 20001~29999: Users specify the format, Inputting 2XXXX represents the display of XX.XX at 100%. 30001~39999: Users specify the format, Inputting 3XXXX represents the display of X.XXX at 100%.	0	-	O	O	O	
16-04	Engineering unit	0：Do not use engineering unit 1：FPM 2：CFM 3：PSI 4：GPH 5：GPM 6：IN 7：FT	0	-	O	O	X	

Group 16 LCM Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
		8：/s						
		9：/m						
		10：/h						
		11：°F						
		12：inW						
		13：HP						
		14：m/s						
		15：MPM						
		16：CMM						
		17：W						
		18：KW						
		19：m						
		20：°C						
16-05	LCD backlight	0~7	5	-	O	O	O	*1
16-06	Automatic return time	0~120	60	Sec	O	O	O	*1
16-07	Copy function selection	0: Do not copy parameters 1: Read inverter parameters and save to the operator. 2: Write the operator parameters to inverter. 3: Compare parameters of inverter and operator.	0	-	O	O	O	
16-08	Selection of allowing reading	0: Do not allow to read inverter parameters and save to the operator. 1: Allow to read inverter parameters and save to the operator.	0	-	O	O	O	
16-09	Selection of operator removed (LCD)	0: Keep operating when LCD operator is removed. 1: Stop operating when LCD operator is removed	0	-	O	O	O	*1
16-10	RTC display setting	0: Hide 1: Display	0		O	O	O	
16-11	RTC date setting	12.01.01 ~ 99.12.31	12.01.01		O	O	O	
16-12	RTC time setting	00:00 ~ 23:59	00:00		O	O	O	
16-13	RTC timer function	0: Disable 1: Enable 2: Set by DI	0		O	O	O	
16-14	P1 start time	00:00 ~ 23:59	08:00		O	O	O	
16-15	P1 stop time	00:00 ~ 23:59	18:00		O	O	O	
16-16	P1 start date	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-17	P1 stop date		5		O	O	O	
16-18	P2 start time	00:00 ~ 23:59	08:00		O	O	O	
16-19	P2 stop time	00:00 ~ 23:59	18:00		O	O	O	
16-20	P2 start date	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-21	P2 stop date		5		O	O	O	
16-22	P3 start time	00:00 ~ 23:59	08:00		O	O	O	
16-23	P3 stop time	00:00 ~ 23:59	18:00		O	O	O	
16-24	P3 start date	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-25	P3 stop date		5		O	O	O	
16-26	P4 start time	00:00 ~ 23:59	08:00		O	O	O	
16-27	P4 stop time	00:00 ~ 23:59	18:00		O	O	O	

Group 16 LCM Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
16-28	P4 start date	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-29	P4 stop date		5		O	O	O	
16-30	RTC offset selection	0: Disable 1: Enable 2: Set by DI	0		O	O	O	
16-31	RTC offset time setting	00:00 ~ 23:59	00:00	-	O	O	O	
16-32	Source of Timer 1	0:None,1:P1, 2:P2,3:P1+P2 4:P3,5:P1+P3, 6:P2+P3,7:P1+P2+P3, 8:P4,9:P1+P4, 10:P2+P4, 11:P1+P2+P4 12:P3+P4 13:P1+P3+P4, 14:P2+P3+P4 15:P1+P2+P3+P4, 16:Off,17:Off+P1 18:Off+P2, 19:Off+P1+P2 20:Off+P3, 21:Off+P1+P3 22:Off+P2+P3 23:Off+P1+P2+P3 24:Off+P4 25:Off+P1+P4 26:Off+P2+P4 27:Off+P1+P2+P4 28:Off+P3+P4 29:Off+P3+P4 30:Off+P2+P3+P4 31:Off+P1+P2+P3+P4	1		O	O	O	
16-33	Source of Timer 2		2		O	O	O	
16-34	Source of Timer 3		4		O	O	O	
16-35	Source of Timer 4		8		O	O	O	
16-36	RTC speed selection	0: Disable 1: by timer 1 2: by timer 2 3: by timer 3 4: by timer 4 5.:by timer 1+2	0		O	O	O	
16-37	Selecton of RTC rotation direction	xxx0b: RTC Run1 Forward rotation xxx1b: RTC Run1 Reversal rotation xx0xb: RTC Run2 Forward rotation xx1xb: RTC Run2 Reversal rotation x0xxb: RTC Run3 Forward rotation x1xxb: RTC Run3 Reversal rotation 0xxxb: RTC Run4 Forward rotation 1xxxb: RTC Run4 Reversal rotation			O	O	O	

Group 17 IM Motor Auto-tuning Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
17-00	Auto-tuning mode	0: Rotating auto-tuning 1: Static auto-tuning 2: Stator resistance measurement 3: Reserved 4: Loop tuning	VF:2, SLV:0	-	O	O	X	
17-01	Motor rated output power	0.00~600.00	-	KW	O	O	X	
17-02	Motor rated current	0.1~999.9	-	A	O	O	X	
17-03	Motor rated voltage	200V: 0.0~255.0 400V:0.0~510.0	220 440	V	O	O	X	
17-04	Motor rated frequency	10.0~400.0	60.0	Hz	O	O	X	
17-05	Motor rated speed	0~24000	KVA	rpm	O	O	X	
17-06	Pole number of motor	2,4,6,8	4	Pole	O	O	X	
17-07	Reserved							
17-08	Motor no-load voltage	200V: 50~240 400V100~480	KVA	V	O	O	X	
17-09	Motor excitation current	0.01~600.00	KVA	A	O	O	X	
17-10	Auto-tuning start	0: Disable 1: Enable	0	-	O	O	X	
17-11	Error history of auto-tune	0: No error 1: Motor data error 2: Stator resistance tuning error 3: Leakage induction tuning error 4: Rotor resistance tuning error 5: Mutual induction tuning error 6: Reserved 7: DT Error 8: Motor's acceleration error 9: Warning	0	-	O	O	X	

*KVA: This parameter will be changed by different capacities of inverter.

Group 18 Slip Compensation Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
18-00	Slip compensation gain at low speed. Slip compensation gain at high speed.	0.00~2.50	VF:0.00 SLV: 1.0	-	O	O	X	*1
18-01	Slip compensation limit	-1.00~1.00	0.0	-	O	O	X	*1
18-02	Slip compensation of filter time	0~250	200	%	O	X	X	
18-03	Regenerative slip compensation selection	0.0~10.0	1.0	Sec	O	X	X	
18-04	FOC delay time	0: Disable 1: Enable	0	-	O	X	X	
18-05	FOC gain	1~1000	100	ms	X	O	X	
18-06	Slip compensation gain at low speed.	0.00~2.00	0.1	-	X	O	X	

Group 19 Reserved

Group 20 Speed Control Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
20-00	ASR gain 1	0.00~250.00	3.00	-	X	O	O	*1
20-01	ASR integral time 1	0.001~10.000	SLV: 0.500 PMSLV :0.08,	Sec	X	O	O	*1
20-02	ASR gain 2	0.00~250.00	3.00	-	X	O	O	*1
20-03	ASR integral time 2	0.001~10.000	SLV: 0.500 PMSLV :0.08,	Sec	X	O	O	*1
20-04	ASR integral time limit	0~300	200	%	X	O	O	
20-05 ~ 20-06	Reserved							
20-07	Selection of acceleration and deceleration of P/PI	0: PI speed control will only be enabled in constant speed. For the speed acceleration and deceleration, only using P control. 1: Speed control is enabled either in acceleration or deceleration.	1	-	X	O	X	
20-08	ASR delay time	0.000~0.500	0.004	Sec	X	O	X	
20-09	Speed Observer Proportional (P) Gain1	0.00~2.55	0.61	-	X	O	X	*1
20-10	Speed Observer Integral (I) Time 1	0.01~10.00	0.05	Sec	X	O	X	*1
20-11	Speed Observer Proportional (P) Gain2	0.00~2.55	0.61	-	X	O	X	*1
20-12	Speed Observer Integral (I) Time 2	0.01~10.00	0.06	Sec	X	O	X	*1

Group 20 Speed Control Function Group*								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
20-13	Low-pass Filter Time constant of speed feedback 1	1~1000	4	ms	X	O	X	
20-14	Low-pass Filter Time constant of speed feedback 2	1~1000	30	ms	X	O	X	
20-15	ASR gain change frequency 1	0.0~400.0	4.0	Hz	X	O	X	
20-16	ASR gain change frequency 2	0.0~400.0	8.0	Hz	X	O	X	
20-17	Torque compensation gain at low speed	0.00~2.50	1.00	-	X	O	X	*1
20-18	Torque compensation gain at high speed	-10~10	0	%	X	O	X	*1

*KVA: This parameter will be changed by different capacities of inverter.

Group 21 Torque Control Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
21-00 ~ 21-04	Reserved							
21-05	Positive torque limit	0~160	160	%	X	O	O	
21-06	Negative torque limit	0~160	160	%	X	O	O	
21-07	Forward regenerative torque limit	0~160	160	%	X	O	O	
21-08	Reversal regenerative torque limit	0~160	160	%	X	O	O	

Group 22 PM Motor Parameter Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
22-00	PM motor rated power	0.00~600.00	-	kW	X	X	O	
22-01	PM motor rated voltage	200V: 50.0~240.0 400V: 100.0~480.0	220.0 440.0	V	X	X	O	
22-02	PM motor rated current	0.1~999.9	KVA	A	X	X	O	
22-03	Pole number of PM motor	2~96	6	poles	X	X	O	
22-04	Rotation speed of PM motor	0~60000 (22-04, 22-06, only need to set one of them, the program will calculate the others.)	1500	rpm	X	X	O	
22-05	Maximum rotation speed of PM motor	0~60000	1500	rpm	X	X	O	
22-06	PM motor frequency	0.0~400.0	75.0	Hz	X	X	O	
22-07	PM motor type	0: SPM 1: IPM	0	-	X	X	O	
22-08	Reserved							
22-09	PM SLV start mode	0: Forced to start 1: Static to start	0	-	X	X	O	
22-10	PM SLV start current	0 ~ 120% Motor rated current	50	%	X	X	O	
22-11	DC injection current	0 ~ 100% Motor rated current	40	%	X	X	O	
22-12	PM SLV Magnetic start-up current	0 ~ 200% Motor rated current	50	%	X	X	O	
22-13	Gain of speed estimation	4~16	8	-	X	X	O	
22-14	Resistance of PM armature	0.001 ~ 32.767	1.000	Ω	X	X	O	
22-15	D-axis inductance of PM motor	0.001 ~ 32.767	0	mH	X	X	O	
22-16	Q-axis inductance of PM motor	0.001 ~ 32.767	0	mH	X	X	O	
22-17	PM EMF	0.001 ~ 32.767	0.001	mV/rad/s	X	X	O	
22-18 ~ 22-19	Reserved							
22-20	Offset angle of the magnetic pole	0~360	0	deg	X	X	O	
22-21	SLV PM motor tuning	0: Disable 1: Self Sensing	0	-	X	X	O	
22-22	Fault history of SLV PM motor tuning	0: No error 1: Error of current in loop tuning 2~10: Reserved 11: Overtime in detection of stator resistance 12: Reserved	0	--	X	X	O	*4

Group 23 Pump and HVAC Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
23-00	Function selection	0: Disable 1: Pump 2: HVAC	0	-	O	O	O	
23-01	Multiple pump control setting	0: Single pump 1: Primary 2: Auxiliary motor 1 3: Auxiliary motor 2 4: Auxiliary motor 3	0		O	X	X	
23-02	Operating pressure setting	0.01 ~ 25.50	2.00	PSI	O	X	X	
23-03	Max pressure setting	0.01 ~ 25.50	10.00	PSI	O	X	X	
23-04	Source of pressure command	0: Set by 23-02 1: Set by AI	200	0	O	X	X	
23-05	Display mode selection	0: Display pressure of target and feedback (If operating with LED keypad, 23-03 must below 9.9PSI) 1. Display target pressure only 2. Display feedback pressure only	5.0	%	O	X	X	
23-06	Proportional gain (P)	0.00~10.00	3.00	-	O	X	X	
23-07	Integral time (I)	0.0~100.0	0.5	Sec	O	X	X	
23-08	Differential time(D)	0.00~10.00	0.00	Sec	O	X	X	
23-09	Difference of constant pressure	0.10 ~ 25.50	0.50	PSI	O	X	X	
23-10	Sleep frequency of constant pressure	0.00 ~ 180.00	0.00	Hz	O	X	X	
23-11	Sleep time of constant pressure	0.0 ~ 255.5	0.0	Sec	O	X	X	
23-12	Limit of maximum pressure	0.00 ~ 25.50	5.00	PSI	O	X	X	
23-13	High voltage warning time	0.0 ~ 600.0	10.0	Sec	O	X	X	
23-14	High voltage stop time	0.0 ~ 600.0	20.0	Sec	O	X	X	
23-15	Limit of minimum pressure	0.00 ~ 25.50	0.50	PSI	O	X	X	
23-16	Low voltage warning time	0.0 ~ 600.0	10.0	Sec	O	X	X	
23-17	High voltage stop time	0.0 ~ 600.0	20.0	Sec	O	X	X	
23-18	Detection time of pressure loss	0.0 ~ 600.0	0.0	Sec	O	X	X	
23-19	Detection proportion of pressure loss	0 ~ 100	0	%	O	X	X	
23-20 ~ 23-22	Reserved							
23-23	Direction of water flow detection	0: Upward detection 1: Downward detection	1		O	X X	X X	
23-24	Pressure range of water flow	0.0 ~ 25.0	1.0	PSI	O	X	X	
23-25	Detection cycle of water flow	0.0 ~ 200.0	20.0	Sec	O	X	X	

Group 23 Pump and HVAC Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
23-26	Detection cycle of water flow acceleration time	0.1 ~ 6000.0	KVA	Sec	O	X	X	
23-27	Detection cycle of water flow deceleration time	0.1 ~ 6000.0	KVA	Sec	O	X	X	
23-28	Force operating frequency	0.0 ~ 200	0.0	Hz-	O	X	X	
23-29	Multiple pump switching time	0 ~ 240	3	Hr	O	X	X	
23-30	Detection time of Multiple pump operation	0.0 ~ 30.0	5.0		O	X	X	
23-31	Selection of multiple pump control synchronizing	0: Disable 1: Pressure setting and Run/Stop synchronizing 2: Pressure setting synchronizing 3: Run/Stop synchronizing	0		O	X	X	
23-32 ~ 23-40	Reserved							
23-41	LOC/REM	0: Disable 1: Enable	1		O	O	O	
23-42	Accumulative energy	0: Disable (Energy continue accumulating) 1: Enable (Energy re-accumulating)	0		O	O	O	
23-43	Energy price units per kWh	0.000 ~ 5.000	0.000	$	O	O	O	
23-44	Units selection of accumulative energy pulse output	0: Disable 1: In units of 0.1kWh 2: In units of 1kWh 3: In units of 10kWh 4: In units of 100kWh 5: In units of 1000kWh	0		O	O	O	
23-45	Feedback mode of flow rate meter	0: Disable 1: Analog input 2: Pulse input	1		O	O	O	
23-46	Maxmum value of flow rate meter	1 ~ 50000	10000	GPM	O	O	O	
23-47	Target value of flow rate meter	1 ~ 50000	5000	GPM	O	O	O	
23-48	Maxmum value of flow feedback	0.01 ~ 99.00	80.00	%	O	O	O	
23-49	Maxmum warning time of flow feedback	0.0 ~ 255.0	3.0	Sec	O	O	O	
23-50	Maxmum stop time of flow feedback	0.0 ~ 255.0	6.0	Sec	O	O	O	
23-51	Minimum value of flow feedback	0.01 ~ 99.00	10.00	%	O	O	O	
23-52	Minimum warning time of flow feedback	0.0 ~ 255.0	3.0	Sec	O	O	O	
23-53	Minimum stop time of flow feedback	0.0 ~ 255.0	6.0	Sec	O	O	O	
23-54	Low suction detection	0: Disable 1: PID difference 2: Current	0		O	O	O	

Group 23 Pump and HVAC Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
		3: Current and PID difference						
23-55	Time of Low suction detection	0 ~ 300	100	Sec	O	O	O	
23-56	PID difference level of low suction	0 ~ 30	10	%	O	O	O	
23-57	Current level of low suction(motor rated current)	0 ~ 100	10	%	O	O	O	
23-58	Action of low suction	0: Disable 1: Warning 2: Stop 3: Stop and restart	0		O	O	O	

Group 24 1 to 8 Pump Card Function Group								
Code	Parameter Name	Range	Default	Unit	Control mode			Attribute
					V/F	SLV	PMSLV	
24-00	1 to 8 pump card function	0: 1 to 8 pump card Disable 1: Fixed type of variable frequency pump First on last off and stop all 2: Fixed type of variable frequency pump Only stop pumps 3: Fixed type of variable frequency pump First on first off and stop all 4: Cycle type of variable frequency pump First on first off and stop all 5: Cycle type of variable frequency pump Only stop pumps	0	-	O	O	O	
24-01	Relay 2-4 function	xxx0b: Reserved xxx1b: Reserved xx0xb: Realy 2 Disable xx1xb: Realy 2 Enable x0xxb: Realy 3 Disable x1xxb: Realy 3 Enable 0xxxb: Realy 4 Disable 1xxxb: Realy 4 Enable	0000b		O	O	O	
24-02	Relay 5-8 function	xxx0b: Realy 5 Disable xxx1b: Realy 5 Enable xx0xb: Realy 6 Disable xx1xb: Realy 6 Enable x0xxb: Realy 7 Disable x1xxb: Realy 7 Enable 0xxxb: Realy 8 Disable 1xxxb: Realy 8 Enable	0000b		O	O	O	
24-03	Continuous time of upper limit frequency	1.0 ~ 600.0	300.0	Sec	O	O	O	*1
24-04	Continuous time of lower limit frequency	1.0 ~ 600.0	300.0	Sec	O	O	O	*1
24-05	Switching time of Magnetic Contactor	1.0 ~ 20.0	1.00	Sec	O	O	O	*1
24-06	Acceptable difference of pump switching	0.0 ~ 20.0	0.0	%	O	O	O	*1

Chapter 5 Trouble Diagnosis and Shooting

5.1 General

Inverter fault detection and early warning / self-diagnosis function. When the inverter detects a fault code displayed on the digital operator, the fault contact output will start acting to cut off the inverter output, so that the motor coasts to stop (The stop way can be selected for some faults).

When the inverter detects a warning / self-diagnosis, the digital operator will display a warning / self-diagnostic code, but the fault output of the contact does not act. Once the warning is removed, the system will automatically return to its original state.

5.2 Fault Detection Function

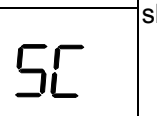
When the fault occurs, please refer to Table 5-1 for the possible causes and take appropriate measures.

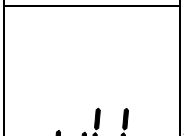
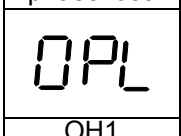
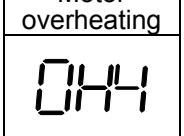
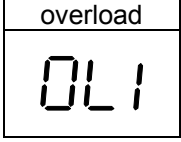
Use one of the following methods to restart:

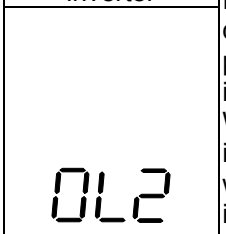
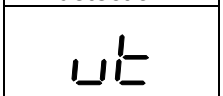
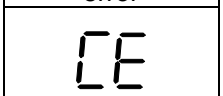
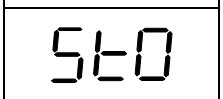
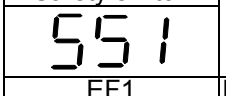
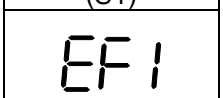
1. Set one of multi-function digital input terminals (03-00, 03-07) to 17 (Fault reset), so that the fault reset signal is ON.
2. Press the RESET on digital keypad.
3. Cut off the main circuit power and then open it again.

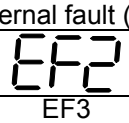
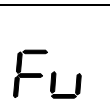
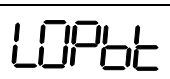
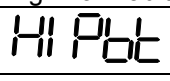
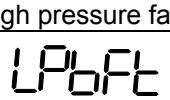
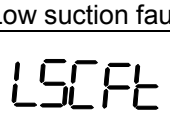
The fault message will be stored in the fault information (group 12 parameters), when a fault occurs.

Table 5-1 Fault information and corrective action

LED display	Description	Possible causes	Corrective action
OC over current 	Over current: The inverter output current exceeds the OC detection value (about 200% of the rated current)	• Acceleration / Deceleration time is too short. • The magnetic switch operation at the inverter output side. • A special motor or applicable capacity is greater than the inverter rated value. • Short circuit or ground fault.	• Prolong acceleration / deceleration time • Check the load wiring • Remove the motor and try to run the inverter
SC short circuit 	Short circuit: Inverter output or the load is short circuit	• Short circuit or ground fault occurs (08-23 = 1). • The faults such as contact and ground short circuit caused by motor damage, insulation deterioration and wire damage.	• Confirm the load wiring
GF ground fault 	Ground fault: The current of the ground short circuit at output side exceeds 50% of inverter rated output current and 08-23 = 1 (GF function is enabled).	• Ground fault occurs(08-23=1) • The defects of motor ground fault or DCCT current sensors. • This is equipment protection, not personal protection.	• Check motor wiring and wiring impedance.

LED display	Description	Possible causes	Corrective action
OV over voltage 	Over voltage of main circuit: DC voltage exceeds the OV detection value – 410Vdc: 220V class 820Vdc: 440V class (for 440V class, input voltage 01-14 is set to lower than 400V, the OV detection value will be decreased to 730Vdc)	• Deceleration time is too short, resulting in recovery energy is too high. • The input voltage is too high. • The use of power factor correction capacitor	• Prolong deceleration time • Check the input circuit and reduce the input voltage to comply the specification requirements. • Remove the power factor correction capacitor.
UV under voltage 	Under voltage of main circuit: DC bus voltage is lower than the UV detection value or the electromagnetic contactor of DC bus is not used, and at the same time, the inverter is operating. About 190Vdc: 220V class; 380Vdc: 440V class (the detection value can be adjusted by 07-13)	• The input voltage is too low. • Phase loss of input power • Acceleration time is too short. • The input Voltage is large fluctuation. • Electromagnetic contactor of DC bus is not used or the feedback signal is not unusual.	• Check the input circuit and the power voltage. • Prolong acceleration time.
IPL input phase loss 	Input phase loss: Phase loss at the input side of the inverter or there is an imbalance great voltage. When 08-09 = 1 (enabed), this fault will be detected.	• IPL occurs. • Terminal screws of R/L1, S/L2 or T/L3 are loose or lost. • Input voltage fluctuation is too big.. • Input Voltage is imbalance per phase • Ageing of the capacity on main circuit inside inverter	• Check the main wiring connection correct • Check if the terminal screw get loose。 • Make sure having stable input voltage or turn off IPL detection function • Replace the circuit board or inverter
OPL output phase loss 	Output phase loss: Phase loss at the output side of the inverter. When 08-10=1, this fault detection function is enabled.	• The output cable or the internal of motor is damaged. • Terminal screws of R/ L1, S/L2 or T/ L3 are loose or lost. • Motor rated capacity is less than 10% of the inverter rated value.	• Check motor wiring. • Check the motor and the inverter capacity.
OH1 Heat sink overheating 	Heat sink is overheating : The temperature of the heat sink is too high. If heat sink overheating fault has occurred with three times in five minutes, it is required to wait 10 minutes before resetting the fault.	• Ambient temperature is too high. The cooling fan has stopped. Carrier frequency setting is too high.	• Check the ambient temperature of the inverter. • Check the fan or dust and dirt in the heat sink. • Check the carrier frequency setting.
OH4 Motor overheating 	Motor overheating : The input of PTC (PositiveTemperature Coefficient) exceeds the overheat protection level	• The surrounding temperature of motor is too high • The input of PTC (PositiveTemperature Coefficient) exceeds the overheat protection level	• Check the surrounding temperature of motor • Check MTand GND terminal wiring be correct
OL1 Motor overload 	Motor overload: Motor overload protection function is enabled according to the overload protection curve 08-05 = xxx1 of the motor internal (motor overload protection enabling).	• Voltage setting of V / F mode is too • high, resulting in motor over-excitation. • Motor rated current setting (02-01) is incorrect. • Motor load is too big.	• Check the V / F mode. Check the motor rated current. Check the load and the • operation cycle time.

LED display	Description	Possible causes	Corrective action
OL2 Over load of the inverter 	Over load of the inverter: The overload protection function of the inverter depends on the overload protection curve of inverter internal. When the over load of the inverter is removed, the warning of over load of the inverter will appear. However, if the warning of over load of the inverter has occurred by 4 times in five minutes, it is required to wait 4 minutes to reset the fault.	• Voltage setting of V / F mode is too high. • The inverter capacity is too small. Motor load is too big.	• Check the V / F mode. Replaced by a higher-capacity • inverter Check the load and the • operation cycle time.
OT over torque detection 	Over torque detection : Inverter output torque is higher than 08-15 (over torque detection level) and exceeds set time of 08-16, then the inverter enables the base block (08-14 = 0 or 2).	• Mechanical load is too big.	• Check the application or operating status • Check whether 08-15 and 08-16 are appropriate values
UT under torque detection 	Under torque detection: When inverter output torque is lower than 08-19 (under torque detection level) and exceeds set time of 08-20, then the inverter enables the base block (08-18 = 0 or 2).	• Reduce the mechanical load suddenly. (for example, the belt is broken)	• Check the application or operating status • Check whether 08-19 and 08-20 are appropriate values
CE communication error 	Modbus communication error : No communication is received in time of 09-06 (communication error detection time) .Subject to 09-07(= 0 to 2), this fault protection is enabled.	• Disconnection or the host stopped communication.	• Check all connections and verify all software architecture at the client side.
FB PID feedback loss 	PID feedback loss: In PID feedback loss detection (10-11 = 2, Motor is coast to stop), PID feedback inputs <PID feedback loss detection level（10-12）and the PID feedback loss detection time is exceeded（10-13）.	• PID feedback sensor can not act properly or it is not install correctly.	• Check PID feedback method setting is correct or not. • Ensure the correct installation and the proper operation of PID feedback signal.
STO Safety switch 	Safety switch of the inverter	① F1 and F2 on the inverter control circuit board are open circuit. ② 08-30 is set to 1: Coast to stop, and digital terminal switch (58) is turned on.	① Check F1 and F2 on the inverter control circuit board are open circuit or not. ② Check digital terminal(58) is turned on
SS1 Safety switch 	Safety switch of the inverter	• When 08-30 is set to 0: Deceleration to stop, and digital terminal switch(58) is turned on	• Check digital terminal(58) is turned on
EF1 External fault (S1) 	External fault (Terminal S1)	• External fault message is received by multifunction digital input terminals. • When 03-00 to 03-05 is set to 25, and 08-24:Selection of external fault operation is set to 0, 1 or 2.	• Check the faults of external causes. • Reset the external fault of multi function digital input.

LED display	Description	Possible causes	Corrective action
EF2 External fault (S2) 	External fault (Terminal S2)	• External fault message is received by multifunction digital input terminals. • When 03-00 to 03-05 is set to 25, and 08-24: Selection of external fault operation is set to 0, 1 or 2.	• Check the faults of external causes. • Reset the external fault of multi function digital input.
EF3 External fault (S3) 	External fault (Terminal S3)		
EF4 External fault (S4) 	External fault (Terminal S4)		
EF5 External fault (S5) 	External fault (Terminal S5)		
EF6 External fault (S6) 	External fault(Terminal S6)		
CF07 Motor control fault 	Motor control fault	• Start-up fault in SLV mode,	• Perform rotational auto-tuning • If rotational auto-tuning can't be performed, please perform the static auto-tuning, or increase the value of 01-08.
FU fuse open 	DC fuse : open circuit DC fuse (Models 230V 50HP or above, 460V 75HP or above) open circuit .	• The power transistor is damaged due to the short circuit at the inverter output side. • Check there are short circuit or not between the terminal ⊖ and U/T1, V/T2, W/T3.	• Check if there is short circuit or not between the motor and the wire or the insulation is damaged. • Repair / replace the inverter.
LOPBT Low flow fault 	Low flow fault	• The feedback signal is not connected. • Due to HVAC feedback value is lower than limit of minimum flow.	• Check feedback signal is correct and with right connection. • Check if feedback value is lower than limit of minimum flow (23-51).
HIPBT High flow fault 	High flow fault	• Due to HVAC feedback value is lower than limit of maximum flow.	• Check feedback signal is correct. • Check if feedback value is lower than limit of maximum flow. (23-48).
LPBFT Low pressure fault 	Low pressure fault	• The feedback signal is not connected. • Due to feedback value of pump pressure is lower than limit of minimum flow.	• Check feedback signal is correct and with connection. • Check if feedback value of pressure is lower than limit of minimum pressure (23-15).
OPBFT High pressure fault 	High pressure fault	• Due to feedback value of pump pressure is lower than limit of maximum flow.	• Check feedback signal is correct. • Check if feedback value of pressure is lower than limit of maximum pressure (23-12).
LSCFT Low suction fault 	Low suction fault	• Insufficient water supply of effluent channel leads to insufficient suction • PID diference is higher than its level or current is lower than output current level	• Check if water of effluent channel is enough, and water supply is regular. • Check PID diference is higher than its level or current is lower than output current level

5.3 Warning / Self-diagnosis Detection Function

When the inverter detects a warning, the digital operator will display the warning code (flash), and the fault output contact will not act. Once the warning is removed, the system will automatically restore the original state.

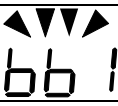
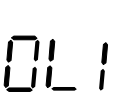
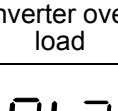
When the inverter detects a self-diagnosis function (for example, there is an invalid setting or two parameters are contradictive), the digital operator will display the self-diagnosis code, and the fault output contact will not act. Before the parameter has been correctly set, the inverter can not execute the operation command.

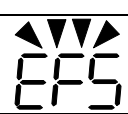
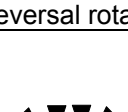
When a warning or a self-diagnostic error occurs, refer to Table 5-2 to confirm and correct the error.

When the RESET key is pressed at this time, the warning message (flash) disappears. If the warning or self-diagnostic error still exists, the warnings will be displayed again in 5 seconds

Table 5-2 warning / self-diagnosis and corrective actions

LED display	Description	Possible causes	Corrective action
OV (flash) over voltage 	Voltage of main circuit： The DC bus voltage exceeds the OV detection level, and the inverter has stopped. 410Vdc: 230 V class 820Vdc: 460 V class	• The input power voltage is too high.	• Check the input power voltage
UV (flash) under voltage 	Voltage of main circuit： The DC bus voltage is lower the UV detection level, and the inverter has stopped. 190Vdc: 230V class 380Vdc: 460V class (07-13 can set the detection level)	• The input power voltage is too low. • Momentary power loss occurs.	• Check the input power voltage. Check the input circuit. • Check the main circuit MC.
OH1 Heat sink overheating 	Heat sink is overheating : The temperature of the heat sink is too high. If heat sink overheating fault has occurred with three times in five minutes, it is required to wait 10 minutes before resetting the fault.	• Ambient temperature is too high. • The cooling fan has stopped. • Carrier frequency setting is too high.	• Check the ambient temperature of the inverter. • Check the fan or dust and dirt in the heat sink. • Check the carrier frequency setting.
OH2 (flash) Inverter over heating warning 	Inverter over heating warning： Use multi function digital input terminals to input the inverter over heating warning. (03-00 to 03-05=31)	• Multi function digital input terminal receives the occurrence signal of external over heating warning.	• Check the external condition
OT (flash) over torque detection 	Over torque detection : The inverter output current is higher than 08-15 (OT detection level) and exceeds set time of 08-16. Subject to 08-14=1, the inverter continues operation.	• Mechanical load is too big.	• Check the application or the machine's operation status. • Check the set values of 08-15 and 08-16.

LED display	Description	Possible causes	Corrective action
UT (flash) under torque detection 	Under torque detection : The inverter output current is lower than 08-19 (under torque detection level) and exceeds set time of 08-20. Subject to 08-18=1，the inverter continues operation.	• Mechanical load is removed momentarily.（for example, the belt is broken off）	• Check the application or the machine's operation status. • Check the settings of 08-19 and 08-20.
bb1 (flash) External block 	External block (Terminal S1)	• External block input is received by multifunction digital input terminals	• Remove the causes of external block.
bb2 (flash) External block 	External block (Terminal S2)		
bb3 (flash) External block 	External block (Terminal S3)		
bb4 (flash) External block 	External block (Terminal S4)		
bb5 (flash) External block 	External block (Terminal S5)		
bb6 (flash) External block 	External block (Terminal S6)		
OL1 Motor over load 	Motor over load: Motor over load protection function is enabled according to the over load curve of motor internal 08-05 =xxx1(Motor over protection is enabled.).	• The voltage setting of V/F mode is too high, resulting in motor over excitation. • Motor rated current setting (02-01) is incorrect. • Motor load is too big. • The voltage setting of V/F mode is too high, and the inverter capacity is too small. • Motor load is too big.	• Check V/F mode. Check Motor rated current. Check the load and operation • cycle. • Check V/Fmode. Replaced by higher capacity inverter Check the load and the • operation cycle
OL2 Inverter over load 	over load of the inverter: Over load fault of the inverter has occurred , but time is less than 4 minutes (if time is over 4 minutes, this warning will be cleared automatically.）		
CE (flash) communication error 	Modbus communication error : when 09-07= 3, no communication data is received over 2 seconds.	• Connection is broken off. • The host has stopped the data transmission.	• Check all connections and verify all software architecture at the client side.

LED display	Description	Possible causes	Corrective action
CLB over current protection level B 	Warning of inverter over current: inverter current reaches current protection level B	• Inverter current is too big. • Motor load is too big.	• Check the load and operation cycle.
Retry(flash) 	Automatic reset has been active, and it would display until the period of 07-01 automatic reset terminates	• The period of 07-01 automatic reset≠0. • The times of 07-02 automatic reset≠0.	• It will disappear after the period of automatic reset.
EF1 (flash) External fault (S1) 	External fault (Terminal S1)	• External fault message is received by multifunction digital input terminals. • When 03-00 to 03-05 is set to 25, and 08-24: Selection of external fault operation is set to 0, 1 or 2.	• Remove external fault causes. • Reset the external fault of • multifunction digital input
EF2 (flash) External fault (S2) 	External fault (Terminal S2)		
EF3 (flash) External fault (S3) 	External fault (Terminal S3)		
EF4 (flash) External fault (S4) 	External fault (Terminal S4)		
EF5 (flash) External fault (S5) 	External fault (Terminal S5)		
EF6 (flash) External fault (S6) 	External fault (Terminal S6)		
EF9 (flash) Error of forward / reversal rotation 	.Forward and reversal rotation command (2 –wire type operation) are input at the same time within 0.5 second or above. .Comply with 07-09 to set the motor stop method. . After the fault is removed, the inverter returns normal status.	• Forward and reversal rotation command are input at the same time. (refer to 2–wire type operation)	• Check external procedure logic

LED display	Description	Possible causes	Corrective action
SE01 Rang setting error 	The parameter setting exceeds the range: When the parameter setting exceeds the allowed range.	• The parameter setting exceeds the allowed range • In some situation, the parameter setting will be based on the other parameter setting (for example 02-00>02-01, 00-12<00-13 or when 00-07 = 1, 00-05 is the same with 00-06 and so on).	• Check the parameter setting.
SE02 Digital input terminal error 	Errors of multifunction digital input terminal	• Errors of multifunction digital input terminals (03-00 to 03-05), as described in the following: ■ UP/DOWN commands are not set at the same time (they must be used together). ■ UP/DOWN commands (08 and 09) and ACC/DEC commands (11) are set at the same time. ■ Speed search 1 (19, maximum frequency) and Speed search 2 (34, from the set frequency) are set at the same time.	• Check the parameter setting
SE03 V/f curve error 	V/f curve setting error:	• V/F curve setting does not follow below steps: 01-02 > 01-12 >01-06 >01-08 (Fmax) (Fbase)(Fmid1) (Fmin)	• Confirm V/F parameter setting.
SE05 PID selection error 	PID selection error:	• 10-00 and 10-01are both set to 1(AI1) or 2 (AI2) at the same time.	• Check the values of paramters10-00, 10-01
HPErr Model Selection error 	Inverter capacity setting error: Inverter capacity setting 13-00 does not match the rated voltage.	• The inverter capacity setting (13-00) does not match the voltage class of the hardware.	• Check the inverter capacity setting (13-00) matches the voltage class of the hardware or not.
SE09 PI setting error 	Inverter PI setting error	• Inverter PI option (03-30) selection conflicts with PID source (10-00 and 10-01).	• Check inverter PI option (03-30) selection and PID source (10-00 and 10-01)
FB (flash) PID feedback breaking 	PID feedback breaking： When it is enabled (as 10-11=1), keep operating, and PID feedback inputs the PID feedback breaking detection time (10-13) of PID feedback breaking level..	• PID feedback signal (such as the transformer) is not active or incorrect installation.	• Check if the PID feedback method is correct or not. • Ensure installation correct and the proper operation of PID feedback signals.

LED display	Description	Possible causes	Corrective action
USP (flash) Unattended Start Protection 	Unattended Start Protection (USP) is enabled (enabled in booting)	• USP in booting (set by multi-function digital input) is enabled，the inverter will not accept any operation command. • Before the warning information is removed, the inverter can't enter the operating mode. (Please refer to related instructions in the full manual 03-00 - 03-05 = 50).	• Operation command is turned off, or terminal reset operation is performed • (03-00 to 03-05 are 3), or use the RESET key on the digital operator to reset. • Close the USP signal and restart the power.
LOPB Low flow error 	Low flow error	• The feedback signal is not connected. • Due to HVAC feedback value is lower than limit of minimum flow.	• Check feedback signal is correct and with right connection. • Check if feedback value is lower than limit of minimum flow.
HIPBT High flow error 	High flow error	• Due to HVAC feedback value is lower than limit of maximum flow.	• Check feedback signal is correct. • Check if feedback value is lower than limit of maximum flow.
LPBFT Low pressure error 	Low pressure error	• The feedback signal is not connected. • Due to feedback value of pump pressure is lower than limit of minimum flow.	• Check feedback signal is correct and with connection. • Check if feedback value of pressure is lower than limit of minimum pressure.
OPBFT High pressure error 	High pressure error	• Due to feedback value of pump pressure is lower than limit of maximum flow.	• Check feedback signal is correct. • Check if feedback value of pressure is lower than limit of maximum pressure.
LSCFT Low suction error 	Inadequate suction error	• Insufficient water of supply tank leads to insufficient suction. • PID diference is higher than its level or current is lower than output current level.	• Check if water of supply tank is enough, and water supply is regular. • Check PID diference is higher than its level or current is lower than output current level
FIRE Fire override mode 	Fire override mode	• Fire override mode is active	• None • (Fire override mode is not a kind of warning).
SE10 PUMP/HVAC Setting error 	PUMP/HVAC settings of inverter error	① PUMP selection of inverter (23-02)> (23-03). ② HVAC selection of inverter (23-46)> (23-47).	• Check pump selection of inverter: (23-02) and (23-03) settings. • Check HVAC selection of inverter: (23-02) and (23-03) settings.
COPUP PUMP communication breaking error 	Breaking error of multiple pumps communication	• Communication breaking or disconnection of pump cascade control.	• Check if it has setting issue or is not properly connected.

5.4 Auto-tuning Error

When the auto-tuning fault occurs, the fault of "AtErr" will be displayed on the digital operator and the motor stops. The fault information is displayed on the 17-11. The fault digital output contact does not act. Refer to Table 5-3, to identify and correct the faults.

Table 5-3 Auto-tuning fault and corrective actions

Error	Description	Cause	Corrective action
01	Motor data input error	• Input data error of auto-tuning. • Error relationship between the motor output current. and motor rated current.	• Check the input data for auto-tuning (17-00 to 17-09). • Check the inverter capacity.
02	Tuning error of the resistor R1 of motor wire to wire.	• Auto-tuning is not completed within a certain time. • Auto-tuning result is beyond the parameter setting. • Exceed the motor rated current. • Three phase output of the inverter is broken off.	• Check the input data of auto-tuning（17-00 to 17-09） • Check motor connection. • Disconnect all loads connected to the motor. • Check the inverter current detection circuit, including the current sensor. • Check motor connection. • Check motor installation.
03	Tuning error of motor leakage inductance		
04	Tuning error of motor rotor resistance R2.		
05	Tuning error of motor mutual inductance Lm		
07	Deadtime compensation detection error		
08	Motor acceleration error (only for the rotary type auto-tuning).	• Motor fails to accelerate in specified time (00-14= 20sec).	• Increase the acceleration time（00-14）. • Disconnect all loads connected to the motor.
09	Other errors of auto-tuning	• Other errors of auto-tuning （except the ATE-01~ATE-08 error, such as the no load current is higher than 70％, rated current or torque exceeds 100％ of the reference）.	• Check motor connection. • Check the input data of auto-tuning

5.5 PM Motor Auto-tuning Error

When the PM motor auto-tuning fault occurs, the fault information of “IPErr” (PM motor tuning failure) will be displayed on the digital operator and the motor stops. The fault information is displayed on 22-22. The fault digital output does not act. Refer to Table 5-4, to identify and correct the faults.

Table 5-4 Auto-tuning fault and corrective actions for PM motor

Error	Description	Cause	Corrective action
01	Static magnetic pole alignment failure.	• Error relationship between motor output current and motor rated current.	• Check input data of auto-tuning (22-02). • Check the inverter capacity • Check Motor connection
02 | 08	Reserved		
09	Current abnormity in loop tuning.	• Error relationship between motor output current and motor rated current.	• Check input data of auto-tuning (22-02). • Check the inverter capacity
10	Reserved		
11	Parameter tuning and detecting is overtime.	• Error relationship between voltage and current.	• Check whether (22-11) is too small, but its value cannot exceed 100%. • Check motor connection.

目 錄

第 1 章 安全注意事項

1.1 送電前

警告

- 主回路端子必須正確配線，單相(R/L1、S/L2)/三相(R/L1、S/L2、T/L3)爲電源輸入端子，絕對不可以與 U/T1、V/T2、W/T3 混用；混用時，送電將造成變頻器的損壞。

注意

- 所選用之電源電壓必須與變頻器之輸入電壓規格相同。
- 搬運變頻器時，請勿直接提取前蓋，應由變頻器本體搬運，以防止前蓋脫落，避免變頻器掉落造成人員受傷或變頻器損壞。
- 請將變頻器安裝於金屬類等不燃物材料之上，請勿安裝於易燃性材料上或附近，以防止發生火災。
- 若多台變頻器同放在一個控制盤內，請外加散熱風扇，使盤內溫度低於 40℃ 以下，以防過熱或火災等發生。
- 請於關閉電源後，再拆卸或裝入操作器，並請按圖操作固定操作器，以免接觸不良造成操作器故障或不顯示。

警告

- 本產品系通過 IEC 61800-3 限制區域使用等級。在某些環境下使用本產品時，可能造成電磁干擾，故在使用前請先進行適當的測試，同時請務必做好接地工程。

注意

- 產品的安裝及使用必須由有資格的專業電氣人員進行。
- 產品的安裝必須以固定式配線方式進行。

1.2 接線

警告

- 實施任何變頻器裝機或配線前，請務必關上總電源，避免觸電及火災發生。
- 配線工程人員須具備相關專業知識，避免觸電與火災發生。
- 確認接地線與大地連接。(220V 級:接地阻抗需低於 100 歐姆; 440V 級:接地阻抗需低於 10 歐姆)
- 接線完成後，確認緊急停止機能有效。(接線責任屬於使用方)
- 勿直接觸碰輸入/輸出電源線，並避免所有接線與變頻器外殼接觸與線路短路。
- 勿對變頻器進行耐壓測試，容易造成半導體元件受損。

注意

- 確認輸入主電源與變頻器相符，避免受傷或火災發生。
- 請依相關接線圖連接煞車電阻及煞車單元，否則有引發火災危險。
- 請依指定轉矩來鎖固端子螺絲，避免引發火災的危險。
- 勿將輸入電源連接至變頻器輸出端子上。
- 勿將電磁接觸器，電磁開關接點連接至輸出端子。
- 勿將進相電容器或 LC/RC 濾波器連接至輸出電路上。
- 確保變頻器、馬達所產生的干擾不會影響周邊感測器或設備。

1.3 運轉前

警告

- 送電前請確認變頻器之機種容量和變頻器功能參數 13- 00 所設定的機種容量相同。
- 變頻器與馬達間線長超過 25 公尺，需降低載波頻率(11-01)或加裝輸出濾波器來降低負載端過電壓或振盪，避免馬達受損。

1.4 參數設定

注意
➢ 進行旋轉型自動調校時，請勿將馬達連接到負載(機械設備)上。 ➢ 進行旋轉型自動調校時，馬達將進行旋轉，確認馬達週遭空間，避免造成危險。

1.5 運轉

警告
➢ 請確認前外蓋安裝完成後，再打開電源。 ➢ 運轉中不可將馬達機組投入或切離，否則會造成變頻器過電流跳脫，嚴重時會造成變頻器主回路損壞。 ➢ 進行復歸機能時，請勿靠近機器，故障清除後，機器會再啓動。 ➢ 勿於雙手潮濕時操作機器。 ➢ 提供一個數位輸入的緊急停止開關，此開關使用在該機能參數被設置時啓用(請參考 08-30 設定) 。 ➢ 提供一個獨立外部硬體緊急開關，當遇危險時可緊急關斷變頻器輸出。 ➢ 復歸警告前請確認運轉命令爲關閉的。 ➢ 若選擇復電後自動重新啓動(07-00)，變頻器將在電源回復後自動啓動。 ➢ 自動調校執行前，請確保週邊系統，機械設備狀態，確保人員安全。 ➢ 無論變頻器處於運轉或停止狀態，避免觸碰相關端子，以防發生危險。 ➢ 電源切斷後，風扇可能會繼續旋轉一段時間。

注意
➢ 散熱座、煞車電阻等發熱元件請勿觸摸。 ➢ 變頻器可以很容易使馬達從低速到高速運轉，請確認馬達與機械的容許範圍。 ➢ 使用煞車模組等搭配產品時，請注意其使用之相關設定。 ➢ 變頻器運轉時，請勿檢查電路板上的信號。

警告
➢ 避免感電！變頻器內部的直流電容器在電源移除後 5 分鐘才能放電完畢，請在電源移除 5 分鐘後，再進行拆裝或實施檢查。20Hp 以上需等待 15 分鐘。

1.6 檢查保養和更換時

警告

- 進行維護檢查前，請先確認電源已經關閉且電源指示燈熄滅(請確認直流電壓不超過 25 伏特)。
- 變頻器端子中有高壓端子，請勿隨意觸摸。
- 電源開啓情況下，請務必安裝保護蓋，另拆卸保護蓋後，請務必透過斷路器斷開電源。
- 除指定的專業人員外，他人請勿進行保養檢查或更換零件。

注意

- 變頻器周圍溫度應在 -10℃～+40(60)℃ 95%RH 不結露環境中使用，但需確保周圍環境無滴水及金屬粉塵。

變頻器報廢時注意事項

注意

當變頻器要處理報廢時，請作爲工業垃圾進行處理，並請注意以下事項：

- 變頻器主回路的電解電容和印刷電路板上的電解電容焚燒時可能會發生爆炸。
- 變頻器的外殼等塑膠件焚燒時會產生有毒氣體。

第 2 章 型號說明

2.1 變頻器銘板

2.2 型號

F510 - 4 010 – H 3 F N4

F510 系列

輸入電壓
2：220V
4：440V

最大適用馬達容量
005：5HP
008：8HP
∫
150：150HP
175：175HP
215：215HP
∫
535：535HP
800：800HP

產品型式
H：標準型(LED 操作器)
C：繪圖型(LCD 操作器)

電源輸入
3：三相輸入

雜訊濾波器
空白：無內建
F：內建

保護等級
空白：IP00/IP20
N4：IP55

型號列表：

變頻器型號 (標準品型號)	適用電壓 (Vac)	適用頻率 (Hz)	馬力數 (Hp)	適用馬達 (KW)	Filter 內建		操作器		IP55 保護
					內含	不含	LED	LCD	
F510-2005-H3	3ph 200~240V +10%/-15%	50/60Hz	5	3.7		◎	◎		
F510-2005-C3			5	3.7		◎		◎	
F510-2008-H3			7.5	5.5		◎	◎		
F510-2008-C3			7.5	5.5		◎		◎	
F510-2010-H3			10	7.5		◎	◎		
F510-2010-C3			10	7.5		◎		◎	
F510-2015-H3			15	11		◎	◎		
F510-2015-C3			15	11		◎		◎	
F510-2020-H3			20	15		◎	◎		
F510-2020-C3			20	15		◎		◎	
F510-2025-H3			25	18.5		◎	◎		
F510-2025-C3			25	18.5		◎		◎	
F510-2030-H3			30	22		◎	◎		
F510-2030-C3			30	22		◎		◎	
F510-2040-H3			40	30		◎	◎		
F510-2040-C3			40	30		◎		◎	
F510-2050-H3			50	37		◎	◎		
F510-2050-C3			50	37		◎		◎	
F510-2060-H3			60	45		◎	◎		
F510-2060-C3			60	45		◎		◎	
F510-2075-H3			75	55		◎	◎		
F510-2075-C3			75	55		◎		◎	
F510-2100-H3			100	75		◎	◎		
F510-2100-C3			100	75		◎		◎	
F510-2125-H3			125	94		◎	◎		
F510-2125-C3			125	94		◎		◎	
F510-2150-H3			150	112		◎	◎		
F510-2150-C3			150	112		◎		◎	
F510-2175-H3			175	130		◎	◎		
F510-2175-C3			175	130		◎		◎	
F510-4005-H3	3ph 380~480V +10%/-15%		5	3.7		◎	◎		
F510-4005-H3F			5	3.7	◎		◎		
F510-4005-C3			5	3.7		◎		◎	
F510-4005-C3F			5	3.7	◎			◎	
F510-4005-C3FN4			5	3.7	◎			◎	◎

變頻器型號 (標準品型號)	適用電壓 (Vac)	適用頻率 (Hz)	馬力數 (Hp)	適用馬達 (KW)	Filter 內建		操作器		IP55 保護
					內含	不含	LED	LCD	
F510-4008-H3	3ph 380~480V +10%/-15%	50/60Hz	7.5	5.5		◎	◎		
F510-4008-H3F			7.5	5.5	◎		◎		
F510-4008-C3			7.5	5.5		◎		◎	
F510-4008-C3F			7.5	5.5	◎			◎	
F510-4008-C3FN4			7.5	5.5	◎			◎	◎
F510-4010-H3			10	7.5		◎	◎		
F510-4010-H3F			10	7.5	◎		◎		
F510-4010-C3			10	7.5		◎		◎	
F510-4010-C3F			10	7.5	◎			◎	
F510-4010-C3FN4			10	7.5	◎			◎	◎
F510-4015-H3			15	11		◎	◎		
F510-4015-H3F			15	11	◎		◎		
F510-4015-C3			15	11		◎		◎	
F510-4015-C3F			15	11	◎			◎	
F510-4015-C3FN4			15	11	◎			◎	◎
F510-4020-H3			20	15		◎	◎		
F510-4020-H3F			20	15	◎		◎		
F510-4020-C3			20	15		◎		◎	
F510-4020-C3F			20	15	◎			◎	
F510-4020-C3FN4			20	15	◎			◎	◎
F510-4025-H3			25	18.5		◎	◎		
F510-4025-H3F			25	18.5	◎		◎		
F510-4025-C3			25	18.5		◎		◎	
F510-4025-C3F			25	18.5	◎			◎	
F510-4025-C3FN4			25	18.5	◎			◎	◎
F510-4030-H3			30	22		◎	◎		
F510-4030-H3F			30	22	◎		◎		
F510-4030-C3			30	22		◎		◎	
F510-4030-C3F			30	22	◎			◎	
F510-4030-C3FN4			30	22	◎			◎	◎
F510-4040-H3			40	30		◎	◎		
F510-4040-H3F			40	30	◎		◎		
F510-4040-C3			40	30		◎		◎	
F510-4040-C3F			40	30	◎			◎	
F510-4040-C3FN4			40	30	◎			◎	◎

變頻器型號 (標準品型號)	適用電壓 (Vac)	適用頻率 (Hz)	馬力數 (Hp)	適用馬達 (KW)	Filter 內建		操作器		IP55 保護
					內含	不含	LED	LCD	
F510-4050-H3	3ph 380~480V +10%/-15%	50/60Hz	50	37		◎	◎		
F510-4050-H3F			50	37	◎		◎		
F510-4050-C3			50	37		◎		◎	
F510-4050-C3F			50	37	◎			◎	
F510-4050-C3FN4			50	37	◎			◎	◎
F510-4060-H3			60	45		◎	◎		
F510-4060-H3F			60	45	◎		◎		
F510-4060-C3			60	45		◎		◎	
F510-4060-C3F			60	45	◎			◎	
F510-4060-C3FN4			60	45	◎			◎	◎
F510-4075-H3			75	55		◎	◎		
F510-4075-H3F			75	55	◎		◎		
F510-4075-C3			75	55		◎		◎	
F510-4075-C3F			75	55	◎			◎	
F510-4075-C3N4			75	55		◎		◎	◎
F510-4100-H3			100	75		◎	◎		
F510-4100-C3			100	75		◎		◎	
F510-4100-C3N4			100	75		◎		◎	◎
F510-4125-H3			125	94		◎	◎		
F510-4125-C3			125	94		◎		◎	
F510-4150-H3			150	112		◎	◎		
F510-4150-C3			150	112		◎		◎	
F510-4175-H3			175	130		◎	◎		
F510-4175-C3			175	130		◎		◎	
F510-4215-H3			215	160		◎	◎		
F510-4215-C3			215	160		◎		◎	

變頻器型號 (標準品型號)	適用電壓 (Vac)	適用頻率 (Hz)	馬力數 (Hp)	適用馬達 (KW)	Filter 內建		操作器		IP55 保護
					內含	不含	LED	LCD	
F510-4250-H3	3ph 380~480V +10%/-15%	50/60Hz	250	185		◎	◎		
F510-4250-C3			250	185		◎		◎	
F510-4300-H3			300	220		◎	◎		
F510-4300-C3			300	220		◎		◎	
F510-4375-H3			375	280		◎	◎		
F510-4375-C3			375	280		◎		◎	
F510-4425-H3			425	317		◎	◎		
F510-4425-C3			425	317		◎		◎	
F510-4535-H3			535	400		◎	◎		
F510-4535-C3			535	400		◎		◎	
F510-4670-H3			670	500		◎	◎		
F510-4670-C3			670	500		◎		◎	
F510-4800-H3			800	600		◎	◎		
F510-4800-C3			800	600		◎		◎	

. 變頻器的短路容量爲 5000A/240V 或 5000A/480V 以下，200~240V 機種爲 220V；380~480V 機種爲 440V。

. IP20 220V 150HP(112KW)及 440V 300HP(220KW)以上開發中。

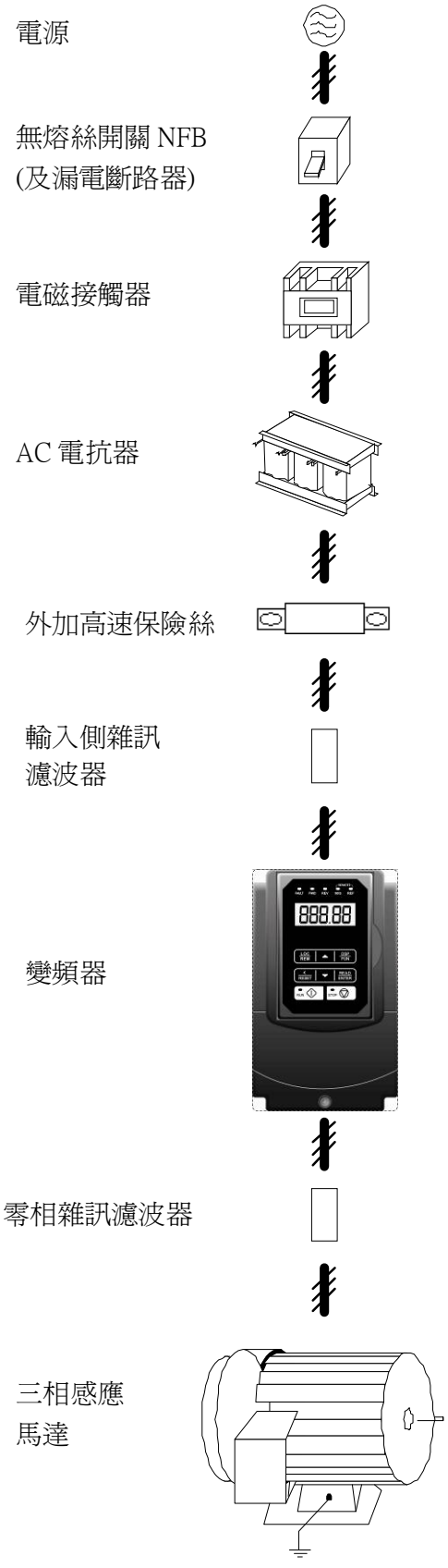
第 3 章 周圍環境及安裝

3.1 端子台螺絲扭力

爲了符合 UL 標準，對主回路端子進行接線時，請使用 UL 認可的銅電線（額定 75°C）及下表所示規格的圓形壓接端子（符合 UL 標準的產品）。東元推薦使用下表 NICHIFU 端子工業株式會社所生產的壓接端子，並請使用端子廠家推薦的壓接工具進行端子的壓接及絕緣套管。

電線尺寸 mm^2 (AWG)	端子螺絲規格	圓形壓接端子型號	鎖固力矩 kgf.cm (in.lbs)	絕緣套管型號	壓接工具型號
0.75 (18)	M3.5	R1.25-3.5	8.2 to 10 (7.1 to 8.7)	TIC 1.25	NH 1
	M4	R1.25-4	12.2 to 14 (10.4 to 12.1)	TIC 1.25	NH 1
1.25 (16)	M3.5	R1.25-3.5	8.2 to 10 (7.1 to 8.7)	TIC 1.25	NH 1
	M4	R1.25-4	12.2 to 14 (10.4 to 12.1)	TIC 1.25	NH 1
2 (14)	M3.5	R2-3.5	8.2 to 10 (7.1 to 8.7)	TIC 2	NH 1 / 9
	M4	R2-4	12.2 to 14 (10.4 to 12.1)	TIC 2	NH 1 / 9
	M5	R2-5	22.1 to 24 (17.7 to 20.8)	TIC 2	NH 1 / 9
	M6	R2-6	25.5 to 30.0 (22.1 to 26.0)	TIC 2	NH 1 / 9
3.5/5.5 (12/10)	M4	R5.5-4	12.2 to 14 (10.4 to 12.1)	TIC 3.5/5.5	NH 1 / 9
	M5	R5.5-5	20.4 to 24 (17.7 to 20.8)	TIC 3.5/5.5	NH 1 / 9
	M6	R5.5-6	25.5 to 30.0 (22.1 to 26.0)	TIC 3.5/5.5	NH 1 / 9
	M8	R5.5-8	61.2 to 66.0 (53.0 to 57.2)	TIC 3.5/5.5	NH 1 / 9
8 (8)	M4	R8-4	12.2 to 14 (10.4 to 12.1)	TIC 8	NOP 60
	M5	R8-5	20.4 to 24 (17.7 to 20.8)	TIC 8	NOP 60
	M6	R8-6	25.5 to 30.0 (22.1 to 26.0)	TIC 8	NOP 60
	M8	R8-8	61.2 to 66.0 (53.0 to 57.2)	TIC 8	NOP 60
14 (6)	M4	R14-4	12.2 to 14 (10.4 to 12.1)	TIC 14	NH 1 / 9
	M5	R14-5	20.4 to 24 (17.7 to 20.8)	TIC 14	NH 1 / 9
	M6	R14-6	25.5 to 30.0 (22.1 to 26.0)	TIC 14	NH 1 / 9
	M8	R14-8	61.2 to 66.0 (53.0 to 57.2)	TIC 14	NH 1 / 9
22 (4)	M6	R22-6	25.5 to 30.0 (22.1 to 26.0)	TIC 22	NOP 60/ 150H
	M8	R22-8	61.2 to 66.0 (53.0 to 57.2)	TIC 22	NOP 60/ 150H
30/38 (3 / 2)	M6	R38-6	25.5 to 30.0 (22.1 to 26.0)	TIC 38	NOP 60/ 150H
	M8	R38-8	61.2 to 66.0 (53.0 to 57.2)	TIC 38	NOP 60/ 150H
50 / 60 (1 / 1/ 0)	M8	R60-8	61.2 to 66.0 (53.0 to 57.2)	TIC 60	NOP 60/ 150H
	M10	R60-10	102 to 120 (88.5 to 104)	TIC 60	NOP 150H
70 (2/0)	M8	R70-8	61.2 to 66.0 (53.0 to 57.2)	TIC 60	NOP 150H
	M10	R70-10	102 to 120 (88.5 to 104)	TIC 60	NOP 150H
80 (3/0)	M10	R80-10	102 to 120 (88.5 to 104)	TIC 80	NOP 150H
	M16	R80-16	255 to 280 (221 to 243)	TIC 80	NOP 150H
100 (4/0)	M10	R100-10	102 to 120 (88.5 to 104)	TIC 100	NOP 150H
	M12	R100-12	143 to 157 (124 to 136)	TIC 100	NOP 150H
	M16	R80-16	255 to 280 (221 to 243)	TIC 80	NOP 150H

3.2 F510 之週邊配備標準接線



■ 無熔絲開關 (NFB) 及漏電斷路器

- 請參考表 3，選用適當額定電流之 NFB。
- 請勿使用 NFB 作爲變頻器之運轉/停止控制。
- 若加裝漏電斷路器以作漏電故障保護時，請選用感度電流 200mA 以上，動作時間 0.1 秒以上(V-TYPE)，以防止高頻誤動作。

■ 電磁接觸器

- 一般使用時，可以不加電磁接觸器，但要作外部順序控制或停電後自動再起動等功能時，需加裝電磁接觸器。
- 請儘量避免使用電磁接觸器作變頻器之運轉／停止控制。

■ AC 電抗器

- 若欲作進一步改善功因或抑制外來突波時，可外加 AC 電抗器。

■ 外加高速保險絲

- 爲確保週邊設備安全，請務必外加高速保險絲(保險絲規格請參閱完整手冊第六章 6.6 說明)。

■ 輸入側雜訊濾波器

- F510 搭配東元專用濾波器，可符合 EN55011A 級規範。
- 輸入側雜訊濾波器之選用，請參閱完整手冊第六章 6.4 說明。

■ 變頻器

- 輸入側 R, S, T 端子無相序區分，可任意變換。
- 接地端子 E 請確實做好接地處理。

■ 零相雜訊濾波器

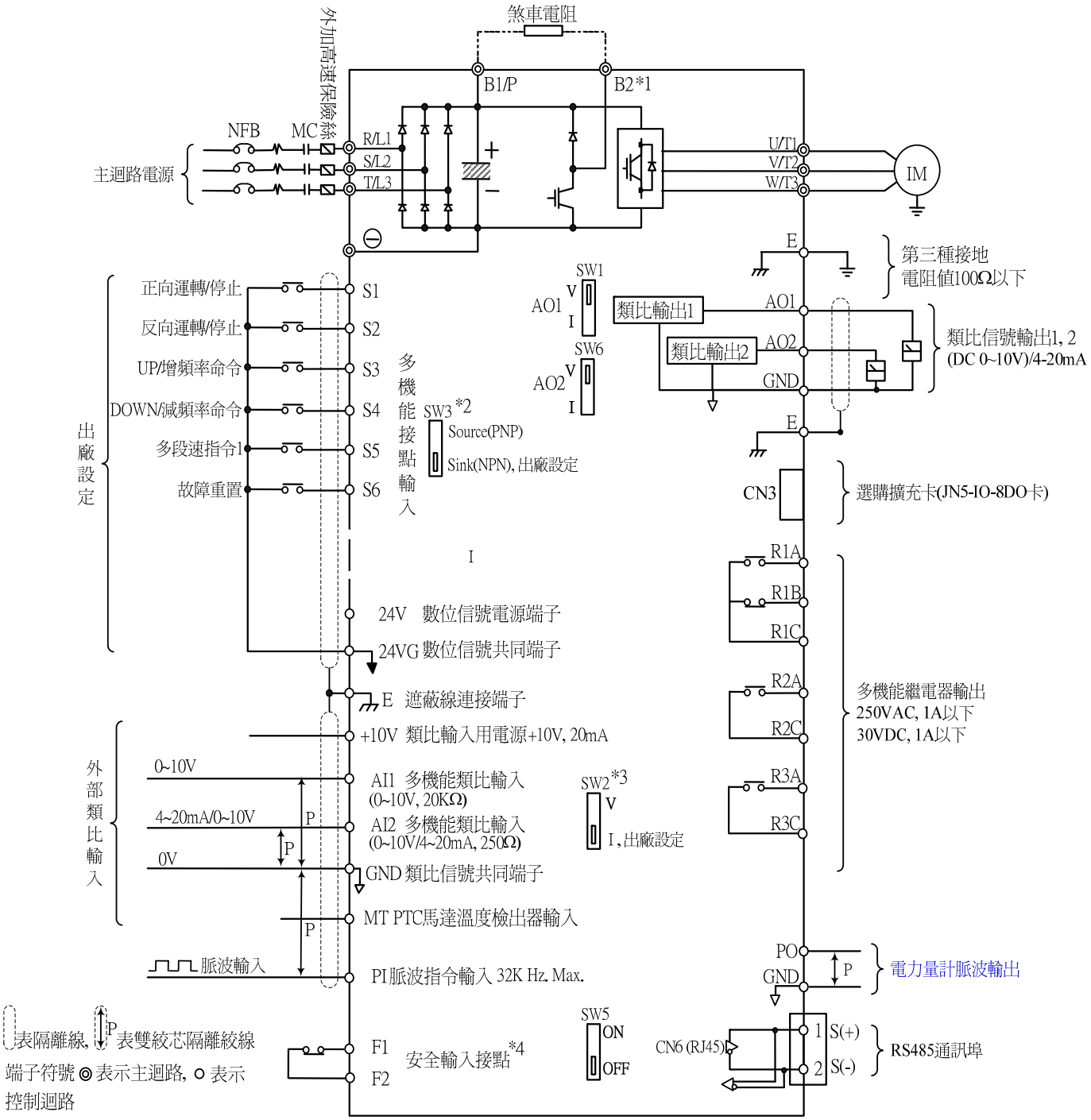
- 變頻器輸出側加裝專用雜訊濾波器時，可降低輻射干擾及感應雜訊。
- 請參閱完整手冊第六章 6.5 說明

■ 馬達

- 若一台變頻器驅動多台馬達時，變頻器之額定電流必需大於馬達同時運轉時之總電流。
- 馬達與變頻器必需分別接地。

3.3 配線方式

以下為 F510 變頻器標準配線圖(◎表示主回路端子，○表示控制回路端子)，F510 依型號不同，配線端子台的位置及符號會稍有差異。主回路端子及控制回路端子說明請參考表 3.1、3.2、3.3。



備註說明：
*1：僅 IP20 220V 5~30HP與440V 5~40HP(含)及IP55 440V 5~25HP容量內建剎晶體機種主回路提供B2端子，可直接於B1, B2間連接煞車電阻。其餘依機種別而異。
*2：多機能數位輸入接點S1~S6，可透過開關SW3設置成Source(PNP)或Sink(NPN)模式。
*3：多機能類比輸入2(AI2)，可透過開關SW2設置成電壓命令輸入(0~10V)或電流命令輸入(4~20mA)。
*4：安全輸入接點F1, F2間需短接變頻器始可正常輸出，使用安全輸入時，請務必拆下F1-F2間的短接線。

3.4 變頻器規格

- 基本規格

(a) 220V 級

變頻器容量 (HP)		5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175
輸出額定	額定輸出容量 (KVA)	5.5	8	11.4	15.2	21.3	26.2	30	41.9	52.5	64.3	76.2	95.2	118.8	152.4	171.4
	額定輸出電流 (A)	14.5	21	30	40	56	69	79	110	138	169	200	250	312	400	450
	最大適用馬達 *1HP (KW)	5 (3.7)	7.5 (5.5)	10 (7.5)	15 (11)	20 (15)	25 (18.5)	30 (22)	40 (30)	50 (37)	60 (45)	75 (55)	100 (75)	125 (90)	150 (110)	175 (130)
	最大輸出電壓 (V)	三相 200V~240V														
	最高輸出頻率 (Hz)	可由參數設定 0.1~400.0 Hz														
電源	額定電壓、頻率	三相 200V~240V， 50/60Hz														
	容許電壓變動	-15% ~ +10%														
	容許頻率變動	±5%														

(b) 440V 級

變頻器容量 (HP)		5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175	215	250	300	375
輸出額定	額定輸出容量 (KVA)	7.0	8.4	13.3	17.5	23.6	28.9	33.5	41.1	54.8	67	78.4	110	125	158	190	225	250	331	392
	額定輸出電流(A)	9.2	11.1	17.5	23	31	38	44	54	72	88	103	145	165	208	250	296	328	435	515
	最大適用馬達 *1HP (KW)	5 (4)	7.5 (5.5)	10 (7.5)	15 (11)	20 (15)	25 (18.5)	30 (22)	40 (30)	50 (37)	60 (45)	75 (55)	100 (75)	125 (90)	150 (110)	175 (132)	215 (160)	250 (185)	300 (220)	375 (280)
	最大輸出電壓 (V)	三相 380V~480V																		
	最高輸出頻率 (Hz)	可由參數設定 0.1~400.0 Hz																		
電源	額定電壓、頻率	三相 380V ~ 480V， 50/60Hz																		
	容許電壓變動	-15% ~ +10%																		
	容許頻率變動	±5%																		

變頻器容量 (HP)		425	535	670	800
輸出額定	額定輸出容量(KVA)	445	525	640	731
	額定輸出電流(A)	585	690	840	960
	最大適用馬達*1HP (KW)	425 (315)	535 (400)	670 (500)	800 (600)
	最大輸出電壓 (V)	三相 380V~480V			
	最高輸出頻率(Hz)	可由參數設定 0.1~400.0 Hz			
電源	額定電壓、頻率	三相 380V ~ 480V， 50/60Hz			
	容許電壓變動	-15% ~ +10%			
	容許頻率變動	±5%			

*1 以標準 4 極感應馬達爲基準。
*2 F510 機種是設計在標準負載，過載能力 120%/1 分鐘。
*3 440V 535HP 以上機種開發中。
*4 大於出廠載波需依據降額定曲線調整負載電流。

220V 級	載波出廠設定	載波範圍	440V 級	載波出廠設定	載波範圍
5~25HP	2KHz	2~16KHz	5~30HP	4KHz	2~16KHz
30HP	2KHz	2~12KHz	40HP	2KHz	2~16KHz
40~50HP	2KHz	2~12KHz (*5)	50~60HP	4KHz	2~12KHz (*5)
60~125HP	2KHz	2~10KHz (*5)	75~215HP	4KHz	2~10KHz (*5)
-	-	-	250HP	2KHz	2~8KHz
150~175HP	2KHz	2~5KHz	300~375HP	4KHz	2~5KHz
-	-	-	425HP	2KHz	2~5KHz
-	-	-	535~800HP	4KHz	2~5KHz

*5 若控制模式爲 SLV，且最大頻率 (01-02) 設定大於 80Hz，範波範圍限制爲 2~8KHz。

以下是不同控制模式下的最大頻率

控制模式	其他設定	最大頻率
V/F	無限制	400Hz
SLV	220V 5~15HP, 440V 5~20HP	150Hz
	220V 20~30HP, 440V 25HP	110Hz
	440V 30~40HP	100Hz
	220V 40~125HP, 440V 50~215HP, 載波(11-01) 設定在 8K 或 8K 以下	100Hz
	220V 40~125HP, 440V 50~215HP, 載波(11-01) 設定在 8K 以上	80Hz
	220V 150~175HP, 440V 250~800HP	100Hz
PMSLV	無限制	400Hz

- 共通規格

控制特性	操作方式	5 位元七段顯示操作器及 LCD 操作器(另可選購 HOA LCD 操作器)，LCD 操作器皆具備參數拷貝功能
	控制方式	V/F, SLV, PMSLV with 空間向量 PWM 方式
	頻率控制範圍	0.1Hz～400.0Hz
	頻率精度(溫度變動)	數位指令：±0.01%(-10～+40℃)，類比指令：±0.1%(25℃±10℃)
	速度控制精度	±0.5%(無感測器向量控制)*1
	頻率設定解析度	數位指令：0.01Hz ，類比指令：0.06Hz/60Hz
	輸出頻率解析度	0.01Hz
	過載耐量	120%/1 分鐘
	頻率設定信號	DC 0～+10V / -10V~+10V 或 4～20mA
	加/減速時間	0.0～6000.0 秒(加速及減速時間可分別設定)
	電壓,頻率特性	可由參數任意設定 V/f 曲線
	回生煞車轉矩	約 20%
	主要控制機能	Auto tuning、 Soft-PWM、過壓保護、動態剎車、速度搜尋、瞬間停電再起動、兩組 PID 控制、滑差補償、RS-485 通信規範、簡易 PLC 機能、2 組類比輸出接點、安全開關
	其他機能	通電時間及運轉時間累積記錄，四組故障履歷及最近一次故障時之狀態記錄，省能源功能設定，欠相保護，智慧型剎車，直流剎車，Dwell，S 曲線加減速，Up/Down 操作，Modbus 通訊，BACNet MS/TP 通訊，Metasys N2 通訊，任意工程單位顯示，Local/Remote 切換鍵，SINK/SOURCE 輸入介面可選擇，使用者參數設定
保護機能	失速(stall)防止	動作電流可設定(加速中、定速中可分別設定，減速中可設定有／無)
	瞬時過電流(OC)及輸出短路(SC)保護	變頻器額定電流的 160%以上停止
	變頻器過載保護(OL2)	變頻器額定電流 120%/1 分鐘停止,出廠設定載波為 2~4KHz*2
	馬達過載保護(OL1)	電子式過載曲線保護
	過電壓(OV)	主回路直流電壓約 410V 以上(220V 級)及 820V 以上(440V 級)，馬達運轉停止
	不足電壓(UV)	主回路直流電壓約 190V 以下(220V 級)及 380V 以下(440V 級)，馬達運轉停止
	瞬時停電自動再起動	斷電 15ms 以上，可設定 2 秒內瞬間停電再啓動功能
	過熱保護(OH)	利用溫度檢出器保護
	接地保護(GF)	利用電流檢出器保護
	充電中顯示	主回路直流電壓≧50V 時充電中 LED 指示燈亮
	輸出欠相保護 (OPL)	輸出欠相保護動作時，馬達自由運轉停止
環境規格	使用場所	室內(無腐蝕性氣體塵埃等之場所)
	周圍溫度	-10～+40℃ (IP20/NEMA1 及 IP55/NEMA12), -10～+50℃ (IP00), 若降額定最高可工作於 60℃
	保存溫度	-20～+70℃
	濕度	95%RH 以下(不結露狀況)
	標高、振動	海拔 1000 米以下，5.9m/s^2(0.6G)以下
通信機能		內建標準 RS-485 介面，支援 Modbus/BACnet/Metasys N2 通訊協定
PLC 機能		內建
雜訊干擾防制(EMI)		附加雜訊濾波器可符合 EN61800-3 ,IP20 400V 75HP(含)以下可內建；IP55 400V 60HP(含)以下內建
雜訊干擾耐受(EMS)		符合 EN61800-3
安規認證	CE 宣告	符合 EN61800-3(CE 與 RE 雜訊耐受能力)及 EN61800-5-1(LVD 低電壓指令)規範
	UL 認證	UL508C
選購配件		1 對 8 泵浦卡，HOA LCD 數位操作器，Profibus 通訊卡

備註說明：

*1. 依據不同安裝條件和馬達種類，速度控制精度有所不同，請洽本公司諮詢。

*2. 載波出廠設定值依機種不同而不同。

3.5 端子機能說明

表 3.1 標準型(IP00/IP20)主回路端子

<table>
<tr><th>端子記號</th><th>220V：5~30HP
440V：5~40HP</th><th>220V: 40~175HP
440V: 50~800HP</th></tr>
<tr><td>R/L1</td><td colspan="2" rowspan="3">主回路電源輸入</td></tr>
<tr><td>S/L2</td></tr>
<tr><td>T/L3</td></tr>
<tr><td>B1／P</td><td rowspan="3">• B1／P－⊖：直流電源輸入
• B1／P－B2：外接煞車電阻</td><td rowspan="2">-</td></tr>
<tr><td>B2</td></tr>
<tr><td>⊖</td><td rowspan="2">• ⊕ -⊖：直流電源輸入或接煞車檢出模組</td></tr>
<tr><td>⊕</td><td>-</td></tr>
<tr><td>U/T1</td><td colspan="2" rowspan="3">變頻器輸出</td></tr>
<tr><td>V/T2</td></tr>
<tr><td>W/T3</td></tr>
<tr><td>E</td><td colspan="2">接地端子 (第三種接地)</td></tr>
</table>

表 3.2 防水型(IP55)主回路端子

端子標示	440V 機種
	5 - 100HP
R/L1,S/L2, T/L3	主電路電源輸入端子
U/T1,V/T2, W/T3	變頻器輸出端子
B1, B2	煞車電阻連接端子[*1]
⊕1, ⊕2	直流電抗器連接端子[*2]
B1, B2, ⊖	直流電源輸入 (DC+, DC-) 煞車模組連接端子
⏚ (PE)	接地點

*1. 440V 25HP (18.5KW) (含)以下內含剎車晶體。

*2. 在連接 DC 電抗器前，請先移除端子 ⊕1 和 ⊕2 之間的短路線。

表 3.3 控制回路端子

種類	端子	端子功能	訊號位準
數位 輸入訊號	S1	正轉運轉─停止命令 (預設),多機能輸入端子*1	24 VDC, 8 mA 光耦合隔離(最大電壓 30 Vdc, 輸入阻抗 4.22kΩ)
	S2	逆轉運轉─停止命令 (預設), 多機能輸入端子*1	
	S3	UP 增頻率指令 (預設), 多機能輸入端子*1	
	S4	DOWN 減頻率指令 (預設), 多機能輸入端子*1	
	S5	多段速頻率指令 1, 多機能輸入端子*1	
	S6	故障復歸輸入, 多機能輸入端子*1	
24V 電源供應	24V	數位訊號 SOURCE 共同點 (SW3 切至 SOURCE 位置)	±15%, 最大輸出電流 250mA(所有負載總和)
	24VG	數位訊號共同端子 數位訊號 SINK 共同點 (SW3 切至 SINK 位置)	
類比輸入 訊號	+10V	速度設定用電源	+10V (最大電流, 20mA)
	MT	外接 PTC 馬達溫度檢出器	1330Ω 動作，550Ω 回復
	AI1	電壓主速指令 (0-10V 輸入)	0 到 +10V, (輸入阻抗: 20KΩ) (12bit 解析度)
	AI2	多機能類比輸入*2,可用 SW2 切換電壓或電流輸入 (0~10V)/(4-20mA)	0 到 +10V, (輸入阻抗:20KΩ) 4 到 20 mA (輸入阻抗: 250Ω) (12bit 解析度)
	GND	類比訊號共同端子	----
	E	遮蔽線連接端子 (大地)	----
類比輸出 訊號	AO1	多機能類比輸出端子*3 (0~10V)/(4-20mA)輸出	0 到 10V(2mA Max.) 4 到 20 mA
	AO2	多機能類比輸出端子*3 (0~10V/(4-20mA)輸出	
	GND	類比訊號共同端子	
脈波輸出 訊號	PO	脈波輸出, BW 32KHz ,	32KHz(max), 開集極輸出
	GND	類比訊號共同端子	----
脈波輸入 訊號	PI	脈波指令輸入, 頻寬 32KHz	L: 0.0 到 0.5V H: 4.0 到 13.2V 0 - 32 KHz(max) (阻抗:3.89 KΩ)
	GND	類比訊號共同端子	----

種類	端子	端子功能	訊號位準
繼電器輸出	R1A-R1B-R1C	電驛 A 接點 (多機能輸出端子) 電驛 B 接點 (多機能輸出端子) 電驛共同端子, 機能請參閱手冊	端子容量: 在 250Vac，10 mA~1A 在 30Vdc，10 mA~1A
	R2A-R2C	機能與 R1A/R1B/R1C 相同	端子容量: 在 250Vac，10 mA~1A 在 30Vdc，10 mA~1A
	R3A-R3C	機能與 R1A/R1B/R1C 相同	
安全輸入	F1	開:以安全輸入自由運轉 關:一般運轉 (使用外部安全開關停止務必將短路線拆除)	24Vdc, 8mA, pull-high
	F2	安全指令共同端子	24V Ground
RS-485 埠	S (+)	RS485/MODBUS	差動輸出入
	S (-)		
接地	E (G)	大地接地 屏蔽連接端子	----

*1:多機能數位輸入功能,請參閱手冊

*2:多機能類比輸入功能,請參閱手冊

*3:多機能類比輸出功能,請參閱手冊

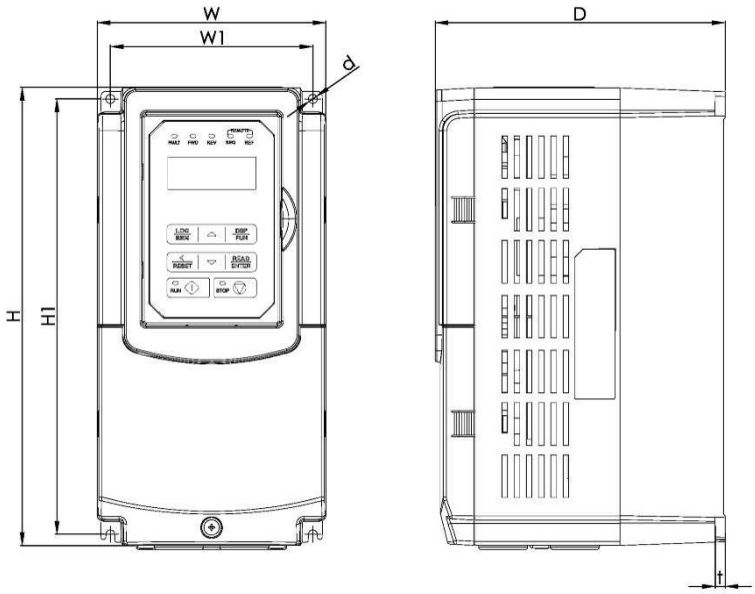
注意

- 端子 10V 輸出電流最大容量爲 20mA。
- 多機能類比輸出 AO1，AO2 爲接電錶專用之類比輸出，請勿用作回授控制等之類比輸出信號。
- 控制板 24V 與 10V 電源僅供內部控制使用，請勿外接至其他裝置供電。

3.6 外形尺寸圖

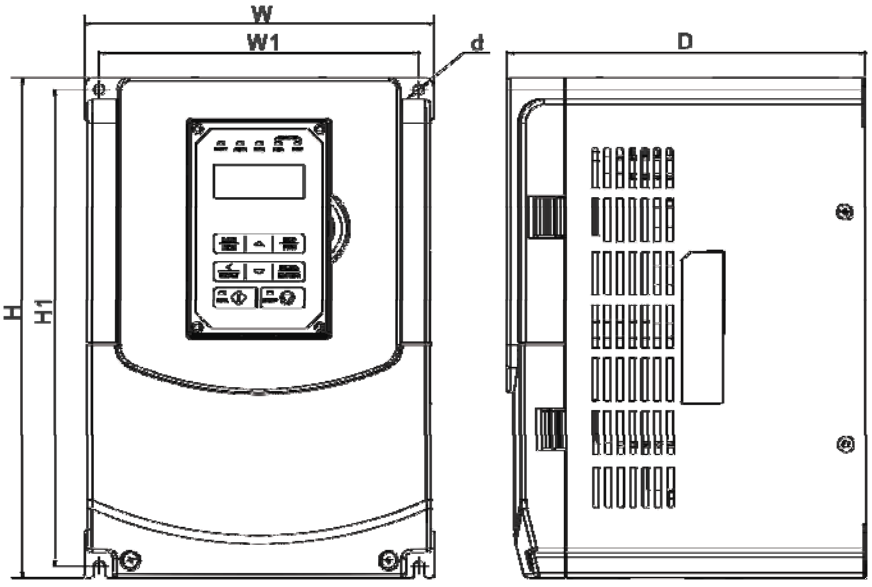
3.6.1 標準型(IP00/IP20)

(a) 220V: 5-7.5HP/440V :5-10HP



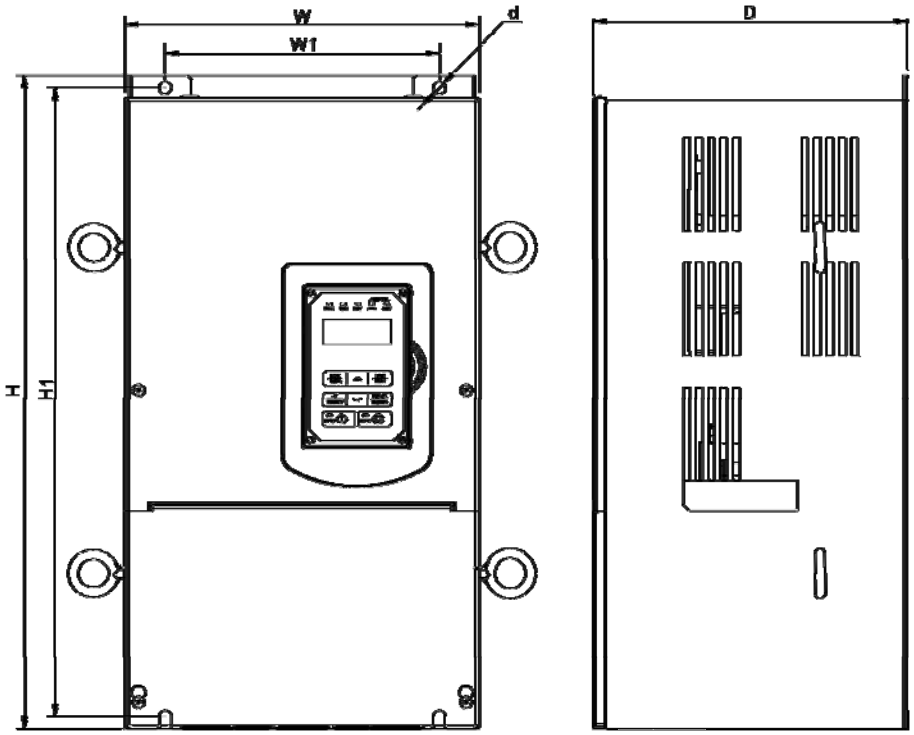
變頻器型號	外型尺寸(mm)								
	W	H	D	W1	H1	t	d	毛重(kg)	備註
F510-2005-H3	140	279	177	122	267	7	M6	3.8	
F510-2008-H3	140	279	177	122	267	7	M6	3.8	
F510-4005-H3	140	279	177	122	267	7	M6	3.8	
F510-4008-H3	140	279	177	122	267	7	M6	3.8	
F510-4010-H3	140	279	177	122	267	7	M6	3.8	

(b) 220V: 10-30HP/440V :15-40HP



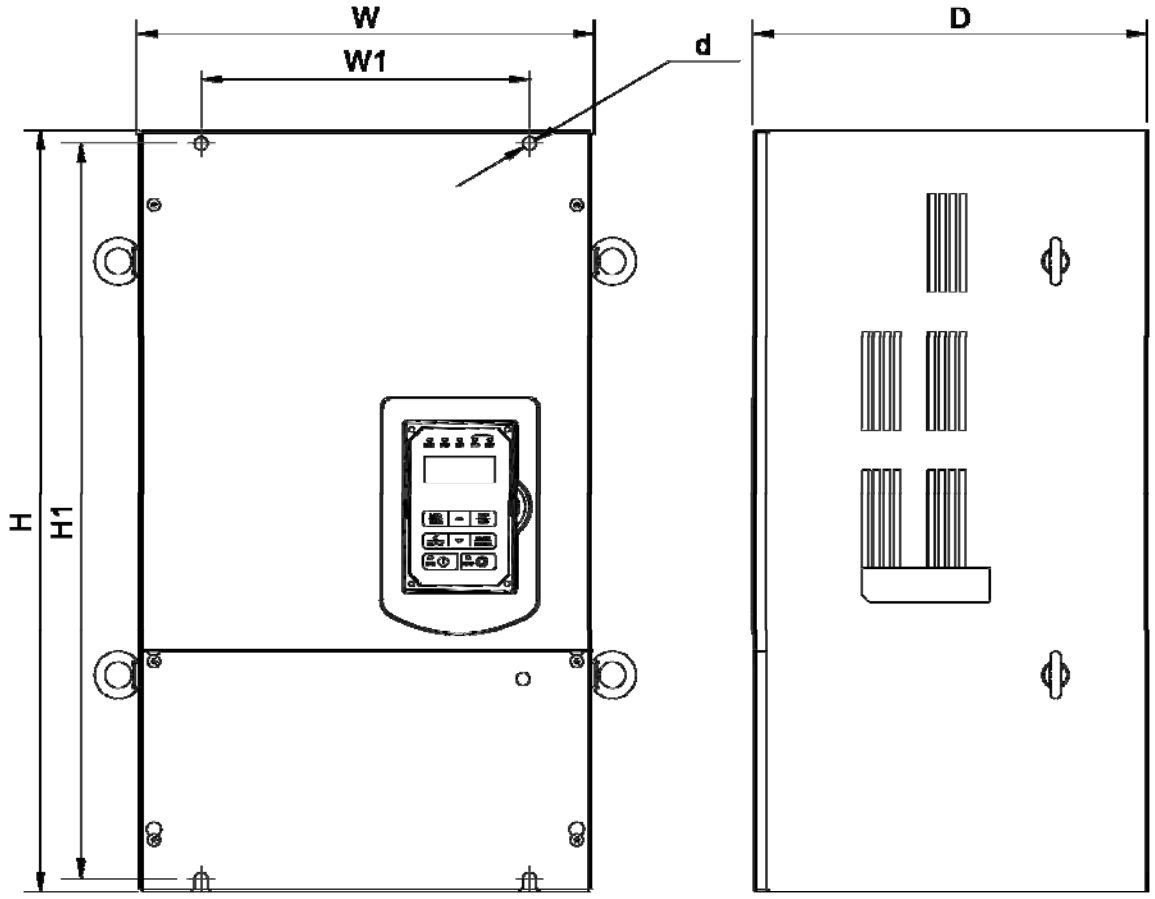
變頻器型號	外型尺寸(mm)								
	W	H	D	W1	H1	t	d	毛重(kg)	備註
F510-2010-H3	210	300	215	192	286	1.6	M6	6.2	
F510-2015-H3	210	300	215	192	286	1.6	M6	6.2	
F510-2020-H3	265	360	225	245	340	1.6	M8	10	
F510-2025-H3	265	360	225	245	340	1.6	M8	10	
F510-2030-H3	265	360	225	245	340	1.6	M8	10	
F510-4015-H3	210	300	215	192	286	1.6	M6	6.2	
F510-4020-H3	210	300	215	192	286	1.6	M6	6.2	
F510-4025-H3	265	360	225	245	340	1.6	M8	10	
F510-4030-H3	265	360	225	245	340	1.6	M8	10	
F510-4040-H3	265	360	225	245	340	1.6	M8	10	

(c) 220V :40-50HP/440V :50-75HP



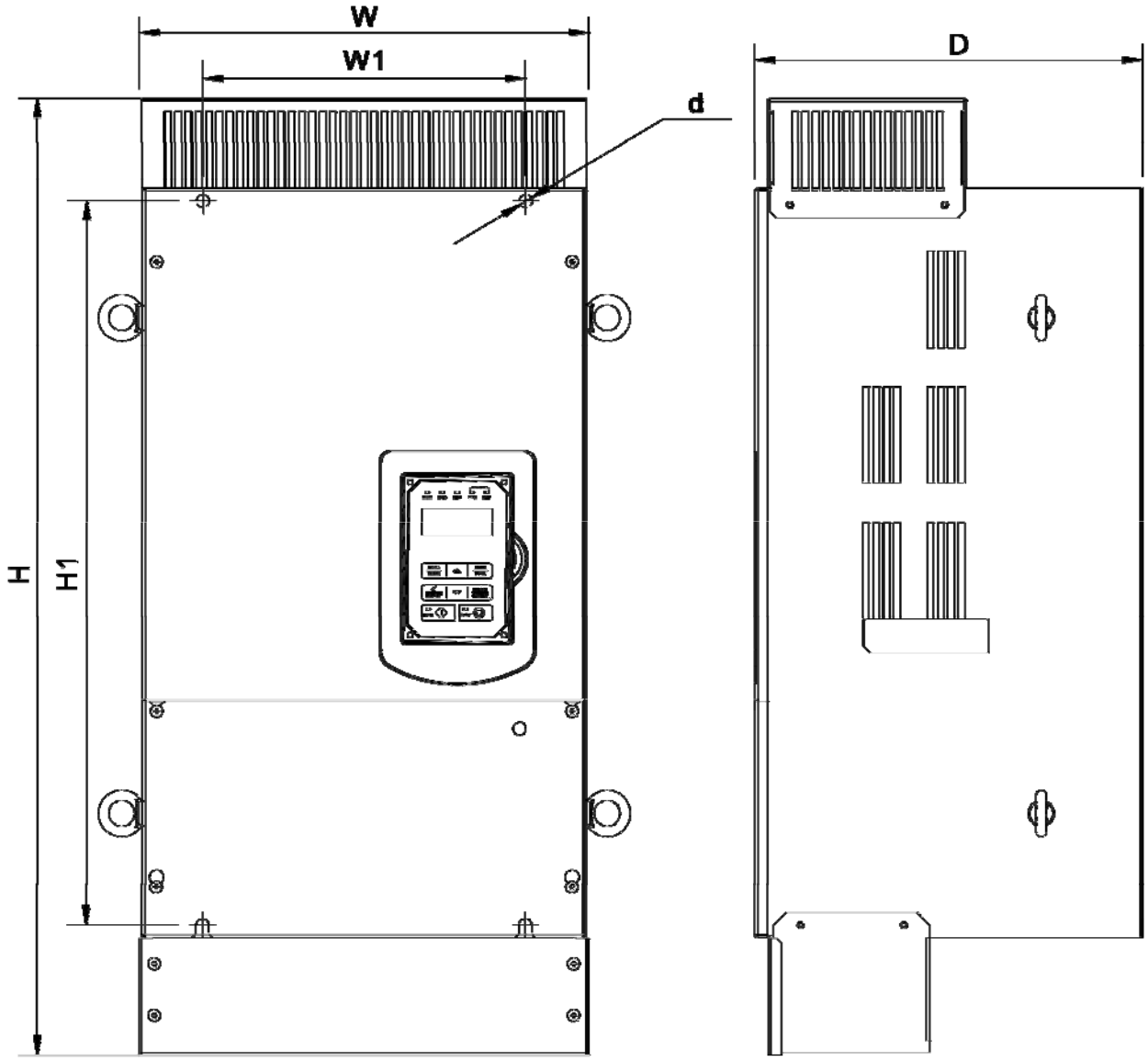
變頻器型號	外型尺寸(mm)								
	W	H	D	W1	H1	t	d	毛重(kg)	備註
F510-2040-H3	284	525	252	220	505	1.6	M8	30	
F510-2050-H3	284	525	252	220	505	1.6	M8	30	
F510-4050-H3	284	525	252	220	505	1.6	M8	30	
F510-4060-H3	284	525	252	220	505	1.6	M8	30	
F510-4075-H3	284	525	252	220	505	1.6	M8	30	

(d) 220V: 60-125HP/440V :100-250HP (IP00)



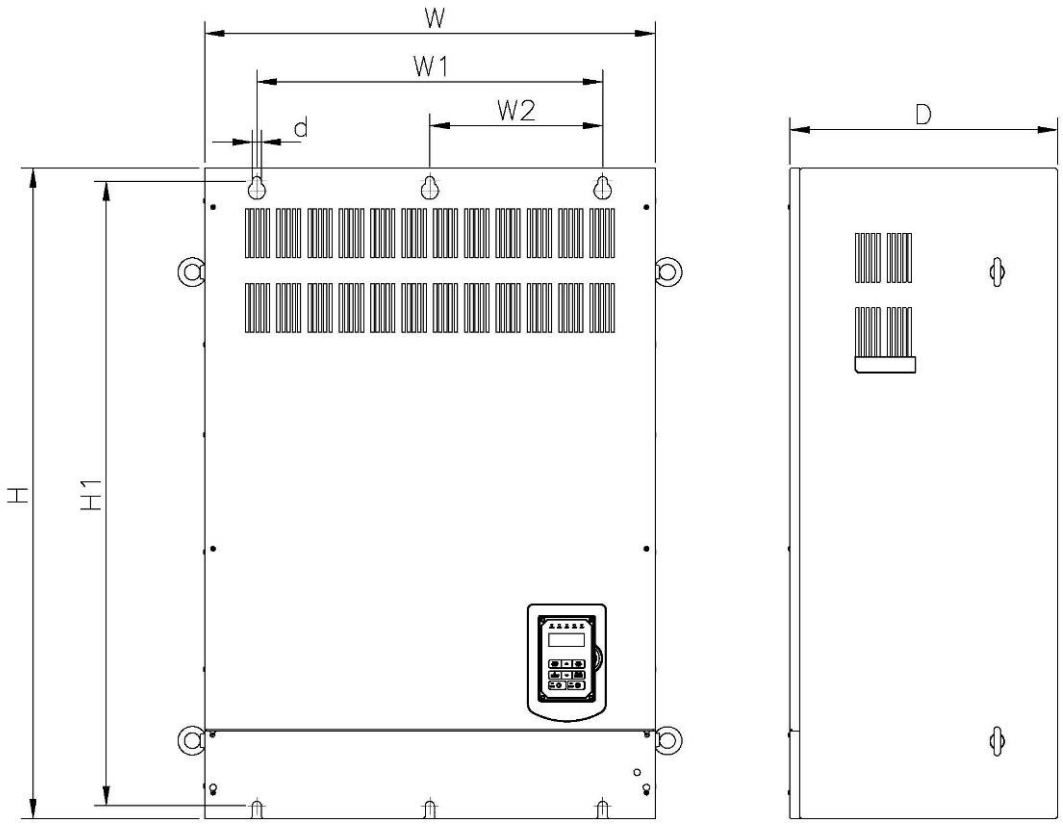
變頻器型號	外型尺寸(mm)								
	W	H	D	W1	H1	t	d	毛重(kg)	備註
F510-2060-H3	344	580	300	250	560	1.6	M10	40.5	
F510-2075-H3	344	580	300	250	560	1.6	M10	40.5	
F510-2100-H3	459	790	324.5	320	760	1.6	M10	74	
F510-2125-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4100-H3	344	580	300	250	560	1.6	M10	40.5	
F510-4125-H3	344	580	300	250	560	1.6	M10	40.5	
F510-4150-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4175-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4215-H3	459	790	324.5	320	760	1.6	M10	74	
F510-4250-H3	459	790	324.5	320	760	1.6	M10	74	

(e) 220V :60-125HP/440V :100-250HP (IP20)



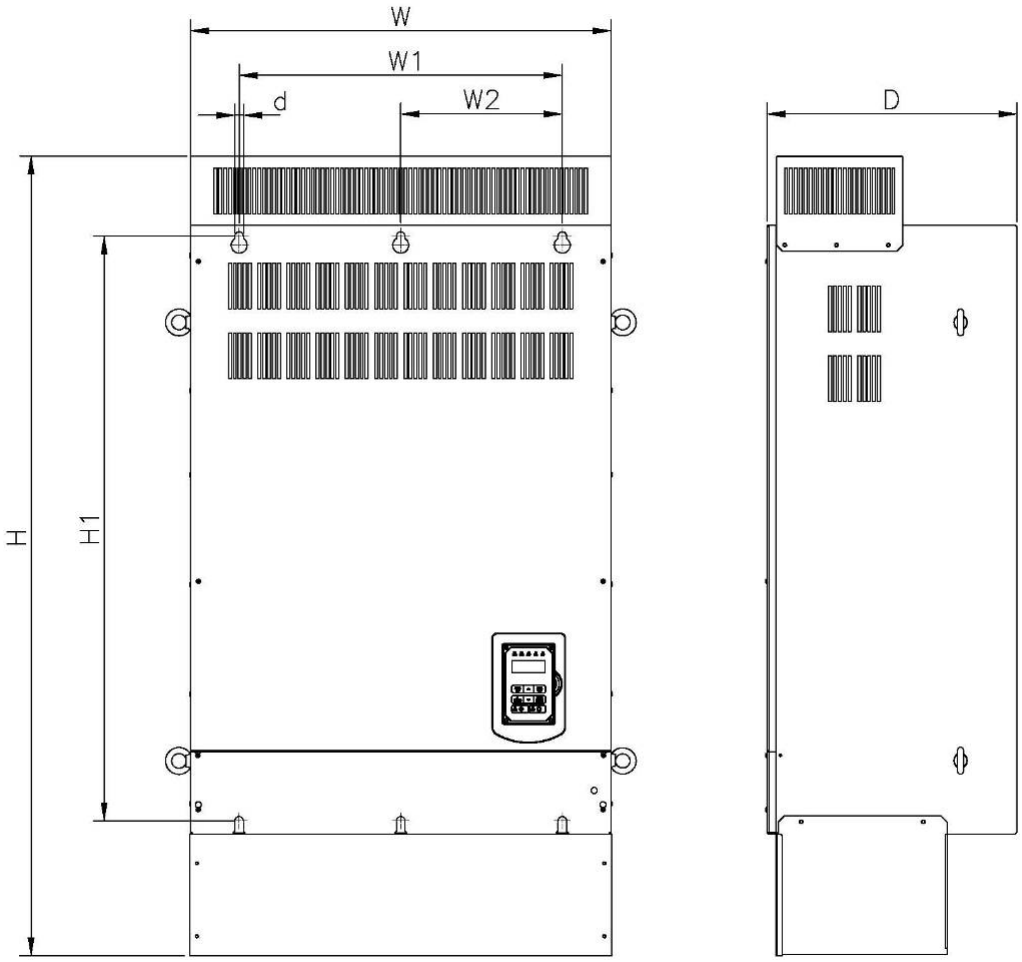
變頻器型號	外型尺寸(mm)								
	W	H	D	W1	H1	t	d	毛重(kg)	備註
F510-2060-H3	348.5	740	300	250	560	1.6	M10	44	
F510-2075-H3	348.5	740	300	250	560	1.6	M10	44	
F510-2100-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-2125-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4100-H3	348.5	740	300	250	560	1.6	M10	44	
F510-4125-H3	348.5	740	300	250	560	1.6	M10	44	
F510-4150-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4175-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4215-H3	463.5	1105	324.5	320	760	1.6	M10	81	
F510-4250-H3	463.5	1105	324.5	320	760	1.6	M10	81	

(f) 220V:150-175HP/440V:300-425HP (IP00)



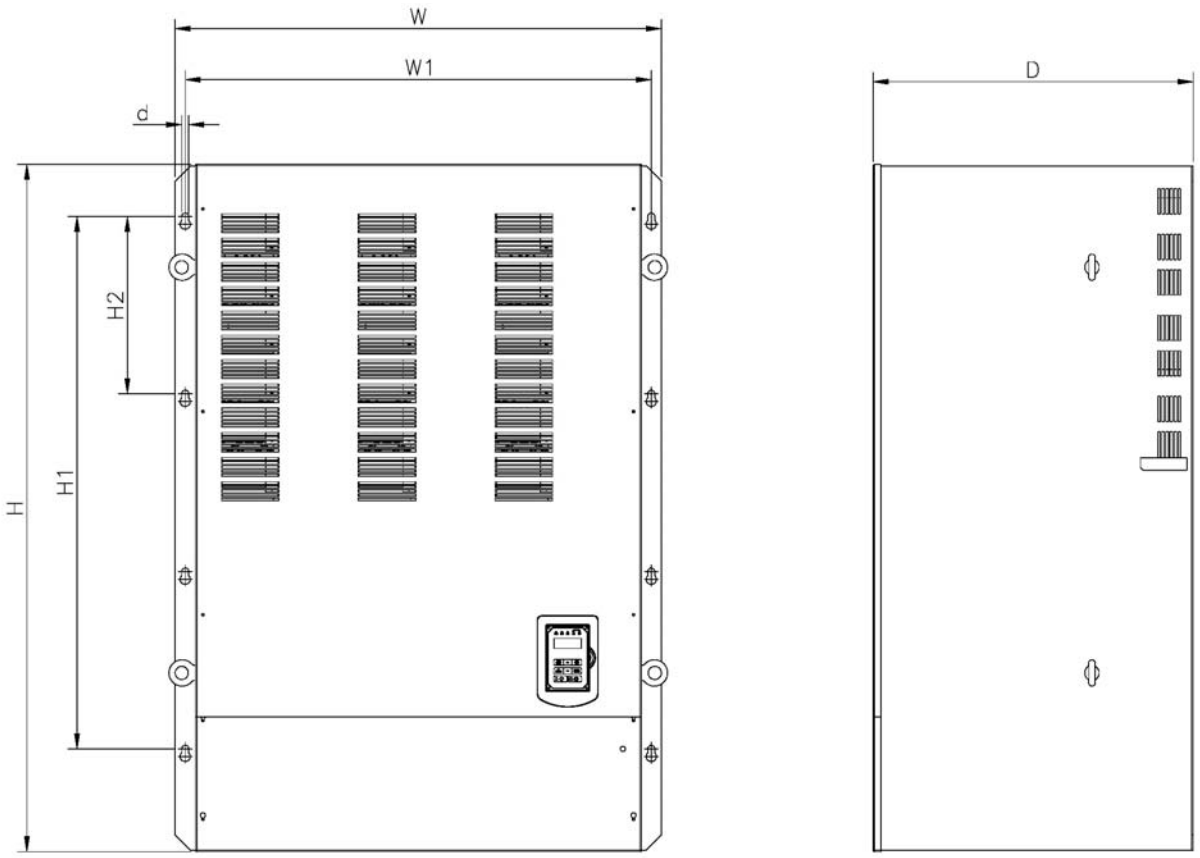
變頻器型號	外型尺寸(mm)									
	W	H	D	W1	W2	H1	t	d	毛重(kg)	備註
F510-2150-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-2175-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-4300-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-4375-H3	690	1000	410	530	265	960	1.6	M12	184	
F510-4425-H3	690	1000	410	530	265	960	1.6	M12	184	

(g) 220V:150-175HP/440V :300-425HP (IP20)



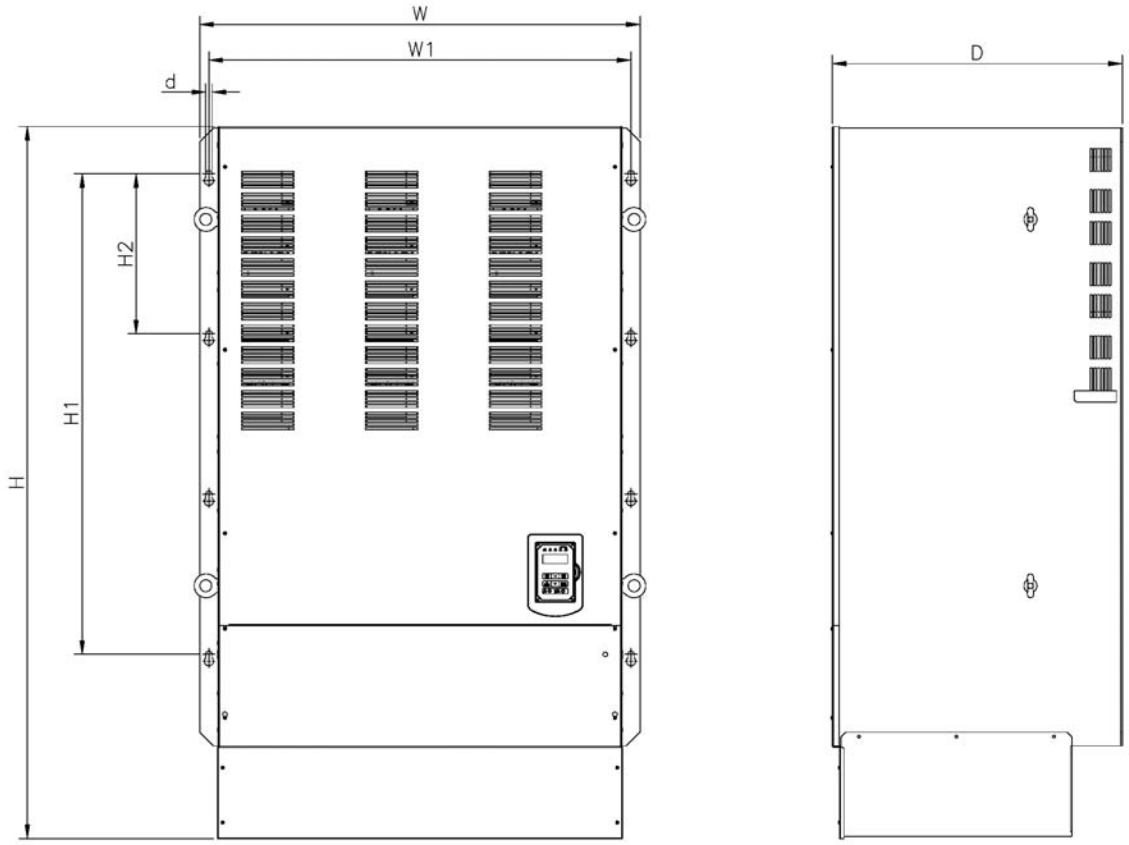
變頻器型號	外型尺寸(mm)									
	W	H	D	W1	W2	H1	t	d	毛重(kg)	備註
F510-2150-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-2175-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-4300-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-4375-H3	690	1313	410	530	265	960	1.6	M12	194	
F510-4425-H3	690	1313	410	530	265	960	1.6	M12	194	

(h) 440V 535-800HP (IP00)



變頻器型號	外型尺寸(mm)									
	W	H	D	W1	H1	H2	t	d	毛重(kg)	備註
F510-4535-H3	960	1556	632	920	1050	350	3	M12	290	
F510-4670-H3	960	1556	632	920	1050	350	3	M12	290	
F510-4800-H3	960	1356	632	920	1050	350	3	M12	290	

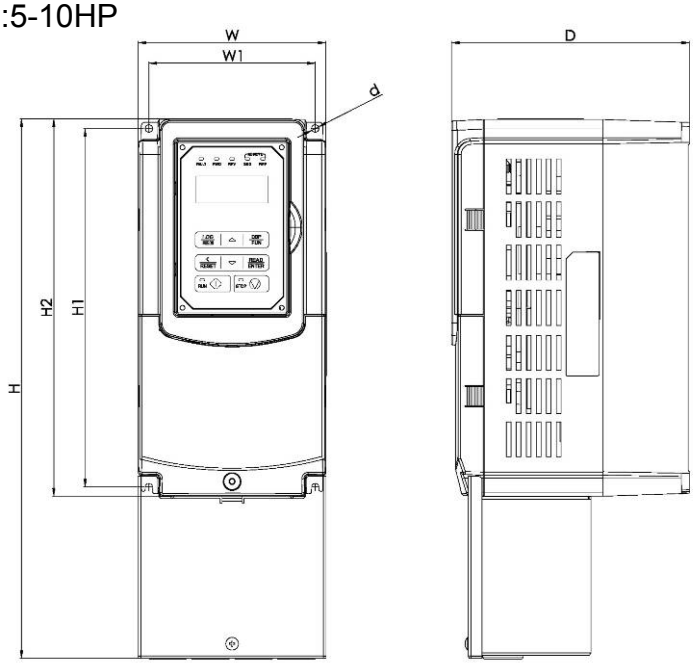
(i) 440V 535-800HP (IP20)



變頻器型號	外型尺寸(mm)									
	W	H	D	W1	H1	H2	t	d	毛重(kg)	備註
F510-4535-H3	960	1556	632	920	1050	350	3	M12	300	
F510-4670-H3	960	1556	632	920	1050	350	3	M12	300	
F510-4800-H3	960	1556	632	920	1050	350	3	M12	300	

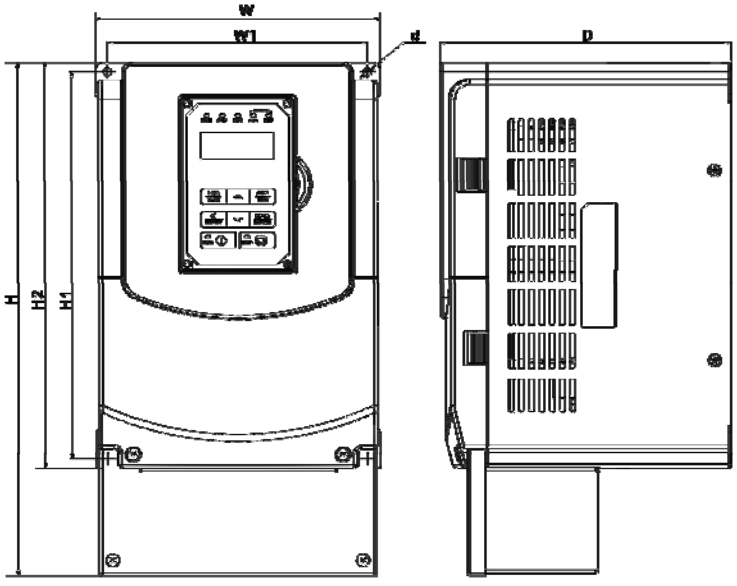
3.6.2 標準型內建濾波器 (IP00/IP20)

(a) 440V :5-10HP



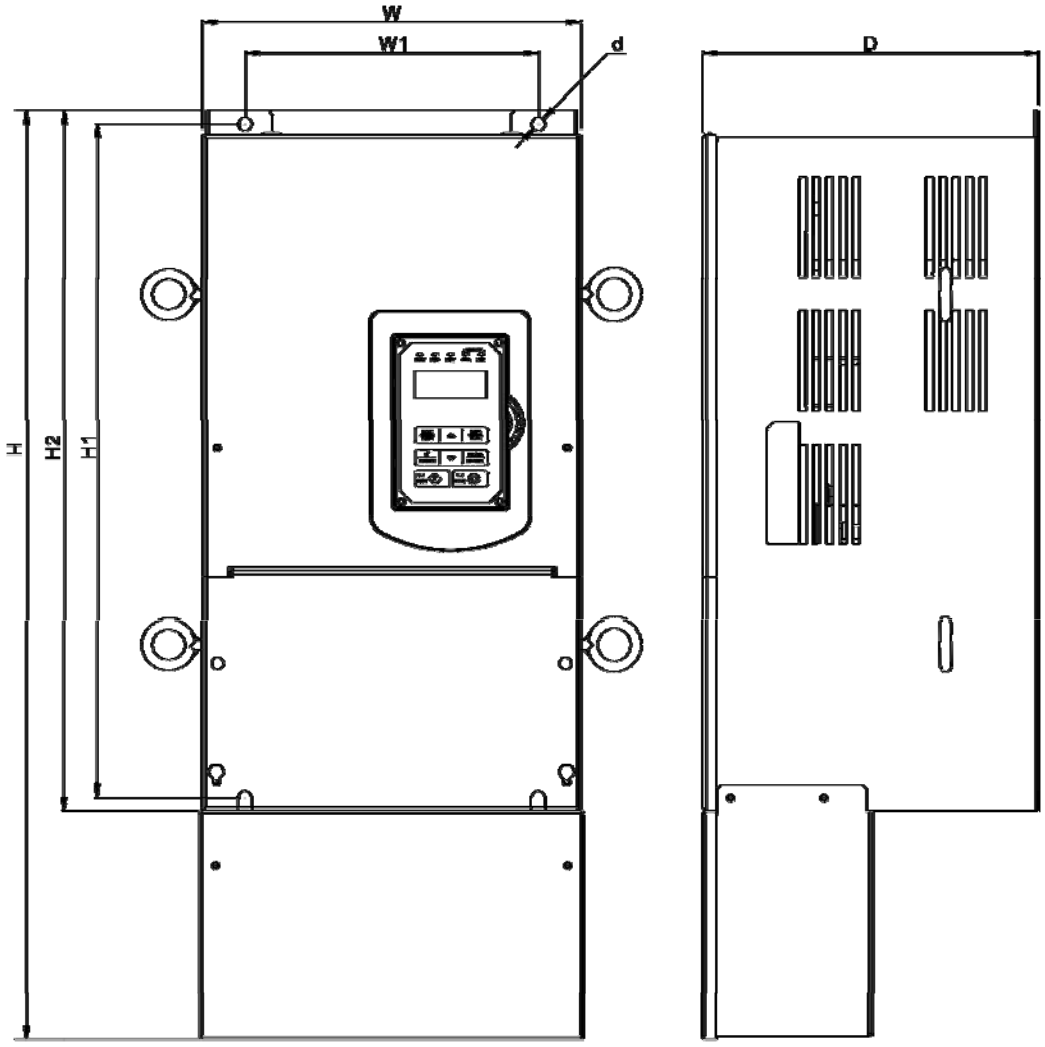
變頻器型號	外型尺寸(mm)									
	W	H	D	W1	H1	H2	t	d	毛重(kg)	備註
F510-4005-H3F	140	400	177	122	267	279	7	M6	5.5	
F510-4008-H3F	140	400	177	122	267	279	7	M6	5.5	
F510-4010-H3F	140	400	177	122	267	279	7	M6	5.5	

(b) 440V :15-40HP



變頻器型號	外型尺寸(mm)									
	W	H	D	W1	H1	H2	t	d	毛重(kg)	備註
F510-4015-H3F	210	416.5	215	192	286	300	1.6	M6	8.0	
F510-4020-H3F	210	416.5	215	192	286	300	1.6	M6	8.0	
F510-4025-H3F	265	500	225	245	340	360	1.6	M8	12.5	
F510-4030-H3F	265	500	225	245	340	360	1.6	M8	12.5	
F510-4040-H3F	265	500	225	245	340	360	1.6	M8	12.5	

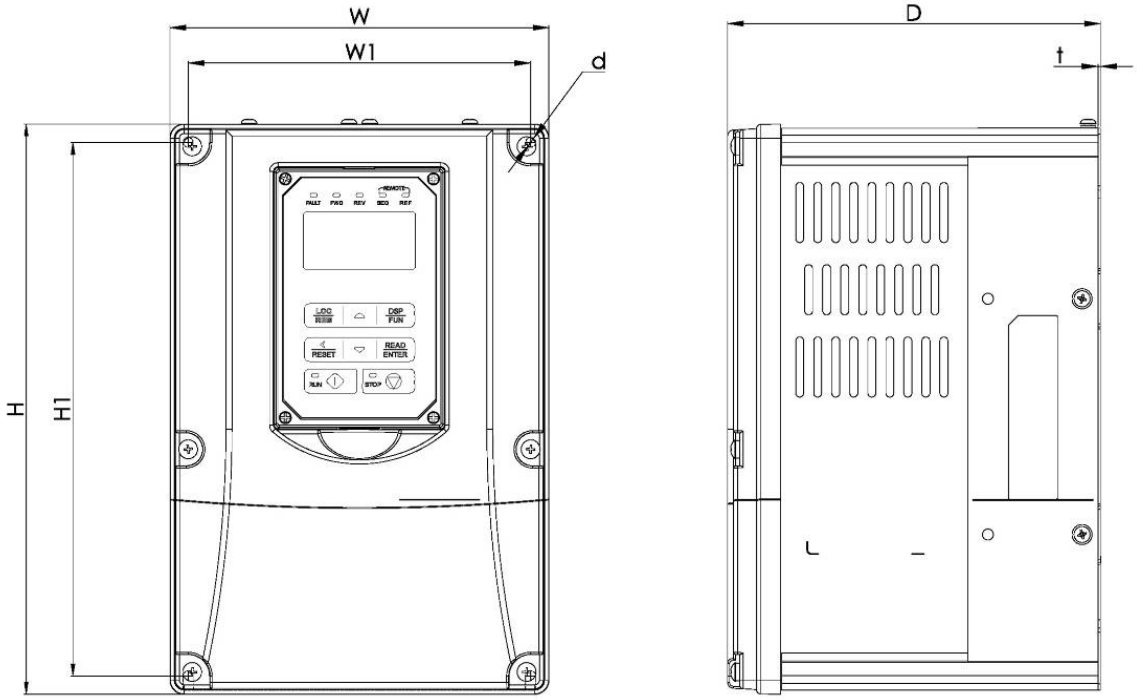
(c) 440V :50-75HP



變頻器型號	外型尺寸(mm)									
	W	H	D	W1	H1	H2	t	d	毛重(kg)	備註
F510-4050-H3F	284	679	252	220	505	525	1.6	M8	32.5	
F510-4060-H3F	284	679	252	220	505	525	1.6	M8	32.5	
F510-4075-H3F	284	679	252	220	505	525	1.6	M8	32.5	

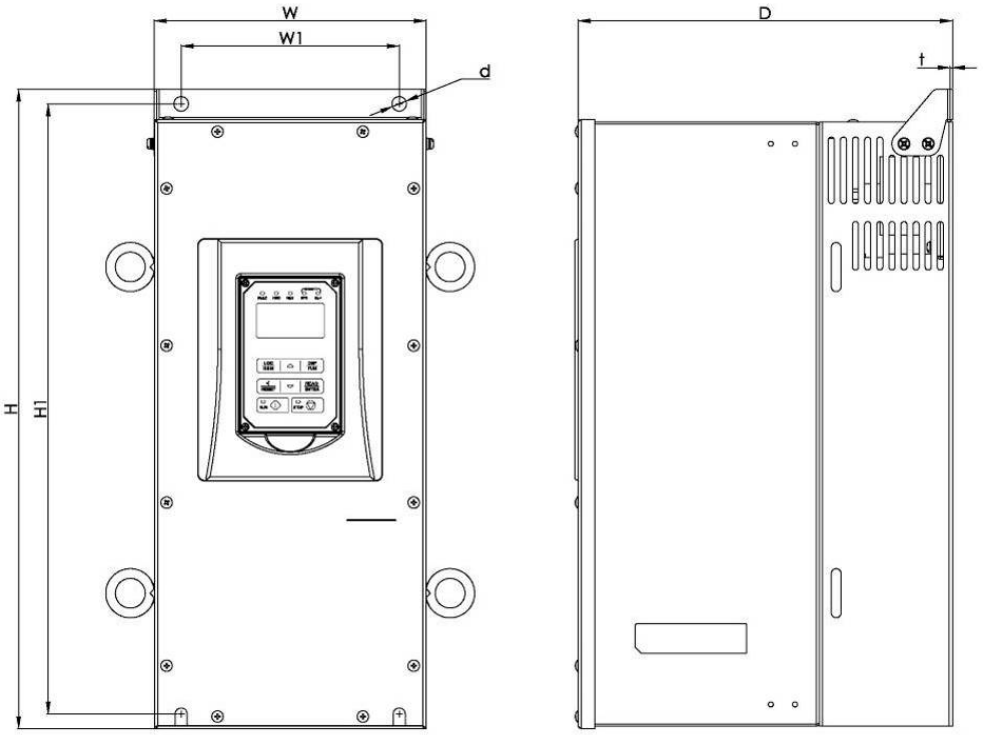
3.6.3 防水型內建濾波器 (IP55)

(a) 440V : 5-25HP



變頻器型號	外型尺寸(mm)								
	W	H	D	W1	H1	t	d	毛重(kg)	備註
F510-4005-C3FN4	189	284	186	171	266	1.2	M5	7	
F510-4008-C3FN4	189	284	186	171	266	1.2	M5	7	
F510-4010-C3FN4	230	320	210	210	305	2	M5	10.5	
F510-4015-C3FN4	230	320	210	210	305	2	M5	10.5	
F510-4020-C3FN4	265	396	227	249	380	2	M5	17	
F510-4025-C3FN4	265	396	227	249	380	2	M5	17	

(b) 440V : 30-60HP (75~100HP 爲外掛濾波器)



變頻器型號	外型尺寸(mm)								
	W	H	D	W1	H1	t	d	毛重(kg)	備註
F510-4030-C3FN4	224	527	311	180	505	2	M10	32.5	
F510-4040-C3FN4	224	527	311	180	505	2	M10	32.5	
F510-4050-C3FN4	224	527	311	180	505	2	M10	32.5	
F510-4060-C3FN4	326	695	343	276	671	2.3	M10	55	
F510-4075-C3N4	326	695	343	276	671	2.3	M10	55	
F510-4100-C3N4	326	695	343	276	671	2.3	M10	55	

第 4 章 軟體索引

4.1 面板使用

4.1.1 面板功能說明

類型	名稱	功能
顯示	主顯示區	顯示頻率、參數、以及電壓、電流、溫度及異常等
	LED 狀態顯示	**FAULT**：當變頻器發生警告或故障訊息時，指示燈亮。 **FWD**：當變頻器處於正轉狀態時，指示燈亮。 （停機時閃爍，運轉後則處於恆亮狀態） **REV**：當變頻器處於反轉狀態時，指示燈亮。 （停機時閃爍，運轉後則處於恆亮狀態） **SEQ**：當變頻器運轉命令來源設定爲外控時，指示燈亮。 **REF**：當變頻器頻率命令來原設定爲外控時，指示燈亮。
按鍵 （8 個按鍵）	RUN 鍵	**RUN** 鍵：變頻器運轉。
	STOP 鍵	**STOP** 鍵：變頻器停止運轉。
	▲鍵	用於頻率與參數設定。
	▼鍵	用於頻率與參數設定。
	LOC/REM 鍵	切換頻率及運轉指令的來源 REMOTE 模式：依參數設定，由控制迴路端子、通訊或其他方式控制 LOCAL 模式：由操作器控制 送電後固定是 REMOTE 模式，若在變頻器停止時按 LOC/REM 鍵，可在 LOCAL 模式及 REMOTE 模式中切換，由參數 23-41 可設定 LOC/REM 鍵有效或無效。
	DSP/FUN 鍵	切換顯示介面，依據頻率畫面→功能選單→監控參數→頻率畫面循環。
	</RESET 鍵	**“<”**左移鍵：變更參數或參數值時使用。 RESET 鍵：檢出故障時，變爲復歸鍵。
	READ/ENTER 鍵	切換進入功能和設定內部值，及修改參數設定寫入確認鍵功能。

4.1.2 數位式操作器的外觀 (Option)

數位式操作器(JN5-OP-F02)配備有內部記憶體可用來從數位式操作器上傳參數設定到變頻器或是從變頻器下載參數設定到數位式操作器。JN5-OP-F02 LCD 數位式操作器名稱與功能如下說明。

驅動模式指示燈

.**FAULT**：發生故障或警告時亮起.

.**FWD**：當輸入正向運轉指令時亮起.

.**REV**：當輸入反向運轉指令時亮起.

.**SEQ**：從控制電路端子或從 RS-485 通訊指令 (REMOTE 模式)啓動運轉指令時會亮起.

.**REF**：從控制電路端子或從 RS-485 通訊指令 (REMOTE 模式)啓動頻率指令時會亮起.

液晶畫面 (最大 8 行？25 字母)

. 顯示監控的資料 , 參數及設定

. 模式顯示 (顯示在液晶畫面的左上方)

Monitor ：在驅動模式時顯示

Group **:** 在所有群組設定模式時顯示

PARA ：在群組參數設定模式時顯

Edit ：在編輯模式或自動調測模式時顯示

圖 4.1 液晶數位式操作器

4.2 參數一覽表

參數群組	名　稱
群組 00	基本功能群組
群組 01	V/F 控制功能群組
群組 02	IM 馬達參數群組
群組 03	外部端子數位輸入輸出功能群組
群組 04	外部端子類比輸入輸出功能群組
群組 05	多段速功能群組
群組 06	自動運轉功能群組
群組 07	運轉停止功能群組
群組 08	保護功能群組
群組 09	通訊功能群組
群組 10	PID 功能群組
群組 11	輔助功能群組
群組 12	監視功能群組
群組 13	維護功能群組
群組 14	PLC 設定群組
群組 15	PLC 監控群組
群組 16	LCM 機能群組
群組 17	IM 馬達自動調校功能群組
群組 18	滑差補償功能群組
群組 19	保留
群組 20	速度控制功能群組
群組 21	轉矩控制功能群組
群組 22	PM 馬達群組
群組 23	泵浦與 HVAC 群組
群組 24	1 對 8 泵浦卡相關機能群組

參數屬性	
*1	運轉中可修改的參數
*2	通訊中不可修改的參數
*3	在做出廠設定時，此參數的值(用戶設定的值)不會恢復爲出廠預設值
*4	參數唯讀不可修改
*5	只有使用 LED 數位操作器時才會顯示

群組 00 基本功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
00-00	馬達控制模式	0: V/F 1:保留 2: SLV 3:保留 4:保留 5: PM SLV	0	-	O	O	O	*3
00-01	馬達轉向	0:正轉 1:反轉	0	-	O	O	O	*1
00-02	主運轉命令來源選擇	0:按鍵面板 1:外控 2:通訊控制 3:PLC 4:RTC 計時器	0*註 1	-	O	O	O	
00-03	保留							
00-04	保留							
00-05	主頻率命令來源選擇	0:按鍵面板 1:外控(類比) 2:端子 UP/DOWN 3:通訊控制 4:保留 5:PID 給定 6:RTC	0*註 1	-	O	O	O	
00-06	副頻率命令來源選擇	0:按鍵面板 1:外控(類比) 2:端子 UP/DOWN 3:通訊控制 4:保留 5 PID 給定 6:RTC	3	-	O	O	O	
00-07	頻率源組合模式選擇	0:主頻率源 1:主頻率源+副頻率源	0	-	O	O	O	
00-08	通訊頻率命令	0.00-400.00	0.00	Hz	O	O	O	
00-09	頻率命令記憶模式	0:不記憶斷電前通訊頻率命令 1:記憶斷電前通訊頻率命令	0	-	O	O	O	
00-10	保留							
00-11	保留							
00-12	頻率上限	0.1~109.0	100.0	%	O	O	O	
00-13	頻率下限	0.0~109.0	0.0	%	O	O	O	
00-14	加速時間 1	0.1~6000.0	-	s	O	O	O	*1
00-15	減速時間 1	0.1~6000.0	-	s	O	O	O	*1
00-16	加速時間 2	0.1~6000.0	-	s	O	O	O	*1
00-17	減速時間 2	0.1~6000.0	-	s	O	O	O	*1
00-18	寸動頻率	0.00~400.00	6.00	Hz	O	O	O	*1
00-19	寸動加速時間	0.1~0600.0	-	s	O	O	O	*1
00-20	寸動減速時間	0.1~0600.0	-	s	O	O	O	*1
00-21	加速時間 3	0.1~6000.0	-	s	O	O	O	*1
00-22	減速時間 3	0.1~6000.0	-	s	O	O	O	*1
00-23	加速時間 4	0.1~6000.0	-	s	O	O	O	*1

群組 00 基本功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
00-24	減速時間 4	0.1~6000.0	-	s	O	O	O	*1
00-25	加減速切換頻率	0.0~400.0	0.0	Hz	O	O	O	
00-26	緊急停止時間	0.1~6000.0	5.0	s	O	O	O	
00-27	保留							
00-28	主頻率命令特性選擇	0: 正特性 (0~10V/4~20mA 對應 0~100%) 1: 負特性 (0~10V/4~20mA 對應 100~0%)	0	-	O	O	O	
00-29	保留							
00-30	保留							
00-31	保留							
00-32	應用調整	0: Disable 1: Water supply pump 2: 保留 3: Exhaust fan 4: HVAC 5: 保留 6: 保留 7: 保留	-					
00-33	保留							
00-34	保留							
00-35	保留							
00-36	保留							
00-37	保留							
00-38	保留							
00-39	保留							
00-40	保留							
00-41	使用者參數 0	選擇 13-06 = 1，啓動使用者參數 設定範圍：01-00 ~24-06 (僅 LCD 可使用)	-		O	O	O	*1
00-42	使用者參數 1		-		O	O	O	*1
00-43	使用者參數 2		-		O	O	O	*1
00-44	使用者參數 3		-		O	O	O	*1
00-45	使用者參數 4		-		O	O	O	*1
00-46	使用者參數 5		-		O	O	O	*1
00-47	使用者參數 6		-		O	O	O	*1
00-48	使用者參數 7		-		O	O	O	*1
00-49	使用者參數 8		-		O	O	O	*1
00-50	使用者參數 9		-		O	O	O	*1
00-51	使用者參數 10		-		O	O	O	*1
00-52	使用者參數 11		-		O	O	O	*1
00-53	使用者參數 12		-		O	O	O	*1
00-54	使用者參數 13		-		O	O	O	*1
00-55	使用者參數 14		-		O	O	O	*1
00-56	使用者參數 15		-		O	O	O	*1

***註 1：軟體版本 V1.1 以前(含)之出廠值爲 1 (外控)；軟體版本 V1.2 以後(含)之出廠值爲 0 (按鍵面板)。**

群組 01 V/F 控制功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
01-00	V/F 曲線選擇	0~FF	6	-	O	X	X	*3
01-01	保留							
01-02	最大輸出頻率	40.0~400.0	60.0	Hz	O	O	O	
01-03	最大輸出電壓	200V: 0.1~255.0	220.0	V	O	X	X	
		400V: 0.2~510.0	440.0					
01-04	中間輸出頻率 2	0.0~400.0	0.0	Hz	O	X	X	
01-05	中間輸出電壓 2	200V: 0.0~255.0	0.0	V	O	X	X	
		400V: 0.0~510.0						
01-06	中間輸出頻率 1	0.0~400.0	3.0	Hz	O	X	X	
01-07	中間輸出電壓 1	200V: 0.0~255.0	14.0	V	O	X	X	
		400V: 0.0~510.0	28.0					
01-08	最小輸出頻率	0.0~400.0	1.5	Hz	O	O	O	
01-09	最小輸出電壓	200V: 0.0~255.0	6.6	V	O	X	X	
		400V: 0.0~510.0	13.2					
01-10	轉矩補償增益	0.0~2.0	1.0	-	O	X	X	*1
01-11	保留							
01-12	基底頻率	10.0~400.0	60.0	Hz	O	O	O	
01-13	基底輸出電壓	200V: 0.0~255.0	220.0	V	O	X	X	
		400V: 0.0~510.0	440.0					
01-14	輸入電壓設定	200V: 155.0~255.0	220.0	V	O	O	O	
		400V: 310.0~510.0	440.0					
01-15	轉矩補償時間	0~10000	200	ms	O	X	X	

群組 02 IM 馬達參數群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
02-00	無載電流	0.01~600.00	KVA	A	O	X	X	
02-01	額定電流	V/F 模式爲 10%~200%變頻器額定電流， SLV 模式爲 25%~200%變頻器額定電流。	KVA	A	O	O	X	
02-02	保留							
02-03	額定轉速	0~60000	KVA	Rpm	O	O	X	
02-04	額定電壓	200V: 50.0~240.0	220.0	V	O	O	X	
		400V: 100.0~480.0	440.0					
02-05	額定功率	0.01~600.00	KVA	kW	O	O	X	
02-06	額定頻率	10.0~400.0	60.0	Hz	O	O	X	
02-07	極數	2,4,6,8	4	-	O	O	X	
02-08	保留							
02-09	激磁電流	10.0~100.0	KVA	%	X	O	X	
02-10	鐵心飽和係數 1	0~100	KVA	%	X	O	X	
02-11	鐵心飽和係數 2	0~100	KVA	%	X	O	X	
02-12	鐵心飽和係數 3	80~300	KVA	%	X	O	X	
02-13	鐵心損失	0.0~15.0	KVA	%	O	X	X	
02-14	保留							
02-15	線間電阻	0.001~60.000	KVA	Ω	O	O	X	

群組 02 IM 馬達參數群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
02-16	轉子電阻	0.001~60.000	KVA	Ω	X	O	X	
02-17	漏感	0.01~200.00	KVA	mH	X	O	X	
02-18	互感	0.1~6553.5	KVA	mH	X	O	X	
02-19	無載電壓	200V: 50~240 400V: 100~480	KVA	V	X	O	X	

群組 03 外部端子數位輸入輸出功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
03-00	多功能端子 S1 功能設定	0: 二線式正轉/停止 1: 二線式反轉/停止 2: 多段速設定指令 1 3: 多段速設定指令 2 4: 多段速設定指令 3 5: 多段速設定指令 4 6: 寸動正轉指令 7: 寸動反轉指令 8: UP 增頻率指令 9: DOWN 減頻率指令 10: 加減速設定指令 1 11: 加減速禁止 12: 保留 13: 保留 14: 緊急停止(減速到零停止) 15: 遮斷停止(自由運轉停止) 16: PID 功能禁止 17: 故障復歸(RESET) 18: 保留 19: 速度搜尋 1(從最大頻率) 20: 手動省能源功能 21: PID 積分復歸 22: 保留 23: 保留 24: PLC 輸入 25: 外部故障 26: 三線試正轉/反轉 27: 本體/遠端 選擇 28: Remote 模式選擇 29: 寸動頻率選擇 30: 加減速設定指令 2 31: 變頻器過熱預警 32: 保留 33: 直流剎車 34: 速度搜尋 2(從頻率指令) 35: 計時功能輸入 36: PID 軟啓動無效 37: 保留 38: 保留 39: 保留	0	-	O	O	O	
03-01	多功能端子 S2 功能設定		1		O	O	O	
03-02	多功能端子 S3 功能設定		8		O	O	O	
03-03	多功能端子 S4 功能設定		9		O	O	O	
03-04	多功能端子 S5 功能設定		2		O	O	O	
03-05	多功能端子 S6 功能設定		17		O	O	O	

群組 03 外部端子數位輸入輸出功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			
					V/F	SLV	PM SLV	屬性
		40: 保留 41: 保留 42: 保留 43: 保留 44: 保留 45: 保留 46: 保留 47: 火災模式(強制運轉模式) 48: KEB 加速 49: 允許參數寫入 50: 送電後直接運轉保護(USP) 51: 保留 52: 保留 53: 二線式自保 (停止指令) 54: PID1/PID2 切換 55: RTC 時間致能 56: RTC 偏移致能 57: 強制頻率運轉 58: 安全機能						
03-06	保留							
03-07	保留							
03-08	(S1~S6)DI 掃瞄時間	0: 掃描時間 4ms 1: 掃描時間 8ms	1	-	O	O	O	
03-09	多功能端子 S1-S4 類型選擇	xxx0b:S1 A 接點 xxx1b:S1 B 接點 xx0xb:S2 A 接點 xx1xb:S2 B 接點 x0xxb:S3 A 接點 x1xxb:S3 B 接點 0xxxb:S4 A 接點 1xxxb:S4 B 接點	0000b	-	O	O	O	
03-10	多功能端子 S5-S6 類型選擇	xxx0b:S5 A 接點 xxx1b:S5 B 接點 xx0xb:S6 A 接點 xx1xb:S6 B 接點 x0xxb:保留 x1xxb:保留 0xxxb:保留 1xxxb:保留	0000b	-	O	O	O	
03-11	繼電器(R1A-R1C)輸出	0: 運轉期間 1: 故障指示	1	-	O	O	O	
03-12	繼電器(R2A-R2C)輸出	2: 頻率到達 3: 任意頻率到達 (03-13±03-14) 4: 頻率檢出 1 (> 03-13) 5: 頻率檢出 2 (< 03-13) 6: 自動再啓動 7: 保留 8: 保留 9: 遮斷停止 10: 保留 11: 保留 12: 過轉矩檢出 13: 保留 14: 保留 15: 保留 16: 保留 17: 保留 18: PLC 狀態 19: PLC 控制 20: 零速	20	-	O	O	O	

群組 03 外部端子數位輸入輸出功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			
					V/F	SLV	PM SLV	屬性
		21: 變頻器待命 22: 低電壓檢出 23: 運轉指令來源 24: 頻率指令來源 25: 低轉矩檢出 26: 頻率斷線 27: 計時功能輸出 28: 保留 29: 保留 30: 保留 31: 保留 32: 通訊控制 33: RTC 計時器 1 34: RTC 計時器 2 35: RTC 計時器 3 36: RTC 計時器 4						
03-13	頻率檢測準位	0.0~400.0	0.0	Hz	O	O	O	
03-14	頻率檢測寬度	0.1~25.5	2.0	Hz	O	O	O	
03-15	保留							
03-16	保留							
03-17	保留							
03-18	保留							
03-19	繼電器(R1A-R3C)類型選擇	xxx0b: R1 A 接點 xxx1b: R1 B 接點 xx0xb: R2 A 接點 xx1xb: R2 B 接點 x0xxb: R3 A 接點 x1xxb: R3 B 接點	0000b	-	O	O	O	
03-20	保留							
03-21	保留							
03-22	保留							
03-23	保留							
03-24	保留							
03-25	保留							
03-26	保留							
03-27	UP/DOWN 頻率保持選擇	0: 停止時保持 UP/DOWN 頻率 1: 停止時清除 UP/DOWN 頻率 2: 停止時允許頻率 UP/DOWN	0	-	O	O	O	
03-28	保留							
03-29	保留							
03-30	保留							
03-31	脈波輸入刻度	50~32000	1000	Hz	O	O	O	*1
03-32	脈波輸入增益	0.0~1000.0	100	%	O	O	O	*1
03-33	脈波輸入偏壓	-100.0~100.0	0.0	%	O	O	O	*1
03-34	脈波輸入濾波時間	0.00~2.00	0.1	Sec	O	O	O	*1
03-35	保留							
03-36	保留							
03-37	計時器 ON 延遲 (DI/DO)	0.0~6000.0	0.0	s	O	O	O	
03-38	計時器 OFF 延遲 (DI/DO)	0.0~6000.0	0.0	s	O	O	O	
03-39	繼電器(R3A-R3C)輸出	範圍和定義和 03-11, 03-12 相同	0	-	O	O	O	

群組 04 外部端子類比輸入輸出功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
04-00	AI 輸入信號種類	0: AI2: 0~10V 1: AI2: 4~20mA	1	-	O	O	O	
04-01	AI1 信號掃瞄濾波時間	0.00~2.00	0.03	s	O	O	O	
04-02	AI1 增益值	0.0~1000.0	100.0	%	O	O	O	*1
04-03	AI1 偏壓值	-100.0~100.0	0	%	O	O	O	*1
04-04	保留							
04-05	AI2 功能設定	0: 輔助頻率 1: 頻率增益 2: 頻率偏壓 3: 電壓偏壓 4: 加減速縮短係數 5: 直流剎車電流 6: 過轉矩偵測準位 7: 運轉中失速準位 8: 頻率下限 9: 跳躍頻率 4 10: 加到 AI1 11: 正轉矩限制 12: 負轉矩限制 13: 回昇轉矩限制 14: 正/負轉矩限制 15: 保留 16: 轉矩補償 17: 保留	10	-	O	O	O	
04-06	AI2 信號掃瞄濾波時間	0.00~2.00	0.03	s	O	O	O	
04-07	AI2 增益值	0.0~1000.0	100.0	%	O	O	O	*1
04-08	AI2 偏壓值	-100.0~100.0	0	%	O	O	O	*1
04-09	保留							
04-10	保留							
04-11	AO1 功能設定	0: 輸出頻率 1: 頻率指令 2: 輸出電壓 3: 直流電壓 4: 輸出電流 5: 輸出功率 6: 馬達速度 7: 輸出功因 8: AI1 輸入 9: AI2 輸入 10: 轉矩命令 11: q 軸電流 12: d 軸電流 13: 保留 14: 保留 15: ASR 輸出 16: 保留 17: q 軸電壓	0	-	O	O	O	

群組 04 外部端子類比輸入輸出功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
		18: d 軸電壓						
		19: 保留						
		20: 保留						
		21: PID 輸入						
		22: PID 輸出						
		23: PID 目標值						
		24: PID 回授值						
		25: 軟啓動器的輸出頻率						
		26: 保留						
		27: 保留						
04-12	AO1 增益值	0.0~1000.0	100.0	%	O	O	O	*1
04-13	AO1 偏壓值	-100.0~100.0	0	%	O	O	O	*1
04-14	保留							
04-15	保留							
04-16	AO2 功能設定	範圍和定義和 04-11 相同	3	-	O	O	O	
04-17	AO2 增益值	0.0~1000.0	100.0	%	O	O	O	*1
04-18	AO2 偏壓值	-100.0~100.0	0	%	O	O	O	*1
04-19	AO 輸出信號種類	0: AO1:0~10V AO2:0~10V	0		O	O	O	
		1: AO1:0~10V AO2:4~20mA						
		2: AO1:4~20mA AO2:0~10V						
		3: AO1:4~20mA AO2: 4~20mA						

群組 05 多段速功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
05-00	多段速加減速模式選擇	0: 段速加減速時間由加減速時間 1~4 設定 1: 段速加減速時間獨立設定	0	-	O	O	O	
05-01	第 0 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
05-02	保留							
05-03	保留							
05-04	保留							
05-05	保留							
05-06	保留							
05-07	保留							
05-08	保留							
05-09	保留							
05-10	保留							
05-11	保留							
05-12	保留							
05-13	保留							
05-14	保留							
05-15	保留							
05-16	保留							
05-17	多段速 0 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-18	多段速 0 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-19	多段速 1 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-20	多段速 1 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-21	多段速 2 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-22	多段速 2 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-23	多段速 3 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-24	多段速 3 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-25	多段速 4 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-26	多段速 4 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-27	多段速 5 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-28	多段速 5 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-29	多段速 6 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-30	多段速 6 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-31	多段速 7 加速時間設定	0.1~6000.0	10.0	s	O	O	O	

群組 05 多段速功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
05-32	多段速 7 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-33	多段速 8 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-34	多段速 8 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-35	多段速 9 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-36	多段速 9 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-37	多段速 10 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-38	多段速 10 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-39	多段速 11 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-40	多段速 11 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-41	多段速 12 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-42	多段速 12 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-43	多段速 13 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-44	多段速 13 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-45	多段速 14 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-46	多段速 14 減速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-47	多段速 15 加速時間設定	0.1~6000.0	10.0	s	O	O	O	
05-48	多段速 15 減速時間設定	0.1~6000.0	10.0	s	O	O	O	

群組 06 自動運轉功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
06-00	自動運轉模式選擇	0: 無效 1: 執行單一週期運轉模式，停止後會由停止前的速度繼續運轉 2: 連續週期運轉模式，停止後會由停止前的速度繼續運轉 3: 單一週期結束後，以最後一段運轉速度繼續運轉，停止後會由停止前的速度繼續運轉 4: 執行單一週期運轉模式，停止後會從第一段速起開始運轉 5: 連續週期運轉模式，停止後會從第一段速起開始運轉 6: 單一週期結束後，以最後一段運轉速度繼續運轉，停止後會從第一段速起開始運轉	0	-	O	O	X	
06-01	第 1 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-02	第 2 段速頻率設定	0.00~400.00	10.00	Hz	O	O	O	*1
06-03	第 3 段速頻率設定	0.00~400.00	20.00	Hz	O	O	O	*1
06-04	第 4 段速頻率設定	0.00~400.00	30.00	Hz	O	O	O	*1
06-05	第 5 段速頻率設定	0.00~400.00	40.00	Hz	O	O	O	*1
06-06	第 6 段速頻率設定	0.00~400.00	50.00	Hz	O	O	O	*1
06-07	第 7 段速頻率設定	0.00~400.00	50.00	Hz	O	O	O	*1
06-08	第 8 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-09	第 9 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-10	第 10 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-11	第 11 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-12	第 12 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-13	第 13 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-14	第 14 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-15	第 15 段速頻率設定	0.00~400.00	5.00	Hz	O	O	O	*1
06-16	第 0 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-17	第 1 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1

群組 06 自動運轉功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
06-18	第 2 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-19	第 3 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-20	第 4 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-21	第 5 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-22	第 6 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-23	第 7 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-24	第 8 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-25	第 9 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-26	第 10 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-27	第 11 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-28	第 12 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-29	第 13 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-30	第 14 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-31	第 15 段運轉時間設定	0.0~6000.0	0.0	s	O	O	X	*1
06-32	第 0 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-33	第 1 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-34	第 2 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-35	第 3 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-36	第 4 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-37	第 5 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-38	第 6 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-39	第 7 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-40	第 8 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-41	第 9 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-42	第 10 段運轉方向選擇	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	
06-43	第 11 段運轉方	0: 停止 1: 正轉 2: 反轉	0	-	O	O	X	

群組 06 自動運轉功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
	向選擇							
06-44	第 12 段運轉方向選擇	0: 停止　1: 正轉　2: 反轉	0	-	O	O	X	
06-45	第 13 段運轉方向選擇	0: 停止　1: 正轉　2: 反轉	0	-	O	O	X	
06-46	第 14 段運轉方向選擇	0: 停止　1: 正轉　2: 反轉	0	-	O	O	X	
06-47	第 15 段運轉方向選擇	0: 停止　1: 正轉　2: 反轉	0	-	O	O	X	

群組 07 運轉停止功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
07-00	瞬停再啓動選擇	0:瞬停再啓動無效 1:瞬停再啓動有效	0	-	O	O	O	
07-01	自動復歸再啓動時間	0~7200	0	s	O	O	O	
07-02	自動復歸再啓動次數	0~10	0	-	O	O	O	
07-03	保留							
07-04	保留							
07-05	保留							
07-06	直流煞車啓動頻率	0.0~10.0	0.5	Hz	O	O	X	
07-07	直流煞車電流準位	0~100	50	%	O	O	X	
07-08	停止時直流制動時間	0.00~10.00	0.50	s	O	O	X	
07-09	停止模式選擇	0: 減速停止 1: 自由運轉停止 2: 全領域直流煞車停止 3: 有計時器的自由運轉停止	0	-	O	O	O	
07-10	保留							
07-11	保留							
07-12	保留							
07-13	低壓檢測準位	200V: 150~210 400V: 300~420	190 380	V	O	O	O	
07-14	預激磁時間	0.00~10.00	2.00	s	X	O	X	
07-15	預激磁準位	100~200	100	%	X	O	X	
07-16	啓動時直流制動時間	0.00~10.00	0.00	s	O	O	X	
07-17	保留							
07-18	最小遮斷時間	0.1~5.0	-	Sec	O	O	O	
07-19	轉向尋找電流	0~100	50	%	O	O	O	
07-20	速度尋找電流	0~100	20	%	O	O	O	
07-21	速度尋找積分時間	0.1~10.0	2.0	Sec	O	O	O	
07-22	速度尋找延遲時間	0.0~20.0	0.2	Sec	O	O	O	
07-23	電壓回復時間	0.1~5.0	2.0	Sec	O	O	O	
07-24	雙向速度尋找選擇	0: 無效 1: 有效	0	-	O	O	O	
07-25	低壓檢測時間	0.00~1.00	0.00	Sec	O	O	O	
07-26	機械煞車選擇	0: 無效 1: 有效	0	-	X	O	O	
07-27	SLV 故障後啓動方式選擇	0: 速度尋找啓動 1: 正常啓動	0	-	X	O	O	
07-28	遮斷後啓動方式選擇	0: 速度尋找啓動 1: 正常啓動	0	-	O	O	X	

群組 08 保護功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
08-00	失速防止功能	xxx0b: 加速時失速防止有效 xxx1b: 加速時失速防止無效 xx0xb: 減速時失速防止有效 xx1xb: 減速時失速防止無效 x0xxb: 運轉中失速防止有效 x1xxb: 運轉中失速防止無效 0xxxb: 運轉中失速防止依據減速時間 1 減速 1xxxb: 運轉中失速防止依據減速時間 2 減速	0000b	-	O	O	O	
08-01	加速失速防止準位	30~200	120	%	O	O	O	
08-02	減速失速防止準位	200V: 330~410 400V: 660~820	395 790	V	O	O	O	
08-03	運轉中失速防止準位	30~200	120	%	O	O	O	
08-04	保留							
08-05	馬達過載(OL1)保護選擇	xxx0b: 馬達過載無效 xxx1b: 馬達過載有效 xx0xb: 馬達過載冷啓動 xx1xb: 馬達過載熱啓動 x0xxb: 標準馬達 x1xxb: 變頻馬達 0xxxb: 保留 1xxxb: 保留	0001b	-	O	O	O	
08-06	過載(OL1)保護動作啓動方式	0:過載保護後停止輸出 1:過載保護後繼續運轉	0	-	O	O	O	
08-07	保留							
08-08	自動穩壓功能(AVR)	0: 有效 1: 無效	0	-	O	O	O	
08-09	輸入欠相保護選擇	0: 無效 1: 有效	0	-	O	O	O	
08-10	輸出欠相保護選擇	0: 無效 1: 有效	0	-	O	O	O	
08-11	保留							
08-12	保留							
08-13	過轉矩檢測選擇	0: 過轉矩偵測無效 1: 到達設定頻率後開始偵測 2: 運轉中即偵測	0	-	O	O	O	
08-14	過轉矩動作選擇	0: 檢出後減速停止 1: 檢出後顯示警告，繼續運轉 2: 檢出後自由運轉停止	0	-	O	O	O	
08-15	過轉矩檢測準位	0~300	150	%	O	O	O	
08-16	過轉矩檢測時間	0.0~10.0	0.1	Sec	O	O	O	
08-17	低轉矩檢測選擇	0: 低轉矩偵測無效 1: 到達設定頻率後開始偵測	0	-	O	O	O	

群組 08 保護功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
		2: 運轉中即偵測						
08-18	低轉矩動作選擇	0: 檢出後減速停止 1: 檢出後顯示警告，繼續運轉 2: 檢出後自由運轉停止	0	-	O	O	O	
08-19	低轉矩檢測準位	0~300	30	%	O	O	O	
08-20	低轉矩檢測時間	0.0~10.0	0.1	Sec	O	O	O	
08-21	加速失速防止限制	0~100	50	%	O	O	O	
08-22	運轉失速檢測時間	2~100	100	ms	O	O	O	
08-23	接地故障(GF)選擇	0: 無效 1: 有效	0	-	O	O	O	
08-24	外部故障工作選擇	0: 減速停止 1: 自由運轉停止 2: 繼續運轉	0	-	O	O	O	
08-25	外部故障檢測選擇	0: 送電後即偵測 1: 運轉中才即偵測	0	-	O	O	O	
08-26	保留							
08-27	保留							
08-28	保留							
08-29	保留							
08-30	安全機能選擇	0: 減速停止 1: 自由運轉停止	0	-	O	O	O	
08-31	保留							
08-32	保留							
08-33	保留							
08-34	保留							
08-35	馬達過熱故障選擇	0: 無效 1: 減速停止 2: 自由運轉停止	0		O	O	O	
08-36	PTC 輸入濾波時間常數	0.00 ~ 5.00	0.20	Sec	O	O	O	
08-37	風扇控制機能	0: 運轉時啓動 1: 永遠啓動 2: 高溫時啓動	0		O	O	O	
08-38	風扇關閉延遲時間	0~600	60	Sec	O	O	O	
08-39	馬達過熱保護延遲時間	0~300	60	Sec	O	O	O	

群組 09 通訊功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
09-00	變頻器通訊站別	1~31	1	-	O	O	O	*2
09-01	通訊模式選擇	0: MODBUS 1: BACNET 2: METASYS 3: PUMP 並聯通訊	0		O	O	O	
09-02	波特率設定 (bps)	0:1200 1:2400 2:4800 3:9600 4:19200 5:38400	3	-	O	O	O	*2
09-03	停止位元選擇	0: 1 停止位元 1: 2 停止位元	0	-	O	O	O	*2
09-04	奇偶位元選擇	0: 無奇偶位 1: 偶位元選擇 2: 奇位元選擇	0	-	O	O	O	*2
09-05	保留							
09-06	通訊異常檢測時間	0.0~25.5	0.0	S	O	O	O	
09-07	故障停止選擇	0: 通訊故障後依減速時間 1 減速停止 1: 通訊故障後自由運轉停止 2: 通訊故障後依減速時間 2 減速停止 3: 通訊故障後繼續運轉	3	-	O	O	O	
09-08	通訊容錯次數	1~20	1	-	O	O	O	
09-09	等待時間	5~65	5	ms	O	O	O	
09-10	Device Instance Number	1 ~ 254	1		O	O	O	

群組 10 PID 功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
10-00	PID 目標值來源設定	0: 由操作器給定 1:AI1 給定 2:AI2 給定 3:保留 4:10-02 給定 5: RTC	1	-	O	O	O	
10-01	PID 回授值來源設定	1:AI1 給定 2:AI2 給定 3: 保留	2	-	O	O	O	
10-02	PID 目標值	0.0~100.0	0.0	%	O	O	O	
10-03	PID 控制模式	xxx0b: PID 無效 xxx1b: PID 有效 xx0xb: PID 正特性 xx1xb: PID 負特性 x0xxb: PID 誤差值 D 控制 x1xxb: PID 回授值 D 控制 0xxxb: PID 輸出 1xxxb: PID 輸出+目標值	0000b	-	O	O	O	
10-04	回授增益	0.01~10.00	1.00	-	O	O	O	*1
10-05	比例增益(P)	0.00~10.00	3.00	-	O	O	O	*1
10-06	積分時間(I)	0.00~100.00	0.50	s	O	O	O	*1
10-07	微分時間(D)	0.00~10.00	0.00	s	O	O	O	*1
10-08	保留							
10-09	PID 偏壓	-100.0~100.0	0	%	O	O	O	*1
10-10	PID 一次延遲時間	0.00~10.00	0.00	s	O	O	O	*1
10-11	PID 回授斷線檢測	0: 無效 1: 警告 2: 故障	0	-	O	O	O	
10-12	PID 回授斷線檢測準位	0~100	0	%	O	O	O	
10-13	PID 回授斷線檢測時間	0.0~10.0	1.0	s	O	O	O	
10-14	PID 積分限制	0.0~100.0	100.0	%	O	O	O	*1
10-15	保留							
10-16	保留							
10-17	PID 休眠起始頻率	0.00~180.00	30.00	Hz	O	O	O	
10-18	PID 休眠延遲時間	0.0~255.5	0.0	s	O	O	O	
10-19	PID 喚醒起始頻率	0.00~180.00	0.00	Hz	O	O	O	
10-20	PID 喚醒延遲時間	0.0~255.5	0.0	s	O	O	O	
10-21	保留							
10-22	保留							
10-23	PID 限制	0.00~100.0	100.0	%	O	O	O	*1
10-24	PID 輸出增益	0.0~25.0	1.0	-	O	O	O	
10-25	PID 反向輸出選擇	0: 不允許反向輸出 1: 允許反向輸出	0	-	O	O	O	
10-26	PID 目標加/減速時間	0.0~25.5	0.0	s	O	O	O	
10-27	PID 回授顯示偏壓	-99.99~99.99	0.00	-	O	O	O	
10-28	PID 回授顯示增益	0.00~100.00	1.00	-	O	O	O	
10-29	PID 休眠選擇	0: 無效	1	-	O	O	O	

群組 10 PID 功能群組

代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
		1: 有效 2: 由 DI 設定						
10-30	PID 目標上限	0.0 ~ 100.0	100.0	%	O	O	O	
10-31	PID 目標下限	0.0 ~ 100.0	0.0	%	O	O	O	
10-32	PID 切換機能	0: PID1 1: PID2 2: 由 DI 設定 3: RTC 計時器動作時,切換至 PID2	0		O	O	O	
10-33	保留							
10-34	保留							
10-35	保留							
10-36	PID2 比例增益(P)	0.00~10.00	3.00	-	O	O	O	*1
10-37	PID2 積分時間(I)	0.0~100.0	0.50	s	O	O	O	*1
10-38	PID2 微分時間(D)	0.00~10.00	0.00	s	O	O	O	*1

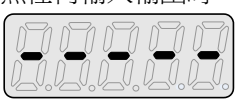
群組 11 輔助功能群組

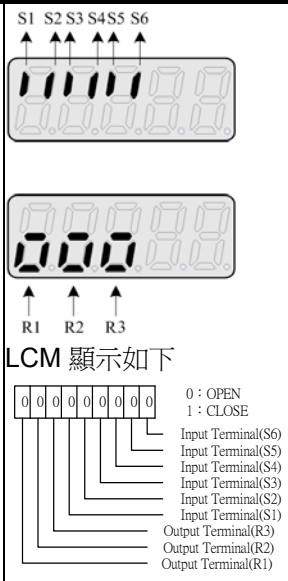
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
11-00	馬達方向鎖定指令	0: 允許正反轉 1: 只允許正轉 2: 只允許反轉	1	-	O	O	O	
11-01	載波頻率	0: 載波隨輸出頻率調整 1: 保留 2~16: 2~16KHz	依馬力數而定	-	O	O	X	
11-02	軟調變選擇	0: 無效 1: 有效	1(V/f) 0(其他)	-	O	O	O	
11-03	自動降載波選擇	0: 無效 1: 有效	0	-	O	X	X	
11-04	加速開始 S 曲線時間設定	0.00~2.50	0.20	s	O	O	O	
11-05	加速結束 S 曲線時間設定	0.00~2.50	0.20	s	O	O	O	
11-06	減速開始 S 曲線時間設定	0.00~2.50	0.20	s	O	O	O	
11-07	減速結束 S 曲線時間設定	0.00~2.50	0.20	s	O	O	O	
11-08	跳躍頻率 1	0.0~400.0	0.0	Hz	O	O	O	
11-09	跳躍頻率 2	0.0~400.0	0.0	Hz	O	O	O	
11-10	跳躍頻率 3	0.0~400.0	0.0	Hz	O	O	O	
11-11	跳躍頻率寬度	0.0~25.5	1.0	Hz	O	O	O	
11-12	手動省能增益	0~100	80	%	O	X	X	
11-13	保留							
11-14	保留							
11-15	保留							
11-16	保留							
11-17	保留							
11-18	手動省能頻率	0.00~400.00	0.00	Hz	O	X	X	

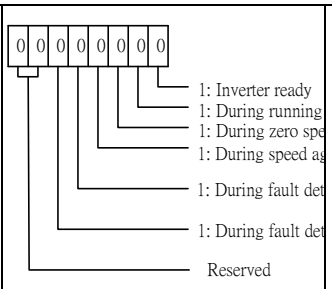
群組 11 輔助功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
11-19	自動省能功能	0:自動省能無效 1:自動省能有效	0	-	O	X	X	
11-20	自動省能濾波時間	0~200	140	ms	O	X	X	
11-21	省能調整電壓上限	0~100	100	%	O	X	X	
11-22	省能調整時間	0~5000	20	ms	O	X	X	*1
11-23	省能偵測準位	0~100	10	%	O	X	X	
11-24	自動省能係數	0.00~655.35	KVA	-	O	X	X	
11-25	保留							
11-26	保留							
11-27	保留							
11-28	保留							
11-29	自動降輸出頻率選擇	0: 無效 1: 有效	0	-	O	X	X	
11-30	可變載波頻率最大限制	2~16	KVA	KHz	O	X	X	
11-31	可變載波頻率最小限制	2~16	KVA	KHz	O	X	X	
11-32	可變載波頻率增益	00~99	00	-	O	X	X	
11-33	保留							
11-34	保留							
11-35	保留							
11-36	保留							
11-37	保留							
11-38	保留							
11-39	保留							
11-40	保留							
11-41	參考頻率消失檢測選擇	0: 參考頻率消失時，減速停止 1: 參考頻率消失時，依 11-42 的設定運轉	0	-	O	O	O	
11-42	參考頻率消失時的頻率命令	0.0~100.0	80.0	%	O	O	O	
11-43	啓動時鎖定頻率	0.0~400.0	0.0	Hz	O	O	O	
11-44	啓動時頻率鎖定時間	0.0~10.0	0.0	s	O	O	O	
11-45	停止時鎖定頻率	0.0~400.0	0.0	Hz	O	O	O	
11-46	停止時頻率鎖定時間	0.0~10.0	0.0	s	O	O	O	
11-47	KEB 減速時間	0.0~25.5	0.0	s	O	X	X	*1
11-48	KEB 檢測準位	200V: 190~210 400V: 380~420	200 400	V	O	X	X	
11-49	保留							
11-50	保留							
11-51	零速煞車選擇	0: 零速直流煞車無效 1: 零速直流煞車有效	0	-	O	X	X	
11-52	保留							
11-53	保留							
11-54	輸出 KWHr 初始	0: 不清除輸出 KWHr 1: 清除輸出 KWHr	0	-	O	O	O	*1
11-55	STOP 鍵選擇	0: 運轉指令不由操作器提供時，停止鍵無效	1	-	O	O	O	

群組 11 輔助功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
		1: 運轉指令不由操作器提供時，停止鍵有效						
11-56	UP/DOWN 選擇	0: 操作器 UP/DOWN 無效，修改頻率後需按 ENTER 才有效 1: 操作器 UP/DOWN 有效，修改頻率後立刻有效	0	-	O	O	O	
11-57	保留							
11-58	記錄參考頻率	0: 無效 1: 有效	0	-	O	O	O	*1

KVA:該參數會隨著不同變頻器的容量大小而不同

群組 12 監視功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
12-00	顯示畫面選擇	00000~77777 由最左位數起，依序爲按 DSP 鍵後會顯示的畫面 0:不顯示 1:輸出電流 2:輸出電壓 3:DC bus 電壓 4:heatsink 溫度 5:PID 回授 6:AI1 值 7:AI2 值	00000	-	O	O	O	*5
12-01	PID 回授顯示模式	0:以整數顯示反饋值(xxx) 1:以小數點 1 位顯示反饋值(xx.x) 2:以小數點 2 位顯示反饋值(x.xx)	0		O	O	O	*5
12-02	PID 回授顯示單位設定	0:xxxxx (無單位) 1:xxxPb(壓力) 2:xxxFL(流量)	0		O	O	O	*5
12-03	線速度顯示	0~65535	0		O	O	O	*5
12-04	線速度顯示模式	0:顯示變頻器輸出頻率 1:以整數顯示線速度(xxxxx) 2:以小數點 1 位元顯示線速度(xxxx.x) 3:以小數點 2 位元顯示線速度(xxx.xx) 4:以小數點 3 位元顯示線速度(xx.xxx)	0		O	O	O	*5
12-05	顯示數位輸入端子狀態 (LED/LCD)	LED 顯示如下 無任何輸入輸出時  有輸入輸出時之對應	-	-	O	O	O	

群組 12 監視功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
								
12-06	保留							
12-07	保留							
12-08	保留							
12-09	保留							
12-10	保留							
12-11	目前故障時之輸出電流	顯示目前故障時的輸出電流	-	A	O	O	O	
12-12	目前故障時之輸出電壓	顯示目前故障時的輸出電壓	-	V	O	O	O	
12-13	目前故障時之輸出頻率	顯示目前故障時的輸出頻率	-	Hz	O	O	O	
12-14	目前故障時之直流電壓	顯示目前故障時的直流電壓	-	V	O	O	O	
12-15	目前故障時之頻率命令	顯示目前故障時的頻率命令	-	Hz	O	O	O	
12-16	頻率命令	LED 進入此參數時，只允許監控頻率命令	-	Hz	O	O	O	
12-17	輸出頻率	顯示目前的輸出頻率	-	Hz	O	O	O	
12-18	輸出電流	顯示目前的輸出電流	-	A	O	O	O	
12-19	輸出電壓	顯示目前的輸出電壓	-	V	O	O	O	
12-20	直流電壓(Vdc)	顯示目前的直流電壓	-	V	O	O	O	
12-21	輸出功率 (kw)	顯示目前的輸出功率	-	kW	O	O	O	
12-22	馬達速度 (rpm)	顯示目前的馬達速度 VF 模式時 馬達速度 = 輸出頻率 x $\frac{120}{\text{馬達極數}}$ 其他模式下，會顯示估測的馬達轉速	-	rpm	O	O	O	
12-23	輸出功率因素 (Pfo)	顯示目前的輸出功因	-	-	O	O	O	
12-24	控制模式	顯示控制模式 0：VF 2：SLV 5：PM SLV	-	-	O	O	O	

群組 12 監視功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
12-25	AI1 輸入	顯示目前的 AI1 輸入 (0V 對應 0%, 10V 對應 100%,)	-	%	O	O	O	
12-26	AI2 輸入	顯示目前的 AI2 輸入 (0V 或 4mA 對應 0%, 10V 或 20mA 對應 100%)	-	%	O	O	O	
12-27	轉矩命令	顯示目前的轉矩命令 (100% 對應馬達轉矩)	-	%	X	O	O	
12-28	馬達轉矩電流 (Iq)	顯示目前的 q 軸電流	-	%	X	O	O	
12-29	馬達激磁電流 (Id)	顯示目前的 d 軸電流	-	%	X	O	O	
12-30	保留							
12-31	保留							
12-32	保留							
12-33	保留							
12-34	保留							
12-35	保留							
12-36	PID 控制輸入	顯示 PID 控制器的誤差輸入 (PID 目標值 – PID 回授) (100% 對應 01-02 或 01-16 設定的最大頻率)	0.01	%	O	O	O	
12-37	PID 輸出	顯示 PID 控制器的輸出 (100% 對應 01-02 或 01-16 設定的最大頻率)	-	%	O	O	O	
12-38	PID 設定	顯示 PID 控制器的目標值 (100% 對應 01-02 或 01-16 設定的最大頻率)	-	%	O	O	O	
12-39	PID 回授	顯示 PID 控制器的回授值 (100% 對應 01-02 或 01-16 設定的最大頻率)	-	%	O	O	O	
12-40	保留							
12-41	散熱片溫度	顯示散熱片或 IGBT 的溫度	-	℃	O	O	O	
12-42	保留							
12-43	變頻器狀態		-	-	O	O	O	
12-44	保留							
12-45	最近故障訊息	顯示目前故障的訊息	-	-	O	O	O	
12-46	前一次故障訊息	顯示前一次故障的訊息	-	-	O	O	O	
12-47	前二次故障訊息	顯示前二次故障的訊息	-	-	O	O	O	
12-48	前三次故障訊息	顯示前三次故障的訊息	-	-	O	O	O	
12-49	前四次故障訊息	顯示前四次故障的訊息	-	-	O	O	O	
12-50	目前故障時之 DI/DO 狀態	顯示目前故障的 DI/DO 狀態，說明如同 12-05	-	-	O	O	O	
12-51	目前故障時之變頻	顯示目前故障時的變頻器狀	-	-	O	O	O	

群組 12 監視功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
	器狀態	態， 說明如同 12-43						
12-52	目前故障時之跳脫時間 1	顯示目前故障時的運轉時間，12-53 爲其天數，12-52 爲其不滿一天的小時數	-	Hr	O	O	O	
12-53	目前故障時之跳脫時間 2		-	day	O	O	O	
12-54	前一次故障頻率命令	顯示上一次故障時的頻率命令	-	Hz	O	O	O	
12-55	前一次故障輸出頻率	顯示上一次故障時的輸出頻率	-	Hz	O	O	O	
12-56	前一次故障輸出電流	顯示上一次故障時的輸出電流	-	A	O	O	O	
12-57	前一次故障輸出電壓	顯示上一次故障時的輸出電壓	-	V	O	O	O	
12-58	前一次故障直流電壓	顯示上一次故障時的直流電壓	-	V	O	O	O	
12-59	前一次故障 DI/DO 狀態	顯示上一次故障的 DI/DO 狀態，說明如同 12-05	-	-	O	O	O	
12-60	前一次故障變頻器狀態	顯示上一次故障時的變頻器狀態，說明如同 12-43	-	-	O	O	O	
12-61	上一次故障時之跳脫時間 1	顯示上一次故障時的運轉時間，12-62 爲其天數，12-61 爲其不滿一天的小時數	-	Hr	O	O	O	
12-62	上一次故障時之跳脫時間 2		-	day	O	O	O	
12-63	最近警告訊息	顯示目前的警告訊息	-	-	O	O	O	
12-64	前一次警告訊息	顯示前一次的警告訊息	-	-	O	O	O	
12-65	保留							
12-66	保留							
12-67	累計能量(kWHr)	0.0 ~ 999.9		kWHr	O	O	O	
12-68	累計能量(MWHr)	0 ~ 60000		MWHr	O	O	O	
12-69	累計電費($)	0 ~ 9999		$	O	O	O	
12-70	累計電費(10000$)	0 ~ 60000		$	O	O	O	
12-71	流量計	1 ~ 50000		GPM	O	O	O	
12-72	RTC 日期	12.01.01 ~ 99.12.31	12.01.01		O	O	O	
12-73	RTC 時間	00:00 ~ 23:59	00:00		O	O	O	
12-74	工作壓力設定	0.01 ~ 25.50	2.00	PSI	O	X	X	
12-75	最大壓力設定	0.01 ~ 25.50	10.00	PSI	O	X	X	

註:參數 12-22 馬達速度(rpm)最大上限爲 65535

群組 13 維護功能群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
13-00	變頻器馬力數	----	-	-	O	O	O	*4
13-01	軟體版本	0.0-9.9	-	-	O	O	O	*4
13-02	保留							
13-03	累計工作時間 1	0~23	-	hr	O	O	O	*4
13-04	累計工作時間 2	0~65535	-	day	O	O	O	*4
13-05	累計工作時間選擇	0：通電時累積時間 1：運轉時累積時間	0	-	O	O	O	*1
13-06	參數鎖定	0：13-06 之外的所有參數不可寫 1：只能用使用者參數 2：所有參數可寫	2	-	O	O	O	*1
13-07	參數密碼功能	0~9999	0	-	O	O	O	
13-08	恢復出廠設定	0：不初始化 2：2 線式初始化 (220/440V, 60Hz) 3：3 線式初始化 (220/440V, 60Hz) 4：2 線式初始化 (230/415V, 50Hz) 5：3 線式初始化 (230/415V, 50Hz) 6：2 線式初始化 (200/380V, 50Hz) 7：3 線式初始化 (200/380V, 50Hz) 8：PLC 初始化 其他：保留	0	-	O	O	O	
13-09	故障履歷清除功能	0：不清除故障履歷 1：清除故障履歷	0	-	O	O	O	*1
13-10	密碼功能 2	0 ~ 9999	0		O	O	O	

群組 14 PLC 設定群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
14-00	T1 設定值 1	0~9999	0	-	O	O	O	
14-01	T1 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-02	T2 設定值 1	0~9999	0	-	O	O	O	
14-03	T2 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-04	T3 設定值 1	0~9999	0	-	O	O	O	
14-05	T3 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-06	T4 設定值 1	0~9999	0	-	O	O	O	
14-07	T4 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-08	T5 設定值 1	0~9999	0	-	O	O	O	
14-09	T5 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-10	T6 設定值 1	0~9999	0	-	O	O	O	
14-11	T6 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-12	T7 設定值 1	0~9999	0	-	O	O	O	
14-13	T7 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-14	T8 設定值 1	0~9999	0	-	O	O	O	
14-15	T8 設定值 2（模式 7）	0~9999	0	-	O	O	O	
14-16	C1 設定值	0~65535	0	-	O	O	O	
14-17	C2 設定值	0~65535	0	-	O	O	O	
14-18	C3 設定值	0~65535	0	-	O	O	O	
14-19	C4 設定值	0~65535	0	-	O	O	O	
14-20	C5 設定值	0~65535	0	-	O	O	O	
14-21	C6 設定值	0~65535	0	-	O	O	O	
14-22	C7 設定值	0~65535	0	-	O	O	O	
14-23	C8 設定值	0~65535	0	-	O	O	O	
14-24	AS1 設定值 1	0~65535	0	-	O	O	O	
14-25	AS1 設定值 2	0~65535	0	-	O	O	O	
14-26	AS1 設定值 3	0~65535	0	-	O	O	O	
14-27	AS2 設定值 1	0~65535	0	-	O	O	O	
14-28	AS2 設定值 2	0~65535	0	-	O	O	O	
14-29	AS2 設定值 3	0~65535	0	-	O	O	O	
14-30	AS3 設定值 1	0~65535	0	-	O	O	O	
14-31	AS3 設定值 2	0~65535	0	-	O	O	O	
14-32	AS3 設定值 3	0~65535	0	-	O	O	O	
14-33	AS4 設定值 1	0~65535	0	-	O	O	O	
14-34	AS4 設定值 2	0~65535	0	-	O	O	O	
14-35	AS4 設定值 3	0~65535	0	-	O	O	O	
14-36	MD1 設定值 1	0~65535	1	-	O	O	O	
14-37	MD1 設定值 2	0~65535	1	-	O	O	O	
14-38	MD1 設定值 3	0~65535	1	-	O	O	O	
14-39	MD2 設定值 1	0~65535	1	-	O	O	O	
14-40	MD2 設定值 2	0~65535	1	-	O	O	O	

群組 14 PLC 設定群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
14-41	MD2 設定值 3	0~65535	1	-	O	O	O	
14-42	MD3 設定值 1	0~65535	1	-	O	O	O	
14-43	MD3 設定值 2	0~65535	1	-	O	O	O	
14-44	MD3 設定值 3	0~65535	1	-	O	O	O	
14-45	MD4 設定值 1	0~65535	1	-	O	O	O	
14-46	MD4 設定值 2	0~65535	1	-	O	O	O	
14-47	MD4 設定值 3	0~65535	1	-	O	O	O	

群組 15 PLC 監控群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
15-00	T1 目前值 1	0~9999	0	-	O	O	O	
15-01	T1 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-02	T2 目前值 1	0~9999	0	-	O	O	O	
15-03	T2 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-04	T3 目前值 1	0~9999	0	-	O	O	O	
15-05	T3 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-06	T4 目前值 1	0~9999	0	-	O	O	O	
15-07	T4 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-08	T5 目前值 1	0~9999	0	-	O	O	O	
15-09	T5 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-10	T6 目前值 1	0~9999	0	-	O	O	O	
15-11	T6 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-12	T7 目前值 1	0~9999	0	-	O	O	O	
15-13	T7 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-14	T8 目前值 1	0~9999	0	-	O	O	O	
15-15	T8 目前值 2（模式 7）	0~9999	0	-	O	O	O	
15-16	C1 目前值	0~65535	0	-	O	O	O	
15-17	C2 目前值	0~65535	0	-	O	O	O	
15-18	C3 目前值	0~65535	0	-	O	O	O	
15-19	C4 目前值	0~65535	0	-	O	O	O	
15-20	C5 目前值	0~65535	0	-	O	O	O	
15-21	C6 目前值	0~65535	0	-	O	O	O	
15-22	C7 目前值	0~65535	0	-	O	O	O	
15-23	C8 目前值	0~65535	0	-	O	O	O	
15-24	AS1 計算結果	0~65535	0	-	O	O	O	
15-25	AS2 計算結果	0~65535	0	-	O	O	O	
15-26	AS3 計算結果	0~65535	0	-	O	O	O	
15-27	AS4 計算結果	0~65535	0	-	O	O	O	
15-28	MD1 計算結果	0~65535	0	-	O	O	O	

群組 15 PLC 監控群組								
代碼	參數名稱	範圍	出廠設定	單位	控制模式			屬性
					V/F	SLV	PM SLV	
15-29	MD2 計算結果	0~65535	0	-	O	O	O	
15-30	MD3 計算結果	0~65535	0	-	O	O	O	
15-31	MD4 計算結果	0~65535	0	-	O	O	O	
15-32	TD 目前值	0~65535	0	-	O	O	O	

群組 16 LCM 功能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
16-00	主螢幕監看	5~75 使用 LCM 操作器時，第一行顯示的監控項目 (初始值爲頻率指令)	16	-	O	O	O	*1
16-01	子螢幕監看 1	5~75 使用 LCM 操作器時，第二行顯示的監控項目 (初始值爲輸出頻率)	17	-	O	O	O	*1
16-02	子螢幕監看 2	5~75 使用 LCM 操作器時，第三行顯示的監控項目 (初始值爲輸出電流)	18	-	O	O	O	*1
16-03	顯示單位選擇	0~39999 決定頻率指令顯示的方式及單位 0：頻率顯示單位爲 0.01Hz 1：頻率顯示單位爲 0.01% 2~38：rpm，設定數字代表馬達極數 40~9999： 使用者指定格式，輸入 0XXXX 表示 100%時的顯示爲 XXXX 10001~19999： 使用者指定格式，輸入 1XXXX 表示 100%時的顯示爲 XXX.X 20001~29999： 使用者指定格式，輸入 2XXXX 表示 100%時的顯示爲 XX.XX 30001~39999： 使用者指定格式，輸入 3XXXX 表示 100%時的顯示爲 X.XXX	0	-	O	O	O	
16-04	工程單位選擇	0：不使用工程單位 1：FPM 2：CFM 3：PSI 4：GPH 5：GPM	0	-	O	O	X	

群組 16 LCM 功能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
		6：IN						
		7：FT						
		8：/s						
		9：/m						
		10：/h						
		11：°F						
		12：inW						
		13：HP						
		14：m/s						
		15：MPM						
		16：CMM						
		17：W						
		18：KW						
		19：m						
		20：°C						
16-05	LCD 背光	0~7	5	-	O	O	O	*1
16-06	自動退回時間	0~120	60	Sec	O	O	O	*1
16-07	複製功能選擇	0：不進行參數複製 1：讀取變頻器參數，存至操作器 2：將操作器參數寫入變頻器 3：比對變頻器和操作器參數	0	-	O	O	O	
16-08	允許讀取選擇	0：不允許讀取變頻器參數，存至操作器 1：允許讀取變頻器參數，存至操作器	0	-	O	O	O	
16-09	操作器斷線選擇	0: LCD 操作器斷線時繼續運轉 1: LCD 操作器斷線時顯示故障停止	0	-	O	O	O	*1
16-10	RTC 時間顯示設定	0: 隱藏 1: 顯示	0		O	O	O	
16-11	RTC 日期設定	12.01.01 ~ 99.12.31	12.01.01		O	O	O	
16-12	RTC 時間設定	00:00 ~ 23:59	00:00		O	O	O	
16-13	RTC 計時器機能	0: 無效 1: 有效 2: 依 DI 設定	0		O	O	O	
16-14	P1 啓始時間	00:00 ~ 23:59	08:00		O	O	O	
16-15	P1 結束時間	00:00 ~ 23:59	18:00		O	O	O	
16-16	P1 啓始日	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-17	P1 結束日		5		O	O	O	
16-18	P2 啓始時間	00:00 ~ 23:59	08:00		O	O	O	
16-19	P2 結束時間	00:00 ~ 23:59	18:00		O	O	O	
16-20	P2 啓始日	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-21	P2 結束日		5		O	O	O	
16-22	P3 啓始時間	00:00 ~ 23:59	08:00		O	O	O	
16-23	P3 結束時間	00:00 ~ 23:59	18:00		O	O	O	

群組 16 LCM 功能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
16-24	P3 啓始日	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-25	P3 結束日		5		O	O	O	
16-26	P4 啓始時間	00:00 ~ 23:59	08:00		O	O	O	
16-27	P4 結束時間	00:00 ~ 23:59	18:00		O	O	O	
16-28	P4 啓始日	1:Mon,2:Tue,3:Wed, 4:Thu,:5:Fri,:6:Sat, 7:Sun	1		O	O	O	
16-29	P4 結束日		5		O	O	O	
16-30	RTC 偏移選擇	0: 無效 1: 有效 2: 依 DI 設定	0		O	O	O	
16-31	RTC 偏移時間設定	00:00 ~ 23:59	00:00	-	O	O	O	
16-32	計時器 1 來源	0:無,1:P1, 2:P2,3:P1+P2 4:P3,5:P1+P3, 6:P2+P3,7:P1+P2+P3, 8:P4,9:P1+P4, 10:P2+P4, 11:P1+P2+P4 12:P3+P4 13:P1+P3+P4, 14:P2+P3+P4 15:P1+P2+P3+P4, 16:Off,17:Off+P1 18:Off+P2, 19:Off+P1+P2 20:Off+P3, 21:Off+P1+P3 22:Off+P2+P3 23:Off+P1+P2+P3 24:Off+P4 25:Off+P1+P4 26:Off+P2+P4 27:Off+P1+P2+P4 28:Off+P3+P4 29:Off+P3+P4 30:Off+P2+P3+P4 31:Off+P1+P2+P3+P4	1		O	O	O	
16-33	計時器 2 來源		2		O	O	O	
16-34	計時器 3 來源		4		O	O	O	
16-35	計時器 4 來源		8		O	O	O	
16-36	RTC 速度選擇	0: 關閉 1: 由計時器 1 選擇 2: 由計時器 2 選擇 3: 由計時器 3 選擇 4: 由計時器 4 選擇 5.: 由計時器 1+2 選擇	0		O	O	O	
16-37	RTC 運轉方向選擇	xxx0b: RTC Run1 正轉 xxx1b: RTC Run1 反轉 xx0xb: RTC Run2 正轉 xx1xb: RTC Run2 反轉 x0xxb: RTC Run3 正轉 x1xxb: RTC Run3 反轉 0xxxb: RTC Run4 正轉 1xxxb: RTC Run4 反轉			O	O	O	

群組 17 IM 馬達自動調校功能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
17-00	自動調校模式選擇	0：旋轉自動調校 1：靜止自動調校 2：定子電阻量測 3：保留 4：迴路調校	VF:2, SLV:0	-	O	O	X	
17-01	馬達額定輸出功率	0.00~600.00	-	KW	O	O	X	
17-02	馬達額定電流	0.1~999.9	-	A	O	O	X	
17-03	馬達額定電壓	200V: 0.0~255.0 400V:0.0~510.0	220 440	V	O	O	X	
17-04	馬達額定頻率	10.0~400.0	60.0	Hz	O	O	X	
17-05	馬達額定速度	0~24000	KVA	rpm	O	O	X	
17-06	馬達極數	2,4,6,8	4	Pole	O	O	X	
17-07	保留							
17-08	馬達無載電壓	200V: 50~240 400V100~480	KVA	V	O	O	X	
17-09	馬達激磁電流	0.01~600.00	KVA	A	O	O	X	
17-10	自動調校啓動	0: 無效 1: 有效	0	-	O	O	X	
17-11	自動調校錯誤履歷	0: 無誤 1: 馬達資料錯誤 2. 定子電阻調校錯誤 3. 漏感調校錯誤 4. 轉子電阻調校錯誤 5. 互感調校錯誤 6. 保留 7. DT 錯誤 8. 馬達加速錯誤 9. 警告	0	-	O	O	X	

KVA:該參數會隨著不同變頻器的容量大小而不同

群組 18 滑差補償功能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
18-00	低速滑差補償增益	0.00~2.50	VF:0.00 SLV: 1.0	-	O	O	X	*1
18-01	高速滑差補償增益	-1.00~1.00	0.0	-	O	O	X	*1
18-02	滑差補償限制	0~250	200	%	O	X	X	
18-03	滑差補償濾波時間	0.0~10.0	1.0	Sec	O	X	X	
18-04	回昇滑差補償選擇	0：無效 1：有效	0	-	O	X	X	
18-05	FOC 延遲時間	1~1000	100	ms	X	O	X	
18-06	FOC 增益	0.00~2.00	0.1	-	X	O	X	

群組 19 保留

群組 20 速度控制功能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
20-00	ASR 增益 1	0.00~250.00	3.00	-	X	O	O	*1
20-01	ASR 積分時間 1	0.001~10.000	SLV: 0.500 PMSLV: 0.08,	Sec	X	O	O	*1
20-02	ASR 增益 2	0.00~250.00	3.00	-	X	O	O	*1
20-03	ASR 積分時間 2	0.001~10.000	SLV: 0.500 PMSLV: 0.08,	Sec	X	O	O	*1
20-04	ASR 積分時間限制	0~300	200	%	X	O	O	
20-05	保留							
20-06	保留							
20-07	加減速 P/PI 選擇	0：PI 速度控制只在定速時有效；加減速時只使用 P 控制 1：PI 速度控制在定速及加減速都有效	1	-	X	O	X	
20-08	ASR 延遲時間	0.000~0.500	0.004	Sec	X	O	X	
20-09	速度觀測增益 1	0.00~2.55	0.61	-	X	O	X	*1
20-10	速度觀測積分時間 1	0.01~10.00	0.05	Sec	X	O	X	*1
20-11	速度觀測增益 2	0.00~2.55	0.61	-	X	O	X	*1
20-12	速度觀測積分時間 2	0.01~10.00	0.06	Sec	X	O	X	*1
20-13	速度回授低通濾波常數 1	1~1000	4	ms	X	O	X	
20-14	速度回授低通濾波常數 2	1~1000	30	ms	X	O	X	
20-15	ASR 增益改變頻率 1	0.0~400.0	4.0	Hz	X	O	X	
20-16	ASR 增益改變頻率 2	0.0~400.0	8.0	Hz	X	O	X	
20-17	低速轉矩補償增益	0.00~2.50	1.00	-	X	O	X	*1
20-18	高速轉矩補償增益	-10~10	0	%	X	O	X	*1

KVA:該參數會隨著不同變頻器的容量大小而不同

群組 21 轉矩控制功能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
21-00	保留							
21-01	保留							
21-02	保留							
21-03	保留							
21-04	保留							
21-05	正轉矩限制	0~160	160	%	X	O	O	
21-06	負轉矩限制	0~160	160	%	X	O	O	
21-07	正轉回昇轉矩限制	0~160	160	%	X	O	O	
21-08	反轉回昇轉矩限制	0~160	160	%	X	O	O	

群組 22 PM 馬達群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
22-00	PM 馬達額定功率	0.00~600.00	-	kW	X	X	O	
22-01	PM 馬達額定電壓	200V: 50.0~240.0 400V: 100.0~480.0	220.0 440.0	V	X	X	O	
22-02	PM 馬達額定電流	0.1~999.9	KVA	A	X	X	O	
22-03	PM 馬達極數	2~96	6	poles	X	X	O	
22-04	PM 馬達額定轉速	0~60000 (22-04, 22-06 只要設定其中之一即可，程式會自動計算另一個)	1500	rpm	X	X	O	
22-05	PM 馬達最大轉速	0~60000	1500	rpm	X	X	O	
22-06	PM 馬達頻率	0.0~400.0	75.0	Hz	X	X	O	
22-07	PM 馬達型式	0: SPM 1: IPM	0	-	X	X	O	
22-08	保留							
22-09	PM SLV 啓動模式	0: 強迫啓動 1: 靜止啓動	0	-	X	X	O	
22-10	PM SLV 啓動電流	0 ~ 120% 馬達額定電流	50	%	X	X	O	
22-11	直流注入電流	0 ~ 100% 馬達額定電流	40	%	X	X	O	
22-12	PM SLV 啓動磁場電流	0 ~ 200% 馬達額定電流	50	%	X	X	O	
22-13	速度估測增益	4~16	8	-	X	X	O	
22-14	PM 電樞電阻	0.001 ~ 32.767	1.000	Ω	X	X	O	
22-15	PM 馬達 D 軸電感	0.001 ~ 32.767	0	mH	X	X	O	
22-16	PM 馬達 Q 軸電感	0.001 ~ 32.767	0	mH	X	X	O	
22-17	PM EMF 常數	0.001 ~ 32.767	0.001	mV/rad/s	X	X	O	
22-18	保留							
22-19	保留							
22-20	磁極偏移角	0~360	0	度	X	X	O	
22-21	SLV PM 馬達調校	0: 不進行 PM 馬達調適 1: Self Sensing	0	-	X	X	O	
22-22	SLV PM 馬達調校故障履歷	0: 無誤 1: 迴路調整時，電流異常 2: 保留 3: 保留 4: 保留 5: 保留 6: 保留 7: 保留 8: 保留 9: 迴路調整電流異常 10: 保留 11: 定子電阻量測逾時 12: 保留	0	--	X	X	O	*4

群組 23 泵浦與 HVAC 機能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
23-00	機能選擇	0: 無效 1: 泵浦選擇 2: HVAC 選擇	0	-	O	O	O	
23-01	單多泵浦及主副機設定	0: 單 Pump 1: 主機 2: 副機 1 3: 副機 2 4: 副機 3	0		O	X	X	
23-02	工作壓力設定	0.01 ~ 25.50	2.00	PSI	O	X	X	
23-03	最大壓力設定	0.01 ~ 25.50	10.00	PSI	O	X	X	
23-04	壓力命令來源	0: 由 23-02 參數設定 1: 由 AI 設定	200	0	O	X	X	
23-05	顯示方式選擇	0: 顯示目標壓力及回授壓力(若配合 LED 操作器,23-03 需小於 9.9PSI) 1. 僅顯示目標壓力 2. 僅顯示回授壓力	5.0	%	O	X	X	
23-06	比例增益(P)	0.00~10.00	3.00	-	O	X	X	
23-07	積分時間(I)	0.0~100.0	0.5	Sec	O	X	X	
23-08	微分時間(D)	0.00~10.00	0.00	Sec	O	X	X	
23-09	恆壓誤差範圍	0.10 ~ 25.50	0.50	PSI	O	X	X	
23-10	恆壓休眠頻率	0.00 ~ 180.00	0.00	Hz	O	X	X	
23-11	恆壓休眠時間	0.0 ~ 255.5	0.0	Sec	O	X	X	
23-12	最大壓力限制	0.00 ~ 25.50	5.00	PSI	O	X	X	
23-13	高壓警告時間	0.0 ~ 600.0	10.0	Sec	O	X	X	
23-14	高壓停機時間	0.0 ~ 600.0	20.0	Sec	O	X	X	
23-15	最小壓力限制	0.00 ~ 25.50	0.50	PSI	O	X	X	
23-16	低壓警告時間	0.0 ~ 600.0	10.0	Sec	O	X	X	
23-17	低壓故障停機時間	0.0 ~ 600.0	20.0	Sec	O	X	X	
23-18	失壓檢測時間	0.0 ~ 600.0	0.0	Sec	O	X	X	
23-19	失壓檢測比例	0 ~ 100	0	%	O	X	X	
23-20	保留							
23-21	保留							
23-22	保留							
23-23	用水檢測方向	0: 向上檢測 1: 向下檢測	1		O	X X	X X	
23-24	用水檢測壓力範圍	0.0 ~ 25.0	1.0	PSI	O	X	X	
23-25	用水檢測週期	0.0 ~ 200.0	20.0	Sec	O	X	X	
23-26	用水檢測加速時間	0.1 ~ 6000.0	KVA	Sec	O	X	X	
23-27	用水檢測減速時間	0.1 ~ 6000.0	KVA	Sec	O	X	X	
23-28	強制運轉頻率	0.0 ~ 200	0.0	Hz-	O	X	X	
23-29	多泵浦併聯交替時間	0 ~ 240	3	Hr	O	X	X	
23-30	多泵浦併聯輔助打水偵測時間	0.0 ~ 30.0	5.0		O	X	X	
23-31	多泵浦併聯同步選擇	0: 關閉 1: 壓力設定及 Run/Stop 同步 2: 壓力設定同步 3: Run/Stop 同步	0		O	X	X	
23-32	保留							

群組 23 泵浦與 HVAC 機能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
23-33	保留							
23-34	保留							
23-35	保留							
23-36	保留							
23-37	保留							
23-40	切換時間選擇	0 ~ 1			O	O	O	
23-41	本體/遠端鍵	0: 無效 1: 有效	1		O	O	O	
23-42	能量重新計算	0: 無效(能量繼續累計) 1: 有效(能量重新計算)	0		O	O	O	
23-43	每度電費單位	0.000 ~ 5.000	0.000	$	O	O	O	
23-44	累積電能脈波輸出單位選擇	0: 累積電能脈波輸出無效 1: 以 0.1kWh 爲單位 2: 以 1kWh 爲單位 3: 以 10kWh 爲單位 4: 以 100kWh 爲單位 5: 以 1000kWh 爲單位	0		O	O	O	
23-45	流量計回授給定方式	0: 無效 1: 類比輸入 2: 脈波輸入	1		O	O	O	
23-46	流量計最大值	1 ~ 50000	10000	GPM	O	O	O	
23-47	流量計目標值	1 ~ 50000	5000	GPM	O	O	O	
23-48	回授最高流量值	0.01 ~ 99.00	80.00	%	O	O	O	
23-49	回授最高流量警告時間	0.0 ~ 255.0	3.0	Sec	O	O	O	
23-50	回授最高流量停機時間	0.0 ~ 255.0	6.0	Sec	O	O	O	
23-51	回授最低流量值	0.01 ~ 99.00	10.00	%	O	O	O	
23-52	回授最低流量警告時間	0.0 ~ 255.0	3.0	Sec	O	O	O	
23-53	回授最低流量停機時間	0.0 ~ 255.0	6.0	Sec	O	O	O	
23-54	吸力過低檢出機能	0: 無效 1: PID 誤差值 2: 電流 3 電流及 PID 誤差值	0		O	O	O	
23-55	吸力過低檢出時間	0 ~ 300	100	Sec	O	O	O	
23-56	吸力過低 PID 誤差準位	0 ~ 30	10	%	O	O	O	
23-57	吸力過低電準位(馬達額定電流)	0 ~ 100	10	%	O	O	O	
23-58	吸力過低動作反應	0: 無效 1: 警告 2: 故障 3: 故障及重新啓動	0		O	O	O	

群組 24 1 對 8 泵浦卡相關機能群組								
代碼	參數名稱	範圍	出廠設定	單位	V/F	SLV	PMSLV	屬性
24-00	1 對 8 泵浦卡機能選擇	0: 1 對 8 泵浦卡動作無效 1: 變頻幫浦固定模式，依先開後關順序，全部停止 2: 變頻幫浦固定模式，僅變頻幫浦停止 3: 變頻幫浦固定模式，依先開先關順序，全部停止 4: 變頻幫浦循環模式，依先開先關順序，全部停止 5: 變頻幫浦循環模式，僅變頻幫浦停止	0	-	O	O	O	
24-01	Relay 2-4 機能選擇	xxx0b: 保留 xxx1b: 保留 xx0xb: Realy 2 無效 xx1xb: Realy 2 有效 x0xxb: Realy 3 無效 x1xxb: Realy 3 有效 0xxxb: Realy 4 無效 1xxxb: Realy 4 有效	0000b		O	O	O	
24-02	Relay 5-8 機能選擇	xxx0b: Realy 5 無效 xxx1b: Realy 5 有效 xx0xb: Realy 6 無效 xx1xb: Realy 6 有效 x0xxb: Realy 7 無效 x1xxb: Realy 7 有效 0xxxb: Realy 8 無效 1xxxb: Realy 8 有效	0000b		O	O	O	
24-03	上限頻率持續時間	1.0 ~ 600.0	300.0	Sec	O	O	O	*1
24-04	下限頻率持續時間	1.0 ~ 600.0	300.0	Sec	O	O	O	*1
24-05	電磁開關切換時間	1.0 ~ 20.0	1.00	Sec	O	O	O	*1
24-06	幫浦切換時的容許偏差	0.0 ~ 20.0	0.0	%	O	O	O	*1

第 5 章 異常診斷及排除

5.1 總則

- 變頻器的故障檢測和預警/自我診斷功能。當變頻器檢測到故障的故障碼顯示在數位操作器時，故障接點輸出動作，切斷變頻器輸出，使馬達自由運轉停止(在某些故障方面，停機的方法是可以選擇)。
- 當變頻器檢測到警告/自我診斷，數位操作器會顯示警告/自診斷代碼，但接點的故障輸出不動作。一旦發生的警告已被排除，系統會自動恢復到原來的狀態。

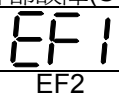
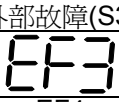
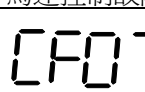
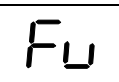
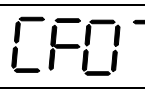
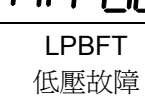
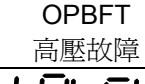
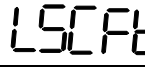
5.2 故障檢測功能

- 故障發生時，參閱表 5.1 查詢可能的原因，採取適當的措施。
- 再啓動時，請使用下列任一種方法：
  1. 設置其中一個多功能數位輸入端子（03-00~03-05）至 17（故障復歸），使故復歸訊號 ON。
  2. 按下數位操作器的 Reset 鍵，清除故障訊息。
  3. 將主電路電源先切斷後再接通。
- 當故障發生時，故障訊息儲存在故障資訊（群組 12 參數）。

表 5.1 錯誤訊息與改正行動

LED 顯示	說　明	可能原因	改正行動
OC 過電流 OC	過電流： 該變頻器輸出電流超過了過流檢測值（約額定電流的 160%）。	.加/減速時間太短。 .在變頻器輸出側電磁開關的操作。 .使用特殊馬達或適用容量大於變頻器額定。 .短路或接地故障發生。	.延長加速 / 減速時間。 .檢查負載接線。 .移除馬達並嘗試運轉變頻器。
SC 短路 SC	短路: 變頻器輸出或負載爲短路。	.短路。 因馬達損壞、絕緣劣化、電纜破損所引起的接觸、接地短路等。	確認負載接線。
GF 接地故障 GF	接地故障: 輸出側的接地短路電流超過了50%變頻器的額定輸出電流及 08-23 = 1 (GF 功能啓動)。	.接地故障發生(08-23=1)。 .馬達接地或 DCCT 電流感測器之缺陷. .此爲設備保護而並非人員保護。	檢查馬達接線及接線阻抗。
OV 過壓 OU	主電路過電壓： 直流電壓已超過過壓檢測值- 410Vdc: 220V class 820Vdc: 440V class (若 440V class，輸入電壓 01-14 設定低於 400V，過壓檢測值會降爲 730Vdc)。	.減速時間過短，導致回升能量過高。 .電源電壓過高。 .功率因數校正電容器的使用。	.延長減速時間。 .檢查輸入電路和降低輸入電壓符合規範要求。 .移除功率因數校正電容。
UV 電壓過低 UV	主電路電壓過低： 直流總線電壓低於低壓檢測值或直流總線電磁接觸器未投入，同時，該變頻器正在運轉。 約 190Vdc: 220V class; 380Vdc: 440V class (該檢測值可由 07-13 調整)。	.輸入電源電壓太低。 .輸入電源欠相。 .加速時間設置太短。 .輸入電源電壓波動過大。 .直流總線電磁接觸器未投入或回授訊號異常。	.檢查輸入電路和電源電壓。 .延長加速時間。

LED 顯示	說　明	可能原因	改正行動
IPL 輸入欠相 IPL	輸入欠相： 變器輸入側欠相或有一不平衡的大電壓。 當 08-09=1(啓動)時，此故障會被檢出。	. 發生輸入欠相 . R/L1、S/L2 或 T/L3 端子螺絲鬆動。 . 輸入電壓波動太大。 . 相間電壓不平衡。 . 變頻器內部的主回路電容器老化。	. 確認主回路電源接線是否正確。 . 檢查端子螺絲是否鬆動。 . 確認電源電壓採取穩定電壓的對策，或將輸入欠相撿出關閉。 . 更換電路板或變頻器。
OPL 輸出欠相 OPL	輸出欠相： 變頻器輸出欠相。 08-10=1 時，啓動此故障檢測。	. 輸出電纜或馬達內部損壞。 . R/ L1、S/L2 或 T/ L3 端子螺絲鬆動或遺失。 . 馬達容量低於變頻器額定之 10%	. 檢查馬達的接線。 . 檢查馬達和變頻器的容量。
OH1 散熱座過熱 OH1	散熱座過熱： 散熱座溫度過高。 若 5 分鐘內已出現 3 次散熱座過熱故障，需等待 10 分鐘才能復歸故障	. 周圍環境的溫度過高。 . 冷卻風扇已經停止。 . 載波頻率設置過高。	. 檢查變頻器環境周圍的溫度。 . 檢查風扇或散熱槽之塵埃和污垢。 . 檢查載波頻率之設定。
OH4 馬達過熱 OH4	馬達過熱： PTC 熱敏電阻的輸入超過過熱保護準位。	. 馬達周圍環境的溫度過高。 . PTC 熱敏電阻的輸入超過過熱保護準位	. 檢查馬達環境周圍的溫度。 . 檢查 MT 與 GND 端接線是否正確。
OL1 馬達過載 OL1	馬達過載： 馬達過載保護功能啓動取決於馬達內部過載曲線 08-05 =xxx1(馬達過載保護啓動)。	. V/F 模式的電壓設定過高，導致馬達過激磁。 . 馬達額定電流設定(02-01)不正確。 . 馬達負載過大。	. 檢查 V/F 模式。 . 檢查馬達額定電流。 . 檢查負載大小和運轉週期時間。
OL2 變頻器過載 OL2	變頻器過載： 該變頻器的過載保護功能取決於變頻器內部過載曲線。 清除變頻器過載故障後，會出現變頻器過載警告，但若 5 分鐘內已出現 4 次變頻器過載故障，需等待 4 分鐘才能復歸故障。	. V/F 模式的電壓設定過高。 . 變頻器容量太小。 . 馬達負載過大。	. 檢查 V/F 模式。 . 替換至更高容量的變頻器。 . 檢查負載大小和運轉週期時間。.
OT 過轉矩偵測 Ot	過轉矩偵測: 變頻器輸出轉矩高於 08-15 (過轉矩偵測準位) 且超過 08-16 設定時間，則變頻器啓動基極遮斷(08-14=0 或 2)。	機械負載過大。	. 檢查應用程序或操作狀態。 . 檢查 08-15 及 08-16 是否爲適當值。
UT 欠轉矩偵測 Ut	低轉矩偵測： 變頻器輸出轉矩低於 08-19 (低轉矩偵測準位)且超過 08-20 設定時間，則變頻器啓動基極遮斷(08-18=0 或 2)。	突然減輕了機械負載。（例如皮帶斷掉）	. 檢查應用程序或操作狀態。 . 檢查 08-19 及 08-20 是否爲適當值。
CE 通訊錯誤 CE	Modbus 通訊錯誤: . 超過 09-06 (通訊異常檢測時間)，未接受到通訊。 . 依 09-07(= 0 to 2)，啓動此故障保護。	連接斷線或與主機已停止通訊。	檢查所有連接和驗證所有用戶端軟體架構。
FB PID 回授斷線 Fb	PID 回授斷線： . 當 PID 回授斷線檢測（10-11 = 2，馬達自由運轉停止），PID 回授輸入<PID 回授斷線檢測準位（10-12）且超過 PID 回授的斷線檢測時間（10-13）。	PID 回授感測器無法正確動作或沒有安裝正確。	. 檢查設立的 PID 回授方式是否正確。 . 確保正確安裝及 PID 回授信號的工作正常。
STO 安全開關 Sto	變頻器安全開關	①變頻器控制板上 F1 與 F2 斷路。 ②08-30 設定爲 1 自由運轉停止，且數位端子開關(58)開啓。	①檢查變頻器控制板上 F1 與 F2 是否短路。 ②檢查數位端子(58)是否開啓。
SS1 安全開關 SS1	變頻器安全開關。	08-30 設定爲 0 減速停止，且數位端子開關(58)開啓。	檢查數位端子(58)是否開啓。

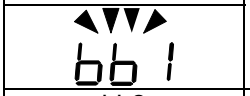
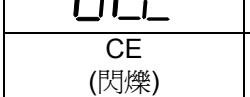
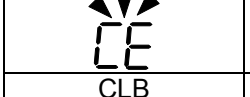
LED 顯示	說　明	可能原因	改正行動
EF1 外部故障(S1) 	外部故障(端子 S1)。	.由多功能數位輸入端子接收外部故障 訊息。 .當 03-00 至 03-05 設置爲 25，而變頻器外部故障工作選擇 08-24 設置爲 0 或 1 或 2。	.檢查外部原因故障。 .復歸多功能數位輸入的外部故障。
EF2 外部故障(S2) 	外部故障(端子 S2)。		
EF3 外部故障(S3) 	外部故障(端子 S3)。		
EF4 外部故障(S4) 	外部故障(端子 S4)。		
EF5 外部故障(S5) 	外部故障(端子 S5)。		
EF6 外部故障(S6) 	外部故障(端子 S6)。		
CF07 馬達控制故障 	馬達控制故障。	SLV 模式下，開機啓動故障。	.執行旋轉型馬達參數檢測。 (Rotational Auto-tuning) .若無法執行旋轉型馬達參數檢測，請執行靜止型馬達參數檢測，或增加 01-08 設定 值。
FU 保險絲開路 	DC 保險絲:開路。 DC 保險絲(Models 230V 50HP 及以上，460V 75HP 以上) 開路。	.由於變頻器輸出側短路，使功率晶體被破壞。 .檢查是不是有端子⊖ 與 U/T1, V/T2,W/T3 之間發生短路。	.檢查馬達和電纜是否爲短路或絕緣損毀。 .修理/替換變頻器.。
CF07 馬達控制故障 	馬達控制故障。	SLV 模式下，開機啓動故障。	.執行旋轉型馬達參數檢測。 **(Rotational Auto-tuning)** .若無法執行旋轉型馬達參數檢測，請執行靜止型馬達參數檢測，或增加 01-08 設定值。
LOPBT 低流量故障 	低流量故障。	.回授訊號未接。 .由於 HVAC 流量回授值低於設定最小流量限制所導致。	.檢查回授訊號是否正確且有接上。 .確認回授流量是否低於最小流量限制值 (參數 23-51)。
HIPBT 高流量故障 	高流量故障。	由於 HVAC 流量回授值低於設定最大流量限制所導致。	.檢查回授訊號是否正確。 .確認回授流量是否低於最大流量限制值(參數 23-48)。
LPBFT 低壓故障 	低壓故障。	.回授訊號未接 .由於 PUMP 壓力回授值低於設定最小壓力限制所導致。	.檢查回授訊號是否正確且有接上。 .確認回授壓力是否低於最小壓力限制值(參數 23-15)。
OPBFT 高壓故障 	高壓故障。	由於 PUMP 壓力回授值低於設定最大壓力限制所導致。	.檢查回授訊號是否正確。 .確認回授壓力是否低於最大壓力限制值(參數 23-12)。
LSCFT 低吸力故障 	低吸力不足故障。	. 出水槽內不足，而造成吸力不足的現象。 . PID 誤差高於 PID 誤差準位或者電流低於輸出電流準位	. 檢測出水槽內是否不足，而出水槽內是否正常供水。 . 確認 PID 誤差高於 PID 誤差準位或者電流低於吸力不足輸出電流準位

5.3 警告/自診斷檢測功能

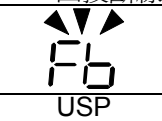
- 當變頻器檢測到一個警告，數位操作機將顯示警告代碼（閃爍），故障輸出接點不動作，一旦此警告解除，系統會自動恢復原來的狀態。
- 當變頻器檢測到一個自診斷功能（例如，有一個無效的設置或矛盾的兩個參數設置），數位操作器將顯示自診斷代碼，且故障輸出接點不動作；直到參數已經設置正確前，變頻器無法執行運轉指令。
- 當一個警告或自我診斷錯誤發生，請參考表 5.2，以確定和糾正造成的錯誤。於此時按下 RESET 鍵，警告消息（閃爍）消失，若警告或自我診斷錯誤仍然存在，警告會在 5 秒內再次顯示。

表 5.2 警告/自診斷和糾正措施

LED 顯示	說　明	可能原因	改正行動
OV (閃爍) 過電壓 	主電路電壓： 直流匯流排電壓超過過電壓檢測準位，而變頻器已停機。 410Vdc: 230 V class 820Vdc: 460 V class	輸入電源電壓過高。	檢查輸入電源之電壓。
UV (閃爍) 低電壓 	主電路電壓： 直流匯流排電壓低於低電壓檢測準位，而變頻器已停機。 190Vdc: 230V class 380Vdc: 460V class (07-13 可設定偵測準位)	. 電力供應電壓過低。 . 發生瞬間功率損失。	. 檢查輸入電源電壓。 . 檢查輸入電路。 . 檢查主回路 MC。
OH1 散熱座過熱 	· 散熱座過熱。 · 散熱座溫度過高。 · 若 5 分鐘內已出現 3 次散熱座過熱故障，需等待 10 分鐘才能復歸故障。	. 周圍環境的溫度過高。 . 冷卻風扇已經停止。 . 載波頻率設置過高。	. 檢查變頻器環境周圍的溫度。 . 檢查風扇或散熱槽之塵埃和 污垢。 . 檢查載波頻率之設定。
OH2 (閃爍) 變頻器過熱警告 	變頻器過熱警告： 利用多功能數位輸入端子輸入變頻器過熱警告信號。 (03-00 至 03-05=31)	多功能數位輸入端子接收到外部過熱警告發生。	檢查外部條件。
OT (閃爍) 過轉矩偵測 	過轉矩偵測： 變頻器輸出電流高於 08-15 (過轉矩偵測準位) 且超過 08-16 設定時間。 服從 08-14=1 設定，變頻器繼續運轉。	機械負載過大。	. 檢查應用或機器運轉狀態。 . 檢查 08-15 和 08-16 設定值。
UT (閃爍) 欠轉矩偵測 	欠轉矩偵測： 變頻器輸出電流低於 08-19 (低轉矩偵測準位)且超過 08-20 設定時間。 服從 08-18=1，變頻器繼續運轉。	機械負載瞬間移除。例如皮帶斷掉）	. 檢查應用或機器運行狀態。 . 檢查 08-19 及 08-20 設定值。

LED 顯示	說　明	可能原因	改正行動
bb1 (閃爍) 外部遮斷 	外部遮斷 (端子 S1)。	由多功能數位輸入端子接收外部遮斷輸入。	移除外部遮斷的原因。
bb2 (閃爍) 外部遮斷 	外部遮斷 (端子 S2)。		
bb3 (閃爍) 外部遮斷 	外部遮斷 (端子 S3)。		
bb4 (閃爍) 外部遮斷 	外部遮斷 (端子 S4)。		
bb5 (閃爍) 外部遮斷 	外部遮斷 (端子 S5)。		
bb6 (閃爍) 外部遮斷 	外部遮斷 (端子 S6)。		
OL1 馬達過載 	馬達過載： 馬達過載保護功能啓動取決於馬達內部過載曲線 08-05 =xxx1(馬達過載保護啓動)。	.V/F 模式的電壓設定過高，導致 馬達過激磁。 .馬達額定電流設定(02-01)不正確。 .馬達負載過大。 .V/F 模式的電壓設定過高。 .變頻器容量太小。 .馬達負載過大。	.檢查 V/F 模式。 .檢查馬達額定電流。 .檢查負載大小和運轉週期時間。 .檢查 V/F 模式。 .替換至更高容量的變頻器。 .檢查負載大小和運轉週期時間。.
OL2 變頻器過載 	變頻器過載： 已出現過變頻器過載故障，時間未滿 4 分鐘，（若已滿 4 分鐘，此警告會自動清除）		
CE (閃爍) 通訊錯誤 	Modbus 通訊錯誤： .當 09-07= 3 時，超過兩秒未接受到通訊資料。	.連接線斷線。 .主機停止資料傳輸。	檢查所有連接並驗證所有用戶端軟體設定。
CLB 電流保護準位 B 	變頻器過電流警告： 變頻器電流到達電流保護準位 B。	.變頻器電流過大 .馬達負載過大。	檢查負載大小和運轉週期時間。
Retry (閃爍) 重試 	自動復歸再啓動已動作，在 07-01 自動復歸再啓動時間未結束前顯示。	.07-01 自動復歸再啓動時間≠0 .07-02 自動復歸再啓動次數≠0	自動復歸再啓動時間過後會消失。

LED 顯示	說　明	可能原因	改正行動
EF1 (閃爍) 外部故障(S1) 	外部故障(端子 S1)	.由多功能數位輸入端子接收外部故障 訊息。 . 當 03-00 至 03-05 設置爲 25，而變頻器外部故障工作選擇 08-24 設置爲 0 或 1 或 2。	.檢查外部故障的原因。 .復歸多功能數位輸入的外部故障。
EF2 (閃爍) 外部故障(S2) 	外部故障(端子 S2)。		
EF3 (閃爍) 外部故障(S3) 	外部故障(端子 S3)。		
EF4 (閃爍) 外部故障(S4) 	外部故障(端子 S4)。		
EF5 (閃爍) 外部故障(S5) 	外部故障(端子 S5)。		
EF6 (閃爍) 外部故障(S6) 	外部故障(端子 S6)。		
EF9 (閃爍) 正反轉錯誤 	.正轉命令與反轉命令（2-線模式運作）在 0.5 秒內或以上同時輸入。 .服從 07-09 設定馬達停止方式。 .錯誤清除後，變頻器回到正常狀態。	正轉命令與反轉命令同時輸入。（參考 2 線模式操作）	檢查外部程序邏輯。
SE01 設定範圍錯誤 	參數設置超出範圍： 當參數設定超出了所允許的範圍。	.參數設定超出了所允許的範圍。 .在某些情況下，參數設置會依照其他參數設置(如 02-00>02-01,00-12<00-13 或是 00-07 = 1 時, 00-05 和 00-06 相同等)。	檢查參數設置。
SE02 數位輸入端子錯誤 	多機能數位輸入端子錯誤。	多機能數位端子錯誤（03-00 至 03-05），如下敘述： ①向上/下命令的同時沒有設置（他們必須一起使用）。 ②向上/向下命令（08 和 09）和 ACC/DEC 命令（11）上都在同一時間設定。 ③速度搜尋 1（19，最大頻率）和速度搜尋 2（34，從設定頻率）同時設定。	檢查參數設置。

LED 顯示	說　明	可能原因	改正行動
SE03 V/f 曲線錯誤 	V/f 曲線設定錯誤。	V/F 曲線設定未依下列架構進行設定: 01-02 > 01-12 >01-06 > (Fmax) (Fbase) (Fmid1) 01-08; (Fmin)	確認 V/F 參數設定。
SE05 PID 選擇錯誤 	PID 選擇錯誤。	10-00 及 10-01 同時設定爲 1(AI1)或同時設定爲 2(AI2)。	檢查參數 10-00,10-01 的設定值。
HPErr 機種別選擇錯誤 	變頻器容量設置錯誤： 變頻器容量設置 13-00 不匹配額定電壓.	該變頻器容量設置（13-00）不匹配硬體電壓等級。	檢查變頻器容量設置（13-00）符合硬體電壓等級。
SE09 PI 設定錯誤 	變頻器 PI 設定錯誤。	變頻器 PI 選項(03-30)選擇與 PID 來源(10-00 及 10-01)衝突。	檢查變頻器 PI 選項(03-30)選擇與 PID 來源(10-00 及 10-01)。
FB (閃爍) PID 回授斷線 	PID 回授斷線： PID 回授斷線檢測啓動（當 10-11=1），繼續運轉，與 PID 回授輸入 PID 回授丟失斷線準位（10-12）的 PID 回授斷線檢測時間（10-13）.	PID 回授信號（如轉換器）不作動或不正確安裝。	.檢查設立的 PID 回授方式是否正確。 .確保正確安裝及 PID 回授信號的工作正常。
USP (閃爍) 無人保護 	無人保護（USP）啓動(開機時啓動)。	.開機時無人保護（多功能數位輸入設定之）啓用，變頻器將不會接受任何運轉命令。 .警告信息清除前，變頻器無法進入運轉模式。（請參閱完整手冊 03-00~03-05=50 的相關說明）。	.運轉命令關閉，或執行端子復歸動作(03-00 至 03-05 爲 3)，或使用數位操作器上的 RESET 鍵進行復歸。 .關閉 USP 信號和重新啓閉電源。
LOPB 低流量錯誤 	低流量錯誤。	.回授訊號未接。 .由於 HVAC 流量回授值低於設定最小流量限制所導致。	.檢查回授訊號是否正確且有接上。 .確認回授流量是否低於最小流量限制值。
HIPBT 高流量錯誤 	高流量錯誤。	由於 HVAC 流量回授值低於設定最大流量限制所導致。	.檢查回授訊號是否正確。 .確認回授流量是否低於最大流量限制值。
LPBFT 低壓錯誤 	低壓錯誤。	.回授訊號未接。 .由於 PUMP 壓力回授值低於設定最小壓力限制所導致。	.檢查回授訊號是否正確且有接上。 .確認回授壓力是否低於最小壓力限制值。
OPBFT 高壓錯誤 	高壓錯誤。	由於 PUMP 壓力回授值低於設定最大壓力限制所導致。	.檢查回授訊號是否正確。 .確認回授壓力是否低於最大壓力限制值。
LSCFT 低吸力錯誤	低吸力不足錯誤。	. 出水槽內不足，而造成吸不足的現象。	. 檢測出水槽內是否不足，而出水槽內是否正常供水。

LED 顯示	說　明	可能原因	改正行動
		. PID 誤差高於 PID 誤差準位或者電流低於輸出電流準位。	. 確認 PID 誤差高於 PID 誤差 準位或者電流低於吸力不足輸出電流準位。
FIRE 強制運轉模式 	消防強制運轉模式。	.此時進入消防強制運轉模式。	無 (消防強制運轉模式非警告)。
SE10 PUMP/HVAC 設定錯誤 	變頻器 PUMP/HVAC 設定錯誤。	①變頻器 PUMP 選項(23-02)>(23-03)。 ②變頻器 HVAC 選項(23-46)>(23-47)。	. 檢查變頻器 PUMP 選項(23-02)選擇與壓力最大值(23-03) 設定。 . 檢查變頻器 HVAC 選項(23-02)選擇與壓力最大值(23-03) 設定。
COPUP PUMP 通訊 斷線錯誤 	多台 PUMP 通訊斷線錯誤。	多台聯接 PUMP 通訊有斷線狀況或無連接上。	看是否通訊有意如通訊壞或者沒連接好。

5.4 自動調校錯誤

當自動調校故障發生時，故障顯示 “AtErr”在數位操作器且馬達停止，故障訊息顯示在 17-11。故障數位輸出接點不動作。參考表 5.3，以確定和糾正所發生的故障。

表 5.3 自動調校故障和糾正措施

錯 誤	說 明	原 因	改正行動
01	馬達資料輸入錯誤。	·輸入自動調校的數據錯誤。 ·馬達輸出電流和馬達額定電流之間的錯誤關係。	·檢查自動調校所輸入資料(17-00 到 17-09)。 ·檢查變頻器的容量。
02	馬達線對線電阻 R1 調校錯誤。	·自動調校在一定時間內未完成。 ·自動調校之結果超出參數設定。 ·超過馬達額定電流。 ·變頻器三相輸出斷線。	·檢查自動調校輸入資料（17-00 到 17-09）。 ·檢查馬達接線。 ·斷開馬達所連接的負載。 ·檢查變頻器電流檢測電路，包括電流感測器。 ·檢查馬達接線。 ·檢查馬達安裝。
03	馬達漏感調校錯誤。		
04	馬達轉子電阻 R2 調校錯誤。		
05	馬達互感 Lm 調校錯誤。		
07	Deadtime 補償偵測錯誤。		
08	馬達加速錯誤(僅適用於旋轉型自動調校)。	馬達在指定的時間(00-14= 20sec)內，沒有加速成功。	·增加加速度時間（00-14）。 ·斷開馬達所連接的負載。
09	自動調校其它錯誤。	自動調校之其它錯誤（除 ATE-01~ATE-08 錯誤，如空載電流高於 70％， 額定電流或轉矩超過參考 100％）。	·檢查馬達接線。 ·檢查自動調校輸入資料。

5.5 PM 馬達自動調校錯誤

當 PM 馬達自動調校故障發生時，故障顯示“IPErr” (PM 馬達調校失敗) 訊息在數位操作器且馬達停止，故障訊息顯示在 22-22。故障數位輸出接點不動作。參考表 5.4，以確定和糾正所發生的故障。

表 5.4 PM 馬達自動調校故障和糾正措施

錯誤	說明	原因	改正行動
01	靜止磁極對位失敗。	馬達輸出電流和馬達額定電流之間的錯誤關係。	·檢查自動調校所輸入資料(22-02)。 ·檢查變頻器的容量。 ·檢查馬達接線。
02 — 08	保留		
09	迴路調整時，電流異常。	馬達輸出電流和馬達額定電流之間的錯誤關係。	·檢查自動調校所輸入資料(22-02)。 ·檢查變頻器的容量。
10	保留		
11	參數調測逾時	電壓、電流關係錯誤	·檢查參數(22-11)是否設定過小，但最大不得設定超過變頻器額定 100% ·檢查馬達接線

TECO Electric & Machinery Co., Ltd.
東元電機股份有限公司

10F., No.3-1, Yuancyu St., Nangang District,
Taipei City 115, Taiwan
115台北市南港區園區街3-1號10樓
Tel :+886-2-6615-9111
Fax :+886-2-6615-0933

http://www.teco.com.tw

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