

8. APPENDIX A: SERIAL COMMUNICATION

Serial communication is the information exchange channel of the frequency inverter with upper computer. Through serial communication, users can use personal computer or industrial control equipment (such as PLC etc) as host to set frequency inverter (slave)'s running frequency or command, modify or read data, read working state and fault information etc and realize remote or centralized control of the frequency inverter .

D31 series frequency inverter adopt RS-485 bus and Modbus protocol for serial communication.

A1. RS-485 bus

The hardware circuit of serial communication for D31 series frequency inverter follows RS-485 standard and a RJ45 interface is provided. Here RS-485 two-wire wiring method is adopted. The array sequence of the corresponding pins of RJ45 interface is shown as below:

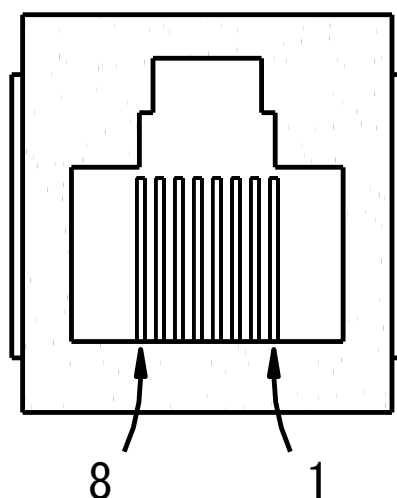


Figure A.1 RJ45 front view

Table A.1 Pin output signal allocation

Pin	Signal description
1	Reserved
2	Common port (signal ground & power ground)
3	Reserved
4	A (RS-485)
5	B (RS-485)
6	Reserved
7	+24 V
8	Common port (signal ground & power ground)

RS-485 two-wire wiring method is half-duplex serial communication. At the same moment the host and slave can not simultaneously transmit or receive data. Only one transmits data and another receives them.

RS-485 two-wire wiring method supports bus-type topological structure. At most 32 nodes can be connected to the same bus. Normally master-slave communication method is adopted in the RS-485 communication network, namely, one master commands as many as 31 slaves.

Under the circumstance of multi-computer communication or long-distance communication, it is suggested to connect the signal ground of the master station with the common port of the frequency inverter to raise the anti-interference ability of communication.

A2. Modbus protocol

Modbus is a master-slave communication protocol. The master governs the whole communication process. Only when the master sends command to the slave, the slave executes the actions or/and send feedback information to the master. Otherwise the slave performs no operation and the slave can not communicate with each other directly.

There are two kinds of dialogues between the master and slaves:

(1) Point-to-point: Master sends command individually to a certain slave which executes action or/and sends feedback information.

When the master command is correct, the slave executes corresponding actions and transmits feedback of result information to the master.

When the master command is false, the slave transmits feedback of error information to the master but executes no actions.

(2) Broadcast mode: The master sends command to all slaves which execute action but send no feedback information.

Modbus protocol has two kinds of transmission patterns: Modbus RTU and Modbus ASCII. D31 series frequency inverter supports Modbus RTU.

A2.1 Description of Modbus-RTU message format

When the Modbus-RTU mode is used for communication, the communication information (message) is represented directly with hexadecimal code (1-9, A-F). Two hexadecimal codes form one byte. The message format is shown as below:

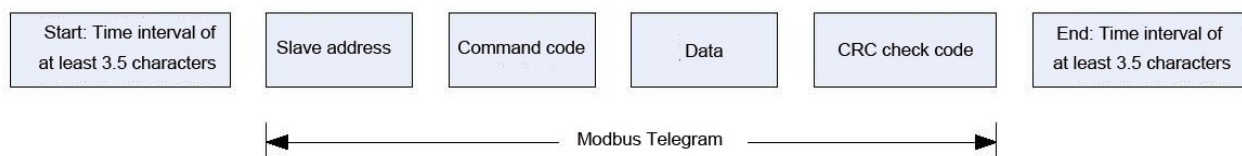


Figure A.2 Modbus Message Format

As shown in Figure A.2, during the communication process, the master and slave determine the start and end of Modbus message according to time interval of at least 3.5 characters. The message includes the complete data information to be transmitted: in the sequence of slave address, command code, data and CRC code. Its length varies with the change of the command code.

The message of Modbus-RTU is classified into three types and two formats:

- 1) Request (Interrogation) message: Command request message transmitted by master to slave;
 - 2) Normal response message: The slave's feedback message when the master's command is correct.
 - 3) Error response message: The slave's feedback message when the master's command is false / invalid.
- 1) and 2) have the same format, while 3) adopts other format.

1. Format of request message and normal response message.

Table A.2 Format of request message and normal response message

Number	Name	Function
1	Slave address	<ul style="list-style-type: none"> Configured from 0 to 247 All slaves execute command but provide no feedback information; If slave address is set to 1~247, the dialog is point-to-point mode. All address-matching slaves execute command and provide feedback information. Under the point-to-point mode, when the matching slave responses, it sends back the slave address of itself.
2	Command code	<ul style="list-style-type: none"> D31 series frequency inverter supports part of command codes of Modbus protocol. All slaves execute command code and the matching slave responses code include: <ol style="list-style-type: none"> 03H:Read one word (2 bytes) 06H:Write one word (2 bytes) During error response, the feedback command code of the slave = the request command code of the master + 80H.
3	Data	<ul style="list-style-type: none"> This part is the main content of communication and the core of data exchange. Its content and length vary with the variation of the command codes. See the following concrete descriptions of every command code.
4	CRC code	<ul style="list-style-type: none"> Cyclical redundancy check (CRC) code is used for error detection of received data done by the receiving equipment and for judging whether the received data are correct. Please refer to —A.3 Cyclical redundancy check (CRC) for generation of CRC code. <p>Note: CRC code first sends low bytes then high bytes. Except this, all messages of Modbus-RTU adopt the transmission sequence of -high bytes first - then low bytes”.</p>

A2.2 Detailed message description of different commands

A2.2.1 Read N words (2*N bytes) -- command code 03H

1. Master request message

Table A.3 Command code 03H host query message format

Slave address	Command code	Communication address		Read word number		CRC code	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
		High byte	Low byte	High byte	Low byte	High byte	Low byte
	03H			00H	01H		

- Slave address and CRC code: See “Table A.2”.
- Command code: 03H, request to read N words (2*N bytes) of the slave machine. Notice that N is at most 5.
- Communication address: The address of read data. This is not the real physical address for data storage, but a number corresponding to the data. Every control, state or monitoring parameter of D31 series frequency inverter corresponds to a communication address. See “A2.5 Communication parameter”.

4) Read word number: The length of the read data with the word (2 bytes) as the count unit. When current request asks for reading one word, it is set to 0001H.

2. Message of slave normal response

Table A.4 Command code 03H of slave machine normal reply message

Slave address	Command code	Read bytes number	Read bytes number 2		...	Read bytes number N		CRC code	
1 byte	1 byte	1 byte	2 bytes		...	2 bytes		2 bytes	
			High byte	Low byte	...	High byte	Low byte	High byte	Low byte
	03H				...				

- 1) Slave address and CRC code: See "A2.2".
- 2) Command code: 03H. The same as the master request command code.
- 3) Read word number: The length of the read data with byte as the count unit. When current master requests to read one word, set read byte number transmitted from the slave to 02H.

Note: The count unit of the length of the read data is different from that of request message.

- 4) Read data: Data corresponding to the communication address in the request message.

Note: Read data firstly sends high byte then low byte in an opposite direction to CRC code.

3. Slave error response message

Table A.5 Slave error response message of Command code 03H

Slave address	Command code	Error code	CRC code	
1 byte	1 byte	1 byte	2 bytes	
			Low byte	High byte
	83H			

- 1) Slave address and CRC code: See "A2.2".
- 2) Command code: 83H. It is = 03H + 80H.
- 3) Error code. For detail see "A2.4 Error code".
- 4) Example: Read upper limit frequency.

Master request message: 01 03 00 08 00 01 05 C8

Normal response message: 01 03 02 13 88 B5 12 (Suppose that current upper limit frequency is 50 Hz)

Error response message: 01 83 03 01 31 (Suppose that read word number is altered from 0001 to 0002)

A2.2.2 Write one word (2 bytes) — Command code 06H

1. Master request message

Table A.6 Format of master request message

Slave address	Command code	Communication address		Write data		CRC code	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
		High byte	Low byte	High byte	Low byte	Low byte	High byte
	06H						

1) Slave address and CRC code: See “Table A.2”.

2) Command code: 06H. Request to write 1 word (2 bytes) of the slave.

3) Communication address: The address of read data. This is not the real physical address for data storage, but a number corresponding to the data. Every control, state or monitoring parameter of D31 series frequency inverter corresponds to a communication address. See “A2.5 Communication parameter”.

4) Write data: Request data written by the slave.

2. Slave normal response message

Table A.7 Slave normal response message

Slave address	Command code	Communication address		Write data		CRC code	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
		High byte	Low byte	High byte	Low byte	Low byte	High byte
	06H						

Slave's normal response message is the same as the master's request message.

3. Slave error response message

Table A.8 Format of slave error response message

Slave address	Command code	Error code	CRC code	
1 byte	1 byte	1 byte	2 bytes	
			Low byte	High byte
	86H			

1) Slave address and CRC code: See “Table A.2”.

2) Command code: 86H. It is = 06H + 80H.

3) Error code. For detail see “A2.4 Error code”.

4. Example: To write upper limit frequency

Master request message: 01 06 00 08 13 24 05 23 (Suppose that the set upper limit frequency is 49 Hz)

Normal response message: 01 06 00 08 13 24 05 23

Error response message: 01 86 04 43 A3 (Suppose current writing operation cannot be performed)

A2.2.3 Write multiple words (2*N bytes) -- command code 10H

1.Host query message

Table A.9 Format of host query message in command code 10H

Slave address	Command code	Communication address		Write words		Write data	Write 1		...	Write N		CRC code	
1 byte	1 byte	2 bytes		2 bytes		1 byte	2 bytes		...	2 bytes		2 bytes	
		Low byte	High byte	Low byte	High byte		Low byte	High byte	...	Low byte	High byte	Low byte	High byte
	10H								...				

(1) Slave address and CRC check code: see Table A.2.

(2) Command code: 10H, N words (2*N bytes) of the request write slave machine. Notice that N is at most 5.

(3) Communication first address: the first address to write data. The address is not the actual physical address of the data, but a number corresponding to the data. Each control, state and monitoring parameter of the converter corresponds to a communication address, see "A2.5 Communication Parameters" for details.

(4) Write words: the number of slave words written.

(5) Number of bytes written: Number of bytes written by slave = number of words written *2.

(6) Write data 1~ write data N: The data requested to be written from the machine.

2.The slave answers the message normally

Table A.10 Command code 10H for slave normal reply message format

Slave address	Command code	Communication address		Write data		CRC code	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
		Low byte	High byte	Low byte	High byte	Low byte	High byte
	10H						

(1) Slave address and CRC check code: see Table A.2.

(2) Command code: 10H, which is consistent with the request command code of the host.

(3) Communication first address: The same as the communication first address of the host.

(4) Write words: the same as the number of words written by the host.

3.Slave machine error response message

Table A.11 Format of slave error response message in command code 10H

Slave address	Command code	Error code	CRC code	
1 byte	1 byte	1 byte	2 bytes	
			Low byte	High byte
	90H			

(1) Slave address and CRC check code: see Table A.2.

(2) Command code: 90H, namely the sum of 10H and 80H.

(3) Error code: see "A2.4 Error code" for details.

4.Example: Write five consecutive parameters starting with the *F 300* parameter

Host query message: 01 10 03 00 05 0A 00 01 00 03 00 04 00 01 00 00 0B 9D AE

(Suppose *F 300*=1;*F 301* = 3;*F 302* = 4;*F 303* = 1;*F 304* =11 five parameters)

Normal reply message: 01 10 03 00 00 05 00 4E

Error response message: 01 90 03 0C 01 (assuming incorrect data setting)

A2.3 Cyclic redundancy check (CRC)

Modbus-RTU's communication message uses cyclic redundancy check (CRC) for transmission error check.

During each communication, the sender computes CRC code of transmitted data according to CRC rules, then sends the data by attaching the CRC code to them; After receiving the data, the receiver re-computes the CRC code according to the same rules. The computed content does not include the received CRC code. The receiver compares the re-calculated CRC code with the received code. If they are not the same, the transmitted data are determined to be false.

D31 series frequency inverter adopts CRC16 rule for message check of serial communication. Every CRC code consists of 2 bytes, including 16-bit binary value. The calculation is as follows:

- 1) Initialize CRC register (16 bit) to 0xFFFF;
 - 2) Perform XOR to the first byte (slave address) and the low 8 bits of the register, and then put the computed result back to CRC register;
 - 3) Make a right shift by 1 bit to the content of CRC register and fill in the highest bit with 0;
 - 4) Check the shift-out bit after right shift;
 - If the shift-out bit is 0, repeat 3), namely, make another right shift;
 - If the shift-out bit is 1, make XOR to CRC register and 0xA001, and put the computed result back to the CRC register;
 - 5) Repeat steps 3) and 4) until 8 right shifts are made. Implement the same procedure to all the 8-bit data;
- Repeat steps 2) ~ 5) to implement the processing of the next byte in the message;
- 7) After all the bytes in the message are computed according to the above procedures, the content in the CRC register is the CRC code.

After the CRC code is acquired through the above-mentioned method, attach it to the transmitted data and send them. It is necessary to exchange the high and low bytes of the CRC code, namely, to send the low byte firstly and then the high byte.

There are two methods to compute CRC code with software: table look-up and on-line computation. Computation speed of the table look-up is fast but its table data occupy considerable space; On-line computation method requires no table data. It saves space but needs much time. Suitable computation method is selected according to concrete circumstance during application.

A2.4 Error code

When the slave is not able to implement master's request, the slave gives feedback of corresponding error code to indicate cause of the current error. Refer to the following table for the concrete meaning of error code.

Table A.12 Description of error code

Error code	Description
01	Command code error
	<ul style="list-style-type: none"> Command code other than 03H 06 and 10H is set in the request message
02	Communication address error
	<ul style="list-style-type: none"> Visited communication address does not exist. The register corresponding to the communication address does not permit performance of the action demanded by the current command code.
03	Data setting error
	<ul style="list-style-type: none"> Written data exceeds the allowable range of the register. Improper setting of certain parameter in the request message.
04	Unable to continue implementing the master's request.
	<ul style="list-style-type: none"> Error occurs during the process of writing data. Currently the register corresponding to the communication address does not permit performance of the action demanded by the command code.

A2.5 Communication parameter

1. Control parameter

Control parameters are edited through serial communication in order to realize frequency inverter 's function setting, running frequency setting, start/stop control and logic/analog output setting.

1) Basic parameters

Basic parameters consist of 10 groups: F0 – f9. They are used to control the function setting of the frequency inverter . Their detailed description, communication addresses and value ranges are shown in “5. Detailed description of parameters”.

Note: The communication address of the basic parameter corresponds to its display code. However, it is required to change F at the highest bit to 0;

Example: The display code of parameter “Running command selection” is *F001*, so the corresponding communication address is 0001;

Another example: The display code of parameter “Default keyboard panel display value” is *F702*, so the corresponding communication address is 0702.

2) Communication control word (Communication address: *F A05*)

3) Communication running frequency setting (Communication address: *F A08*)

Table A.13 Detailed description of communication control word

Bit	Description of function	0	1	Default value
0	JOG	NO-JOG	Jog frequency	0
1	Forward/reverse rotation	Forward rotation	Reverse rotation	0
2	Running/stop	Stop	Running	0
3	Free stop	No action	Free stop	0

Bit	Description of function	0	1	Default value
4	Emergency stop	No action	Emergency stop	0
5	Fault reset	No action	Reset	0
6	Given frequency by communication	Disable	Enable	0
7	Given code by communication	Disable	Enable	0
8	Multi-speed 1	OFF	ON	0
9	Multi-speed 2	OFF	ON	0
10	Multi-speed 3	OFF	ON	0
11	Multi-speed 4	OFF	ON	0
12	Motor parameter switch	1nd Motor Parameter	2nd Motor Parameter	0
13	PID control Disabling	Enabling PID control	Disabling PID control	0
14	Acceleration/ deceleration curve switch	Acceleration/ deceleration curve 1	Acceleration/ deceleration curve 2	0
15	DC braking	No DC braking	DC braking start	0

Table A.14 Communication running frequency setting

Bit	Description of function	Default
0-15	Running frequency data of communication setting. Hexadecimal setting: 50Hz→(50Hz)×100 = 5000→1388Hz It is if setting: 50Hz, write 1388H in the FA08 address	0.0

4) Communication analog output setting (Communication address: FA16)

Table A.15 Communication analog output setting

Bit	Description of function	Lower limit	Upper limit	Default
0-15	Analog output data of communication setting (in correspondence with analog output function 10)	0 (0000H)	1023 (03FFH)	0

2. Monitoring parameter

Monitoring parameters can be read through serial communication to see the running state of the converter. The following table is the description of monitoring parameters.

Table A.16 Monitoring parameters 1

No.	Communication address	Description of function	Unit	Note
1	FD03	Real-time running state	-	See table A.18 for details
2	FD12	Real-time running frequency	0.01 Hz	
3	FE18	Actual output frequency	0.01 Hz	
4	FE09	DC bus input voltage	0.01 %	

No.	Communication address	Description of function	Unit	Note
5	FE10	Output voltage	0.01 %	
6	FE08	Output current	0.01 %	
7	FE20	Output torque	0.01 %	
8	FE29	Output power	0.01 kW	
9	FE50	Motor speed (estimated)	1 rpm	
10	FE11	Logic input	-	See Table A.19 for details
11	FE12	Logic output	-	See Table A.20 for details
12	FE30	Logic input AI1 (10-bit accuracy)	-	Range (0-1023)
13	FE31	Logic input AI2 (10-bit accuracy)	-	Range (0-1023)
14	FC39	Fault monitoring	-	See A.21 for details
15	FE41	Frequency converter rated current		

Table A.17 Monitoring parameter specification 2

No.	Communication address	Description of function	Unit	Note
1	E000	Real-time running state	-	See table A.18 for details
2	E001	Real-time running frequency	0.01Hz	
3	E002	output current	0.01A	
4	E003	Fault monitoring	-	See Table A.21 for details
5	E004	PID given		
6	E005	PID feedback		
7	E006	output voltage	V	
8	E007	Motor speed (estimated)	1rpm	
9	E008	Output torque	0.01%	
10	E009	DC bus input voltage	V	
11	E010	Input power	0.01kW	
12	E011	Output power	0.01kW	
13	E012	Input power accumulates	W.h	
14	E013	Output power accumulation	W.h	

No.	Communication address	Description of function	Unit	Note
15	E014	Cumulative running time	h(小时)	
16	E015	Logic input	-	See Table A.19 for details
17	E016	Logic output	-	See Table A.20 for details
18	E017	Analog input AI1 (10-bit precision)	-	Range (0-1023)
19	E018	Analog input AI2 (10-bit precision)	-	Range (0-1023)

Table A.18 Real-time running state monitoring

Communication address	Description of function		
FD03	Real-time running state monitoring		
Bit	Description	0	1
0	Reserved	-	-
1	Fault	No fault	Tripping
2-8	Reserved	-	-
9	Forward/reverse rotation	Forward rotation	Reverse rotation
10	Running/stop	Stop	Running
11-15	Reserved	-	-

Table A.19 Logic input state monitoring

Communication address	Description of function		
FE11	Logic input state monitoring		
Bit	Description	0	1
0	Terminal L1	OFF	ON
1	Terminal L2	OFF	ON
2	Terminal L3	OFF	ON
3	Terminal L4	OFF	ON
4	Terminal L5	OFF	ON
5	Terminal L6	OFF	ON
6	Terminal L7 or As AI1 during logic input	OFF	ON
7	Terminal L8 or As AI1 during logic input	OFF	ON
8-15	Reserved	-	-

Table A.20 Logic Output state monitoring

Communication address	Description of function		
FE12	Logic output state monitoring		
Bit	Description	0	1
0	Terminal LO1-CLO1	OFF	ON
1	Relay T2	OFF	ON
2	Relay T1	OFF	ON
3-15	Reserve	-	-

Table A.21 Fault monitoring

Communication address	Description of function	
FC39	Fault monitoring	
Value	Corresponding fault	Panel display
0000H	No fault	<i>nErr</i>
0001H	Acceleration overcurrent	<i>E-01</i>
0002H	Deceleration overcurrent	<i>E-01</i>
0003H	Constant speed overcurrent	<i>E-01</i>
0008H	Input phase failure	<i>E-41</i>
0009H	Output phase failure	<i>E-42</i>
000AH	Acceleration overvoltage	<i>E-11</i>
000BH	Deceleration overvoltage	<i>E-11</i>
000CH	Constant speed overvoltage	<i>E-11</i>
000DH	frequency inverter overload	<i>E-21</i>
000EH	Motor overload	<i>E-22</i>
0010H	Overheat tripping	<i>E-24</i>
0011H	Emergency tripping	<i>E-43</i>
0012H	EEPROM error 1 (write error)	<i>E-31</i>
0013H	EEPROM error 2 (Read error)	<i>E-31</i>
0014H	EEPROM error 3 (Internal error)	<i>E-31</i>
0018H	External communication error	<i>E-33</i>
001AH	Current detection fault	<i>E-34</i>
001EH	Undervoltage	<i>E-12</i>

9. APPENDIX B: CONCISE PARAMETER LIST

[-F0-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F000</i>	Operation frequency of keypad	<i>F009~F008</i>	0.0	○	
<i>F001</i>	V/F control mode selection	0: V/F constant 1: Variable torque 2: Sensor-less vector control 3: Energy saving	0	●	
<i>F002</i>	Command mode selection 1	0: Terminal board 1: Keypad 2: Serial communication	1	●	
<i>F003</i>	Frequency setting mode selection 1	0: Built-in potention meter 1: AI1 input 2: AI2 input 3: Keypad(Given frequency) 4: Serial communication (Given frequency) 5: UP/DOWN setting 6: AI1+AI2 7: PID setting of keypad (PID given) 8: Simple PLC running	3	●	
<i>F004</i>	Command mode selection 2	0: Terminal board 1: Keypad 2: Serial communication	0	○	
<i>F005</i>	Frequency setting mode selection 2	0: Built-in potention meter 1: AI1 input 2: AI2 input 3: Keypad(Given frequency) 4: Serial communication (Given frequency) 5: UP/DOWN speed given 6: AI1+AI2 7: PID setting of keypad (PID given) 8: Simple PLC running option	2	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F006</i>	Frequency /PID given source conversion	0: Switch between <i>F003</i> and <i>F005</i> 1: Switch is disabled 2: Switch between <i>F003</i> and <i>F021</i> selected frequency /PID source 3: Switch between <i>F005</i> and <i>F021</i> selected frequency /PID source	0	○	
<i>F007</i>	Maximum frequency	30.0~400.0 Hz	50.0	●	
<i>F008</i>	Upper limit frequency	0.5 Hz ~ <i>F007</i>	50.0	○	
<i>F009</i>	Lower limit frequency	0.0 Hz ~ <i>F008</i>	0.0	○	
<i>F010</i>	Acceleration time 1	0.1~3200 s	varies by model	○	
<i>F011</i>	Deceleration time 1	0.1~3200 s	varies by model	○	
<i>F012</i>	PWM carrier frequency	1.5k~12.0 kHz	varies by model	○	
<i>F013</i>	Carrier frequency control mode selection	0: not reduced automatically 1: reduced automatically	1	●	
<i>F014</i>	Random PWM mode	0: Disable. 1: Enable.	0	○	
<i>F015</i>	Automatic acceleration/deceleration	0: Disabled (manual). 1: Automatic (at acceleration & deceleration) 2: Automatic (only at acceleration)	0	●	
<i>F016</i>	Factory reserved	-	-		
<i>F017</i>	Parameter setting mQDo function	0: Default value. 1: 2-wire control (Negative logic mode, ramp stop). 2: 3-wire control (Negative logic mode, ramp stop). 3: External input UP/DOWN setting (Negative logic mode, slowdown stop). 4 ~ 16: Factory reserved 17: PID sleep & Wake Control (<i>F003</i> =7 <i>F910</i> =0.1s <i>F911</i> =75.0% <i>F915</i> =5.0s <i>F919</i> =38.0Hz) 18: PID basic control (<i>F002</i> =1 <i>F003</i> =7 <i>F367</i> =1 <i>F523</i> =2 <i>F900</i> =1 <i>F917</i> =100 <i>F918</i> =20) 19: Factory reserved	0	●	
<i>F018</i>	Factory reserved	-	-		
<i>F020</i>	Factory reserved	-	-		

NO.	Parameter Name	Setting Range	default	WRT	
<i>F021</i>	Primary and secondary frequencies /PID are given	0: Single channel given 1: $F003 + F005$ 2: $F003 - F005$ 3: MAX ($F003, F005$) 4: MIN ($F003, F005$)	0	○	
<i>F022</i>	<i>F005</i> frequency given coefficient	0.0~ 100.0%	100.0 %		
<i>F023</i>	<i>F005</i> frequency bias given	0.0Hz~400.0Hz	0.0Hz		
<i>F024</i>	Lower limit selection and <i>F005</i> = 3/7 setting	0~ 5	0		
<i>F099</i>	Factory reserved	Same as <i>F020</i>			

[-F1-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F100</i>	Auto-tuning	0: Auto-tuning disabled 1: Application of individual settings of <i>F203</i> 2: Auto-tuning enabled	0	●	
<i>F101</i>	Base frequency 1	25.0~400.0 Hz	50.0	●	
<i>F102</i>	Base frequency voltage1	50~660 V	varies by model	●	
<i>F103</i>	Motor rated current	0.1~200.0 A	varies by model	●	
<i>F104</i>	Motor rated speed	100~15000 rpm	varies by model	●	
<i>F105</i>	Motor no-load current	10.0~100.0%	varies by model	●	
<i>F106</i>	Motor electronic thermal protection level 1	varies by model	varies by model	○	
<i>F107</i>	stall prevention level 1	varies by model	varies by model	●	
<i>F108</i>	Base frequency 2	25.0~400.0 Hz	50.0	●	
<i>F109</i>	Base frequency voltage 2	50~660V	varies by model	●	
<i>F110</i>	Motor electronic-thermal protection level 2	varies by model	varies by model	○	
<i>F111</i>	Stall prevention level 2	varies by model	varies by model	○	
<i>F112</i>	factory reserved	-			
<i>F113</i>	factory reserved	-			
<i>F114</i>	factory reserved	-			
<i>F115</i>	factory reserved	-			

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 120</i>	Default setting	0: - 1: Standard default setting (Initialization) 2: Save user-defined parameters 3: Call user-defined parameters 4: Trip record clear 5: Cumulative operation time clear 6: Cumulative fan operation time record clear 7: Initialization of type information 8: P-type rating. 9: G-type rating.	0	●	

[-f2-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 201</i>	Supply voltage correction	0: Supply voltage uncorrected, output voltage limited. 1: Supply voltage corrected, output voltage limited. 2: Supply voltage uncorrected, output voltage unlimited. 3: Supply voltage corrected, output voltage unlimited.	3	●	
<i>F 202</i>	Voltage boost 1	0.0~30.0%	varies by model	○	
<i>F 203</i>	Torque boost	0.0~30.0%	varies by model	○	
<i>F 204</i>	Slip frequency gain	0~150%	50	○	
<i>F 205</i>	Exciting current coefficient	100~130	100	●	
<i>F 206</i>	Voltage boost 2	0~30%	varies by model	○	
<i>F 207</i>	Speed control response coefficient	1~150	40	●	
<i>F 208</i>	Speed control stability coefficient	1~100	20	●	
<i>F 209</i>	Stall prevention control coefficient 1	10~250	100	●	
<i>F 210</i>	Stall prevention control coefficient 2	50~150	100	●	
<i>F 211</i>	Maximum voltage adjustment coefficient	90~120%	104	●	
<i>F 212</i>	Waveform switching adjustment coefficient	0.1~14kHz	14.0	●	
<i>F 213</i>	factory reserved				
<i>F 214</i>	factory reserved				

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 2 15</i>	factory reserved				
<i>F 2 16</i>	factory reserved				
<i>F 2 17</i>	multipoint profile V/F patter	0: factory reserved. 1: factory reserved. 2: Enable multipoint profile V/F patter.	0	•	
<i>F 2 18</i>	point 1 output frequency (F1)	0~ <i>F 2 20</i>	10.0	•	
<i>F 2 19</i>	point 1 output frequency voltage (V1)	0~100%	20.0	•	
<i>F 2 20</i>	point 2 output frequency (f2)	<i>F 2 18</i> ~ <i>F 2 20</i>	20.0	•	
<i>F 2 21</i>	point 2 output frequency voltage (V2)	0~100%	40.0	•	
<i>F 2 22</i>	point 3 output frequency (f3)	<i>F 2 20</i> ~ <i>F 10 1</i>	30.0	•	
<i>F 2 23</i>	point 3 output frequency voltage (V3)	0~100%	60.0	•	

[-f3-]

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 3 00</i>	AI1 terminal function selection	0: AI1 - analog input 1: AI1 - contact input (Sink mode) 2: AI1 - contact input (Source mode)	0	•	
<i>F 3 01</i>	Input terminal function for LI1	0: No function is assigned 1: Standby terminal 2: Forward run command 3: Reverse run command 4: Jog run mode 5: Acceleration/deceleration 2 pattern selection 6: Preset-speed command 1 7: Preset-speed command 2 8: Preset-speed command 3 9: Preset-speed command 4 10: Reset command 11: Trip stop command from external input device 13: DC braking command 14: PID control disabling 15: Permission of parameter editing 16: Combination of standby and reset commands 17: Frequency source switching to AI1 18: Combination of forward run and jog run	2	•	
<i>F 3 02</i>	Input terminal function for LI2		3	•	
<i>F 3 03</i>	Input terminal function for LI3		0	•	
<i>F 3 04</i>	Input terminal function for LI4		10	•	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 304</i>	Input terminal function for LI4	19: Combination of reverse run and jog run 20: Frequency setting source switching 21: No.2 Switching of V/F setting 22: No.2 motor switching 23: Frequency UP signal input from external contacts 24: Frequency DOWN signal input from external contacts 25: Frequency UP/DOWN cancellation signal input from external contacts 26: inversion of trip stop command from external device 27 Thermal trip stop signal input from external device 28: inversion of thermal trip stop signal input from external device 29: Forced switching from remote to local control 30: Operation holding (stop of 3-wire operation) 31: Forced switching of command mode and terminal board command 32: Display cancellation of the cumulative power amount (kWh) 33: Fire-speed control seef419 34: Coast stop (gate off) 35: Inversion of Reset 36: Forced switching of stall prevention level 2 37: PID control integral value clear PID control integral value clear 38: inversion of PID error signal 39: Forward running command + Acc&Dec curve 2 40: Reverse running command + Acc&Dec curve 2 41: Forward running command + Multi-speed section 1 42: Reverse running command + Multi-speed section 1 43: Forward running command + Multi-speed section 2 44: Reverse running command + Multi-speed section 2 45: Forward running command + Multi-speed section3 46: Reverse running command + Multi-speed section 3 47: Forward running command + Multi-speed section 4	10	•	

NO.	Parameter Name	Setting Range	default	WRT	User setting
F304	Input terminal function for LI4	48: Reverse running command + Multi-speed section 4 49: Multi-speed section 1 + Acc&Dec curve 2 50: Multi-speed section 2 + Acc&Dec curve 2 51: Multi-speed section 3 + Acc&Dec curve 2 52: Multi-speed section 4 + Acc&Dec curve 2 53: Forward running command +Multi-speed section 1+ Acc&Dec curve 2 54: Reverse running command +Multi-speed section 1+ Acc&Dec curve 2 55: Forward running command +Multi-speed section 2+ Acc&Dec curve 2 56: Reverse running command +Multi-speed section 2+ Acc&Dec curve 2 57: Forward running command +Multi-speed section 3+ Acc&Dec curve 2 58: Reverse running command +Multi-speed section 3+ Acc&Dec curve 2 59: Forward running command +Multi-speed section 4+ Acc&Dec curve 2 60: Reverse running command +Multi-speed section 4+ Acc&Dec curve 2 61: UP/DOWN speed clean up+ fault reset 62: Running permission+ Forward running command (only 2-wire control) 63: Running permission+ reverse running command (only 2-wire control) 64: Acc&dec curve 3 65: Acce/Dece curve 3 + Forward running command 66: Acce/Dece curve 3 + Reverse running command 67: Command source switch 68: Command source + frequency source switch 69: Three-wire control stop reverse 70: Reset when simple PLC stops 71: Simple PLC time out 72: Simple PLC pause 73/74: PID control + frequency given source switch 75:(UP/DOWN) stop speed clearance	10	•	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 305</i>	AI1 voltage-current input selection	0:0~5V voltage signal input. 1:0~10V voltage signal input. 2: 0-20mA(4-20mA) current signal input.	0	•	
<i>F 306</i>	sink/soruce mode selection	0: Source (Positive) logic terminal mode. 1: Sink (Negative) logic terminal mode	1	•	
<i>F 307</i>	AO voltage-current output selection	0: Current signal output. 1: Voltage signal output.	1	•	
<i>F 308</i>	Input terminal function of AI1	<i>F 301~F 304</i>	0	•	
<i>F 309</i>	Always-active terminal selection 1	<i>F 301~F 304</i>	1	•	
<i>F 310</i>	Always-active terminal selection 2	<i>F 301~F 304</i>	0	•	
<i>F 311</i>	Output terminal function A of LO1-CLO1	<i>F 315</i>	4	•	
<i>F 312</i>	Output terminal function B of LO1-CLO1	<i>F 315</i>	255	•	
<i>F 313</i>	AI2 terminal function selection	0: AI2 - analog input 1: AI2 - contact input (Sink) 2: AI2 - contact input (Source)	0	•	
<i>F 314</i>	Input terminal function of AI2	<i>F 301~F 304</i>	0	•	
<i>F 315</i>	Output terminal function A of T1 (T1A-T1B-T1C)	0: Output frequency higher than lower limit frequency 2: Output frequency equals to upper limit frequency 4: Output frequency is higher or equal to <i>F 337</i> 6: (set frequency - <i>F 339</i>) < output frequency < (set frequency + <i>F 339</i>) 8: (<i>F 338</i> - <i>F 339</i>) < output frequency < (<i>F 338</i> + <i>F 339</i>) 10: Output frequency higher or equal to <i>F 338</i> + <i>F 339</i> 12: <i>F.003</i> or <i>F.005</i> source supply given speed=AI1 signal 14: <i>F.003</i> or <i>F.005</i> source supply given speed=AI2 signal 16: AI1's value higher or equal to <i>f340</i> + <i>F 341</i> 18: AI2's value is higher or equal to <i>F 342</i> + <i>F 343</i>	40	•	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 3 15</i>	Output terminal function A of T1 (T1A-T1B-T1C)	20: AI2 is the speed given source 22: Frequency inverter forward motor power supply (acceleration, deceleration, constant speed or DC braking) 24: Ready for running of the frequency inverter (running permission and running command available) 26: Motor reverse running 28: Under local mode for frequency inverter 30: Fault happened in the frequency inverter 32: Evaluated motor torque is at <i>F 4 12</i> level time is still less than <i>F 4 14</i> set value. 34: Motor current is less than <i>F 4 08</i> and its lasting time is over <i>F 4 10</i> setting. 36: Fault occurred and could not reset. 38: Fault occurred but it could reset. 40: Fault occurs in the frequency inverter 42: Alarm occurs 44: Motor heating status has reached 50% of motor overload fault level. 46: DC braking resistor status has reached 50% DC braking resistor overload fault level. 48: Evaluated motor torque reaches <i>F 4 12</i> *70% 50: Run time≥ <i>F 4 28</i> set value 52: The equipment sends maintenance alarm warning. (Fan, PCB or capacitor needs replacement.) 54: PTC heating sensor needle has detected motor temperature reaching 60% of trip level. 56: Undervoltage alarm is valid. 58: Brake pull 60: In the process of motor acceleration process	40	•	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 3 15</i>	Output terminal function A of T1 (T1A-T1B-T1C)	62: In the process of motor deceleration 64: In the process of motor deceleration or acceleration 66: Heat sink temperature has reached alarm value 68: One PLC recycle completes 70: One PLC speed section completes 72: The inverter is ready to receive the running signal 74~79: unused 80: LI1 input is valid 82: LI2 input is valid 84: PID feedback pressure equal to or higher than $F 6 2 7 + F 6 2 8$ 86: PID feedback pressure equal to or higher than $F 9 1 8 + F 6 2 8$ 88~253: Unused 254: Relay constant output OFF 255: Relay constant output ON	40	●	
<i>F 3 16</i>	Output terminal logic selection of LO1-CLO1	0: And logic 1: Or logic	0	●	
<i>F 3 17</i>	LO1-CLO1 output delay	0.0~60.0 s	0.0	○	
<i>F 3 18</i>	Relay 1 closing delay	0.0~60.0 s	0.0	○	
<i>F 3 19</i>	External contact input - UP response time	0.0~10.0 s	0.1	○	
<i>F 3 20</i>	External contact input - UP frequency steps	0.0 Hz ~ $F 0 0 7$	0.1	○	
<i>F 3 21</i>	External contact input - DOWN response time	0.0~10.0 s	0.1	○	
<i>F 3 22</i>	External contact input - DOWN frequency steps	0.0 Hz ~ $F 0 0 7$	0.1	○	
<i>F 3 23</i>	Initial up/down frequency	0.0 Hz ~ $F 0 0 7$	0.0	○	
<i>F 3 24</i>	Change of the initial up/down frequency	0/2/4: disabled 1/3/5: enabled	1	○	
<i>F 3 25</i>	AI1 input point 1 setting	0~100%	0	○	
<i>F 3 26</i>	AI1 input point 1 frequency	0.0~400.0 Hz	0.0	○	
<i>F 3 27</i>	AI1 input point 2 setting	0~100%	100	○	
<i>F 3 28</i>	AI1 input point 2 frequency	0.0~400.0 Hz	50.0	○	
<i>F 3 29</i>	AI2 input point 1 setting	0~100%	0	○	
<i>F 3 30</i>	AI2 input point 1 frequency	0.0~400.0 Hz	0.0	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
F 331	AI2 input point 2 setting	0~100%	50	○	
F 332	AI2 input point 2 frequency	0.0~400.0 Hz	50.0	○	
F 333	AI1 input bias	0~255	varies by model	○	
F 334	AI1 input gain	0~255	varies by model	○	
F 335	AI2 input bias	0~255	varies by model	○	
F 336	AI2 input gain	0~255	varies by model	○	
F 337	Low-speed signal output frequency	0.0 Hz ~F007	0.0	○	
F 338	Speed reach detection output frequency	0.0 Hz ~F007	0.0	○	
F 339	Speed reach detection band	0.0 Hz ~F007	2.5	○	
F 340	AI1 input reach detection level	0~100%	0	○	
F 341	AI1 input reach detection band	0~20%	3	○	
F 342	AI2 input reach detection level	0~100%	0	○	
F 343	AI2 input reach detection band	0~20%	3	○	
F 344	Frequency command agreement detection range	0.0 Hz ~F007	2.5	○	
F 345	Logic output/pulse train output selection (LO1-CLO1)	0: Logic output 1: Pulse train output	0	●	
F 346	Pulse train output function selection (LO - CLO)	0: Output frequency 1: Output current 2: Set frequency (Before PID) 3: Frequency setting value (After PID) 4: DC voltage 5: Output voltage command value 6: Input power 7: Output power 8: AI1 Input value 9: AI2 Input value 10: Torque 11: Torque current 12: Motor cumulative load factor 13: Inverter cumulative load factor 14: PBR (braking reactor) cumulative load factor	0	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 347</i>	Maximum numbers of pulse train	500~1600	800	○	
<i>F 348</i>	AO1 selection	0: Output frequency 1: Output current 2: Set frequency (before PID) 3: Frequency setting value (after PID) 4: DC voltage 5: Output voltage command value 6: Input power 7: Output power 8: AI1 input 9: AI2 input 10: Torque 11: Torque current 12: Motor cumulative load factor 13: Inverter cumulative load factor 14: brake resistor cumulative load factor 15: Serial communication data 16: 185% proofread 17: 150% proofreading 18: 100% proofread	0	○	
<i>F 349</i>	AO1 gain adjustment	1~1280	varies by model	○	
<i>F 350</i>	Inclination characteristic of analog output	0: Negative 1: Positive	1	○	
<i>F 351</i>	Bias of analog output	0~100%	0	○	
<i>F 352</i>	output frequency when AO1 = 0V	0 Hz ~ <i>F.007</i>	0.0	○	
<i>F 353</i>	output frequency when AO1 = 10V	0 Hz ~ <i>F.007</i>	0.0	○	
<i>F 354</i>	AO1 bias	0~255	128	○	
<i>F 355</i>	Analog Output Voltage Bias Calibration (AO1)	<i>F 301</i> ~ <i>F 304</i> (15kW and above)	0	●	
<i>F 356</i>	Input terminal function for LI6	<i>F 301</i> ~ <i>F 304</i> (15kW and above)	0	●	
<i>F 357</i>	Input terminal function for LI7	<i>F 301</i> ~ <i>F 304</i> (15kW and above)	0	●	
<i>F 358</i>	Input terminal function for LI8	<i>F 301</i> ~ <i>F 304</i> (15kW and above)	0	●	
<i>F 359</i>	Output terminal function A of T2	See <i>F 315</i>	0	●	
<i>F 360</i>	Relay 2 auxiliary functions	See <i>F 315</i>	255	●	
<i>F 361</i>	Output terminal logic selection of T2	0: And Logic (15kW and above) 1: Or Logic	0	●	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 362</i>	Relay 2 closing delay	0~60.0s (15kW and above)	0.0	●	
<i>F 363</i>	Input terminal active mode	8 bits - hexadecimal display, each option: 0: Closure is valid 1: Disconnect effective			
<i>F 364</i>	Logical input terminal filtering	0~200	0		
<i>F 365</i>	Relay output 1 assistant function	<i>F 315</i>	255		
<i>F 366</i>	Relay output 1 function logic relation	0~1	0		
<i>F 367</i>	Terminal run detection selection at power on	0: disable 1: enable	0		
<i>F 368</i>	Analog output signal type (AO2)	0: Current signal output 1: Voltage signal output	1	●	
<i>F 369</i>	Analog output function selection (AO2)	<i>F 348</i>	0	○	
<i>F 370</i>	Analog output current scaling (AO2)	1~1280	Based on machine model	○	
<i>F 371</i>	AO2 Analog output slope	0: Negative slope 1: Positive slope	1	○	
<i>F 372</i>	AO2 Analog output bias	0~100%	0	○	
<i>F 373</i>	Analog Output current Bias Calibration (AO2)	0~255	4	●	
<i>F 374</i>	Percentage of AO monitored values	0~250%	0	●	
<i>F 375</i>	Relay 1 disconnect delay	0~60.0s	0.0	●	
<i>F 376</i>	Relay 2 disconnect delay	0.0~60.0s	0.0	●	

[-f4-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 400</i>	Retry selection	0: disabled 1~10 times.	0	●	
<i>F 401</i>	Electronic-thermal protection characteristic selection	0: Trip enable, stall disable (standard motor) 1: Trip enable, stall enable (standard motor) 2: Trip disable, stall disable (standard motor)	0	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F401</i>	Electronic-thermal protection characteristic selection	3: Trip disable, stall enable (standard motor) 5: Trip enable, stall disable (forced cooling motor) 6: Trip enable, stall enable (forced cooling motor) 7: Trip disable, stall disable (forced cooling motor) 8: Trip disable, stall enable (forced cooling motor)	0	○	
<i>F402</i>	Motor 150%-overload time limit	10-2400 s	300	○	
<i>F403</i>	Emergency stop selection	0: Coast stop 1: Slowdown stop 2: Emergency DC braking	0	●	
<i>F404</i>	emergency braking time	0.0-20.0 s	1.0	○	
<i>F405</i>	Input phase failure detection	0: Disabled, No tripping. 1: Enabled	0	●	
<i>F406</i>	Output phase failure detection mode selection	0: Disabled 1: At start-up (Only one time after power is turned on) 2: At start-up (each time) 3: During operation 4: At start-up + during operation 5: Detection of cutoff on output side	0	●	
<i>F407</i>	Small current trip/alarm selection	0: Alarm 1: trip	0	○	
<i>F408</i>	Small current detection current	0~100%	0.00	○	
<i>F409</i>	Small current detection current hysteresis	1~20%	10	○	
<i>F410</i>	Small current detection time	0-255 s	0	○	
<i>F411</i>	Over-torque trip/Overcurrent indication	0: Over-torque alarm (70%) 1: Over-torque fault 2: Over-torque alarm (100%) 3: Over-current alarm (70%) 4: Overcurrent fault 5: Overcurrent alarm (100%)	0	○	
<i>F412</i>	Over-torque detection level	0~250%	130	○	
<i>F413</i>	Over-torque detection level hysteresis	0~100%	10	○	
<i>F414</i>	Over-torque detection time	0.0~10.0 s	0.5	○	
<i>F415</i>	Overvoltage limit operation	0: Enabled. speed. 1: Disabled 2: Enabled (Quick deceleration). 3: Enabled (Dynamic quick deceleration).	2	●	

NO.	Parameter Name	Setting Range	default	WRT	User setting
F416	Overvoltage limit operation level	100-150%	130	●	
F417	Undervoltage trip/alarm selection	0: Alarm only (detection level below 60%) 1: Tripping (detection level below 60%). 2: Alarm only (detection level below 50%)	0	●	
F418	Instantaneous power failure coast stop selection	0: disabled 1: factory reserved 2: Coast stop.	0	●	
F419	Forced fire-speed control function	0: Disabled. 1: Enabled.	0	○	
F420	Detection of output short-circuit during start-up	0: Each time (standard pulse) 1: Only one time after power is turned on (standard pulse) 2: Each time (short-time pulse) 3: Only one time after power is turned on (short-time pulse)	0	●	
F421	Motor electric-thermal protection retention selection	0: disabled. 1: Enabled.	0	○	
F422	AI1 input loss	1~100%	0	○	
F423	Activation of the frequency inverter during 4-20mA signal loss	0: No measures. 1: Coast stop. 2: switch to Fallback speed. 3: Speed maintaining. 4: Slowdown stop.	0	●	
F424	Fallback speed	0.0 Hz ~F007	0.0	○	
F425	PTC thermal selection	0: Disabled 1: Enabled (trip mode) 2: Enabled (alarm mode)	0	○	
F426	Resistor value for PTC detection	100-9999Ω	3000	○	
F428	Cumulative operation time alarm setting	0.0-999.9 h (0.1=10 hour)	610.0	○	
F429	frequency inverter trip retention selection	0: clearing 1: maintaining	0	○	
F430	Heat sink temperature reaches the alarm value	0 ~100℃	60	●	
F431	Analog output current scaling (AO1)	1~1280			
F432	Analog Output current Bias Calibration (AO1)	0~255			
F433	Analog output voltage scaling (AO2)	1~1280			
F434	Analog Output Voltage Bias Calibration (AO2)	0~255			

[-f5-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F500</i>	Auto-restart control selection	0: Disabled 1: At auto-restart after momentary stop 2: When turning standby (input terminal function =1) on or off 3: At auto-restart or when turning standby (input terminal function =1) on or off 4: At start-up 5~7: Factory reserved 8: DC braking and then start.	0	●	
<i>F501</i>	auto-stop time limit for lower-limit frequency operation	0.0: disable 0.1-600.0 s	0.1	○	
<i>F502</i>	Bumpless operation selection	0: disabled. 1: enabled.	1	○	
<i>F503</i>	Starting frequency setting	0.5~10.0 Hz	0.5	○	
<i>F504</i>	Operation starting frequency	0.0 Hz ~ <i>F007</i>	0.0	○	
<i>F505</i>	Operation starting frequency hysteresis	0.0 Hz ~ <i>F007</i>	0.0	○	
<i>F506</i>	DC braking starting frequency	0.0 Hz ~ <i>F007</i>	0.0	○	
<i>F507</i>	DC braking current	varies by model	varies by model	○	
<i>F508</i>	DC braking time	0.0~20.0 s	1.0	○	
<i>F510</i>	Acceleration/deceleration 1 pattern	0: Linear 1: S pattern 1 2: S pattern 2 3: Elevator acceleration / deceleration curve	0	○	
<i>F511</i>	Acceleration/deceleration 2 pattern	0: Linear 1: S pattern 1 2: S pattern 2	0	○	
<i>F512</i>	Acceleration/deceleration 3 pattern	0: Linear 1: S pattern 1 2: S pattern 2	0	○	
<i>F513</i>	Acceleration/deceleration 1 and 2 switching frequency	0.0 Hz ~ <i>F008</i>	0.0	○	
<i>F514</i>	Acceleration/deceleration 2 and 3 switching frequency	0.0 Hz ~ <i>F008</i>	0.0	○	
<i>F515</i>	Selecting an acceleration/deceleration pattern	1: Acc/Dec 1 2: Acc/Dec 2 3: Acc/Dec 3	1	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F516</i>	S-pattern lower-limit adjustment amount	0~50%	10	○	
<i>F517</i>	S-pattern upper-limit adjustment amount	0~50%	10	○	
<i>F518</i>	Acceleration time 2	0.0~3200 s	20.0	○	
<i>F519</i>	Deceleration time 2	0.0~3200 s	20.0	○	
<i>F520</i>	Acceleration time 3	0.0~3200 s	20.0	○	
<i>F521</i>	Deceleration time 3	0.0~3200 s	20.0	○	
<i>F522</i>	Reverse-run prohibition	0: Forward/reverse run permitted. 1: Reverse run prohibited. 2: Forward run prohibited.	0	●	
<i>F523</i>	stop type	0: Ramp shutdown 1: Free shutdown of keyboard 2: 2 line control free stop 3: 2 line control free stop	2	○	
<i>F526</i>	Positive and negative operation is preferred	0: Forward + reverse ->reverse 1: forward + reverse ->downtime 2: Forward + reverse ->Let me give you the direction 3: Forward + reverse ->In the direction given by 4: Forward + reverse ->positive	1	○	
<i>F527</i>	regenerative braking selection	0: Disabled 1: Enabled (with resistor overload protection) 2: Enabled (without resistor overload protection)	2		
<i>F528</i>	regenerative braking resistance	1.0~1000.0Ω	20.0	●	
<i>F529</i>	regenerative braking resistor capacity	0.01~30.0 kW	0.12	●	
<i>F530</i>	Positive and negative dead zone time	0.0~25.0s	10	○	
<i>F531</i>	Acceleration / deceleration S - curve upper limit 2	0~50 %	10	●	
<i>F532</i>	Acceleration / deceleration S - curve lower limit 3	0~50 %	10	●	
<i>F533</i>	Acceleration / deceleration S - curve upper limit 3	0~50 %	10	●	

[-f6-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F600</i>	Prohibition of panel reset operation	0: Permitted 1: Prohibited	0	○	
<i>F601</i>	Switching between remote control and Local control	0: Local control mode 1: remote control mode 2. JOG function is set with <i>F700</i>	1	○	
<i>F602</i>	Password check/input	0~9999	0	○	
<i>F603</i>	Current/voltage display mode	0: % 1: A (ampere)/V (volt),	1	○	
<i>F604</i>	Frequency free unit magnification	0: unit is Hz 0.01-200.0: free unit	0.00	○	
<i>F605</i>	Factory reserved	-	0	●	
<i>F606</i>	Inclination characteristic of free unit display	0: Negative inclination (downward slope) 1: Positive inclination (upward slope)	1	○	
<i>F607</i>	Bias of free unit display	0.00 Hz ~ <i>F007</i>	0.00	○	
<i>F608</i>	Free step 1 (pressing a panel key once)	Disabled: 0.00 Enabled: 0.01 Hz ~ <i>F007</i>	0.00	○	
<i>F609</i>	Free step 2 (panel display)	0: disabled 1~255: enabled	0	○	
<i>F610</i>	Standard monitor display selection	0: Output frequency(Hz(free)) 1: Frequency command(Hz(free)) 2: Output current(%/A) 3: frequency inverter rated current (A) 4: frequency inverter load (%) 5: Output power (kW) 6: Stator frequency (Hz (free)) 7: communication data display 8: Output speed 9: Communication counter 10: Normal communication counter 11: Stop - given frequency (<i>F900</i> =0)/given PID (<i>F900</i> ≠0), Run - output frequency	0	○	
<i>F611</i>	panel running order clear selection	0: clear 1: keep	1	○	
<i>F612</i>	Panel operation prohibition (F000)	0: Permitted 1: Prohibited	0	○	
<i>F613</i>	Prohibition of panel operation (RUN/STOP keys)	0: Permitted. 1: Prohibition.	0	○	
<i>F614</i>	Prohibition of panel emergency stop operation	0: Permitted. 1: Prohibition.	0	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F616</i>	Integral output power retention selection	0: (clear) 1: (memory)	1	○	
<i>F617</i>	Integral output power display unit selection	0: 1kWh. 1: 10kWh. 2: 100kWh. 3: 1000kWh.	varies by model	○	
<i>F618</i>	Search and resetting of changed parameters selection	0: disable 1: enable	0	○	
<i>F619</i>	factory reserved	Frequency converter internal temperature monitoring 1			
<i>F620</i>	factory reserved	Frequency converter internal temperature monitoring 2			
<i>F621</i>	LCD contrast control	15~40	25		
<i>F622</i>	factory reserved				
<i>F623</i>	Bit0: Fan self-running	0: The fan works when the converter is running 1: The fan works when the inverter is powered on	0	○	
	Bit1: Positive power monitoring	0: Monitoring both positive and negative power 1: Monitor only positive power			
<i>F624</i>	Keyboard panel displays 2	Same as <i>F610</i>	2	○	
	Quick Monitoring 1	Same as <i>F610</i>			
<i>F625</i>	Keyboard panel displays 3	Same as <i>F610</i>	1	○	
	Quick Monitoring 2	1 ~ 8: see <i>F610</i> 9: PID is given 10: PID feedback			
<i>F626</i>	Keyboard panel displays 4	Same as <i>F610</i>	5	○	
	Quick Monitoring 2	1 ~ 8: see <i>F610</i> 9: PID is given 10: PID feedback			
<i>F627</i>	Relay output -PID feedback check out	0.00~99.99	0.00		
<i>F628</i>	Relay output -PID feedback to detect bandwidth	0.00~99.99	0.00		
<i>F629</i>	Factory reserved				

[-f7-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 700</i>	JOG key function setting	0~6	5	○	
<i>F 701</i>	jog run frequency	0.0~20.0 Hz	5.0	○	
<i>F 702</i>	Jog stopping pattern	0: Slow down stop. 1: coast stop. 2: DC braking.	0	●	
<i>F 703</i>	Jump frequency 1	0.0 Hz ~ <i>F 007</i>	0.0	○	
<i>F 704</i>	Jumping width 1	0.0 ~30.0 Hz	0.0	○	
<i>F 705</i>	Jump frequency 2	0.0 Hz ~ <i>F 007</i>	0.0	○	
<i>F 706</i>	Jumping width 2	0.0~30.0 Hz	0.0	○	
<i>F 707</i>	Jump frequency 3	0.0 Hz ~ <i>F 007</i>	0.0	○	
<i>F 708</i>	Jumping width 3	0.0~30.0 Hz	0.0	○	
<i>F 709</i>	Braking mode selection	0~3	0	●	
<i>F 710</i>	Release frequency	<i>F 503</i> ~20.0Hz	3.0	○	
<i>F 711</i>	Release time	0~25.0s	0.5	○	
<i>F 712</i>	Creeping frequency	<i>F 503</i> ~20.0Hz	3.0	○	
<i>F 713</i>	Creeping time	0~25.0s	1.0	○	
<i>F 714</i>	Droop gain	0~100%	0	○	
<i>F 715</i>	Droop insensitive torque band	0~100%	10	○	
<i>F 716</i>	Preset-speed 1	<i>F 009</i> ~ <i>F 008</i>	3.0	○	
<i>F 717</i>	Preset-speed 2	<i>F 009</i> ~ <i>F 008</i>	6.0	○	
<i>F 718</i>	Preset-speed 3	<i>F 009</i> ~ <i>F 008</i>	9.0	○	
<i>F 719</i>	Preset-speed 4	<i>F 009</i> ~ <i>F 008</i>	12.0	○	
<i>F 720</i>	Preset-speed 5	<i>F 009</i> ~ <i>F 008</i>	15.0	○	
<i>F 721</i>	Preset-speed 6	<i>F 009</i> ~ <i>F 008</i>	18.0	○	
<i>F 722</i>	Preset-speed 7	<i>F 009</i> ~ <i>F 008</i>	21.0	○	
<i>F 723</i>	Preset-speed 8	<i>F 009</i> ~ <i>F 008</i>	24.0	○	
<i>F 724</i>	Preset-speed 9	<i>F 009</i> ~ <i>F 008</i>	27.0	○	
<i>F 725</i>	Preset-speed 10	<i>F 009</i> ~ <i>F 008</i>	30.0	○	
<i>F 726</i>	Preset-speed 11	<i>F 009</i> ~ <i>F 008</i>	33.0	○	
<i>F 727</i>	Preset-speed 12	<i>F 009</i> ~ <i>F 008</i>	36.0	○	
<i>F 728</i>	Preset-speed 13	<i>F 009</i> ~ <i>F 008</i>	39.0	○	
<i>F 729</i>	Preset-speed 14	<i>F 009</i> ~ <i>F 008</i>	45.0	○	
<i>F 730</i>	Preset-speed 15	<i>F 009</i> ~ <i>F 008</i>	50.0	○	
<i>F 731</i>	factory reserved				
<i>F 732</i>	Multi-speed 0 run time	0~65000.0s(min)	0.0		
<i>F 733</i>	Multi-speed 1 run time	0~65000.0s(min)	0.0		
<i>F 734</i>	Multi-speed 2 run time	0~65000.0s(min)	0.0		

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 735</i>	Multi-speed 3 run time	0~65000.0s(min)	0.0		
<i>F 736</i>	Multi-speed 4 run time	0~65000.0s(min)	0.0		
<i>F 737</i>	Multi-speed 5 run time	0~65000.0s(min)	0.0		
<i>F 738</i>	Multi-speed 6 run time	0~65000.0s(min)	0.0		
<i>F 739</i>	Multi-speed 7 run time	0~65000.0s(min)	0.0		
<i>F 740</i>	Multi-speed 8 run time	0~65000.0s(min)	0.0		
<i>F 741</i>	Multi-speed 9 run time	0~65000.0s(min)	0.0		
<i>F 742</i>	Multi-speed 10 run time	0~65000.0s(min)	0.0		
<i>F 743</i>	Multi-speed 11 run time	0~65000.0s(min)	0.0		
<i>F 744</i>	Multi-speed 12 run time	0~65000.0s(min)	0.0		
<i>F 745</i>	Multi-speed 13 run time	0~65000.0s(min)	0.0		
<i>F 746</i>	Multi-speed 14 run time	0~65000.0s(min)	0.0		
<i>F 747</i>	Multi-speed 15 run time	0~65000.0s(min)	0.0		
<i>F 732</i>	Multi-speed 0 run time	0~65000.0s(min)	0.0		
<i>F 733</i>	Multi-speed 1 run time	0~65000.0s(min)	0.0		
<i>F 734</i>	Multi-speed 2 run time	0~65000.0s(min)	0.0		
<i>F 735</i>	Multi-speed 3 run time	0~65000.0s(min)	0.0		
<i>F 736</i>	Multi-speed 4 run time	0~65000.0s(min)	0.0		
<i>F 737</i>	Multi-speed 5 run time	0~65000.0s(min)	0.0		
<i>F 738</i>	Multi-speed 6 run time	0~65000.0s(min)	0.0		
<i>F 739</i>	Multi-speed 7 run time	0~65000.0s(min)	0.0		
<i>F 740</i>	Multi-speed 8 run time	0~65000.0s(min)	0.0		
<i>F 741</i>	Multi-speed 9 run time	0~65000.0s(min)	0.0		
<i>F 742</i>	Multi-speed 10 run time	0~65000.0s(min)	0.0		
<i>F 743</i>	Multi-speed 11 run time	0~65000.0s(min)	0.0		
<i>F 744</i>	Multi-speed 12 run time	0~65000.0s(min)	0.0		
<i>F 745</i>	Multi-speed 13 run time	0~65000.0s(min)	0.0		
<i>F 746</i>	Multi-speed 14 run time	0~65000.0s(min)	0.0		
<i>F 747</i>	Multi-speed 15 run time	0~65000.0s(min)	0.0		
<i>F 748</i>	PLC speed direction option	0~65535	0		
<i>F 749</i>	Simple PLC running mode	0: run one time and then stop 1: run one time and keep running at the final value 2: recycle running	0		
<i>F 750</i>	Simple PLC restart mode selection	0: start running from the first phase 1: keep running from the interrupt frequency	0		
<i>F 751</i>	Simple PLC Power drop memory selection	0: no memory for power drop 1: memory for power drop	0		

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F 752</i>	Simple PLC running time unit selection	0: second (s) 1: min	0		
<i>F 753</i>	Nonstandard function selection	0~65535	0	○	
<i>F 754</i>	AI1 curve selection	0: Curve (Point 2) 1: Curve (Point 4)	0	○	
<i>F 755</i>	AI1 curve 2 set point 1 input	0.0 ~ 100.0%	0.0%	○	
<i>F 756</i>	AI1 curve 2 sets point 1 output	-100% ~ 100%	0.0%	○	
<i>F 757</i>	AI1 curve 2 set point 2 input	0.0 ~ 100.0%	30.0%	○	
<i>F 758</i>	AI1 curve 2 sets point 2 output	-100% ~ 100%	30.0%	○	
<i>F 759</i>	AI1 curve 2 set point 3 input	0.0 ~ 100.0%	60.0%	○	
<i>F 760</i>	AI1 curve 2 sets point 3 output	-100% ~ 100%	60.0%	○	
<i>F 761</i>	AI1 curve 2 set point 4 input	0.0 ~ 100.0%	100.0%	○	
<i>F 762</i>	AI1 curve 2 sets point 4 output	-100% ~ 100%	100.0%	○	
<i>F 763</i>	LI1 effective delay	6500.0 ~ 0.0 s	0.0	○	
<i>F 764</i>	LI1 invalid delay	6500.0 ~ 0.0 s	0.0	○	
<i>F 765</i>	LI2 effective delay	6500.0 ~ 0.0 s	0.0	○	
<i>F 766</i>	LI2 invalid delay	6500.0 ~ 0.0 s	0.0	○	
<i>F 767</i>	AI1 filtering coefficient	0.00 -10.00	0.30	○	
<i>F 768</i>	AI2 filtering coefficient	0.00 -10.00	0.30	○	
<i>F 769</i>	AO1 filtering coefficient	0.00 -10.00	0.00	○	
<i>F 770</i>	AO2 filtering coefficient	0.00 -10.00	0.00	○	
<i>F 772</i>	Password Setting	0~9999	0	○	
<i>F 773</i>	Password duration	0~9999 min	5	○	
<i>F 813</i>	Module writes data 1	0: Off	1	○	
<i>F 814</i>	Module writes data 2	1: Communication command control (FA05) 2: Reservations 3: Communication frequency setting (FA08) 4 ~ 6: reservations	3	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F815</i>	Module dates read 1	0: Off	1	○	
<i>F816</i>	Module dates read 2	1: Status Information (FD03)	2	○	
<i>F817</i>	Module dates read 3	2: Output frequency (FD12)	12	○	
<i>F818</i>	Module dates read 4	3: Output current (FE08)	18	○	
<i>F819</i>	Module dates read 5	4: Output voltage (FE10) 5: Fault information (FC39) 6: PID feedback value (FA36) 7: Input terminal information (FD01) 8: Output terminal information (FD02) 9: AI1 input (FE30) 10: AI2 input (FE31) 11: Motor speed (FE50) 12: Absolute value of output current (<i>E002</i>), unit 0.01a 13: Absolute value of output voltage (<i>E006</i>), unit V 14: Absolute value of input voltage of DC bus (<i>E009</i>), unit V 15: PID given value (FA35) 16: Output torque (FE20), 0.01% of rated torque per unit motor 17: Input power (FE28), 0.01kW 18: Output power (FE29), 0.01kW 19: Input power accumulation/input electric energy (FE44), the unit is determined according to the parameter <i>F517</i> 20: Output power accumulation/output electric energy (FE45), the unit is determined according to the parameter <i>F517</i> 21: Cumulative running time (FE17), unit h (hours)	8	○	

[-f8-]					
NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F800</i>	Modbus baud rate	0: 9600 bps 1: 19200 bps 2: 4800 bps 3: 2400 bps 4: 1200 bps	1	○	
<i>F801</i>	Modbus parity	0: NONE 1: EVEN 2: ODD	1	○	
<i>F802</i>	Modbus address	0-247	1	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F803</i>	Modbus timeout	0: timeout check disabled. 1-100s	0	○	
<i>F804</i>	Modbus transger waiting time	0~2.00 s	0.00	○	
<i>F805</i>	Modbus behaviour on communication fault	0: frequency inverter stop, communication command, frequency mode open(by <i>F.002</i> , <i>F.003</i>) 1: None (continued operation) 2: Deceleration stop 3: Coast stop 4: Communication error (<i>E - 33</i> trip) or Network error (<i>E - 35</i> trip)	4	○	
<i>F806</i>	Number of motor poles for communication	1~8	2	○	
<i>F821</i>	factory reserved				
<i>F822</i>	factory reserved				
<i>F823</i>	factory reserved				
<i>F824</i>	factory reserved				
<i>F825</i>	factory reserved				
<i>F826</i>	factory reserved				
<i>F827</i>	factory reserved				
<i>F828</i>	factory reserved				
<i>F829</i>	factory reserved				
<i>F830</i>	PID setting of keypad	0~100%	0.0	○	

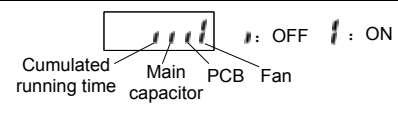
[-f9-]					
NO.	Parameter Name	Setting Range	Default	WRT	User setting
<i>F900</i>	PID control setting	0: Disabled, 1: Enabled (Feedback: AI1) 2: Enabled (Feedback: AI2)	0	○	
<i>F901</i>	Proportional gain (P control)	0.01~100.0	varies by model	○	
<i>F902</i>	Integral gain	0.01~100.0	varies by model	○	
<i>F903</i>	Differential gain	0.00~2.55	0.00	○	
<i>F904</i>	PID control waiting time	0~2400 s	0	○	
<i>F905</i>	PID regulator diviation input signal negation/Direction	0: disable/Direct action 1: enable/Reaction	0	○	
<i>F906</i>	Sleep mode awakening hysteresis bandwidth	0.0 Hz ~ <i>F007</i>	0.2	○	
<i>F907</i>	Sleeping mode awakening threshold based on PI deviation	0.0 Hz ~ <i>F917</i>	0.0	○	

NO.	Parameter Name	Setting Range	default	WRT	User setting
<i>F908</i>	Sleeping mode awakening threshold based on PI feedback	0.0 Hz ~ <i>F917</i>	0.0	○	
<i>F909</i>	sleeping mode action	0: Motor slowdown to a stop. 1: Motor keep running at lower limit frequency.	0	●	
<i>F910</i>	wake up delay	0~600.0s	0.0	●	
<i>F911</i>	Auto wake up level	0~200.0%	0.0	○	
<i>F912</i>	Auto sleep level	0~200.0%	100	○	
<i>F913</i>	Upper limit of PID setting	0~100%	100	●	
<i>F914</i>	Lower limit of PID setting	0~ <i>F913</i>	0	●	
<i>F915</i>	Delay control of sleep mode	Disable: 0.0 Enable: 0.1-600.0 s	0.1	○	
<i>F916</i>	PID control deviation limit	0~100%	0.0	○	
<i>F917</i>	Sensor range	0.00~99.99	1.00		
<i>F918</i>	PID adjustment	0.00~ <i>F917</i>	0.00		
<i>F919</i>	Sleeping frequency	0.0Hz~ <i>F008</i>	0.0		
<i>F920</i>	Sleeping threshold tolerance	0.0~25.0%	0.0		

Note 1: in the volume of “WRT”, “○”: means writable at stop or running status.; “●”: means unwritable at stop or running status;

Note 2: we can obtained modbus parameter address by replacing ‘F.’ of ‘0’. E.g. *F908*’s address is 0x0908.

NO.	Parameter Name	Description
<i>U000</i>	CPU1 Version	E.g: 100, G-type, v= g; P-type, v= p;
<i>U001</i>	Operation frequency	Value is displayed in Hz/free unit. See <i>F604</i> .
<i>U002</i>	Direction of rotation	0 Forward run, 1 Reverse run.
<i>U003</i>	frequency command value	Value is displayed in Hz/free unit. See <i>F604</i> .
<i>U004</i>	load current	The frequency inverter output current (%/A) is displayed.
<i>U005</i>	input voltage (AC RMS)	The frequency inverter input voltage (%/V) is displayed.
<i>U006</i>	output voltage (AC RMS)	The frequency inverter output voltage command (%/V) is displayed.
<i>U007</i>	Input terminal status indicated	11kW or below: 15kW or above:
<i>U008</i>	Output terminal status indicated	, without T2 at 11kW or below

NO.	Parameter Name	Description
U009	cumulative operation time	(0.01=1 hour, 1.00=100 hours)
U010	Output speed	Displays the motor speed (min-1) by calculating with output frequency and pole numbers.
U011	Rated current	The rated current of the frequency inverter (A) is displayed.
U012	Torque current	The torque current (%/A) is displayed.
U013	Load current	The frequency inverter output current (load current) (%/A) is displayed.
U014	Torque	The torque (%) is displayed.
U015	Input power	The frequency inverter input power (kW) is displayed.
U016	Output power	The frequency inverter output power (kW) is displayed.
U017	PID feedback	The PID feedback value is displayed. (Hz/free unit)
U018	Frequency command value (PID-computed)	The PID-computed frequency command value is displayed. (Hz/free unit)
U019	Integral input power	The integrated amount of power (kWh) supplied to the frequency inverter is displayed.
U020	Integral output power	The integrated amount of power (kWh) supplied from the frequency inverter is displayed.
U021	Communication counter	Displays the counter numbers of communication through the network.
U022	Normal state communication counter	Displays the counter numbers of communication only at normal state in the all communication through network.
U023	Cpu2 version	U 10
U024	Parts replacement alarm information	 <p>Cumulated running time Main capacitor PCB Fan</p> <p>OFF : ON</p> <p>ON: Needs to be replaced</p>
U025	Cpu1 revision	
U026	PID setting	Displayed in % term.
U027	PID feedback	Displayed in % term.
U1--	Past trip 1	Enter into the display of detailed information on past trip 1
U2--	Past trip 2	Enter into the display of detailed information on past trip 2
U3--	Past trip 3	Enter into the display of detailed information on past trip 3
U4--	Past trip 4	Enter into the display of detailed information on past trip 4