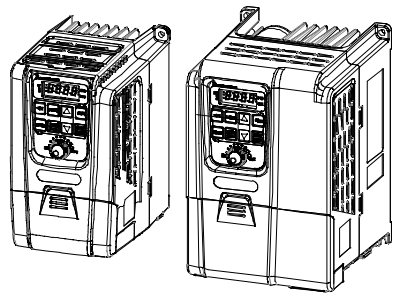
RM6E1 Series
Simple Version
Operation Manual



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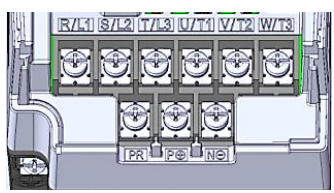
XB200161

Thank you for using RHYMEBUS RM6E1 series drive.
For proper operations and safety purposes, please read complete manual carefully (enclose CD inside the box) or visit RHYMEBUS website: http://www.rhymebus.com.tw to download the operation manual. To prevent any possible dangers ,only the qualified personnel may proceed with the installation. Please pay attention to the safety precautions marked with "DANGER" or "CAUTION" in complete manual before installation.

DANGER	User may cause the casualty or serious damages if user does not abide by the instructions of the manual to execute the tasks.
CAUTION	User may cause injuries to the people or damage the equipment if user does not abide by the instructions of the manual to execute the tasks.

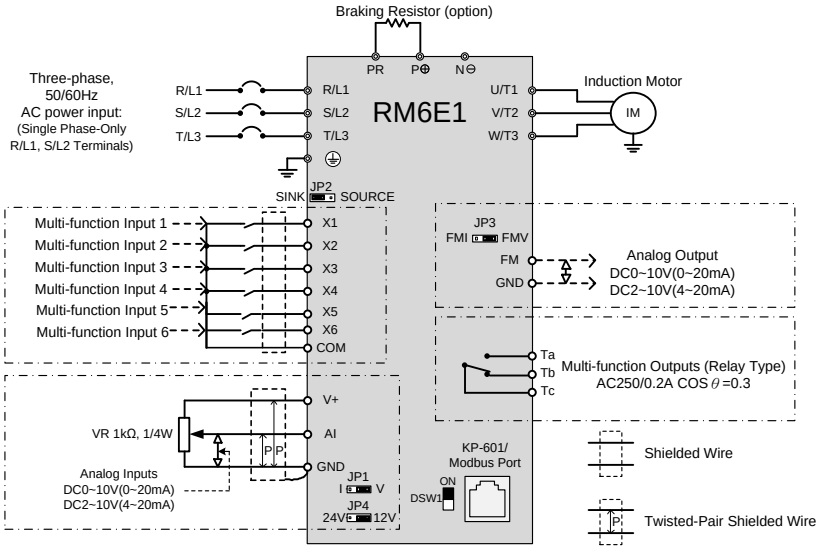
※Although the "⚠" mark may indicate minor damages, serious damages or injuries may be possibly incurred if the caution is not under user's attention.

■ Terminals of Main Circuit



Type	Symbol	Function	Description
Power Source	R/L1,S/L2,T/L3	AC power source input terminals	Three-phase; sinusoidal power source input terminal. For the single-phase power source 110/220V, please connect only R/L1,S/L2 terminals.
Motor	U/T1,VT2,W/T3	Drive outputs to motor terminals	The terminals output three phase variable frequency and voltage to motor.
Power and Brake	P⊕,NΘ	Dynamic braking unit connecting terminal	The terminals between P⊕and NΘ connect dynamic braking unit (option).
	P⊕,PR	External braking resistor connectingterminal	The terminals between P⊕and PR connect external braking resistor (option).
Grounding	⏚	Grounding terminal	Ground the drive in compliance with the NEC standard or local electrical code.

■ Descriptions of Terminal and Wiring Diagram

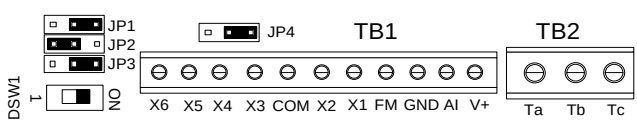


※JP1: I/V; AI signal selection
"I" position: AI-GND terminal is inputted with the current signal.
"V" position: AI-GND terminal is inputted with the voltage signal.
※JP2: SINK / SOURCE selection
The signal input selection of multi-function input terminal.
※JP3: FMI / FMV; FM signal selection
"FMI" position: Output current signal.
"FMV" position: Output voltage signal.

※JP4: 12V / 24V; V+ signal selection
"12V" position: Output DC12V between V+ and GND terminals.
"24V" position: Output DC24V between V+ and GND terminals.
※DSW1: The terminal resistor selection of Modbus communication(the internal resistance is 100Ω).

■ Control Terminals

Control Terminal Mapping



■ Description of Control Terminals

Type		Symbol	Function	Description
Control circuit terminal	Control power	V+ *Note 3	Power terminal for analog input control	DC+12V position: Maximum supplied current is 20mA. DC+24V position: Maximum supplied current is 50mA.
		GND	Common terminal for analog input control	Common terminal for control power (12V/24V) and analog input terminal (AI).
		AI *Note 1	Analog signal input terminal	The function is set by F5.01(default: frequency command) DC 0~10V / 2~10V (20kΩ);DC 0~20mA / 4~20mA (250Ω)
	Input terminals	X1	Multi-function input terminal 1	Short the terminal of X1 with COM and set the function F5.19. (default: forward command)
		X2	Multi-function input terminal 2	Short the terminal of X2 with COM and set the function F5.20. (default: reverse command)
		X3	Multi-function input terminal 3	Short the terminal of X3 with COM and set the function F5.21. (default: jog command)
		X4	Multi-function input terminal 4	Short the terminal of X4 with COM and set the function F5.22. (default: reset command)

Type		Symbol	Function	Description
Control circuit terminal	Control power	X5	Multi-function input terminal 5	Short the terminal of X5 with COM and set the function F5.23. (default: disable)
		X6	Multi-function input terminal 6	Short the terminal of X6 with COM and set the function F5.24. (default: disable)
		COM	Input/output common terminal	The common terminal of input control signal.
	Output terminals	FM *Note 2	Analog signal output terminal	The function is set by F5.12. (default: output frequency) DC 0~10V / 2~10V (1mAMax);DC 0~20mA / 4~20mA (500ΩMax)
		Ta	Multi-function output terminals (default:fault detection)	N.O (normally open contact; a contact) The function is set by F5.26, (capacity: AC250V, 0.2AMax, cosθ=0.3)
		Tb		N.C (normally closed contact; b contact) The function is set by F5.26 (capacity: AC250V, 0.2AMax, cosθ=0.3)
		Tc		Common terminal for Ta,Tb

Note 1: I/V selection is set by JP1(default: V);
Note 2: FMI/FMV selection is set by JP3 (default: FMV);
Note 3: 24V/12V selection is set by JP4 (default: 12V);

■ Parameter List [F0 System Parameter]

Func.	Name	Descriptions	Range of Setting	Unit	Default
F0.00	Drive Information	0: Software version 1: Drive model number 2: Drive rated current 3: Drive running hours 4: Drive supply power time 5: Software checksum code	—	—	—
F0.01	Parameter Lock	0: Parameters are changeable 1: Parameters are locked	0, 1	—	0
F0.02	Parameter Password Setting	Set the password for the parameter protection	0~9999	1	0
F0.03	Parameter Password Unlock	Unlock the passwords for the parameters	0~9999	1	—
F0.05	Power Source	The value of setting according to the actual power source	100.0~120.0 *Note 3 190.0~240.0 *Note 4 340.0~480.0 *Note 5	0.1V	110.0 *Note 3 220.0 *Note 4 380.0 *Note 5
F0.08 ~ F0.13	Fault Record 1 ~ Fault Record 6	0: Fault code 1: Output current at drive fault 2: DC bus voltage at drive fault 3: Output frequency at drive fault	—	—	—
F0.18	Parameter Display Selection of Password lock	1: Paramerter cannot be changed after F0.18 locked, but it can display the setting value. 2: Paramerter cannot be changed after F0.18 locked, but it cannot display the setting value.	0~1	0	
F0.20	Default Setting	0: Disable CLF: Clear fault records dF60: Default the factory setting of 60Hz dF50: Default the factory setting of 50Hz SAv: Store setting rES: Resume setting rdEE: Read the parameters from drive to digital keypad UrEE: Write the parameters from digital keypad to drive	—	—	0

■ Parameter List [F1 Operation Parameter]

<table>
<tr><th>Func.</th><th>Name</th><th>Descriptions</th><th>Range of Setting</th><th>Unit</th><th>Default</th></tr>
<tr><td rowspan="12">F1.00</td><td rowspan="12">Start Command Selection</td><td>
<table>
<tr><td></td><td>Start command</td><td>Rotation direction</td></tr>
<tr><td>0</td><td>FWD or REV command</td><td>FWD or REV command</td></tr>
<tr><td>1</td><td>FWD command</td><td>REV command</td></tr>
<tr><td>2</td><td rowspan="4">Operation panel</td><td>FWD, REV command</td></tr>
<tr><td>3</td><td>Forward</td></tr>
<tr><td>4</td><td>Reverse</td></tr>
<tr><td>5</td><td>Reverse command</td></tr>
<tr><td>6~7</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>8</td><td>Communication control</td><td>Communication control</td></tr>
<tr><td>9</td><td>Communication control</td><td>Reverse command</td></tr>
<tr><td>10</td><td>Forward command</td><td>Communication control</td></tr>
<tr><td>11</td><td>Operation panel</td><td>Communication control</td></tr>
</table>
</td><td rowspan="12">0~11</td><td rowspan="12">—</td><td rowspan="12">3</td></tr>
<tr><td>F1.01</td><td>Primary Frequency Command Selection</td><td>0: Frequency command by analog input selection
1: Frequency command by operation panel.
2: Motor rotation speed setting by operation panel.
3: Machine speed setting by operation panel.
4: Frequency command by multi-function input terminal as UP/DOWN command.
5: Frequency command by communication terminal.</td><td>0~5</td><td>—</td><td>1</td></tr>
<tr><td>F1.02</td><td>Secondary Frequency Command Selection</td><td>0: Frequency command by analog input selection(F1.03).
1: Frequency command by operation panel.
2: Frequency command by multi-function input terminal as UP/DOWN command.</td><td>0~2</td><td>—</td><td>0</td></tr>
<tr><td>F1.03</td><td>Analog Input Selection</td><td>0: Pot knob+ AI
1: Pot knob – AI
2: AI – Pot knob
3: Pot knob or AI (switch by multi-function input terminal)
4: Pot knob
5: AI</td><td>0~5</td><td>—</td><td>0</td></tr>
<tr><td>F1.04</td><td>“Pot knob” Command Source Selection</td><td>0: From drive’s operation panel.
1: From external keypad(KP-601).</td><td>0, 1</td><td>—</td><td>0</td></tr>
<tr><td>F1.05</td><td>Validity of STOP of the Operation Panel</td><td>0: Start command from the terminal, STOP key disabled.
1: Start command from the terminal, STOP key enabled.</td><td>0, 1</td><td>—</td><td>1</td></tr>
<tr><td>F1.06</td><td>Frequency Command Selection (operation panel)</td><td>0: In the monitor mode, frequencycommand cannot be changed.
1: In the monitor mode, frequency command is changeable.</td><td>0, 1</td><td>—</td><td>1</td></tr>
<tr><td>F1.07</td><td>Frequency Command Auto-Storing (operation panel)</td><td>0: In the monitor mode, the frequency command cannot be stored.
1: In the monitor mode, the frequency command can be stored automatically after 3 minutes.</td><td>0, 1</td><td>—</td><td>1</td></tr>
<tr><td rowspan="4">F1.08</td><td rowspan="4">Main Display Selection</td><td>Control panel have 8 display option</td><td rowspan="4">1~8</td><td rowspan="4">—</td><td rowspan="4">1</td></tr>
<tr><td>1: Output frequency
2:Frequency command
3: Output voltage
4: DC bus voltage</td><td>5: Output current
6: Display mode 6(F1.09)
7: Display mode 7(F1.10)
8: Display mode 8(F1.11)</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>F1.09</td><td>Display Mode 6</td><td rowspan="3">0: Terminal status
1: Temperature of heatsink
2: Motor rotation speed(RPM)
3: Machine speed(MPM)
4: The sector of sequential operation control
5: The cycle of sequential operation control</td><td rowspan="3">6: Counting value
7: Current limit level
8: Primary frequency command
9: Secondary frequency command
10: PID command
11: PID feedback</td><td>0~11</td><td>—</td><td>0</td></tr>
<tr><td>F1.10</td><td>Display Mode 7</td><td>0~11</td><td>—</td><td>1</td></tr>
<tr><td>F1.11</td><td>Display Mode 8</td><td>0~11</td><td>—</td><td>2</td></tr>
</table>

Func.	Name	Descriptions	Range of Setting	Unit	Default
F1.12	Number of Motor Poles	Determination of RPM display value.	2~10	2P	4P
F1.13	Machine Speed Ratio	Set the ratio of machine speed. This function determines MPM display value.	0.00~500.00	0.01	20.00
F1.14	Digits of Decimal Value (MachineSpeed)	Select the digits of decimal values displaying the machine speed.	0~3	—	0
F1.14	Digits of DecimalValue (MachineSpeed)	Select the digits of decimal values displaying the machine speed.	0~3	—	0
F1.17	SPEC Key Setting	Same function as multi-function input	-28 ~ +28 *Note 7	—	0
F1.18	SPEC Key Self-Holding Function	0: Disable 1: Enable	0, 1	—	0
F1.19	Stop Mode	0: Ramp to stop + DC braking 1: Coast to stop 2: Coast to stop+ DC braking	0~2	—	0
F1.20	Reverse Prohibition	0: Reverse rotation allowed 1: Reversal rotation NOT allowed	0, 1	—	0
F1.21	Switching Frequency	The setting value is higher and the motor noise is lower.	0~6	—	2 *Note 8
F1.22	Overload Decrease Switching Frequency	0：The switching frequency will not be adjusted by the load of current. 1：The swithching frequency will be auto-adjusted according to the load of current.	0,1	—	1
F1.23	Number of Tolerance to Drive Fault	Set the number of tolerance to drive fault conditions when OC, faults are occurred during the certain time period.	0~16	1	0

■ Parameter List [F2 Operation Parameter]

Func.	Name	Descriptions				Range of Setting	Unit	Default
F2.00	Primary Speed (Preset Speed 1)	Multi-speed level 4 command	Multi-speed level 3 command	Multi-speed level 2 command	Multi-speed level 1 command	0.00~ 400.00	0.01Hz	50.00 *Note 1
		OFF	OFF	OFF	OFF			60.00 *Note 2
F2.01	Preset Speed 2	OFF	OFF	OFF	ON			10.00
F2.02	Preset Speed 3	OFF	OFF	ON	OFF			20.00
F2.03	Preset Speed 4	OFF	OFF	ON	ON			30.00
F2.04	Preset Speed 5	OFF	ON	OFF	OFF			0.00
F2.05	Preset Speed 6	OFF	ON	OFF	ON			0.00
F2.06	Preset Speed 7	OFF	ON	ON	OFF			0.00
F2.07	Preset Speed 8	OFF	ON	ON	ON			0.00
F2.08	Preset Speed 9	ON	OFF	OFF	OFF			0.00
F2.09	Preset Speed 10	ON	OFF	OFF	ON			0.00
F2.10	Preset Speed 11	ON	OFF	ON	OFF			0.00
F2.11	Preset Speed 12	ON	OFF	ON	ON			0.00
F2.12	Preset Speed 13	ON	ON	OFF	OFF			0.00
F2.13	Preset Speed 14	ON	ON	OFF	ON			0.00
F2.14	Preset Speed 15	ON	ON	ON	OFF			0.00
F2.15	Preset Speed 16	ON	ON	ON	ON			0.00
F2.16	Jog Speed	Jog speed						6.00
F2.17	Reference Frequency of Accel/Decel Time	The frequency corresponding to accel/decel time.				0.01~ 400.00	0.01Hz	50.00 *Note 1 60.00 *Note 2
F2.18	Primary Acceleration Time	The acceleration time of primary speed, preset speed 5~16, and jog speed.				0.0~ 3200.0	0.1 sec	5.0

Func.	Name	Descriptions	Range of Setting	Unit	Default
F2.19	Primary DecelerationTime	The deceleration time of primary speed, preset speed 5~16, and jog speed.	0.0~ 3200.0	0.1 sec	5.0
F2.20	Acceleration Time of Preset Speed 2	Acceleration time of preset speed 2	0.0~ 3200.0	0.1 sec	5.0
F2.21	Deceleration Time of Preset Speed 2	Deceleration time of preset speed 2	0.0~ 3200.0	0.1 sec	5.0
F2.22	Acceleration Time of Preset Speed 3	Acceleration time of preset speed 3	0.0~ 3200.0	0.1 sec	5.0
F2.23	Deceleration Time of Preset Speed 3	Deceleration time of preset speed 3	0.0~ 3200.0	0.1 sec	5.0
F2.24	Acceleration Time of Preset Speed 4	Acceleration time of preset speed 4	0.0~ 3200.0	0.1 sec	5.0
F2.25	Deceleration Time of Preset Speed 4	Deceleration time of preset speed 4	0.0~ 3200.0	0.1 sec	5.0
F2.26	Secondary Acceleration Time	Multi-function input terminals select the secondary acceleration time.	0.0~ 3200.0	0.1 sec	5.0
F2.27	Secondary Deceleration Time	Multi-function input terminals select the secondary deceleration time.	0.0~ 3200.0	0.1 sec	5.0
F2.28	Set S-curve for Accel/Decel Time	Set S-curve to slow the acceleration and deceleration at start and stop.	0.0~5.0	0.1 sec	0.0
F2.30	Limitation of Output Voltage	0: Output voltage of V/F pattern is not limited. 1: Output voltage of V/F pattern is limited (voltage compensation disabled).	0, 1	—	0
F2.31	V/F Pattern Selection	0: Linear 1: Energy saving mode (auto-adjust V/F according to the loads) 2: Square curve 3: 1.7th power curve 4: 1.5th power curve	0~4	—	0
F2.32	Maximum Output Frequency	Maximum output frequency of drive	0.1~400.00	0.1Hz	50.0 *Note 1 60.0 *Note 2
F2.33	Starting Frequency	Starting frequency of drive's output frequency.	0.1~10.0	0.1Hz	0.5
F2.34	Starting Voltage	The voltage corresponds to the output starting frequency.	0.1~50.0 *Note 3,4 0.1~100.0 *Note 5	0.1Vac	8.0 *Note3,4 12.0 *Note 5
F2.35	Base Frequency	The frequency corresponds to the base xvoltage in V/F pattern.	0.1~400.00	0.1Hz	50.0 *Note 1 60.0 *Note 2
F2.36	Base Voltage	The voltage corresponds to the base frequency in V/F pattern.	0.1~255.0 *Note 3,4 0.1~510.0 *Note 5	0.1Vac	220.0 *Note3,4 380.0 *Note 5
F2.37	V/F Frequency1	Frequency at the first point of V/F pattern	0.0~399.9	0.1Hz	0.0
F2.38	V/F Voltage 1	Voltage at the first point of V/F pattern	0.0~255.0 *Note 3,4 0.0~510.0 *Note 5	0.1Vac	0.0
F2.39	V/F Frequency 2	Frequency at the second point of V/F pattern.	0.0~399.9	0.1Hz	0.0
F2.40	V/F Voltage 2	Voltage at the second point of V/F pattern.	0.0~255.0 *Note 3,4 0.0~510.0 *Note 5	0.1Vac	0.0
F2.42	Jump Frequency 1	Avoid mechanical resonance point 1.	0.0~400.00	0.1Hz	0.0
F2.43	Jump Frequency 2	Avoid mechanical resonance point 2.	0.0~400.00	0.1Hz	0.0
F2.44	Jump Frequency 3	Avoid mechanical resonance point 3.	0.0~400.00	0.1Hz	0.0
F2.45	Jump Frequency Range	Set the range of the jump frequency 1, 2, 3.	0.0~25.5	0.1Hz	0.0
F2.47	Frequency Upper Limit	The upper limit of output frequency (1.00=maximum output frequency)	0.00~1.00	0.01	1.00
F2.48	Frequency Lower Limit	The lower limit of output frequency (1.00=maximum output frequency)	0.00~1.00	0.01	0.00

■ Parameter List [F3 Control Parameter]

Func.	Name	Descriptions	Range of Setting	Unit	Default
F3.00	Holding Frequency	The drive accelerate to the holding frequency and running at constant speed.	0.0~400.00	0.1Hz	0.5
F3.01	Holding Time Interval	The drive runs at holding frequency by constant speed and running the time interval.	0.0~360.0	0.1sec	0.0
F3.03	Stall Prevention Level at the Acceleration	If stall is occurred during acceleration, the motor keeps running at the constant speed(200%: Off).	30%~200% of drive rated current	1%	170
F3.04	Stall Prevention Level at the Constant Speed	If stall is occurred at constant speed running, the motor speed is decreased(200%: Off).	30%~200% of drive rated current	1%	160
F3.05	Acceleration Time for Stall Prevention at the Constant Speed	Set the acceleration time for the stall prevention of the constant speed.	0.1~3200.0	0.1sec	5.0
F3.06	Deceleration Time for Stall Prevention at the Constant Speed	Set the deceleration time at the stall prevention of the constant speed.	0.1~3200.0	0.1sec	5.0
F3.07	Deceleration Stall Prevention	0: Deceleration stall prevention: Disabled 1: Deceleration stall prevention: Enabled	0, 1	—	1
F3.10	Frequency Response Time of Motor Slip Compensation	Set the frequency response time of motor slip compensation. Unit: 5ms	1~255	1	40
F3.12	Automatic Boost Voltage Range	According to the load condition, adjust the output voltage of the V/F Pattern (0.0: Off).	0.0~25.5	0.1	1.0
F3.13	Response Time of Automatic Boost Voltage	Set the response time of automatic boost voltage range.	1~255	1ms	60
F3.15	Voltage Compensation for Current Oscillation	Adjust the voltage according to the current oscillation.	0.00~2.55	0.01	0.10
F3.16	Response Time of Voltage Compensation for Current Oscillation	Adjust the response time of voltage compensation according to current oscillation (0: Off).	0~250	1	10
F3.18	Automatic Voltage Regulation(AVR)	0: Disable 1: Enable	0, 1	—	1
F3.19	Response Time of AVR	Set the response time of automatic voltage regulation.	0~255	1ms	50
F3.21	DC Braking Level	Set the current level of DC braking	0~150% of drive rated current	1%	50
F3.22	DC Braking Response Time	Adjust the response time according to DC braking.	1~255	1ms	10
F3.23	Time Interval of DC Braking at Start	Set the time interval for DC braking before drive starts.	0.0~60.0	0.1sec	0.0
F3.24	Time Interval of DC Braking at Stop	Set the time interval for DC braking at drive stops.	0.0~60.0	0.1sec	0.5
F3.25	DC Braking Frequency at Stop	Active frequency level of DC braking at stop.	0.1~60.0	0.1Hz	0.5
F3.27	Active Level of Dynamic Brake	Dynamic brake activates when the DC bus voltage is over the setting. Function disable setting: 100/200V series: 410 400V series: 820	350~410 *Note 3,4 700~820 *Note 5	1Vdc	390 *Note3,4 780 *Note 5
F3.28	Pulse Setting of BrakingTransistor	Set the pulse width of drive baking signal.	10~90	1%	50
F3.30	Operation Selection at Instantaneous Power Failure	0: Drive cannot be restarted 1: Drive can be restarted 2: Ramp to stop (please refer to theF3.31~F3.35) 3: When the power is restored during the ramp to stop interval, the drive re-accelerates again	0~3	—	0

Func.	Name	Descriptions	Range of Setting	Unit	Default
F3.31	The Voltage Level Setting at Power Failure	Set the voltage level of power source for ramp to stop. When the voltage of power input is lower than the setting level, drive ramps to stop.	75.0~96.0 *Note 3 150.0~192.0 *Note 4 300.0~384.0 *Note 5	0.1V	87.5 *Note 3 175.0 *Note 4 320.0 *Note 5
F3.32	Subtracted Frequency of Deceleration at Power Failure	When the power failure, the output frequency = drive's original output frequency - subtracted frequency.	0.0~20.0	0.1Hz	3.0
F3.33	Deceleration Time 1 at Power Failure	Set a deceleration time down to the turning frequency set in (F3.35).	0.0~3200.0	0.1sec	5.0
F3.34	Deceleration Time 2 at Power Failure	Set a deceleration time below the turning frequency set in (F3.35).	0.0~3200.0	0.1sec	5.0
F3.35	Turning Frequency at Power Failure	Set the turning frequency level at power failure that the deceleration time is switched from the F3.33 setting to the F3.34 setting.	0.0~400.00	0.1Hz	0.0
F3.37	The Current Level of Speed Tracing	When the current large than the tracing current, the output frequency is tracing downward.	0~200% of drive rated current	1%	150
F3.38	Delay Time for Speed Tracing	Set the output delay time before the speed tracing.	0.1~60.0	0.1sec	0.5
F3.39	The V/F Pattern of Speed Tracing	Set the percentage of V/F output voltage at the speed tracing.	0~100%	1%	100

■ Parameter List [F4 Protection Parameters]

Func.	Name	Descriptions	Range of Setting	Unit	Default
F4.00	Grounding Fault Protection (GF)	0: Disable 1: Enable(GF)	0, 1	—	1
F4.01	Grounding Detection Level	Detecting if the unbalanced current is over the setting level	30~100% of drive rated current	1%	70
F4.02	Grounding Detection Sensitivity	Detect the sensitivity of grounding.	1~255	1 time	10
F4.05	Accumulating Number of Over-Current Limitation at 200% Limitation	When the accumulating numbers of drive over current are over the accumulating numbers of current limits (F4.05), drive trips to OL2 protection. Unit: 250 times (0: disable)	0~255	1 time	0
F4.07	Motor 1 Overload Protection (OL)	0: Motor overload protection: Disabled 1: Motor overload protection:Enabled(OL) 2: Motor overload protection of independent cooling fans: Enabled(OL)	0~2	—	1
F4.08	Motor 1 Rated Current	Current setting according to the motor rated current.	10%~150% of drive rated current	0.1A	According to the rated current of motor
F4.09	Motor 1 No-Load Current	Current setting according to the motor's no-load condition	0~ motor rated current	0.1A	1/3 motor rated current
F4.10	Trip Time of Motor 1 Overload	Set the tripped time of motor when motor is overload(150% of Motor rated current).	0.5~10.0	0.1min	5.0
F4.12	Protection Level of Drive Overheat	Set the tripped level of drive when drive is overheat.	85~115	1℃	90 *Note 6
F4.13	Drive Overheat Pre-alarm Selection	0: Disable 1: Warning (OHt): Continuous operation (relay terminal outputs) 2: Warning (OHt): Reduce switching frequency operation (relay terminal outputs) 3: Warning (OHt): Stop operation (relay terminal outputs)	0~3	—	2

Func.	Name	Descriptions	Range of Setting	Unit	Default
F4.14	Drive Overheat Pre-alarm Level	Set the temperature level of warning alarm.	45~105	1℃	70
F4.15	Drive Overheat Dead Band	Set the temperature dead band of temperature warning and fan active level.	0.1~10.0	0.1℃	3.0
F4.17	Fan Control Selection	0: Forced air: Start the fan at power on. 1: Operation air: Start the fan at operation. 2: Temperature control: Fan activation according to temperature level	0~2	—	1
F4.18	Temperature Level of Fan Activation	Set the temperature level of fan activation.	25~60	1℃	50
F4.19	Minimum Operation Time of Fan	Set the minimum operation time of fans when the fan control is stopped.	0.1~25.0	0.1min	0.5
F4.21	PTC Overheat Warning Level (Motor Overheat Protection)	Set the temperature warning level(OH1) of PTC	0.0~10.0	0.1Vdc	1.2
F4.22	PTC Overheat Warning Disposal	0: Warning (OH1): Continue operation (relay terminal outputs) 1: Warning (OH1): Stop operation (relay terminal outputs)	0, 1	—	0
F4.23	PTC Overheat Trip Level	Set the overheat trip level of PTC	0.0~10.0	0.1V	2.4
F4.25	System Overload Detection (OLO)	0: Disable 1: Enable(OLO)	0, 1	—	0
F4.26	System Overload Detection Status	0: Detection during the constant speed only 1: Detection during the running only	0, 1	—	0
F4.27	Output Setting of System Overload	0: Drive is still running when the overload is detected 1: Drive is tripped when the overload is detected	0, 1	—	0
F4.28	System Overload Detection Level	Set the level of the current for overload detection	30%~200% of drive rated current	1%	160
F4.29	System Overload Detection Time	The output current is larger than the setting F4.28 and exceeds the time interval of the overload detection	0.1~300.0	0.1sec	0.1
F4.36	Current Limit (I-limit)	Current over F4.36 × the rated current of drive during operation, the drive may adjust PWM ouput and limit output current.	30%~200% of drive rated current	1%	180
F4.37	Gain of I-limit	The gain of the current limitation response (P).	0.00~1.00	0.01	0.10
F4.38	Integration Time of I-limit	Lower integration time I setting value will result the current limitation response more fast but lower setting value would cause the effect of oscillating current.	0~10.0	0.1	0.6
F4.39	Selection of Current Limitation	0:Disable 1:Enable	0,1	—	0
F4.41	Motor 2 Overload Protection (OL)	0: Motor overload protection: Disabled 1: Motor overload protection: Enabled(OL) 2: Motor overload protection of independent cooling fans: Enabled(OL)	0~2	—	1
F4.42	Motor 2 Rated Current	Current setting according to the motor rated current.	10%~150% of drive rated current	0.1A	According to the rated current of motor
F4.43	Motor 2 No-Load Current	Current setting according to the motor's no-load condition	10%~150% of drive rated current	0.1A	According to the rated current of motor
F4.44	Trip Time of Motor 2 Overload	Set the tripped time of motor when motor is overload(150% of Motor rated current).	0.5~10.0	0.1min	5.0

Func.	Name	Descriptions	Range of Setting	Unit	Default
F4.45	PID Feedback High Detection Setting	0: Disable 1: Warning, drive continuous operation. 2: Error, drive trip to stop.	0~2	—	0
F4.46	PID Feedback High Detection Level	Detect if the PID feedbackis higher than setting level	0~100	1%	100
F4.47	PID Feedback High Detection Time	Feedback signal is higher than setting level and reach the detection time, the drive will be activated.	0.0~25.5	0.1sec	2.0
F4.48	PID Feedback Low Detection Setting	0: Disable 1: Warning, drive continuous operation. 2: Error, drive trip to stop.	0~2	—	0
F4.49	PID Feedback Low Detection Level	Detect if the PID feedback is lower than setting level	0~100	1%	0
F4.50	PID Feedback Low Detection Time	If feedback signal is lower than setting level and reach the detection time, the drive will be activated.	0.0~25.5	0.1sec	10.0

■ Parameter List [F5 Multi-function Parameter]

Func.	Name	Descriptions	Range of Setting	Unit	Default
F5.00	“Pot knob” Selection (Analog Input)	0: Analog input gain 1: Frequency command 2: Current limit 3: Variable voltage of V/F pattern	0~3	—	1
F5.01	AI Selection (Analog Input)	0: Analog input gain 1:Frequencycommand 2: Current limit 3: Variable voltage of V/F pattern 4: PTC temperature 5: PID feedback	0~5	—	1
F5.02	AI Input Source Selection	0:DC 4~20mA (2~10V) 1:DC 0~20 mA (0~10V)	0, 1	—	1
F5.03	Pot Gain (Analog Input)	Analog input of “Pot knob” gain	0.00~2.00	0.01	1.00
F5.04	“Pot knob” Bias (Analog Input)	Analog input of “Pot knob” bias	-1.00~1.00	0.01	0.00
F5.05	AI Gain (Analog Input)	Analog input of AI gain	0.00~2.00	0.01	1.00
F5.06	AI Bias (Analog Input)	Analog input of AI bias	-1.00~1.00	0.01	0.00
F5.07	Filter Setting of AnalogFrequency	Filter the signal based on analog input setting.	0~255	—	20
F5.08	AnalogFrequency Dead Band	When signal noise is large, appropriately increase the dead band to stabilize the frequency. But this will reduce the tuning linearity.	0.00~2.55	0.01Hz	0.00
F5.09	Acceleration Time of V	Set the acceleration time of the variable voltage of V/F pattern.	0.0~3200.0	0.1sec	5.0
F5.10	Deceleration Time of V	Set the deceleration time of the variable voltage of V/F pattern.	0.0~3200.0	0.1sec	5.0
F5.12	FM Analog Output Signal Selection	0: Output frequency (before slip compensation) 1: Output frequency (after slip compensation) 2: Frequency command 3: Output voltage 4: Output current 5: DC bus voltage 6: “Pot knob” analog input signal 7: AI analog input signal 8: PID command 9: PID feedback signal	0~9	—	0
F5.13	FM Analog Output Gain	Analog output adjustment ratio.	0.00~2.00	0.01	1.00
F5.14	FM Analog Output Bias	Analog output adjustment offset.	-1.00~1.00	0.01	0.00

Func.	Name	Descriptions		Range of Setting	Unit	Default
F5.15	FM Range Option	0:DC 4~20mA (2~10V) 1:DC 0~20 mA (0~10V)		0, 1	—	1
F5.19	Multi-function Input Terminal X1	0: Disable ±1: Jog command ±2: Secondary accel/decel command switching ±3: Multi-speed level 1 command ±4: Multi-speed level 2 command ±5: Multi-speed level 3 command ±6: Multi-speed level 4 command ±7: Reset command ±8: External fault command(EF) ±9: Interruption of output command(bb) ±10: Coast to stop command(Fr) ±11: Speed search from the maximum frequency ±12: Speed search from the frequency setting ±13: Holding command ±14: UP command ±15: DOWN command	±16: Clean UP/DOWN frequency command ±17: UP/DOWN command enter key ±18: Analog input source selection(Pot knob/AI) ±19: Primary and secondary frequency command option ±20: Start command of sequential operation control ±21: Pause command of sequential operation control ±22: Forward command ±23: Reverse command ±24: Stop command with 3-wire start/stop circuit ±25: DC braking enable(Stop) ±26: Counter input ±27: Counter clear ±28: Current limit enable ±29: Selection for motor switching ±30: PIDswitching (open-loopselection) ±31: PID integrator reset	-31 ~ +31 *Note 7	—	22
F5.20	Multi-function Input Terminal X2			-31 ~ +31 *Note 7	—	23
F5.21	Multi-function Input Terminal X3			-31 ~ +31 *Note 7	—	1
F5.22	Multi-function Input Terminal X4			-31 ~ +31 *Note 7	—	7
F5.23	Multi-function Input Terminal X5			-31 ~ +31 *Note 7	—	0
F5.24	Multi-function Input Terminal X6			-31 ~ +31 *Note 7	—	0
F5.25	Digital Input Response Time	When the input signal is under the setting time, program will not be activated.		1~255	1ms	10
F5.26	Multi-function Output Setting of Ta/Tb/Tc Terminals	0: Disable ±1: Running detection ±2: Constant speed detection ±3: Zero speed detection ±4: Frequency detection ±5: Overload Detection (OLO) ±6: Stall prevention detection ±7: Low voltage detection (LE) ±8: Braking transistor is active detection(db) ±9: Restart after instantaneous power failure detection ±10: Restart after fault condition detection ±11: Fault detection	±12: Start detection of sequential operation control ±13: One complete operation sector detection of sequential operation control ±14: One complete operation cycle detection of sequential operation control ±15: Pause command detection of sequential operation control ±16: Detection of counter value1 ±17: Detection of counter value2 ±18: Reverse detection ±19: NTC temperature warning detection (OHt) ±20: Fan operation detection ±21: PTC temperature warning detection (OH1) ±22: Feedback high detection ±23: Feedback low detection	-23~+23 *Note 7	—	11
F5.30	UP/DOWN Memory Selection	0: Erase UP/DOWN frequency command when power off 1: Store UP/DOWN frequency command when power off		0, 1	—	0
F5.31	UP/DOWN Frequency Calibration	0: 0.01Hz 1~8: ×0.05Hz	9: 0.5Hz 10~250: ×0.1Hz	0~250	—	0

Func.	Name	Descriptions	Range of Setting	Unit	Default
F5.32	UP/DOWN Calibrating Time	1~5: Terminal adjust the response time. Continuous acceleration or deceleration when over the setting time 6: Edge trigger	1~6	—	1
F5.33	UP/DOWN Frequency Adjustment	Adjust UP/DOWN frequency on keypad directly	0.00~400.00	0.01Hz	0.00
F5.35	Counting Mode	0: Up counting mode 1: Down counting mode	0, 1	—	0
F5.36	Counter Value 1	Set counter value 1 for sequential operation control cycle	0~9999	1	0
F5.37	Counter Value 2	Set counter value 2 for sequential operation control cycle	0~9999	1	0
F5.39	Constant Speed Detection Range	Set the bandwidth of constant speed detection range	0.0~10.0	0.1Hz	2.0
F5.40	Frequency Detection Range	Set the bandwidth of frequency detection range	0.0~10.0	0.1Hz	2.0
F5.41	Frequency Detection Level	Set the frequency detection level of multi-function terminal	0.0~400.00	0.1Hz	0.0

■ Parameter List [F6 Special Parameters]

Func.	Name	Descriptions		Range of Setting	Unit	Default
F6.00	Operation Mode for Sequential Operation Control	0: Sequential operation control disable. 1: Sequential operation controloperates one cycle and stops. 2: Sequential operation control operates in circulation.	3: Sequential operation control operates one cycle and stops (by STOP key on the operation panel). 4: Sequential operation control operates in circulation (by STOP key on the operation panel).	0~4	—	0
F6.01	Cycle Times for Sequential Operation Control	1~9998: The number of cycle times of sequential operation control circulation. 9999: Infinite cycles of sequential operation control circulation.		1~9999	—	5
F6.02	Sequence of One Operation Cycle for Sequential Operation Control	0: Single direction 1: Dual direction		0, 1	—	0
F6.04	Hold Time Unit for Sequential Operation Control	0: Second 1: Minute 2: Hour		0~2	—	0
F6.05	Accel/Decel Timeof Sector 1 of Sequential Operation Control	Set the accel/decel time of sector 1 of sequential operation control.		0.0~360.0	0.1sec	0.0
F6.06	Hold Time of Sector 1of Sequential Operation Control	Set the hold time of sector 1 of sequential operation control.		0.0~360.0	0.1sec	0.0
F6.07	Accel/Decel Timeof Sector 2 of Sequential Operation Control	Set the accel/decel time of sector 2 of sequential operation control.		0.0~360.0	0.1sec	0.0
F6.08	Hold Time of Sector 2 of Sequential Operation Control	Set the hold time of sector 2 of sequential operation control.		0.0~360.0	0.1sec	0.0
F6.09	Accel/Decel Timeof Sector 3 of Sequential Operation Control	Set the accel/decel time of sector 3 of sequential operation control.		0.0~360.0	0.1sec	0.0
F6.10	Hold Time of Sector 3 of Sequential Operation Control	Set the hold time of sector 3 of sequential operation control.		0.0~360.0	0.1sec	0.0

Func.	Name	Descriptions	Range of Setting	Unit	Default
F6.11	Accel/Decel Time of Sector 4 of Sequential Operation Control	Set the accel/decel time of sector 4 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.12	Hold Time of Sector 4 of Sequential Operation Control	Set the hold time of sector 4 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.13	Accel/Decel Timeof Sector 5 of Sequential Operation Control	Set the accel/decel time of sector 5 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.14	Hold Time of Sector 5 of Sequential Operation Control	Set the hold time of sector 5 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.15	Accel/Decel Timeof Sector 6 of Sequential Operation Control	Set the accel/decel time of sector 6 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.16	Hold Time of Sector 6 of Sequential Operation Control	Set the hold time of sector 6 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.17	Accel/Decel Timeof Sector 7 of Sequential Operation Control	Set the accel/decel time of sector 7 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.18	Hold Time of Sector 7 of Sequential Operation Control	Set the hold time of sector 7 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.19	Accel/Decel Timeof Sector 8 of Sequential Operation Control	Set the accel/decel time of sector 8 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.20	Hold Time of Sector 8 of Sequential Operation Control	Set the hold time of sector 8 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.21	Accel/Decel Time of Sector 9 of Sequential Operation Control	Set the accel/decel time of sector 9 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.22	Hold Time of Sector 9 of Sequential Operation Control	Set the hold time of sector 9 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.23	Accel/Decel Time of Sector 10 of Sequential Operation Control	Set the accel/decel time of sector 10 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.24	Hold Time of Sector 10 of Sequential Operation Control	Set the hold time of sector 10 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.25	Accel/Decel Timeof Sector 11 of Sequential Operation Control	Set the accel/decel time of sector 11of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.26	Hold Time of Sector 11 of Sequential Operation Control	Set the hold time of sector 11 of sequential operation control.	0.0~360.0	0.1sec	0.0

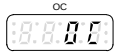
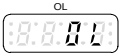
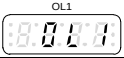
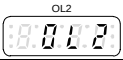
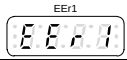
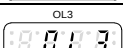
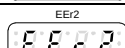
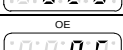
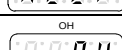
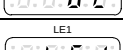
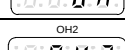
Func.	Name	Descriptions	Range of Setting	Unit	Default
F6.27	Accel/Decel Time of Sector 12 of Sequential Operation Control	Set the accel/decel time of sector 12 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.28	Hold Time of Sector 12 of Sequential Operation Control	Set the hold time of sector 12 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.29	Accel/Decel Timeof Sector 13 of Sequential OperationControl	Set the accel/decel time of sector 13 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.30	Hold Time of Sector 13 of Sequential OperationControl	Set the hold time of sector 13 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.31	Accel/Decel Time of Sector 14 of Sequential OperationControl	Set the accel/decel time of sector 14 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.32	Hold Time of Sector 14 of Sequential OperationControl	Set the hold time of sector 14 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.33	Accel/Decel Time of Sector 15 of Sequential OperationControl	Set the accel/decel time of sector 15 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.34	Hold Time of Sector 15 of Sequential OperationControl	Set the hold time of sector 15 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.35	Accel/Decel Timeof Sector 16 of Sequential OperationControl	Set the accel/decel time of sector 16 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.36	Hold Time of Sector 16 of Sequential Operation Control	Set the hold time of sector 16 of sequential operation control.	0.0~360.0	0.1sec	0.0
F6.37	Direction Control of Sequential Operation Control	Sequential operation control direction is defined with binary format. X_{16}~X_1 (Xn=0: forward；Xn=1: reverse) Xn: N_{th} operation direction	0~FFFF	—	0
F6.40	PID Control Selection	0: PID control disable 1: Forward control, D postposition 2: Reverse control, D postposition 3: Forward control, D preposition 4: Reverse control, D preposition	0~4	—	0
F6.41	Feedback Signal Detection	0: Open loop detection disable 1: Open loop detection enable (noFb)	0,1	—	1
F6.42	Feedback Signal Filter	Filter the feedback signal.	0~255	—	10
F6.43	PID Buffer Space	Set the buffer space of PID output value.	0~255	—	2
F6.44	Proportional Gain(P)	Set the gain value for discrepancy. (0.0: P control disabled).	0.0~25.0	0.1	1.0
F6.45	Integration Time(I)	Set the integration time for discrepancy. (0.0: I control disabled)	0.0~100.0	0.1sec	1.2
F6.46	Derivative Time(D)	Set the derivative time for discrepancy. (0.0: D control disabled)	0.00~2.50	0.01sec	0.00
F6.47	Integration Upper Limitation	Set the upper limitation value of integrator.	0~200%of maximum frequency	1%	100

Func.	Name	Descriptions	Range of Setting	Unit	Default
F6.48	Integration Lower Limitation	Set the lower limitation value of integrator.	-100~100%of maximum frequency	1%	0
F6.49	Integrator Initialized Value	Set the initial value of the integrator before PID starts.	-100~100% of maximum frequency	1%	0
F6.50	PID Output Upper Limit	Set the PID control output frequency	0.00~1.00	0.01	1.00
F6.51	PID Compensation Gain	(PID command – PID feedback)*F6.51	0.1~8.0	—	1.00
F6.52	Propotional Gain(P) Selection	0: postposition P 1: preposition P	0~1	—	1
F6.53	Feedback Signal Selection	0: Direct signal 1: Reverse signal	0~1	—	0
F6.54	Derivative Time of Feedback	Set the derivative time for feedback signal.	0.00~2.50	0.01sec	0.00
F6.55	Communication Address	The host uses the address to send and receive messages from the drive (0: Disable)	0~254	—	0
F6.56	Baud Rate	0: 4800bps 1: 9600bps 2: 19200bps 3: 38400bps	0~3	—	1
F6.57	Communication Protocol	0: 8,N,2 1: 8,E,1 2: 8,O,1 3: 8,N,1	0~2	—	1
F6.58	Communication Overtime (Cot)	When the data transmission during communication transmission is interrupted, has no data transmitting, or delays, drive displays “Cot” message (0.0: Communication overtime disable)	0.0~100.0	0.1sec	0.0
F6.59	Communication Overtime Disposal	0: Warning (Cot): Continue operation. 1: Warning (Cot): Ramp to stop 2: Warning (Cot): Coast to stop	0~2	—	0
F6.60	Multi-Function Input Selection	0: Multi-function inputs from multi-function terminals 1: Multi-function inputs from communication control	0, 1	—	0
F6.61	PID Sleep Selection	0:Disable 1:Enable	0~1	—	0
F6.62	PID Wakeup Initial Frequency	Setting the frequency for PID Wakeup Process(1.00=max.output frequency)	0.00~1.00	0.01	0.00
F6.63	PID Wakeup Delay Time	Setting the time for PID Wakeup Process	250	1sec	0
F6.64	PID Sleep Initial Frequency	Setting the frequency for PID Sleep Process (1.00=max.output frequency)	0.00~1.00	0.01	0.00
F6.65	PID Sleep Delay Time	Setting the time for PID Sleep Process	0~250	1sec	0
F6.66	PID Output lower limit	PID control for output frequency	0.00~1.00	0.01	0.00

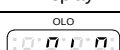
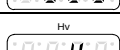
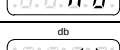
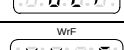
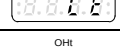
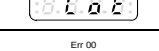
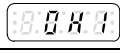
The color as [ ] means function can be set during the operation.
(Note):
1. The default setting of 50Hz
2. The default setting of 60Hz
3. Specifications of 100V series
4. Specifications of 200V series
5. Specifications of 400V series
6. The default value is “105” for 2003B3/4005B3 models and the default value is “90” for remained models.
7. + : Represents a contact (Normal open), — : Represents b contact (Normal close)
UP/DOWN control wiring must not exceed over 20m when multi-function terminals are used for UP/DOWN control.
8. When the setting value of switching frequency(F1.21) exceeds “4”, the drive must be de-rating for usage or selecting the higher capacity of drive.

■ Fault Displays

Error Trip Messages of Drive

Display	Description	Display	Description
Fot 	IGBT module error	noFb 	PID feedback signal error
GF 	Grounding fault	AdEr 	A/D converter error
OC 	Drive over current	EF 	External fault
OL 	Motor overload	PAdF 	Keypad interruption during copy
OL1 	Drive overload	EEr 	EEPROM error
OL2 	Drive current limit	EEr1 	Internal memory error
OL3 	Braking transistor overload	EEr2 	Internal memory error
OLO 	System overload	ntcF 	Thermal sensor fault
OE 	Over voltage	OH 	Drive overheat
LE1 	Under voltage during operation	OH2 	Motor overheat

Warning Messages of Drive

Display	Description	Display	Description
OLO 	System overload	Fr 	Coast to stop
Hv 	Power source over voltage	dtF 	Forwad/reverse command input simultaneously
db 	Braking transistor is active	WrF 	Different software version inter-copy
LE 	Power source under voltage	Cot 	Modbus communication overtime
OHt 	Drive overheat	Err 00 	Keypad cable trip before connecting
OH1 	Motor overheat	Err 01 	Keypad cable trip during operation
bb 	Drive output interruption		