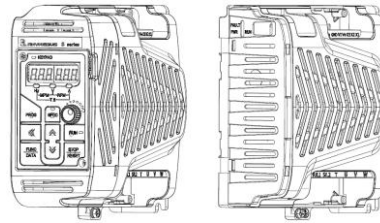
RHYMEBUS

RM6S2/S3 Series Parameter Manual



2021.04.20 Edition XB200226

Thank you for using RHYMEBUS RM6S2/S3 series drive.
For proper operations and safety purposes, please read manual carefully.
Only the qualified personnel may proceed with the installation.
Scan the QR code on the right side for the complete operation manual.
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.
CAUTION	The heat sink may become hot when the drive is running, please do not touch.

■ Standard Specifications

Single phase Series

Model (RM6S2-□□□□E1)	10P5	1001	1002	20P5	2001	2002
Maximum applicable motor (HP/kW)	0.5/0.4	1/0.75	2/1.5	0.5/0.4	1/0.75	2/1.5
Rated output capacity (kVA)	0.95	1.6	2.6	1.14	1.71	2.67
Rated output current (A)	2.5	4.2	6.8	3	4.5	7.0
Maximum output voltage (V)	Three phase 200~240V					
Range of output frequency (Hz)	0.1~600.00Hz					
Power source (ψ, V, Hz)	Single phase 100~120V 50/60Hz			Single phase 200~240V 50/60Hz		
Input current (A)	9.9	16.7	27	6	8.9	13.8
Permissible Ac power source	85~132V 50/60Hz / ±5%			170~264V 50/60Hz / ±5%		
Overload protection	150% of drive rated output current for 1 min					
Cooling method	Nature cooling		Fan	Nature cooling		Fan
Applicable safety standard	UL61800-5-1					
Protection structure	IP20					
Weight / Mess (kg)	0.83	0.86	0.91	0.73	0.78	0.91

Three phase Series

Model (RM6S3-□□□□E3)	20P5	2001	2002	40P5	4001	4002
Maximum applicable motor (HP/kW)	0.5/0.4	1/0.75	2/1.5	0.5/0.4	1/0.75	2/1.5
Rated output capacity (kVA)	1.14	1.71	2.86	0.99	1.65	2.63
Rated output current (A)	3	4.5	7.5	1.5	2.5	4.0
Maximum output voltage (V)	Three phase 200~240V			Three phase 380~480V		
Range of output frequency (Hz)	0.1~600.00Hz					
Power source (ψ, V, Hz)	Three phase 200~240V 50/60Hz			Three phase 380~480V 50/60Hz		
Input current (A)	3.4	5.2	8.6	1.7	2.9	4.6
Permissible Ac power source	170~264V 50/60Hz / ±5%			323~528V 50/60Hz / ±5%		
Overload protection	150% of drive rated output current for 1 min					
Cooling method	Nature cooling		Fan	Nature cooling		Fan
Applicable safety standard	UL61800-5-1					
Protection structure	IP20					
Weight / Mess (kg)	0.76	0.78	0.86	0.81	0.85	0.88

※ Braking transistor is custom-made in 200V series.

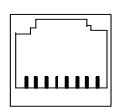
■ Descriptions of Main Circuit Terminals

Type	Symbol	Function	Description
Power Source	R/L1,S/L2	AC power source input terminals	Single-phase; sinusoidal power source input terminal.
	R/L1,S/L2,T		Three-phase; sinusoidal power source input terminal.
Motor	U,V,W	Drive outputs to motor terminals	Output three-phase variable frequency and voltage to motor.
Grounding	⏚	Grounding terminal	Ground the drive in compliance with the NEC standard or local electrical Code.

■ Descriptions of Control Circuit Terminals

Type	Symbol	Function	Description
Control Power	V+	Power terminal	Output DC+12V; Maximum supplied current is 20mA
	GND	Common terminal	Common of input control signal terminals
Input Terminals	X1	Multi-function input terminal 1~6	The function is set by H1-00 (Default: Forward)
	X2		The function is set by H1-01 (Default: Reverse)
	X3		The function is set by H1-02 (Default: Jog)
	X4		The function is set by H1-03 (Default: External fault)
	X5		The function is set by H1-04 (Default: Reset)
	X6		The function is set by H1-05 (Default: Disable)
	AI	Analog input terminal	Input range: DC 0~10V /DC 4~20mADC. Select by the SW2.
Output Terminals	Ta	Multi-function output terminals (relay type)	Ta:N.O (contact a); Tb: N.C (contact b) The function is set by H2-00. Default setting: Error detection Capacity: AC250V, 0.5A Max, cosθ=0.3
	Tb		
	Tc		

■ Modbus Port (RS-485) / Keypad-601A



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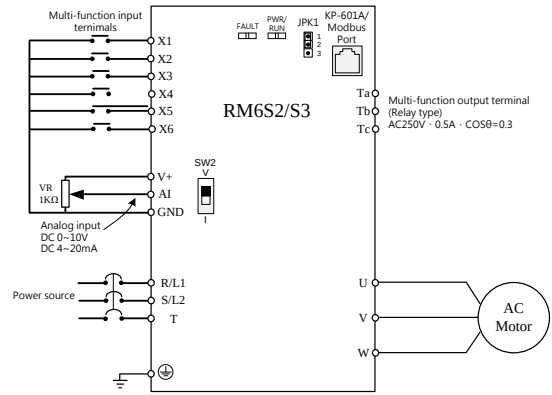
Type	Pin	Function	Description
Modbus (RS-485)/ KP-601A Communication	1	Communication transmission terminal (DX+)	Modbus (RS-485) communication uses pin1, 2.
	2	Communication transmission terminal (DX-)	
	3	Power terminal of KP (+13V)	Only for KP-601A linking
	4	Auto-detect terminal of KP	Only for KP-601A linking
	5、6	Reversed	Reversed
	7	Common ports terminal of KP power(0V)	Only for KP-601A linking
	8		

Note: Terminal resistor selection of communication control is JPK1.
(The internal resistance is 100)

■ Terminal Wiring Diagram

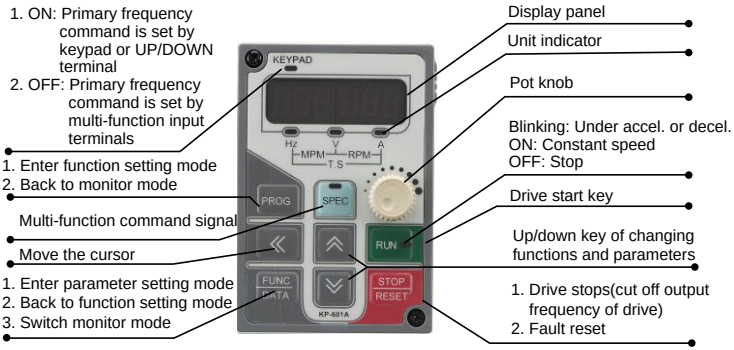


■ Description of Indicator Light

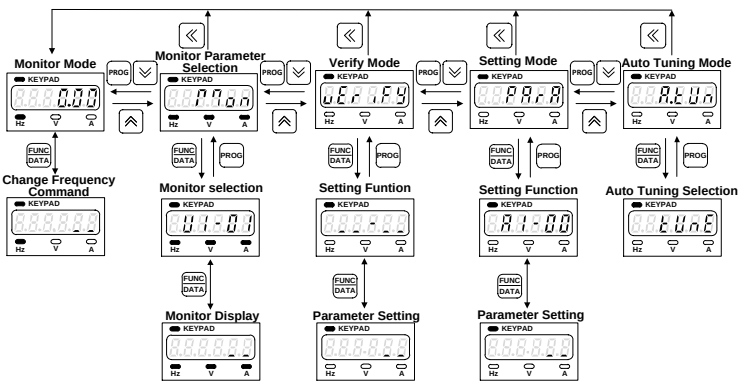
User can monitor the condition of drive by LED light without the keypad.

Condition		Fault LED Light(Red)		Power/Run LED Light (Green)	
Normal	Power On	Stay ON		Stay ON	
	Operation	Stay OFF		ON(0.25sec)	OFF(0.25sec)
Warning/Fault	Fault Code	The number times of the indicator light flashs			
		ON(0.5sec)	OFF(0.5sec)	ON(0.5sec)	OFF(0.5sec)
	OC	Once	Once	Once	Once
	OE	Twice	Twice	Once	Once
	OL	Three times	Three times	Once	Once
	OL1	Four times	Four times	Once	Once
	LE1	Five times	Five times	Once	Once
	OH	Six times	Six times	Once	Once
	EF	Once	Once	Twice	Twice
	PAdF	Twice	Twice	Twice	Twice
	Cot	Three times	Three times	Twice	Twice
	LE	Four times	Four times	Twice	Twice
	OLO	Five times	Five times	Twice	Twice
	bb	Six times	Six times	Twice	Twice
	Fr	Seven times	Seven times	Twice	Twice
	dtF	Once	Once	Three times	Three times
	EEr1	Four times	Four times	Three times	Three times
	EEr2	Five times	Five times	Three times	Three times
	EEr	Six times	Six times	Three times	Three times
	OHt	Twice	Twice	Four times	Four times
	WrF	Five times	Five times	Four times	Four times

■Digital Type Keypad KP-601A (Optional)

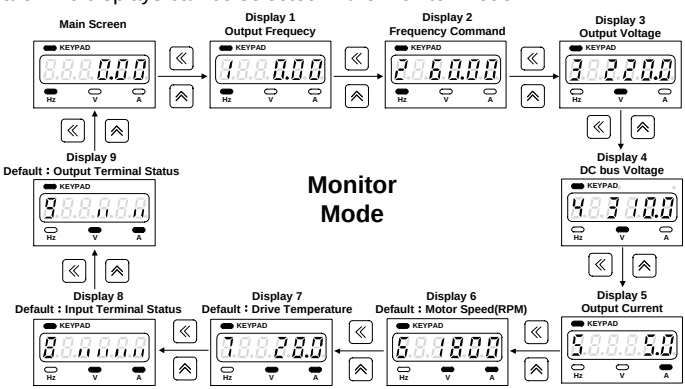


■Operation of Keypad



■Description of Monitor Mode

There are nine displays can be selected in the monitor mode.



■ PM Motor Setting Step

A. Restore the default value of PM motor (A1-05=dF_PM)

B. Set the maximum frequency (E1-00), maximum voltage (E1-01), base frequency (E1-02), and base voltage (E1-03)

C. Set the motor rated current (E2-01) and the number of motor poles (E2-04)

D. Select the mode of initial position (C7-03): DC braking(C7-03=0), HFI(C7-03=1), and pulse(C7-03=4)

E. Select the auto tuning mode (A1-03): rotational tuning (A1-03=4) or stationary tuning (A1-03=6)
   i. Motor related parameters will update after complete tuning: line-to-line resistor (E2-05), Ld (E2-11), Lq (E2-12), and back EMF constant (E2-13)
   ii. Please confirm the motor rotate normally when use rotational tuning.

F. If back EMF constant is lower than 25, please try to increase the switching frequency (C7-01) and current level in IF mode.

■ Parameter List

Group	Name	Group	Name
A1	Initialization (4000H)	E3	Motor2 V/F Pattern (4440H)
A3	Keypad Selection (4040H)	E4	Motor2 Parameters (4460H)
A4	Function Selection (4065H)	G1	Solar Pump parameters (4800H)
A5	Maintenance Selection (4080H)	G2	Pump Control Parameters (4830H)
b1	Operation Mode Selection (4100H)	H1	Multi-Function Digital Inputs (4A00H)
b2	DC Braking (4120H)	H2	Multi-Function Digital Outputs (4A20H)
b3	Speed trace (4130H)	H3	Multi-Function Analog Inputs (4A40H)
b4	Multi-Function Component (4140H)	H5	ModbusSerial Communication (4A80H)
b5	PID Control (4160H)	L1	Driver & Motor Protection (4C00H)
b6	Holding Function (41A0H)	L2	Restart After Instant Power Failure (4C20H)
C1	Accel./Decel. Times (4200H)	L3	Stall Prevention (4C40H)
C2	S-Curve Characteristics (4220H)	L4	Speed and Torque Detection (4C60H)
C3	V/F Control Compensation (4240H)	L5	Fault Restart (4C80H)
C4	Carrier Frequency (4260H)	L6	Extend Protection (4CA0H)
C5	Automatic Speed Regulator (ASR) (4280H)	L7	Torque Limit (4CC0H)
C6	OLV Current Estimator Gain (4290H)	P1	Sequence Control (5000H)
C7	PM Control Setting(42A0H)	P2	Traverse Function (5080H)
d1	Preset Speed (4300H)	o1	Current Loop Gain Setting (5900H)
d2	Frequency Upper/Lower Limits (4320H)	U1	Operation Status Monitor (6000H)
d3	Jump Frequency (4340H)	U2	Fault Trace (6100H)
d4	Up/Down Control (4360H)	U3	Fault History (6200H)
d5	Torque Control (4380H)	U4	Maintenance Monitor (6300H)
d6	Field Weakening (43A0H)	U5	PID Monitor (6400H)
d7	Offset Frequency (43B0H)	U6	Operation Status Monitor 2 (6500H)
E1	Motor1 V/F Pattern (4400H)	U7	Program Control Monitor (6600H)
E2	Motor1 Parameters (4420H)	U8	System Monitor (6700H)

means function can be set up during the operation.

Setting Parameter List

Func.	Name	Range	dF60
A1-02	Control Method Selection	0:V/F Control 2:Vector Control 6:PM Control 1 (I/F+EMF) 7:PM Control 2 (HFI+EMF)	0
A1-03	Auto tuning Function	0:Disable 1:Rotational tuning 2:Stationary tuning with no-load current 3:Stationary tuning 4:Stationary tuning (PM motor)	0
A1-04	Power Source	190.0~240.0V(220V series) 340.0~480.0V(380V series)	220.0 380.0
A1-05	Default Setting	none dF60:Default value for 60Hz dF50:Default value for 50Hz dFPM:PM motor default value dFSol:Solar pump default value SAv:Save the setting value rES:Restore the setting value Wr_KP: Keypad ← Drive rd_KP: Keypad → Drive Commt:Communication test	—
A1-06	Propotion of Output Voltage for Auto tuning	0~15	8
A1-07	Parameter Password Input/ Recode	0000~9999	—
A1-08	Parameter Password Setting	0000~9999	—
A1-09	Display selection of Parameter Lock	0:Only display A1-07 1:Display all functions	0
A3-00	Keypad Frequency Command	0.00~E1-00 Hz	60.00
A3-01	Keypad Frequency Selection	0:A3-00 (Digital) 1:Pot knob(Analog)	0
A3-02	Keypad Pot Function Selection	0~19 (Please refer to H3-00)	0
A3-03	Keypad Pot Response	0.000~50.00 sec	0.000
A3-04	Function Selection (SPEC)	-60~+60 (Please refer to H1-00)	0
A3-05	Self-holding (SPEC)	0,1	0
A3-06	Main Display Selection	000~999	102
A3-07	Display 6	000~999	109
A3-08	Display 7	000~999	106
A3-09	Display 8	000~999	107
A3-10	Display 9	000~999	108
A3-11	Main Display Gain 1	0.01~100.00	1.00
A3-12	Main Display Gain 2	0.1~1000.0	1.0
A3-13	Main Display Decimal Value	0~3	3
A3-14	Validity range of STOP (keypad)	0:All range 1:b1-00=2	0

Func.	Name	Range	dF60
A3-15	Frequency Command Selection (keypad)	0:Command is changeable in the monitor mode 1:Command is fixed in the monitor mode	0
A3-16	Display and "---" show alternately at Stop	0:Disable 1:Enable 2:b1-02=1	2
A3-17	Parameter Setting Method	0:Effective when press FUNC DATA key 1:Effective when setting is changed	0
A3-18	Selection When Keypad is Disconnected	0:Drive keeps operation 1:Drive trips "PAdF"	0
A3-19	Function of "Func/Data" Key	0:A3-00 3:A3-22 1:A3-20 4:B5-17 2:A3-21	0
A3-20	MPM Command 0	0~(E1-00)*(b1-15)*(b1-16)	50
A3-21	MPM Command 1	0~(E1-00)*(b1-15)*(b1-16)	50
A3-22	MPM Command 2	0~(E1-00)*(b1-15)*(b1-16)	50
A3-23	Dual Display	000~999	000
A3-24	Main Display in Secondary Frequency	000~999	000
A3-25	Secondary Display in Secondary Frequency	000~999	000
A4-00	Control Function Selection	0:None 2:Pump 1:Preserve 3:Air conditioning	0
A5-00	U2-00 Setting	0~9	0
A5-01	Maintenance Management Function	0:None 1:Clr.Err :Clear Fault records 2:Clr.kwh: Clear Watt-hour meter 3:Clr.All :Clear all item	—
A5-02	Cumulative Power On Setting	0~49999	0
A5-03	Cumulative Operation Time Setting	0~49999	0
A5-04	Cooling Fan Operation Time Setting	0~49999	0
b1-00	Primary Frequency Selection	0.oPEr:Keypad 1.din:Digital Input (X1~X6) 2.Ain:Analog Input (AI) 3.Comm:Communication 7.mPm0:MPM speed 0 8.mPm1:MPM speed 1 9.mPm2:MPM speed 2 10.Pid:PID output	0
b1-01	Secondary Frequency Selection		0
b1-02	Primary Start Command	0:Keypad(RUN key) 1:Digital input(X1~X6) 2:Communication interface	0
b1-03	Secondary Start Command		0
b1-04	Primary Direction Command	0:Keypad (SPEC key + A3-04=5) 1:Digital input(X1~X6) 2:Communication interface	0
b1-05	Secondary Direction Command		0
b1-07	Number of DIgital Input Terminal controls by Modbus	0~6	6

Func.	Name	Range	dF60
b1-10	Stop method	0:Ramp to Stop + DC braking 1:Coast to stop 2:Coast to stop + DC braking	0
b1-11	Reverse Operation Selection	0:Enable 1:Disable	0
b1-12	Phase Order Selection	0:Clockwise (IEC) 1:Couterclockwise (NEMA)	0
b1-13	Operation Selection after Local/Remote Switching	0:Cut off the start command and issue the new start command to operate 1:Operate immediately if the start command issue	0
b1-14	Run Selection at Power ON	0:Cut off the start command and issue the new start command to operate 1:Operate immediately if the start command issue	0
b1-15	MPM gain 1	Frequency= MPM / b1-15×b1-16	1
b1-16	MPM gain 2		1
b2-00	DC Braking Frequency	0.1~60.0 Hz	0.5
b2-01	DC Braking Level	0~150% of drive rated current	50
b2-02	DC Braking Response Time	0.001~60.000 sec	1.000
b2-03	Time of DC Braking at Start	0.0~60.0 sec	0.0
b2-04	Time of DC Braking after Ramp to Stop	0.0~60.0 sec	0.5
b2-05	Delay Time of DC Braking after Coast to Stop	0.0~60.0 sec	0.5
b2-06	Time of DC Braking after Coast to Stop	0.0~600.0 sec	5.0
b2-07	DC Braking Level at Zero Speed	0~150% of drive rated current	0
b3-00	Speed Trace Selection at Start	0:None 1:Setting frequency 2:Maximum frequency	0
b3-01	Current Level of Speed Trace	0~200% of drive rated current	150
b3-02	V/F Gain During Speed Trace	0.10~1.00	1.00
b3-03	Wait / Trace Time of Speed Trace	0.0~100.0sec	0.5
b3-04	Acceleration Time of Speed Trace	0.1~6.0sec	0.4
b3-05	Deceleration Time of Speed Trace	0.1~10.0sec	2.0
b3-06	Stable Time of Speed Trace	0~500ms	200
b3-07	Start Frequency Gain During Speed Trace	0.10~1.00	1.00
b3-08	Filter Constant of Speed Trace	0.001~1.000	0.03
b4-00	Counter Mode	0: Up counter mode 1: Down counter mode	0
b4-01	Counter Value 1	0~60000	0

Func.	Name	Range	dF60
b4-02	Counter Value 2	0~60000	0
b4-03	Counter Cycle Value	0~60000	0
b4-04	Timer ON-Delay Time	0.0~6000.0 sec	0.0
b4-05	Timer OFF-Delay Time	0.0~6000.0 sec	0.0
b5-00	PID Function Selection	0:PID OFF 1:Freq. Output =PID 2:Freq. Output =PID + Freq. command 3:External usage(working when power is on) 4:External usage(working when operating) 5:External usage(working depend on X1~X6)	0
b5-01	Proportional Gain 1(P)	0.00~100.00	1.00
b5-02	Integration Time 1(I)	0.000~36.000 sec	1.000
b5-03	Derivative Time1(D)	0.000~10.000 sec	0.000
b5-04	Proportional Gain 2(P)	0.00~100.00	1.00
b5-05	Integral Time 2(I)	1.0~36.000 sec	1.000
b5-06	Derivative Time2(D)	0.000~10.000 sec	0.000
b5-07	Integral Upper Limit	-1.00~1.00	1.00
b5-08	Integral Lower Limit	-1.00~1.00	0.00
b5-09	Intergral Initial Value	-320.00~320.00	0.00
b5-10	PID Input Limit	0.00~1.00	1.00
b5-11	PID Delay Time	0.00~10.00 sec	0.00
b5-12	PID Output Bias	-320.00~320.00%	0.00
b5-13	PID Output Gain	-25.00~25.00	1.00
b5-14	PID Proportional Selection	0: General mode 1: prepositive mode	0
b5-15	PID Derivative Selection	0: General mode 1: prepositive mode	0
b5-16	PID Feedback Filter	0.001~1.000	1.000
b5-17	PID Set Point Value	-320.00~320.00	0.00
b5-18	Feedforward Controller Gain	-25.00~25.00	0.00
b5-19	Feedforward Controller Limit	-1.00~1.00	0.00
b5-20	PID Output Limit	0.00~1.00	0.00
b5-21	PID Output 2 Upper Limit	-1.00~1.00	1.00
b5-22	PID Output 2 Lower Limit	-1.00~1.00	0.00
b5-23	PID Feedback loss Detection Selection	0: None 1: Alarm 2: Ramp to stop 3: Coast to stop	0

Func.	Name	Range	dF60
b5-24	PID Feedback Low Detection Level	-1.00~1.00	-1.00
b5-25	PID Feedback Low Detection Time	0.0~60.0 sec	1.0
b5-26	PID Feedback High Detection Level	-1.00~1.00	1.00
b5-27	PID Feedback High Detection Time	0.0~60.0 sec	1.0
b5-28	PID Sleep Initial Frequency	-320.00~320.00	0.00
b5-29	PID Sleep Delay Time	0.0~600.0 sec	0.0
b5-30	PID Wakeup Initial Frequency	-320.00~320.00	0.00
b5-31	PID Wakeup Delay Time	0.0~600.0 sec	0.0
b5-32	PID Error Dead Band	0.000~1.000	0.001
b5-33	Holding Time of PID Parameter Switching	0.000~60.000 sec	0.000
b5-34	PID Softer Start Accel./ Decel. Time	0.0~6000.0 sec	0.0
b5-35	PID Direction Selection	0: Forward control 1: Reverse controll	1
b5-36	Upper Limit of Transmitter	-320.00~320.00	1.00
b5-37	Lower Limit of Transmitter	-320.00~320.00	0.00
b5-38	2nd PI control selection	0: Depend on b5-40 1: Swtich back to the primary PI after the deviation is lower than 5% of b5-39.	0
b5-39	(2nd PI) Active Range	-320.00~320.00	1.00
b5-40	(2nd PI) Active Time	0.0~300.0 sec	0.0
b6-00	Holding Freq. at Start	0.00~600.00 Hz	0.00
b6-01	Holding Time at Start	0.0~360.0 sec	0.0
b6-02	Holding Freq. at Stop	0.00~600.00 Hz	0.00
b6-03	Holding Time at Stop	0.0~360.0 sec	0.0
C1-00	Reference Frequency of Accel./Decel.Time	0.01~600.00 Hz	60.00
C1-01	Accel. Time 0	0.0~3200.0 sec	5.0
C1-02	Decel. Time 0	0.0~3200.0 sec	5.0
C1-03	Accel. Time 1	0.0~3200.0 sec	5.0
C1-04	Decel. Time 1	0.0~3200.0 sec	5.0
C1-05	Aecel. Time 2 (Motor 2 Aecel.Time 0)	0.0~3200.0 sec	5.0
C1-06	Decel. Time 2 (Motor 2 Decel.Time 0)	0.0~3200.0 sec	5.0
C1-07	Aecel. Time 3 (Motor 2 Aecel.Time 1)	0.0~3200.0 sec	5.0
C1-08	Decel. Time 3 (Motor 2 Decel.Time 1)	0.0~3200.0 sec	5.0
C1-09	Secondary Accel. Time	0.0~3200.0 sec	5.0
C1-10	Secondary Decel. Time	0.0~3200.0 sec	5.0

Func.	Name	Range	dF60
C1-11	Accel. Time When Output Voltage Adjustment of V/F Pattern	0.0~3200.0 sec	5.0
C1-12	Decel. Time When Output Voltage Adjustment of V/F Pattern	0.0~3200.0 sec	5.0
C1-13	Fast Stop Time	0.0~3200.0 sec	5.0
C1-14	Accel. /Decel. Time Unit	0:0.1~3200 sec 1:0.01~320 sec	0
C1-15	Accel. /Decel. Time Switching Frequency	0~400 Hz	0
C2-00	S-Curve time at Accel Start	0.00~10.00 sec	0.00
C2-01	S-Curve time at Accel End	0.00~10.00 sec	0.00
C2-02	S-Curve time at Decel Start	0.00~10.00 sec	0.00
C2-03	S-Curve time at Decel End	0.00~10.00 sec	0.00
C3-00	Motor Slip Compensation	-60.0~60.0 Hz	0.0
C3-01	Slip Compensation Response Time	0.000~10.000 sec	0.800
C3-02	Automatic Voltage Regulation (AVR)	0:Disable 1:Enable at all range 2:Disable at decel.(V/F) / Enable at decel.(OLV) 3: Deceleration(V/F)	1
C3-03	Response Time of AVR	0.000~20.000 sec	0.050
C3-04	Current Oscillation Compensation Gain	0.0~500.0	0.0
C3-05	Current Oscillation Compensation Response Time	0.000~1.000 sec	0.000
C3-06	Automatic Torque Compensation Gain	0.0~25.5	1.0
C3-07	Automatic Torque Compensation Response Time	0.000~20.000 sec	1.000
C3-08	Low Speed Slip Compensation Gain	0~100	0
C3-10	Motor 2 Slip Compensation	-60.0~60.0 Hz	0.0
C3-11	Motor 2 Slip Compensation Response Time	0.000~10.000 sec	0.800
C3-12	Motor 2 Automatic Voltage Regulation (AVR)	0:Disable 1:Enable at all range 2:Disable at decel.(V/F) / Enable at decel.(OLV) 3: Deceleration(V/F)	1
C3-13	Motor 2 Response Time of AVR	0.000~20.000 sec	1.000
C3-14	Motor 2 Current Oscillation Compensation Gain	0.0~500.0	1.0

Func.	Name	Range	dF60
C3-15	Motor 2 Current Oscillation Compensation Response Time	0.000~1.000 sec	0.010
C3-16	Motor 2 Automatic Torque Compensation Gain	0.0~25.5	1.0
C3-17	Motor 2 Automatic Torque Compensation Response Time	0.000~20.000 sec	1.000
C3-18	Motor 2 Low Speed Slip Compensation Gain	0~100	0
C3-20	Motor 1 Frequency Oscillation Compensation Gain	0.0~300.0	10.0
C3-21	Motor 1 Frequency Oscillation Compensation Filter	0.000~1.000	0.500
C4-00	Carrier Frequency	0~6	1
C5-00	ASR Proportional Gain 1(P)	0.00~300.00	2.00
C5-01	ASR Integral Time 1(I)	0.000~10.000 sec	0.05
C5-02	ASR Proportional Gain 2(P)	0.00~300.00	4.00
C5-03	ASR Integral Time 2(I)	0.000~10.000 sec	0.050
C5-06	ASR Delay Time	0.000~0.500 sec	0.000
C5-07	ASR Switching Frequency	0.0~400.0 Hz	120.0
C5-08	ASR Integral Limit	0~400%	400
C5-09	Speed Estimator Proportional Gain	0.00~10.00	0.25
C5-10	Speed Estimator Integral Gain	0.0~200.0	25.0
C5-11	EMF Proportional Gain at High speed	0.01~100.00	1.60
C5-12	EMF Proportional Gain at Low speed	0.01~100.00	0.80
C5-13	EMF Compensation Propotional Gain	0.00~100.00	1.00
C5-14	EMF Compensation Integral Gain	0.00~100.00	16.00
C6-00	OLV Point 0 Frequency	0.00~300.00 Hz	20.00
C6-01	OLV Point 0 Gain	0.00~300.00	0.20
C6-02	OLV Point 1 Frequency	0.00~300.00 Hz	50.00
C6-03	OLV Point 1 Gain	0.00~300.00	0.50
C6-04	OLV Point 2 Frequency	0.00~300.00 Hz	80.00

Func.	Name	Range	dF60
C6-05	OLV Point 2 Gain	0.00~300.00	1.00
C6-06	OLV Point 3 Frequency	0.00~300.00 Hz	120.00
C6-07	OLV Point 3 Gain	0.00~300.00	1.00
C7-00	Current Level in IF mode	0.00~1.00	0.00
C7-01	PM Control Method Switching Frequency	0.0~100.0 Hz	20.0
C7-02	HFI Signal Filter	0.000~1.000	0.000
C7-03	HFI Control Method	0:DC braking postioning 1:HFI postioning 2:Pulse postioning	1
C7-04	Timeout of HFI Initial Position Detection	0.00~5.00 sec	0.50
C7-05	HFI Angle Offset	-1.00~1.00	0.10
C7-06	HFI Frequency	0~2000 Hz	800
C7-07	HFI Voltage	0.00~0.50	0.20
C7-08	Judgment Level of HFI Success	-1.00~1.00	0.00
C7-10	Current Offset Of d-axis	-0.50~0.50	0.00
C7-11	Gain of Voltage Utilization	0~10	0
C7-12	Duty of Pulse Positioning	1~1000	150
d1-00	Preset Speed 0	0.00~600.00	60.00
d1-01	Preset Speed 1	0.00~600.00	10.00
d1-02	Preset Speed 2	0.00~600.00	20.00
d1-03	Preset Speed 3	0.00~600.00	30.00
d1-04	Preset Speed 4	0.00~600.00	0.00
d1-05	Preset Speed 5	0.00~600.00	0.00
d1-06	Preset Speed 6	0.00~600.00	0.00
d1-07	Preset Speed 7	0.00~600.00	0.00
d1-08	Preset Speed 8	0.00~600.00	0.00
d1-09	Preset Speed 9	0.00~600.00	0.00
d1-10	Preset Speed 10	0.00~600.00	0.00
d1-11	Preset Speed 11	0.00~600.00	0.00
d1-12	Preset Speed 12	0.00~600.00	0.00
d1-13	Preset Speed 13	0.00~600.00	0.00
d1-14	Preset Speed 14	0.00~600.00	0.00
d1-15	Preset Speed 15	0.00~600.00	0.00
d1-16	Jog Speed	0.00~600.00	6.00
d2-00	Output Freq. Limit Selection	0:d2-01 and d2-02 1:d2-03 and d2-04	0
d2-01	Freq. Upper Limit (%)	0.00~1.00	1.00
d2-02	Freq. Lower Limit (%)	0.00~1.00	0.00
d2-03	Freq. Upper Limit (Hz)	0.00~600.00 Hz	60.00
d2-04	Freq. Lower Limit (Hz)	0.00~600.00 Hz	0.00
d3-00	Jump Freq. 1	0.0~600.0 Hz	0.0
d3-01	Jump Freq. 2	0.0~600.0 Hz	0.0
d3-02	Jump Freq. 3	0.0~600.0 Hz	0.0
d3-03	Jump Freq. Range	0.1~20.0 Hz	1.0
d4-00	UP/DOWN Memory Selection	0:Disable 1:Enable	0
d4-01	UP/DOWN Freq. Resolution	0.01~25.00 Hz	0.01
d4-02	UP/DOWN Trigger Mode	0:Edge trigger 1~5:Response time(sec)	0
d4-03	UP/DOWN Freq. Adjustment	0.00~600.00 Hz	0.00
d4-04	Freq. Resolution during Accel./Decel.	0.01~25.00 Hz	4.00

Func.	Name	Range	dF60
d5-01	Torque Control Selection	0:Speed Control 1:Torque Control	0
d5-02	Torque Command Delay Time	0~1000 msec	0
d5-03	Speed Limit Selection	0:Frequency command 1:d5-04	0
d5-04	Speed Limit	-120~120%	0
d5-05	Speed Limit Bias	0~120%	10
d5-06	Speed/Torque Control Switch Delay Time	0~1000 msec	0
d5-08	Unidirectional Speed Limit bias	0:Disabled (bidirectional) 1:Enabled (unidirectional)	1
d5-10	T/F Curve Max Torque Gain	0.000~2.000	1.000
d5-11	T/F Curve Max Freq.	0.0~600.0 Hz	60.0
d5-12	T/F Curve Mini Torque Gain	0.000~2.000	1.000
d5-13	T/F Curve Mini Freq.	0.0~600.0 Hz	0.0
d6-00	Field Weakening Level	0~100 %	80
d6-01	Field Weakening Freq. Limit	0~400 Hz	0.0
d7-00	Offset Freq. 0	-1.00~1.00	0.00
d7-01	Offset Freq. 1	-1.00~1.00	0.00
d7-02	Offset Freq. 2	-1.00~1.00	0.00
E1-00	Maximum Output Freq.	0.1~600.0 Hz	60.0
E1-01	Maximum Output Voltage	0.0~255.0V (220V series) 0.0~510.0V (380V series)	220.0 380.0
E1-02	Base Freq.	0.1~600.0 Hz	60.0
E1-03	Base Voltage	0.0~255.0V (220V series) 0.0~510.0V (380V series)	220.0 380.0
E1-04	Start Freq.	0.1~10.0 Hz	0.5
E1-05	Start Voltage	0.1~50.0V (220V series) 0.1~100.0V (380V series)	8.0 12.0
E1-06	V/F Freq. 1	0.1~600.0 Hz	0.0
E1-07	V/F Voltage 1	0.0~255.0V (220V series) 0.0~510.0V (380V series)	0
E1-08	V/F Freq. 2	0.1~600.0 Hz	0.0
E1-09	V/F Voltage 2	0.0~255.0V (220V series) 0.0~510.0V (380V series)	0
E1-10	Output Voltage Limit	0:Disable 1:Enable	0
E1-11	VF Pattern	0:Linear 1:Energy-saving 2:Square Curve 3:1.7th power Curve 4:1.5th power Curve	0
E1-12	Non-linear Start Freq.	0.0~600.0 Hz	0.0
E1-13	Non-Linear Start Voltage	0.0~255.0V (220V series) 0.0~510.0V (380V series)	0.0
E2-01	Motor Rated Current	10~150% of drive rated current	—
E2-02	Motor Rated Slip	0.00~20.00 Hz	—
E2-03	Motor No-Load Current	0~E2-01	—
E2-04	Number of Motor Poles	1~24	4
E2-05	Motor Line-to-Line Resistance	0.001~65.000 Ω	—
E2-06	Motor Leakage Inductance	0.01~40.0 %	—
E2-07	Motor Iron-Core Saturation Coefficient 1	0.01~1.00	0.9
E2-08	Motor Iron-Core Saturation Coefficient 2	0.01~1.00	0.8
E2-09	Motor Iron-Core Saturation Coefficient 3	0.01~1.00	0.7

Func.	Name	Range	dF60
E2-11	PM Motor Ld	0.001~60.000 mH	3.000
E2-12	PM Motor Lq	0.001~60.000 mH	3.000
E2-13	Back-EMF Constant	0.0~6500.0	60.0
E3-00	Motor 2 Maximum Output Freq.	0.1~600.0 Hz	60.0
E3-01	Motor 2 Maximum Output Voltage	0.0~255.0V (220V series) 0.0~510.0V (380V series)	220.0 380.0
E3-02	Motor 2 Base Freq.	0.1~600.0 Hz	60.0
E3-03	Motor 2 Base Voltage	0.0~255.0V (220V series) 0.0~510.0V (380V series)	220.0 380.0
E3-04	Motor 2 Start Freq.	0.1~10.0 Hz	0.5
E3-05	Motor 2 Start Voltage	0.1~50.0V (220V series) 0.1~100.0V (380V series)	8.0 12.0
E3-06	Motor 2 V/F Freq. 1	0.1~600.0 Hz	0.0
E3-07	Motor 2 V/F Voltage 1	0.0~255.0V (220V series) 0.0~510.0V (380V series)	0
E3-08	Motor 2 V/F Freq. 2	0.1~600.0 Hz	0.0
E3-09	Motor 2 V/F Voltage 2	0.0~255.0V (220V series) 0.0~510.0V (380V series)	0
E3-10	Motor 2 Output Voltage Limit	0:Disable 1:Enable	0
E3-11	Motor 2 VF Pattern	0:Linear 1:Energy-saving 2:Square Curve 3:1.7th power Curve 4:1.5th power Curve	0
E3-12	Motor 2 Non-linear Start Freq.	0.0~600.0 Hz	0.0
E3-13	Motor 2 on-Linear Start Voltage	0.0~255.0V (220V series) 0.0~510.0V (380V series)	0.0
E4-01	Motor 2 Rated Current	10~150% of drive rated current	—
E4-02	Motor 2 Rated Slip	0.00~20.00 Hz	—
E4-03	Motor 2 No-Load Current	0~E4-01	—
E4-04	Motor 2 Number of Motor Poles	1~24	4
E4-05	Motor 2 Line-to-Line Resistance	0.001~65.000 Ω	—
E4-02	Motor 2 Rated Slip	0.00~20.00 Hz	—
E4-03	Motor 2 No-Load Current	0~E4-01	—
E4-04	Motor 2 Number of Motor Poles	1~24	4
E4-05	Motor 2 line-to-Line Resistance	0.001~65.000 Ω	—
E4-06	Motor 2 Leakage Inductance	0.01~40.0 %	—
E4-07	Motor 2 Iron-Core Saturation Coefficient 1	0.01~1.00	0.9
E4-08	Motor 2 Iron-Core Saturation Coefficient 2	0.01~1.00	0.8
E4-09	Motor 2 Iron-Core Saturation Coefficient 3	0.01~1.00	0.7
E4-11	PM Motor 2 Ld	0.001~60.000 mH	3.000
E4-12	PM Motor 2 Lq	0.001~60.000 mH	3.000
E4-13	PM Motor 2 Back-EMF Constant	0.0~6500.0	60.0
G1-00	Maximum Open Circuit Voltage	90~700V	300
G1-01	Start Voltage Auto Update	0:Disable 1:Real value 2:Estimated value	0
G1-02	Start Voltage	80~700V	285

Func.	Name	Range	dF60
G1-03	Shutdown Freq.	0.01~60.00Hz	14
G1-04	Low Freq. Detection time	0~255 (unit:30sec)	1
G1-05	Water Shortage Protection Restart Time	1:Auto regulation 2:Preset time	1
G1-06	Water Sensor Type	0:Normally open 1:Normally close 2:Flow senesor	0
G1-07	Water Check Time	0~255 (unit:30sec)	1
G1-08	Automatic Restart Time	0~200 sec	0
G1-09	Automatic Shutdown Time	0.0~1440.0 min	0
G1-10	Upper Limit of Start Voltage Auto Update	0.8~1	0.97
G1-11	Check Interval	200~1000 msec	500
G1-12	Freq. Increment per Second	0.1~10Hz	0.8
G1-13	Freq. Decrement Gain	0.01~100.00	2.5
G1-14	Freq. Decrement Detection Voltage	0.750~0.950	0.825
G1-15	Flow Sensor Detection Level	0.0~100.0%	0.0
G1-16	Flow Sensor Maximum Pulse	0~65535	225
G1-17	Water Level Protection	0:Disable 1:Enable	0
G1-18	Automatic Transfer Switch (ATS)	0:Disable 1:Enable	0
G1-19	ATS Voltage Adjustment	0~255V	127
G1-20	Start Voltage Hysteresis Band	1.000~1.500	1.015
G1-21	Solar detection interval time	1~255 min	30
G1-22	AC Detection Voltage in ATS	90~255V	220
G2-00	Pressure Boost (Water Usage Detection)	0.000~1.000	0.015
G2-01	Pressure Boost Time (Water Usage Detection)	0.1~25.0 sec	0.6
G2-02	Time Interval of Pressure Boost (Water Usage Detection)	0~25000 sec	35
G2-03	Drive Standby level	0~120 Hz	10
G2-04	PID Start Range	0.00~1.00	0.03
G2-05	Start Rate Setting (ON/OFF mode)	0.00~1.00	0
G2-06	Pressure Dead Band (ON/OFF Mode)	0.00~1.00	0.03
G2-07	Record status at power failure	0~1	1
G2-08	Auto-restart Selection (Fb Lo)	0:Disable 1:Press “RESET” key to reset. 2:Resupply the power to reset 3:Resart automatically according to the setting of G2-13.	1
G2-09	Number times of auto-restart (Fb Lo)	0~255	24
G2-10	Pressure Level (Fb Lo)	0.00~1.00	0.40
G2-11	Current Level (Fb Lo)	0~100	1
G2-12	Detection Time (Fb Lo)	0~250	60

Func.	Name	Range	dF60
G2-13	Shutdown Time (Fb Lo)	0~200	5
G2-14	Noise Prevention	0:Disable 1:Enable	0
G2-15	Continuous Water Supply Control	0:Disable 1:Enable	0
G2-16	PID Error Gain	0.01~0.80	0.10
G2-17	P Selection	0:Disable 1:Enable	1
G2-18	Proportional Gain (P)	0.0~25.0	0.20
G2-19	Integral Time (I)	0.00~250.00	20.00
G2-20	Integral Upper Limit	-1.00~1.00	1.00
G2-21	Integral Lower Limit	-1.00~1.00	0.40
G2-22	Integral Initialized Value	-1.00~1.00	0.00
H1-00	Multi-function Input Terminal (X1)	0:Disable ±1:Jog command ±2:FWD command ±3:REV command ±4:Start command ±5:Direction selection ±6:Stop command ±7:Secondary freq. command ±8:Secondary Accel./Decel. ±9:Multi-speed level 1 ±10:Multi-speed level 2 ±11:Multi-speed level 3 ±12:Multi-speed level 4 ±13:Accel./Decel. selection 1 ±14:Accel./Decel. selection 2 ±15:Multi-speed level 1 + Accel./Decel. selection 1 ±16:Multi-speed level 2 + Accel./Decel. selection 2 ±17:Reset command ±18:UP command ±19:DOWN command ±20:Set UP/DOWN freq. ±21:Clear UP/DOWN freq. ±22:External fault (EF) ±23:Interruption of output(bb) ±24:Coast to stop(Fr) ±25:Holding command ±26:Speed trace from the maximum freq. ±27:Speed trace from the setting freq. ±28:sequential operation Start ±29:Pause command of sequential operation ±30:Holding command of sequential operation ±31:DC braking enable at stop ±32:Current limit enable ±33:Secondary start command ±34:Secondary direction command ±35:Secondary frequency + Secondary start + Secondary direction ±36:PID integral reset ±37:PID integral hold ±38:PID enable ±39:Second PID parameter ±40:PID softer start cancel ±42:Local/Remote selection ±43:Field weakening ±44:Reserve ±45:Drive enable ±46:Forward/Reverse detection (V/F control with simple PG feedback)	2
H1-01	Multi-function Input Terminal (X2)		3
H1-02	Multi-function Input Terminal (X3)		1
H1-03	Multi-function Input Terminal (X4)		22

Func.	Name	Range	dF60
H1-04	Multi-function Input Terminal (X5)	±47:External overheat(OH3) ±48:Motor 2 selection ±49:Offset frequency 0 ±50:Offset frequency 1 ±51:Offset frequency 2 ±52:Counter input ±53:Counter clear ±54:Timer input ±55:Speed/torque control selection ±56:External fault 1(EF1) ±57:Reserve ±58:ASR gain selection ±59:ASR integral reset ±60:Traverse function disable	17
H1-05	Multi-function Input Terminal (X6)		0
H1-08	Response Time (X1)	1~500 mesc	10
H1-09	Response Time (X2)	1~500 mesc	10
H1-10	Response Time (X3)	1~500 mesc	10
H1-11	Response Time (X4)	1~500 mesc	10
H1-12	Response Time (X5)	1~500 mesc	10
H1-13	Response Time (X6)	1~500 mesc	10
H2-00	Multi-function digital output terminal (Ta1,Tb1)	0:Disable ±1:Detection during operation ±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 detection ±9:Restart after instant power failure detection ±10:Restart after error condition detection ±11:Error detection ±12:Sequential operation detection ±13:Step end at sequential operation ±14:Cycle end at sequential operation ±15:Sequential operation pause detection ±16:Sequential operation holding detection ±17:Counter value 1 detection ±18:Counter value 2 detection ±19:Counter overflow detection ±20:Timer output ±21:Detection during reverse ±22:NTC temperature warning detection(Ht) ±23:Fan operation detection ±24:Reserve ±25:PID feedback low detection ±26:PID feedback high detection ±27:PID sleep detection ±28:Analog input detection 1：Warn level detection ±29:Analog input detection 1：Fault level detection ±30:Analog input detection 2：Warn level detection ±31:Analog input detection 2：Fault level detection ±32:Local/Remote status ±33:Drive ready ±34:Drive enable detection ±35:Fast stop detection ±36:Output interruption detection ±37:Speed trace detection	3

Func.	Name	Range	dF60
H2-00	Multi-function digital output terminal (Ta1,Tb1)	±38:Frequency detection with direction ±39:Frequency loss detection ±40:Torque detection 1 ±41:Torque detection 2 ±42:Motor 2 selection ±43:Traverse function detection ±44:Traverse function acceleration detection ±45:Regeneration detection ±46:Torque limit detection ±47:Speed limit detection in torque control	3
H3-01	Analog Input Selection (AI)	0: Disable 1: Frequency command 2: Frequency gain 3: Frequency offset 4: Auxiliary frequency 1 5: Auxiliary frequency 2 6: Current limit 7: PID setpoint 8: PID feedback 9: Differential PID feedback 10:Output voltage adjustment of V/F pattern. 11: Analog input protection 1 12: Analog input protection 2 13: Frequency limit 14: Forward torque limit 15: Reverse torque limit 16: Regeneration torque limit 17: Torque limit / Torque command 18: Torque compensation 19: Torque limit	1
H3-02	Gain (AI)	-10.000~10.000	1.000
H3-03	Bias (AI)	-10.000~10.000	0.00
H3-04	Input Range Selection (AI)	0:0~10 Vdc 1:4~20 mA	0
H3-05	Response Time (AI)	0.000~50.000 sec	0.000
H3-16	Offset (AI)	-1.000~1.000	0
H3-20	Analog Input Selection (Virtual Analog Input 1)	Please refer to H3-01	0
H3-21	Virtual Analog Input 1 Value	-1.000~1.000	0.000
H5-00	Comm. Address	0~254	0
H5-01	Comm. Baud Rate	1200 bps 19200 bps 2400 bps 38400 bps 4800 bps 57600 bps 9600 bps 76800 bps 14400 bps 115200 bps	9600
H5-02	Comm. Protocol	8, N, 1 8, E, 1 8, N, 2 8, O, 1	8N1
H5-03	Drive Transmit Delay Time	5~65 msec	10
H5-04	Comm. Overtime Selection	0:Ramp to stop 1:Coast to stop 2:Keep running	0
H5-05	Comm. Overtime (Cot)	0.0~100.0 sec	0
H5-06	Comm. protocol Selection	0:Modbus RTU 1:Modbus ASCII	0
H5-07	Parameters Modify Mode by Comm.	0:Store at EEPROM 1:Don't store at EEPROM	0
L1-02	Motor Overload Protection (OL)	0:Disable 1:Standard motor 2:Drive dedicated motor (external fan cooling)	1
L1-03	Motor Overload Protection Time	0~10.0 min	5.0

Func.	Name	Range	dF60
L1-06	Overheating Warning Selection (OHt)	0: None 1: Keep running 2: Carrier reduction 3: Stop	2
L1-07	Overheating Warning Level (OHt)	45~105℃	70
L1-08	Drive Overheating Dead Band	0.1~10.0℃	3.0
L1-10	Temperature Level of Fan Activation	25~65℃	50
L1-11	Fan Off Delay Time	0.1~25.0 min	0.5
L1-12	System Overload Detection	0:Disable 1:Enable	0
L1-13	System Overload Detection Mode	0:During constant speed 1:During operation	0
L1-14	Output Setting after System Overload	0:Keeps operation 1:Trips to protection	0
L1-15	System Overload Detection Level	30~200%	160
L1-16	System Overload Detection Time	0.1~300.0sec	0.1
L1-17	Dynamic Braking Selection	0:Disable 2:On,"DBOH" alarm 1:Enable 3:On,"DBOH" fault	1
L1-18	Dynamic Braking Active Level	350~410V (220V series) 700~820V (380V series)	380 760
L1-19	Brake Resistor Pulse Setting	10~90 %	50
L1-20	Input Phase Loss Protection Selection	0:Disable 1:Enable	1
L1-21	Output Phase Loss Protection Selection	0:Disable 1:Enable	1
L1-22	Current Limit	0.1~2.00	2.00
L2-00	Operation Selection at Instant Power Failure	0:Drive cannot restart 1:Drive restart 2:Ramp to stop 3:Restart if the power restore during ramp to stop 4:Ramp to stop with KEB (Enable when start command is on) 5:Ramp to stop with KEB and drive restart 6:Ramp to stop with KEB 7: Drive restart from 0 Hz	0
L2-01	Voltage Level of Ramp to Stop by Power Failure	210.0~270.0V (220V series) 420.0~540.0V (380V series)	250.0 450.0
L2-02	Subtracted Freq. of Ramp to Stop by Power Failure	0.0~20.0 Hz	0.5
L2-03	Deceleration Time 1 of Ramp to Stop by Power Failure	0.0~3200.0 sec	25.0
L2-04	Deceleration Time 2 of Ramp to Stop by Power Failure	0.0~3200.0sec	25.0
L2-05	Switching Freq. of Ramp to Stop by Power Failure	0.0~400.0Hz	0.0
L2-06	KEB setpoint DC Voltage	150~250V (220V series) 300~500V (380V series)	250.0 450.0
L2-07	KEB PI Gain	0.000~5.000	0.12
L2-08	KEB PI Integration	0.00~50.00	1.00
L2-09	KEB PI Limit	0.0~120.0Hz	60.0
L2-10	LE Dection time	0~250 ms	50
L3-00	Stall Prevention Level at Acceleration	30~200%	170
L3-01	Stall Prevention Level at Constant Speed	30~200%	160
L3-02	Acceleration Time after Stall Prevention under Constant Speed	0.1~3200.0sec	5.0
L3-03	Deceleration Time for Stall Prevention under Constant Speed	0.1~3200.0sec	5.0
L3-04	Stall Prevention at Deceleration	0:Disable 1:Enable	1
L3-05	Stall Prevention Delay Time	0~5000msec	100
L3-06	Overvoltage Suppression Selection	0:Disable 1:Enable 2:Enable at constant speed	0
L3-07	Overvoltage Suppression Active Level	1.05~2.00	1.10
L3-08	Overvoltage Suppression Frequancy Limit	0.0~30.0Hz	6.0
L3-09	Overvoltage Suppression P Gain	0.000~5.000	0.100
L3-10	Overvoltage Suppression I Gain	0.00~50.00	5.00
L3-11	Overvoltage Suppression AVR Gain	0~100	50
L4-00	Constant Speed Detection Range	0.0~20.0 Hz	2.0
L4-01	Freq. Detection Level	0.0~400.0 Hz	0.0
L4-02	Freq. Detection Range	0.0~20.0 Hz	2.0
L4-03	Freq. Detection Level (+/-)	-400.0~400.0 Hz	0.0
L4-04	Freq. Detection Range (+/-)	0.0~20.0 Hz	2.0
L4-05	Freq. Detection Selection	0:Disable at baseblock (bb) 1:Enable at baseblock(bb)	1
L4-06	Freq. Command Loss Detection Selection	0:None 1:Stop 2:Keep running according to the L4-07.	0
L4-07	Freq. Command at Freq. Command Loss	0.000~1.000	0.800
L4-10	Toreque Detection Selection 1	0:Disable 1:Detect OL3 at constant speed (Alarm) 2:Detect OL3 at running (Alarm) 3:Detect OL3 at constant speed (Fault) 4:Detect OL3 at running (Fault) 5:Detect UL3 at constant speed (Alarm) 6:Detect UL3 at running. (Alarm) 7:Detect UL3 at constant speed. (Fault) 8:Detect UL3 at running. (Fault)	0

Func.	Name	Range	dF60
L4-11	Torque Detection Level 1	0.00~3.00	1.50
L4-12	Torque Detection Time 1	00.~300.0 sec	0.1
L4-13	Toreque Detection Selection 2	0:Disable 1:Detect OL4 at constant speed.(Alarm) 2:Detect OL4 at runnig (Alarm) 3:Detect OL4 at constant speed (Fault) 4:Detect OL4 at running (Fault) 5:Detect UL4 at constant speed (Alarm) 6:Detect UL4 at running (Alarm) 7:Detect UL4 at constant speed (Fault) 8:Detect UL4 at running (Fault)	1
L4-14	Torque Detection Level 2	0.00~3.00	1.50
L4-15	Torque Detection Time 2	0.0~300.0 sec	0.1
L5-00	Fault Restart Selection	0:Resart immediately after the fault is reset 1:Restart after the setting time in L5-02 PS. Only for OC、OE、GF	0
L5-01	Auto-restart Times Setting	0~16	0
L5-02	Fault Reset Interval Time	0.5~600.0 sec	10.0
L5-03	Output Terminal Selection During Auto Restart Fault	0:No detection 1:Detection	0
L5-04	Fault Auto-Reset Selection	0:Disable 1:Enable PS:Only for LE1,HF1,HF2	0
L6-00	Analog Input Detection 1 Fault Level (A1 Err)	0.000~1.000	0.000
L6-01	Analog Input Detection 1 Warn Level (A1 Warn)	0.000~1.000	0.000
L6-02	Analog Input Detection 1 Warn Dead Band	0.000~1.000	0.000
L6-03	Analog Input Detection 1 Warn Mode	0: None, digital output only 1: Warn 2: Ramp to stop 3: Coast to stop	0
L6-04	Analog Input Detection 2 Fault Level (A2 Err)	0.000~1.000	0.000
L6-05	Analog Input Detection 2 Warn Level (A2 Warn)	0.000~1.000	0.000
L6-06	Analog Input Detection 2 Warn Dead Band	0.000~1.000	0.000
L6-07	Analog Input Detection 2 Warn Mode	0:None, digital output only 1:Warn 2:Ramp to stop 3:Coast to stop	0
L6-08	External fault 1 (EF1) Selection	0:None 1:Warn 2:Ramp to stop 3:Coast to stop 4:Coast to stop + DC braking	1
L6-09	External fault 1 (EF1) Detection	0:Detection all the time 1:Detect during operation	1

Func.	Name	Range	dF60
L7-00	Forward Torque Limit	0.00~3.00	2.00
L7-01	Reverse Torque Limit	0.00~3.00	2.00
L7-02	Forward Regeneration Torque Limit	0.00~3.00	2.00
L7-03	Reverse Regeneration Torque Limit	0.00~3.00	2.00
P1-00	Sequence Control Mode	0:Direct Change 1:Stop before Change	0
P1-01	Sequence Control Direction	0:Single direction 1:Dual direction	0
P1-02	Sequence Control Cycle	1~9998:Number of cycle time 9999:Infinite cycles	1
P1-03	Accel/Decel Time Unit for Sequential Control	0:second 1:minute 2:hour	0
P1-04	Hold Time Unit for Sequential Control		0
P1-05	Accel/Decel Time of Sector 0	0.0~360.0	0.0
P1-06	Hold Time of Sector 0	0.0~360.0	0.0
P1-07	Accel/Decel Time of Sector 1	0.0~360.0	0.0
P1-08	Hold Time of Sector 1	0.0~360.0	0.0
P1-09	Accel/Decel Time of Sector 2	0.0~360.0	0.0
P1-10	Hold Time of Sector 2	0.0~360.0	0.0
P1-11	Accel/Decel Time of Sector 3	0.0~360.0	0.0
P1-12	Hold Time of Sector 3	0.0~360.0	0.0
P1-13	Accel/Decel Time of Sector 4	0.0~360.0	0.0
P1-14	Hold Time of Sector 4	0.0~360.0	0.0
P1-15	Accel/Decel Time of Sector 5	0.0~360.0	0.0
P1-16	Hold Time of Sector 5	0.0~360.0	0.0
P1-17	Accel/Decel Time of Sector 6	0.0~360.0	0.0
P1-18	Hold Time of Sector 6	0.0~360.0	0.0
P1-19	Accel/Decel Time of Sector 7	0.0~360.0	0.0
P1-20	Hold Time of Sector 7	0.0~360.0	0.0
P1-21	Accel/Decel Time of Sector 8	0.0~360.0	0.0
P1-22	Hold Time of Sector 8	0.0~360.0	0.0
P1-23	Accel/Decel Time of Sector 9	0.0~360.0	0.0
P1-24	Hold Time of Sector 9	0.0~360.0	0.0
P1-25	Accel/Decel Time of Sector 10	0.0~360.0	0.0
P1-26	Hold Time of Sector 10	0.0~360.0	0.0
P1-27	Accel/Decel Time of Sector 11	0.0~360.0	0.0
P1-28	Hold Time of Sector 11	0.0~360.0	0.0
P1-29	Accel/Decel Time of Sector 12	0.0~360.0	0.0

Func.	Name	Range	dF60
P1-30	Hold Time of Sector 12	0.0~360.0	0.0
P1-31	Accel/Decel Time of Sector 13	0.0~360.0	0.0
P1-32	Hold Time of Sector 13	0.0~360.0	0.0
P1-33	Accel/Decel Time of Sector 14	0.0~360.0	0.0
P1-34	Hold Time of Sector 14	0.0~360.0	0.0
P1-35	Accel/Decel Time of Sector 15	0.0~360.0	0.0
P1-36	Hold Time of Sector 15	0.0~360.0	0.0
P1-37	Sequence Control Direction	0~FFFF	0000
P1-38	Sequence Control Pause Resume Mode	0:Resume from the pause point 1:Resume from the beginning of the stage	0
P1-39	Sequence Control Pause Mode	0:Pause with stop command. 1:Pause without stop command.	0
P2-00	Traverse Mode	0:Disable 1:Enable during constant speed 2:Enable during operation	0
P2-01	Traverse Amplitude	0.00~0.20	0.00
P2-02	Traverse Step	0.00~0.50%	0.000
P2-03	Traverse Step Time	0.000~0.500 sec	0.000
P2-04	Traverse Deceleration Time	0.0~120.0 sec	0.0
P2-05	Traverse Acceleration Time	0.0~120.0 sec	0.0
o1-00	Gain (D-Axis Current)	0.01~10.00	1.00
o1-01	Gain (Q-Axis Current)	0.01~10.00	1.00
o1-02	Gain (Flux)	0.01~5.00	1.00
o1-04	Proportional Gain (D-Axis Current)	0.000~60.000	0.700
o1-05	Integral Gain (D-Axis Current)	0.0000~60.000	150.0
o1-06	Proportional Gain (Q-Axis Current)	0.000~60.000	0.700
o1-07	Integral Gain (Q-Axis Current)	0.0~6000.0	150.0
o1-08	Proportional Gain (Flux)	0.000~60.000	2.000
o1-09	Integral Gain (Flux)	0.00~600.00	10.00
o1-10	AutoTuning Acceleration Time (Rotational)	0.0~30.0 sec	5.0
o1-11	Motor PWM Deadtime	0~400	90
o1-12	Motor PWM Deadtime Smooth Angle	0.0~20.0	6.0
o1-13	Motor Current Angle Offset	-30.0~30.0°	1.5
o1-14	Motor Current Angle LPF Constant (Numerator)	1~5000	64
o1-15	Motor Current Angle LPF Constant (Denominatior)	1~5000	8

Monitor Parameter List

Func.	Name	Description
U1-00	Control Method	0:V/F Control 2:Vector Control 6:PM Control 1 (I/F+EMF) 7:PM Control 2 (HFI+EMF)
U1-01	Frequency Command	Display the frequency command (Hz)
U1-02	Output Frequency	Display the output frequency (Hz)
U1-03	Output Voltage	Display the output voltage (V)
U1-04	Output Current	Display the output current (A)
U1-05	DC bus Voltage	Display the DC bus Voltage (V)
U1-06	Drive Temperature	Displays the temperature of heatsink (℃)
U1-07	Input Terminal Status	Please refer to note 1
U1-08	Output Terminal Status	Please refer to note 2
U1-09	Motor Speed	Display RPM of motor (Estimated from the output frequency)
U1-10	Power Factor	Display the power factor
U1-11	Power Factor Angle	Display the power factor angle
U1-12	Output Frequency with Compensation	Display the output frequency with compensation (Hz)
U1-13	Drive Status	Please refer to note 3
U1-14	Output Power	Display the output power.
U1-15	Torque Output %	Display torque commands as a percentage during vector control.
U1-16	Frequency command %	Display the frequency command as a percentage.
U1-17	Output Frequency %	Display the output frequency as a percentage.
U1-18	Output Power %	Display the output power as a percentage.
U1-19	Error Code(Now)	Display the current fault.
U1-20	Warn Code(Now)	Display the current warn.
U1-21	Torque Command %	Display torque commands as a percentage.
U1-22	Torque Compensation %	Display the torque compensation as a percentage.
U1-24	MPM 0 Command	Display the machine speed command 0.
U1-25	Monitor MPM 0	Display the output machine speed 0.
U1-26	MPM 1 Command	Display the machine speed command 1.
U1-27	Monitor MPM 1	Display the output machine speed 1.
U1-28	MPM 2 Command	Display the machine speed command 2.
U1-29	Monitor MPM 2	Display the output machine speed 2.
U1-30	Salience Ratio of HFI	Display the Salience Ratio of HFI
U1-31	PM Estimated Speed (Besides IF Mode)	Display the PM estimated speed expect IF mode.
U1-32	PM Estimated Speed (For IF Mode)	Display the PM estimated speed in IF mode.
U1-33	PM Estimated Back-EMF Constant	Display the estimated back-EMF constant.
U2-00	Fault Histroy Item	Display the fault history item set by A5-00

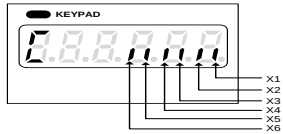
Func.	Name	Description
U2-01	Error Code	Display the error code of U2-00
U2-02	Frequency command	Display the frequency command at U2-00 (Hz)
U2-03	Output frequency	Display the output frequency at U2-00 (Hz)
U2-04	Ouput Voltage	Display the output voltage at U2-00 (V)
U2-05	Output current	Display the output current at U2-00 (A)
U2-06	DC Bus Voltage	Display the DC bus voltage at U2-00 (V)
U2-07	Drive Temperature	Display the drive temperature at U2-00 (℃)
U2-08	Cumulative Operation Time	Display the cumulative operation time at U2-00 (hr)
U2-09	Operation Status	Display the operation status at U2-00
U2-10	Input Terminal Status	Display the input terminal at U2-00
U2-11	Output Terminal Status	Display the output terminal at U2-00
U2-13	Torque Command	Display the torque command at U2-00(%)
U2-14	Motor Q-Axis Current	Display the motor Q-axis current of U2-00(%)
U2-15	Motor D-Axis Current	Display the motor D-axis current of U2-00(%)
U3-00	Fault History 0	Display the latest fault code.
U3-01	Fault History 1	Display the second last fault code.
U3-02	Fault History 2	Display the third last fault code.
U3-03	Fault History 3	Display the fourth last fault code.
U3-04	Fault History 4	Display the fifth last fault code.
U3-05	Fault History 5	Display the sixth last fault code.
U3-06	Fault History 6	Display the seventh last fault code.
U3-07	Fault History 7	Display the eighth last fault code.
U3-08	Fault History 8	Display the ninth last fault code.
U3-09	Fault History 9	Display the tenth last fault code.
U4-00	Cumulative Power On Time	Display the cumulative power on time (hr)
U4-01	Cumulative Operation Time	Display the cumulative operation time (hr)
U4-02	Cooling Fan Operation Time	Display the cumulative operation time of the cooling fan (hr)
U4-03	Cooling Fan Maintenance	Display the cooling fan operation time as a percentage (%)
U4-07	Motor Overload Estimate (OL)	Shows the value of the motor overload detection accumulator (%)
U4-08	kWh Lower Digit	Display the output power usage. Take 12345678.9kWh for example: U4-08:678.9kWh U4-09:12345MWh
U4-09	kWh upper Digit	
U4-10	Frequency command from Modbus Communication	Display the frequency command from the Modbus communication (Hz)
U4-12	Frequancy Command Source	Display the frequancy command source Display formate: XY-nn X:Frequency Command 0=Local 1=Primary Frequency (b1-00) 2=Secondary Frequency (b1-01) Y-nn: Source 0-00=Keypad 1-00 to 1-15=preset speed (d1-00 to d1-15) 2-00 to 2-15=analog input and preset speed 3-00=Modbus Communication

Func.	Name	Description
U4-13	Start Command Source	Display the start command source Display formate: XY-nn X:Start command 0=Local 1=Primary start command (b1-02) 2=Primary start command (b1-03) Y:Source 0:Keypad 1:Muti-function 2:Communication nn:Start command limit status 00:No limit stauts 01:Start command on at power on 02:Start command on at local/remote switch 03:Start command on during under voltage 04:Fast stop
U4-14	Feedback Frequency	Display the feedback frequency
U4-15	Frequency Command	Display the frequency command
U4-16	Voltage Input Level (AI)	Display the voltage input level of AI terminal
U4-18	Current Input Level (AI)	Display the current input level of AI terminal
U4-19	Input Level (Keypad Pot)	Display the input level of keypad pot
U4-23	UP/DOWN Set Freqaancy	Display the UP/DOWN frequency adjustment (Hz)
U4-25	Torque Command from Communication	Display the torque command set by communication (%)
U4-26	Torque Compensation from Communication	Display the torque compensation set by communication (%)
U5-01	PID Setpoint	Display the PID setpoint (%)
U5-02	PID Feedback	Display the feedback of PID control (%)
U5-03	PID Differential Feedback	Display the PID differential feedback (%)
U5-04	PID Adjusted Feedback	Display the PID adjusted feedback. If differential feedback isn't used, the value will be same with U5-02 (%)
U5-05	PID Input	Display the PID input (%)
U5-06	PID Output	Display the PID output (%)
U5-07	PID Output 2	Display the PID output 2 (%)
U5-08	PID Cumulative Integral Value	Display the PID cumulative integral value (%)
U6-01	Motor q-Axis Current	Displays the output value for current control relative to motor secondary current (%)
U6-02	Motor d-Axis Current	Displays the output value for current control relative to motor exciting current (%)
U6-03	Output Voltage Command (Vq)	Output voltage command for the q-Axis (Vac)
U6-04	Output Voltage Command (Vd)	Output voltage command for the d-Axis (Vac)
U6-05	Offset Frequency	Display the offset frequency
U7-01	Sequence Control: Cycle	Display the current number of sequence control cycle
U7-02	Sequence Control: Step	Display the current section of sequence control
U7-03	Digital Input Counter Value	Display the value of digital input counter
U7-04	Analog Input Current Limit	Display the current limit from analog input (A)
U7-05	Fault Restart Count	Display the count value of the Fault restart
U8-00	Software Version	Display the version of software
U8-01	Software CRC Code	Display the CRC code of software

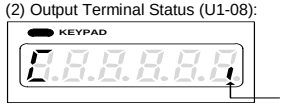
Func.	Name	Description
U8-02	Parameter List CRC Code	Display the CRC code of prarmeter list
U8-03	Parameter CRC Code	Display the CRC code of prarmeter
U8-04	Drive HP	Display the horse power of the drive (Hp)
U8-05	Drive Rated Current	Display the rated current of drive. (A)

Note:

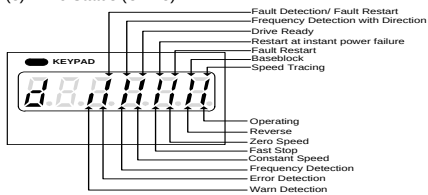
(1) Input Terminal Status (U1-07):



(2) Output Terminal Status (U1-08):



(3) Drive Status (U1-13):



Error Trip Messages of Drive

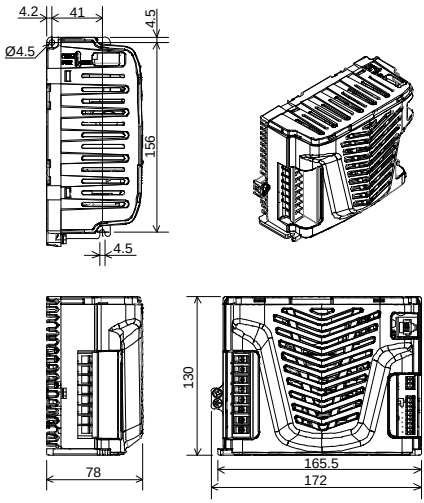
Display	Description	Display	Description
	EEPROM Error		Keypad connection interrupted
	EEPROM Error 0		Drive overheat
	A/D converter error		Analog input protection 1
	Fuse open		Analog input protection 2
	Under voltage during operation		Input phase loss
	Drive over current		Output phase loss
	Grounding fault		Over voltage
	PID feedback signal error		Operation command fault
	Start command lock 2 (Power ON/OFF)		Start command lock 3 (Local/Remote)
	External fault		External fault 1
	Drive overload		Motor Overload
	Motor over torque 1		Current limit
	Motor over torque 2		System overload
	Motor under torque 1		Motor under torque 2
	Speed deviation		Over speed

Warning Messages of Drive

Display	Description	Display	Description
	Power source under voltage		Keypad cable trip (before connecting)
	Drive output interruption		Keypad cable trip (connected)
	Coast to stop		Analog input warn 1
	Over voltage at stop		Analog input warn 2
	Parameter locked		Parameter Password Unlock
	Communication overtime		Direction command error
	Drive overheat		External overheat

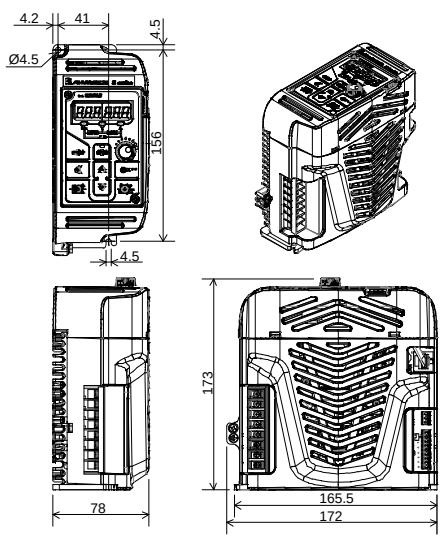
■ **Outline Dimension**

(1)Outline Dimension of Drive (Exclude KP and KP Accessory)



Unit:mm

(2) Outline Dimension (Include KP and KP Accessory)



Unit:mm