GREEN TECH

www.rhymebus.com.tw **GREEN LIFE**

White-tailed Robin

Cinclidium Leucura Montiun Design
White-tailed Robin usually perches on bushes along or may gather together in a richly fertile and totally clean place- As Rhymebus drive carries the responsibility to increase the energy use efficiency and save the energy to green the environment for our life and future.

RM6E1 Variable Frequency Drive

Green Tech · Green Life
RHYMEBUS

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GREEN TECH, GREEN LIFE

FEATURES

- With the temperature management and fan control functions to increase the lifetime of cooling fan and saving the energy.
  a. User can monitor the temperature of drive and setting the pre-alarm level to forecast the maintenance cycle of cooling fan.
  b. Fan will be standby under idle speed, light-duty load or low surrounding temperature conditions.
- Special function key(SPEC):
  Programmable function key for forward/reverse running, jog speed, selection of primary/secondary frequency command…etc.
- Allow RS-485 communication interface control (Modbus RTU communication protocol).
- 6 sets of fault records:
  Record 4 types of information under fault condition,respectively. (fault code, ouput current, DC bus voltage, output frequency)
- Built-in dynamic braking unit(DBU); braking level and control function are adjustable.
- Running hours and service time of drive can be saved and displayed.
- Group design for the functions facilitate the function setting and management.
- Sequential operation control and PID control function.
- Provide 8 kinds of status monitor display(last three displays can be set to monitor 12 different kinds of status)
- Provide PTC sensor setting functions for preventing the motor from overheating.
- Energy-saving selection for light-duty load.
- Auto-torque boost function.
- Provide 16 preset speeds control.
- The filter of analog input signal can be adjusted.
- The response time of digital input signal is adjustable(adjustable dead band detection).
- Independent adjustment selection of V, F for analog input signal.
- Two sets of analog input signals can do addition, subtraction and gain control.
- Programmable input and output terminals and two modes selection (SINK/SOURCE) for input signal.
- User can connect KP-601 keypad(option) for remote control, parameters duplication and saving.
- The switching frequency can be adjusted between 800Hz ~ 16kHz.

THE DESCRIPTION OF NOMENCLATURE

ISO 9001 IP20

TYPE	RM6E1-2002B3	→ Model Number
INPUT	3PH AC200~240V 12.5A 50/60Hz	→ Input Power Specs
OUTPUT	3PH AC200~240V 8A 0.1~400Hz	→ Output Current & Capacity
PGM NO.	9748-1	→ Software Number
SERIAL NO.	XXXXXXXXXXX	→ Product Serial Number

Rhymebus Corporation, Taiwan

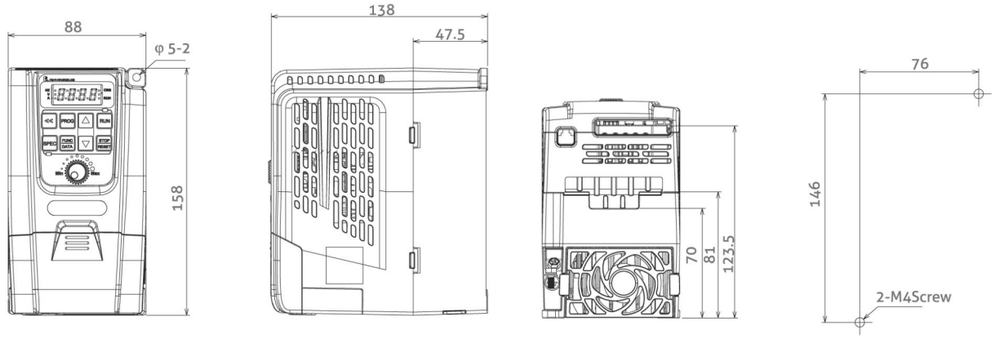
RM6E1 2 001 B 1

- 1 → Input Power Phase
  1:Single-Phase
  3:Three-Phase
- B → Brake Type
  B:with Braking Transistor
- 001 → Horse Power Code(see HP Table)
- 2 → Input Voltage
  1:AC100v~120V
  2:AC200V~240V
  4:AC380V~480V
- RM6E1 → Product Series

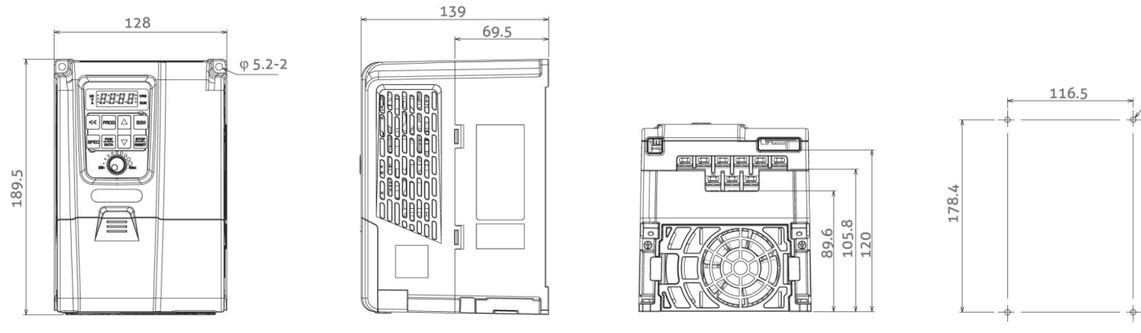
Horse Power Code	Horse Power
0P2	0.25 (200W)
0P5	0.5
001	1
1P5	1.5
002	2
003	3
004	4
005	5
007	7.5

Overall Dimensions of Drive

A. Model Number：RM6E1-10P2B1 ~ RM6E1-1001B1; RM6E1-20P2B1 ~ RM6E1-2002B1;
RM6E1-20P2B3 ~ RM6E1-2003B3; RM6E1-40P5B3 ~ RM6E1-4003B3



B. Model Number：RM6E1-1002B1 ~ RM6E1-1003B1; RM6E1-2003B1;
RM6E1-2004B3 ~ RM6E1-2005B3;RM6E1-4005B3 ~ RM6E1-4007B3



SPECIFICATIONS

01

1 ϕ 100V Series

Model Name. (RM6E1-□□□□B1)	10P2	10P5	1001	1002	1003
Maximum Applicable Motor (HP/kW)	0.25 / 0.2	0.5 / 0.4	1 / 0.75	2 / 1.5	3/2.2
Rated Output Capability (kVA)	0.6	1.0	1.6	2.9	3.8
Rated Output Current (A)	1.5	2.5	4.2	7.5	10
Rated Output Voltage (V)	3 φ 200~240V				
Range Of Output Frequency (Hz)	0.1~400.0Hz				
Power Source (ϕ , V, Hz)	1 φ , 100~120V, 50 / 60Hz				
Input Current(A)	6	9.1	15.3	30	40
Permissible AC Power Source Fluctuation	88V~132V				
Overload Protection	150% of drive rated output current for 1 min				
Cooling Method	Nature cooling		Fan cooling		
Applicable Safety Standards	-	UL 508C		-	
Protective Structure	IP20	IP20, UL open type		IP20	
Weight / Mass(kg)	1.1	1.1	1.2	-	-

※Single-Phase 100V Series 2HP, 3HP models are under certification.

02

1 ϕ 200V Series

Model Name. (RM6E1-□□□□B1)	20P2	20P5	2001	21P5	2002	2003
Maximum Applicable Motor (HP/kW)	0.25 / 0.2	0.5 / 0.4	1 / 0.75	1.5 / 1.1	2/1.5	3/2.2
Rated Output Capability (kVA)	0.6	1.1	1.9	2.3	2.9	3.8
Rated Output Current (A)	1.5	3	5	6	7.5	10
Rated Output Voltage (V)	3 φ 200~240V					
Range Of Output Frequency (Hz)	0.1~400.0Hz					
Power Source (ϕ , V, Hz)	1 φ , 200~240V, 50 / 60Hz					
Input Current(A)	3	5.8	9.1	10.9	13.7	20
Permissible AC Power Source Fluctuation	176V~264V					
Overload Protection	150% of drive rated output current for 1 min					
Cooling Method	Nature cooling		Fan cooling			
Applicable Safety Standards	-	UL 508C				-
Protective Structure	IP20	IP20, UL open type				IP20
Weight / Mass(kg)	1.1	1.1	1.2	1.2	1.2	2.5

03

3 ϕ 200V Series

Model Name. (RM6E1-□□□□B3)	20P2	20P5	2001	21P5	2002	2003	2004	2005
Maximum Applicable Motor (HP/kW)	0.25 / 0.2	0.5 / 0.4	1 / 0.75	1.5 / 1.1	2/1.5	3/2.2	4/3	5/3.7
Rated Output Capability (kVA)	0.6	1.1	1.6	2.3	3	3.8	5	6.5
Rated Output Current (A)	1.5	3	4.2	6	8	10	13	17
Rated Output Voltage (V)	3 φ 200~240V							
Range Of Output Frequency (Hz)	0.1~400.0Hz							
Power Source (ϕ , V, Hz)	3 φ , 200~240V, 50 / 60Hz							
Input Current(A)	1.7	3.2	4.4	6.3	8.4	11.5	15	19
Permissible AC Power Source Fluctuation	176V~264V							
Overload Protection	150% of drive rated output current for 1 min							
Cooling Method	Nature cooling			Fan cooling				
Applicable Safety Standards	-	UL 508C				-		
Protective Structure	IP20	IP20, UL open type				IP20		
Weight / Mass(kg)	1.1	1.1	1.1	1.1	1.2	1.2	2.5	2.5

04

3 ϕ 400V Series

Model Name. (RM6E1-□□□□B3)	40P5	4001	4002	4003	4005	4007
Maximum Applicable Motor (HP/kW)	0.5 / 0.4	1 / 0.75	2 / 1.5	3 / 2.2	5/3.7	7.5/5.5
Rated Output Capability (kVA)	1.1	1.9	3	4.2	6.9	11
Rated Output Current (A)	1.5	2.5	4	5.5	9	14
Rated Output Voltage (V)	3 φ 380~480V					
Range Of Output Frequency (Hz)	0.1~400.0Hz					
Power Source (ϕ , V, Hz)	3 φ , 380~480V, 50 / 60Hz					
Input Current(A)	1.7	2.8	4.4	6.1	10.3	16
Permissible AC Power Source Fluctuation	332V~528V					
Overload Protection	150% of drive rated output current for 1 min					
Cooling Method	Nature cooling		Fan cooling			
Applicable Safety Standards	-	UL 508C			-	
Protective Structure	IP20	IP20, UL open type			IP20	
Weight / Mass(kg)	1.1	1.1	1.2	1.2	2.5	2.5

GENERAL SPECIFICATIONS

01 Control and operational characteristics

Control Characteristics

Control method	•Voltage vector sinusoidal PWM control(V/F control); •Switching frequency: 800Hz~16kHz
Range of frequency setting	0.1-400.0Hz
Resolution of frequency setting	Keypad:0.01Hz(0.01~99.99Hz/100.0~400.0Hz) Analog input：0.06Hz/60Hz
Resolution of output frequency	0.01Hz
Overload protection	150% of drive rated output current for 1 minute
DC braking	•Start/stop braking time: 0~60.0sec •Stop braking frequency: 0.1~60Hz •Braking ability: 0~150% of rated current
Braking torque	Approximately 20%(with the external braking resistor connected, braking torque is approximately 100%)
V/F pattern	•V/F pattern (2 V/F points) •Square curve, 1.7th power curve, 1.5th power curve. •Output voltage adjustment of V/F pattern(Variable voltage (V) adjustment of V/F pattern for acceleration / deceleration).
Acceleration/ deceleration time	•Coast to stop, 0.0~3200.0sec(Independent setting of the acceleration / deceleration). •The time setting range of the speed acceleration from 0 to 60Hz is 0.015sec ~ 19200000sec(222 days).
Stall prevention	Stall prevention at acceleration / constant speed(the current level of stall prevention is 30~200%), Stall prevention at deceleration
Other functions	Slip compensation, auto-torque compensation, auto-adjustment for output voltage stability, auto-operation for energy-saving, auto-adjustment of switching frequency, restart after instantaneous power failure, speed tracing, over-torque detection, DC braking, dynamic braking duty control, sequential operation control, counter function, PID control, Modbus communication, jump frequency, holding frequency, upper/lower limits of output frequency, 16 preset-speeds, acceleration/deceleration switch, S-curve acceleration/deceleration, fan control, parameters duplication, overload detection

Operational Characteristics

Frequency setting signal	Keypad (include KP-601 controller)：▲ ▼ Analog signal: (DC 0-10V/2-10V)/0~100% or (DC 0-20mA/4-20mA)/0~100% Digital signal: Jog speed, 16-speed control can be selected RS-485 Modbus communication
Operation setting signal	Keypad (include KP-601 controller)：RUN / STOP Digital signal: FWD/REV control, 3-wire start/stop control RS-485 Modbus communication
Multi-function inputs	4 programmable input terminals: X1-X4 Response time (1~255, Unit: 1ms) Refer to the chapter of function setting description for F5.19~F5.22.
Analog input	1set analog input terminal: AI(DC 0-10V/2-10V or DC 0-20mA/4-20mA) Analog filter (0~255, Unit: 5ms), the dead band of analog frequency, gain and bias are adjustable. Refer to the chapter of function setting description for F5.01, F5.02.
Multi-function outputs	1set programmable output terminal：Ta/Tc Refer to chapter of function setting description for F5.26.
Analog output	1set analog output terminal：FM(DC 0-10V/2-10V or DC 0-20mA/4-20mA) Variable gain and bias Refer to the chapter of function setting description for F5.12~F5.15.

02 Display, protections, environment

Protections

Error trip messages of drive	Under voltage during operation(LE1), Drive over current(OC), Grounding fault(GF), Over voltage(OE), Drive overheat(OH), Motor overload(OL), System overload(OLO), Keypad interruption during copy(PAdF), IGBT module error(Fot)*Note 1, Drive overload(OL1), Drive current limit(OL2), Braking transistor overload(OL3), Motor overheat(OH2), PID feedback signal error(noFb), External fault(EF), Internal memory error(EEr1, EEr2), EEPROM error(EEr), A/D converter error(AdEr)
Warning messages of drive	Power source under voltage(LE), Drive output interruption(bb), Coast to stop(Fr), Braking transistor is active (db), Keypad cable trip before connecting(Err_00), Keypad cable trip during operation(Err_01), System overload(OLO), Power source under voltage(Hv),, Drive overheat(OHt), Motor overheat(OH1), FWD/REV command input simultaneously(dtF)、Different software version inter-copy(wrF)、Modbus communication overtime(Cot)

Display

Build-in operation panel	4-digit 7-segment display unit, 8 status indicators, 8 buttons, 1 analog knob. 8 monitor modes: output frequency, frequency command, output voltage, DC voltage, output current, and three programmable monitor modes (see function F1.09~F1.11).
External keypad	Keypad KP-601 is available for external connection to the drive *Note 2

Environment

Atmosphere	Non-corrosive or non-conductive, or non-explosive gas or liquid, and non-dusty
Surrounding temperature	-10°C (14°F) ~ +50°C (122°F) (Non-freezing and non-condensing)
Storage temperature	-20°C (-4°F) ~ +60°C (149°F)
Relative humidity	90% RH or less (No-condensing atmosphere)
Vibration	Less than 5.9m/sec² (0.6G)
Altitude	Less than 1000m (3280 ft.)

Note1: Only 3HP below(100V/200V series) have IGBT module error protection (Fot). Note2: KP-601 is an optional accessory.

TERMINALS DEFINITION

01 Terminal of main circuit

	Type	Symbol	Function	Descriptions
Main Circuit	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 output to motor terminals	The terminals output three phase variable frequency and voltage to motor.
	Power and braking	P⊕,N⊖	Dynamic braking unit connecting terminals	The terminals between P⊕ and N⊖ connect dynamic braking unit(option).
		P⊕,PR	External braking resistor connecting terminals	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.

02 Terminal of control circuit

	Type	Symbol	Function	Descriptions
Control Circuit	Input terminals	X1(note1)	Multi-function input terminal 1	Short the terminal of X1 with COM and set the function F5.19. (default: forward command).
		X2(note1)	Multi-function input terminal 2	Short the terminal of X2 with COM and set the function F5.20. (default: reverse command).
		X3(note1)	Multi-function input terminal 3	Short the terminal of X3 with COM and set the function F5.21. (default: jog command).
		X4(note1)	Multi-function input terminal 4	Short the terminal of X4 with COM and set the function F5.22. (default: reset command).
		COM	Input/output common terminal	The common terminal of input control signal.
		AI(note2)	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)
	Control power	V+(note3)	Power terminal for analog input control	12V position: Maximum supplied current is 20mA. 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).
	Output terminals	FM(note4)	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	The function is set by F5.26 (default: fault detection). Relay type terminal (capacity: AC250V, 0.2AMax, cosθ=0.3).
		Tc		Common terminal for Ta.

Note 1:SINK/SOURCE selection is set by JP2 (default: SINK) Note 2: V/I selection is set by JP1 (default: V);
Note 3: 12V/24V selection is set by JP4 (default: 12V) Note 4: FMV/FMI selection is set by JP 3 (default: FMV).

03 Communication connector (RJ-45)

Type	Terminal Location	Function	Descriptions
Modbus(RS-485) /KP-601 communication	1	Communication transmission terminal (DX+)	Differential input of RS-485 *Note 1 Modbus (RS-485) communication only uses pin1, 2.
	2	Communication transmission terminal (DX-)	
	3	Power terminal of KP-601(+16V)	Only for KP-601 linking.
	4	Auto-detect terminal of KP-601	Only for KP-601 linking.
	5 6	Reserved	Reserved
	7 8	Common terminal of KP-601 power(0V)	Only for KP-601 linking.

Note 1： The terminal resistor (100Ω) selection is set by DSW1 (default setting: ON)