TOPTEK

TOPTEK ELECTRONICS CORPORATION

TOPVERT E1 series

QUICK START

High performance general purpose compact drive
Sensorless Vector Controlled AC drive

ISO 9001:2008 CE

Thank you for choosing TOPTEK'S TOPVERT E1 Series Drive. TOPVERT E1 Series are Sensorless current vector control high-performance drive. They were manufactured by adopting high-quality components, material and incorporating the latest microprocessor technology available.

Copyright statement

Getting Started

This manual will be helpful in the installation, parameter setting, troubleshooting, and daily maintenance of the drives. To guarantee safe operation of the equipment, read the following safety guidelines before connecting power to the Drives. Keep this operating manual handy and distribute to all users for reference.

WARNING

Always read this manual thoroughly before using TOPVERT E1 Series Drives.

DANGER! AC input power must be disconnected before any maintenance.
Do not connect or disconnect wires and connectors while power is applied to the circuit. Maintenance must be performed by qualified technicians.

CAUTION! There are highly sensitive MOS components on the printed circuit boards. These components are especially sensitive to static electricity.
To avoid damage to these components, do not touch these components or the circuit boards with metal objects or your bare hands.

DANGER! A charge may still remain in the DC-link capacitor with voltages even if the power has been turned off.
To avoid personal injury, please ensure that power has turned off before operating Drive and wait ten minutes for capacitors to discharge to safe voltage levels.

CAUTION! Ground the TOPVERT E1 using the ground terminal.
The grounding method must comply with the laws of the country where the Drive is to be installed. Refer to Basic Wiring Diagram.

DANGER! The Drive may be destroyed beyond repair if incorrect cables are connected to the input/output terminals. Never connect the Drive output terminals U/T1, V/T2, and W/T3 directly to the AC main circuit power supply.

CAUTION! The final enclosures of the Drive must comply with EN50178. (Live parts shall be arranged in enclosures or located behind barriers that meet at least the requirements of the Protective Type IP20.
The top surface of the enclosures or barrier that is easily accessible shall meet at least the requirements of the Protective Type IP40).
(TOPVERT E1 Series corresponds with this regulation.)

CAUTION! Heat sink may heat up over 70℃ (158℉), during the operation. Do not touch the heat sink.

CAUTION! The rated voltage for the drive must be ≤ 240V (≤ 480V for 460V models, ≤ 600V For 575V models) and the mains supply current capacity must be ≤ 5000A RMS (≤10000A RMS for the ≥ 40hp (30kW) models).

CAUTION! The leakage current between chassis and earth could be up to 22mA.

CAUTION! The load motor should meet IEC:60034-1 standard.

STANDARD SPECIFICATIONS

TOPVERT E1 series			High performance general purpose compact drive
Control Characteristics	Output frequency range		0.1 - 600Hz, Programmable
	Overload endurance		150% of rated current for 1 minute/10 minutes, Ta <=40, 200% of rated current for 3 seconds
	Maximum output voltage		Proportional to Input Voltage, 3-Phase output
	Power factor/Efficiency		Power factor no lower than 0.95,Efficiency no lower than 95% at full load
	Control system		SPWM (Sinusoidal Pulse Width Modulation) vector control, 2 control modes :V/F, SVC
	Speed control range		V/F mode 20:1; SVC mode 120:1
	Output frequency resolution		Analog input: 10 Bit(1/1024), Digital input: 0.01Hz, Fly-Shuttle dial input: 0.01Hz
	Output frequency accuracy		Analog input: Within ±0.2% of max. output frequency (25℃ ±10℃). Digital input: Within 0.01% of set output frequency
	PWM carrier Frequency		0.7 -18kHz, Adjustable (Some models are limited)
	Torque characteristics		auto-torque boost, auto-slip compensation; starting torque can be 150% at 1.0Hz
	Skip frequency		Setting range 0.00 -600Hz, Max. 6 points, skip width are adjustable
	Accel/Decel time		0.1-60000 seconds (2 Independent settings for Accel/Decel Time)
	Stall prevention		0 to 250% of Rated Current, independent adjustable both in acceleration and constant speed operation.
	DC Braking		DC Braking both when start up and stop , Braking Current Level: 0 to 125% of rated output current. Braking time: 0 to 60 seconds. Braking Start-Point when stop: 0.1-600Hz
	Dynamic braking		Braking torque Approx. 20%(10%E.D.). Dynamic Brake chopper built-in in
	V/F Pattern		2 of adjustable Random V/F curve. Constant Torque curve & Reduced Torque curve are available.
OPERATING Characteristics	Frequency Setting	Keypad	By an Encoder style Fly-Shuttle dial. (setting resolution 0.01Hz/0.1Hz/1Hz/10Hz adjustable)
		External Signal	0 ~ +10VDC((Input impedance 20kΩ),4 ~20mA DC ((Input impedance 250Ω), Multi-Function Inputs 1 ~ 4 (15 Steps Jog, up/down), PLC run, RS-485 port MODBUS protocol
	Operation Setting	Keypad	Set by RUN, STOP and JOG. Switch-able between Keypad and External signal
		External Signal	2 wire control(FWD/STOP、REV/STOP、RUN/STOP、FWD/REV), 3 wire control, FWD, REV, MI1 to MI6 can be combined to offer various modes of operation, RS-485 serial interface MODBUS protocol
	Multi-Function Digital Input (DI) (6 terminals)		Multi-step selection 0 to 15, first to second accel/decel switches, accel/decel inhibit, Input the counter, Pause Stop, EF Input, Emergency Stop, auxiliary motor control is invalid, ACI/AVI speed command selection,, Reset, PLC Run, Jog, Up/Down command, Sink/Source selection, Parameter team selection…etc, up to 43 functions.
	Multi-Function Output Indication (DO) (4 indications, 2 of them are optional)		Include a form C relay contact, a form A relay contact and 2 Open collector output. They can be programmed to below indications: Drive Operating, Frequency Attained, zero speed, Base Block, Over torque, Fault Indication, Local/Remote indication, PLC Operation indication, and Auxiliary Motor Output, Drive ready for use, IGBT over-heat indication …etc, up to 63 functions.
	Multi-Function Analog Input (AI)		AVI: 0 ~ +10VDC((Input impedance 20kΩ), ACI: 4 ~20mA DC ((Input impedance 250Ω). 2 different Input terminals can be programmed to 15 functions
	Multi-Function Analog Output (AO)		Include AVO, They can be programmed to Proportional to output frequency, output current, voltage, frequency command or motor's speed …etc, up to 15 functions.
	Fault Indication		The output will be activated when faults occur (User may get 1 or up to 4 indications from below terminals: Relay contact point RA, RB, RC. or 2 Open-collector
	Communication function		RS-485 serial port, MODBUS protocol, ASCII & RTU. (Baud rate up to 125 k bps) (Optional)
Other Functions			PID feedback control, Flying start, Automatic voltage regulation (AVR), 2 accel./decel time selection , Auto-optimum accel./decel. Time, S-curves, External fault interlock, External fault reset, Auto Restart after fault, 16 Fault records, Automatic energy–saving, Upper/Lower limit, Programmable pulse output, Password protection, Pump and Fan process control, Sleep/Wakeup function , Auto-Tuning, By-Pass, Y-Delta control,. Bi-Directional Speed search, Reverse inhibit, Automatic torque boost & slip compensation, 16-step PLC run, 16 step preset speed, Coast or ramp to stop, Random V/F curve, Mechanical brake release control, IGBT/ Heatsink temperature display & Pre-warning, Quiet operation mode (No noise), User define Multi-function display, Over torque detection, Over current/voltage t stall prevention, Sink/Source (NPN/PNP) mode, Electronic Thermal Relay, Internal Counter, DC injection brake both in start and stop, Dynamic brake, Controlled cooling Fan, Removable keypad operator, Programmable Multi-Function DI,DO,AI,AO and Ry terminals.
Intelligent Protection Functions			Self-testing, AC source Over Voltage, Phase loss, Over Voltage, Over Current, Under Voltage, Over Torque, External Fault, Motor over-load, IGBT Over-temperature, Heat-sink Over-temperature, Electronic thermal, Ground Fault, Output short circuit, Stall Prevention, Fuse protection, IGBT short circuit , Drive Over Load , DC bus capacitor life monitoring, Auto carrier frequency adjust according temperature, 16 Trip records, Run information of latest Fault such like DC-BUS voltage, Output voltage/Frequency/Current, Command frequency, IGBT temperature, Heat-sink temperature….etc.
Digital Keypad (PU-02 Digital Keypad with copy function and PU-03 Digital Keypad with LCD display are available as an option)			**Eight Function keys:** Access Run, Stop, Reset/ Digit Shift, Forward/ Reverse run, Display mode, Keypad Enable, Programming data and Jog operation…etc. **One Encoder style Fly-Shuttle dial:** Sets the parameter number and changes the numerical data **One 6 digits 7 segment display:** Display the Setting frequency/actual operation frequency, Output current/Voltage, motor speed, Fault trip User defined unit(up to 88 type)…etc. **Six LED Display for status indication:** Display the Drive run/stop status, Forward/Reverse run status, Keypad enable, and Frequency command source. **One RJ-45 connector:** Removable Keypad, remote control distance up to 150 meters.
Environment	Certificate		Complies with CE (EN61800-3) standard
	Temperature		Ambient: -10℃ ~ +40℃/(-10℃ ~ + 50℃) (Non-Condensing and not frozen). Storage: -20℃ ~ +60℃
	Humidity		Below 98% R.H. (Non-Condensing)
	Vibration		Below 20Hz: 1G, above 20Hz: 0.6G
	Installation Location		Altitude 1,000 m or lower, keep away from corrosive gasses, liquid and dust

*TOPVERT all series are designed and manufactured base on CNS, IEC, CE and UL standard.

1-Phase, 100 ~ 120VAC, 50/60 Hz (Tolerance Range:90 ~ 132V,47 ~ 63Hz) Output Voltage :200~240VAC											
Model	Applicable Motor (230V 4 P)		Rated Output				Source	Enclosure Construction			
TOPVERT **E1-xxxxx**	Power (kW)	Horse Power (Hp)	Capacity (kVA)	Current (A)	Voltage (V)	Frequency (Hz)	Current (A)	Cooling Methods	Protection Methods (IP/NEMA)	Net Weight (kg)	Frame Code
110P2	0.2	0.25	0.6	1.5	3- Phase, 0-240 (Max)	0.1- 600	2.9	Fan-cooled	IP 20 NEMA 1		E1-A
110P4	0.4	0.5	1.2	3			5.7				
110P7	0.75	1	2	5			9.5				
111P5	1.5	2	3	7.5			14				

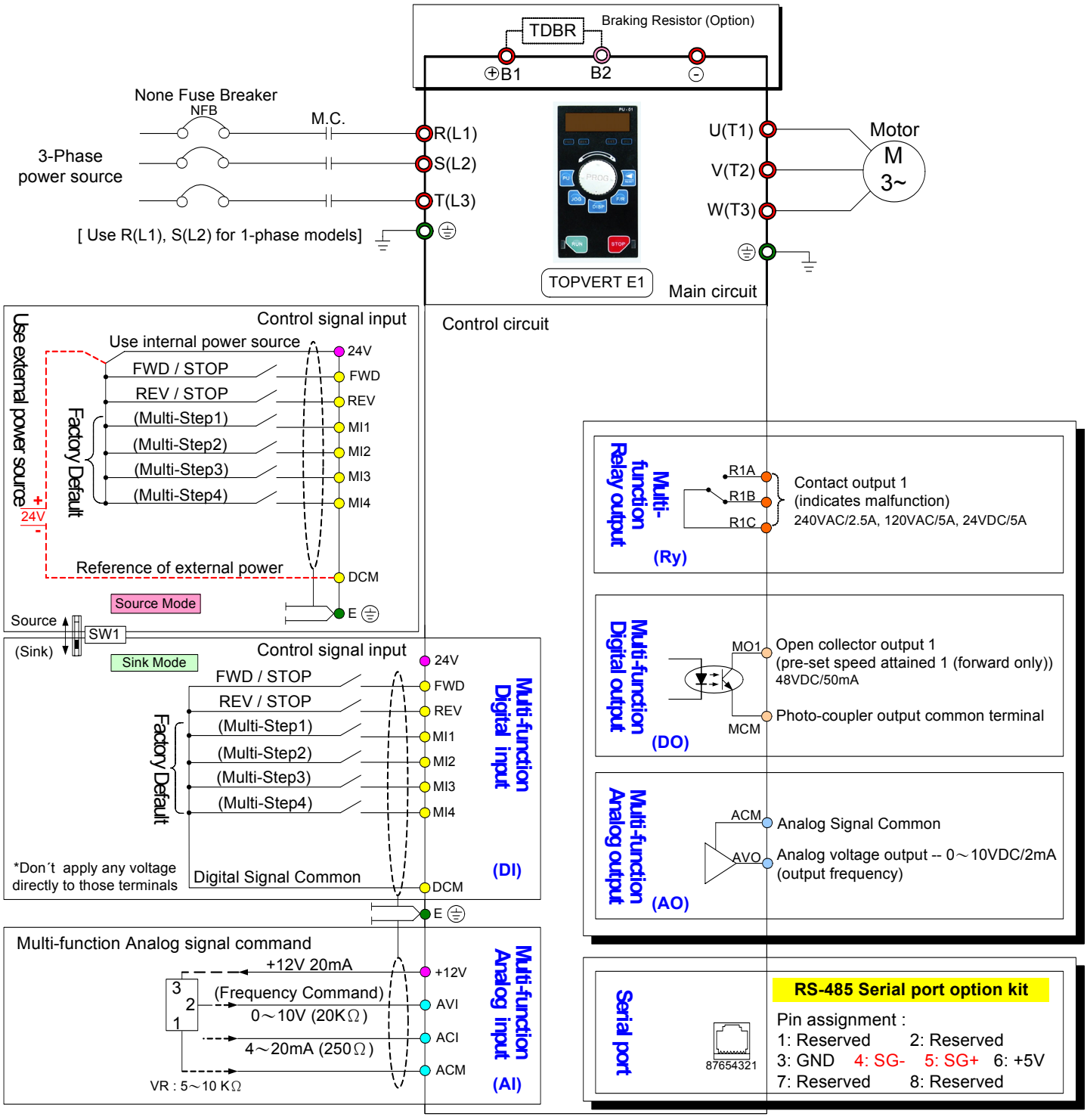
1-Phase, 200~240VAC, 50/60 Hz (Tolerance Range: 180~264V, 47~63Hz)											
Model	Applicable Motor (230V 4 P)		Rated Output				Source	Enclosure Construction			
TOPVERT **E1-xxxxx**	Power (kW)	Horse Power (Hp)	Capacity (kVA)	Current (A)	Voltage (V)	Frequency (Hz)	Current (A)	Cooling Methods	Protection Methods (IP/NEMA)	Net Weight (kg)	Frame Code
210P2*	0.2	0.25	0.6	1.5	3- Phase, 0-240 (Max)	0.1-600	2.9	Fan-cooled	IP 20 NEMA 1	1.5	E1-A
210P2A										1.24	E1-S
210P2B											
210P4*	0.4	0.5	1.2	3			5.7			1.51	E1-A
210P4A										1.24	E1-S
210P4B											
210P7*	0.75	1	2	5			9.5			1.56	E1-A
210P7A										1.28	E1-S
210P7B											
211P5*	1.5	2	3	7.5			14			1.62	E1-A
211P5A										1.32	E1-S
211P5B											
212P2	2.2	3	4.4	11			21			1.68	E1-A
212P2B											

3-Phase, 200~240VAC, 50/60 Hz (Tolerance Range: 180~264V, 47~63Hz)											
Model	Applicable Motor (230V 4 P)		Rated Output				Source	Enclosure Construction			
TOPVERT **E1-xxxxx**	Power (kW)	Horse Power (Hp)	Capacity (kVA)	Current (A)	Voltage (V)	Frequency (Hz)	Current (A)	Cooling Methods	Protection Methods (IP/NEMA)	Net Weight (kg)	Frame Code
230P4*	0.4	0.5	1.2	3	3- Phase, 0-240 (Max)	0.1-600	3.3	Fan-cooled	IP 20 NEMA 1	1.5	E1-A
230P4A										1.24	E1-S
230P4B											
230P7*	0.75	1	2	5			5.5			1.51	E1-A
230P7A										1.25	E1-S
230P7B											
231P5*	1.5	2	3	7.5			8.3			1.56	E1-A
231P5A										1.28	E1-S
231P5B											
232P2	2.2	3	4.4	11			12			1.62	E1-A
232P2B											
233P7	3.7	5	6.8	17			19			1.68	
233P7B											
235P5	5.5	7.5	10	25			28				E1-B
237P5	7.5	10	13	33			36				

3-Phase, 380~480VAC, 50/60 Hz (Tolerance Range: 323~528V, 47~63Hz)											
Model	Applicable Motor (460V 4 P)		Rated Output				Source	Enclosure Construction			
TOPVERT **E1-xxxxx**	Power (kW)	Horse Power (Hp)	Capacity (kVA)	Current (A)	Voltage (V)	Frequency (Hz)	Current (A)	Cooling Methods	Protection Methods (IP/NEMA)	Net Weight (kg)	Frame Code
430P4*	0.4	0.5	1.3	1.6	3- Phase, 0-460 (Max)	0.1-600	1.8	Fan-cooled	IP 20 NEMA 1	1.57	E1-A
430P4B											E1-S
430P7*	0.75	1	2.4	3			3.3			1.57	E1-A
430P7B											E1-S
431P5*	1.5	2	3.3	4.2			4.6			1.62	E1-A
431P5B											E1-S
432P2	2.2	3	4.8	6			6.6			1.64	E1-A
432P2B											
433P7	3.7	5	6.8	8.5			9.4			1.74	
433P7B											
435P5	5.5	7.5	10	13			14				E1-B
437P5	7.5	10	14	18			20				

Remark: * Not for new design

Basic Wiring Diagram



Remark: ◎ → Main circuit ○ → Control circuit → Shielded leads & Cable ( ) → Factory default □ → option

Main Circuit Terminal Explanations

Terminal Symbol	Content Explanation
R(L1),S(L2),T(L3)	AC line input terminals
U(T1),V(T2),W(T3)	Drive output terminals motor connections
⊕/B1, B2	Connections for Braking Resistor (optional) Refer to Chapter 9 (the selection chart)
⏚	Ground terminals, please have these terminals grounded following the third-type grounding of 230V series and the special grounding of 460V series within the electrician regulations

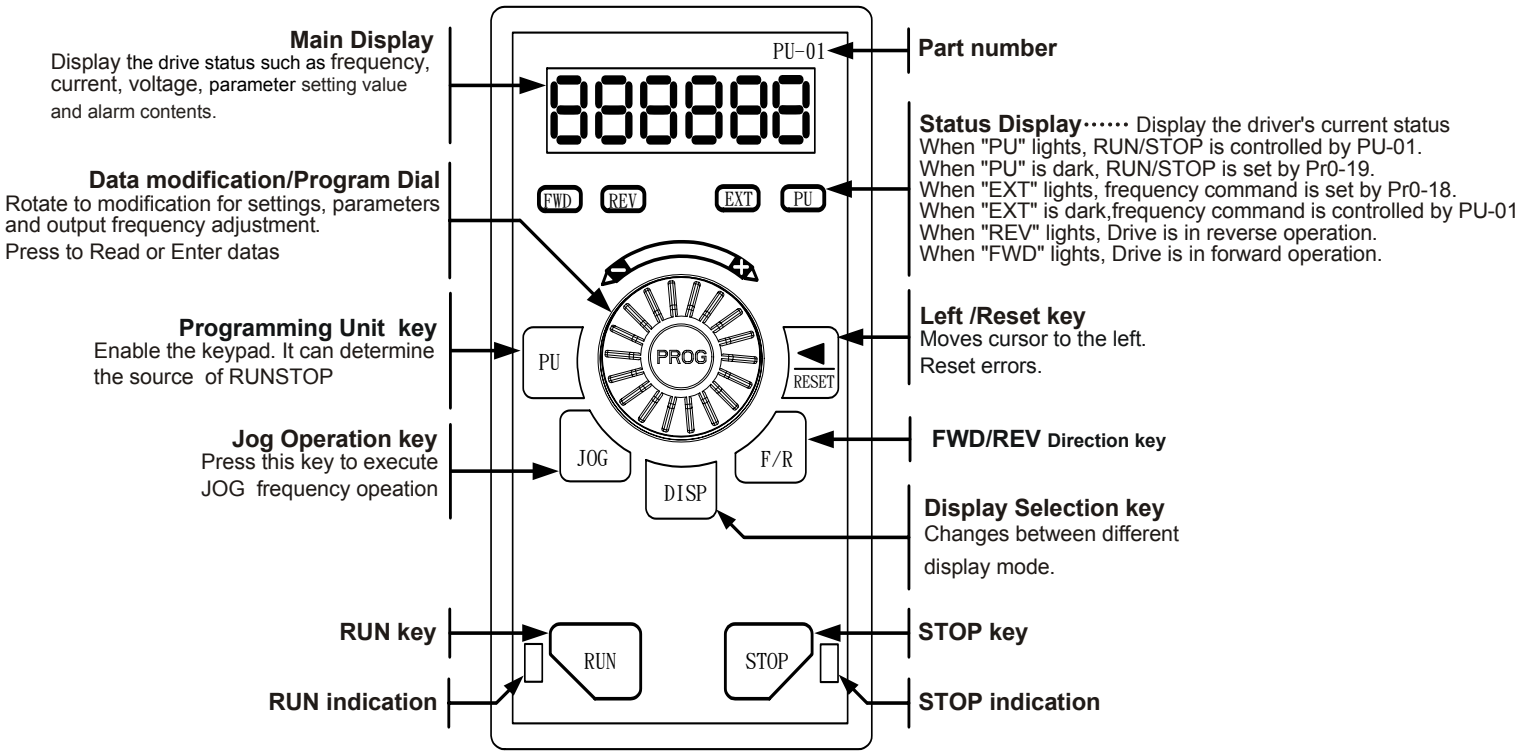
Control Terminal Explanations

Terminal Symbols	Explanation on the Terminal Function	Factory Default
MI1	Multi-function input selection 1 (3-wire STOP-designated terminal)	multi-step speed command 1
MI2	Multi-function input selection 2	multi-step speed command 2
MI3	Multi-function input selection 3	multi-step speed command 3
MI4	Multi-function input selection 4	multi-step speed command 4
AVO	Multi-function analog voltage output (0~10VDC, 2mA)	Output frequency
R1A	Multi-function relay 1 output contact (NO / a)	Resistive Load 5A(N.O.)/3A(N.C.) 240VAC 5A(N.O.)/3A(N.C.) 24VDC Inductive Load 1.5A(N.O.)/0.5A(N.C.) 240VAC 1.5A(N.O.)/0.5A(N.C.) 24VDC Refer to Pr.2-19, Pr.2-20
R1B	Multi-function relay 1 output contact (NC / b)	
R1C	Multi-function relay 1 output contact – the common end	
E	Shield terminal	
24V	Digital control source signal Reference point is DCM	+24V 50mA
FWD	FWD RUN-STOP command	
REV	REV RUN-STOP command	
DCM	Digital control signal - the common end	
+12V	Auxiliary reference power Reference point is ACM	+12V 20mA
ACM	Analog control signal - the common end	

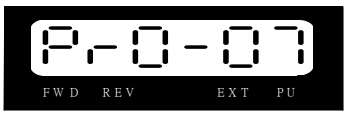
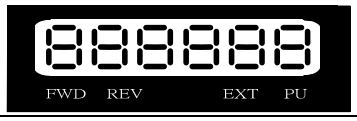
AVI	Multi-Function analog voltage command	The maximum operation frequency corresponding to 0~+10V
ACI	Multi-Function analog current command	The maximum operation frequency corresponding to 4~20mA
MO1	Multi-function output terminal 1 (photo coupler)	pre-set speed attained (Max 48VDC 50mA)
MCM	Multi-function output terminal (photo coupler) – the common end	

Control signal wiring size: 18 AWG (0.75 mm^2)
Analog control signal wire specification: 18 AWG (0.75 mm^2), covered with shield twisted net.

Description of the Digital Keypad

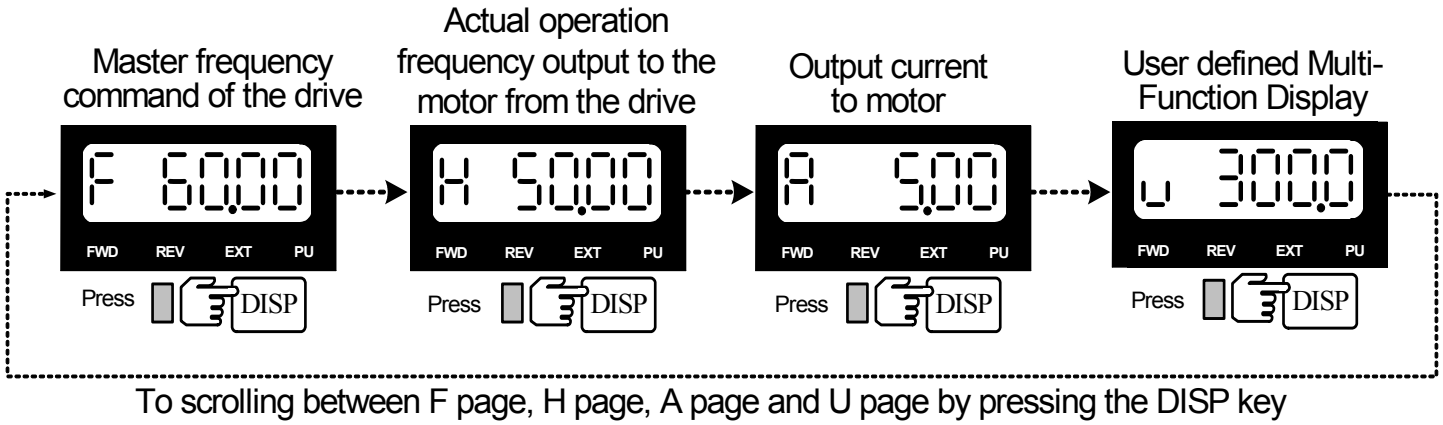


Explanations of Display Messages

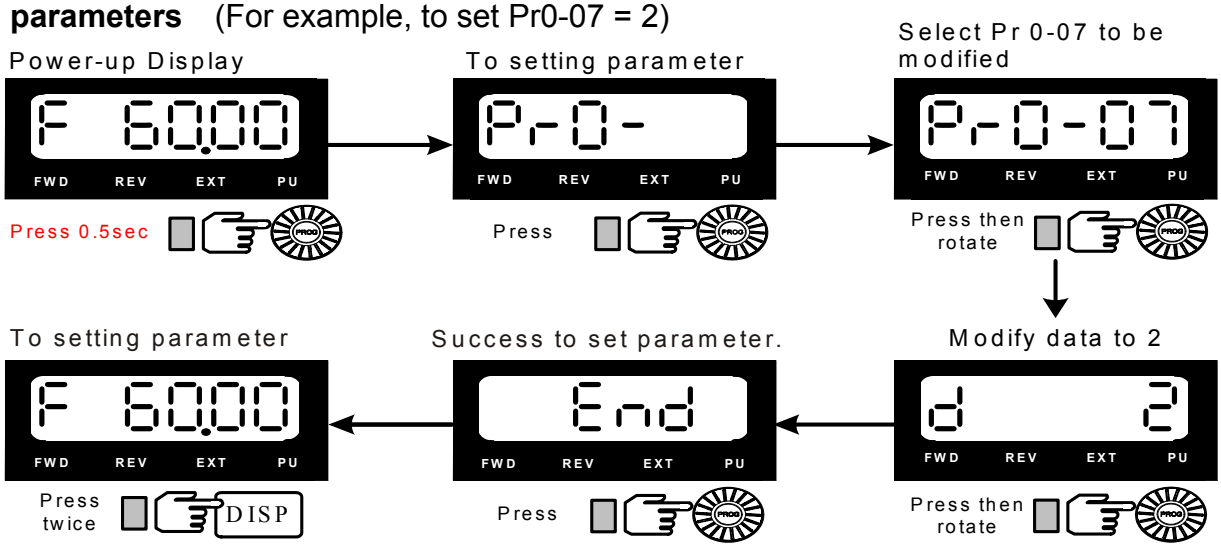
Messages Displayed	Descriptions
	Display master frequency command of the drive (Press the DISP key to read)
	Display actual operation frequency output to the motor from the drive (Press the DISP key to read)
	Display output current to motor (Press the DISP key to read)
	Display User-selected content on Pr0-07 (Press the DISP key to read)
	Display Read/Save selected content (For PU-02 only) (Press the DISP key to read)
	The specified parameter item (Rotate and press the dial to modification, read and Enter) (Press RESET to display those parameters which data are different from factory default)
	Value of the parameter content (Rotate the dial to modify for setting parameters)
	If the “End” message is displayed , for about 1 second, it is an indication that the data has been accepted and saved to the internal memory.

Operation Steps

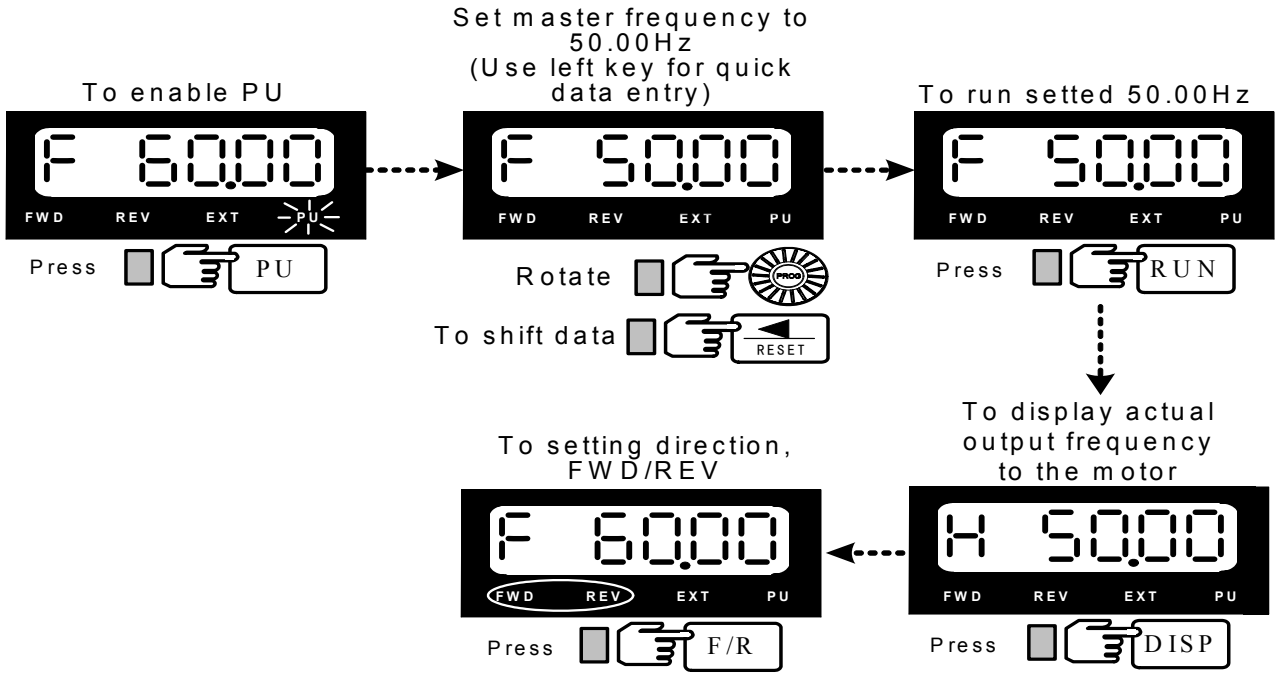
Selecting display mode



Setting parameters (For example, to set Pr0-07 = 2)

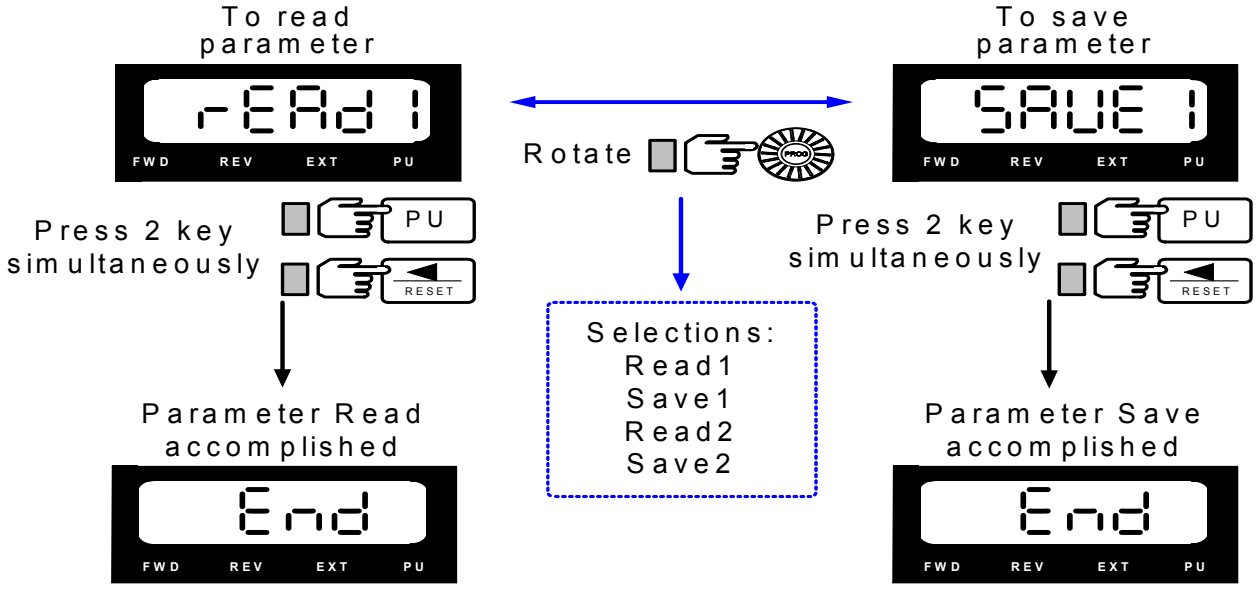


To run (For example, to run 50 Hz from PU)



Parameters READ/SAVE Operation (For PU-02 only)

(Parameter copy can execute between same drive model only)



FUNCTIONS and PARAMETER SUMMARY

★=This parameter cannot be set during operation.	◎: Available in Firmware Version 2.xx and after only.	⊙: Available in Firmware Version 3.xx and after only.
{ }Parameter no. in Firmware Version 1.xx	[ ] :optional	

Group 0: System parameters

	Parameters	Functions	Settings			Factory Setting	User
★	Pr0-00	Model display	Display according to the model number			Read Only	
★	Pr0-01	Rated output current to motor	Display according to the model number			Read Only	
★	Pr0-02	Parameter Reset (Motor V/F selecting)	10: Parameter reset for 60Hz - 230/460V motor application			8	
			9: Parameter reset for 50Hz - 220/380V motor application				
			8: Parameter reset for 60Hz - 220/380V motor application				
			7: Parameter reset for 50Hz - 230/460V motor application				
			6: Parameter reset for 60Hz - 240/415V motor application			◎	
			5: Parameter reset for 50Hz - 240/415V motor application			◎	
	Pr0-03	Password Input (The Key)	0～9999			0	
	Pr0-04	Password set (The Lock)	0～9999			0	
	Pr0-05	Parameter Locking Level	Bit0	0	All parameters are readable,	b00000	
				1	Parameters after Pr0-05 cannot read "Err" message will displayed when try to read.		
			Bit1	0	Enable Frequency Command.		
				1	Disable frequency command		
			Bit2	0	Enable run command from PU		
				1	Disable run command from PU		
	Pr0-06	Power on display selection	0: Frequency command value			0	
			1: Actual output frequency (Hz)				
			2: Output current				
			3: User defined contents on Pr0-07				
	Pr0-07	Versatile display	0: Motor speed (RPM)			0	
			1: DC-Bus Voltage (Vdc)				
			2: Actual output voltage (Vac)				
			3: Output voltage command value (Vac)				
			4: PID feedback frequency value (Hz)				
			5: Running step no. of MSS run				
			6: Sleep time (Pr8-07)				
			7: Auto-Restart after Fault (Pr6-10)				
			8: PID frequency command value (Hz)				
			9: (Factory Reserved)				
			10: Output power factor angle (°)				
			11: Counter value				
			12: Over-Torque detection time 1 (Pr5-17)				
			13: (Factory Reserved)				
			14: Dwell Time at Accel. (Pr6-14)				
			15: Dwell Time at Decel. (Pr6-16)				
			16: DC Braking time in Start-up (Pr6-01)				
			17: DC Braking Time during stop (Pr6-02)				

			18: Remain time of the executing MSS Run				
			19: (Factory Reserved)				
			20: (Factory Reserved)				
			21: Accumulated power-up Day (day)				
			22: Accumulated power-up time (hh:mm)				
			23: (Factory Reserved)				
			24: (Factory Reserved)				
			25: (Factory Reserved)				
			26: The signal of AVI analog input (Vdc)				
			27: The signal of ACI analog input (mAdc)				
			28: (Factory Reserved)				
			29: (Factory Reserved)				
			30～33: (Factory Reserved)				
			34: Over-Torque detection level 1 (Pr5-16)				
			35: Motor 1 Auto torque boost (Pr5-01)				
			36~37: (Factory Reserved)				
			38: Stall level while run in constant torque area (Pr5-12)				
			39～52: (Factory Reserved)				
			53: Output power (kW)				
			54: Output capacity (kVA)				
			55：(Factory Reserved)				
			56: The temperature of IGBT module--TH1 (°C)				
			57: The temperature of environment or fin (TH2) (°C)				
			58: (Factory Reserved)				
			59: (Factory Reserved)				
			60: Drive overload accumulated time (OL)				
			61~63：(Factory Reserved)				
			64: DC Bus voltage upon a fault (Vdc)				
			65: Output voltage upon a fault (Vac)				
			66: Output frequency upon a fault (Hz)				
			67: IGBT module temperature upon a fault (°C)			◎	
			68: Output current value upon a fault (Aac)				
			69：Temperature of Fin or environment upon a fault (°C)			◎	
			70~86：(Factory Reserved)				
			87: DC Bus ripple voltage (Vdc)			◎	
			88: (Factory Reserved)			◎	
	Pr0-08	User-Defined coefficient K	0～39 (no use)			0	
			40～60000 (the corresponding value for Pr1-00-- the max. frequency).				
	Pr0-09	The decimal places	0~3 (0=Without d.p., 1= 1 digit d.p.,) (2=2 digit d.p., 3=3 digit d.p.)			0	
	Pr0-10	Firmware version	Read-only			x.xx	
	Pr0-11	EPROM store set	Bit0	0	FWD/REV direction command will be store	b00000	
				1	FWD/REV direction command not store		
			Bit1	0	Frequency command from PU will be store		
				1	Frequency command from PU not store		
			Bit2	0	RS-485 frequency command will be store		
				1	RS-485 frequency command not store		
			Bit3	0	Up/Down frequency command will be store		
				1	Up/Down frequency command not store		

			Bit4	0	Changed parameter will be store		
				1	Changed parameter not store		
	Pr0-12	Auto Accelerate/ Decelerate	0: Linear Acc, linear Dec. 1: Auto Acc, linear Dec. 2: Linear Acc, auto Dec. 3: Auto Acc, auto Dec. 4: Linear Acc,/Dec., auto to prevent stall.			0	
★	Pr0-13	Accelerate/ Decelerate time unit	0: 0.01 Second 1: 0.1 Second 2: 1 Second			0	
	Pr0-14	PWM Carrier frequency upper bound	0=0.7kHz 1～18kHz			10	
	Pr0-15	PWM Carrier frequency lower bound	0=0.7kHz 1～18kHz			10	
	Pr0-16	Automatic Voltage Regulation (AVR)	0: Enable Automatic Voltage Regulation 1: Disable Automatic Voltage Regulation 2: Disable Automatic Voltage Regulation while in decele			0	
	Pr0-17	Automatic Energy-Saving Operation (AESO) and others	Bit0	0	Disable Automatic Energy-Saving Operate	b00000	
				1	Enable Automatic Energy-Saving Operate		
			Bit1	0	Allow output voltage over source voltage		
				1	Maximum output voltage equals to source voltage		
			Bit2	0	For constant torque load application.		
				1	For variable torque load application.		
			Bit3	0	Regen-torque no slip compensation		
				1	Regen-torque with slip compensation		
			Bit4	0	Low noise mode operation		
				1	Quiet mode operation		
	Pr0-18	Source of the frequency command	0: From PU 1: From RS485 communication port 2: From external analog signal 3: From external Up/Down terminals 4: (Factory Reserved)			0	
	Pr0-19	Source of the operation command	0: From RS485 communication port or PU 1: From external terminals or PU 2: From PU 3: From external terminals			0	
	Pr0-20	Stop/ Run/safety lockout	Bit0	0	Ramp to stop	b00000	
				1	Coast to stop		
			Bit1	0	Terminal command not run after reset		
				1	Terminal command restart after reset		
			Bit2	0	Line start Lockout is enabled		
				1	Line start Lockout is disabled		
			Bit3	0	FWD/REV go through zero point		
				1	FWD/REV go not through zero point		
			Bit4	0	Linear Accel/Decel at high speed zone		
				1	S-curve Accel/Decel at high speed zone		
	Pr0-21	Direction limit	0: Enable Forward/Reverse operation 1: Disable Reverse operation 2: Disabled Forward operation			0	
	Pr0-22	Waiting time to restart after stop	0.00~60.00sec			0.00	

	Pr0-23	Cooling fan control & PID direction	Bit0	0	Fan on while power on	b00000	
				1	Fan on while run command effect		
			Bit1	0	(Factory Reserved)		
				1			
			Bit2	0	(Factory Reserved)		
				1			
			Bit3	0	PID reverse operation allow		
				1	PID reverse operation not allow		
			Bit4	0	(Factory Reserved)		
				1			
	Pr0-24	Resolution of dial	0=0.01 Hz			1	
			1=0.10Hz				
			2=1.00Hz				
			3=10.00 Hz				
★ ◎	Pr0-25	Parameter select	0: Team A			0	
			1: Team B				
			2: Select Team A or Team B by MI3				

Group 1: Basic parameters

	Parameters	Functions	Settings		Factory Setting	User
★	Pr1-00	Maximum operation frequency	50.00～600.00Hz		60.00/50.00	
★	Pr1-01	1st Frequency 1 (Fbase 1) (Base frequency 1)	0.00～600.00 Hz		60.00/50.00	
	Pr1-02	1st Voltage 1 (Vbase 1) (Motor rated voltage 1)	230V models: 0.0～255.0V	460V models: 0.0～510.0V	230V:230.0 460V:460.0	
★	Pr1-03	2nd Frequency 1 (Fmid 1) (Middle frequency 1)	0.00～600.00 Hz		0.50	
	Pr1-04	2nd Voltage 1 (Vmid 1) (Middle voltage 1)	230V models: 0.0～255.0V	460V models: 0.0～510.0V	230V:5.0 460V:10.0	
★	Pr1-05	3rd Frequency 1 (Flow 1) (Low-point frequency 1)	0.00～600.00 Hz		0.50	
	Pr1-06	3rd Voltage 1 (Vlow 1) (Low-point voltage 1)	230V models: 0.0～255.0	460V models: 0.0～510.0V	230V:5.0 460V:10.0	
	Pr1-07	0Hz Voltage 1 (V0Hz 1) (Output voltage at 0Hz)	230V models: 0.0～25.5	460V models: 0.0～51.0V	0.0	
	Pr1-08	Start-up frequency	0.00～600.00 Hz		0.50	
	Pr1-09	Output frequency Upper limit	0.0～150.0% of Maximum operation frequency (Pr1-00)		110.0	
	Pr1-10	Output Frequency Lowerl limit	0.0～100.0% of Maximum operation frequency (Pr1-00)		0.0	
	Pr1-11	1st Acceleration time	0.00～60000 Sec		10.00/60.00	
	Pr1-12	1st Deceleration time	0.00～60000 Sec		10.00/60.00	
	Pr1-13	2nd Acceleration time	0.00～60000 Sec		10.00/60.00	
	Pr1-14	2nd Deceleration time	0.00～60000 Sec		10.00/60.00	
	Pr1-15	JOG Acceleration time	0.00～60000 Sec		10.00/60.00	
	Pr1-16	JOG Deceleration time	0.00～60000 Sec		10.00/60.00	
	Pr1-17	JOG frequency	0.00～600.00 Hz		6.00	
	Pr1-18	1st/2nd Acceleration/Deceleration Switching frequency	0.00～600.00 Hz		0.000	
	Pr1-19	S-Acc. departure time when accelerate	0.00～12000 Sec		0.00	
	Pr1-20	S-Acc. arrival time when accelerate	0.00～12000 Sec		0.00	
	Pr1-21	S-Dec. departure time when decelerate	0.00～12000 Sec		0.00	
	Pr1-22	S-Dec. arrival time when decelerate	0.00～12000 Sec		0.00	

	Pr1-23 {Pr1-29}	Offset voltage while decelerate	230V models: -50.0~50.0 V	460V models: -100.0~100.0 V	0.00	
★	Pr1-24 {Pr1-23}	Skip Frequency 1 upper limit	0.00~600.00Hz		0.00	
★	Pr1-25 {Pr1-24}	Skip Frequency 1 lower limit	0.00~600.00Hz		0.00	
★	Pr1-26 {Pr1-25}	Skip Frequency 2 upper limit	0.00~600.00Hz		0.00	
★	Pr1-27 {Pr1-26}	Skip Frequency 2 lower limit	0.00~600.00Hz		0.00	
★	Pr1-28 {Pr1-27}	Skip Frequency 3 upper limit	0.00~600.00Hz		0.00	
★	Pr1-29 {Pr1-28}	Skip Frequency 3 lower limit	0.00~600.00Hz		0.00	
★◎	Pr1-30	Skip Frequency 4 upper limit	0.00～600.00 Hz)		0.00	
★◎	Pr1-31	Skip Frequency 4 lower limit	0.00～600.00 Hz		0.00	
★◎	Pr1-32	Skip Frequency 5 upper limit	0.00～600.00 Hz		0.00	
★◎	Pr1-33	Skip Frequency 5 lower limit	0.00～600.00 Hz		0.00	
★◎	Pr1-34	Skip Frequency 6 upper limit	0.00～600.00 Hz		0.00	
★◎	Pr1-35	Skip Frequency 6 lower limit	0.00～600.00 Hz		0.00	
★◎	Pr1-36	1st Frequency 2 (Fbase 2) (Base frequency 2)	0.00～600.00 Hz		60.00/50.00	
◎	Pr1-37	1st Voltage 2 (Vbase 2) (Motor rated voltage 2)	230V models: 0.0～255.0V	460V models: 0.0～510.0V	230V:230 460V:460	
★◎	Pr1-38	2nd Frequency 2 (Fmid 2) (Middle frequency 2)	0.00～600.00 Hz		0.50	
★◎	Pr1-39	2nd Voltage 2 (Vmid 2) (Middle voltage 2)	230V models: 0.0～255.0V	460V models: 0.0～510.0V	230V:5.0 460V:10.0	
★◎	Pr1-40	3rd Frequency 2 (Flow 2) (Low-point frequency 2)	0.00～600.00 Hz		0.50	
★◎	Pr1-41	3rd Voltage 2 (Vlow 2) (Low-point voltage 2)	230V model: 0.0～255.0V	460V model: 0.0～510.0V	230V:5.0 460V:10.0	
★◎	Pr1-42	0Hz Voltage 2 (V0Hz 2) (Output voltage at 0Hz)	230V models: 0.0～25.5	460V models: 0.0～51.0V	0.0	

Group 2: Digital Input/Output parameters

	Parameters	Functions	Settings	Factory Setting	User
★	Pr2-00	External operation	0: 2-wire mode 1- FWD/STOP, REV/STOP 1: 2-wire mode 2- RUN/STOP, REV/FWD 2: 3-wire mode -RUN,STOP, FWD/REV	0	
★	Pr2-01	Multi-Function Digital input MI1	0: No definition	1	
★	Pr2-02	Multi-Function Digital input MI2	1: Multi-step speed command 1	2	

★	Pr2-03	Multi-Function Digital input MI3	2: Multi-step speed command 2	3	
★	Pr2-04	Multi-Function Digital input MI4	3: Multi-step speed command 3	4	
★	Pr2-05	(Factory Reserved)	4: Multi-step speed command 4	5	
★	Pr2-06	(Factory Reserved)	5: External Reset 6: Clear counter 7: 1st and 2nd acceleration/ deceleration time select 8: Acceleration/deceleration inhibit 9: Force the frequency command from AVI 10: Force the frequency command from ACI 11: (Factory Reserved) 12: Emergency stop 13: Disable PID function 14: External fault input (EF) 15: B.B. traces from the bottom upward 16: B.B. traces from the top downward 17: Force operation command to external 18: Cancel the auto acceleration/ deceleration function 19: FWD JOG command 20: REV JOG command 21: JOG command 22: Cancel PLC Run 23: Pause PLC Run 24: Up command 25: Down command 26: Zero speed is replaced by DC braking 27: Pause 28: Disable dwell function 29: Disable traverse function 30: Disable Speed search during start-up 31: Disable EEPROM write function 32: Counter Trigger input (MI2 only) 33~41: (Factory Reserved) 42: Motor Select ◎ 43: Confirm signal of Motor selection ◎ 44: Disable reverse operation ◎ 45: Disabled forward operation ◎	14	
	Pr2-07	UP/DOWN command mode	Bit 0: 0 Up command-Accel by the Acc. time; 1 Up command-Accel by Pr2-08 setting Bit 1: 0 Down Command-Decel by the Dec. time; 1 Down Command-Decel by Pr2-08 setting Bit 2: (Factory Reserved) Bit 3: 0 FWD/REV terminals act by edge trigger; 1 FWD/REV terminals act by level trigger Bit 4: 0 (Factory Reserved); 1 (Factory Reserved)	b00000	
	Pr2-08	UP/DOWN command rate	0.01～1.00Hz/msec (10～1000Hz/sec)	0.01	
	Pr2-09	Digital Input terminal debounce time	0.001～30.000 Sec	0.005	
	Pr2-10	Polarity of Digital Input terminals	00000~007FF (0=Close circuit enable 1=Open circuit enable)	h00000	

	Pr2-11	Target count value	0～65500	0	
	Pr2-12	Pre warn count value	0～65500	0	
	Pr2-13	Digital pulse output gain	1~20	1	
	Pr2-14	Pre-set arrival frequency 1	0.00～600.00 Hz	60.00/50.00	
	Pr2-15	Pre-set arrival frequency 1 bandwidth	0.00～600.00 Hz	2.00	
	Pr2-16	Pre-set arrival frequency 2	0.00～600.00 Hz	60.00/50.00	
	Pr2-17	Pre-set arrival frequency 2 bandwidth	0.00～600.00 Hz	2.00	
	Pr2-18	Polarity of Digital output terminals	00000~0003F	h00000	
◎	Pr2-19	Delay time of Digital output terminals	0.000~60.000 Sec	0.003	
	Pr2-20 {Pr2-19}	Multi-Function Digital output 1- Relay 1	0: No definition	11	
	Pr2-21 {Pr2-20}	(Factory Reserved)	1: Drive in run	1	
	Pr2-22 {Pr2-21}	Multi-Function Digital output 3 - MO1	2: Master frequency attained 1 (Both Forward and Reverse)	5	
	Pr2-23 {Pr2-22}	(Factory Reserved)	3: Master frequency attained 2 (Both Forward and Reverse)		
◎	Pr2-24	(Factory Reserved)	4: Pre-set speed attained 1 (Both Forward and Reverse)	9	
◎	Pr2-25	(Factory Reserved)	5: Pre-set speed attained 1 (Forward only)	0	
			6: Pre-set speed attained 2 (Both Forward and Reverse)	0	
			7 : Pre-set speed attained 2 (Forward only)		
			8: Drive in decel		
			9: Drive ready for operate		
			10: Low voltage alarm (LU, LUr)		
			11: Fault Indication		
			12: Base block (B.B.) Indication		
			13: Zero Speed (including shutdown)		
			14: Zero speed (while in run)		
			15: Terminal count value attained		
			16: Pre warn count value attained		
			17: PLC Run running		
			18: PLC Run paused		
			19: A step of PLC Run completed		
			20: PLC Run completed		
			21: OH1 pre–warning indication		
			22: Dwell Accel/Decel in execution		
			23: External operation mode indication		
			24: Over-torque 1 (ot1)		
			25: (Factory Reserved)		
			26: Software brake output (MO1 only)		
			27: Auxiliary Motor no. 1		
			28: Auxiliary Motor no. 2		
			29: Auxiliary Motor no. 3		
			30: Over-torque 2 (ot2) ◎		
			31: OH2 pre–warning indication ◎		
			32: Motor selection output (Pr5-49) ◎		
			33~47: (Factory Reserved)		
			48: Master speed executing		
			49: PLC Run step 1 executing		
			50: PLC Run step 2 executing		
			51: PLC Run step 3 executing		
			52: PLC Run step 4 executing		
			53: PLC Run step 5 executing		

			54: PLC Run step 6 executing 55: PLC Run step 7 executing 56: PLC Run step 8 executing 57: PLC Run step 9 executing 58: PLC Run step 10 executing 59: PLC Run step 11 executing 60: PLC Run step 12 executing 61: PLC Run step 13 executing 62: PLC Run step 14 executing 63: PLC Run step 15 executing 64~79: (Factory Reserved)		
◎	Pr2-26	(Factory Reserved)	(Factory Reserved)	0	
◎	Pr2-27	(Factory Reserved)			
◎	Pr2-28	(Factory Reserved)			

Group 3: Analog Input/Output parameters

	Parameters	Functions	Settings	Factory Setting	User
	Pr3-00	Addition Function of the Analog Inputs	0: Enable addition function 1: Disable addition function	0	
	Pr3-01	Analog input noise filter time	0.00~2.00 sec	0.10	
	Pr3-02 Valid for ACI (Pr3-06)	AVI Analog Input	0: No functions 1: Frequency command 2: To adjust 1st Acceleration/deceleration time) (same as Pr1-11, Pr1-12) 3: Over Current stall prevention level during constant speed run on the constant torque region (same as Pr5-12) 4: Over Current stall prevention level during accel on the constant torque region (same as Pr5-10) 5: Over-Torque detection level 1 (ot1) (same as Pr5-16) 6: Motor 1 Torque boost level (same as Pr5-01) 7: Auxiliary command when main frequency command is AVI only 8: Auxiliary command when main frequency command is ACI only 9: (Factory Reserved) 10: Auxiliary command of master frequency command 11: PID feedback signal 12: PID offset signal (same as Pr7-05) 13: DC Braking current level (same as Pr6-00) 14: Voltage adjusts during run. (AVI Pr3-02 only) 15: External temperatures signal 16: Torque adjust	1	
	Pr3-03	AVI analog Input bias	-10.00～10.00V	0.00	
	Pr3-04	AVI analog Input gain	-500.0～+500.0%	100.0	
	Pr3-05	AVI analog Input bias mode	0: Zero bias 1: Value lower than bias = bias 2: Value higher than bias = bias 3: The absolute value of the bias voltage while serving as the center	0	
	Pr3-06	ACI Analog Input (see Pr3-02)	Same as Pr3-02	0.00	
	Pr3-07	ACI analog Input bias	0.00～20.00mA	4.00	
	Pr3-08	ACI analog Input gain	-500.0～+500.0%	100.0	

	Pr3-09	ACI analog Input bias mode	0：Zero bias 1: Value lower than bias = bias 2: Value higher than bias = bias 3: The absolute value of the bias voltage while serving as the center	1	
	Pr3-10	Loss of the ACI signal	0: Disabled 1: Continue operation by the last frequency commar 2: Decelerate to stop 3: Coast to stop and display AcI.	0	
	Pr3-11	(Factory Reserved)	(Factory Reserved)	0.00	
	Pr3-12	(Factory Reserved)	(Factory Reserved)	0.00	
	Pr3-13	(Factory Reserved)	(Factory Reserved)	100	
	Pr3-14	(Factory Reserved)	(Factory Reserved)	0	
	Pr3-15	Analog output 1 function (AVO)	0: Output frequency (Hz)	0	
	Pr3-16	(Factory Resewrved)	1: Command frequency (Hz) 2: Motor Speed 3: Output current (A rms) 4: Output voltage (VAC) 5: DC BUS voltage (VDC) 6: Power factor 7: Power 8: AVI (V) 9: ACI (mA) 10: (Factory Reserved) 11~12: (Factory Resewrved) 13: Output voltage command 14: Counter Value 15: User defined value on Pr3-21 16~23: (Factory Reserved) 24: Define to digital output (MOx) ◎	0	
	Pr3-17	AVO Analog output gain	-900.0～900.0%	100.0	
	Pr3-18	(Factory Resewrved)	(Factory Resewrved)	80.0	
	Pr3-19	AVO Analog output bias	-10.00～10.00V	0.00	
	Pr3-20	(Factory Resewrved)	(Factory Resewrved)	4.00	
	Pr3-21	User defined analog output value	0.0～100.0%	0.0	

Group 4: Multi-Step Speed and Process Logic Control operation parameters

	Parameters	Functions	Settings	Factory Setting	User
	Pr4-00	The 1st step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-01	The 2nd step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-02	The 3rd step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-03	The 4th step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-04	The 5th step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-05	The 6th step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-06	The 7th step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-07	The 8th step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	
	Pr4-08	The 9th step speed of PLC Run or MSS Run	0.00～600.00 Hz	0.00	

	Pr4-09	The 10th step speed of PLC Run or MSS Run	0.00～600.00 Hz			0.00	
	Pr4-10	The 11th step speed of PLC Run or MSS Run	0.00～600.00 Hz			0.00	
	Pr4-11	The 12th step speed of PLC Run or MSS Run	0.00～600.00 Hz			0.00	
	Pr4-12	The 13th step speed of PLC Run or MSS Run	0.00～600.00 Hz			0.00	
	Pr4-13	The 14th step speed of PLC Run or MSS Run	0.00～600.00 Hz			0.00	
	Pr4-14	The 15th step speed of PLC Run or MSS Run	0.00～600.00 Hz			0.00	
	Pr4-15	The duration of master speed	0.0～65500 Sec			0.0	
	Pr4-16	The 1st step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-17	The 2nd step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-18	The 3rd Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-19	The 4th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-20	The 5th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-21	The 6th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-22	The 7th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-23	The 8th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-24	The 9th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-25	The 10th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-26	The 11th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-27	The 12th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-28	The 13th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-29	The 14th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-30	The 15th Step duration of PLC Run or MSS Run	0.0～65500 Sec			0.0	
	Pr4-31	The PLC Run or MSS Run time multiplier	1～10			1	
	Pr4-32	The PLC Run or MSS Run operation direction of each step	00000~07FFF（0：forward；1：reverse）			h00000	
	Pr4-33	PLC Run operation mode	Bit 0	0	Direction determined by Pr4-32	b01000	
				1	Direction determined by the master speed		
			Bit 1	0	Without zero intervals (Continue mode)		
				1	With zero intervals (Stop mode)		
			Bit 2	0	Run zero speed when PLC Run Paused		
				1	Run original programmed step speed when PLC Run Paused		
			Bit 3	0	Re-Execute PLC Run from step 0 after recover from power interruption		
				1	Continue Execute PLC Run from the point which power interrupted after recover from power interruption		

	Pr4-34	PLC Run operation cycle	0~60000 : 0~60000 cycle 0= PLC Run disabled 60001: Continuously execute recurring cycles			0	
	Pr4-35	What to do after PLC Run completed	0~15：step speed (0=master speed) 16：stop			16	
	Pr4-36	Multi-Step Speed Run (MSS RUN) operation mode	Bit 0	0	Direction determined by Pr4-32	b00001	
				1	Direction determined by the master speed		
			Bit 1	0	Duration of MSS Run determined by Mix terminals.		
				1	Duration of MSS Run determined by Pr4-15~Pr4-30 setting.		
			Bit 2	0	Without zero intervals (Continue mode)		
				1	With zero intervals (Stop mode)		
			Bit 3 ◎	0	Jog command ineffective during Run		
				1	Jog command effective during Run		

Group 5: Motor parameters and protection parameters

	Parameters	Functions	Settings		Factory Setting	User
★	Pr5-00	Full-Load Current of Motor 1	Amp (10~120% of drive's rated current)		xxxA（100%）	
	Pr5-01	Auto Torque Compensation of Motor 1	0.0～25.0%		0.0	
	Pr5-02	Slip Compensation of Motor 1	0～20 RPM		0	
	Pr5-03	Number of Motor Poles 1	2～20		4	
	Pr5-04	Rotor Resistance R1 of Motor 1	0.000～65.535 Ω		0	
★	Pr5-05	Auto-tuning & control mode selection	0: No function 1: To execute auto-tuning and switch to Sensorless vector control mode 2: Reset to V/F control mode		0	
★	Pr5-06	Low Voltage Level I	230V models: 160～220VAC	460V models: 320～440VAC	230V:180 460V:360	
★	Pr5-07	Over-Voltage Stall Prevention Level	230V models: 320～500VDC	460V models: 640～1000VDC	230V:380 460V:760	
	Pr5-08	Software Braking Level	230V models: 320～500VDC	460V models: 640～1000VDC	230V:373 460V:746	
	Pr5-09	Phase-Loss Protection	0: Warn and keep operation (below 50%) 1: Warn and ramp to stop 2: Warn and coast to stop		0	
	Pr5-10	Over- Current Stall Prevention level during accel on the constant torque region	Amp (10~250% of drive's rated current)		A(170%)	
	Pr5-11	Over- Current Stall Prevention low-limit level during accel on the constant power region	Amp (0~250% of drive's rated current)		A(120%)	
	Pr5-12	Over-Current Stall Prevention level during constantant speed on the constant torque region Operation	Amp (10~250% of drive's rated current)		A(170%)	

	Pr5-13	Over- Current Stall Prevention low-limit level during constant speed run on the constant power region	Amp (0~250% of drive's rated current)			A(120%)	
	Pr5-14	Over-Current Deceleration Time during Operation	0.050~600.00 Sec			3.00	
	Pr5-15	Over-Torque Detection Selection 1 (ot1)	0：Disabled 1：Over-torque detection during constant speed operation, stop operation after detection. 2：Over-torque detection during constant speed operation, continue to operate after detection. 3：Over-torque detection during operation, stop operation after detection 4：Over-torque detection during operation, continue operation after detection.			0	
	Pr5-16	Over-Torque Detection Level 1 (ot1)	Amp(10～250% of drive's rated current)			A(150%)	
	Pr5-17	Over-Torque Detection Time 1 (ot1)	0.0～60.0 Sec			0.1	
	Pr 5-18	Motor 1- Electronic Thermal Relay Selection (Ol1)	0：Electronic thermal relay function disabled 1：Inverter duty motor (with independent cooling fan) 2：Standard motor (with shaft mounted cooling fan)			0	
	Pr5-19	Motor 1- Electronic Thermal Relay Characteristic	30～600 Sec			60	
	Pr5-20	IGBT Over-Heat pre–warning setting (Oh2)	0.0~110.0			85.0	
	Pr5-21	Over-Torque Detection Selection 2 (ot2)	0: Disabled 1: Over-torque detection during constant speed operation, stop operation after detection. 2: Over-torque detection during constant speed operation, continue to operate after detection. 3: Over-torque detection during entire (acceleration, steady state, deceleration) operation, stop operation after detection 4: Over-torque detection during entire (acceleration, steady state, deceleration) operation, continue operation after detection.			0	
	Pr5-22	Over-Torque Detection Level 2 (ot2)	Amp(10～250% of drive's rated current)			A(150%)	
	Pr5-23	Over-Torque Detection Time 2 (ot2)	0.0～60.0 Sec			0.1	
	Pr5-24 {Pr5-21}	Most Recent Fault Record	0: no fault	16: HPF (protection circuit fault)	32: ot2 (Over-Torque2)	0	
	Pr5-25 {Pr5-22}	2nd Most Recent Fault Record	1: Oc (over-current)	17: Oh1 (IGBT overheat)	33: Ol2 (electronic thermal relay 2)		
	Pr5-26 {Pr5-23}	3rd Most Recent Fault Record	2: Ou (over-voltage)	18: Oh2 (Heatsink overheat)	34: rnot (Motor selection error)		
	Pr5-27 {Pr5-24}	4th Most Recent Fault Record	3: GF (ground fault)	19: SoFt (Pre-charge circuit error)			
◎	Pr5-28	5th Most Recent Fault Record	4: SC (IGBT failure)	20: ACI. (ACI error)	36: LUr (Low Voltage during Run)		
◎	Pr5-29	6th Most Recent Fault Record	5: oL (drive overload)	21: ASC (RS-485 error)	37: oUd (over-voltage during decel)		

◎	Pr5-30	7th Most Recent Fault Record	6: oL1 (electronic thermal relay 1)	22: PI.d (PID error)	38: `x CoPY (Parameter copy error)		
◎	Pr5-31	8th Most Recent Fault Record	7: ot1 (Over-Torque1)	23: Pu (Keypad communication overtime)	39: LU (Low Voltage)		
◎	Pr5-32	9th Most Recent Fault Record	8: oCn (over-current during constant speed)	24: tunE (Auto tuning failure)	40: bb (External Base Block)		
◎	Pr5-33	10th Most Recent Fault Record	9: oCA (over-current during accel.)	25: bF (braking chopper failure)			
◎	Pr5-34	11th Most Recent Fault Record	10: oCd (over-current during decel.)	26:(Factory Reserved)			
◎	Pr5-35	12th Most Recent Fault Record	11: EP1 (EPROM error 1)	27: PHL (Phase-Loss protect or capacitor aged)			
◎	Pr5-36	13th Most Recent Fault Record	12: EP2 (EPROM error 2)	28: CC (current signal error during stop)			
◎	Pr5-37	14th Most Recent Fault Record	13: EF (external fault)	29: CPu (CPU error)			
◎	Pr5-38	15th Most Recent Fault Record	14: Ct1 (current sensor 1)	30: FAn (Fan failure)			
◎	Pr5-39	16th Most Recent Fault Record	15: Ct2 (current sensor 2)	31: AnI fault (Analog input error)			

★ ◎	Pr5-40	Full-Load Current of Motor 2	Amp (10~120% of drive's rated current)		xxxA （100%）	
◎	Pr5-41	Auto Torque Compensation of Motor 2	0.0～25.0%		0.0	
◎	Pr5-42	Slip Compensation of Motor 2	0～20 RPM		0	
◎	Pr5-43	Number of Motor Poles 2	2～20		4	
◎	Pr5-44	Rotor Resistance R1 of Motor 2	0.000～65.535 Ω		0	
◎	Pr5-45	Motor 2- Electronic Thermal Relay Selection (oL2)	0: Electronic thermal relay function disabled		0	
			1: Inverter duty motor (with independent cooling fan)			
			2: Standard motor (with shaft mounted cooling fan)			
◎	Pr5-46	Motor 2- Electronic Thermal Relay Characteristic	30～600 Sec		60	
◎	Pr5-47	Heatsink Over-Heat pre–warning setting (oH2)	0.0～110.0 ℃		85.0	
◎	Pr5-48	Delay Time for Motor Selection	0.00~60.00 Sec		0.05	
◎	Pr5-49	Motor selection mode	Bit 0	0 Cannot be switch during operation.	b00000	
				1 Can be switch during operation.		
			Bit 1	0 No need to waiting for confirm signal when swiching		
				1 Need to waiting for confirm signal when swiching		

Group 6: Special Parameters

	Parameters	Functions	Settings	Factory Setting	User
	Pr6-00	DC Braking Current Level	Amp (0~125% of drive's rated current)	A(0%)	
	Pr6-01	DC Braking Time during Start-up	0.00～60.00 Sec	0.00	
	Pr6-02	DC Braking Time during stopping	0.00～60.00 Sec	0.00	
	Pr6-03	Start-point for DC Braking during stopping	0.00～600.00 Hz	0.00	
	Pr6-04	Increasing Rate of the DC Braking Voltage	0.01~300.00%	50.00%	
	Pr6-05	Momentary Power Loss Operation Selection	0：Operation stops after momentary power loss. 1：Operation continues after momentary power loss, speed search Speed Search starts with Last Output Frequency Downward 2：Operation continues after momentary power loss, speed search starts with the Start-up frequency Upward	0	
	Pr6-06	Maximum Allowable Power Loss Time	0.1～5.0 Sec	2.0	
	Pr6-07	Base-Block Time for Speed Search (BB)	0.1～5.0 Sec	0.5	
	Pr6-08	Maximum Current Level for Speed Search	Amp (20～200% of drive's rated current)	A(120%)	
	Pr6-09	Deceleration Time for Speed Search	0.50～120.00 Sec	3.00	
	Pr6-10	Auto Restart after Fault	0～10 times	0	
	Pr6-11	Speed Search during Start-up	0：speed search disabled 1：speed search through the frequency command 2：FWD-speed search only (motor only runs in FWD direction) 3：REV-speed search only (motor only runs in REV direction) 4：FWD/REV speed search enabled in both directions (FWD first) 5：REV/FWD speed search enabled in both directions (REV first)	0	
	Pr6-12	Speed Search Frequency (FWD direction)	0.00～600.00 Hz	60.00/50.00	
	Pr6-13	Speed Search Frequency (REV direction)	0.00～600.00 Hz	60.00/50.00	
	Pr6-14	Dwell Time at Accel.	0.00~60.00 Sec	0.00	
	Pr6-15	Dwell Frequency at Accel.	0.00～600.00 Hz	6.00	
	Pr6-16	Dwell Time at Decel.	0.00~60.00 Sec	0.00	
	Pr6-17	Dwell Frequency at Decel.	0.00～600.00 Hz	6.00	
	Pr6-18	Dwell Frequency current	Amp (0~150% of rated current)	A(0%)	
	Pr6-19	Traverse Skip Frequency	0.00~100.00Hz	0.00	
	Pr6-20	The Amplitude of traverse	0.00~200.00Hz	0.00	

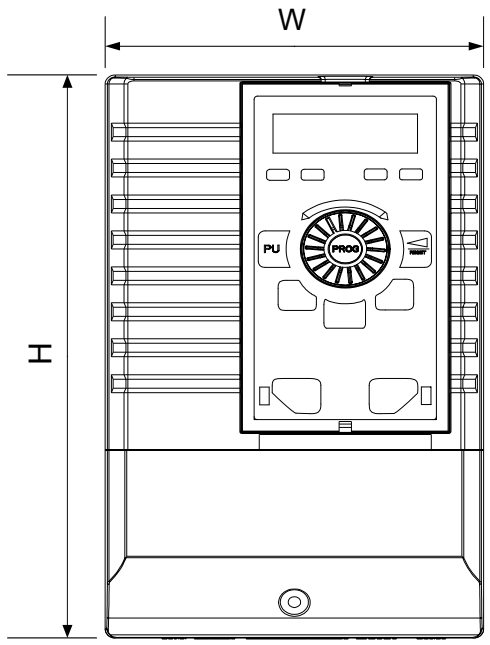
Group 7: High-function Parameters (PID and Communication)

	Parameters	Functions	Settings	Factory Setting	User
	Pr7-00	Proportional Gain (P)	0.0～500.0%	80.0	
	Pr7-01	Integral Time (I)	0.00～100.00 Sec 0.00：no integral	1.00	
	Pr7-02	Derivative Control (D)	0.00～5.00 Sec	0.00	
	Pr7-03	Upper limit for Integral Control	0.0～100.0%	100.0	
	Pr7-04	PID Output Frequency Limit	0.0～100.0%	100.0	
	Pr7-05	PID Offset	-100.0~+100.0%	0.0	
	Pr7-06	Primary Delay Filter Time	0.000~0.100 Sec	0.000	
	Pr7-07	PID Feedback Signal Detection Time	0.0～6000.0 Sec	0.0	
	Pr7-08	Treatment of the Erroneous PID Feedback Signals	0: warn and keep operating 1: warn and RAMP to stop 2: warn and COAST to stop	0	
	Pr7-9	Treatment of Keypad Transmission Fault	0: Warn and RAMP to stop 1: Warn and COAST to stop	0	
	Pr7-10	Keypad Transmission Fault detection	0.0: Disable and keep operating 0.1~60.0 Sec	0.0	
	Pr7-11	Communication Address	1～254	1	
	Pr7-12	Transmission Speed (Baud rate)	1.2～125 Kbps	9.6	
	Pr7-13	Transmission Fault Treatment	0: warn and keep operating 1: warn and RAMP to stop 2: warn and COAST to stop 3: No warning and keep operating	3	
	Pr7-14	Time-out Detection	0.0: disabled 0.1~60.0 Sec	0.0	
	Pr7-15	Communication Protocol	0：7,N,2 ASCII / 9：8,E,2 ASCII 1：7,E,1 ASCII / 10：8,O,2 ASCII 2：7,O,1 ASCII / 11：8,N,1 RTU 3：7,E,2 ASCII / 12：8,N,2 RTU 4：7,O,2 ASCII / 13：8,E,1 RTU 5：8,N,1 ASCII / 14：8,O,1 RTU 6：8, N,2 ASCII / 15：8,E,2 RTU 7：8,E,1 ASCII / 16：8,O,2 RTU 8：8,O,1 ASCII	0	

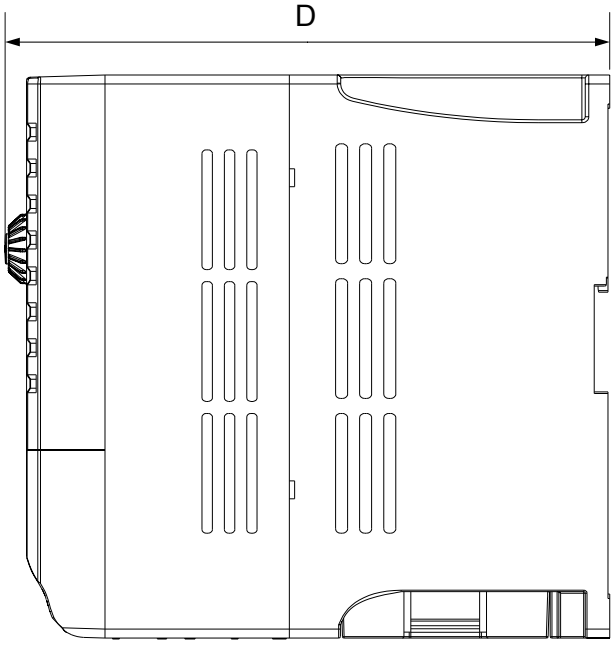
Group 8: Fan & Pump Control Parameters

	Parameters	Functions		Settings	Factory Setting	User
★	Pr8-00	V/F Curve Selection	0	V/F Curve determined by Parameter Group 1	0	
			1	1.5 Power Curve		
			2	Square Power Curve		
	Pr8-01	Start-Up Frequency of the Auxiliary Motor		0.00～600.00 Hz	0.00	
	Pr8-02	Stop Frequency of the Auxiliary Motor		5.00～600.00 Hz	5.00	
	Pr8-03	Time Delay before Stopping the Auxiliary Motor		0.0～6000.0 Sec	0.00	
	Pr8-04	Time Delay before Stopping the Auxiliary Motor		0.0～6000.0 Sec	0.00	
	Pr8-05	Sleep Frequency		0.00～600.00 Hz	0.00	
	Pr8-06	Wake-up Frequency		0.00～600.00 Hz	0.00	
	Pr8-07	Sleep Time		0.0～6000.0 Sec	0.0	

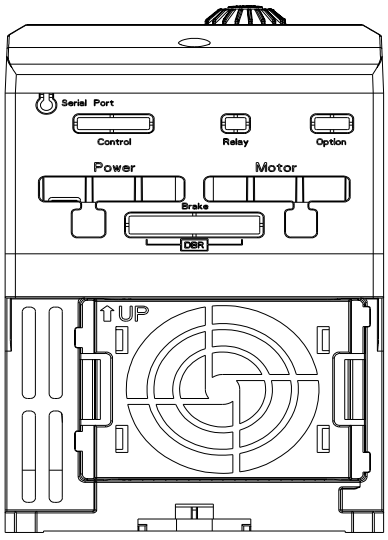
Dimension:



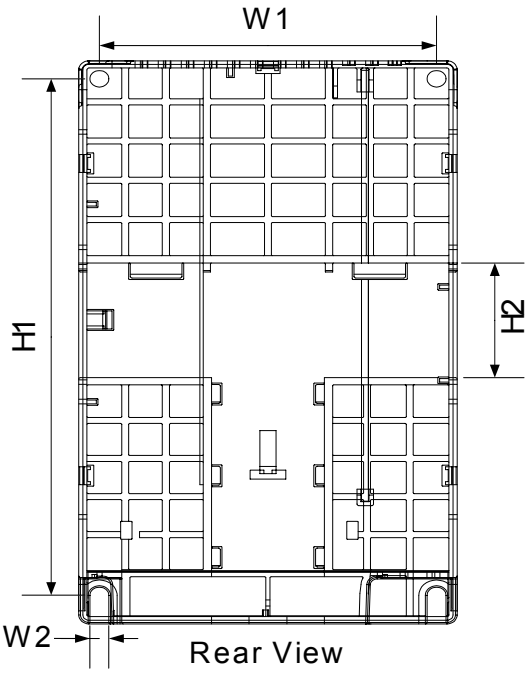
Front View



Side View



Bottom View



Rear View

Unit: mm(inch)

Frame	W	H	D	W1	W2	H1	H2
E1-S	110.0 (4.33)	188.0 (7.4)	136.0 (5.35)	98.0 (3.86)	6.0 (0.24)	172.5 (6.79)	35.3 (1.39)
E1-A	110.0 (4.33)	188.0 (7.4)	174.0 (6.85)	98.0 (3.86)	6.0 (0.24)	172.5 (6.79)	35.3 (1.39)
E1-B	160.0 (6.30)	250.0 (9.84)	186.0 (7.32)	140.0 (5.51)	6.0 (0.24)	230.0 (9.06)	

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