

# Table of Contents

<b>Chapter 0 Preface</b> .....	2
0.1 Preface .....	2
<b>Chapter 1 Safety precautions</b> .....	3
1.1 Before power up .....	3
1.2 During power up .....	4
1.3 Before operation.....	4
1.4 During operation.....	4
1.5 Inverter Disposal .....	5
<b>Chapter 2 Environment &amp; Installation</b> .....	6
2.1 Considerations for peripheral equipment .....	6
2.2 Specifications.....	7
2.2.1 Product Specifications .....	7
2.2.2 General Specifications.....	9
2.3 Standard wiring .....	11
2.3.1 Single Phase.....	11
2.3.2 Single/Three Phase .....	12
2.3.3 Three Phase.....	13
2.4 Terminal Description .....	14
2.4.1 Description of main circuit terminals.....	14
2.4.2 Control circuit terminal description .....	15
2.5 Outline Dimensions .....	16
2.5.1 IP20/NEMA1 dimensions.....	16
2.5.2 IP66/NEMA4X dimensions .....	26
<b>Chapter 3 Software Index</b> .....	29
3.1 Keypad Description.....	29
3.1.1 Operator Panel Functions.....	29
3.2 Programmable Parameter Groups.....	30
<b>Chapter 4 Troubleshooting and Maintenance</b> .....	49
4.1 Error display and corrective action.....	49
4.1.1 Manual Reset and Auto-Reset .....	49
4.1.2 Keypad Operation Error Instruction.....	51
4.1.3 Special conditions.....	52
4.2 General troubleshooting .....	53

# Chapter 0 Preface

## 0.1 Preface

To extend the performance of the product and ensure personnel safety, please read this manual thoroughly before using the inverter. Should there be any problem in using the product that cannot be solved with the information provided in the manual, contact Our's technical or sales representative who will be willing to help you.

### ※Precautions

The inverter is an electrical product. For your safety, there are symbols such as "Danger", "Caution" in this manual as a reminder to pay attention to safety instructions on handling, installing, operating, and checking the inverter. Be sure to follow the instructions for highest safety.



**Danger**

Indicates a potential hazard that could cause death or serious personal injury if misused.



**Caution**

Indicates that the inverter or the mechanical system might be damaged if misused.



**Danger**

- Risk of electric shock. The DC link capacitors remain charged for five minutes after power has been removed. It is not permissible to open the equipment until 5 minutes after the power has been removed.
- Do not make any connections when the inverter is powered on. Do not check parts and signals on circuit boards during the inverter operation.
- Do not disassemble the inverter or modify any internal wires, circuits, or parts.
- Ensure that the Inverter Ground terminal is connected correctly.



**Caution**

- Do not perform a voltage test on parts inside the inverter. High voltage can destroy the semiconductor components.
- Do not connect T1, T2, and T3 terminals of the inverter to any AC input power supply.
- CMOS ICs on the inverter's main board are susceptible to static electricity. Do not touch the main circuit board.

# Chapter 1 Safety precautions

## 1.1 Before Power Up



### Danger

- Make sure the main circuit connections are correct Single phase L1(L),L3(N), Three phase L1(L),L2,L3(N) are power-input terminals and must not be mistaken for T1,T2 and T3. Otherwise, inverter damage can result.



### Caution

- The line voltage applied must comply with the inverter's specified input voltage.(See the nameplate)
- To avoid the front cover from disengaging, or other damage do not carry the inverter by its covers. Support the drive by the heat sink when transporting. Improper handling can damage the inverter or injure personnel and should be avoided.
- To avoid the risk of fire, do not install the inverter on a flammable object.Install on nonflammable objects such as metal.
- This product provides the 24V for internal use only, do not use as the power supply sources for other external components, such as sensors, electronic components ... etc., otherwise it will cause adverse situation.
- When disconnecting the remote keypad, turn the power off first to avoid any damage to the keypad or the inverter.



### Caution

- This product is sold subject to EN 61800-3 and EN 61800-5-1. In a domestic environment this product may cause radio interference in which case the user may be required to apply corrective measures.
- Motor over temperature protection is not provided.



### Caution

- Work on the device/system by unqualified personnel or failure to comply with warnings can result in severe personal injury or serious damage to material. Only suitably qualified personnel trained in the setup, installation, commissioning and operation of the product should carry out work on the device/system.
- Only permanently-wired input power connections are allowed.

## 1.2 During Power Up



### Danger

- When the momentary power loss is longer than 2 seconds, the inverter will not have sufficient stored power for its control circuit. Therefore, when the power is re-applied, the run operation of the inverter will be based on the setup of following parameters:
  - Run parameters. 00-02 or 00-03.
  - Direct run on power up. Parameter. 07-04 and the status of external run switch.

**Note-** the start operation will be regardless of the settings for parameters 07-00/07-01/07-02.

 **Danger. Direct run on power up.**

If direct run on power up is enabled and inverter is set to external run with the run FWD/REV switch closed then the inverter will restart.

 **Danger**

Prior to use, ensure that all risks and safety implications are considered.

- When the momentary power loss ride through is selected and the power loss is short, the inverter will have sufficient stored power for its control circuits to function, therefore, when the power is resumed the inverter will automatically restart depending on the setup of parameters 07-00 & &- 7-01.

## 1.3 Before Operation



### Caution

- Make sure the inverter model and rating are the same as that set in parameter 13-00.

**Note :** On power up the supply voltage set in parameter 01-01 will flash on the display for 2 seconds.

## 1.4 During Operation



### Danger

- Do not connect or disconnect the motor during operation. Otherwise, It may cause the inverter to trip or damage the unit.



### Danger

- To avoid electric shock, do not take the front cover off while power is on.
- The motor will restart automatically after stop when auto-restart function is enabled. In this case, care must be taken while working around the drive and associated equipment .
- The operation of the stop switch is different than that of the emergency stop switch. The stop switch has to be activated to be effective. Emergency stop has to be de-activated to become effective.



### Caution

- Do not touch heat radiating components such as heat sinks and brake resistors. 
- The inverter can drive the motor from low speed to high speed. Verify the allowable speed ranges of the motor and the associated machinery.
- Risk of electric shock. The DC link capacitors remain charged for five minutes after power has been removed. It is not permissible to open the equipment until 5 minutes after the power has been removed.



### Caution

- The Inverter should be used in environments with temperature range from (14-104°F) or (-10 to 50°C) \* and relative humidity of 95%.

\* IP20 : -10 ~ 50 °C without stick on type dust cover.

NEMA1 : -10 ~ 40 °C with stick on type dust cover.



### Danger

- Make sure that the power is switched off before disassembling or checking any components.

## 1.5 Inverter Disposal



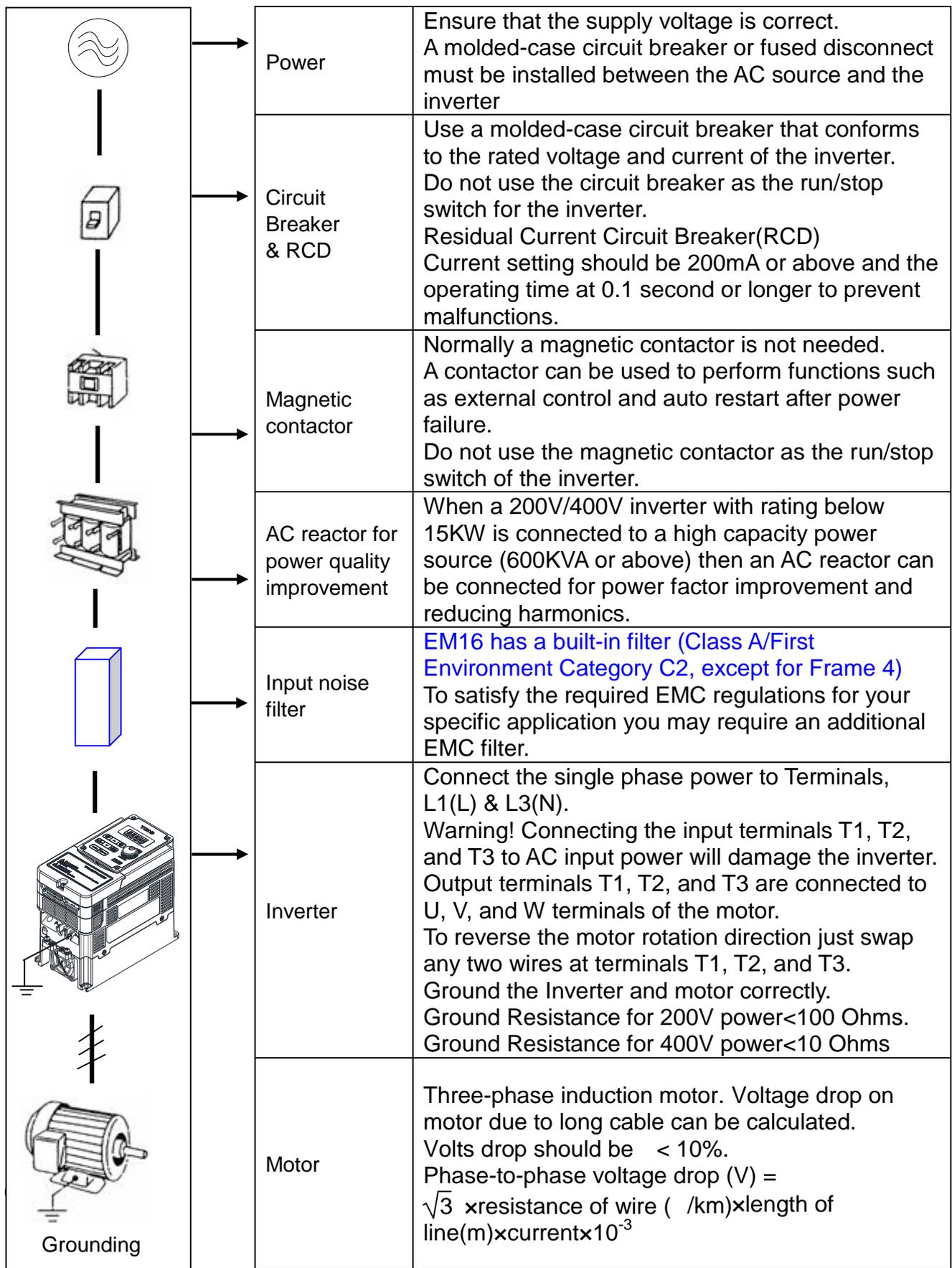
### Caution

Please dispose of this unit with care as an industrial waste and according to your required local regulations.

- The capacitors of inverter main circuit and printed circuit board are considered as hazardous waste and must not be burnt.
- The plastic enclosure and parts of the inverter such as the cover board will release harmful gases if burnt.

# Chapter 2 Environment & Installation

## 2.1 Considerations for peripheral equipment



# Model identification

## EM16-340-0075-F-20

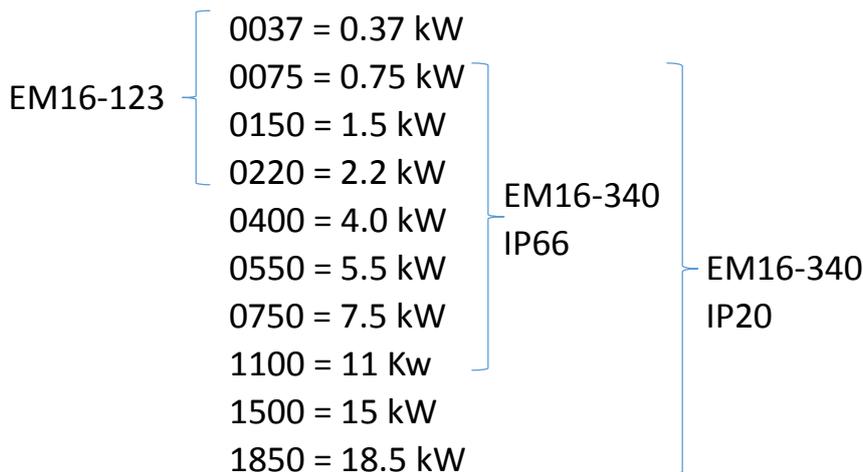
Series	Power supply	Motor power	EMI Filter	IP degree	Local command
EM16	123	0037	F	20	(blank)
	340	0075		66	S
		0150			
		0220			
		0400			
		0550			
		0750			
		1100			
		1500			
		1850			

Power supply:  
 123 = 1ph 230V  
 340 = 3ph 400V

EMI filter:  
 F = integrated standard EMI filter A-class, C2-category

IP degree:  
 20 = IP20 enclosure  
 66 = IP66 enclosure

Local command:  
 Blank = No built-in  
 S = Power Switch + Potentiometer on board



## 2.2 Specifications

### 2.2.1 Product Specifications

**230V Class:  
Single phase + Internal EMI filter**

**Type:  
Enclosure IP20**

	----			
<b>Model:EM16-123-----F-20</b>	<b>0037</b>	<b>0075</b>	<b>0150</b>	<b>0220</b>
Recommended motor power (KW)	<b>0.4</b>	<b>0.75</b>	<b>1.5</b>	<b>2.2</b>
Rated output current (A)	<b>3.1</b>	<b>4.5</b>	<b>7.5</b>	<b>10.5</b>
Rated power capacity (KVA)	<b>1.2</b>	<b>1.7</b>	<b>2.90</b>	<b>4.00</b>
Input voltage range(V)	<b>Single Phase:200~240V,50/60HZ</b>			
Allowable voltage fluctuation	<b>+10%-15%</b>			
Output voltage range(V)	<b>Three phase: 0~240V</b>			
Input current (A)*	<b>8.5</b>	<b>12</b>	<b>16</b>	<b>23.9</b>
Inverter net weight (Kg)	<b>1.65</b>	<b>1.65</b>	<b>2.5</b>	<b>2.5</b>
Allowable momentary power loss time (s)	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>
Enclosure	<b>IP20</b>			

The input current is calculated value at full rated output current.

**F: Built-in EMI filter  
20: Protection class IP20**

**Type:  
Enclosure IP66  
Power-switch on board  
Potentiometer on board**

	----			
<b>Model:EM16-123-----F-66-S</b>	<b>0037</b>	<b>0075</b>	<b>0150</b>	<b>0220</b>
Recommended motor power (KW)	<b>0.4</b>	<b>0.75</b>	<b>1.5</b>	<b>2.2</b>
Rated output current (A)	<b>3.1</b>	<b>4.5</b>	<b>7.5</b>	<b>10.5</b>
Rated power capacity (KVA)	<b>1.2</b>	<b>1.7</b>	<b>2.90</b>	<b>4.00</b>
Input voltage range(V)	<b>Single Phase:200~240V,50/60HZ</b>			
Allowable voltage fluctuation	<b>+10%-15%</b>			
Output voltage range(V)	<b>Three phase: 0~240V</b>			
Input current (A)*	<b>8.5</b>	<b>12</b>	<b>16</b>	<b>23.9</b>
Inverter net weight (Kg)	<b>1.65</b>	<b>1.65</b>	<b>2.5</b>	<b>2.5</b>
Allowable momentary power loss time (s)	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>
Enclosure	<b>IP66</b>			

The input current is calculated value at full rated output current.

**F: Built-in EMI filter  
66: Protection class IP66**

## S: Built-in Power Switches and Potentiometer

### 400VClass: Three phase + Integral EMI filter

#### □ Type: Enclosure IP20

Model: EM16-340-----F-20	0075	0150	0220	0400
Recommended motor power (KW)	0.75	1.5	2.2	3.7
Rated output current (A)	2.3	3.8	5.2	8.8
Rated power capacity (KVA)	1.7	2.9	4.0	6.7
Input voltage range(V)	Three phase:380~480V,50/60HZ			
Allowable voltage fluctuation	+10%-15%			
Output voltage range(V)	Three phase:0~480V			
Input current (A)*	4.2	5.6	7.3	11.6
Inverter net weight (Kg)	1.7	1.7	2.5	2.5
Allowable momentary power loss time (s)	2.0	2.0	2.0	2.0
Enclosure	IP20			

The input current is calculated value at full rated output current.

Model: EM16-340-----F-20	0550	0750	1100	1500	1850
Recommended motor power (KW)	5.5	7.5	11	15	18.5
Rated output current (A)	13.0	17.5	24	32	40
Rated power capacity (KVA)	9.9	13.3	19.1	24	30.5
Input voltage range(V)	Three phase:380~480V,50/60HZ				
Allowable voltage fluctuation	+10%-15%				
Output voltage range(V)	Three phase: 0~480V				
Input current (A)*	17	23	31	38	48
Inverter net weight (Kg)	6.7	6.7	6.7	13.7	13.7
Allowable momentary power loss time (s)	2.0	2.0	2.0	2.0	2.0
Enclosure	IP20				

The input current is calculated value at full rated output current.

#### F: Built-in EMI filter 20: Protection class IP20

**400VClass:**  
**Three phase + Integral EMI filter**

- **Type:**
- Enclosure IP66**
- Power-switch on board**
- Potentiometer on board**

Model: EM16-340------F-66-S	----			
	0075	0150	0220	0400
Recommended motor power (KW)	0.75	1.5	2.2	3.7
Rated output current (A)	2.3	3.8	5.2	8.8
Rated power capacity (KVA)	1.7	2.9	4.0	6.7
Input voltage range(V)	Three phase:380~480V,50/60HZ			
Allowable voltage fluctuation	+10%-15%			
Output voltage range(V)	Three phase:0~480V			
Input current (A)*	4.2	5.6	7.3	11.6
Inverter net weight (Kg)	1.7	1.7	2.5	2.5
Allowable momentary power loss time (s)	2.0	2.0	2.0	2.0
Enclosure	IP66			

Model: EM16-340------F-66-S	----		
	0550	0750	1100
Recommended motor power (KW)	5.5	7.5	11
Rated output current (A)	13.0	17.5	24
Rated power capacity (KVA)	9.9	13.3	19.1
Input voltage range(V)	Three phase:380~480V,50/60HZ		
Allowable voltage fluctuation	+10%-15%		
Output voltage range(V)	Three phase: 0~480V		
Input current (A)*	17	23	31
Inverter net weight (Kg)	6.7	6.7	6.7
Allowable momentary power loss time (s)	2.0	2.0	2.0
Enclosure	IP66		

The input current is calculated value at full rated output current.  
 S 400V series only up to 15HP.

- F: Built-in EMI filter**
- 66: Protection class IP66**
- S: Built-in Power Switches and Potentiometer**

## 2.2.2 General Specifications

Item		EM16
<b>Control Mode</b>		V/F Control, Vector Control
<b>Frequency</b>	Output Frequency	0.01~599.00Hz
	Starting Torque	150%/1Hz(Vector)
	Speed Control Range	1:50
	Setting resolution	Digital input: 0.01Hz
		Analog input:0.06Hz/60Hz
	Setting	Keypad:Set directly with keys or the VR on the keypad
		External Input Terminlas: AI1(0/2~10V), AI2(0/4~20mA)input Multifunction input up/down function(Group3)
Setting frequency by communication method.		
Frequency limit	Lower and upper frequency limits 3 skip frequency settings.	
<b>Run</b>	Operation set	Keypad run, stop button
		External terminals: Multi- operation-mode2 / 3 wire selection Jog operation
		Run signal by communication method.
<b>Main Control Features</b>	V / F curve setting	18 fixed curves and one customized curve
	Carrier frequency	1~16KHz
	Acceleration and deceleration control	2 off Acc / dec time parameters. 4 off S curve parameters.
	Multifunction input	29 functions (refer to description on group3)
	Multifunction output	21 functions (refer to description on group3)
	Multifunction analog output	5 functions (refer to description on group4)
	Main features	Overload Detection,16 preset speeds,Auto-run,Acc/Dec Switch (2 Stages),Main/Alt run Command select,Main/Alt Frequency Command select,PID control, torque boost, V/F start Frequency, Fault reset, Firemode.
<b>Display</b>	LED	Display :parameter / parameter value / frequency / line speed / DC voltage / output voltage / output current / PID feedback / input and output terminal status / Heat sink temperature / Program Version / Fault Log.
	LED Status Indicator	Run / Stop / Forward / Reverse ,and etc.
<b>Protective Functions</b>	Overload Protection	The relays to protect the motor and the inverter. (150%/1min)
	Over voltage	·220V: >410V ,380V: >820V
	Under Voltage	·220V: <190V ,380V: <380V
	Momentary Power Loss Restart	Inverter auto-restart after a momentary power loss.
	Stall Prevention	Stall prevention for Acceleration/ Deceleration/ Operation.
	Short-circuit output terminal	Electronic Circuit Protection
	Grounding Fault	Electronic Circuit Protection

<b>Item</b>		EM16
<b>Control Mode</b>		V/F Control, Vector Control
	Other protection features	Protection for overheating of heat sink, The carrier frequency decreasing with the temperature function, fault output, reverse prohibit, prohibit for direct start after power up and error recovery, parameter lock up
	All frames include brake transistor	
<b>Communication control</b>		Standard built-in RS485 communication (Modbus), One to one or One to many control.
<b>Environment</b>	Operating temperature	-10~50°C (Note1)
	Storage temperature	-20~60°C
	Humidity	95% RH or less (no condensation) (Compliance with IEC 60068 - 2-78)
	Shock	20Hz or less 1G(9.8m/s <sup>2</sup> ) 20~50Hz 0.6G(5.88m/s <sup>2</sup> ) (Compliance with IEC 60068 - 2-6)
	Protection class	IP20/NEMA1/IP66/NEMA4X ( Depending on models)

Note1:

IP20 type:

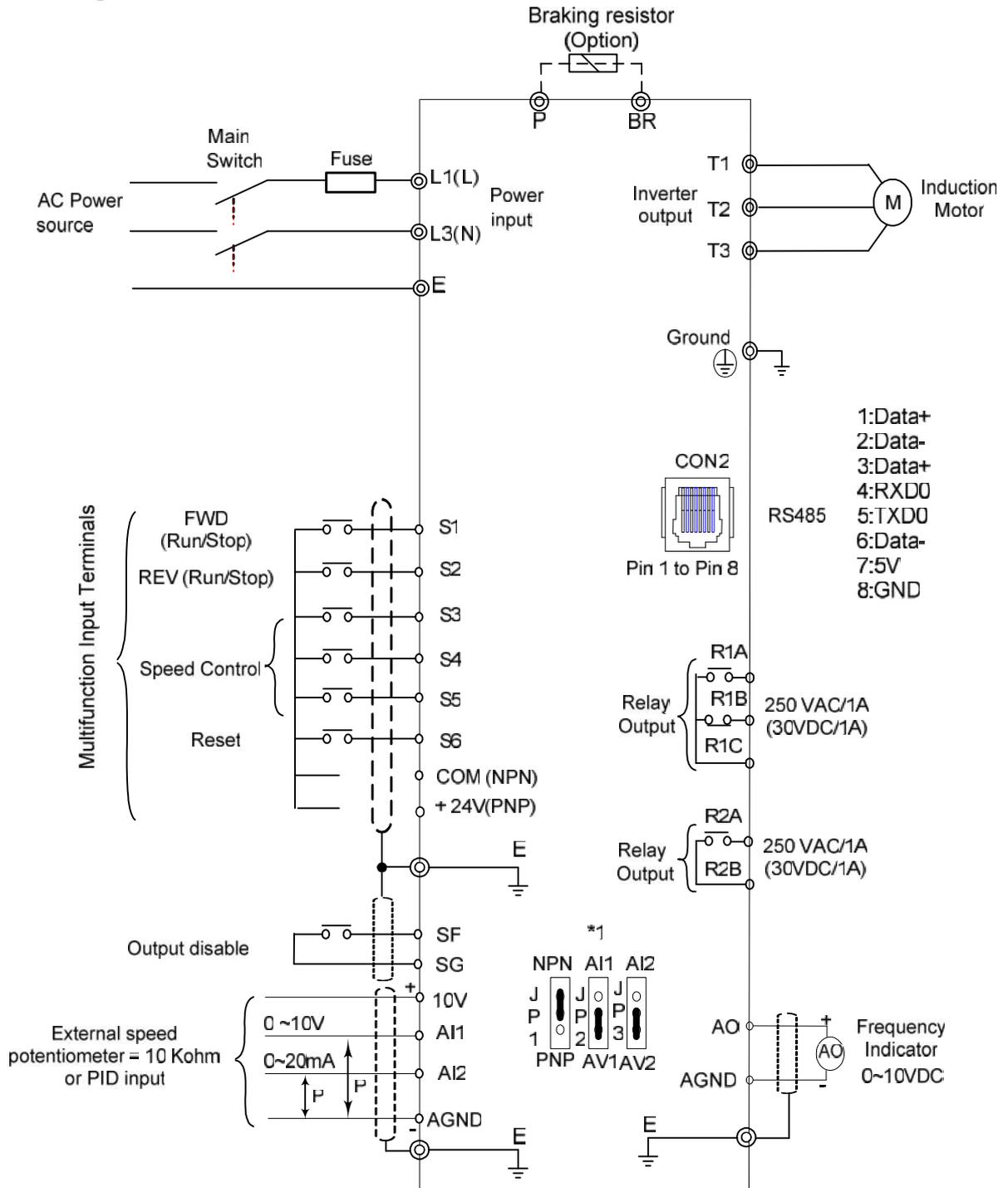
-10 ~ 50°C (without stick on type dust cover.)

-10 ~40°C (with stick on type dust cover.)

IP66 type: -10 ~ 50

## 2.3 Standard wiring

### 2.3.1 Single Phase:



Ⓜ Indicates shield wire ⓂP Indicates twisted-pair shield wire

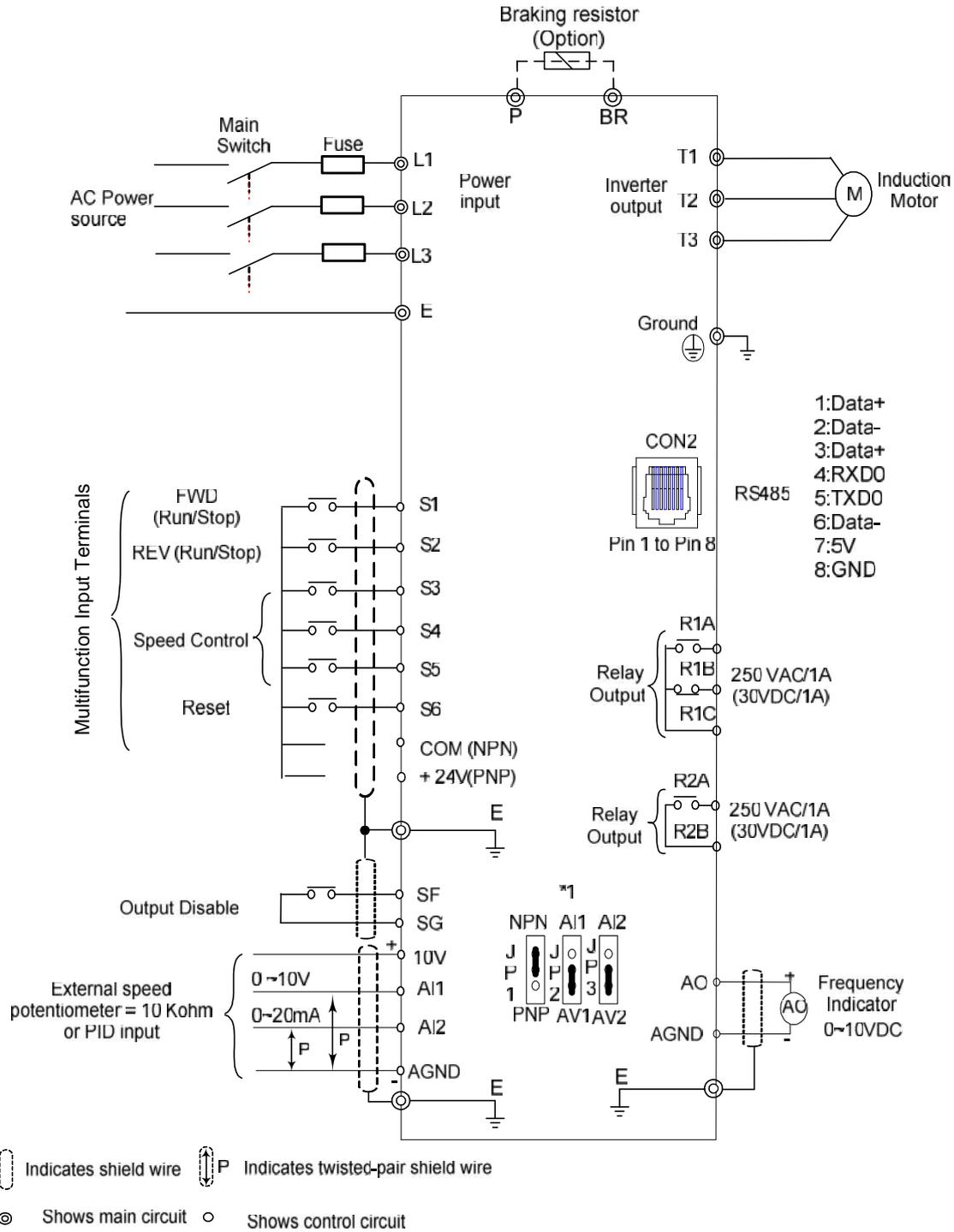
⊙ Shows main circuit ○ Shows control circuit

\*1: JP1:NPN/PNP selection, JP2:AI1 0~10V/0~20mA selection, JP3:AI2 0~10V/0~20mA selection

#### Models:

EM16-123-0037-F-...
EM16-123-0075-F-...
EM16-123-0150-F-...
EM16-123-0220-F-...

## 2.3.3 Three phase



\*1: JP1:NPN/PNP selection, JP2:AI1 0~10V/0~20mA selection, JP3:AI2 0~10V/0~20mA selection

### Models:

EM16-340-0075-F-...
EM16-340-0150-F-...
EM16-340-0220-F-...
EM16-340-0400-F-...
EM16-340-0550-F-...
EM16-340-0750-F-...
EM16-340-1100-F-...
EM16-340-1500-F-...
EM16-340-1850-F-...

## 2.4 Terminal Description

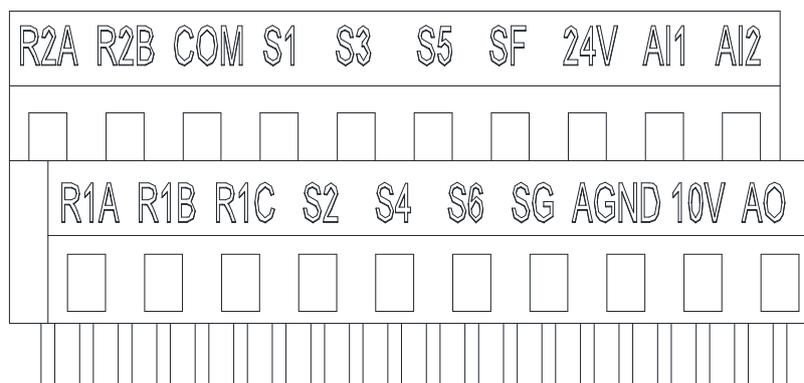
### 2.4.1 Description of main circuit terminals

Terminal symbols	TM1 Function Description
L1(L)	Main power input:single phase: L1(L)/L3(N) single/three phase:L1(L)/L2/L3(N) three phase:L1/L2/L3
L2	
L3(N)	
T1	Inverter output, connect to U/V/W terminals of motor
T2	
T3	
P	Braking resistor connection terminal: Used in applications when it is required to stop a high inertia load rapidly. (refer to specifications of the braking resistor)
BR	
	Ground terminal

## 2.4.2 Control circuit terminal description

Type	Terminal	Terminal function	Signal level
Digital input signal	S1	Forward Stop (Preset), Multi function input terminal	24 VDC, 8 mA, Optical coupling isolation(Max,voltage30 Vdc, Input impedance 3.3k )
	S2	Reverse Stop (Preset), Multi function input terminal	
	S3	Preset Speed0 (5-02),Multi function input terminal	
	S4	Preset Speed1 (5-03), Multi function input terminal	
	S5	Preset Speed2 (5-05), Multi function input terminal	
	S6	Fault reset input, Multi function input terminal	
Relay output	R1A	NO(Normally open)	250VAC/1A(30VDC/1A)
	R1B	NC(Normally closed)	
	R1C	COMMON	
	R2A		
	R2B		
24VPower supply	COM	Digital signal common terminal (JP1 Switching NPN position)	±15%,Max output current 60mA
	24V	Digital signal common terminal (JP1 Switching PNP position)	
The analog input signal	10V	Built in Power for an external speed potentiometer	10V(Max current: 20mA)
	A11	Multifunctional analog input: JP2 selects voltage or current input Voltage: JP2 in AV1 position Current: JP2 in A11 position	0 ~ 10V,(Max current: 20mA) (Input impedance: 153K )
	A12	Multifunctional analog input: JP3 selects voltage or current input Voltage: JP3 in AV2 position Current: JP3 in A12 position	0 ~ 10V,0 ~20mA (Input impedance: 153K )
	AGND	The analog common terminal	----
		Shielding wire connecting terminal (The earth)	----
The analog output signal	AO	Multifunctional analog output terminal*3	0 ~10V,(Max current:2mA)
	AGND	The analog common terminal	----
Safety switch	SF	Terminal SF is for output disable	
	SG		

### Control circuit terminals:



# 2.5 Outline Dimensions

mm

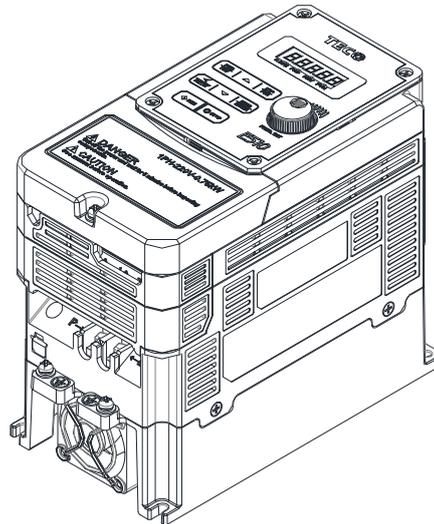
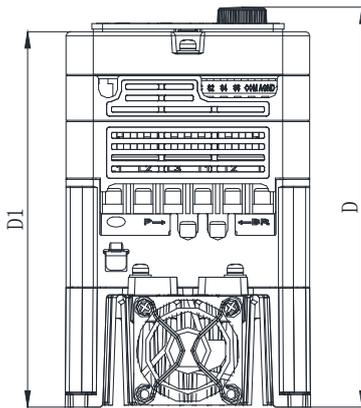
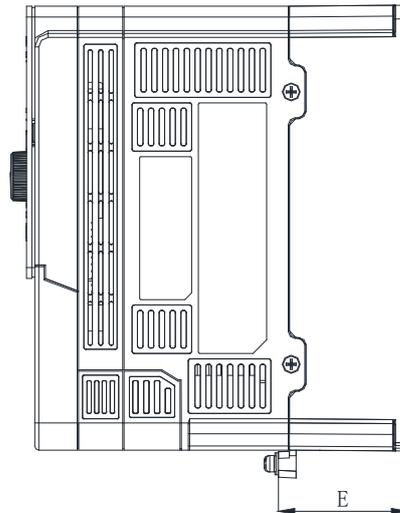
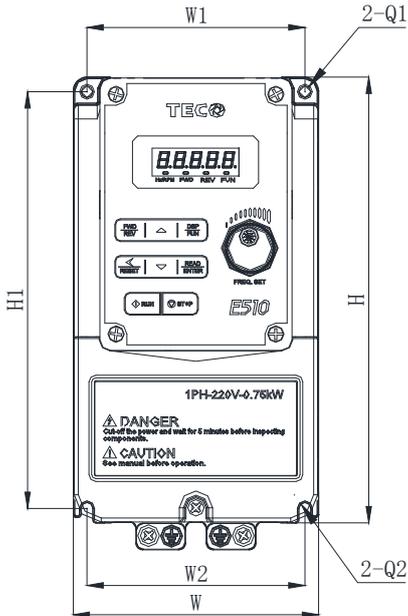
Tolerance Table				
1 ~ 10 ± 0.1	10 ~ 50 ± 0.2	50 ~ 100 ± 0.3	100 ~ 200 ± 0.5	200 ~ 400 ± 0.8

## 2.5.1 IP20 dimensions

### □ Frame1 (IP20)

Single phase: 230V 0.37~0.75 kW

Three phase: 400V 0.75~1.5 kW

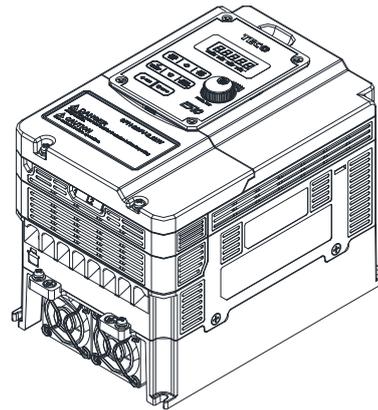
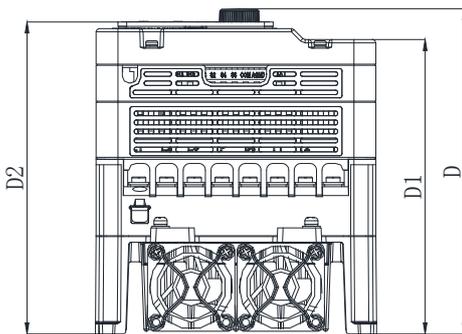
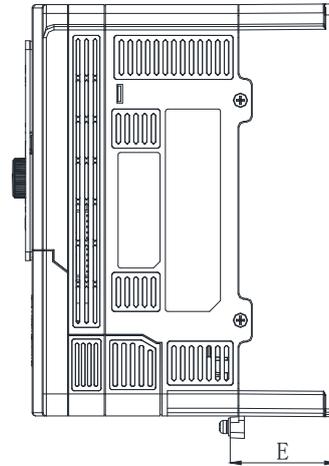
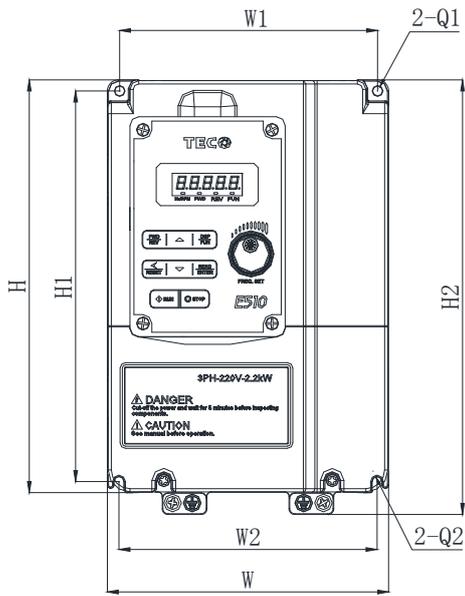


Model	Dimensions (mm)										N.W (Kg)
	W	W1	W2	H	H1	D	D1	E	Q1	Q2	
EM16-123-0037-F-20	90.6	80.5	80.5	163.6	153	149	137.8	48	4.3	4.3	1.7
EM16-123-0075-F-20											
EM16-340-0075-F-20											
EM16-340-0150-F-20											

## □ Frame2 (IP20)

Single phase: 230V 1.5~2.2 kW

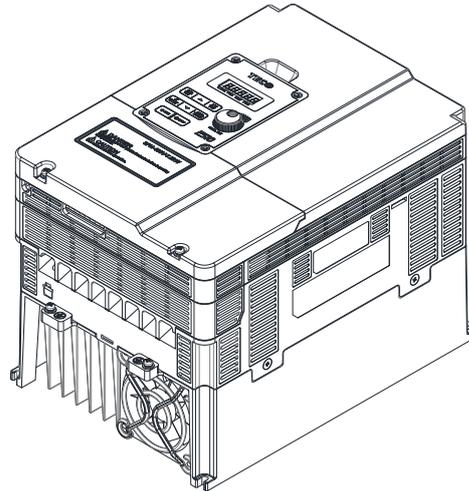
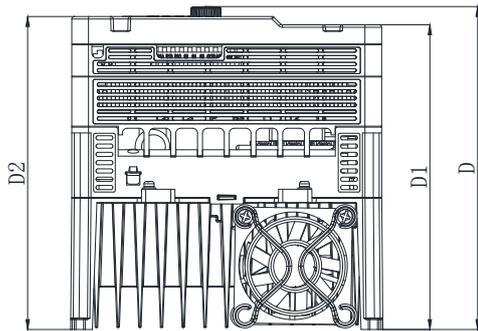
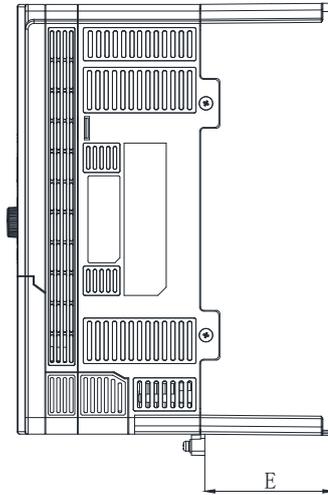
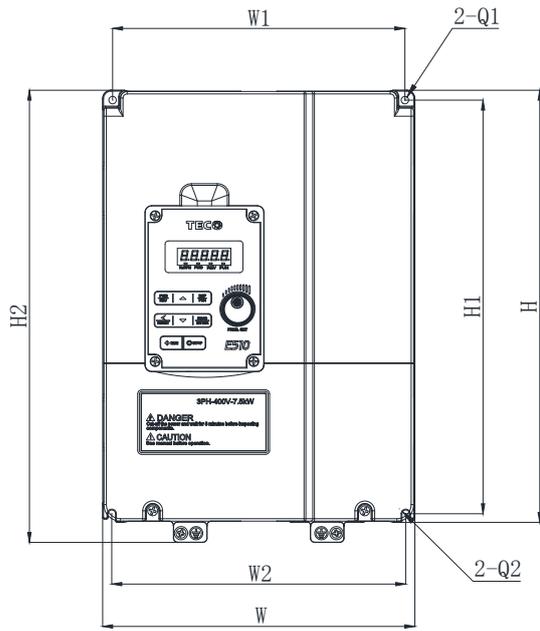
Three phase: 400V 2.2-4.0 kW



Model	Dimensions (mm)												N.W (Kg)
	W	W1	W2	H	H1	H2	D	D1	D2	E	Q1	Q2	
EM16-123-0150-F-20	128.7	118	118	187.6	177.6	197.5	150	133.8	141.8	48.2	4.5	4.5	2.5
EM16-123-0220-F-20													
EM16-340-0220-F-20													
EM16-340-0400-F-20													

# □ Frame3 (IP20)

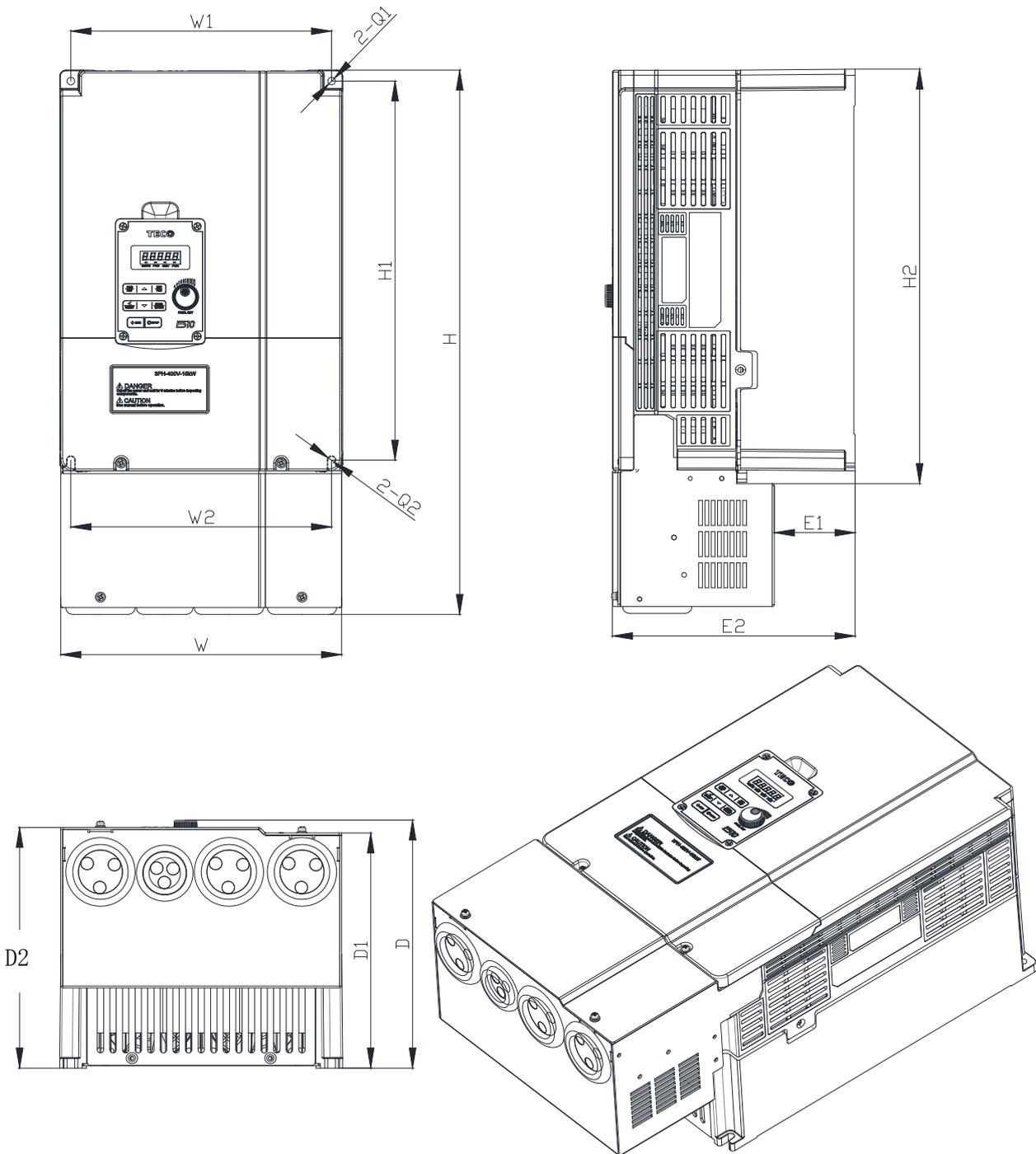
Three phase: 400V 5.5~11 kW



Model	Dimensions (mm)												N.W (Kg)
	W	W1	W2	H	H1	H2	D	D1	D2	E	Q1	Q2	
EM16-340-0550-F-20													
EM16-340-0750-F-20	186.9	175	176	260.9	249.8	273	197.2	184	189	76.7	4.5	4.5	6.7
EM16-340-1100-F-20													

## □ Frame4 (IP20)

Three phase: 400V 15~18.5 kW



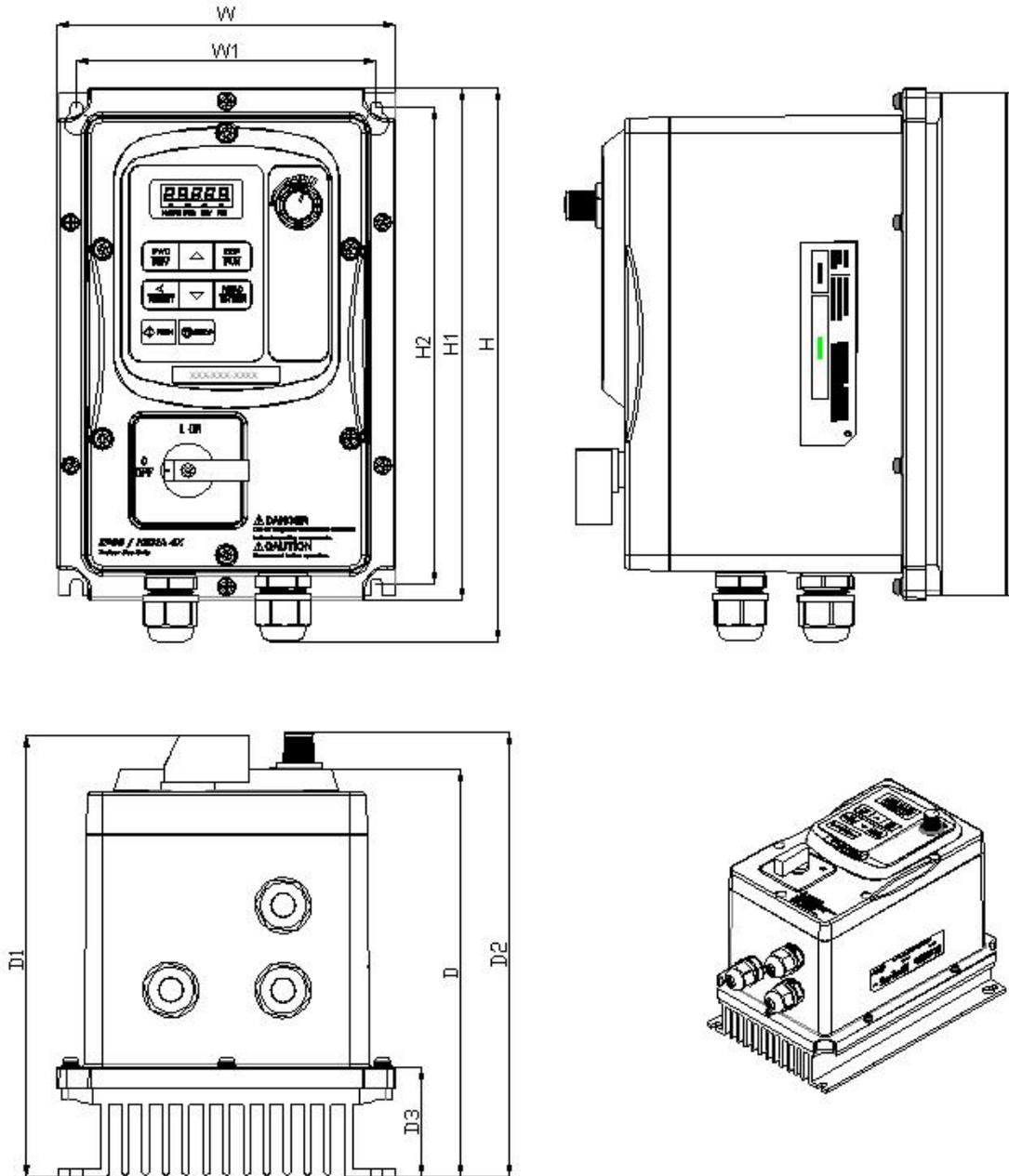
Model	Dimensions (mm)													N.W (Kg)
	W	W1	W2	H	H1	H2	D	D1	D2	E1	E2	Q1	Q2	
EM16-340-1500-F-20	224.6	207	20	436	303.5	330.9	200.7	187.5	192.5	64	192.5	6	6	13.7
EM16-340-1850-F-20														

## 2.5.2 IP66 dimensions

### □ Frame 1 (IP66)

Single phase : 230V 0.37~0.75 kW

Three phase: 400V 0.75~1.5 kW

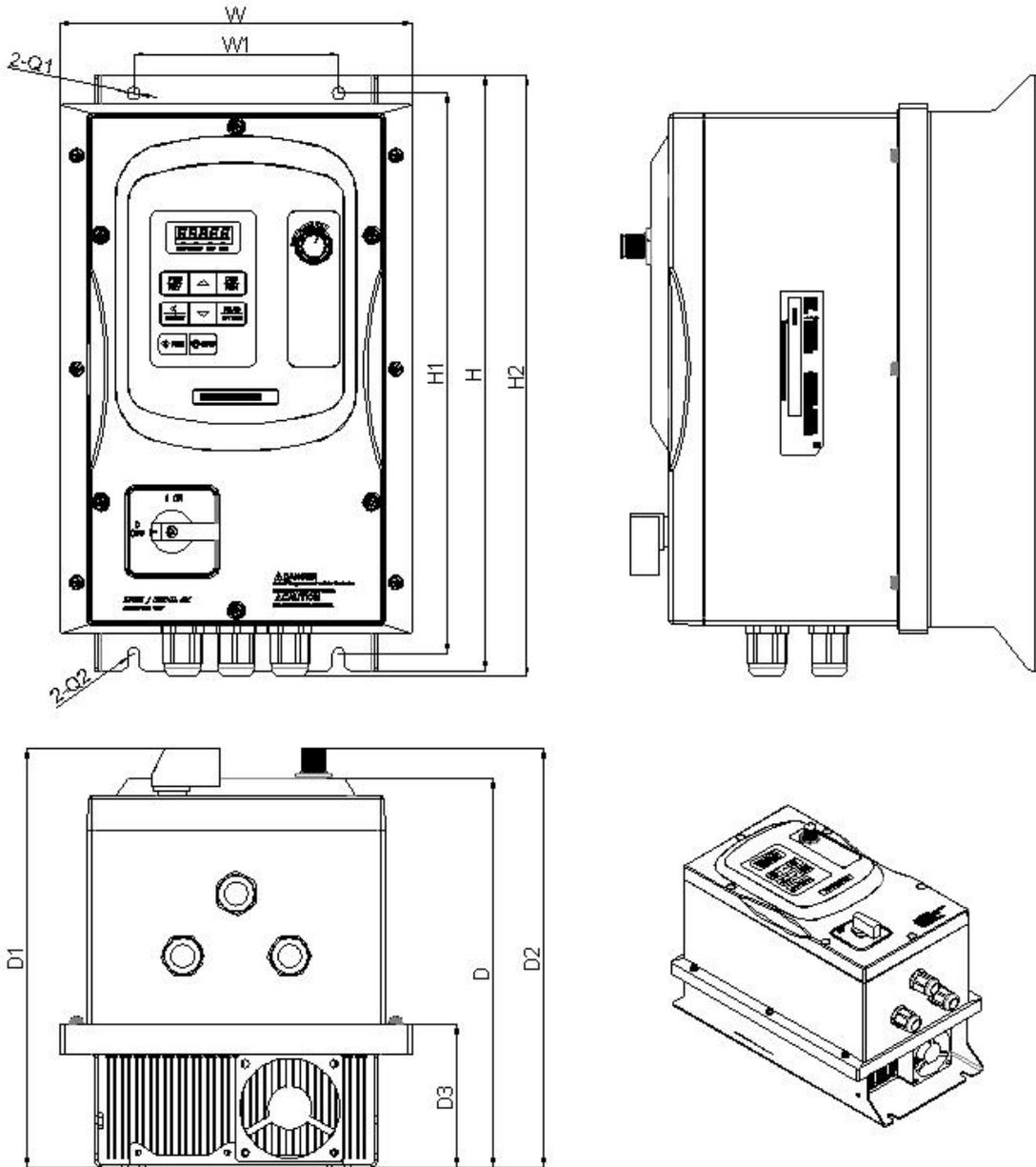


Model	Dimensions (mm)												N.W (Kg)
	W	W1	H	H1	H2	D	D1	D2	D3	Q1	Q2	Q3	
EM16-123-0037-F-66-S	150.8	133.3	248.7	230.2	214.2	183	200	200	49.5	5.4	5.4	10.6	2.9
EM16-123-0075-F-66-S													
EM16-340-0075-F-66-S													
EM16-340-0150-F-66-S													

□ **Frame 2 (IP66)**

**Single phase : 230V 1.5~2.2 kW ;**

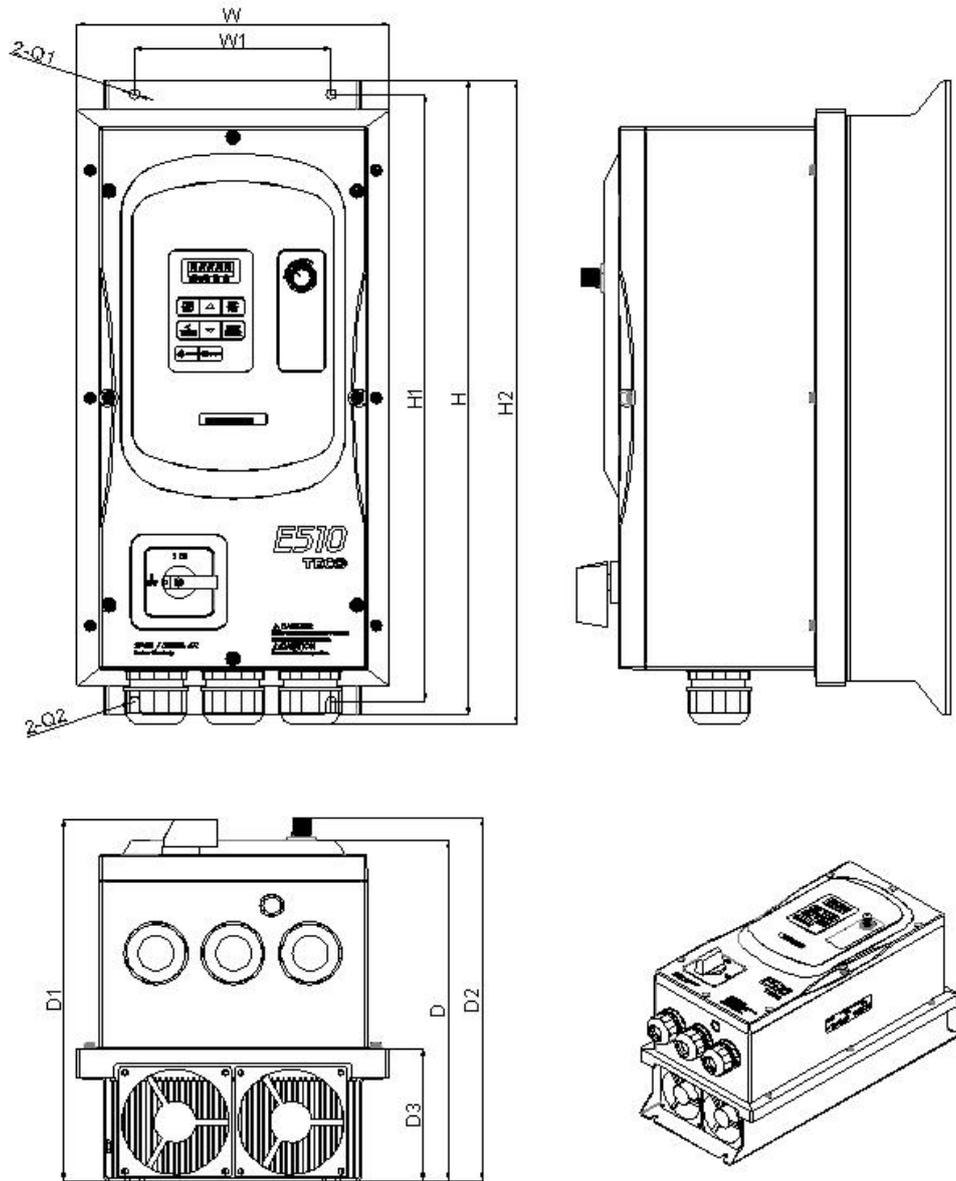
**Three phase: 400V 2.2~4 kW ;**



Model	Dimensions (mm)											N.W (kg)
	W	W1	H	H1	H2	D	D1	D2	D3	Q1	Q2	
EM16-123-0150-F-66-S	198	115	335	315	337.9	218.4	235.2	235.2	79.8	7	7	5.98
EM16-123-0220-F-66-S												
EM16-340-0220-F-66-S												
EM16-340-0400-F-66-S												

□ Frame 3 (IP66)

Three phase: 400V 5.5~18.5 kW

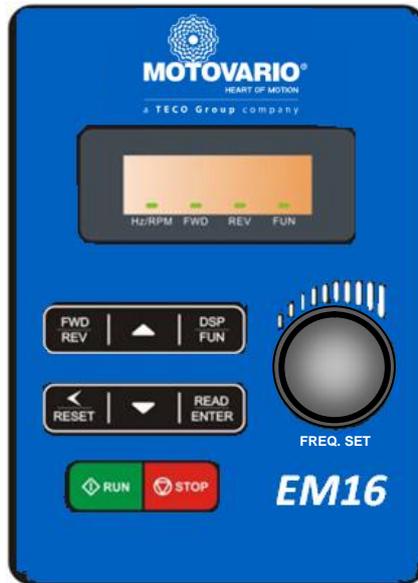


Model	Dimensions (mm)											N.W (kg)
	W	W1	H	H1	H2	D	D1	D2	D3	Q1	Q2	
EM16-340-0550-F-66-S	222.8	140	460	440	466.3	246.6	266.5	263.5	96	7	7	12.68
EM16-340-0750-F-66-S												
EM16-340-1100-F-66-S												

# Chapter 3 Software Index

## 3.1 Keypad Description

### 3.1.1 Operator Panel Functions



Type	Item	Function
Digital display & LEDs	Main digital displays	Frequency Display, Parameter, voltage, Current, Temperature , Fault messages.
	LED Status	Hz/RPM: ON when the frequency or line speed is displayed. OFF when the parameters are displayed. FWD: ON while the inverter is running forward. Flashes while stopped. REV: ON while the inverter is running reverse. Flashes while stopped. FUN: ON when the parameters are displayed. OFF when the frequency is displayed.
Variable Resistor	FREQ SET	Used to set the frequency
Keys On Keypad (8 buttons)	RUN	RUN: Run at the set frequency.
	STOP	STOP: Decelerate or Coast to Stop.
		Increment parameter number and preset values.
		Decrement parameter number and preset values.
	FWD/REV (Dual function keys)	FWD: Forward Run REV: Reverse Run
	DSP/FUN (Dual function keys)	DSP: Switch between available displays FUN: Used to examine the parameter content
	READ/ENTER (Dual function keys)	READ: ENTER: Used to display the preset value of parameters and for saving the changed parameter values.
	</ RESET (Dual function keys)	<“Left Shift: used while changing the parameters or parameter values RESET: Use to Reset alarms or resettable faults

## 3.2 Programmable Parameter Groups

Parameter Group No.	Description
Group 00	Basic parameters
Group 01	V/F Pattern selections & setup
Group 02	Motor parameters
Group 03	Multi function digital Inputs/Outputs
Group 04	Analog signal inputs/ Analog output
Group 05	Preset Frequency Selections.
Group 06	Auto Run function (Auto Sequencer)
Group 07	Start/Stop command setup
Group 08	Drive and motor Protection
Group 09	Communication function setup
Group 10	PID function setup
Group 11	Performance control functions
Group 12	Digital Display & Monitor functions
Group 13	Inspection & Maintenance functions
Group 14	PLC Setting function
Group 15	PLC Monitoring function

Parameter notes for Parameter Groups	
*1	Parameter can be adjusted during running mode
*2	Cannot be modified in communication mode
*3	Does not change with factory reset
*4	Read only
*5	Available for above V1.1
*6	Available for above V1.3
*7	Available for above V1.7

Group 00- Basic parameters					
No.	Description	Range	Factory Setting	Unit	Note
00-00	Control Mode Selection	0:V/F Mode	0	-	
		1:Vector Mode			
00-01	Reserved				
00-02	Main Run Command Source Selection	0:Keypad	0	-	
		1:External Run/Stop Control			
		2:Communication			
		3:PLC			
00-03	Alternative Run Command Source Selection	0:Keypad	0	-	
		1:External Run/Stop Control			
		2:Communication			
00-04	Operation Modes for External Terminals	0:Forward/Stop-Reverse/Stop	0	-	
		1:Run/Stop- Reverse/Forward			
		2:3 Wire Control Mode-Run/Stop			
00-05	Main Frequency Command Source Selection	0:UP/DOWN of Keypad	0	-	
		1:Potentiometer on Keypad			
		2:External AI1Analog Signal Input			
		3:External AI2 Analog Signal Input			
		4:External Up/Down Frequency Control			
		5:Communication Setting Frequency			
		6:PID Ouput Frequency			
		7:Pulse Input			
					*6
00-06	Alternative Frequency Command Source Selection	0:UP/DOWN of Keypad	4	-	
		1:Potentiometer on Keypad			
		2:External AI1Analog Signal Input			
		3:External AI2 Analog Signal Input			
		4:External Up/Down Frequency Control			
		5:Communication Setting Frequency			
		6:PID Ouput Frequency			
		7:Pulse Input			
					*6
00-07	Main and Alternative Frequency Command Modes	0:Main or Alternative Frequency 1:Main Frequency+ Alternative Frequency	0	-	
00-08	Communication Frequency Command	0.00~599.00	0.00	Hz	*4
00-09	Frequency Command Save on Power Down	0: Disable	0	-	
		1: Enable			
00-10	Initial Frequency Selection (keypad mode)	0:by Current Frequency Command	0	-	
		1:by 0 Frequency Command			
		2:by 00-11			
00-11	Initial Frequency Setpoint	0.00~599.00	50.00/60.00	Hz	
00-12	Frequency Upper Limit	0.01~599.00	50.00/60.00	Hz	
00-13	Frequency Lower Limit	0.00~598.99	0.00	Hz	
00-14	Acceleration Time 1	0.1~3600.0	10.0	Sec	*1
00-15	Deceleration Time 1	0.1~3600.0	10.0	Sec	*1
00-16	Acceleration Time 2	0.1~3600.0	10.0	Sec	*1
00-17	Deceleration Time 2	0.1~3600.0	10.0	Sec	*1
00-18	Jog Frequency	0.00~599.00	2.00	Hz	*1*7
00-19	Jog Acceleration Time	0.1~3600.0	0.5	Sec	*1*7
00-20	Jog Deceleration Time	0.1~3600.0	0.5	Sec	*1*7

Group 01- V/F Pattern selection & Setup					
No.	Description	Range	Factory Setting	Unit	Note
01-00	Volts/Hz Patterns	0~18	0/9	-	
01-01	V/F Max voltage	200V:170.0~264.0 400V:323.0~528.0	220.0/440.0	Vac	
01-02	Base Frequency	0.20 ~ 599.00	50.00/60.00	Hz	
01-03	Max Frequency Voltage Ratio	0.0 ~ 100.0	100.0	%	
01-04	Mid Frequency 2	0.10 ~ 599.00	25.00/30.00	Hz	
01-05	Mid Frequency Voltage Ratio 2	0.0 ~ 100.0	50.0	%	
01-06	Mid Frequency 1	0.10 ~ 599.00	10.00/12.00	Hz	
01-07	Mid Frequency Voltage Ratio 1	0.0 ~ 100.0	20.0	%	
01-08	Min Frequency	0.10 ~ 599.00	0.50/0.60	Hz	
01-09	Min Frequency Voltage Ratio	0.0 ~ 100.0	1.0	%	
01-10	Volts/Hz Curve Modification (Torque Boost)	0 ~ 10.0	0.0	%	*1
01-11	V/F start Frequency	0.00~10.00	0.00	Hz	
01-12	Slip compensation gain	0.05~10.00	0.10	S	
01-13	V/F Mode Select	0 : Mode 0 1 : Mode 1	by models	-	*7

Group 02- Motor parameters					
No.	Description	Range	Factory Setting	Unit	Note
02-00	Motor No Load Current	0~[(Parameter 02-01)-0.1]	-	Amps(AC)	*3
02-01	Motor Rated Current (OL1)	0.2~100	-	A	*3
02-02	Motor rated Slip Compensation	0.0 ~ 200.0	0.0	%	*1
02-03	Motor rated speed	0~39000	-	Rpm	*3
02-04	Motor rated voltage	200V: 170.0~264.0 400V: 323.0~528.0	220.0/440.0	V	
02-05	Motor rated power	0.1~37.0	-	KW	
02-06	Motor rated frequency	0~599.0	50.0/60.0	Hz	
02-07	Motor pole number	2 ~16	4	-	
02-08 ~ 02-13	Reserved				
02-14	Auto Tune	0: Disable 1: Start Auto tune function.	0		
02-15	Stator resistance gain	----			*3*4
02-16	Rotor resistance gain	----			*3*4

Group 03- External Digital Inputs and Relay Output Functions					
No.	Description	Range	Factory Setting	Unit	Note
03-00	Multifunction Input Term. S1	0:Forward/Stop Command	0	-	
03-01	Multifunction Input Term. S2	1:Reverse/Stop Command	1	-	
03-02	Multifunction Input Term. S3	2:Speed Selection 1	2	-	
03-03	Multifunction Input Term. S4	3:Speed Selection 2	3	-	
03-04	Multifunction Input Term. S5	4:Speed Selection 3	4	-	
03-05	Multifunction Input Term. S6	5:Speed Selection 4	17		
		6:Jog Forward Command			
		7:Jog Reverse Command			
		8:Up Command			
		9:Down Command			
		10:Acc/Dec 2			
		11:Acc/Dec Disabled			
		12:Main/Alternative run source select			
		13:Main/ Alternative Frequency Command select			
		14: Rapid Stop ( Decel to stop )			
		15: Base Block			
		16: Disabl PID Function			
		17: Fault Reset			
		18:Auto Run Mode Enable			
		19:Speed Search			
20:Energy Saving (only V/F)					
21:Reset PID integral value to Zero					
22:Counter Input					
23:Counter Reset					
24:PLC Input					
25:Pulse Input-Width Measure (S3)		*6			
26:Pulse Input-Frequenct Measure (S3)		*6			
27:Enable KEB Function					
28:Fire mode function		*5			
03-06	Up/Down frequency step	0.00~5.00	0.00	Hz	
03-07	Up/Down Keep Frequency Status after Stop Command	0: When Up/Down is used, the preset frequency is held as the inverter stops, and the UP/Down function is disabled	0	-	
		1:When Up/Down is used, the preset frequency is reset to 0 Hz as the inverter stops.			
		2:When Up/Down is used, the preset frequency is held as the inverter stops, and the UP/Down is available.			
03-08	S1 ~ S6 scan confirmation	1~200 Number of Scan cycles	10	2ms	
03-09	S1~ S5 switch type select	xxxx0:S1 NO xxx1:S1 NC	00000	-	
		xxx0x:S2 NO xxx1x:S2 NC			
		xx0xx:S3 NO xx1xx:S3 NC			
		x0xxx:S4 NO x1xxx:S4 NC			
		0xxxx:S5 NO 1xxxx:S5 NC			
03-10	S6 switch type select	xxxx0:S6 NO xxxx1:S6 NC	00000	-	
03-11	Output Relay RY1	0:Run	0	-	

Group 03- External Digital Inputs and Relay Output Functions					
No.	Description	Range	Factory Setting	Unit	Note
	( Terminals R1A,R1B, R1C )				
03-12	Output Relay RY2. ( Terminals R2A, R2B )	1:Fault	1		
		2:Output Frequency Reached			
		3:Output Frequency Reached within Preset Range (3-13±3-14)			
		4:Output Frequency Detection1 (> 3-13)			
		5:Output Frequency Detection2 (< 3-13)			
		6:Auto Restart			
		7:Momentary AC Power Loss			
		8:Rapid Stop			
		9:Base Block			
		10:Motor Overload Protection(OL1)			
		11:Drive Overload Protection(OL2)			
		12: Over-torque Threshold Level (OL3)			
		13:Preset Output Current Reached (03-15~16)			
		14: Brake Control (03-17~18)			
		15: PID Feedback Signal Loss			
		16: Single pre-set count (3-22)			
		17: Dual pre-set count (3-22~23)			
		18:PLC Status Indicator (00-02)			
		19:PLC control			
		20:Zero Speed			
03-13	Preset Frequency Reached Level	0.00~599.00	0.00	Hz	*1
03-14	Frequency Reached Detection Range (±)	0.00~30.00	2.00	Hz	*1
03-15	Preset output current reached	0.1~15.0	0.1	A	
03-16	Preset output Current detection delay Time	0.1~10.0	0.1	Sec	
03-17	Brake Release level	0.00~20.00	0.00	Hz	
03-18	Brake Engage Level	0.00~20.00	0.00	Hz	
03-19	Relay Output function type	0:A (Normally open) 1:B (Normally close)	0	-	
03-20	Internal / external multi-function input terminal selection	0~63	0	-	
03-21	Action to set the internal multi-function input terminals	0~63	0	-	
03-22	Pre-set count 1	0~9999	0	-	
03-23	Pre-set count 2	0~9999	0	-	
03-24	Output under current detection	0:Disable	0	-	
		1:Enable			
03-25	Output under current detection level	5%~100%	20%	%	
03-26	Output under current detection delay time	0.0~50.0s	20.0	Sec	
03-27	Pulse Frequency	0.01~0.20	0.1	kHz	*7
03-28	Pulse Frequency Gain	0.01~9.99	1.00		*6

※ “NO” indicates normally open, “NC” indicates normally closed.

Group 04- Analog signal inputs / Analog output					
No.	Description	Range	Factory Setting	Unit	Note
04-00	Analog Input Signal Type Select (AI1/AI2)	AI1 AI2	1	-	*7
		(0): 0~10V (0~20mA) 0~10V (0~20mA)			
		(1): 0~10V (0~20mA) 2~10V (4~20mA)			
		(2): 2~10V (4~20mA) 0~10V (0~20mA)			
	(3): 2~10V (4~20mA) 2~10V (4~20mA)				
04-01	AI1 Signal Verification Scan Rate	1~200	50	2ms	
04-02	AI1 Gain	0 ~ 1000	100	%	*1
04-03	AI1 Bias	0 ~ 100	0	%	*1
04-04	AI1 Bias Selection	0: Positive 1: Negative	0	-	*1
04-05	AI1 Slope	0: Positive 1: Negative	0	-	*1
04-06	AI2 Signal Verification Scan Rate	1~200	50	2ms	
04-07	AI2 Gain	0 ~ 1000	100	%	*1
04-08	AI2 Bias	0 ~ 100	0	%	*1
04-09	AI2 Bias Selection	0: Positive 1: Negative	0	-	*1
04-10	AI2 Slope	0: Positive 1: Negative	0	-	*1
04-11	Analog Output (AO) Mode	0: Output Frequency 1: Frequency Command 2: Output Voltage 3: DC Bus Voltage 4: Motor Current (100% rated current)	0	-	*1
04-12	Analog Output (AO) Gain	0 ~ 1000	100	%	*1
04-13	Analog Output (AO) Bias	0 ~ 100	0	%	*1
04-14	AO Bias Selection	0: Positive 1: Negative	0	-	*1
04-15	AO Slope	0: Positive 1: Negative	0	-	*1
04-16	F-Gain Function	0: Invalid 1: Effective	0	-	*1

Group 05- Preset Frequency Selections					
No.	Description	Range	Factory Setting	Unit	Note
05-00	Preset Speed Control Mode Selection	0: Common Accel/Decel Accel/Decel 1 or 2 apply to all speeds	0	-	
		1: Individual Accel/Decel for each preset speed 0-15 apply to the selected preset speeds (Acc0/Dec0~Acc15/Dec15)			
05-01	Preset Speed 0 (Keypad Freq)	0.00 ~ 599.00	5.00	Hz	
05-02	Preset Speed1 (Hz)		5.00	Hz	*1
05-03	Preset Speed2 (Hz)		10.00	Hz	*1
05-04	Preset Speed3 (Hz)		20.00	Hz	*1
05-05	Preset Speed4 (Hz)		30.00	Hz	*1
05-06	Preset Speed5 (Hz)		40.00	Hz	*1
05-07	Preset Speed6 (Hz)		50.00	Hz	*1
05-08	Preset Speed7 (Hz)		50.00	Hz	*1
05-09	Preset Speed8 (Hz)		0.00	Hz	*1
05-10	Preset Speed9 (Hz)		0.00	Hz	*1
05-11	Preset Speed10 (Hz)		0.00	Hz	*1
05-12	Preset Speed11 (Hz)		0.00	Hz	*1
05-13	Preset Speed12 (Hz)		0.00	Hz	*1
05-14	Preset Speed13 (Hz)		0.00	Hz	*1
05-15	Preset Speed14 (Hz)		0.00	Hz	*1
05-16	Preset Speed15 (Hz)		0.00	Hz	*1
05-17	Preset Speed0-Acctime		0.1 ~ 3600.0	10.0	Sec
05-18	Preset Speed0-Dectime	10.0		Sec	*1
05-19	Preset Speed1-Acctime	10.0		Sec	*1
05-20	Preset Speed1-Dectime	10.0		Sec	*1
05-21	Preset Speed2-Acctime	10.0		Sec	*1
05-22	Preset Speed2-Dectime	10.0		Sec	*1
05-23	Preset Speed3-Acctime	10.0		Sec	*1
05-24	Preset Speed3-Dectime	10.0		Sec	*1
05-25	Preset Speed4-Acctime	10.0		Sec	*1
05-26	Preset Speed4-Dectime	10.0		Sec	*1
05-27	Preset Speed5-Acctime	10.0		Sec	*1
05-28	Preset Speed5-Dectime	10.0		Sec	*1
05-29	Preset Speed6-Acctime	10.0		Sec	*1
05-30	Preset Speed6-Dectime	10.0		Sec	*1
05-31	Preset Speed7-Acctime	10.0		Sec	*1
05-32	Preset Speed7-Dectime	10.0		Sec	*1
05-33	Preset Speed8-Acctime	10.0		Sec	*1
05-34	Preset Speed8-Dectime	10.0		Sec	*1
05-35	Preset Speed9-Acctime	10.0		Sec	*1
05-36	Preset Speed9-Dectime	10.0		Sec	*1
05-37	Preset Speed10-Acctime	10.0		Sec	*1
05-38	Preset Speed10-Dectime	10.0		Sec	*1
05-39	Preset Speed11-Acctime	10.0		Sec	*1
05-40	Preset Speed11-Dectime	10.0		Sec	*1
05-41	Preset Speed12-Acctime	10.0		Sec	*1
05-42	Preset Speed12-Dectime	10.0		Sec	*1

Group 05- Preset Frequency Selections					
No.	Description	Range	Factory Setting	Unit	Note
05-43	Preset Speed13-Acctime		10.0	Sec	*1
05-44	Preset Speed13-Dectime		10.0	Sec	*1
05-45	Preset Speed14-Acctime		10.0	Sec	*1
05-46	Preset Speed14-Dectime		10.0	Sec	*1
05-47	Preset Speed15-Acctime		10.0	Sec	*1
05-48	Preset Speed15-Dectime		10.0	Sec	*1

Group 06- Auto Run Function (Auto Sequencer)					
No.	Description	Range	Factory Setting	Unit	Note
06-00	Auto Run Mode Selection (Sequencer)	0: Disabled. 1: Single cycle. (Continues to run from the Unfinished step if restarted). 2: Periodic cycle. (Continues to run from the unfinished step if restarted). 3: Single cycle, then holds the speed Of final step to run. (Continues to run from the unfinished step if restarted). 4: Single cycle. (Starts a new cycle if restarted). 5: Periodic cycle. (Starts a new cycle if restarted). 6: Single cycle, then hold the speed of final step to run. (Starts a new cycle if restarted).	0	-	
06-01	Auto _ Run Mode Frequency Command 1	0.00~599.00	0.00	Hz	*1
06-02	Auto _ Run Mode Frequency Command 2		0.00	Hz	*1
06-03	Auto _ Run Mode Frequency Command 3		0.00	Hz	*1
06-04	Auto _ Run Mode Frequency Command 4		0.00	Hz	*1
06-05	Auto _ Run Mode Frequency Command 5		0.00	Hz	*1
06-06	Auto _ Run Mode Frequency Command 6		0.00	Hz	*1
06-07	Auto _ Run Mode Frequency Command 7		0.00	Hz	*1
06-08	Auto _ Run Mode Frequency Command 8		0.00	Hz	*1
06-09	Auto _ Run Mode Frequency Command 9		0.00	Hz	*1
06-10	Auto _ Run Mode Frequency Command10		0.00	Hz	*1
06-11	Auto _ Run Mode Frequency Command		0.00	Hz	*1

Group 06- Auto Run Function (Auto Sequencer)					
No.	Description	Range	Factory Setting	Unit	Note
	11				
06-12	Auto_ Run Mode Frequency Command 12		0.00	Hz	*1
06-13	Auto_ Run Mode Frequency Command 13		0.00	Hz	*1
06-14	Auto_ Run Mode Frequency Command 14		0.00	Hz	*1
06-15	Auto_ Run Mode Frequency Command 15		0.00	Hz	*1
06-16	Auto_ Run Mode Running Time Setting 0	0.0 ~ 3600.0	0.0	Sec	
06-17	Auto_ Run Mode Running Time Setting 1		0.0	Sec	
06-18	Auto_ Run Mode Running Time Setting 2		0.0	Sec	
06-19	Auto_ Run Mode Running Time Setting 3		0.0	Sec	
06-20	Auto_ Run Mode Running Time Setting 4		0.0	Sec	
06-21	Auto_ Run Mode Running Time Setting 5		0.0	Sec	
06-22	Auto_ Run Mode Running Time Setting 6		0.0	Sec	
06-23	Auto_ Run Mode Running Time Setting 7		0.0	Sec	
06-24	Auto_ Run Mode Running Time Setting 8		0.0	Sec	
06-25	Auto_ Run Mode Running Time Setting 9		0.0	Sec	
06-26	Auto_ Run Mode Running Time Setting 10		0.0	Sec	
06-27	Auto_ Run Mode Running Time Setting 11		0.0	Sec	
06-28	Auto_ Run Mode Running Time Setting 12		0.0	Sec	
06-29	Auto_ Run Mode Running Time Setting 13		0.0	Sec	
06-30	Auto_ Run Mode Running Time Setting 14		0.0	Sec	
06-31	Auto_ Run Mode			0.0	Sec

Group 06- Auto Run Function (Auto Sequencer)					
No.	Description	Range	Factory Setting	Unit	Note
	Running Time Setting 15				
06-32	Auto_ Run Mode Running Direction 0	0: Stop 1: Forward 2: Reverse	0	-	
06-33	Auto_ Run Mode Running Direction 1		0	-	
06-34	Auto_ Run Mode Running Direction 2		0	-	
06-35	Auto_ Run Mode Running Direction 3		0	-	
06-36	Auto_ Run Mode Running Direction 4		0	-	
06-37	Auto_ Run Mode Running Direction 5		0	-	
06-38	Auto_ Run Mode Running Direction 6		0	-	
06-39	Auto_ Run Mode Running Direction 7		0	-	
06-40	Auto_ Run Mode Running Direction 8		0	-	
06-41	Auto_ Run Mode Running Direction 9		0	-	
06-42	Auto_ Run Mode Running Direction10		0	-	
06-43	Auto_ Run Mode Running Direction 11		0	-	
06-44	Auto_ Run Mode Running Direction12		0	-	
06-45	Auto_ Run Mode Running Direction13		0	-	
06-46	Auto_ Run Mode Running Direction 14		0	-	
06-47	Auto_ Run Mode Running Direction 15	0	-		

Frequency of the step 0 is set by parameter 05-01, keypad frequency.

Group 07- Start/Stop Command Setup					
No.	Description	Range	Factory Setting	Unit	Note
07-00	Momentary Power Loss and Restart	0: Momentary Power Loss and Restart Disable 1: Momentary Power Loss and Restart Enable	0	-	
07-01	Auto Restart Delay Time	0.0~800.0	0.0	Sec	
07-02	Number of Auto Restart Attempts	0~10	0	-	
07-03	Reset Mode Setting	0: Enable Reset Only when Run Command is Off 1: Enable Reset when Run Command is On or Off	0	-	

Group 07- Start/Stop Command Setup					
No.	Description	Range	Factory Setting	Unit	Note
07-04	Direct Running on Power Up	0: Enable Direct run on power up 1: Disable Direct run on power up	1	-	
07-05	Delay-ON Timer	1.0~300.0	1.0	Sec	
07-06	DC Injection Brake Start Frequency	0.10 ~ 10.00	1.5	Hz	
07-07	DC Injection Brake Level (Current Mode)	0.0 ~ 150.0	50.0	%	
07-08	DC Injection Brake Time	0.0 ~ 25.5	0.5	Sec	
07-09	Stopping Method	0: Deceleration to stop 1: Coast to stop	0	-	
07-10	Starting Methods	0: Normal Start    1: Speed Search	0	-	
07-11	Starting method for auto restart after fault	0: Speed Search    1: Normal start	0	-	
07-12	Power Loss Ride Through Time	0.0 ~ 2.0	0.5	Sec	
07-13	Main Circuit Low Voltage Detection Level	150.0~210.0    300.0~420.0	190.0/3 80.0	Vac	
07-14	Kinetic Energy Back-up Deceleration Time	0.0~25.0: KEB Deceleration Time	0.0	Sec	
07-15	DC Injection Brake Mode	0: Current Mode    1 : Voltage Mode	1	-	*6
07-16	DC Injection Brake Level (Voltage Mode)	0.0~10.0	4.0	-	*6

Group 08- Drive & Motor Protection Functions					
No.	Description	Range	Factory Setting	Unit	Note
08-00	Trip Prevention Selection	xxxx0: Enable Trip Prevention During Acceleration xxxx1: Disable Trip Prevention During Acceleration xxx0x: Enable Trip Prevention During Deceleration xxx1x: Disable Trip Prevention During Deceleration xx0xx: Enable Trip Prevention in Run Mode xx1xx: Disable Trip Prevention in Run Mode x0xxx: Enable Over Voltage Prevention in Run Mode x1xxx: Disable Over Voltage Prevention in Run Mode	01000	-	*5
08-01	Trip Prevention Level During Acceleration (%)	50 ~ 200	200	% <sup>1</sup>	
08-02	Trip Prevention Level During Deceleration (%)	50 ~ 200	200		
08-03	Trip Prevention Level in Run Mode (%)	50 ~ 200	200		
08-04	Over Voltage Prevention	350.0~390.0/700.0~780.0	380.0/7 60.0	VD C	

<sup>1</sup> Base on the percentage of inverter rated current.

Group 08- Drive & Motor Protection Functions					
No.	Description	Range	Factory Setting	Unit	Note
	Level in Run Mode				
08-05	Electronic Motor Overload Protection Operation Mode	0: Disable 1: Enable	1	-	*7
08-06	Operation After Overload Protection is Activated	0: Coast-to-Stop After Overload Protection is Activated 1: Drive Will Not Trip when Overload Protection is Activated (OL1)	0	-	
08-07	Over Heat Protection (cooling fan control)	0: Auto (Depends on temp.) 1: Operate while in RUN Mode 2: Always Run 3: Disabled	1	-	
08-08	AVR Function (Auto Voltage Regulation)	0: AVR Function Enable	4	-	*5
		1: AVR Function Disable			
		2: AVR Function Disable for Stop			
		3: AVR Function Disable for Deceleration.			
		4: AVR Function Disabled for Stop and Deceleration.			
5: When VDC>360V, AVR Function is Disabled for Stop and Deceleration.					
08-09	Input Phase Loss Protection	0: Disabled 1: Enabled	0	-	
08-10	Output Phase Loss Protection	0: Disabled	0	-	
		1: Enabled			
08-11	Motor Type Selection	0: Overload protection (Standard Motor)	0	-	
		1: Overload protection (Inverter Duty Motor)			
08-12	Motor Overload Protection Curve	0: Motor Overload Protection for General loads (OL=103 %) (150% for 1 Minutes)	0	-	
		1: Motor Over load Protection for HVAC ( Fan & Pump) (OL=113%) (123% for 1 Minutes).			
08-13	Over Torque Detection Control	0: Over Torque Detection Disabled	0	-	
		1: Over torque detection after set frequency is reached			
		2: Over torque detection after run command			
08-14	Over torque protection action	0: Stop Output After Over Torque Detection (Free Run to Stop)	0	-	
		1: Continue Running After Over Torque Detection (Display only OL3)			
08-15	Over Torque Detection Level	30~300	160	-	
08-16	Over Torque Detection Time	0.0~25.0	0.1	-	
08-17	Fire Mode (for firmware below v1.1)	0: Disabled.	0	-	*5
		1: Enabled			
08-18	Ground Fault Detection	0: Disabled	0		*7
		1: Enabled			

Notes: Regarding fire mode function, please refer to the conditions below,

1. Below firmware v1.1, Fire Mode is enabled by setting 08-17 = 1
2. Above (including) firmware v1.1, Fire Mode is enabled by setting digital inputs 03-00~03-05 = 28. Parameter 08-17 is then removed.
3. 08-18 is applicable to frame 3 and 4 only.

Group 09- Communication function setup					
No.	Description	Range	Factory Setting	Unit	Note
09-00	Assigned Communication Station Number	1 ~ 32	1	-	*2*3
09-01	RTU/ASCII Code Selection	0: RTU Code 1: ASCII Code	0	-	*2*3
09-02	Baud Rate Setting (bps)	0: 4800 1: 9600 2: 19200 3: 38400	2	bps	*2*3
09-03	Stop Bit Selection	0: 1 Stop Bit 1: 2 Stop Bits	0	-	*2*3
09-04	Parity Selection	0: Without Parity 1: With Even Parity 2: With Odd Parity	0	-	*2*3
09-05	Data Format Selection	0: 8-Bits Data 1: 7-Bits Data	0	-	*2*3
09-06	Communication Time-Out Detection Time	0.0 ~ 25.5	0.0	Sec	
09-07	Communication Time Out Operation Selection	0: Deceleration to Stop (00-15: Deceleration Time 1) 1: Coast to Stop 2: Deceleration to Stop (00-17: Deceleration Time 2) 3: Continue Operating	0	-	
09-08	Comm. Fault Tolerance Count.	1 ~ 20	3		
09-09	Wait Time of Inverter Transmission	5 ~ 65	5	ms	

Group 10- PID Function Setup					
No.	Description	Range	Factory Setting	Unit	Note
10-00	PID Target Value Selection (When 00-05\00-06=6 This Function is Enabled)	0: Potentiometer on Keypad 1: Analog Signal Input. (AI1) 2: Analog Signal Input. (AI2) 3: Frequency Set by Communication 4: Keypad Frequency Parameter 10-02	1	-	*1
10-01	PID Feedback Value Selection	0: Potentiometer on Keypad 1: Analog Signal Input. (AI1) 2: Analog Signal Input. (AI2) 3: Frequency Set by Communication	2	-	*1
10-02	PID Target(Keypad Input)	0.0~100.0	50.0	%	*1
10-03	PID Mode Selection	0: Disabled 1: Deviation D Control. FWD Characteristic. 2: Feedback D Control FWD Characteristic. 3: Deviation D Control Reverse Characteristic. 4: Feedback D Control Reverse Characteristic.	0	-	

Group 10- PID Function Setup					
No.	Description	Range	Factory Setting	Unit	Note
10-04	Feedback Gain Coefficient	0.00 ~ 10.00	1.00		*1
10-05	Proportional Gain	0.0 ~ 10.0	1.0		*1
10-06	Integral Time	0.0 ~ 100.0	10.0	Sec	*1
10-07	Derivative Time	0.00 ~ 10.00	0.00	Sec	*1
10-08	PID Offset	0: Positive 1: Negative	0	-	*1
10-09	PID Offset Adjust	0 ~ 109	0	%	*1
10-10	PID Output Lag Filter Time	0.0 ~ 2.5	0.0	Sec	*1
10-11	Feedback Loss Detection Mode	0: Disabled 1: Enabled - Drive Continues to Operate After Feedback Loss 2: Enabled - Drive "STOPS" After Feedback Loss	0	-	
10-12	Feedback Loss Detection Level	0 ~ 100	0	%	
10-13	Feedback Loss Detection Delay Time	0.0 ~25.5	1.0	Sec	
10-14	Integration Limit Value	0 ~ 109	100	%	*1
10-15	Integral Value Resets to Zero when Feedback Signal Equals the Target Value	0: Disabled 1: After 1 Second 30: After 30 Second (0~30)	0	-	
10-16	Allowable Integral value Error Margin (Units, 1 Unit = 1/8192)	0 ~ 100	0	-	
10-17	PID Sleep Frequency Level	0.00~599.00	0.00	Hz	
10-18	PID Sleep Function Delay Time	0.0 ~25.5	0.0	Sec	
10-19	PID Wake up frequency Level	0.00~599.00	0.00	Hz	
10-20	PID Wake up function Delay Time	0.0 ~ 25.5	0.0	Sec	
10-21	Max PID Feedback Setting Level	0 ~999	100	-	*1
10-22	Min PID Feedback Setting Level	0 ~999	0	-	*1

Group 11- Performance Control Functions					
No.	Description	Range	Factory Setting	unit	Note
11-00	Reverse Operation Control	0: Reverse Command is Enabled 1: Reverse Command is Disabled	0	-	
11-01	Carrier Frequency (kHz)	1~16	5	KHz	
11-02	Carrier Mode Selection	0: Mode0, 3Phase PWM modulation 1: Mode1, 2Phase PWM modulation 2: Mode2, 2Phase Soft PWM Modulation	0	-	
11-03	Carrier Frequency Reduction by Temperature Rise	0:Disabled 1:Enabled	0	-	
11-04	S-Curve Acc 1	0.0 ~ 4.0	0.2	Sec	
11-05	S-Curve Acc 2	0.0 ~ 4.0	0.2	Sec	
11-06	S-Curve Dec 3	0.0 ~ 4.0	0.2	Sec	
11-07	S-Curve Dec 4	0.0 ~ 4.0	0.2	Sec	
11-08	Skip Frequency 1	0.00 ~ 599.00	0.00	Hz	*1
11-09	Skip Frequency 2	0.00 ~ 599.00	0.00	Hz	*1

Group 11- Performance Control Functions					
No.	Description	Range	Factory Setting	unit	Note
11-10	Skip Frequency 3	0.00 ~ 599.00	0.00	Hz	*1
11-11	Skip Frequency Range Bandwith ( $\pm$ )	0.00 ~ 30.00	0.00	Hz	*1
11-12	Energy Saving Gain (V/F Mode)	0 ~ 100	80	%	
11-13	Regeneration Prevention Function	0:Disable	0	-	
		1:Enable			
		2:Enable (only during constant speed)			
11-14	Regeneration Prevention Voltage Level	200V:300.0~400.0	380.0	V	
		400V:600.0~800.0	760.0		
11-15	Regeneration Prevention Frequency Limit	0.00 ~ 15.00	3.00	Hz	
11-16	Regeneration Prevention Voltage Gain	0~200	100	%	
11-17	Regeneration Prevention Frequency Gain	0~200	100	%	

Group 12 Digital Display & Monitor Functions					
No.	Description	Range	Factory Setting	Unit	Note
12-00	Extended Display Mode	00000~88888 Each digit can be set from 0 to 8 as listed below.	00000	-	*1
		0: Default Display (Frequency and Parameters)			
		1:Output Current			
		2:Output Voltage			
		3:DC Voltage			
		4:Temperature			
		5:PID Feedback			
		6:Analog Signal Input. (AI1)			
		7:Analog Signal Input. (AI2)			
8: Count Status					
12-01	PID Feedback Display Format	0:Integer (xxx)	0	-	*1
		1:One Decimal Place (xx.x)			
		2:Two Decimal Places (x.xx)			
12-02	PID Feedback Display Unit Setting	0:xxx--	0	-	*1
		1:xxxpb(pressure)			
		2:xxxfl(flow)			
12-03	Custom Units (Line Speed) Value	0~65535	1500/1800	RPM	*1
12-04	Custom Units (Line Speed) Display Mode	0:Drive Output Frequency is Displayed	0	-	*1
		1:Line Speed.Integer.(xxxxx)			
		2:Line Speed.One Decimal Place. (xxxx.x)			
		3:Line Speed.Two Decimal Places (xxx.xx)			
		4:Line Speed.Three Decimal Places (xx.xxx)			

**Group 12 Digital Display & Monitor Functions**

No.	Description	Range	Factory Setting	Unit	Note
12-05	Inputs and Output Logic Status Display ( S1~S6, RY1 and RY2)		-	-	*4
12-06	Alarm Selections for Inverter Components Life Expectancy	xxx0:Life Alarm of Inrush Current Suppression Circuit is Invalid xxx1:Life Alarm of Inrush Current Suppression Circuit is Valid ---	00000	-	*1
		xxx0x:Life Alarm of Control Circuit Capacitors is Invalid xxx1x:Life Alarm of Control Circuit Capacitors is Valid ---			
		xx0xx:Life Alarm of Main Circuit Capacitors is Invalid xx1xx:Life Alarm of Main Circuit Capacitors is Valid ---			
12-07	Detect Main Circuit Capacitors	Reserved			
12-08	Display of Inrush Current Suppression Circuit	0~100	100	%	
12-09	Display of Control Circuit Capacitors	0~100	100	%	
12-10	Reserved				
12-11	Output Current when Fault Appeared	----	0	A	
12-12	Output Voltage when Fault Appeared	----	0	Vac	
12-13	Output Frequency when Fault Appeared	----	0	Hz	
12-14	DC Bus Voltage when Fault Appeared	----	0	Vac	
12-15	Frequency Command when Fault Appeared	----	0	Hz	

Group 13 Inspection & Maintenance Functions					
No.	Description	Range	Factory Setting	unit	Note
13-00	Drive Horsepower Code	----	-	-	*3
13-01	Software Version	----	-	-	*3*4
13-02	Fault Log (Latest 3 Faults)	----	-	-	*3*4
13-03	Accumulated Inverter Operation Time 1	0~23	-	hour	*3
13-04	Accumulated Inverter Operation Time 2	0~65535	----	day	*3
13-05	Accumulated Inverter Operation Time Mode	0: Power On time 1: Operation time	0	-	*3
13-06	Parameter Lock	0: Enable all Functions 1: Preset Speeds from 05-01 to 05-15 Can't be Changed 2: All Functions Can't be Changed Except for Preset speeds from 05-01 to 05-15 3: Disable All Functions Except 13-06	0	-	
13-07	Parameter Lock Code	00000~65535	00000	-	
13-08	Reset Drive to Factory Settings	1150: Reset to factory setting. 50Hz,220V/380V system. 1160: Reset to factory setting. 60Hz,220V/380V system. 1250: Reset to factory setting 50Hz,230V/400V system. 1260: Reset to factory setting 60Hz,230V/460V system. 1350: Reset to factory setting 50Hz,220V/415V system. 1360: Reset to factory setting 60Hz,230V/400V system. 1112: Reset PLC	00000	-	

Group 14 PLC Setting function					
No.	Description	Range	Factory Setting	unit	Note
14-00	Setting Value1 of T1	0~9999	0	-	
14-01	Setting Value1 of T1 (mode 7)	0~9999	0	-	
14-02	Setting Value1 of T2	0~9999	0	-	
14-03	Setting Value1 of T2 (mode 7)	0~9999	0	-	
14-04	Setting Value1 of T3	0~9999	0	-	
14-05	Setting Value1 of T3 (mode 7)	0~9999	0	-	
14-06	Setting Value1 of T4	0~9999	0	-	
14-07	Setting Value1 of T4 (mode 7)	0~9999	0	-	
14-08	Setting Value1 of T5	0~9999	0	-	
14-09	Setting Value1 of T5 (mode 7)	0~9999	0	-	
14-10	Setting Value1 of T6	0~9999	0	-	
14-11	Setting Value1 of T6 (mode 7)	0~9999	0	-	
14-12	Setting Value1 of T7	0~9999	0	-	
14-13	Setting Value1 of T7 (mode 7)	0~9999	0	-	
14-14	Setting Value1 of T8	0~9999	0	-	
14-15	Setting Value1 of T8 (mode 7)	0~9999	0	-	
14-16	Setting Value1 of C1	0~65535	0	-	
14-17	Setting Value1 of C2	0~65535	0	-	
14-18	Setting Value1 of C3	0~65535	0	-	
14-19	Setting Value1 of C4	0~65535	0	-	
14-20	Setting Value1 of C5	0~65535	0	-	
14-21	Setting Value1 of C6	0~65535	0	-	
14-22	Setting Value1 of C7	0~65535	0	-	
14-23	Setting Value1 of C8	0~65535	0	-	
14-24	Setting Value1 of AS1	0~65535	0	-	
14-25	Setting Value2 of AS1	0~65535	0	-	
14-26	Setting Value3 of AS1	0~65535	0	-	
14-27	Setting Value1 of AS2	0~65535	0	-	
14-28	Setting Value2 of AS2	0~65535	0	-	
14-29	Setting Value3 of AS2	0~65535	0	-	
14-30	Setting Value1 of AS3	0~65535	0	-	
14-31	Setting Value2 of AS3	0~65535	0	-	
14-32	Setting Value3 of AS3	0~65535	0	-	
14-33	Setting Value1 of AS4	0~65535	0	-	
14-34	Setting Value2 of AS4	0~65535	0	-	
14-35	Setting Value3 of AS4	0~65535	0	-	
14-36	Setting Value1 of MD1	0~65535	1	-	
14-37	Setting Value2 of MD1	0~65535	1	-	
14-38	Setting Value3 of MD1	1~65535	1	-	
14-39	Setting Value1 of MD2	0~65535	1	-	
14-40	Setting Value2 of MD2	0~65535	1	-	
14-41	Setting Value3 of MD2	1~65535	1	-	
14-42	Setting Value1 of MD3	0~65535	1	-	
14-43	Setting Value2 of MD3	0~65535	1	-	
14-44	Setting Value3 of MD3	1~65535	1	-	
14-45	Setting Value1 of MD4	0~65535	1	-	
14-46	Setting Value2 of MD4	0~65535	1	-	
14-47	Setting Value3 of MD4	1~65535	1	-	

Group 15 PLC Monitoring function					
No.	Description	Range	Factory Setting	unit	Note
15-00	Current Value of T1	0~9999	0	-	
15-01	Current Value of T1(mode 7)	0~9999	0	-	
15-02	Current Value of T2	0~9999	0	-	
15-03	Current Value of T2(mode 7)	0~9999	0	-	
15-04	Current Value of T3	0~9999	0	-	
15-05	Current Value of T3(mode 7)	0~9999	0	-	
15-06	Current Value of T4	0~9999	0	-	
15-07	Current Value of T4(mode 7)	0~9999	0	-	
15-08	Current Value of T5	0~9999	0	-	
15-09	Current Value of T5(mode 7)	0~9999	0	-	
15-10	Current Value of T6	0~9999	0	-	
15-11	Current Value of T6(mode 7)	0~9999	0	-	
15-12	Current Value of T7	0~9999	0	-	
15-13	Current Value of T7(mode 7)	0~9999	0	-	
15-14	Current Value of T8	0~9999	0	-	
15-15	Current Value of T8(mode 7)	0~9999	0	-	
15-16	Current Value of C1	0~65535	0	-	
15-17	Current Value of C2	0~65535	0	-	
15-18	Current Value of C3	0~65535	0	-	
15-19	Current Value of C4	0~65535	0	-	
15-20	Current Value of C5	0~65535	0	-	
15-21	Current Value of C6	0~65535	0	-	
15-22	Current Value of C7	0~65535	0	-	
15-23	Current Value of C8	0~65535	0	-	
15-24	Current Value of AS1	0~65535	0	-	
15-25	Current Value of AS2	0~65535	0	-	
15-26	Current Value of AS3	0~65535	0	-	
15-27	Current Value of AS4	0~65535	0	-	
15-28	Current Value of MD1	0~65535	0	-	
15-29	Current Value of MD2	0~65535	0	-	
15-30	Current Value of MD3	0~65535	0	-	
15-31	Current Value of MD4	0~65535	0	-	
15-32	Current Value of TD	0~65535	0	μs	

# Chapter 4 Troubleshooting and Maintenance

## 4.1 Error display and corrective action

### 4.1.1 Manual Reset and Auto-Reset

Faults which can not be recovered manually			
Display	content	Cause	Corrective action
-OV- -OU-	Voltage too high when stopped	Detection circuit malfunction	Consult with the supplier
-LV- -LU-			
-OH- -OH-	The inverter is overheated when stopped	1. Detection circuit malfunction 2. Ambient temperature too high or bad ventilation	Improve the ventilation conditions, if no result then replace the inverter
OH-C OH-C			
EPr EPr	EEPROM problem	Faulty EEPROM	Consult with the supplier
COt COt			
CtEr CtEr	Current Sensor detection error	Current sensor error or circuit malfunction	Consult with the supplier
Err4 Err4			
r-OFF r-OFF	power relay off error	power relay or relative circuit broken	Consult with the supplier
Faults which can be recovered manually and automatically			
Display	content	Cause	Corrective action
OC-A OC-A	Over-current at acceleration	1. Acceleration time too short 2. The capacity of the motor exceeds the capacity of the inverter 3. Short circuit between the motor coil and the case 4. Short circuit between motor wiring and ground 5. IGBT module damaged	1. Set a longer acceleration time 2. Replace inverter with one that has the same rating as that of the motor 3. Check the motor 4. Check the wiring 5. Consult with the supplier
OC-C OC-C			
	Over-current at fixed speed	1. Transient load change 2. Transient power change	1. Increase the capacity of the inverter 2. Install inductor on the power Supply input side

Display	content	Cause	Corrective action
OC-d OC-d	Over-current at deceleration	The preset deceleration time is too short.	Set a longer deceleration time
OC-S OC-S	Over current at start	1.Short circuit between the motor coil and the case 2.Short circuit between motor coil and ground 3.the IGBT module damaged	1.Inspect the motor 2.Inspect the wiring 3.Consult with the supplier
OV-C OU-C	Excessive Voltage during operation/ deceleration	1.Deceleration time setting too short or excessive load inertia 2.Power voltage varies widely (fluctuates)	1.Set a longer deceleration time 2. Add a brake resistor or brake module 3.Add a reactor at the power input side
PF PF	Input phase Loss	Abnormal fluctuations in the main circuit voltage	1.Check the main circuit power supply wiring. 2.Check the power supply voltage
ud-C ud-C	Output under current detection	Output current < Output under current detection level	Set the level according to application
LF LF	Output phase loss	Loss of output voltage on any of the phases	1.Check output cable connection 2.Determine resistance between the lines 3.Check whether the terminals are loose
<b>Faults which can be recovered manually but not automatically</b>			
Display	content	Cause	Corrective action
OC OC	Over-current during stop	Detection circuit malfunction	Consult with the supplier
OL1 OL1	Motor overload	loading too large	Consider increasing the Motor capacity
OL2 OL2	Inverter overload	Excessive Load	Consider increasing the inverter capacity
OL3 OL3	Over torque	1.Load too large 2.The setting of (8-15, 8-16) too small	1.Increase the inverter capacity 2.Set(8-15,8-16) as needed
LV-C LU-C	Voltage too low during operation	1.Power voltage too low 2.Power voltage varies widely (fluctuates)	1.Improve power quality 2.Consider adding a reactor at the power input side
OVSP Ousp	Motor rotating too fast	Rotation speed and the set speed value vary widely	1.Load may be too large 2.Check if the set speed is correct.
LIFE1 LIFE1	Inrush current suppression circuit life expectancy alarm	Inrush current suppression circuit is damaged	Consult with the supplier

Display	content	Cause	Corrective action
LIFE2 LIFE2	Control circuit capacitor life expectancy alarm	Control circuit capacitor is damaged	Consult with the supplier
LIFE3 LIFE3	Main Circuit Capacitor life expectancy alarm	Capacitor Main Circuit is damaged	Consult with the supplier
GF GF	Output side ground Fault	If ground fault detection is enabled by 08-18, then for any ground faults (short circuit to ground) the inverter output will switch off.	<ol style="list-style-type: none"> <li>1. Check the motor winding resistance for failures.</li> <li>2. Check the motor cable for ground short circuits</li> <li>3. If the above is correct, then consult with the supplier</li> </ol>

#### 4.1.2 Keypad Operation Error Instruction

Display	content	Cause	Corrective action
LOC LOC	<ol style="list-style-type: none"> <li>1. Parameter already locked</li> <li>2. Motor direction locked</li> <li>3. Parameter password(13 - 07) enabled</li> </ol>	<ol style="list-style-type: none"> <li>1. Attempt to modify frequency parameter while 13-06&gt;0.</li> <li>2. Attempt to reverse direction when 11- 00=1.</li> <li>3. Parameter (13 - 07) enabled, set the correct password will show LOC.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust 13-06</li> <li>2. Adjust 11-00</li> </ol>
Err1 Err1	Keypad operation error	<ol style="list-style-type: none"> <li>1. Press or while 00-05/00-06&gt;0 or running at preset speed.</li> <li>2. Attempt to modify the Parameter.Can not be modified during operation (refer to the parameter list).</li> </ol>	<ol style="list-style-type: none"> <li>1. The or is available for modifying the parameter only when 00-05/00-06=0</li> <li>2. Modify the parameter in STOP mode.</li> </ol>
Err2 Err2	Parameter setting error	<ol style="list-style-type: none"> <li>1. 00-13 is within the range of(11-08 ± 11-11) or (11-09 ± 11-11) or (11-10 ± 11-11)</li> <li>2. 00-12 00-13</li> <li>3. 00-05 = 00-06</li> </ol>	<ol style="list-style-type: none"> <li>1. Modify 11-08~11-10 or 11-11</li> <li>2. Set 00-12&gt;00-13</li> <li>3. Set 00-05 and 00-06 to different value</li> </ol>
Err5 Err5	Modification of parameter is not available in communication	<ol style="list-style-type: none"> <li>1. Control command sent during communication.</li> <li>2. Attempt to modify the function 09-02 ~ 09-05 during communication</li> </ol>	<ol style="list-style-type: none"> <li>1. Issue enable command before communication</li> <li>2. Set parameters 09-02 ~ 09-05 function before communication</li> </ol>
Err6 Err6	Communication failed	<ol style="list-style-type: none"> <li>1. Wiring error</li> <li>2. Communication parameter setting error.</li> <li>3. Incorrect communication protocol</li> </ol>	<ol style="list-style-type: none"> <li>1. Check hardware and wiring</li> <li>2. Check Functions (09-00~09- 05).</li> </ol>
Err7 Err7	Parameter conflict	<ol style="list-style-type: none"> <li>1. Attempt to modify the function 13-00/13-08.</li> <li>2. Voltage and current detection circuit is abnormal.</li> </ol>	If reset is not possible, please consult with the supplier.

### 4.1.3 Special conditions

Display	Fault	Description
StP0 StP0	Zero speed at stop	Occurs when preset frequency <0.1Hz
StP1 StP1	Fail to start directly On power up.	If the inverter is set for external terminal control mode (00-02/00-03=1) and direct start is disabled (07-04=1) The inverter cannot be started and will flash STP1. The run input is active at power-up, refer to descriptions of (07-04).
StP2 StP2	Keypad Stop Operated when inverter in external Control mode.	If the Stop key is pressed while the inverter is set to external control mode (00-02/00-03=1) then 'STP2' flashes after stop. Release and re-activate the run contact to restart the inverter.
E.S. E.S.	External Rapid stop	When external rapid stop input is activated the inverter will decelerate to stop and the display will flash with E.S. message.
b.b. b.b.	External base block	When external base block input is activated the inverter stops immediately and then the display will flash with b.b. message.
PdEr PdEr	PID feedback loss	PID feedback loss is detected.
AtEr AtEr	Auto tuning error	1. Motor nameplate data Input errors. 2. Emergency stop is activated while auto tuning.
FlrE FlrE	Fire Mode	1. Software rev below 1.1, the fire mode is enabled when 08-17 = 1 2. Software ver 1.1 and above, the fire mode is enabled when 03-00~03-05 = 【28】 3. The display on the keypad indicates FlrE Under fire mode function, the inverter will run at full speed

## 4.2 General troubleshooting

Status	Checking point	Remedy
<b>Motor runs in wrong direction</b>	Is the wiring for the output terminals correct?	Wiring must match U, V, and W terminals of the motor.
	Is the wiring for forward and reverse signals correct?	Check for correct wiring.
<b>The motor speed can not be regulated.</b>	Is the wiring for the analog frequency inputs correct?	Check for correct wiring.
	Is the setting of operation mode correct?	Check the Frequency Source set in parameters 00-05/00-06.
	Is the load too excessive?	Reduce the load.
<b>Motor running speed too high or too low</b>	Check the motor specifications (poles, voltage...) correct?	Confirm the motor specifications.
	Is the gear ratio correct?	Confirm the gear ratio.
	Is the setting of the highest output frequency correct?	Confirm the highest output frequency
<b>Motor speed varies unusually</b>	Is the load too excessive?	Reduce the load.
	Does the load vary excessively?	1. Minimize the variation of the load. 2. Consider increasing the capacities of the inverter and the motor.
	Is the input power erratic or is there a phase loss ?	1. Consider adding an AC reactor at the power input side if using single-phase power. 2. Check wiring if using three-phase power.
<b>Motor can not run</b>	Is the power connected to the correct L1(L), L2, and L3(N) terminals? is the charging indicator lit ?	1. Is the power applied ? 2. Turn the power OFF and then ON again. 3. Make sure the power voltage is correct. 4. Make sure screws are secured firmly.
	Is there voltage across the output terminals T1, T2, and T3?	Turn the power OFF and then ON again.
	Is overload causing the motor to stall?	Reduce the load so the motor will run.
	Are there any abnormalities in the inverter?	See error descriptions to check wiring and correct if necessary.
	Is there a forward or reverse run command ?	
	Has the analog frequency signal been input?	1. Is analog frequency input signal wiring correct? 2. Is voltage of frequency input correct?
	Is the operation mode setting correct?	Operate through the digital keypad