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  - **Outstanding Torque and Harmonic Characteristics than that of traditional Sine Coded PWM technology**
- **High Speed Range**
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- **Download & Upload from the Key-Pad**
- **Standard On-Board 32 Character LCD Key-Pad**
- **Speed Search**
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- **Meters, [RPM] [Hz] [Current] [Voltage]**
- **4~20 mA Signal Output**

!! WARNING !!

1. *This inverter contains high voltage which can cause electric shock resulting in personal injury or loss of life.*

2. *Be sure all AC power is removed from the inverter before servicing the inverter.*

3. *Wait at least 3 minutes after turning off the AC power for the Bus Capacitor to discharge. Make sure to check the Charge LED on the PCB.*

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CAUTION

1. *Service only by qualified Personnel.*

2. *Make sure of power-up restart is off to prevent any unexpected operation of the motor.*

3. *Make sure of Ground Connection.*

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5. *Never connect the input power leads to the output terminals of inverter.*

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USER SELECTION GUIDE (iH SPECIFICATIONS)

200 Volt Class

Inverter Type (SVOOOiH-O)		030-2	037-2	045-2	055-2
Applicable Motor	Motor [HP]	40	50	60	75
	Motor [kW]	30	37	45	55
Output Ratings	Capacity [kVA]	46	55	68	84
	Rated Current [A]	122	146	180	220
	Output Frequency	0.5 to 400 Hz			
	Output Voltage	3 Phase, 0 to Input Voltage			
Input	Input Voltage	3 Phase, 200 to 230 V (± 10 %)			

Ratings	Input Frequency	50 to 60 Hz (± 5 %)
Control	Control Method	Space Vector PWM
	Frequency Resolution	0.01Hz
	Frequency Accuracy	0.01 % of Maximum Frequency (Digital Setting) 0.1 % of Maximum Frequency (Analog Setting)
	V/F ratio	Linear, Non-linear, User Programmable
	Braking Torque	About 20 %
	Overload Capacity	150 % for 1 minute
	Torque Boost	0 to 20 % programmable, Auto boost
Operating	Operation Method	Key-pad Control Terminal Control Remote(Option)
	Frequency Setting	Analog : 0 to 10V / 4 to 20 mA / or Inverted Digital : using Key-pad
	Acceleration/ Deceleration Time	0.1 to 6,000 sec 8 Pre-defined Acc./Dec. Ramp (programmable)
	Multi-Step	8 Preset Operation Speed (Programmable)
Programmable I/O	Programmable Input	6 Programmable Inputs
	Programmable Output	5 Programmable Outputs
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	Instant Power Failure	Below 15 msec; Continuous Operation Over 15 msec; Auto Restart(Programmable)
Operating Condition	Ambient Temperature	-10 to 40
	Humidity	Below 90 % Relative Humidity(Non Condensing)
	Altitude	Less Than 1,000m without derating
	Cooling system	Forced Air Cooling

USER SELECTION GUIDE (iH SPECIFICATIONS)

400 Volt Class

Inverter Type (SVOOOiH-O)		030-4	037-4	045-4	055-4	075-4	090-4	110-4	132-4	160-4
Applicable	Motor [HP]	40	50	60	75	100	120	150	175	215

Motor	Motor [kW]	30	37	45	55	75	90	110	132	160
Output Ratings	Capacity [kVA]	46	57	70	85	116	140	170	200	250
	Rated Current [A]	61	75	91	110	152	183	223	264	325
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Inspect the inverter for any damage that may have occurred during the shipping.

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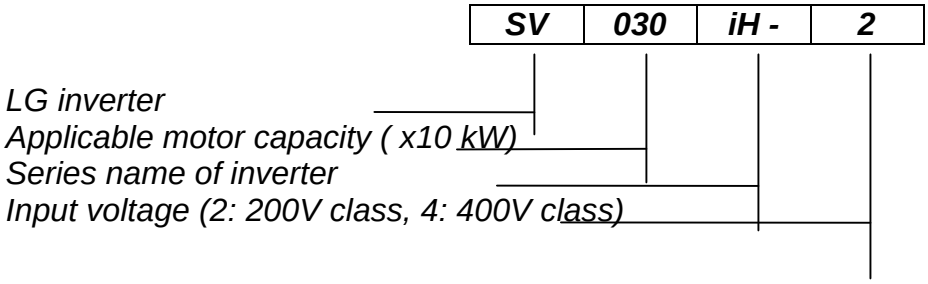
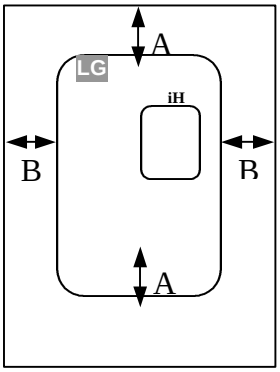


2. ***Environmental Conditions***

- *Verify that ambient condition of the mounting location. Ambient temperature should not be below –10 , and must not exceed 40 ; relative humidity should be less than 90 % (non-condensing), below an altitude of 1,000 m.*
- *Do not mount the inverter in direct sunlight. Isolate the inverter from excessive vibration.*

3. ***Mounting***

- *The iH must be mounted vertically with sufficient space (horizontally and vertically) between adjacent equipment. (A: over 150mm, B: over 50mm)*



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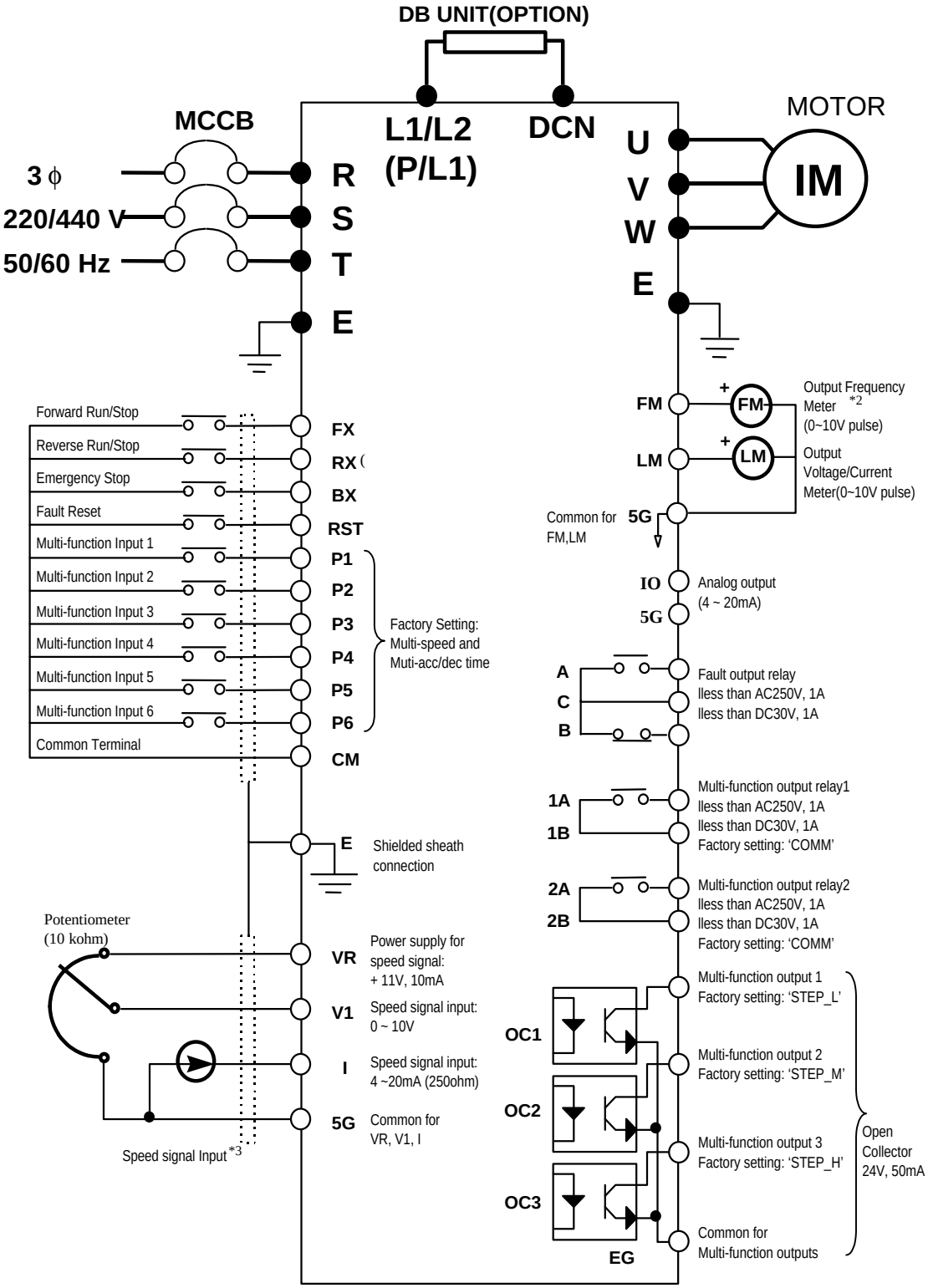


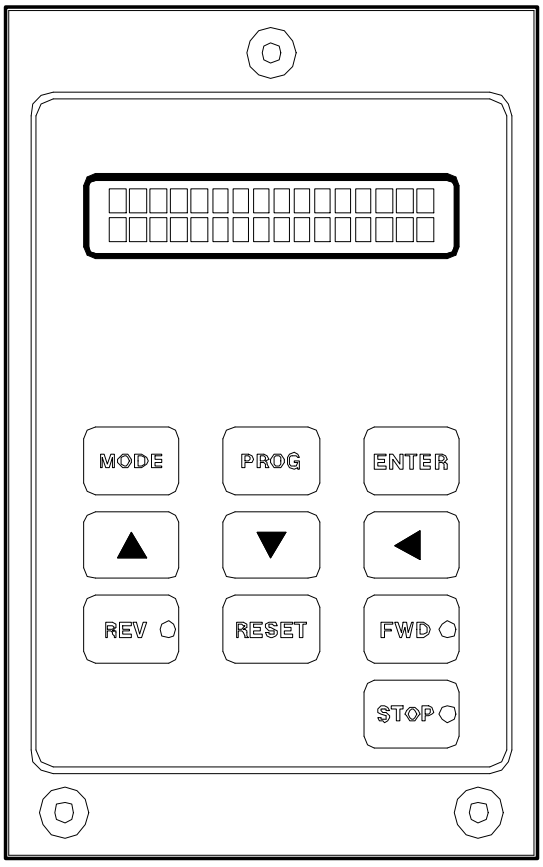
Note) 1. ● display main circuit terminals, ○ display control circuit terminals.
2. Analog output voltage can b set upto 12V.
3. Analog speed command can be set by Voltage, Current and both of them.

II. CHAPTER TWO

1. Key-Pad Operation

- ***Display***

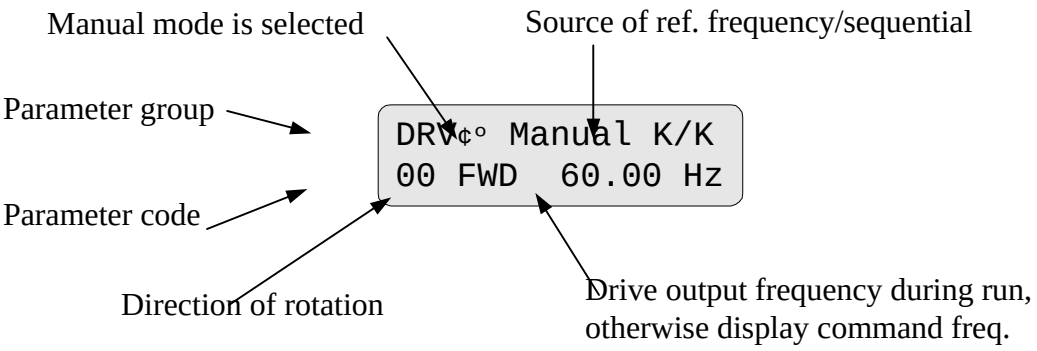
iH uses 32 alpha-numeric LCD display for better man-machine interface. All drive functions can be accessed via keypad. The keypad also has upload and download from drive capability. Users have easy access to drive programming with parameter description on the LCD display.



1) MODE: User can choose specific drive parameter group he or she desires.
2) PROG: User can enter the drive programming mode by choosing this mode.

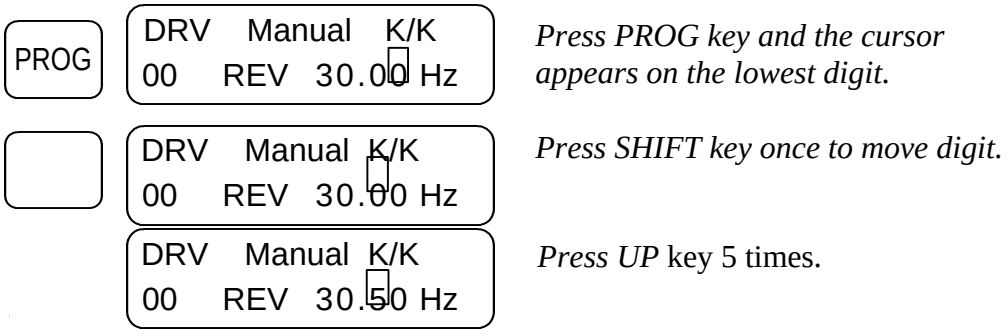
3) *ENTER: Saves the changed parameter to EPROM of drive.*
4) *ARROWS: Used to scroll through each parameter code in a group. Also used to increment and decrement the parameter data value.*
5) *REV: Run in reverse direction.*
6) *FWD: Run in reverse direction.*
7) *STOP: Stop running.*
8) *RESET: Reset all the drive faults.*

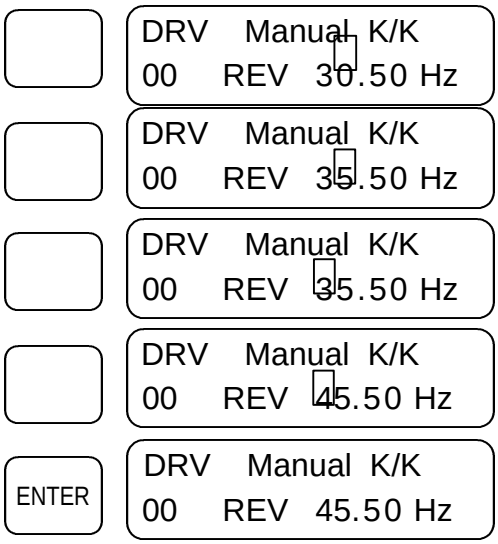
- ***Alpha-numeric Display***



- ***Procedure of setting data***

To Change command frequency from 30.00 Hz to 45.50 Hz,





Press SHIFT key once to shift the cursor to next digit.

Press UP key 5 times.

Press SHIFT key once to shift the cursor to next digit.

Press UP key once to make 4.

Press ENTER key to store new value.

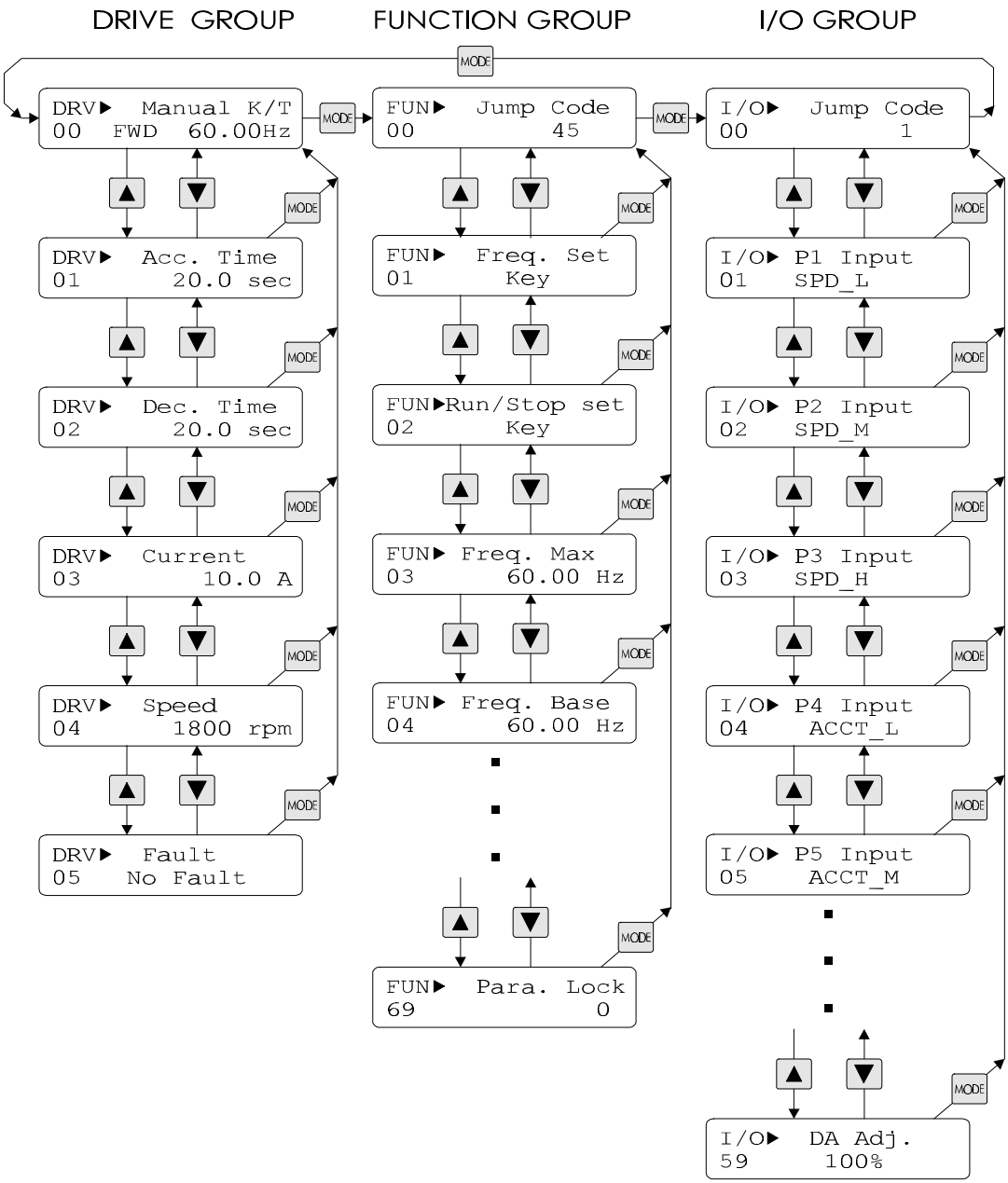
The same procedure is applied to all other parameters, while the drive is running, the output frequency can be changed to new command frequency.

- ***Operation***

There are 3 Parameter Groups as shown below.

Group	***LCD control panel***	***Description***
Drive group	***DRV***	*Target frequency, acc.(dec) time, speed, current,etc.*
Function group	***FUN***	*Maximum frequency, manual torque boost, etc.*
Sequence & I/O group	***I/O***	*Multi input terminals, option, etc.*

- ***Scrolling between Group***



In any of the parameter groups, user can jump to a specific parameter code by following these steps.

-Method-

Select a parameter group that requires a change.

At the beginning of each program group the menu will read [Jump Code]. Press the [PROG] key. Enter the code number of the parameter needed to be changed then press [ENTER].(There is no jump code for [Drive Group])

2. Control Method

The iH has several operation methods as shown below.

Operation Method	Function	Function Setting
Operation using Keypad	*Run/Stop command and frequency are set only through the Keypad*	*FUN01: Key* *FUN02: Key*
Operation using Control Terminals	*Run/Stop can be performed by closing FX or RX terminal, frequency reference is set through V1 or I terminal*	*FUN01: Terminal* *FUN02: Terminal-1 or Terminal-2*
Operation using both The Keypad and Control Terminals	*Run/Stop is performed by the Keypad. Frequency reference is set through V1 or I terminal*	*FUN01: Terminal* *FUN02: Key*
	Run/Stop is performed by either the FX or RX terminal. Frequency reference is set through the Keypad	*FUN01: Key* *FUN02: Terminal-1 or Terminal-2*

3. Control Terminals

1A	1B	2A	2B	OC1	OC2	C M	RST	FX	RX	BX	P7	VR	V1	V2	5G	
A	C	B	EG	OC3	P1	P2	P3	P4	P5	P6	C M	I	FM	LM	5G	*IO*	*5G*

Symbols	Functions
V1	*Speed Signal Input (0 to +10 VDC) (Wiper Connection Terminal)*
VR	Voltage Power Supply for Speed Signal Terminal (+10 VDC)
I	Current Speed Signal Input Terminal (4 ~ 20 mA)
FM	Analog / Digital Frequency Output Terminal (For External Meters)
LM	Current / Voltage Output Terminal (For External Meters)
5G	Common Terminal For [V1] [I] [FM] [LM]
FX	Forward Direction Command Terminal
RX	Reverse Direction Command Terminal
BX	Emergency-Stop Command Terminal
RST	Fault Reset Terminal
P1	Multi-Function Input Terminal 1
P2	Multi-Function Input Terminal 2
P3	Multi-Function Input Terminal 3
P4	Multi-Function Input Terminal 4
P5	Multi-Function Input Terminal 5
P6	Multi-Function Input Terminal 6
P7	Not in use
CM	Common Terminal for [FX] [RX] [BX] [P1] [P2] [P3] [P4] [P5] [P6] [RST]
OC1	Multi-Function Output Terminal 1 (Open Collector Type 24 V)
OC2	Multi-Function Output Terminal 2 (Open Collector Type 24 V)
OC3	Multi-Function Output Terminal 3 (Open Collector Type 24 V)
EG	Ground Terminal for OC1, OC2, and OC3
1A, 1B	Auxiliary Relays for Multi-Function Output
2A, 2B	(AC250 Volts / 1 Amp) (DC30 Volts / 1 Amp)
A	Relay Output Terminal for Fault Signal
B	(AC250 Volts / 1 Amp) (DC30 Volts / 1Amp)
C	
IO, 5G	utput terminal

4. Power Terminals

R	S	T	E	U	V	W	E	L1	L2	DCN

Symbols	Functions
R	AC Line Input, 200V class, 400V class
S	

T	
E	Earth Terminal from Input Power Line
U	3-Phase Output Terminals (to Motor)
V	
W	
E	Earth Terminal to Output Motor Line
L1	External DC Reactor(L1-L2) and DB Unit(+) Terminals
L2	For SV033/037/045/055iH-4 units, these terminals are shown as '**P/L1'** terminal.
DCN	DB Unit(-) Terminal For SV033/037/045/055iH-4 units, this terminal is shown as '**N'** terminal.

!!WARNING!!

Normal stray capacitance between the inverter chassis and the power devices inside the inverter and AC line can provide a high impedance shock hazard. Do not apply power to the inverter if the inverter frame (power terminal E) is not grounded.

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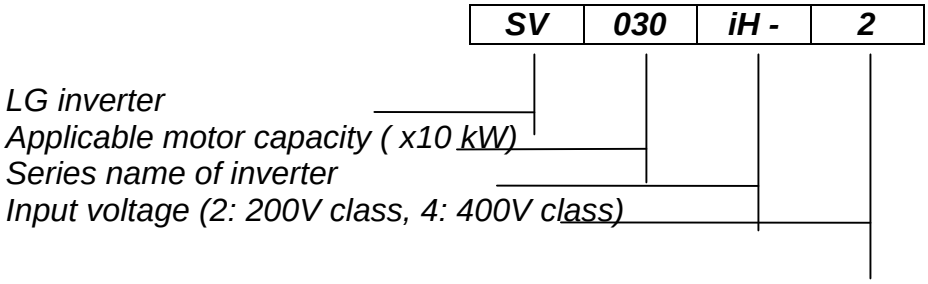

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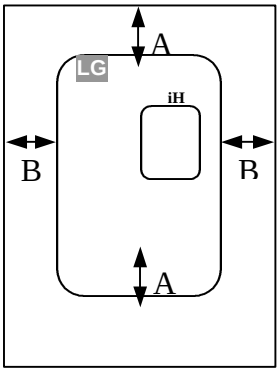

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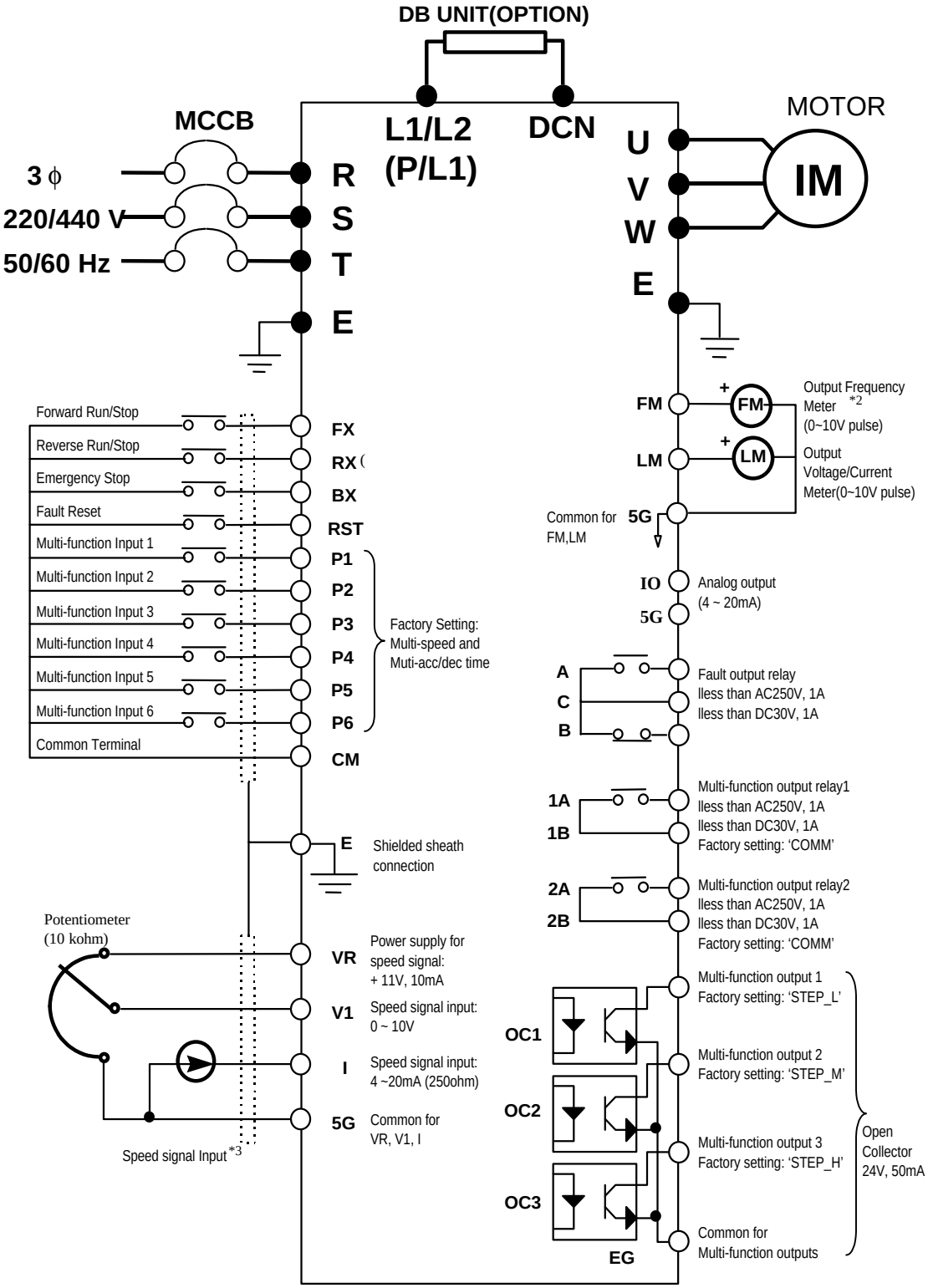

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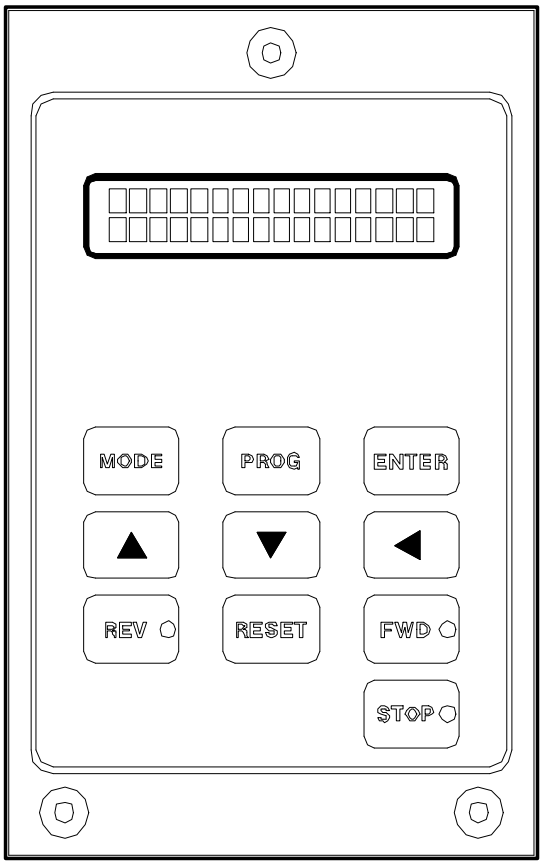

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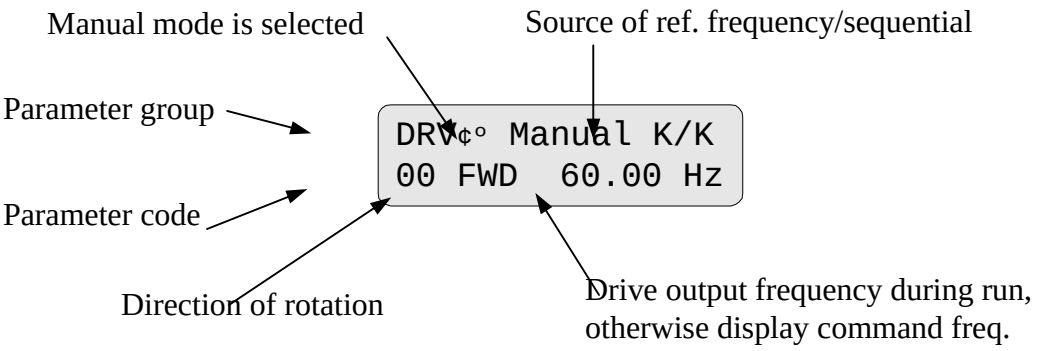

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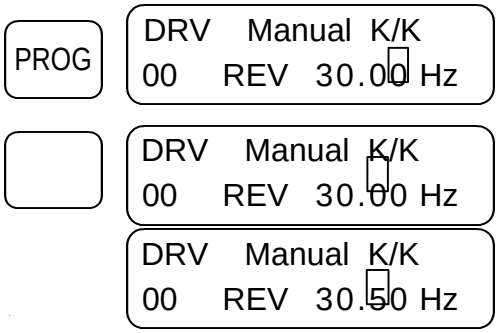
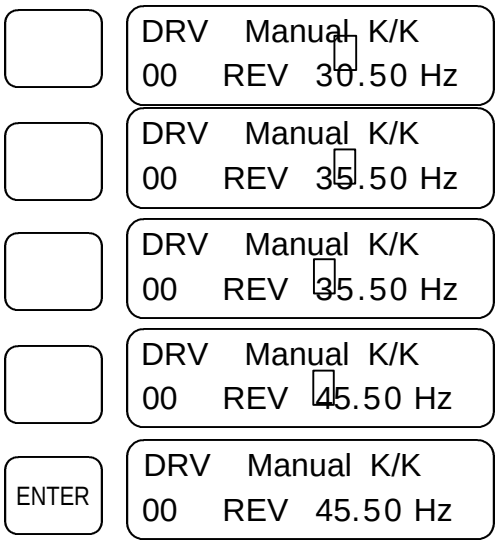


Press PROG key and the cursor appears on the lowest digit.

Press SHIFT key once to move digit.

Press UP key 5 times.



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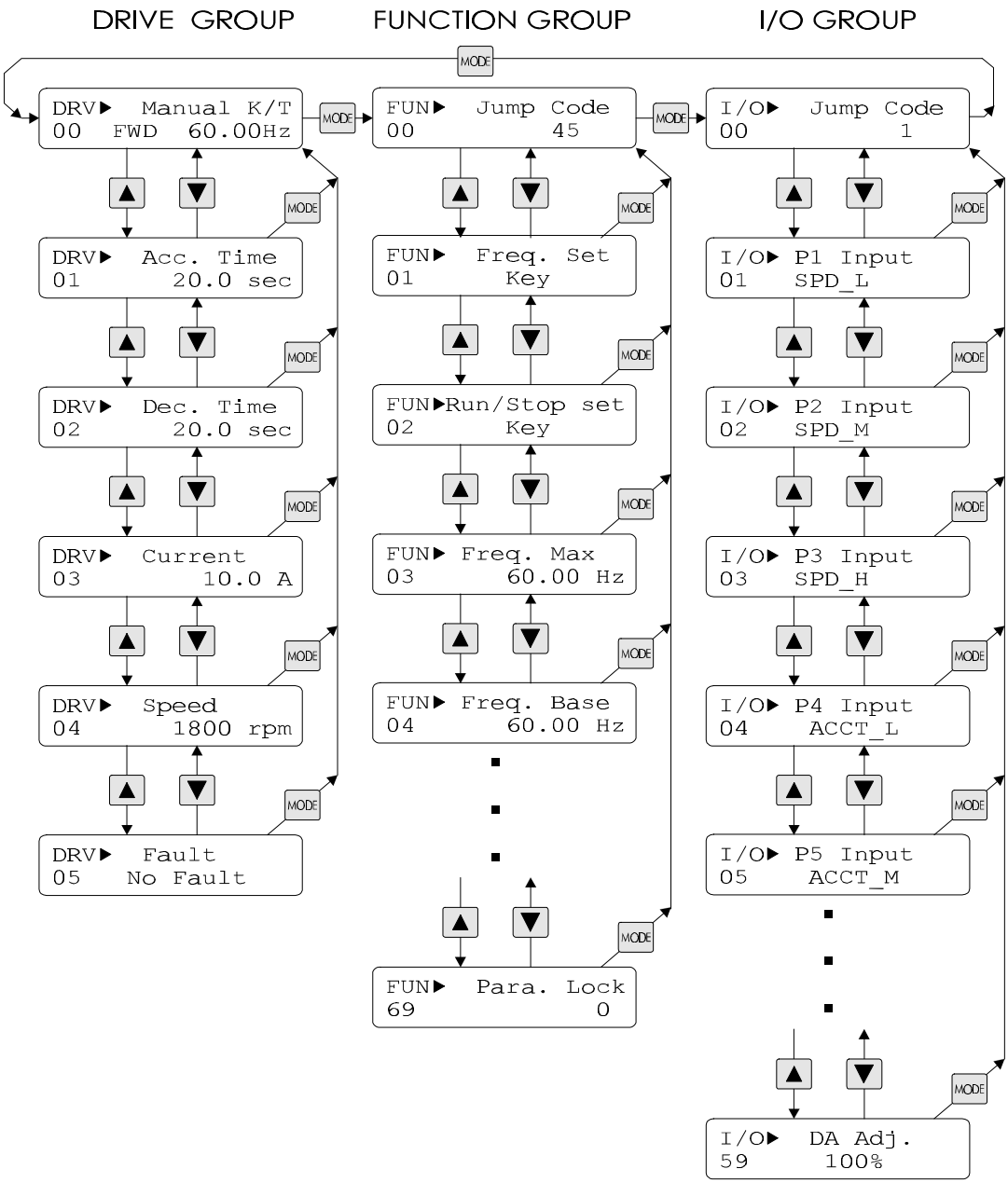
Sequence & I/O group	***I/O***	*Multi input terminals, option, etc.*

- ***Scrolling between Group***



In any of the parameter groups, user can jump to a specific parameter code by following these steps.

-Method-

Select a parameter group that requires a change.

At the beginning of each program group the menu will read [Jump Code]. Press the [PROG] key. Enter the code number of the parameter needed to be changed then press [ENTER].(There is no jump code for [Drive Group])

4. Control Method

The iH has several operation methods as shown below.

Operation Method	Function	Function Setting
Operation using Keypad	*Run/Stop command and frequency are set only through the Keypad*	*FUN01: Key* *FUN02: Key*
Operation using Control Terminals	*Run/Stop can be performed by closing FX or RX terminal, frequency reference is set through V1 or I terminal*	*FUN01: Terminal* *FUN02: Terminal-1 or Terminal-2*
Operation using both The Keypad and Control Terminals	*Run/Stop is performed by the Keypad. Frequency reference is set through V1 or I terminal*	*FUN01: Terminal* *FUN02: Key*
	Run/Stop is performed by either the FX or RX terminal. Frequency reference is set through the Keypad	*FUN01: Key* *FUN02: Terminal-1 or Terminal-2*

3. Control Terminals

1A	1B	2A	2B	OC1	OC2	C M	RST	FX	RX	BX	P7	VR	V1	V2	5G	
A	C	B	EG	OC3	P1	P2	P3	P4	P5	P6	C M	I	FM	LM	5G	*IO*	*5G*

Symbols	Functions
V1	*Speed Signal Input (0 to +10 VDC) (Wiper Connection Terminal)*
VR	Voltage Power Supply for Speed Signal Terminal (+10 VDC)
I	Current Speed Signal Input Terminal (4 ~ 20 mA)
FM	Analog / Digital Frequency Output Terminal (For External Meters)
LM	Current / Voltage Output Terminal (For External Meters)
5G	Common Terminal For [V1] [I] [FM] [LM]
FX	Forward Direction Command Terminal
RX	Reverse Direction Command Terminal
BX	Emergency-Stop Command Terminal
RST	Fault Reset Terminal
P1	Multi-Function Input Terminal 1
P2	Multi-Function Input Terminal 2
P3	Multi-Function Input Terminal 3
P4	Multi-Function Input Terminal 4
P5	Multi-Function Input Terminal 5
P6	Multi-Function Input Terminal 6
P7	Not in use
CM	Common Terminal for [FX] [RX] [BX] [P1] [P2] [P3] [P4] [P5] [P6] [RST]
OC1	Multi-Function Output Terminal 1 (Open Collector Type 24 V)
OC2	Multi-Function Output Terminal 2 (Open Collector Type 24 V)
OC3	Multi-Function Output Terminal 3 (Open Collector Type 24 V)
EG	Ground Terminal for OC1, OC2, and OC3
1A, 1B	Auxiliary Relays for Multi-Function Output
2A, 2B	(AC250 Volts / 1 Amp) (DC30 Volts / 1 Amp)
A	Relay Output Terminal for Fault Signal
B	(AC250 Volts / 1 Amp) (DC30 Volts / 1Amp)
C	
IO, 5G	utput terminal

4. Power Terminals

R	S	T	E	U	V	W	E	L1	L2	DCN

Symbols	Functions
R	AC Line Input, 200V class, 400V class
S	

T	
E	Earth Terminal from Input Power Line
U	3-Phase Output Terminals (to Motor)
V	
W	
E	Earth Terminal to Output Motor Line
L1	External DC Reactor(L1-L2) and DB Unit(+) Terminals
L2	For SV033/037/045/055iH-4 units, these terminals are shown as '**P/L1'** terminal.
DCN	DB Unit(-) Terminal For SV033/037/045/055iH-4 units, this terminal is shown as '**N'** terminal.

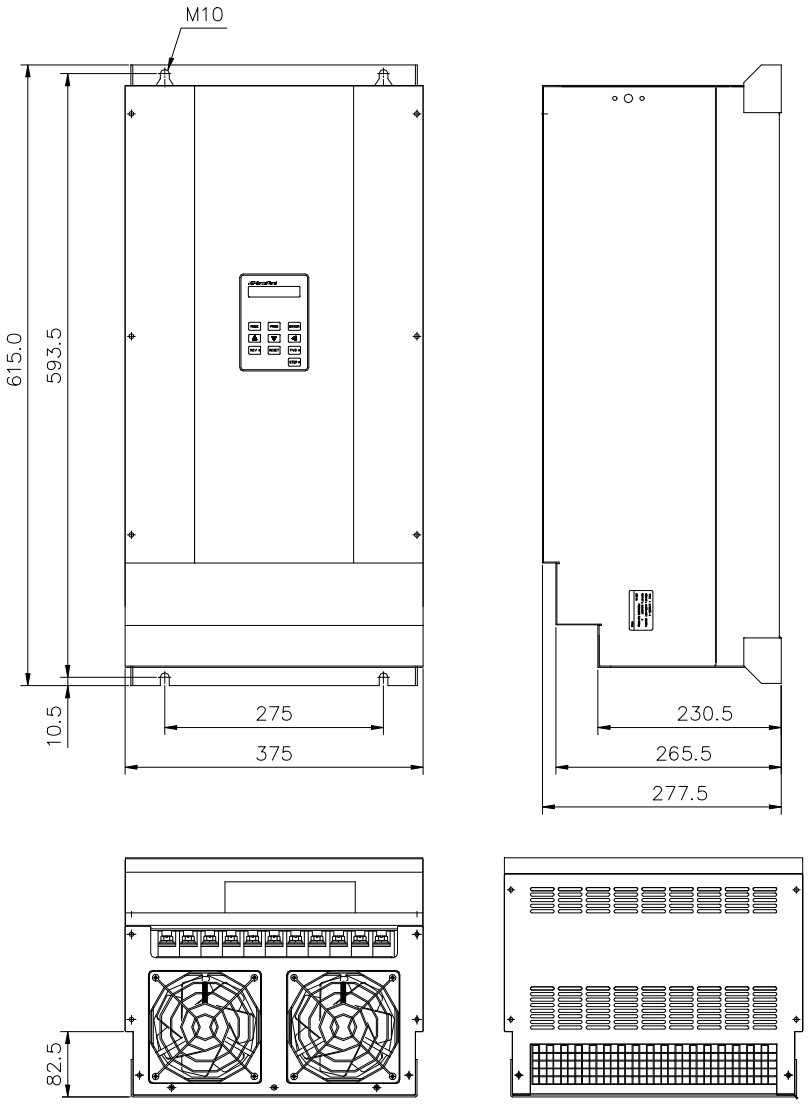
!!WARNING!!

Normal stray capacitance between the inverter chassis and the power devices inside the inverter and AC line can provide a high impedance shock hazard. Do not apply power to the inverter if the inverter frame (power terminal E) is not grounded.

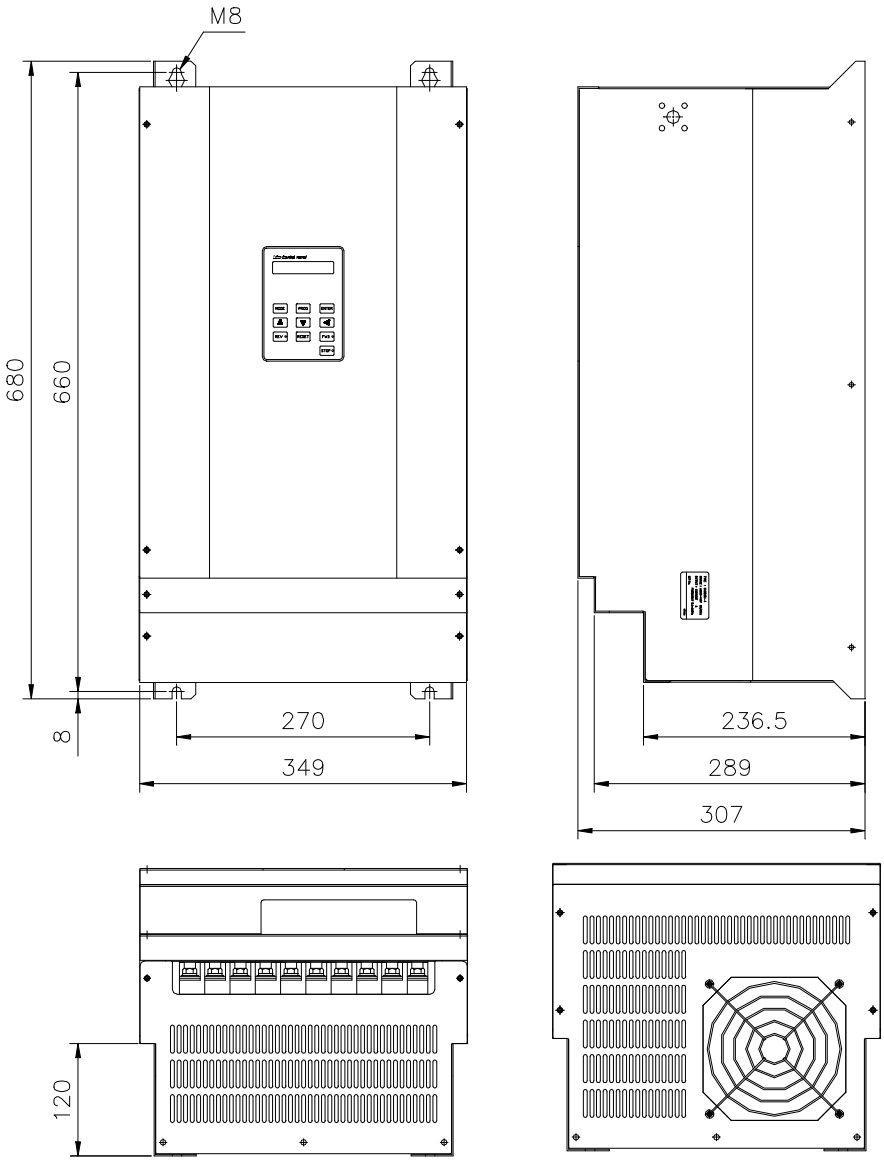
V. CHAPTER FIVE
DIMENSIONS

Dimensions

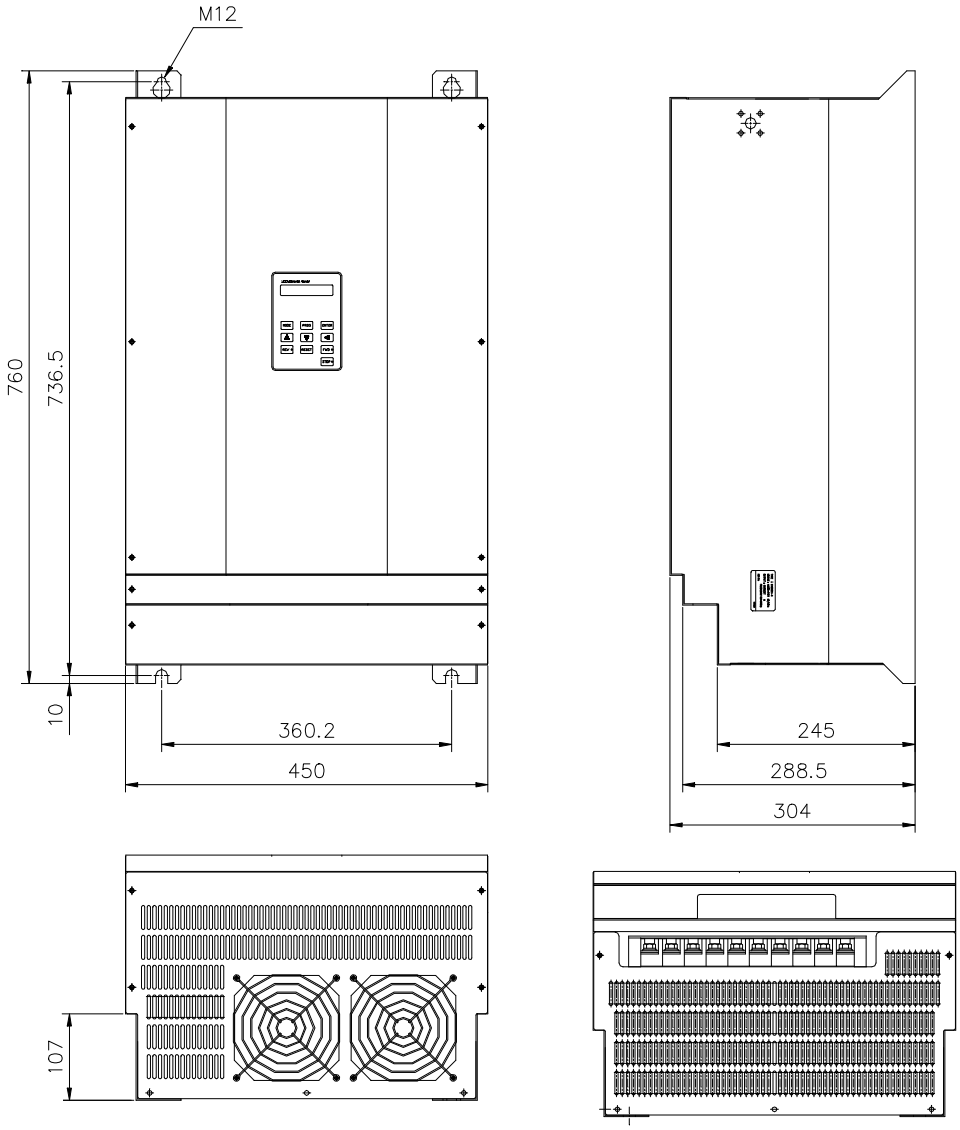
1. SV030iH-2, SV037iH-2 unit: mm



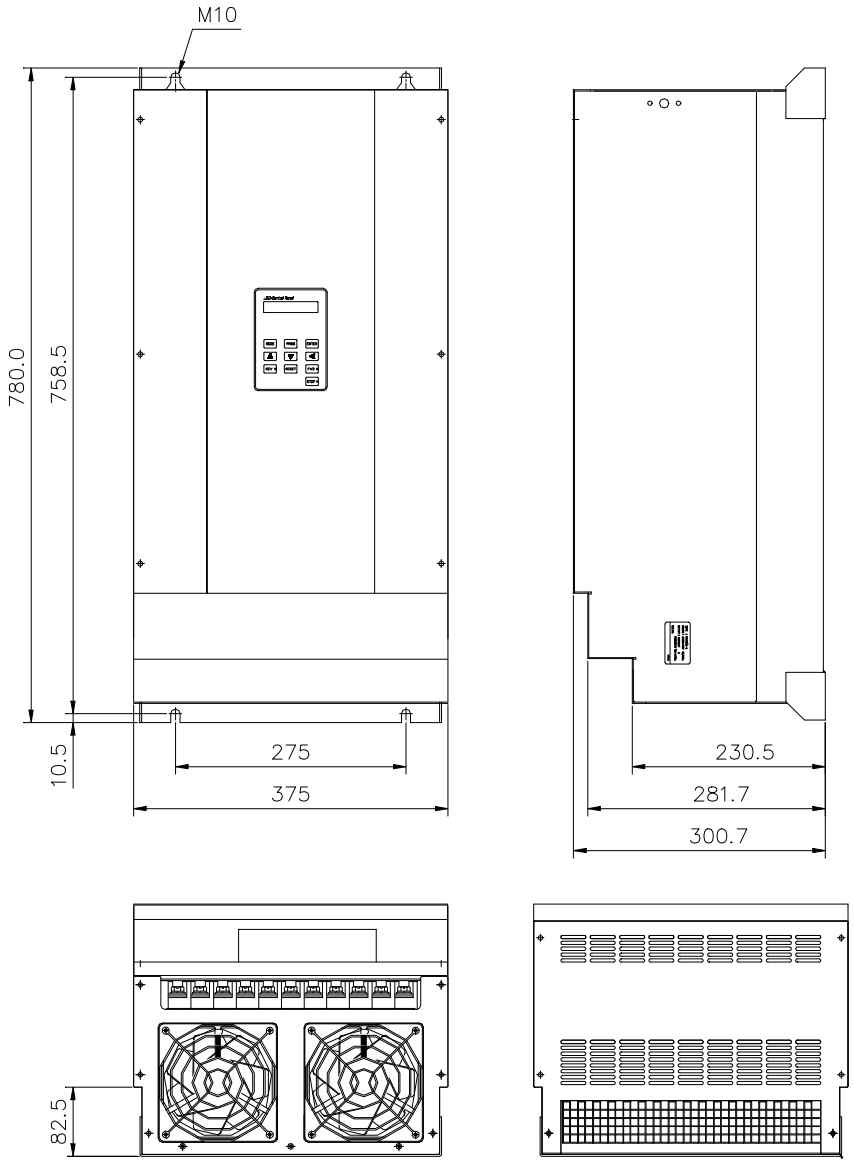
2. SV030iH-4 unit: mm



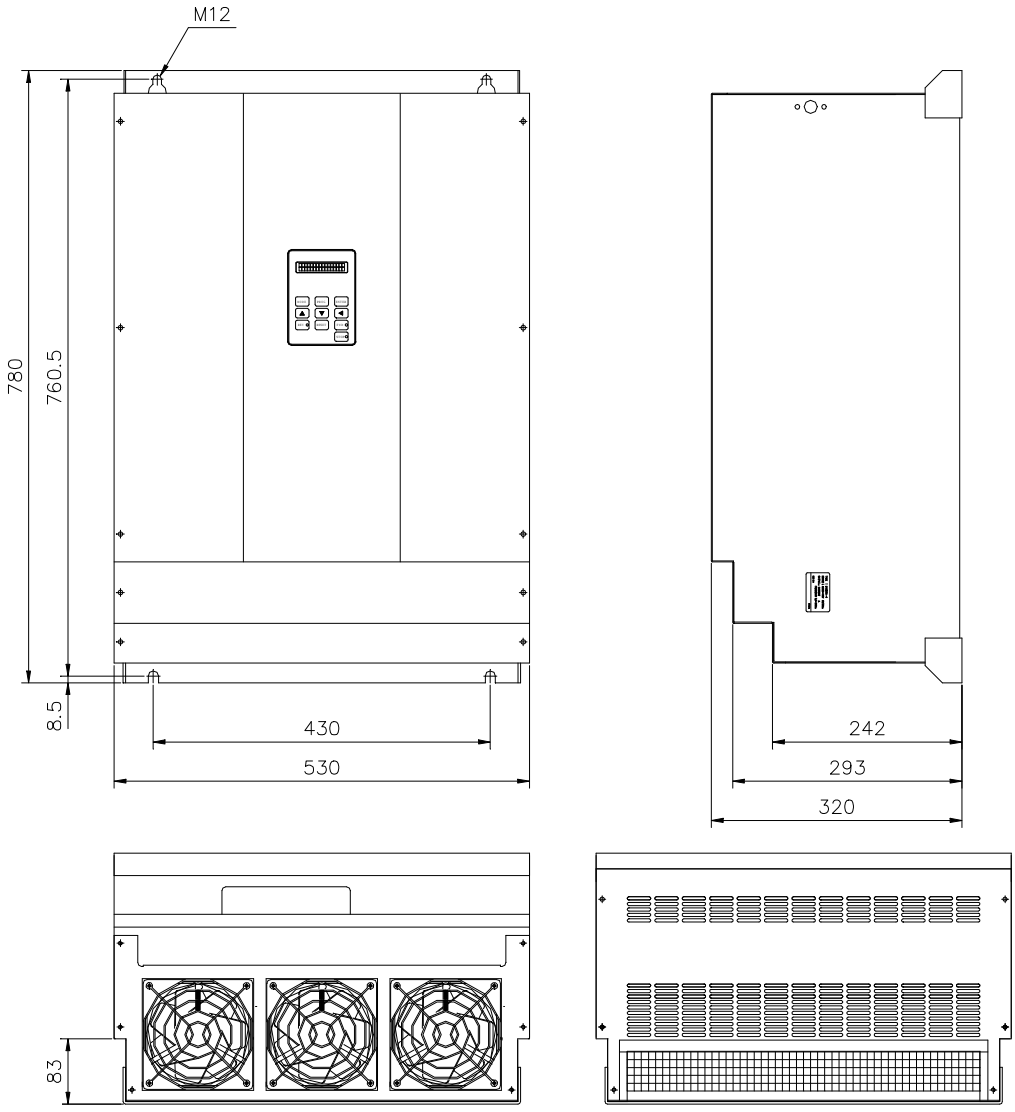
3. SV037iH-4, SV045iH-4, SV055-4 unit: mm



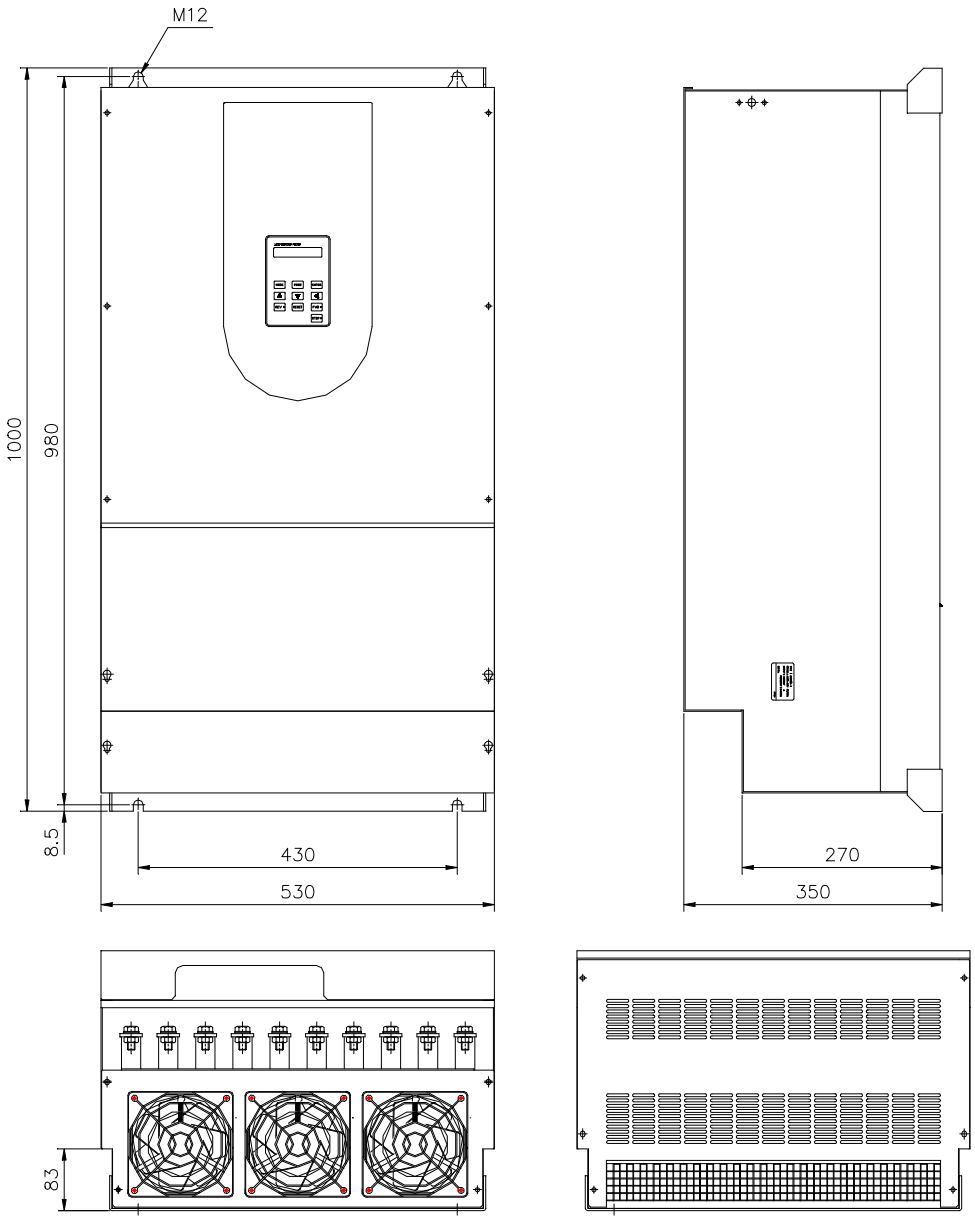
4. SV045iH-2, SV055iH-2, SV075-4 unit: mm



5. SV090iH-4, SV110iH-4 unit: mm



5. SV132iH-4, SV160iH-4 unit: mm



VI. CHAPTER SIX
MAINTENANCE AND TROUBLE SHOOTING

1. Maintenance

SV-iH Series can be influenced by temperature, humidity, and vibration. To avoid any possible uncertainty, the drive must be maintained properly by certified personnel.

2. Precaution

- Only certified personnel familiar with the equipment are permitted to install, operate and maintain the drive.
- Observe the Charge LED on the drive to be sure of complete power dissipation.
- The output voltage of your SV-iH drive can only be measured by a rectifier voltage meter(such as RMS meter). Other instruments such as digital meter will read incorrect value due to the high switching PWM frequency.

3. Routine Inspection

- Check Input-Line Voltage to the drive for any fluctuation.
- Check the Cooling Fan.
- Check for any physical vibration to the drive.
- Check the temperature for any overheating.

4. Visual Inspection

- Any loosen screw, nuts, or rust?
  → Tighten up or change.
- Any deposit of dust in the AC Drive or Cooling Fan?
  → Clean the dust off or any conductive fines.
- Any disconnection of connector from PCB?
  → Tighten up the connector.
- Any sound from the Fan?
  → Replace.

5. Maintenance Schedule of Key Parts

XIII. Parts Description	**Schedule**
XIV. DC Bus Capacitor	2 years
Cooling Fan	1 year
IGBT	-
Diode	-
Snubber Condenser	1 year
Control PCB	3 years
Optional DB	1 year

6. Fault Trip Description

When a Fault Trip occurred, the inverter cuts off its output and displays the fault status in DRV 05. The last two faults are saved in I/O 46, 47 with the operation status at the instant of Fault Trip.

Fault Display	Description	Remedy
DRV¢º Fault 05 OC Trip	The output current of the inverter has reached the overcurrent protection level.	● Extend Acceleration time in DRV 01. ● Reduce the Torque boost in FUN 08,09. ● Check wiring to motor for possible short circuits. ● If problem persists, the load inertia may be too great for that size inverter. A larger inverter may be required.
DRV¢º Fault 05 GF Trip	Inverter output terminals (U,V,W) shorted to ground.	● Check the wiring from the inverter to motor for ground. ● Check motor widings for ground.
DRV¢º Fault 05 OV Trip	The DC bus voltage of the inverter is over the overvoltage protection level.	● Check whether input voltage is within the limits of the inverter. ● Extend Deceleration time in DRV 02 to accommodate the high inertia level. Additional DB unit may be required to dissipate excessive voltage.

		● Eccentric loads and regenerative loads may cause overvoltage trips. A larger inverter may be required to accommodate the larger load requirement.
Fault Display	**Description**	**Remedy**
DRV¢º Fault 05 OC Limit	The output current of the inverter has been exceeded the value set in FUN 48 over the time set in FUN 49.	● Check for mechanical failure which may have caused excessive motor current(bearing failure, jam, brake sticking, etc)
DRV¢º Fault 05 Fuse Open	The internal fuse is opened. This is caused when a IGBT on the output side of the inverter is damaged. The fuse opens to prevent further damage.	● Check whether the IGBTs are damaged. ● Replace the Fuse.
DRV¢º Fault 05 Over Heat	The heat sink temperature of the inverter is over 85°C.(internal heat sensor)	● Check whether the Cooling Fan is rotating. ● Check the air inlet and outlet. ● Check the ambient temperature.
DRV¢º Fault 05 ETH	The motor temperature calculated by the 'Electronic Thermal' has been exceeded the value set in FUN 51.	● Check whether the ETH level is set correctly. ● Check whether the inverter is operated at low frequency with heavy load for a long time.
DRV¢º Fault 05 EXT Trip	The multi-function input terminal configured as 'EXT_TRIP' is opened.	● Check the multi-function input terminal.
DRV¢º Fault 05 LV Trip	The DC bus voltage of the inverter is under the Low voltage protection level.	● Check the input line voltage. ● If the input line voltage is within the limit, there may by an error in the dynamic braking circuit. Contact Factory or your local distributor for assistance.
DRV¢º Fault 05 BX	The 'BX' terminal is closed.	● Check the 'BX' terminal.

If the problem persists, please contact LGIS or your local distributor for assistance.

!!CAUTION!!

Risk of Electric Shock *– More than one disconnect switch may be required to de-energize the equipment before servicing.*