Thank you for purchasing LS Variable Frequency Drives!

SAFETY INSTRUCTIONS

- Always follow safety instructions to prevent accidents and potential hazards from occurring.

- In this manual, safety messages are classified as follows:

⚠ **WARNING**	Improper operation may result in serious personal injury or death.
⚠ **CAUTION**	Improper operation may result in slight to medium personal injury or property damage.

- Throughout this manual we use the following two illustrations to make you aware of safety considerations:

⚠ Identifies potential hazards under certain conditions.
Read the message and follow the instructions carefully.

⚠ Identifies shock hazards under certain conditions.
Particular attention should be directed because dangerous voltage may be present.

- Keep operating instructions handy for quick reference.

- Read this manual carefully to maximize the performance of SV-iG5A series inverter and ensure its safe use.

⚠ WARNING

- **Do not remove the cover while power is applied or the unit is in operation.**
  Otherwise, electric shock could occur.

- **Do not run the inverter with the front cover removed.**
  Otherwise, you may get an electric shock due to high voltage terminals or charged capacitor exposure.

- **Do not remove the cover except for periodic inspections or wiring, even if the input power is not applied.**
  Otherwise, you may access the charged circuits and get an electric shock.

- **Wiring and periodic inspections should be performed at least 10 minutes after disconnecting the input power and after checking the DC link voltage is discharged with a meter (below DC 30V).**
  Otherwise, you may get an electric shock.
- **Operate the switches with dry hands.**
  Otherwise, you may get an electric shock.
- **Do not use the cable when its insulating tube is damaged.**
  Otherwise, you may get an electric shock.
- **Do not subject the cables to scratches, excessive stress, heavy loads or pinching.**
  Otherwise, you may get an electric shock.

⚠ CAUTION

- **Install the inverter on a non-flammable surface. Do not place flammable material nearby.**
  Otherwise, fire could occur.
- **Disconnect the input power if the inverter gets damaged.**
  Otherwise, it could result in a secondary accident and fire.
- **After the input power is applied or removed, the inverter will remain hot for a couple of minutes.**
  Otherwise, you may get bodily injuries such as skin-burn or damage.
- **Do not apply power to a damaged inverter or to an inverter with parts missing even if the installation is complete.**
  Otherwise, electric shock could occur.
- **Do not allow lint, paper, wood chips, dust, metallic chips or other foreign matter into the drive.**
  Otherwise, fire or accident could occur.

[Risk of injury or Electric Shock]

- Read the manual carefully and follow the safety Instructions before installing or using the device.
- Before opening the cover, disconnect all power sources and wait for at least 10 minutes.

[Risque de blessure ou de choc électrique]

- Avant d'installer ou d'utiliser l'appareil, vous devez lire attentivement le manuel et suivre les consignes de sécurité.
- Avant d'ouvrir le capot, débrancher toutes les sources d'alimentation et attendre au moins 10 minutes.

OPERATING PRECAUTIONS

(1) Handling and installation

- ☐ Handle according to the weight of the product.
- ☐ Do not stack the inverter boxes higher than the number recommended.
- ☐ Install according to instructions specified in this manual.
- ☐ Do not open the cover during delivery.
- ☐ Do not place heavy items on the inverter.
- ☐ Check the inverter mounting orientation is correct.
- ☐ Do not drop the inverter, or subject it to impact.
- ☐ Follow your national electrical code for grounding. Recommended Ground impedance for 200 V Class is below 100 ohm and for 400V class below 10 ohm.
- ☐ iG5A series contains ESD (Electrostatic Discharge) sensitive parts. Take protective measures against ESD before touching the PCB for inspection or installation.
- ☐ Use the inverter under the following environmental conditions:

Environment	Surrounding temperature	- 10 ~ 50 ℃ (non-freezing)
	Relative humidity	90% RH or less (non-condensing)
	Storage temperature	- 20 ~ 65 ℃
	Location	Protected from corrosive gas, combustible gas, oil mist or dust
	Altitude, Vibration	Max. 1,000m above sea level, Max. 5.9m/sec^2 (0.6G) or less
	Atmospheric pressure	70 ~ 106 kPa

(2) Wiring

- ☐ Do not connect a power factor correction capacitor, surge suppressor, or RFI filter to the output of the inverter.
- ☐ The connection orientation of the output cables U, V, W to the motor will affect the direction of rotation of the motor.
- ☐ Incorrect terminal wiring could result in the equipment damage.
- ☐ Reversing the polarity (+/-) of the terminals could damage the inverter.
- ☐ Only authorized personnel familiar with LS inverter should perform wiring and inspections.
- ☐ Always install the inverter before wiring. Otherwise, you may get an electric shock or have bodily injury.

(3) Trial run

- ☐ Check all parameters during operation. Changing parameter values might be required depending on the load.
- ☐ Always apply permissible range of voltage to the each terminal as indicated in this manual. Otherwise, it could lead to inverter damage.

(4) Operation precautions

- When the Auto restart function is selected, stay away from the equipment as a motor will restart suddenly after an alarm stop.
- The Stop key on the keypad is valid only when the appropriate function setting has been made. Prepare an emergency stop switch separately.
- If an alarm reset is made with the reference signal present, a sudden start will occur. Check that the reference signal is turned off in advance. Otherwise an accident could occur.
- Do not modify or alter anything inside the inverter.
- Motor might not be protected by electronic thermal function of inverter.
- Do not use a magnetic contactor on the inverter input for frequent starting/stopping of the inverter.
- Use a noise filter to reduce the effect of electromagnetic interference. Otherwise nearby electronic equipment may be affected.
- In case of input voltage unbalance, install AC reactor. Power Factor capacitors and generators may become overheated and damaged due to potential high frequency noise transmitted from inverter.
- Use an insulation-rectified motor or take measures to suppress the micro surge voltage when driving 400V class motor with inverter. A micro surge voltage attributable to wiring constant is generated at motor terminals, and may deteriorate insulation and damage motor.
- Before operating unit and prior to user programming, reset user parameters to default settings.
- Inverter can easily be set to high-speed operations, Verify capability of motor or machinery prior to operating unit.
- Stopping torque is not produced when using the DC-Break function. Install separate equipment when stopping torque is needed.

(5) Fault prevention precautions

- Provide a safety backup such as an emergency brake which will prevent the machine and equipment from hazardous conditions if the inverter fails.

(6) Maintenance, inspection and parts replacement

- Do not conduct a megger (insulation resistance) test on the control circuit of the inverter.
- Refer to Chapter 6 for periodic inspection (parts replacement).

(7) Disposal

- Handle the inverter as an industrial waste when disposing of it.

(8) General instructions

- Many of the diagrams and drawings in this instruction manual show the inverter without a circuit breaker, a cover or partially open. Never run the inverter like this. Always place the cover with circuit breakers and follow this instruction manual when operating the inverter.

Important User Information

- The purpose of this manual is to provide the user with the necessary information to install, program, start up and maintain the SV-iG5A series inverter.
- To assure successful installation and operation, the material presented must be thoroughly read and understood before proceeding.
- This manual contains…

Chapter	Title	Description
1	Basic information and precautions	Provides general information and precautions for safe use of the SV-iG5A series inverter.
2	Installation and Wiring	Provides instructions on how to install and wiring for power source and signal terminal of SV-iG5A inverter.
3	Basic configuration	Describes how to connect the optional peripheral devices to the inverter.
4	Programming keypad and Basic operation	Illustrates keypad features and display & Provides instructions for quick start of the inverter.
5	Function list	Parameter values are listed.
6	Troubleshooting and maintenance	Defines the various inverter faults and the appropriate action to take as well as general troubleshooting information.
7	Specifications and Option	Gives information on Input/Output rating, control type and more details of the SV-iG5A inverter. Explains options including Remote keypad, Conduit, EMC filter, DB resistor, DeviceNet Module.

EAC mark

The EAC (EurAsian Conformity) mark is applied to the products before they are placed on the market of the Eurasian Customs Union member states.
It indicates the compliance of the products with the following technical regulations and requirements of the Eurasian Customs Union:
Technical Regulations of the Customs Union 004/2011 “On safety of low voltage equipment”
Technical Regulations of the Customs Union 020/2011 “On electromagnetic compatibility of technical products”

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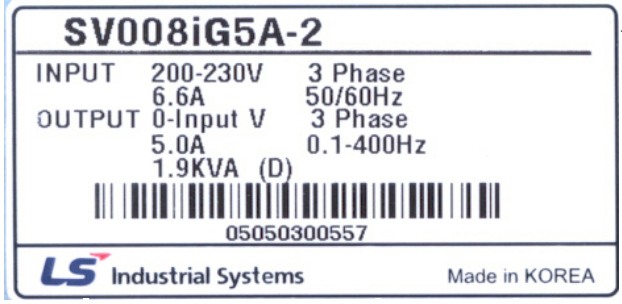
DECLARATION OF CONFORMITY i

CHAPTER 1 - BASIC INFORMATION AND PRECAUTIONS

1.1 Important precautions

Unpacking and inspection

- Inspect the inverter for any damage that may have occurred during shipping. To verify the inverter unit is the correct one for the application you need, check the inverter type, output ratings on the nameplate and the inverter is intact.



SV	075	iG5A	-	2	(N)

LS Inverter	Motor rating		Series Name		Input power		Keypad
	004	0.4 [kW]	iG5A		1	Single Phase 200~230[V]	Non-loader I/O Products
	008	0.75 [kW]					
	015	1.5 [kW]					
	022	2.2 [kW]					
	037	3.7 [kW]			2	Three Phase 200~230[V]	
	040	4.0 [kW]					
	055	5.5 [kW]					
	075	7.5 [kW]					
	110	11.0 [kW]			4	Three Phase 380~480[V]	
	150	15.0 [kW]					
	185	18.5 [kW]					
	220	22.0 [kW]					

- Accessories

If you have found any discrepancy, damage, etc., contact your sales representative.

Preparations of instruments and parts required for operation

- Instruments and parts to be prepared depend on how the inverter is operated. Prepare equipment and parts as necessary.

Installation

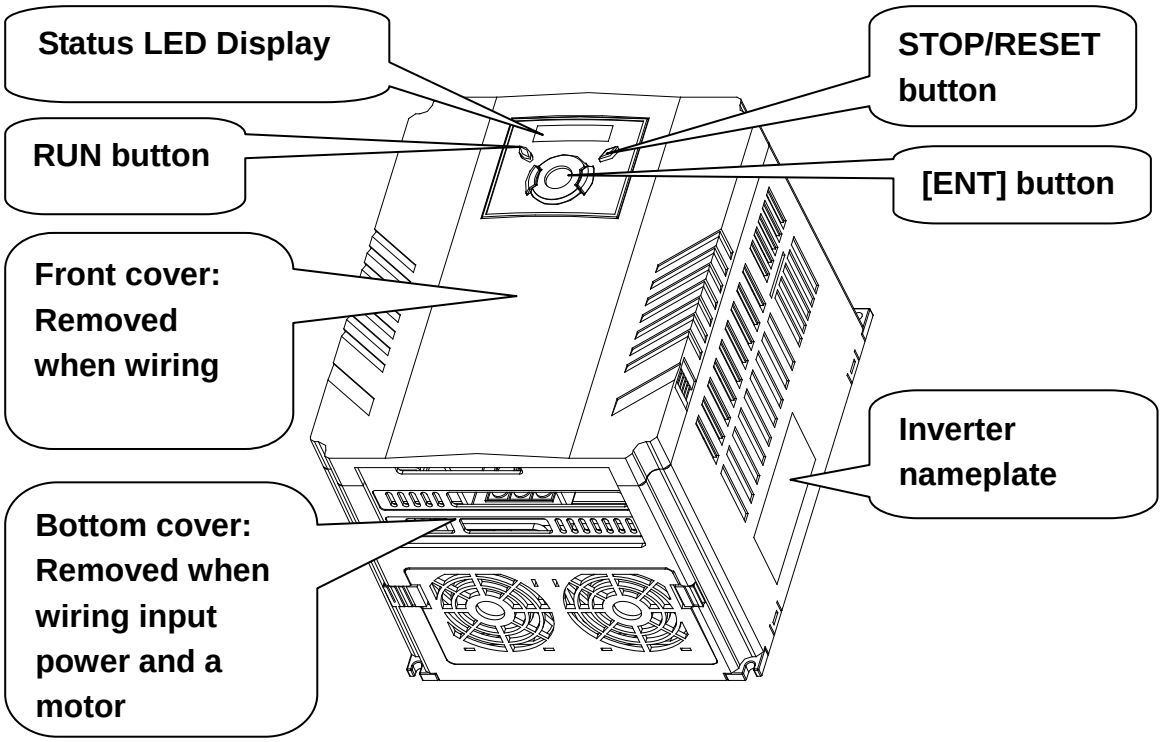
- To operate the inverter with high performance for a long time, install the inverter in a proper place in the correct direction and with proper clearances.

Wiring

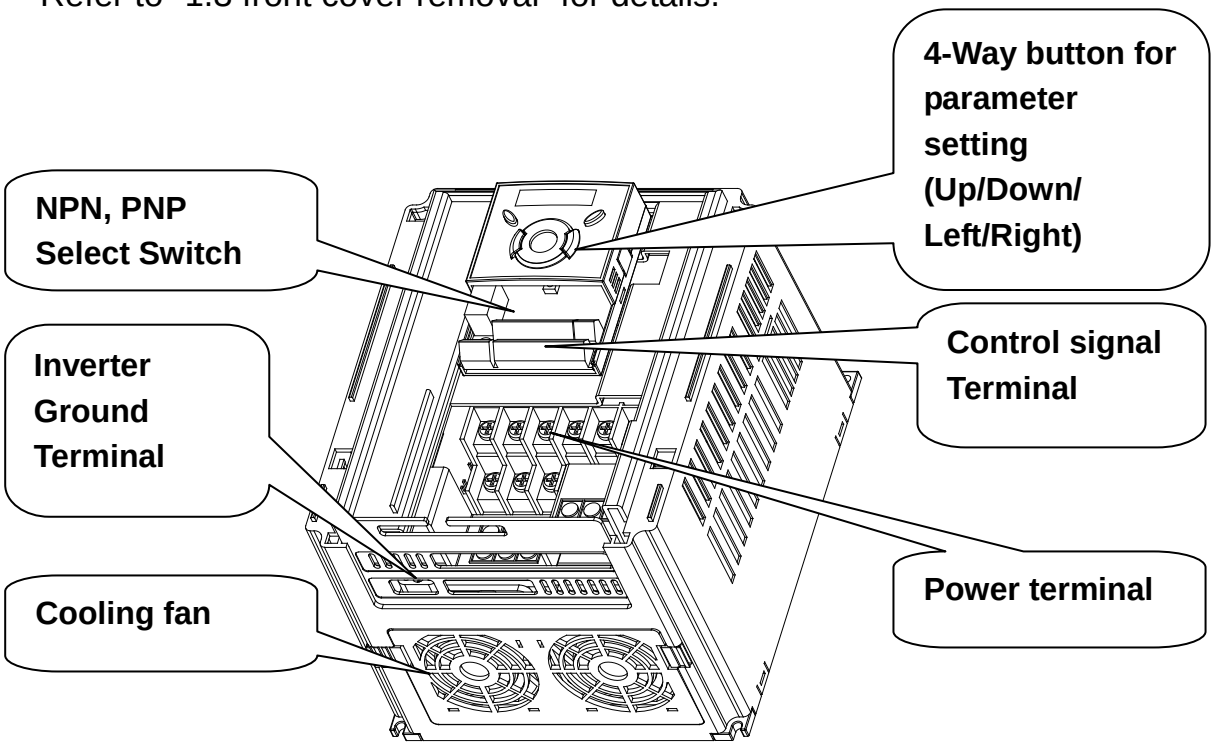
- Connect the power supply, motor and operation signals (control signals) to the terminal block. Note that incorrect connection may damage the inverter and peripheral devices.

1.2 Product Details

- Appearance

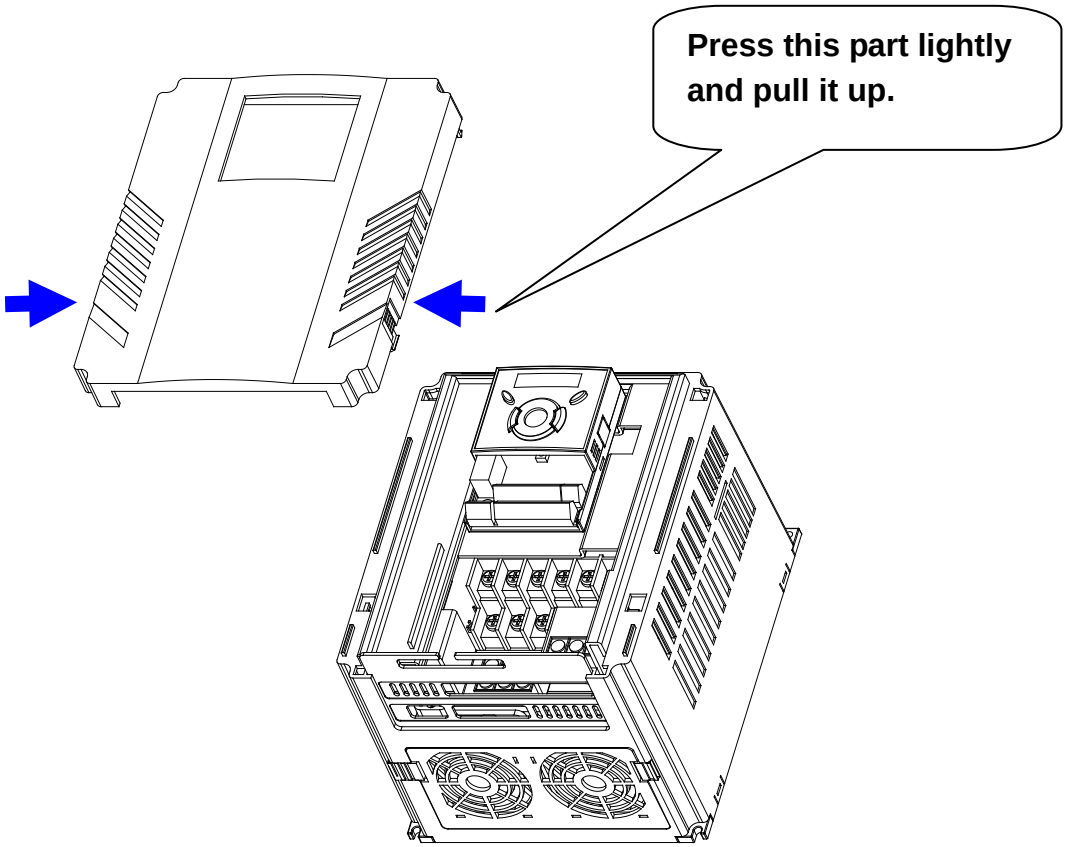


- Inside view after front cover is removed
  Refer to “1.3 front cover removal” for details.

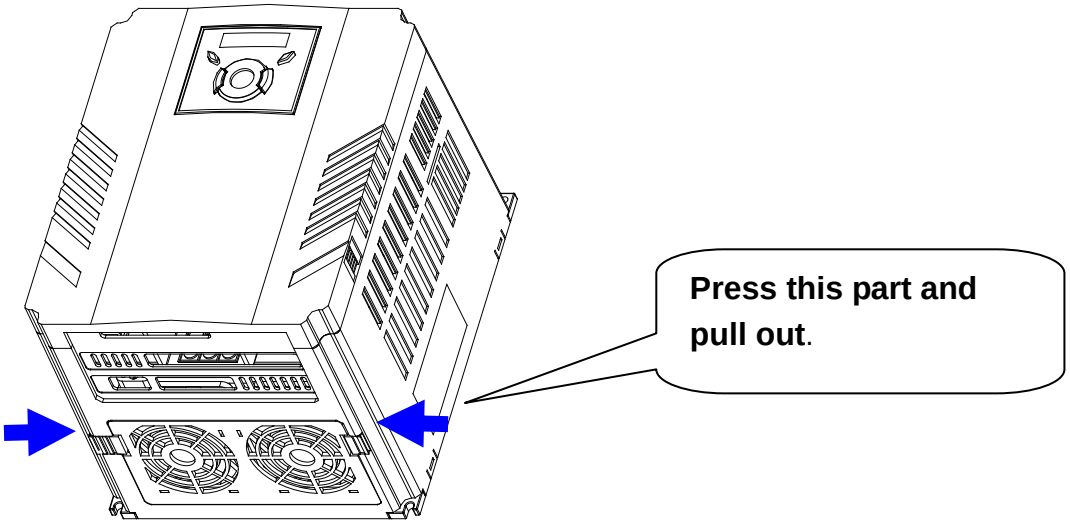


1.3 Prod

- To remove the front cover: Press the both indented sides of the cover lightly and pull up.



- To change the inverter fan: Press the both sides of bottom cover lightly and pull out to your side.



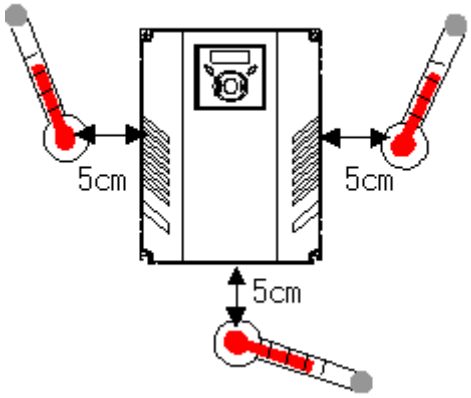
MEMO

CHAPTER 2 - INSTALLATION AND WIRING

2.1 Installation precautions

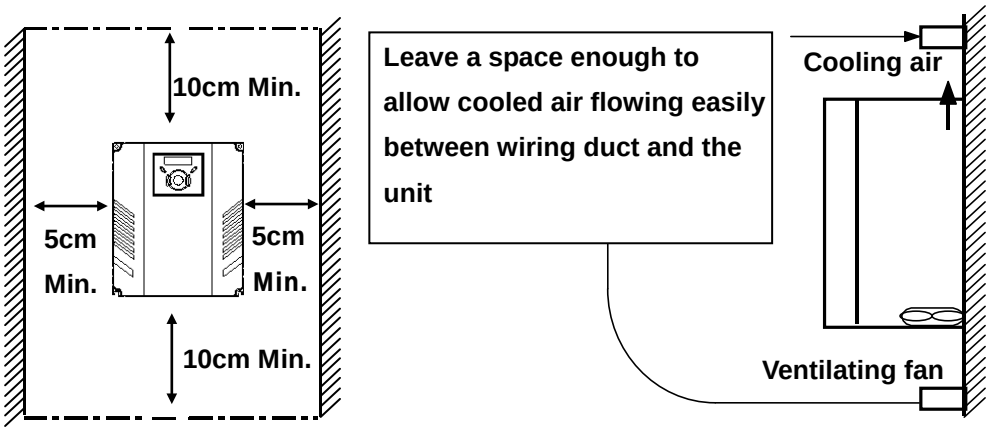
⚠ CAUTION

- Handle the inverter with care to prevent damage to the plastic components. Do not hold the inverter by the front cover. It may fall off.
- Install the inverter in a place where it is immune to vibration (5.9 m/s^2 or less).
- Install in a location where temperature is within the permissible range (-10~50°C).



<Ambient Temp Checking Location>

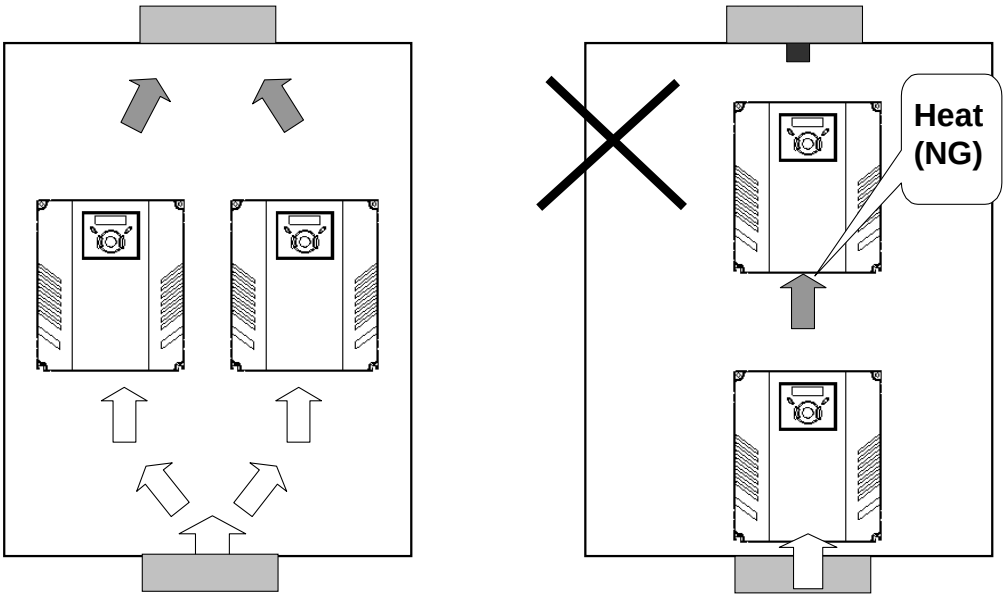
- The inverter will be very hot during operation. Install it on a non-combustible surface.
- Mount the inverter on a flat, vertical and level surface. Inverter orientation must be vertical (top up) for proper heat dissipation. Also leave sufficient clearances around the inverter.



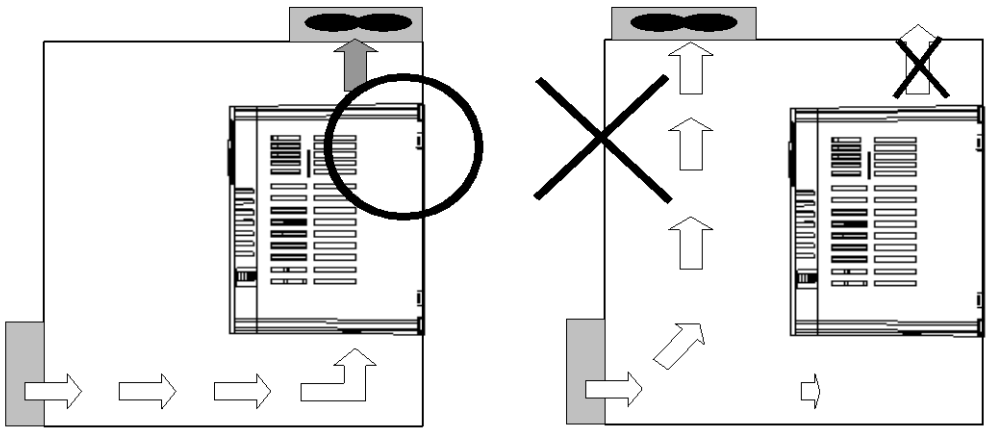
- Protect from moisture and direct sunlight.
- Do not install the inverter in any environment where it is exposed to water drops, oil mist, dust, etc. Install the inverter in a clean place or inside a “totally enclosed” panel any suspended matter is not entered.

- When two or more inverters are installed or a cooling fan is mounted in a panel, the inverters and fan must be installed in proper positions with extreme care to keep the ambient temperature below the permissible range.
- Installed the inverter using screws or bolts to insure the inverter is firmly fastened.

< For installing multiple inverters in a panel>

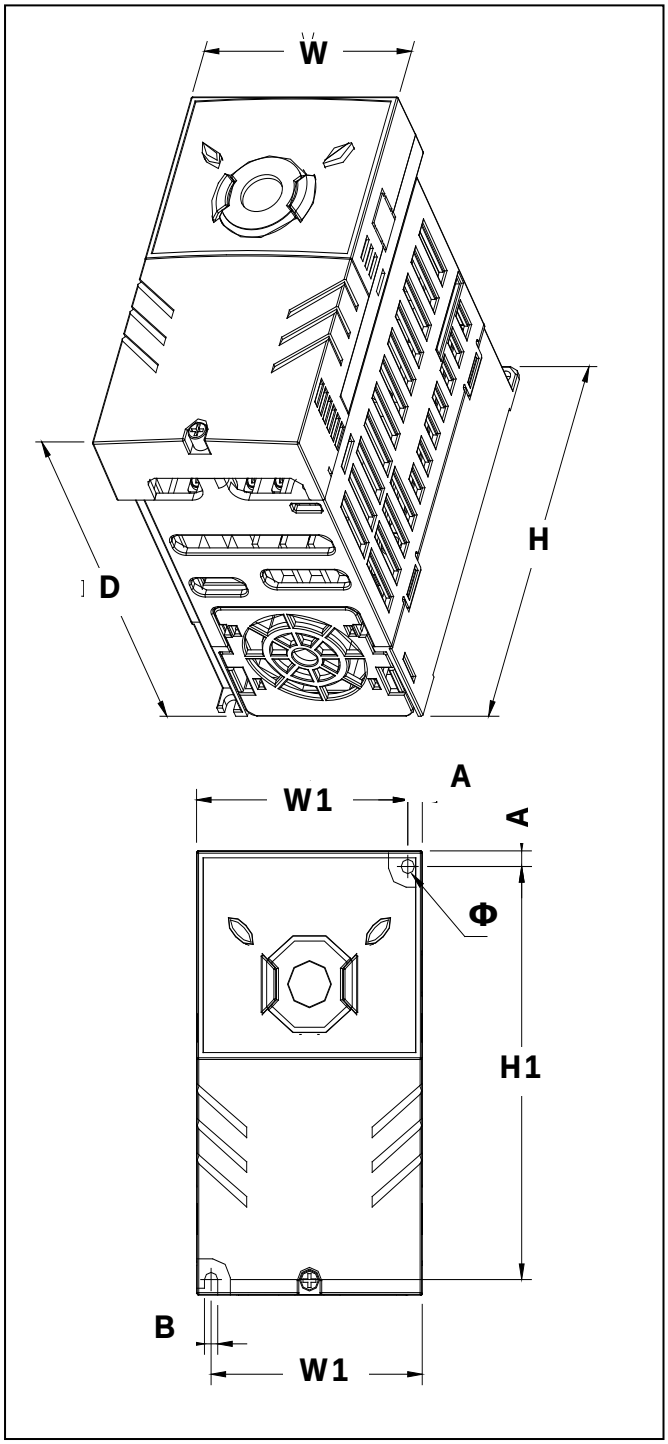


⚠ CAUTION
Take caution on proper heat ventilation when installing inverters and fans in a panel.

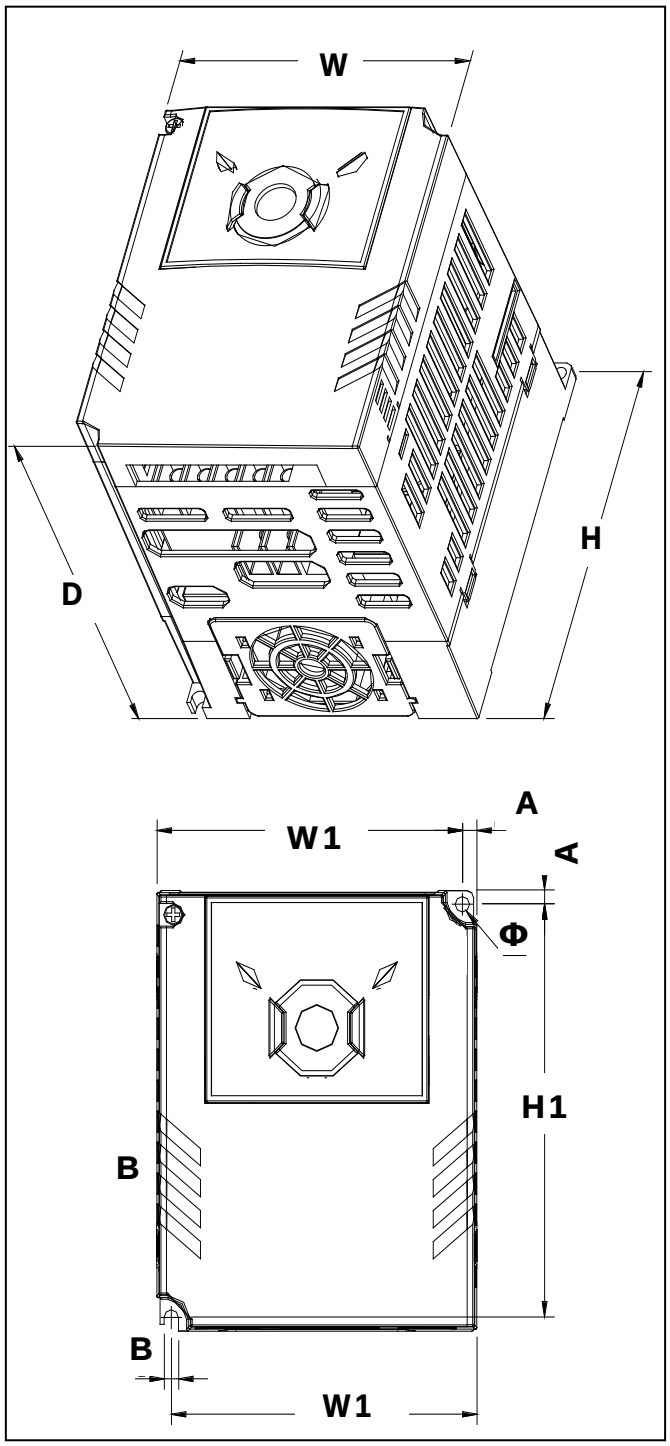


2.2 Dimensions

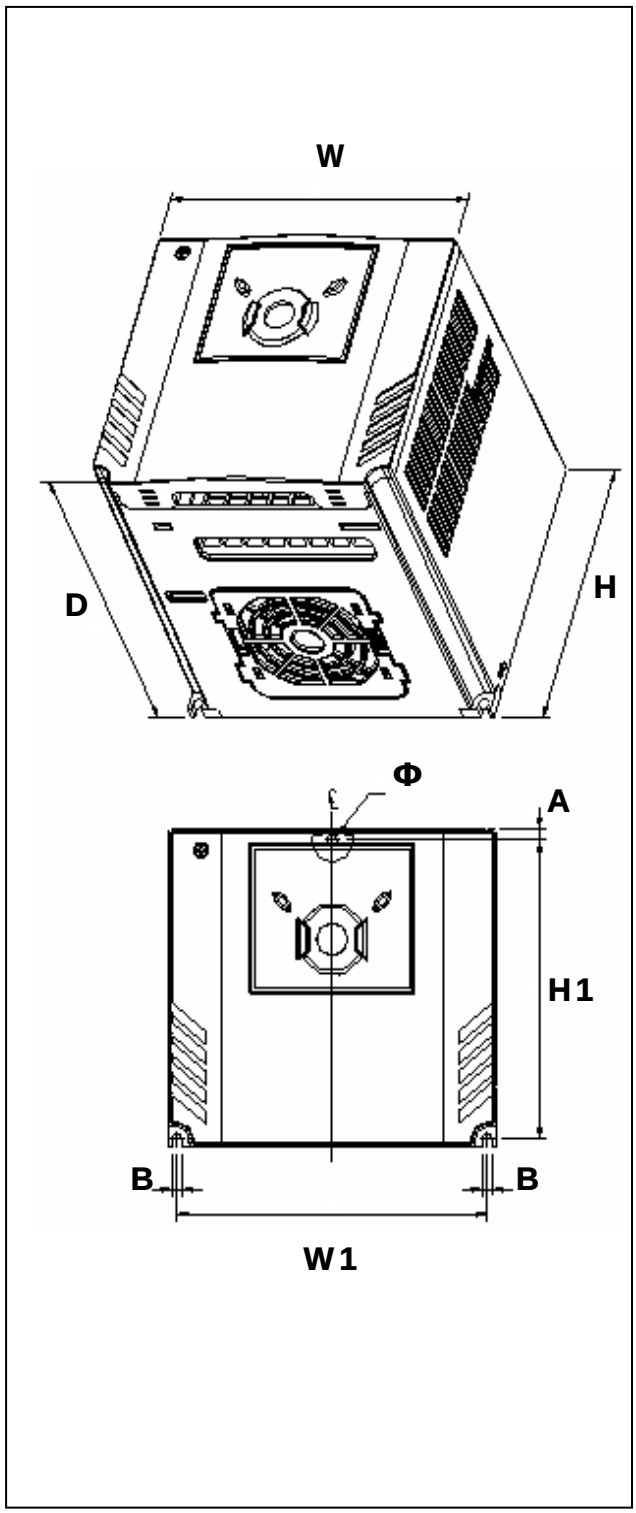
SV004iG5A-1
SV004iG5A-2 / SV008iG5A-2
SV004iG5A-4 / SV008iG5A-4

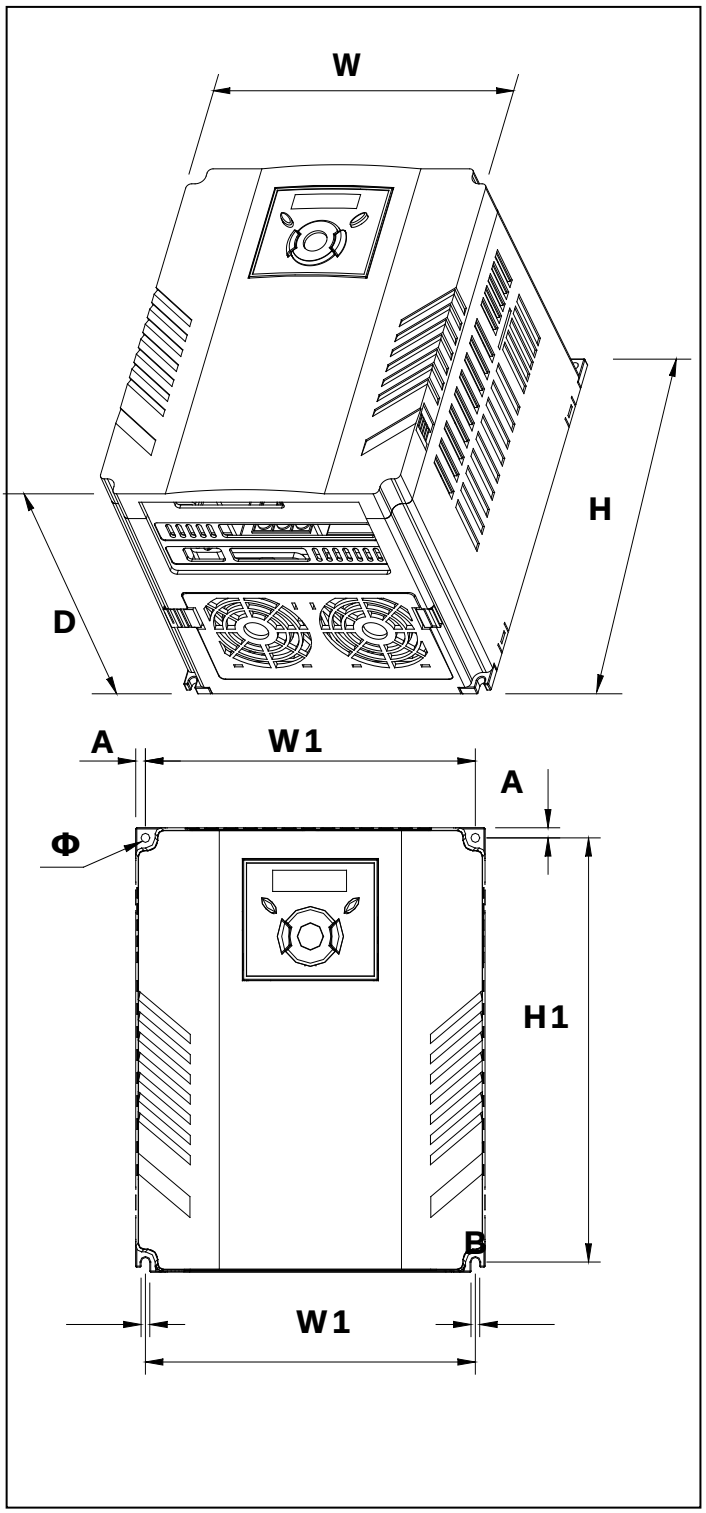


SV008iG5A-1
SV015iG5A-2 / SV015iG5A-4

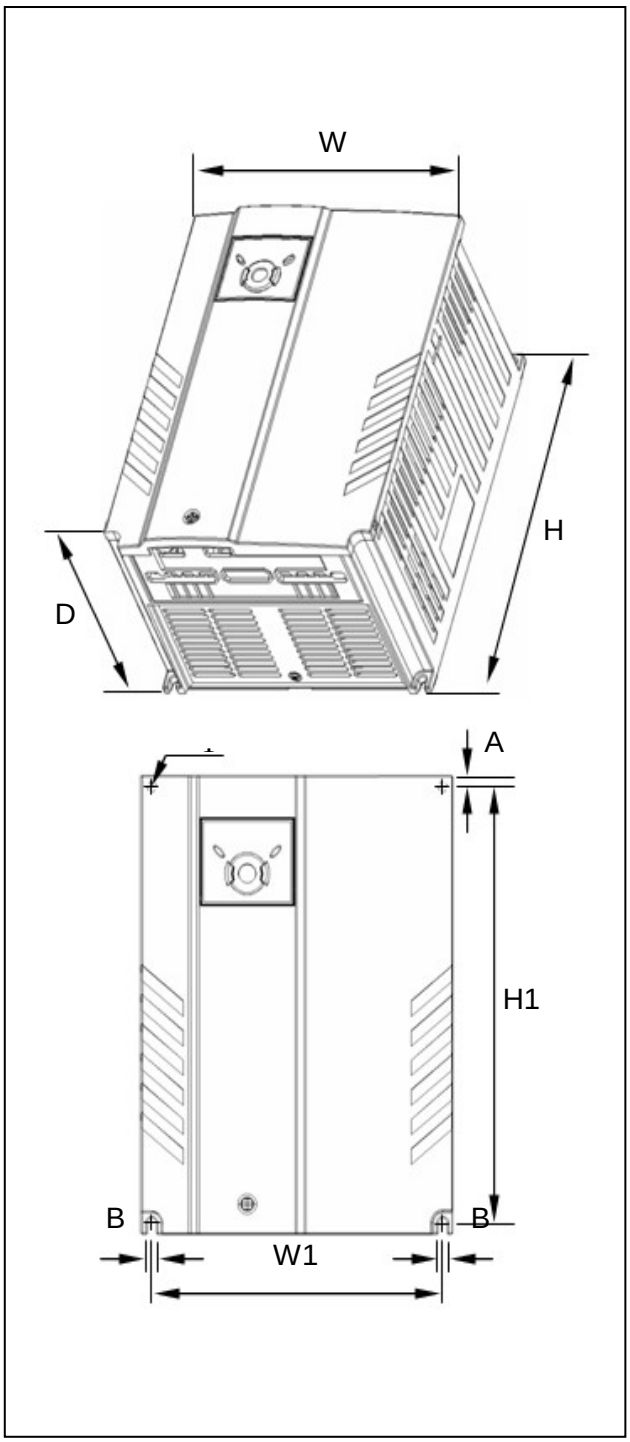


SV015IG5A-1
SV022iG5A-2 / SV037iG5A-2 / SV040iG5A-2 SV055iG5A-2 / SV075iG5A-2
SV022iG5A-4 / SV037iG5A-4 / SV040iG5A-4 SV055iG5A-4 / SV075iG5A-4

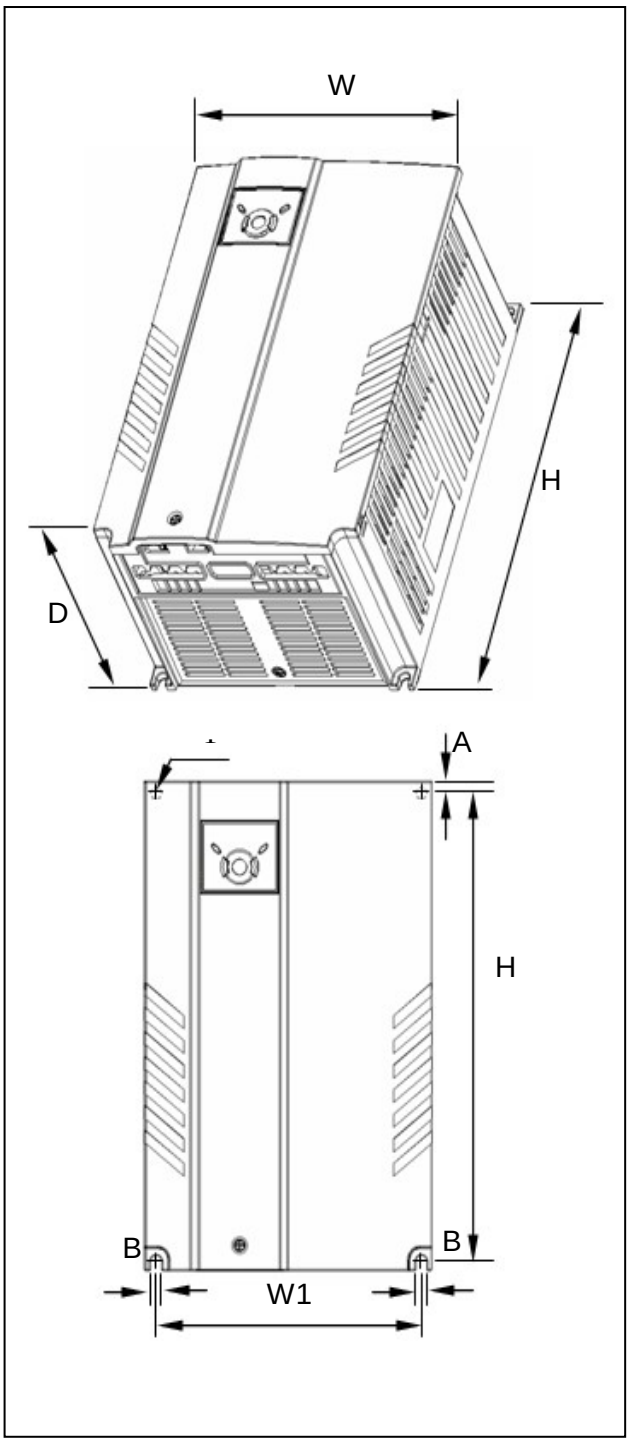




SV110iG5A-2 / SV150iG5A-2
SV110iG5A-4 / SV150iG5A-4

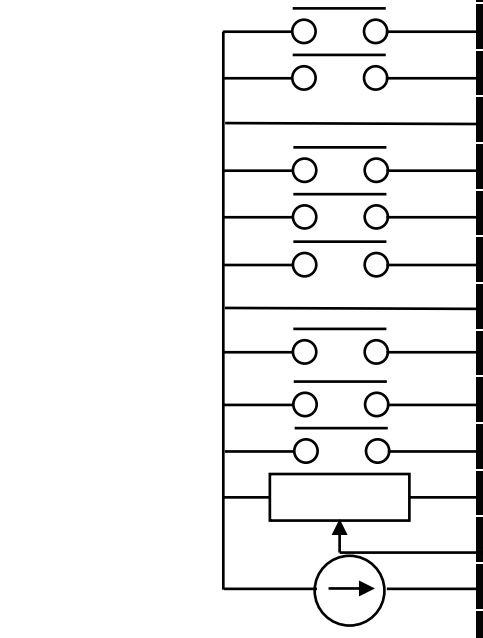


SV185iG5A-2 / SV220iG5A-2
SV185iG5A-4 / SV220iG5A-4

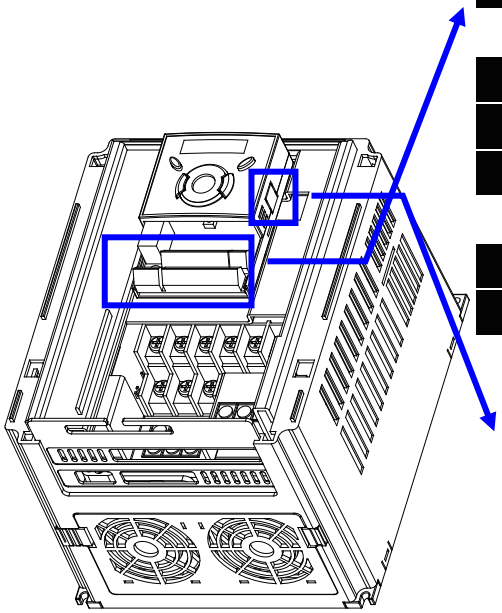


Inverter	[kW]	W [mm]	W1 [mm]	H [mm]	H1 [mm]	D [mm]	Φ	A [mm]	B [mm]	[Kg]
SV004iG5A-1	0.4	70	65.5	128	119	130	4.0	4.5	4.0	0.76
SV008iG5A-1	0.75	100	95.5	128	120	130	4.5	4.5	4.5	1.12
SV015iG5A-1	1.5	140	132	128	120.5	155	4.5	4.5	4.5	1.84
SV004iG5A-2	0.4	70	65.5	128	119	130	4.0	4.5	4.0	0.76
SV008iG5A-2	0.75	70	65.5	128	119	130	4.0	4.5	4.0	0.77
SV015iG5A-2	1.5	100	95.5	128	120	130	4.5	4.5	4.5	1.12
SV022iG5A-2	2.2	140	132	128	120.5	155	4.5	4.5	4.5	1.84
SV037iG5A-2	3.7	140	132	128	120.5	155	4.5	4.5	4.5	1.89
SV040iG5A-2	4.0	140	132	128	120.5	155	4.5	4.5	4.5	1.89
SV055iG5A-2	5.5	180	170	220	210	170	4.5	5.0	4.5	3.66
SV075iG5A-2	7.5	180	170	220	210	170	4.5	5.0	4.5	3.66
SV110iG5A-2	11.0	235	219	320	304	189.5	7.0	8.0	7.0	9.00
SV150iG5A-2	15.0	235	219	320	304	189.5	7.0	8.0	7.0	9.00
SV185iG5A-2	18.5	260	240	410	392	208.5	10.0	10.0	10.0	13.3
SV220iG5A-2	22.0	260	240	410	392	208.5	10.0	10.0	10.0	13.3
SV004iG5A-4	0.4	70	65.5	128	119	130	4.0	4.5	4.0	0.76
SV008iG5A-4	0.75	70	65.5	128	119	130	4.0	4.5	4.0	0.77
SV015iG5A-4	1.5	100	95.5	128	120	130	4.5	4.5	4.5	1.12
SV022iG5A-4	2.2	140	132	128	120.5	155	4.5	4.5	4.5	1.84
SV037iG5A-4	3.7	140	132	128	120.5	155	4.5	4.5	4.5	1.89
SV040iG5A-4	4.0	140	132	128	120.5	155	4.5	4.5	4.5	1.89
SV055iG5A-4	5.5	180	170	220	210	170	4.5	5.0	4.5	3.66
SV075iG5A-4	7.5	180	170	220	210	170	4.5	5.0	4.5	3.66
SV110iG5A-4	11.0	235	219	320	304	189.5	7.0	8.0	7.0	9.00
SV150iG5A-4	15.0	235	219	320	304	189.5	7.0	8.0	7.0	9.00
SV185iG5A-4	18.5	260	240	410	392	208.5	10.0	10.0	10.0	13.3
SV220iG5A-4	22.0	260	240	410	392	208.5	10.0	10.0	10.0	13.3

2.3 Terminal wiring (Control I/O)

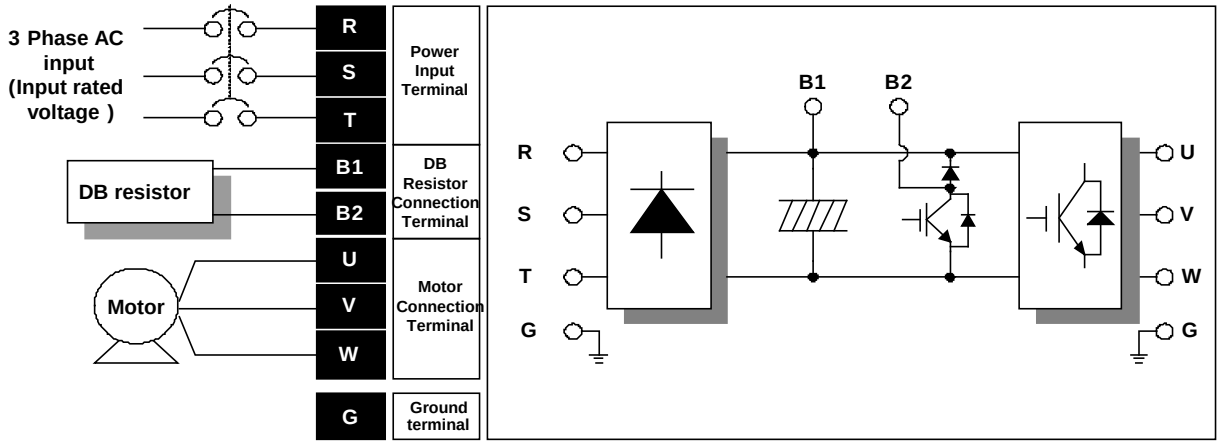


T/M	Description	
MO	Multi-function open collector output	
MG	MO Common	
24	24V output	
P1	MF input terminal (factory setting)	FX: Forward run
P2		RX: Reverse run
CM	Input signal common	
P3	MF input terminal (factory setting)	BX: Emergency stop
P4		RST: Trip reset
P5		JOG: Jog operation
CM	Input signal common	
P6	MF input terminal (factory setting)	Multi-step freq.-Low
P7		Multi-step freq.-Middle
P8		Multi-step freq.-High
VR	10V power supply for potentiometer	
V1	Freq. setting voltage signal input: -0~10V	
I	Freq. setting current signal input: 0~20mA	
AM	Multi-function analog output signal: 0~10V	
3A	Multi-function relay output terminal	A contact output
3B		B contact output
3C		A/B contact common
S+	RS485 communication terminal	
S-		

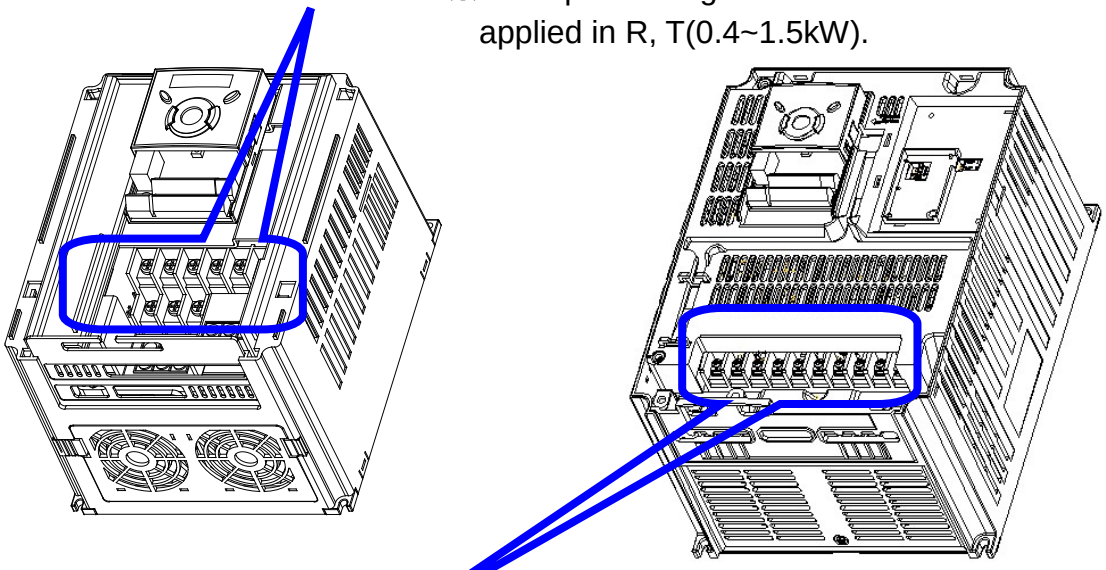


※ For connection to Remote Option or parameter copying.

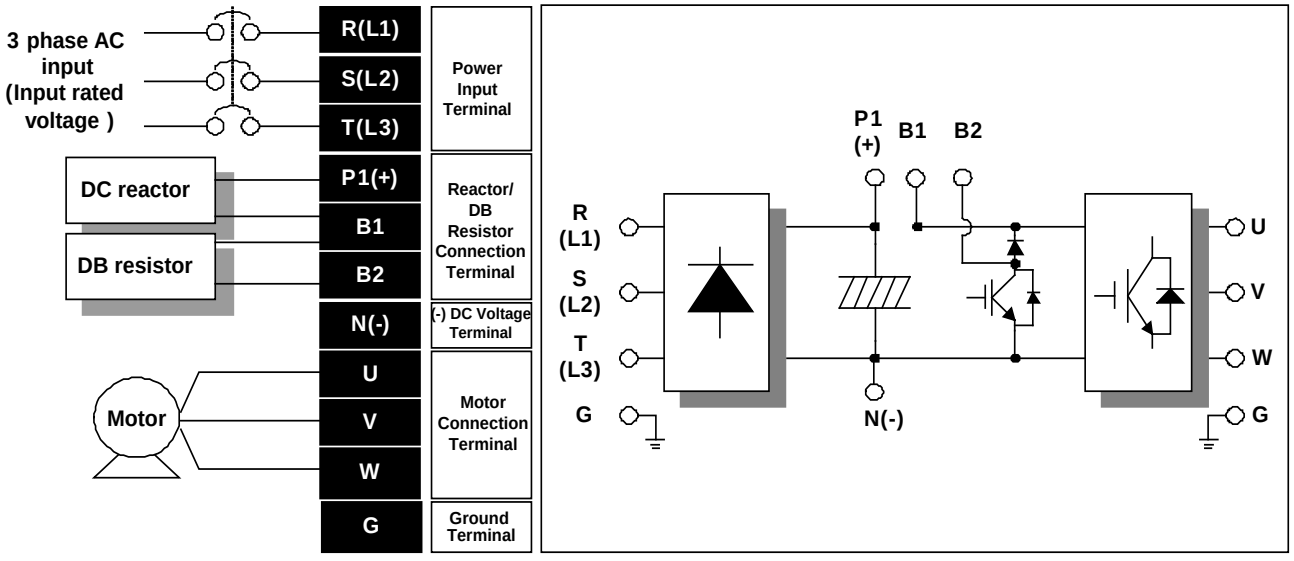
* Power terminal wiring (0.4 ~ 7.5kW)



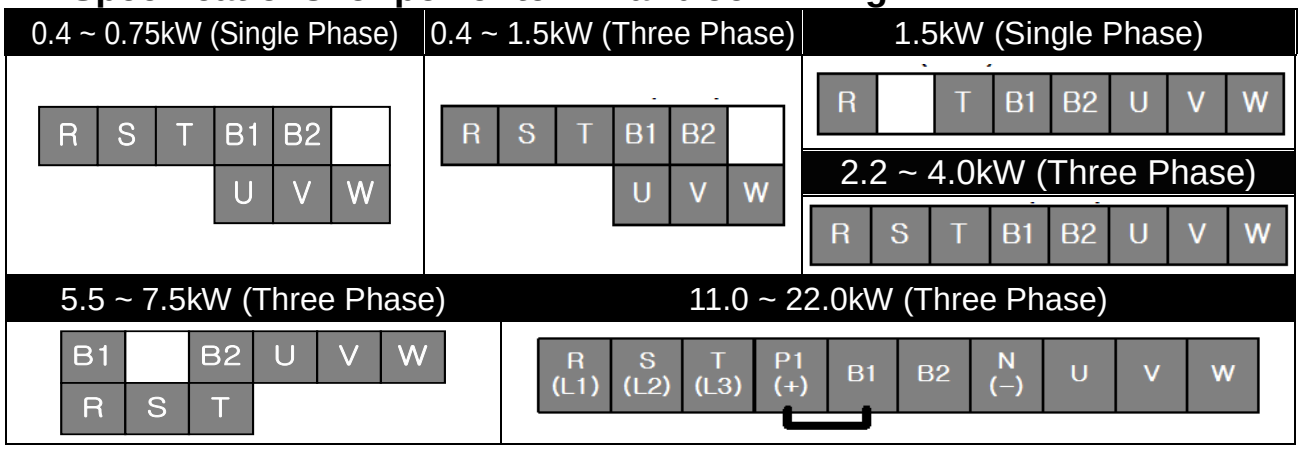
※ AC input of Single Phase Products must be applied in R, T(0.4~1.5kW).



* Power terminal wiring (11.0 ~ 22.0kW)

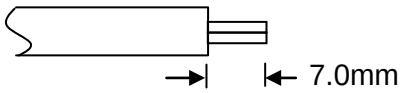


2.4 Specifications for power terminal block wiring



	R,S,T Size		U,V,W Size		Ground Size		Terminal Screw Size	Screw Torque (Kgf.cm)/lb-in
	mm^2	AWG	mm^2	AWG	mm^2	AWG		
SV004iG5A-1	2	14	2	14	3.5	12	M3.5	10/8.7
SV008iG5A-1								
SV015iG5A-1							M4	15/13
SV004iG5A-2							M3.5	10/8.7
SV008iG5A-2								
SV015iG5A-2								
SV022iG5A-2							M4	15/13
SV037iG5A-2	3.5	12	3.5	12				
SV040iG5A-2								
SV055iG5A-2	5.5	10	5.5	10	5.5	10	M5	32/28
SV075iG5A-2	8	8	8	8				
SV110iG5A-2	14	6	14	6	14	6	M6	30.7/26.6
SV150iG5A-2	22	4	22	4				
SV185iG5A-2	30	2	30	2	22	4	M8	30.6/26.5
SV220iG5A-2	38							
SV004iG5A-4	2	14	2	14	2	14	M3.5	10/8.7
SV008iG5A-4								
SV015iG5A-4							M4	15/13
SV022iG5A-4								
SV037iG5A-4								
SV040iG5A-4								
SV055iG5A-4	3.5	12			3.5	12	M5	32/28
SV075iG5A-4			3.5	12				
SV110iG5A-4	5.5	10	5.5	10	8	8		30.7/26.6
SV150iG5A-4	14	6	8	8				
SV185iG5A-4					14	6	M6	30.6/26.5
SV220iG5A-4	22	4	14	6				

*Strip the sheaths of the wire insulation 7mm when a ring terminal is not used for power connection.



*SV185iG5A-2 and SV220iG5A-2 must use Ring or Fork Terminal certainly approved by UL.

⚠ CAUTION

- Apply rated torques to the terminal screws. Loose screws may cause short circuits and malfunctions. Tightening the screw too much may damage the terminals and cause short circuits and malfunctions.
- Use copper wires only with 600V, 75℃ ratings for wiring.
- Make sure the input power is off before wiring.
- When power supply is switched off following operation, wait at least 10 minutes after LED keypad display is off before you start working on it.
- Applying input power supply to the output terminals U, V and W causes internal inverter damage.
- Use ring terminals with insulated caps when wiring the input power and motor wiring.
- Do not leave wire fragments inside the inverter. Wire fragments can cause faults, breakdowns and malfunctions.
- When more than one motor is connected to one inverter, total wire length should be less than 200m (656ft). Do not use a 3-wire cable for long distances. Due to increased leakage capacitance between wires, over-current protective feature may operate or equipment connected to the output side may malfunction. In case of long wire length, it should be required to lower carrier frequency or use Micro Surge Filter.

Length between Inverter and Motor	Up to 50m	Up to 100m	More than 100m
Allowable Carrier Frequency	Less than 15kHz	Less than 5kHz	Less than 2.5kHz

(For products of less than 3.7kW, the wire length should be less than 100m(328ft)).

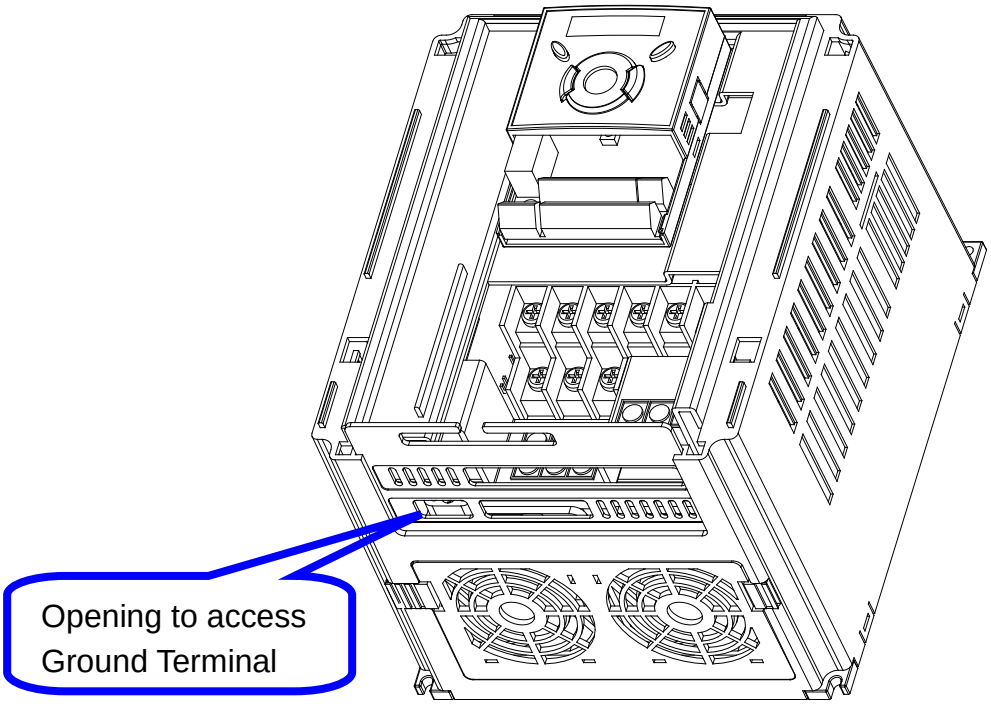
- Never short B1 and B2 terminals. Shorting terminals may cause internal inverter damage.
- Do not install a power factor capacitor, surge suppressor or RFI filters in the output side of the inverter. Doing so may damage these components.
- To avoid circuit interruption or damaging connected equipment, do not install magnetic contactors on the output side of the inverter.

[WARNING]

- Power supply wirings must be connected to the R, S, and T terminals. Connecting them to the U, V, W terminals causes internal damages to the inverter. Motor should be connected to the U, V, and W Terminals. Arrangement of the phase sequence is not necessary.
- If the forward command (Fx) is on, the motor should rotate counter clockwise when viewed from the load side of the motor. If the motor rotates in the reverse direction, switch the cables at the U and V terminals.

⚠ WARNING

- Use the Type 3 grounding method (Ground impedance: Below 100Ω) for 230V class inverters.
- Use the Special Type 3 grounding method (Ground impedance: Below 10Ω) for 460V class inverters.
- Use the dedicated ground terminal to ground the inverter. Do not use the screw in the case or chassis, etc for grounding.



Note

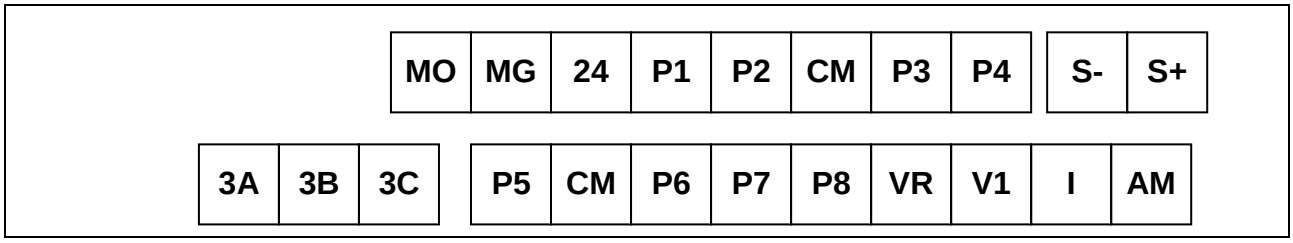
Grounding procedure

1) Remove the front cover.
2) Connect the Grounding wire to the ground terminal through the opening for ground terminal as shown above. Enter the screw driver from vertical to the terminal and secure the screw tightly.

[Grounding work guidance]

Inverter capacity	200V Class			400V Class		
	Wire size	Terminal screw	Ground Spec.	Wire size	Terminal screw	Ground Spec.
0.4~4.0 kW	3.5 mm^2	M3	Ground Impedance Below 100 Ω	2.0 mm^2	M3	Ground Impedance Below 10 Ω
5.5~7.5 kW	5.5 mm2	M4		3.5 mm2	M4	
11 ~ 15 kW	14.0 mm2	M5		8.0 mm2	M5	
18.5~22 kW	22.0 mm2	M6		14.0 mm2	M5	

2.5 Control terminal specification



T/M	Terminal Description	Wire size [mm^2]		Screw size	Torque [Nm]	Specification
		single wire	Stran-ded			
P1~ P8	Multi-function input T/M 1-8	1.0	1.5	M2.6	0.4	-
CM	Common Terminal					-
VR	Power supply for external potentiometer					Output voltage: 12V Max output current: 100mA Potentiometer:1 ~ 5kohm
V1	Input terminal for Voltage operation					Max input voltage: -10V ~ +10V input
I	Input terminal for Current operation					0 ~ 20mA input Internal resistor: 250 ohm
AM	Multi-function analog output terminal					Max output voltage: 11[V] Max output current: 10mA
MO	Multi-function terminal for open collector					Below DC 26V,100mA
MG	Ground terminal for external power supply					-
24	24V External Power Supply					Max output current: 100mA
3A	Multi-function relay output A contact					Below AC 250V, 1A
3B	Multi-function relay output B contact					Below DC 30V, 1A
3C	Common for Multi-function relays					-

Note 1) Tie the control wires more than 15cm away from the control terminals. Otherwise, it interfere front cover reinstallation

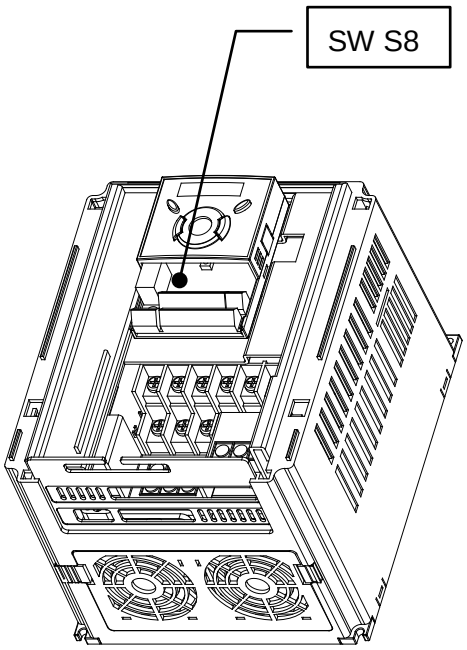
Note 2) Use Copper wires rated 600V, 75 ℃ and higher.

Note 3) Use the recommended tightening torque when securing terminal screws.

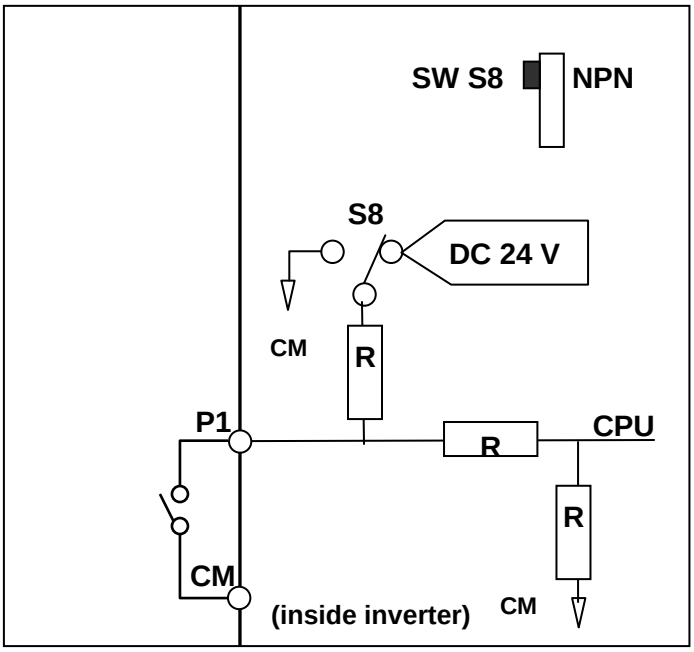
Note

When you use external power supply (24V) for multi-function input terminal (P1~P8), terminals will be active above 12V level. Take caution not to drop the voltage below 12V.

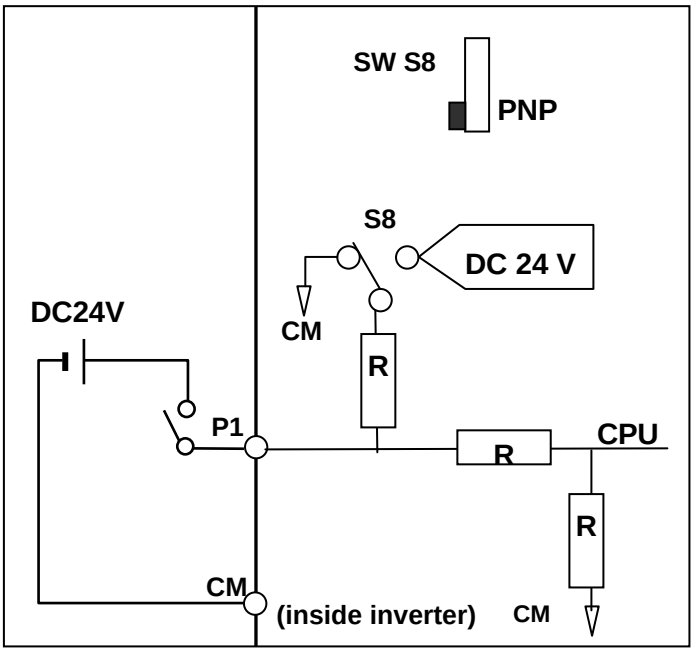
2.6 PNP/NPN selection and connector for communication option



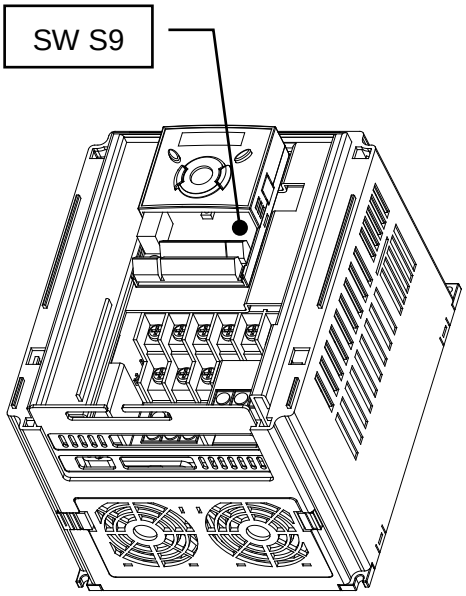
1. When using DC 24V inside inverter [NPN]



2. When using external DC 24V [PNP]

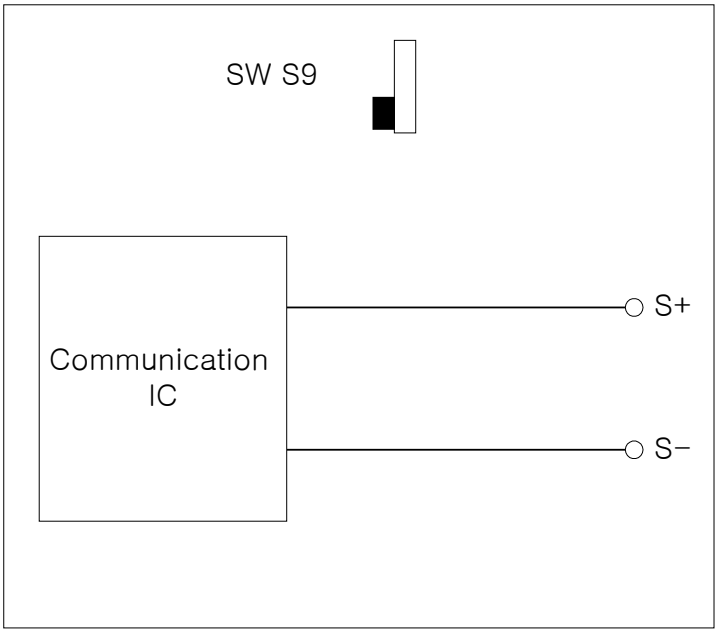


2.7 Terminating Resistor selection

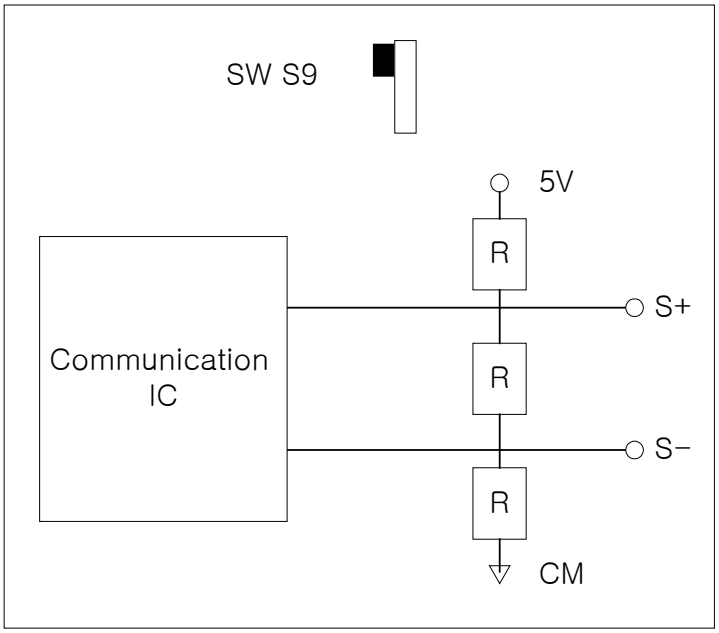


※ Terminating Resistor applies to iG5A made after the latter half of 2013.

1. When not using Terminating Resistor



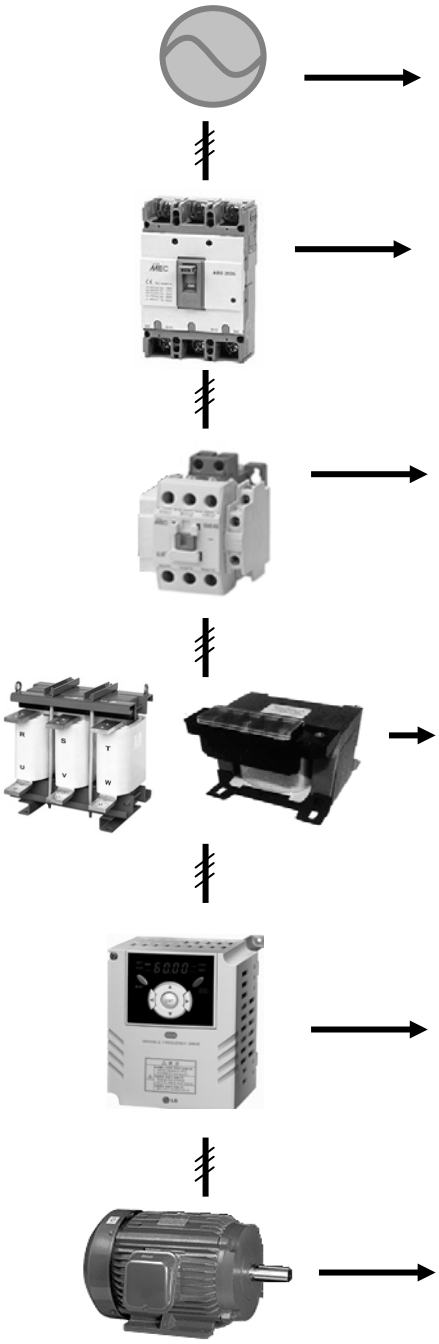
2. When using Terminating Resistor



CHAPTER 3 - BASIC CONFIGURATION

3.1 Connection of peripheral devices to the inverter

The following devices are required to operate the inverter. Proper peripheral devices must be selected and correct connections made to ensure proper operation. An incorrectly applied or installed inverter can result in system malfunction or reduction in product life as well as component damage. You must read and understand this manual thoroughly before proceeding.



AC Source Supply	Use the power supply within the permissible range of inverter input power rating (Refer to Page 7-1).
MCCB or Earth leakage circuit breaker (ELB)	Select circuit breakers with care. A large inrush current may flow in the inverter at power on.
Magnetic Contactor	Install it if necessary. When installed, do not use it for the purpose of starting or stopping. Otherwise, it could lead to reduction in product life.
AC and DC Reactors notice1	The AC reactors must be used when the power factor is to be improved or the inverter is installed near a large power supply system (more than 10 times of inverter capacity and wiring distance within 10m).
Installation and wiring	To operate the inverter with high performance for a long time, install the inverter in a proper place in the correct direction and with proper clearances. Incorrect terminal wiring could result in the equipment damage.
To motor	Do not connect a power factor capacitor, surge suppressor or radio noise filter to the output side of the inverter.

Notice1) Terminal block for DC reactor is composed in the more than 11kw capacity.

3.2 Recommended MCCB

Inverter Capacity	MCCB	MC	ELCB
004iG5A-1	ABS33c/5, UTE100/15	MC-6a	EBS33c/5
008iG5A-1	ABS33c/10, UTE100/15	MC-9a, MC-9b	EBS33c/10
015iG5A-1	ABS33c/15, UTE100/15	MC-18a, MC-18b	EBS33c/15
004iG5A-2	ABS33c/5, UTE100/15	MC-6a	EBS33c/5
008iG5A-2	ABS33c/10, UTE100/15	MC-9a, MC-9b	EBS33c/10
015iG5A-2	ABS33c/15, UTE100/15	MC-18a, MC-18b	EBS33c/15
022iG5A-2	ABS33c/20, UTE100/20	MC-22b	EBS33c/20
037iG5A-2	ABS33c/30. UTE100/30	MC-32a	EBS33c/30
040iG5A-2		MC-32a	EBS33c/30
055iG5A-2	ABS53c/50, UTE100/50	MC-50a	EBS53c/50
075iG5A-2	ABS63c/60, UTE100/60	MC-65a	EBS63c/60
110iG5A-2	ABS103c/100, UTE100/90	MC-85a	EBS103c/100
150iG5A-2	ABS103c/125, UTS150/125	MC-130a	EBS103c/125
185iG5A-2	ABS203c/150, UTS150/150	MC-150a	EBS203c/150
220iG5A-2	ABS203c/175, UTS250/175	MC-185a	EBS203c/175
004iG5A-4	ABS33c/3, UTE100/15	MC-6a	EBS33c/5
008iG5A-4	ABS33c/5, UTE100/15	MC-6a	EBS33c/5
015iG5A-4	ABS33c/10, UTE100/15	MC-9a, MC-9b	EBS33c/10
022iG5A-4		MC-12a, MC-12b	EBS33c/10
037iG5A-4	ABS33c/15, UTE100/15	MC-18a, MC-18b	EBS33c/15
040iG5A-4	ABS33c/20, UTE100/20	MC-18a, MC-18b	EBS33c/20
055iG5A-4	ABS33c/30, UTE100/30	MC-22b	EBS33c/30
075iG5A-4		MC-32a	EBS33c/30
110iG5A-4	ABS53c/50, UTE100/50	MC-50a	EBS53c/50
150iG5A-4	ABS63c/60, UTE100/60	MC-65a	EBS63c/60
185iG5A-4	ABS103c/75, UTE100/80	MC-75a	EBS103c/75
220iG5A-4	ABS103c/100, UTE100/90	MC-85a	EBS103c/100

Note

1. The capacity of the MCCB should be 1.5 to 2 times the rated output current of the drive.
2. Use an MCCB keep the drive from faulting out instead of using overheat protection (150% for one minute at the rated output current.)
3. In case magnetic contactor is used on single-phase product, wire R and T phases.

3.3 Recommendable Fuse, Reactors

Inverter Capacity	AC Input fuse [External Fuse]		AC Reactor	DC Reactor
	Current	Voltage		
004iG5A-1	10 A	600 V	4.20 mH, 3.5A	-
008iG5A-1	10 A		2.13 mH, 5.7A	-
015iG5A-1	15 A		1.20 mH, 10A	-
004iG5A-2	10 A		4.20 mH, 3.5A	-
008iG5A-2	10 A		2.13 mH, 5.7A	-
015iG5A-2	15 A		1.20 mH, 10A	-
022iG5A-2	25 A		0.88 mH, 14A	-
037iG5A-2	30 A		0.56 mH, 20A	-
040iG5A-2	30 A		0.56 mH, 20A	-
055iG5A-2	30 A		0.39 mH, 30A	-
075iG5A-2	50 A		0.28 mH, 40A	-
110iG5A-2	70 A		0.20 mH, 59 A	0.74 mH, 56 A
150iG5A-2	100 A		0.15 mH, 75 A	0.57 mH, 71 A
185iG5A-2	100 A		0.12 mH, 96 A	0.49 mH, 91 A
220iG5A-2	125 A		0.10 mH, 112 A	0.42mH, 107 A
004iG5A-4	5 A		18.0 mH, 1.3A	-
008iG5A-4	10 A		8.63 mH, 2.8A	-
015iG5A-4	10 A		4.81 mH, 4.8A	-
022iG5A-4	10 A		3.23 mH, 7.5A	-
037iG5A-4	20 A		2.34 mH, 10A	-
040iG5A-4	20 A		2.34 mH, 10A	-
055iG5A-4	20 A		1.22 mH, 15A	-
075iG5A-4	30 A		1.14 mH, 20A	-
110iG5A-4	35 A		0.81 mH, 30 A	2.76 mH, 29 A
150iG5A-4	45 A		0.61 mH, 38 A	2.18 mH, 36 A
185iG5A-4	60 A		0.45 mH, 50 A	1.79 mH, 48 A
220iG5A-4	70 A		0.39 mH, 58 A	1.54 mH, 55 A

[Note]

- The drive is suitable for use in a circuit capable of delivering not more than 65 kA RMS at the drive's maximum rated voltage.

[Caution]

- Use Class H or RK5 UL listed Input fuses and UL listed breakers ONLY. See the table above for the voltage and current ratings for the fuses and breakers.

[Remarque]

- L'entraînement convient pour une utilisation dans un circuit capable de délivrer pas plus de 65 kA RMS à la tension nominale maximale de l'entraînement.

- Appliquer des couples de marche aux vis des bornes. Des vis desserrées peuvent provoquer des courts-circuits et des dysfonctionnements. Ne pas trop serrer la vis, car cela risque d'endommager les bornes et de provoquer des courts-circuits et des dysfonctionnements.

- Utiliser uniquement des fils de cuivre avec une valeur nominale de 600 V, 75 ℃ pour le câblage de la borne d'alimentation.

[Attention]

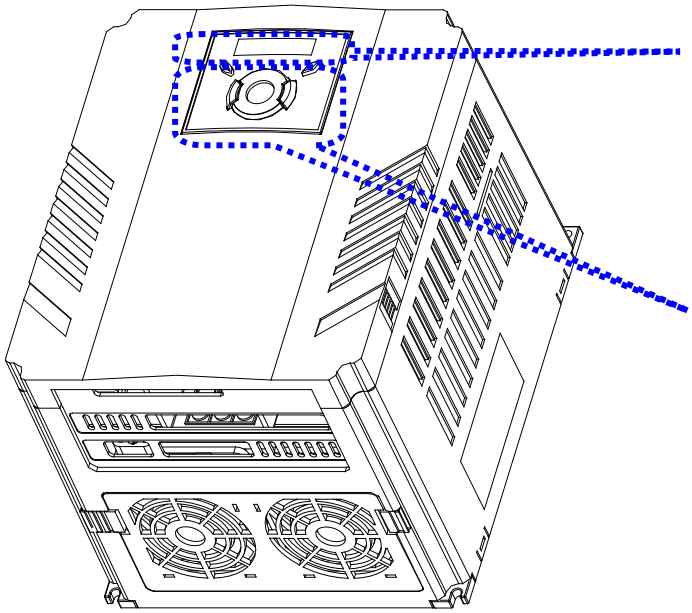
- Utiliser UNIQUEMENT des fusibles d'entrée homologués de Classe H ou RK5 UL et des disjoncteurs UL. Se reporter au tableau ci-dessus pour la tension et le courant nominal des fusibless et des disjoncteurs.

- Les câblages de l'alimentation électrique doivent être connectés aux bornes R, S et T. Leur connexion aux bornes U, V et W provoque des dommages internes à l'onduleur. Le moteur doit être raccordé aux bornes U, V et W. L'arrangement de l'ordre de phase n'est pas nécessaire.

- Si la commande avant (Fx) est activée, le moteur doit tourner dans le sens anti-horaire si on le regarde côté charge du moteur. Si le moteur tourne dans le sens inverse, inverser les câbles aux bornes U et V.

CHAPTER 4 - PROGRAMMING KEYPAD AND BASIC OPERATION

4.1 Keypad features



Display
- SET/RUN LED
- FWD/REV LED
- 7-Segment LED

Key
- RUN
- STOP/RESET
- Up/Down
- Left/Right
- Enter [ENT]

Display		
FWD	Lit during forward run.	Blinks when a fault occurs.
REV	Lit during reverse run.	
RUN	Lit during operation.	
SET	Lit during parameter setting.	
7 segment	Displays operation status and parameter information.	

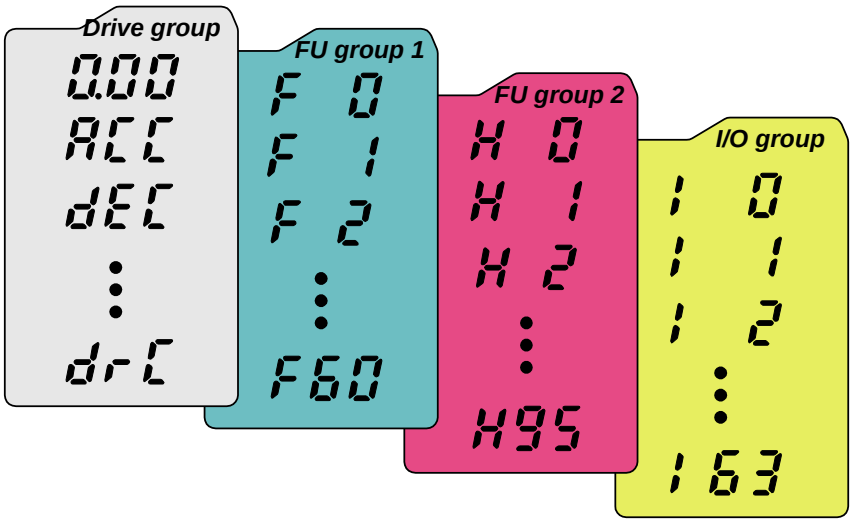
Keys		
RUN		Run command
STOP/RESET		STOP: Stop command during operation, RESET: Reset command when fault occurs.
▲	UP	Used to scroll through codes or increase parameter value
▼	Down	Used to scroll through codes or decrease parameter value
◀	Left	Used to jump to other parameter groups or move a cursor to the left to change the parameter value
▶	Right	Used to jump to other parameter groups or move cursor to the right to change the parameter value
●	ENT	Used to set the parameter value or save the changed parameter value

4.2 Alpha-numeric view on the LED keypad

	0		A		K		U
	1		B		L		V
	2		C		M		W
	3		D		N		X
	4		E		O		Y
	5		F		P		Z
	6		G		Q		
	7		H		R		
	8		I		S		
	9		J		T		

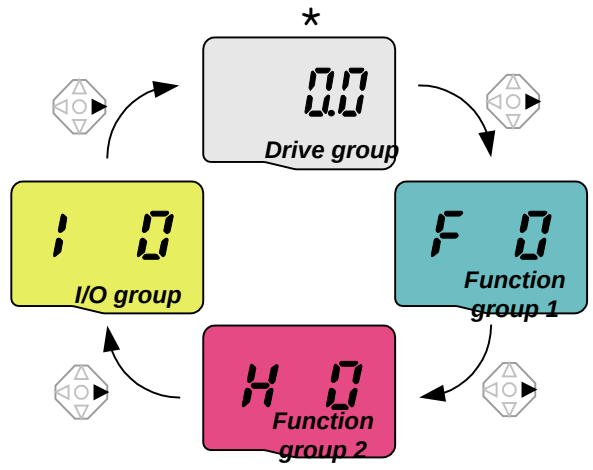
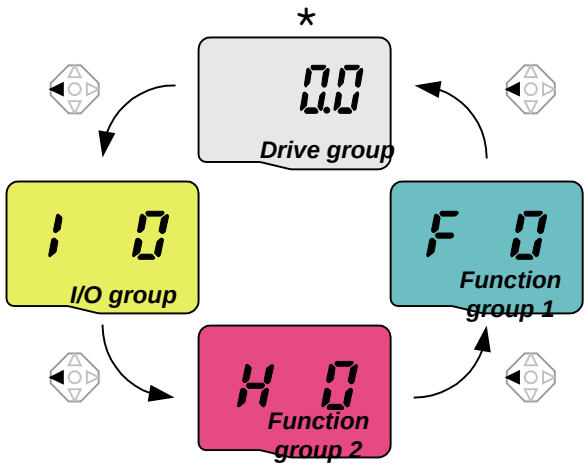
4.3 Moving to other groups

- There are 4 different parameter groups in SV- iG5A series as shown below.



Drive group	Basic parameters necessary for the inverter to run. Parameters such as Target frequency, Accel/Decel time settable.
Function group 1	Basic function parameters to adjust output frequency and voltage.
Function group 2	Advanced function parameters to set parameters for such as PID Operation and second motor operation.
I/O (Input/Output) group	Parameters necessary to make up a sequence using Multi-function input/output terminal.

- **Moving to other parameter groups** is only available in the first code of each group as the figure shown below.

Moving to other groups using the Right (▶) key	Moving to other groups using the Left (◀) key
	

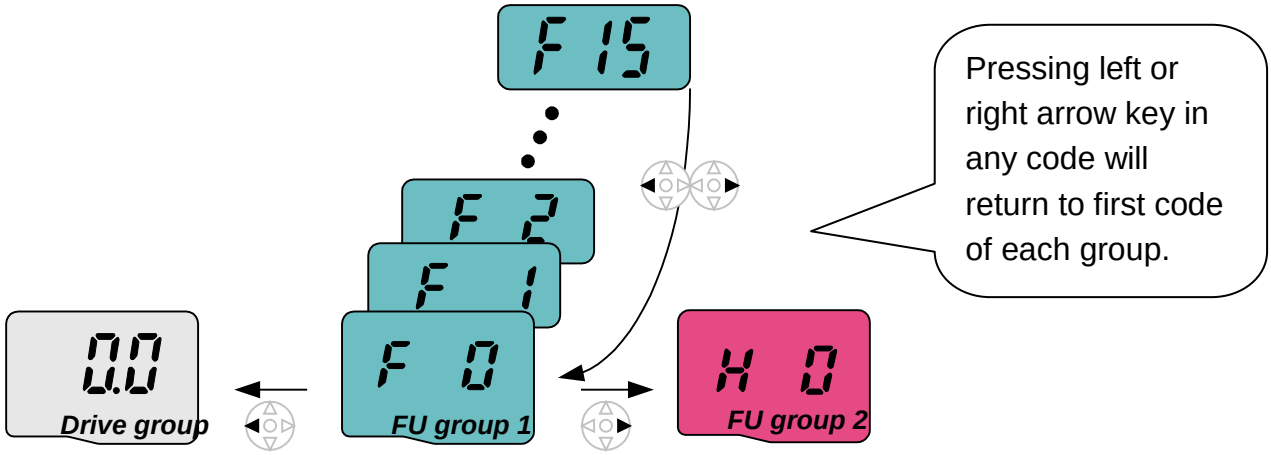
* Target frequency can be set at **0.0** (the 1st code of drive group). Even though the preset value is 0.0, it is user-settable. The changed frequency will be displayed after it is changed.

● How to move to other groups at the 1st code of each group

1	0.00	-. **The 1st code in Drive group "0.00"** will be displayed when AC input power is applied. -. Press the right arrow (▶) key once to go to Function group 1.
2	F 0	-. **The 1st code in Function group 1 "F 0"** will be displayed. -. Press the right arrow (▶) key once to go to Function group 2.
3	H 0	-. **The 1st code in Function group 2 "H 0"** will be displayed. -. Press the right arrow (▶) key once to go to I/O group.
4	I 0	**-. The 1st code in I/O group "I 0" will be displayed.** -. Press the right arrow (▶) key once again to return to Drive group.
5	0.00	-. Return to **the 1st code in Drive group "0.00"**.

♣ If the left arrow key (◀) is used, the above will be executed in the reverse order.

● How to move to other groups from any codes other than the 1st code

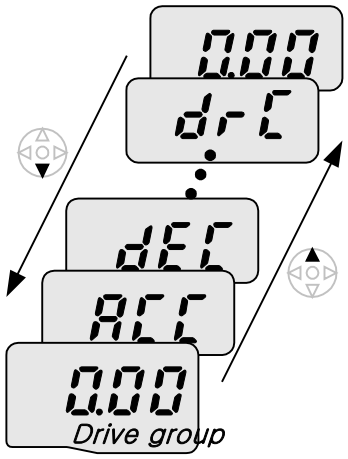


● To move from the F 15 to function group 2

1	F 15	-. In F 15, press the Left (◀) or Right arrow (▶) key. Pressing the key goes to the first code of the group.
2	F 0	-. The 1st code in function group 1 "F 0" is displayed. -. Press the right arrow (▶) key.
3	H 0	-. The 1st code in function group 2 "H 0" will be displayed.

4.4 How to change the codes in a group

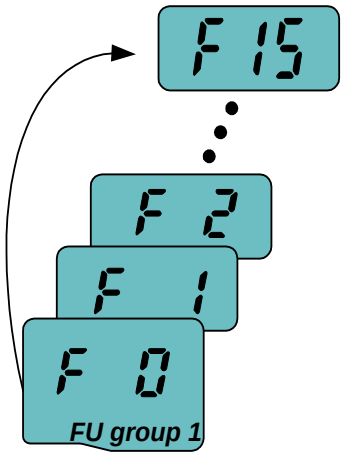
- Code change in Drive group



1	0.00	-. In the 1st code in Drive group “0.00”, press the Up (▲) key once.
2	ACC	-. The 2nd code in Drive group “ACC” is displayed. -. Press the Up (▲) key once.
3	dEC	-. The 3rd code “dEC” in Drive group is displayed. -. Keep pressing the Up (▲) key until the last code appears.
4	drC	-. The last code in Drive group “drC” is displayed. -. Press the Up (▲) key again.
5	0.00	-. Return to the first code of Drive group.
♣ Use Down (▼) key for the opposite order.		

- Code jump

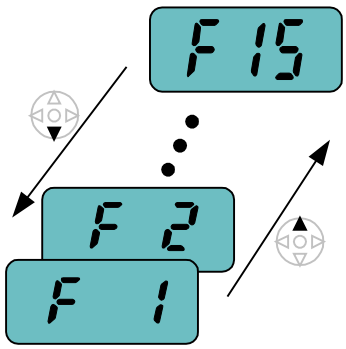
When moving from the “F 0” to the “F 15” directly



1	F 0	-. Press the Ent (●) key in “F 0”.
2	1	-. 1 (the code number of F1) is displayed. Use the Up (▲) key to set to 5.
3	05	-. “**0**5” is displayed by pressing the Left (◀) key once to move the cursor to the left. The numeral having a cursor is displayed brighter. In this case, **0** is active. -. Use the Up (▲) key to set to 1.
4	15	-. **1**5 is set. -. Press the Ent (●) key once.
5	F 15	-. Moving to F 15 has been complete.
♣ Function group 2 and I/O group are settable with the same setting.		

● Navigating codes in a group

When moving from F 1 to F 15 in Function group 1



1	F 1	-. In F 1, continue pressing the Up (▲) key until F15 is displayed.
2	F 15	-. Moving to F15 has been complete.

♣ The same applies to Function group 2 and I/O group.

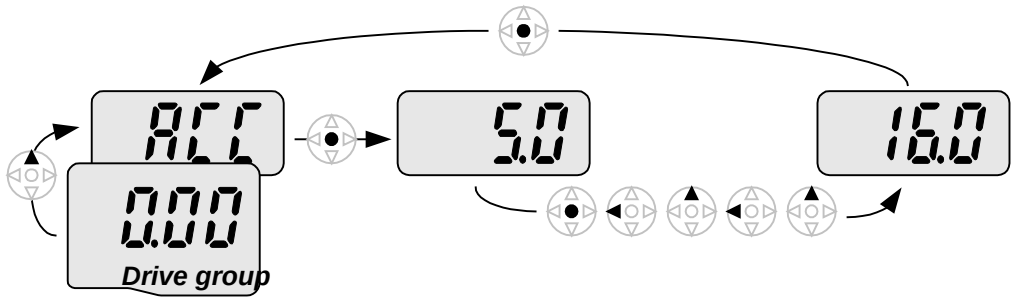
♣Note: Some codes will be skipped in the middle of increment (▲)/decrement (▼) for code change. That is because it is programmed that some codes are intentionally left blank for future use or the codes user does not use are invisible.
Refer to the Ch.5 for more specific contents

For example, when F24 [High/low frequency limit select] is set to “O (No) ”, F25 [High frequency limit] and F26 [Low frequency limit] are not displayed during code change. But When F24 is set to “1(Yes)”, F25 and F26 will appear on the display.

4.5 Parameter setting

- Changing parameter values in Drive Group

When changing ACC time from 5.0 sec to 16.0 sec



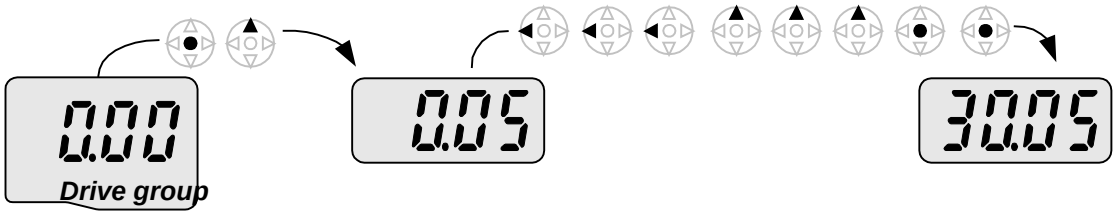
1	0.00	-. In the first code “0.00”, press the Up (▲) key once to go to the second code.
2	ACC	-. ACC [Accel time] is displayed. -. Press the Ent key (●) once.
3	5.0	-. Preset value is 5.**0**, and the cursor is in the digit **0**. -. Press the Left (◀) key once to move the cursor to the left.
4	5.0	-. The digit **5** in **5**.0 is active. Then press the Up (▲) key once.
5	6.0	-. The value is increased to **6**.0. -. Press the Left (◀) key to move the cursor to the left.
6	06.0	-. **0**.60 is displayed. The first **0** in **0**.60 is active. -. Press the Up (▲) key once.
7	16.0	-. **1**6.0 is set. -. Press the Ent (●) key once. -. **1**6.0 is blinking. -. Press the Ent (●) key once again to return to the parameter name.
8	ACC	-. **ACC** is displayed. **Accel time** is changed from 5.0 to 16.0 sec.

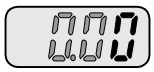
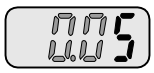
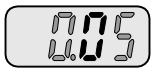
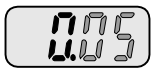
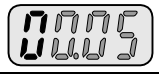
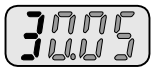
♣ In step 7, pressing the Left (◀) or Right (▶) key while 16.0 is blinking will disable the setting.

Note 1) Pressing the Left (◀)/ Right (▶) /Up (▲) /Down (▼) key while cursor is blinking will cancel the parameter value change. Pressing the Enter key (●) in this status will enter the value into memory.

● Frequency setting

When changing run frequency to 30.05 Hz in Drive group



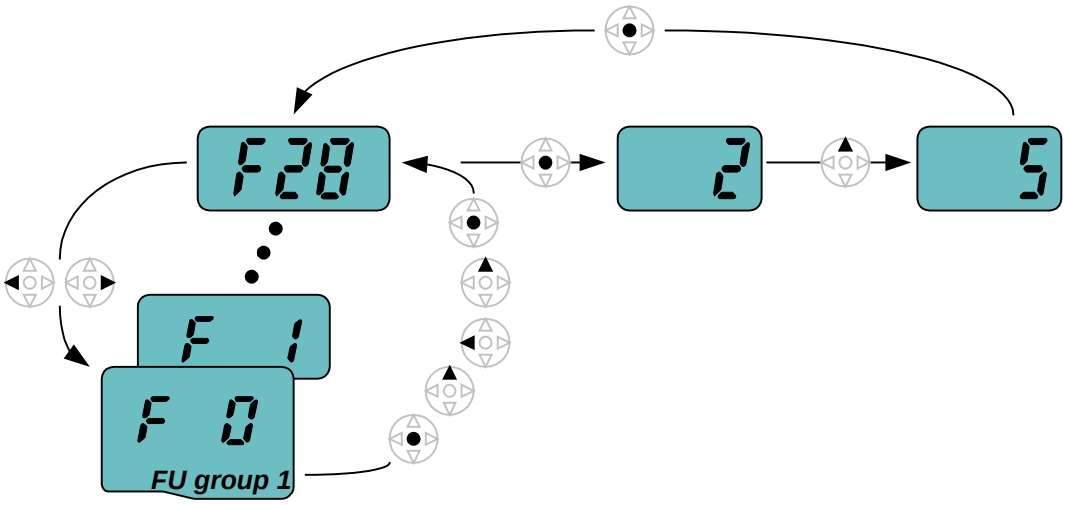
1		-. In “0.00”, press the Ent (●) key once.
2		-. The second decimal **0** becomes active. -. Press the UP (▲) key until 5 is displayed.
3		-. Press the Left (◀) key once.
4		-. The first decimal **0** becomes active. -. Press the Left (◀) key once.
5		-. Press the Left (◀) key once.
6		-. Set 3 using UP (▲) key.
7		-. Press the Ent (●) key. -. 30.05 is blinking. -. Press the Ent (●) key.
8		-. 30.05 is entered into memory.

♣ SV-iG5A display can be extended to 5 digits using left (◀)/right (▶) keys.

♣ Parameter setting is disabled when pressing other than Enter Key in step 7.

● Changing parameter value in Input/Output group

When changing the parameter value of F28 from 2 to 5



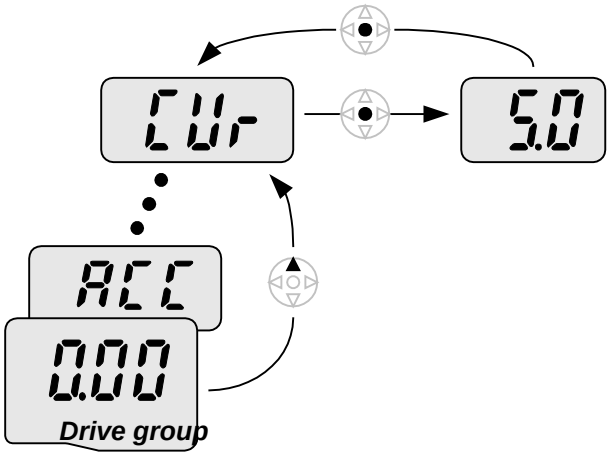
1	F 0	-. In F0, press the Ent (●) key once.
2	1	-. Check the present code number. -. Increase the value to 8 by pressing the Up (▲) key.
3	8	-. When 8 is set, press the Left (◀) key once.
4	08	-. **0** in **0**8 is active. -. Increase the value to 2 by pressing the Up (▲) key.
5	28	-. **2**8 is displayed -. Press the Ent (●) key once.
6	F 28	-. The parameter number F28 is displayed. -. Press the Ent (●) key once to check the set value.
7	2	-. The preset value 2 is displayed. -. Increase the value to 5 using UP key (▲).
8	5	-. Press the Ent (●) key.
9	F 28	-. Code number will appear after 5 is blinking. Parameter change is complete. -. Press either Left (◀) or Right (▶) keys.
10	F 0	-. Moving to first code of Function group 1 is complete.

♣ The above setting is also applied to change parameter values in function group 2 and I/O group.

4.6 Monitoring of operation status

- Output current display

Monitoring output current in Drive group

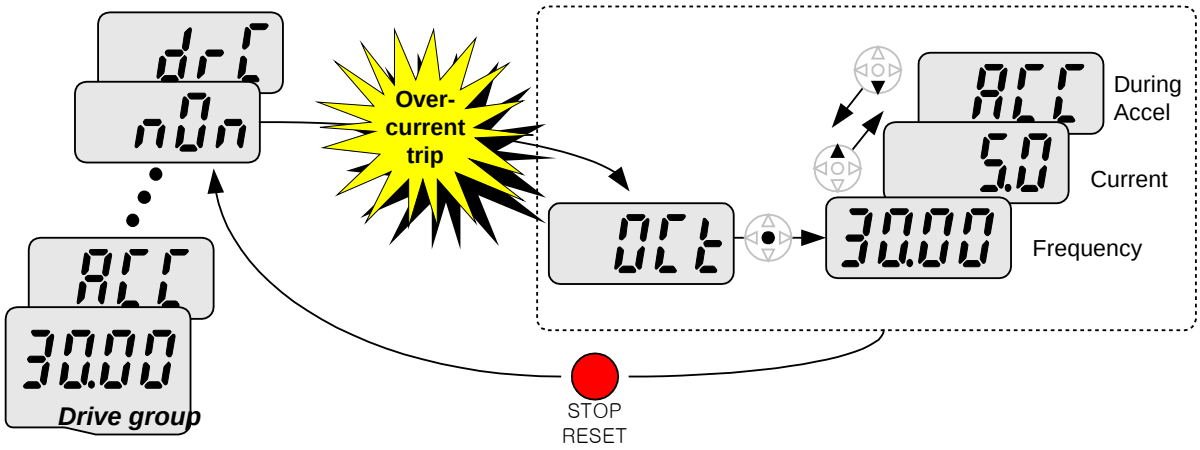


1	0.00	-. In [0.0], continue pressing the Up (▲) or Down (▼) key until [CUr] is displayed.
2	CUr	-. Monitoring output current is provided in this parameter. -. Press the Enter (●) key once to check the current.
3	5.00	-. Present output current is 5 A. -. Press the Enter (●) key once to return to the parameter name.
4	CUr	-. Return to the output current monitoring code.

♣ Other parameters in Drive group such as dCL (Inverter DC link voltage) or vOL (Inverter output voltage) can be monitored via the same method.

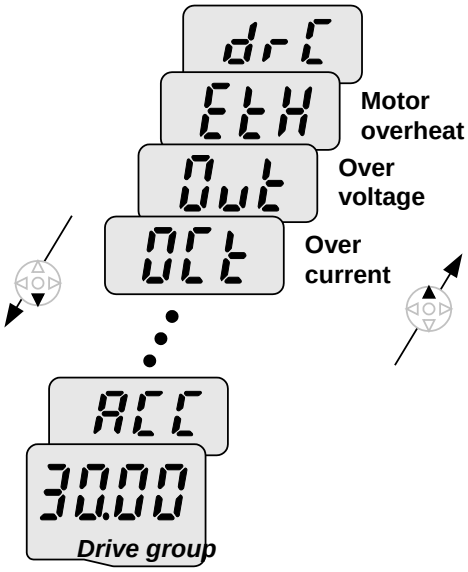
- Fault display

How to monitor fault condition in Drive group



1	OCt	-. This message appears when an Overcurrent fault occurs. -. Press the Enter (●) key or UP/Down key once.
2	30.00	-. The **run frequency** at the time of fault (30.0) is displayed. -. Press the Up (▲) key once.
3	5.0	-. The **output current** at the time of fault is displayed. -. Press the Up (▲) key once.
4	ACC	-. Operating status is displayed. A fault occurred during acceleration. -. Press the STOP/RST key once.
5	nOn	-. A fault condition is cleared and “nOn” is displayed.

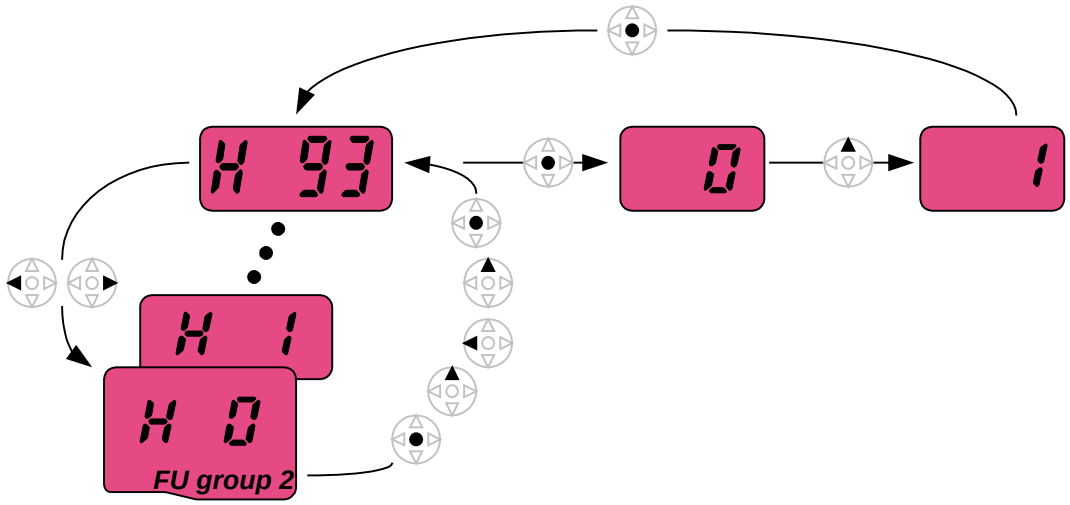
When more than one fault occurs at the same time



-. Maximum three faults information is displayed as shown left.

● Parameter initialize

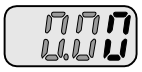
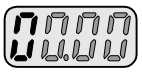
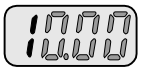
How to initialize parameters of all four groups in H93

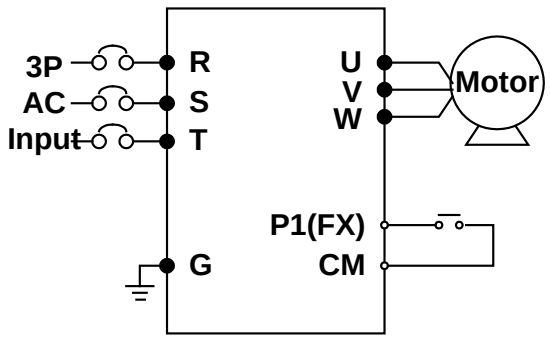


1	H 0	-. In H0, press the Enter (●) key once.
2	1	-. Code number of H0 is displayed. -. Increase the value to 3 by pressing the Up (▲) key.
3	3	-. In **3**, press the Left (◀) key once to move the cursor to the left.
4	03	-. **0**3 is displayed. **0** in **0**3 is active. -. Increase the value to 9 by pressing the Up (▲) key.
5	93	-. **9**3 is set. -. Press the Enter (●) key once.
6	H 93	-. The parameter number is displayed. -. Press the Enter (●) key once.
7	0	-. Present setting is 0. -. Press the Up (▲) key once to set to 1 to activate parameter initialize.
8	1	-. Press the Enter (●) key once.
9	H 93	-. Return to the parameter number after blinking. Parameter initialize has been complete. -. Press the either Left (◀) or Right (▶) key.
10	H 0	-. Return to H0.

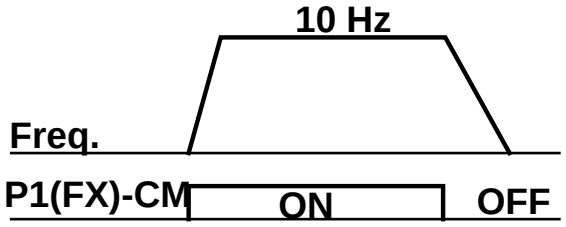
4.7 Frequency Setting and Basic Operation

☞ **Caution :** The following instructions are given based on the fact that all parameters are set to factory defaults. Results could be different if parameter values are changed. In this case, initialize parameter values (see page 10-21) back to factory defaults and follow the instructions below.

● Frequency Setting via keypad and operating via terminals		
1		-. Apply AC input power to the inverter.
2		-. When 0.00 appears, press the Ent (●) key once.
3		-. The second digit in 0.0**0** is lit as shown right. -. Press the Left (◀) key three times.
4		-. **0**0.00 is displayed and the first **0** is lit. -. Press the Up (▲) key.
5		-. **1**0.00 is set. Press the Ent (●) key once. -. 10.00 is blinking. Press the Ent (●) key once.
6		-. Run frequency is set to **10.00** Hz when the blinking stops. -. Turn on the switch between P1 (FX) and CM terminals.
7		-. RUN lamp begins to blink with FWD (Forward Run) lit and accelerating frequency is displayed on the LED. -. When target run frequency 10Hz is reached, **10.00** is displayed. -. Turn off the switch between P1 (FX) and CM terminals.
8		-. RUN lamp begins to blink and decelerating frequency is displayed on the LED. -. When run frequency is reached to 0Hz, Run and FWD lamp turn off and **10.00** is displayed.

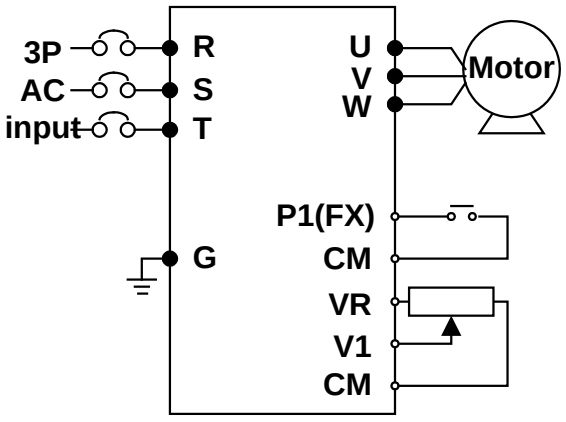


Wiring

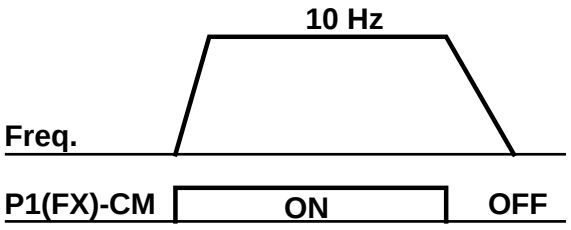


Operating pattern

● Frequency Setting via potentiometer and operating via terminals		
1		-. Apply AC input power to the inverter.
2	0.00	-. When 0.00 appears Press the Up (▲) key four times.
3	Fr9	-. Frq is displayed. Frequency setting mode is selectable. -. Press the Ent (●) key once.
4	0	-. Present setting method is set to 0 (frequency setting via keypad). -. Press the Up (▲) key three times.
5	3	-. After 3 (Frequency setting via potentiometer) is set, press the Ent (●) key once.
6	Fr9	-. Frq is redisplayed after 3 stops blinking. -. Press the Down (▼) key four times. -. Turn the potentiometer to set to 10.00 Hz in either Max or Min direction.
7	10.00	-. Turn on the switch between P1 (FX) and CM (See Wiring below). -. RUN lamp begins to blink with FWD lamp lit and the accelerating frequency is displayed on the LED. -. When run frequency 10Hz is reached, the value is displayed as shown left. -. Turn off the switch between P1 (FX) and CM terminals.
8	10.00	-. RUN lamp begins to blink and decelerating frequency is displayed on the LED. -. When run frequency is reached to 0Hz, Run and FWD lamp turn off and **10.00** is displayed.

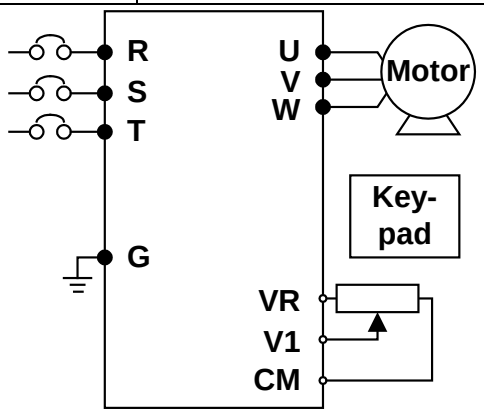


Wiring

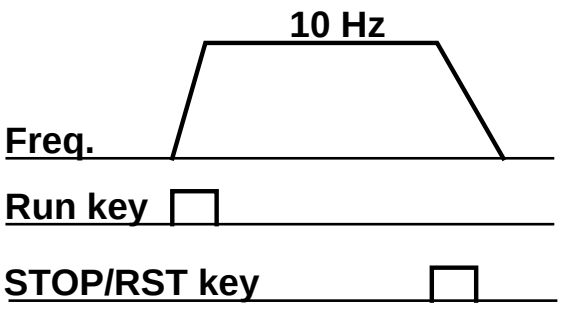


Operating pattern

● Frequency setting via potentiometer and operating via the Run key		
1		-. Apply AC input power to the inverter.
2	0.00	-. When 0.00 is displayed, press the Up (▲) key three times.
3	drv	-. “drv” is displayed. Operating method is selectable. -. Press the Ent (●) key.
4	1	-. Check the present operating method (“1”: Run via control terminal). -. Down (▼) key once.
5	0	-. After setting “0”, press the Ent (●) key. When 0 is blinking, press the Ent again.
6	drv	-. “drv” is displayed after “0” is blinking. Operation method is set via the Run key on the keypad. -. Press the Up (▲) key once.
7	Frq	-. Different frequency setting method is selectable. -. Press the Ent (●) key.
8	0	-. Check the present frequency setting method (“**0**” is run via keypad). -. Press the Up (▲) key three times.
9	3	-. After checking “**3**” (frequency setting via potentiometer), press the Ent (●) key.
10	Frq	-. “**Frq**” is displayed after “3” is blinking. Frequency setting is set via the potentiometer on the keypad. -. Press the Down (▼) key four times. -. Turn the potentiometer to set to 10.0 Hz in either Max or Min direction.
11	10.00	-. Press the Run key on the keypad. -. RUN lamp begins to blink with FWD lamp lit and accelerating frequency is displayed on the LED. -. When run frequency 10Hz is reached, **10.00** is displayed as shown left. -. Press the STOP/RST key.
12	10.00	-. RUN lamp begins to blink and decelerating frequency is displayed on the LED. -. When run frequency is reached to 0Hz, Run and FWD lamp turn off and **10.00** is displayed.



Wiring



Operating pattern

MEMO

CHAPTER 5 - FUNCTION LIST

● DRV Group

LED display	Address for communication	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
0.00	A100	[Frequency command]	0 ~ 400 [Hz]	This parameter sets the frequency that the inverter is commanded to output. **During Stop**: Frequency Command **During Run:** Output Frequency **During Multi-step operation: <u>Multi-step frequency 0</u>.** It cannot be set greater than F21- [Max frequency].	0.00	O
ACC	A101	[Accel time]	0 ~ 6000 [Sec]	During Multi-Accel/Decel operation, this parameter serves as Accel/Decel time 0.	5.0	O
dEC	A102	[Decel time]			10.0	O
drv	m	[Drive mode]	0 ~ 4	0: Run/Stop via Run/Stop key on the keypad 1: Terminal operation — FX: Motor forward run, RX: Motor reverse run 2: Terminal operation — FX: Run/Stop enable, RX: Reverse rotation select 3: RS485 communication 4: Set to Field Bus communication 1)	1	X
Frq	A104	[Frequency setting method]	0 ~ 9	0: Digital — Keypad setting 1 1: Digital — Keypad setting 2 2: Analog — V1 1: -10 ~ +10 [V] 3: Analog — V1 2: 0 ~ +10 [V] 4: Analog — Terminal I: 0 ~ 20 [mA] 5: Analog — Terminal V1 setting 1 + Terminal I 6: Analog — Terminal V1 setting 2+ Terminal I 7: RS485 communication 8: Digital Volume 9: Set to Field Bus communication 1)	0	X
St1	A105	[Multi-Step freq. 1]	0 ~ 400 [Hz]	Sets Multi-Step frequency 1 during Multi-step operation.	10.00	O
St2	A106	[Multi-Step freq. 2]		Sets Multi-Step frequency 2 during Multi-step operation.	20.00	O
St3	A107	[Multi-Step freq. 3]		Sets Multi-Step frequency 3 during Multi-step operation.	30.00	O
CUr	A108	[Output current]	-	Displays the output current to the motor.	-	-
rPM	A109	[Motor RPM]	-	Displays the number of Motor RPM.	-	-

1) : This function will be supported when iG5A communication option board is applied.

LED display	Address for communication	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
dCL	A10A	[Inverter DC link voltage]	-	Displays DC link voltage inside the inverter.	-	-
vOL	A10B	[User display select]	-	This parameter displays the item selected at H73- [Monitoring item select]. vOL: Output voltage POr: Output power tOr: Torque	vOL	-
nOn	A10C	[Fault Display]	-	Displays the types of faults, frequency and operating status at the time of the fault	-	-
drC	A10D	[Direction of motor rotation select]	F, r	Sets the direction of motor rotation when drv - [Drive mode] is set to either 0 or 1. F: Forward r: Reverse	F	O
drv2	A10E	[Drive mode 2]	0 ~ 4	0: Run/Stop via Run/Stop key on the keypad 1: Terminal operation — FX: Motor forward run, RX: Motor reverse run 2: Terminal operation — FX: Run/Stop enable, RX: Reverse rotation select 3: RS-485 communication 4: Set to Field Bus communication [3]	1	X
Frq2[1]	A10F	[Frequency setting method 2]	0 ~ 9	0: Digital — Keypad setting 1 1: Digital — Keypad setting 2 2: Analog — V1 1: -10 ~ +10 [V] 3: Analog — V1 2: 0 ~ +10 [V] 4: Analog — Terminal I: 0 ~ 20 [mA] 5: Analog — Terminal V1 setting 1 + Terminal I 6: Analog — Terminal V1 setting 2+ Terminal I 7: Analog — RS-485 communication 8: Up-Down (Digital Volume) run 9: Set to Field Bus communication [3]	0	X
rEF[2]	A110	PID control standard value setting	0~400 [Hz] or 0~100 [%]	-	If H58 is 0, it is expressed as a [Hz] unit. If H58 is 1, it is expressed as a [%] unit. In [Hz] unit, you can't set Max. frequency more than (F21). In [%] unit, 100% means Max. frequency.	0.00	0
Fbk[2]	A111	PID control	-	-	It indicates a feedback amount in	-	-

LED display	Address for communication	Parameter name	Min/Max range	Description		Factory defaults	Adj. during run
		feedback amount			PID control. If H58 is 0, it is expressed as a [Hz] unit. If H58 is 1, it is expressed as a [%] unit.		

1): Only displayed when one of the Multi-function input terminals 1-8 [I17~I24] is set to “22”.
2): It is indicated when H49(PID control selection) is 1.

● Function Group 1

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
F 0	A200	[Jump code]	0 ~ 71	Sets the parameter code number to jump.	1	O
F 1	A201	[Forward/ Reverse run disable]	0 ~ 2	0 Fwd and rev run enable 1 Forward run disable 2 Reverse run disable	0	X
F 2	A202	[Accel pattern]	0 ~ 1	0 Linear 1 S-curve	0	X
F 3	A203	[Decel pattern]				
F 4	A204	[Stop mode select]	0 ~ 3	0 Decelerate to stop 1 DC brake to stop 2 Free run to stop 3 Power Braking stop	0	X
F 8[1)]	A208	[DC Brake start frequency]	0.1 ~ 60 [Hz]	This parameter sets DC brake start frequency. It cannot be set below F23 - [Start frequency].	5.00	X
F 9	A209	[DC Brake wait time]	0 ~ 60 [sec]	When DC brake frequency is reached, the inverter holds the output for the setting time before starting DC brake.	0.1	X
F10	A20A	[DC Brake voltage]	0 ~ 200 [%]	This parameter sets the amount of DC voltage applied to a motor. It is set in percent of H33 – [Motor rated current].	50	X
F11	A20B	[DC Brake time]	0 ~ 60 [sec]	This parameter sets the time taken to apply DC current to a motor while motor is at a stop.	1.0	X
F12	A20C	[DC Brake start voltage]	0 ~ 200 [%]	This parameter sets the amount of DC voltage before a motor starts to run. It is set in percent of H33 – [Motor rated current].	50	X
F13	A20D	[DC Brake start time]	0 ~ 60 [sec]	DC voltage is applied to the motor for DC Brake start time before motor accelerates.	0	X
F14	A20E	[Time for magnetizing a motor]	0 ~ 60 [sec]	This parameter applies the current to a motor for the set time before motor accelerates during Sensorless vector control.	0.1	X
F20	A214	[Jog frequency]	0 ~ 400 [Hz]	This parameter sets the frequency for Jog operation. It cannot be set above F21 – [Max frequency].	10.00	O

[1)]: Only displayed when F 4 is set to 1 (DC brake to stop).

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
F21[1)]	A215	[Max frequency]	40 ~ 400 [Hz]	This parameter sets the highest frequency the inverter can output. It is frequency reference for Accel/Decel (See H70). ⚠Caution Any frequency cannot be set above Max frequency except Base frequency.	60.00	X
F22	A216	[Base frequency]	30 ~ 400 [Hz]	The inverter outputs its rated voltage to the motor at this frequency (see motor nameplate).	60.00	X
F23	A217	[Start frequency]	0.1 ~ 10 [Hz]	The inverter starts to output its voltage at this frequency. It is the frequency low limit.	0.50	X
F24	A218	[Frequency high/low limit select]	0 ~ 1	This parameter sets high and low limit of run frequency.	0	X
F25 [2)]	A219	[Frequency high limit]	0 ~ 400 [Hz]	This parameter sets high limit of the run frequency. It cannot be set above F21 – [Max frequency].	60.00	X
F26	A21A	[Frequency low limit]	0 ~ 400 [Hz]	This parameter sets low limit of the run frequency. It cannot be set above F25 - [Frequency high limit] and below F23 – [Start frequency].	0.50	X
F27	A21B	[Torque Boost select]	0 ~ 1	0 Manual torque boost 1 Auto torque boost	0	X
F28	A21C	[Torque boost in forward direction]	0 ~ 15 [%]	This parameter sets the amount of torque boost applied to a motor during forward run. It is set in percent of Max output voltage.	2	X
F29	A21D	[Torque boost in reverse direction]		This parameter sets the amount of torque boost applied to a motor during reverse run. It is set as a percent of Max output voltage	2	X

1): If H40 is set to 3 (Sensorless vector), Max. frequency is settable up to 300Hz.

2): Only displayed when F24 (Frequency high/low limit select) is set to 1.

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
F30	A21E	[V/F pattern]	0 ~ 2	0 {Linear} 1 {Square} 2 {User V/F}	0	X
F31[1)]	A21F	[User V/F frequency 1]	0 ~ 400 [Hz]	It is used only when V/F pattern is set to 2(User V/F) It cannot be set above F21 – [Max frequency]. The value of voltage is set in percent of H70 – [Motor rated voltage]. The values of the lower-numbered parameters cannot be set above those of higher-numbered.	15.00	X
F32	A220	[User V/F voltage 1]	0 ~ 100 [%]		25	X
F33	A221	[User V/F frequency 2]	0 ~ 400 [Hz]		30.00	X
F34	A222	[User V/F voltage 2]	0 ~ 100 [%]		50	X
F35	A223	[User V/F frequency 3]	0 ~ 400 [Hz]		45.00	X
F36	A224	[User V/F voltage 3]	0 ~ 100 [%]		75	X
F37	A225	[User V/F frequency 4]	0 ~ 400 [Hz]		60.00	X
F38	A226	[User V/F voltage 4]	0 ~ 100 [%]		100	X
F39	A227	[Output voltage adjustment]	40 ~ 110 [%]	This parameter adjusts the amount of output voltage. The set value is the percentage of input voltage.	100	X
F40	A228	[Energy-saving level]	0 ~ 30 [%]	This parameter decreases output voltage according to load status.	0	0
F50	A232	[Electronic thermal select]	0 ~ 1	This parameter is activated when the motor is overheated (time-inverse).	0	0

1): Set F30 to 2(User V/F) to display this parameter.

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
F51 1)	A233	[Electronic thermal level for 1 minute]	50 ~ 200 [%]	This parameter sets max current capable of flowing to the motor continuously for 1 minute. The set value is the percentage of H33 – [Motor rated current]. It cannot be set below F52 – [Electronic thermal level for continuous].	150	0
F52	A234	[Electronic thermal level for continuous]	50 ~ 150 [%]	This parameter sets the amount of current to keep the motor running continuously. It cannot be set higher than F51 – [Electronic thermal level for 1 minute].	100	0
F53	A235	[Motor cooling method]	0 ~ 1	0 Standard motor having cooling fan directly connected to the shaft. 1 A motor using a separate motor to power a cooling fan.	0	0
F54	A236	[Overload warning level]	30 ~ 150 [%]	This parameter sets the amount of current to issue an alarm signal at a relay or multi-function output terminal (see I54, I55). The set value is the percentage of H33- [Motor rated current].	150	0
F55	A237	[Overload warning time]	0 ~ 30 [Sec]	This parameter issues an alarm signal when the current greater than F54- [Overload warning level] flows to the motor for F55- [Overload warning time].	10	0
F56	A238	[Overload trip select]	0 ~ 1	This parameter turns off the inverter output when motor is overloaded.	1	0
F57	A239	[Overload trip level]	30 ~ 200 [%]	This parameter sets the amount of overload current. The value is the percentage of H33- [Motor rated current].	180	0
F58	A23A	[Overload trip time]	0 ~ 60 [Sec]	This parameter turns off the inverter output when the F57- [Overload trip level] of current flows to the motor for F58- [Overload trip time].	60	0

1): Set F50 to 1 to display this parameter.

<table>
<tr><th>LED display</th><th>Address for communi-cation</th><th>Parameter name</th><th>Min/Max range</th><th>Description</th><th>Factory defaults</th><th>Adj. during run</th></tr>
<tr><td>F59</td><td>A23B</td><td>[Stall prevention select]</td><td>0 ~ 7</td><td>This parameter stops accelerating during acceleration, decelerating during constant speed run and stops decelerating during decal..
<table>
<tr><th></th><th>During Decel.</th><th>During constant run</th><th>During Accel.</th></tr>
<tr><th></th><th>Bit 2</th><th>Bit 1</th><th>Bit 0</th></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>2</td><td>-</td><td>✓</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>✓</td><td>✓</td></tr>
<tr><td>4</td><td>✓</td><td>-</td><td>-</td></tr>
<tr><td>5</td><td>✓</td><td>-</td><td>✓</td></tr>
<tr><td>6</td><td>✓</td><td>✓</td><td>-</td></tr>
<tr><td>7</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table></td><td>0</td><td>X</td></tr>
<tr><td>F60</td><td>A23C</td><td>[Stall prevention level]</td><td>30 ~ 200 [%]</td><td>This parameter sets the amount of current to activate stall prevention function during Accel, Constant or Decel run.
The set value is the percentage of the H33- [Motor rated current].</td><td>150</td><td>X</td></tr>
<tr><td>F61 1)</td><td>A23D</td><td>[When Stall prevention during decal., voltage limit select</td><td>0~1</td><td>In Stall prevention run during deceleration, if you want to limit output voltage, select 1</td><td>0</td><td>-</td></tr>
<tr><td>F63</td><td>A23F</td><td>[Save up/down frequency select]</td><td>0 ~ 1</td><td>This parameter decides whether to save the specified frequency during up/down operation.
When 1 is selected, the up/down frequency is saved in F64.</td><td>0</td><td>X</td></tr>
<tr><td>F64 2)</td><td>A240</td><td>[Save up/down frequency]</td><td>-</td><td>If ‘Save up/down frequency’ is selected at F63, this parameter saves the frequency before the inverter stops or decelerated.</td><td>0.00</td><td>X</td></tr>
<tr><td>F65</td><td>A241</td><td>[Up-down mode select]</td><td>0~2</td><td>We can select up-down mode among three thing
<table>
<tr><td>0</td><td>Increases goal frequency as a standard of Max. freq./Min. freq..</td></tr>
<tr><td>1</td><td>Increases as many as step freq. according to edge input.</td></tr>
<tr><td>2</td><td>Available to combine 1 and 2</td></tr>
</table></td><td>0</td><td>X</td></tr>
</table>

1): It is indicated when setting bit 2 of F59 as 1
2): Set F63 to 1 to display this parameter.

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
F66	A242	[Up-down step frequency]	0~400 [Hz]	In case of choosing F65 as a 1 or 2, it means increase or decrease of frequency according to up-down input	0.00	X
F70	A246	[Draw run mode select]	0~3	0 Inverter doesn't run as a draw mode 1 V1(0~10V) input draw run 2 I(0~20mA) input draw run 3 V1(-10~10V) input draw run	0	X
F71	A247	[Draw rate]	0~100 [%]	Sets rate of draw	0.00	0

● Function Group 2

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
H 0	A300	[Jump code]	0~95	Sets the code number to jump.	1	O
H 1	A301	[Fault history 1]	-	Stores information on the types of faults, the frequency, the current and the Accel/Decel condition at the time of fault. The latest fault is automatically stored in the H 1- [Fault history 1].	nOn	-
H 2	A302	[Fault history 2]	-		nOn	-
H 3	A303	[Fault history 3]	-		nOn	-
H 4	A304	[Fault history 4]	-		nOn	-
H 5	A305	[Fault history 5]	-		nOn	-
H 6	A306	[Reset fault history]	0~1	Clears the fault history saved in H 1-5.	0	O
H 7	A307	[Dwell frequency]	0.1~400 [Hz]	When run frequency is issued, motor starts to accelerate after dwell frequency is applied to the motor during H8- [Dwell time]. [Dwell frequency] can be set within the range of F21- [Max frequency] and F23- [Start frequency].	5.00	X
H 8	A308	[Dwell time]	0~10 [sec]	Sets the time for dwell operation.	0.0	X
H10	A30A	[Skip frequency select]	0 ~ 1	Sets the frequency range to skip to prevent undesirable resonance and vibration on the structure of the machine.	0	X
H11[1)]	A30B	[Skip frequency low limit 1]	0.1~400 [Hz]	Run frequency cannot be set within the range of H11 thru H16. The frequency values of the low numbered parameters cannot be set above those of the high numbered ones. Settable within the range of F21 and F23.	10.00	X
H12	A30C	[Skip frequency high limit 1]			15.00	X
H13	A30D	[Skip frequency low limit 2]			20.00	X
H14	A30E	[Skip frequency high limit 2]			25.00	X
H15	A30F	[Skip frequency low limit 3]			30.00	X
H16	A310	[Skip frequency high limit 3]			35.00	X

[1)]: only displayed when H10 is set to 1. # H17, H18 are used when F2, F3 are set to 1 (S-curve).

<table>
<tr><th>LED display</th><th>Address for communic-ation</th><th>Parameter name</th><th>Min/Max range</th><th>Description</th><th>Factory defaults</th><th>Adj. during run</th></tr>
<tr><td>H17</td><td>A311</td><td>[S-Curve accel/decel start side]</td><td>1~100 [%]</td><td>Set the speed reference value to form a curve at the start during accel/decel. If it is set higher, linear zone gets smaller.</td><td>40</td><td>X</td></tr>
<tr><td>H18</td><td>A312</td><td>[S-Curve accel/decel end side]</td><td>1~100 [%]</td><td>Set the speed reference value to form a curve at the end during accel/decel. If it is set higher, linear zone gets smaller.</td><td>40</td><td>X</td></tr>
<tr><td>H19</td><td>A313</td><td>[Input/outp-ut phase loss protection select]</td><td>0 ~ 3</td><td>0 Disabled 1 Output phase protection
2 Input phase protection 3 Input/output phase protection</td><td>0</td><td>O</td></tr>
<tr><td>H20</td><td>A314</td><td>[Power On Start select]</td><td>0 ~ 1</td><td>This parameter is activated when drv is set to 1 or 2 (Run/Stop via Control terminal).
Motor starts acceleration after AC power is applied while FX or RX terminal is ON.</td><td>0</td><td>O</td></tr>
<tr><td>H21</td><td>A315</td><td>[Restart after fault reset selection]</td><td>0 ~1</td><td>This parameter is activated when drv is set to 1 or 2 (Run/Stop via Control terminal).
Motor accelerates after the fault condition is reset while the FX or RX terminal is ON.</td><td>0</td><td>O</td></tr>
<tr><td>H22 1)</td><td>A316</td><td>[Speed Search Select]</td><td>0 ~ 15</td><td>This parameter is active to prevent any possible fault when the inverter outputs its voltage to the running motor.
<table>
<tr><th></th><th>1. H20-[Power On start]</th><th>2. Restart after instant power failure</th><th>3. Operation after fault</th><th>4. Normal accel.</th></tr>
<tr><td></td><td>Bit 3</td><td>Bit 2</td><td>Bit 1</td><td>Bit 0</td></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>2</td><td>-</td><td>-</td><td>✓</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>-</td><td>✓</td><td>✓</td></tr>
<tr><td>4</td><td>-</td><td>✓</td><td>-</td><td>-</td></tr>
</table></td><td>0</td><td>X</td></tr>
</table>

1) Normal acceleration has first priority. Even though #4 is selected along with other bits, Inverter performs Speed search #4.

<table>
<tr><th>LED display</th><th>Address for communi-cation</th><th>Parameter name</th><th>Min/Max range</th><th colspan="6">Description</th><th>Factory defaults</th><th>Adj. durin g run</th></tr>
<tr><td rowspan="17">H22 1)</td><td rowspan="17">A316</td><td rowspan="17">-</td><td>-</td><td>-</td><td>1. H20- [Power On start]</td><td>2. Restart after instant power failure</td><td>3. Operation after fault</td><td>4. Normal accel</td><td>-</td><td rowspan="17">O</td></tr>
<tr><td rowspan="16">-</td><td></td><td>Bit 3</td><td>Bit 2</td><td>Bit 1</td><td>Bit 0</td><td rowspan="16">-</td></tr>
<tr><td>5</td><td></td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>6</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>7</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>8</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>9</td><td>✓</td><td></td><td></td><td>✓</td></tr>
<tr><td>10</td><td>✓</td><td></td><td>✓</td><td></td></tr>
<tr><td>11</td><td>✓</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>12</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>13</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>14</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>15</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>H23</td><td>A317</td><td>[Current level during Speed search]</td><td>80~200 [%]</td><td colspan="6">This parameter limits the amount of current during speed search.
The set value is the percentage of the H33- [Motor rated current].</td><td>100</td><td>O</td></tr>
<tr><td>H24</td><td>A318</td><td>[P gain during Speed search]</td><td>0~9999</td><td colspan="6">It is the Proportional gain used for Speed Search PI controller.</td><td>100</td><td>O</td></tr>
<tr><td>H25</td><td>A319</td><td>[I gain during speed search]</td><td>0~9999</td><td colspan="6">It is the Integral gain used for Speed search PI controller.</td><td>200</td><td>O</td></tr>
<tr><td>H26</td><td>A31A</td><td>[Number of Auto Restart try]</td><td>0 ~10</td><td colspan="6">This parameter sets the number of restart tries after a fault occurs.
Auto Restart is deactivated if the fault outnumbers the restart tries.
This function is active when [drv] is set to 1 or 2 {Run/Stop via control terminal}.
Deactivated during active protection function (OHT, LVT, EXT, HWT etc.).</td><td>0</td><td>O</td></tr>
</table>

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
H27	A31B	[Auto Restart time]	0~60 [sec]	This parameter sets the time between restart tries.	1.0	O
H30	A31E	[Motor type select]	0.2~ 22.0	0.2 0.2kW ~ ~ 22.0 22.0kW	7.5[1)]	X
H31	A31F	[Number of motor poles]	2 ~ 12	This setting is displayed via rPM in drive group.	4	X
H32	A320	[Rated slip frequency]	0 ~ 10 [Hz]	$f_s = f_r - \left(\frac{rpm \times P}{120}\right)$ Where, f_s = Rated slip frequency f_r = Rated frequency rpm = Motor nameplate RPM P = Number of Motor poles	2.33 [2)]	X
H33	A321	[Motor rated current]	0.5~150 [A]	Enter motor rated current on the nameplate.	26.3	X
H34	A322	[No Load Motor Current]	0.1~ 100 [A]	Enter the current value detected when the motor is rotating in rated rpm after the load connected to the motor shaft is removed. Enter the 50% of the rated current value when it is difficult to measure H34 – [No Load Motor Current].	11	X
H36	A324	[Motor efficiency]	50~100 [%]	Enter the motor efficiency (see motor nameplate).	87	X
H37	A325	[Load inertia rate]	0 ~ 2	Select one of the following according to motor inertia. 0 Less than 10 times 1 About 10 times 2 More than 10 times	0	X

[1)]: H30 is preset based on inverter rating.

[2)]: H32 ~ H36 factory default values are set based on OTIS-LG motor.

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. During run
H39	A327	[Carrier frequency select]	1 ~ 15 [kHz]	This parameter affects the audible sound of the motor, noise emission from the inverter, inverter temp, and leakage current. If the set value is higher, the inverter sound is quieter but the noise from the inverter and leakage current will become greater.	3	O
H40	A328	[Control mode select]	0 ~ 3	0 {Volts/frequency Control} 1 {Slip compensation control} 3 {Sensorless vector control}	0	X
H41	A329	[Auto tuning]	0 ~ 1	If this parameter is set to 1, it automatically measures parameters of the H42 and H44.	0	X
H42	A32A	[Stator resistance (Rs)]	0 ~ 28 [Ω]	This is the value of the motor stator resistance.	-	X
H44	A32C	[Leakage inductance (Lσ)]	0~ 300.0 [mH]	This is leakage inductance of the stator and rotor of the motor.	-	X
H45 1)	A32D	[Sensorless P gain]	0~ 32767	P gain for Sensorless control	1000	O
H46	A32E	[Sensorless I gain]		I gain for Sensorless control	100	O
H47	A32F	[Sensorless torque limit]	100~220 [%]	Limits output torque in sensorless mode.	180.0	X
H48	A330	PWM mode select	0~1	If you want to limit an inverter leakage current, select 2 phase PWM mode. It has more noise in comparison to Normal PWM mode. 0 Normal PWM mode 1 2 phase PWM mode	0	X
H49	A331	PID select	0~1	Selects whether using PID control or not	0	X

1): Set H40 to 3 (Sensorless vector control) to display this parameter.

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
H50 [1]	A332	[PID F/B select]	0 ~ 2	0 Terminal I input (0 ~ 20 mA) 1 Terminal V1 input (0 ~ 10 V) 2 RS-485 comm. feedback	0	X
H51	A333	[P gain for PID]	0~ 999.9 [%]	This parameter sets the gains for the PID controller.	300.0	O
H52	A334	[Integral time for PID	0.1~32.0 [sec]		1.0	O
H53	A335	[Differential time for PID (D gain)]	0 ~ 30.0 [sec]		0.0	O
H54	A336	[PID control mode select]	0~1	Selects PID control mode 0 Normal PID control 1 Process PID control	0	X
H55	A337	[PID output frequency high limit]	0.1 ~ 400 [Hz]	This parameter limits the amount of the output frequency through the PID control. The value is settable within the range of F21 – [Max frequency] and F23 – [Start frequency].	60.00	O
H56	A338	[PID output frequency low limit]	0.1 ~ 400 [Hz]		0.50	O
H57	A339	[PID standard value select]	0~4	Selects PID standard value. Standard value is indicated in “rEF” of Drive group. 0 Loader digital setting 1 1 Loader digital setting 2 2 V1 terminal setting 2: 0~10V 3 I terminal setting: 0~20mA 4 Setting as a RS-485 communication	0	X
H58	A33A	[PID control unit select]	0~1	Selects a unit of the standard value or feedback amount. 0 Frequency[Hz] 1 Percentage[%]	0	X
H59	A33B	[PID output inverse]]	0~1	Select the output direction of PID control. 0 No 1 Yes	0	X

[1]: Set H49 to 1 (PID control) to display this parameter.

LED display	Address for communi-cation	Parameter name	Min/Max range	Description		Factory defaults	Adj. during run
H60	A33C	[Self-diagnostic select]	0 ~ 3	0	Self-diagnostic disabled	0	X
				1	IGBT fault/Ground fault		
				2	Output phase short & open/ Ground fault		
				3	Ground fault (This setting is unable when more than 11kW)		
H61[1)]	A33D	[Sleep delay time]	0~2000[s]	Sets a sleep delay time in PID drive.		60.0	X
H62	A33E	[Sleep frequency]	0~400 [Hz]	Sets a sleep frequency when executing a sleep function in PID control drive. You can't set more than Max. frequency(F21)		0.00	O
H63	A33F	[Wake up level]	0~100 [%]	Sets a wake up level in PID control drive.		35.0	O
H64	A340	[KEB drive select]	0~1	Sets KEB drive.		0	X
H65[2)]	A341	[KEB action start level]	110~140 [%]	Sets KEB action start level according to level.		125.0	X
H66	A342	[KEB action stop level]	110~145 [%]	Sets KEB action stop level according to level.		130.0	X
H67	A343	[KEB action gain]	1~20000	Sets KEB action gain.		1000	X
H70	A346	[Frequency Reference for Accel / Decel]	0 ~ 1	0	Based on Max freq (F21)	0	X
				1	Based on Delta freq.		
H71	A347	[Accel / Decel time scale]	0 ~ 2	0	Settable unit: 0.01 second.	1	O
				1	Settable unit: 0.1 second.		
				2	Settable unit: 1 second.		

1): **Set H49 as a 1**

2): **It is indicated when setting H64(KEB drive select) as a 1**
(KEB does not operate when cut power after loading ting input (about 10%).

LED display	Address for commu-nication	Parameter name	Min/Max range	Description		Factory defaults	Adj. during run
H72	A348	[Power on display]	0 ~ 17	This parameter selects the parameter to be displayed on the keypad when the input power is first applied.		0	O
				0	Frequency command		
				1	Accel time		
				2	Decel time		
				3	Drive mode		
				4	Frequency mode		
				5	Multi-Step frequency 1		
				6	Multi-Step frequency 2		
				7	Multi-Step frequency 3		
				8	Output current		
				9	Motor rpm		
				10	Inverter DC link voltage		
				11	User display select (H73)		
				12	Fault display		
				13	Direction of motor rotation select		
				14	Output current 2		
				15	Motor rpm 2		
				16	Inverter DC link voltage 2		
				17	User display select 2		
H73	A349	[Monitoring item select]	0 ~ 2	One of the following can be monitored via vOL - [User display select].		0	O
				0	Output voltage [V]		
				1	Output power [kW]		
				2	Torque [kgf · m]		
H74	A34A	[Gain for Motor rpm display]	1 ~ 1000 [%]	This parameter is used to change the motor rotating speed (r/min) to mechanical speed (m/mi) and display it.		100	O
H75	A34B	[DB resistor operating rate limit select]	0 ~ 1	0	Unlimited	1	O
				1	Use DB resistor for the H76 set time.		
H76	A34C	[DB resistor operating rate]	0 ~ 30[%]	Set the percent of DB resistor operating rate to be activated during one sequence of operation.		10	O

LED display	Address for commu-nication	Parameter name	Min/Max range	Description		Factory defaults	Adj. during run
H77[1)]	A34D	[Cooling fan control]	0 ~ 2	0	Always ON	0	O
				1	Keeps ON when its temp is higher than inverter protection limit temp. Activated only during operation when its temp is below that of inverter protection limit.		
				2	Regardless of the operation fan is active when its temp is higher than inverter protection limit temp.		
H78	A34E	[Operating method select when cooling fan malfunctions]	0 ~ 1	0	Continuous operation when cooling fan malfunctions.	0	O
				1	Operation stopped when cooling fan malfunctions.		
H79	A34F	[S/W version]	x.xx	This parameter displays the inverter software version.		x.xx	X
H81[2)]	A351	[2nd motor Accel time]	0 ~ 6000 [sec]	This parameter actives when the selected terminal is ON after I17-I24 is set to 12 {2nd motor select}.		5.0	O
H82	A352	[2nd motor Decel time]				10.0	O
H83	A353	[2nd motor base frequency]	30 ~ 400 [Hz]			60.00	X
H84	A354	[2nd motor V/F pattern]	0 ~ 2			0	X
H85	A355	[2nd motor forward torque boost]	0 ~ 15 [%]			5	X
H86	A356	[2nd motor reverse torque boost]				5	X
H87	A357	[2nd motor stall prevention level]	30~150 [%]	-		150	X
H88	A358	[2nd motor Electronic thermal level for 1 min]	50~200 [%]	-		150	O
H89	A359	[2nd motor Electronic thermal level for continuous]	50~150 [%]			100	O
H90	A35A	[2nd motor rated current]	0.1~100 [A]			26.3	X

[1)] Exception: Since SV004iG5A-2/SV004iG5A-4 is Natural convection type, this code is hidden.
[2)]: It is indicated when choosing I17~I24 as a 12 (2nd motor select).

LED display	Address for commu-nication	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
H91[1)]	A35B	[Parameter read]	0 ~ 1	Copy the parameters from inverter and save them into remote loader.	0	X
H92	A35C	[Parameter write]	0 ~ 1	Copy the parameters from remote loader and save them into inverter.	0	X
H93	A35D	[Parameter initialize]	0 ~ 5	This parameter is used to initialize parameters back to the factory default value. 0 - 1 All parameter groups are initialized to factory default value. 2 Only Drive group is initialized. 3 Only Function group 1 is initialized. 4 Only Function group 2 is initialized. 5 Only I/O group is initialized.	0	X
H94	A35E	[Password register]	0 ~ FFFF	Password for H95-[Parameter lock]. Set as hexadecimal value.	0	O
H95	A35F	[Parameter lock]	0 ~ FFFF	This parameter is able to lock or unlock parameters by typing password registered in H94. UL (Unlock) Parameter change enable L (Lock) Parameter change disable	0	O

[1)] H91,H92 parameters are displayed when Remote option is installed.

●I/O Group

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory defaults	Adj. during run
I 0	A400	[Jump code]	0 ~ 87	Sets the code number to jump.	1	O
I 2	A402	[NV input Min voltage]	0 ~ -10 [V]	Sets the minimum voltage of the NV (-10V~0V) input.	0.00	O
I 3	A403	[Frequency correspondin-g to I 2]	0 ~ 400 [Hz]	Sets the inverter output minimum frequency at minimum voltage of the NV input.	0.00	O
I 4	A404	[NV input Max voltage]	0 ~ -10 [V]	Sets the maximum voltage of the NV input.	10.0	O
I 5	A405	[Frequency correspondin-g to I 4]	0 ~ 400 [Hz]	Sets the inverter output maximum frequency at maximum voltage of the NV input.	60.00	O
I 6	A406	[Filter time constant for V1 input]	0 ~ 9999	Adjusts the responsiveness of V1 input (0 ~ +10V).	10	O
I 7	A407	[V1 input Min voltage]	0 ~ 10 [V]	Sets the minimum voltage of the V1 input.	0	O
I 8	A408	[Frequency correspondin-g to I 7]	0 ~ 400 [Hz]	Sets the inverter output minimum frequency at minimum voltage of the V1 input.	0.00	O
I 9	A409	[V1 input Max voltage]	0 ~ 10 [V]	Sets the maximum voltage of the V1 input.	10	O
I10	A40A	[Frequency correspondin-g to I 9]	0 ~ 400 [Hz]	Sets the inverter output maximum frequency at maximum voltage of the V1 input.	60.00	O
I11	A40B	[Filter time constant for I input]	0 ~ 9999	Sets the input section's internal filter constant for I input.	10	O
I12	A40C	[I input Min current]	0 ~ 20 [mA]	Sets the minimum current of I input.	4.00	O
I13	A40D	[Frequency correspondin-g to I 12]	0 ~ 400 [Hz]	Sets the inverter output minimum frequency at minimum current of I input.	0.00	O
I14	A40E	[I input Max current]	0 ~ 20 [mA]	Sets the Maximum current of I input.	20.00	O
I15	A40F	[Frequency correspondin-g to I 14]	0 ~ 400 [Hz]	Sets the inverter output maximum frequency at maximum current of I input.	60.00	O
I16	A410	[Criteria for Analog Input Signal loss]	0 ~ 2	0: Disabled 1: activated below half of set value. 2: activated below set value.	0	O
I17	A411	[Multi-function input terminal P1 define]	0 ~ 27	0 Forward run command 1 Reverse run command	0	O
I18	A412	[Multi-function input terminal P2 define]		2 Emergency Stop Trip 3 Reset when a fault occurs {RST}	1	O

LED display	Address for communi-cation	Parameter name	Min/Max range	Description		Factory defaults	Adj. during run
I19	A413	[Multi-function input terminal P3 define]		4	Jog operation command	2	O
				5	Multi-Step freq – Low		
I20	A414	[Multi-function input terminal P4 define]		6	Multi-Step freq – Mid	3	O
				7	Multi-Step freq – High		
I21	A415	[Multi-function input terminal P5 define]		8	Multi Accel/Decel – Low	4	O
				9	Multi Accel/Decel – Mid		
I22	A416	[Multi-function input terminal P6 define]		10	Multi Accel/Decel – High	5	O
				11	DC brake during stop		
I23	A417	[Multi-function input terminal P7 define]		12	2nd motor select	6	O
				13	-Reserved-		
I24	A418	[Multi-function input terminal P8 define]		14	-Reserved-	7	O
				15	Up-down: Frequency increase (UP) command		
				16	Up-down: Frequency decrease command (DOWN)		
				17	3-wire operation		
				18	External trip: A Contact (EtA)		
				19	External trip: B Contact (EtB)		
				20	Self-diagnostic function		
				21	Change from PID operation to V/F operation		
				22	2nd Source		
				23	Analog Hold		
				24	Accel/Decel Disable		
				25	Up/Down Save Freq. Initialization		
				26	JOG-FX		
				27	JOG-RX		

* See “Chapter 6 Troubleshooting and maintenance” for External trip A/B contact.
* Each multi-function input terminal must be set differently.

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory default	Adj. during run
I25	A419	[Input terminal status display]	BIT 7 / BIT 6 / BIT 5 / BIT 4 / BIT 3 / BIT 2 / BIT 1 / BIT 0	P8 / P7 / P6 / P5 / P4 / P3 / P2 / P1	0	O
I26	A41A	[Output terminal status display]	BIT1 / BIT0	3AC / MO	0	O
I27	A41B	[Filtering time constant for Multi-function Input terminal]	1 ~ 15	If the value is set higher, the responsiveness of the Input terminal is getting slower.	4	O
I30	A41E	[Multi-Step frequency 4]	0 ~ 400 [Hz]	It cannot be set greater than F21 – [Max frequency].	30.00	O
I31	A41F	[Multi-Step frequency 5]			25.00	O
I32	A420	[Multi-Step frequency 6]			20.00	O
I33	A421	[Multi-Step frequency 7]			15.00	O
I34	A422	[Multi-Accel time 1]	0~ 6000 [sec]	-	3.0	O
I35	A423	[Multi-Decel time 1]			3.0	
I36	A424	[Multi-Accel time 2]			4.0	
I37	A425	[Multi-Decel time 2]			4.0	
I38	A426	[Multi-Accel time 3]			5.0	
I39	A427	[Multi-Decel time 3]			5.0	
I40	A428	[Multi-Accel time 4]			6.0	
I41	A429	[Multi-Decel time 4]			6.0	
I42	A42A	[Multi-Accel time 5]			7.0	
I43	A42B	[Multi-Decel time 5]			7.0	

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory default	Adj. during run
I44	A42C	[Multi-Accel time 6]			8.0	
I45	A42D	[Multi-Decel time 6]			8.0	
I46	A42E	[Multi-Accel time 7]			9.0	
I47	A42F	[Multi-Decel time 7]			9.0	
I50	A432	[Analog output item select]	0 ~ 3	Output item: 0 Output freq. — Max frequency; 1 Output current — 150 %; 2 Output voltage — 200V: AC 282V, 400V: AC 564V; 3 Inverter DC link voltage — 200V: DC 400V, 400V: DC 800V	0	O
I51	A433	[Analog output level adjustment]	10~200 [%]	Based on 10V.	100	O
I52	A434	[Frequency detection level]	0 ~ 400 [Hz]	Used when I54 or I55 is set to 0-4. Cannot be set higher than F21.	30.00	O
I53	A435	[Frequency detection bandwidth]			10.00	O
I54	A436	[Multi-function output terminal select]	0 ~ 19	0 FDT-1 1 FDT-2 2 FDT-3 3 FDT-4	12 17	O
I55	A437	[Multi-function relay select]		4 FDT-5 5 Overload (OLt) 6 Inverter Overload (IOLt) 7 Motor stall (STALL) 8 Over voltage trip (Ovt) 9 Low voltage trip (Lvt) 10 Inverter Overheat (OHt)		

<table>
<tr><th>LED display</th><th>Address for communi-cation</th><th>Parameter name</th><th>Min/Max range</th><th colspan="5">Description</th><th>Factory default</th><th>Adj. during run</th></tr>
<tr><td></td><td></td><td></td><td></td><td colspan="5">11 Command loss
12 During Run
13 During Stop
14 During constant run
15 During speed searching
16 Wait time for run signal input
17 Multi-function relay select
18 Warning for cooling fan trip
19 Brake signal select</td><td></td><td></td></tr>
<tr><td rowspan="10">I56</td><td rowspan="10">A438</td><td rowspan="10">[Fault relay output]</td><td rowspan="10">0 ~ 7</td><td></td><td>When setting the H26–[Number of auto restart try]</td><td>When the trip other than low voltage trip occurs</td><td>When the low voltage trip occurs</td><td></td><td rowspan="10">2</td><td rowspan="10">O</td></tr>
<tr><td></td><td>Bit 2</td><td>Bit 1</td><td>Bit 0</td><td></td></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td><td></td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>✓</td><td></td></tr>
<tr><td>2</td><td>-</td><td>✓</td><td>-</td><td></td></tr>
<tr><td>3</td><td>-</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>4</td><td>✓</td><td>-</td><td>-</td><td></td></tr>
<tr><td>5</td><td>✓</td><td>-</td><td>✓</td><td></td></tr>
<tr><td>6</td><td>✓</td><td>✓</td><td>-</td><td></td></tr>
<tr><td>7</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td rowspan="6">I57</td><td rowspan="6">A439</td><td rowspan="6">[Output terminal select when communic-ation error occurs]</td><td rowspan="6">0 ~ 3</td><td></td><td colspan="2">Multi-function relay</td><td colspan="2">Multi-function output terminal</td><td rowspan="6">0</td><td rowspan="6">O</td></tr>
<tr><td></td><td colspan="2">Bit 1</td><td colspan="2">Bit 0</td></tr>
<tr><td>0</td><td colspan="2">-</td><td colspan="2">-</td></tr>
<tr><td>1</td><td colspan="2">-</td><td colspan="2">✓</td></tr>
<tr><td>2</td><td colspan="2">✓</td><td colspan="2">-</td></tr>
<tr><td>3</td><td colspan="2">✓</td><td colspan="2">✓</td></tr>
<tr><td rowspan="3">I59</td><td rowspan="3">A43B</td><td rowspan="3">[Communic-ation protocol select]</td><td rowspan="3">0 ~ 1</td><td colspan="5">Set communication protocol.</td><td rowspan="3">0</td><td rowspan="3">X</td></tr>
<tr><td>0</td><td colspan="4">Modbus RTU</td></tr>
<tr><td>1</td><td colspan="4">LS BUS</td></tr>
</table>

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory default	Adj. during run
I60	A43C	[Inverter number]	1 ~ 250	Set for RS485 communication	1	O
I61	A43D	[Baud rate]	0 ~ 4	Select the Baud rate of the RS485. 0 1200 [bps] 1 2400 [bps] 2 4800 [bps] 3 9600 [bps] 4 19200 [bps]	3	O
I62	A43E	[Drive mode select after loss of frequency command]	0 ~ 3	It is used when freq command is given via V1 /I terminal or RS485. 0 Continuous operation at the frequency before its command is lost. 1 Free Run stop (Output cut-off) 2 Decel to stop 3 Lost Preset	0	O
I63	A43F	[Wait time after loss of frequency command]	0.1 ~ 120 [sec]	This is the time inverter determines whether there is the input frequency command or not. If there is no frequency command input during this time, inverter starts operation via the mode selected at I62.	1.0	O
I64	A440	[Communication time setting]	2 ~ 100 [ms]	Frame communication time	5	O
I65	A441	[Parity/ stop bit setting]	0~3	When the protocol is set, the communication format can be set. 0 Parity: None, Stop Bit: 1 1 Parity: None, Stop Bit: 2 2 Parity: Even, Stop Bit: 1 3 Parity: Odd, Stop Bit: 1	O	O
I66	A442	[Read address register 1]	0~ 42239	The user can register up to 8 discontinuous addresses and read them all with one Read command.	5	O
I67	A443	[Read address register 2]			6	
I68	A444	[Read address register 3]			7	
I69	A445	[Read address register 4]			8	

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory default	Adj. during run
I70	A446	[Read address register 5]			9	
I71	A447	[Read address register 6]			10	
I72	A448	[Read address register 7]			11	-
I73	A449	[Read address register 8]			12	-
I74	A44A	[Write address register 1]	0~ 42239	The user can register up to 8 discontinuous addresses and write them all with one Write command	5	O
I75	A44B	[Write address register 2]			6	
I76	A44C	[Write address register 3]			7	
I77	A44D	[Write address register 4]			8	
I78	A44E	[Write address register 5]			5	
I79	A44F	[Write address register 6]			6	
I80	A450	[Write address register 7]			7	
I81	A451	[Write address register 8]			8	
I82[1)]	A452	[Brake open current]	0~180 [%]	Sets current level to open the brake. It is set according to H33's (motor rated current) size	50.0	O
I83	A453	[Brake open delay time]	0~10 [s]	Sets Brake open delay time.	1.00	X
I84	A454	[Brake open FX frequency]	0~400 [Hz]	Sets FX frequency to open the brake	1.00	X
I85	A455	[Brake open RX frequency]	0~400 [Hz]	Sets RX frequency to open the brake	1.00	X

LED display	Address for communi-cation	Parameter name	Min/Max range	Description	Factory default	Adj. during run
I86	A456	[Brake close delay time]	0~19 [s]	Sets delay time to close the brake	1.00	X
I87	A457	[Brake close frequency	0~400 [Hz]	Sets frequency to close the brake	2.00	X
I88[2)]	A458	Lost Preset Freq	0~400 [Hz]	If I62 is set “3”, when the drive go into the lost command state, the drive will operate the motor at lost command frequency.	30.00	O

[1)] : It is indicated when choosing I54~I55 as a 19 (Brake signal).

[2)] : It is indicated when choosing I62 as a 3 (Lost Preset).

MEMO

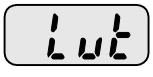
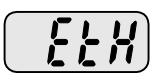
CHAPTER 6 - TROUBLESHOOTING AND MAINTENANCE

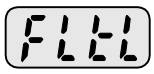
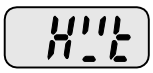
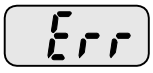
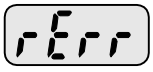
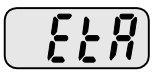
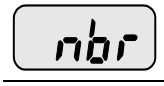
6.1 Protective functions

⚠ WARNING

When a fault occurs, the cause must be corrected before the fault can be cleared. If protective function keeps active, it could lead to reduction in product life and damage to the equipment.

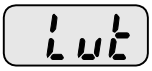
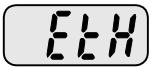
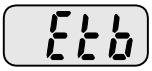
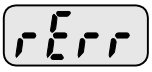
- **Fault Display and information**

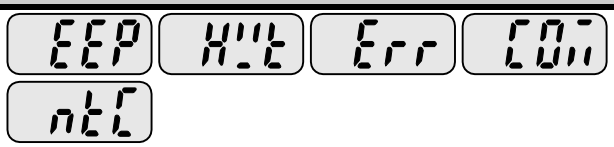
Keypad display	Protective functions	Descriptions
	Overcurrent	The inverter turns off its output when the output current of the inverter flows more than the inverter rated current.
	Overcurrent2	When IGBT's Arm is short and output short occurs, the inverter turns off its output
	Ground fault current	The inverter turns off its output when a ground fault occurs and the ground fault current is more than the internal setting value of the inverter.
	Inverter Overload	The inverter turns off its output when the output current of the inverter flows more than the rated level (150% for 1 minute).
	Overload trip	The inverter turns off its output if the output current of the inverter flows at 150% of the inverter rated current for more than the current limit time (1 min).
	Inverter overheat	The inverter turns off its output if the heat sink overheats due to a damaged cooling fan or an alien substance in the cooling fan by detecting the temperature of the heat sink.
	Output Phase loss	The inverter turns off its output when the one or more of the output (U, V, W) phase is open. The inverter detects the output current to check the phase loss of the output.
	Over voltage	The inverter turns off its output if the DC voltage of the main circuit increases higher than 400 V when the motor decelerates. This fault can also occur due to a surge voltage generated at the power supply system.
	Low voltage	The inverter turns off its output if the DC voltage is below 180V because insufficient torque or overheating of the motor can occur when the input voltage of the inverter drops.
	Electronic Thermal	The internal electronic thermal of the inverter determines the overheating of the motor. If the motor is overloaded the inverter turns off the output. The inverter cannot protect the motor when driving a motor having more than 4 poles or multi motors.
	Input phase loss	Inverter output is blocked when one of R, S, T is open or the electrolytic capacitor needs to be replaced.

Keypad display	Protective functions	Descriptions
	Self-diagnostic malfunction	Displayed when IGBT damage, output phase short, output phase ground fault or output phase open occurs.
	Parameter save error	Displayed when user-setting parameters fails to be entered into memory.
	Inverter hardware fault	Displayed when an error occurs in the control circuitry of the inverter.
	Communication Error	Displayed when the inverter cannot communicate with the keypad.
	Remote keypad communication error	Displayed when inverter and remote keypad does not communicate each other. It does not stop Inverter operation.
	Keypad error	Displayed after Inverter resets keypad when keypad error occurs and this status is maintained for a certain time.
	Cooling fan fault	Displayed when a fault condition occurs in the inverter cooling fan.
	Instant cut off	Used for the emergency stop of the inverter. The inverter instantly turns off the output when the EST terminal is turned on. ⚠ **Caution** The inverter starts to regular operation when turning off the EST terminal while FX or RX terminal is ON.
	External fault A contact input	When multi-function input terminal (I17-I24) is set to 18 {External fault signal input: A (Normal Open Contact)}, the inverter turns off the output.
	External fault B contact input	When multi-function input terminal (I17-I24) is set to 19 {External fault signal input: B (Normal Close Contact)}, the inverter turns off the output.
	Operating method when the frequency command is lost	When inverter operation is set via Analog input (0-10V or 0-20mA input) or option (RS485) and no signal is applied, operation is done according to the method set in I62 (Operating method when the frequency reference is lost).
	NTC open	When NTC is not connected, outputs are cut off.
	Brake control error	When Break control, if rating current flows below than set value, cut off the output without break open.

6.2 Fault Remedy

Keypad display	Cause	Remedy
OCt Overcurrent	⚠ Caution	
	When an overcurrent fault occurs, operation must be started after the cause is removed to avoid damage to IGBT inside the inverter.	
	● Accel/Decel time is too short compared to the GD^2 of the load. ● Load is greater than the inverter rating. ● Inverter output is issued when the motor is free running. ● Output short circuit or ground fault has occurred. ● Mechanical brake of the motor is operating too fast.	☞ Increase the Accel/Decel time. ☞ Replace the inverter with appropriate capacity. ☞ Resume operation after stopping the motor or use H22 (Speed search). ☞ Check output wiring. ☞ Check the mechanical brake.
OC2 Overcurrent2	● Short occurs between up and down of IGBT ● Inverter output short occurs. ● Accel/Decel time is very fast comparing with GD^2	☞ Check the IGBT. ☞ Check output Wring. ☞ Increase the Accel/Decel time.
GFt Ground fault current	● Ground fault has occurred at the output wiring of the inverter ● The insulation of the motor is damaged due to heat	☞ Check the wiring of the output terminal. ☞ Replace the motor.
IOL Inverter overload	● Load is greater than the inverter rating. ● Torque boost scale is set too large.	☞ Upgrade the capacity of motor and inverter or reduce the load weight. ☞ Reduce torque boost scale.
OLt Overload trip		
OHt Inverter overheat	● Cooling system has faults. ● An old cooling fan is not replaced with a new one. ● Ambient temperature is too high.	☞ Check for alien substances clogged in the heat sink. ☞ Replace the old cooling fan with a new one. ☞ Keep ambient temperature under 50°C.
POt Output Phase loss	● Faulty contact of magnetic switch at output. ● Faulty output wiring.	☞ Make connection of magnetic switch at output of the inverter securely. ☞ Check output wiring.
FAn Cooling fan fault	● An alien substance is clogged in a ventilating slot. ● Inverter has been in use without changing a cooling fan.	☞ Check the ventilating slot and remove the clogged substances. ☞ Replace the cooling fan.

Keypad display	Cause	Remedy
 Over voltage	● Decel time is too short compared to the GD^2 of the load. ● Regenerative load is at the inverter output. ● Line voltage is too high.	☞ Increase the Decel time. ☞ Use Dynamic Brake Unit. ☞ Check whether line voltage exceeds its rating.
 Low voltage	● Line voltage is low. ● Load larger than line capacity is connected to line (ex: welding machine, motor with high starting current connected to the commercial line). ● Faulty magnetic switch at the input side of the inverter.	☞ Check whether line voltage is below its rating. ☞ Check the incoming AC line. Adjust the line capacity corresponding to the load. ☞ Change a magnetic switch.
 Electronic thermal	● Motor has overheated. ● Load is greater than inverter rating. ● ETH level is set too low. ● Inverter capacity is incorrectly selected. ● Inverter has been operated at low speed for too long.	☞ Reduce load weight and operating duty. ☞ Change inverter with higher capacity. ☞ Adjust ETH level to an appropriate level. ☞ Select correct inverter capacity. ☞ Install a cooling fan with a separate power supply.
 External fault A contact input	● The terminal set to “18 (External fault-A)” or “19 (External fault-B)” in I20-I24 in I/O group is ON.	☞ Eliminate the cause of fault at circuit connected to external fault terminal or cause of external fault input.
 External fault B contact input		
 Operating method when the frequency command is lost	● No frequency command is applied to V1 and I.	☞ Check the wiring of V1 and I and frequency reference level.
 Remote keypad communication error	● Communication error between inverter keypad and remote keypad	☞ Check for connection of communication line and connector.
 Brake control error	● Break open current is not flow any more.	☞Check the Motor Capacity & Wiring

Protective functions and cause	Descriptions
 EEP : Parameter save error HWT : Hardware fault Err : Communication error COM : Keypad error NTC : NTC error	☞ Contact your local LSIS sales representative.

☞ **Overload Protection**

IOLT : IOLT(inverter Overload Trip) protection is activated at 150% of the inverter rated current for 1 minute and greater.

OLT : OLT is selected when F56 is set to 1 and activated at 200% of F57[Motor rated current] for 60 sec in F58. This can be programmable.

iG5A is not provided with "Overspeed Protection."

6.3 Precautions for maintenance and inspection

⚠ WARNING
Make sure to remove the input power while performing maintenance. Make sure to perform maintenance after checking the DC link capacitor has discharged. The bus capacitors in the inverter main circuit can still be charged even after the power is turned off. Check the voltage between terminal P or P1 and N using a tester before proceeding. SV-iG5A series inverter has ESD (Electrostatic Discharge) sensitive components. Take protective measures against ESD before touching them for inspection or installation. Do not change any inner parts and connectors. Never modify the inverter.

6.4 Check points

- Daily inspections
  - ✓ Proper installation environment
  - ✓ Cooling system fault
  - ✓ Unusual vibration and noise
  - ✓ Unusual overheating and discoloration

- Periodic inspection

✓ Screws and bolts may become loose due to vibration, temperature changes, etc.
✓ Check that they are tightened securely and retighten as necessary.
✓ Alien substances are clogged in the cooling system.
✓ Clean it using the air.
✓ Check the rotating condition of the cooling fan, the condition of capacitors and the connections with the magnetic contactor.
✓ Replace them if there are any abnormalities.

6.5 Part replacements

The inverter consists of many electronic parts such as semiconductor devices. The following parts may deteriorate with age because of their structures or physical characteristics, leading to reduced performance or failure of the inverter. For preventive maintenance, the parts must be changed periodically. The parts replacement guidelines are indicated in the following table. Lamps and other short-life parts must also be changed during periodic inspection.

Part name	Change period (unit: Year)	Description
Cooling fan	3	Exchange (as required)
DC link capacitor in main circuit	4	Exchange (as required)
Electrolytic capacitor on control board	4	Exchange (as required)
Relays	-	Exchange (as required)

CHAPTER 7 - SPECIFICATIONS

7.1 Technical data

- Input & output ratings: Single Phase 200V Class

SV ■■■iG5A –1 ■■		004	008	015
Max capacity[1]	[HP]	0.5	1	2
	[kW]	0.4	0.75	1.5
Output ratings	Capacity [kVA] [2]	0.95	1.9	3.0
	FLA [A] [3]	2.5	5	8
	Max Frequency	400 [Hz] [4]		
	Max Voltage	3Φ 200 ~ 230V [5]		
Input ratings	Rated Voltage	1Φ 200 ~ 230 VAC (+10%, -15%)		
	Rated Frequency	50 ~ 60 [Hz] (±5%)		
Cooling method		Forced cooling		
Weight [kg]		0.77	1.12	1.84

- Input & output ratings: Three Phase 200V Class

SV ■■■iG5A –2 ■■		004	008	015	022	037	040	055	075	110	150	185	220
Max capacity[1]	[HP]	0.5	1	2	3	5	5.4	7.5	10	15	20	25	30
	[kW]	0.4	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22
Output ratings	Capacity [kVA] [2]	0.95	1.9	3.0	4.5	6.1	6.5	9.1	12.2	17.5	22.9	28.2	33.5
	FLA [A] [3]	2.5	5	8	12	16	17	24	32	46	60	74	88
	Max Frequency	400 [Hz] [4]											
	Max Voltage	3Φ 200 ~ 230V [5]											
Input ratings	Rated Voltage	3Φ 200 ~ 230 VAC (+10%, -15%)											
	Rated Frequency	50 ~ 60 [Hz] (±5%)											
Cooling method		N/C[6]	Forced cooling										
Weight [kg]		0.76	0.77	1.12	1.84	1.89	1.89	3.66	3.66	9.0	9.0	13.3	13.3

1) Indicates the maximum applicable motor capacity when using a 4-pole standard motor.
2) Rated capacity is based on 220V for 200V class and 440V for 400V class.
3) Refer to 13-4 when Carrier frequency setting (H39) is above 3kHz.
4) Max frequency setting range is extended to 300Hz when H40 (Control mode select) is set to 3 (Sensorless vector control).
5) Maximum output voltage cannot be higher than the input voltage. It can be programmable below input voltage.
6) N/C: Natural Convention

- Input & output ratings: Three Phase 400V Class

SV ■■■ iG5A – 4 ■■		004	008	015	022	037	040	055	075	110	150	185	220
Max capacity	[HP]	0.5	1	2	3	5	5.4	7.5	10	15	20	25	30
	[kW]	0.4	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22
Output ratings	Capacity [kVA] [2]	0.95	1.9	3.0	4.5	6.1	6.9	9.1	12.2	18.3	22.9	29.7	34.3
	FLA [A] [3]	1.25	2.5	4	6	8	9	12	16	24	30	39	45
	Max Frequency	400 [Hz] [4]											
	Max Voltage	3Φ 380 ~ 480V [5]											
Input ratings	Rated Voltage	3Φ 380 ~ 480 VAC (+10%, -15%)											
	Rated Frequency	50 ~ 60 [Hz] (±5%)											
Cooling method		N/C	Forced cooling										
Weight [kg]		0.76	0.77	1.12	1.84	1.89	1.89	3.66	3.66	9.0	9.0	13.3	13.3

1) Indicates the maximum applicable motor capacity when using a 4-pole standard motor.
2) Rated capacity is based on 220V for 200V class and 440V for 400V class.
3) Refer to '7.2 Temperature Derating Information' when Carrier frequency setting (H39) is above 3kHz.
4) Max frequency setting range is extended to 300Hz when H40 (Control mode select) is set to 3 (Sensorless vector control).
5) Maximum output voltage cannot be higher than the input voltage. It can be programmable below input voltage.
6) N/C: Natural Convention

- Control

Control method		V/F, Sensorless vector control
Frequency setting resolution		Digital command: 0.01Hz Analog command: 0.06Hz (Max freq.: 60Hz)
Frequency accuracy		Digital command: 0.01% of Max output frequency Analog command: 0.1% of Max output frequency
V/F pattern		Linear, Squared, User V/F
Overload capacity		150% per 1 min.
Torque boost		Manual/Auto torque boost
Dynamic Braking	Max braking torque	20% [1)]
	Time/%ED	150% [2)] when using optional DB resistor

1) Means average braking torque during Decel to stop of a motor.
2) Refer to page 7-7 for DB resistor specification.

- Operation

Operation mode		Keypad/ Terminal/ Communication option/ Remote keypad selectable	
Frequency setting		Analog: 0 ~ 10[V], -10 ~ 10[V], 0 ~ 20[mA] Digital: Keypad	
Operation features		PID, Up-down, 3-wire	
Input	Multi-function terminal P1 ~ P8	NPN / PNP selectable (See page 2-13)	
		FWD/REV RUN, Emergency stop, Fault reset, Jog operation, Multi-step Frequency-High, Mid, Low, Multi-step Accel/Decel-High, Mid, Low, DC braking at stop, 2nd motor select, Frequency UP/Down, 3-wire operation, External trip A, B, PID-Inverter (v/f) operation bypass, Option-inverter (v/f) operation bypass, 2nd Source, Analog Hold, Accel/Decel stop, Up/Down Save Freq, Jog FX/RX	
Output	Open collector terminal	Fault output and inverter status output	Less than DC 24V 50mA
	Multi-function relay		(N.O., N.C.) Less than AC250V 1A, Less than DC 30V 1A
	Analog output	0 ~ 10 Vdc (less than10mA): Output Freq, Output Current, Output Voltage, DC link selectable	

- Protective function

Trip	Over Voltage, Under Voltage, Over Current, Over Current 2, Ground Fault current detection, Inverter Overheat, Motor Overheat, Output Phase Open, Overload Protection, Communication Error, Loss of Speed Command, Hardware Fault, Fan trip, Brake error.
Alarm	Stall prevention, overload
Momentary Power Loss[1)]	Below 15 msec: Continuous operation (should be within rated input voltage, rated output power.) Above 15 msec: Auto restart enable

1) Single Phase products: Continuous operation (should be within rated input voltage, rated output power)

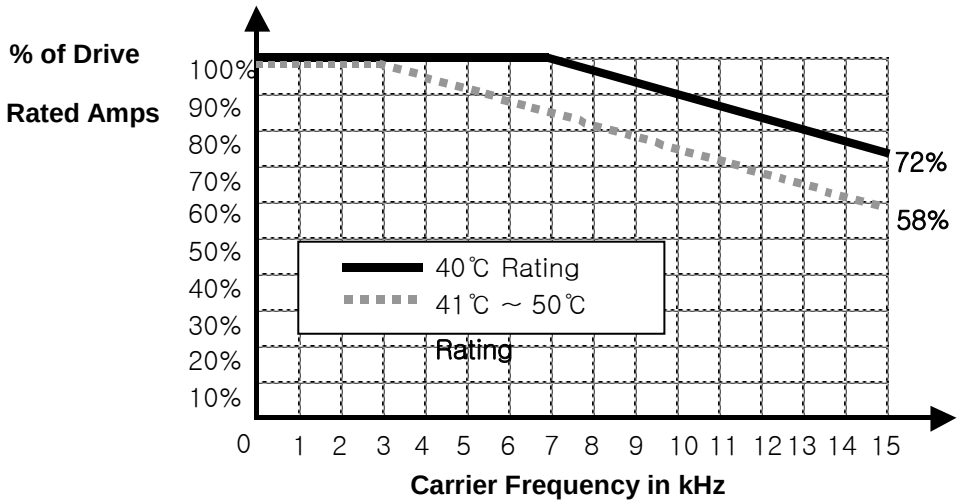
- Environment

Protection Degree	IP20, UL Enclosure(ENC) type1(Ambient Temperature 40°C)[2)]
Ambient temp	-10°C ~ 50°C
Storage temp	-20°C ~ 65°C
Humidity	Below 90% RH (no condensation)
Altitude/Vibration	Below 1,000m, 5.9m/sec^2 (0.6G)
Atmospheric pressure	70~106 kPa
Location	Protected from corrosive gas, combustible gas, oil mist or dust Pollution Degree 2 Environment

2) UL Enclosure(ENC) type1 with top cover and conduit box installed.

7.2 Temperature Derating Information

- Load and ambient temperature classified by the Carrier Frequency



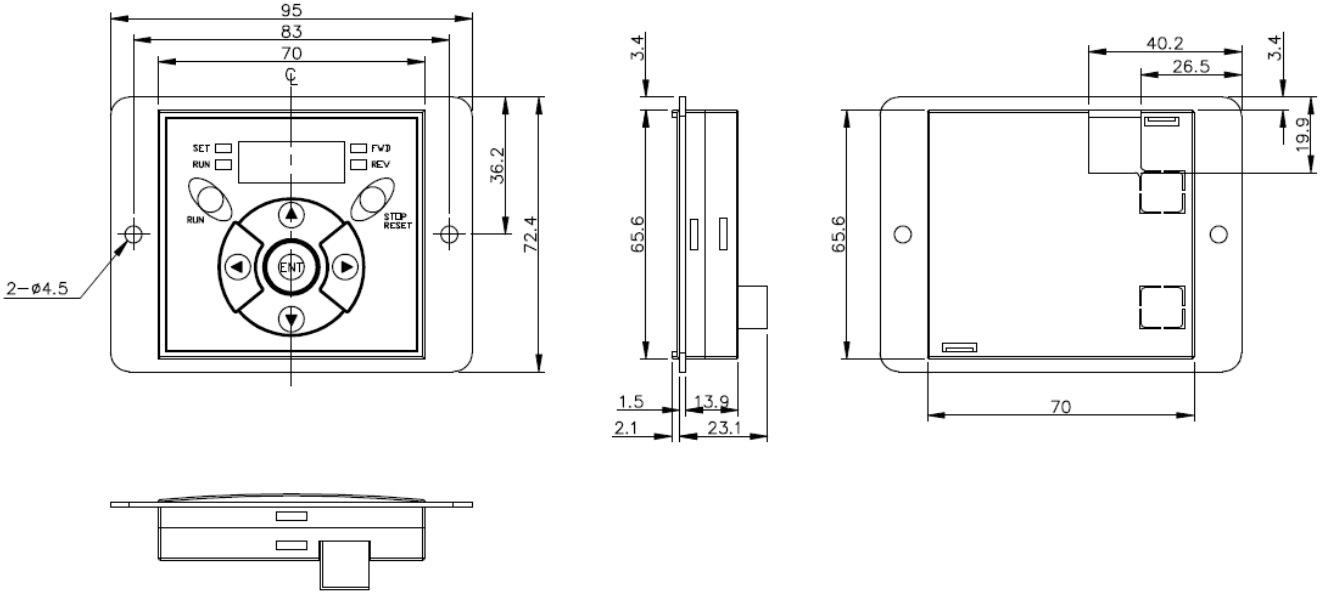
⚠ Caution

1) The above graph is only applied when the inverter is operated in the allowable temperature. Pay attention to the air cooling when the inverter is installed in a panel box, and the inside temperature should be within an allowable temperature range.
2) This derating curve is based on inverter current rating when rated motor is connected.

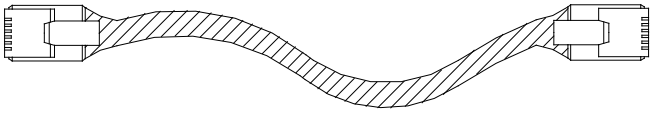
7.3 Remote option

- Parts

1) Remote Keypad



2) Remote Cable (1M, 2M, 3M, and 5M)

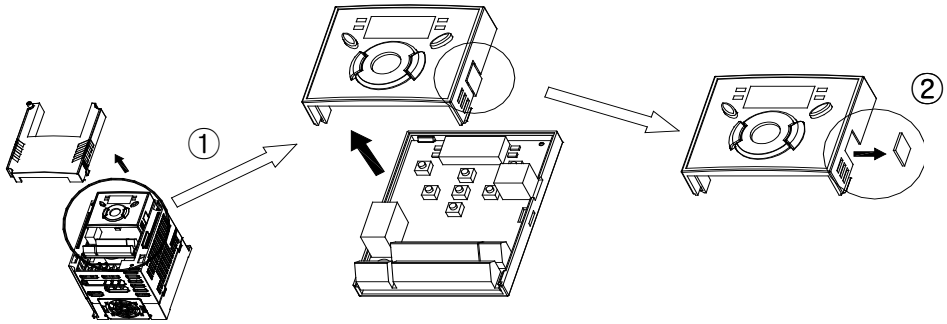


- Remote Cable Model Number

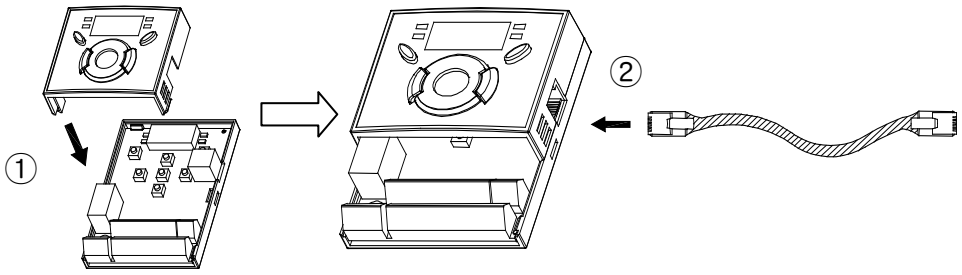
Model number	Specification
64100022	INV, REMOTE 1M (SV-iG5A)
64100001	INV, REMOTE 2M (SV-iG5A)
64100002	INV, REMOTE 3M (SV-iG5A)
64100003	INV, REMOTE 5M (SV-iG5A)

- Installation

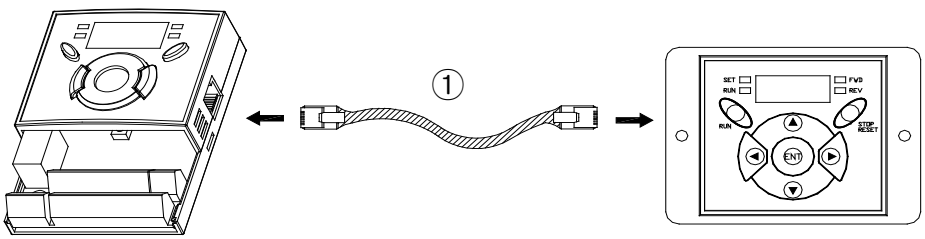
1) Take off the top cover of the I/O board kit (①) and remove the hole cover (②) to connect remote cable on the side.



2) Attach the top cover of the I/O board kit (①) and connect the remote cable (②) as shown below.



3) Connect the other side of the remote cable to the remote keypad (①) as shown below.



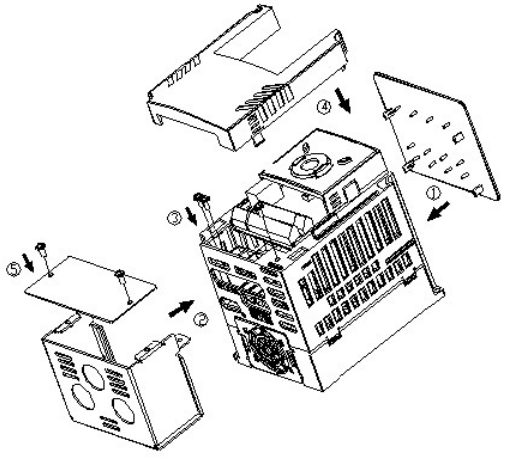
⚠ CAUTION

- Without Parameter Read(H91), Parameter Write(H92) is not available since the Remote memory is empty when the Remote keypad is first used.
- Do not use the remote cable other than standard LS'. Otherwise, malfunction may occur due to noise input or voltage drop in the keypad.
- Check for disconnection of the communication cable and/or poor cable connection if "----" is displayed on the 7-segment display of the Remote keypad.
- When Parameter Read(H91) is executed, "rd"(Read) and "wr"(Verify) is displayed successively on the 7-segment display of the Remote keypad. On the other hand, when Parameter Write(H92) is executed, "wr"(Write) is displayed only.

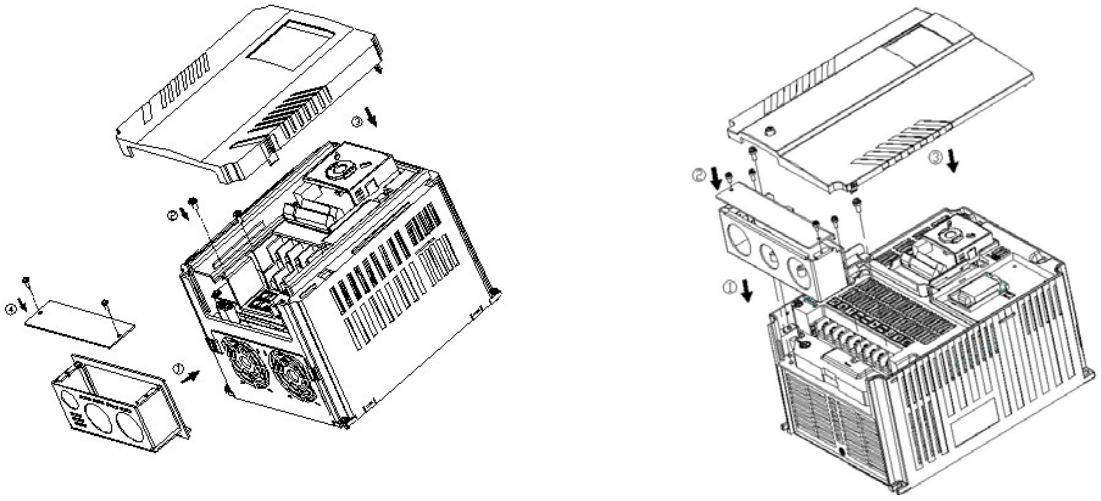
7.4 Conduit Kit

● Installation

1) SV004IG5A-1, SV008IG5A-1, SV015IG5A-1, SV004IG5A-2, SV008IG5A-2, SV015IG5A-2, SV022IG5A-2, SV037IG5A-2, SV040IG5A-2, SV004IG5A-4, SV008IG5A-4, SV015IG5A-4, SV022IG5A-4, SV037IG5A-4, SV040IG5A-4



2) SV055IG5A-2, SV055IG5A-4, SV075IG5A-2, SV075IG5A-4, SV110IG5A-2, SV110IG5A-4, SV150IG5A-2, SV150IG5A-4, SV185IG5A-2, SV185IG5A-4, SV220IG5A-2, SV220IG5A-4



● Conduit Kit

Conduit Kit	Model
Inverter Conduit Kit 1	SV004IG5A-2/4, SV008IG5A-2/4, SV004IG5A-1
Inverter Conduit Kit 2	SV015IG5A-2/4, SV008IG5A-1
Inverter Conduit Kit 3	SV022IG5A-2/4, SV037IG5A-2/4, SV040IG5A-2/4, SV015IG5A-1
Inverter Conduit Kit 4	SV055IG5A-2/4, SV075IG5A-2/4
Inverter Conduit Kit 5	SV110IG5A-2/4, SV150IG5A-2/4
Inverter Conduit Kit 6	SV185IG5A-2/4, SV220IG5A-2/4

7.5 Braking resistor

Input Voltage	Inverter capacity [kW]	100 % braking		150% braking	
		[Ω]	[W]*	[Ω]	[W]*
200V	0.4	400	50	300	100
	0.75	200	100	150	150
	1.5	100	200	60	300
	2.2	60	300	50	400
	3.7	40	500	33	600
	5.5	30	700	20	800
	7.5	20	1000	15	1200
	11.0	15	1400	10	2400
	15.0	11	2000	8	2400
	18.5	9	2400	5	3600
	22.0	8	2800	5	3600
400V	0.4	1800	50	1200	100
	0.75	900	100	600	150
	1.5	450	200	300	300
	2.2	300	300	200	400
	3.7	200	500	130	600
	5.5	120	700	85	1000
	7.5	90	1000	60	1200
	11.0	60	1400	40	2000
	15.0	45	2000	30	2400
	18.5	35	2400	20	3600
	22.0	30	2800	10	3600

* The wattage is based on Enable duty (%ED) 5% with continuous braking time 15 sec.

7.6 DeviceNet/Ethernet Communication Module

● iG5A for Communication type

1) iG5A for communication type has to be used for using DeviceNet and Ethernet communication option modules.
2) Please refer to 'Installation of communication module' in user's manual for installation for iG5A DeviceNet and Ethernet communication.
3) iG5A for communication has been designed to install the communication option module easily.
4) Production name of communication type is as follows.
   <Production name of communication type>

SV	xxx	iG5A	-	2	FB
LS Inverter	Capacity Note1)	Type	-	Input Voltage Note2)	iG5A for Communication

Note 1) The capacity range is applied from 0.4 to 22 kW products.
Note 2) In put Voltage is classified as 1 (Single phase 200V class), 2 (Three phase 200V class) and 4 (Three phase 400V class).

Remark

- To use the communication option module for iG5A, you must be use the iG5A for communication.
- The name of iG5A for communication is indicated as 'FB'.
- DeviceNet function supports above the iG5A for communication's version of software 2.3 (DeviceNet) and 2.4 (DeviceNet, Ethernet).

● DeviceNet /Ethernet communication option

1) Please use the option user's manual contained in package for using option module for iG5A.
2) Communication option code

Product Code	Product Name
64100019	iG5A DeviceNet Module
64100020	iG5A Ethernet Module

7.7 RS-485 Common Parameter Code List (Common area)

<Common area>: Area accessible regardless of inverter models [Note 1)]

Address	Parameter	Scale	Unit	R/W	Allotment for Bits
0h0000	Inverter model	-	-	R	A : iG5A
0h0001	Inverter capacity	-	-	R	FFFF: 0.4kW / 0000: 0.75kW / 0002: 1.5kW 0003: 2.2kW / 0004: 3.7kW / 0005: 4.0kW 0006: 5.5kW / 0007: 7.5kW / 0008: 11kW 0009: 15kW / 000A: 18.5kW / 000B: 22kW
0h0002	Inverter Input Voltage	-	-	R	0 : 220V, 1 : 440V
0h0003	S/W version	-	-	R	(E.g.) 0h0022 : Version 2.2
0h0004	Parameter Lock	-	-	R/W	0 : Lock(default), 1: Unlock
0h0005	Freq. Reference	0.01	Hz	R/W	Starting freq. ~ Max. freq.
0h0006	Run Command	-	-	R	B15, B14, B13 : Reserved
					B12, B11, B10, B9, B8: Freq. command 0: DRV-00, 1: Not Used, 2~8: Multi-Step frequency 1~7 9: Up, 10: Down, 11: Up-Down Zero 12: V0, 13: V1, 14: I, 15: V0+I, 16: V1+I, 17: JOG, 18: PID, 19: Communication, 20~31 : Reserved
					B7, B6: Run Command 0 : Terminal, 1 : Keypad, 3 : Communication
				R/W	B5 Reserved / B4 Emergency stop (0->1) B3 Fault reset (0->1) / B2 Reverse run (0->1) B1 Forward run (0->1) / B0 Stop (0->1)
0h0007	Acceleration Time	0.1	sec	R/W	See Function List
0h0008	Deceleration Time	0.1	sec	R/W	
0h0009	Output Current	0.1	A	R	
0h000A	Output Frequency	0.01	Hz	R	
0h000B	Output Voltage	0.1	V	R	
0h000C	DC Link Voltage	0.1	V	R	
0h000D	Output Power	0.1	kW	R	
0h000E	Inverter Status	-	-	-	B0 Stop / B1 Forward running B2 Reverse running / B3 Fault (Trip) B3 Fault (Trip) / B4 Acceleration B5 Deceleration / B6 Speed arrived B7 DC Braking / B8 Stopping B9 Not Used / B10 Brake open B10 Brake open / B11 Forward run B12 Reverse run / B13 REM. R/S B14 REM. Freq. / B15 Reserved
0h000F	Trip information-A	-	-	R	B15 LVT / B14 IOLT / B13 POT B12 FAN / B11 EEP / B10 EXT-B

Address	Parameter	Scale	Unit	R/W	Allotment for Bits
					B9 HW-Diag B8 OLT B7 ETH B6 OHT B5 GFT B4 COL B3 EST(BX) B2 EXT-A B1 OVT B0 OCT
0h0010	Input terminal status	-	-	R	B15, B14, B13, B12, B11, B10, B9, B8 : Reserved B7 P8 B6 P7 B5 P6 B4 P5 B3 P4 B2 P3 B1 P2 B0 P1
0h0011	Output terminal status	-	-	R	B7 3ABC B4 MO Others : Reserved
0h0012	V1	-	-	R	Value corresponding to 0 ~ + 10V input
0h0013	V2	-	-	R	Value corresponding to 0 ~ - 10V input when setting Freq Mode to 2
0h0014	I1	-	-	R	Value corresponding to 0 ~ 20mA input
0h0015	RPM	-	-	R	See Function List
0h001A	Unit display	-	-	R	Not Used
0h001B	Pole number	-	-	R	
0h001C	Custom Version	-	-	R	
0h001D	Trip information-B	-	-	R	B5 NBR B4 OC2 B3 REEP B2 NTC B1 FLTL B0 COM Others : Reserved
0h001E	PID Feedback	0.1	%	R/W	Writes feedback amount when feedback is set by communication in PID drive.
0h001F	Output torque	0.01	kgfm	R	Motor output torque display
0h0100 ~ 0h0107	Read address register (Note3)	-	-	R	0h0100 : I66 0h0101 : I67 0h0102 : I68 0h0103 : I69 0h0104 : I70 0h0105 : I71 0h0106 : I72 0h0107 : I73
0h0108 ~ 0h010F	Write address register (Note3)	-	-	W	0h0108 : I74 0h0109 : I75 0h010A : I76 0h010B : I77 0h010C : I78 0h010D : I79 0h010E : I80 0h010F : I81

Note 1) The changed value in Common area affects the current setting but returns to the previous setting when power is cycled or Inverter is reset. However, changing value is immediately reflected in other parameter groups even in the case of Reset or Power On/Off. S/W version of Common area is displayed in Hexadecimal, while that of parameter area is displayed in decimal.

Note 3) User can register up to Read address 8 ea/Write address 8 ea of discontinuous addresses and read/write them n data(s) with one Read/Write command. Input/Output group I66 through I73 are registered in the common read addresses 0h0100 through 0h0107 and it can be read the discontinuous n data(s) (less than 8 ea) with a read command. Input/Output group I74 through I81 are registered in the common write addresses 0h0108 through 0h010F and it can be written discontinuous n data(s) (less than 8 ea) with a write command.

DECLARATION OF CONFORMITY

Council Directive(s) to which conformity is declared:

2006/95/CE and 2004/108/CE

Units are certified for compliance with:

EN 61800-3:2004
EN 50178:1997

Type of Equipment:	**Inverter (Power Conversion Equipment)**
Model Name:	**SV - iG5A Series**
Trade Mark:	**LS Industrial Systems Co., Ltd.**
Representative:	**LS Industrial Systems Co., Ltd.**
Address:	**LS Tower, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do 1026-6, Korea**
Manufacturer:	**LS Industrial Systems Co., Ltd.**
Address:	**181, Samsung-ri, Mokchon-Eup, Chonan, Chungnam, 330-845, Korea**

We, the undersigned, hereby declare that equipment specified above conforms to the Directives and Standards mentioned.

Place: **Chonan, Chungnam, Korea**

11/08/2008 (Signature/Date)

Mr. Dok Ko Yong Chul / Factory Manager

(Full name / Position)

TECHNICAL STANDARDS APPLIED

The standards applied in order to comply with the essential requirements of the Directives 2006/95/CE "Electrical material intended to be used with certain limits of voltage" and 2004/108/CE "Electromagnetic Compatibility" are the following ones:

• EN 50178 (1997)	**“Electronic equipment for use in power installations”.**
•EN 61800-3 (2004)	**“Adjustable speed electrical power drive systems. Part 3: EMC product standard including specific methods”**
• EN 55011/A2 (2003)	**“Industrial, scientific and medical (ISM) radio-frequency equipment. Radio disturbances characteristics. Limits and methods of measurement”**
•EN61000-4-2/A2 (2001)	**“Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge immunity test.**
•EN61000-4-3/A2 (2004)	**“Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radiofrequency, electromagnetic field immunity test.**
•EN61000-4-4/A2 (2002)	**“Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 4: Electrical fast transients / burst immunity test.**
•EN61000-4-5/A1 (2001)	**“Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 5: Surge immunity test.**
•EN61000-4-6/A1 (2001)	**“Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 6: Immunity to conducted disturbances, induced by radio-frequency fields.**
•CEI/TR 61000-2-1 (1990)	**“Electromagnetic compatibility (EMC). Part 2: Environment. Environment description for low-frequency conducted disturbances and signalling in public low voltages supply systems”**
• EN 61000-2-2 (2003)	**“Electromagnetic compatibility (EMC). Part 2: Environment. Compatibility level for low-frequency conducted disturbances and signalling in public low voltages supply systems”**
• EN 61000-2-4 (1997)	**“Electromagnetic compatibility (EMC). Part 2: Environment. Compatibility level in industrial plants for low-frequency conducted disturbances”**
•EN60146-1-1/A1 (1998)	**“Semiconductor convertors. General requirements and line commutated convertors. Part 1-1: Specifications of basic requirements”**

EMI / RFI POWER LINE FILTERS

LS inverters, iG5A series

RFI FILTERS

THE LS RANGE OF POWER LINE FILTERS **FF (Footprint) - FE (Standard) SERIES**, HAVE BEEN SPECIFICALLY DESIGNED WITH HIGH FREQUENCY **LS INVERTERS**. THE USE OF LS FILTERS, WITH THE INSTALLATION ADVICE OVERLEAF HELP TO ENSURE TROUBLE FREE USE ALONG SIDE SENSITIVE DEVICES AND COMPLIANCE TO CONDUCTED EMISSION AND IMMUNITY STANDARS **TO EN 50081 -> EN61000-6-3:02 and EN61000-6-1:02**

CAUTION

IN CASE OF A LEAKAGE CURRENT PROTECTIVE DEVICES IS USED ON POWER SUPPLY, IT MAY BE FAULT AT POWER-ON OR OFF. IN AVOID THIS CASE, THE SENSE CURRENT OF PROTECTIVE DEVICE SHOULD BE LARGER THAN VALUE OF LEAKAGE CURRENT AT WORST CASE IN THE BELOW TABLE.

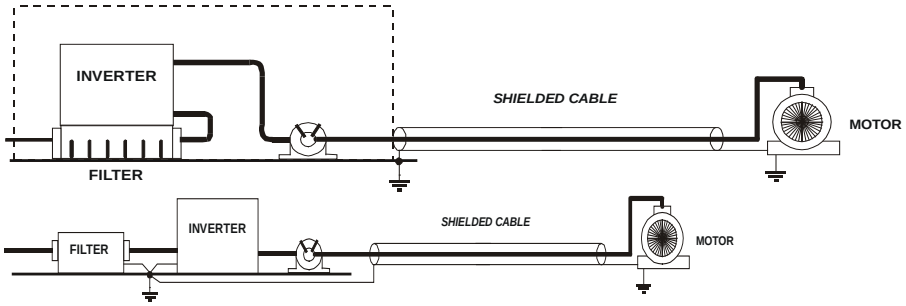
RECOMMENDED INSTALLATION INSTRUCTIONS

To conform to the EMC directive, it is necessary that these instructions be followed as closely as possible. Follow the usual safety procedures when working with electrical equipment. All electrical connections to the filter, inverter and motor must be made by a qualified electrical technician.

1-) Check the filter rating label to ensure that the current, voltage rating and part number are correct.
2-) For best results the filter should be fitted as closely as possible to the incoming mains supply of the wiring enclousure, usually directly after the enclousures circuit breaker or supply switch.
3-) The back panel of the wiring cabinet of board should be prepared for the mounting dimensions of the filter. Care should be taken to remove any paint etc... from the mounting holes and face area of the panel to ensure the best possible earthing of the filter.
4-) Mount the filter securely.
5-) Connect the mains supply to the filter terminals marked LINE, connect any earth cables to the earth stud provided. Connect the filter terminals marked LOAD to the mains input of the inverter using short lengths of appropriate gauge cable.
6-) Connect the motor and fit the ferrite core (output chokes) as close to the inverter as possible. Armoured or screened cable should be used with the 3 phase conductors only threaded twice through the center of the ferrite core. The earth conductor should be securely earthed at both inverter and motor ends. The screen should be connected to the enclosure body via and earthed cable gland.
7-) Connect any control cables as instructed in the inverter instructions manual.

IT IS IMPORTANT THAT ALL LEAD LENGHTS ARE KEPT AS SHORT AS POSSIBLE AND THAT INCOMING MAINS AND OUTGOING MOTOR CABLES ARE KEPT WELL SEPARATED.

FF SERIES (Footprint)



FE SERIES (Standard)

iG5A series / Footprint Filters

INVERTER	POWER	CODE	CURRENT	VOLTAGE	LEAKAGE CURRENT	DIMENSIONS L W H	MOUNTING Y X	WEIGHT	MOUNT	FIG.	OUTPUT CHOKES
SINGLE PHASE					(MAX.)						
SV004iG5A-1	0.4kW	FFG5A-M005-(x)	5A	250VAC	3.5mA	175x76.5x40	161x53	1.2Kg.	M4	A	FS – 1
SV008iG5A-1	0.75kW	FFG5A-M006-(x)	6A	250VAC	3.5mA	176.5x107.5x40	162.5x84	1.3Kg.	M4	A	FS – 1
SV015iG5A-1	1.5kW	FFG5A-M012-(x)	12A	250VAC	3.5mA	176.5x147.5x45	162.5x124	1.8Kg.	M4	A	FS – 1
THREE PHASE					NOM. MAX.						
SV004iG5A-2 SV008iG5A-2	0.4kW 0.75kW	FFG5A-T005-(x)	5A	250VAC	0.5mA 27mA	175x76.5x40	161x53	1.2Kg.	M4	A	FS – 1
SV008iG5A-2NC	0.75kW	FFG5A-T006-(x)	6A	250VAC	0.5mA 27mA	176.5x107.5x40	162.5x84	1.2Kg.	M4	A	FS – 1
SV015iG5A-2	1.5kW	FFG5A-T012-(x)	12A	250VAC	0.5mA 27mA	176.5x107.5x40	162.5x84	1.3Kg.	M4	A	FS – 2
SV022iG5A-2	2.2kW	FFG5A-T020-(x)	20A	250VAC	0.5mA 27mA	176.5x147.5x45	162.5x124	1.8Kg.	M4	A	FS – 2
SV037iG5A-2	3.7kW										
SV040iG5A-2	4.0kW										
SV055iG5A-2	5.5kW	FFG5A-T030-(x)	30A	250VAC	0.5mA 27mA	266x185.5x60	252x162	2Kg.	M4	B	FS – 2
SV075iG5A-2	7.5kW	FFG5A-T050-(x)	50A	250VAC	0.5mA 27mA	270x189.5x60	252x162	2.5Kg.	M4	B	FS – 2
SV110iG5A-2	11kW		100A	250VAC	0.5mA 27mA						
SV150iG5A-2	15kW										
SV180iG5A-2	18kW		120A	250VAC	0.5mA 27mA						
SV220iG5A-2	22kW										
SV004iG5A-4 SV008iG5A-4	0.4kW 0.75kW	FFG5A-T005-(x)	5A	380VAC	0.5mA 27mA	175x76.5x40	161x53	1.2Kg.	M4	A	FS – 1
SV008iG5A-4NC	0.75kW	FFG5A-T006-(x)	6A	380VAC	0.5mA 27mA	176.5x107.5x40	162.5x84	1.2Kg.	M4	A	FS – 1
SV015iG5A-4	1.5kW										
SV022iG5A-4 SV037iG5A-4 SV040iG5A-4	2.2kW 3.7kW 4.0kW	FFG5A-T011-(x)	11A	380VAC	0.5mA 27mA	176.5x147.5x45	162.5x124	1.5Kg.	M4	A	FS – 2
SV055iG5A-4	5.5kW	FFG5A-T030-(x)	30A	380VAC	0.5mA 27mA	266x185.5x60	252x162	2Kg.	M4	B	FS – 2
SV075iG5A-4	7.5kW										
SV110iG5A-4 SV150iG5A-4	11kW 15kW	FFG5A-T051-(x)	51A	380VAC	0.5mA 27mA	368x258.5x65	354x217	2.5Kg.	M6	B	FS – 2
SV185iG5A-4	18kW	FFG5A-T060-(x)	60A	380VAC	0.5mA 27mA	460x288x65	446x246	2.8Kg.	M8	B	FS – 2
SV220iG5A-4	22kW	FFG5A-T070-(x)	70A	380VAC	0.5mA 27mA	460x288x65	446x246	2.8Kg.	M8	B	FS – 2

iG5A series / Standard Filters

INVERTER	POWER	**CODE**	CURRENT	VOLTAGE	LEAKAGE CURRENT	DIMENSIONS L W H	MOUNTING Y X	WEIGHT	MOUNT	FIG.	OUTPUT CHOKES
SINGLE PHASE					**(MAX.)**						
SV004iG5A-1	0.4kW	**FE-M010-(x)**	10A	250VAC	3.5mA	150 x 55 x 45	140 x 36	0.6 Kg	---	C	**FS – 1**
SV008iG5A-1	0.75kW										
SV015iG5A-1	1.5kW	**FE-M015-(x)**	15A	250VAC	3.5mA	150 x 55 x 45	140 x 36	0.6 Kg	---	C	**FS – 1**
THREE PHASE					**NOM.** **MAX.**						
SV004iG5A-2	0.4kW	**FE-T006-(x)**	6A	250VAC	0.5mA 27mA	250x110x60	238x76	1.6Kg.	---	C	**FS – 2**
SV008iG5A-2	0.75kW										
SV008iG5A-2NC	0.75kW										
SV015iG5A-2	1.5kW	**FE-T012-(x)**	12A	250VAC	0.5mA 27mA	250x110x60	238x76	1.6Kg.	---	C	**FS – 2**
SV022iG5A-2	2.2kW	**FE-T020-(x)**	20A	250VAC	0.5mA 27mA	270x140x60	258x106	2.2Kg.	---	C	**FS – 2**
SV037iG5A-2	3.7kW										
SV040iG5A-2	4.0kW										
SV055iG5A-2	5.5kW	**FE-T030-(x)**	30A	250VAC	0.5mA 27mA	270x140x60	258x106	2.4Kg.	---	C	**FS – 2**
SV075iG5A-2	7.5kW	**FE-T050-(x)**	50A	250VAC	0.5mA 27mA	270x140x90	258x106	3.2Kg.	---	C	**FS – 2**
SV110iG5A-2	11kW	**FE-T100-(x)**	100A	250VAC	0.5mA 27mA	420x200x130	408x166	13.8Kg.	---	C	**FS – 3**
SV150iG5A-2	15kW										
SV185iG5A-2	18kW	**FE-T120-(x)**	120A	250VAC	0.5mA 27mA	420x200x130	408x166	13.8Kg.	---	C	**FS – 3**
SV220iG5A-2	22kW										
SV004iG5A-4	0.4kW	**FE-T006-(x)**	6A	380VAC	0.5mA 27mA	250x110x60	238x76	1.6Kg.	---	C	**FS – 2**
SV008iG5A-4	0.75kW										
SV008iG5A-4NC	0.75kW										
SV015iG5A-4	1.5kW										
SV022iG5A-4	2.2kW	**FE-T012-(x)**	12A	380VAC	0.5mA 27mA	250x110x60	238x76	1.6Kg.	---	C	**FS – 2**
SV037iG5A-4	3.7kW										
SV040iG5A-4	4.0kW										
SV055iG5A-4	5.5kW	**FE-T030-(x)**	30A	380VAC	0.5mA 27mA	270x140x60	258x106	2.4 Kg.	---	C	**FS – 2**
SV075iG5A-4	7.5kW										
SV110iG5A-4	11W	**FE-T050-(x)**	50A	380VAC	0.5mA 27mA	270x140x90	258x106	3.2Kg.	---	C	**FS – 2**
SV150iG5A-4	15kW										
SV185iG5A-4	18kW	**FE-T060-(x)**	60A	380VAC	0.5mA 27mA	270x140x90	258x106	3.2Kg.	---	C	**FS – 2**
SV220iG5A-4	22kW	**FE-T070-(x)**	70A	380VAC	0.5mA 27mA	350x180x90	338x146	7.5Kg.	---	C	**FS – 2**

(x) (1) Industrial environment EN50081-2 (A class) → EN61000-6-4:02
(3) Domestic and industrial environment EN50081-1 (B class) → EN61000-6-3:02

FF SERIES (Footprint)

FIG. A

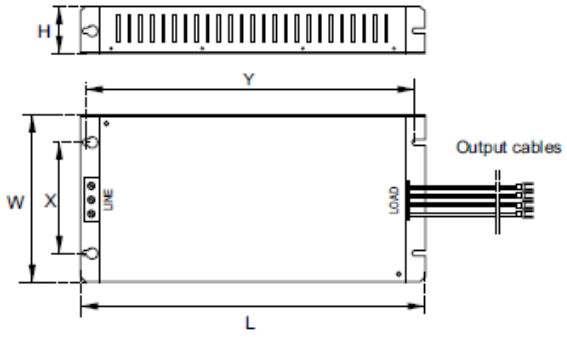
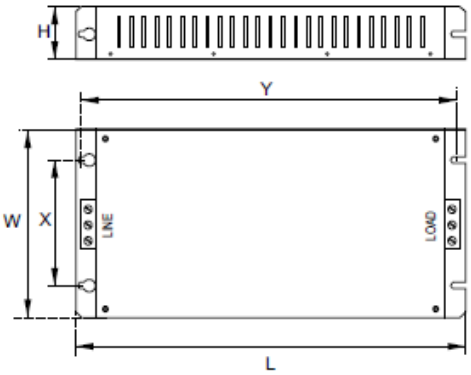
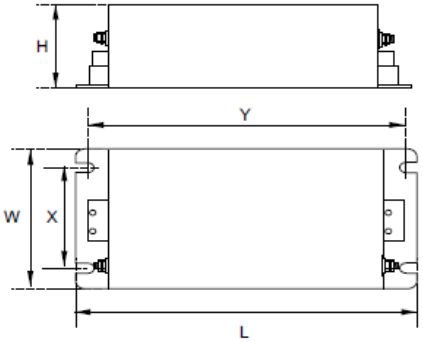


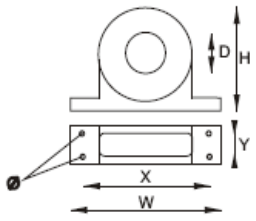
FIG. B



FE SERIES (Standard)

FIG. C





FS SERIES (output chokes)

CODE	D	W	H	X	Ø
FS – 1	21	85	46	70	5
FS – 2	28.5	105	62	90	5
FS – 3	48	150	110	125 x 30	5

LS VMC vector motor control

Vector Motor Control Ibérica S.L.
C/ Mar del Caribe, 10
Pol. Ind. La Torre del Rector
08130 Santa Perpètua de Mogoda
(BARCELONA) ESPAÑA
Tel. (+34) 935 748 206
Fax (+34) 935 748 248
info@vmc.es
www.vmc.es

Warranty

Maker	**LS Industrial Systems Co., Ltd.**	**Installation (Start-up) Date**	
Model No.	**SV-iG5A**	**Warranty Period**	
Customer Information	**Name**		
	Address		
	Tel.		
Sales Office (Distributor)	**Name**		
	Address		
	Tel.		

Warranty period is 12 months after installation or 18 months after manufactured when the installation date is unidentified. However, the guarantee term may vary on the sales term.

IN-WARRANTY service information
If the defective part has been identified under normal and proper use within the guarantee term, contact your local authorized LS distributor or LS Service center.

OUT-OF WARRANTY service information
The guarantee will not apply in the following cases, even if the guarantee term has not expired.

- Damage was caused by misuse, negligence or accident.
- Damage was caused by abnormal voltage and peripheral devices' malfunction (failure).
- Damage was caused by an earthquake, fire, flooding, lightning, or other natural calamities.
- When LS nameplate is not attached.
- When the warranty period has expired.

Revision History

No	Date	Edition	Changes
1	2004. 2	First Release	Only 5.5, 7.5kW included
2	2004. 9	2nd Edition	0.4~4.0kW added to first release
3	2005. 6	4th Edition	CI changed
4	2006. 5	5th Edition	S/W Version up (V1.7)
5	2007. 11	6th Edition	S/W Version up (V2.0)
6	2008. 4	7th Edition	S/W Version up (V2.2)
7	2008. 11	8th Edition	Contents of EMI / RFI POWER LINE FILTERS updated
8	2009. 7	9th Edition	S/W Version up (V2.3)