Safety Information

Read and follow all safety instructions in this manual precisely to avoid unsafe operating conditions, property damage, personal injury, or death.

Safety symbols in this manual

⚠ Danger

Indicates an imminently hazardous situation which, if not avoided, will result in severe injury or death.

⚠ Warning

Indicates a potentially hazardous situation which, if not avoided, could result in injury or death.

ⓘ Caution

Indicates a potentially hazardous situation that, if not avoided, could result in minor injury or property damage.

Safety information

⚠ Danger

- Do not open the cover of the equipment while it is on or operating. Likewise, do not operate the inverter while the cover is open. Exposure of high voltage terminals or charging area to the external environment may result in an electric shock. Do not remove any covers or touch the internal circuit boards (PCBs) or electrical contacts on the product when the power is on or during operation. Doing so may result in serious injury, death, or serious property damage.
- Do not open the cover of the equipment even when the power supply to the inverter has been turned off unless it is necessary for maintenance or regular inspection. Opening the cover may result in an electric shock even when the power supply is off.
- The equipment may hold charge long after the power supply has been turned off. Use a multi-meter to make sure that there is no voltage before working on the inverter, motor or motor cable.
- Supply earthing system: TT, TN, not suitable for corner-earthed systems

⚠ Warning

- This equipment must be grounded for safe and proper operation.
- Do not supply power to a faulty inverter. If you find that the inverter is faulty, disconnect the power supply and have the inverter professionally repaired.
- The inverter becomes hot during operation. Avoid touching the inverter until it has cooled to avoid burns.
- Do not allow foreign objects, such as screws, metal chips, debris, water, or oil to get inside the inverter. Allowing foreign objects inside the inverter may cause the inverter to malfunction or result in a fire.
- Do not operate the inverter with wet hands. Doing so may result in electric shock.

ⓘ Caution

- Do not modify the interior workings of the inverter. Doing so will void the warranty.
- The inverter is designed for 3-phase motor operation. Do not use the inverter to operate a single phase motor.
- Do not place heavy objects on top of electric cables. Doing so may damage the cable and result in an electric shock.

Table of Contents

1 Introduction

1.1 Purpose of the Manual

This instruction manual provides information for safe installation, and commissioning of the SV-IS7 Series..

Read and follow the instruction manual in order to use the IS7 drive safely and professionally, and pay particular attention to the safety instructions and general warnings. Keep this instruction manual available with the IS7 drive at all times.

Note

Detailed informations for each parameter is on technical manual.

1.2 Intended Use

The inverter is an electronic motor controller that :

1. Regulates motor speed in response to system feedback or to remote commands from external controllers. A power drive system consists of the IS7 inverter, the motor and equipment driven by the motor.
2. Monitors aspects of system and motor status.
3. Can be used for motor protection.

Depending on configuration, the inverter can be used in standalone applications or form part of a larger appliance or installation.

The inverter is intended for use in residential, industrial and commercial environments in accordance with local laws and standards. Do not use the inverter in applications that do not comply with specified designated operating conditions and environments.

1.3 Intended Audience

This start-up manual is for:

- Knowledge of standard electrical wiring practices, electronic components,and electrical schematic symbols.
- Minimal knowledge of SV-IS7 product names and terminology.
- No experience or training in installing, operating, or servicing SV-IS7.

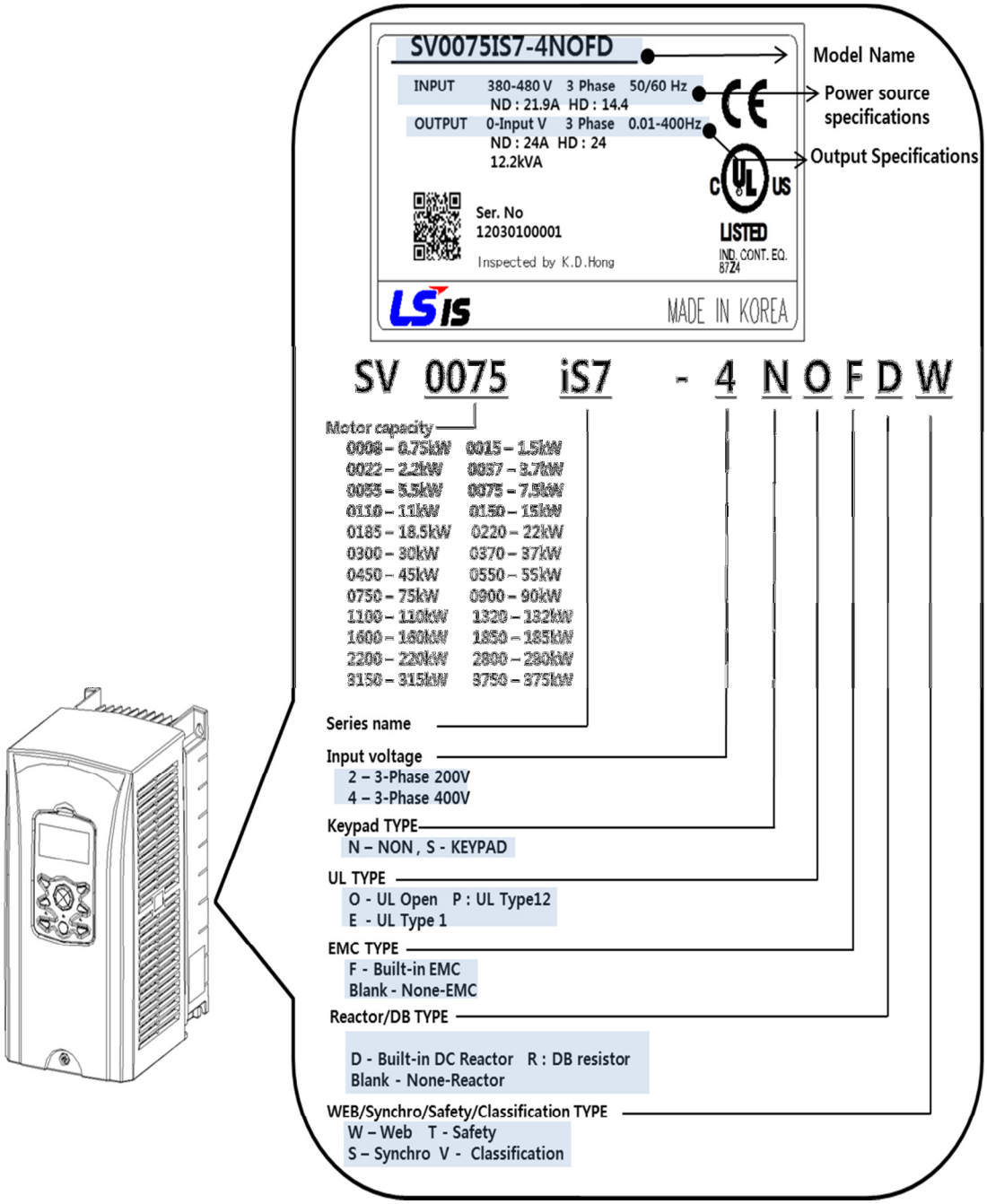
The audience for this manual will install, start-up, and service SV-IS7.

1.4 Product Identification

The SV-IS7 Inverter is manufactured in a range of product groups based on drive capacity and power source specifications. Product name and specifications are detailed on the rating plate. Check the rating plate before installing the product and make sure that the product meets your requirements. For more detailed product specifications.

Note

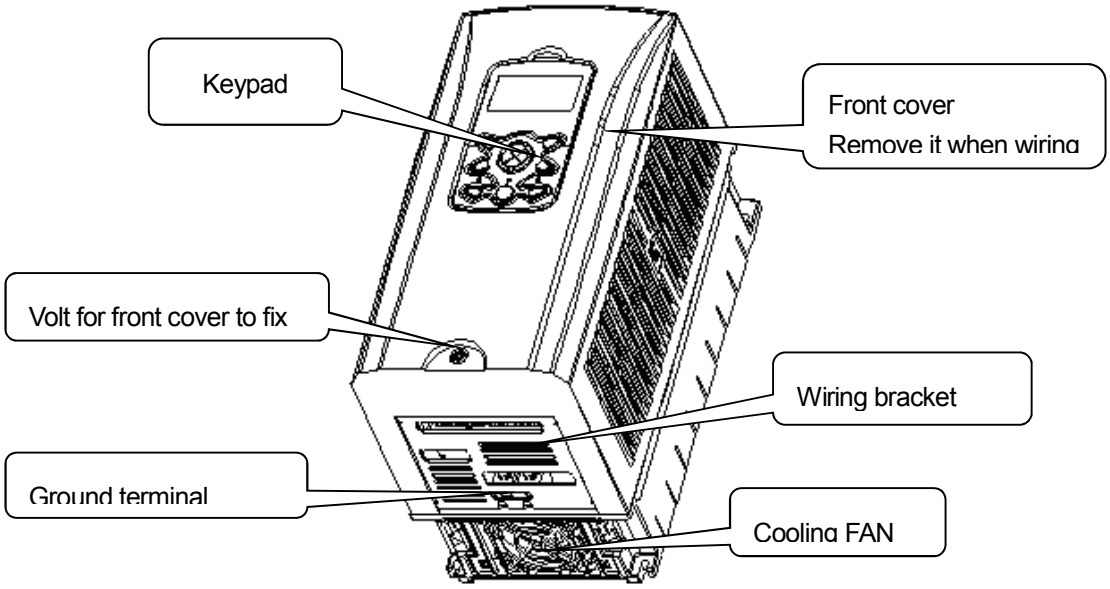
Check the product name, open the packaging, and then confirm that the product is free from defects. Contact your supplier if you have any issues or questions about your product.

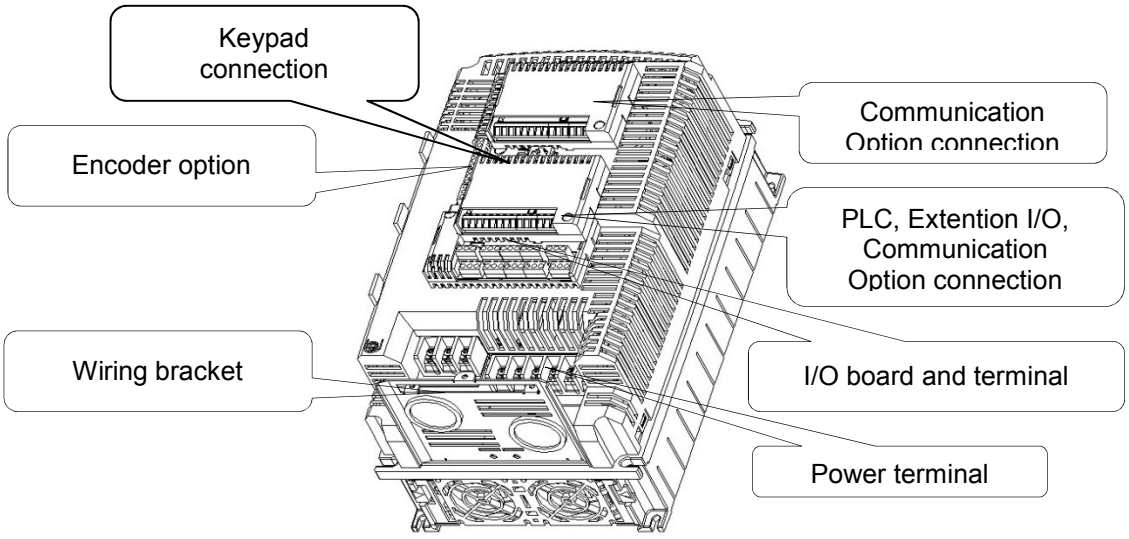

SV0075IS7-4NOFD
Model Name
INPUT 380-480 V 3 Phase 50/60 Hz
ND : 21.9A HD : 14.4
Power source specifications
OUTPUT 0-Input V 3 Phase 0.01-400Hz
ND : 24A HD : 24
12.2kVA
Output Specifications
Ser. No
12030100001
Inspected by K.D.Hong
LISTED
IND. CONT. EQ.
87Z4
MADE IN KOREA
SV 0075 iS7 - 4 N O F D W
Motor capacity
0008 – 0.75kW 0015 – 1.5kW
0022 – 2.2kW 0037 – 3.7kW
0055 – 5.5kW 0075 – 7.5kW
0110 – 11kW 0150 – 15kW
0185 – 18.5kW 0220 – 22kW
0300 – 30kW 0370 – 37kW
0450 – 45kW 0550 – 55kW
0750 – 75kW 0900 – 90kW
1100 – 110kW 1320 – 132kW
1600 – 160kW 1850 – 185kW
2200 – 220kW 2800 – 280kW
3150 – 315kW 3750 – 375kW
Series name
Input voltage
2 – 3-Phase 200V
4 – 3-Phase 400V
Keypad TYPE
N – NON , S - KEYPAD
UL TYPE
O - UL Open P : UL Type12
E - UL Type 1
EMC TYPE
F - Built-in EMC
Blank - None-EMC
Reactor/DB TYPE
D - Built-in DC Reactor R : DB resistor
Blank - None-Reactor
WEB/Synchro/Safety/Classification TYPE
W – Web T - Safety
S – Synchro V - Classification

1.5 Part Names

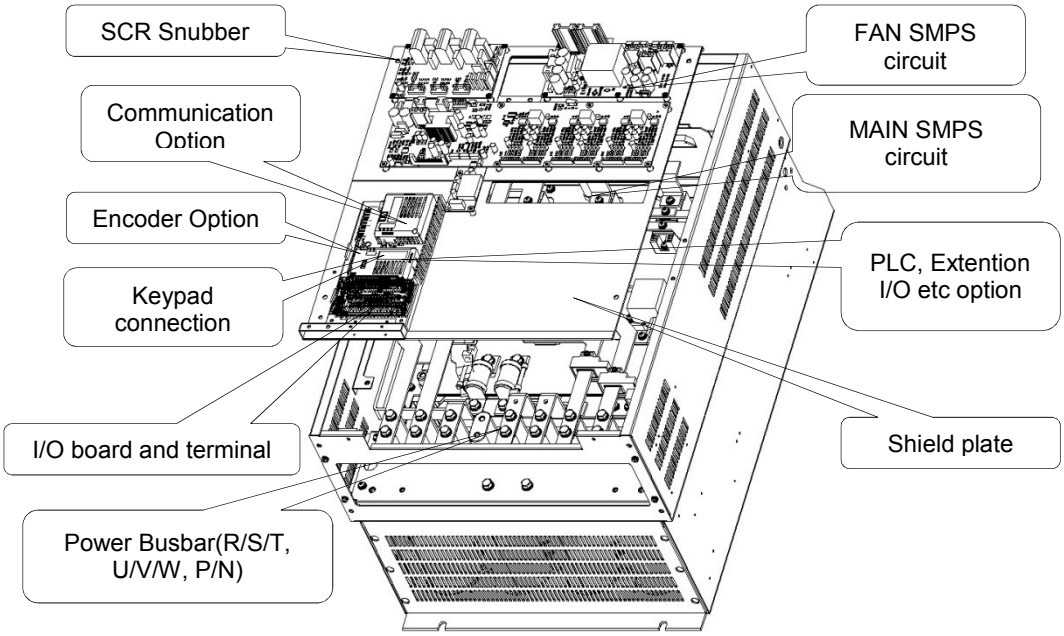
The illustration below displays part names. Details may vary between product groups.

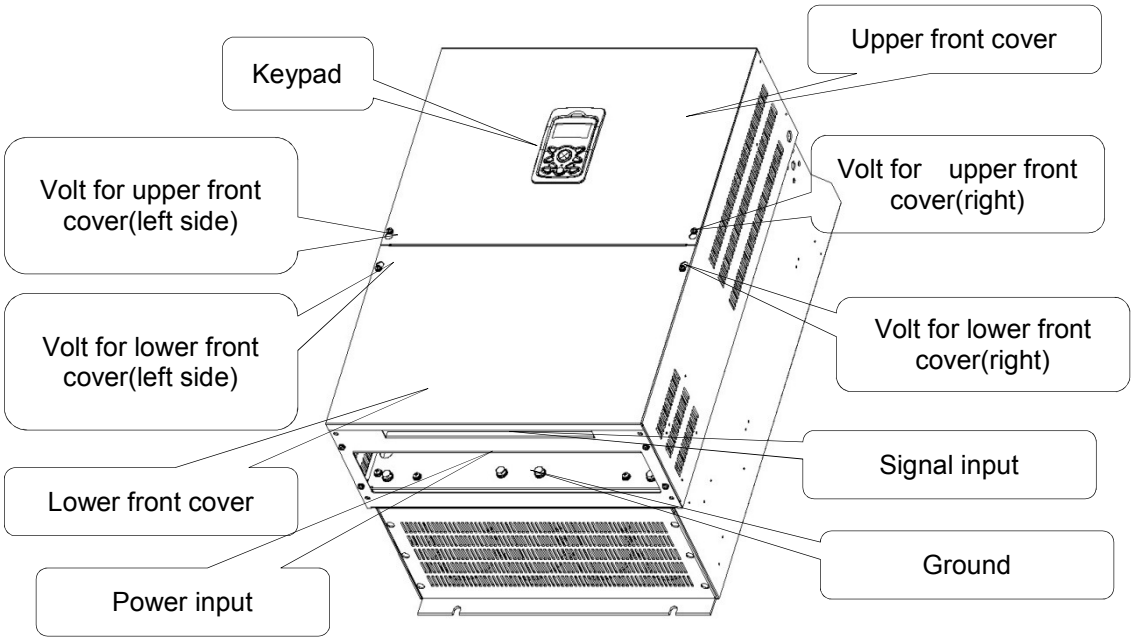
0.75~75kW(3-Phase)



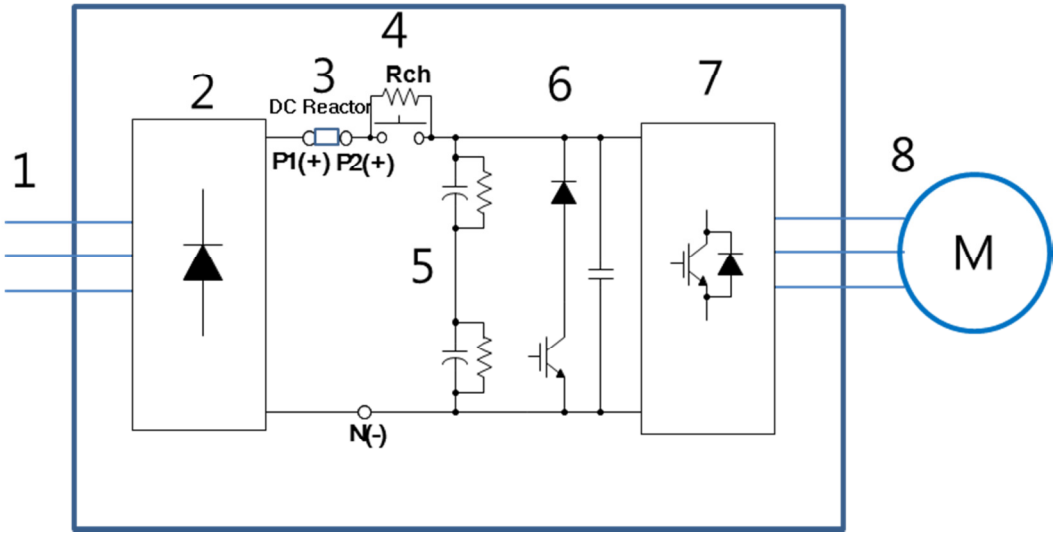


90~375kW(3-Phase)





1.6 Block Diagram



No.	Name	Description
1	Line power input	3-phase AC line power supply to the adjustable frequency drive
2	Rectifier	The rectifier bridge converts the AC input to DC current to supply inverter power
3	P1(+), P2(+)	DC reactor wiring connection.
4	Charging resistor	Restrict inrush current when power is turned on.
5	Capacitor Bank	Stores the DC power.
6	Dynamic Braking Unit	In above ranges (30~375kW), Braking unit has to be additionally installed.
7	Inverter	Converts the DC into a controlled PWM AC waveform for a controlled variable output to the motor.
8	Output to motor	Regulated 3-phase output power to the motor

2 Installation Instruction

2.1 Installation Considerations

Inverters are composed of various precision, electronic devices, and therefore the installation environment can significantly impact the lifespan and reliability of the product. The table below details the ideal operation and installation conditions for the inverter.

Items	Description
Ambient Temperature*	- CT (Heavy Duty) load : - 10 ~ 50℃ (without ice or frost) - VT (Normal Duty) load : - 10~ 40℃ (without ice or frost) (It is recommended that you use less than 80% load when you use VT load at 50℃.) - IP54 product: -10~40 ℃ (without ice or frost)
Ambient Humidity	90% relative humidity (no condensation)
Storage Temperature	- 4–149 °F (-20–65 ℃)
Environmental Factors	An environment free from corrosive or flammable gases, oil residue or dust
Altitude/Vibration	Lower than 3,280 ft (1,000 m) above sea level/less than 0.6 G (5.9 m/sec^2)
Air Pressure	70 –106 kPa

* The ambient temperature is the temperature measured at a point 2” (5 cm) from the surface of the inverter.

2.2 Selecting and Preparing a Site for Installation

Be careful so that the plastic parts of the inverter may not be damaged.

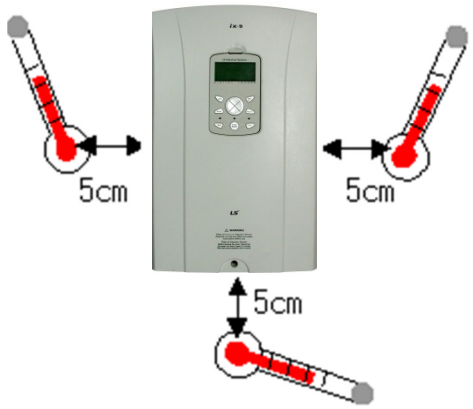
Do not move the product holding the cover only.

Do not install the product where there is vibration, a press or cart..

Life of the inverter greatly influenced by the surrounding temperatures, make sure that the surrounding temperature does not exceed the permitted temperature (-10 ~ 50 C).

The life of the inverter is affected by ambient temperature. Place that inverter installed in of ambient temperatures should not exceed the following allowable temperature.

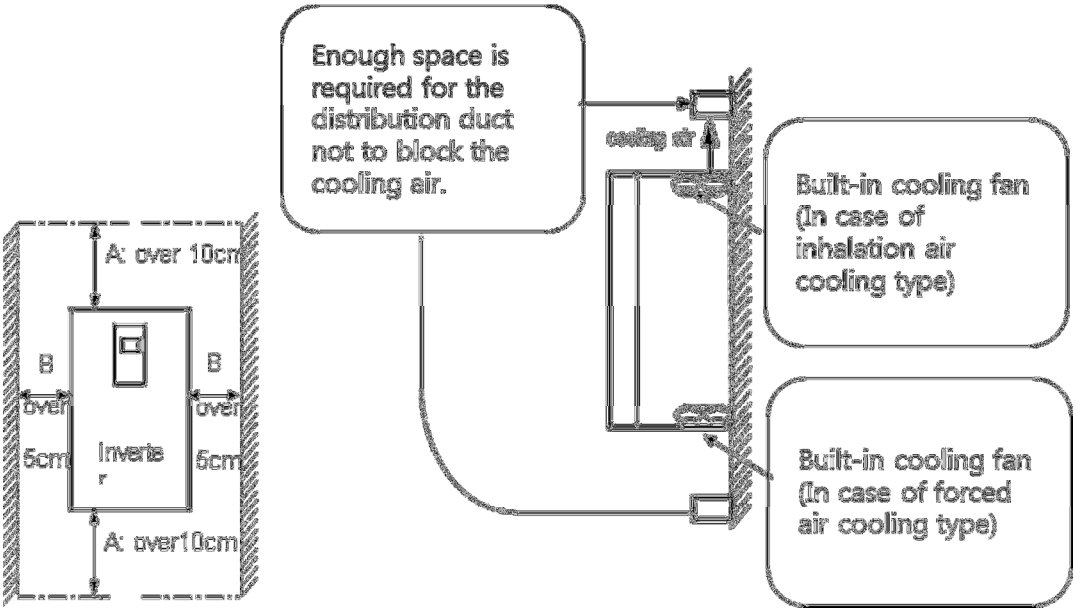
When the inverter is installed inside the panel, panel temperature must not exceed the following allowable temperature. In other word, the ambient temperature inside or outside of the panel, regardless of the installation, needs a 5cm gap around the inverter as shown.



Allowable Temperature
Characteristics, such as no ice in ambient Temperature CT(Heavy Duty) load: - 10 ~ 50℃ VT(Normal Duty)load: - 10~ 40℃ (However, VT(Normal Duty) in 50℃, less than 80% of the load use recommended) IP54 Product : -10 ~40℃

<Measurement Points of Surrounding Temperature>

Install the inverter on an inflammable surface because its temperature rises high during operation.
Sufficient space is required to prevent heat saturation because the inverter emits heat.



Remark

Over 50cm, B : over 20cm is necessary when you install an inverter above 30kW

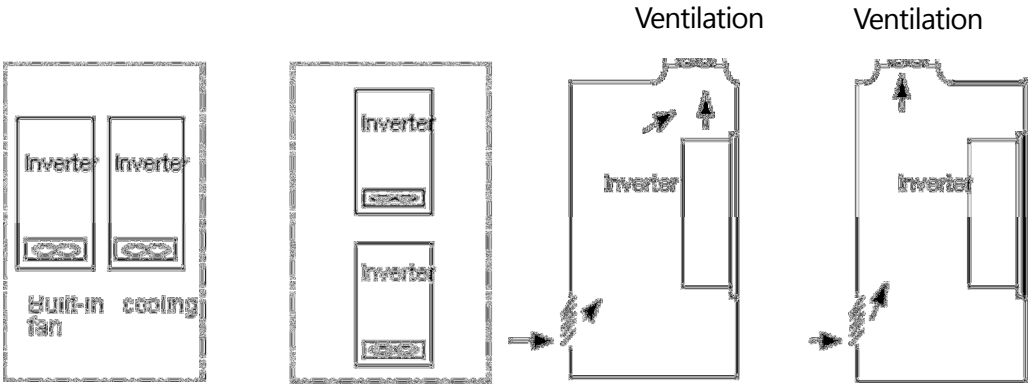
⚠ Caution

Avoid direct rays of light or a warm and humid place.

Install the inverter in a closed panel or clean place free from foreign substances such as oil mist and fiber dust.

In order to meet the EMC standard, 200V 30~75kW and more than 90kW product should be installed inside a metal cabinet or panel.

If you install two or more inverters inside the panel, be careful about the location of the ventilation fan and inverter. See the figure below.



Acceptable(O) Acceptable(X) Acceptable(O) Acceptable(X)

Install the inverter upright using screws or bolts so that the inverter does not move.

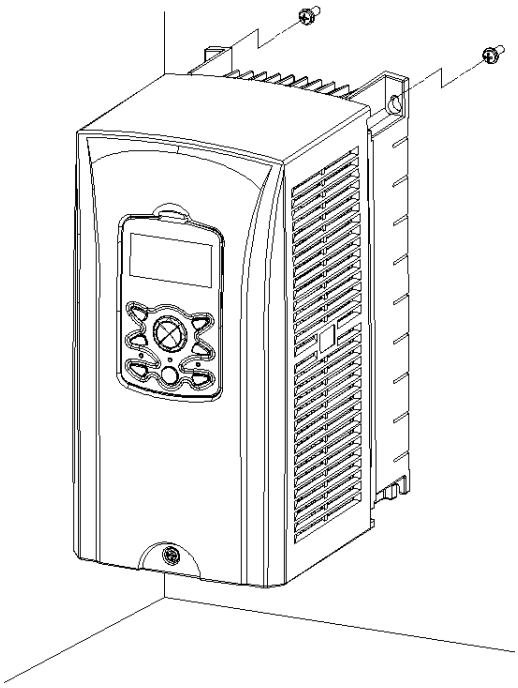
Note

Arrange the panels in order to the hot air generated by the heating of the inverter should be released.

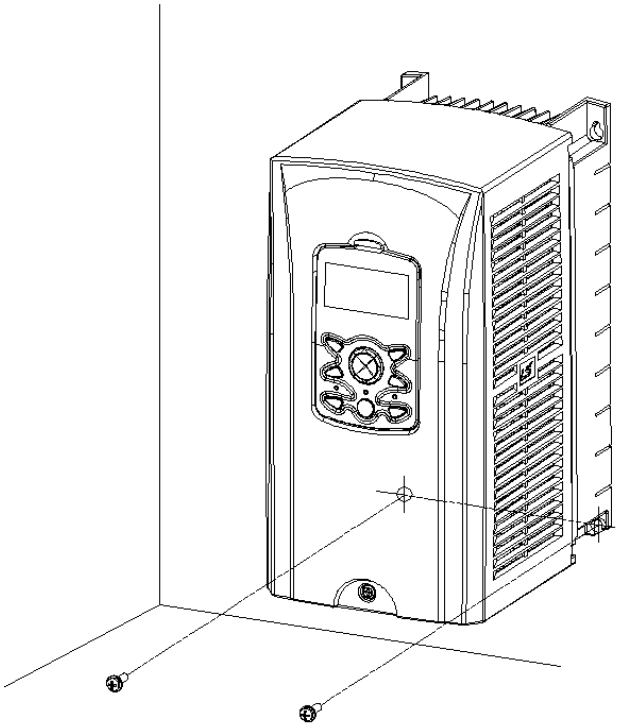
2.3 Mounting

Mount the inverter on a wall or inside a panel following the procedures provided below. Before installation, ensure that there is sufficient space to meet the clearance specifications, and that there are no obstacles impeding the cooling fan's air flow.

1. Use a level to draw a horizontal line on the mounting surface, and then carefully mark the fixing points.
2. Drill the two upper mounting bolt holes, and then install the mounting bolts. Do not fully tighten the bolts at this time. Fully tighten the mounting bolts after the inverter has been mounted.
3. Mount the inverter on the wall or inside a panel using the two upper bolts, and then fully tighten the upper mounting bolts.



4 Install the two lower mounting bolts. Ensure that the inverter is placed flat on the mounting surface, and that the installation surface can securely support the weight of the inverter.

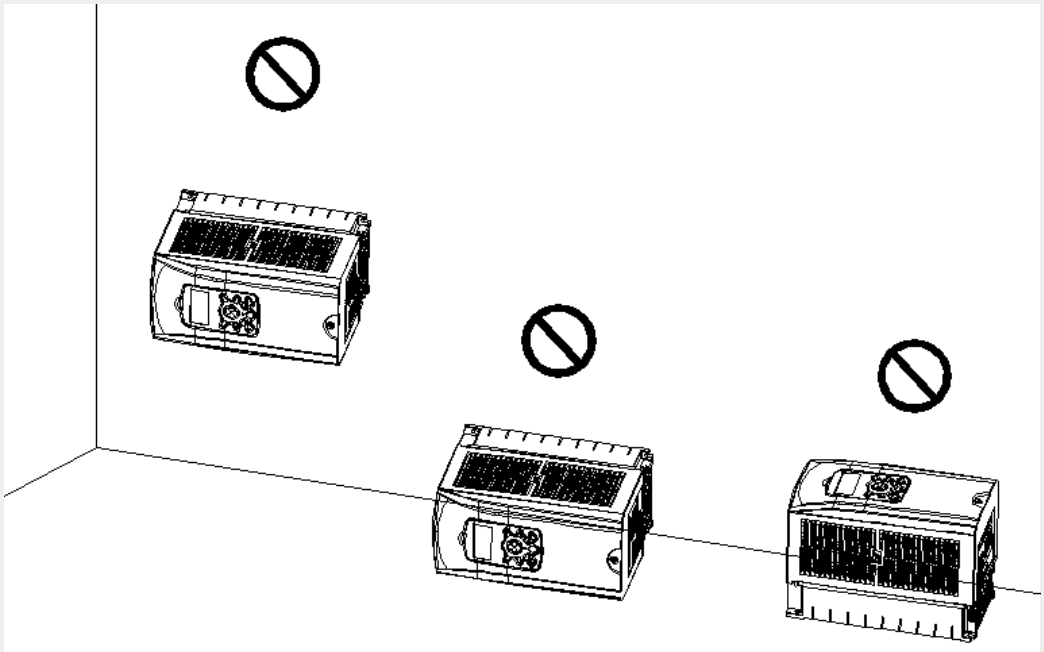


Note

The quantity and dimensions of the mounting brackets vary based on frame size.

Caution

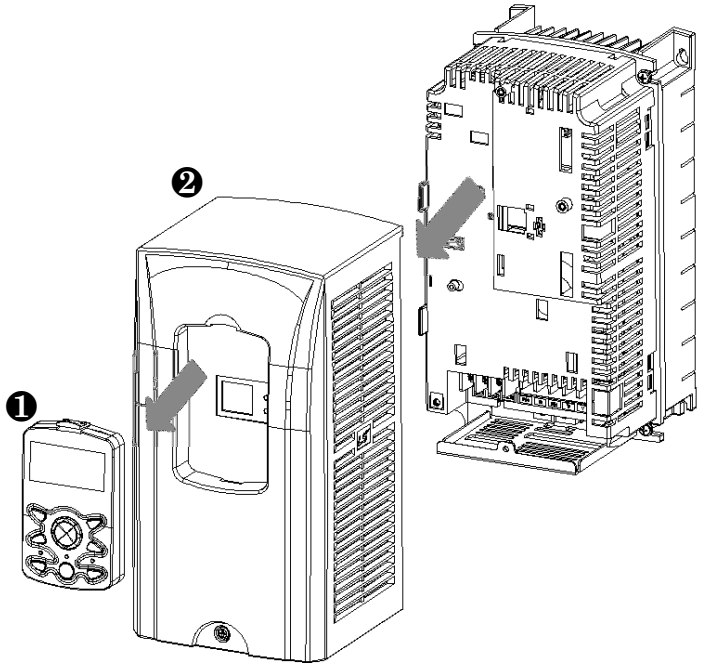
- Do not transport the inverter by lifting with the inverter's covers or plastic surfaces. The inverter may tip over if covers break, causing injuries or damage to the product. Always support the inverter using the metal frames when moving it.
- Hi-capacity inverters are very heavy and bulky. Use an appropriate transport method that is suitable for the weight.
- Do not install the inverter on the floor or mount it sideways against a wall. The inverter must be installed vertically, on a wall or inside a panel, with its rear flat on the mounting surface.



2.4 Motor Connection

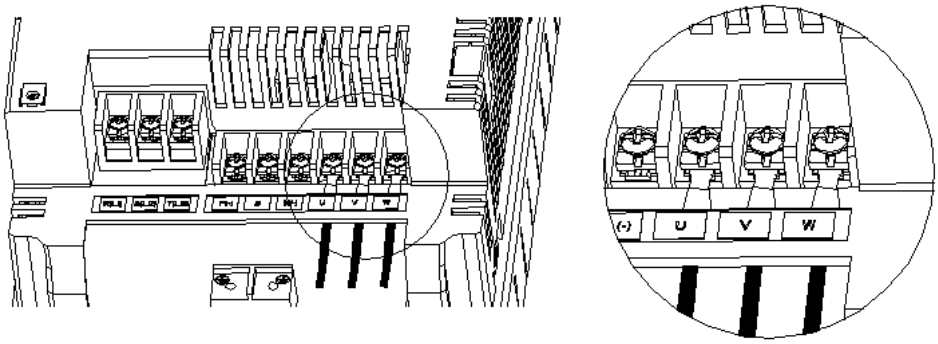
Connect motor by following procedure. Check cable specifications on 5.2 before connecting.

1 First, separate the keypad and the cable of keypad(❶)
Ex) 0.75~7.5kW

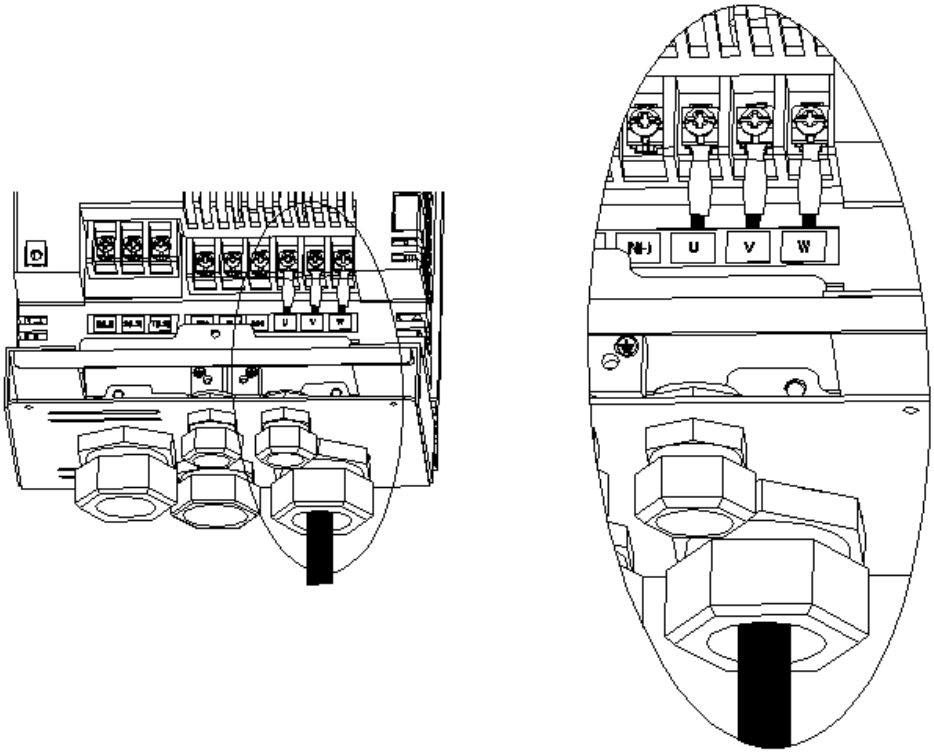


2 Loosen the bolt that secures the top cover. Then remove the cover by lifting it. (❷)

3 Connect the cables to the power terminals.



<Standard type>



<Conduit type>

ⓘ 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 malfuctions.
- Use copper wires only with 600 V, 75 ℃ rating for the power terminal wiring, and 300 V,

75 ℃ rating for the control terminal wiring.

- 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.

Note

- Use STP (Shielded Twisted Pair) cables to connect a remotely located motor with the inverter. Do not use 3 core cables.
- Make sure that the total cable length does not exceed 492 ft (150 m). For inverters < = 3.7 kW capacity, ensure that the total cable length does not exceed 165 ft (50 m).
- Long cable runs can cause reduced motor torque in low frequency applications due to voltage drop. Long cable runs also increase a circuit's susceptibility to stray capacitance and may trigger over-current protection devices or result in malfunction of equipment connected to the inverter.
- Voltage drop is calculated by using the following formula:
- Voltage Drop (V) = [√3 X cable resistance (mΩ/m) X cable length (m) X current (A)] / 1000
- Use cables with the largest possible cross-sectional area to ensure that voltage drop is minimized over long cable runs. Lowering the carrier frequency and installing a micro surge filter may also help to reduce voltage drop.

Distance	< 165 ft (50 m)	< 330 ft (100 m)	> 330 ft (100 m)
Allowed Carrier Frequency	<15 kHz	<5 kHz	<2.5 kHz

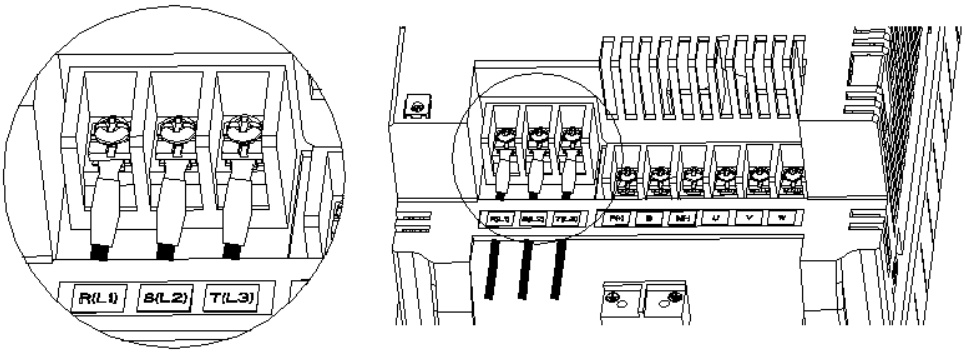
2.5 AC Input Connection

Connect AC Input power by following procedure. Check cable specifications on 5.2 before connecting.

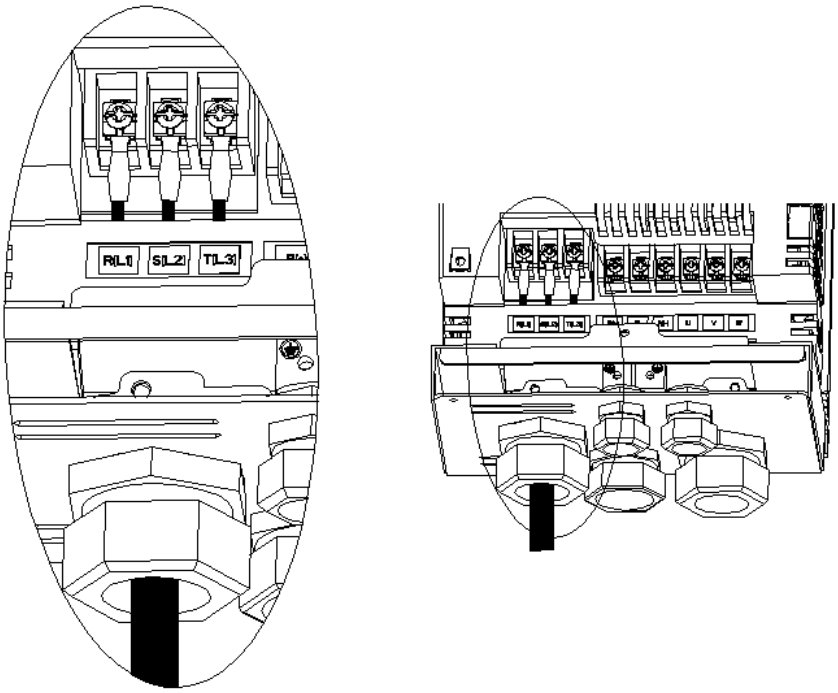
1 Connect 3 Phase AC input cable to R,S,T

2 Do not activate the EMC filter if the inverter uses a power source with an asymmetrical grounding structure, for example a grounded delta connection. Personal injury or death by electric shock may result.

Ex) 0.75~7.5kW



<Standard type>



<Conduit type>

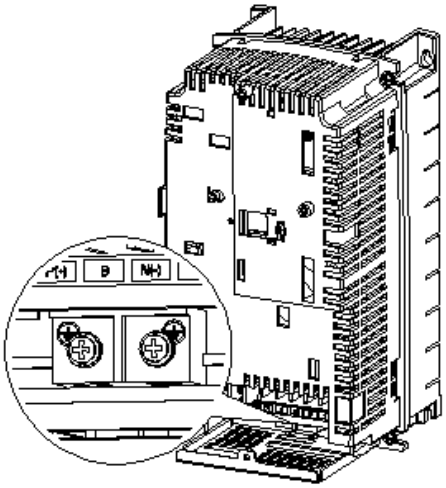
Caution

- Power supply cables must be connected to the R, S, and T terminals. Connecting power cables to other terminals will damage the inverter.
- Use insulated ring lugs when connecting cables to R/S/T and U/V/W terminals.
- The inverter's power terminal connections can cause harmonics that may interfere with other communication devices located near to the inverter. To reduce interference the installation of noise filters or line filters may be required.
- To avoid circuit interruption or damaging connected equipment, do not install phase-advanced condensers, surge protection, or electronic noise filters on the output side of the inverter.
- To avoid circuit interruption or damaging connected equipment, do not install magnetic contactors on the output side of the inverter.

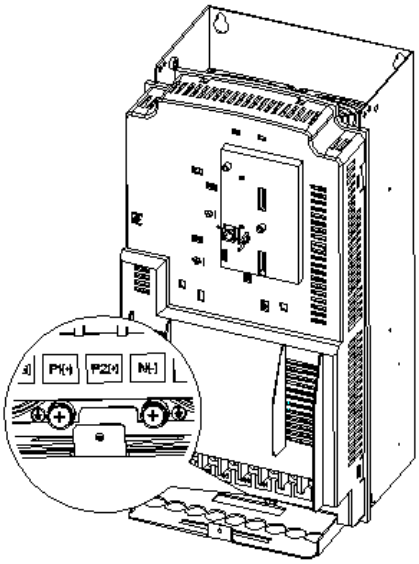
2.6 Grounding

Remove the terminal cover(s) and cable guide. Then follow the instructions below to install the ground connection for the inverter.

1 Locate the ground terminal and connect an appropriately rated ground cable to the terminals.

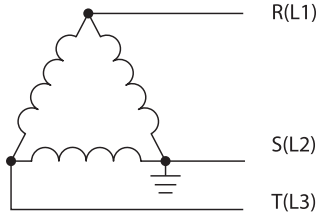
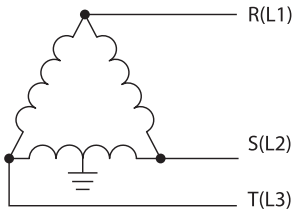
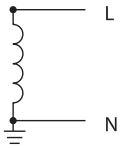
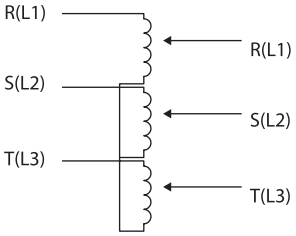


0.75–7.5 kW (3-Phase)



11–75 kW (3-Phase)

IS7 0.75–22 kW (3 phase) inverters have EMC filters built-in and activated as a factory default design. An EMC filter prevents electromagnetic interference by reducing radio emissions from the inverter. EMC filter use is not always recommended, as it increases leakage current. If an inverter uses a power source with an asymmetrical grounding connection, the EMC filter must be turned off.

Asymmetrical Grounding Connection			
One phase of a delta connection is grounded (TN Systems)		Intermediate grounding point on one phase of a delta connection (TN Systems)	
The end of a single phase is grounded (TN Systems)		A 3-phase connection without grounding (TN Systems)	

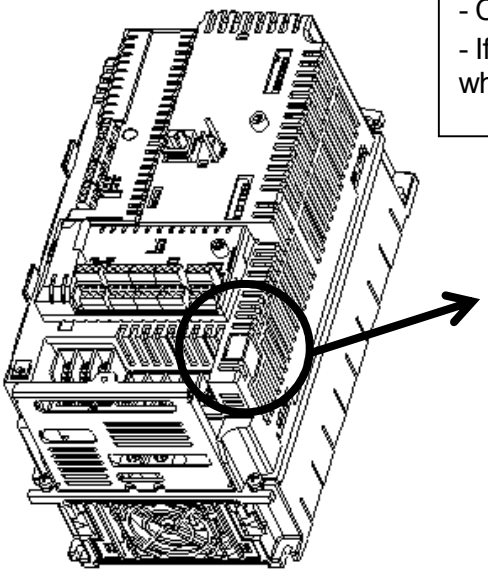
Note

- 200 V products require Class 3 grounding. Resistance to ground must be ≤ 100 Ω.
- 400 V products require Special Class 3 grounding. Resistance to ground must be ≤ 10 Ω.
- Keep the ground wire connections as short as possible.
- Do not ground one inverter to another in a “daisy chain” fashion.
- Follow the motor manufacturer wiring requirements.

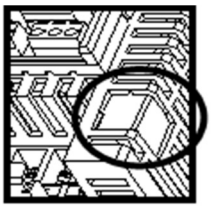
Built-in EMC Filter

The product which has a built-in EMC filter is efficient for reducing conductive and radiated noise from the input part of inverter. Turns On the On/Off switch of EMC filter to perform the EMI function if you are select the product which has a built-in EMC filter. (However, when unable to use EMC filter or due to the asymmetric structure of the ground to use, EMC filter of on/off swich is set to off

1) How to set EMC Filter functions (Less than 7.5kW Products)



- Cut off plastic cover which marked below.
- If short circuit connector is connected with SW1 which is inside, EMC Filter works.



EMC filter OFF

EMC filter ON

2) How to remove EMC Filter ON/OFF connector (Less than 7.5kW Product)

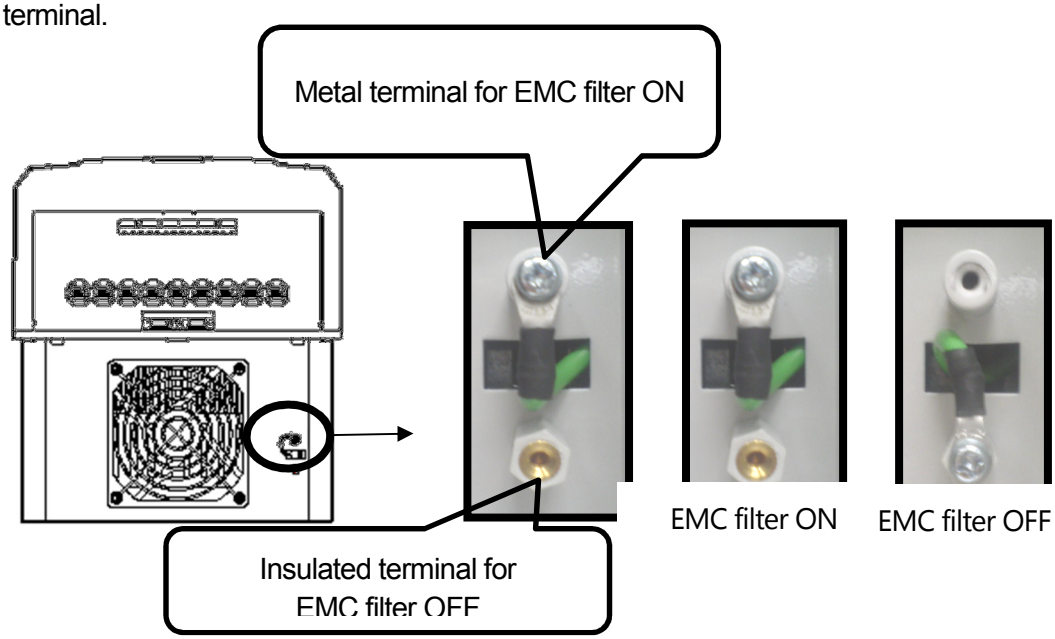
EMC filter ON

EMC filter OFF

Check the voltage by a tester in 10minute after cutting the power supply. In case separate with connector, pull the connector while pressing fixed hasp. When reinstalling, be sure to hook the hasp of the connector. (if it is hard to separate them, please tweezers.)

3) How to set EMC Filter functions (11~22kW Products)

EMC filter ON/OFF set terminal is located in lower part of the 11~22KW Terminal as shown figure below. Initial set isON. When the green wire is connected in upper metal connection terminal, EMC filter is ON and EMC filter is OFF if it is connected in insulated connection terminal.



EMC filter has effect in reducing air electronic wave while being used in power source of symmetrical ground method. Be sure to use EMC filter in symmetrical ground method such as Y connection.

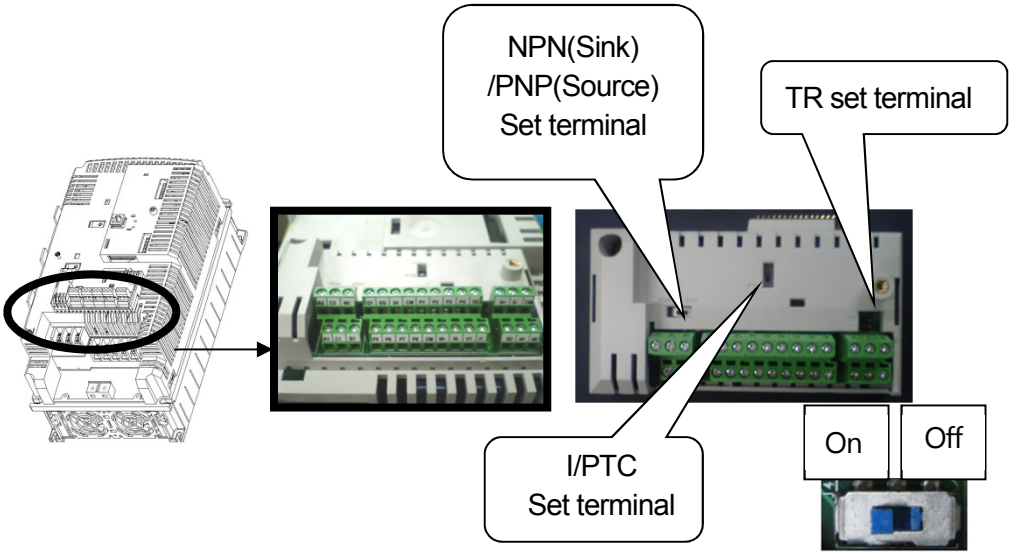
⚠ Warning

Leakage current increases while EMC filter is ON. Do not use EMC filter when the input is asymmetrical way such as Delta connection. It may cause an electric shock.

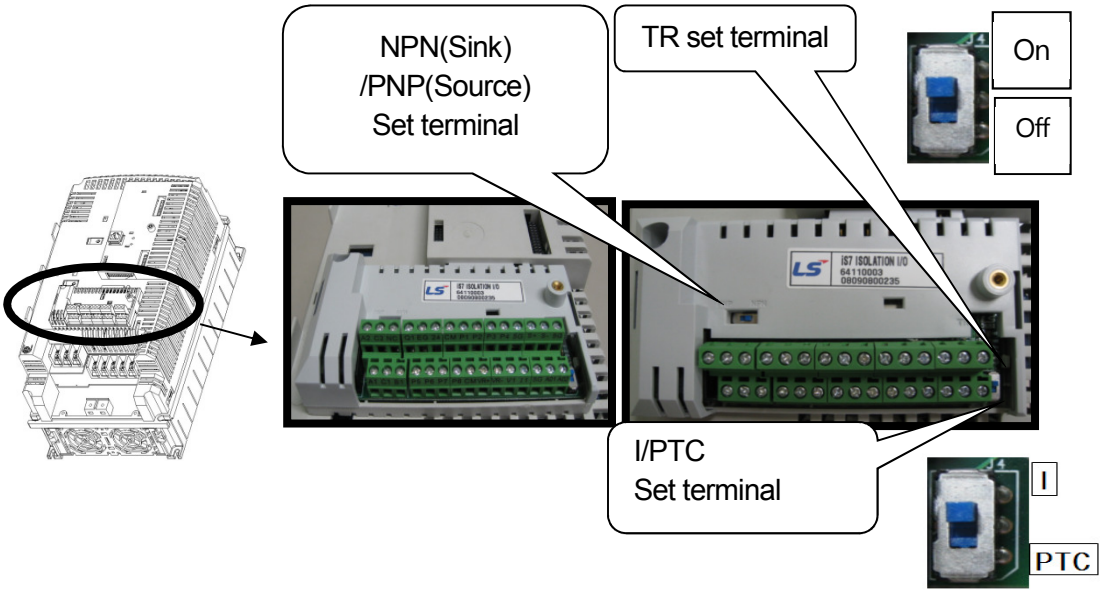
2.7 Control Wiring

The illustrations below show the detailed layout of control wiring terminals and control board switches.

2.7.1 Control terminal line diagram (Basic I/O terminal block, below 22kW products)



2.7.2 Control terminal line diagram (Insulated I/O terminal block, above 30kW products)

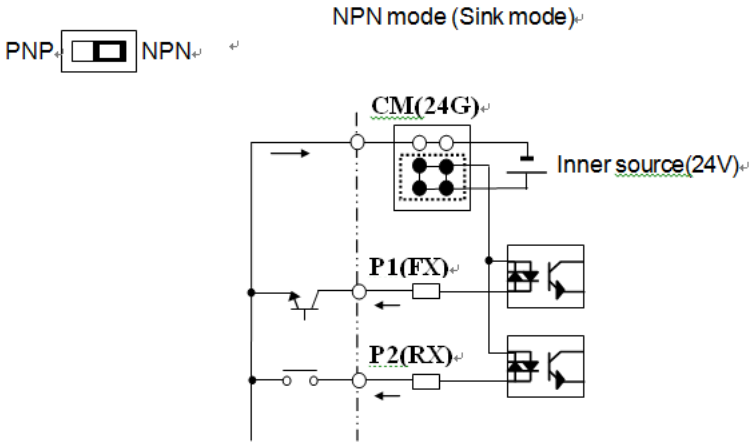


1)how to set NPN (Sink)/PNP (Source)

iS7 serves 2 sequence input terminals of control circuit: NPN mode (Sink mode) and PNP mode(Source mode). It is possible to change the logic of input terminal with NPN mode (Sink mode) and PNP mode (Source mode) by using NPN (Sink)/PNP (Source) set terminal. Each mode connecting methods are follows.

(1) NPN mode(Sink mode)

Set NPN (Sink)/PNP (Source) switch into NPN. CM (24V GND) is common terminal of contact point input signal. Initial set of Factory default is NPN mode (Sink mode).

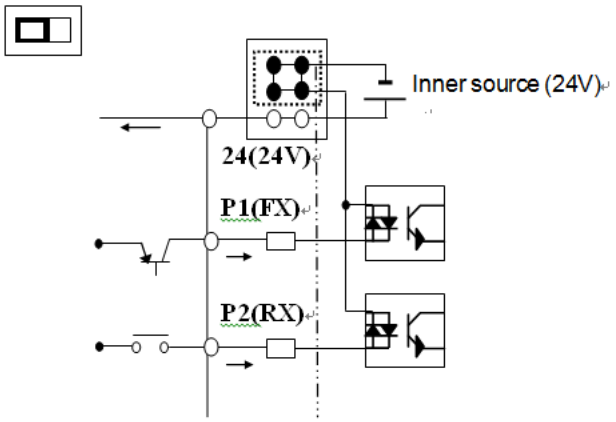


(2) PNP mode (Source mode) – When use inner source

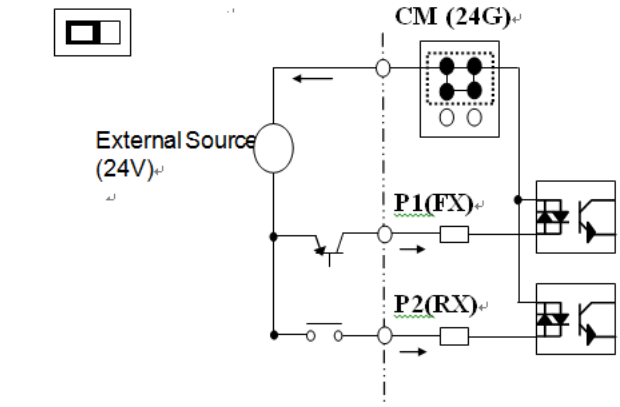
Set NPN (Sink)/PNP (Source) switch into PNP. 24 (24V inner source) is common terminal of contact point input signal. PNP mode (Source mode) – Set NPN (Sink)/PNP (Source) switch into PNP When use exterior source.

If you want try to use exterior 24V source, connect exterior source (-) terminal with CM (24V GND).

PNP NPN PNP mode (Source mode) – When using inner source



PNP NPN PNP mode (Source mode) – When using external source



Control circuit Terminal Labels and Descriptions

Type		Label	Name	Description
Input signal	Contact point start function selection	P1~P8	Multi-function input1~8	Available by defining as multi-function input
		CM	Sequence common terminal	Common terminal of the contact point input terminal (note: In case of Basic I/O, common terminal is different from the 5G common terminal)
	Analog Frequency	VR(+)	Frequency setting power(+) terminal	Power supply for analog frequency setting Maximum output is +12V, 100mA.
		VR(-)	Frequency setting power(-) terminal	Power supply for analog frequency setting Maximum output is -12V, 100mA.
		V1	Frequency setting (voltage)	Becomes set frequency with input of DC -10~10V. Unipolar 0~+10[V]),Biopolar(-10[V] ~10[V]) input resistance 20kΩ
		I1	Frequency setting (current)	Becomes set frequency with input of DC 0~20mA input resistance 249Ω
		5G	Frequency setting common terminal	Common terminal of analog frequency setting signal and analog voltage and current terminals (note: In case Basic I/O, common terminal are different from the CM common terminal)
Output Signal	Analog	A01	Multi-function analog voltage output terminal	Select the one among Output frequency, Output current, and DC voltage. Ouput voltage: 0~10V Maximum output voltage: 10V Maximum output current: 10mA
		A02	Multi-function analog current output terminal	Select the one among Output frequency, Output current, Output voltage and DC voltage. Output current: 4~20mA (0~20mA) Maximum output current: 20mA

	Contact Point	Q1	Multi-function terminal (open collector)	DC 26V, below 100mA
		EG	Common terminal for open collector	External power supply common earth terminal of the open collector
		24	Exterior 24V power	Maximum output current: 150mA
		A1, B1,C 1	Fault signal output	Protection function is activated to break output. (below AC 250V 5A, DC 30V 5A) Fault signal: A1-C1 electrified (B1-C1 unelectrified) Normal signal: B1-C1 electrified (A1-C1 unelectrified)
		A2, C2	Multi-function relay 2 output A contact point	Output the signal while running. User defined multi-function output terminal. (below AC 250V 5A, DC 30V 5A)
		S+,S- ,CM	RS-485 signal input terminal	RS-485 signal line (see Chapter 11 Communication Function of the manual.)

Note

- While making wiring connections at the control terminals ensure that the total cable length does not exceed 165 ft (50 m).
- Ensure that the length of any safety related wiring does not exceed 100 ft (30 m).
- Ensure that the cable length between the keypad and the inverter does not exceed 10 ft (3.04 m). Cable connections longer than 10 ft (3.04 m) may cause signal errors.
- Use ferrite material to protect signal cables from electro-magnetic interference.
- Take care when supporting cables using cable ties, to apply the cable ties no closer than 6 inches from the inverter. This provides sufficient access to fully close the terminal cover.

2.8 Post-Installation Checklist

After completing the installation, check the items in the following table to make sure that the inverter has been safely and correctly installed.

Items	Check Point	Result
Installation Location/Power I/O Verification	Is the installation location appropriate?	
	Does the environment meet the inverter's operating conditions?	
	Does the power source match the inverter's rated input?	
	Is the inverter's rated output sufficient to supply the equipment? (Degraded performance will result in certain circumstances.	
Power Terminal Wiring	Is a circuit breaker installed on the input side of the inverter?	
	Is the circuit breaker correctly rated?	
	Are the power source cables correctly connected to the R/S/T terminals of the inverter? (Caution: connecting the power source to the U/V/W terminals may damage the inverter.)	
	Are the motor output cables connected in the correct phase rotation (U/V/W)? (Caution: motors will rotate in reverse direction if three phase cables are not wired in the correct rotation.)	
	Are the cables used in the power terminal connections correctly rated?	
	Is the inverter grounded correctly?	
	Are the power terminal screws and the ground terminal screws tightened to their specified torques?	
	Are the overload protection circuits installed correctly on the motors (if multiple motors are run using one inverter)?	
	Is the inverter separated from the power source by a magnetic contactor (if a braking resistor is in use)?	
	Are advanced-phase capacitors, surge protection and electromagnetic interference filters installed correctly? (These devices MUST not be installed on the output side of the inverter.)	
Control Terminal Wiring	Are STP (shielded twisted pair) cables used for control terminal wiring?	

Items	Check Point	Result
	Is the shielding of the STP wiring properly grounded?	
	If 3-wire operation is required, are the multi-function input terminals defined prior to the installation of the control wiring connections?	
	Are the control cables properly wired?	
	Are the control terminal screws tightened to their specified torques?	
	Is the total cable length of all control wiring < 165 ft (100 m)?	
	Is the total length of safety wiring < 100 ft (30 m)?	
Miscellaneous	Are optional cards connected correctly?	
	Is there any debris left inside the inverter?	
	Are any cables contacting adjacent terminals, creating a potential short circuit risk?	
	Are the control terminal connections separated from the power terminal connections?	
	Have the capacitors been replaced if they have been in use for > 2 years?	
	Has a fuse been installed for the power source?	
	Are the connections to the motor separated from other connections?	

Note

STP (Shielded Twisted Pair) cable has a highly conductive, shielded screen around twisted cable pairs. STP cables protect conductors from electromagnetic interference.

3 Start-Up Procedure

3.1 Safety Instructions for Start-Up

Before applying power

1. See if cover is closed in appropriate posion.
2. Check all cable connection is tightened with the right thickness and enough torque.
3. Ensure the input power is turned OFF.
4. Check R, S, T input power cable's voltage. No voltage should be shown between each phase and ground.
5. Check U,V,W output terminal cable's voltage. No voltage should be shown between each phase and ground
6. Confirm continuity of the motor by measuring resistances on U-V, V-W, and W-U.
7. Check for proper grounding of the inverter and the motor.
8. Inspect the inverter for loose connections on terminals.
9. Confirm that the supply voltage matches voltage of the inverter and motor.

Caution

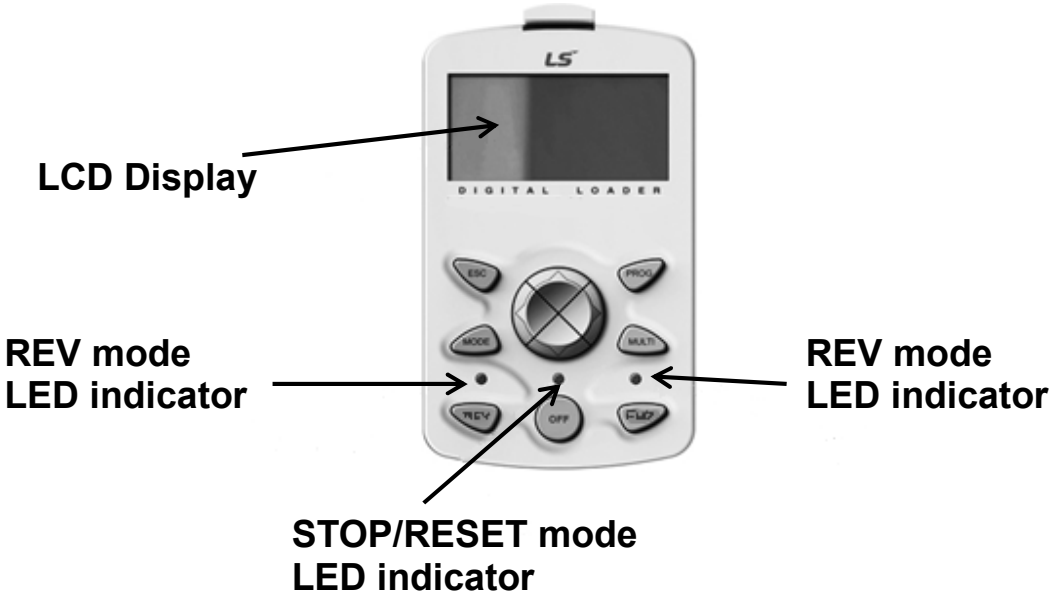
The inverters contain high voltage when connected to AC line power. Installation, start-up, and maintenance must be performed by qualified personnel only. Failure to perform installation, start-up, and maintenance by qualified personnel could result in death or serious injury..

Applying Power

1. Confirm that the input voltage is balanced within 2%.
2. Ensure that all operator devices are in the OFF position. Panel doors must be closed or cover mounted.
3. To apply power to the inverter, turn to the ON position for units with a disconnect switch.

3.2 About the Keypad

The keypad is composed of two main components – the display and the operation (input) keys. Refer to the following illustration to identify part names and functions.



3.2.1 Operation Keys

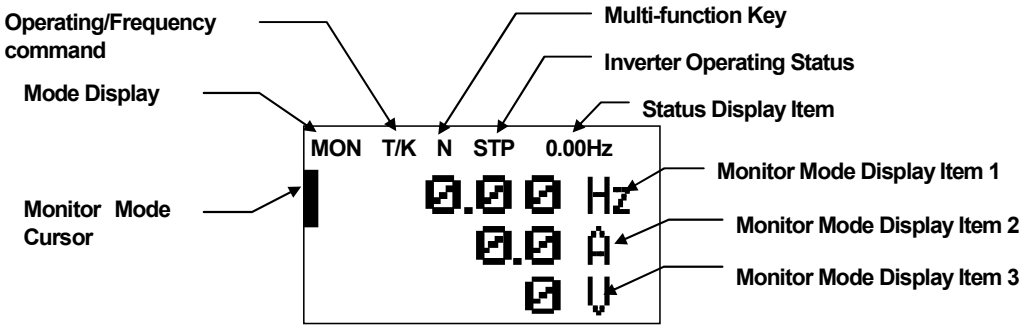
The following table lists the names and functions of the keypad's operation keys.

Key	Name	Description
MODE	[MODE] Key	Used to switch between modes.
PROG /ENT	[PROG / Ent] Key	Used to select, confirm, or save a parameter value.
	[Up] key [Down] key	Switch between codes or increase or decrease parameter values.
	[Left] key [Right] key	Switch between groups or move the cursor during parameter setup or modification.
MULTI	[MULTI] Key	Used to perform special functions, such as user code registration.
ESC	[ESC] Key	Used to cancel an input during parameter setup. Pressing the [ESC] key before pressing the [PROG / ENT] key reverts the parameter value to the previously set value. Pressing the [ESC] key while editing the codes in any function group makes the keypad display the first code of the function group. Pressing the [ESC] key while moving through the modes makes the keypad display Monitor mode.
FWD	[FWD] Key	Motor rotates in forward direction.
REV	[REV] Key	Motor rotates in reverse direction.
STOP /RESET	[STOP/RESET] Key	Stop operating. Trip release after a trip occurs.

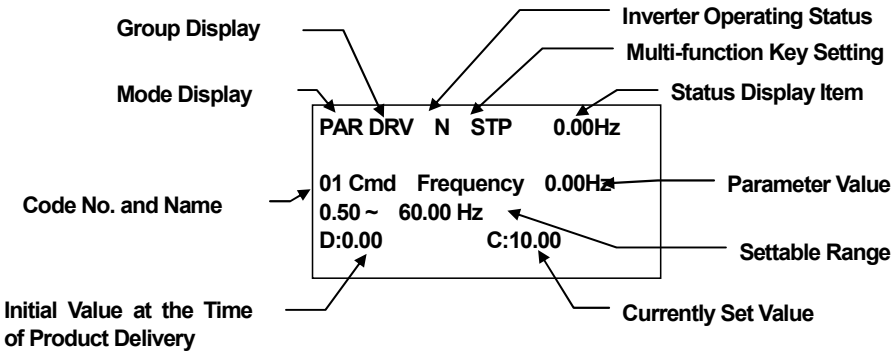
3.2.2 About the Display

Monitor mode display

(1) Monitor Mode



(2) Parameter change display



4) Display Item List

(1) Mode Display Items : see “Mode shift”.

(2) Group Display Items : see “Group shift”.

(3) Operation Command/Frequency Command Display Items (Type of Sequence and number of steps are displayed during auto sequence operation)

(4) Monitor Display Items

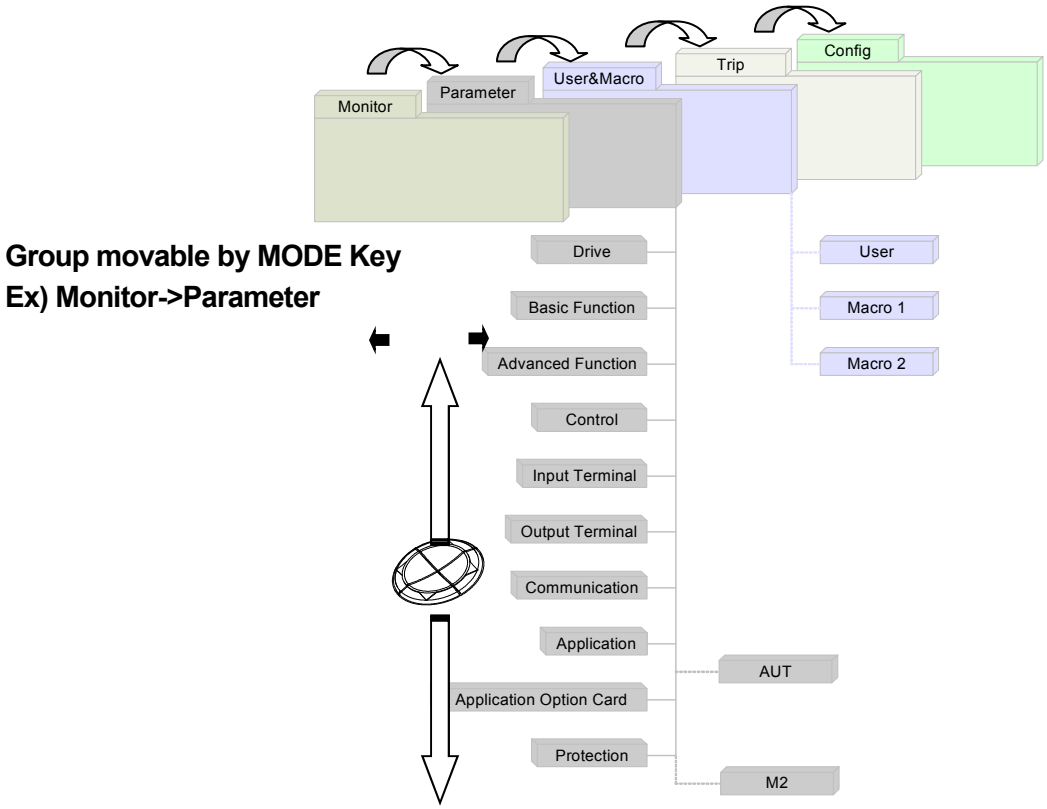
No	Function	Display	Description
1	Mode Display	MON	Monitor Mode
		PAR	Parameter Mode
		U&M	USR & Macro Mode
		TRP	Trip Mode
		CNF	Configuration Mode
2	Operating Command	K	Keypad operation command
		O	FieldBus communication option operation command
		A	Application option operation command
		R	Built-in 485 operation command
		T	Terminal block operation command
3	Frequency Command	K	Keypad frequency command
		V	V1 input frequency command
		I	I1 input frequency command
		P	Pulse input frequency command
		U	Frequency command during UP operation (Up-Down operation)
		D	Frequency command during DOWN operation (Up-Down operation)
		S	Frequency command during STOP operation (Up-Down operation)
		O	FBus Option frequency command
		X	V2, I2 frequency command of sub-terminal block
		J	Jog frequency command

No	Function	Display	Description
		R	Internal 485 frequency command
		1~9 A~F	Sequential frequency command
4	Multi Function Key Setting	JOG Key	Used for shift to Keypad JOG mode
		Local/Remote	Used to select local or remote operation
		User Group Select Key	Used to register parameters as a user group in the parameter mode or delete parameters in the user group.
5	Inverter Operating Status	STP	Motor stopped
		FWD	Operation in forward
		REV	Operating in reverse direction
		DC	DC output
		WAN	Warning
		STL	Stalling
		SPS	Speed Search
		OSS	Software Over Current controlled
		OSH	Hardware OverCurrent controlled
		TUN	Auto Tuning

(5) Status Display Items: see “Operating status monitoring”.
(6) Monitor Mode Display Items: see “Operating status monitoring”.

3.2.3 Display Modes

SV-iS7 series inverter parameters consist of the following 5 modes. Each mode has its own function items suitable for the desired properties. The parameter mode displays the functions necessary for inverter operation in groups.



Mode	Display	Description
Monitor mode	MON	Displays information on the operating status of the inverter. Can monitor frequency setting, operating frequency display, output current and voltage, etc.
Parameter mode	PAR	Used to set functions necessary for operation. Divided into a total of 12 groups, each suited to the level of the functional requirement and objective.
User & Macro mode	U&M	Facilitates the grouping of the required functions by using user group and macro group. This is not displayed unless the user code is not registered nor when the user/macro mode shifts with the mode key unless the macro is selected.
Trip mode	TRP	In case of a failure during operation, the type of failure and the information on the operating frequency/current/voltage at the time that the failure occurred are displayed. You can also monitor the type of the trips which previously occurred. Trip Mode is however, not displayed when there is no previous failure history during normal operation.
Configuration mode	CNF	You can set the user environment for the inverter itself, provided that it is not directly related to operating functions such as keypad language selection, monitor mode environment selection, display type of the option card fitted to the inverter, parameter initialization and copying.

1) Parameter mode

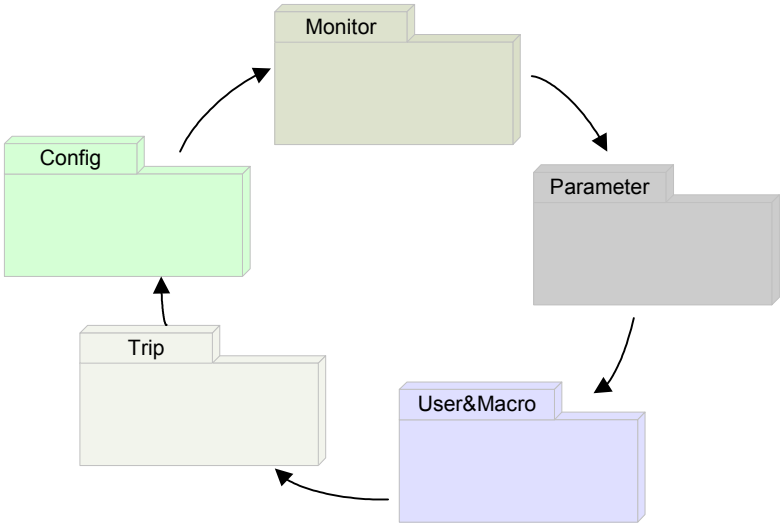
Mode	Display	Description
Drive group	DRV	Functions necessary for operation including frequency/acceleration/deceleration time setting and operation command selection, etc.
Basic group	BAS	Sets the basic functions such as the motor parameter and sequential frequency, etc.
Advanced function group	ADV	Sets the acceleration/deceleration pattern and frequency control function, etc.
Control function group	CON	Sets functions related to sensorless and vector control.
Input terminal function group	IN	Sets functions related to the inverter input terminal block including multi-function digital inputs and analog inputs.

Output terminal function group	OUT	Sets the inverter output terminal block functions such as the relay and analog outputs.
Communication function group	COM	Sets the functions related to built-in RS-485 communication and any communication option card where applicable.
Application function group	APP	Sets functions such as PID control and auto sequence operation.
Auto Sequence run group	AUT	This group is displayed if Auto Sequence Group in APP group is selected and sets the functions necessary for auto sequence operation.
Application option group	APO	Sets functions related to the encoder option and PLC option card, if they are being used.
Protection group	PRT	Sets functions related to the motor and inverter protection.
Motor 2 function group (Motor 2)	M2	This group is displayed when Motor #2 is selected among the multi-function input terminal functions and sets functions related to Motor #2.

2) User& Macro mode

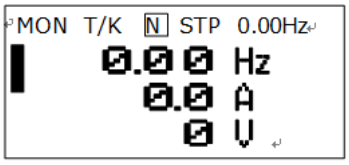
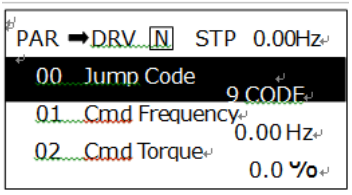
Group	Display	Description
User group	USR	Of the function items of each group of the parameter mode, the items that need to be monitored or that are frequently set by the user are grouped and displayed. They are registered by using the multi-function key of the keypad.
Macro group	MCx	The required inverter load functions can be grouped and selected at the time of delivery from the factory. If the user selects a desired type of operation, the groups displayed in MC1 or MC2 are shown. You can select them in CNF Mode. For more details, see 8-48 page, 8.1.31 Addition to Macro Group in the detailed user manual, available from LSIS website.

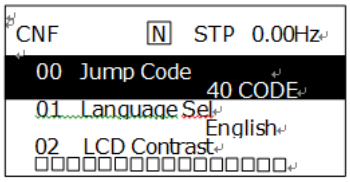
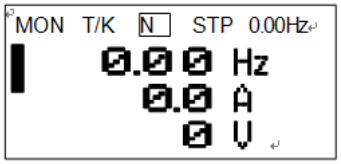
3.2.4 Mode shift



1) Mode Shift at the time of delivery

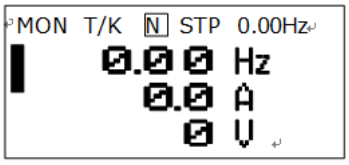
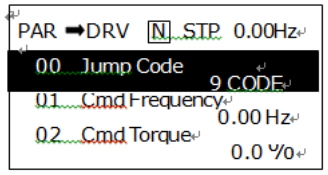
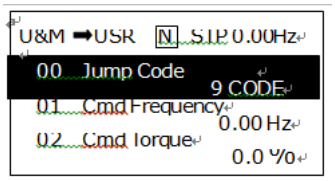
You can change the display as follows if you shift modes by using the mode key. The User/Macro Mode and Trip Mode are not displayed at the time of the product being delivered. For detailed description on the two modes, see page 8-47, 48, 8.1.30 Additional to User Group (USR Grp) or 8.1.31 Addition to Macro Group.

	- Upon Power-up, a display emerges as shown on the left. This display is the monitor mode. - Press Mode key once.
	- You have now shifted to Parameter Mode. - Press Mode key once.

	- You have now shifted to Config Mode. - Press Mode key once.
	- You now route back to Monitor Mode.

2) Mode Shift with User/Macro Mode and Trip Mode

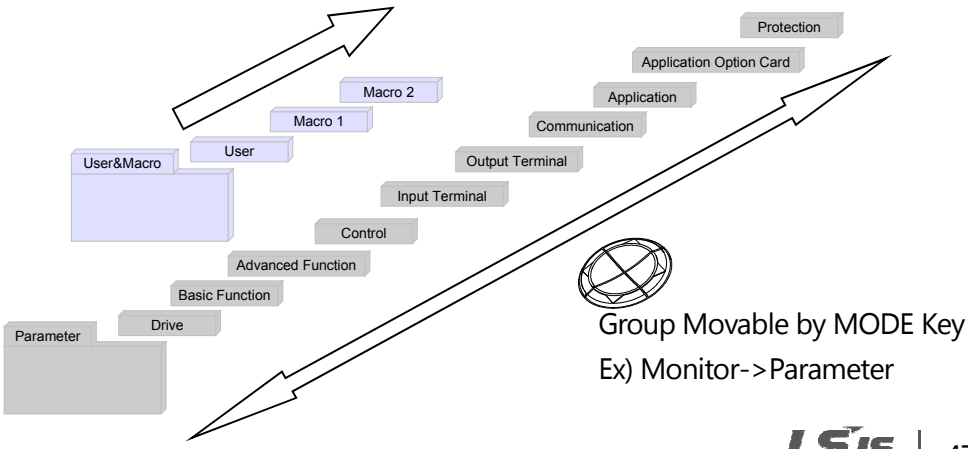
If the user registers the user code or sets the macro function using the multi-function key, the User/Macro Mode will be displayed unlike the mode shift at the time of the product delivery. In addition, in case of a trip during operation, the Trip Mode will be displayed and the trip information will be saved in the trip mode as past history if you withdraw the trip using RESET function. The mode shift in the two modes is as follows.

	- Power on, a display emerges as shown on the left. The present mode is the monitor mode. - Press Mode key once.
	- You have shifted to Parameter Mode. - Press Mode key once.
	- You have shifted to User/Macro Mode. - Press Mode key once.

TRP Last-1 00 Trip Name (1) External Trip 01 Output Freq 0.00 Hz 02 Output Current 0.0 A	- You have shifted to Trip Mode. - Press Mode key once.
CNF N STP 0.00Hz 00 Jump Code 40 CODE 01 Language Sel English 02 LCD Contrast	- You have shifted to Config Mode. - Press Mode key once.
MON T/K N STP 0.00Hz 0.00 Hz 0.0 A 0 V	- You come back to Monitor Mode.

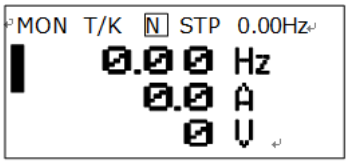
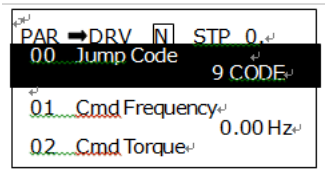
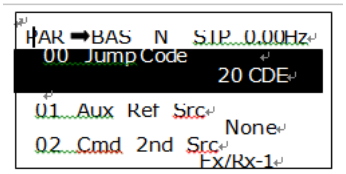
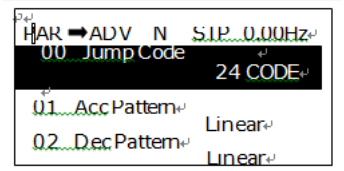
3.2.5 Group shift

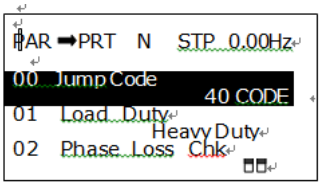
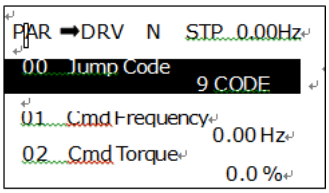
You can make inter-group shift by using Left/Right keys after shift to Parameter Mode or User/Macro Mode using the Mode key.



1) Group Shift in Parameter Mode

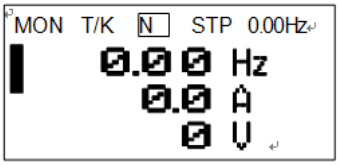
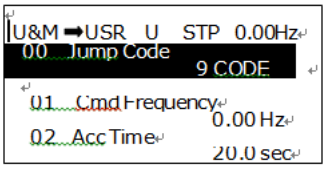
If you press Right key in the Parameter Mode, the display changes as follows. If you press Left key, the display order will be reversed.

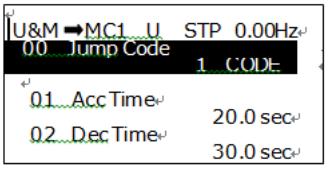
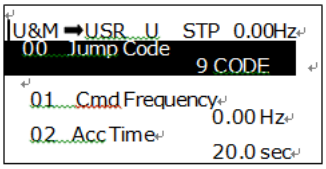
	- Power on, a display emerges as shown on the left. The present mode is the monitor mode. - Press Mode key once.
	- You have shifted to Parameter Mode. - The drive group of Parameter Mode is being displayed. - Press Right key once.
	- You shift to Basic Function Group(BAS). - Press Right key once.
	- You shift to the Advanced Function Group(ADV). - Press Right Shift key 7 times.

	- The group changed in sequence, PRT is displayed. - Press Right Shift key once.
	- You come back to the Drive Group(DRV) of Parameter Group.

2) Group shift in User/Macro Mode

To shift to User/Macro Mode, the user code should be registered or you select the macro function. For user code and macro group registration, see page 8-47, 48, 8.1.30 Addition to User Group (USR Grp) or 8.1.31 Addition to Macro Group. If the user code is registered and you have selected the macro function, you can shift the group as follows.

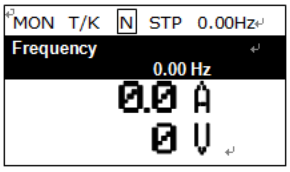
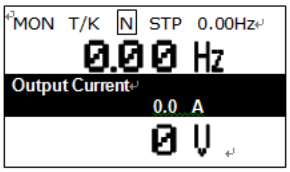
	- Power on, a display emerges as shown on the left. The present mode is the monitor mode. - Press Mode key twice.
	- You have shifted to User/Macro Mode(U&M). - The User Group(USR) is being displayed. - Press Right key.

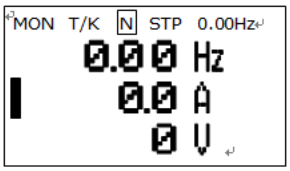
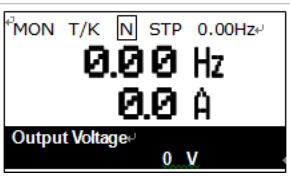
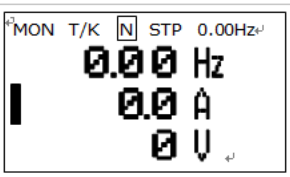
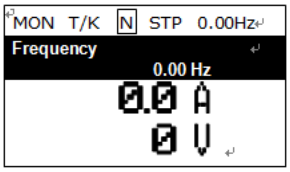
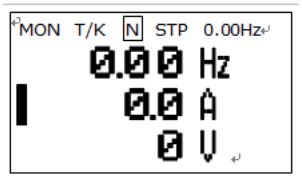
	- You have shifted to Macro Group(MC1). - Press Right key.
	- You come back to User Group(USR).

3.2.6 Code(Function Item) shift

1) Code shift in monitor mode

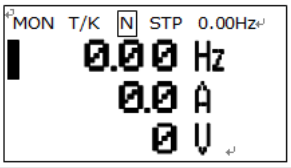
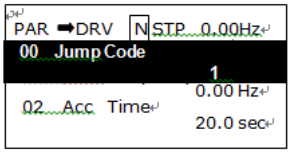
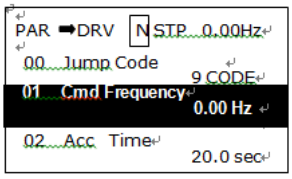
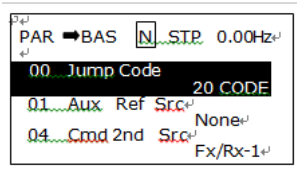
If you press Up and Down keys where the cursor is, names of frequency and current, etc. will be displayed.

	- Power on, a display emerges as shown on the left. The present mode is the monitor mode. - The cursor is at the front of Hz item. - Press Down key.
	- The output current is displayed in the second display item. - Do not press any key for about 2 seconds after shift.

	- The cursor shifts to the second display item after the output current display is gone. - Press Down key.
	- The third display item displays the output voltage. - Do not press any key for about 2 seconds after shift.
	- The output voltage display gone, the cursor shifts to the third display item. - Press Up key twice.
	- The first item displays frequency.
	- Frequency display gone, the cursor is in the first display item.

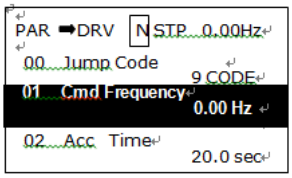
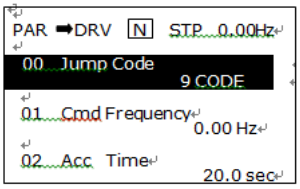
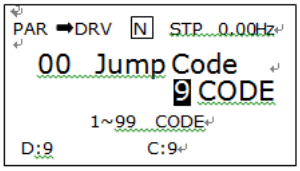
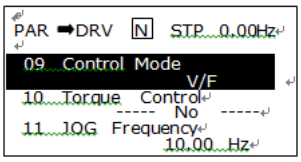
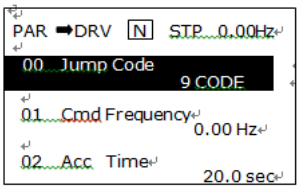
2) Code shift (function Items) in other modes and groups

Using Up and Down keys: The following figures give an example of shifting the code by using Up and Down keys in DRV and BAS of Parameter Mode. Code shift in other modes are the same.

	- Power on, the display emerges as on the left. The present mode is Monitor Mode(MON). - Press Mode key once.
	- The display shows DRV of Parameter Mode. If DRV is not displayed, press Mode key until DRV appears or press ESC once.
	- If you press Down key, you will shift to code No. 0 in DRV of Parameter Mode as shown on the left. - Press Right key once.
	- You shift to BAS of Parameter Mode. - You can shift the code by using Up or Down key.

3) How to Shift in Jump Code

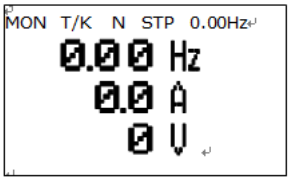
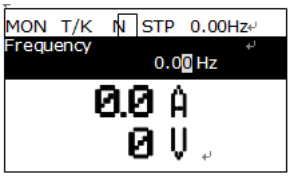
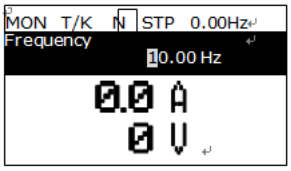
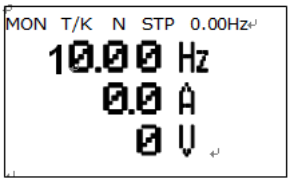
In groups of Parameter Mode and User/Macro Mode, there is Jump Code Entry item for shift to the code of each group. If the code number is high, you can shift faster than by using Up and Down keys. The following figures give an example of shift to code number 09 of DRV.

	- Check that code number 00 is displayed in the initial display of DRV of PAR(Parameter Mode). - Press Program key(PROG).
	- The cursor flashes so that you can enter the code number as on the left.
	- Enter 9 using Up key and press PROG.
	- You shift to Control Mode of code number 9.
	- If you press ESC, you will shift to 00 of DRV.

3.2.7 Parameter setting

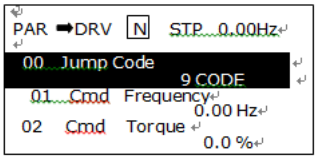
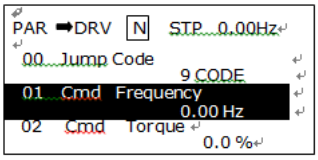
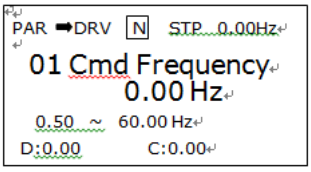
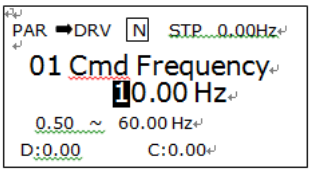
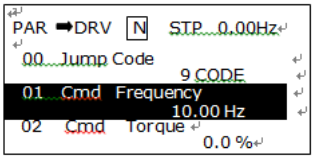
1) Parameter setting in monitor mode

You can set some parameters including frequency in Monitor Mode. The following is an example of frequency setting.

	- Check whether the cursor is in frequency item and the 09 frequency setting method in DRV is keypad. - Press PROG.
	- Detailed information of the item is displayed and the cursor flashed. - You can shift to the desired place for frequency setting by using Shift key.
	- Set frequency at 10Hz using Up key. - Press PROG.
	- The desired frequency has been set at 10Hz.

2) Parameter setting in other modes and groups

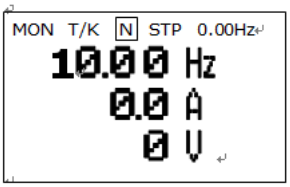
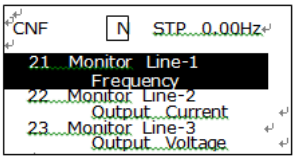
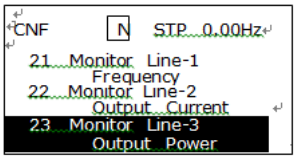
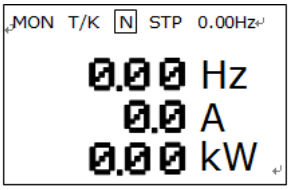
This gives the example of changing the operational frequency in the Drive Group of Parameter Mode. A similar procedure applies other modes or groups.

	- This is the initial display of Parameter Mode. - Press Down key.
	- You have shifted to 01 frequency setting code. - Press PROG.
	- The cursor flashes so that you can enter the desired operating frequency. - If you want to set the frequency at 10Hz, move the cursor to the desired place using Left/Right keys.
	- Enter 10Hz using Up key and press PROG.
	- The desired frequency has been changed to 10Hz.

3.2.8 Operating status monitoring

1) Using monitor mode

Three items at a time can be displayed items in Monitor Mode. Some items including frequency can be edited. Displayed items can be selected by the user in Config Mode(CNF).

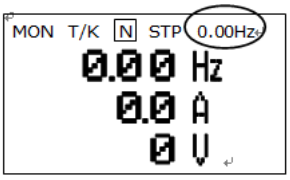
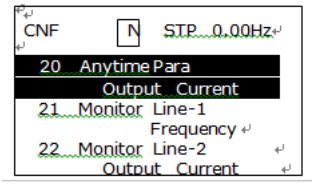
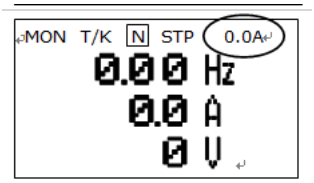
	- This is the initial display of Monitor Mode. - The frequency, current and voltage are set as the default monitor items at the time of product delivery. - Of the displayed items, for frequency, the target frequency is displayed during stop and operating frequency during operation.
	- You can set the items to display in Monitor Mode in sequence at No. 21~23 in CNF. - Move to No. 23 using Down key.
	- Change the No. 23 item in Monitor Mode to output power.
	- The third displayed item in Monitor Mode has been changed to output power.

2) Possible items for monitoring

Mode	Code	Function Display	Setting Range		Initial Value
CNF	20	Anytime Para	0	Frequency	0 : Frequency
	21	Monitor Line-1	1	Speed	0 : Frequency
	22	Monitor Line-2	2	Output Current	2 : Output Current
	23	Monitor Line-3	3	Output Voltage	3 : Output Voltage
			4	Output Power	
			5	WHour Counter	
			6	DCLink Voltage	
			7	DI Status	
			8	DO Status	
			9	V1 Monitor[V]	
			10	V1 Monitor[%]	
			11	I1 Monitor[mA]	
			12	I1 Monitor[%]	
			13	V2 Monitor[V]	
			14	V2 Monitor[%]	
			15	I2 Monitor[mA]	
			16	I2 Monitor[%]	
			17	PID Output	
			18	PID ref Value	
			19	PID Fdb Value	
			20	Torque	
			21	Torque Limit	
			22	Trq Bias Ref	
			23	Speed Limit	
			24	Load Speed	
			25	Temperature	

3) How to use status display

The items displayed on the top right of the keypad are displayed in modes other than Monitor Mode as well. Thus if you register a variable you are interested in the display, you can monitor it at any time regardless of the mode shift or change.

	- This is the initial display of Monitor Mode. - At the time of product delivery, the status item displays frequency.
	- Select the item to display in status display in code 20 of CNF. - Select output current. - The unit at the top of the display has changed from frequency to current.
	- The status display now shows current in Monitor Mode as well.

3.2.9 Failure status monitoring

1) Failure during operation

TRP current Over Voltage (01) 01 Output Freq 48.30 Hz 02 Output Current	- In case of a failure during operation, the mode automatically shifts to Trip Mode and the type of the current failure is displayed.
TRP Last-1 01 Output Freq 48.30 Hz 02 Output Current 33.3 A	- If you press Down key, the output frequency, current and operating status are displayed relating to the time that the failure occurred.
MON T/K N STP 0.0A 0.00 Hz 0.0 A 0 V	- If the failure status is terminated by Reset, the keypad values prior to the failure are again displayed.

2) Multiple failures at a time

TRP current Over Voltage (02) 01 Output Freq 48.30 Hz 02 Output Current	- In case of multiple failures, the number of failures is displayed next to the failure type. - Press PROG.

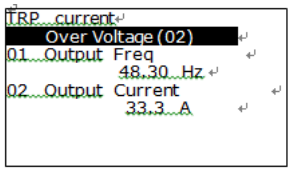
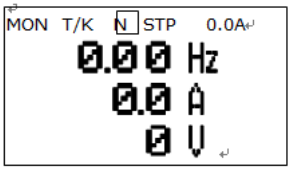
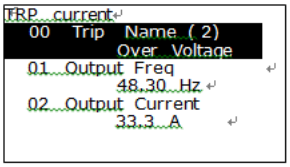
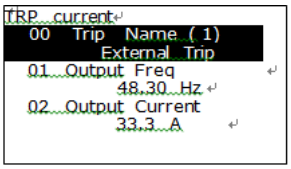
TRP current 00 Trip Name (2) 0 Over Voltage 1 Externa Trip	- The types of failures are displayed. - Press PROG.
TRP current Over Voltage (02) 01 Output Freq 48.30 Hz 02 Output Current	- The display mode before failure checking is restored.

3) Saving and monitoring of failure history

Previous failures are saved in Trip Mode. Up to 5 failures can be saved.

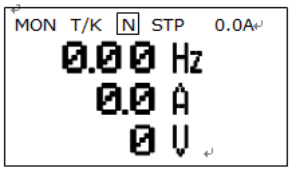
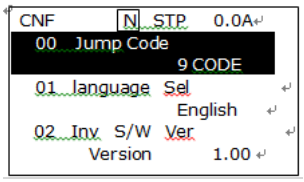
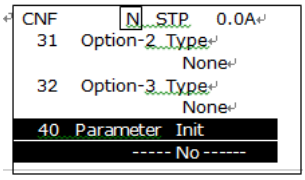
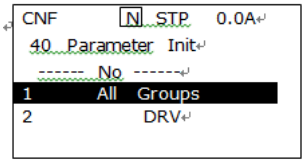
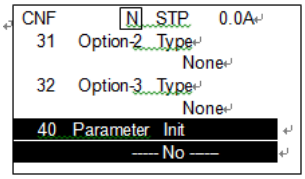
Failure history is saved not only by Reset but also in case of a low voltage failure due to being switched off.

If the number of failures exceeds 5, the preceding 5 messages are automatically deleted.

	- In case of a failure during operation, the mode automatically shifts to Trip Mode with the trip displayed.
	- If you press Reset or the terminal is entered, the failure above is reset, the above failure is automatically save. The previous drive status is then restored. - Move to Trip Mode using Mode key.
	- The most recent failure is saved in Last-1 code. - Press Right key.
	- A previous failure is saved in Last-2 code. - If another failure occurs, what was in Last-2 moves to Last-3.

3.2.10 How to initialize parameters

You can initialize the parameter which was has been changed by the user to the initial state at the time of delivery. Not only the entire parameter but individual groups of the parameter mode can be selected and initialized.

	- Monitor Mode is displayed.
	- Shift to CNF by using Mode key.
	- Shift to code 40 using Down key. - Press PROG.
	- Of the Parameter items to initialize, select All Groups and press PROG.
	- Initialization completed, you come back to the initialization selection display.

3.3 Easy Start

Run Easy Start On to easily setup the basic motor parameters required to operate a motor in a batch. Easy Start shows up when on initial power is given. To see the easy start again, set CNF-61 (Easy Start On) to '1 (Yes)' to activate the feature, initialize all parameters by setting CNF-40 (Parameter Init) to '1 (All Grp)', and restart the inverter to activate Easy Start On.

Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
CNF	61	Parameter easy start settings	Easy Start On	1	Yes	-	-

Easy Start On Setting Details

Code	Description
CNF-61 Easy Start On	**Follow the procedures listed below to set the easy start on parameters.** **No** — **Procedures** 1 — Set CNF-61 (Easy Start On) **to** '1(Yes)'. 2 — Select **'1 (All Grp)' in** CNF-40 **(Parameter Init) to initialize all parameters in the inverter.** 3 — Restarting the inverter will activate Easy Start On. Set the values in the following screens on the Keypad. To escape from Easy Start On, press the [ESC] key. **Start Easy Set:** Select 'Yes'. - CNF-01 Language Sel : select the language you want. - DRV-14 Motor Capacity : select the capacity of the motor. - BAS-11 Pole Number : select the pole number of the motor. - BAS-15 Rated Volt : select the rated voltage of the motor. - BAS-10 60/50Hz Sel : select the rated frequency of the motor. - BAS-19 AC Input Volt : set the input voltage. - DRV-06 Cmd Source : selects the operating command method. - DRV-01 Cmd Frequency : select the operating frequency. Now you come back to the monitoring display. The minimum parameter to drive the motor having been set, the motor is operated by the operating command method set in DRV-06. When the settings are complete, the minimum parameter settings on the motor have been made. The Keypad will return to a monitoring display. Now the motor can be operated with the command source set at DRV-06.

Verifying the Motor Rotation

This chapter is about a procedure to check the motor direction. Follow the instructions below to protect the motor from rotating in the reverse direction.

Caution

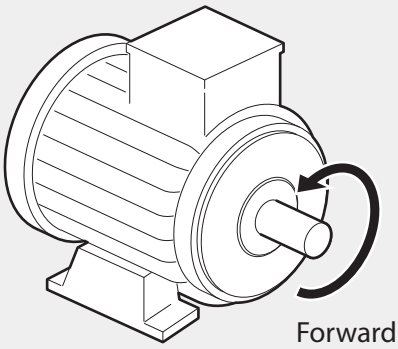
- Ensure that the motor, system, and any attached equipment are ready for start. It is the responsibility of the user to ensure safe operation under any condition.
- Failure to ensure that the motor, system, and any attached equipment are ready for start could result in personal injury or equipment damage.

Note

- Risk of damage to pumps/compressors can be caused by motor running in wrong direction.
- Before running the inverter, check the motor rotation.

Procedure of checking motor direction

1. Supply AC power input to the inverter. Take a look at keypad(LCD loader) and see if it is turned on.
2. Set DRV-02 Keypad Run Direction code as '1(Forward)'.
3. Set DRV-06 Command Source code as ' 0(keypad)'
4. Set an anonymous frequency reference. Low set value of frequency would be better for your safety.
5. Observe the motor's rotation from the load side and ensure that the motor rotates counterclockwise (forward).



Forward operation

ⓘ Caution

- Check the parameter settings before running the inverter. Parameter settings may have to be adjusted depending on the load.
- To avoid damaging the inverter, do not supply the inverter with an input voltage that exceeds the rated voltage for the equipment.
- Before running the motor at maximum speed, confirm the motor's rated capacity. As inverters can be used to easily increase motor speed, use caution to ensure that motor speeds do not accidently exceed the motor's rated capacity.

Note

If the forward command (Fx) is on, the motor should rotate counterclockwise 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.

3.4 Trial Run

After the post-installation checklist has been completed, follow the instructions below to test the inverter.

1 Turn on the power supply to the inverter. Ensure that the keypad display light is on.

2 Select the command source.

3 Set a frequency reference, and then check the following:

- If V1 is selected as the frequency reference source, does the reference change according to the input voltage.
- If I1 is selected as the frequency reference source, does the reference change according to the input current.

4 Set the acceleration and deceleration time.

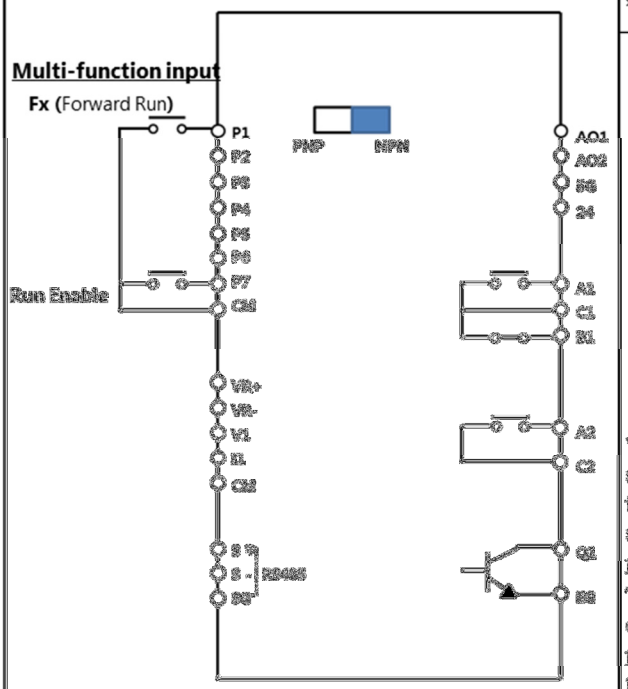
5 Start the motor and check the following:

- Ensure that the motor rotates in the correct direction (refer to the note above)
- Ensure that the motor accelerates and decelerates according to the set times, and that the motor speed reaches the frequency reference.

3.5 Application Set-up Examples

3.5.1 Terminal Block as a Command Input Device (Fwd/Rev run commands)

Multi-function terminals can be selected as a command input device.

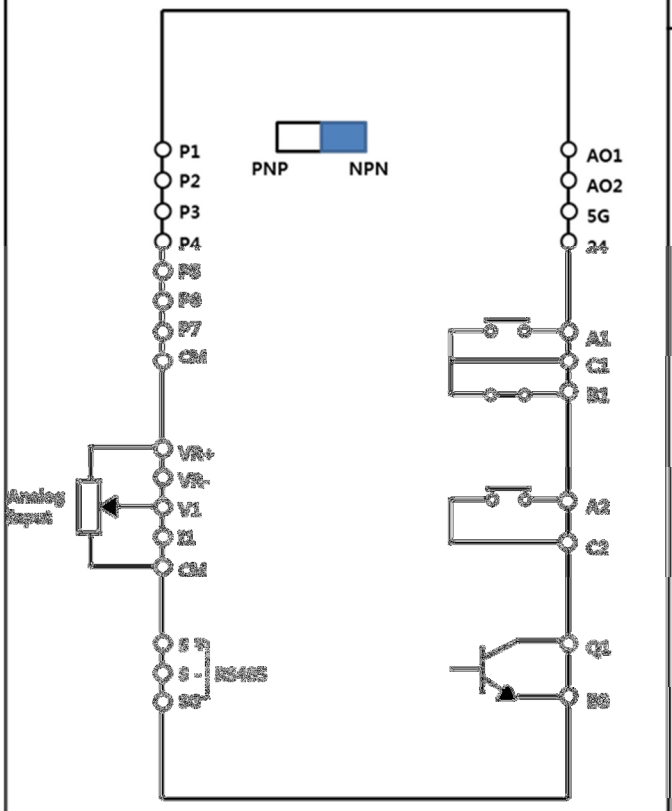
Wiring	Note
	* = Default Value < Note > When command source is selected as terminal(Fx/Rx), run signal can be given by powering P1. To ensure run command for safety purpose, set an unused digital input as 'Run Enable'.

Parameter	
Function	Setting
DRV-06: Command Source	1. Fx/Rx-1 (Run by terminal) *
IN-65: P1 Define	1. Fx (Forward run) *
ADV-70: Run Enable Mode	1. DI Dependent
IN-71: P7 Define	13. Run Enable

3.5.2 Setting a Frequency Reference using Input Voltage(V1)

You can set and modify a frequency reference by setting voltage inputs when using the V1 terminal.

Wiring



Parameter

Function	Setting
DRV-07: Frequency Reference	2. V1 (Voltage)
IN-08: V1 – Volt x1	0.00 V *
IN-09: V1 – Perc y1	0.00 % *
IN-10: V1 – Volt x2	10.00 V *
IN-11: V1 – Perc y2	100.00 % *

Note

* = Default Value

< Note >

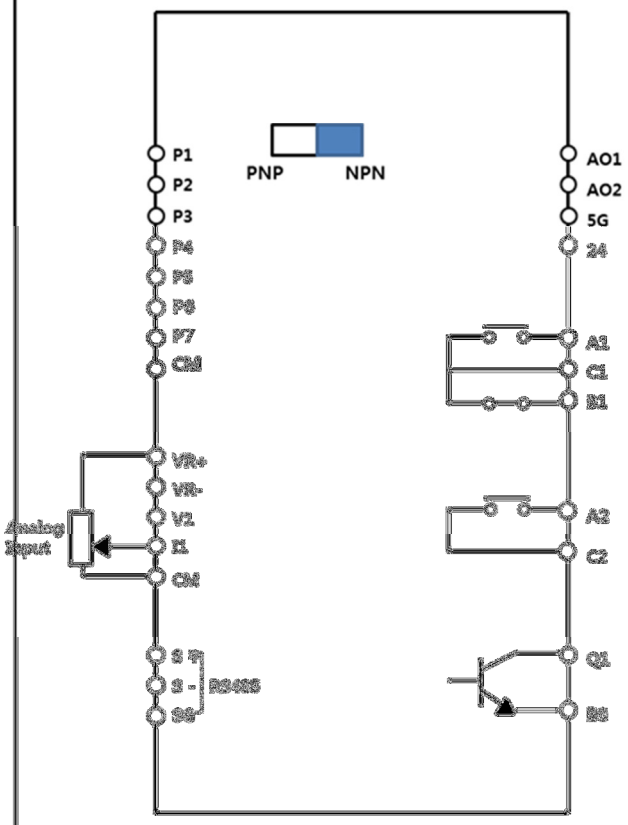
Users can set and modify a frequency reference by setting voltage inputs when using the V1 terminal. Use a voltage output from an external source or use the voltage output from the VR terminal to provide inputs to V1.

Parameters through IN08~11 are used to adjust the minimum and maximum voltage range and referred frequency.

Percentages will be based on IN01(Freq at 100%).

3.5.3 Setting a Reference Frequency using Input Current (I1)

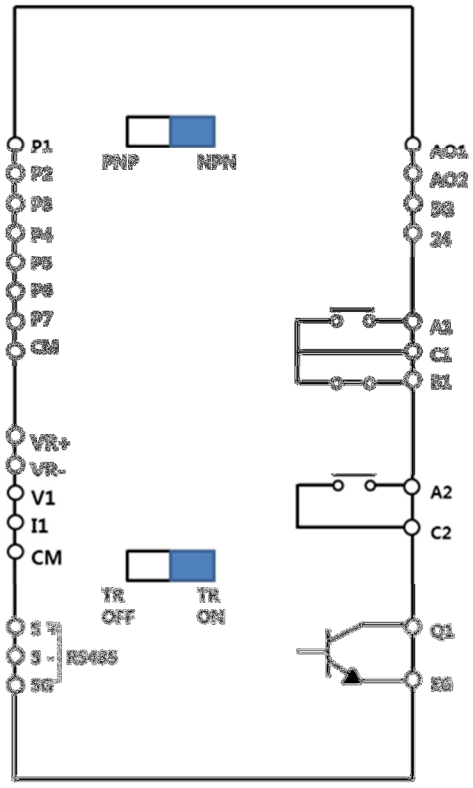
You can set and modify a frequency reference using input current at the I1 terminal.

Wiring	Note
	* = Default Value < Note > Users can set and modify a frequency reference by setting current inputs when using the I2 terminal. Parameters through IN53~56 are used to adjust the minimum and maximum current range and referred frequency. Percentages will be based on IN01(Freq at 100%).

Parameter	
Function	Setting
DRV-07: Frequency Reference	5. I2 (Current)
IN-53: I2 – Curr x1	4.00 mA *
IN-54: I2 – Perc y1	0.00 % *
IN-55: I2 – Curr x2	20.00 mA *
IN-56: I2 – Perc y2	100.00 % *

3.5.4 Setting a Frequency Reference via RS-485 Communication

Control the inverter with upper-level controllers, such as PCs or PLCs, via RS-485 communication. Set the Frq (Frequency reference source) code (code 07) in the DRV group to 6 (Int 485) and use the RS-485 signal input terminals (S+/S-/SG) for communication.

Wiring	Note
 RS485 Communication	* = Default Value < Note > This example is to indicate how to communicate inverter with RS485 communication. To use RS485 communication features, connect the communication cables and set the communication parameters on the inverter. By using the example parameters, users can set inverter station ID, protocol, and baud rate.

Parameter

Function	Setting
COM-01: Int485 Station ID	1 *
COM-02: Int485 Protocol	0. Modbus RTU *
COM-03: Int485 Baud Rate	3. 9600 bps *

4 Diagnostics and Troubleshooting

This chapter explains how to troubleshoot a problem when inverter protective functions, fault trips, warning signals, or faults occur. If the inverter does not work normally after following the suggested troubleshooting steps, please contact the LSIS customer service center.

4.1 Trip and Warning

When the inverter detects a fault, it stops the operation (trips) or sends out a warning signal. When a trip or warning occurs, the keypad displays the information briefly.Detailed information is shown on the LCD display. When more than 2 trips occur at roughly the same time, the keypad displays the higher priority fault information. In the keypad, fault trips with higher priority are displayed first. Use the [Up], [Down], [Left] or [Right] cursor key on the keypad to view the fault trip information.The fault conditions can be categorized as follows.

- Level: When the fault is corrected, the trip or warning signal disappears and the fault is not saved in the fault history.
- Latch: When the fault is corrected and a reset input signal is provided, the trip or warning signal disappears.
- Fatal: When the fault is corrected, the fault trip or warning signal disappears only after the user turns off the inverter, waits until the charge indicator light goes off, and turns the inverter on again. If the the inverter is still in a fault condition after powering it on again, please contact the supplier or the LSIS customer service center.

4.1.1 Fault Trips

Protection Functions for Output Current and Input Voltage

LCD Display	Type	Description
Over Load	Latch	Displayed when the motor overload trip is activated and the actual load level exceeds the set level. Operates when PRT-20 is set to a value other than ‘0’.
Under Load	Latch	Displayed when the motor underload trip is activated and the actual load level is less than the set level. Operates when PRT-27 is set to a value other than ‘0’.
Over Current1	Latch	Displayed when inverter output current exceeds 200% of the rated current.

LCD Display	Type	Description
Over Voltage	Latch	Displayed when internal DC circuit voltage exceeds the specified value.
Low Voltage	Level	Displayed when internal DC circuit voltage is less than the specified value.
Low Voltage2	Latch	Displayed when internal DC circuit voltage is less than the specified value during inverter operation.
Ground Trip	Latch	Displayed when a ground fault trip occurs on the output side of the inverter and causes the current to exceed the specified value. The specified value varies depending on inverter capacity.
E-Thermal	Latch	Displayed based on inverse time-limit thermal characteristics to prevent motor overheating. Operates when PRT-40 is set to a value other than ‘0’.
Out Phase Open	Latch	Displayed when a 3-phase inverter output has one or more phases in an open circuit condition. Operates when bit 1 of PRT-05 is set to ‘1’.
In Phase Open	Latch	Displayed when a 3-phase inverter input has one or more phases in an open circuit condition. Operates only when bit 2 of PRT-05 is set to ‘1’.
Inverter OLT	Latch	Displayed when the inverter has been protected from overload and resultant overheating, based on inverse time-limit thermal characteristics. Allowable overload rates for the inverter are 150% for 1 min and 200% for 0.5 sec. 200% 0.5 sec might differ according to the inverter capacity.
No Motor Trip	Latch	Displayed when the motor is not connected during inverter operation. Operates when PRT-31 is set to ‘1’.
Safety Opt Err	Latch	During an emergency, a safety feature to shut off the inverter output operation will occur.

Protection Functions Using Abnormal Internal Circuit Conditions and External Signals

LCD Display	Type	Description
Fuse Open	Latch	A failure occurs when the inverter DC fuse responds to over current only above 30kW.
Over Heat	Latch	A failure occurs when the temperature of the inverter cooling fan rises over the prescribed degree.
Over Current2	Latch	A failure occurs when the DC part in the inverter detects short circuit current.
External Trip	Latch	This is an external failure signal by function selection of the multi-function terminal. Of the IN65~75 functions, No.3 External Trip is selected.
BX	Level	The inverter output is blocked by function selection of the multi-function terminal. Of the IN65~75 functions, No.4 BX is selected.
H/W-Diag	Fatal	Trouble with the memory device within the inverter (EPP ROM), analog-digital switch output (ADC Off Set) or CPU malfunction (Watch Dog-1, Watch Dog-2). - EEP Err : In the event of problems during Parameter Read/Write because of KPD EEP ROM damage, etc. - ADC Off Set : In the event of trouble in the current sensing area (U/V/W CT etc.) - Gate Pwr Loss : In the event of trouble in the power of IGBT Gate of the product 30kW or higher. (When trouble occurs in 22kW product, it requires checking the capacity settings of the product)
NTC Open	Latch	A failure occurs when abnormality is detected with the temperature detecting sensor of the power switch (IGBT).
Fan Trip	Latch	A failure occurs when abnormality is detected with the cooling fan. Operation resumes if PRT-79 is set at 0.
IP54 FAN Trip	Latch	Detected when IP54 product has a fault of internal circulationat FAN.
Thermal Trip	Latch	A failure occurs when resistance goes beyond

LCD Display	Type	Description
		the prescribed value after the external temperature sensor is connected to the terminal block. Operation resumes if PRT-34 is set at values other than 0.
ParaWrite Trip	Latch	Trouble during parameter writing with the inverter's main body from the keypad.
Over Speed Trip	Latch	A failure occurs when the motor speed goes up above the overspeed detection level. The detection level is set in PRT-70.
Dev Speed Trip	Latch	A failure occurs when the speed that got feedback from the encoder goes up above the set variation value. Operation resumes if PRT-73 is set at 1.
Encoder Trip	Latch	A failure occurs when PRT-77 Enc Wire Check is set at 1 and abnormality is detected for the set period of time.
Pre-PID Fail	Latch	A failure occurs when the control amount(PID feedback) is continuously input below the set value during Pre-PID operation by the function setting between APP-34 ~36, which is regarded as an abnormal state of the system.

Option and Keypad Protection

LCD Display	Type	Description
Lost Keypad	Level	A failure occurs when operating commands come from the keypad or there is any problem with the communication between the keypad and inverter's main body in the Keypad JOG Mode. Operation resumes if PRT-11 is set at values other than 0. (occurs 2 seconds after the communication is interrupted)
Lost Command	Level	When there is a problem with the command if frequency or operating commands are given by the terminal block or communication command other than the keypad. Operation resumes if PRT-12 is set at values other than 0.

LCD Display	Type	Description
Option Trip-1	Latch	When the option gets out of the option slot No. 1 after it was inserted during power supply or when communication is not available with the inverter
Option Trip-2	Latch	When the option gets out of the option slot No. 2 after it was inserted during power supply or when communication is not available with the inverter
Option Trip-3	Latch	When the option gets out of the option slot No. 3 after it was inserted during power supply or when communication is not available with the inverter
I/O Board Trip	Latch	When the basic and insulated I/O boards are disconnected or have a fault of connection.

4.1.2 Warning Message

LCD Display	Description
Over Load	An alarm signal is released in case of overload to the motor. Operation resumes if you set PRT-17 at 1. If signals are necessary for the output contact point, No. 4 overload is selected among the functions of OUT31~33.
Under Load	Set PRT-25 at 1 if an alarm is necessary for an underload situation. As the output signal, No. 6 Under Load is selected among the functions of OUT31~33.
Inv Over Load	An alarm is released if time equal to 60% of the level at which the inverter IOLT functions is accumulated. As the output signal, No. 5 IOL is selected among the functions of OUT31~33.
Lost Command	An alarm signal can be released as well when PRT-12 Lost Cmd Mode is 0. The alarm is released in a certain condition between PRT13~15. As the output signal, No. 12 Lost Command is selected among the functions of OUT31~33.
Fan Warning	An alarm is released if a problem is detected with the cooling fan with PRT-79 FAN Trip Mode set at 1. As the output signal, No.8 Fan Warning is selected among the functions of OUT31~33.
DB Warn %ED	An alarm is released if the DB resistance consumption rate is above the prescribed degree. The detection level is set at PRT-66.
Enc Conn Check	An alarm is signified if No. 3 Enc Test is selected from BAS-20

LCD Display	Description
	Auto Tuning and no signal is input during the encoder test. Signals are released if ENC Tune is set among the functions of OUT31~33.
Enc Dir Check	An alarm is signified if No. 3 Enc Test is selected from BAS-20 Auto Tuning and the setting is wrongly changed between encoder phase A and B during the encoder test or the rotation direction is reverse. Signals are released if ENC Dir is set among the functions of OUT31~33.
Lost Keypad	An alarm is signified if the operating command is keypad or any problem is detected with the communication between the keypad and the main body of the inverter in Keypad JOG Mode with PRT-11 Lost KPD Mode set 0. As the output signal, No. 29 Lost Keypad is selected among the functions of OUT31~33.
Check Line PLZ	An alarm is signified if the communication error is detected between Control CPU and Keypad. It might be occurred from the connection cable between Control CPU and Keypad.
Fire Mode	When fire function is activated, the alarm signal will occur. If you need a contact signal ouput, you will select OUT31~33 Fire Mode function.

4.2 Troubleshooting Fault Trips

When a fault trip or warning occurs due to a protection function, refer to the following table for possible causes and remedies.

Type	Cause	Remedy
Over Load	The load is greater than the motor's rated capacity.	Ensure that the motor and inverter have appropriate capacity ratings.
	The set value for the overload trip level (PRT-21) is too low.	Increase the set value for the overload trip level.
Under Load	There is a motor-load connection problem.	Replace the motor and inverter with models with lower capacity.
	The set value for underload level (PRT-24) is less than the system's minimum load.	Reduce the set value for the underload level.
Over Current1	Acc/Dec time is too short, compared to load inertia (GD^2).	Increase Acc/Dec time.

Type	Cause	Remedy
	The inverter load is greater than the rated capacity.	Replace the inverter with a model that has increased capacity.
	The inverter supplied an output while the motor was idling.	Operate the inverter after the motor has stopped or use the speed search function (CON-70).
	The mechanical brake of the motor is operating too fast.	Check the mechanical brake.
Over Voltage	Deceleration time is too short for the load inertia (GD^2).	Increase the acceleration time.
	A generative load occurs at the inverter output.	Use the braking unit.
	The input voltage is too high.	Determine if the input voltage is above the specified value.
Low Voltage	The input voltage is too low.	Determine if the input voltage is below the specificed value.
	A load greater than the power capacity is connected to the system (a welder, direct motor connection, etc.)	Increase the power capacity.
	The magnetic contactor connected to the power source has a faulty connection.	Replace the magnetic contactor.
Low Voltage2	The input voltage has decreased during the operation.	Determine if the input voltage is above the specified value.
	An input phase-loss has occurred.	Check the input wiring.
	The power supply magnetic contactor is faulty.	Replace the magnetic contractor.
Ground Trip	A ground fault has occurred in the inverter output wiring.	Check the output wiring.
	The motor insulation is damaged.	Replace the motor.
E-Thermal	The motor has overheated.	Reduce the load or operation frequency.
	The inverter load is greater than the rated capacity.	Replace the inverter with a model that has increased capacity.
	The set value for electronic thermal protection is too low.	Set an appropriate electronic thermal level.
	The inverter has been operated at low speed for an extended duration.	Replace the motor with a model that supplies extra power to the cooling

Type	Cause	Remedy
		fan.
Out Phase Open	The magnetic contactor on the output side has a connection fault.	Check the magnetic contactor on the output side.
	The output wiring is faulty.	Check the output wiring.
In Phase Open	The magnetic contactor on the input side has a connection fault.	Check the magnetic contactor on the input side.
	The input wiring is faulty.	Check the input wiring.
	The DC link capacitor needs to be replaced.	Replace the DC link capacitor. Contact the retailer or the LSIS customer service center.
Inverter OLT	The load is greater than the rated motor capacity.	Replace the motor and inverter with models that have increased capacity.
	The torque boost level is too high.	Reduce the torque boost level.
Over Heat	There is a problem with the cooling system.	Determine if a foreign object is obstructing the air inlet, outlet, or vent.
	The inverter cooling fan has been operated for an extended period.	Replace the cooling fan.
	The ambient temperature is too high.	Keep the ambient temperature below 50 ℃.
Over Current2	Output wiring is short-circuited.	Check the output wiring.
	There is a fault with the electronic semiconductor (IGBT).	Do not operate the inverter. Contact the retailer or the LSIS customer service center.
NTC Open	The ambient temperature is too low.	Keep the ambient temperature above -10 ℃.
	There is a fault with the internal temperature sensor.	Contact the retailer or the LSIS customer service center.
Fan Trip	A foreign object is obstructing the fan's air vent.	Remove the foreign object from the air inlet or outlet.
	The cooling fan needs to be replaced.	Replace the cooling fan.
IP54 FAN Trip	Internal fan connector is not connected. Internal fan PCB board's power connector is not connected. Inverter cooling fan become to change period time	Connect internal Fan connector. Internal fan PCB board's power connector is connected. Inverter cooling fan have to changed.

Type	Cause	Remedy
No Motor Trip	The motor is disconnected to the output of inverter. The current level of detection of Trip is incorrect.	Check the connection of wiring. Check the value of parameter both BAS-13 (Rated current) and PRT-32 (No Motor Level).

4.3 Troubleshooting Other Faults

When a fault other than those identified as fault trips or warnings occurs, refer to the following table for possible causes and remedies.

Type	Cause	Remedy
Parameters cannot be set.	The inverter is in operation (driving mode).	Stop the inverter to change to program mode and set the parameter.
	The parameter access is incorrect.	Check the correct parameter access level and set the parameter.
	The password is incorrect.	Check the password, disable the parameter lock and set the parameter.
	Low voltage is detected.	Check the power input to resolve the low voltage and set the parameter.
The motor does not rotate.	The frequency command source is set incorrectly.	Check the frequency command source setting.
	The operation command source is set incorrectly.	Check the operation command source setting.
	Power is not supplied to the terminal R/S/T.	Check the terminal connections R/S/T and U/V/W.
	The charge lamp is turned off.	Turn on the inverter.
	The operation command is off.	Turn on the operation command. (RUN).
	The motor is locked.	Unlock the motor or lower the load level.
	The load is too high.	Operate the motor independently.
	An emergency stop signal is input.	Reset the emergency stop signal.
	The wiring for the control circuit	Check the wiring for the control

Type	Cause	Remedy
	terminal is incorrect.	circuit terminal.
	The input option for the frequency command is incorrect.	Check the input option for the frequency command.
	The input voltage or current for the frequency command is incorrect.	Check the input voltage or current for the frequency command.
	The PNP/NPN mode is selected incorrectly.	Check the PNP/NPN mode setting.
	The frequency command value is too low.	Check the frequency command and input a value above the minimum frequency.
	The [OFF] key is pressed.	Check that the stop state is normal, if so resume operation normally.
	Motor torque is too low.	Change the operation modes (V/F, IM, and Sensorless). If the fault remains, replace the inverter with a model with increased capacity.
The motor rotates in the opposite direction to the command.	The wiring for the motor output cable is incorrect.	Determine if the cable on the output side is wired correctly to the phase (U/V/W) of the motor.
	The signal connection between the control circuit terminal (forward/reverse rotation) of the inverter and the forward/reverse rotation signal on the control panel side is incorrect.	Check the forward/reverse rotation wiring.
The motor only rotates in one direction.	Reverse rotation prevention is selected.	Remove the reverse rotation prevention.
	The reverse rotation signal is not provided, even when a 3-wire sequence is selected.	Check the input signal associated with the 3-wire operation and adjust as necessary.
The motor is overheating.	The load is too heavy.	Reduce the load. Increase the Acc/Dec time.
		Check the motor parameters and set the correct values.
		Replace the motor and the inverter with models with appropriate capacity for the load.
	The ambient temperature of the motor	Lower the ambient temperature of

Type	Cause	Remedy
	is too high.	the motor.
	The phase-to-phase voltage of the motor is insufficient.	Use a motor that can withstand phase-to-phase voltages surges greater than the maximum surge voltage.
		Only use motors suitable for apllications with inverters.
		Connect the AC reactor to the inverter output (set the carrier frequency to 3 kHz).
	The motor fan has stopped or the fan is obstructed with debris.	Check the motor fan and remove any foreign objects.
The motor stops during acceleration.	The load is too high.	Reduce the load.
		Increase the volume of the torque boost.
		Replace the motor and the inverter with models with capacity appropriate for the load.
	The current is too big.	If the output current exceeds the rated load, decrease the torque boost.
The motor stops when connected to load.	The load is too high.	Reduce the load.
		Replace the motor and the inverter with models with capacity appropriate for the load.
The motor does not accelerate. /The acceleration time is too long.	The frequency command value is low.	Set an appropriate value.
	The load is too high.	Reduce the load and increase the acceleration time. Check the mechanical brake status.
	The acceleration time is too long.	Change the acceleration time.
	The combined values of the motor properties and the inverter parameter are incorrect.	Change the motor related parameters.
	The stall prevention level during acceleration is low.	Change the stall prevention level.
	The stall prevention level during operation is low.	Change the stall prevention level.

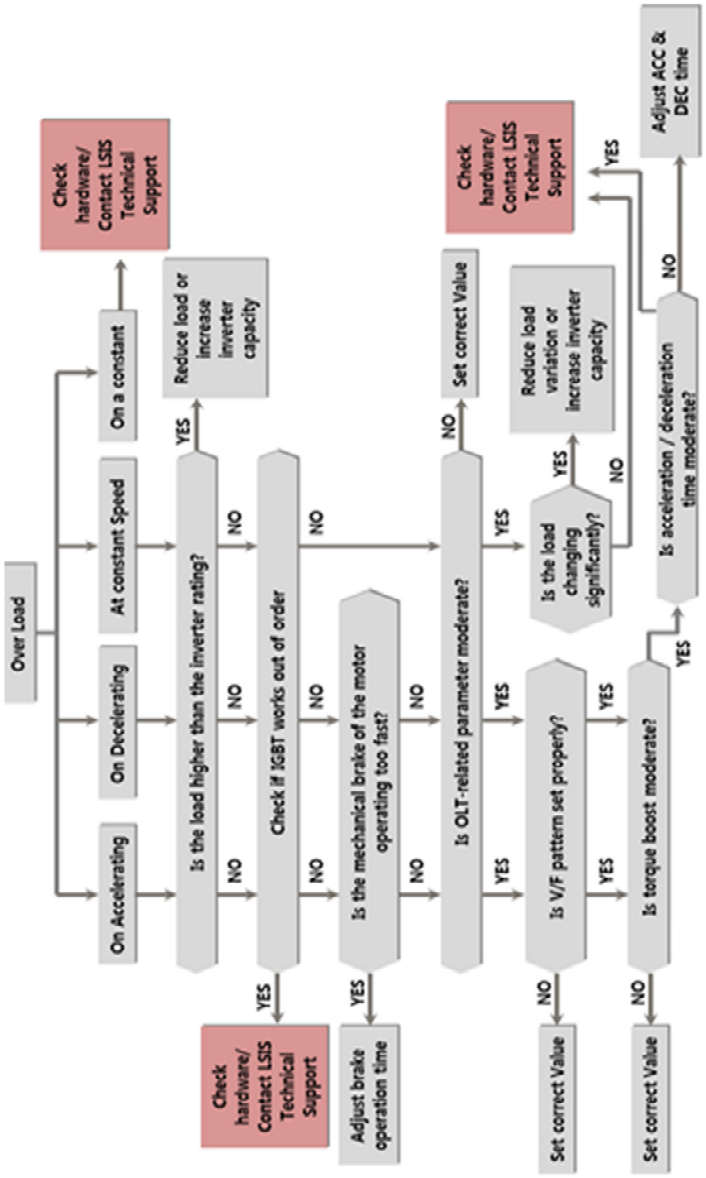
Type	Cause	Remedy
Motor speed varies during operation.	There is a high variance in load.	Replace the motor and inverter with models with increased capacity.
	The input voltage varies.	Reduce input voltage variation.
	Motor speed variations occur at a specific frequency.	Adjust the output frequency to avoid a resonance area.
The motor rotation is different from the setting.	The V/F pattern is set incorrectly.	Set a V/F pattern that is suitable for the motor specification.
The motor deceleration time is too long even with Dynamic Braking (DB) resistor connected.	The deceleration time is set too long.	Change the setting accordingly.
	The motor torque is insufficient.	If motor parameters are normal, it is likely to be a motor capacity fault. Replace the motor with a model with increased capacity.
	The load is higher than the internal torque limit determined by the rated current of the inverter.	Replace the inverter with a model with increased capacity.
While the inverter is in operation, a control unit malfunctions or noise occurs.	Noise occurs due to switching inside the inverter.	Change the carrier frequency to the minimum value.
		Install a micro surge filter in the inverter output.
When the inverter is operating, the earth leakage breaker is activated.	An earth leakage breaker will interrupt the supply if current flows to ground during inverter operation.	Connect the inverter to a ground terminal.
		Check that the ground resistance is less than 100Ω for 200 V inverters and less than 10Ω for 400 V inverters.
		Check the capacity of the earth leakage breaker and make the appropriate connection, based on the rated current of the inverter.
		Lower the carrier frequency.
		Make the cable length between the inverter and the motor as short as possible.

Type	Cause	Remedy
The motor vibrates severely and does not rotate normally.	Phase-to-phase voltage of 3-phase power source is not balanced.	Check the input voltage and balance the voltage.
		Check and test the motor's insulation.
The motor makes humming, or loud noises.	Resonance occurs between the motor's natural frequency and the carrier frequency.	Slightly increase or decrease the carrier frequency.
	Resonance occurs between the motor's natural frequency and the inverter's output frequency.	Slightly increase or decrease the carrier frequency.
		Use the frequency jump function to avoid the frequency band where resonance occurs.
The motor vibrates/hunts.	The frequency input command is an external, analog command.	In situations of noise inflow on the analog input side that results in command interference, change the input filter time constant (IN-07).
	The wiring length between the inverter and the motor is too long.	Ensure that the total cable length between the inverter and the motor is less than 200 m (50 m for motors rated 3.7 kW or lower).
The motor does not come to a complete stop when the inverter output stops.	It is difficult to decelerate sufficiently, because DC braking is not operating normally.	Adjust the DC braking parameter.
		Increase the set value for the DC braking current.
		Increase the set value for the DC braking stopping time.
The output frequency does not increase to the frequency reference.	The frequency reference is within the jump frequency range.	Set the frequency reference higher than the jump frequency range.
	The frequency reference is exceeding the upper limit of the frequency command.	Set the upper limit of the frequency command higher than the frequency reference.
	Because the load is too heavy, the stall prevention function is working.	Replace the inverter with a model with increased capacity.
The cooling fan does not rotate.	The control parameter for the cooling fan is set incorrectly.	Check the control parameter setting for the cooling fan.

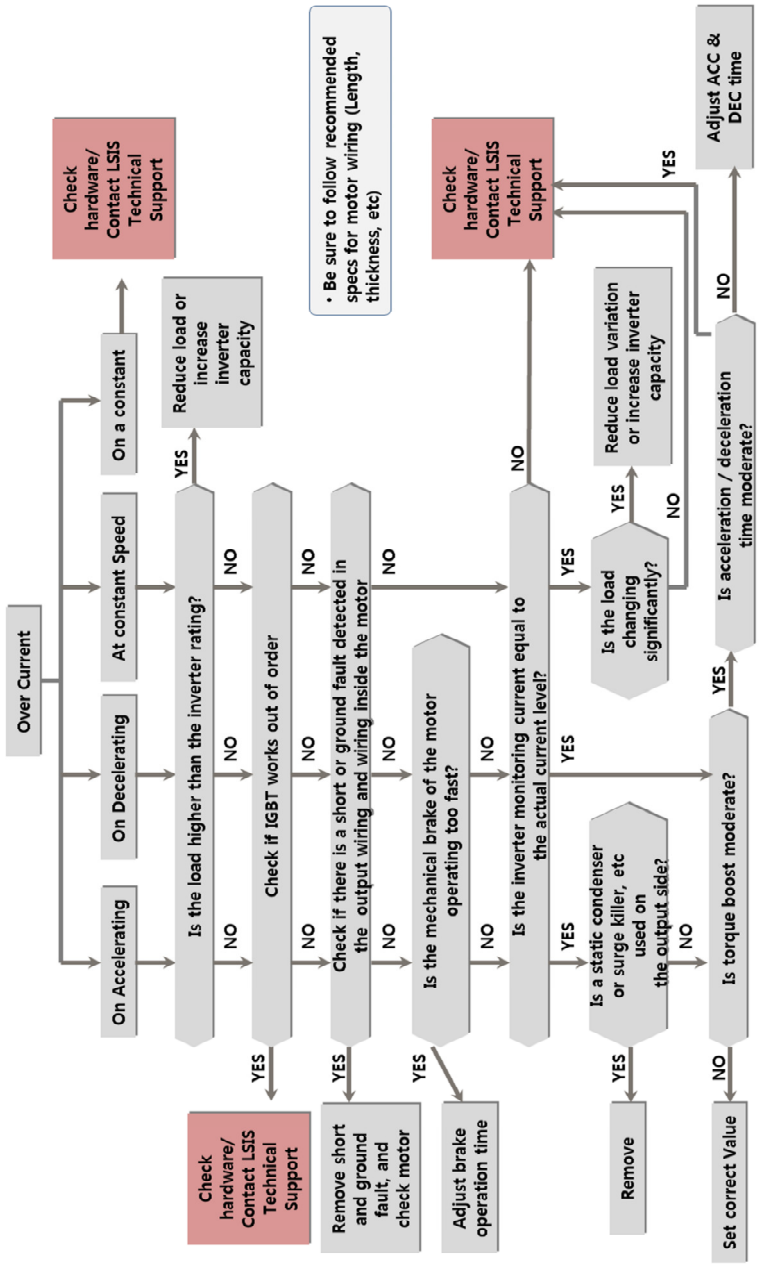
4.4 Troubleshooting Flow Chart

This chapter explains how to troubleshoot a problem when inverter protective functions, fault trips, warning signals, or faults occur. Follow below procedures to troubleshoot each fault and warning.

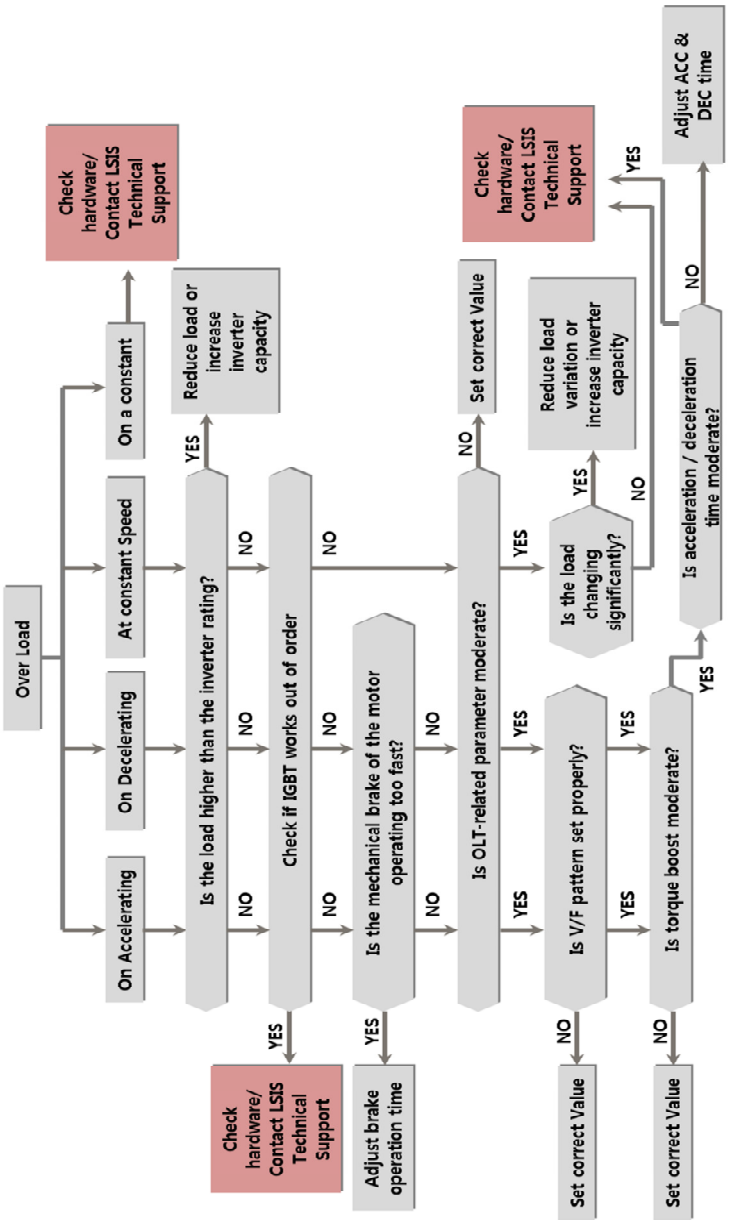
1) Overload Fault



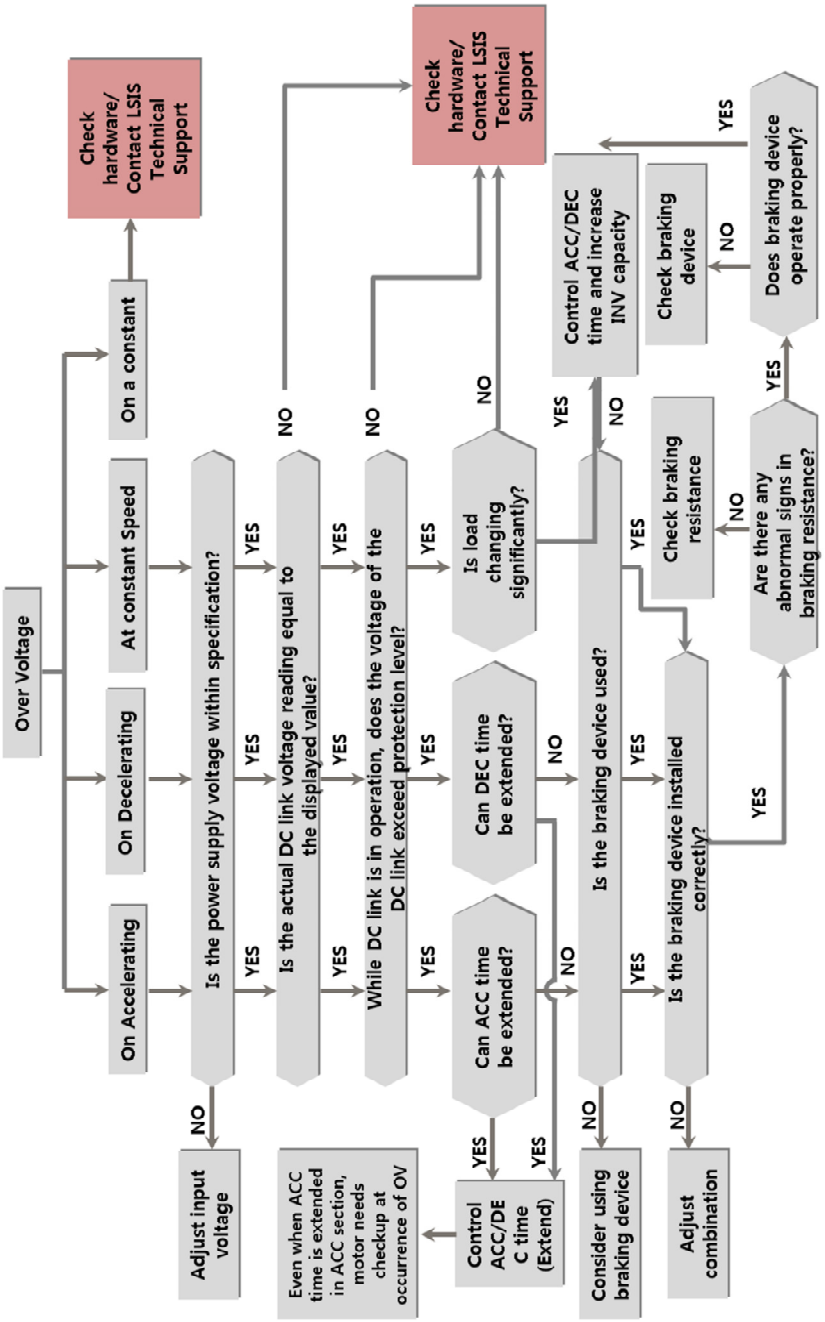
2) Overcurrent Fault



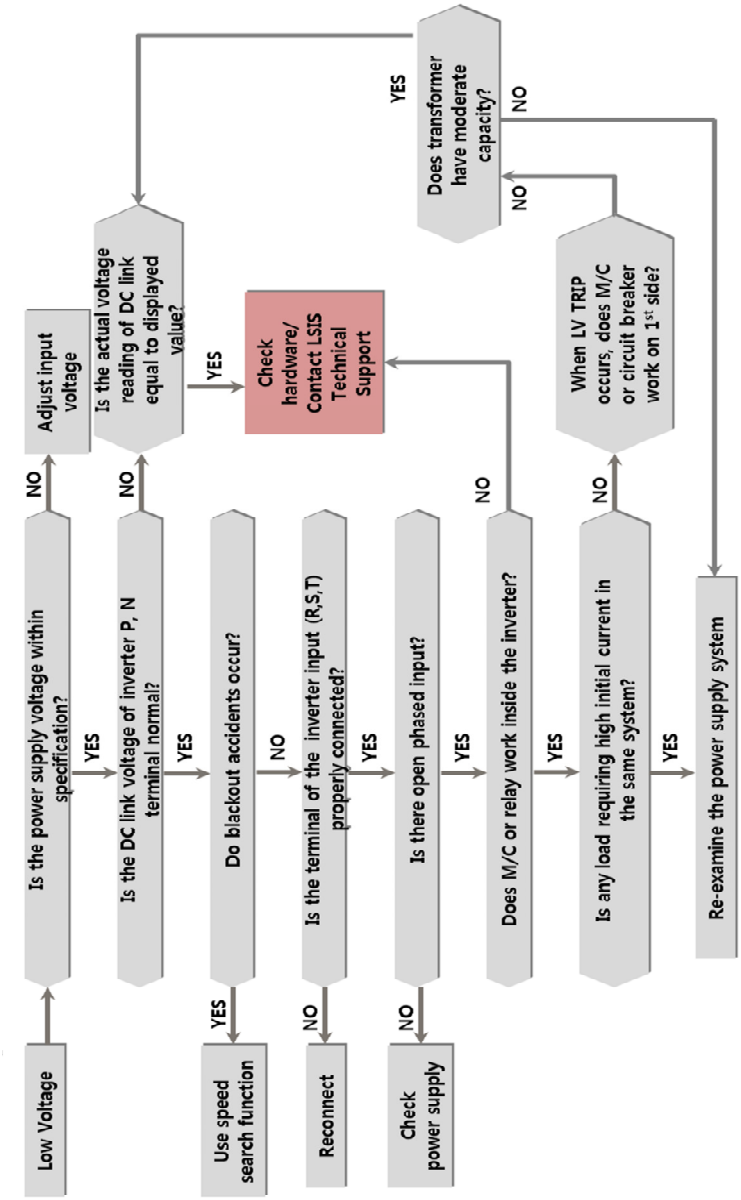
3) Over Load Fault



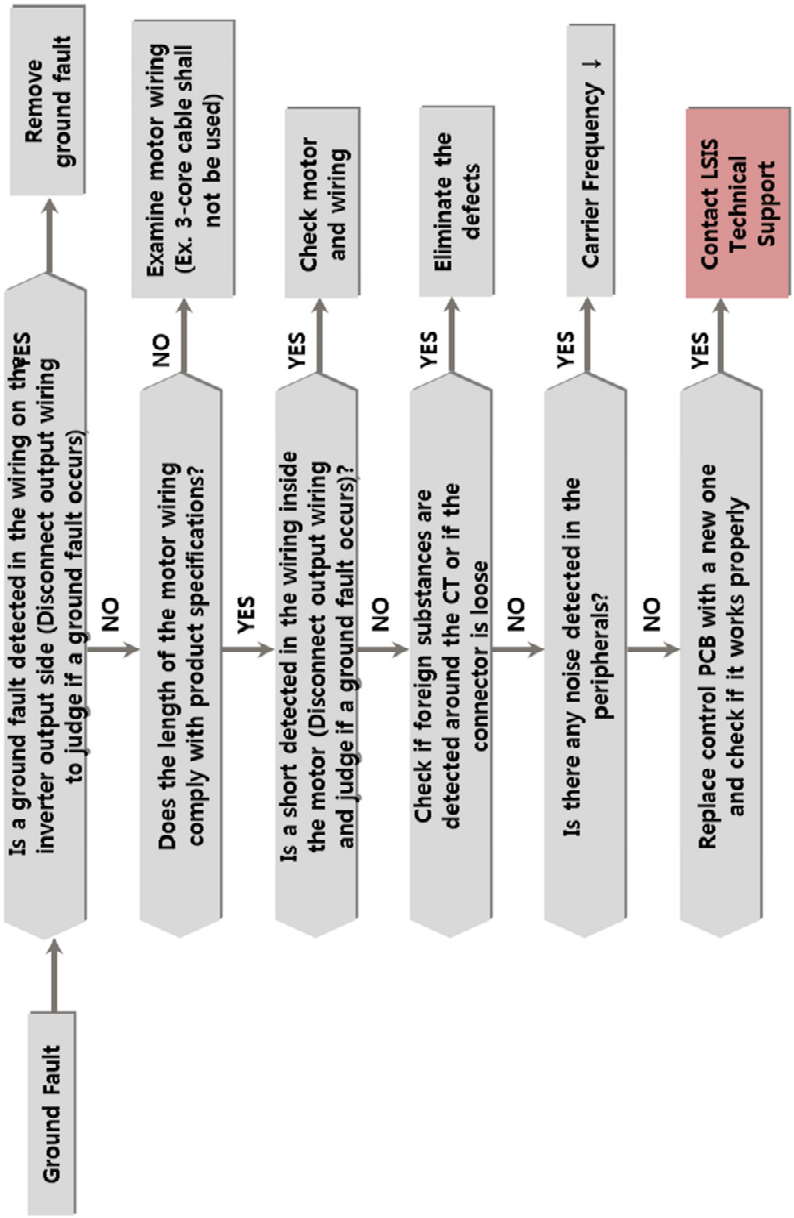
4) Over Voltage Fault



5) Low Voltage Fault

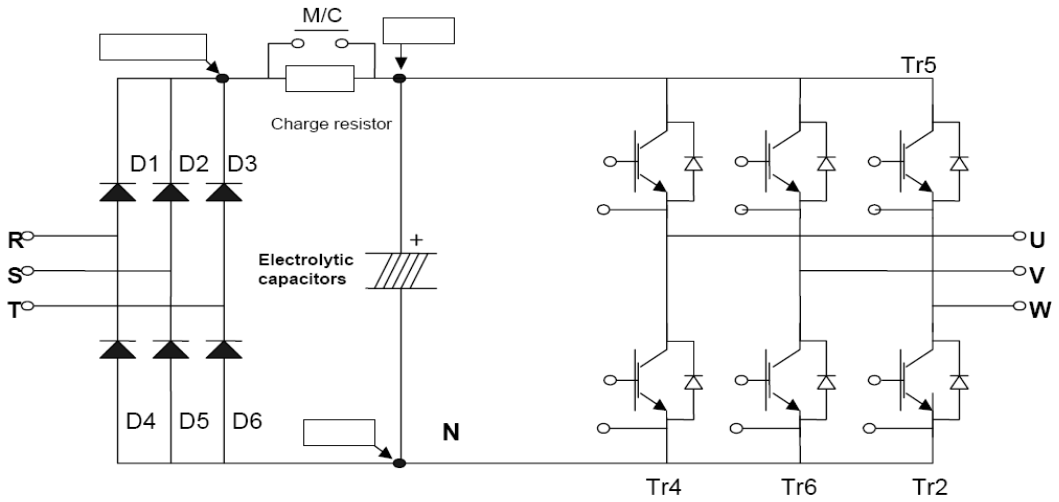


6) Ground Fault



4.5 How to Check Power Components

Before checking the power components, be sure to disconnect AC Input supply and wait until the Main Electrolytic Capacitors (DCP-DCN) is discharged.



- Turn the power off and disconnect RST/UVW wiring.
- Determine whether inverter terminals ((R,S,T, U, V, W, P1 (or P2), N)) are energized or not using a tester.
- Wait until the Main Electrolytic Capacitors (DCP-DCN) is discharged to a safe level.
- Mega ohoms will be displayed when the circuit is open. When closed, the resistance value ranges from a few ohms to tens of Ω.
- The displayed value is not always the same according to modules and tester types but should be similar.
- Modules number and checking point

Module		Test polarity		Check value	Number	Test polarity		Check value
		+	-			+	-	
Diode	D1	R	DCP+	Closed	D4	R	N	Open
		DCP+	R	Open		N	R	Closed
	D2	S	DCP+	Closed	D5	S	N	Open
		DCP+	S	Open		N	S	Closed
	D3	T	DCP+	Closed	D6	T	N	Open
		DCP+	T	Open		N	T	Closed
IGBT	Tr1	U	DCP	Closed	Tr4	U	N	Open
		DCP	U	Open		N	U	Closed
	Tr3	V	DCP	Closed	Tr6	V	N	Open
		DCP	V	Open		N	V	Closed
	Tr5	W	DCP	Closed	Tr2	W	N	Open
		DCP	W	Open		N	W	Closed

5 Technical Specification

5.1 Input and Output Specifications

Input voltage of 200V class (0.75~22kW)

Type : SV xxx iS7 – 2x			0008	0015	0022	0037	0055	0075	0110	0150	0185	0220
1)Motor Applied		[HP]	1	2	3	5	7.5	10	15	20	25	30
		[kW]	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22
Rated Output	2)Rated Capacity [kVA]		1.9	3.0	4.5	6.1	9.1	12.2	17.5	22.9	28.2	33.5
	3)Rated Current[A]	CT	5	8	12	16	24	32	46	60	74	88
		VT	8	12	16	24	32	46	60	74	88	124
	Output Frequency		4) 0 ~ 400 [Hz]									
	Output Voltage [V]		5) 3-phase 200 ~ 230V (Sensorless-1:0~300Hz, Sensorless-2,Vector:0.1~120Hz)									
Rated Input	Available Voltage [V]		3-phase 200 ~ 230 VAC (-15%,+10%,)									
	Input Frequency		50 ~ 60 [Hz] (±5%)									
	Rated Current [A]	CT	4.3	6.9	11.2	14.9	22.1	28.6	44.3	55.9	70.8	85.3
		VT	6.8	10.6	14.9	21.3	28.6	41.2	54.7	69.7	82.9	116.1

* Non DCR products are provided warranty service when used in CT (Heavy duty) load rating only.

Input voltage of 200V class (30~75kW)

Type : SV xxx iS7 – 2x			0300	0370	0450	0550	0750	-	-	-	-	-
1)Motor Applied		[HP]	40	50	60	75	100	-	-	-	-	-
		[kW]	30	37	45	55	75	-	-	-	-	-
Rated Output	2)Rated Capacity [kVA]		46	57	69	84	116	-	-	-	-	-
	3)Rated Current[A]	CT	116	146	180	220	288	-	-	-	-	-
		VT	146	180	220	288	345	-	-	-	-	-
	Output Frequency		4) 0 ~ 400 [Hz] (Sensorless-1:0~300Hz, Sensorless-2,Vector:0.1~120Hz)									
	Output Voltage [V]		5) 3-phase 200 ~ 230V									
Rated Input	Available Voltage [V]		3-phase 200 ~ 230 VAC (-15%~+10%)									
	Input Frequency		50 ~ 60 [Hz] (±5%)									
	Rated Current [A]	CT	121	154	191	233	305	-	-	-	-	-
		VT	152	190	231	302	362	-	-	-	-	-

* Non DCR products are provided warranty service when used in CT (Heavy duty) load rating only.

Input voltage of 400V class (0.75~22kW)

Type : SV xxx iS7 – 4x			0008	0015	0022	0037	0055	0075	0110	0150	0185	0220
1) Motor Applied		[HP]	1	2	3	5	7.5	10	15	20	25	30
		[kW]	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22
Rated Output	2) Rated Capacity [kVA]		1.9	3.0	4.5	6.1	9.1	12.2	18.3	22.9	29.7	34.3
	3)Rated Current[A]	CT	2.5	4	6	8	12	16	24	30	39	45
		VT	4	6	8	12	16	24	30	39	45	61
	Output Frequency		4) 0 ~ 400 [Hz] (Sensorless-1: 0~300Hz, Sensorless-2, Vector: 0.1~120Hz)									
	Output Voltage [V]		5) 3-phase 380 ~ 480V									
Rated Input	Available Voltage [V]		3-phase 380 ~ 480 VAC (-15%~+10%)									
	Input Frequency		50 ~ 60 [Hz] (±5%)									
	Rated Current [A]	CT	2.2	3.6	5.5	7.5	11.0	14.4	22.0	26.6	35.6	41.6
		VT	3.7	5.7	7.7	11.1	14.7	21.9	26.4	35.5	41.1	55.7

* Non DCR products are provided warranty service when used in CT (Heavy duty) load rating only.

Input voltage of 400V class (30~160kW)

Type : SV xxx iS7 – 4x			0300	0370	0450	0550	0750	0900	1100	1320	1600	-
1)Motor Applied		[HP]	40	50	60	75	100	120	150	180	225	-
		[kW]	30	37	45	55	75	90	110	132	160	-
Rated Output	2)Rated Capacity [kVA]		46	57	69	84	116	139	170	201	248	-
	3)Rated Current[A]	CT	61	75	91	110	152	183	223	264	325	-
		VT	75	91	110	152	183	223	264	325	370	-
	Output Frequency		4) 0 ~ 400 [Hz] (Sensorless-1: 0~300Hz, Sensorless-2, Vector: 0~120Hz)									
	Output Voltage [V]		5) 3-phase 380 ~ 480V									
Rated Input	Available Voltage [V]		3-phase 380 ~ 480 VAC (-15%, +10%)									
	Input Frequency		50 ~ 60 [Hz] (±5%)									
	Rated Current[A]	CT	55.5	67.9	82.4	102.6	143.4	174.7	213.5	255.6	316.3	
		VT	67.5	81.7	101.8	143.6	173.4	212.9	254.2	315.3	359.3	

* Non DCR products are provided warranty service when used in CT (Heavy duty) load rating only.

Input voltage of 400V class (185~375kW)

Type : SV xxx iS7 – 4x			1850	2200	2800	3150	3750	-	-	-	-	-
1)Motor Applied		[HP]	250	300	375	420	500	-	-	-	-	-
		[kW]	185	220	280	315	375	-	-	-	-	-
Rated Output	2)Rated Capacity [kVA]		286	329	416	467	557	-	-	-	-	-
	3)Rated Current[A]	CT	370	432	547	613	731	-	-	-	-	-
		VT	432	547	613	731	877	-	-	-	-	-
	Output Frequency		4) 0 ~ 400 [Hz] (Sensorless-1:0~300Hz, Sensorless-2,Vector:0~120Hz)									
	Output Voltage [V]		5) 3-phase 380 ~ 480V									
Rated Input	Available Voltage [V]		3-phase 380 ~ 480 VAC (-15%, +10%)									
	Input Frequency		50 ~ 60 [Hz] (±5%)									
	Rated Current[A]	CT	404	466	605	674	798	-	-	-	-	-
		VT	463	590	673	796	948	-	-	-	-	-

1) Motor Applied indicates the maximum capacity applied to use of a standard 4 pole standard motor.

2) Rated capacity : the input capacity of a 200V class is based on 220V and that of a 400V class is based on 440V. The current rating is based on CT current.

3) The output of rated current is limited according to setting of the carrier frequency (CON-04).

4) In case of Sensorless-1, you can set the frequency at up to 300Hz by selecting 3, 4 as the control mode (DRV-09 Control Mode).

In case of Sensorless-2, you can set the frequency at up to 120Hz by selecting 3, 4 as the control mode (DRV-09 Control Mode).

5) The maximum output voltage does not go up over the supplied power voltage. You can select the output voltage as you want below the supplied power voltage.

5.2 Cable Selection

When you install power and signal cables in the terminal blocks, only use cables that meet the required specification for the safe and reliable operation of the product. Refer to the following information to assist you with cable selection.

Caution

- Wherever possible use cables with the largest cross-sectional area for mains power wiring, to ensure that voltage drop does not exceed 2%.
- Use copper cables rated for 600 V, 75 ℃ for power terminal wiring.
- Use copper cables rated for 300 V, 75 ℃ for control terminal wiring.
- The inverters in the range between 15 and 90 kW must be grounded conveniently with fixed connections.
- The inverters in the range between 5,5kW and 11kW must be grounded with and industrial connector according to IEC 60309.
- The minimum size of the protective earthing conductor shall comply with the local safety regulations for high protective earthing conductor current equipment.
- Only one conductor per terminal should be simultaneously connected

Ground Cable and Power Cable Specifications

Inverter Capacity	Grounding wire size (mm²)	
	200V class	400V class
0.75 ~ 3.7kW	3.5	2
5.5 ~ 7.5 kW	5.5	3.5
11 ~ 15 kW	14	8
18.5 ~ 22 kW	22	14
30 ~ 45 kW	22	22
55 ~ 75 kW	38	38
90 ~ 110 kW	-	60
132 ~ 220 kW	-	100
280 ~ 315 kW	-	185
375 kW	-	240

Inverter applied		Cable			
		mm²		AWG	
		R,S,T	U,V,W	R,S,T	U,V,W
200V	0.75 kW	2.5	2.5	14	14
	1.5 kW	2.5	2.5	14	14
	2.2 kW	2.5	2.5	14	14
	3.7 kW	4	4	12	12
	5.5 kW	6	6	10	10
	7.5 kW	10	10	8	8
	11 kW	16	16	6	6
	15 kW	25	22	4	4
	18.5 kW	35	30	2	2
	22 kW	35	30	2	2
	30 kW	70	70	1/0	1/0
	37 kW	95	95	2/0	2/0
	45 kW	95	95	2/0	2/0
	55 kW	120	120	3/0	3/0
	75 kW	150	150	4/0	4/0
400V	0.75~1.5kW	2.5	2.5	14	14
	2.2 kW	2.5	2.5	14	14
	3.7 kW	2.5	2.5	14	14
	5.5 kW	4	2.5	12	14
	7.5 kW	4	4	12	12
	11 kW	6	6	10	10
	15 kW	16	10	6	8
	18.5 kW	16	10	6	8
	22 kW	25	16	4	6
	30~37 kW	25	25	4	4
	45 kW	70	70	1/0	1/0
	55 kW	70	70	1/0	1/0
	75 kW	70	70	1/0	1/0

	90 kW	100	100	4/0	4/0
	110 kW	100	100	4/0	4/0
	132 kW	150	150	300	300
	160 kW	200	200	400	400
	185 kW	200	200	400	400
	220 kW	250	250	500	500
	280 kW	325	325	650	650
	315 kW	2x200	2x200	2x400	2x400
	375 kW	2x250	2x250	2x500	2x500

Signal (Control) Cable Specifications

Terminals	Wire thickness 1)	
	mm^2	AWG
P1–P7/CM/VR/V1/I2/24	0.33–1.25	16–22
AO1/AO2/CM/Q1/EG	0.33–2.0	14–22
A1/B1/C1/A2/C2/A3/C3/A4/C4/A5/C5	0.33–2.0	14–22
S+,S-,SG	0.75	18

1) Use STP (shielded twisted-pair) cables for signal wiring.

5.3 Product Specification Details

1) Control

Control Method	V/F control, V/F PG, slip compensation, sensorless vector-1, sensorless vector-2, vector control
Frequency Setting Resolving Power	Digital command : 0.01Hz Analog command : 0.06Hz (maximum frequency : 60Hz)
Frequency Degree	Digital command operation : 0.01% of the maximum frequency Analog command operation : 0.1% of the maximum frequency
V/F Pattern	Linear, double reduction, user V/F
Overload Capacity	CT current rating :150% for 1 minute, VT current rating :110% for 1 minute
Torque Boost	Manual torque boost, Automatic torque boost

2) Operation

Operating Method		Selectable among keypad/terminal block/communication operation	
Frequency Setting		**Analog:** 0 ~ 10[V], -10 ~ 10[V], 0 ~ 20[mA] **Digital:** keypad	
Operating Function		PID control, up-down operation, 3-wire operation, DC break, Frequency limit, Frequency jump, Second function, Slip compensation, Reverse rotation prevention, Auto restarting, Inverter By-pass, Auto tuning Flying Start, Energy buffering, Power breaking, Flux breaking, Leakage current reduction, MMC, Easy Start.	
Input	**Multi-function terminal (8 points) P1 ~ P8[1)]**	NPN (Sink) / PNP (Source) selectable	
		Function: forward operation, reverse operation, reset, external trip, emergency stop, jog operation, sequential frequency-high/medium/low, multi - level acceleration and deceleration – high/medium/low, D.C. control during stop, selection of a second motor, frequency increase, frequency decrease, 3-wire operation, change to general operation during PID operation, Main inverter body operation during option operation, analog command frequency fixation, acceleration and deceleration stop selectable.	
Output	**Multi-function open collector terminal**	Failure output and inverter operation output	Below DC 46V 100mA
	Multi-function relay terminal		Below (N.O., N.C.) AC250V 1A, Below DC 30V 1A
	Analog output	0 ~ 10 Vdc (below 20mA) : selectable from frequency, current, voltage, direct current voltage	

1) The Functions for Multi-function terminal available according to IN-65~72 parameter setting of IN Group.

3) Protective Function

Trip	over voltage, low voltage, over current, earth current detection, inverter overheat, motor overheating, output imaging, overload protection, communication error, frequency command loss, hardware failure, cooling fan failure, pre-PID failure, no motor trip, external break trip. etc
Alarm	Stall prevention, overload, light load, encoder error, fan failure, keypad command loss, speed command loss.
Instantaneous Interruption[2)]	Below CT class 15 msec (VT class 8 msec) : operation continues (within rated input voltage, rated output) Over CT class 15 msec (VT class 8 msec) : automatically restarts

2) Operation at the CT (Heavy Duty) current rating

4) Structure and Use Environment

Cooling Method	Forced cooling : 0.75~15kW (200/400V class), 22kW (400V class) Inhalation cooling : 22~75kW (200V class), 30~375kW (400V class)
Protection Structure	- 0.75~22kW(200V), 0.75~75kW(400V): Open type IP 21 (default), UL enclosed type 1 (Option) [3)] - 30~75kW (200V), 90~375kW(400V): Open type IP 00 (default), UL enclosed type 1 (Option) [3)] - 0.75~22kW-2/4 and etc. : Enclosed IP54 type, UL enclosed type 12
Ambient Temperature	- CT (Heavy Duty) load : - 10 ~ 50℃ (without ice or frost) - VT (Normal Duty) load : - 10~ 40℃ (without ice or frost) (It is recommended that you use less than 80% load when you use VT load at 50℃.) - IP54 product: -10~40 ℃ (without ice or frost)
Preservation Temperature	-20°C ~ 65°C
Surrounding Humidity	Below 90% RH of relative humidity (with no dew formation)
Altitude, Vibration	Below 1,000m, below 5.9m/sec^2 (0.6G)
Environment	There should be no corrosive gas, flammable gas, oil mist or dust.

	(Pollution degree 2 environment)

3) UL Enclosed type 1 with conduit box installed.

5.4 Terminal Screw Specifications

Input/Output Termianl Screw Specification

Inverter applied		Terminal screw size	Screw torque[1)] (Kgf·cm)
200V	0.75 kW	M4	7.1~12
	1.5 kW	M4	7.1~12
	2.2 kW	M4	7.1~12
	3.7 kW	M4	7.1~12
	5.5 kW	M4	7.1~12
	7.5 kW	M4	7.1~12
	11 kW	M6	30.6~38.2
	15 kW	M6	30.6~38.2
	18.5 kW	M8	61.2~91.8
	22 kW	M8	61.2~91.8
	30 kW	M8	61.2 ~ 91.8
	37 kW	M8	61.2 ~ 91.8
	45 kW	M8	61.2 ~ 91.8
	55 kW	M10	89.7 ~ 122.0
	75 kW	M10	89.7 ~ 122.0
400V	0.75~1.5kW	M4	7.1~12
	2.2 kW	M4	7.1~12
	3.7 kW	M4	7.1~12
	5.5 kW	M4	7.1~12
	7.5 kW	M4	7.1~12

	11 kW	M5	24.5~31.8
	15 kW	M5	24.5~31.8
	18.5 kW	M6	30.6~38.2
	22 kW	M6	30.6~38.2
	30~37 kW	M8	61.2~91.8
	45 kW	M8	61.2~91.8
	55 kW	M8	61.2~91.8
	75 kW	M8	61.2~91.8
	90 kW	M12	182.4~215.0
	110 kW	M12	182.4~215.0
	132 kW	M12	182.4~215.0
	160 kW	M12	182.4~215.0
	185 kW	M12	182.4~215.0
	220 kW	M12	182.4~215.0
	280 kW	M12	182.4~215.0
	315 kW	M12	182.4~215.0
	375 kW	M12	182.4~215.0

Control Circuit Terminal Screw Specification

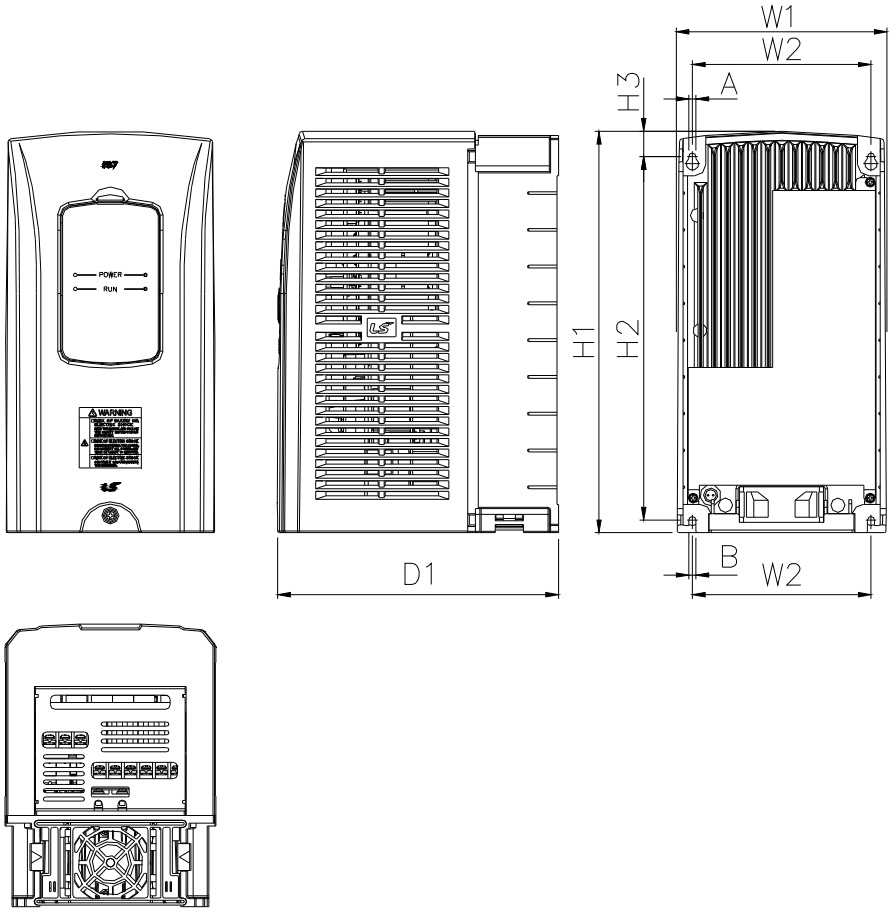
Terminal	Terminal Screw Size	Screw Torque(Kgf·cm/Nm)
P1–P8/CM/VR/V1/I1/AO/Q1/EG/24/A1/B1/C1/S+,S-,5G	M3	0.5~0.6 Nm

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 malfuctions. Use copper wires only with 600 V, 90 ℃ rating for the power terminal wiring, and 300 V, 75 ℃ rating for the control terminal wiring.

5.5 External Dimensions (UL Enclosed Type1, IP21 Type)

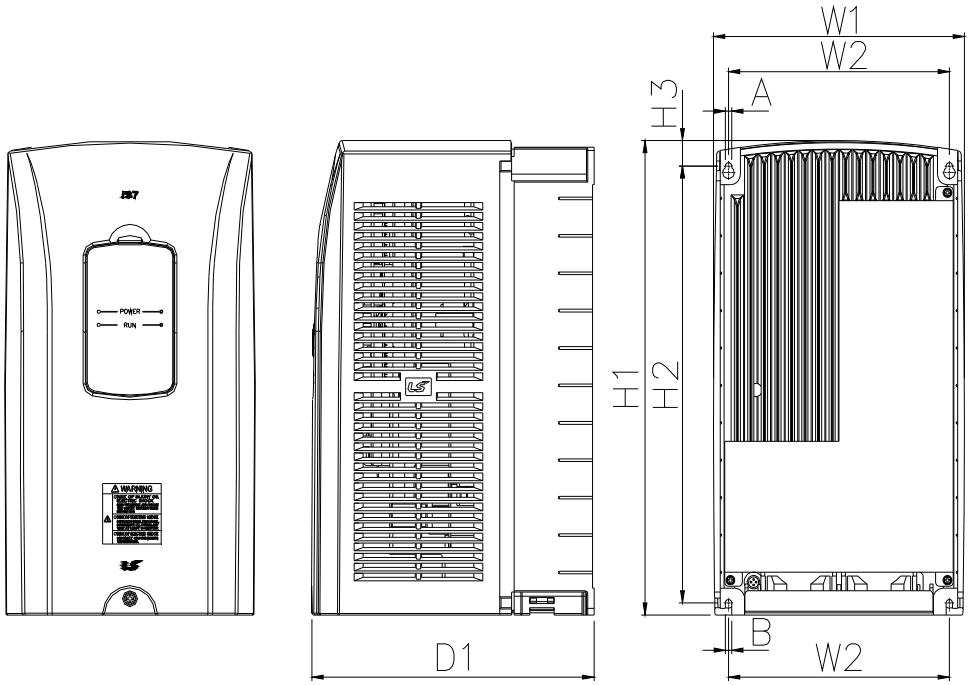
1) SV0008-0037iS7 (200V/400V)

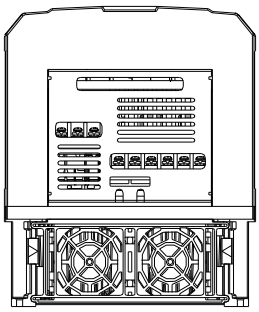


mm(inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0008~0037 iS7 - 2/4	150(5.90)	127(5.00)	284(11.18)	257(10.11)	18(0.70)	200(7.87)	5(0.19)	5(0.19)

2) SV0055-0075iS7 (200V/400V)

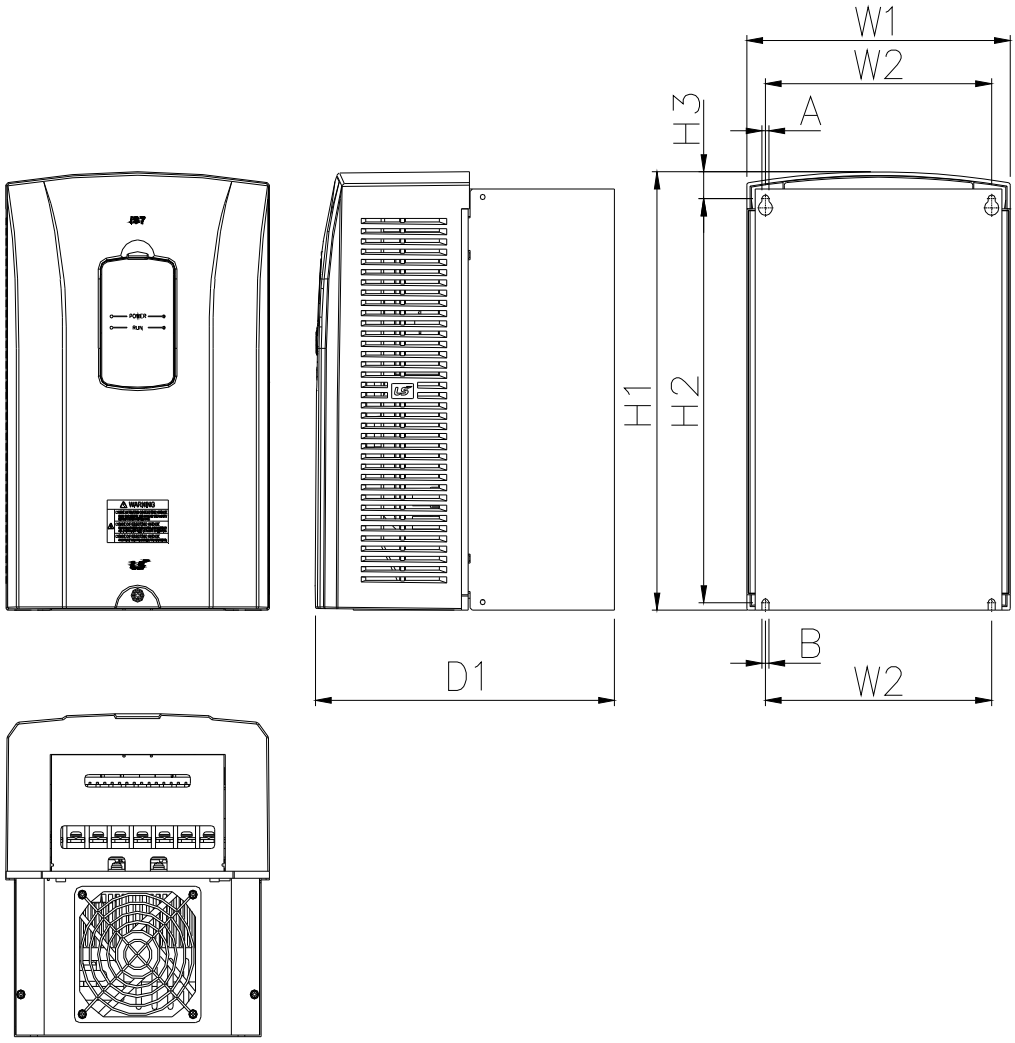




mm(inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0055~0075 iS7 - 2/4	200(7.87)	176(6.92)	355(13.97)	327(12.87)	19(0.74)	225(8.85)	5(0.19)	5(0.19)

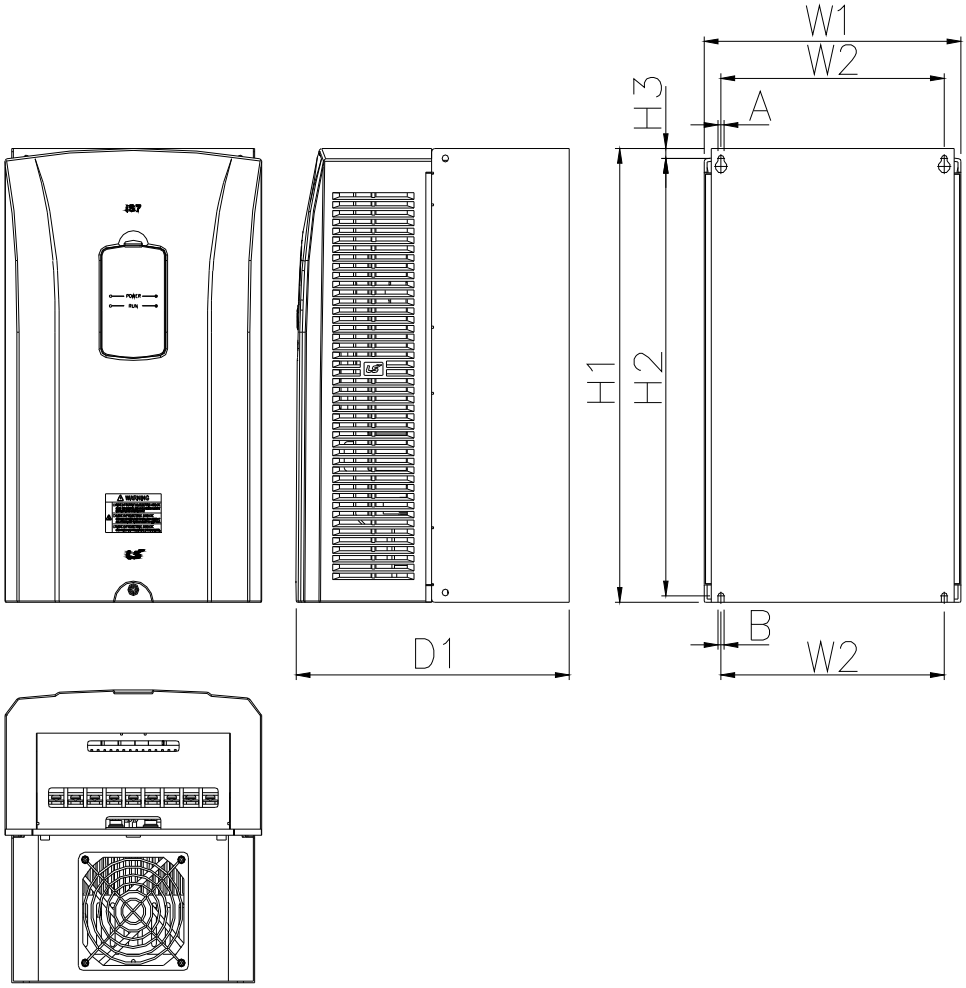
3) SV0110-0150iS7 (200V/400V)



mm(inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0110~0150 iS7- 2/4	250(9.84)	214.6(8.44)	385(15.15)	355(13.97)	23.6(0.92)	284(11.18)	6.5(0.25)	6.5(0.25)

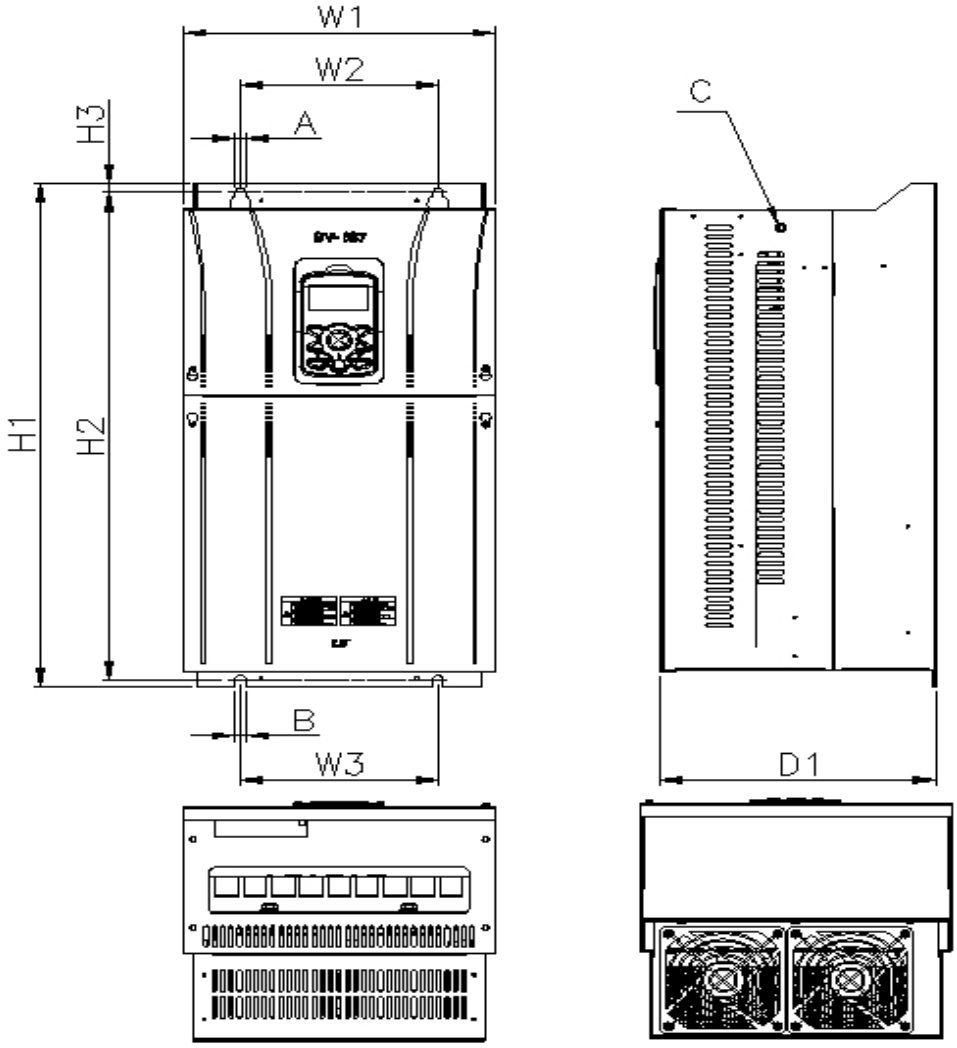
4) SV0185-0220iS7 (200V/400V)



mm (inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0185~0220 iS7- 2/4	280(11.02)	243.5(9.58)	461.6(18.17)	445(17.51)	10.1(0.39)	298(11.73)	6.5(0.25)	6.5(0.25)

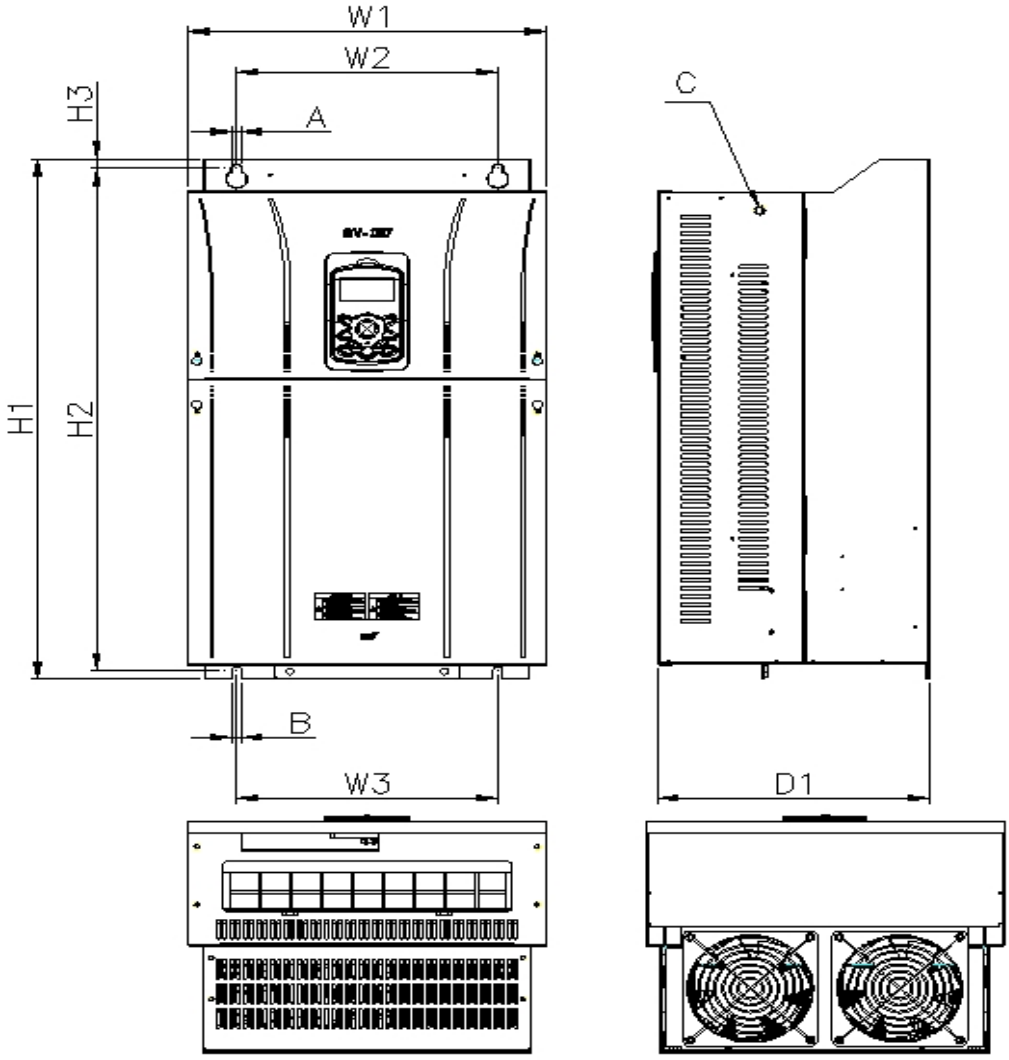
5) SV0300-iS7 (200V, IP00 Type)



mm (inches)

Inverter capacity	W1	W2/W3	H1	H2	H3	D1	A	B	C
SV0300 iS7-2	300 (11.81)	190 (7.48)	570 (22.44)	552 (21.73)	10 (0.39)	265.2 (10.44)	10 (0.39)	10 (0.39)	M8

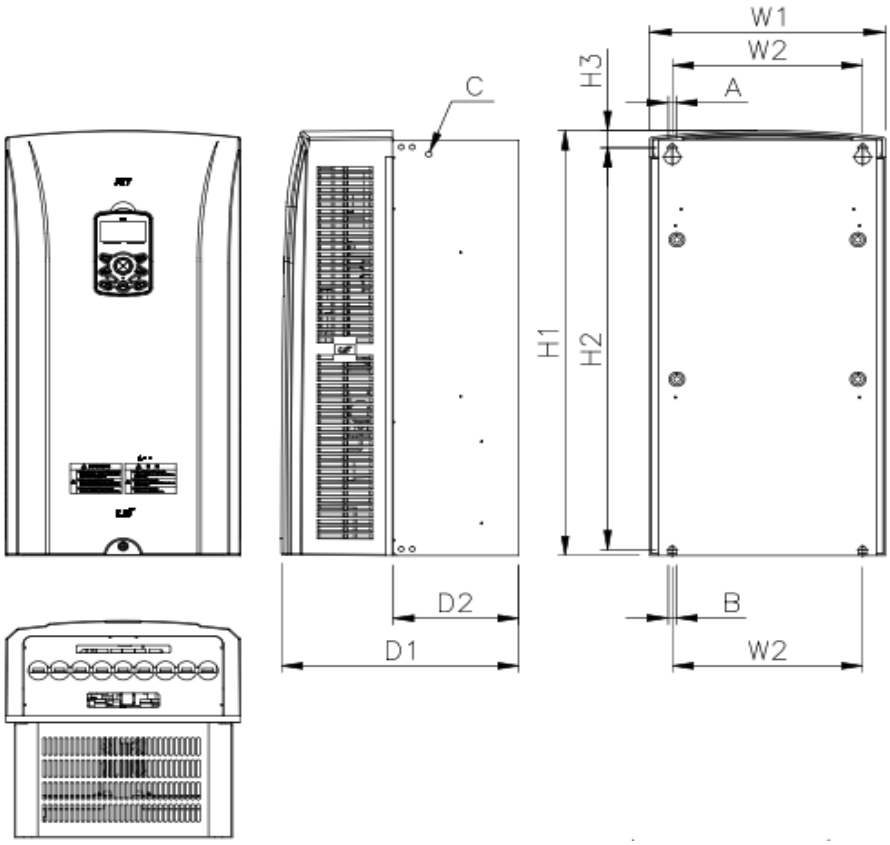
6) SV0370-0450iS7 (200V, IP00 Type)



mm (inches)

Inverter capacity	W1	W2/W3	H1	H2	H3	D1	A	B	C
SV0370~0450 iS7-2	370 (14.56)	270 (10.63)	630 (24.8)	609 (23.97)	11 (0.43)	281.2 (11.07)	10 (0.39)	10 (0.39)	M10

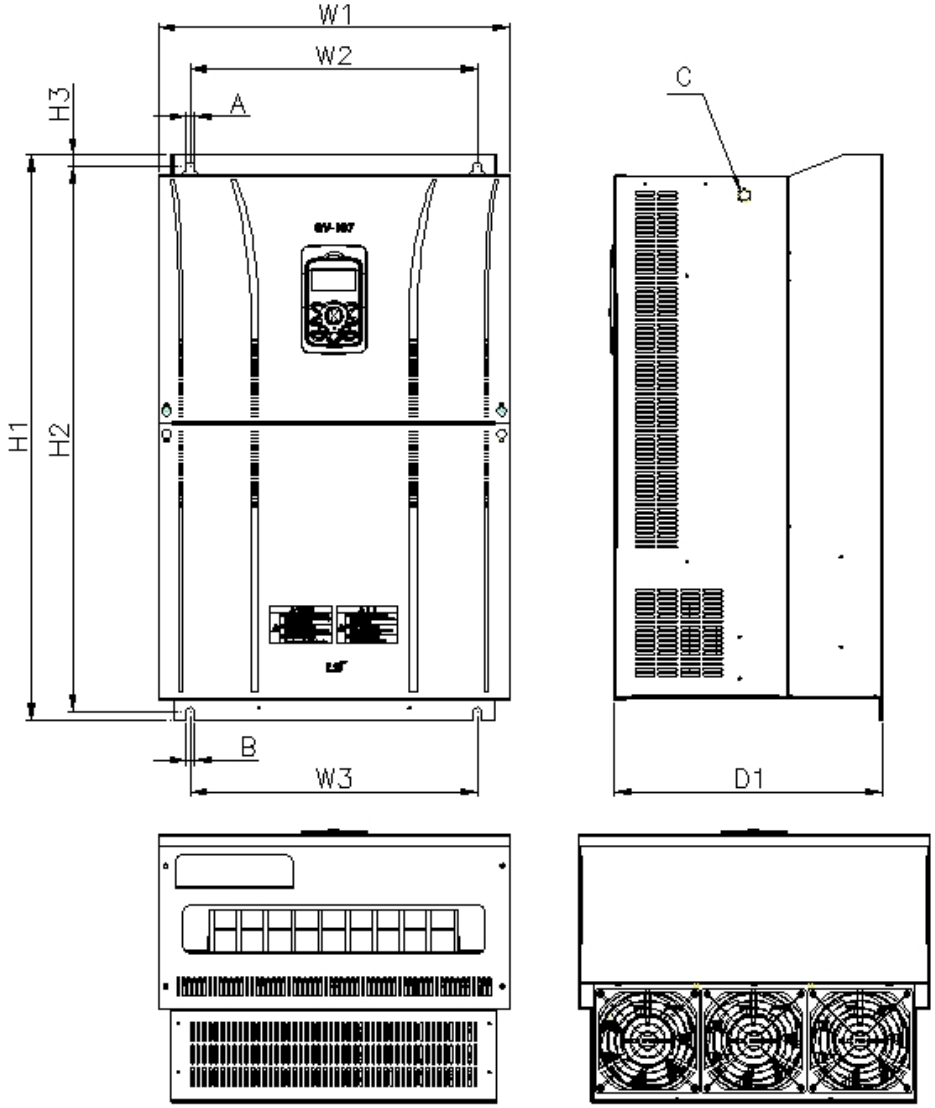
7) SV0300-0450iS7 (400V)



mm (inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	D2	A	B	C
SV0300~0450 iS7-4	300.1 (11.81)	242.8 (9.55)	594.1 (23.38)	562 (22.12)	24.1 (0.94)	DCR Type		10 (0.39)	10 (0.39)	M8
						303.2 (11.93)	303.2 (11.93)			
						Non-DCR Type				
						271.2 (10.67)	271.2 (10.67)			

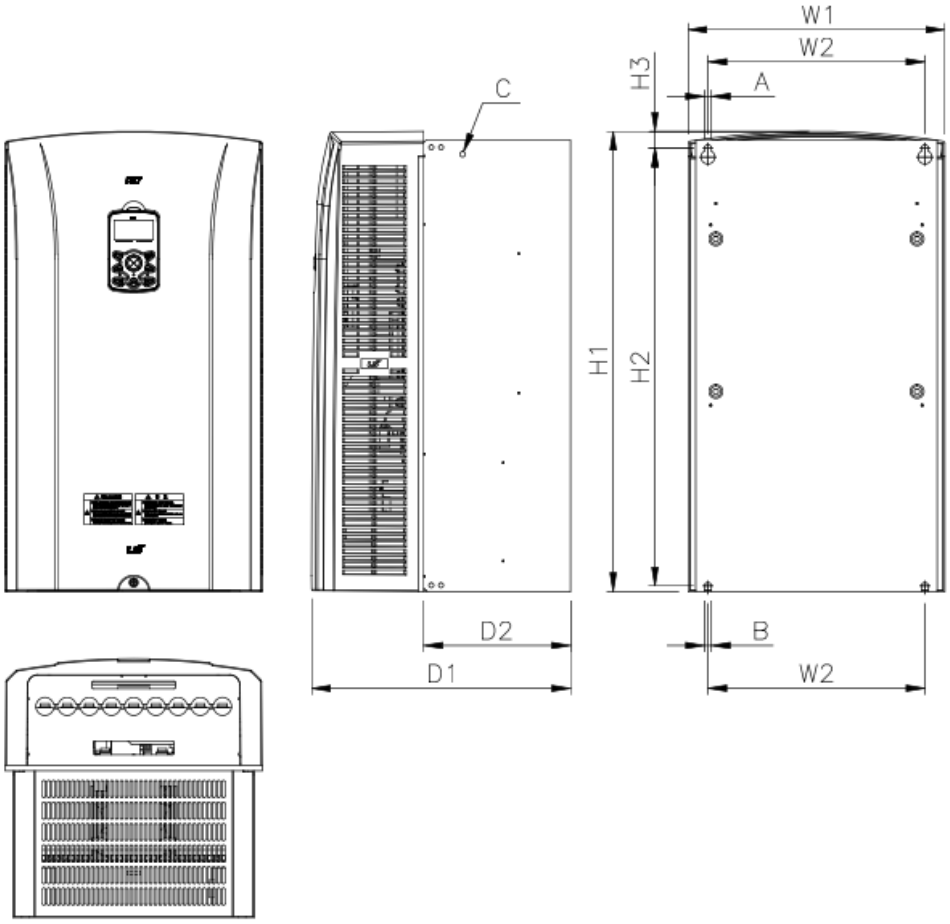
8) SV0550-0750iS7 (200V, IP00 Type)



mm(inches)

Inverter capacity	W1	W2/W3	H1	H2	H3	D1	A	B	C
SV0550~0750 iS7-2	465 (18.3)	381 (15.0)	750 (29.52)	723.5 (28.48)	15.5 (0.61)	355.6 (14.0)	11 (0.43)	11 (0.43)	M16

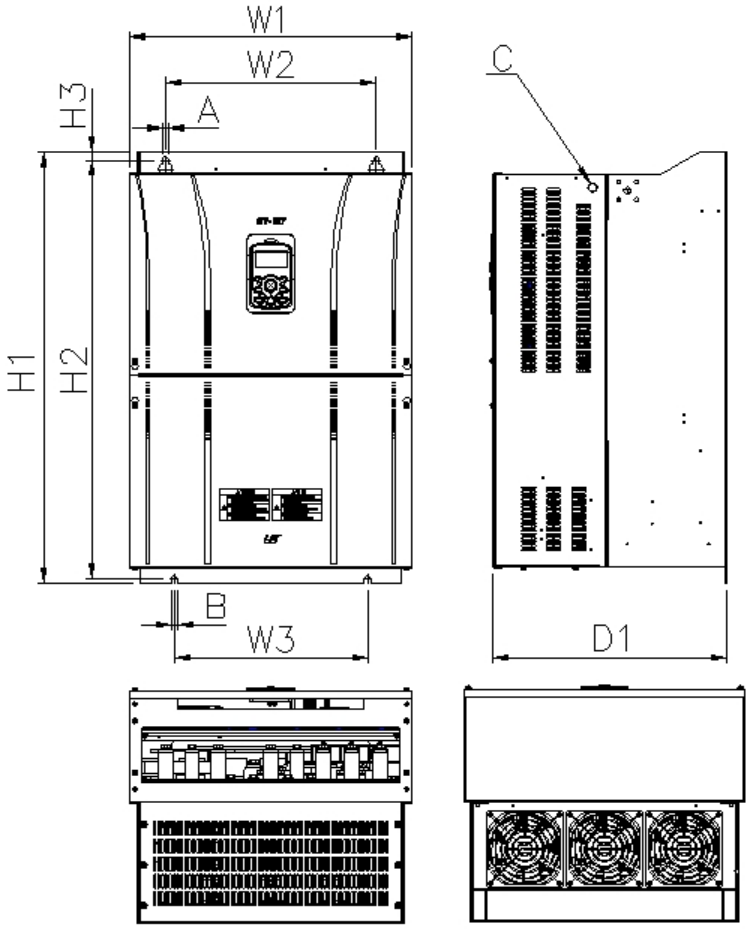
9) SV0550-0750iS7 (400V)



mm (inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	D2	A	B	C
SV0550~0750 iS7-4	370.1 (14.57)	312.8 (12.31)	663.5 (26.12)	631.4 (24.85)	24.1 (0.94)	DCR Type		10 (0.39)	10 (0.39)	M8
						373.3 (14.69)	211.5 (8.32)			
						Non-DCR Type				
						312.4 (12.29)	150.6 (5.92)			

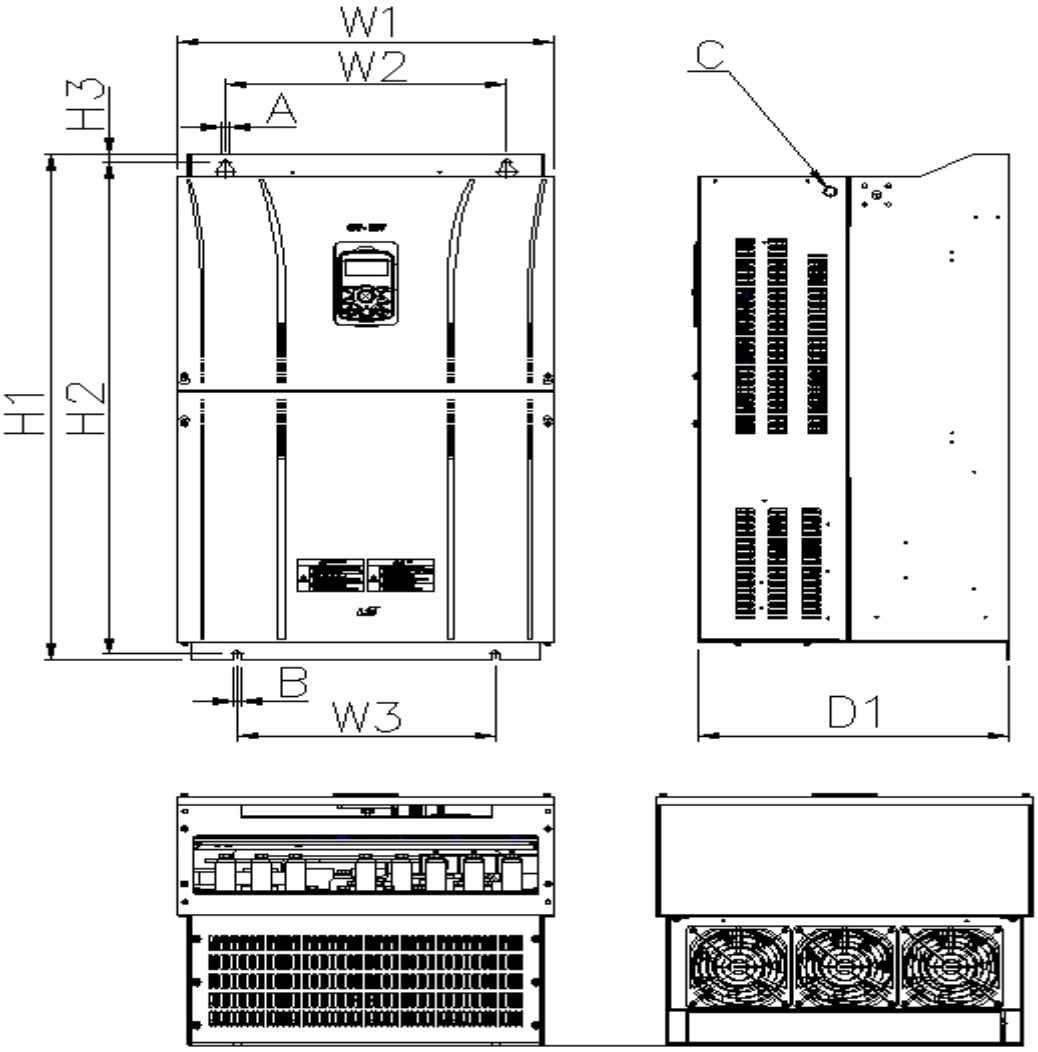
10) SV0900-1100iS7 (400V, IP00 Type)



mm (inches)

Inverter capacity	W1	W2	W3	H1	H2	H3	D1	A	B	C
SV0900~1100 iS7-4	510 (20.07)	381 (15.0)	350 (13.77)	783.5 (30.84)	759 (29.88)	15.5 (0.61)	422.6 (16.63)	11 (0.43)	11 (0.43)	M16

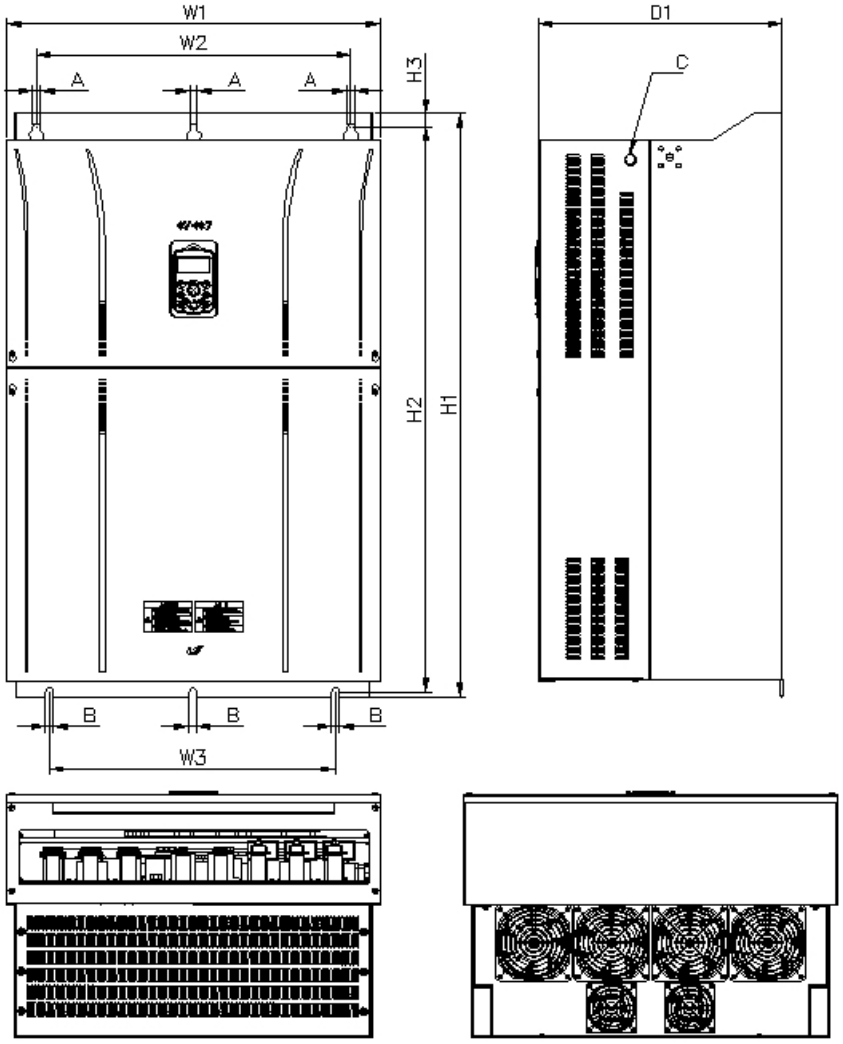
11) SV1320-1600iS7 (400V, IP00 Type)



mm (inches)

Inverter capacity	W1	W2	W3	H1	H2	H3	D1	A	B	C
SV1320~1600 iS7-4	510 (20.07)	381 (15.0)	350 (13.77)	861 (33.89)	836 (32.93)	15.5 (0.61)	422.6 (16.63)	11 (0.43)	11 (0.43)	M16

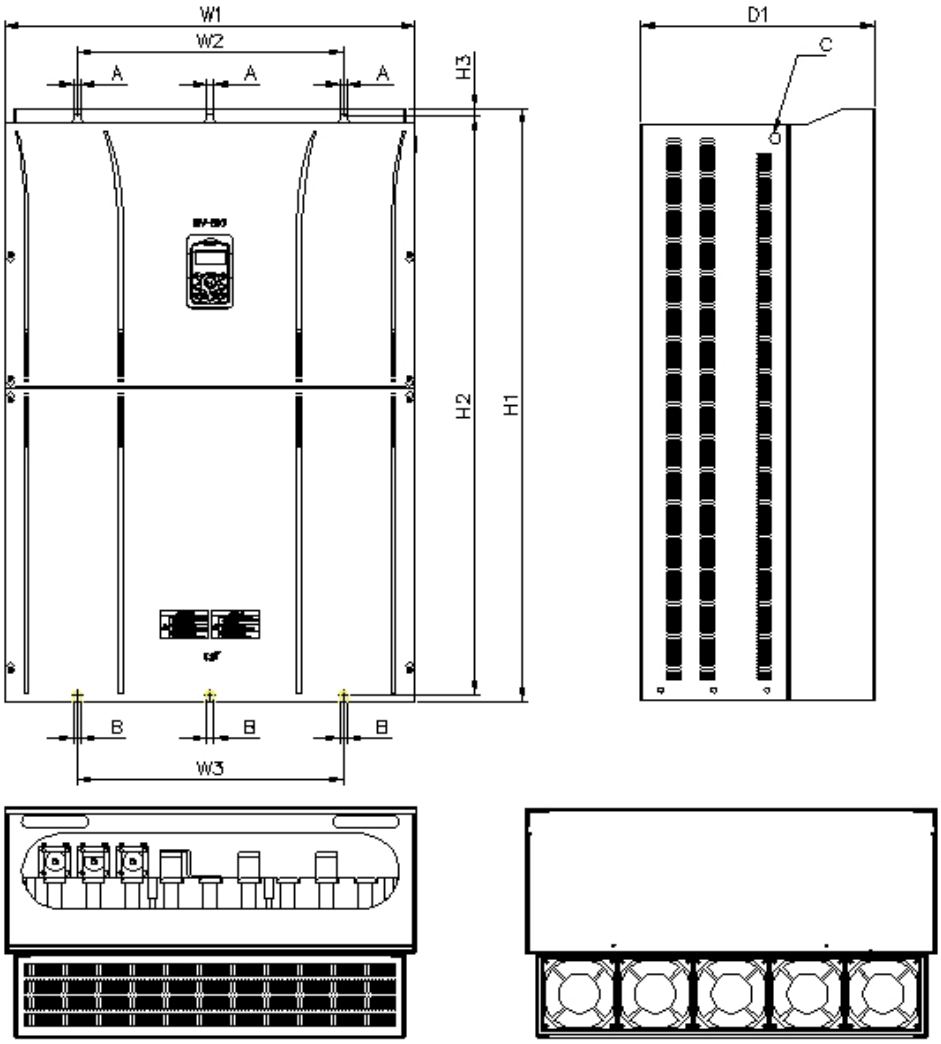
12) SV1850-2200iS7 (400V, IP00 Type)



mm (inches)

Inverter capacity	W1	W2	W3	H1	H2	H3	D1	A	B	C
SV1850/ 2200iS7-4	690 (27.16)	581 (22.87)	528 (20.79)	1078 (42.44)	1043.5 (41.08)	25.5 (1.00)	450 (17.72)	14 (0.55)	15 (0.59)	M20

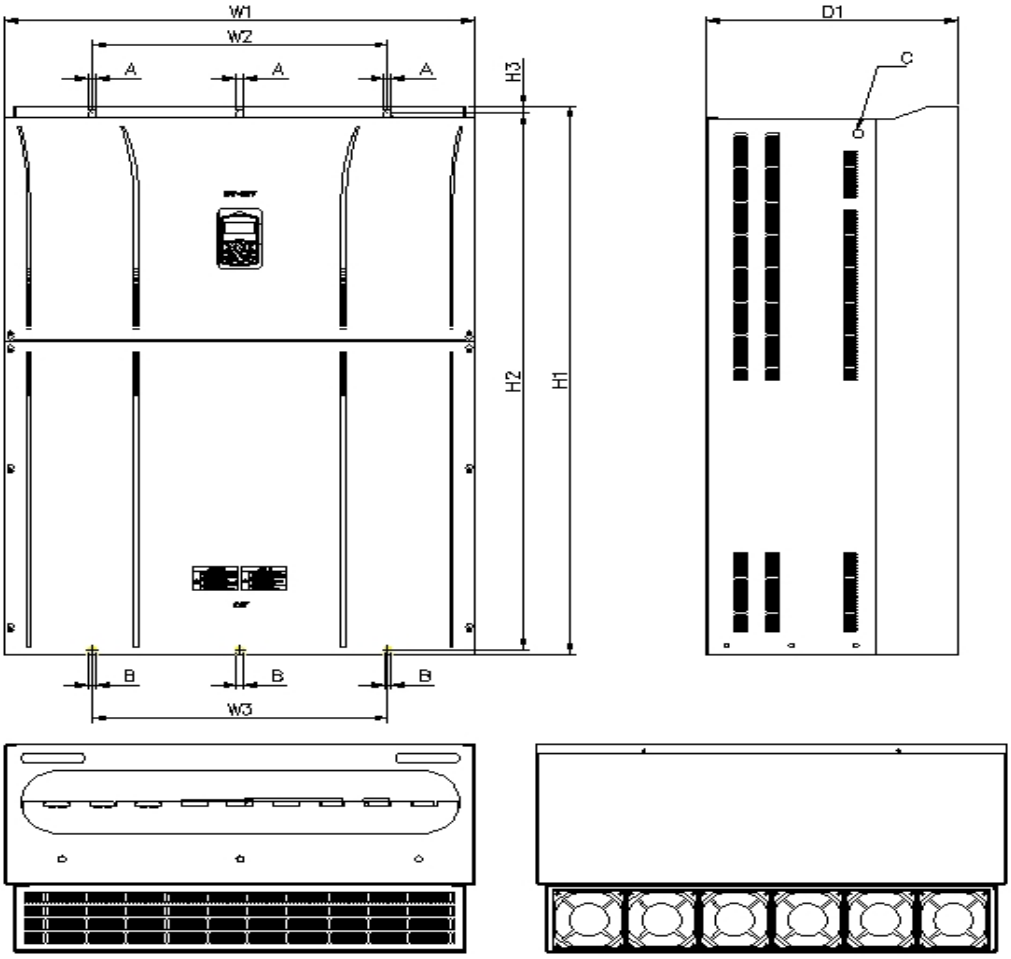
13) SV2800iS7 (400V, IP00 Type)



mm (inches)

Inverter capacity	W1	W2	W3	H1	H2	H3	D1	A	B	C
SV2800iS7-4	771 (30.35)	500 (19.69)	500 (19.69)	1138 (44.80)	1110 (43.70)	15 (0.59)	440 (17.32)	13 (0.51)	13 (0.51)	M16

14) SV3150-3750iS7 (400V, IP00 Type)

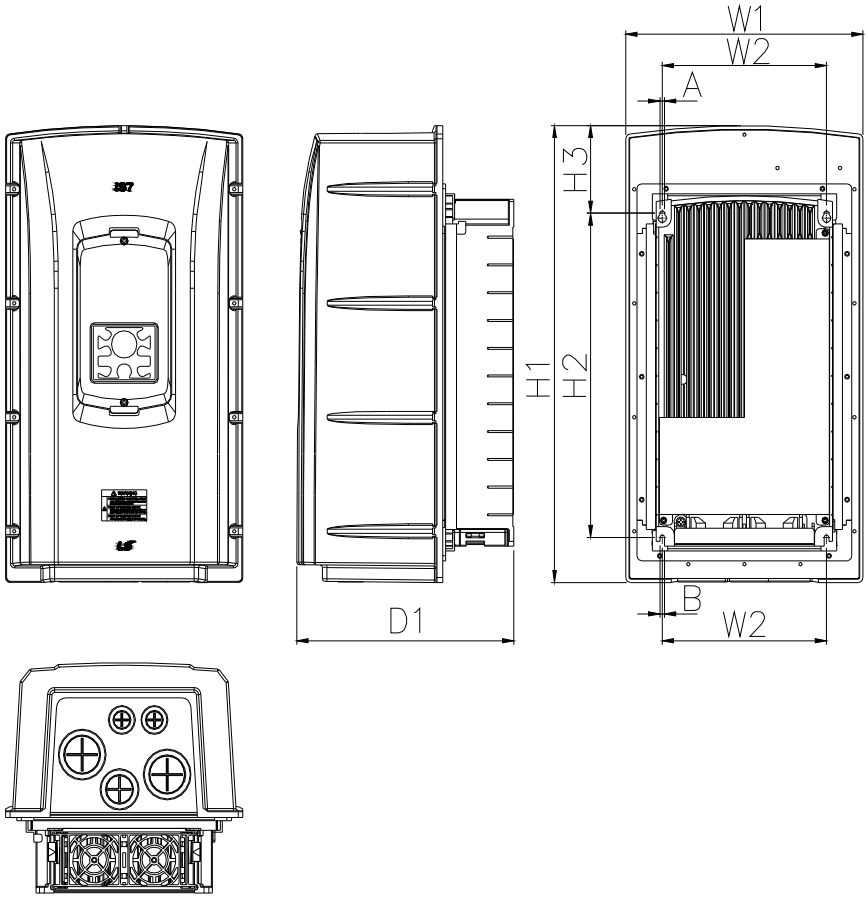


mm (inches)

Inverter capacity	W1	W2	W3	H1	H2	H3	D1	A	B	C
SV3150/ 3750iS7-4	922 (36.30)	580 (22.83)	580 (22.83)	1302.5 (51.28)	1271.5 (50.06)	15 (0.59)	495 (19.49)	14 (0.55)	14 (0.55)	M16

5.6 External dimension (UL Enclosed Type12, IP54 Type)

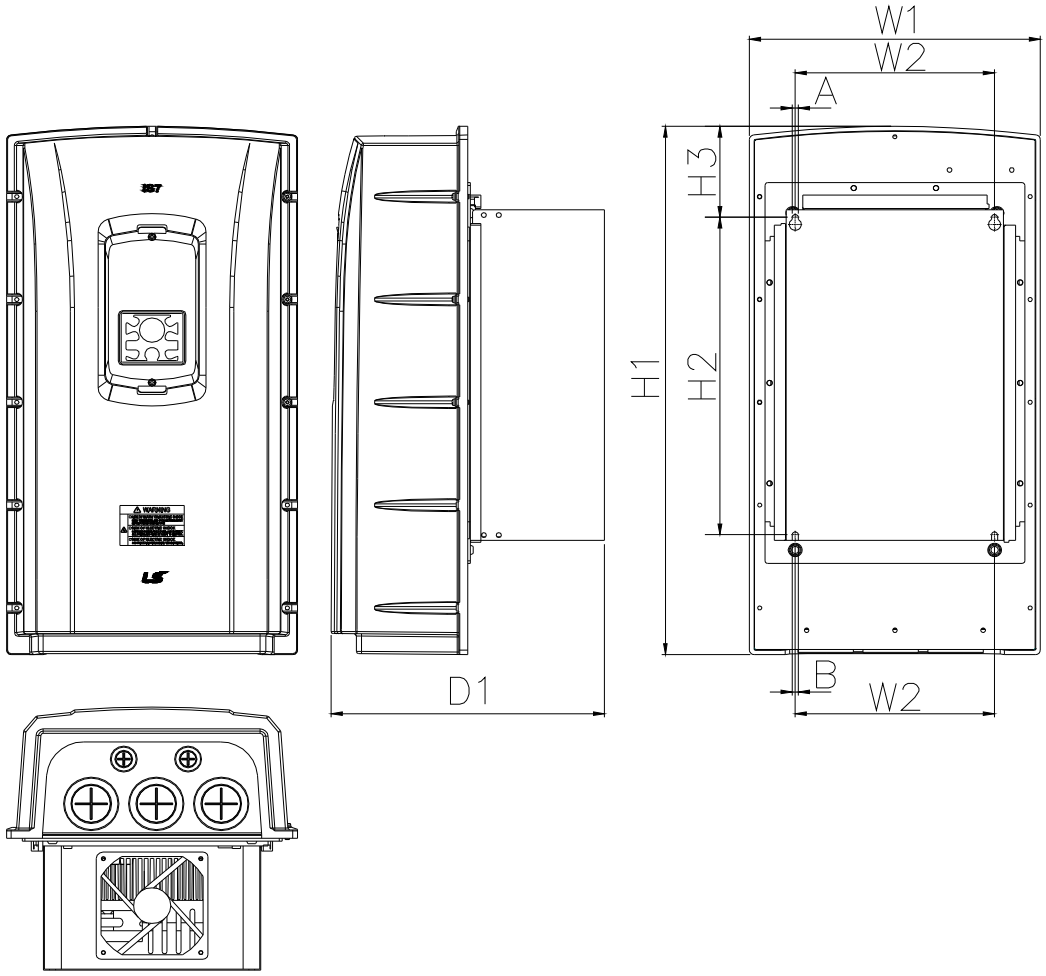
1) SV0008-0037iS7 (200V/400V)



mm (inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0008~0037 iS7-2/4	204.2 (8.03)	127 (5.0)	419 (16.49)	257 (10.11)	95.1 (3.74)	208 (8.18)	5 (0.19)	5 (0.19)

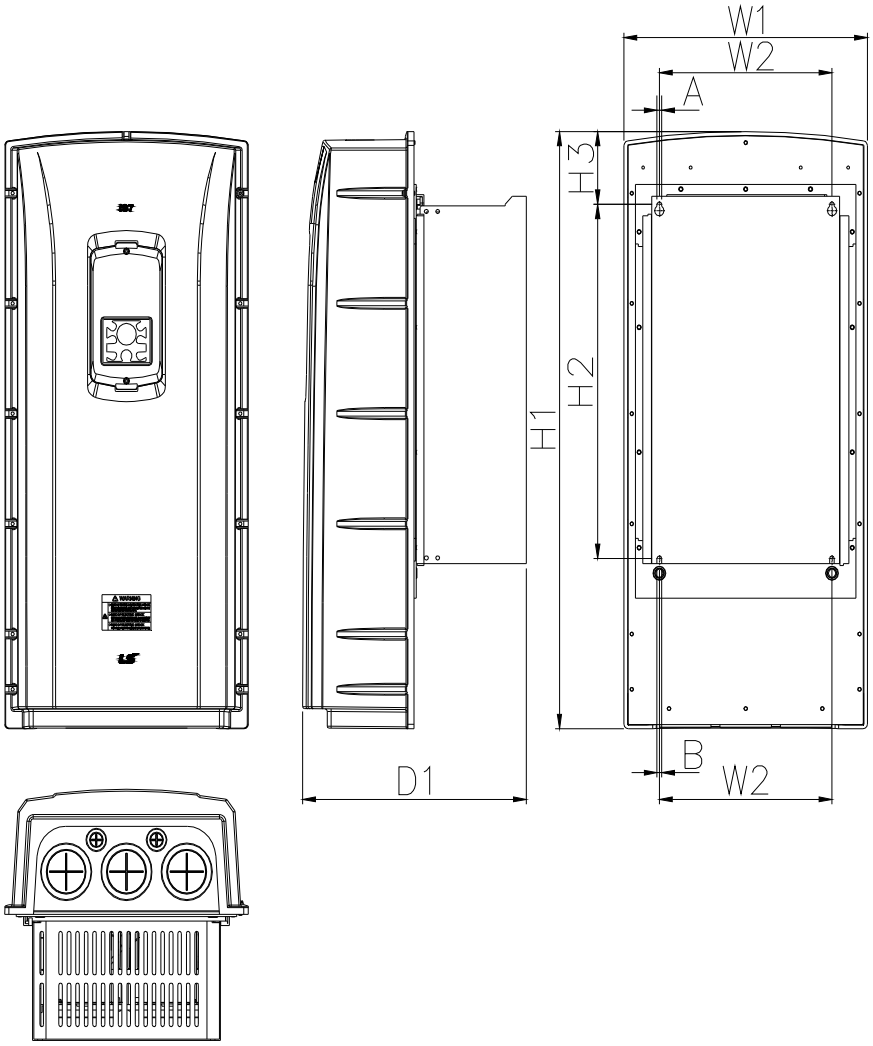
2) SV0055-0075iS7 (200V/400V)



mm (inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0055~0075 iS7- 2/4	254 (10.0)	176 (6.92)	460.6 (18.13)	327 (12.87)	88.1 (3.46)	232.3 (9.14)	5 (0.19)	5 (0.19)

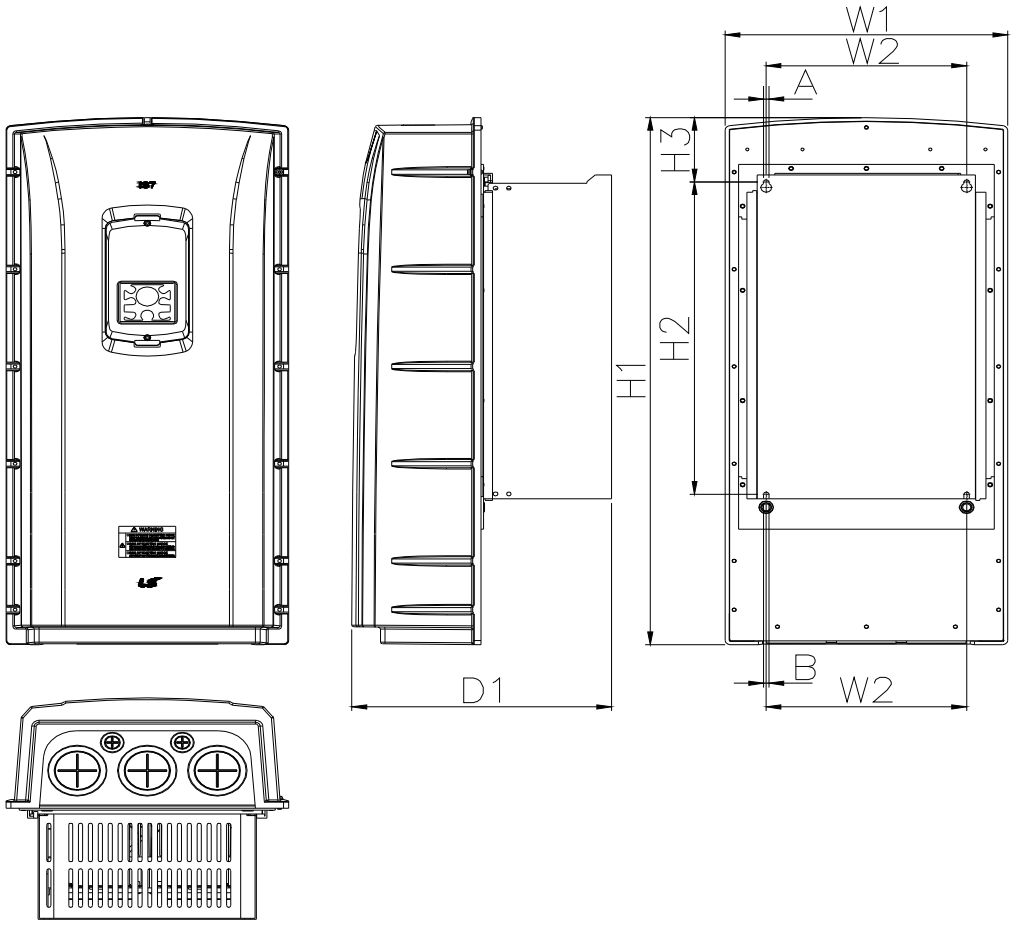
3) SV0110-0150iS7 (200V/400V)



mm (inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0110~0150 iS7-2/4	313.1 (12.32)	214.6 (8.44)	590.8 (23.25)	355 (13.97)	101.7 (4.0)	294.4 (11.59)	6.5 (0.25)	6.5 (0.25)

4) SV0185-0220iS7 (200V/400V)



mm (inches)

Inverter capacity	W1	W2	H1	H2	H3	D1	A	B
SV0185~0220 iS7-2/4	343.2 (13.51)	243.5 (9.58)	750.8 (29.55)	445 (17.51)	91.6 (3.60)	315.5 (12.42)	6.5 (0.25)	6.5 (0.25)

5.7 Peripheral Devices

Compatible Circuit Breaker, Leakage Breaker and Magnetic Contactor Models (manufactured by LSIS)

Inverter Capacity[kW]		Circuit Breaker				Leakage Breaker		Magnetic Contactor	
		METASOL		SUSOL					
		Model	[A]	Model	[A]	Model	[A]	Model	[A]
200V	0008iS7-2	ABS33c	15	UTE100	15	EBS33c	15	MC-9b	11
	0015iS7-2	ABS33c	15	UTE100	15	EBS33c	15	MC-12b	13
	0022iS7-2	ABS33c	30	UTE100	30	EBS33c	30	MC-18b	18
	0037iS7-2	ABS33c	30	UTE100	30	EBS33c	30	MC-32a	32
	0055iS7-2	ABS53c	50	UTS150	50	EBS53c	50	MC-40a	40
	0075iS7-2	ABS63c	60	UTS150	60	EBS63c	60	MC-50a	55
	0110iS7-2	ABS103c	100	UTS150	100	EBS103c	100	MC-65a	65
	0150iS7-2	ABS103c	125	UTS150	125	EBS203c	125	MC-100a	105
	0185iS7-2	ABS203c	150	UTS150	150	EBS203c	150	MC-130a	130
	0220iS7-2	ABS203c	175	UTS250	175	EBS203c	175	MC-150a	150
	0300iS7-2	ABS203c	225	UTS250	225	EBS203c	225	MC-150a	150
	0370iS7-2	ABS403c	300	UTS400	300	EBS403c	300	MC-225a	225
	0450iS7-2	ABS403c	350	UTS400	350	EBS403c	350	MC-330a	330
	0550iS7-2	ABS603c	500	UTS600	500	EBS603c	500	MC-400a	400
	0750iS7-2	ABS603c	630	UTS600	600	EBS603c	630	MC-630a	630
400V	0008iS7-4	ABS33c	15	UTE100	15	EBS33c	15	MC-9b	9
	0015iS7-4	ABS33c	15	UTE100	15	EBS33c	15	MC-9b	9
	0022iS7-4	ABS33c	15	UTE100	15	EBS33c	15	MC-12b	12
	0037iS7-4	ABS33c	15	UTE100	15	EBS33c	15	MC-18b	18
	0055iS7-4	ABS33c	30	UTE100	30	EBS33c	30	MC-22b	22
	0075iS7-4	ABS33c	30	UTE100	30	EBS33c	30	MC-32a	32
	0110iS7-4	ABS53c	50	UTS150	50	EBS53c	50	MC-40a	40
	0150iS7-4	ABS63c	60	UTS150	60	EBS63c	60	MC-50a	50
	0185iS7-4	ABS103c	80	UTS150	80	EBS103c	75	MC-65a	65
	0220iS7-4	ABS103c	100	UTS150	100	EBS103c	100	MC-65a	65
	0300iS7-4	ABS103c	125	UTS150	125	EBS203c	125	MC-100a	105
	0370iS7-4	ABS203c	150	UTS150	150	EBS203c	150	MC-130a	130
	0450iS7-4	ABS203c	175	UTS250	175	EBS203c	175	MC-150a	150
	0550iS7-4	ABS203c	225	UTS250	225	EBS203c	225	MC-185a	185
	0750iS7-4	ABS403c	300	UTS400	300	EBS403c	300	MC-225a	225
	0900iS7-4	ABS403c	400	UTS400	400	EBS403c	400	MC-330a	330
	1100iS7-4	ABS603c	500	UTS600	500	EBS603c	500	MC-400a	400
	1320iS7-4	ABS603c	630	UTS600	600	EBS603c	630	MC-400a	400
	1600iS7-4	ABS603c	630	UTS600	600	EBS603c	630	MC-630a	630
	1850iS7-4	ABS803c	800	UTS800	800	EBS803c	800	MC-630a	630
	2200iS7-4	ABS803c	800	UTS800	800	EBS803c	800	MC-800a	800
	2800iS7-4	ABS1003b	1000	UTS1200	1000	EBS1003c	1000	1000A	1000
	3150iS7-4	ABS1203b	1200	UTS1200	1200	EBS1203c	1200	1200A	1200
	3750iS7-4	1400A	1400	1400A	1400	1400A	1400	1400A	1400

Maximum allowed prospective short-circuit current at the input power connection is defined in IEC 60439-1 as 100 kA. SV-IS7 is suitable for use in a circuit capable of delivering not more than 100kA RMS at the drive's maximum rated voltage, depending on the selected MCCB. RMS symmetrical amperes for recommended MCCB are the following table.

5.8 Reactors, Braking Resistor and Fuse Specifications

Caution

(1) If you apply the recommended reactor, More than 85% power factor and THD 40% less operation is possible in generally power environment. However, the condition is based on the rated load. Improvement in the case of light load is reduced.
(2) During operation, the input power factor and harmonic wave is affected by the impedance of the line
Therefore, even applying the reactor, the input power factor and THD improvement can be lowered than the displayed in (1) by the installed transformer capacity, the transformer impedance, line length
(3) Generally, the higher the value of the inductance L of applied reactor, improvement of power factor and harmonic effects increases. But loss due to voltage drop will increase. Therefore, use the recommended reactor.
(4) IS7 has a mounted DC reactor products based on the Normal Duty load factor. In operation Heavy Duty, Improvement may be lower than the displayed in (1)

IS7 200V 30 ~ 75kW, 400V 280 ~ 375kW capacity products does not have a built-in DC reactor. If you wish to use the product by applying a DC reactor, please refer to the specifications of the DC reactor.

Specifications of the DC reactor

Capacity of inverter	Specifications of the DC reactor	
	mH	A
0300iS7-2	0.24	200
0370iS7-2	0.2	240
0450iS7-2	0.17	280
0550iS7-2	0.12	360
0750iS7-2	0.1	500

Capacity of inverter	Specifications of the DC reactor	
	mH	A
2800iS7-4	0.09	836

3150iS7-4	0.076	996
3750iS7-4	0.064	1195

Specifications of the AC reactor

Capacity of inverter	Specifications of the AC reactor			
	Heavy Duty		Normal Duty	
	mH	A	mH	A
0008iS7-2	2.13	5.7	1.20	10
0015iS7-2	1.20	10	0.88	14
0022iS7-2	0.88	14	0.56	20
0037iS7-2	0.56	20	0.39	30
0055iS7-2	0.39	30	0.28	40
0075iS7-2	0.28	40	0.20	59
0110iS7-2	0.20	59	0.15	75
0150iS7-2	0.15	75	0.12	96
0185iS7-2	0.12	96	0.10	112
0220iS7-2	0.10	112	0.07	160
0300iS7-2	0.07	160	0.05	200
0370iS7-2	0.05	200	0.044	240
0450iS7-2	0.044	240	0.038	280
0550iS7-2	0.038	280	0.026	360
0750iS7-2	0.026	360	0.02	500

Capacity of inverter	Specifications of the AC reactor			
	Heavy Duty		Normal Duty	
	mH	A	mH	A
0008iS7-4	8.63	2.8	4.81	4.8
0015iS7-4	4.81	4.8	3.23	7.5
0022iS7-4	3.23	7.5	2.34	10
0037iS7-4	2.34	10	1.22	15
0055iS7-4	1.22	15	1.14	20
0075iS7-4	1.14	20	0.81	30
0110iS7-4	0.81	30	0.61	38
0150iS7-4	0.61	38	0.45	50
0185iS7-4	0.45	50	0.39	58
0220iS7-4	0.39	58	0.287	80
0300iS7-4	0.287	80	0.232	98
0370iS7-4	0.232	98	0.195	118
0450iS7-4	0.195	118	0.157	142
0550iS7-4	0.157	142	0.122	196
0750iS7-4	0.122	196	0.096	237
0900iS7-4	0.096	237	0.081	289
1100iS7-4	0.081	289	0.069	341
1320iS7-4	0.069	341	0.057	420
1600iS7-4	0.057	420	0.042	558
1850iS7-4	0.042	558	0.042	558
2200iS7-4	0.042	558	0.029	799
2800iS7-4	0.029	799	0.029	799
3150iS7-4	0.029	799	0.024	952
3750iS7-4	0.024	952	0.024	952

5.9 Braking Resistor and Fuse Specifications

Product (kW)		Braking Resistor		Fuse	
		Resistor (Ω)	Rated Capacity (W)	Current (A)	Voltage (V)
3-Phase 200 V	0.75	150	150	10	500
	1.5	60	300	15	
	2.2	50	400	20	
	3.7	33	600	32	
	5.5	20	800	50	
	7.5	15	1200	63	
	11	10	2400	80	
	15	8	2400	100	
	18.5	5	3600	125	
	22	5	3600	160	
	30	5	5000	200	
	37	4.5	7000	250	
	45	3.5	10000	350	
	55	3.0	15000	400	
	75	2.5	20000	450	
3-Phase 400 V	0.75	600	150	10	
	1.5	300	300	10	
	2.2	200	400	15	
	3.7	130	600	20	
	5.5	85	1000	32	
	7.5	60	1200	35	
	11	40	2000	50	
	15	30	2400	63	
	18.5	20	3600	70	
	22	20	3600	100	
	30	12	5000	125	

Product (kW)		Braking Resistor		Fuse	
	37	12	5000	125	500V
	45	6	10000	160	
	55	6	10000	200	
	75	6	10000	250	
	90	4.5	15000	350	
	110	3.5	17000	400	
	132	3.0	20000	450	
	160	2.5	25000	450	
	185	2	30000	620	
	220	2	30000	800	
	280	1.5	40000	1000	
	315	1	60000	1200	
	375	1	60000	1400	

The standard for braking torque is 150% and the working rate (%ED) is 5%. If the working rate is 10%, the rated capacity for braking resistance must be calculated at twice the standard.

6 Warranty

Warranty Information

Fill in this warranty information form and keep this page for future reference or when warranty service may be required.

Product Name	LSIS Standard Inverter	Date of Installation	
Model Name	SV-IS7	Warranty Period	
Customer Info	Name (or company)		
	Address		
	Contact Info.		
Retailer Info	Name		
	Address		
	Contact info.		

Warranty Period

The product warranty covers product malfunctions, under normal operating conditions, for 12 months from the date of installation. If the date of installation is unknown, the product warranty is valid for 18 months from the date of manufacturing. Please note that the product warranty terms may vary depending on purchase or installation contracts.

Warranty Service Information

During the product warranty period, warranty service (free of charge) is provided for product malfunctions caused under normal operating conditions. For warranty service, contact an official LSIS agent or service center.

Non-Warranty Service

A service fee will be incurred for malfunctions in the following cases:

- intentional abuse or negligence
- power supply problems or from other appliances being connected to the product
- acts of nature (fire, flood, earthquake, gas accidents etc.)
- modifications or repair by unauthorized persons
- missing authentic LSIS rating plates
- expired warranty period

Visit Our Website

Visit us at ***http://www.lsis.com*** for detailed service information.

7 Appendix

UL mark

The UL mark applies to products in the United States and Canada. This mark indicates that UL has tested and evaluated the products and determined that the products satisfy the UL standards for product safety. If a product received UL certification, this means that all components inside the product had been certified for UL standards as well.

Suitable for Installation in a Compartment Handing Conditioned Air

CE mark

The CE mark indicates that the products carrying this mark comply with European safety and environmental regulations. European standards include the Machinery Directive for machine manufacturers, the Low Voltage Directive for electronics manufacturers and the EMC guidelines for safe noise control.

Low Voltage Directive

We have confirmed that our products comply with the Low Voltage Directive (EN 61800-5-1).

EMC Directive

The Directive defines the requirements for immunity and emissions of electrical equipment used within the European Union. The EMC product standard (EN 61800-3) covers DK requirements stated for drives.