

- SV-iS7 is the official name for the iS7 series inverters.
- This operation manual is intended for users with basic knowledge of electricity and electric devices.
- Keep this manual near the product for future reference whenever setting change, maintenance or service is required.
- Ensure that the field operators and service engineers can easily access this manual.
- For detailed information about the optional extension boards, including the specifications and the requirements for installation and operation, refer to the instruction manuals that are supplied with the products.

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 which, 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 the high voltage terminals or the 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 a charge long after the power supply has been turned off. Use a multi-meter to make sure that the remaining voltage is below 30 VDC before working on the inverter, motor, or motor cable.

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.
- Do not use cables with damages or cracks on the protective insulation when wiring the inverter. Damaged insulation may cause misoperation, an electric shock or a fire.
- Do not place heavy objects on top of electric cables. Doing so may damage the cable and result in an electric shock.

Note

[English]

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

[French]

Le courant maximum de court-circuit présumé autorisé au connecteur d'alimentation électrique est défini dans la norme IEC 60439-1 comme égal à 100 kA. L'entraînement convient pour une utilisation dans un circuit capable de délivrer pas plus de 100 kA RMS à la tension nominale maximale de l'entraînement. Le tableau suivant indique le MCCB recommandé selon le courant RMS symétrique en ampères.

| | | | | | | |
|-----------------|-----------------|-------------------|-------------------|-------------------|---------|---------|
| Working Voltage | UTE100 (E/N) | UTS150 (N/H/L) | UTS250 (N/H/L) | UTS400 (N/H/L) | | |
| 240V(50/60Hz) | 50/65kA | 65/100/150kA | 65/100/150kA | 65/100/150kA | | |
| 480V(50/60Hz) | 25/35kA | 35/65/100kA | 35/65/100kA | 35/65/100kA | | |
| Working Voltage | ABS33c | ABS53c | ABS63c | ABS103c | ABS203c | ABS403c |
| 240V(50/60Hz) | 30kA | 35kA | 35kA | 85kA | 85kA | 75kA |
| 480V(50/60Hz) | 7.5kA | 10kA | 10kA | 26kA | 26kA | 35kA |

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1 About the Product

This chapter provides details on product identification and part names. To install the inverter correctly and safely, carefully read and follow the instructions.

1.1 Preparing for Installation and Operation

1.1.1 Identifying the Product

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.

The iS7 inverter is manufactured in a range of product groups based on drive capacity and power source specifications. The 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.

Model name
SV008iS7-2NOFDW

Power source specifications
INPUT 380-480V 3 Phase 50/60Hz
Heavy Duty : 26.6A, Normal Duty : 35.5A

Output specifications
OUTPUT 0-Input V 3 Phase 0.01-400Hz
Heavy Duty : 30A, Normal Duty : 39A
22.9kVA
Ser. No 550XXXXXXX
Inspected by D. K. YU
KCC-REM-LSR-XXXXXXX

SV 008 iS7-2 N O F D W

Motor capacity

| INV Model | Motor Capacity | |
|-----------|------------------|-----------------|
| | VT (Normal duty) | CT (Heavy duty) |
| 0008 | 1.5 [kW] | 0.75 [kW] |
| 0015 | 2.2 [kW] | 1.5 [kW] |
| 0022 | 3.7 [kW] | 2.2 [kW] |
| 0037 | 5.5 [kW] | 3.7 [kW] |
| 0055 | 7.5 [kW] | 5.5 [kW] |
| 0075 | 11 [kW] | 7.5 [kW] |
| 0110 | 15 [kW] | 11 [kW] |
| 0150 | 18.5 [kW] | 15 [kW] |
| 0185 | 22 [kW] | 18.5 [kW] |
| 0220 | 30 [kW] | 22 [kW] |
| 0300 | 37 [kW] | 30 [kW] |
| 0370 | 45 [kW] | 37 [kW] |
| 0450 | 55 [kW] | 45 [kW] |
| 0550 | 75 [kW] | 55 [kW] |
| 0750 | 90 [kW] | 75 [kW] |
| 0900 | 110 [kW] | 90 [kW] |
| 1100 | 132 [kW] | 110 [kW] |
| 1320 | 160 [kW] | 132 [kW] |
| 1600 | 185 [kW] | 160 [kW] |
| 1850 | 220 [kW] | 185 [kW] |
| 2200 | 280 [kW] | 220 [kW] |
| 2800 | 315 [kW] | 280 [kW] |
| 3150 | 375 [kW] | 315 [kW] |
| 3750 | 450 [kW] | 375 [kW] |

Series name

Application type
W - Web
S - Synchro
T - Safety
V - Marine class

DC Reactor or DB Resistor
- No built-in DC reactor nor DB resistor
D - Built-in DC reactor
R - Built-in DB resistor

EMC filter
- No-EMC
F - Built-in EMC

UL type
O - Open
E - Enclosed UL Type1
P - Enclosed UL Type 12

Keypad type
N - No keypad present
S - GLCD Keypad

Input voltage
2 - 3-phase 200-230 V
4 - 3-phase 380-480 V

Note1) Optional conduit parts are available for the Enclosed UL Type 1 models (0.75–75 kW products).

Note2) Built-in DB resistor is available only for the Web application models (0.75–3.7 kW products).

Note3) To use safety function, please buy 0.75-160kW product including safety option. However 185-375kW product users have to buy safety option and apply to standard products because safety option is not included.

1.1.2 Checking the Product for Defects or Damage

If you suspect that the product has been mishandled or damaged in any way, contact the LSELECTRIC Customer Support center with the phone numbers listed on the back cover of this manual.

1.1.3 Preparing the Product for Installation and Operation

Preparation steps for installation and operation may slightly vary by product type and application. Refer to the manual and prepare the product accordingly.

1.1.4 Installing the Product

Refer to the installation section of this manual and install the product correctly considering the installation and operating conditions at the installation location, such as installation clearances, to prevent premature deterioration or performance loss.

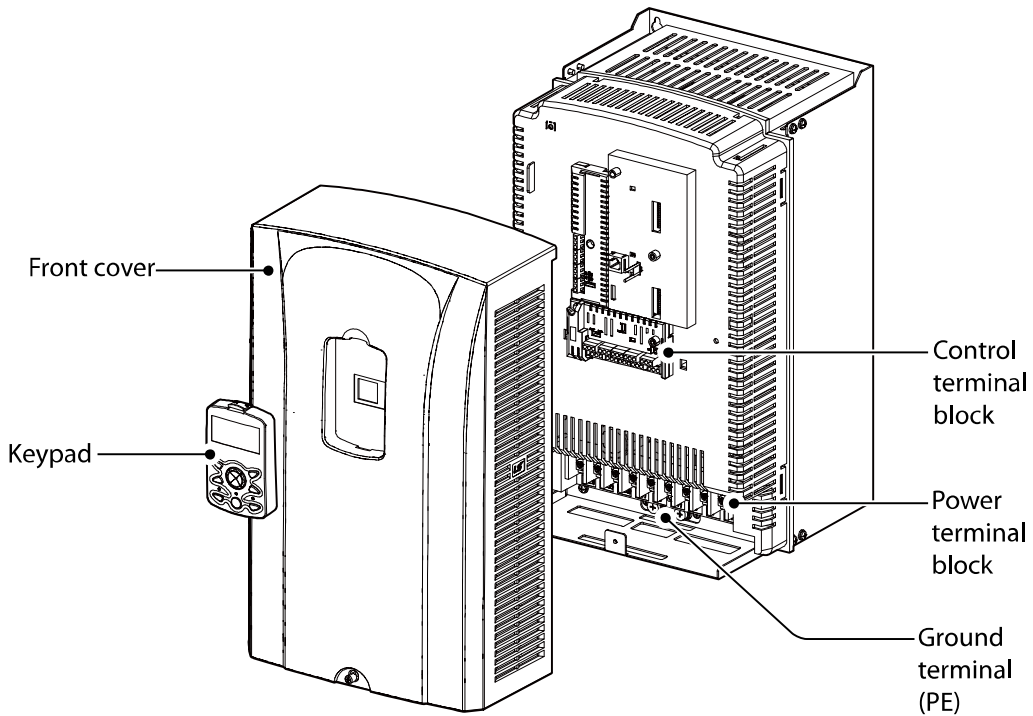
1.1.5 Connecting the Cables

Connect the power input/output and signal cables to the terminal block according to the instructions provided in this manual. Ensure that all the cables are connected correctly before supplying power to the product. Incorrect cable connections may damage the product.

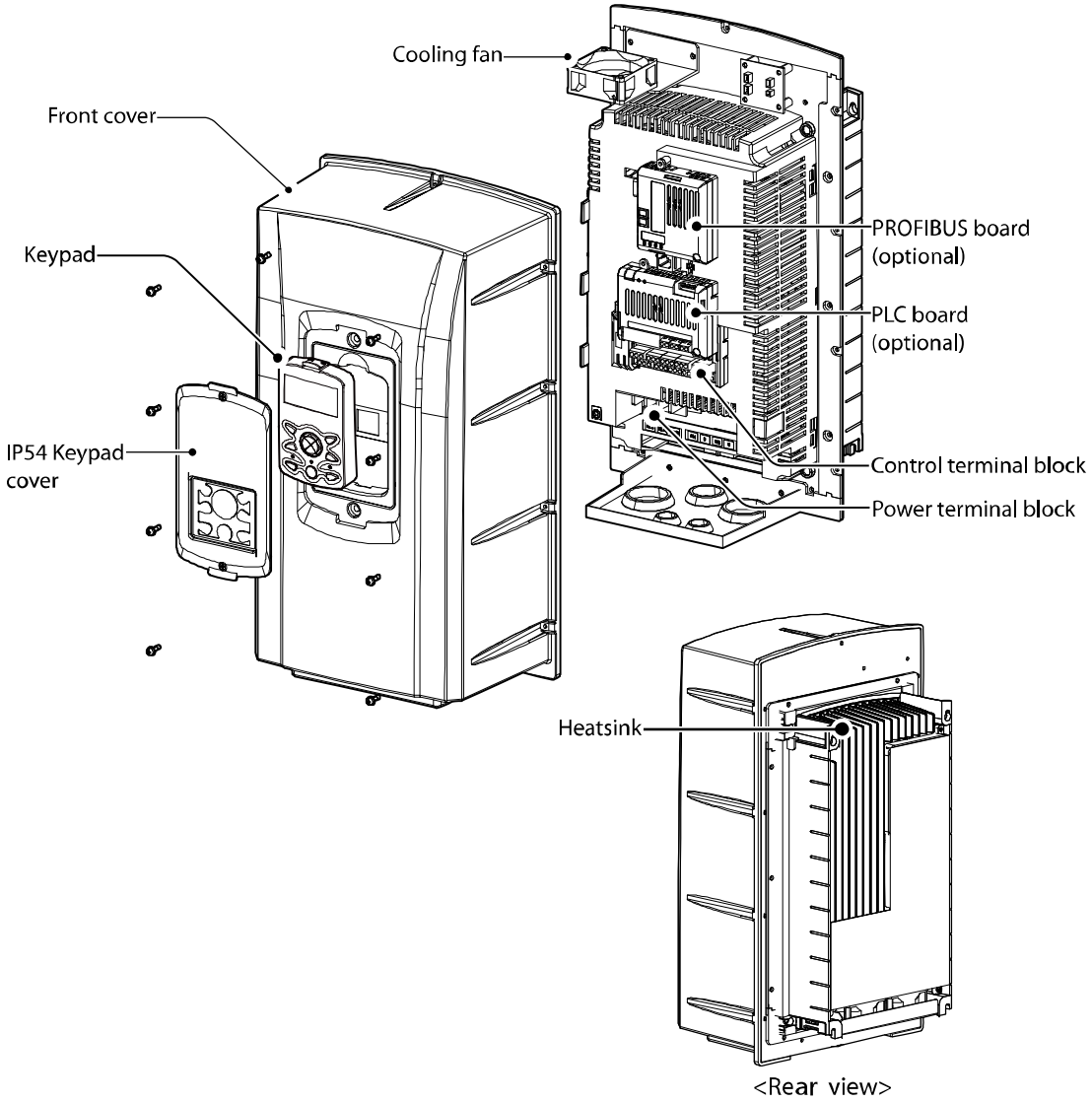
1.2 Part Names

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

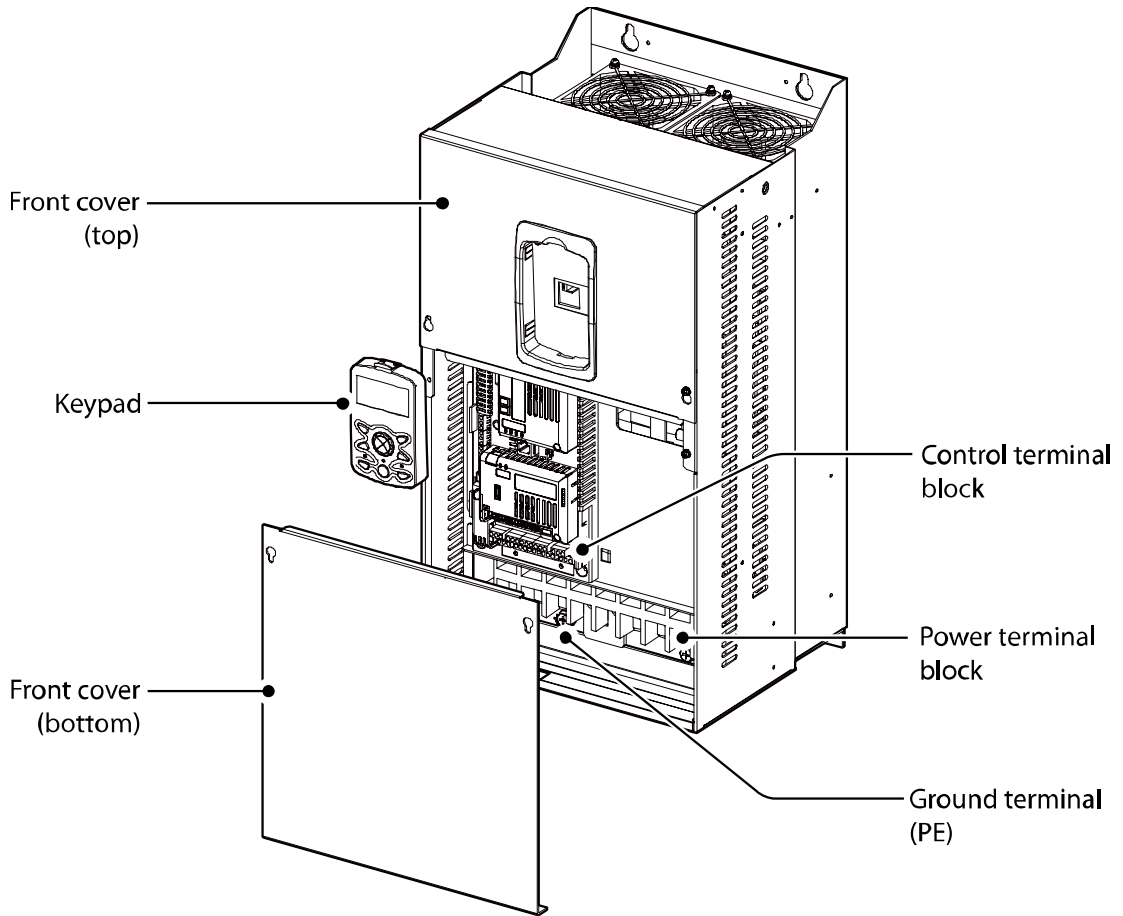
1.2.1 Interior and Exterior View (IP 21 Model Types Less than 22 kW [200 V] / Less than 75 kW [400 V])



1.2.2 Interior and Exterior View (IP 54 Model Types Less than 22 kW [200/400 V])



1.2.3 Interior and Exterior View (Model Types 30 kW and up [200 V] / 90 kW and up [400 V])



Note

Refer to the installation manual provided with the optional module products before installing communication modules in the inverter.

2 Technical Specifications

2.1 Input and Output Specifications 200 V Class (0.75–22 kW)

| Model SV xxx iS7–2x | | | 0008 | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0185 | 0220 | |
|---------------------|----------------------|-------------|---|------|------|------|------|------|------|------|------|-------|--|
| Applied Motor | Normal load | HP | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | |
| | | kW | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | |
| | Heavy load | 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 | Rated Capacity (kVA) | | 1.9 | 3.0 | 4.5 | 6.1 | 9.1 | 12.2 | 17.5 | 22.9 | 28.2 | 33.5 | |
| | Rated Current (A) | Normal load | 8 | 12 | 16 | 24 | 32 | 46 | 60 | 74 | 88 | 124 | |
| | | Heavy load | 5 | 8 | 12 | 16 | 24 | 32 | 46 | 60 | 74 | 88 | |
| | Output Frequency | | 0–400 Hz (Sensorless-1: 0–300 Hz, Sensorless-2, Vector: 0.1–120 Hz) | | | | | | | | | | |
| | Output Voltage (V) | | 3-Phase 200–230 V | | | | | | | | | | |
| Rated input | Working Voltage (V) | | 3-Phase 200–230 VAC (-15%–+10%) | | | | | | | | | | |
| | Input Frequency | | 50–60 Hz (±5%) | | | | | | | | | | |
| | Rated Current (A) | Normal load | 6.8 | 10.6 | 14.9 | 21.3 | 28.6 | 41.2 | 54.7 | 69.7 | 82.9 | 116.1 | |
| | | Heavy load | 4.3 | 6.9 | 11.2 | 14.9 | 22.1 | 28.6 | 44.3 | 55.9 | 70.8 | 85.3 | |

- Only the heavy duty ratings apply to model types without a built-in DC resistor (NON-DCR).
- The standard used for 200 V inverters is based on a 220 V supply voltage.
- The rated output current is limited based on the carrier frequency set at CON-04.
- The output frequency is limited to 0–300 Hz if DRV-09 (control mode) is set to “3 (Sensorless-1),” and to 0–120 Hz if DRV-09 (control mode) is set to “4 (Sensorless-3).”
- The maximum output voltage cannot exceed the input voltage of the power source.

2.2 Input and Output Specifications 200 V Class (30–75 kW)

| Model SV xxx iS7–2x | | | 0300 | 0370 | 0450 | 0550 | 0750 | | | | | |
|---------------------|----------------------|-------------|---|------|------|------|------|--|--|--|--|--|
| Applied Motor | Normal load | HP | 50 | 60 | 75 | 100 | 125 | | | | | |
| | | kW | 37 | 45 | 55 | 75 | 90 | | | | | |
| | Heavy load | HP | 40 | 50 | 60 | 75 | 100 | | | | | |
| | | kW | 30 | 37 | 45 | 55 | 75 | | | | | |
| Rated output | Rated Capacity (kVA) | | 46 | 57 | 69 | 84 | 116 | | | | | |
| | Rated Current (A) | Normal load | 146 | 180 | 220 | 288 | 345 | | | | | |
| | | Heavy load | 116 | 146 | 180 | 220 | 288 | | | | | |
| | Output Frequency | | 0–400 Hz (Sensorless-1: 0–300 Hz, Sensorless-2, Vector: 0.1–120 Hz) | | | | | | | | | |
| | Output Voltage (V) | | 3-Phase 200–230 V | | | | | | | | | |
| Rated input | Working Voltage (V) | | 3-Phase 200–230 VAC (-15%–+10%) | | | | | | | | | |
| | Input Frequency | | 50–60 Hz (±5%) | | | | | | | | | |
| | Rated Current (A) | Normal load | 152 | 190 | 231 | 302 | 362 | | | | | |
| | | Heavy load | 121 | 154 | 191 | 233 | 305 | | | | | |

- The standard motor capacity is based on a standard 4-pole motor.
- The standard used for 200 V inverters is based on a 200 V supply voltage.
- The rated output current is limited based on the carrier frequency set at CON-04.
- The output frequency is limited to 0–300 Hz if DRV-09 (control mode) is set to “3 (Sensorless-1),” and to 0–120 Hz if DRV-09 (control mode) is set to “4 (Sensorless-3).”
- The maximum output voltage cannot exceed the input voltage of the power source.

2.3 Input and Output Specifications 400 V Class (0.75–22 kW)

| Model SV xxx iS7-2x | | | 0008 | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0185 | 0220 | |
|---------------------|----------------------|-------------|---|------|------|------|------|------|------|------|------|------|--|
| Applied Motor | Normal load | HP | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | |
| | | kW | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | |
| | Heavy load | 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 | Rated Capacity (kVA) | | 1.9 | 3.0 | 4.5 | 6.1 | 9.1 | 12.2 | 18.3 | 22.9 | 29.7 | 34.3 | |
| | Rated Current (A) | Normal load | 4 | 6 | 8 | 12 | 16 | 24 | 30 | 39 | 45 | 61 | |
| | | Heavy load | 2.5 | 4 | 6 | 8 | 12 | 16 | 24 | 30 | 39 | 45 | |
| | Output Frequency | | 0–400 Hz (Sensorless-1: 0–300Hz, Sensorless-2, Vector: 0.1–120Hz) | | | | | | | | | | |
| | Output Voltage (V) | | 3-Phase 380–480 V | | | | | | | | | | |
| Rated input | Working Voltage (V) | | 3-Phase 380–480 VAC (-15%–+10%) | | | | | | | | | | |
| | Input Frequency | | 50–60 Hz (±5%) | | | | | | | | | | |
| | Rated Current (A) | Normal load | 3.7 | 5.7 | 7.7 | 11.1 | 14.7 | 21.9 | 26.4 | 35.5 | 41.1 | 55.7 | |
| | | Heavy load | 2.2 | 3.6 | 5.5 | 7.5 | 11.0 | 14.4 | 22.0 | 26.6 | 35.6 | 41.6 | |

- Only the heavy duty ratings apply to model types without a built-in DC resistor (NON- DCR).
- The standard motor capacity is based on a standard 4-pole motor.
- The standard used for 400 V inverters is based on a 440 V supply voltage.
- The rated output current is limited based on the carrier frequency set at CON-04.
- The output frequency is limited to 0-300 Hz if DRV-09 (control mode) is set to “3 (Sensorless-1),” and to 0-120 Hz if DRV-09 (control mode) is set to “4 (Sensorless-3).”
- The maximum output voltage cannot exceed the input voltage of the power source.

2.4 Input and Output Specifications 400 V Class (30–160 kW)

| Model SV xxx iS7-2x | | | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 | 1600 | |
|---------------------|----------------------|-------------|---|------|-------|-------|-------|-------|-------|-------|-------|--|
| Applied Motor | Normal load | HP | 50 | 60 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | |
| | | kW | 37 | 45 | 55 | 75 | 90 | 110 | 132 | 160 | 185 | |
| | Heavy load | HP | 40 | 50 | 60 | 75 | 100 | 125 | 150 | 200 | 250 | |
| | | kW | 30 | 37 | 45 | 55 | 75 | 90 | 110 | 132 | 160 | |
| Rated output | Rated Capacity (kVA) | | 46 | 57 | 69 | 84 | 116 | 139 | 170 | 201 | 248 | |
| | Rated Current (A) | Normal load | 75 | 91 | 110 | 152 | 183 | 223 | 264 | 325 | 370 | |
| | | Heavy load | 61 | 75 | 91 | 110 | 152 | 183 | 223 | 264 | 325 | |
| | Output Frequency | | 0–400 Hz (Sensorless-1: 0–300 Hz, Sensorless-2, Vector: 0.1–120 Hz) | | | | | | | | | |
| | Output Voltage (V) | | 3-Phase 380–480 V | | | | | | | | | |
| Rated input | Working Voltage (V) | | 3-Phase 380–480 VAC (-15%–+10%) | | | | | | | | | |
| | Input Frequency | | 50–60 Hz (±5%) | | | | | | | | | |
| | Rated Current (A) | Normal load | 67.5 | 81.7 | 101.8 | 143.6 | 173.4 | 212.9 | 254.2 | 315.3 | 359.3 | |
| | | Heavy load | 55.5 | 67.9 | 82.4 | 102.6 | 143.4 | 174.7 | 213.5 | 255.6 | 316.3 | |

- The standard used for 400 V inverters is based on a 440 V supply voltage.
- The rated output current is limited based on the carrier frequency set at CON-04.
- The output frequency is limited to 0–300 Hz if DRV-09 (control mode) is set to “3 (Sensorless-1),” and to 0–120 Hz if DRV-09 (control mode) is set to “4 (Sensorless-3).”
- The maximum output voltage cannot exceed the input voltage of the power source.

2.5 Input and Output Specifications 400 V Class (185–375 kW)

| Model SV xxx iS7-2x | | | 1850 | 2200 | 2800 | 3150 | 3750 | | | | | | |
|---------------------|----------------------|-------------|---|------|------|------|------|--|--|--|--|--|--|
| Applied Motor | Normal load | HP | 350 | 400 | 500 | - | - | | | | | | |
| | | kW | 220 | 280 | 315 | 375 | 450 | | | | | | |
| | Heavy load | HP | 300 | 350 | 400 | 500 | - | | | | | | |
| | | kW | 185 | 220 | 280 | 315 | 375 | | | | | | |
| Rated output | Rated Capacity (kVA) | | 286 | 329 | 416 | 467 | 557 | | | | | | |
| | Rated Current (A) | Normal load | 432 | 547 | 613 | 731 | 877 | | | | | | |
| | | Heavy load | 370 | 432 | 547 | 613 | 731 | | | | | | |
| | Output Frequency | | 0–400 Hz (Sensorless-1: 0–300 Hz, Sensorless-2, Vector: 0–120 Hz) | | | | | | | | | | |
| | Output Voltage (V) | | 3-Phase 380–480 V | | | | | | | | | | |
| Rated input | Working Voltage (V) | | 3-Phase 380–480 VAC (-15%–+10%) | | | | | | | | | | |
| | Input Frequency | | 50–60 Hz (±5%) | | | | | | | | | | |
| | Rated Current (A) | Normal load | 463 | 590 | 673 | 796 | 948 | | | | | | |
| | | Heavy load | 404 | 466 | 605 | 674 | 798 | | | | | | |

- The standard motor capacity is based on a standard 4-pole motor.
- The standard used for 400 V inverters is based on a 440 V supply voltage.
- The rated output current is limited based on the carrier frequency set at CON-04.
- The output frequency is limited to 0–300 Hz if DRV-09 (control mode) is set to “3 (Sensorless-1),” and to 0–120 Hz if DRV-09 (control mode) is set to “4 (Sensorless-3).”
- The maximum output voltage cannot exceed the input voltage of the power source.

Note

[English]

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

[French]

Le courant maximum de court-circuit présumé autorisé au connecteur d'alimentation électrique est défini dans la norme IEC 60439-1 comme égal à 100 kA. L'entraînement convient pour une utilisation dans un circuit capable de délivrer pas plus de 100 kA RMS à la tension nominale maximale de l'entraînement. Le tableau suivant indique le MCCB recommandé selon le courant RMS symétrique en ampères.

| | | | | | | |
|-----------------|-----------------|-------------------|-------------------|-------------------|---------|---------|
| Working Voltage | UTE100 (E/N) | UTS150 (N/H/L) | UTS250 (N/H/L) | UTS400 (N/H/L) | | |
| 240V(50/60Hz) | 50/65kA | 65/100/150kA | 65/100/150kA | 65/100/150kA | | |
| 480V(50/60Hz) | 25/35kA | 35/65/100kA | 35/65/100kA | 35/65/100kA | | |
| Working Voltage | ABS33c | ABS53c | ABS63c | ABS103c | ABS203c | ABS403c |
| 240V(50/60Hz) | 30kA | 35kA | 35kA | 85kA | 85kA | 75kA |
| 480V(50/60Hz) | 7.5kA | 10kA | 10kA | 26kA | 26kA | 35kA |

2.6 Product Specification Details

2.6.1 Control

| Items | | Description |
|---------|-------------------------------|---|
| Control | Control modes | V/F control, V/F PG, slip compensation, sensorless vector-1, sensorless vector-2, vector control |
| | Frequency settings resolution | Digital command: 0.01 Hz Analog command: 0.06 Hz (maximum frequency: 60 Hz) |
| | Frequency accuracy | Digital command: 0.01% of maximum output frequency Analog command: 0.1% of maximum output frequency |
| | V/F pattern | Linear, square reduction, user V/F |
| | Overload capacity | Rated current for heavy duty operation: 150% for 1 min Rated current for normal duty operation: 110% for 1 min |
| | Torque boost | Manual torque boost, automatic torque boost |

- Only the heavy load ratings apply to 0.75-22 kW model types without a built-in DC resistor (NON-DCR).

2.6.2 Operation

| Items | | Description | | | | | |
|-------------------------|--|---|-------------------------|-------------|--|---|--|
| Operation | Operation types | Select from keypad, terminal strip, or network communication operation. | | | | | |
| | Frequency settings | Analog type: -10~10 V, 0~20 mA Digital type: keypad | | | | | |
| | Operation function | <ul style="list-style-type: none"> • PID control • 3-wire operation • Frequency limit • Second function • Reverse rotation prevention • Inverter bypass • Flying start • Power braking • Leakage reduction • Easy start • Up-down operation • DC braking • Frequency jump • Slip compensation • Automatic restart • Automatic tuning • Energy buffering • Flux braking • MMC | | | | | |
| | Input | <table border="1"> <thead> <tr> <th>Multi-function terminal</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td></td> <td>Select NPN (Sink) or PNP (Source) mode.</td> </tr> <tr> <td></td> <td> <ul style="list-style-type: none"> • Forward direction operation • Reverse direction </td> </tr> </tbody> </table> | Multi-function terminal | Description | | Select NPN (Sink) or PNP (Source) mode. | |
| Multi-function terminal | Description | | | | | | |
| | Select NPN (Sink) or PNP (Source) mode. | | | | | | |
| | <ul style="list-style-type: none"> • Forward direction operation • Reverse direction | | | | | | |

| Items | | | Description | |
|-------|---------------|---|--|--|
| | | (8 EA) P1–P8* | <ul style="list-style-type: none"> Reset operation Emergency stop Multi-step speed frequency-high/med/low DC braking during stop Frequency increase 3-wire operation Acceleration/deceleration/stop Operation by keypad input during an operation by network communication | <ul style="list-style-type: none"> External trip Jog operation Multi-step acc/dec-high/med/low Second motor selection Frequency reduction Transition from PID to general operation Analog command frequency fix |
| | | Multi-function open collector terminal | Fault output and inverter operation status output | Less than DC 26 V, 100 mA |
| | | Multi-function relay terminal | | N.O.: Less than AC 250 V 1A, DC 30 V, 3A N.C.: Less than AC 250 V 1A, DC 30 V 1A |
| | Analog output | DC 0–10 V, 0–20 mA: Select output type from frequency, current, voltage, or DC voltage. | | |

* Set the Input Group codes IN-65 through IN-72 to configure the multi-function terminal functions.

2.6.3 Protection Function

| Items | | Description |
|---------------------|------------------------|---|
| Protection function | Trips | <ul style="list-style-type: none"> Over voltage Low voltage Over current Earth current detection Inverter overheat Motor overheat Output imaging Overload protection Network communication error Lost command Hardware failure Cooling fan failure Pre-PID failure No motor trip External trip Other safety functions |
| | Alarms | <ul style="list-style-type: none"> Stall prevention Overload Light load Encoder error Fan failure Keypad command loss Speed command loss |
| | Instantaneous blackout | <p>Less than 15 ms (CT) [Less than 8 ms (VT)]: Continue operation (must be within the rated input voltage and rated output range). Over 15 ms (CT) [Over 8 ms (VT)]: Automatically restart</p> |

2.6.4 Structure and Operating Environment Control

| Items | | Description |
|-------------------------------------|----------------------|---|
| Structure/ operating environment | Cooling type | <p>Forced cooling: 0.75–15 kW (200/400 V class), 22 kW (400 V class) Inhalation cooling: 22–75 kW (200 V class), 30–375 kW (400 V class)</p> |
| | Protection structure | <p>- 0.75–22 kW (200V), 0.75–75 kW (400 V): Open type IP 21 (default), UL enclosed type 1 (optional)* - 30–75 kW (200 V), 90–375 kW (400 V): Open type IP 00 - 0.75–22 kW, frame types 2, 4 and others.: Enclosed IP54 type, UL enclosed type 12</p> |
| | Ambient temperature | <ul style="list-style-type: none"> CT load (heavy duty): -10–50°C VT load (normal duty): -10–40°C No ice or frost should be present. Working under normal load at 50°C (122°F), it is recommended that less than 80% load is applied. IP54 product: -10–40°C No ice or frost should be present. |

| Items | | Description |
|-------|-------------------------|---|
| | Storage temperature. | -20°C–65°C (-4–149°F) |
| | Ambient humidity | Relative humidity less than 90% RH (to prevent condensation from forming) |
| | Operation altitude | Maximum 1000m above sea level for standard operation. From 1000 to 4000m, the rated input voltage and rated output current of the drive must be derated by 1% for every 100m. |
| | Oscillation | Less than 5.9 m/sec ² (0.6 G). |
| | Surrounding environment | Prevent contact with corrosive gases, inflammable gases, oil stains, dust, and other pollutants (Pollution Degree 2 Environment). |

* UL Enclosed type 1 when an optional conduit box is installed. The 30–75 kW (200 V class) product is regarded as UL Open type IP 20 when an optional conduit box is installed.

3 Installing the Inverter

3.1 Installation Considerations

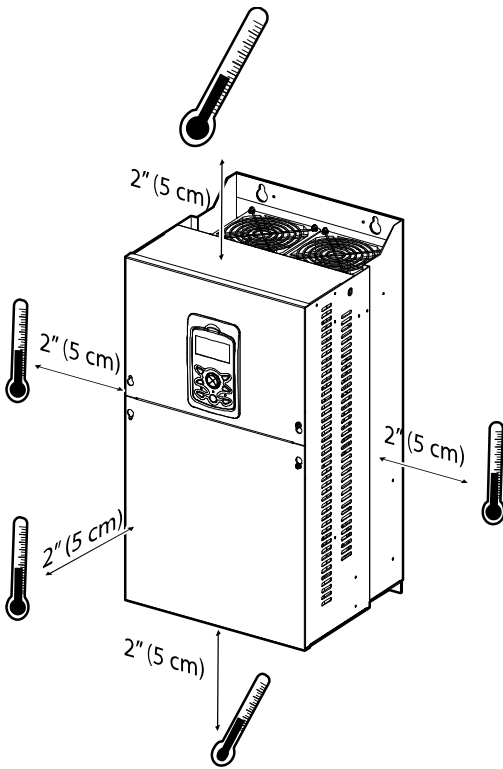
Inverters are composed of various precision electronic devices, and therefore the installation environment can significantly impact the lifespan and reliability of the product. The table below details the ideal operation and installation conditions for the inverter.

| Items | Description |
|-----------------------|---|
| Ambient Temperature* | CT load (heavy duty): -10°C–50°C VT load (normal duty): -10°C–40°C IP54 model types: -10°C–40°C |
| Ambient Humidity | 90% relative humidity (no condensation) |
| Storage Temperature | - 4–149°F (-20–65°C) |
| Environmental Factors | An environment free from corrosive or flammable gases, oil residue, or dust (pollution degree 2) |
| 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. No ice or frost should be present.

⚠ 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 place heavy objects on top of electric cables. Doing so may damage the cable and result in an electric shock.
- 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.



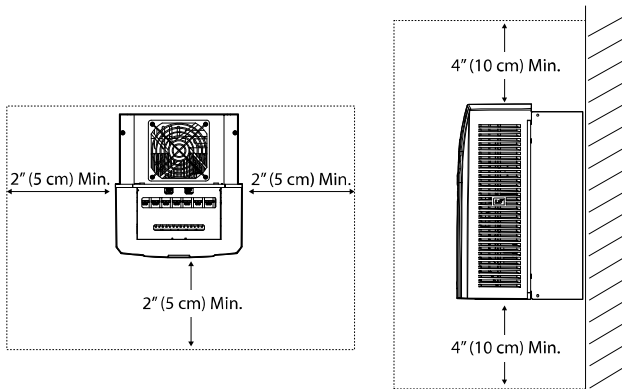
⚠ Caution

Do not allow the ambient temperature to exceed the allowable range while operating the inverter.

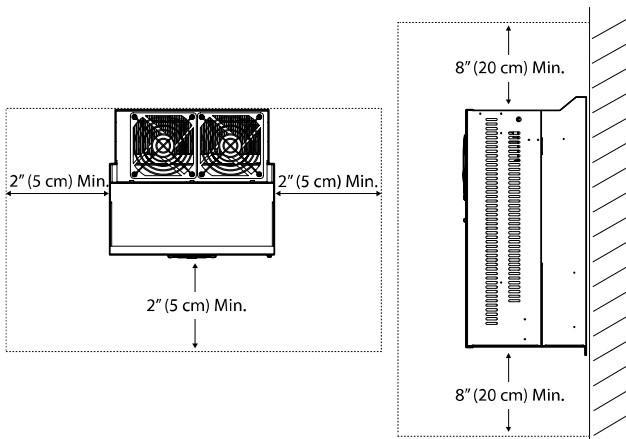
3.2 Selecting and Preparing a Site for Installation

When selecting an installation location, consider the following requirements:

- The inverter must be installed on a wall that can support the inverter's weight.
- The location must be free from vibration. Vibrations can adversely affect the operation of the inverter.
- The inverter can become very hot during operation. Install the inverter on a surface that is fire resistant or flame retardant with sufficient clearance around the inverter to allow for air circulation. The illustrations below detail the required installation clearances.



<Clearance requirements for model types with less than 30 kW capacity>



<Clearance requirements for model types with more than 30 kW capacity>

⚠ Caution

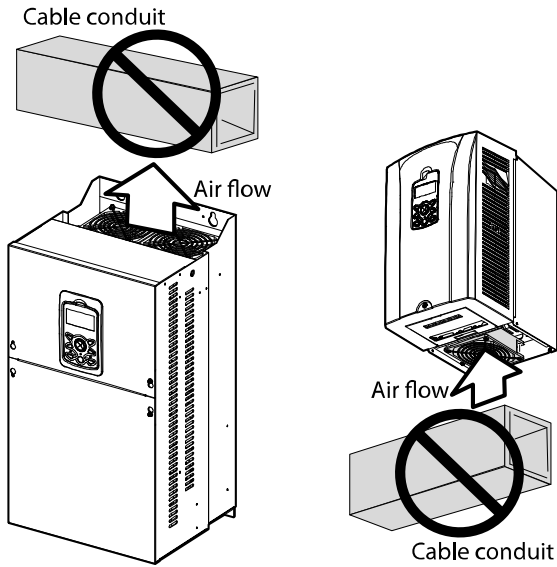
Install the inverter on a non-flammable surface, and do not place flammable material near the inverter. Otherwise, a fire may result.

Note

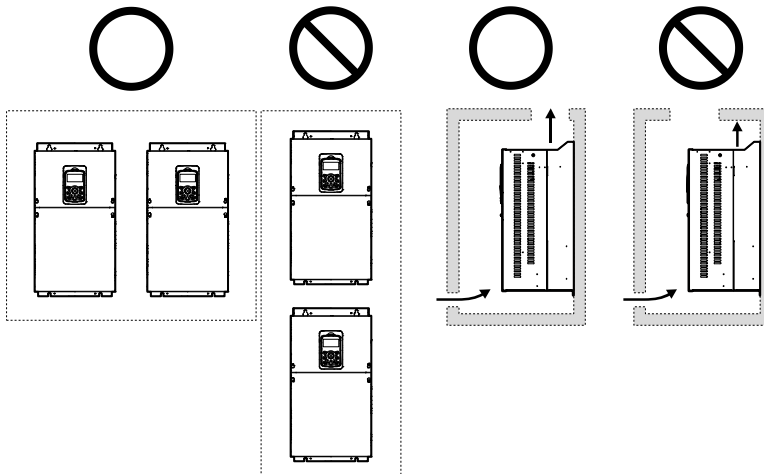
Model types with capacities of 30 kW or more require a minimum of 8" clearance above and below the unit.

Installing the Inverter

- Ensure that the cable conduits do not obstruct the air flow to and from the cooling fan.



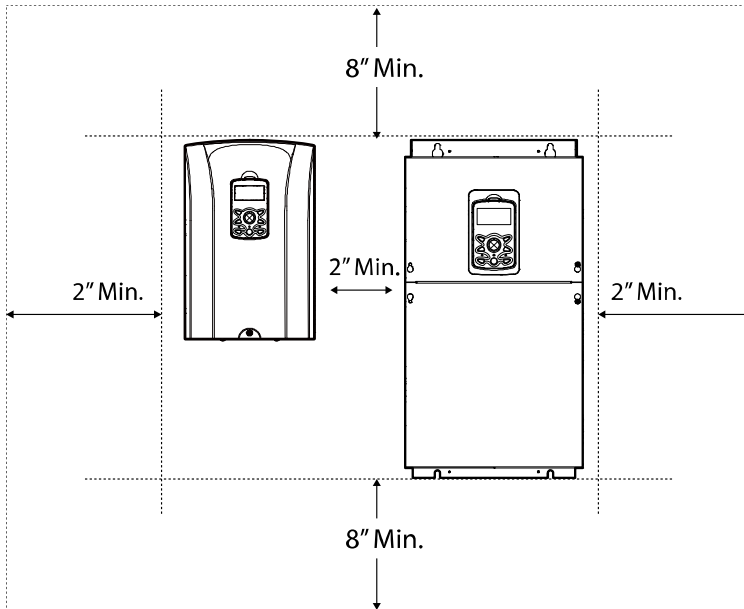
- Ensure sufficient air circulation is provided around the inverter when it is installed. If the inverter is to be installed inside a panel, enclosure, or cabinet rack, carefully consider the position of the inverter's cooling fan and vents. The cooling fan must be positioned to efficiently dissipate the heat generated by the operation of the inverter.



Note

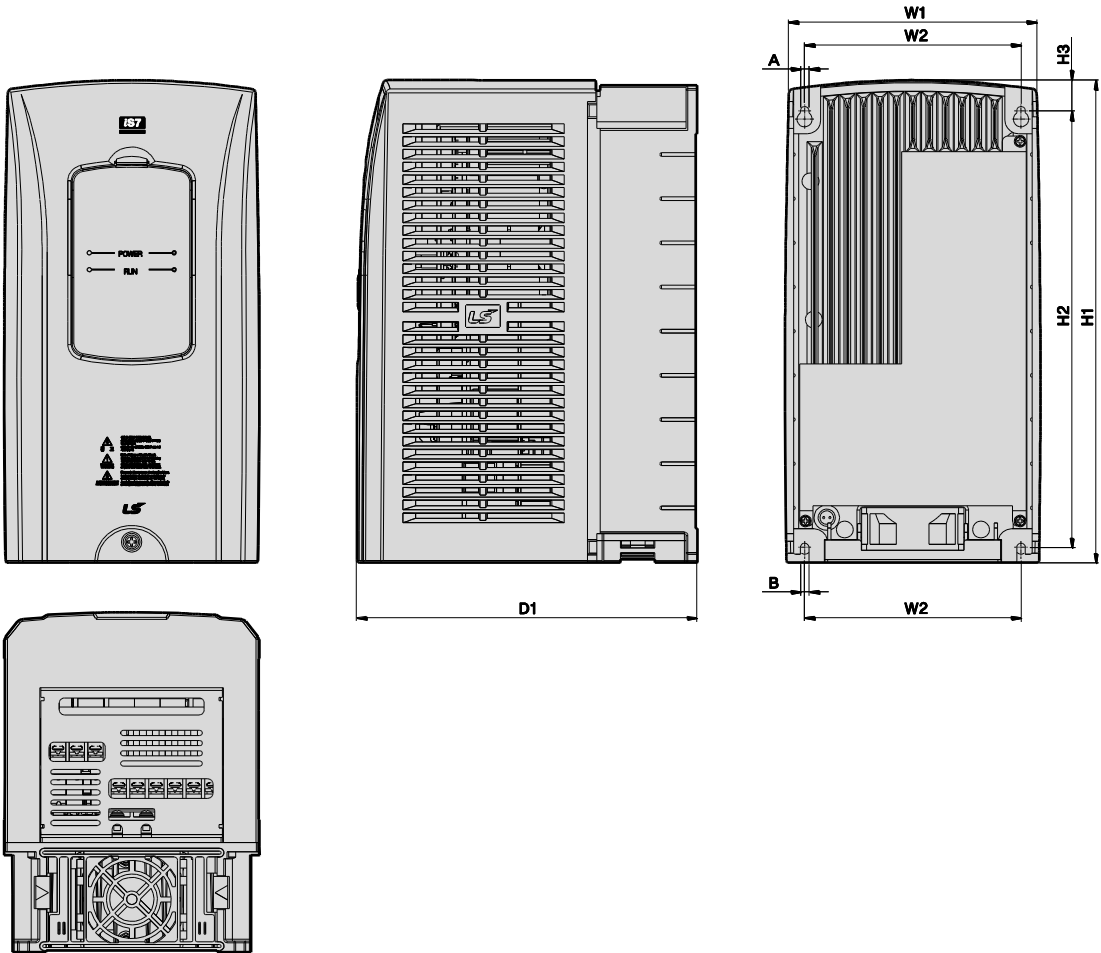
In order to meet EMC standards, 200 V, 30–75 kW model types and model types with capacities of 90 kW or more should be installed inside a metal cabinet.

- If you are installing multiple inverters of different ratings, provide sufficient clearance to meet the clearance specifications of the larger inverter. The iS7 inverters rated for up to 30 kW may be installed side by side.



3.3 Exterior and Dimensions (UL Enclosed Type 1, IP21 Type)

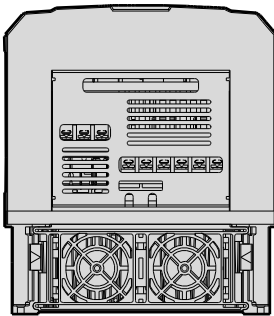
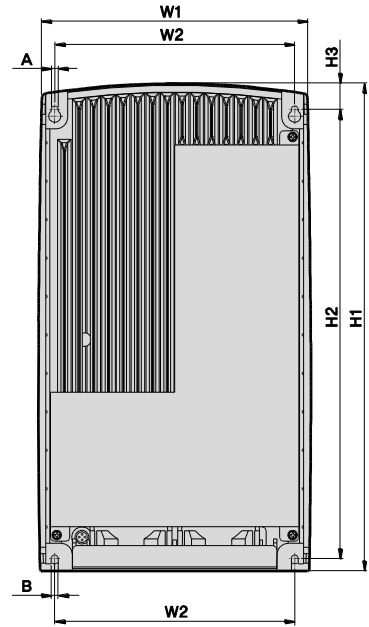
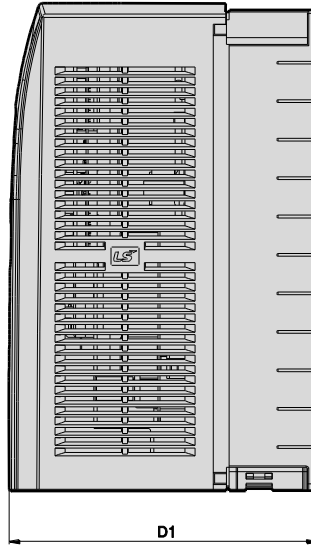
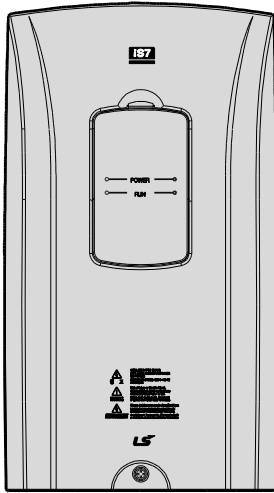
SV0008-0037iS7 (200 V/400 V)



Units: mm (inch)

| 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) |

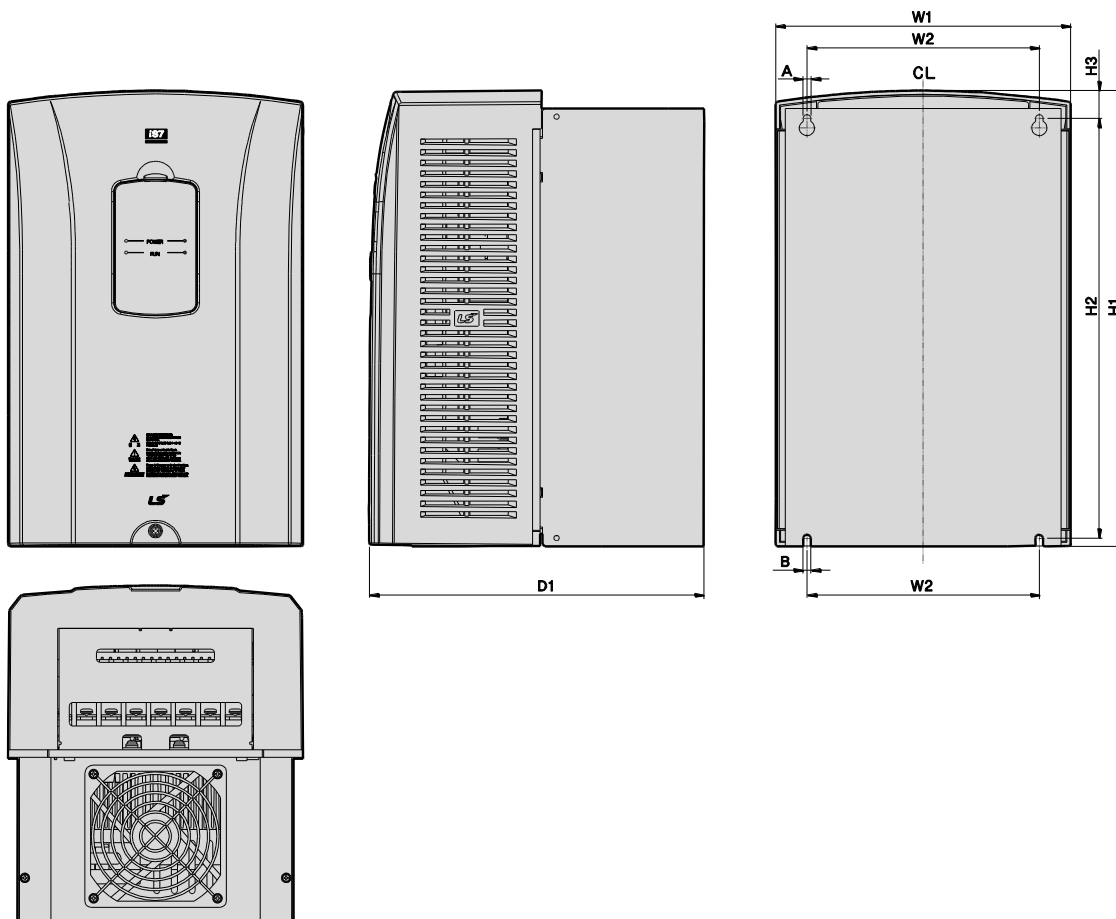
SV0055-0075iS7 (200 V/400 V)



Units: mm (inch)

| 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) |

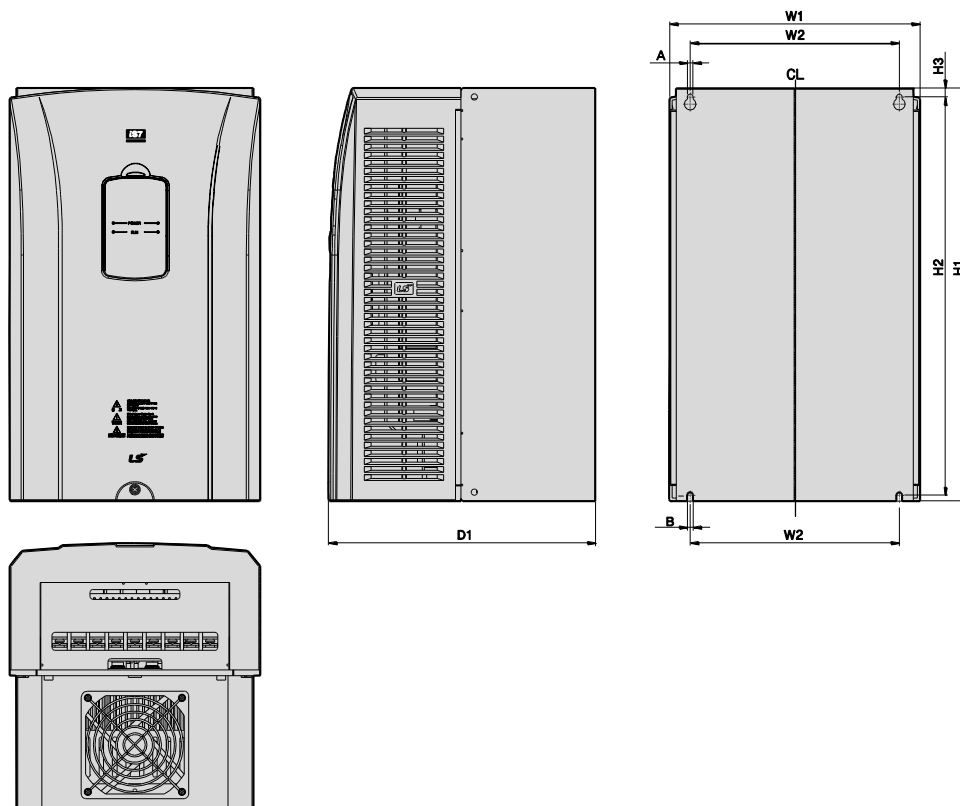
SV0110-0150iS7 (200 V/400 V)



Units: mm (inch)

| 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) |

SV0185-0220iS7 (200 V/400 V)

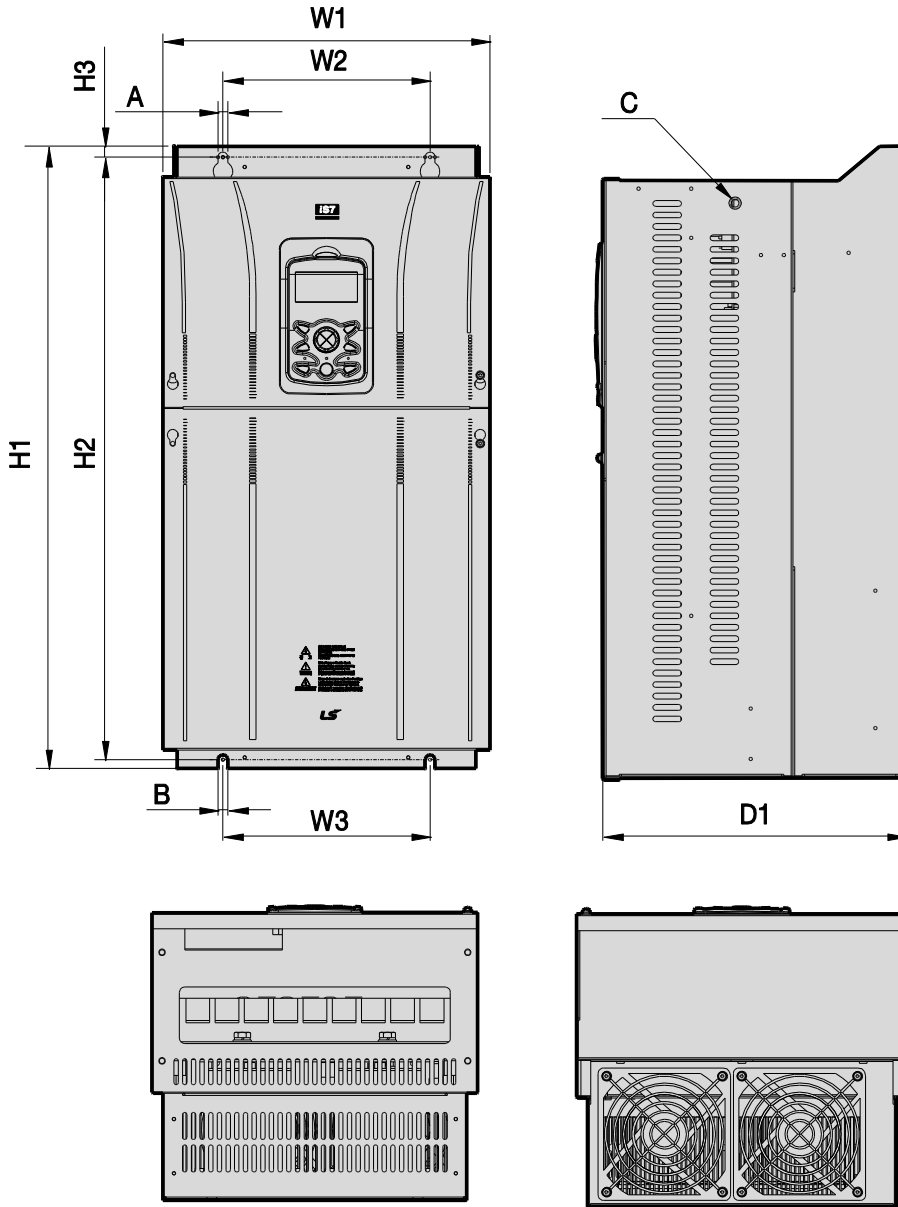


Units: mm (inch)

| Inverter Capacity | W1 | W2 | H1 | H2 | H3 | D1 | A | B |
|---------------------|----------------|-----------------|------------------|----------------|----------------|----------------|---------------|---------------|
| SV0185-0220iS7- 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) |

Installing
the Inverter

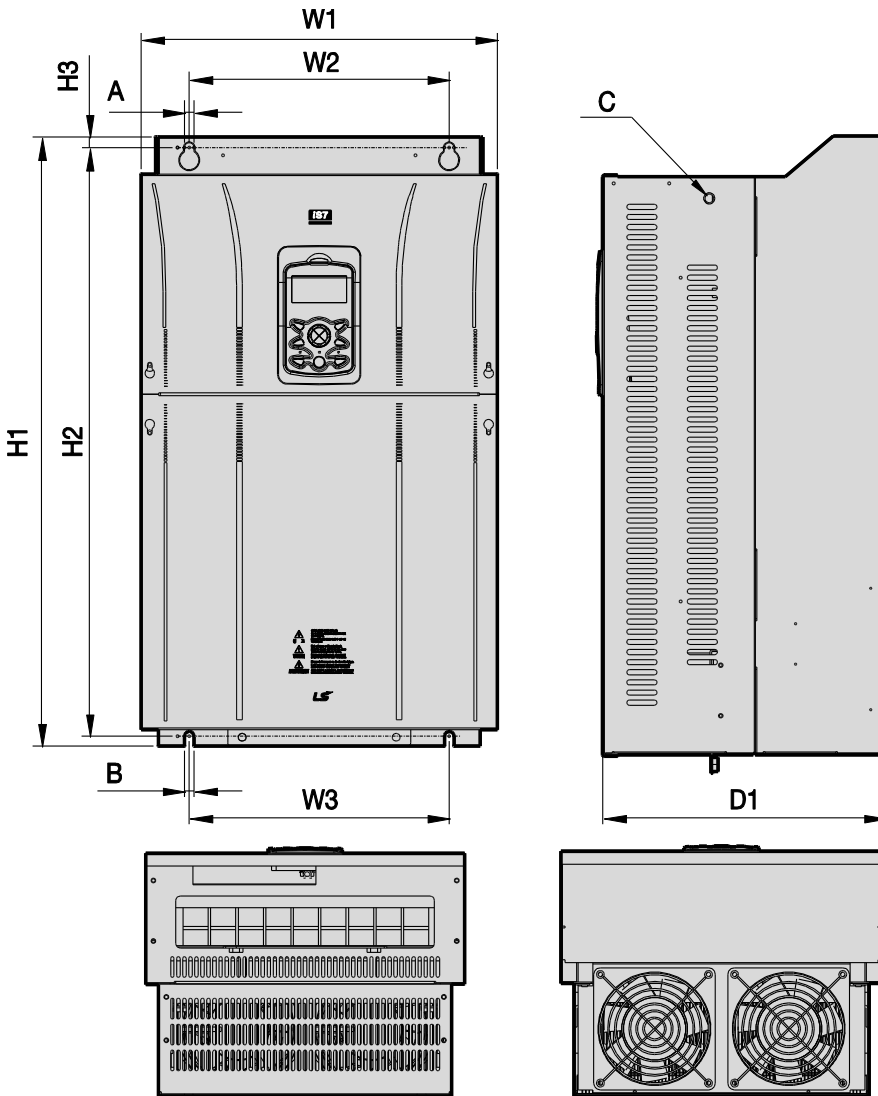
SV0300-iS7 (200 V, IP00 Type)



Units: mm (inch)

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

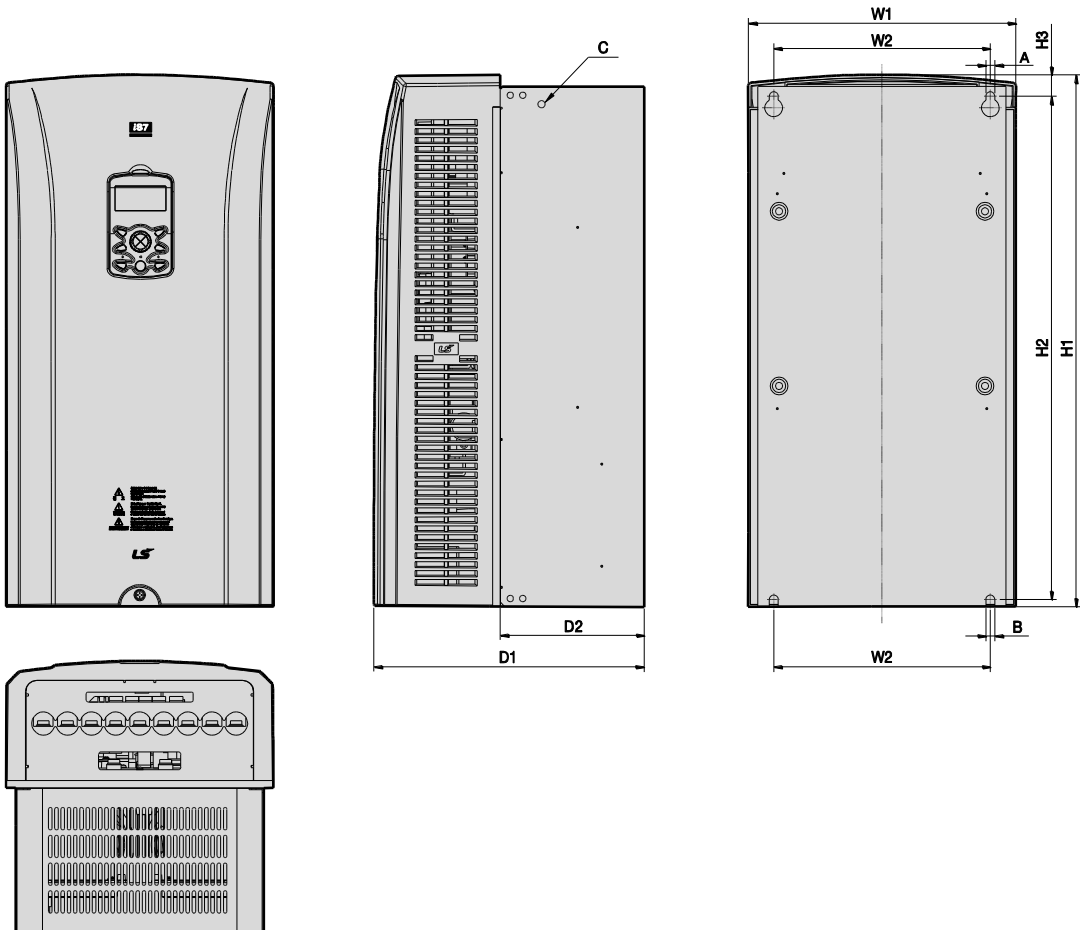
SV0370-0450iS7 (200 V, IP00 Type)



Units: mm (inch)

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

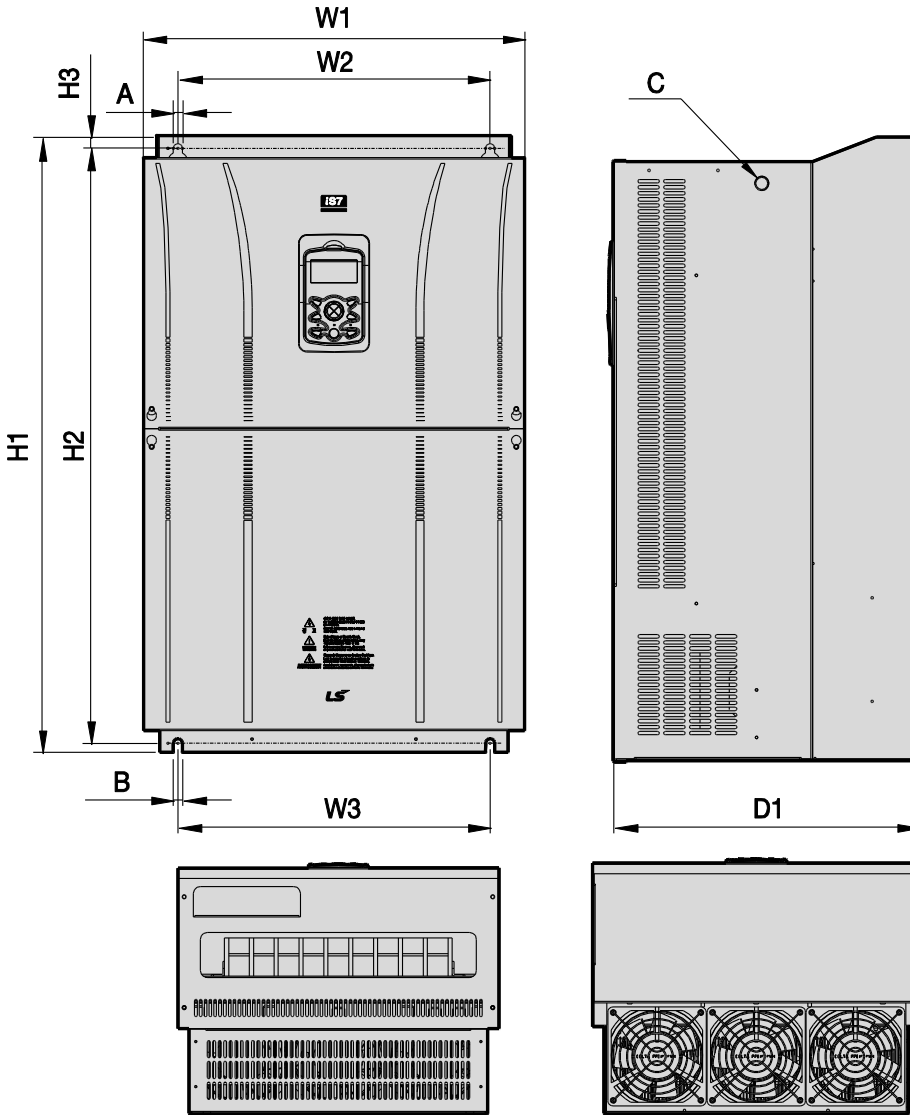
SV0300-0450iS7 (400 V)



Units: mm (inch)

| Inverter Capacity | W1 | W2 | H1 | H2 | H3 | D1 | D2 | A | B | C |
|--------------------|------------------|-----------------|------------------|----------------|----------------|------------------|---------------|--------------|--------------|----|
| SV300-450 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) | 161 (6.33) | | | |
| | | | | | | Non-DCR type | | | | |
| | | | | | | 271.2 (10.67) | 129 (5.78) | | | |

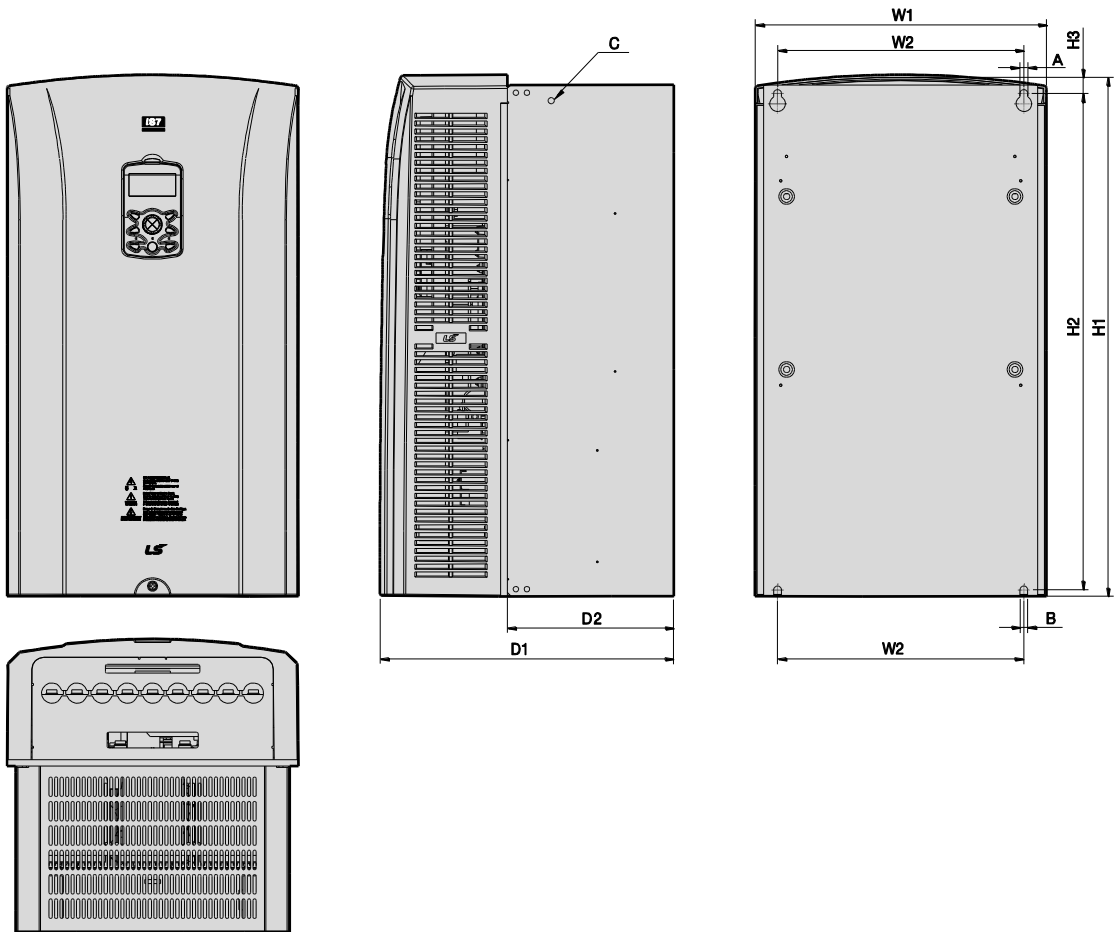
SV0550-0750iS7 (200 V, IP00 Type)



Units: mm (inch)

| Inverter Capacity | W1 | W2 | W3 | H1 | H2 | H3 | D1 | A | B | C |
|----------------------|---------------|---------------|---------------|----------------|------------------|----------------|-----------------|--------------|--------------|-----|
| SV0550-0750 iS7-2 | 465 (18.3) | 381 (15.0) | 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 |

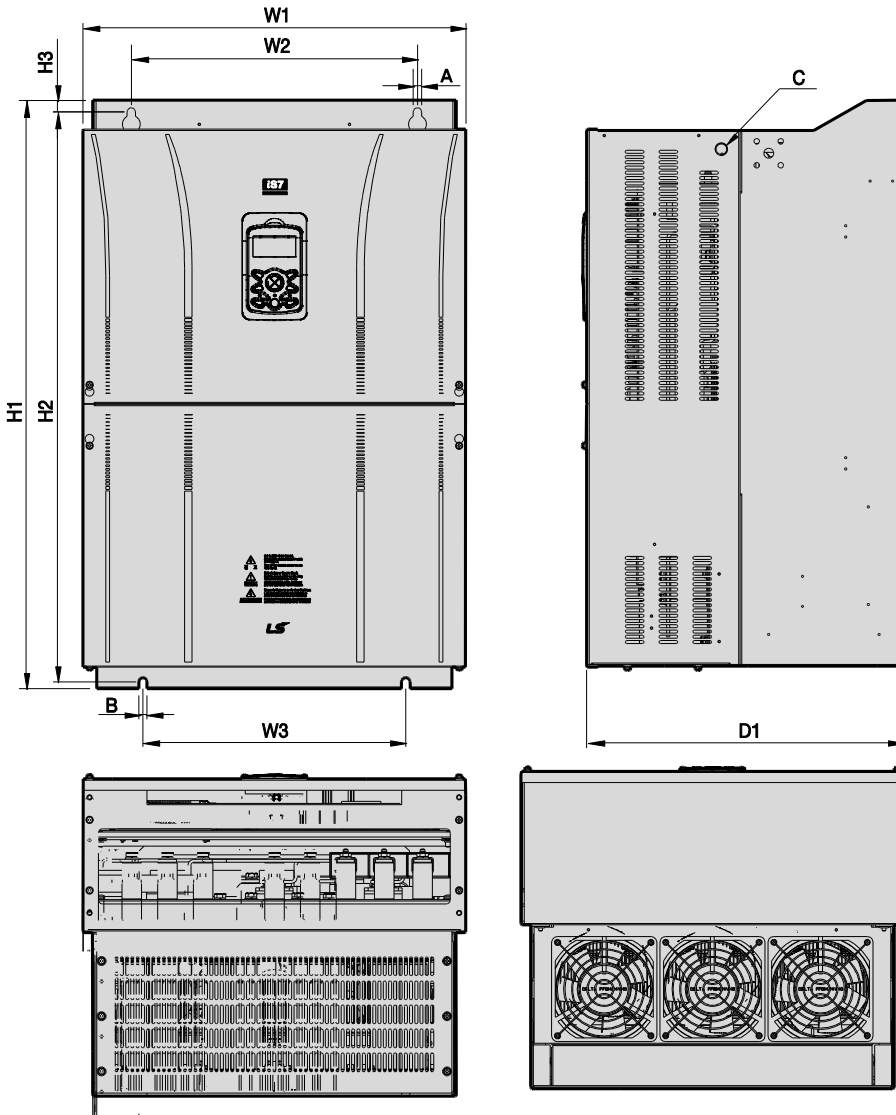
SV0550-0750iS7 (400 V)



Units: mm (inch)

| 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) | | | |

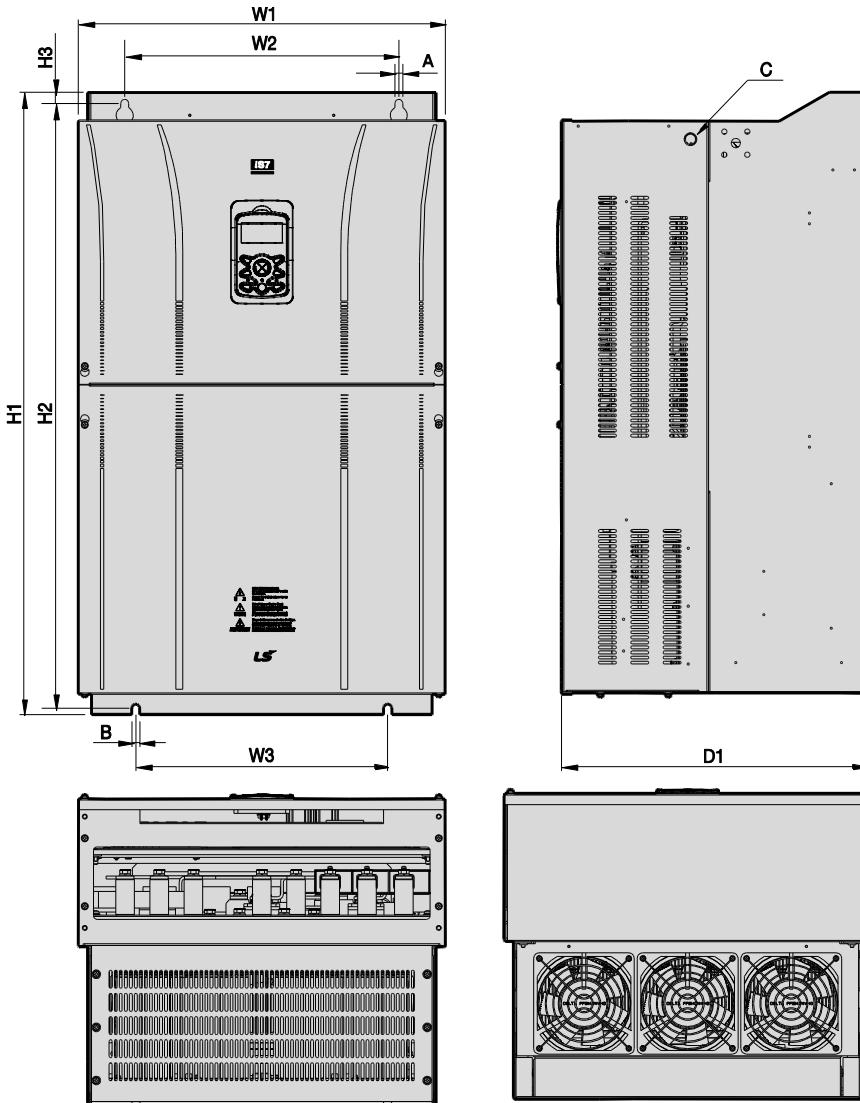
SV0900-1100iS7 (400 V, IP00 Type)



Units: mm (inch)

| 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 |

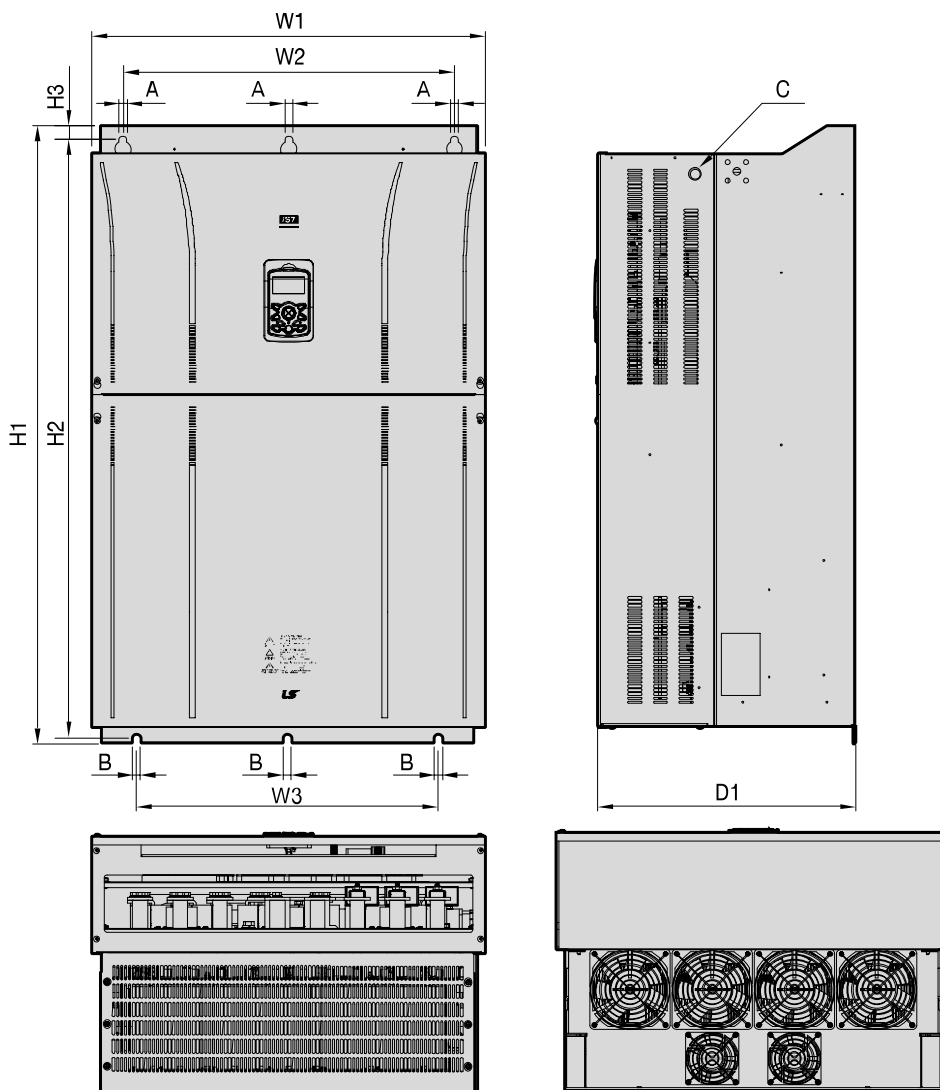
SV1320-1600iS7 (400 V, IP00 Type)



Units: mm (inch)

| 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) | 836.5 (32.93) | 15.5 (0.61) | 422.6 (16.63) | 11 (0.43) | 11 (0.43) | M16 |

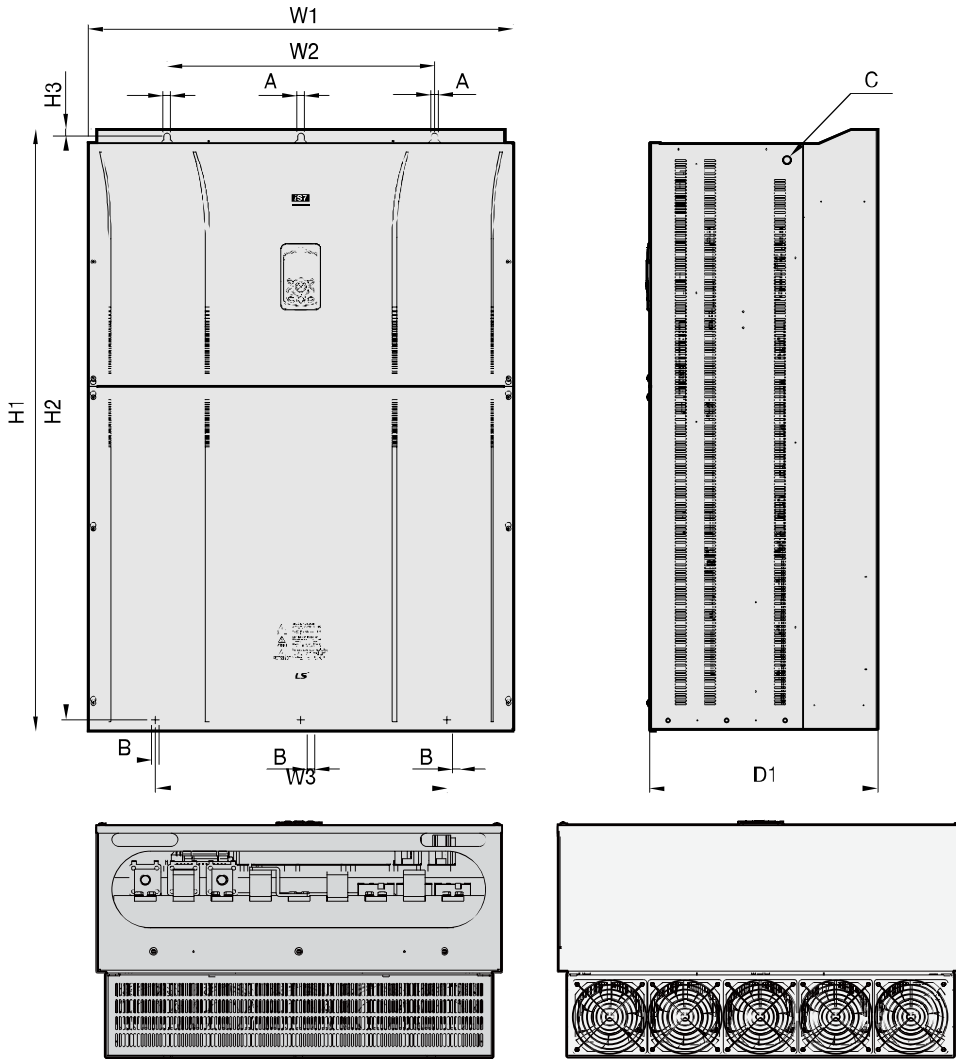
SV1850-2200iS7 (400 V, IP00 Type)



Units: mm (inch)

| 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 |

SV2800iS7 (400 V, IP00 Type)

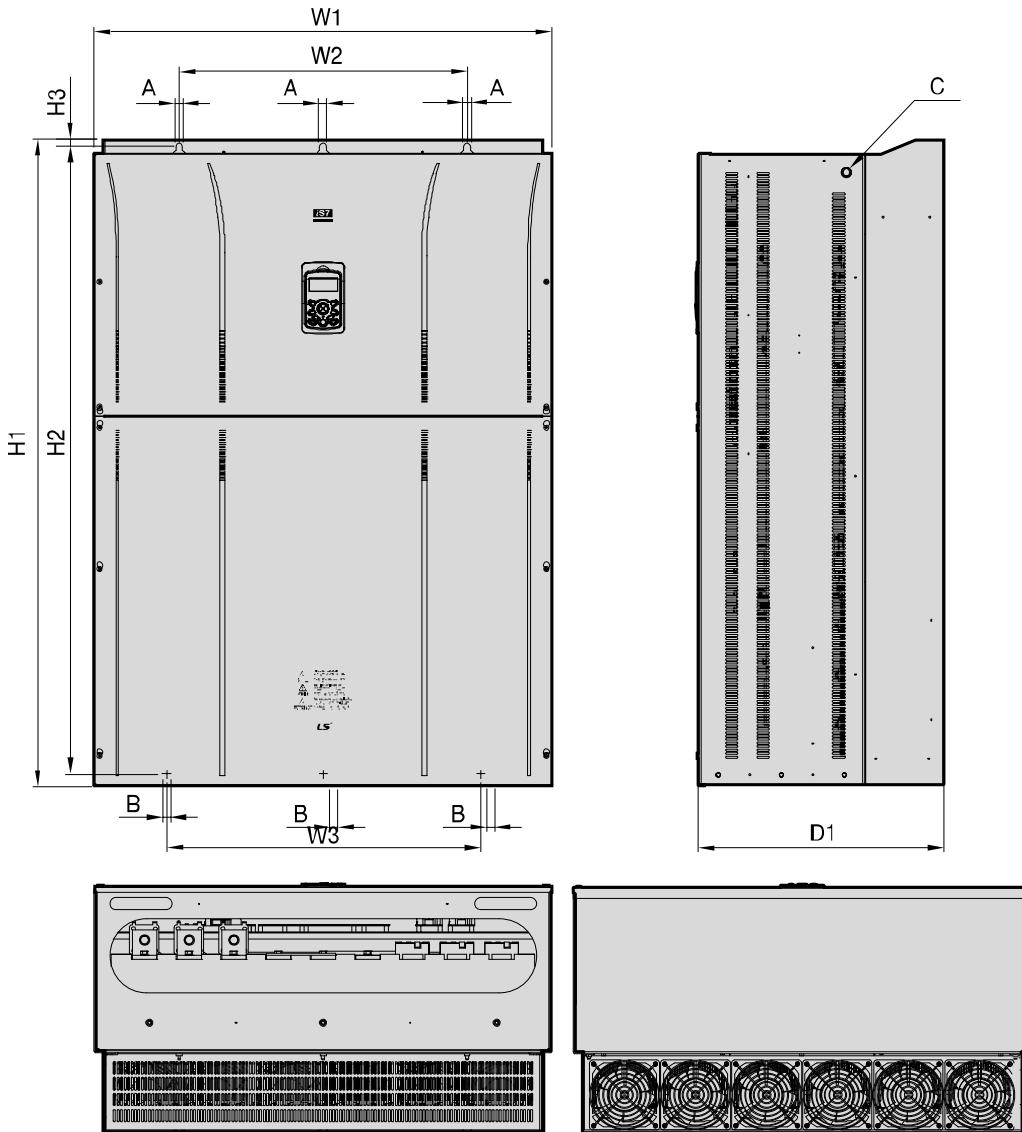


Units: mm (inch)

| 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 |

For 280 kW model types, 1 volts are supplied with the product.

SV3150-3750iS7 (400 V, IP00 Type)



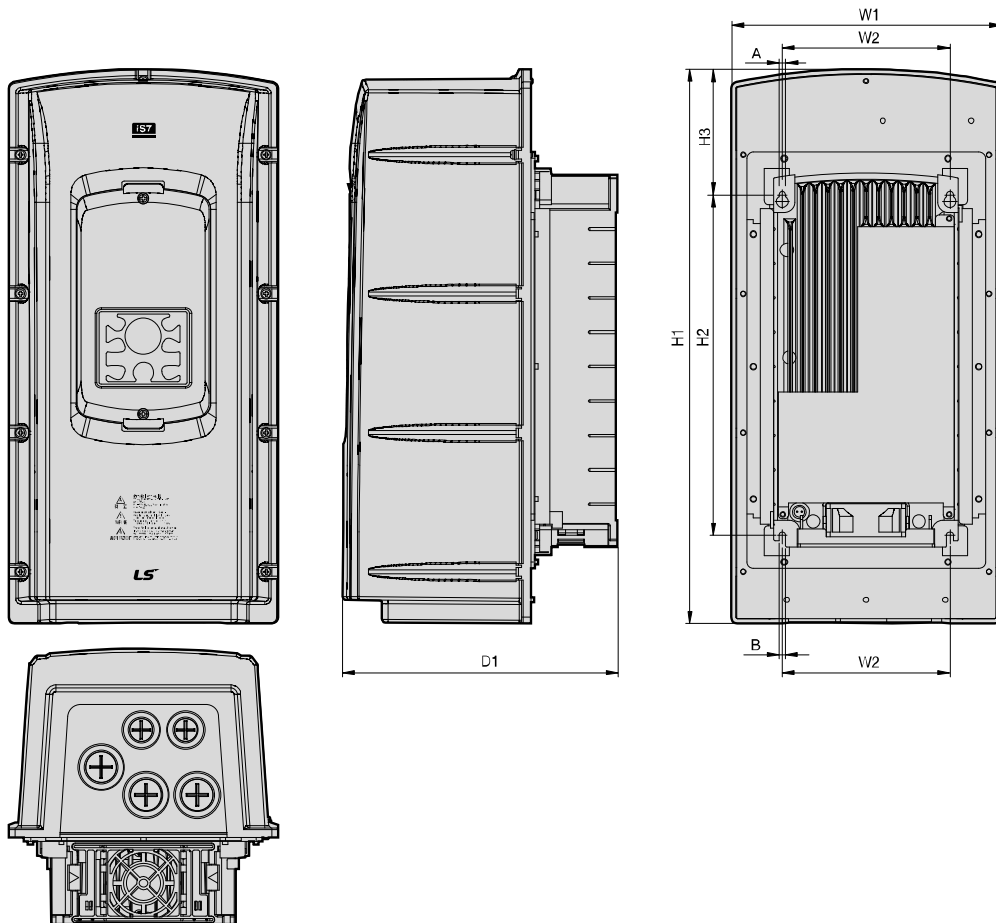
Units: mm (inch)

| 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 |

For 315-375 kW model types, I volts are supplied with the product.

3.4 Exterior and Dimensions (UL Enclosed Type 12, IP54 Type)

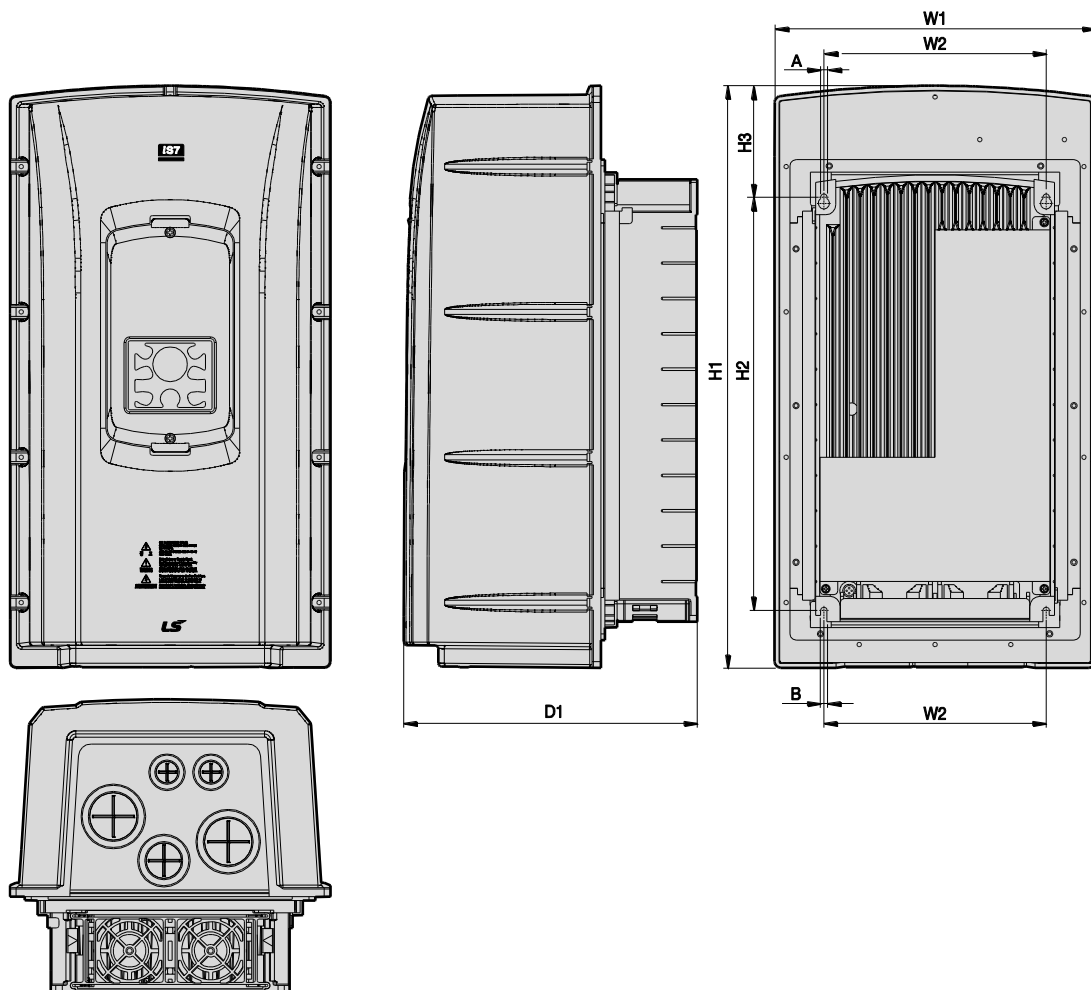
SV0008-0037iS7 (200 V/400 V)



Units: mm (inch)

| 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) |

SV0055-0075iS7 (200 V/400 V)

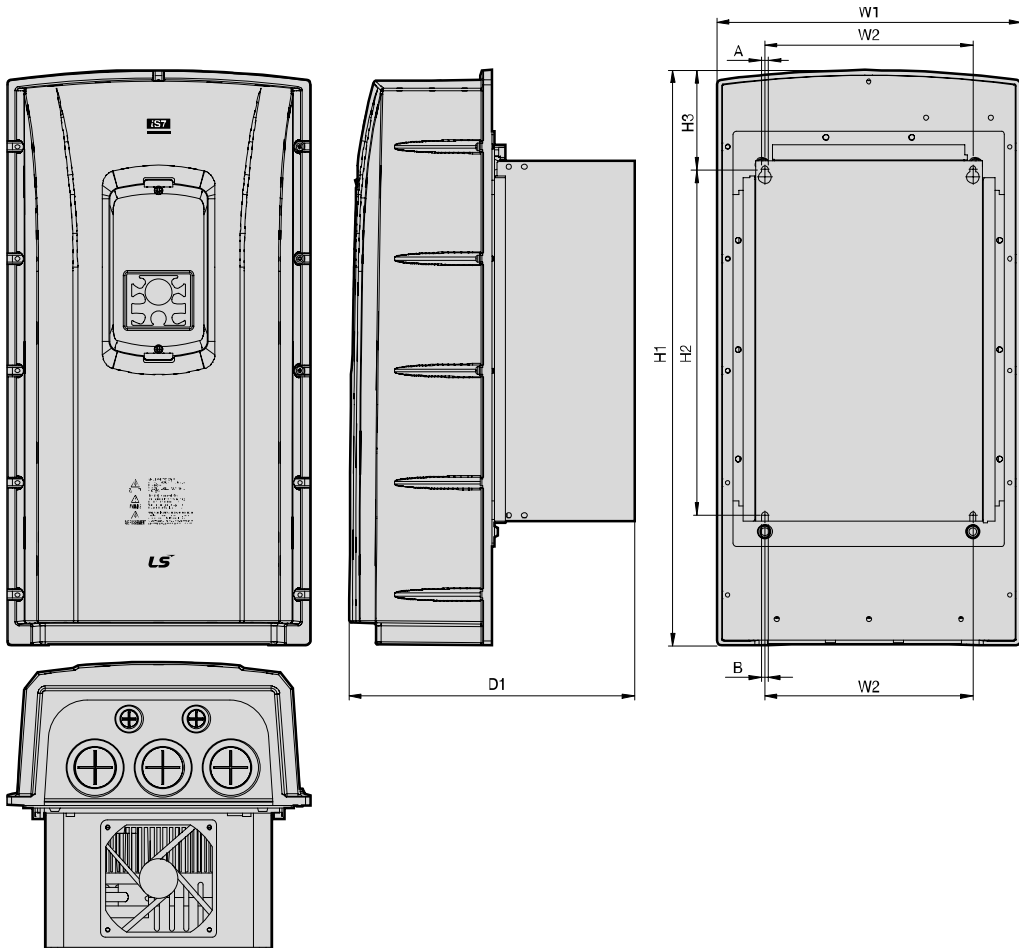


Installing
the Inverter

Units: mm (inch)

| 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) |

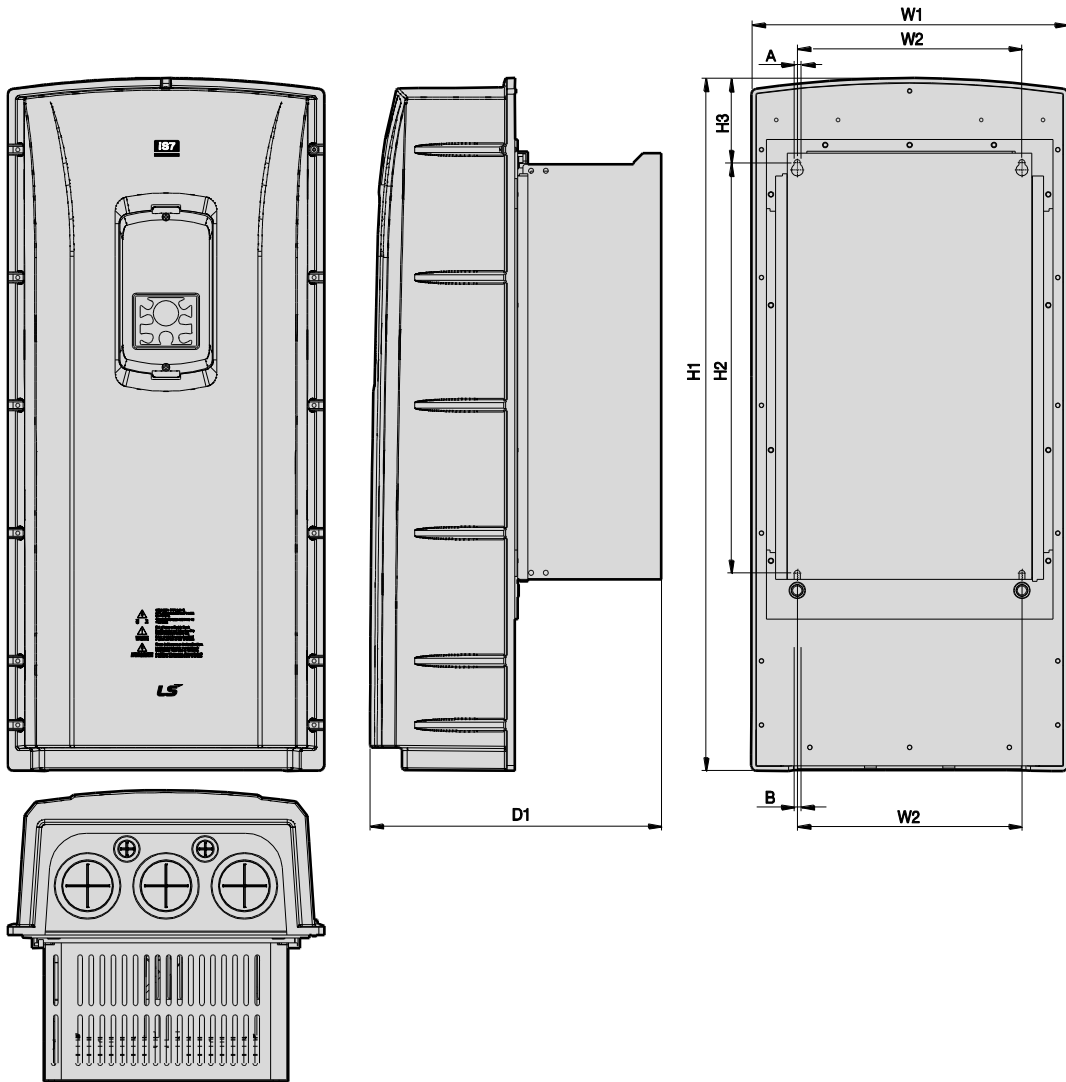
SV0110-0150iS7 (200 V/400 V)



Units: mm (inch)

| 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) |

SV0185-0220iS7 (200 V/400 V)



Units: mm (inch)

| 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) |

3.5 Frame Dimensions and Weight (UL Enclosed Type 1, IP 21 Type)

| Inverter Capacity | W[mm] | H[mm] | D[mm] | Weight[Kg] w/ built-in EMC and DCR | Weight[Kg] w/ built-in EMC | Weight[Kg] w/ built-in DCR | Weight[Kg] non-DCR types |
|-------------------|-------|-------|-------|------------------------------------|----------------------------|----------------------------|--------------------------|
| SV0008iS7-2/4 | 150 | 284 | 200 | 5.5 | 4.5 | 5.0 | 4.5 |
| SV0015iS7-2/4 | 150 | 284 | 200 | 5.5 | 4.5 | 5.0 | 4.5 |
| SV0022iS7-2/4 | 150 | 284 | 200 | 5.5 | 4.5 | 5.0 | 4.5 |
| SV0037iS7-2/4 | 150 | 284 | 200 | 5.5 | 4.5 | 5.0 | 4.5 |
| SV0055iS7-2/4 | 200 | 355 | 225 | 10 | 8.4 | 9.3 | 7.7 |
| SV0075iS7-2/4 | 200 | 355 | 225 | 10 | 8.4 | 9.3 | 7.7 |
| SV0110iS7-2/4 | 250 | 385 | 284 | 20 | 17.2 | 16.8 | 14 |
| SV0150iS7-2/4 | 250 | 385 | 284 | 20 | 17.2 | 16.8 | 14 |
| SV0185iS7-2 | 280 | 461.6 | 298 | 30 | 27 | 25.9 | 22.9 |
| SV0220iS7-2 | 280 | 461.6 | 298 | 30 | 25.8 | 25.9 | 22.9 |
| SV0185iS7-4 | 280 | 461.6 | 298 | 27.4 | 23.5 | 23.3 | 19.7 |
| SV0220iS7-4 | 280 | 461.6 | 298 | 27.4 | 23.5 | 23.5 | 20.1 |
| SV0300iS7-2 | 300 | 570 | 265.2 | - | - | - | 29.5 |
| SV0370iS7-2 | 370 | 630 | 281.2 | - | - | - | 44 |
| SV0450iS7-2 | 370 | 630 | 281.2 | - | - | - | 44 |
| SV0550iS7-2 | 465 | 750 | 355.6 | - | - | - | 72.5 |
| SV0750iS7-2 | 465 | 750 | 355.6 | - | - | - | 72.5 |

Note

- The weight specified in the table indicates the total weight of the product without packaging, which includes the built-in parts, such as the EMC filter and DCR.
- The built-in EMC filter and DCR are not available for 30–75 kW (200 V) products.

| Inverter Capacity | W[mm] | H[mm] | D[mm] | Weight[Kg] w/ built-in EMC and DCR | Weight[Kg] w/ built-in EMC | Weight[Kg] w/ built-in DCR | Weight[Kg] non-DCR types |
|-------------------|-------|--------|-------|------------------------------------|----------------------------|----------------------------|--------------------------|
| SV0300iS7-4 | 300 | 594 | 300.4 | - | - | 41 | 28 |
| SV0370iS7-4 | 300 | 594 | 300.4 | - | - | 41 | 28 |
| SV0450iS7-4 | 300 | 594 | 300.4 | - | - | 41 | 28 |
| SV0550iS7-4 | 370 | 663.4 | 371 | - | - | 63 | 45 |
| SV0750iS7-4 | 370 | 663.4 | 371 | - | - | 63 | 45 |
| SV0900iS7-4 | 510 | 784 | 423 | - | - | 101 | - |
| SV1100iS7-4 | 510 | 784 | 423 | - | - | 101 | - |
| SV1320iS7-4 | 510 | 861 | 423 | - | - | 114 | - |
| SV1600iS7-4 | 510 | 861 | 423 | - | - | 114 | - |
| SV1850iS7-4 | 690 | 1078 | 450 | - | - | 200 | - |
| SV2200iS7-4 | 690 | 1078 | 450 | - | - | 200 | - |
| SV2800iS7-4 | 771 | 1138 | 440 | - | - | - | 252 |
| SV3150iS7-4 | 922 | 1302.5 | 495 | - | - | - | 352 |
| SV3750iS7-4 | 922 | 1302.5 | 495 | - | - | - | 352 |

Note

- The weight specified in the table indicates the total weight of the product without packaging, which includes built-in parts, such as the EMC filter and DCR.
- 300-220 kW (400 V) products have built-in DCR only.
- 280-375 kW (400 V) products are provided without a built-in EMC filter and DCR.

3.6 Frame Dimensions and Weight (UL Enclosed Type 12, IP54 Type)

| Inverter Capacity | W[mm] | H[mm] | D[mm] | Weight[Kg] w/ built-in EMC and DCR | Weight[Kg] w/ built-in EMC | Weight[Kg] w/ built-in DCR | Weight[Kg] non-DCR types |
|-------------------|-------|-------|-------|------------------------------------|----------------------------|----------------------------|--------------------------|
| SV0008iS7-2/4 | 204 | 419 | 208 | 8.2 | 7.2 | 7.7 | 6.7 |
| SV0015iS7-2/4 | 204 | 419 | 208 | 8.2 | 7.2 | 7.7 | 6.7 |
| SV0022iS7-2/4 | 204 | 419 | 208 | 8.2 | 7.2 | 7.7 | 6.7 |
| SV0037iS7-2/4 | 204 | 419 | 208 | 8.2 | 7.2 | 7.7 | 6.7 |
| SV0055iS7-2/4 | 254 | 461 | 232 | 12.8 | 10.2 | 12.1 | 9.5 |
| SV0075iS7-2/4 | 254 | 461 | 232 | 12.9 | 10.3 | 12.2 | 9.6 |
| SV0110iS7-2/4 | 313 | 591 | 294 | 25.6 | 22.8 | 22.4 | 19.6 |
| SV0150iS7-2/4 | 313 | 591 | 294 | 25.9 | 23.1 | 22.7 | 19.9 |
| SV0185iS7-2 | 343 | 751 | 316 | 38.3 | 34.2 | 34.1 | 29.9 |
| SV0220iS7-2 | 343 | 751 | 316 | 38.3 | 34.2 | 34.1 | 29.9 |
| SV0185iS7-4 | 343 | 751 | 316 | 34.9 | 31 | 31 | 27.1 |
| SV0220iS7-4 | 343 | 751 | 316 | 34.9 | 31 | 31 | 27.1 |

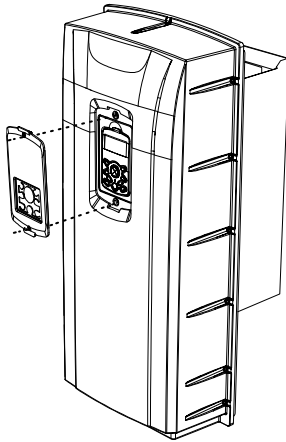
Note

- The weight specified in the table indicates the total weight of the product without packaging, which includes the built-in parts, such as the EMC filter and DCR.
- Only 0.75-22 kW products are available in IP 54 Type specifications.

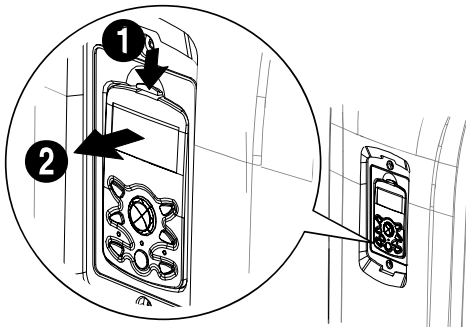
3.7 Installation Procedures for UL Enclosed Type12 and IP54 Type Products

3.7.1 Disassembling the Keypad Cover and Keypad

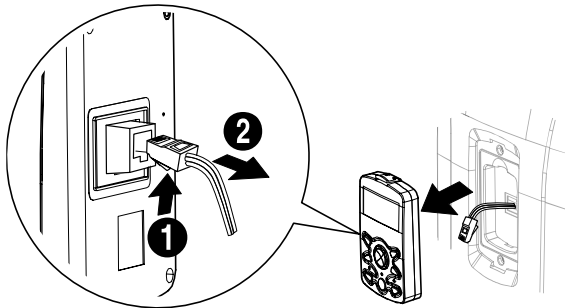
- 1 Loosen the screws that secure the keypad cover and remove the keypad cover.



- 2 Depress the tab at the top of the keypad and gently lift the keypad from the inverter to remove it. Be careful not to damage the keypad cable.

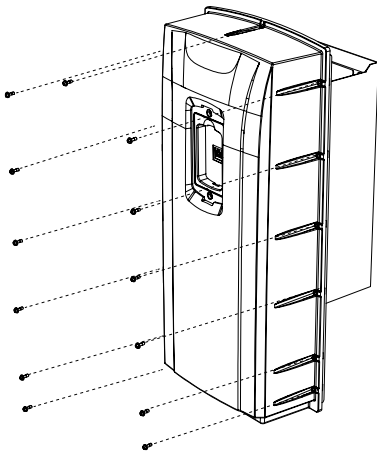


- 3 Depress the tab on the keypad cable connector and disconnect the cable from the back of the keypad.

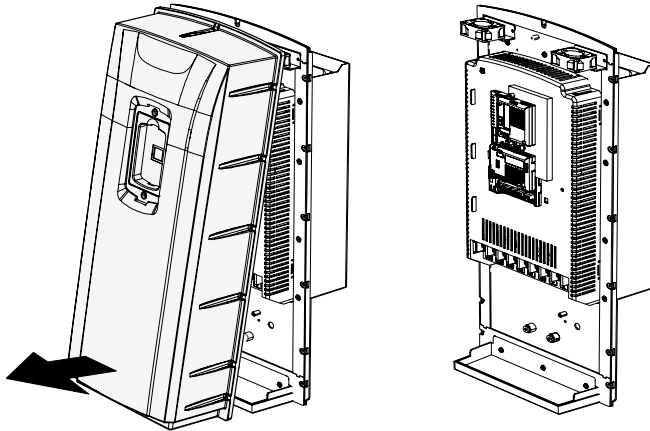


3.7.2 Disassembling the IP54 Front Cover

- 1 Loosen the screws that secure the front cover to the chassis. There are 9–13 screws on the cover depending on the model type.

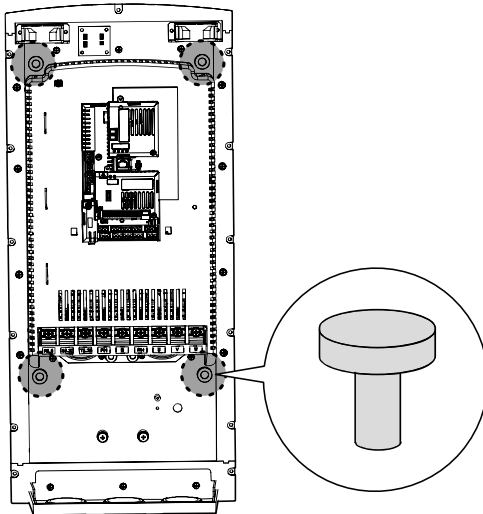


- 2 Remove the cover by lifting it upwards from the bottom.

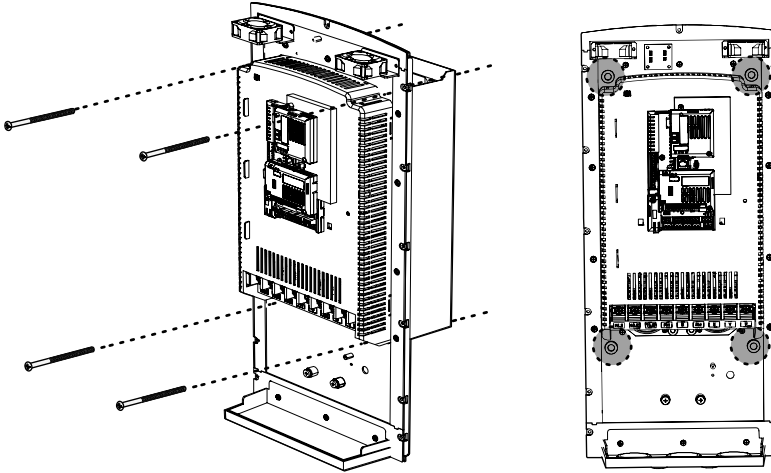


3.7.3 Mounting the Inverter

- 1 Remove the 4 rubber feet from the corners.



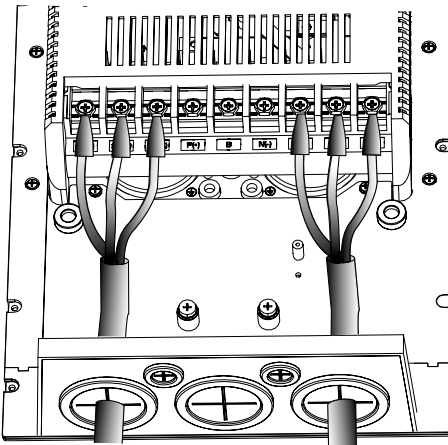
- 2 Place the inverter on a flat wall or in a cabinet, and use 4 screws or bolts to securely fix the inverter to the surface.



3.7.4 Connecting the Power Cables

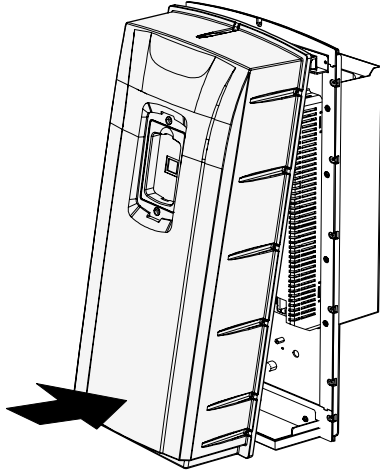
Connect the power cables to the input (R, S, T) and output (U, V, W) terminals. Then, tighten the terminal screws.

Refer to [4 Connecting the Cables](#) on page [49](#) for detailed information.

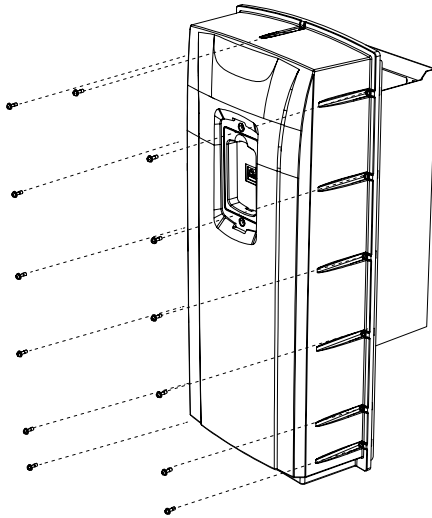


3.7.5 Reassembling the IP54 Front Cover and the Keypad

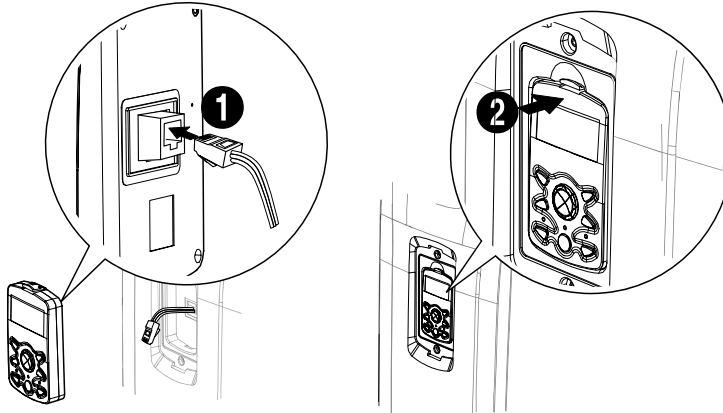
- 1 Place the front cover on the chassis and align the screw holes on each side.



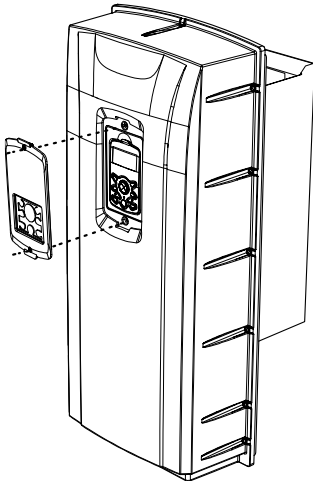
- 2 Insert and tighten the screws. There are 9–13 screws on the cover depending on the model type.



- 3 Connect the signal cable to the keypad, align the lower part of the keypad to the bottom of the keypad receptacle, and then push the top part of the keypad into the chassis until the keypad snaps into place.



- 4 Place the keypad cover on top of the keypad, and secure it using 2 screws.



4 Connecting the Cables

Connect cables to the power and signal terminal blocks of the inverter.

⚠ Caution

ESD (Electrostatic discharge) from the human body may damage sensitive electronic components on the PCB. Therefore, be extremely careful not to touch the PCB or the components on the PCB with bare hands while you work on the I/O PCB.

To prevent damage to the PCB from ESD, touch a metal object with your hands to discharge any electricity before working on the PCB, or wear an anti-static wrist strap and ground it on a metal object.

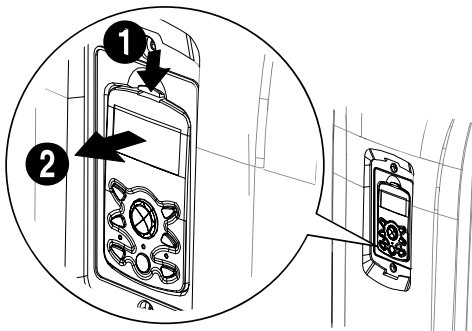
4.1 Removing the Front Cover for Cable Connection

⚠ Danger

Wait at least 10 minutes before opening the covers and exposing the terminal connections. Before working on the inverter, test the connections to ensure the DC voltage has been fully discharged. Personal injury or death by electric shock may result if the DC voltage has not been discharged.

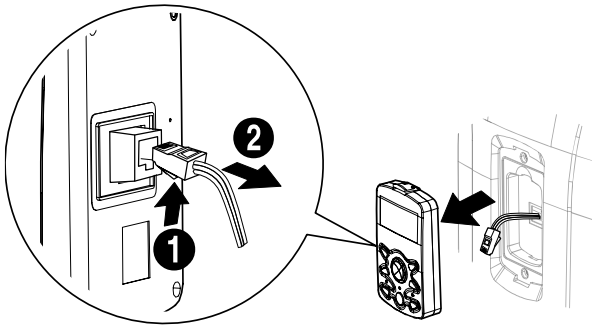
4.1.1 IP 21 Type Products

- 1 Depress the tab at the top of the keypad and gently lift the keypad from the inverter to remove it. Be careful not to damage the keypad cable.

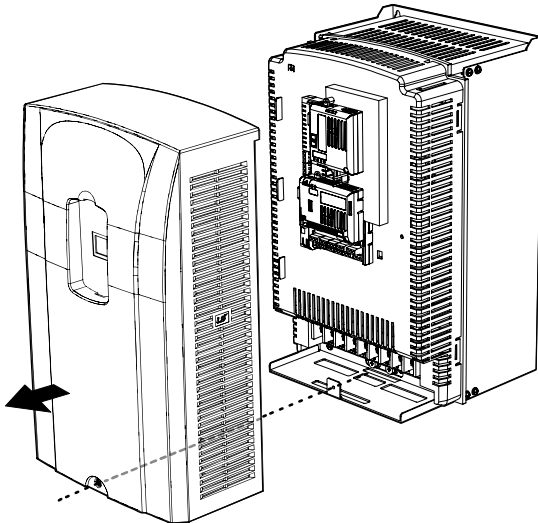


Connecting the Cables

- 2 Depress the tab on the keypad cable connector and disconnect the cable from the back of the keypad.

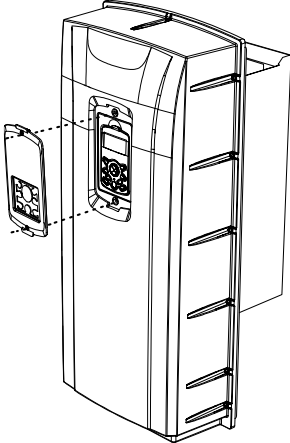


- 3 Loosen the screw from the bottom part of the front cover, and then remove the front cover.

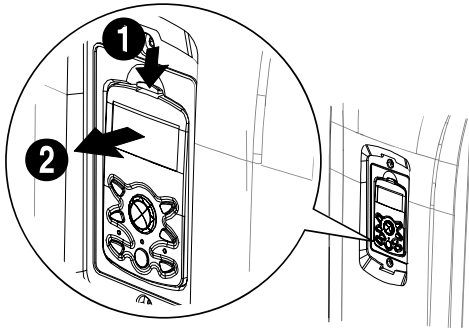


4.1.2 IP 54 Type Products

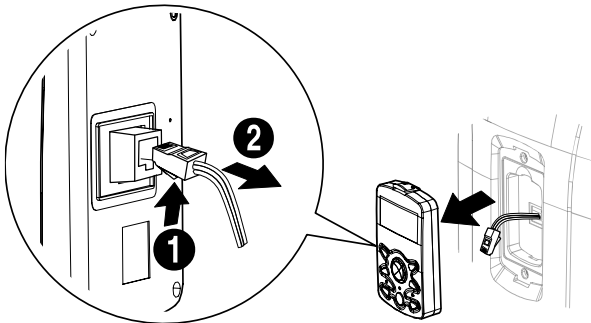
- 1 Loosen the two screws securing the keypad cover, and then remove the keypad cover.



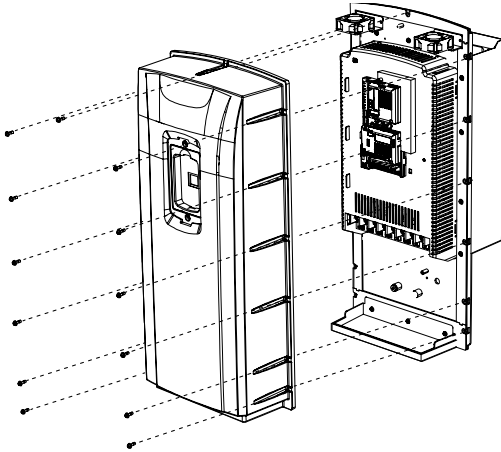
- 2 Depress the tab at the top of the keypad and gently lift the keypad from the inverter to remove it. Be careful not to damage the keypad cable.



- 3 Depress the tab on the keypad cable connector and disconnect the cable from the back of the keypad.

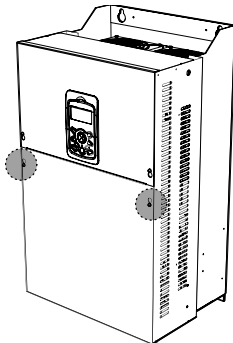


- 4 Remove the screws from each side of the front cover, and then remove the front cover.

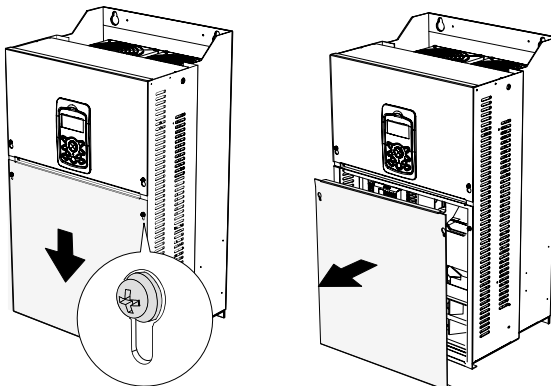


4.1.3 90–375 kW, 400 V and 30–75 kW, 200 V Products

- 1 Loosen the two screws on the front cover.



- 2 Slide the cover downwards and remove it from the inverter.



4.2 Activating and Deactivating the Built-in EMC Filter

Some iS-7 inverter models have built-in EMC filters to reduce conductive and radiational noise at the inverter input. Refer to *1.1.1 Identifying the Product* on page 1 and check your inverter's model type and specifications to see if it has a built-in EMC filter.

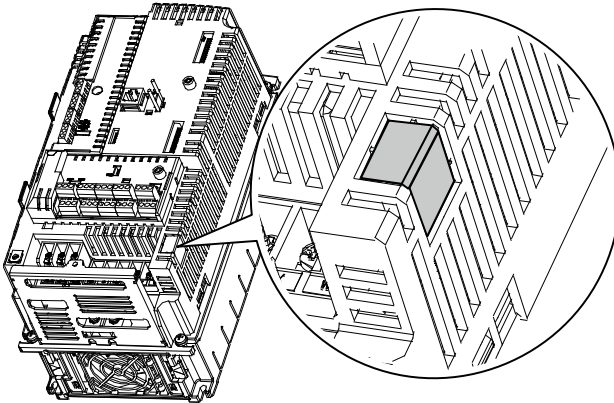
If your inverter has a built-in EMC filter, refer to the following instructions to activate or deactivate it.

⚠ Danger

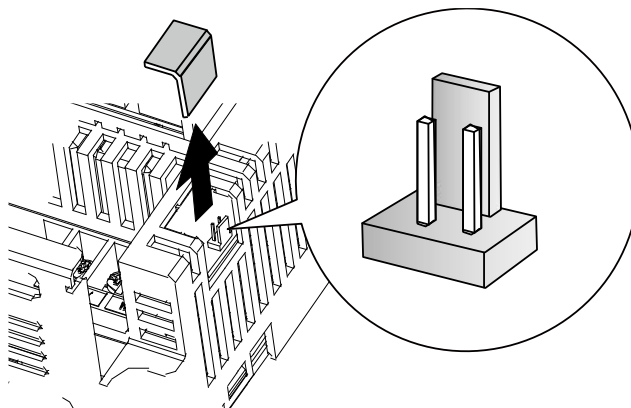
Do not activate the EMC filter if the inverter uses a power source with an asymmetrical grounding structure, for example a grounded delta connection. Personal injury or death by electric shock may result if the power source is not grounded properly.

4.2.1 Up to 7.5 kW Inverters

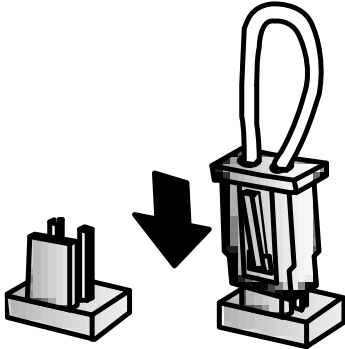
- 1 Locate the plastic knockout cap that covers the EMC filter switch (jumper SW1).



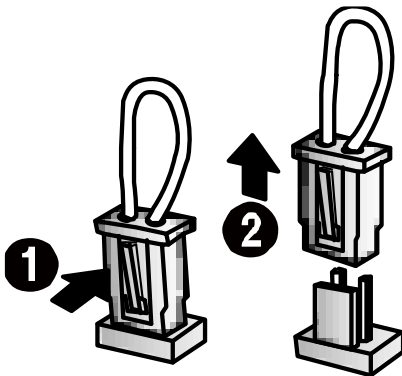
- 2 Remove the knockout cap and locate the jumper switch. The EMC filter will be deactivated if the two jumper pins are not connected.



- 3 Connect the two jumper pins using a short circuit connector to activate the EMC filter.

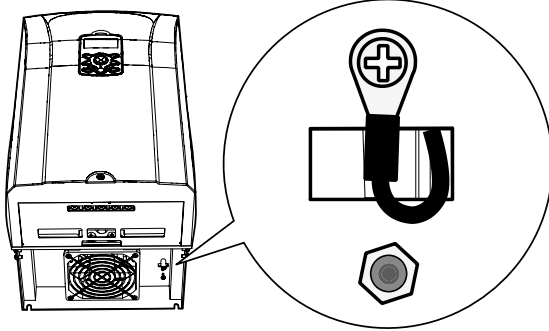


- 4 To remove the short circuit connector and deactivate the EMC filter, pull the connector while pressing the latch on the side of the connector. Use pliers or tweezers if you cannot reach the latch with your fingers.



4.2.2 11–22 kW Inverters

- 1 Locate the EMC filter cable and the ground terminal at the bottom of the inverter.

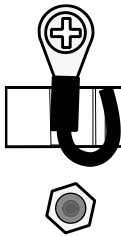


The EMC filter is deactivated if the EMC filter cable is connected to the insulated stud.



<EMC filter is turned OFF>

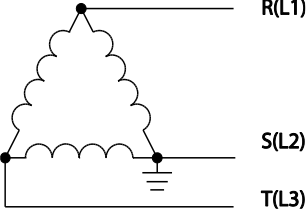
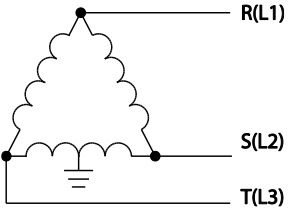
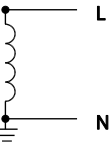
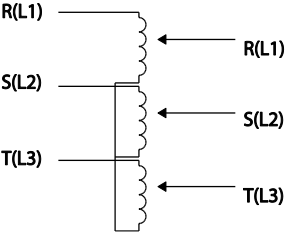
- 2 Remove the EMC filter cable from the insulated stud and connect it to the ground terminal (metal) to activate the EMC filter.



<EMC filter is turned ON>

An EMC filter prevents electromagnetic interference by reducing radio emissions from the inverter. Using an EMC filter is not always recommended, as it increases current leakage. If an inverter uses a power source with an asymmetrical grounding connection, the EMC filter must be turned off.

Before using the inverter, confirm the power supply's grounding system. Disable the EMC filter if the power source has an asymmetrical grounding connection.

| Asymmetrical Grounding Connection | | | |
|--|---|--|--|
| <p>One phase of a delta connection is grounded</p> |  | <p>Intermediate grounding point on one phase of a delta connection</p> |  |
| <p>The end of a single phase is grounded</p> |  | <p>A 3-phase connection without grounding</p> |  |

Note

- When the EMC Filter is deactivated, the Y-CAP is disconnected from Ground

4.3 Precautions for Wiring the Inverter

⚠ Warning

- Do not connect power to the inverter until installation has been fully completed and the inverter is ready to be operated. Doing so may result in electric shock.
- Wiring and inspection of wiring must be performed by an authorized engineer.

⚠ Caution

- Install the inverter before connecting the cables.
- Ensure that no metal debris, such as wire clippings, remain inside the inverter. Metal debris in the inverter can cause inverter failure.
- 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 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.
- Make sure that the total cable length does not exceed 495 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 the malfunction of equipment connected to the inverter.
- Route the signal cables away from the power cables. Otherwise, signal errors may occur due to electric interference.
- Tighten terminal screws to their specified torques. Loose terminal block screws may allow the cables to disconnect and cause a short circuit or inverter failure. Refer to [4.7 Specifications of the Power Terminal Block and Exterior Fuse](#) on page [6666](#) for torque specifications.
- Do not place heavy objects on top of electric cables. Heavy objects may damage the cable and result in electric shock.
- Use cables with the largest cross-sectional area, appropriate for power terminal wiring, to ensure that voltage drops do not exceed 2%.
- Use copper cables rated at 600 V, 75°C for power terminal wiring.
- Use copper cables rated at 300 V, 75°C for control terminal wiring.
- If you need to rewire the terminals due to wiring-related faults, ensure that the inverter keypad display is turned off and the charge lamp under the terminal cover is off before working on wiring connections. The inverter may hold a high-voltage electric charge long after the power supply has been turned off.

4.4 Ground Connection

Warning

Install ground connections for the inverter and the motor by following the correct specifications to ensure safe and accurate operation. Using the inverter and the motor without the specified grounding connections may result in electric shock.

Caution

- Do not use the ground terminal as the signal (control) ground.
- Do not share the ground connection with other machines that consume a large amount of power, such as a welding machine.
- Connect the ground cable to the nearest earth contact and keep the cable length as short as possible.

Because the inverter is a high-frequency switching device, leakage current may occur during operation. To avoid the danger of electrocution due to current leakage, the inverter must be properly grounded. Ground connection must be made to the specified ground terminal on the inverter. Do not connect ground cables to chassis screws.

Note

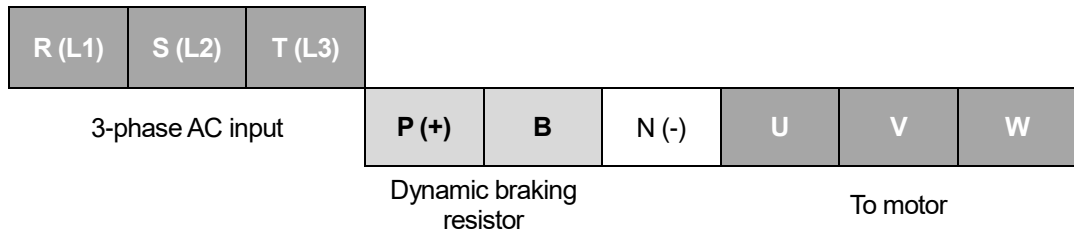
- 200 V products require Class 3 grounding. Resistance to ground must be $\leq 100 \Omega$.
- 400 V products require Special Class 3 grounding. Resistance to ground must be $\leq 10 \Omega$.

The following table lists the minimum ground cable specifications that must be met to properly ground the inverters.

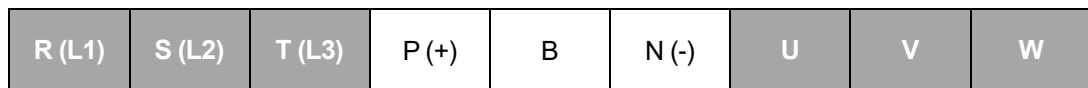
| Inverter Capacity | Grounding wire size (mm ²) | |
|-------------------|---|-------------|
| | 200 V class | 400 V class |
| 0.75–3.7kW | 4 | 2.5 |
| 5.5–7.5 kW | 6 | 4 |
| 11–15 kW | 16 | 10 |
| 18.5–22 kW | 25 | 16 |
| 30–45 kW | 25 | 16 |
| 55–75 kW | 35 | 35 |
| 90–110 kW | - | 60 |
| 132–220 kW | - | 100 |
| 280–315 kW | - | 185 |
| 375 kW | - | 240 |

4.5 Terminal Wiring Diagram

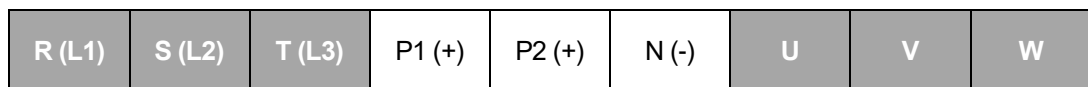
4.5.1 Up to 7.5 kW Inverters



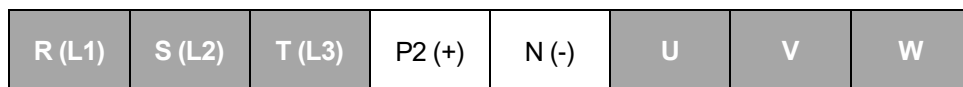
4.5.2 11–22 kW Inverters



4.5.3 30–75 kW Inverters



4.5.4 90–160 kW Inverters



4.5.5 185–220 kW Inverters

| | | | | | | | |
|--------|--------|--------|--------|-------|---|---|---|
| R (L1) | S (L2) | T (L3) | P2 (+) | N (-) | U | V | W |
|--------|--------|--------|--------|-------|---|---|---|

4.5.6 280–375 kW Inverters

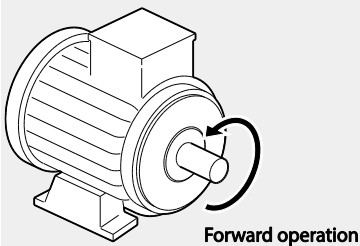
| | | | | | | | | |
|--------|--------|--------|--------|--------|-------|---|---|---|
| R (L1) | S (L2) | T (L3) | P1 (+) | P2 (+) | N (-) | U | V | W |
|--------|--------|--------|--------|--------|-------|---|---|---|

Note

- Inverters with a rated capacity of 11 kW or more are equipped with linearly arranged terminal blocks.
- 0.75–22 kW inverters have built-in DC reactors. The installation of an external DC reactor is not necessary for these inverters.
- The inverter must be properly grounded using the ground terminal.

Note

If the forward command (Fx) is turned 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.



Remarque

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

4.6 Connecting Cables to the Power Terminal Block

⚠ Caution

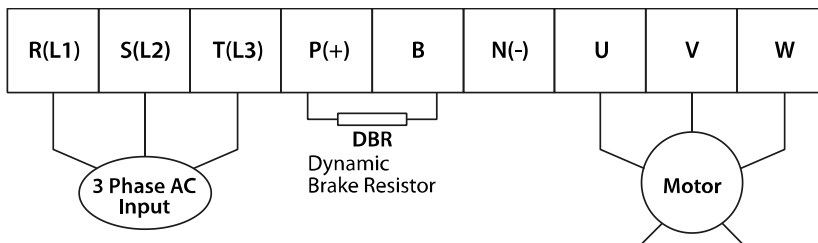
Power supply cables must be connected to the R, S, and T terminals. Connecting power cables to other terminals will damage the inverter.

Note

The motor will rotate in the opposite direction if the U, V, and W terminals are connected in a wrong phase order.

4.6.1 0.75–22 kW (200 V/400 V)

Cable connection for utilizing the built-in dynamic braking unit

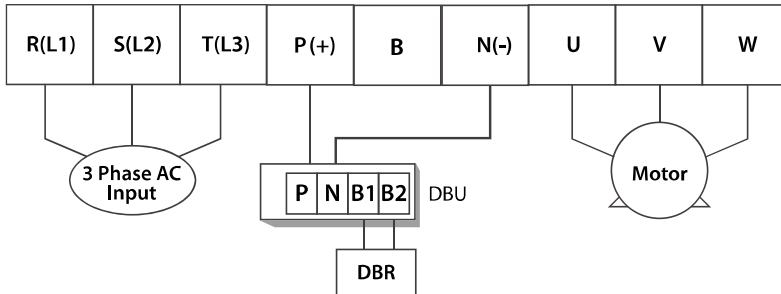


Connect the cables from the dynamic braking unit to the P (+) and B terminals to utilize the built-in dynamic braking unit.

| Terminal Symbol | Terminal Name | Description |
|------------------------|------------------------------------|---|
| R (L1), S (L2), T (L3) | AC power supply input terminals | AC input terminals |
| P (+) | (+) DC voltage terminal | (+) DC link voltage terminal |
| N (-) | (-) DC voltage terminal | (-) DC link voltage terminal. |
| P (+), B | Dynamic braking resistor terminals | Dynamic braking resistor terminals |
| U, V, W | Inverter output terminals | Output terminals to a 3-phase induction motor |

Cable connection for utilizing the optional dynamic braking unit

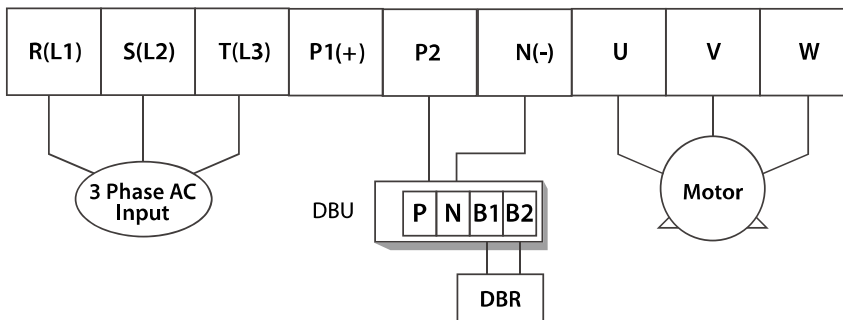
Connect the cables from dynamic braking unit to P (+) and N (-) terminals to utilize the optional dynamic braking unit. Do not connect cables to B terminal.



| Terminal Symbol | Terminal Name | Description |
|------------------------|------------------------------------|---|
| R (L1), S (L2), T (L3) | AC power supply input terminals | AC input terminals |
| P (+) | (+) DC voltage terminal | (+) DC link voltage terminal |
| N (-) | (-) DC voltage terminal | (-) DC link voltage terminal. |
| P (+), B | Dynamic braking resistor terminals | Dynamic braking resistor terminals |
| U, V, W | Inverter output terminals | Output terminals to a 3-phase induction motor |

4.6.2 30–75 kW (200 V/400 V)

Connect the cables from the dynamic braking unit to the P (+) and B terminals to utilize the built-in dynamic braking unit.



In 30-75 kW 200 V model types, the P1 and P2 terminals are connected with a jumper pin.

| Terminal Symbol | Terminal Name | Description |
|------------------------|---------------------------------|--------------------|
| R (L1), S (L2), T (L3) | AC power supply input terminals | AC input terminals |

| Terminal Symbol | Terminal Name | Description |
|-----------------|--|---|
| P1 (+) | (+) DC voltage terminal | (+) DC link voltage terminal |
| P2, N (-) | Dynamic braking resistor terminal / DC common* | Dynamic braking resistor terminals |
| N (-) | (-) DC voltage terminal | (-) DC link voltage terminal |
| U, V, W | Inverter output terminals | Output terminals to a 3-phase induction motor |

*Contact LSELECTRIC Customer Support before configuring the P2 (+) and N (-) terminals as the DC common source. There are a few factors that require special attention for this application.

Note

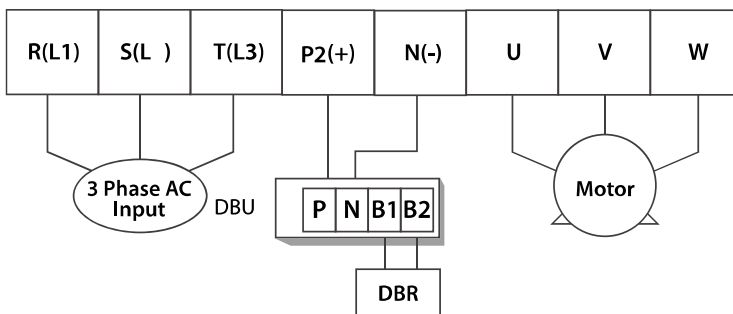
External DC reactors cannot be used with 30–75 kW inverters. To use a DC reactor with these inverters, purchase a 30–75 kW inverter that has a built-in DC reactor.

⚠ Caution

- When a built-in DCR unit is present, the P1 (+) and P (-) terminals are connected to the reactor's input and output terminals respectively.
- If your product does not have a built-in DCR unit, the P2 (+) and N (-) terminals may be used as the common DC source. Do not use the P1 (+) terminal as the common DC source, as this may result in product damage.
- Use the P2 (+) and N (-) terminals to connect a dynamic braking resistor to the inverter. Do not connect the dynamic braking unit to the P1 (+) terminal, as this may result in product damage.
- Contact LSELECTRIC Customer Support before configuring the N (-) terminal as the DC common source. There are a few factors that require special attention for this application.

4.6.3 90–160 kW (400 V)

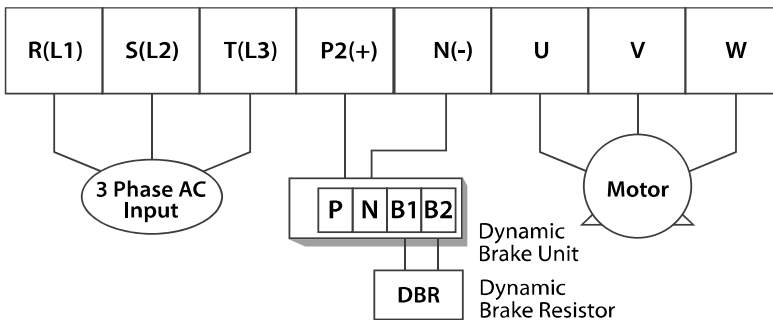
Connect the cables from the dynamic braking unit to the P2 (+) and N (-) terminals to utilize an external dynamic braking unit.



| Terminal Symbol | Terminal Name | Description |
|------------------------|-----------------------------------|---|
| R (L1), S (L2), T (L3) | AC power supply input terminals | AC input terminals |
| N (-) | (-) DC voltage terminal | (-) DC link voltage terminal |
| P2 (+), N (-) | Dynamic braking resistor terminal | Dynamic braking resistor terminals |
| U, V, W | Inverter output terminals | Output terminals to a 3-phase induction motor |

4.6.4 185–220 kW (400 V)

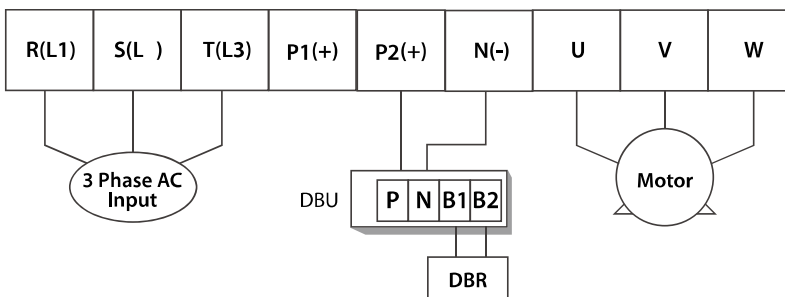
Connect the cables from the dynamic braking unit to the P2 (+) and N (-) terminals to utilize an external dynamic braking unit.



| Terminal Symbol | Terminal Name | Description |
|------------------------|-----------------------------------|---|
| R (L1), S (L2), T (L3) | AC power supply input terminals | AC input terminals |
| N (-) | (-) DC voltage terminal | (-) DC link voltage terminal |
| P2 (+), N (-) | Dynamic braking resistor terminal | Dynamic braking resistor terminals |
| U, V, W | Inverter output terminals | Output terminals to a 3-phase induction motor |

4.6.5 280–375 kW (200 V/400 V)

Connect the cables from the dynamic braking unit to the P2 (+) and N (-) terminals to utilize the built-in dynamic braking unit.



| Terminal Symbol | Terminal Name | Description |
|------------------------|--|---|
| R (L1), S (L2), T (L3) | AC power supply input terminals | AC input terminals |
| P1 (+) | (+) DC voltage terminal | (+) DC link voltage terminal |
| P2/N (-) | Dynamic braking resistor terminal / DC common* | Dynamic braking resistor terminals |
| N (-) | (-) DC voltage terminal | (-) DC link voltage terminal |
| U, V, W | Inverter output terminals | Output terminals to a 3-phase induction motor |

*Contact LSELECTRIC Customer Support before configuring the P2 (+) and N (-) terminals as the DC common source. There are a few factors that require special attention for this application.

⚠ Caution

- Apply rated torques to the terminal screws. Loose screws may cause the terminals to short circuit and malfunction. Tightening the screws too much may damage the terminals and cause them to short circuit and malfunction.
- Only use copper wires with a 600 V, 75 °C rating for the power terminal wiring, and a 300 V, 75 °C rating for the control terminal wiring.
- Power supply wiring must be connected to the R, S, and T terminals. Connecting them to the U, V, W terminals causes internal damage to the inverter. The motor should be connected to the U, V, and W terminals. Arrangement of the phase sequence is not necessary.

4.7 Specifications of the Power Terminal Block and Exterior Fuse

| Inverter capacity | Terminal screw size | Screw torque ¹⁾ (Kgf·cm) | Cable ²⁾ | | | | Exterior fuse | | |
|-------------------|---------------------|--|---------------------|-------|--------------|-------|---------------|---------|-------|
| | | | mm ² | | AWG or kcmil | | Current | Voltage | |
| | | | R,S,T | U,V,W | R,S,T | U,V,W | | | |
| 200V | 0.75 kW | M4 | 7.1–12 | 2.5 | 2.5 | 14 | 14 | 10 A | 500 V |
| | 1.5 kW | M4 | 7.1–12 | 2.5 | 2.5 | 14 | 14 | 15 A | 500 V |
| | 2.2 kW | M4 | 7.1–12 | 2.5 | 2.5 | 14 | 14 | 20 A | 500 V |
| | 3.7 kW | M4 | 7.1–12 | 4 | 4 | 12 | 12 | 32 A | 500 V |
| | 5.5 kW | M4 | 7.1–12 | 6 | 6 | 10 | 10 | 50 A | 500 V |
| | 7.5 kW | M4 | 7.1–12 | 10 | 10 | 8 | 8 | 63 A | 500 V |
| | 11 kW | M6 | 30.6–38.2 | 16 | 16 | 6 | 6 | 80 A | 500 V |
| | 15 kW | M6 | 30.6–38.2 | 25 | 25 | 4 | 4 | 100 A | 500 V |
| | 18.5 kW | M8 | 61.2–91.8 | 35 | 35 | 2 | 2 | 125 A | 500 V |
| | 22 kW | M8 | 61.2–91.8 | 50 | 50 | 1 | 1 | 160 A | 500 V |
| | 30 kW | M8 | 61.2–91.8 | 70 | 70 | 1/0 | 1/0 | 200 A | 500 V |
| | 37 kW | M8 | 61.2–91.8 | 95 | 95 | 2/0 | 2/0 | 250 A | 500 V |
| | 45 kW | M8 | 61.2–91.8 | 95 | 95 | 2/0 | 2/0 | 350 A | 500 V |
| | 55 kW | M10 | 89.7–122.0 | 120 | 120 | 3/0 | 3/0 | 400 A | 500 V |
| | 75 kW | M10 | 89.7–122.0 | 150 | 150 | 4/0 | 4/0 | 450 A | 500 V |
| 400V | 0.75–1.5kW | M4 | 7.1–12 | 2.5 | 2.5 | 14 | 14 | 10 A | 500 V |
| | 2.2 kW | M4 | 7.1–12 | 2.5 | 2.5 | 14 | 14 | 15 A | 500 V |
| | 3.7 kW | M4 | 7.1–12 | 2.5 | 2.5 | 14 | 14 | 20 A | 500 V |
| | 5.5 kW | M4 | 7.1–12 | 4 | 2.5 | 12 | 14 | 32 A | 500 V |
| | 7.5 kW | M4 | 7.1–12 | 4 | 4 | 12 | 12 | 35 A | 500 V |
| | 11 kW | M5 | 24.5–31.8 | 6 | 6 | 10 | 10 | 50 A | 500 V |
| | 15 kW | M5 | 24.5–31.8 | 10 | 10 | 8 | 8 | 63 A | 500 V |
| | 18.5 kW | M6 | 30.6–38.2 | 16 | 10 | 6 | 8 | 70 A | 500 V |
| | 22 kW | M6 | 30.6–38.2 | 25 | 16 | 4 | 6 | 100 A | 500 V |
| | 30 kW | M8 | 61.2–91.8 | 25 | 25 | 4 | 4 | 125 A | 500 V |
| | 37 kW | M8 | 61.2–91.8 | 25 | 35 | 4 | 2 | 125 A | 500 V |
| | 45 kW | M8 | 61.2–91.8 | 50 | 50 | 1 | 1 | 160 A | 500 V |
| | 55 kW | M8 | 61.2–91.8 | 70 | 70 | 1/0 | 1/0 | 200 A | 500 V |
| | 75 kW | M8 | 61.2–91.8 | 95 | 95 | 2/0 | 2/0 | 250 A | 500 V |
| | 90 kW | M12 | 182.4–215.0 | 100 | 100 | 4/0 | 4/0 | 350 A | 500 V |
| | 110 kW | M12 | 182.4–215.0 | 100 | 100 | 4/0 | 4/0 | 400 A | 500 V |
| | 132 kW | M12 | 182.4–215.0 | 150 | 150 | 300 | 300 | 450 A | 500 V |
| | 160 kW | M12 | 182.4–215.0 | 200 | 200 | 400 | 400 | 450 A | 500 V |
| | 185 kW | M12 | 182.4–215.0 | 200 | 200 | 400 | 400 | 620 A | 500 V |
| 220 kW | M12 | 182.4–215.0 | 250 | 250 | 500 | 500 | 800 A | 500 V | |
| 280 kW | M12 | 182.4–215.0 | 325 | 325 | 650 | 650 | 1000 A | 500 V | |
| 315 kW | M12 | 182.4–215.0 | 2x200 | 2x200 | 2x400 | 2x400 | 1200 A | 500 V | |
| 375 kW | M12 | 182.4–215.0 | 2x250 | 2x250 | 2x500 | 2x500 | 1400 A | 500 V | |

1) Apply rated torques to the terminal screws. Loose screws may cause the terminals to short circuit and malfunction.

2) Only use copper wires with a 600 V, 75°C rating for the power terminal wiring.

4.7.1 Cable Length between the Inverter and the Motor

The maximum cable lengths of the inverter and the motor are listed in <Table 1) Maximum cable length by inverter capacity>.

Make sure that the total cable length does not exceed 495 ft (150 m). For inverters with a capacity of less than 3.7 kW, 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 the malfunction of equipment connected to the inverter.

<Table 1) Maximum Cable Length by Inverter Capacity>

| Inverter capacity | Up to 3.7 kW | 5.5 kW or more |
|----------------------|-----------------|------------------|
| Maximum cable length | < 164 ft (50 m) | < 492 ft (150 m) |

The following table lists maximum carrier frequencies available for model types with a rated capacity of 5.5 kW or more.

<Table 2) Maximum Carrier Frequency according to Cable Length>

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

Depending on the system layout and operating conditions at the installation site, high peak output voltage may result.

a) If the output peak voltage is too high even when the motor cable length is shorter than the maximum recommended cable length for the inverter capacity:

- use a motor with a high insulation rating.
- install an output circuit filter (micro surge filter).
- install a dv/dt filter, or a sine wave filter.

b) If the cable length is too long:

- use thicker cables to prevent voltage drop.
[Voltage Drop (V) = $[\sqrt{3} \times \text{cable resistance (m}\Omega\text{/m)} \times \text{cable length (m)} \times \text{current (A)}] / 1000$]
- do not use 3-core cables.
- use a lower carrier frequency.

4.7.2 Protective Measures for the Inverter and the Motor

The inverter output voltage pulse, regardless of the actual output frequency, is identical to the DC link voltage pulse, which has a very short rising time. When the power is transmitted through the output cables, the output peak voltage can rise up to twice the total DC link voltage (2.8 times the main power voltage).

If a switching device (a magnetic contactor or relay) is connected to the output side of the inverter, high-voltage surges may result whenever a switch is made, regardless of the length of the motor cable.

Such high-voltage surges can damage the inverter's output components (such as the current sensor), motor cables, and the motor itself. To protect the inverter and the motor from such damage caused by a high-voltage surge, do not install switching devices in the output side of the inverter. You can install an output reactor, dv/dt filter, or sine wave filter to protect the inverter and motor from a surge voltage.

An output surge with a high switching frequency and fast rising time causes a motor shaft current that runs through the motor bearing. It slowly corrodes the surface of the motor bearing, eventually seizing up the motor.

To decrease the motor shaft current and protect the motor insulation, refer to <Table 1) Maximum cable length by inverter capacity>. Install a dv/dt filter or sine wave filter if possible, regardless of the length of the motor cable.

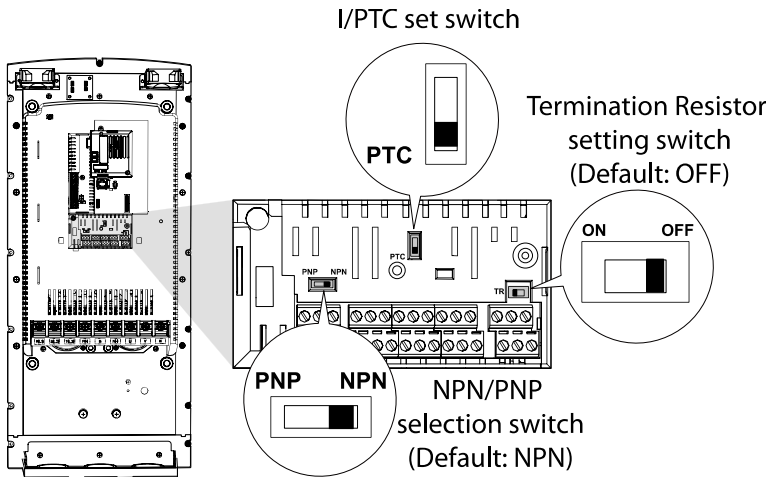
⚠ Caution

Only use Class H or RK5 UL listed input fuses and UL listed breakers. See the table above for the voltage and current ratings for the fuses and breakers.

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

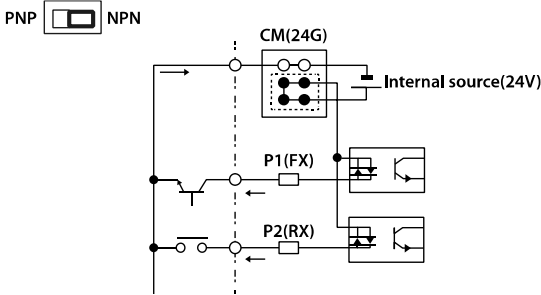
4.8 Control Terminal Wiring for iS7 Inverters Rated for Up To 22 kW

The iS7 inverter supports both PNP (Source) and NPN (Sink) modes for sequence inputs at the terminal. Select an appropriate mode to suit your requirements using the PNP/NPN selection switch above the control terminal block. Refer to the following information for detailed applications.



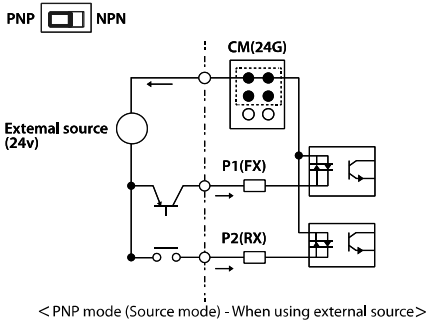
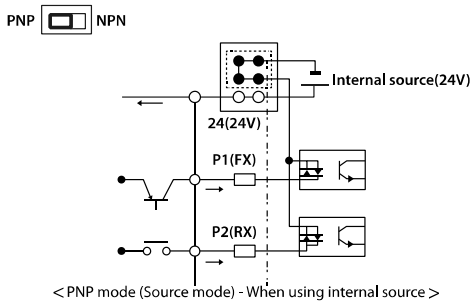
4.8.1 NPN Mode (Sink)

Select NPN using the PNP/NPN selection switch. The factory default setting is NPN mode. CM (24V GND) is the common ground terminal for all terminal inputs.



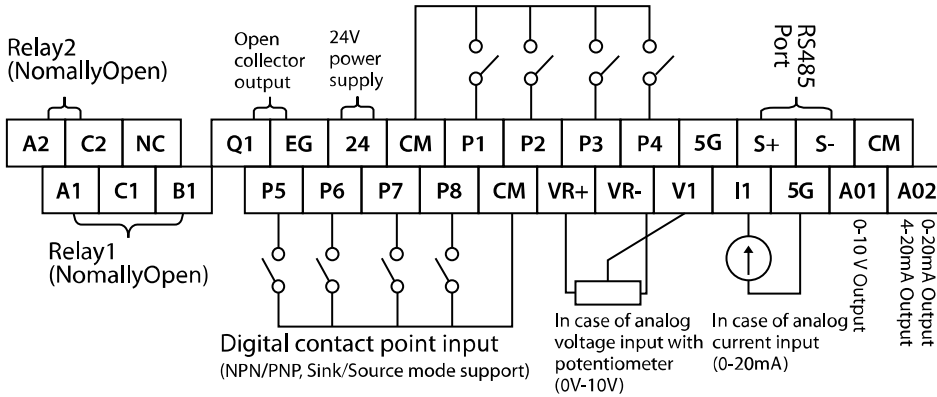
4.8.2 PNP Mode (Source)

Select PNP using the PNP/NPN selection switch. The factory default setting is NPN mode. CM (24 V GND) is the common ground terminal for all terminal inputs, and 24 is the 24 V internal source. If you are using an external 24 V source, select PNP (sink) mode and build a circuit that connects the external source (-) and the CM terminal.



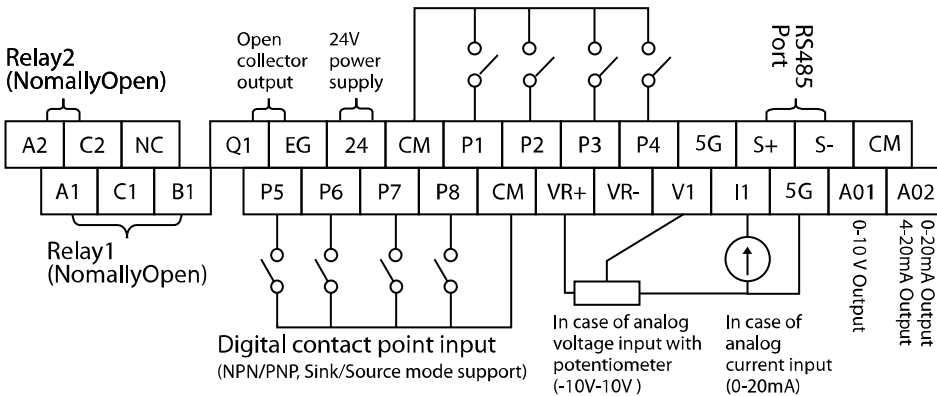
4.8.3 0.75–22 kW (Basic I/O)

Wiring Examples



Default Functions Assigned for the Multi-Function Terminals

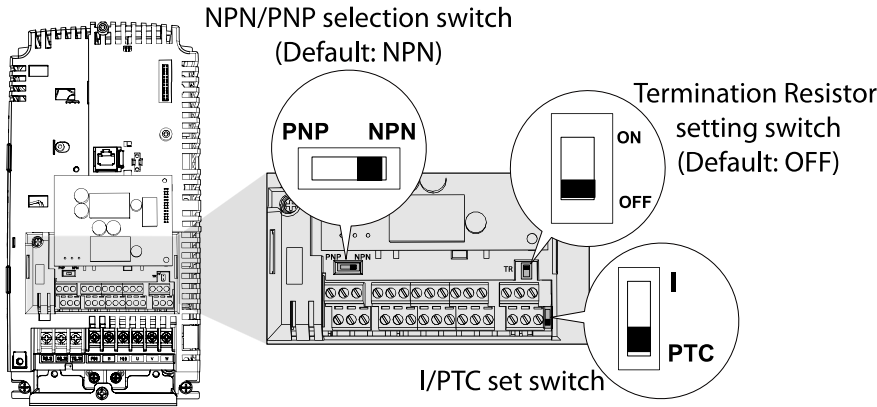
| | | | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
| FX | RX | BX | RST | Sp-L | Sp-M | Sp-H | JOG |



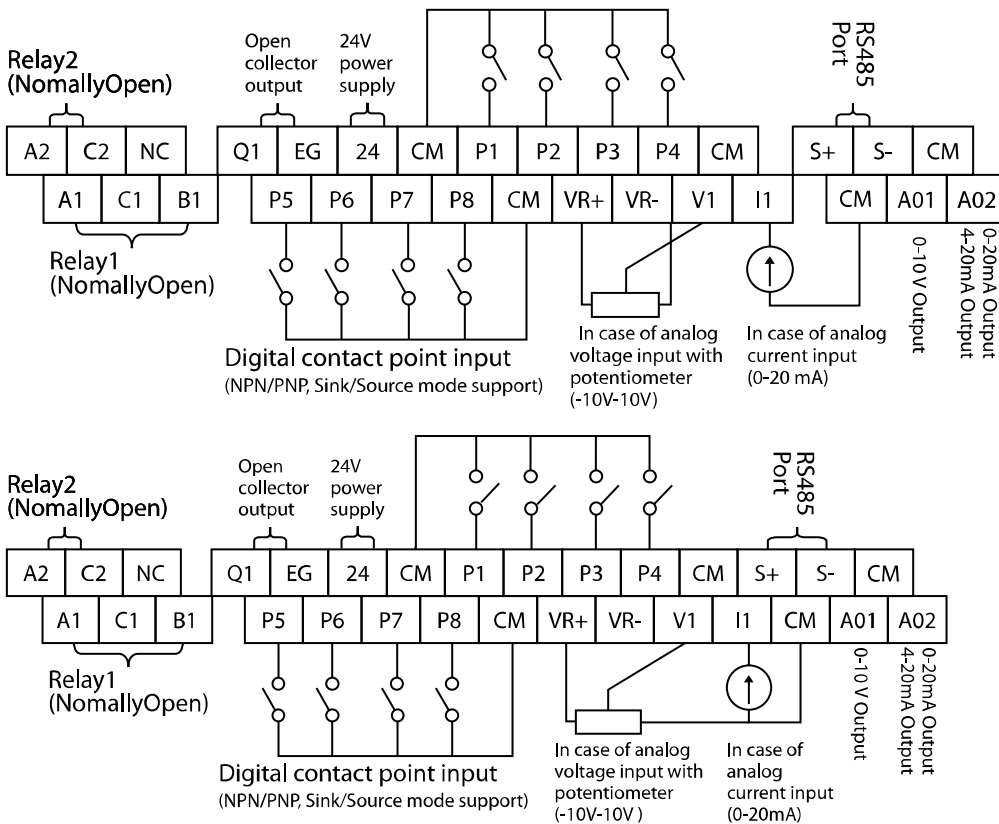
Note

- The TR (termination resistor) switch is used to terminate the RS485 network connection (120 Ω). Please turn on the TR switch of the last positioned Drive and turn off the TR switch of the remaining drives.
- For analog voltage input, use a potentiometer rated at 0.5W, 1kOhm.
- Refer to [8 Table of Functions](#) on page [157](#) for the multi-function terminal configurations.

4.9 Control Terminal Wiring for iS7 Inverters Rated for 30 kW or More



30–375 kW (control terminal block)



Note

- The TR (termination resistor) switch is used to terminate the RS485 network connection (120 Ω). Please turn on the TR switch of the last positioned Drive and turn off the TR switch of the remaining drives.
- Use a potentiometer rated for 0.5 W, 1 k Ω .

If the analog voltage (V) or current (I) input is used to set the frequency reference, the analog input is reflected when the input is actually received. For instance, the voltage input 0 V at V1 does not indicate that no input is received at V1, but it means that 0 V input is actually received at V1.

Note

When you use the analog voltage input, the bipolar input range (-10 – +10V), in comparison to the unipolar input range (0–10V), allows for more accurate input control with smaller increments.

⚠ Caution

If the analog input is interrupted when setting a frequency reference using the analog voltage (V) input and no voltage input is received at the terminal, an offset voltage may be applied to keep the frequency reference at approximately 4–5 Hz.

4.10 Terminal Inputs for Inverter Operation

| Input Type | Symbol | Name | Description |
|----------------|--------------|--|--|
| Terminal input | P1–P8 | Multi-function input1–8 | Configurable for multi-function input terminals. Refer to 8 Table of Functions on page 157 for the multi-function terminal configurations. |
| | CM | Common sequence | Common terminal for terminal inputs (5G common terminal is used for analog frequency inputs only). |
| Input signal | Analog input | VR(+) | Potentiometer frequency reference (+) Used to setup or modify a frequency reference via the analog voltage or current input. Maximum output is +12 V, 100 mA. |
| | | VR(-) | Potentiometer frequency reference (-) Used to setup or modify a frequency reference via the analog voltage or current input. Maximum output is -12 V, 100 mA. |
| | V1 | Voltage input for frequency reference Used to setup or modify a frequency reference via the analog voltage input terminal. Unipolar: 0–10 V Bipolar: -10–10 V Input resistance 20 k Ω | |
| | I1 | Current input for frequency reference Used to setup or modify a frequency reference via the current input terminals. Input current: DC 0–20 mA Input resistance 249 Ω | |

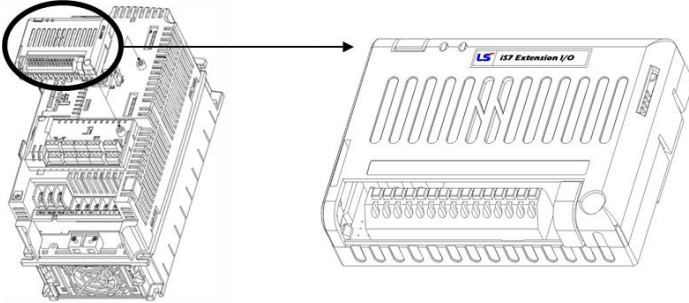
| Input Type | Symbol | Name | Description |
|---------------|-----------------|---|--|
| | 5G | Frequency setting common terminal | Common terminal for analog voltage and current terminals (CM common terminal is used for terminal inputs only). |
| Output Signal | Analog output | AO1 | Multi-function analog voltage output terminal Used to send inverter output information to external devices. Output voltage: 0–10 V Maximum output voltage: 10 V Maximum output current: 10 mA |
| | | AO2 | Multi-function analog current output terminal Used to send inverter output information to external devices. Output current: 4–20 mA (0–20 mA) Maximum output current: 20 mA |
| | Terminal output | Q1 | Multi-function terminal (open collector) DC 26 V, below 100 mA |
| | | EG | Common terminal for open collector Common ground contact for an open collector (with external power source). |
| | | 24 | External 24 V power source Maximum output current: 150 mA |
| | | CM | External 24 V common Common ground contact for the external 12 V power source. |
| | | A1, B1, C1 | Fault signal output Sends out alarm signals when the inverter's safety features are activated (below AC 250 V 5 A, DC 30 V 5 A). Fault condition: A1 and C1 contacts are connected (B1 and C1 open connection) Normal operation: B1 and C1 contacts are connected (A1 and C1 open connection) |
| | | A2, C2 | Multi-function relay2 output A contact Outputs the signal while running. User defined multi-function output terminal. (< AC 250 V, 5 A / < DC 30 V, 5 A) |
| | S+, S-, CM | RS-485 signal line Used to send or receive RS-485 signals. | |

4.11 Cable Specifications for Control Block Wiring

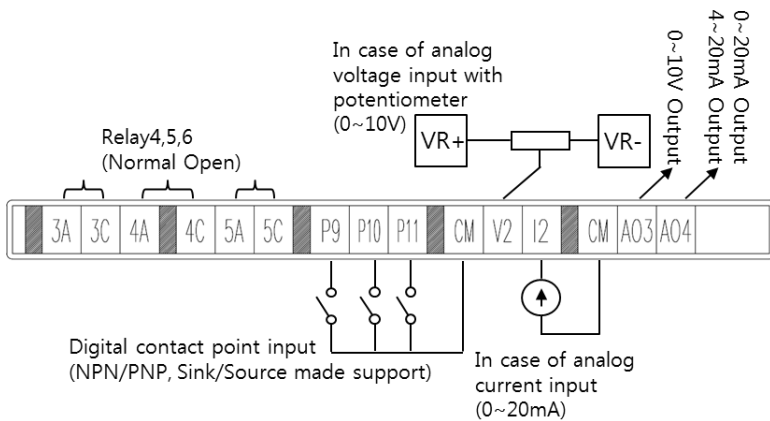
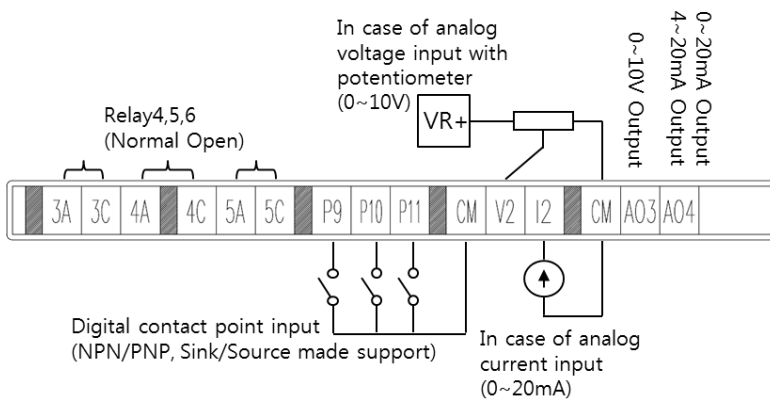
| Terminal Name | | Cable size ¹⁾ | | Specifications |
|---------------|--|--|--|---|
| | | mm ² | AWG | |
| P1–P8 | Multi-function input terminal | 0.33– 1.25 | 16–22 | - |
| CM | Common terminal input (5G common is used for analog frequency inputs only). | | | Common earth for multi-function input terminal |
| VR+ | Analog frequency setting (+) power | | | Output voltage: +12 V Maximum output voltage: 100 mA |
| VR- | Analog frequency setting (-) power | | | Output voltage: -12 V Maximum output voltage: 100 mA |
| V1 | Multi-function analog voltage input terminal | | | Input voltage: 0–10 V or -10–10 V |
| I1 | Multi-function analog current input terminal | | | 0–20 mA input Internal resistance: 249 Ω |
| AO1 | Multi-function analog voltage output terminal | 0.33– 2.0 | 14–22 | Maximum output voltage: 10 V Maximum output current: 10 mA |
| AO2 | Multi-function analog current output terminal | | | Maximum output current: 20 mA |
| 5G | Frequency setting common terminal (CM common terminal is used for terminal inputs only). | | | Common terminal of analog frequency setting signal and analog current and voltage terminals |
| Q1 | Multi-function terminal (open collector) | | | DC 26 V, below 100 mA |
| EG | Ground terminal for external power | | | Common terminal for an open collector external power source |
| 24 | External 24 V power supply | | | Maximum output current: 150 mA |
| CM | 24 V common | 16–22 | Common terminal for external 24 V power source | |
| A1 | Multi-function relay 1 output A | 0.33– 2.0 | 14–22 | Below AC 250 V/5 A, Below DC 30 V/5 A |
| B1 | Multi-function relay 1 output B | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| C1 | Multi-function relay 1 common terminal | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| A2 | Multi-function relay 2 output A | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| C2 | Multi-function relay 2 common terminal | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| S+,S- | RS485 signal input terminal | | | 0.75 |
| CM | RS485 common terminal | For multi-connections, RS485 power ground (shield) connection terminal | | |

1) Use shielded, twisted-pair cables.

4.12 Control Terminal Wiring for iS7 Extension I/O (Optional)



Extension I/O (control terminal block)



4.13 Terminal Inputs for Inverter Operation

| Input Type | Symbol | Name | Description | |
|---------------|-----------------|--------|---|--|
| Input signal | Terminal input | P9–P11 | Multi-function input9–11 Configurable for multi-function input terminals. Refer to <i>8 Table of Functions</i> on page 157 for the multi-function terminal configurations. | |
| | | CM | Common sequence Common terminal for terminal inputs (5G common terminal is used for analog frequency inputs only). | |
| | Analog input | V2 | Voltage input for frequency reference Used to setup or modify a frequency reference via the analog voltage input terminal. Unipolar: 0–10 V Bipolar: -10–10 V Input resistance 20 k Ω | |
| | | I2 | Current input for frequency reference Used to setup or modify a frequency reference via the current input terminals. Input current: DC 0–20 mA Input resistance 249 Ω | |
| Output Signal | Analog output | AO3 | Multi-function analog voltage output terminal Used to send inverter output information to external devices. Output voltage: 0–10 V Maximum output voltage: 10 V Maximum output current: 10 mA | |
| | | AO4 | Multi-function analog current output terminal Used to send inverter output information to external devices. Output current: 4–20 mA (0–20 mA) Maximum output current: 20 mA | |
| | Terminal output | 3A, 3C | Multi-function relay3 output A contact | Outputs the signal while running. User defined multi-function output terminal. (< AC 250 V, 5 A / < DC 30 V, 5 A) |
| | | 4A, 4C | Multi-function relay4 output A contact | |
| | | 5A, 5C | Multi-function relay5 output A contact | |
| | | CM | External 24 V common Common ground contact for the external 24V power source. | |

4.14 Cable Specifications for Control Block Wiring

| Terminal Name | | Cable size ¹⁾ | | Specifications |
|---------------|---|--------------------------|-------|---|
| | | mm ² | AWG | |
| P9– P11 | Multi-function input terminal | 0.33– 1.25 | 16–22 | - |
| CM | Common terminal input (5G common is used for analog frequency inputs only). | | | Common earth for multi-function input terminal |
| V2 | Multi-function analog voltage input terminal | | | Input voltage: 0–10 V or -10–10 V |
| I2 | Multi-function analog current input terminal | | | 0–20 mA input Internal resistance: 249 Ω |
| AO3 | Multi-function analog voltage output terminal | | | Maximum output voltage: 10 V Maximum output current: 10 mA |
| AO4 | Multi-function analog current output terminal | | | Maximum output current: 20 mA |
| CM | 24 V common | | | Common terminal for external 24 V power source |
| 3A | Multi-function relay 3 output A | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| 3C | Multi-function relay 3 common terminal | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| 4A | Multi-function relay 4 output A | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| 4C | Multi-function relay 4 common terminal | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| 5A | Multi-function relay 5 output A | | | Below AC 250 V/5 A, Below DC 30 V/5 A |
| 5C | Multi-function relay 5 common terminal | | | Below AC 250 V/5 A, Below DC 30 V/5 A |

2) Use shielded, twisted-pair cables.

4.15 Setting the Built-in Surge Filter

The iS7 series inverters have a built-in surge filter between the input phases and the ground connection to absorb and mitigate surge current. This filter consists of a Y-CAP and multiple varistors.

However, in a non-grounded power system where specific ground faults occur frequently, adequate measures are required to avoid inverter damage.

Refer to the following table for details on how to prevent damage to specific power systems.

| Power supply system and ground type | Varistors and Y-CAP connection | Effect |
|---|--------------------------------|--|
| Directly grounded system | 2-pin connector (on) | Reduced voltage stress and noise |
| Non-grounded or impedance ground system | 2-pin connector (off) | Reduced risk of inverter damage if ground fault occurs |

Note

Not EMC Filter built-in type 0.75–22 KW (200/400 V) products do not support this function.

⚠ Caution

- You can deactivate the built-in surge filter if there is no risk of surge voltage occurring in the system.
- In order to prevent accidents, remove the jumper switch after the internal voltage of the inverter is completely discharged.

4.16 Activating or Deactivating the Surge Filter

4.16.1 iS7 30–75KW (400 V) Inverters

Contact LSELECTRIC Customer Support and ask for assistance to deactivate the built-in surge filter for the 30–75 KW (400 V) inverters.

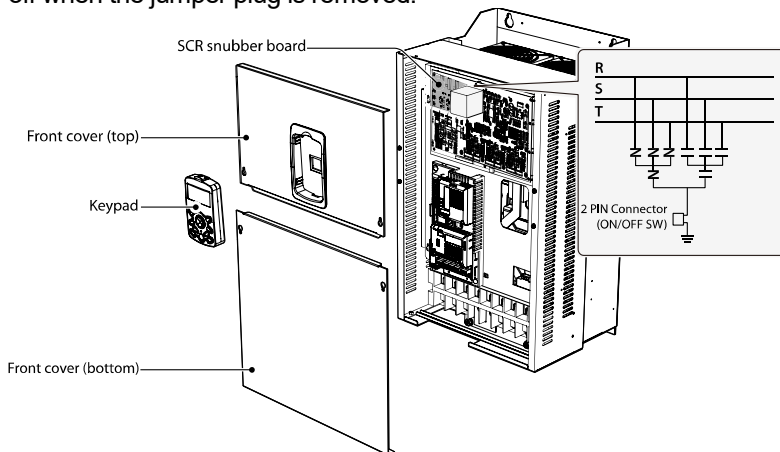
4.16.2 iS7 90–375 kW (400V) Inverters

Remove the keypad and the screws from the front cover, and then remove the front cover.

⚠ Caution

Be careful not to open the front cover with the keypad attached, as this can damage the keypad cable.

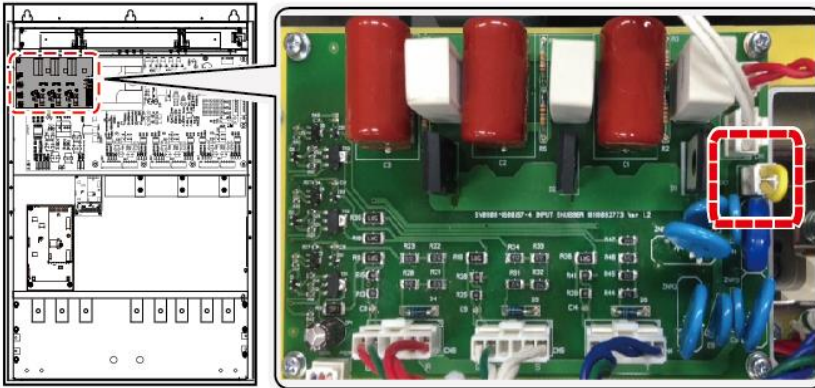
Refer to the figure below and locate the SCR snubber board. On the circuit board, activate or deactivate the surge filter by connecting the two jumper pins or breaking the connection between the two pins using a jumper plug. The filter is turned on when the jumper plug is installed, and it is turned off when the jumper plug is removed.



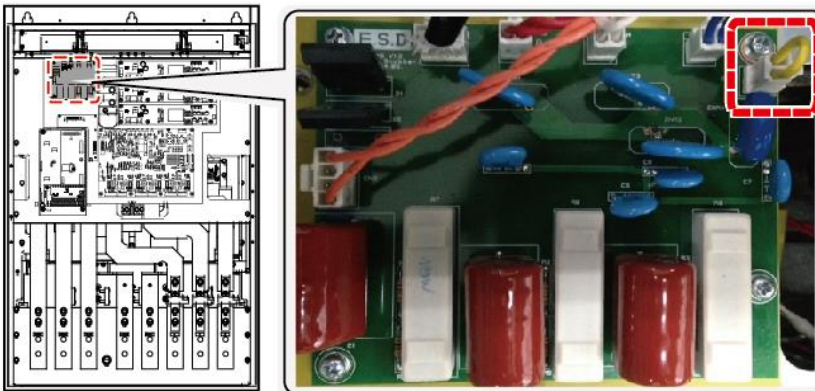
<Removing the front cover (Ex: 90–160 KW)>

Refer to the following figures to locate the jumper switch on the SCR snubber board and install or remove the jumper cap to activate or deactivate the built-in surge filter.

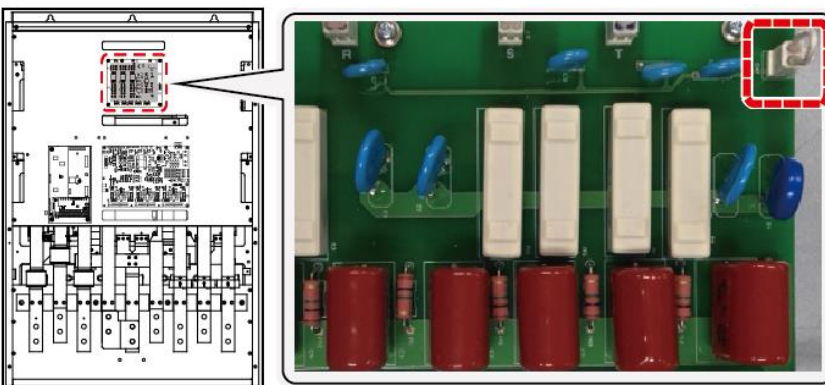
SV900-1600iS7 (400 V)



SV1850-2200iS7 (400 V)



SV2800-3750iS7 (400 V)



4.17 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? (Certain circumstances will result in degraded performance.) | |
| 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 the reverse direction if three-phase cables are not wired in the correct phase 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? | |
| | 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 < 328 ft (100 m) for model types | |

| Items | Check Point | Result |
|---------------|--|--------|
| | rated at 3.7 kW and below, and 984 ft (300 m) for model types rated at more than 3.7 kW? | |
| | Is the total length of safety wiring < 100 ft (30 m)? | |
| Miscellaneous | Are optional modules 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) cables have a highly conductive, shielded screen around twisted-pair cables. STP cables protect conductors from electromagnetic interference.

4.18 Test Run

When you turn on the iS7 inverter for the first time, it starts in Easy Start mode to help you configure the basic parameters required for inverter operation.

4.18.1 Entering Easy Start Mode

The inverter starts in Easy Start mode when you turn on the inverter for the first time, or when the inverter is turned on following a parameter initialization.

Note

- Before setting the parameter values for a user application, initialize the parameter settings to make sure that the default setting is applied to all parameters.
- If you initialized all parameters after an inverter trip occurred, the inverter starts in Easy Start mode after it is reset, regardless of the pending trip condition.
- Easy Start mode is not available while the inverter is already running.

4.18.2 Setting the Basic Parameters in Easy Start Mode

Refer to the following sequence table to understand the Easy Start sequence and configure the basic parameters according to the instructions.

| Sequence | Instruction |
|-----------------------|--|
| Start Easy Set | Select "Yes" to start the inverter in Easy Start mode (select "No" to start the inverter in Monitor mode). |
| CNF-01 Language Sel | Select the keypad display language (only English is available at the moment). |
| DRV-14 Motor Capacity | Set the motor capacity. (Ex: 0.75 kW, 1.5 kW) |
| BAS-11 Pole Number | Set the number of poles in the motor. |
| BAS-15 Rated Volt | Set the rated motor voltage. Set this value to "0 V" if the rated motor voltage is identical to the input voltage. |
| BAS-10 60/50 Hz Sel | Set the rated motor frequency. |
| BAS19 AC Input Volt | Set the inverter input voltage. |
| DRV-06 Cmd Source | Set the source of the frequency reference. (Ex: KEYPAD, FX/RX-1, FX/RX-2, etc.) |
| DRV-01 Cmd Frequency | Set the frequency reference. (Ex: 50 Hz, 60 Hz, etc.) |

Note

While you are in Easy Start mode, you can press the [ESC] key on the keypad to cancel Easy Start mode and enter Monitor mode.

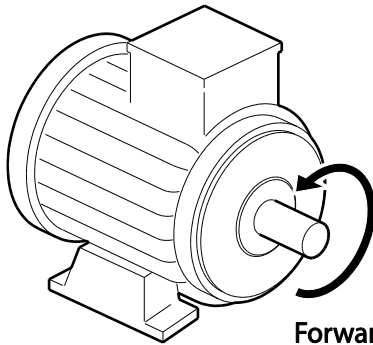
4.18.3 Checking the Inverter Operation

⚠ Caution

Using an inverter, you can easily operate a motor at a high speed. Before operating a motor using an inverter, ensure that the set speed is within the motor's rated speed.

Follow the instructions to ensure that the motor operates correctly according to the inverter settings, and adjust the settings if required.

- 1 Set DRV-06 (CMD source) to "0 (KEYPAD)."
- 2 Set DRV-07 (Freq Ref Src) to "0 (Keypad-1)."
- 3 Set DRV-01 (CMD Frequency) to a temporary speed (Ex: 60 Hz).
- 4 Press the FWD key on the keypad, and ensure that the motor is rotating in the correct direction. When 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.



⚠ Caution

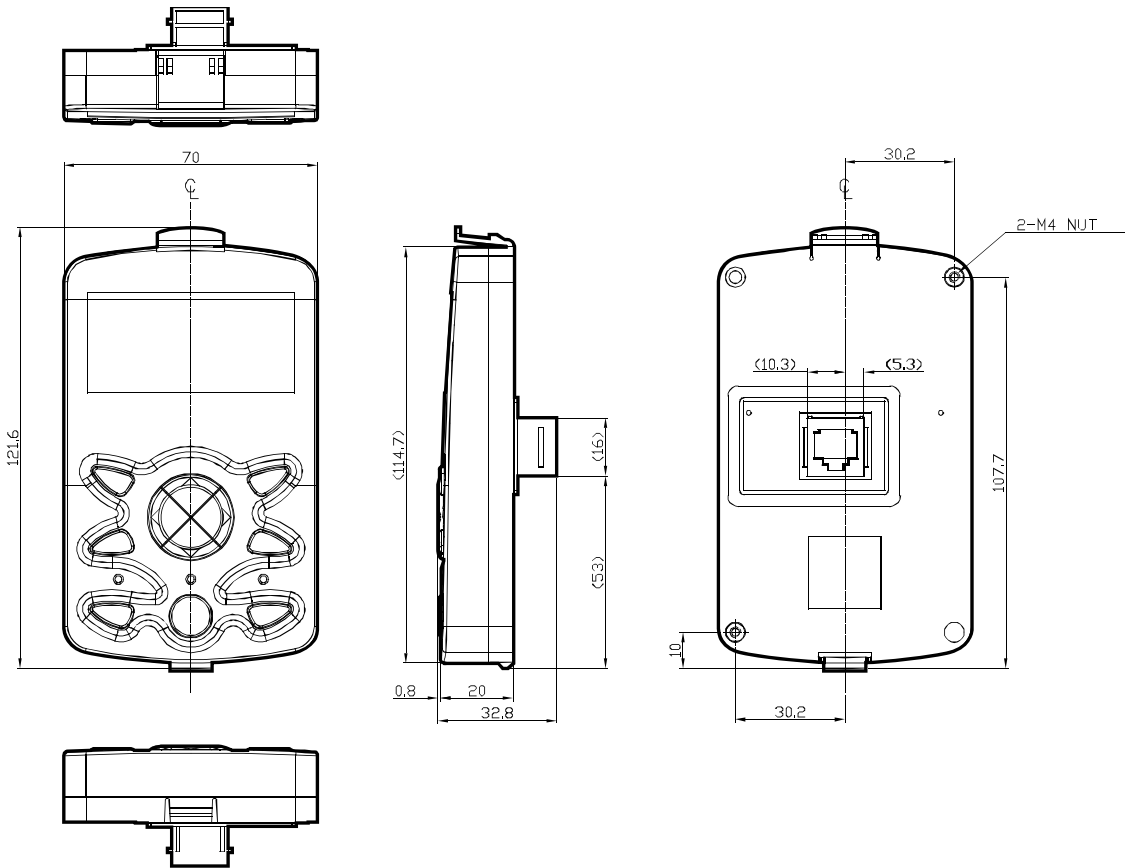
Ensure that the input power is within the inverter's rated input voltage range during operation.

5 Using the Keypad

5.1 About the Keypad

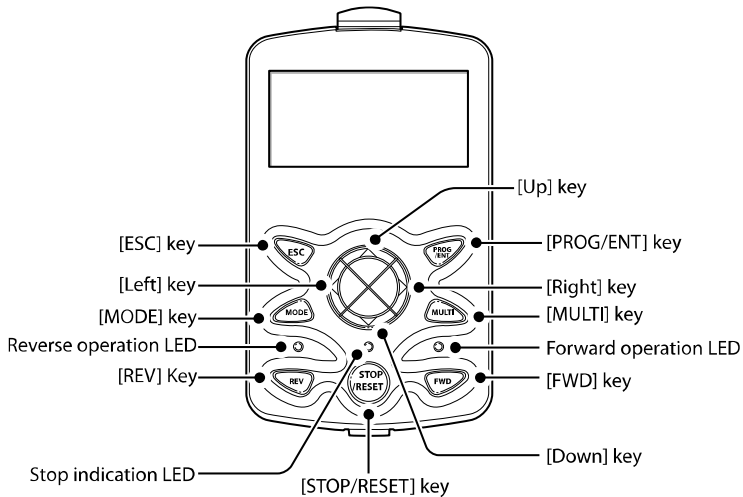
A keypad is used to set inverter parameters, monitor the inverter's status, and operate the inverter.

5.1.1 Dimensions



5.1.2 Key Functions

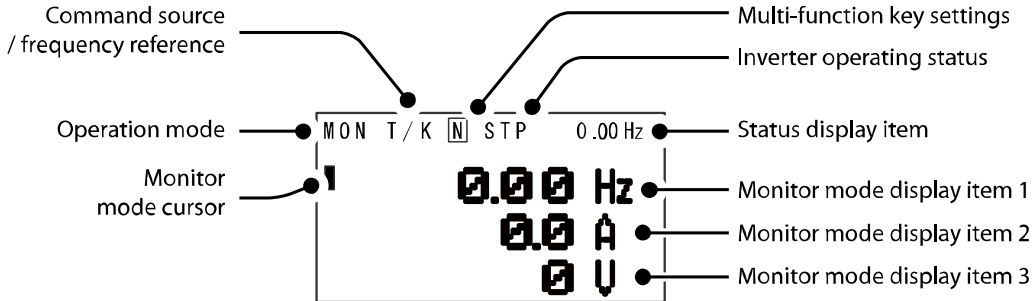
The following table lists the names and functions of the keypad's operation keys.



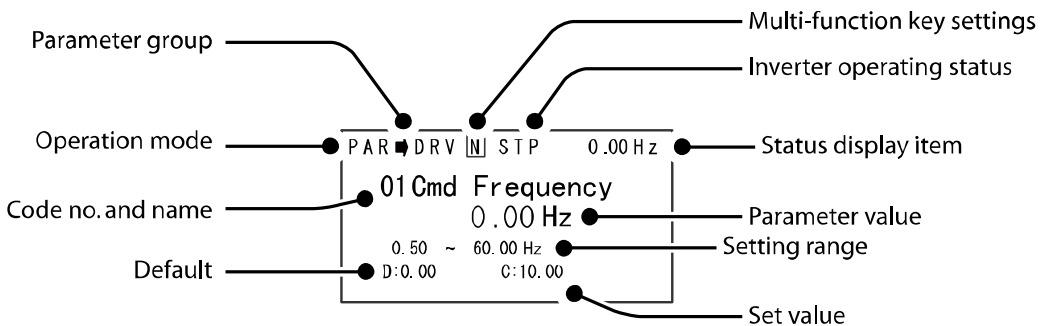
| Section | Buttons | Key Name | Function Description | |
|---------|------------------|---|--|--|
| KEY | | [MODE] key | Used to switch between modes. | |
| | | [PROG/ENT] key | If this button is pressed once, the parameter can be edited at the status of the editable parameter code. If this button is pressed after modification, it will save the modified data. | |
| | | [Up] key | Switch between codes, or increase or decrease parameter values. | |
| | | [Down] key | | |
| | | [Left] key | | Switch between groups or move the cursor during parameter setup or modification. |
| | | [Right] key | | |
| | | [MULTI] key | Used to register jog or user codes. | |
| | | [ESC] key | If you press this key before pressing the [PROG / ENT] key, it will revert the parameter value to the previous value. If you press this key while editing the codes in any function group, the keypad will display the first code of the function group. If you press this key while moving through the modes, the keypad will display Monitor mode. | |
| | | [FWD] key | Used to operate the motor in the forward direction. | |
| | | [REV] key | Used to operate the motor in the reverse direction. | |
| | [STOP/RESET] key | Used to stop the operation and release a fault. | | |

5.1.3 Display Items

Monitor Mode



Parameter Mode



5.1.4 Display Item List

The following table lists the items in the display.

| Item | Description |
|-----------------------|--|
| Mode display items | Displays the current mode's display items. For more details, refer to 5.3 Navigating Modes on page 94. |
| Parameter group items | Displays the current parameter group's items. For more details, refer to 5.4 Navigating Modes and Parameters on page 97. |

| Item | Description |
|--|---|
| Command source / frequency reference items | Displays the types of sequences and the number of steps during an auto sequence operation. |
| Status display items | Displays the output frequency, output voltage, and current. For more details, refer to 5.1.3 Display Items on pages 88. |
| Monitor mode display items | Displays the current operation status. For more details, refer to 5.1.3 Display Items on pages 88. |

Monitor display items

The following table lists display icons and their names and functions.

| No | Function | Display | Description |
|---------|------------------------------|--------------|---|
| 1 | Operation mode | MON | Monitor mode |
| | | PAR | Parameter mode |
| | | U&M | User-defined and Macro mode |
| | | TRP | Trip mode |
| | | CNF | Configuration mode |
| 2 | Command source | 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 reference | 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 and I2 frequency commands for sub-terminal block |
| | | J | Jog frequency command |
| | | R | Internal 485 frequency command |
| 1-9 A-F | Multi-step frequency command | | |
| 4 | Multi-function key settings | JOG key | Used to switch to Keypad JOG mode |
| | | Local/Remote | Used to select local or remote operation |

| No | Function | Display | Description |
|----|---------------------------|-----------------------|---|
| | | User Group Select key | Used to register parameters as a user group in Parameter mode or delete parameters in the user group. |
| 5 | Inverter operating status | STP | Motor stopped |
| | | FWD | Operating in the forward direction |
| | | REV | Operating in the reverse direction |
| | | DC | DC output |
| | | WAN | Warning |
| | | STL | Stalling |
| | | SPS | Speed Search |
| | | OSS | Software over current controlled |
| | | OSH | Hardware over current controlled |
| | | TUN | Auto tuning |

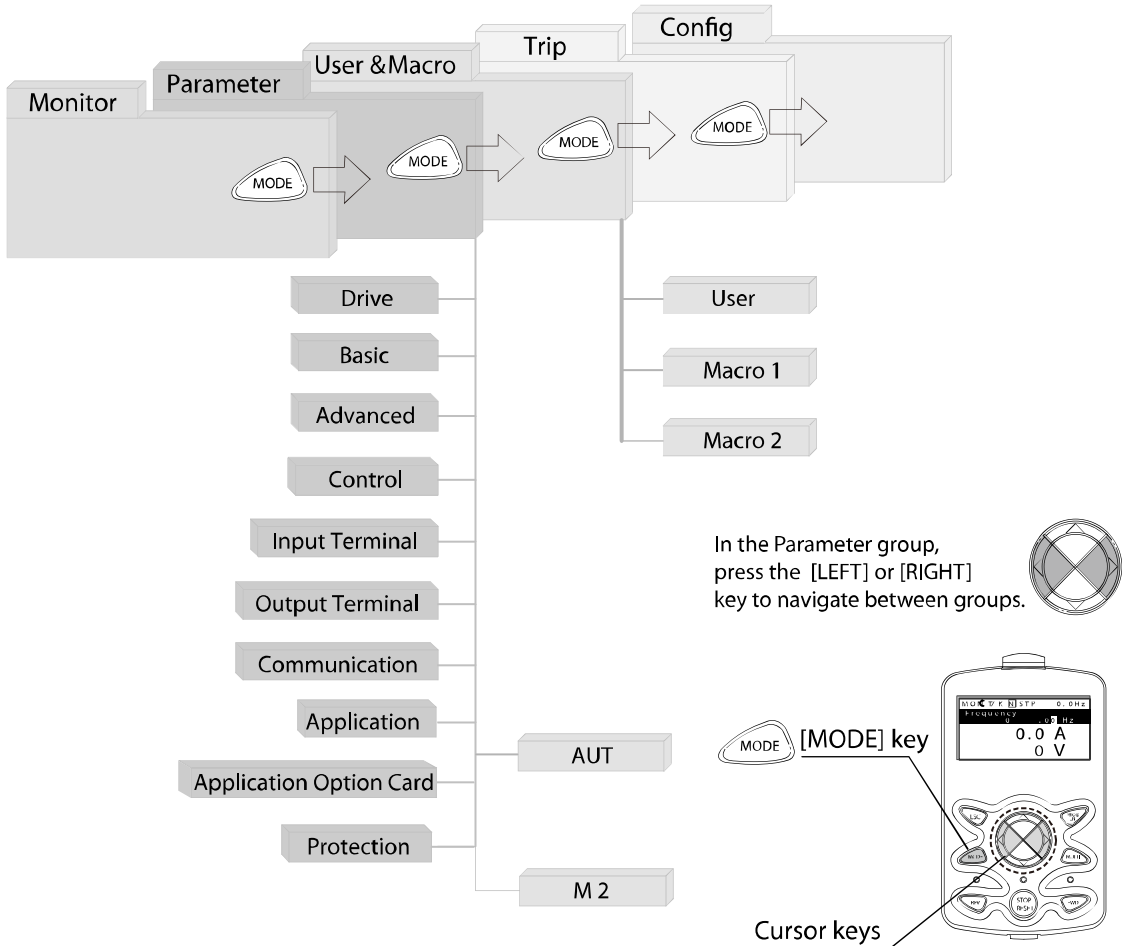
*OSS / OSH may cause overcurrent when the load is too large or when the acceleration/deceleration time is short. The inverter monitors the output current so that an overcurrent trip does not occur and also performs overcurrent suppression.

At this time, the output frequency is automatically changed to reduce the output current or the inverter output is temporarily cut off to prevent overcurrent.

5.2 Menu Items

The SV-iS7 series inverter uses 5 modes to monitor or configure different functions. Each mode has its own function items suitable for the desired properties. The parameters in Parameter mode and User & Macro mode are divided into smaller groups of relevant functions.

Press the [MODE] key to navigate between groups.



| Mode | Display | Description |
|--------------------|---------|---|
| Monitor mode | MON | Displays the inverter's operation status information. You can monitor the frequency setting, operating frequency display, output current, voltage, etc. |
| Parameter mode | PAR | Used to configure the functions required to operate the inverter. These functions are divided into 12 groups based on purpose and complexity. |
| User & Macro mode | U&M | Used to define User and Macro groups. These user-definable groups allow specific functions of the inverter to be grouped and managed in separate groups. This mode will not be displayed when navigating through modes if no User groups or Macro groups have been defined. |
| Trip mode | TRP | Used to monitor the inverter's fault trip information, including the previous fault trip history. When a fault trip occurs during inverter operation, the operation frequency, output current, and output voltage of the inverter at the time of the fault can be monitored. This mode will not be displayed if the inverter is not at fault and a fault trip history does not exist. |
| Configuration mode | CNF | Used to configure the inverter features that are not directly related to the operation of the inverter. The settings you can configure in Configuration mode include keypad display language options, monitor mode environment settings, communication module display settings, and parameter duplication and initialization. |

5.2.1 Parameter Mode

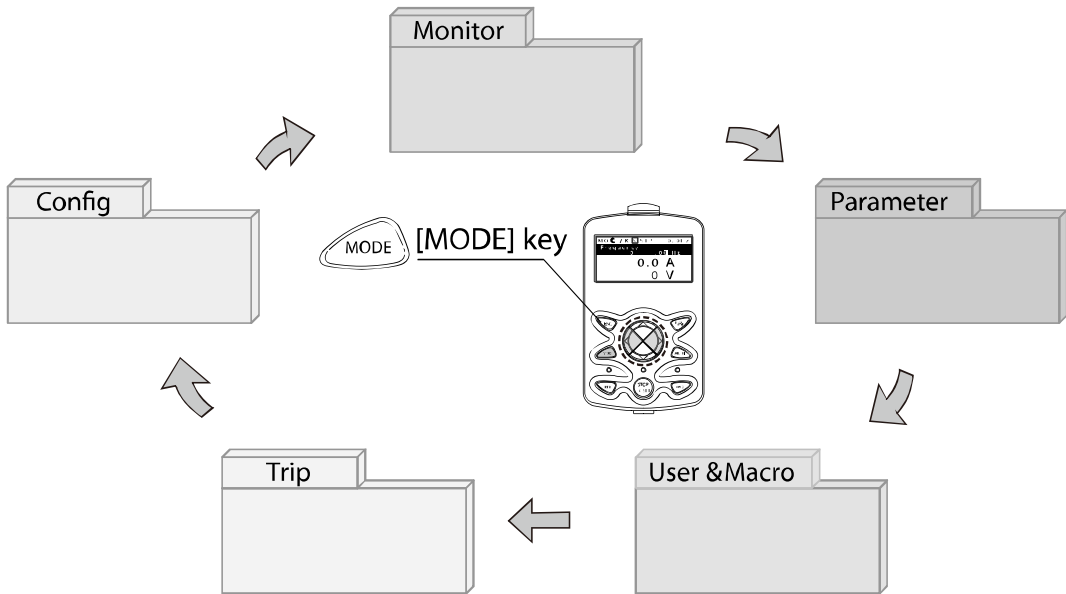
| Mode | Display | Description |
|--------------------------------|---------|---|
| Drive group | DRV | Includes frequency/acceleration/deceleration time setting, operation command selection, etc. |
| Basic group | BAS | Configures basic operation parameters. These parameters include motor parameters and multi-step frequency parameters. |
| Advanced function group | ADV | Configures acceleration or deceleration, patterns, and frequency limits. |
| Control function group | CON | Configures functions related to sensorless and vector control. |
| Input terminal function group | IN | Configures input terminal-related features, including digital multi-functional inputs and analog inputs. |
| Output terminal function group | OUT | Configures the inverter output terminal block-related features, including the relay and analog outputs. |
| Communication function group | COM | Configures the communication features for the RS-485, if one is installed. |
| Application function group | APP | Configures the features related to PID control and auto sequence operation. |
| Auto Sequence run | AUT | Configures the necessary features for auto sequence operation. |

| Mode | Display | Description |
|----------------------------------|---------|---|
| group | | This group will be displayed if the auto sequence operation in the APP group is selected. |
| Application option group | APO | Configures the encoder and PLC option module-related features if they are installed. |
| Protection group | PRT | Configures motor and inverter protection features. |
| Motor 2 function group (Motor 2) | M2 | Configures the secondary motor-related features. This group will be displayed when Motor #2 is selected from the multi-function input terminal functions. |

5.22 User & Macro Mode

| Group | Display | Description |
|-------------|---------|---|
| User group | USR | Used to group frequently accessed function parameters. User parameter groups can be configured using the multi-function key on the keypad. |
| Macro group | MCx | This provides different factory preset groups of functions based on the type of load. Group MC1, MC2, or MC3 will be displayed when the user selects the desired load type. Macro groups can be selected in CNF mode. |

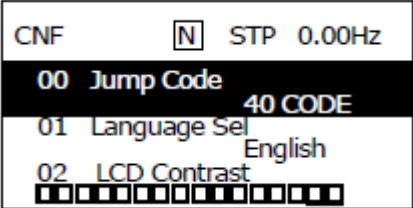
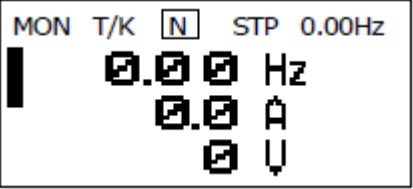
5.3 Navigating Modes



5.3.1 Mode Navigation at the Factory Default

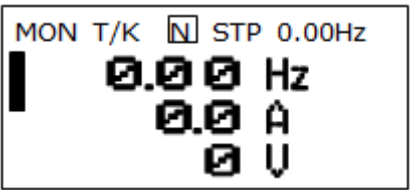
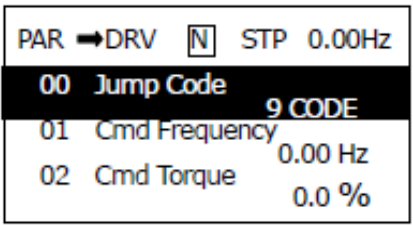
You can change the display to navigate modes by using the [MODE] key. The User & Macro Mode and Trip Mode are not displayed when the inverter is set to the factory default settings.

| | |
|--|---|
| | <ul style="list-style-type: none"> • Displays when the inverter is powered on. This is the display of Monitor mode (MON). • Press the [MODE] key. |
| | <ul style="list-style-type: none"> • You are now in Parameter mode (PAR). • Press the [MODE] key. |

| | |
|---|--|
|  | <ul style="list-style-type: none"> You are now in Config mode (CNF). Press the [MODE] key. |
|  | <ul style="list-style-type: none"> You are now in Monitor mode again. |

5.3.2 Mode Navigation with User/Macro Mode and Trip Mode

If you register a user code or set the macro function using the [MULTI] key, the User & Macro mode will be displayed, unlike the factory default settings during mode navigation. In addition, when a trip occurs during operation, Trip mode will be displayed. The trip information will also be saved in the trip mode history if you release the trip using the RESET function. The two modes for mode navigation are as follows.

| | |
|---|---|
|  | <ul style="list-style-type: none"> Displays when the inverter is powered on. This is the display of Monitor mode (MON). Press the [MODE] key. |
|  | <ul style="list-style-type: none"> You are now in Parameter mode (PAR). Press the [MODE] key. |

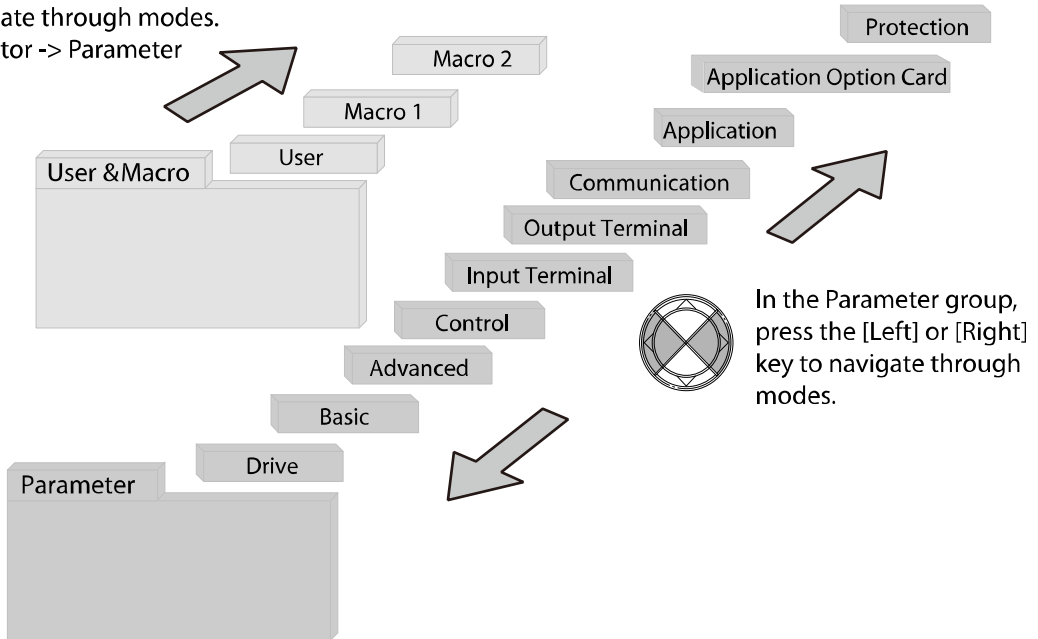
| | |
|--|--|
| | <ul style="list-style-type: none"> You are now in User & Macro mode (U&M). Press the [MODE] key. |
| | <ul style="list-style-type: none"> You are now in Trip mode (TRP). Press the [MODE] key. |
| | <ul style="list-style-type: none"> You are now in Config mode (CNF). Press the [MODE] key. |
| | <ul style="list-style-type: none"> You are now in Monitor mode again. |

5.4 Navigating Modes and Parameters

You can navigate modes by using the [Left] or [Right] keys after navigating to the Parameter Mode or User & Macro Mode via the [Mode] key.

Press the [MODE] key to navigate through modes.

Ex) Monitor -> Parameter



5.4.1 Group Navigation in Parameter mode

If you press the [Right] key in Parameter mode, the display will change as shown below. If you press the [Left] key, the display order will be reversed.

```

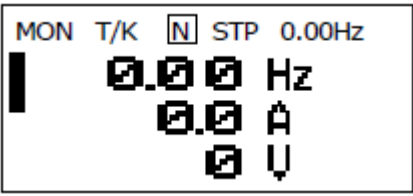
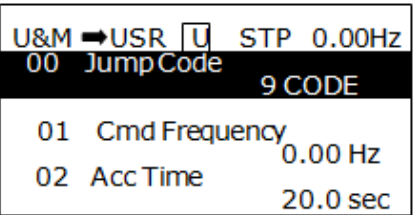
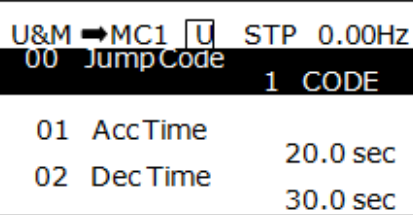
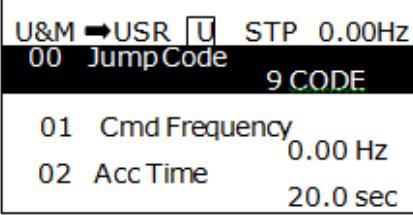
MON T/K [N] STP 0.00Hz
|  0.00 Hz
  0.0 A
   0 V
  
```

- Displays when the inverter is powered on. This is the display of Monitor mode (MON).
- Press the [MODE] key.

| | |
|---|---|
| <pre> PAR →DRV [N] STP 0.00Hz 00 Jump Code 9 CODE 01 Cmd Frequency 0.00 Hz 02 Cmd Torque 0.0 % </pre> | <ul style="list-style-type: none"> You are now in Parameter mode (PAR). The Drive Group (DRV) of Parameter mode is displayed. Press the [Right] key. |
| <pre> PAR →BAS [N] STP 0.00Hz 00 Jump Code 20 CODE 01 Aux Ref Src None 02 Cmd 2nd Src Fx/Rx-1 </pre> | <ul style="list-style-type: none"> You are now in the Basic Function Group (BAS). Press the [Right] key. |
| <pre> PAR →ADV [N] STP 0.00Hz 00 Jump Code 24 CODE 01 Acc Pattern Linear 02 Dec Pattern Linear </pre> | <ul style="list-style-type: none"> You are now in the Advanced Function Group (ADV). Press the [Right] key 7 times. |
| <pre> PAR →PRT [N] STP 0.00Hz 00 Jump Code 40 CODE 01 Load Duty Heavy Duty 02 Phase Loss Chk [][] </pre> | <ul style="list-style-type: none"> The group sequence will change and the Protection Function Group (PRT) will be displayed. Press the [Right] key. |
| <pre> PAR →DRV [N] STP 0.00Hz 00 Jump Code 9 CODE 01 Cmd Frequency 0.00 Hz 02 Cmd Torque 0.0 % </pre> | <ul style="list-style-type: none"> You are now in the Drive group (DRV) of the Parameter group again. |

5.4.2 Group Shift in User & Macro Mode

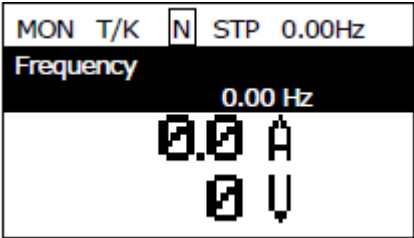
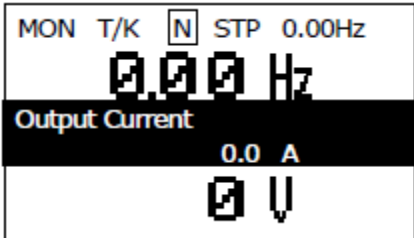
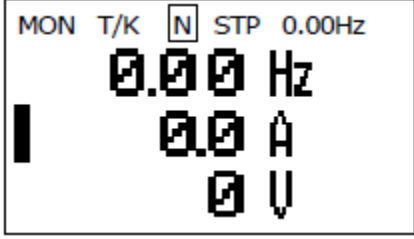
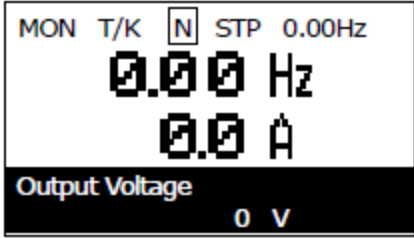
To navigate to User & Macro Mode, the user code should be registered or the macro function should be selected. If the user code is registered and the macro function is selected, you can navigate to the group as shown below.

| | |
|--|---|
|  <p>MON T/K [N] STP 0.00Hz 0.00 Hz 0.0 A 0 U</p> | <ul style="list-style-type: none"> • Displays when the inverter is powered on. This is the display of Monitor mode (MON). • Press the [MODE] key twice. |
|  <p>U&M ->USR [U] STP 0.00Hz 00 JumpCode 9 CODE 01 Cmd Frequency 0.00 Hz 02 Acc Time 20.0 sec</p> | <ul style="list-style-type: none"> • You are now in the User & Macro mode (U&M). • The User Group (USR) is displayed. • Press the [Right] key. |
|  <p>U&M ->MC1 [U] STP 0.00Hz 00 JumpCode 1 CODE 01 AccTime 20.0 sec 02 Dec Time 30.0 sec</p> | <ul style="list-style-type: none"> • You are now in the Macro group (MC1). • Press the [Right] key. |
|  <p>U&M ->USR [U] STP 0.00Hz 00 JumpCode 9 CODE 01 Cmd Frequency 0.00 Hz 02 Acc Time 20.0 sec</p> | <ul style="list-style-type: none"> • You are now in the User Group (USR) again. |

5.5 Navigating through Codes (Function Items)

5.5.1 Code Navigation in Monitor Mode

To display the frequency, output current, and output voltage, press the [Up] or [Down] keys to scroll through the items.

| | |
|---|---|
|  <p>MON T/K [N] STP 0.00Hz Frequency 0.00 Hz 0.0 A 0 V</p> | <ul style="list-style-type: none"> • Displays when the inverter is powered on. This display is in Monitor mode. • The cursor is located at the frequency item. • Press the [Down] key. |
|  <p>MON T/K [N] STP 0.00Hz 0.000 Hz Output Current 0.0 A 0 V</p> | <ul style="list-style-type: none"> • The second display item displays the output current. • Do not press any key for approximately 2 seconds after navigation. |
|  <p>MON T/K [N] STP 0.00Hz 0.000 Hz 0.0 A 0 V</p> | <ul style="list-style-type: none"> • The output current text has disappeared and the cursor has moved to the second display item. • Press the [Down] key. |
|  <p>MON T/K [N] STP 0.00Hz 0.000 Hz 0.0 A Output Voltage 0 V</p> | <ul style="list-style-type: none"> • The third display item displays the output voltage. • Do not press any key for approximately 2 seconds after navigation. |

| | |
|--|--|
| | <ul style="list-style-type: none"> The output voltage text has disappeared and the cursor has moved to the third display item. Press the [Up] key twice. |
| | <ul style="list-style-type: none"> The first item displays the frequency. |
| | <ul style="list-style-type: none"> The frequency text has disappeared and the cursor has moved to the first display item. |

5.5.2 Code Navigation (function items) in Other Modes and Groups

Using the [Up] and [Down] keys: The following example demonstrates how to navigate through the codes in the Drive (DRV) group and the Basic [BAS] group of Parameter mode. Code navigation in other modes is the same as follows.

| | |
|--|---|
| | <ul style="list-style-type: none"> Displays when the inverter is powered on. This display is in Monitor mode. Press the [Down] key. |
|--|---|

| | |
|--|--|
| <pre> PAR →DRV [N] STP 0.00Hz 00 Jump Code 1 CODE 01 Cmd Frequency 0.00 Hz 02 Acc Time 20.0 sec </pre> | <ul style="list-style-type: none"> Displays the Drive (DRV) group of Parameter mode. If the DRV group is not displayed, press the [MODE] key until the DRV group appears, or press the [ESC] key. |
| <pre> PAR →DRV [N] STP 0.00Hz 00 Jump Code 9 CODE 01 Cmd Frequency 0.00 Hz 02 Acc Time 20.0 sec </pre> | <ul style="list-style-type: none"> If you press the [Down] key, you will navigate to code No. 01 in the DRV group of Parameter mode. Press the [Right] key. |
| <pre> PAR →BAS [N] STP 0.00Hz 00 Jump Code 20 CODE 01 Aux Ref Src None 04 Cmd 2nd Src Fx/Rx-1 </pre> | <ul style="list-style-type: none"> You have moved to the Basic (BAS) group of Parameter mode. You can navigate through the codes using the [Up] or [Down] keys. |

5.5.3 Code Navigation Using Jump Code

In the Parameter mode and User/Macro mode groups, you can use the Jump Code Entry item to move to a desired code. It is quicker to move to a large code number using the Jump Code Entry item rather than the [Up] and [Down] keys. The following example demonstrates how to move to code No. 09 of the Drive (DRV) group.

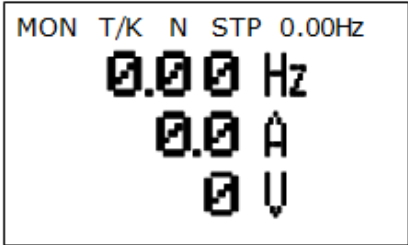
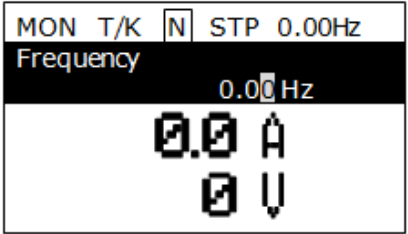
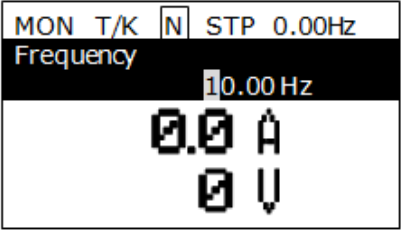
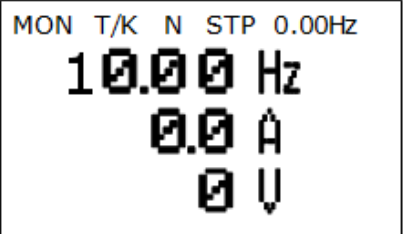
| | |
|--|--|
| <pre> PAR →DRV [N] STP 0.00Hz 00 Jump Code 9 CODE 01 Cmd Frequency 0.00 Hz 02 Acc Time 20.0 sec </pre> | <ul style="list-style-type: none"> Ensure that code No. 00 is displayed in the initial display of the Drive (DRV) group of Parameter mode. Press the [PROG/ENT] key. |
|--|--|

| | |
|---|--|
| <pre> PAR →DRV [N] STP 0.00Hz 00 JumpCode 9 CODE 01 Cmd Frequency 0.00 Hz 02 Acc Time 20.0 sec </pre> | <ul style="list-style-type: none"> The cursor flashes and you can enter the code number. |
| <pre> PAR →DRV [N] STP 0.00Hz 00 JumpCode 9 CODE 1~99 CODE D:9 C:9 </pre> | <ul style="list-style-type: none"> Press the [Up] key to enter 9 and then press the [PROG/ENT] key. |
| <pre> PAR →DRV [N] STP 0.00Hz 09 Control Mode V/F 10 Torque Control ----- No ----- 11 JOG Frequency 10.00 Hz </pre> | <ul style="list-style-type: none"> You have moved to code No. 09 of the DRV group. |
| <pre> PAR →DRV [N] STP 0.00Hz 00 JumpCode 9 CODE 01 Cmd Frequency 0.00 Hz 02 Acc Time 20.0 sec </pre> | <ul style="list-style-type: none"> Press the [ESC] key to move to code No. 00 of the DRV group. |

5.6 Setting Parameters

5.6.1 Parameter Settings in Monitor Mode

You can set some parameters, such as the frequency, in Monitor mode. The following example demonstrates how to set the frequency.

| | |
|---|--|
|  | <ul style="list-style-type: none"> • Ensure that the cursor is at the frequency item. Also, ensure that the frequency can be set to 09 in the Drive (DRV) group using the keypad. • Press the [PROG/ENT] key. |
|  | <ul style="list-style-type: none"> • Detailed information of the item is displayed and the cursor flashes. • Press the [Left] or [Right] keys to move the cursor to the desired location to set the frequency. |
|  | <ul style="list-style-type: none"> • Press the [Up] key to set the frequency to 10 Hz. • Press the [PROG/ENT] key. |
|  | <ul style="list-style-type: none"> • The frequency reference is set to 10 Hz. |

5.6.2 Parameter Settings in Other Modes and Groups

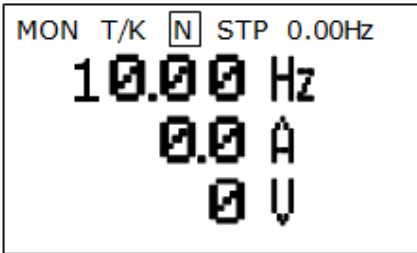
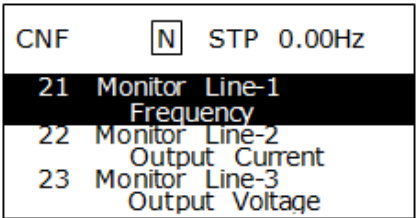
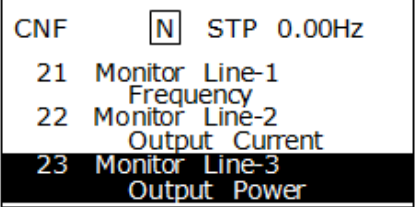
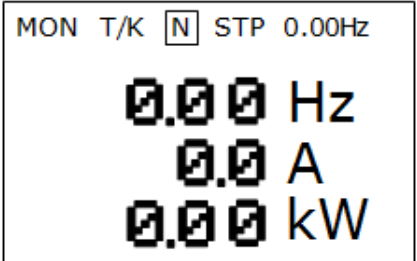
The following example demonstrates how to change the frequency of the Drive (DRV) group in Parameter mode. The frequency in the other modes or groups can be set as follows.

| | |
|---|--|
| <pre> PAR →DRV [N] STP 0.00Hz 00 JumpCode 9 CODE 01 Cmd Frequency 0.00 Hz 02 Cmd Torque 0.0 % </pre> | <ul style="list-style-type: none"> This is the initial display in Parameter mode. Press the [Down] key. |
| <pre> PAR →DRV [N] STP 0.00Hz 00 JumpCode 9 CODE 01 Cmd Frequency 0.00 Hz 02 Cmd Torque 0.0 % </pre> | <ul style="list-style-type: none"> You have moved to the 01 frequency setting code. Press the [PROG/ENT] key. |
| <pre> PAR →DRV [N] STP 0.00Hz 01 Cmd Frequency 0.00 Hz 0.50 ~ 60.00 Hz D:0.00 C:0.00 </pre> | <ul style="list-style-type: none"> The cursor flashes and you can enter the desired frequency. If the frequency reference is set to 10 Hz, press the [Left] or [Right] keys to move the cursor to the desired place. |
| <pre> PAR →DRV [N] STP 0.00Hz 01 Cmd Frequency 10.00 Hz 0.50 ~ 60.00 Hz D:0.00 C:0.00 </pre> | <ul style="list-style-type: none"> Press the [Up] key to enter 10 Hz and then press the [PROG/ENT] key. |
| <pre> PAR →DRV [N] STP 0.00Hz 00 JumpCode 9 CODE 01 Cmd Frequency 10.00 Hz 02 Cmd Torque 0.0 % </pre> | <ul style="list-style-type: none"> The frequency reference is set to 10 Hz. |

5.7 Monitoring Operating Status

5.7.1 Using Monitor Mode

Three items can be displayed in Monitor mode at a time. Also, some items, such as the frequency item, can be edited. You can select the displayed items in Configuration (CNF) mode.

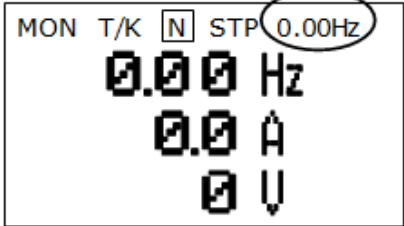
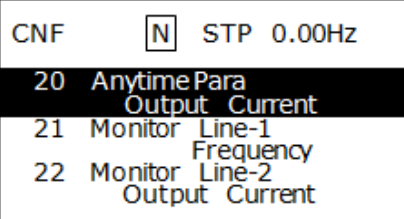
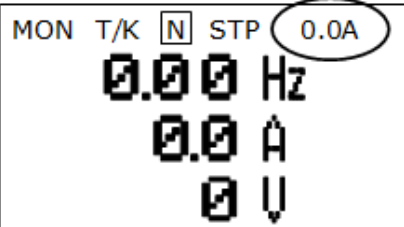
| | |
|--|---|
|  <p>MON T/K [N] STP 0.00Hz 10.00 Hz 0.0 A 0 V</p> | <ul style="list-style-type: none"> • This is the initial display in Monitor mode. • The frequency, current, and voltage are set as the default monitor items. • The frequency reference is displayed when the inverter operation has stopped, and the operating frequency is displayed when the inverter is operating. |
|  <p>CNF [N] STP 0.00Hz 21 Monitor Line-1 Frequency 22 Monitor Line-2 Output Current 23 Monitor Line-3 Output Voltage</p> | <ul style="list-style-type: none"> • You can set the items to display in Monitor mode in sequence from 21 to 23 in Configuration (CNF) mode. • Press the [Down] key to move to code No. 23 |
|  <p>CNF [N] STP 0.00Hz 21 Monitor Line-1 Frequency 22 Monitor Line-2 Output Current 23 Monitor Line-3 Output Power</p> | <ul style="list-style-type: none"> • Change the code No. 23 item in Monitor mode to the output power. |
|  <p>MON T/K [N] STP 0.00Hz 0.00 Hz 0.0 A 0.00 kW</p> | <ul style="list-style-type: none"> • Ensure that the third displayed item in Monitor mode is changed to the output power. |

5.7.2 Monitoring Items

| 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 | | |

5.7.3 Using the Status Display

The items displayed on the right-top of the display are shown in other modes, including Monitor mode. If you register a desired variable in the display, you can monitor it at any time regardless of the mode navigation or change.

| | |
|---|---|
|  | <ul style="list-style-type: none"> • This is the initial display of Monitor mode. • When the inverter settings are set to the factory default, the status item displays the frequency. |
|  | <ul style="list-style-type: none"> • Select the item to display in the status display in code 20 of Configuration (CNF) mode. • Press the [PROG/ENT] key to change the item to the output current. • The unit at the top of the display is changed from hertz (frequency) to amps (current). |
|  | <ul style="list-style-type: none"> • Ensure that the unit in the status display is changed to amps (current) in Monitor mode. |

5.8 Monitoring Faults

5.8.1 Faults during Inverter Operation

| | |
|---|--|
| <pre> TRP current Over Voltage (01) 01 Output Freq 48.30 Hz 02 Output Current 33.3 A </pre> | <ul style="list-style-type: none"> If a fault trip occurs during inverter operation, the inverter enters Trip mode automatically and displays the type of fault trip that has occurred. |
| <pre> TRP Last-1 01 Output Freq 48.30 Hz 02 Output Current 33.3 A 03 Inverter State Stop </pre> | <ul style="list-style-type: none"> Press the [Down] key to view the information on the inverter at the time of the fault, including the output frequency, current, and operating status. |
| <pre> MON T/K N STP 0.0A 0.00 Hz 0.0 A 0 V </pre> | <ul style="list-style-type: none"> When the inverter is reset and the fault trip is released, the keypad display returns to the screen that was displayed before the fault trip occurred. |

5.8.2 Multiple Faults at a Time during Inverter Operation

| | |
|---|--|
| <p>TRP current</p> <p>Over Voltage (02)</p> <p>01 Output Freq 48.30 Hz</p> <p>02 Output Current 33.3 A</p> | <ul style="list-style-type: none"> • If multiple fault trips occur at the same time, the number of fault trips that occurred is displayed next to the fault trip type. • Press the [PROG/ENT] key. |
| <p>TRP current</p> <p>00 Trip Name (2)</p> <p>0 Over Voltage</p> <p>1 Externa Trip</p> | <ul style="list-style-type: none"> • The types of all the fault trips are displayed. • Press the [PROG/ENT] key. |
| <p>TRP current</p> <p>Over Voltage (02)</p> <p>01 Output Freq 48.30 Hz</p> <p>02 Output Current 33.3 A</p> | <ul style="list-style-type: none"> • The display mode that was shown before you checked the fault information is displayed. |

5.8.3 Saving and Monitoring the Fault Trip History

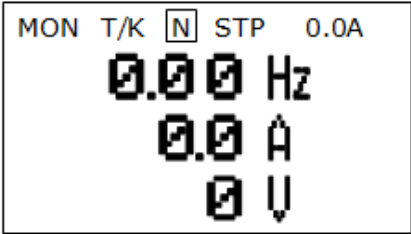
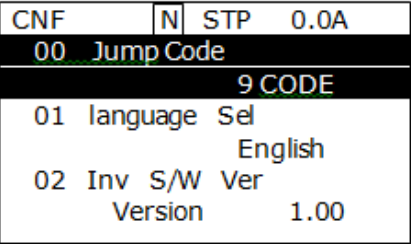
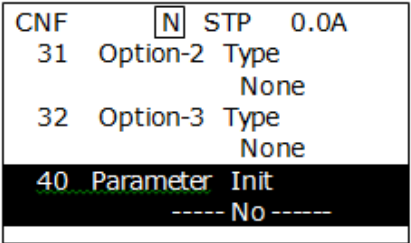
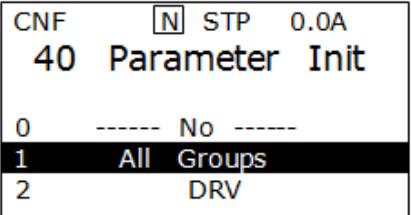
Previous fault trips can be saved in Trip mode. You can save up to 5 previous fault trips. Fault trips caused by resetting the inverter, as well as low voltage faults caused by the inverter being switched off, are also saved.

If there are more than 5 fault trips, the oldest 5 fault trips are automatically deleted.

| | |
|---|--|
| <pre> TRP current Over Voltage (02) 01 Output Freq 48.30 Hz 02 Output Current 33.3 A </pre> | <ul style="list-style-type: none"> If a fault trip occurs during inverter operation, the inverter enters Trip mode and displays the type of fault trip that has occurred. |
| <pre> MON T/K [N] STP 0.0A 0.00 Hz 0.0 A 0 V </pre> | <ul style="list-style-type: none"> If you press the [STOP/RESET] key or an input is entered on the terminal, the fault trip is automatically saved and the display status that was displayed before the fault trip occurred is displayed. Press the [MODE] key to move to Trip mode. |
| <pre> TRP current 00 Trip Name (2) Over Voltage 01 Output Freq 48.30 Hz 02 Output Current 33.3 A </pre> | <ul style="list-style-type: none"> The most recent fault trip is saved in the Last-1 code. Press the [Right] key. |
| <pre> TRP current 00 Trip Name (1) External Trip 01 Output Freq 48.30 Hz 02 Output Current 33.3 A </pre> | <ul style="list-style-type: none"> The previous fault trips are saved in the Last-2 code. If another fault trip occurs, the previous fault trips saved in the Last-2 code move to the Last-3 code. |

5.9 Initializing Parameters

You can initialize the changed parameters. In addition to initializing the entire parameter, you can also select the individual parameter mode to be initialized.

| | |
|---|--|
|  | <ul style="list-style-type: none"> • Monitor mode is displayed. |
|  | <ul style="list-style-type: none"> • Press the [MODE] key to move to Configuration (CNF) mode. |
|  | <ul style="list-style-type: none"> • Press the [Down] key to move to code No. 40. • Press the [PROG/ENT] key. |
|  | <ul style="list-style-type: none"> • Of the parameter items to initialize, select All Groups and then press the [PROG/ENT] key. |

```
CNF      N  STP  0.0A
31  Option-2 Type
      None
32  Option-3 Type
      None
40  Parameter Init
      ---- No ----
```

- The Parameter Initialization option is displayed again when the initialization is complete.

6 Basic Functions

6.1 Setting Frequency References

The iS7 inverter provides several methods to set up and modify a frequency reference for an operation. The keypad, analog inputs [for example voltage (V1) and current (I1) signals], or RS-485 (digital signals from higher-level controllers, such as PCs or PLCs) can be used.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------------------|--------------|-------------------|-----------|---------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 0 | KeyPad-1 | 0-9 | - |
| | | | | 1 | KeyPad-2 | | |
| | | | | 2 | V1 | | |
| | | | | 3 | I1 | | |
| | | | | 4 | V2 | | |
| | | | | 5 | I2 | | |
| | | | | 6 | Int 485 | | |
| | | | | 7 | Encoder | | |
| | | | | 8 | Field Bus | | |
| | | | | 9 | Pulse | | |

6.1.1 Keypad as the Source (Keypad-1 setting)

You can modify the frequency reference using the keypad and apply changes by pressing the [ENT/PROG] key. To use the keypad as a frequency reference input source, go to DRV-07 (Frequency reference source) and change the parameter value to "0 (Keypad-1)". Input the frequency reference for an operation at DRV-01 (Frequency reference).

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------------------|---------------|-------------------|----------|----------------------|------|
| DRV | 01 | Frequency reference | Cmd Frequency | 0.00 | | 0.00–max. frequency* | Hz |
| | 07 | Frequency reference source | Freq Ref Src | 0 | Keypad-1 | 0–9 | - |

* You cannot set a frequency reference that exceeds the max. frequency, as configured with DRV-20.

6.1.2 Keypad as the Source (Keypad-2 setting)

You can use the [UP] and [DOWN] cursor keys to modify a frequency reference. To use this as a second option, set the keypad as the source of the frequency reference by going to DRV-07 (Frequency reference source) and changing the parameter value to "1 (Keypad-2)". This allows frequency reference values to be increased or decreased by pressing the [UP] and [DOWN] cursor keys.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------------------|---------------|-------------------|----------|-----------------------|------|
| DRV | 01 | Frequency reference | Cmd Frequency | 0.00 | | 0.00–max. frequency * | Hz |
| | 07 | Frequency reference source | Freq Ref Src | 1 | Keypad-2 | 0–9 | - |

* You cannot set a frequency reference that exceeds the max. frequency, as configured with DRV-20.

6.1.3 V1 Terminal as the Source

You can set and modify a frequency reference by setting voltage inputs when using the V1 terminal. Use voltage inputs ranging from 0–10 V (unipolar) for forward-only operations. Use voltage inputs ranging from -10 to +10 V (bipolar) for both directions, with negative voltage inputs used for reverse operations.

6.1.3.1 Setting a Frequency Reference for 0–10 V Input

Set IN-06 (V1 Polarity) to “0 (unipolar)”. Use a voltage output from an external source or use the voltage output from the VR terminal to provide inputs to V1. Refer to the diagrams below for the wiring required for each application.


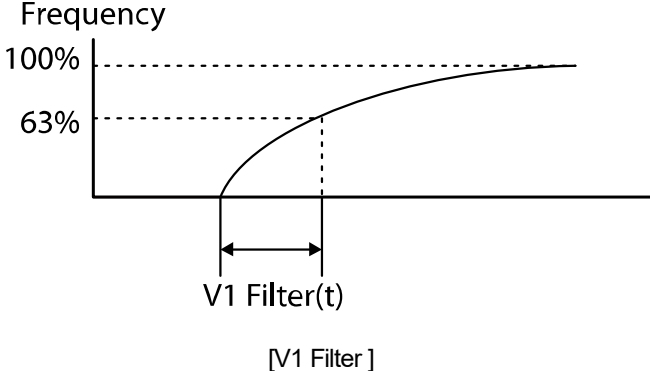


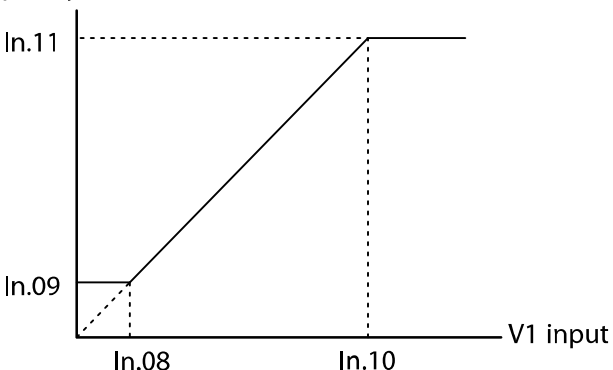
[External source application] [Internal source (VR) application]

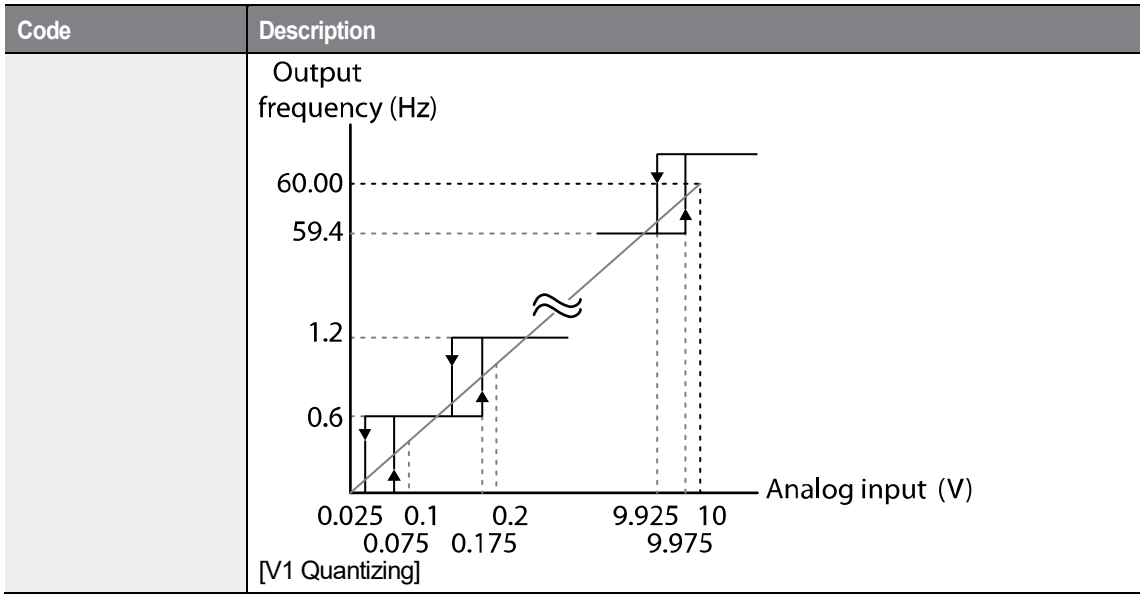
| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|---------------------|-----------------------------------|---------------|-------------------|-------------------|---------------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 2 | V1 | 0–9 | - |
| IN | 01 | Frequency at maximum analog input | Freq at 100% | Maximum frequency | | 0.00–max. frequency | Hz |
| | 05 | V1 input monitor | V1 Monitor[V] | 0.00 | | 0.00–10.00 | V |
| | 06 | V1 polarity options | V1 Polarity | 0 | Unipolar | 0–1 | - |
| | 07 | V1 input filter time constant | V1 Filter | 10 | | 0–10000 | ms |
| | 08 | V1 minimum input voltage | V1 volt x1 | 0.00 | | 0.00–10.00 | V |
| | 09 | V1 output at minimum voltage (%) | V1 Perc y1 | 0.00 | | 0.00–100.00 | % |
| | 10 | V1 maximum input voltage | V1 Volt x2 | 10.00 | | 0.00–10.00 | V |
| | 11 | V1 output at maximum voltage (%) | V1 Perc y2 | 100.00 | | 0–100 | % |
| | 16 | Rotation direction options | V1 Inverting | 0 | No | 0–1 | - |
| 17 | V1 quantizing level | V1 Quantizing | 0.04 | | 0.00*, 0.04–10.00 | % | |

* Quantizing is disabled if “0” is selected.

0–10 V Input Voltage Setting Details

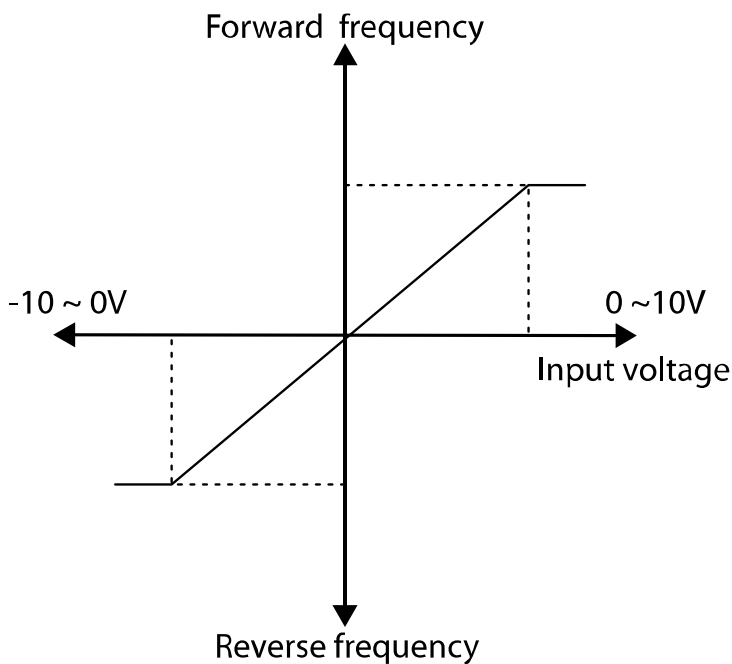
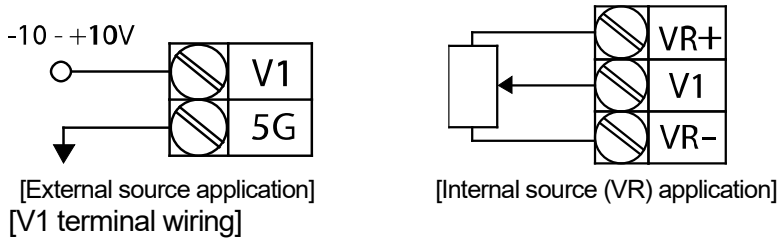
| Code | Description |
|---------------------------------------|---|
| IN-01 Freq at 100% | <p>Configures the frequency reference at the maximum input voltage when a potentiometer is connected to the control terminal block. A frequency set with code IN-01 becomes the maximum frequency only if the value set in code IN-11 (or IN-15) is 100%.</p> <ul style="list-style-type: none"> Set code IN-01 to 40.00 and use default values for codes IN-02–IN-16. The motor will run at 40.00 Hz when a 10 V input is provided at V1. Set code IN-11 to 50.00 and use default values for codes IN-01–IN-16. The motor will run at 30.00 Hz (50% of the default maximum frequency–60 Hz) when a 10 V input is provided at V1. |
| IN-05 V1 Monitor[V] | Configures the inverter to monitor the input voltage at V1. |
| IN-07 V1 Filter | <p>The V1 filter may be used when there are large variations between reference frequencies. Variations can be mitigated by increasing the time constant, but this requires an increased response time.</p> <p>The value t (time) indicates the time required for the frequency to reach 63% of the reference, when external input voltages are provided in multiple steps.</p> <p>V1 input from external source </p>  |
| IN-08 V1 volt x1– IN-11 V1 Perc y2 | These parameters are used to configure the gradient level and offset values of the output frequency, based on the input voltage. |

| Code | Description |
|---------------------|---|
| | <p>Frequency reference</p>  |
| IN-16 V1 Inverting | <p>Inverts the direction of rotation. Set this code to “1 (Yes)” if you need the motor to run in the opposite direction from the current rotation.</p> |
| IN-17 V1 Quantizing | <p>Quantizing may be used when the noise level is high in the analog input (V1 terminal) signal. Quantizing is useful when you are operating a noise-sensitive system, because it suppresses any signal noise. However, quantizing will diminish system sensitivity (resultant power of the output frequency will decrease based on the analog input). You can also turn on the low-pass filter using code IN-07 to reduce the noise, but increasing the value will reduce responsiveness and may cause pulsations (ripples) in the output frequency.</p> <p>Parameter values for quantizing refer to a percentage based on the maximum input. Therefore, if the value is set to 1% of the maximum analog input (60 Hz), the output frequency will increase or decrease by 0.6 Hz for every 0.1 V change in voltage.</p> <p>When the analog input is increased, an increase in the input equal to 75% of the set value will change the output frequency, and then the frequency will increase according to the set value. Likewise, when the analog input decreases, a decrease in the input equal to 75% of the set value will make an initial change to the output frequency.</p> <p>As a result, the output frequency will be different at acceleration and deceleration, mitigating the effect of analog input changes over the output frequency (ripples).</p> |



6.1.3.2 Setting a Frequency Reference for -10~+10 V Input

Set DRV-07 (Frequency reference source) to “2 (V1)”, and then set IN-06 (V1 Polarity) to “1 (bipolar)”. Use the output voltage from an external source to provide an input to V1.



[Bipolar input voltage and output frequency]

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|-----------------------------------|--------------|-------------------|---------|------------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 2 | V1 | 0-9 | - |
| IN | 01 | Frequency at maximum analog input | Freq at 100% | 60.00 | | 0-max. frequency | Hz |
| | 05 | V1 input monitor | V1 Monitor | 0.00 | | 0.00-10.00 V | V |
| | 06 | V1 polarity options | V1 Polarity | 1 | Bipolar | 0-1 | - |
| | 12 | V1 minimum input | V1- volt x1 | 0.00 | | 0.00-10.00 V | V |

| Group | Code | Name | LCD Display | Parameter Setting | Setting Range | Unit |
|-------|------|----------------------------------|-------------|-------------------|---------------|------|
| | | voltage | | | | |
| | 13 | V1 output at minimum voltage (%) | V1- Perc y1 | 0.00 | -100.00–0.00% | % |
| | 14 | V1 maximum input voltage | V1- Volt x2 | -10.00 | -10.00–0.00 V | V |
| | 15 | V1 output at maximum voltage (%) | V1- Perc y2 | -100.00 | -100.00–0.00% | % |

Rotational Directions for Different Voltage Inputs

| Command / Voltage Input | Input voltage | |
|-------------------------|---------------|---------|
| | 0–10 V | -10–0 V |
| FWD | Forward | Reverse |
| REV | Reverse | Forward |

10–10 V Voltage Input Setting Details

| Code | Description |
|---|---|
| IN-12 V1- volt x1– IN-15 V1- Perc y2 | <p>Sets the gradient level and offset value of the output frequency in relation to the input voltage. These codes are displayed only when IN-06 is set to “1 (bipolar)”. As an example, if the minimum input voltage (at V1) is set to “-2 (V)” with 10% output ratio, and the maximum voltage is set to “-8 (V)” with an 80% output ratio, the output frequency will vary within the range of 6–48 Hz.</p> <p>V1 input</p> <p>For details about the 0–+10 V analog inputs, refer to the code descriptions IN-08 V1 volt x1–IN-11 V1 Perc y2 on page 117.</p> |

6.1.3.3 Setting a Reference Frequency using Input Current (I1)

You can set and modify a frequency reference using input current at the I1 terminal. Set DRV-07 (Frequency reference source) to “3 (I1)” and apply an input current of 0–20 mA to I1.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|-----------------------------------|---------------|-------------------|----|-------------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 3 | I1 | 0–9 | - |
| IN | 01 | Frequency at maximum analog input | Freq at 100% | 60.00 | | 0–max. frequency | Hz |
| | 20 | I1 input monitor | I1 Monitor | 0.00 | | 0.00–20.00 | mA |
| | 22 | I1 input filter time constant | I1 Filter | 10 | | 0–10000 | ms |
| | 23 | I1 minimum input current | I1 Curr x1 | 4.00 | | 0.00–20.00 | mA |
| | 24 | I1 output at minimum current (%) | I1 Perc y1 | 0.00 | | 0–100 | % |
| | 25 | I1 maximum input current | I1 Curr x2 | 20.00 | | 4.00–20.00 | mA |
| | 26 | I1 output at maximum current (%) | I1 Perc y2 | 100.00 | | 0.00–100.00 | % |
| | 31 | I1 rotation direction options | I1 Inverting | 0 | No | 0–1 | - |
| | 32 | I1 quantizing level | I1 Quantizing | 0.04 | | 0.00*, 0.04–10.00 | % |

* Quantizing is disabled if “0” is selected.

Input Current (I1) Setting Details

| Code | Description |
|---------------------------------------|---|
| IN-01 Freq at 100% | <p>Configures the frequency reference for operation at the maximum current (when IN-26 is set to 100%).</p> <ul style="list-style-type: none"> If IN-01 is set to 40.00, and default settings are used for IN-23–26, an input current of 20 mA (max) to I1 will produce a frequency reference of 40.00 Hz. If IN-26 is set to 50.00, and default settings are used for IN-01 (60 Hz) and IN-23–26, an input current of 20 mA (max) to I1 will produce a frequency reference of 30.00 Hz (50% of 60 Hz). |
| IN-20 I1 Monitor | Used to monitor the input current at I1. |
| IN-22 I1 Filter | Configures the time for the operation frequency to reach 63% of the target frequency based on the input current at I1. |
| IN-23 I1 Curr x1– IN-26 I1 Perc y2 | <p>Configures the gradient level and offset value of the output frequency.</p> <p>Frequency reference</p> <p>[Gradient and offset configuration based on output frequency]</p> |
| IN-32 I1 Quantizing | Same as V1 Quantizing. For more details, refer to 6.1.3.1 Setting a Frequency Reference for 0–10 V Input on page 116. |

6.1.4 Setting a Frequency Reference Using an I/O Expansion Module (Terminal V2/I2)

After installing an optional I/O expansion module to the iS7 inverter, you can set and modify a frequency reference using the input voltage or current at the V2/I2 terminal.

6.1.4.1 Setting a Reference Frequency using Input Voltage at V2 Terminal

Set the DRV-07 (Frequency reference source) to “4 (V2)” and apply an input voltage of -10~+12 V to the V2 terminal.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|--------------------------------|---------------|-------------------|----|-------------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 4 | V2 | 0-9 | - |
| IN | 35 | V2 input display | V2 Monitor | 0.00 | | -10.00~+10.00 | V |
| | 37 | V2 input filter time constant | V2 Filter | 10 | | 0-10000 | ms |
| | 38 | Minimum V2 input voltage | V2 Volt x1 | 0.00 | | 0.00-10.00 | V |
| | 39 | Output% at minimum V2 voltage | V2 Perc y1 | 0.00 | | 0.00-100.00 | % |
| | 40 | Maximum V2 input voltage | V2 Volt x2 | 10.00 | | 0.00-10.00 | V |
| | 41 | Output% at maximum V2 voltage | V2 Perc y2 | 100.00 | | 0.00-100.00 | % |
| | 42 | Minimum V2 input voltage' | V2 -Volt x1' | 0.00 | | 0-10 | V |
| | 43 | Output% at minimum V2 voltage' | V2 -Perc y1' | 0.00 | | 0-100 | % |
| | 44 | Maximum V2 input voltage' | V2 -Volt x2' | -10.00 | | 0-10 | V |
| | 45 | Output% at maximum V2' voltage | V2 -Perc y2' | -100.00 | | -100-0 | % |
| | 46 | Invert V2 rotational direction | V2 Inverting | No | | No/Yes | - |
| | 47 | V2 quantizing level | V2 Quantizing | 0.04 | | 0.00*, 0.04-10.00 | % |

* Quantizing is disabled if “0” is selected.

6.1.4.2 Setting a Reference Frequency using Input Current at I2 Terminal

Set the DRV-07 (Frequency reference source) to "5 (I2)" and apply an input voltage of 0–20 mA to the I2 terminal.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------------------------|---------------|-------------------|----|-------------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 5 | I2 | 0–9 | - |
| | 50 | I2 input monitor | I2 Monitor | 0.00 | | 0.00–20.00 | mA |
| | 52 | I2 input filter time constant | I2 Filter | 10 | | 0–10000 | ms |
| | 53 | I2 minimum input current | I2 Curr x1 | 4.00 | | 0.00–20.00 | mA |
| | 54 | I2 output at minimum current (%) | I2 Perc y1 | 0.00 | | 0–100 | % |
| | 55 | I2 maximum input current | I2 Curr x2 | 20.00 | | 4.00–20.00 | mA |
| | 56 | I2 output at maximum current (%) | I2 Perc y2 | 100.00 | | 0.00–100.00 | % |
| | 61 | I2 rotation direction options | I2 Inverting | 0 | No | 0–1 | - |
| | 62 | I2 quantizing level | I2 Quantizing | 0.04 | | 0.00*, 0.04–10.00 | % |

* Quantizing is disabled if "0" is selected.

6.1.5 Setting a Frequency with Pulse Input (with an optional encoder module)

After installing an optional encoder module, you can set a frequency reference by setting DRV-07 (Frequency reference source) to “9 (Pulse)” and providing a pulse frequency of 0–32.00 kHz to the pulse input terminal.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|-----------------------|-----------------------------------|---------------|-------------------|-----------|---------------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 7 | Encoder | 0–9 | - |
| IN | 01 | Frequency at maximum analog input | Freq at 100% | 60.00 | | 0.00–max. frequency | Hz |
| APO | 01 | Encoder option mode | Enc Opt Mode | 2 | Reference | 0-2 | - |
| | 04 | Encoder type selection | Enc Type Sel | 0 | - | 0-2 | - |
| | 05 | Encoder pulse selection | Enc Pulse Sel | 2 | A | 0-2 | - |
| | 06 | Encoder pulse number | Enc Pulse Num | - | | 10-5000 | - |
| | 09 | Pulse input display | Pulse Monitor | - | | - | kHz |
| | 10 | Encoder filter time constant | Enc Filter | 10 | | 0-10000 | ms |
| | 93 | Minimum pulse input | Enc Pulse x1 | 0.0 | | 0-100 | kHz |
| | 94 | Minimum pulse Output% | Enc Perc Y1 | 0.00 | | 0-100 | % |
| | 95 | Maximum pulse input | Enc Pulse x2 | 100.0 | | 0-200 | kHz |
| 96 | Maximum pulse Output% | Enc Perc y2 | 100.00 | | 0-100 | % | |

* Quantizing is disabled if “0” is selected.

Pulse Input Setting Details

| Code | Description |
|---------------------------------------|---|
| APO-01 Enc Opt Mode | Sets the encoder option mode. Set APO-01 to "2 (Reference)" to receive a pulse input for the frequency reference. |
| APO-04 Enc Type Sel | Sets the output type. |
| APO-05 Enc Pulse Sel | Selects the encoder pulse to use. |
| APO-06 Enc Pulse Num | Sets the number of pulses that is appropriate for the encoder specification. |
| APO-09 Pulse Monitor | Displays the pulse frequency supplied at the encoder option module when APO-1 is set to "2 (Reference)". |
| APO-10 Enc Filter | Sets the time for the pulse input to reach 63% of its nominal frequency (when the pulse frequency is supplied in multiple steps). |
| APO-11 Enc Pulse x1-IN-96 Enc Perc y2 | <p>Configures the gradient level and offset values for the output frequency.</p> <p>Frequency reference</p> |

6.1.6 Setting a Frequency Reference via RS-485 Communication

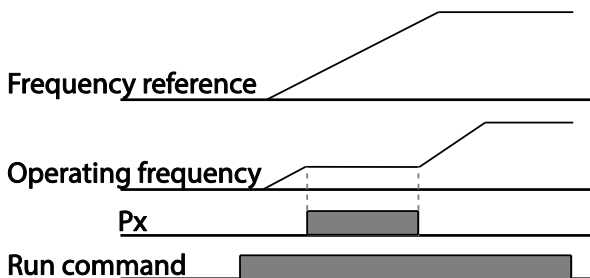
Control the inverter with upper-level controllers, such as PCs or PLCs, via RS-485 communication. Set DRV-07 (Frequency reference source) to “6 (Int 485)” and use the RS-485 signal input terminals (S+/S-/SG) for communication.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|--|--------------|-------------------|--------------|---------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 6 | Int 485 | 0–9 | - |
| COM | 01 | Integrated RS-485 communication inverter ID | Int485 St ID | - | 1 | 1–250 | - |
| | 02 | Integrated communication protocol | Int485 Proto | 0 | ModBus RTU | 0–2 | - |
| | | | | 1 | ModBus ASCII | | |
| | | | | 2 | LS Inv 485 | | |
| | 04 | Integrated communication speed | Int485 BaudR | 3 | 9600 bps | 1200–38400 | bps |
| | 04 | Integrated communication frame configuration | Int485 Mode | 0 | D8/PN/S1 | 0–3 | - |
| | | | | 1 | D8/PN/S2 | | |
| | | | | 2 | D8/PE/S1 | | |
| 3 | | | | D8/PO/S1 | | | |

6.2 Frequency Hold by Analog Input

If you set a frequency reference via the analog input at the control terminal block, you can hold the operation frequency of the inverter by assigning a multi-function input as the analog frequency hold terminal. The operation frequency will be linked to the analog input signal.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|-------|----------------------------|--|-------------------|-------------|---------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | 0 | Keypad-1 | 0-9 | - |
| | | | | 1 | Keypad-2 | | |
| | | | | 2 | V1 | | |
| | | | | 3 | I1 | | |
| | | | | 4 | V2 | | |
| | | | | 5 | I2 | | |
| | | | | 6 | Int 485 | | |
| | | | | 7 | Encoder | | |
| | | | | 8 | Field Bus | | |
| | | | | 9 | PLC | | |
| IN | 65-75 | Px terminal configuration | Px Define(Px: P1-P8 [optional: P9-P11]) [Optional P9-11] | 21 | Analog Hold | 65-75 | - |



6.3 Changing the Displayed Units (Hz↔Rpm)

You can change the units used to display the operational speed of the inverter by setting DRV- 21 (Speed unit selection) to “0 (Hz Display)” or “1 (Rpm Display)”.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------------|-------------|-------------------|-------------|---------------|------|
| DRV | 21 | Speed unit selection | Hz/Rpm Sel | 0 | Hz Display | 0–1 | - |
| | | | | 1 | Rpm Display | | |

6.4 Setting Multi-Step Frequency

Multi-step operations can be carried out by assigning different speeds (or frequencies) to the Px terminals. Step 0 uses the frequency reference source set at DRV-07. Px terminal parameter values 7 (Speed-L), 8 (Speed-M), 9 (Speed-H), and 10 (Speed-X) are recognized as binary commands and work in combination with Fx or Rx run commands. The inverter operates according to the frequencies set at BAS-50–64 (multi-step frequency 1–15) and the binary command combinations.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|-------|-------------------------------|--|-------------------|---------|---------------|------|
| DRV | 07 | Frequency reference source | Freq Ref Src | - | - | - | - |
| BAS | 50–64 | Multi-step frequency 1–15 | Step Freq - x | - | - | - | Hz |
| IN | 65–75 | Px terminal configuration | Px Define (Px: P1–P8 [optional: P9–P11]) [Optional P9–P11] | 7 | Speed-L | 0–51 | - |
| | | | | 8 | Speed-M | | - |
| | | | | 9 | Speed-H | | - |
| | | | | 10 | Speed-X | | - |
| | 89 | Multi-step command delay time | InCheck Time | 1 | - | 1–5000 | ms |

Multi-step Frequency Setting Details

| Code | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|---|-------|-------|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|-------|----|----|----|----|---|---|---|---|---|
| BAS Group 50–64 | Configure multi-step frequency 1–15. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IN-65–75 Px Define | <p>Choose the terminals to set up as multi-step inputs, and then set the relevant codes (IN-65–75) to 7 (Speed-L), 8 (Speed-M), 9 (Speed-H), or 10 (Speed-X). Provided that terminals P6, P7, and P8 have been set to Speed-L, Speed-M and Speed-H respectively, the following multi-step operation will be available.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>[An example of a multi-step operation]</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Fx/Rx</th> <th>P8</th> <th>P7</th> <th>P6</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>✓</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>1</td> <td>✓</td> <td>-</td> <td>-</td> <td>✓</td> </tr> <tr> <td>2</td> <td>✓</td> <td>-</td> <td>✓</td> <td>-</td> </tr> <tr> <td>3</td> <td>✓</td> <td>-</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>4</td> <td>✓</td> <td>✓</td> <td>-</td> <td>-</td> </tr> <tr> <td>5</td> <td>✓</td> <td>✓</td> <td>-</td> <td>✓</td> </tr> <tr> <td>6</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>-</td> </tr> <tr> <td>7</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table> <p>By setting the Speed-X, you can configure up to 16 multi-step speeds, where the highest bit is Speed-X.</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Fx/Rx</th> <th>P8</th> <th>P7</th> <th>P6</th> <th>P5</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>✓</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table> | Speed | Fx/Rx | P8 | P7 | P6 | 0 | ✓ | - | - | - | 1 | ✓ | - | - | ✓ | 2 | ✓ | - | ✓ | - | 3 | ✓ | - | ✓ | ✓ | 4 | ✓ | ✓ | - | - | 5 | ✓ | ✓ | - | ✓ | 6 | ✓ | ✓ | ✓ | - | 7 | ✓ | ✓ | ✓ | ✓ | Speed | Fx/Rx | P8 | P7 | P6 | P5 | 0 | ✓ | - | - | - |
| Speed | Fx/Rx | P8 | P7 | P6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ✓ | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ✓ | - | - | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ✓ | - | ✓ | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ✓ | - | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ✓ | ✓ | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ✓ | ✓ | - | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ✓ | ✓ | ✓ | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Speed | Fx/Rx | P8 | P7 | P6 | P5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ✓ | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Code | Description | | | | | |
|--------------------|--|---|---|---|---|---|
| | 1 | ✓ | - | - | - | ✓ |
| | 2 | ✓ | - | - | ✓ | - |
| | 3 | ✓ | - | - | ✓ | ✓ |
| | 4 | ✓ | - | ✓ | - | - |
| | 5 | ✓ | - | ✓ | - | ✓ |
| | 6 | ✓ | - | ✓ | ✓ | - |
| | 7 | ✓ | - | ✓ | ✓ | ✓ |
| | 8 | ✓ | ✓ | - | - | - |
| | 9 | ✓ | ✓ | - | - | ✓ |
| | 10 | ✓ | ✓ | - | ✓ | - |
| | 11 | ✓ | ✓ | - | ✓ | ✓ |
| | 12 | ✓ | ✓ | ✓ | - | - |
| | 13 | ✓ | ✓ | ✓ | - | ✓ |
| | 14 | ✓ | ✓ | ✓ | ✓ | - |
| | 15 | ✓ | ✓ | ✓ | ✓ | ✓ |
| IN-89 InCheck Time | <p>Set a time interval for the inverter to check for additional terminal block inputs after receiving an input signal.</p> <p>After IN-89 is set to 100 ms and an input signal is received at P6, the inverter will search for inputs at other terminals for 100 ms, before proceeding to accelerate or decelerate based on the configuration at P6.</p> | | | | | |

6.5 Command Source Configuration

Various devices can be selected as command input devices for the iS7 inverter. Input devices available include the keypad, multi-function input terminal, RS-485 communication, and field bus adapter.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------|-------------|-------------------|-----------|---------------|------|
| DRV | 06 | Command Source | Cmd Source | 0 | Keypad | 0-5 | - |
| | | | | 1 | Fx/Rx-1 | | |
| | | | | 2 | Fx/Rx-2 | | |
| | | | | 3 | Int 485 | | |
| | | | | 4 | Field Bus | | |
| | | | | 5 | PLC | | |

6.5.1 The Keypad as a Command Input Device

Set DRV-06 to "0 (Keypad)" to select the keypad as the command source.

Since the keypad is now the command source, forward or reverse operation starts when the [FWD] or [REV] key is pressed, and it stops when the [STOP/RESET] key is pressed.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------|-------------|-------------------|--------|---------------|------|
| DRV | 06 | Command source | Cmd Source | 0 | KeyPad | 0-5 | - |

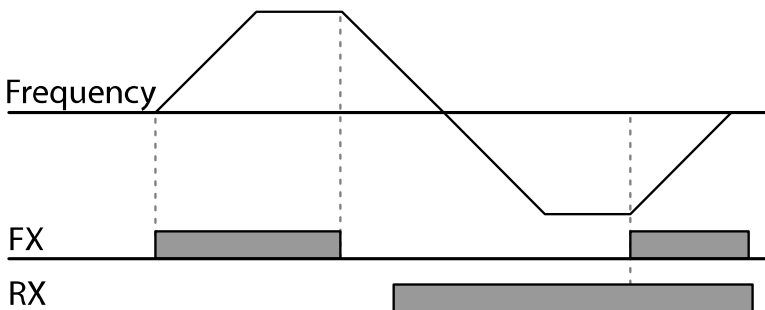
6.5.2 The Terminal Block as a Command Input Device (Fwd/Rev run commands)

Multi-function terminals can be selected as a command input device. This is configured by setting DRV-06 (command source) to “1 (Fx/Rx-1)”. Select two terminals for the forward and reverse operations, and then set the relevant codes (2 of the 11 multi-function terminal codes, IN-65–75 for P1–P8 [optional: P9–P11]) to “1 (Fx)” and “2 (Rx)” respectively. This application enables both terminals to be turned on or off at the same time, constituting a stop command that will cause the inverter to stop operating.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|-------|---------------------------|--|-------------------|---------|---------------|------|
| DRV | 06 | Command source | Cmd Source | 1 | Fx/Rx-1 | 0–5 | - |
| IN | 65–75 | Px terminal configuration | Px Define(Px: P1– P8 [optional: P9–P11]) | 1 | Fx | 0–51 | - |
| | | | | 2 | Rx | | |
| | 88 | Delay time setting | Run On Delay | - | 1.00 | 0.00–100.00 | Sec |

Fwd/Rev Command by Multi-function Terminal – Setting Details

| Code | Description |
|--------------------|---|
| DRV-06 Cmd Source | Set to “1 (Fx/Rx-1)”. |
| IN-65–75 Px Define | Assign a terminal for forward (Fx) operation. Assign a terminal for reverse (Rx) operation. |
| IN-88 Run On Delay | Set the delay time if the inverter operation needs to be synchronized with other sequences. When the run command input (Fx/Rx) is given, the operation begins after the set time has elapsed. |



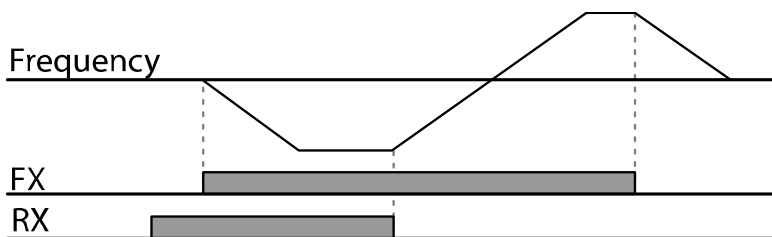
6.5.3 The Terminal Block as a Command Input Device (Run and Rotation Direction Commands)

Multi-function terminals can be selected as a command input device. This is configured by setting DRV-06 (command source) to “2 (Fx/Rx-2)”. Select two terminals for run and rotation direction commands, and then set the relevant codes (2 of the 11 multi-function terminal codes, IN-65–75 for P1–P11 [optional: P9–P11]) to “1 (Fx)” and “2 (Rx)” respectively. This application uses an Fx input as a run command, and an Rx input to change a motor’s rotation direction (On: Rx, Off: Fx).

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|-------|---------------------------|--|-------------------|---------|---------------|------|
| DRV | 06 | Command source | Cmd Source | 2 | Fx/Rx-2 | 0–5 | - |
| IN | 65–75 | Px terminal configuration | Px Define (Px: P1–P8 [optional: P9–P11]) | 1 | Fx | - | - |
| | | | | 2 | Rx | | |
| | 88 | Delay time setting | Run On Delay | - | 1.00 | 0.00–100.00 | Sec |

Run Command and Fwd/Rev Change Command Using Multi-function Terminal – Setting Details

| Code | Description |
|--------------------|---|
| DRV-06 Cmd Source | Set to “2 (Fx/Rx-2)”. |
| IN-65–75 Px Define | Assign a terminal for the run command (Fx). Assign a terminal for changing the rotation direction (Rx). |
| IN-88 Run On Delay | Set the delay time if the inverter operation needs to be synchronized with other sequences. When the run command input (Fx/Rx) is given, the operation begins after the set time has elapsed. |



6.5.4 RS-485 Communication as a Command Input Device

Internal RS-485 communication can be selected as a command input device by setting DRV-06 (command source) in the Drive group to “3 (Int 485)”. This configuration uses upper level controllers, such as PCs or PLCs, to control the inverter by transmitting and receiving signals via the S+, S-, and RS-485 signal input terminals at the terminal block.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|--------------------------------------|--------------|-------------------|--------------|---------------|------|
| DRV | 06 | Command source | Cmd Source | 3 | Int 485 | 0–5 | - |
| COM | 04 | Integrated communication inverter ID | Int485 St ID | 1 | | 1–250 | - |
| | 05 | Integrated communication protocol | Int485 Proto | 0 | ModBus RTU | - | - |
| | 06 | Integrated communication speed | Int485 BaudR | 3 | 9600 bps | 1200–38400 | bps |
| | 07 | Integrated communication frame setup | Int485 Mode | 0 | D8 / PN / S1 | - | - |

6.6 Forward or Reverse Run Prevention

The rotation direction of motors can be configured to prevent motors from running in a forward or reverse direction. When reverse direction prevention is configured, pressing the [REV] key on the keypad will cause the motor to decelerate to 0 Hz and stop.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|------------------------|-------------|-------------------|--------------|---------------|------|
| ADV | 09 | Run prevention options | Run Prevent | 0 | None | 0–2 | - |
| | | | | 1 | Forward Prev | | |
| | | | | 2 | Reverse Prev | | |

Forward/Reverse Run Prevention Setting Details

| Code | Description | | |
|--------------------|--------------------------------|--------------|-----------------------------|
| ADV-09 Run Prevent | Choose a direction to prevent. | | |
| | Setting | | Description |
| | 0 | None | Do not set run prevention. |
| | 1 | Forward Prev | Set forward run prevention. |
| | 2 | Reverse Prev | Set reverse run prevention. |

6.7 Power-on Run

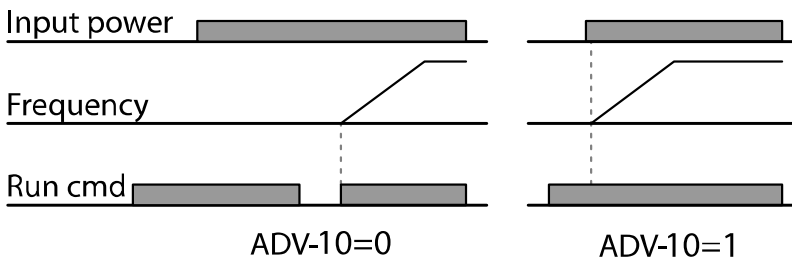
The Power-on Run feature can be set up to start an inverter operation after powering up based on the run commands by terminal inputs (if they are configured).

⚠ Caution

Use caution when operating the inverter with Power-on Run enabled as the motor will begin rotating when the inverter starts up.

To enable Power-on Run, set DRV-06 (command source) to “1 (Fx/Rx-1)” or “2 (Fx/Rx-2)” and ADV-10 to “1”. If a run command via a terminal input is on, the inverter starts operating according to the terminal input settings as soon as it is turned on.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------|----------------|--------------|-------------------|--------------------|---------------|------|
| DRV | 06 | Command source | Cmd Source | 1, 2 | Fx/Rx-1 or Fx/Rx-2 | 0-5 | - |
| ADV | 10 | Power-on run | Power-on Run | 1 | Yes | 0-1 | - |



Note

- To prevent a repeat fault trip from occurring when a load, such as a fan, is free-running on a Power-on Run, set CON-71 (speed search options) bit 4 to “1”. The inverter will perform a speed search at the

beginning of the operation. If the speed search is not enabled, the inverter will start its operation in a normal V/F pattern and accelerate the motor.

- If the inverter has been turned on without Power-on Run enabled, the terminal block command must be first turned off, and then turned on again to begin the inverter's operation.

6.8 Setting Acceleration and Deceleration Times

6.8.1 Acc/Dec Time Based on Maximum Frequency

Regardless of the operating frequency, acc/dec time values can be set based on the maximum frequency. To set acc/dec time values based on the maximum frequency, set BAS-08 (Acc/Dec reference) to "0 (Max Freq)".

The acceleration time set at DRV-03 (Acceleration time) refers to the time required for the inverter to reach the maximum frequency from a stopped state (0 Hz). Likewise, the value set at DRV-04 (Deceleration time) refers to the time required to return to a stopped state (0 Hz) from the maximum frequency.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|--------------|------|-------------------|-------------|-------------------|----------|---------------------|------|
| DRV | 03 | Acceleration time | Acc Time | 75 kW and less | 20.0 | 0.0–600.0 | sec |
| | | | | 90 kW and up | 60.0 | | |
| | 04 | Deceleration time | Dec Time | 75 kW and less | 30.0 | 0.0–600.0 | sec |
| 90 kW and up | | | | 90.0 | | | |
| | 20 | Maximum frequency | Max Freq | 60.00 | | 0.00–400.00 | Hz |
| BAS | 08 | Acc/Dec reference | Ramp T Mode | 0 | Max Freq | Max Freq/Delta Freq | - |
| | 09 | Time scale | Time scale | 1 | 0.1 | 0–2 (0.01/0.1/1) | sec |

Acc/Dec Time Based on Maximum Frequency – Setting Details

| Code | Description | | | | | | | | |
|--|--|--|--|---|----------|--|---|------------|--|
| BAS-08 Ramp T Mode | Set BAS-08 to "0 (Max Freq)" to setup acc/dec time based on maximum frequency. | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Configuration</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Max Freq</td> <td>Set the acc/dec time based on the maximum frequency.</td> </tr> <tr> <td>1</td> <td>Delta Freq</td> <td>Set the acc/dec time based on the operating frequency.</td> </tr> </tbody> </table> | Configuration | Description | 0 | Max Freq | Set the acc/dec time based on the maximum frequency. | 1 | Delta Freq | Set the acc/dec time based on the operating frequency. |
| | Configuration | Description | | | | | | | |
| | 0 | Max Freq | Set the acc/dec time based on the maximum frequency. | | | | | | |
| 1 | Delta Freq | Set the acc/dec time based on the operating frequency. | | | | | | | |
| If, for example, the maximum frequency is 60.00 Hz, the acc/dec times are set to 5 seconds, and the frequency reference for operation is set at 30 Hz (half of 60 Hz). Therefore, the time required to reach 30 Hz is 2.5 seconds (half of 5 seconds). | | | | | | | | | |
| | | | | | | | | | |

| Code | Description | | | | | | | | |
|-------------------|--|---------------|-------------|---|---|---|---|---|---|
| | | | | | | | | | |
| BAS-09 Time scale | <p>Use the time scale for all time-related values. It is particularly useful when more accurate acc/dec times are required, due to load characteristics, or when the maximum time range needs to be extended.</p> <table border="1"> <thead> <tr> <th>Configuration</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.01 sec Sets 0.01 second as the minimum unit.</td> </tr> <tr> <td>1</td> <td>0.1 sec Sets 0.1 second as the minimum unit.</td> </tr> <tr> <td>2</td> <td>1 sec Sets 1 second as the minimum unit.</td> </tr> </tbody> </table> | Configuration | Description | 0 | 0.01 sec Sets 0.01 second as the minimum unit. | 1 | 0.1 sec Sets 0.1 second as the minimum unit. | 2 | 1 sec Sets 1 second as the minimum unit. |
| Configuration | Description | | | | | | | | |
| 0 | 0.01 sec Sets 0.01 second as the minimum unit. | | | | | | | | |
| 1 | 0.1 sec Sets 0.1 second as the minimum unit. | | | | | | | | |
| 2 | 1 sec Sets 1 second as the minimum unit. | | | | | | | | |

⚠ Caution

Note that the range of maximum time values may change automatically when the units are changed. If for example, the acceleration time is set to 6000 seconds, a time scale change from 1 second to 0.01 second will result in a modified acceleration time of 60.00 seconds.

6.8.2 Acc/Dec Time Based on Operation Frequency

Acc/Dec times can be set based on the time required to reach the next frequency from the existing operation frequency. To set the acc/dec time values based on the existing operation frequency, set BAS-08 (Acc/Dec reference) to "1 (Delta Freq)".

| Group | Code | Name | LCD Display | Settings | Setting Range | Unit |
|-------|------|-------------------|-------------|----------------|---------------------|------|
| DRV | 03 | Acceleration time | Acc Time | 20.0 | 0.0 - 600.0 | sec |
| | 04 | Deceleration time | Dec Time | 30.0 | 0.0 - 600.0 | sec |
| BAS | 08 | Acc/Dec reference | Ramp T Mode | 1 Delta Freq | Max Freq/Delta Freq | - |

Acc/Dec Time Based on Operation Frequency– Setting Details

| Code | Description | | | | | | |
|--|--|--|-------------|--------------|--|----------------|--|
| BAS-08 Ramp T Mode | Set BAS-08 to "1 (Delta Freq)" to set acc/dec times based on operation frequency. | | | | | | |
| | <table border="1"> <thead> <tr> <th>Configuration</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0 Max Freq</td> <td>Set the acc/dec time based on the maximum frequency.</td> </tr> <tr> <td>1 Delta Freq</td> <td>Set the acc/dec time based on the operating frequency.</td> </tr> </tbody> </table> | Configuration | Description | 0 Max Freq | Set the acc/dec time based on the maximum frequency. | 1 Delta Freq | Set the acc/dec time based on the operating frequency. |
| | Configuration | Description | | | | | |
| | 0 Max Freq | Set the acc/dec time based on the maximum frequency. | | | | | |
| 1 Delta Freq | Set the acc/dec time based on the operating frequency. | | | | | | |
| If the acc/dec times are set to 5 seconds, and multiple frequency references are used in the operation in 2 steps, at 10 Hz and 30 Hz, each acceleration stage will take 5 seconds (refer to the graph below). | | | | | | | |
| | | | | | | | |

6.8.3 Multi-Step Acc/Dec Time Configuration

The acc/dec times can be configured via a multi-function terminal by setting the ACC (acceleration time) and DEC (deceleration time) codes in the DRV group.

| Group | Code | Name | LCD Display | Parameter Setting | | Setting Range | Unit |
|-------|------------|---------------------------------|--|-------------------|--------|---------------|------|
| DRV | 03 | Acceleration time | Acc Time | 75 kW and less | 20.0 | 0.0–600.0 | sec |
| | | | | 90 kW and up | 60.0 | | |
| | 04 | Deceleration time | Dec Time | 75 kW and less | 30.0 | 0.0–600.0 | sec |
| | | | | 90 kW and up | 90.0 | | |
| BAS | 70, 72, 74 | Multi-step acceleration time1–3 | Acc Time–x | x.xx | | 0.0–600.0 | sec |
| | 71, 73, 75 | Multi-step deceleration time1–3 | Dec Time–x | x.xx | | 0.0–600.0 | sec |
| IN | 65–75 | Px terminal configuration | Px Define (Px: P1–P8 [optional: P9–P11]) | 11 | XCEL-L | - | - |
| | | | | 12 | XCEL-M | | |
| | | | | 49 | XCEL-H | | |
| | 89 | Multi-step command delay time | In Check Time | 1 | | 1–5000 | ms |

Acc/Dec Time Setup via Multi-function Terminals – Setting Details

| Code | Description | | | | | | | | |
|---|---|-------------------|-------------|-----------|-------------------|-----------|-------------------|-----------|-------------------|
| BAS-70, 72, 74 Acc Time 1–3 | Set multi-step acceleration time 1–3. | | | | | | | | |
| BAS-71, 73, 75 Dec Time 1–3 | Set multi-step deceleration time 1–3. | | | | | | | | |
| IN-65–75 Px Define (P1–P8 [optional P9–P11]) | Choose and configure the terminals to use for multi-step acc/dec time inputs. | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Configuration</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>11 XCEL-L</td> <td>Acc/Dec command-L</td> </tr> <tr> <td>12 XCEL-M</td> <td>Acc/Dec command-M</td> </tr> <tr> <td>49 XCEL-H</td> <td>Acc/Dec command-H</td> </tr> </tbody> </table> | Configuration | Description | 11 XCEL-L | Acc/Dec command-L | 12 XCEL-M | Acc/Dec command-M | 49 XCEL-H | Acc/Dec command-H |
| | Configuration | Description | | | | | | | |
| | 11 XCEL-L | Acc/Dec command-L | | | | | | | |
| | 12 XCEL-M | Acc/Dec command-M | | | | | | | |
| 49 XCEL-H | Acc/Dec command-H | | | | | | | | |
| acc/dec commands are recognized as binary code inputs and will control the acceleration and deceleration based on parameter values set at BAS-70–75 | | | | | | | | | |
| If, for example, the P7 and P8 terminals are set as XCEL-L and XCEL-M respectively, the following operation will be available. | | | | | | | | | |

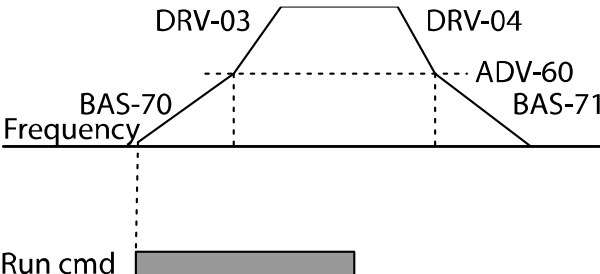
| Code | Description | | | | | | | | | | | | | | | |
|---------------------|--|--------------|----|----|---|---|---|---|---|---|---|---|---|---|---|---|
| | <table border="1"> <thead> <tr> <th>Acc/Dec time</th> <th>P8</th> <th>P7</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>-</td> <td>-</td> </tr> <tr> <td>1</td> <td>-</td> <td>✓</td> </tr> <tr> <td>2</td> <td>✓</td> <td>-</td> </tr> <tr> <td>3</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table> <p>[Multi-function terminal P7, P8 configuration]</p> | Acc/Dec time | P8 | P7 | 0 | - | - | 1 | - | ✓ | 2 | ✓ | - | 3 | ✓ | ✓ |
| Acc/Dec time | P8 | P7 | | | | | | | | | | | | | | |
| 0 | - | - | | | | | | | | | | | | | | |
| 1 | - | ✓ | | | | | | | | | | | | | | |
| 2 | ✓ | - | | | | | | | | | | | | | | |
| 3 | ✓ | ✓ | | | | | | | | | | | | | | |
| IN-89 In Check Time | Set the time for the inverter to check for other terminal block inputs. If IN-89 is set to 100 ms and a signal is supplied to the P6 terminal, the inverter searches for other inputs over the next 100 ms. When the time expires, the acc/dec time will be set based on the input received at P6. | | | | | | | | | | | | | | | |

6.8.4 Configuring Acc/Dec Time Switch Frequency

By configuring the switch frequency, you can switch between two different sets of acc/dec times (acc/dec gradients) without configuring the multi-function terminals.

| Group | Code | Name | LCD Display | Parameter Setting | Setting Range | Unit |
|-------|------|-------------------------------|----------------|-------------------|---------------------|--------|
| DRV | 03 | Acceleration time | Acc Time | 10.0 | 0.0–600.0 | sec |
| | 04 | Deceleration time | Dec Time | 10.0 | 0.0–600.0 | sec |
| BAS | 70 | Multi-step acceleration time1 | Acc Time-1 | 20.0 | 0.0–600.0 | sec |
| | 71 | Multi-step deceleration time1 | Dec Time-1 | 20.0 | 0.0–600.0 | sec |
| ADV | 60 | Acc/dec time switch frequency | Xcel Change Fr | 30.00 | 0–Maximum frequency | Hz/RPM |

Acc/Dec Time Switch Frequency Setting Details

| Code | Description |
|----------------------------------|--|
| <p>ADV-60 Xcel Change Fr</p> | <p>After the acc/dec switch frequency has been set, the acc/dec gradients configured at BAS-70 and 71 will be used when the inverter's operation frequency is at or below the switch frequency. If the operation frequency exceeds the switch frequency, the gradient level configured for the acceleration and deceleration times (set at DRV-03 and DRV-04) will be used.</p> <p>If you configure the P1–P8 [optional: P9–P11] multi-function input terminals for multi-step acc/dec gradients (XCEL-L, XCEL-M, XCEL-H), the inverter will operate based on the acc/dec inputs at the terminals regardless of the acc/dec switch frequency configurations.</p>  |

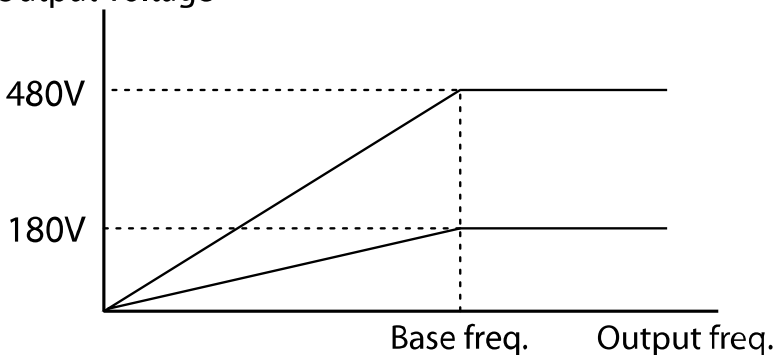
6.9 Output Voltage Setting

Output voltage settings are required when a motor's rated voltage differs from the input voltage to the inverter. Set BAS-15 to configure the motor's rated operating voltage. The set voltage becomes the output voltage of the inverter's base frequency. When the inverter operates above the base frequency, and when the motor's voltage rating is lower than the input voltage at the inverter, the inverter adjusts the voltage and supplies the motor with the voltage set at BAS-15 (motor-rated voltage). If the motor's rated voltage is higher than the input voltage at the inverter, the inverter will supply the inverter input voltage to the motor.

If BAS-15 (motor-rated voltage) is set to "0," the inverter corrects the output voltage based on the input voltage in the stopped condition. If the frequency is higher than the base frequency and when the input voltage is lower than the parameter setting, the input voltage will be the inverter output voltage.

| Group | Code | Name | LCD Display | Parameter Setting | Setting Range | Unit |
|-------|------|---------------------|-------------|-------------------|---------------|------|
| BAS | 15 | Motor rated voltage | Rated Volt | 220 | 0, 180–480 | V |

Output voltage



7 Troubleshooting and Maintenance

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 LSELECTRIC Customer Support.

Danger

Wait at least 10 minutes before opening the covers and exposing the terminal connections. Before working on the inverter, test the connections to ensure the DC voltage has been fully discharged. Personal injury or death by electric shock may result if the DC voltage has not been discharged.

7.1 Protection Functions

7.1.1 Protection from Output Current and Input Voltage

| Type | Category | Details | Remarks |
|---------------------------|----------|---|---------|
| 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 any 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 any value other than "0". | - |
| Over Current ¹ | Latch | Displayed when the inverter output current exceeds 200% of the rated current. | - |
| Over Voltage | Latch | Displayed when the internal DC circuit voltage exceeds the specified value. | - |
| Low Voltage | Level | Displayed when the internal DC circuit voltage is less than the specified value. | - |
| 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 the inverter capacity. | - |
| E-Thermal | Latch | Displayed based on inverse time limit thermal characteristics to prevent motor overheating. Operates when PRT-40 is set to any 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". | - |

| Type | Category | Details | Remarks |
|----------------|----------|--|---------|
| 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 4 sec. Protection is based on the inverter rated capacity, and may vary depending on the device's capacity. | - |
| Low Voltage2 | Latch | Displayed when the internal DC circuit voltage is less than the specified value during inverter operation. | - |
| Safety Opt Err | Latch | Displayed when a safety feature is activated to block the inverter output during an emergency. | - |

7.1.2 Abnormal Circuit Conditions and External Signals

| Type | Category | Details | Remarks |
|---------------|----------|---|---------|
| Fuse Open | Latch | Displayed when the inverter DC fuse is exposed to an overcurrent above 30 kW. | - |
| Over Heat | Latch | Displayed when the temperature of the inverter heat sink exceeds the specified value. | - |
| Over Current2 | Latch | Displayed when the DC circuit in the inverter detects a specified level of excessive, short circuit current. | - |
| External Trip | Latch | Displayed when an external fault signal is provided by the multi-function terminal. Set one of the multi-function input terminals at IN-65–72 to "3 (External Trip)" to enable external trip. | - |
| BX | Level | Displayed when the inverter output is blocked by a signal provided from the multi-function terminal. Set one of the multi-function input terminals at IN-65–71 to "4 (BX)" to enable the input block function. | - |
| H/W-Diag | Fatal | Displayed when an error is detected in the memory (EEPROM), analog-digital converter output (ADC Off Set), or CPU watchdog (Watch Dog-1, Watch Dog-2). EEP Err: An error in reading/writing parameters due to a keypad or memory (EEPROM) fault. ADC Off Set: An error in the current sensing circuit (U/V/W terminal, current sensor, etc.). Gate Pwr Loss: An interruption in the supply of power to the IGBT Gate of a product rated 30 kW or higher (when a fault occurs in a 22 kW-rated product, the capacity settings should be | - |

| Type | Category | Details | Remarks |
|-----------------|----------|--|------------------------------|
| | | checked). | |
| NTC Open | Latch | Displayed when an error is detected in the temperature sensor of the Insulated Gate Bipolar Transistor (IGBT). | - |
| Fan Trip | Latch | Displayed when an error is detected in the cooling fan. Set PRT-79 to "0" to activate fan trip (for models with a capacity below 22 kW). | - |
| IP54 FAN Trip | Latch | Displayed when the IP54 product detects an internal circulation at the cooling fan. | Only applied to IP54 product |
| Thermal Trip | Latch | Displayed when the resistance value exceeds the prescribed value after the external temperature sensor is connected to the terminal block. Operates when PRT-34 is set to any value other than "0". | - |
| ParaWrite Trip | Latch | Displayed when communication fails during parameter writing. Occurs when using an LCD keypad due to a control cable fault or a bad connection. | - |
| Over Speed Trip | Latch | Displayed when the motor speed exceeds the overspeed detection level. Set the detection level at PRT-70. | - |
| Dev Speed Trip | Latch | Displayed when the speed that received feedback from the encoder exceeds the set variation value. Operates when PRT-73 is set to "1". | - |
| Encoder Trip | Latch | Displayed when PRT-77 Enc Wire Check is set to "1" and an abnormality is detected for the set period of time. | - |
| Pre-PID Fail | Latch | Displayed when pre-PID is operating with functions set at APP-34–36. A fault trip occurs when a controlled variable (PID feedback) is measured below the set value and the low feedback continues, as it is treated as a load fault. | - |
| Ext-Brake | Latch | When Control Mode (DRV-09) is V/F or Sensorless1 or Sensorless2: The trip occurs when OUT-31–32 is set to BR control and the output current is lower than ADV-41 value (% for BAS-13) for about 10 seconds. When Control Mode (DRV-09) is Vector: The trip occurs when OUT-31-32 is set to BR Control and the current is lower than half of the BAS-14 value. | - |

7.1.3 Keypad and Optional Expansion Modules

| Type | Category | Details | Remarks |
|----------------|----------|--|---------|
| Lost Keypad | Level | Displayed when operating commands come from the keypad or there is any problem with the communication between the keypad and inverter's main body in Keypad JOG mode. Operates when PRT-11 is set to any value other than "0" (occurs 2 seconds after the communication is interrupted). | - |
| Lost Command | Level | Displayed when a frequency or operation command error is detected during inverter operation by controllers other than the keypad (e.g. using a terminal block and a communication mode). Set PRT-12 to any value other than "0". | - |
| Option Trip-1 | Latch | Displayed when the extension module is removed from option slot No. 1 after it was installed while the inverter was turned on, or when communication is not available with the inverter. | - |
| Option Trip-2 | Latch | Displayed when the extension module is removed from option slot No. 2 after it was installed during power supply, or when communication is not available with the inverter. | - |
| Option Trip-3 | Latch | Displayed when the extension module is removed from option slot No. 3 after it was installed during power supply, or when communication is not available with the inverter. | - |
| I/O Board Trip | Latch | Displayed when the basic and insulated I/O boards are disconnected or have a connection fault. | - |

Note

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 inverter is still in a fault condition after it is powered on again, please contact the supplier or the LSELECTRIC Customer Support.

The function for saving the fault history and the fault signal output may not be performed if the functions are not set or the inverter is seriously damaged.

7.2 Warning Messages

| Type | Description |
|----------------|--|
| Over Load | Displayed when the motor is overloaded. Operates when PRT-17 is set to "1". To operate, select "4 (Over Load)". Set the digital output terminal or relay (OUT31-33) to "4 (Over Load)" to receive overload warning output signals. |
| Under Load | Displayed when the motor is underloaded. Operates when PRT-25 is set to "1". Set the digital output terminal or relay (OUT31-33) to "6 (Under Load)" to receive underload warning output signals. |
| Inv Over Load | Displayed when the accumulated overload time is equivalent to 60% of the inverter overheat protection (inverter IOLT) level. Set the digital output terminal or relay (OUT31-33) to "5 (IOL)" to receive inverter overload warning output signals. |
| Lost Command | The Lost Command warning alarm occurs even when PRT-12 is set to "0". The warning alarm occurs based on the condition set at PRT-13-15. Set the digital output terminal or relay (OUT31-33) to "12 (Lost Command)" to receive lost command warning output signals. |
| Fan Warning | Displayed when an error is detected from the cooling fan while PRT-79 is set to "1". Set the digital output terminal or relay (OUT31-33) to "8 (Fan Warning)" to receive fan warning output signals. |
| DB Warn %ED | Displayed when the DB resistor usage rate exceeds the set value. Set the detection level at PRT-66. |
| Enc Conn Check | Displayed when "3 (Enc Test)" is set at BAS-20 (Auto Tuning) and no signal is input during the encoder test. Set the ENC Tune at OUT31-33 to release a signal. |
| Enc Dir Check | Displayed when "3 (Enc Test)" is set at BAS-20 (Auto Tuning) and the settings for A and B encoder phases are changed or are the opposite during the encoder test. Set the ENC Dir at OUT31-33 to release a signal. |
| Lost Keypad | Displayed when operating commands come from the keypad or there is any problem with the communication between the keypad and inverter's main body in Keypad JOG mode after setting PRT-11 (Lost KPD Mode) to "0". Set the Lost Keypad (29) at OUT31-33. |
| Check Line PLZ | Displayed when there is any problem with communication between the keypad and the iS7 Control CPU (control connection cables). |
| Fire Mode | Displayed when the fire function is activated. If a contact signal output is required, set the Fire Mode (37) at OUT31-33. |
| PID Sleep | Displayed when the PID Sleep mode is activated. An alarm is generated to distinguish PID sleep mode from operation stop status. |
| AUX Power On | Displayed when the AUX Power option is activated. When the inverter main power is Off, a low voltage trip does not occur and an auxiliary power option alarm occurs. |

7.3 Troubleshooting Fault Trips

| Type | Problem | Solution |
|---------------------------|--|---|
| 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 lower capacity models. |
| | The set value for the underload level (PRT-29 and PRT-30) is less than the system's minimum load. | Increase the set value for the underload level. |
| Over Current1 | Acc/dec time is too short compared to load inertia (GD2). | Increase acc/dec time. |
| | 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-60). |
| | The mechanical brake of the motor is operating too fast. | Check the mechanical brake. |
| Over Voltage | The deceleration time is too short for the load inertia (GD2). | Increase the deceleration time. |
| | A generative load occurs at the inverter output. | Use the braking unit. |
| | The input voltage is too high. | Check if the input voltage is above the specified value. |
| | The set value for electronic thermal protection is too low. | Set an appropriate electronic thermal level. |
| | The inverter has been operated at a low speed for an extended period. | Replace the motor with a model that supplies extra power to the cooling fan. |
| Low Voltage /Low Voltage2 | The input voltage is too low. | Check if the input voltage is below the specified value. |
| | A load greater than the power capacity is connected to the system (e.g. 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. |
| Ground Trip | A ground fault has occurred in the | Check the output wiring. |

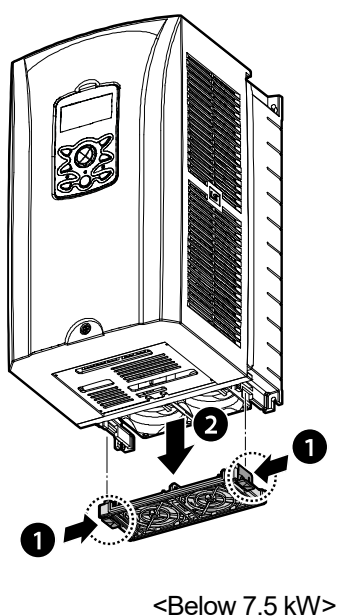
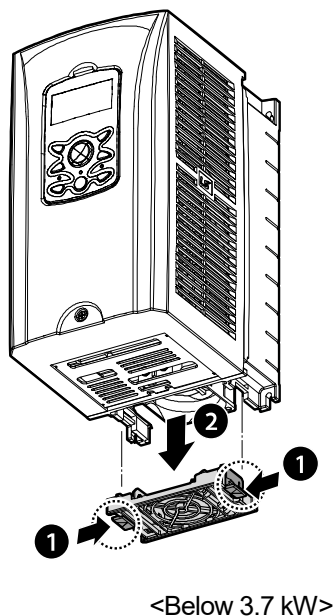
| Type | Problem | Solution |
|----------------|--|---|
| | inverter output wiring. | |
| | The motor insulation is damaged. | Replace the motor. |
| E-Thermal | The motor has overheated. | Reduce the load or operation frequency. |
| | The inverter load is greater than the rated capacity. | Replace the inverter with a model that has increased capacity. |
| 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 LSELECTRIC Customer Support. |
| 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. | Check if a foreign object is obstructing the air inlet, outlet, or vent. |
| | The inverter cooling fan has been operating for an extended period. | Replace the cooling fan. |
| | The ambient temperature is too high. | Keep the ambient temperature below 50°C. |
| Over Current2 | The output wiring has 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 LSELECTRIC Customer Support. |
| NTC Open | The ambient temperature is too low. | Keep the ambient temperature above 10°C. |
| | There is a fault with the internal temperature sensor. | Contact the retailer or the LSELECTRIC Customer Support. |
| FAN Trip | There is a foreign object in the inverter vent where the fan is located. | Remove the foreign object from the air inlet or outlet. |
| | The cooling fan needs to be replaced. | Replace the cooling fan. |
| IP54 FAN Trip | The fan connector is not connected. | Connect the fan connector. |
| | The power connector for the internal fan PCB board is not connected. | Connect the power connector for the internal fan PCB board. |

| Type | Problem | Solution |
|---------------|---|--|
| | The cooling fan needs to be replaced. | Replace the cooling fan. |
| No Motor Trip | The motor is not connected to the inverter output. | Check the wiring connections. |
| | The current level for trip detection is not set properly. | Check the values of both BAS-13 (Rated current) and PRT-32 (No Motor Level). |

7.4 Replacing the Cooling Fan

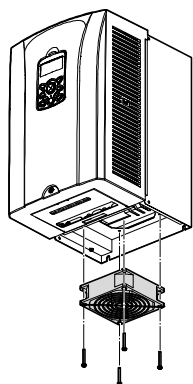
7.4.1 Products Rated below 7.5 kW

To replace the cooling fan, push the bracket on the bottom in the direction of the arrows in the diagram below and then pull it forward. Then, disconnect the fan connector.



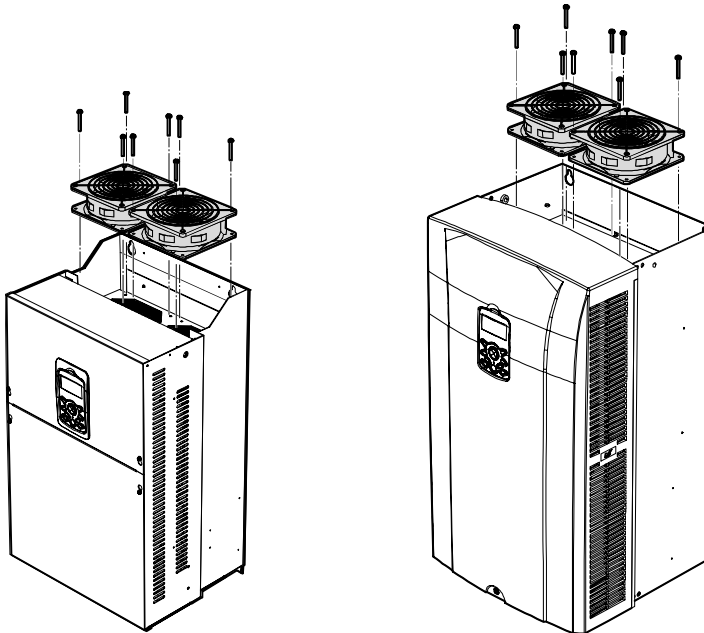
7.4.2 Products Rated at 11-15 kW 200 V/400 V and 18.5-22 kW 400 V

To replace the cooling fan, loosen the screws at the bottom of the input and output terminals and disconnect the fan connector.



7.4.3 Products Rated at more than 30 kW (200 V) / 90 kW (400 V), and 18.5–22 kW (200 V) / 30–75 kW (200/400 V)

To replace the cooling fan, loosen the screws at the top of the product and disconnect the fan connector.



Model types > 30 kW (200 V) ,
Model types > 90 kW (400 V)

18.5–22 kW (200 V) ,
30–75 kW (400V)

7.5 Daily and Regular Inspection Lists

| Inspection area | Inspection item | Inspection details | Inspection Cycle | | | Inspection method | Judgment standard | Inspection equipment |
|-----------------|---------------------|--|------------------|----------------|---|-------------------|---|-----------------------------------|
| | | | Daily | Regular (Year) | | | | |
| | | | | 1 | 2 | | | |
| Total | Ambient environment | Is the ambient temperature and humidity within the designated range, and is there any dust or foreign objects present? | 0 | | | Visual inspection | No ice (ambient temperature: -10°C →+40°C) and no condensation (ambient humidity below 50%) | Thermometer, hygrometer, recorder |

| Inspection area | Inspection item | Inspection details | Inspection Cycle | | | Inspection method | Judgment standard | Inspection equipment |
|----------------------|---------------------|---|------------------|----------------|---|---|--|----------------------------|
| | | | Daily | Regular (Year) | | | | |
| | | | | 1 | 2 | | | |
| | Inverter | Are there any abnormal vibrations or noise? | O | | | Visual inspection | No abnormality | |
| | Power voltage | Are the input and output voltages normal? | O | | | Measure voltages between R/S/T phases in the inverter terminal block. | | Digital multimeter, tester |
| Input/Output circuit | Total | 1) Megger test (between input/output terminals and and earth terminal) 2) Is there anything loose in the device? 3) Is there any evidence of overheating in each part? 4) Cleaning | | O | O | 1) Disconnect the inverter and short R/S/T/U/V/W terminals, and then measure from each terminal to the ground using Megger test equipment. 2) Tighten up all screws. 3) Visual inspection | 1) Over 5MΩ 2), 3) No matter | DC 500 V Megger |
| | Cable connections | 1) Are there any corroded cables? 2) Is there any damage to cable insulation? | | O | | Visual inspection | No abnormality | |
| | Terminal block | Is there any damage? | | O | | Visual inspection | No abnormality | |
| | Smoothing condenser | 1) Is liquid leaking inside? 2) Is the safety apparatus in position? Is there any protuberance? 3) Check the power failure capacity. | O O | | O | 1), 2) Visual inspection 3) Measure with a capacity meter. | 1),2) No abnormality 3) Rated capacity over 85% | Capacity meter |
| | Relay | 1) Is there any chattering noise during operation? 2) Is there any damage to the | | O O | | 1), 2) Visual inspection | 1),2) No abnormality | |

| Inspection area | Inspection item | Inspection details | Inspection Cycle | | | Inspection method | Judgment standard | Inspection equipment |
|-----------------|------------------|--|------------------|----------------|---|---|---|------------------------------------|
| | | | Daily | Regular (Year) | | | | |
| | | | | 1 | 2 | | | |
| | | contacts? | | | | | | |
| | Braking resistor | 1) Is there any damage from resistance? 2) Check for disconnection. | | O | | 1) Visual inspection 2) Disconnect one side and measure with a tester. | 1) No abnormality 2) Must be within $\pm 10\%$ of the rated value of the resistor. | Digital multimeter / analog tester |

⚠ Caution

Do not perform a megger test (insulation resistance test) on the control circuit of the inverter.

| Inspection area | Inspection item | Inspection details | Inspection Cycle | | | Inspection method | Judgment standard | Inspection equipment |
|------------------------------------|----------------------|--|------------------|----------------|---|--|--|------------------------------------|
| | | | Daily | Regular (Year) | | | | |
| | | | | 1 | 2 | | | |
| Control circuit Protection circuit | Operation check | 1) Check for output voltage imbalance while the inverter is in operation. 2) Is there an error in the display circuit after the sequence protection test? | | O | | 1) Measure voltage between the inverter output terminals U/V/W. 2) Test the inverter output protection in both short and open circuit conditions. | 1) Balance the voltage between phases: within 4 V for 200 V series and within 8 V for 400 V series. 2) The circuit must work according to the sequence. | Digital multimeter or DC voltmeter |
| Cooling system | Cooling fan | 1) Is there any abnormal vibration or sound? 2) Are any of the fan parts loose? | O | | O | 1) Turn it manually while the inverter is turned off. 2) Check all connected parts and tighten all screws. | 1) It should turn smoothly. 2) No abnormality | |
| Display | Meter | Is the display value normal? | O | O | | Check the command value on the display device. | Specified and managed values must match. | Voltmeter, ammeter, etc. |
| Motor | Total | 1) Are there any abnormal vibrations or sound? 2) Is there any abnormal smell? | O | | O | 1) Visual inspection 2) Check the abnormality, such as overheating, damage, etc. | No abnormality | |
| | Isolation resistance | Megger test (between the input, output and earth terminals). | | | O | Disconnect the cables for terminals U/V/W and test the wiring. | Must be above 5 MΩ. | DC 500 V Megger |

⚠ Caution

If the inverter has not been operated for a long time, capacitors lose their charging capability and are depleted. To prevent depletion, turn on the inverter once a year and allow it to operate for 30-60 minutes. Run the inverter under no-load conditions.

8 Table of Functions

8.1 Parameter Mode – DRV Group (→DRV)

DRV Group (PAR → DRV)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Note1) Control Mode | | | | |
|--------------|-------------------------------|------------------|-------------------------------|--|--------------------------------------|----------------------------|------------------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 00 | - | Jump Code | Jump code | 1-99 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01 | 0h1101 | Cmd Frequency | Target frequency | Starting frequency -maximum frequency (Hz) | 0.0 | 0 | 0 | 0 | 0 | X | X |
| 02 | 0h1102 | Cmd Torque | Torque command | -180~180 (%) | 0.0 | 0 | X | X | X | 0 | 0 |
| 03 | 0h1103 | Acc Timed | Acceleration time | 0~600 (sec) | Below 75 kW 20.0 Above 90 kW 60.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04 | 0h1104 | Dec Time | Deceleration time | 0~600 (sec) | Below 75 kW 30.0 Above 90 kW 90.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06 | 0h1106 | Cmd Source | Command source | 0 Keypad | 1:Fx/Rx-1 | X | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 Fx/Rx-1 | | | | | | | |
| | | | | 2 Fx/Rx-2 | | | | | | | |
| | | | | 3 Int 485 | | | | | | | |
| | | | | 4 Field Bus | | | | | | | |
| | | | | 5 PLC | | | | | | | |
| 07 | 0h1107 | Freq Ref Src | Frequency reference source | 0 Keypad-1 | 0:Keypad-1 | X | 0 | 0 | 0 | X | X |
| | | | | 1 Keypad-2 | | | | | | | |
| | | | | 2 V1 | | | | | | | |
| | | | | 3 I1 | | | | | | | |
| 08 | 0h1108 | Trq Ref Src | Torque reference source | 4 V2 | 0:Keypad-1 | X | X | X | X | 0 | 0 |
| | | | | 5 I2 | | | | | | | |
| | | | | 6 Int 485 | | | | | | | |
| | | | | 7 Encoder | | | | | | | |
| | | | | 8 FieldBus | | | | | | | |
| | | | | 9 PLC | | | | | | | |
| | | | | 10 Synchro | | | | | | | |
| | | | | 11 Binary | | | | | | | |
| 09 Note1) | 0h1109 | Control Mode | Control mode | 0 V/F | 0:V/F | X | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 V/F PG | | | | | | | |
| | | | | 2 Slip Compen | | | | | | | |
| | | | | 3 Sensorless-1 | | | | | | | |
| | | | | 4 Sensorless-2 | | | | | | | |
| | | | | 5 Vector | | | | | | | |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 1) Effectiveness of each code according to the Control Mode setting.

V/F: V/Fmode (PG included), SL: Sensorless-1, 2 mode, VC: Vector mode, SLT: Sensorless-1, 2 Torque mode,

VCT: Vector Torque mode, Refer to the Options manual for options.

DRV Group (PAR → DRV)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|------------------|-------------------------------|-------------------|------------------------------|---|-----------------------------------|----------------------------|-----------------|--------|-------------|-------------|-------------|
| | | | | | | | V / F | S L | V L C | S L T | V C T |
| 10 | 0h110A | Torque Control | Torque control | 0 No 1 Yes | 0: No | X | X | X | X | O | O |
| 11 | 0h110B | Jog Frequency | Jog frequency | 0.5–maximum frequency (Hz) | 10.00 | O | O | O | O | O | O |
| 12 | 0h110C | Jog Acc Time | Jog run acceleration time | 0–600 (sec) | 20.0 | O | O | O | O | O | O |
| 13 | 0h110D | Jog Dec Time | Jog run deceleration time | 0–600 (sec) | 30.0 | O | O | O | O | X | X |
| 14 | 0h110E | Motor Capacity | Motor capacity | 0:0.2kW, 1:0.4kW 2:0.75kW, 3:1.5kW 4:2.2kW, 5:3.7kW 6:5.5kW, 7:7.5kW 8:11kW, 9:15kW 10:18.5kW, 11:22kW 12:30kW, 13:37kW 14:45kW, 15:55kW 16:75kW, 17:90kW 18:110kW, 9:132kW 20:160kW, 1:185kW 22:220kW,23:280kW 24:315kW,25:375kW 26:450kW | Dependent on inverter capacity | X | O | O | O | O | O |
| 15 | 0h110F | Torque Boost | Torque boost method | 0 Manual 1 Auto 2 Advanced Auto | 0:Manual | X | O | X | X | X | X |
| 16 Note 2) | 0h1110 | Fwd Boost | Forward torque boost | 0–15 (%) | Below 75kW 2.0 Above 90kW 1.0 | X | O | X | X | X | X |
| 17 | 0h1111 | Rev Boost | Reverse torque boost | 0–15(%) | Below 75kW 2.0 Above 90kW 1.0 | X | O | X | X | X | X |
| 18 | 0h1112 | Base Freq | Base frequency | 30–400 (Hz) | 60.00 | X | O | O | O | O | O |
| 19 | 0h1113 | Start Freq | Starting frequency | 0.01–10 (Hz) | 0.50 | X | O | X | X | X | X |
| 20 | 0h1114 | Max Freq | Maximum frequency | 40–400 | 60.00 | X | O | O | O | O | O |
| 21 | 0h1115 | Hz/Rpm Sel | Speed unit selection | 0 Hz Display 1 Rpm Display | 0:Hz | O | O | O | O | O | O |
| 25 | 0h1119 | Output Freq | Output speed monitoring | 0-Max Frequency | 0.00 | O | O | O | O | O | O |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 2) DRV-16–17 displayed only when DRV-15 (Torque Boost) is set as “Manual” or “Advanced Auto”.

DRV Group (PAR → DRV)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----------------------------|-------------------------------|-------------------|----------------|---------------|---------------|----------------------------|-----------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 26 <small>Note2)</small> | 0h111A | Adv ATB Filter | Adv ATB Filter | 1~1000[msec] | 100 | 0 | X | X | X | O | O |
| 27 | 0h111B | Adv ATB M Gain | Adv ATB M Gain | 0~300.0[%] | 50.0 | 0 | O | O | O | O | O |
| 28 | 0h111C | Adv ATB G Gain | Adv ATB G Gain | 0~300.0[%] | 50.0 | 0 | O | O | O | O | O |
| 30 | 0h111E | kW/HP Select | kW/HP Select | 0 kW 1 HP | 0: kW | 0 | O | O | O | X | X |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 3)) DRV-26~28 code is displayed only when DRV-15 (Torque Boost) code value is "Advanced Auto

8.2 Parameter Mode – Basic Function Group (→BAS)

BAS Group(PAR → BAS)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | | |
|-----------------------------|-------------------------------|------------------|--|------------------|---------------------|----------------------------|--------------|--------|--------|-------------|-------------|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 00 | - | Jump Code | Jump code | 0-99 | 20 | O | O | O | O | O | O | |
| 01 | 0h1201 | Aux Ref Src | Auxiliary reference source | 0 | None | 0:None | X | O | O | O | X | X |
| | | | | 1 | V1 | | | | | | | |
| | | | | 2 | I1 | | | | | | | |
| | | | | 3 | V2 | | | | | | | |
| | | | | 4 | I2 | | | | | | | |
| | | | | 5 | Pulse | | | | | | | |
| 02 <small>Note3)</small> | 0h1202 | Aux Calc Type | Auxiliary command calculation type | 0 | $M+(G^*A)$ | 0: $M+(G^*A)$ | X | O | O | O | X | X |
| | | | | 1 | $M^*(G^*A)$ | | | | | | | |
| | | | | 2 | $M/(G^*A)$ | | | | | | | |
| | | | | 3 | $M+(M^*(G^*A))$ | | | | | | | |
| | | | | 4 | $M+G^*2(A-50\%)$ | | | | | | | |
| | | | | 5 | $M^*(G^*2(A-50\%))$ | | | | | | | |
| | | | | 6 | $M/(G^*2(A-50\%))$ | | | | | | | |
| | | | | 7 | $M+M^*G^*2(A-50\%)$ | | | | | | | |
| 03 | 0h1203 | Aux Ref Gain | Auxiliary command gain | -200.0–200.0 (%) | 100.0 | O | O | O | O | X | X | |
| 04 | 0h1204 | Cmd 2nd Src | Second command source | 0 | Keypad | 1: Fx/Rx-1 | X | O | O | O | O | O |
| | | | | 1 | Fx/Rx-1 | | | | | | | |
| | | | | 2 | Fx/Rx-2 | | | | | | | |
| | | | | 3 | Int 485 | | | | | | | |
| | | | | 4 | FieldBus | | | | | | | |
| | | | | 5 | PLC | | | | | | | |
| 05 | 0h1205 | Freq 2nd Src | Second frequency source | 0 Keypad-1 | 0:Keypad-1 | O | O | O | O | X | X | |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 3) BAS-02 code is displayed only when BAS-01 (Aux Ref Src) code has a value other than “None”.

BAS Group (PAR → BAS)


| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|--------------|-------------------------------|------------------|---------------------------------|----------------|-----------------------------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 06 | 0h1206 | Trq 2nd Src | Second torque command source | 1 Keypad-2 | 0:Keypad-1 | O | X | X | X | O | O |
| | | | | 2 V1 | | | | | | | |
| | | | | 3 I1 | | | | | | | |
| | | | | 4 V2 | | | | | | | |
| | | | | 5 I2 | | | | | | | |
| | | | | 6 Int 485 | | | | | | | |
| | | | | 7 Encoder | | | | | | | |
| | | | | 8 FieldBus | | | | | | | |
| | | | | 9 PLC | | | | | | | |
| | | | | 10 Synchro | | | | | | | |
| | | | | 11 Binary Type | | | | | | | |
| | | | | 12 Keypad-2 | | | | | | | |
| 07 | 0h1207 | V/F Pattern | V/F pattern options | 0 Linear | 0:Linear | X | O | O | X | X | X |
| | | | | 1 Square | | | | | | | |
| | | | | 2 User V/F | | | | | | | |
| | | | | 3 Square2 | | | | | | | |
| 08 | 0h1208 | Ramp T Mode | Acc/Dec standard frequency | 0 Max Freq | 0:Max Freq | X | O | O | O | X | X |
| | | | 1 Delta Freq | | | | | | | | |
| 09 | 0h1209 | Time Scale | Time scale settings | 0 0.01 sec | 1:0.1 sec | X | O | O | O | X | X |
| | | | | 1 0.1 sec | | | | | | | |
| | | | | 2 1 sec | | | | | | | |
| 10 | 0h120A | 60/50 Hz Sel | Input power frequency | 0 60 Hz | 0:60 Hz | X | O | O | O | O | O |
| | | | | 1 50 Hz | | | | | | | |
| 11 | 0h120B | Pole Number | Number of motor poles | 248 | Dependent on inverter capacity | X | O | O | O | O | O |
| 12 | 0h120C | Rated Slip | Rated slip speed | 0-3000 (rpm) | | | | | | | |
| 13 | 0h120D | Rated Curr | Motor rated current | 1-1000 (A) | | | | | | | |
| 14 | 0h120E | Noload Curr | Motor no-load current | 0.5-1000 (A) | | | | | | | |
| 15 | 0h120F | Rated Volt | Motor rated voltage | 180-480 (V) | 0 | X | O | O | O | O | O |
| 16 | 0h1210 | Efficiency | Motor efficiency | 70-100 (%) | Dependent on inverter capacity | X | O | O | O | O | O |
| 17 | 0h1211 | Inertia Rate | Load inertia rate | 0-8 | Dependent on inverter capacity | X | O | O | O | O | O |
| 18 | 0h1212 | Trim Power % | Power display adjustment | 70-130 (%) | | O | O | O | O | O | O |
| 19 | 0h1213 | AC Input Volt | Input power voltage | 170-230 (V) | 220 V | O | O | O | O | O | O |
| | | | | 380-480 (V) | 220 44x0 V | | | | | | |
| 20 | - | Auto Tuning | Auto tuning | 0 None | 0:None | X | X | O | O | O | O |
| | | | | 1 All | | | | | | | |
| | | | | 2 ALL(Stdstl) | | | | | | | |
| | | | | 3 Rs+Lsigma | | | | | | | |
| | | | | 4 Enc Test | | | | | | | |
| | | | | 5 Tr | | | | | | | |
| 6 Tr(Stdstl) | | | | | | | | | | | |

BAS Group (PAR → BAS)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----------------------------|-------------------------------|----------------|--------------------------------|--|------------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 21 | - | Rs | Stator resistance | Dependent on motor setting | - | X | X | O | O | O | O |
| 22 | - | Lsigma | Leakage inductance | Dependent on motor setting | - | X | X | O | O | O | O |
| 23 | - | Ls | Stator inductance | Dependent on motor setting | - | X | X | O | O | O | O |
| 24 <small>Note4)</small> | - | Tr | Rotor time constant | 25-5000 (ms) | - | X | X | O | O | O | O |
| 41 <small>Note5)</small> | 0h1229 | User Freq 1 | User frequency 1 | 0-maximum frequency (Hz) | 15.00 | X | O | X | X | X | X |
| 42 | 0h122A | User Volt 1 | User voltage 1 | 0-100 (%) | 25 | X | O | X | X | X | X |
| 43 | 0h122B | User Freq 2 | User frequency 2 | 0-maximum frequency (Hz) | 30.00 | X | O | X | X | X | X |
| 44 | 0h122C | User Volt 2 | User voltage 2 | 0-100 (%) | 50 | X | O | X | X | X | X |
| 45 | 0h122D | User Freq 3 | User frequency 3 | 0-maximum frequency (Hz) | 45.00 | X | O | X | X | X | X |
| 46 | 0h122E | User Volt 3 | User voltage 3 | 0-100 (%) | 75 | X | O | X | X | X | X |
| 47 | 0h122F | User Freq 4 | User frequency 4 | 0-maximum frequency (Hz) | 60.00 | X | O | X | X | X | X |
| 48 | 0h1230 | User Volt 4 | User voltage 4 | 0-100 (%) | 100 | X | O | X | X | X | X |
| 50 <small>Note6)</small> | 0h1232 | Step Freq-1 | Multi-step speed frequency 1 | Starting frequency -maximum frequency(Hz) | 10.00 | O | O | O | O | X | X |
| 51 | 0h1233 | Step Freq-2 | Multi-step speed frequency 2 | | 20.00 | O | O | O | O | X | X |
| 52 | 0h1234 | Step Freq-3 | Multi-step speed frequency 3 | | 30.00 | O | O | O | O | X | X |
| 53 | 0h1235 | Step Freq-4 | Multi-step speed frequency 4 | | 40.00 | O | O | O | O | X | X |
| 54 | 0h1236 | Step Freq-5 | Multi-step speed frequency 5 | | 50.00 | O | O | O | O | X | X |
| 55 | 0h1237 | Step Freq-6 | Multi-step speed frequency 6 | | 60.00 | O | O | O | O | X | X |
| 56 | 0h1238 | Step Freq-7 | Multi-step speed frequency 7 | | 60.00 | O | O | O | O | X | X |
| 57 | 0h1239 | Step Freq-8 | Multi-step speed frequency 8 | | 55.00 | O | O | O | O | X | X |
| 58 | 0h123A | Step Freq-9 | Multi-step speed frequency 9 | | 50.00 | O | O | O | O | X | X |
| 59 | 0h123B | Step Freq-10 | Multi-step speed frequency 10 | | 45.00 | O | O | O | O | X | X |
| 60 | 0h123C | Step Freq-11 | Multi-step speed frequency 11 | | 40.00 | O | O | O | O | X | X |
| 61 | 0h123D | Step Freq-12 | Multi-step speed frequency 12 | | 35.00 | O | O | O | O | X | X |
| 62 | 0h123E | Step Freq-13 | Multi-step speed frequency 13 | | 25.00 | O | O | O | O | X | X |
| 63 | 0h123F | Step Freq-14 | Multi-step speed frequency 14 | | 15.00 | O | O | O | O | X | X |
| 64 | 0h1240 | Step Freq-15 | Multi-step speed frequency 15 | | 5.00 | O | O | O | O | X | X |
| 70 | 0h1246 | Acc Time-1 | Multi-step acceleration time 1 | 0-600 (sec) | 20.0 | O | O | O | O | X | X |
| 71 | 0h1247 | Dec Time-1 | Multi-step deceleration time 1 | 0-600 (sec) | 20.0 | O | O | O | O | X | X |

Table of Functions

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----------------------------|-------------------------------|----------------|--------------------------------|---------------|------------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 72 <small>Note7)</small> | 0h1248 | Acc Time-2 | Multi-step acceleration time 2 | 0-600 (sec) | 30.0 | O | O | O | O | X | X |
| 73 | 0h1249 | Dec Time-2 | Multi-step deceleration time 2 | 0-600 (sec) | 30.0 | O | O | O | O | X | X |
| 74 | 0h124A | Acc Time-3 | Multi-step acceleration time 3 | 0-600 (sec) | 40.0 | O | O | O | O | X | X |
| 75 | 0h124B | Dec Time-3 | Multi-step deceleration time 3 | 0-600 (sec) | 40.0 | O | O | O | O | X | X |
| 76 | 0h124C | Acc Time-4 | Multi-step deceleration time 4 | 0-600 (sec) | 50.0 | O | O | O | O | X | X |
| 77 | 0h124D | Dec Time-4 | Multi-step deceleration time 4 | 0-600 (sec) | 50.0 | O | O | O | O | X | X |
| 78 | 0h124E | Acc Time-5 | Multi-step deceleration time 5 | 0-600 (sec) | 60.0 | O | O | O | O | X | X |
| 79 | 0h124F | Dec Time-5 | Multi-step deceleration time 5 | 0-600 (sec) | 60.0 | O | O | O | O | X | X |
| 80 | 0h1250 | Acc Time-6 | Multi-step deceleration time 6 | 0-600 (sec) | 70.0 | O | O | O | O | X | X |
| 81 | 0h1251 | Dec Time-6 | Multi-step deceleration time 6 | 0-600 (sec) | 70.0 | O | O | O | O | X | X |
| 82 | 0h1252 | Acc Time-7 | Multi-step deceleration time 7 | 0-600 (sec) | 80.0 | O | O | O | O | X | X |
| 83 | 0h1253 | Dec Time-7 | Multi-step deceleration time 7 | 0-600 (sec) | 80.0 | O | O | O | O | X | X |

*  The grey cells indicate a hidden code which is only visible when setting a code.

*  The grey cells indicate a hidden code which is only visible when setting a code.

Note 4) BAS-24 is shown only when DRV-09 Control Mode is set to "Sensorless-2" or "Vector".

Note 5) BAS-41-48 is displayed only when it is set as "User V/F" even if there is only one BAS-07 or M2-V/F Patt (M2-25).

Note 6) IN-50-64 is displayed only when it is set as "multi-step speed" (Speed -L.M.H,X) even if there is only one among multi-function input IN-65-72.

Note 7) displayed only when it is set as "multi-step Acc/Dec" (Xcel-L,M,H) even if there is only one among multi-function input IN-72-75.

8.3 Parameter Mode – Expansion Function Group (PAR→ADV)

Expansion Function Group (PAR → ADV)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|-----------------------------|-----------------------|----------------|--|---|---------------|--------------------|--------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 00 | - | Jump Code | Jump code | 0-99 | 24 | O | O | O | O | O | O |
| 01 | 0h1301 | Acc Pattern | Acceleration pattern | 0 Linear | 0:Linear | X | O | O | O | X | X |
| 02 | 0h1302 | Dec Pattern | Deceleration pattern | 1 S-curve | | X | O | O | O | X | X |
| 03 | 0h1303 | Acc S Start | S-curve acceleration start point gradient | 1-100 (%) | 40 | X | O | O | O | X | X |
| 04 | 0h1304 | Acc S End | S-curve acceleration end point gradient | 1-100 (%) | 40 | X | O | O | O | X | X |
| 05 | 0h1305 | Dec S Start | S-curve deceleration start point gradient | 1-100 (%) | 40 | X | O | O | O | X | X |
| 06 | 0h1306 | Dec S End | S-curve deceleration end point gradient | 1-100 (%) | 40 | X | O | O | O | X | X |
| 07 | 0h1307 | Start Mode | Start mode | 0 Acc | 0:Acc | X | O | O | O | X | X |
| | | | | 1 Dc-Start | | | | | | | |
| 08 | 0h1308 | Stop Mode | Stop mode | 0 Dec | 0:Dec | X | O | O | O | X | X |
| | | | | 1 Dc-Brake | | | | | | | |
| | | | | 2 Free-Run | | | | | | | |
| | | | | 3 -Reserved- | | | | | | | |
| | | | | 4 Power Braking | | | | | | | |
| 09 | 0h1309 | Run Prevent | Selection of prohibited rotation direction | 0 None | 0:None | X | O | O | O | X | X |
| | | | | 1 Forward Prev | | | | | | | |
| | | | | 2 Reverse Prev | | | | | | | |
| 10 | 0h130A | Power-on Run | Start with power on | 0 No | 0:No | O | O | O | O | X | X |
| | | | | 1 Yes | | | | | | | |
| 12 <small>Note8)</small> | 0h130C | Dc-Start Time | Starting DC braking time | 0-60 (sec) | 0.00 | X | O | O | O | X | X |
| 13 | 0h130D | Dc Inj Level | DC supply | 0-200 (%) | 50 | X | O | O | O | X | X |
| 14 <small>Note9)</small> | 0h130E | Dc-Block Time | Output blocking time before DC braking | 0-60 (sec) | 0.10 | X | O | O | O | X | X |
| 15 | 0h130F | Dc-Brake Time | DC braking time | 0-60 (sec) | 1.00 | X | O | O | O | X | X |
| 16 | 0h1310 | Dc-Brake Level | DC braking rate | 0-200 (%) | 50 | X | O | O | O | X | X |
| 17 | 0h1311 | Dc-Brake Freq | DC braking frequency | Starting frequency-60 (Hz) | 5.00 | X | O | O | O | X | X |
| 20 | 0h1314 | Acc Dwell Freq | Acceleration dwell frequency | Starting frequency -maximum frequency (Hz) | 5.00 | X | O | O | O | X | X |
| 21 | 0h1315 | Acc Dwell Time | Acceleration dwell operation time | 0-60.0 (sec) | 0.00 | X | O | O | O | X | X |
| 22 | 0h1316 | Dec Dwell Freq | Deceleration dwell frequency | Starting frequency -maximum frequency (Hz) | 5.00 | X | O | O | O | X | X |
| 23 | 0h1317 | Dec Dwell Time | Deceleration dwell operation time | 0-60.0 (sec) | 0.00 | X | O | O | O | X | X |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 8) ADV-12 is displayed only when ADV-07 "Stop Mode" is set as "DC-Start".

Note 9) ADV-14-17 is displayed only when ADV-08 "Stop Mode" is set as "DC-Brake".

Expansion Function Group (PAR → ADV)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|---------------|-----------------------|----------------|-----------------------------------|---|---------------|--------------------|--------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 24 | 0h1318 | Freq Limit | Frequency limit | 0 No 1 Yes | 0:No | X | O | O | O | X | X |
| 25 Note10) | 0h1319 | Freq Limit Lo | Frequency lower limit | 0–upper limit (Hz) | 0.50 | O | O | O | O | X | X |
| 26 | 0h131A | Freq Limit Hi | Frequency upper limit | 0.5–maximum frequency (Hz) | 60.00 | X | O | O | O | X | X |
| 27 | 0h131B | Jump Freq | Frequency jump | 0 No 1 Yes | 0:No | X | O | O | O | X | X |
| 28 Note11) | 0h131C | Jump Lo 1 | Jump frequency lower limit 1 | 0–jump frequency upper limit 1 (Hz) | 10.00 | O | O | O | O | X | X |
| 29 | 0h131D | Jump Hi 1 | Jump frequency upper limit 1 | Jump frequency lower limit 1–maximum frequency (Hz) | 15.00 | O | O | O | O | X | X |
| 30 | 0h131E | Jump Lo 2 | Jump frequency lower limit 2 | 0–jump frequency upper limit 2 (Hz) | 20.00 | O | O | O | O | X | X |
| 31 | 0h131F | Jump Hi 2 | Jump frequency upper limit 2 | Jump frequency lower limit 2–maximum frequency (Hz) | 25.00 | O | O | O | O | X | X |
| 32 | 0h1320 | Jump Lo 3 | Jump frequency lower limit 3 | 0–jump frequency upper limit 3 (Hz) | 30.00 | O | O | O | O | X | X |
| 33 | 0h1321 | Jump Hi 3 | Jump frequency upper limit 3 | Jump frequency lower limit 3–maximum frequency (Hz) | 35.00 | O | O | O | O | X | X |
| 34 Note10) | 0h1322 | Jog Freq Limit | Jog frequency limit | 0 No 1 Yes | 1:Yes | O | O | O | O | X | X |
| 41 Note12) | 0h1329 | BR Rls Curr | Brake release current | 0–180.0 (%) | 50.0 | O | O | O | O | X | X |
| 42 | 0h132A | BR Rls Dly | Brake release delay time | 0–10.00 (sec) | 1.00 | X | O | O | O | X | X |
| 44 | 0h132C | BR Rls Fwd Fr | Brake release forward frequency | 0–400 (Hz) | 1.00 | X | O | O | O | X | X |
| 45 | 0h132D | BR Rls Rev Fr | Brake release reverse frequency | 0–400 (Hz) | 1.00 | X | O | O | O | X | X |
| 46 | 0h132E | BR Eng Dly | Brake engage delay time | 0–10 (sec) | 1.00 | X | O | O | O | X | X |
| 47 | 0h132F | BR Eng Fr | Brake engage frequency | 0–400 (Hz) | 2.00 | X | O | O | O | X | X |
| 50 | 0h1332 | E-Save Mode | Energy saving operation | 0 None 1 Manual 2 Auto | 0:None | X | O | O | X | X | X |
| 51 Note13) | 0h1333 | Energy Save | Energy saving amount | 0–30 (%) | 0 | O | O | O | O | X | X |
| 60 | 0h133C | Xcel Change Fr | Acc/dec time transition frequency | 0–maximum frequency (Hz) | 0.00 | X | O | O | O | X | X |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 10) ADV-25–26, 34 is displayed only when ADV-24 (Freq Limit) is set as “Freq Limit”.

Note 11) ADV-28–33 is displayed only when ADV-27 (Jump Freq) is set as “Yes”.

Note 12) ADV-41–47 is displayed only when a code of OUT-31–33 is set as “BR Control”.

Note 13) ADV-51 is displayed only when ADV-50 (E-Save Mode) is set as a value other than “None”.

Expansion Function Group (PAR → ADV)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | | |
|---------------|-----------------------|-----------------|--|---|---------------|--------------------|--------------|-----|-------|-------|-------|---|
| | | | | | | | V / F | S L | V L C | S L T | V C T | |
| 61 | - | Load Spd Gain | Revolution display gain | 0.1-6000.0 (%) | 100.0 | O | O | O | O | X | X | |
| 62 | - | Load Spd Scale | Revolution display scale | 0 | x 1 | 0:x 1 | O | O | O | O | X | X |
| | | | | 1 | x 0.1 | | | | | | | |
| | | | | 2 | x 0.01 | | | | | | | |
| | | | | 3 | x 0.001 | | | | | | | |
| | | | | 4 | x 0.0001 | | | | | | | |
| 63 | 0h133F | Load Spd Unit | Revolution display unit | 0 | Rpm | 0:rpm | O | O | O | O | O | O |
| | | | | 1 | Mpm | | | | | | | |
| 64 | 0h1340 | FAN Control | Cooling fan control | 0 | During Run | 0:During Run | O | O | O | O | X | X |
| | | | | 1 | Always ON | | | | | | | |
| | | | | 2 | Temp Control | | | | | | | |
| 65 | 0h1341 | U/D Save Mode | Up/down operation frequency save | 0 | No | 0:No | O | O | O | O | X | X |
| | | | | 1 | Yes | | | | | | | |
| 66 | 0h1342 | On/Off Ctrl Src | Output contact On/Off control options | 0 | None | 0:None | X | O | O | O | O | O |
| | | | | 1 | V1 | | | | | | | |
| | | | | 2 | I1 | | | | | | | |
| | | | | 3 | V2 | | | | | | | |
| | | | | 4 | I2 | | | | | | | |
| 67 | 0h1343 | On-C Level | Output contact point On level | 10–100 (%) | 90.00 | X | O | O | O | O | O | |
| 68 | 0h1344 | Off-C Level | Output contact point Off level | -100.00–output contact point On level (%) | 10.00 | X | O | O | O | O | O | |
| 70 | 0h1346 | Run En Mode | Safe operation selection | 0 | Always Enable | 0:Always Enable | X | O | O | O | O | O |
| | | | | 1 | DI Dependent | | | | | | | |
| 71 Note14) | 0h1347 | Run Dis Stop | Safe operation stop method | 0 | Free-Run | 0:Free-Run | X | O | O | O | O | O |
| | | | | 1 | Q-Stop | | | | | | | |
| | | | | 2 | Q-Stop Resume | | | | | | | |
| 72 | 0h1348 | Q-Stop Time | Safe operation deceleration time | 0–600.0 (sec) | 5.0 | O | O | O | O | O | O | |
| 73 | 0h1349 | RegenAvd Mode | Regeneration evasion mode | Bit | 001-111 | 001 | X | O | O | O | O | O |
| | | | | 0 | Steady | | | | | | | |
| | | | | 1 | Accelerating | | | | | | | |
| | | | | 2 | Decelerating | | | | | | | |
| 74 | 0h134A | RegenAvd Sel | Selection of regeneration evasion function for press | 0 | No | No | X | O | O | O | O | O |
| | | | | 1 | Yes | | | | | | | |
| 75 | 0h134B | RegenAvd Level | Operational voltage level of regeneration evasion motion for press | 200 V: 300–400 | 350 V | X | O | O | O | X | X | |
| | | | | 400 V: 600–800 | 700 V | | | | | | | |
| 76 Note15) | 0h134C | CompFreq Limit | Compensation frequency limit of regeneration for evasion for press | 0–10.00 Hz | 1.00 (Hz) | X | O | O | O | X | X | |
| 77 | 0h134D | RegenAvd Pgain | Regeneration evasion for press P gain | 0–100.0 % | 50.0 (%) | O | O | O | O | X | X | |

Table of Functions

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | | |
|------------------------------|-----------------------|-----------------|---|---|--------------------|--------------------|--------------|-----|-----|-------|-------|--|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 78 | 0h134E | RegenAvd l gain | Regeneration evasion for press l gain | 20–30000 (ms) | 500 (ms) | O | O | O | O | X | X | |
| 79 | 0h134F | DB Turn On Lev | DB unit operating voltage | 200 V : 350–400 (V) 400 V : 600–800 (V) | 390 (V) 780 (V) | X | O | O | O | O | O | |
| 80 | 0h1350 | Fire Mode Sel | Select fire mode | 0 None 1 Fire Mode 2 Fire Test | 0:None | X | O | O | O | X | X | |
| 81 <small>Note16)</small> | 0h1351 | Fire Mode Freq | Fire mode frequency | 0-maximum frequency (Hz) | 60.00 | X | O | O | O | X | X | |
| 82 | 0h1352 | Fireq Mode Dir | Fire mode operating direction | 0 Forward 1 Reverse | 0:Forward | X | O | O | O | X | X | |
| 83 | - | Fire Mode Cnt | Fire mode counter | 0-99 | 0 | X | O | O | O | X | X | |
| 85 | 0h1355 | U/D Mode Sel | U/D Mode | 0 U/D Normal 1 U/D Step 2 U/D Step+Norm | 0:U/D Normal | X | O | O | O | X | X | |
| 86 <small>Note17)</small> | 0h1356 | U/D Step Freq | U/D step frequency | 0-maximum frequency [Hz] | 0.00 | O | O | O | O | X | X | |
| 87 | 0h1357 | OVM Mode Sel | Over Modulation Mode | 0 None 1 Yes | 0:None | O | O | X | O | O | O | |
| 91 | 0h135B | Auxiliary OPT | AUX Power Option | 0 None 1 Yes | 0:None | O | O | O | O | O | O | |
| 92 <small>Note18)</small> | 0h135C | SlipGain Mot-H | slip compensation offsetting gain H | 0~200[%] | 50 | O | O | X | X | X | X | |
| 93 | 0h135D | SlipGain Gen-H | slip compensation regenerative gain H | 0~200[%] | 50 | O | O | X | X | X | X | |
| 94 | 0h135E | SlipGain Mot-L | slip compensation offsetting gain L | 0~200[%] | 50 | O | O | X | X | X | X | |
| 95 | 0h135F | SlipGain Gen-L | slip compensation regenerative gain L | 0~200[%] | 50 | O | O | X | X | X | X | |
| 96 | 0h1360 | Slip Filter | slip compensation filter | 0~10000[msec] | 300 | O | O | X | X | X | X | |
| 97 | 0h1361 | Slip Comp Freq | slip compensation frequency | 0~60.00[Hz] | 5.00 | O | O | X | X | X | X | |
| 98 | 0h1362 | Slip Gain Freq | slip compensation gain switchover frequency | 0~20.00[Hz] | 9.00 | O | O | X | X | X | X | |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 14) ADV-71–72 is displayed only when ADV-70 (Run En Mode) is set as “DI Dependent”.

ADV-73 is displayed only when ADV-74 (RegenAvd Sel) is set as “Yes”.

Note15) ADV-76–78 is displayed only when ADV-75 (RegenAvd Sel) is set as “Yes”.

Note16) ADV-81–83 displayed only when ADV-80 (Fire Mode Sel) is set as “Fire Mode” or “Fire Test”.

Note17) ADV-86 is displayed when ADV-85 (U/D Mode Sel) is not set to “U/D Normal”.

Note18) ADV-92–98 is displayed only when DRV-09 (Control Mode) is set as “Slip Compen”

8.4 Parameter Mode – Control Function Group (→CON)

Control Function Group (PAR → CON)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|------------------------------|-------------------------------|----------------|--|-----------------------------------|-----------------------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 00 | - | Jump Code | Jump code | 0-99 | 51 | O | O | O | O | O | O |
| 04 | 0h1404 | Carrier Freq | Carrier frequency | Below 22 kW | 0.7-15 (kHz) | 5.0 | O | O | O | O | O |
| | | | | 30-45 kW | 0.7-10 (kHz) | 5.0 | | | | | |
| | | | | 55-75 kW | 0.7-7 (kHz) | 5.0 | | | | | |
| | | | | 90-110 kW | 0.7-6 (kHz) | 3.0 | | | | | |
| | | | | 132-160 kW | 0.7-5 (kHz) | 3.0 | | | | | |
| | | | | 185-220 kW | 0.7-3 (kHz) | 2.0 | | | | | |
| | | | | 280-375 kW | 0.7-2 (kHz) | 2.0 | | | | | |
| 05 | 0h1405 | PWM Mode | Switching mode | 0 Normal PWM 1 Low leakage PWM | 0:Normal PWM | X | O | O | O | O | O |
| 09 | 0h1409 | PreExTime | Initial excitation time | 0-60 (sec) | 1.00 | X | X | X | O | O | O |
| 10 | 0h140A | Flux Force | Initial excitation power supply | 100-500 (%) | 100.0 | X | X | X | O | O | O |
| 11 | 0h140B | Hold Time | Continued operation duration | 0-60 (sec) | Dependent on control mode | X | X | X | O | X | X |
| 12 | 0h140C | ASR P Gain 1 | Speed controller proportional gain 1 | 10-500 (%) | 50.0 | O | X | X | O | X | X |
| 13 | 0h140D | ASR I Gain 1 | Speed controller integral gain 1 | 10-9999 (msec) | 300 | O | X | X | O | X | X |
| 15 | 0h140F | ASR P Gain 2 | Speed controller proportional gain 2 | 10-500 (%) | 50.0 | O | X | X | O | X | X |
| 16 | 0h1410 | ASR I Gain 2 | Speed controller integral gain 2 | 10-9999 (ms) | 300 | O | X | X | O | X | X |
| 18 | 0h1412 | Gain SW Freq | Gain exchange frequency | 0-120 (Hz) | 0.00 | X | X | X | O | X | X |
| 19 | 0h1413 | Gain Sw Delay | Gain exchange time | 0-100 (sec) | 0.10 | X | X | X | O | X | X |
| 20 | 0h1414 | SL2 G View Sel | Sensorless 2nd gain display setting | 0 No | 0:No | O | X | X | X | X | X |
| | | | | 1 Yes | | | | | | | |
| 21 | 0h1415 | ASR-SL P Gain1 | Sensorless speed controller proportional gain1 | 0-5000 (%) | Dependent on motor capacity | O | X | O | X | X | X |
| 22 | 0h1416 | ASR-SL I Gain1 | Sensorless speed controller integral gain 1 | 10-9999 (ms) | Dependent on motor capacity | O | X | O | X | X | X |
| 23 <small>Note17)</small> | 0h1417 | ASR-SL P Gain2 | Senseless speed controller proportional gain 2 | 1.0-1000.0 (%) | Dependent on motor capacity | O | X | X | X | X | X |
| 24 | 0h1418 | ASR-SL I | Sensorless2 | 1.0-1000.0 (%) | Dependent | O | X | X | X | X | X |

Table of Functions

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|-----|-----------------------|----------------|---|---------------|-----------------------------|--------------------|--------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| | | Gain2 | speed controller integral gain 2 | | on motor capacity | | | | | | |
| 26 | 0h141A | Observer Gain1 | Sensorless2 measurer gain 1 | 0-30000 | 10500 | O | X | X | X | X | X |
| 27 | 0h141B | Observer Gain2 | Sensorless2 measurer gain 2 | 1-1000 (%) | 100.0 | O | X | X | X | X | X |
| 28 | 0h141C | Observer Gain3 | Sensorless2 measurer gain 3 | 0-30000 | 13000 | O | X | X | X | X | X |
| 29 | 0h141D | S-Est P Gain1 | Sensorless2 speed estimator proportional gain 1 | 0-30000 | Dependent on motor capacity | O | X | X | X | X | X |
| 30 | 0h141E | S-Est I Gain1 | Sensorless2 speed estimator integral gain 1 | 0-30000 | Dependent on motor capacity | O | X | X | X | X | X |

*  The grey cells indicate a hidden code which is only visible when setting a code.

Note 17) CON-23-28, 31-32 are displayed only when DRV-09 (Control Mode) is "Sensorless2" and CON-20 (SL2 G View Sel) is set as "Yes".

Control Function Group (PAR → CON)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | | |
|------------------------------|-----------------------|----------------|---|----------------|-----------------------------|--------------------|--------------|-----|-----|-------|-------|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 31 | 0h141F | S-Est P Gain2 | Sensorless2 speed estimator proportional gain 2 | 1.0–1000.0 (%) | Dependent on motor capacity | 0 | X | X | X | X | X | |
| 32 | 0h1420 | S-Est I Gain2 | Sensorless2 speed estimator integral gain 2 | 1.0–1000.0 (%) | Dependent on motor capacity | 0 | X | X | X | X | X | |
| 34 | 0h1422 | SL2 OVM Perc | Sensorless2 overvoltage modulation range adjustment | 100–180 (%) | 120 | X | X | 0 | X | X | X | |
| 35 | 0h1423 | SL2 L-ExcitLmt | Magnetic flux current minimum ratio | 3~100[%] | 10 | 0 | X | X | X | 0 | X | |
| 45 <small>Note18)</small> | 0h142D | PG P Gain | PG operation proportional gain | 0–9999 | 3000 | 0 | 0 | X | X | X | X | |
| 46 | 0h142E | PG I Gain | PG operation integral gain | 0–9999 | 50 | 0 | 0 | X | X | X | X | |
| 47 | 0h142F | PG Slip Max% | PG operation maximum slip | 0–200 | 100 | X | 0 | X | X | X | X | |
| 48 | - | ACR P Gain | Current controller P gain | 0–10000 | 1200 | 0 | X | 0 | 0 | 0 | 0 | |
| 49 | - | ACR I Gain | Current controller I gain | 0–10000 | 120 | 0 | X | 0 | 0 | 0 | 0 | |
| 51 | 0h1433 | ASR Ref LPF | Speed controller reference filter | 0–20000 (ms) | 0 | X | X | 0 | 0 | X | X | |
| 52 | 0h1434 | Torque Out LPF | Torque controller output filter | 0–2000 (ms) | 0 | X | X | X | X | 0 | 0 | |
| 53 | 0h1435 | Torque Lmt Src | Torque limit setting options | 0 | Keypad-1 | 0:Keypad-1 | X | X | X | X | 0 | 0 |
| | | | | 1 | Keypad-2 | | | | | | | |
| | | | | 2 | V1 | | | | | | | |
| | | | | 3 | I1 | | | | | | | |
| | | | | 4 | V2 | | | | | | | |
| | | | | 5 | I2 | | | | | | | |
| | | | | 6 | Int 485 | | | | | | | |
| | | | | 7 | Encoder | | | | | | | |
| | | | | 8 | FieldBus | | | | | | | |
| | | | | 9 | PLC | | | | | | | |
| | | | | 10 | Synchro | | | | | | | |
| 11 | Binary Type | | | | | | | | | | | |
| 54 <small>Note19)</small> | 0h1436 | FWD +Trq Lmt | Forward offsetting torque limit | 0–200 (%) | 180.0 | 0 | X | X | X | 0 | 0 | |
| 55 | 0h1437 | FWD –Trq Lmt | Forward offsetting torque limit | 0–200 (%) | 180.0 | 0 | X | X | X | 0 | 0 | |
| 56 | 0h1438 | REV +Trq Lmt | Reverse regenerative torque limit | 0–200 (%) | 180.0 | 0 | X | X | X | 0 | 0 | |
| 57 | 0h1439 | REV –Trq Lmt | Reverse regenerative torque limit | 0–200 (%) | 180.0 | 0 | X | X | X | 0 | 0 | |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 18) CON-45–47 are displayed when the Encoder module is installed and Control mode is set as “V/F PG”.

Note 19) CON-54–57 are displayed only when DRV-09 (Control Mode) is set as “Sensorless-1, 2” or “Vector”.

In addition, the initial value of the torque limit is changed to 150% when the ADV-74 RegenAvd Level function is set.

Control Function Group (PAR → CON)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | 1)Control Mode | | | | | |
|---------------|-------------------------------|-------------------|--|-----------------------------|---------------|-----------------------|-------------------|--------|--------|-------------|-------------|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 58 | 0h143A | Trq Bias Src | Torque bias setting options | 0 | Keypad-1 | 0:Keypad-1 | X | X | X | O | X | X |
| | | | | 1 | Keypad-2 | | | | | | | |
| | | | | 2 | V1 | | | | | | | |
| | | | | 3 | I1 | | | | | | | |
| | | | | 4 | V2 | | | | | | | |
| | | | | 5 | I2 | | | | | | | |
| | | | | 6 | Int 485 | | | | | | | |
| | | | | 7 | FieldBus | | | | | | | |
| 8 | PLC | | | | | | | | | | | |
| 59 | 0h143B | Torque Bias | Torque bias | -120~120 (%) | 0.0 | O | X | X | O | X | X | |
| 60 | 0h143C | Torque Bias FF | Torque bias compensation | 0~100 (%) | 0.0 | O | X | X | O | X | X | |
| 62 | 0h143E | Speed Lmt Src | Speed limit setting options | 0 | Keypad-1 | 0:Keypad-1 | O | X | X | X | X | O |
| | | | | 1 | Keypad-2 | | | | | | | |
| | | | | 2 | V1 | | | | | | | |
| | | | | 3 | I1 | | | | | | | |
| | | | | 4 | V2 | | | | | | | |
| | | | | 5 | I2 | | | | | | | |
| | | | | 6 | Int 485 | | | | | | | |
| | | | | 7 | FieldBus | | | | | | | |
| 8 | PLC | | | | | | | | | | | |
| 63 | 0h143F | FWD Speed Lmt | Forward speed limit | 0~maximum frequency (Hz) | 60.00 | O | X | X | X | X | O | |
| 64 | 0h1440 | REV Speed Lmt | Reverse speed limit | 0~maximum frequency (Hz) | 60.00 | O | X | X | X | X | O | |
| 65 | 0h1441 | Speed Lmt Gain | Speed limit operation gain | 100~5000 (%) | 500 | O | X | X | X | X | O | |
| 66 | 0h1442 | Droop Perc | Droop operation amount | 0~100 (%) | 0.0 | O | X | X | X | X | O | |
| 67 Note20) | 0h1443 | Droop St Trq | Droop start torque | 0~100 (%) | 100.0 | O | X | X | X | X | O | |
| 68 | 0h1444 | SPD/TRQAc c T | Torque mode →speed mode exchange acceleration time | 0~600 (sec) | 20.0 | O | X | X | X | X | O | |
| 69 | 0h1445 | SPD/TRQAc c T | Torque mode →speed mode exchange deceleration time | 0~600 (sec) | 30.0 | O | X | X | X | X | O | |

* The grey cells indicate a hidden code which is only visible when setting a code.


Note 20) CON-67 is displayed only when the Encoder option module is installed.

Control Function Group (PAR → CON)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | 1)Control Mode | | | | |
|---------------|-----------------------|----------------|--|--|--|--------------------|----------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 70 | 0h1446 | SS Mode | Speed search mode selection | 0 Flying Start - 1 1 Flying Start - 2 | 0 | X | O | O | O | X | X |
| 71 | 0h1447 | Speed Search | Speed search operation selection | Bit 0000-1111 | 0000 | X | O | O | O | X | X |
| | | | | 1 Speed search selection on acceleration | | | | | | | |
| | | | | 2 Restart after trips | | | | | | | |
| | | | | 3 Restart after instantaneous interruption | | | | | | | |
| | | | | 4 Start immediately after power On | | | | | | | |
| 72 Note21) | 0h1448 | SS Sup-Current | Speed search standard current | 80-200 (%) | Below 75 kW 150 Above 90 kW 100 | O | O | O | X | X | X |
| 73 | 0h1449 | SS P-Gain | Speed search proportional gain | 0-9999 | 100 | O | O | O | X | X | X |
| 74 | 0h144A | SS I-Gain | Speed search integral gain | 0-9999 | 200 | O | O | O | X | X | X |
| 75 | 0h144B | SS Block Time | Output block time before speed search | 0-60 (sec) | 1.0 | X | O | O | X | X | X |
| 77 | 0h144D | KEB Select | Energy buffering selection | 0 None | 0:None | X | O | O | O | X | X |
| | | | | 1 KEB-1 | | | | | | | |
| | | | | 2 KEB-2 | | | | | | | |
| 78 Note21) | 0h144E | KEB Start Lev | Energy buffering start level | 110-200 (%) | 130 | X | O | O | O | X | X |
| 79 | 0h144F | KEB Stop Lev | Energy buffering stop level | 130-210 (%) | 135 | X | O | O | O | X | X |
| 80 | 0h1450 | KEB Gain | Energy buffering gain | 1-2000 | 1000 | O | O | O | O | X | X |
| 82 Note22) | 0h1452 | ZSD Frequency | Permanent detection frequency | 0-10 (Hz) | 2.00 | O | X | X | O | X | O |
| 83 | 0h1453 | ZSD Band | Permanent detection frequency band | 0-2 (Hz) | 1.00 | O | X | X | O | X | O |
| 86 Note23) | 0h1456 | KEB P Gain | Energy buffering P gain | 0-20000 | 1500 | O | O | O | O | X | X |
| 87 | 0h1457 | KEB I Gain | Energy buffering I gain | 1-20000 | 500 | O | O | O | O | X | X |
| 88 | 0h1458 | KEB Slip Gain | Energy buffering slip gain | 0-2000.0 (%) | 30.0 | O | O | O | O | X | X |
| 89 | 0h1459 | KEB Acc Time | Energy buffering acceleration time | 0-600 (sec) | 10.0 | O | O | O | O | X | X |
| 90 | 0h145A | New AHR Sel | Select function for preventing current hunting | 0 No | 0:No | O | O | X | X | X | X |
| | | | | 1 Yes | | | | | | | |
| 91 | 0h145B | AHR P-Gain | Gain from current | 0-32767 | 1000 | X | O | X | X | X | X |

Table of Functions

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | 1)Control Mode | | | | |
|-----|-------------------------------|-------------|--------------------|---------------|---------------|----------------------------|----------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| | | | hunting prevention | | | | | | | | |

*  The grey cells indicate a hidden code which is only visible when setting a code.

Note 21) CON-72-75 are displayed only when CON-71,77 is set as a bit or other than "None".

Note 22) CON-82-83 are displayed only when DRV-09 (Control Mode) is set as "Vector".

Note 23) CON-78-79,86-89 are displayed only when CON-77 (KEB Select) is set as "KEB-1" or "KEB-2"

Note 24) CON-91 is displayed only when CON-90 (New AHR Sel) is set as "Yes".

8.5 Parameter Mode – Input Terminal Block Function Group (→IN)

Input Terminal Block Function Group (PAR → IN)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|------------------------------|-----------------------|----------------|-----------------------------------|--|---------------|--------------------|--------------|-------|-------|-------|-------|
| | | | | | | | V / F | S / L | V / C | S / L | V / C |
| 00 | - | Jump Code | Jump code | 0-99 | 65 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01 | 0h1501 | Freq at 100% | Frequency at maximum analog input | Start frequency-maximum frequency (Hz) | 60.00 | 0 | 0 | 0 | 0 | X | X |
| 02 | 0h1502 | Torque at 100% | Torque at maximum analog input | 0-200 (%) | 100.0 | 0 | X | X | 0 | 0 | 0 |
| 05 | 0h1505 | V1 Monitor(V) | V1 input voltage display | 0-10 (V) | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06 | 0h1506 | V1 Polarity | V1 input polarity selection | 0 Unipolar 1 Bipolar | 0: Unipolar | 0 | 0 | 0 | 0 | 0 | 0 |
| 07 | 0h1507 | V1 Filter | V1 input filter time constant | 0-10000 (ms) | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08 | 0h1508 | V1 Volt x1 | V1 minimum input voltage | 0-10 (V) | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 09 | 0h1509 | V1 Perc y1 | V1 minimum output voltage (%) | 0-100 (%) | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0h150A | V1 Volt x2 | V1 maximum input voltage | 0-10 (V) | 10.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0h150B | V1 Perc y2 | V1 maximum output voltage (%) | 0-100 (%) | 100.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 <small>Note24)</small> | 0h150C | V1 (-)Volt x1' | V1 (-) minimum input voltage | -10-0 (V) | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0h150D | V1(-)Perc y1' | V1 (-) minimum output voltage (%) | -100-0 (%) | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0h150E | V1(-)Volt x2' | V1 (-) maximum input voltage | -10-0 (V) | -10.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 0h150F | V1(-)Perc y2' | V1 (-) maximum output voltage (%) | -100-0 (%) | -100.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0h1510 | V1 Inverting | Rotation direction change | 0 No 1 Yes | 0: No | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 0h1511 | V1 Quantizing | V1 quantization change | 0.04-10 (%) | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0h1514 | I1 Monitor(mA) | I1 input display | 0-20 (mA) | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0h1516 | I1 Filter | I1 input filter time constant | 0-10000 (ms) | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0h1517 | I1 Curr x1 | I1 minimum input current | 0-20 (mA) | 4.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0h1518 | I1 Perc y1 | Output at I1 minimum current (%) | 0-100 (%) | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0h1519 | I1 Curr x2 | I1 maximum input current | 4-20 (mA) | 20.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0h151A | I1 Perc y2 | Output at I1 maximum current | 0-100 (%) | 100.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | 0h151F | I1 Inverting | Rotation direction change | 0 No 1 Yes | 0: No | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0h1520 | I1 Quantizing | I1 quantization level | 0.04-10 (%) | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 |

Note 24) IN-12-15 codes are displayed only when IN-06 (V1 Polarity) is set as "Bipolar".

Input Terminal Block Function Group (PAR → IN)


| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Page | Control Mode | | | | |
|-------------------------------|-----------------------|----------------|-----------------------------------|---------------|---------------|--------------------|------|--------------|-----|-----|-------|-------|
| | | | | | | | | V / F | S L | V C | S L T | V C T |
| 35 <small>Note 25)</small> | 0h1523 | V2 Monitor(V) | V2 input display | 0-10 (V) | 0.00 | O | 124 | O | O | O | O | O |
| 36 | 0h1524 | V2 Polarity | V1 input polarity selection | 0 Unipolar | 1: Bipolar | O | 124 | O | O | O | O | O |
| | | | | 1 Bipolar | | | | | | | | |
| 37 | 0h1525 | V2 Filter | V2 input filter time constant | 0-10000 (ms) | 10 | O | 124 | O | O | O | O | O |
| 38 | 0h1526 | V2 Volt x1 | V2 minimum input voltage | 0-10 (V) | 0.00 | O | 124 | O | O | O | O | O |
| 39 | 0h1527 | V2 Perc y1 | Output at V2 minimum voltage (%) | 0-100 (%) | 0.00 | O | 124 | O | O | O | O | O |
| 40 | 0h1528 | V2 Volt x2 | V2 maximum input voltage | 0-10 (V) | 10.00 | O | 124 | O | O | O | O | O |
| 41 | 0h1529 | V2 Perc y2 | Output at V2 maximum voltage (%) | 0-100 (%) | 100.00 | O | 124 | O | O | O | O | O |
| 42 | 0h152A | V2 -Volt x1' | V2 -minimum input voltage | -10-0 (V) | 0.00 | O | 124 | O | O | O | O | O |
| 43 | 0h152B | V2 -Perc y1' | Output at V2 -minimum voltage (%) | -100-0 (%) | 0.00 | O | 124 | O | O | O | O | O |
| 44 | 0h152C | V2 -Volt x2' | V2 -maximum input voltage | -10-0 (V) | -10.00 | O | 124 | O | O | O | O | O |
| 45 | 0h152D | V2 -Perc y2' | Output at V2 -maximum voltage (%) | -100-0 (%) | -100.00 | O | 124 | O | O | O | O | O |
| 46 | 0h152E | V2 Inverting | Rotation direction change | 0 No | 0:No | O | 124 | O | O | O | O | O |
| | | | | 1 Yes | | | | | | | | |
| 47 | 0h152F | V2 Quantizing | V2 quantization level | 0.04-10 (%) | 0.04 | O | 124 | O | O | O | O | O |
| 50 | 0h1532 | I2 Monitor(mA) | I2 input display | 0-20 (mA) | 0.00 | O | 125 | O | O | O | O | O |
| 52 | 0h1534 | I2 Filter | I2 input filter time constant | 0-10000 (ms) | 15 | O | 125 | O | O | O | O | O |
| 53 | 0h1535 | I2 Curr x1 | I2 minimum input current | 0-20 (mA) | 4.00 | O | 125 | O | O | O | O | O |
| 54 | 0h1536 | I2 Perc y1 | Output at I2 minimum current (%) | 0-100 (%) | 0.00 | O | 125 | O | O | O | O | O |
| 55 | 0h1537 | I2 Curr x2 | I2 maximum input current | 0-20 (mA) | 20.00 | O | 125 | O | O | O | O | O |
| 56 | 0h1538 | I2 Perc y2 | Output at I2 maximum current (%) | 0-100 (%) | 100.00 | O | 125 | O | O | O | O | O |
| 61 | 0h153D | I2 Inverting | Rotation direction change | 0 No | 0:No | O | 125 | O | O | O | O | O |
| | | | | 1 Yes | | | | | | | | |
| 62 | 0h153F | I2 Quantizing | I2 quantization level | 0.04-10 (%) | 0.04 | O | 125 | O | O | O | O | O |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 25) IN-35-62 codes are displayed only when the expansion IO module is installed.

Input Terminal Block Function Group (PAR → IN)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | | |
|------------------------------|-----------------------|-------------|-------------------------------|---------------|---------------|--------------------|--------------|-----|-----|-------|-------|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 65 | 0h1541 | P1 Define | P1 terminal function setting | 0 | NONE | 1:FX | X | O | O | O | O | O |
| | | | | 1 | FX | | | | | | | |
| 66 | 0h1542 | P2 Define | P2 terminal function setting | 2 | RX | 2:RX | X | X | X | O | O | O |
| 67 | 0h1543 | P3 Define | P3 terminal function setting | 3 | RST | 5:BX | X | O | O | O | O | O |
| 68 | 0h1544 | P4 Define | P4 terminal function setting | 4 | External Trip | 3:RST | X | O | O | O | O | O |
| 69 | 0h1545 | P5 Define | P5 terminal function setting | 5 | BX | 7:Sp-L | X | O | O | O | O | O |
| 70 | 0h1546 | P6 Define | P6 terminal function setting | 6 | JOG | 8:Sp-M | X | O | O | O | O | O |
| 71 | 0h1547 | P7 Define | P7 terminal function setting | 7 | Speed-L | 9:Sp-H | X | O | O | O | O | O |
| 72 | 0h1548 | P8 Define | P8 terminal function setting | 8 | Speed-M | 6:JOG | X | O | O | O | O | O |
| 73 <small>Note26)</small> | 0h1549 | P9 Define | P9 terminal function setting | 9 | Speed-H | 0:NONE | X | O | O | O | O | O |
| 74 | 0h154A | P10 Define | P10 terminal function setting | 10 | Speed-X | 0:NONE | X | O | O | O | O | O |
| 75 | 0h154B | P11 Define | P11 terminal function setting | 11 | XCEL-L | 0:NONE | X | | | | | |
| | | | | 12 | XCEL-M | | | | | | | |
| | | | | 13 | RUN Enable | | | | | | | |
| | | | | 14 | 3-Wire | | | | | | | |
| | | | | 15 | 2nd Source | | | | | | | |
| | | | | 16 | Exchange | | | | | | | |
| | | | | 17 | Up | | | | | | | |
| | | | | 18 | Down | | | | | | | |
| | | | | 19 | U/D Save | | | | | | | |
| | | | | 20 | U/D Clear | | | | | | | |
| | | | | 21 | Analog Hold | | | | | | | |
| | | | | 22 | I-Term Clear | | | | | | | |
| | | | | 23 | PID Openloop | | | | | | | |
| | | | | 24 | P Gain2 | | | | | | | |
| | | | | 25 | XCEL Stop | | | | | | | |
| | | | | 26 | 2nd Motor | | | | | | | |
| | | | | 27 | Trv Offset Lo | | | | | | | |
| | | | | 28 | Trv Offset Hi | | | | | | | |
| | | | | 29 | Interlock 1 | | | | | | | |
| | | | | 30 | Interlock 2 | | | | | | | |
| | | | | 31 | Interlock 3 | | | | | | | |
| | | | | 32 | Interlock 4 | | | | | | | |

*  The grey cells indicate a hidden code which is only visible when setting a code.

Note 26) IN73-75 codes are displayed only when the expansion IO module is installed.

Input Terminal Block Function Group (PAR → IN)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|-----|-----------------------|--------------|--|------------------------|---------------|--------------------|--------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| | | | | 33 -Reserved- | | | | | | | |
| | | | | 34 Pre Excite | | | | | | | |
| | | | | 35 Speed/Torque | | | | | | | |
| | | | | 36 ASR Gain 2 | | | | | | | |
| | | | | 37 ASR P/PI | | | | | | | |
| | | | | 38 Timer In | | | | | | | |
| | | | | 39 Thermal In | | | | | | | |
| | | | | 40 Dis Aux Ref | | | | | | | |
| | | | | 41 SEQ-1 | | | | | | | |
| | | | | 42 SEQ-2 | | | | | | | |
| | | | | 43 Manual | | | | | | | |
| | | | | 44 Go Step | | | | | | | |
| | | | | 45 Hold Step | | | | | | | |
| | | | | 46 FWD JOG | | | | | | | |
| | | | | 47 REV JOG | | | | | | | |
| | | | | 48 Trq Bias | | | | | | | |
| | | | | 49 XCEL-H | | | | | | | |
| | | | | 50 KEB Select | | | | | | | |
| | | | | 51 Fire Mode | | | | | | | |
| 85 | 0h1555 | DI On Delay | Multi-function input terminal On filter | 0-10000 (ms) | 10 | O | O | O | O | O | O |
| 86 | 0h1556 | DI Off Delay | Multi-function input terminal Off filter | 0-10000 (ms) | 3 | O | O | O | O | O | O |
| 87 | 0h1557 | DINC/NO Sel | Multi-function input contact point selection | P8 – P1 | 0000 0000 | X | O | O | O | O | O |
| | | | | 0 A contact point (NO) | | | | | | | |
| | | | | 1 B contact point (NC) | | | | | | | |
| 88 | 0h1558 | RunOn Delay | Operating command delay time | 0-100 (sec) | 0.00 | X | O | O | O | O | O |
| 89 | 0h1559 | InCheck Time | Sequential command delay time | 1-5000 (ms) | 1 | X | O | O | O | O | O |
| 90 | 0h155A | DI Status | Multi-function input terminal status | P8 – P1 | 0000 0000 | O | O | O | O | O | O |
| | | | | 0 Open (Off) | | | | | | | |
| | | | | 1 Connection (On) | | | | | | | |

8.6 Parameter Mode – Output Terminal Block Function Group (→OUT)

Output Terminal Block Function Group (PAR → OUT)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----|-------------------------------|----------------|--------------------------|---------------|---------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 00 | - | JumpCode | Jump code | 0-99 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01 | 0h1601 | AO1 Mode | Analog output 1 | 0 | Frequency | 0: Frequency | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 | Current | | | | | | |
| | | | | 2 | Voltage | | | | | | |
| | | | | 3 | DC Link Volt | | | | | | |
| | | | | 4 | Torque | | | | | | |
| | | | | 5 | Watt | | | | | | |
| | | | | 6 | Idss | | | | | | |
| | | | | 7 | Iqss | | | | | | |
| | | | | 8 | Target Freq | | | | | | |
| | | | | 9 | Ramp Freq | | | | | | |
| | | | | 10 | Speed Fdb | | | | | | |
| | | | | 11 | Speed Dev | | | | | | |
| | | | | 12 | PIDRef Value | | | | | | |
| | | | | 13 | PIDFdb Value | | | | | | |
| | | | | 14 | PID Output | | | | | | |
| | | | | 15 | Constant | | | | | | |
| 02 | 0h1602 | AO1 Gain | Analog output1 gain | -1000-1000(%) | 100.0 | 0 | 0 | 0 | 0 | 0 | |
| 03 | 0h1603 | AO1 Bias | Analog output 1 bias | -100-100(%) | 0.0 | 0 | 0 | 0 | 0 | 0 | |
| 04 | 0h1604 | AO1 Filter | Analog output1 filter | 0-10000 (ms) | 5 | 0 | 0 | 0 | 0 | 0 | |
| 05 | 0h1605 | AO1 Const % | Analog constant output 1 | 0-1000(%) | 0.0 | 0 | 0 | 0 | 0 | 0 | |
| 06 | 0h1606 | AO1 Monitor | Analog output 1 monitor | 0-1000(%) | 0.0 | - | 0 | 0 | 0 | 0 | |
| 07 | 0h1607 | AO2 Mode | Analog output 2 item | 0 | Frequency | 0: Frequency | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 | Current | | | | | | |
| | | | | 2 | Voltage | | | | | | |
| | | | | 3 | DC Link Volt | | | | | | |
| | | | | 4 | Torque | | | | | | |
| | | | | 5 | Watt | | | | | | |
| | | | | 6 | Idss | | | | | | |
| | | | | 7 | Iqss | | | | | | |
| | | | | 8 | Target Freq | | | | | | |
| | | | | 9 | Ramp Freq | | | | | | |
| | | | | 10 | Speed Fdb | | | | | | |
| | | | | 11 | Speed Dev | | | | | | |
| | | | | 12 | PIDRef Value | | | | | | |
| | | | | 13 | PIDFbk Value | | | | | | |
| | | | | 14 | PID Output | | | | | | |
| | | | | 15 | Constant | | | | | | |

Output Terminal Block Function Group (PAR → OUT)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|----------------------|-----------------------|-------------|--------------------------|----------------|---------------|--------------------|--------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 08 | 0h1608 | AO2 Gain | Analog output 2 gain | -1000–1000 (%) | 80.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 09 | 0h1609 | AO2 Bias | Analog output 2 bias | -100–100 (%) | 20.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0h160A | AO2 Filter | Analog output 2 filter | 0–10000 (ms) | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0h160B | AO2 Const % | Analog constant output 2 | 0–100 (%) | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0h160C | AO2 Monitor | Analog output 2 monitor | 0–1000 (%) | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 <i>Note27)</i> | 0h160E | AO3 Mode | Analog output 3 item | 0 | Frequency | 0: Frequency | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 | Current | | | | | | |
| | | | | 2 | Voltage | | | | | | |
| | | | | 3 | DC Link Volt | | | | | | |
| | | | | 4 | Torque | | | | | | |
| | | | | 5 | Watt | | | | | | |
| | | | | 6 | Idss | | | | | | |
| | | | | 7 | Iqss | | | | | | |
| | | | | 8 | Target Freq | | | | | | |
| | | | | 9 | Ramp Freq | | | | | | |
| | | | | 10 | Speed Fdb | | | | | | |
| | | | | 11 | Speed Dev | | | | | | |
| | | | | 12 | PID Ref Value | | | | | | |
| | | | | 13 | PID Fbk Value | | | | | | |
| | | | | 14 | PID Output | | | | | | |
| 15 | Constant | | | | | | | | | | |
| 15 | 0h160F | AO3 Gain | Analog output 3 gain | -1000–1000 (%) | 100.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0h1610 | AO3 Bias | Analog output 3 bias | -100–100 (%) | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 0h1611 | AO3 Filter | Analog output 3 filter | 0–10000 (ms) | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | - | AO3 Const % | Analog constant output 3 | 0–100 (%) | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | 0h1613 | AO3 Monitor | Analog output 3 monitor | -1000–1000 (%) | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0h1614 | AO4 Mode | Analog output 4 item | 0 | Frequency | 0: Frequency | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 | Current | | | | | | |
| | | | | 2 | Voltage | | | | | | |
| | | | | 3 | DC Link Volt | | | | | | |
| | | | | 4 | Torque | | | | | | |
| | | | | 5 | Watt | | | | | | |
| | | | | 6 | Idss | | | | | | |
| | | | | 7 | Iqss | | | | | | |
| | | | | 8 | Target Freq | | | | | | |
| | | | | 9 | Ramp Freq | | | | | | |
| | | | | 10 | Speed Fdb | | | | | | |
| | | | | 11 | Speed Dev | | | | | | |
| | | | | 12 | PID Ref Value | | | | | | |
| | | | | 13 | PID Fbk Value | | | | | | |
| | | | | 14 | PID Output | | | | | | |
| 15 | Constant | | | | | | | | | | |

Output Terminal Block Function Group (PAR → OUT)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | |
|---------------|-----------------------|---------------|--------------------------|--------------------------------------|---------------|--------------------|--------------|-------|-------|-------|
| | | | | | | | V / F | S / L | V / C | S / T |
| 21 | 0h1615 | AO4 Gain | Analog output 4 gain | -1000–1000 (%) | 80.0 | - | O | O | O | O |
| 22 | 0h1616 | AO4 Bias | Analog output 4 bias | -100–100 (%) | 20.0 | O | O | O | O | O |
| 23 | 0h1617 | AO4 Filter | Analog output 4 filter | 0–10000 (ms) | 5 | O | O | O | O | O |
| 24 | - | AO4 Const % | Analog constant output 4 | 0–100 (%) | 0.0 | O | O | O | O | O |
| 25 | 0h1619 | AO4 Monitor | Analog output 4 monitor | 0–1000 (%) | 0.0 | O | O | O | O | O |
| 30 | 0h161E | Trip Out Mode | Failure output item | Bit 000 - 111 | 010 | O | O | O | O | O |
| | | | | 1 Low voltage | | | | | | |
| | | | | 2 Failure other than low voltage | | | | | | |
| | | | | 3 Final failure of automatic restart | | | | | | |
| 31 | 0h161F | Relay 1 | Multi-function relay 1 | 0 NONE | 29:Trip | O | O | O | O | O |
| 32 | 0h1620 | Relay 2 | Multi-function relay 2 | 1 FDT-1 | 14:Run | O | O | O | O | O |
| 33 | 0h1621 | Q1 Define | Multi-function output 1 | 2 FDT-2 | 1:FDT-1 | O | O | O | O | O |
| 34 Note28) | 0h1622 | Relay 3 | Multi-function relay 3 | 3 FDT-3 | 2:FDT-2 | O | O | O | O | O |
| 35 | 0h1623 | Relay 4 | Multi-function relay 4 | 4 FDT-4 | 3:FDT-3 | O | O | O | O | O |
| 36 | 0h1624 | Relay 5 | Multi-function relay 5 | 5 Over Load | 4:FDT-4 | O | O | O | O | O |
| | | | | 6 IOL | | | | | | |
| | | | | 7 Under Load | | | | | | |
| | | | | 8 Fan Warning | | | | | | |
| | | | | 9 Stall | | | | | | |
| | | | | 10 Over Voltage | | | | | | |
| | | | | 11 Low Voltage | | | | | | |
| | | | | 12 Over Heat | | | | | | |
| | | | | 13 Lost Command | | | | | | |
| | | | | 14 Run | | | | | | |
| | | | | 15 Stop | | | | | | |
| | | | | 16 Steady | | | | | | |
| | | | | 17 Inverter Line | | | | | | |
| | | | | 18 Comm Line | | | | | | |
| | | | | 19 Speed Search | | | | | | |
| | | | | 20 Step Pulse | | | | | | |
| | | | | 21 Seq Pulse | | | | | | |
| | | | | 22 Ready | | | | | | |
| | | | | 23 Trv Acc | | | | | | |
| | | | | 24 Trv Dec | | | | | | |
| | | | | 25 MMC | | | | | | |
| | | | | 26 Zspd Dect | | | | | | |
| | | | | 27 Torque Dect | | | | | | |
| | | | | 28 Timer Out | | | | | | |

Note 27) OUT 14-25 codes are displayed only when the expansion IO module is installed.

Note 28) OUT 34-36 codes are displayed only when the expansion IO module is installed.

Output Terminal Block Function Group (PAR → OUT)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----|-------------------------------|-----------------|---|--------------------------|---------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| | | | | 29 Trip | | | | | | | |
| | | | | 30 Lost Keypad | | | | | | | |
| | | | | 31 DB Warn %ED | | | | | | | |
| | | | | 32 ENC Tune | | | | | | | |
| | | | | 33 ENC Dir | | | | | | | |
| | | | | 34 On/Off Control | | | | | | | |
| | | | | 35 BR Control | | | | | | | |
| | | | | 36 KEB Operating | | | | | | | |
| | | | | 37 Fire Mode | | | | | | | |
| | | | | 38 Run2 | | | | | | | |
| 41 | 0h1629 | DO Status | Multi-function output monitoring | - | 000 | X | - | - | - | - | - |
| 50 | 0h1632 | DO On Delay | Multi-function output On delay | 0-100 (sec) | 0.00 | O | O | O | O | O | O |
| 51 | 0h1633 | DO Off Delay | Multi-function output Off delay | 0-100 (sec) | 0.00 | O | O | O | O | O | O |
| 52 | 0h1634 | DO NC/NO Sel | Multi-function output contact point selection | Q1,Relay2,Relay1 | 000 | X | O | O | O | O | O |
| | | | | 0 A contact point (NO) | | | | | | | |
| | | | | 1 B contact point (NC) | | | | | | | |
| 53 | 0h1635 | TripOut OnDly | Failure output On delay | 0-100 (sec) | 0.00 | O | O | O | O | O | O |
| 54 | 0h1636 | TripOut OffDly | Failure output Off delay | 0-100.00 (sec) | 0.00 | O | O | O | O | O | O |
| 55 | 0h1637 | TimerOn Delay | Timer On delay | 0-100.00 (sec) | 0.00 | O | O | O | O | O | O |
| 56 | 0h1638 | TimerOff Delay | Timer Off delay | 0-100.00 (sec) | 0.00 | O | O | O | O | O | O |
| 57 | 0h1639 | FDT Frequency | Detected frequency | 0-maximum frequency (Hz) | 30.00 | O | O | O | O | O | O |
| 58 | 0h163A | FDT Band | Detected frequency width | 0-maximum frequency (Hz) | 10.00 | O | O | O | O | O | O |
| 59 | 0h163B | TD Level | Detected torque amount | 0-150 (%) | 100 | O | X | X | O | X | O |
| 60 | 0h163C | TD Band | Detected torque width | 0-10 (%) | 5.0 | O | X | X | O | X | O |

*  The grey cells indicate a hidden code which is only visible when setting a code.

8.7 Parameter Mode – Communication Function Group (→COM)

Communication Function Group (PAR → COM)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|--------------------------------|-----------------------|----------------|--------------------------------------|-----------------|---------------|--------------------|--------------|-----|-----|---------|-------|
| | | | | | | | V / F | S L | V C | S L C T | V C T |
| 00 | - | Jump Code | Jump code | 0-99 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01 | 0h1701 | Int485 St ID | Built-in communication inverter ID | 1-250 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02 | 0h1702 | Int485 Proto | Built-in communication protocol | 0 ModBus RTU | 0: ModBus RTU | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 --Reserved -- | | | | | | | |
| | | | | 2 Serial Debug | | | | | | | |
| 03 | 0h1703 | Int485 BaudR | Built-in communication speed | 0 1200 bps | 3: 9600 bps | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 2400 bps | | | | | | | |
| | | | | 2 4800 bps | | | | | | | |
| | | | | 3 9600 bps | | | | | | | |
| | | | | 4 19200 bps | | | | | | | |
| | | | | 5 38400 bps | | | | | | | |
| 04 | 0h1704 | Int485 Mode | Built-in communication frame setting | 0 D8/PN/S1 | 0: D8/PN/S1 | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 1 D8/PN/S2 | | | | | | | |
| | | | | 2 D8/PE/S1 | | | | | | | |
| | | | | 3 D8/PO/S1 | | | | | | | |
| 05 | 0h1705 | Resp Delay | Transmission delay after reception | 0-1000 (ms) | 5 ms | 0 | 0 | 0 | 0 | 0 | 0 |
| 06 <small>Note29-1)</small> | 0h1706 | FBus S/W Ver | Communication option S/W version | - | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07 | 0h1707 | FBus ID | Communication option inverter ID | 0-255 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08 | 0h1708 | FBUS BaudRate | FBus communication speed | - | 12 Mbps | | 0 | 0 | 0 | 0 | 0 |
| 09 | 0h1709 | FieldBus LED | Communication option LED status | - | - | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0h171E | ParaStatus Num | Number of output parameters | 0-8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | 0h171F | Para Stauts-1 | Output address 1 | 0000-FFFF Hex | 000A | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0h1720 | Para Stauts-2 | Output address 2 | 0000-FFFF Hex | 000E | 0 | 0 | 0 | 0 | 0 | 0 |
| 33 | 0h1721 | Para Stauts-3 | Output address 3 | 0000-FFFF Hex | 000F | 0 | 0 | 0 | 0 | 0 | 0 |
| 34 | 0h1722 | Para Stauts-4 | Output address 4 | 0000-FFFF Hex | 0000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 | 0h1723 | Para Stauts-5 | Output address 5 | 0000-FFFF Hex | 0000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36 | 0h1724 | Para Stauts-6 | Output address 6 | 0000-FFFF Hex | 0000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 37 | 0h1725 | Para Stauts-7 | Output address 7 | 0000-FFFF Hex | 0000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38 | 0h1726 | Para Stauts-8 | Output address 8 | 0000-FFFF Hex | 0000 | 0 | 0 | 0 | 0 | 0 | 0 |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 29-1) COM 06-17 codes are displayed only when the communication module is installed.

Refer to the Options manual for options.

Communication Function Group (PAR → COM)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|-----|-----------------------|----------------|---------------------------------------|---------------|---------------|--------------------|--------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 50 | 0h1732 | Para Ctrl Num | Number of input parameters | 0-8 | 2 | O | O | O | O | O | |
| 51 | 0h1733 | Para Control-1 | Input address 1 | 0000-FFFF Hex | 0005 | X | O | O | O | O | |
| 52 | 0h1734 | Para Control-2 | Input address 2 | 0000-FFFF Hex | 0006 | X | O | O | O | O | |
| 53 | 0h1735 | Para Control-3 | Input address 3 | 0000-FFFF Hex | 0000 | X | O | O | O | O | |
| 54 | 0h1736 | Para Control-4 | Input address 4 | 0000-FFFF Hex | 0000 | X | O | O | O | O | |
| 55 | 0h1737 | Para Control-5 | Input address 5 | 0000-FFFF Hex | 0000 | X | O | O | O | O | |
| 56 | 0h1738 | Para Control-6 | Input address 6 | 0000-FFFF Hex | 0000 | X | O | O | O | O | |
| 57 | 0h1739 | Para Control-7 | Input address 7 | 0000-FFFF Hex | 0000 | X | O | O | O | O | |
| 58 | 0h173A | Para Control-8 | Input address 8 | 0000-FFFF Hex | 0000 | X | O | O | O | O | |
| 68 | 0h1744 | FBus Swap Sel | Profibus swap | 0 | No | 0:No | X | O | O | O | O |
| | | | | 1 | Yes | | | | | | |
| 70 | 0h1746 | Virtual DI 1 | Communication multi-function input 1 | 0 | None | 0:None | O | O | O | O | |
| 71 | 0h1747 | Virtual DI 2 | Communication multi-function input 2 | 1 | FX | 0:None | O | O | O | O | |
| 72 | 0h1748 | Virtual DI 3 | Communication multi-function input 3 | 2 | RX | 0:None | O | O | O | O | |
| 73 | 0h1749 | Virtual DI 4 | Communication multi-function input 4 | 3 | RST | 0:None | O | O | O | O | |
| 74 | 0h174A | Virtual DI 5 | Communication multi-function input 5 | 4 | External Trip | 0:None | O | O | O | O | |
| 75 | 0h174B | Virtual DI 6 | Communication multi-function input 6 | 5 | BX | 0:None | O | O | O | O | |
| 76 | 0h174C | Virtual DI 7 | Communication multi-function input 7 | 6 | JOG | 0:None | O | O | O | O | |
| 77 | 0h174D | Virtual DI 8 | Communication multi-function input 8 | 7 | Speed-L | 0:None | O | O | O | O | |
| 78 | 0h174E | Virtual DI 9 | Communication multi-function input 9 | 8 | Speed-M | 0:None | O | O | O | O | |
| 79 | 0h174F | Virtual DI 10 | Communication multi-function input 10 | 9 | Speed-H | 0:None | O | O | O | O | |
| 80 | 0h1750 | Virtual DI 11 | Communication multi-function input 11 | 10 | Speed-X | 0:None | O | O | O | O | |
| 81 | 0h1751 | Virtual DI 12 | Communication multi-function input 12 | 11 | XCEL-L | 0:None | O | O | O | O | |
| 82 | 0h1752 | Virtual DI 13 | Communication multi-function input 13 | 12 | XCEL-M | 0:None | O | O | O | O | |
| 83 | 0h1753 | Virtual DI 14 | Communication multi-function input 14 | 13 | RUN Enable | 0:None | O | O | O | O | |
| 84 | 0h1754 | Virtual DI 15 | Communication multi-function input 15 | 14 | 3-Wire | 0:None | O | O | O | O | |
| 85 | 0h1755 | Virtual DI 16 | Communication multi-function input 16 | 15 | 2nd Source | 0:None | O | O | O | O | |
| | | | | 16 | Exchange | 0:None | O | O | O | O | |
| | | | | 17/18 | Up/Down | | | | | | |
| | | | | 19 | Reserved | | | | | | |
| | | | | 20 | U/D Clear | | | | | | |
| | | | | 21 | Analog Hold | | | | | | |

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | | | | | | | | | |
|-----|-----------------------|----------------|---|---------------|-------------------|--------------------|--------------|-----|-----|-------|-------|---|---|---|---|---|---|---|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | | | | | | | | |
| | | | | 22 | I-Term Clear | | | | | | | | | | | | | | |
| | | | | 23 | PID Openloop | | | | | | | | | | | | | | |
| | | | | 24 | P Gain2 | | | | | | | | | | | | | | |
| | | | | 25 | XCEL Stop | | | | | | | | | | | | | | |
| | | | | 26 | 2nd Motor | | | | | | | | | | | | | | |
| | | | | 27 | Trv Offset Lo | | | | | | | | | | | | | | |
| | | | | 28 | Trv Offset Hi | | | | | | | | | | | | | | |
| | | | | 29 | Interlock 1 | | | | | | | | | | | | | | |
| | | | | 30 | Interlock 2 | | | | | | | | | | | | | | |
| | | | | 31 | Interlock 3 | | | | | | | | | | | | | | |
| | | | | 32 | Interlock 4 | | | | | | | | | | | | | | |
| | | | | 33 | Reserved | | | | | | | | | | | | | | |
| | | | | 34 | Pre Excite | | | | | | | | | | | | | | |
| | | | | 35 | Speed/Torque | | | | | | | | | | | | | | |
| | | | | 36 | ASR Gain 2 | | | | | | | | | | | | | | |
| | | | | 37 | ASR P/PI | | | | | | | | | | | | | | |
| | | | | 38 | Timer In | | | | | | | | | | | | | | |
| | | | | 39 | Thermal In | | | | | | | | | | | | | | |
| | | | | 40 | Dis Aux Ref | | | | | | | | | | | | | | |
| | | | | 41 | SEQ-1 | | | | | | | | | | | | | | |
| | | | | 42 | SEQ-2 | | | | | | | | | | | | | | |
| | | | | 43 | Manual | | | | | | | | | | | | | | |
| | | | | 44 | Go Step | | | | | | | | | | | | | | |
| | | | | 45 | Hold Step | | | | | | | | | | | | | | |
| | | | | 46 | FWD JOG | | | | | | | | | | | | | | |
| | | | | 47 | REV JOG | | | | | | | | | | | | | | |
| | | | | 48 | Trq Bias | | | | | | | | | | | | | | |
| | | | | 49 | XCEL-H | | | | | | | | | | | | | | |
| | | | | 50 | KEB Select | | | | | | | | | | | | | | |
| | | | | 51 | Fire Mode | | | | | | | | | | | | | | |
| 86 | 0h1756 | Virt DI Status | Communication multi-function input monitoring | - | - | 0 | X | O | O | O | O | O | O | O | O | O | O | O | O |
| 90 | 0h175A | Comm Mon Sel | Monitor type selection | 0 1 | Int 485 Keypad | 0: Int 485 | O | O | O | O | O | O | O | O | O | O | O | O | O |
| 91 | 0h175B | RcvFrame Num | Number of reception frames | - | - | 0 | - | O | O | O | O | O | O | O | O | O | O | O | O |
| 92 | 0h175C | Err Frame Num | Number of error frames | - | - | 0 | - | O | O | O | O | O | O | O | O | O | O | O | O |
| 93 | 0h175D | Nak Frame Num | Number of writing error frames | - | - | 0 | - | O | O | O | O | O | O | O | O | O | O | O | O |
| 94 | note 29-2) | Comm Update | Communication update | 0 1 | No Yes | 0 | - | O | O | O | O | O | O | O | O | O | O | O | O |

note29-2) COM 94 is displayed when the communication option module is installed.

8.8 Parameter Mode – Applied Function Group (→APP)

Applied Function Group (PAR → APP)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | | |
|---------------|-------------------------------|-------------------|--------------------------------|-----------------|------------------|----------------------------|--------------|--------|--------|-------------|-------------|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 00 | - | Jump Code | Jump code | 0-99 | 20 | O | O | O | O | O | O | |
| 01 | 0h1801 | App Mode | Applied function selection | 0 | None | 0: None | X | O | O | O | X | X |
| | | | | 1 | Traverse | | | | | | | |
| | | | | 2 | Proc PID | | | | | | | |
| | | | | 3 | Reserved | | | | | | | |
| | | | | 4 | Auto Sequence | | | | | | | |
| 08 Note30) | 0h1808 | Trv Aplmit % | Traverse operating range | 0-20 (%) | 0.0 | O | O | O | O | X | X | |
| 09 | 0h1809 | Trv Scramb % | Traverse scramble magnitude | 0-50 (%) | 0.0 | O | O | O | O | X | X | |
| 10 | 0h180A | Trv Acc Time | Traverse acceleration time | 0.1-600.0 (sec) | 2.0 | O | O | O | O | X | X | |
| 11 | 0h180B | Trv Dec Time | Traverse deceleration time | 0.1-600.0 (sec) | 3.0 | O | O | O | O | X | X | |
| 12 | 0h180C | Trv Offset Hi | Traverse offset upper limit | 0-20.0 (%) | 0.0 | O | O | O | O | X | X | |
| 13 | 0h180D | Trv Offset lo | Traverse offset lower limit | 0-20.0 (%) | 0.0 | O | O | O | O | X | X | |
| 16 Note31) | 0h1810 | PID Output | PID output monitor | (%) | 0.00 | - | O | O | O | X | X | |
| 17 | 0h1811 | PID Ref Value | PID reference monitor | (%) | 50.00 | - | O | O | O | X | X | |
| 18 | 0h1812 | PID Fdb Value | PID feedback monitor | (%) | 0.00 | - | O | O | O | X | X | |
| 19 | 0h1813 | PID Ref Set | PID reference setting | -100-100 (%) | 50% | O | O | O | O | X | X | |
| 20 | 0h1814 | PID Ref Source | PID reference selection | 0 | Keypad | 0:Key pad | X | O | O | O | X | X |
| | | | | 1 | V1 | | | | | | | |
| | | | | 2 | I1 | | | | | | | |
| | | | | 3 | V2 | | | | | | | |
| | | | | 4 | I2 | | | | | | | |
| | | | | 5 | Int 485 | | | | | | | |
| | | | | 6 | Encoder | | | | | | | |
| | | | | 7 | FieldBus | | | | | | | |
| | | | | 8 | PLC | | | | | | | |
| | | | | 9 | Synchro | | | | | | | |
| | | | | 10 | Binary Type | | | | | | | |

*  The grey cells indicate a hidden code which is only visible when setting a code.

Note 30) APP 08-13 codes are displayed only when APP-01 (App Mode) is set as "Traverse".

Note 31) APP 16-45 codes are displayed only when APP-01 (App Mode) is set as "Proc PID" or APP-01(App Mode) is set as "MMC" and Reql Bypass (APO-34) is set as "No".

Applied Function Group (PAR → APP)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | | |
|-----|-----------------------|----------------|--|---|---------------|--------------------|--------------|-----|-----|-------|-------|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 21 | 0h1815 | PID F/B Source | PID feedback selection | 0 | V1 | 0:V1 | X | O | O | O | X | X |
| | | | | 1 | I1 | | | | | | | |
| | | | | 2 | V2 | | | | | | | |
| | | | | 3 | I2 | | | | | | | |
| | | | | 4 | Int 485 | | | | | | | |
| | | | | 5 | Encoder | | | | | | | |
| | | | | 6 | FieldBus | | | | | | | |
| | | | | 7 | PLC | | | | | | | |
| | | | | 8 | Synchro | | | | | | | |
| | | | 9 | Binary Type | | | | | | | | |
| 22 | 0h1816 | PID P-Gain | PID proportional gain | 0-1000 (%) | 50.0 | O | O | O | O | X | X | |
| 23 | 0h1817 | PID I-Time | PID integral time | 0-200.0 (sec) | 10.0 | O | O | O | O | X | X | |
| 24 | 0h1818 | PID D-Time | PID differential time | 0-1000 (ms) | 0 | O | O | O | O | X | X | |
| 25 | 0h1819 | PID F-Gain | PID feed forward gain | 0-1000.0 (%) | 0.0 | O | O | O | O | X | X | |
| 26 | 0h181A | P Gain Scale | Proportional gain scale | 0-100.0 (%) | 100.0 | X | O | O | O | X | X | |
| 27 | 0h181B | PID Out LPF | PID output filter | 0-10000 (ms) | 0 | O | O | O | O | X | X | |
| 28 | 0h181C | PID Mode | PID mode select | 0 | Process PID | 0:Process PID | - | O | O | O | X | X |
| | | | | 1 | Normal PID | | | | | | | |
| 29 | 0h181D | PID Limit Hi | PID upper limit frequency | PID lower limit frequency (Hz)-300 (Hz) | 60.00 | O | O | O | O | X | X | |
| 30 | 0h181E | PID Limit Lo | PID lower limit frequency | -300-PID upper limit frequency (Hz) | -60.00 | O | O | O | O | X | X | |
| 31 | 0h181F | PID Out Inv | PID output inverse | 0 | No | 0:No | - | O | O | O | X | X |
| | | | | 1 | Yes | | | | | | | |
| 32 | 0h1820 | PID Out Scale | PID output scale | 0.1-1000 (%) | 100.0 | X | O | O | O | X | X | |
| 34 | 0h1822 | Pre-PID Freq | PID control period movement frequency | 0-maximum frequency (Hz) | 0.00 | X | O | O | O | X | X | |
| 35 | 0h1823 | Pre-PID Exit | PID control period movement level | 0-100 (%) | 0.0 | X | O | O | O | X | X | |
| 36 | 0h1824 | Pre-PID Delay | PID control period movement delay time | 0-9999 (sec) | 600 | O | O | O | O | X | X | |
| 37 | 0h1825 | PID Sleep DT | PID sleep mode delay time | 0-999.9 (sec) | 60.0 | O | O | O | O | X | X | |
| 38 | 0h1826 | PID Sleep Freq | PID sleep mode frequency | 0-maximum frequency (Hz) | 0.00 | O | O | O | O | X | X | |
| 39 | 0h1827 | PID WakeUp Lev | PID wake up level | 0-100 (%) | 35 | O | O | O | O | X | X | |
| 40 | 0h1828 | PID WakeUp Mod | PID wake up mode setting | 0 | Below Level | 0:Below Level | O | O | O | O | X | X |
| | | | | 1 | Above Level | | | | | | | |
| | | | | 2 | Beyond Level | | | | | | | |
| 41 | 0h1829 | PID Rev Run En | PID reverse operation | 0 | No | 0:No | X | O | O | O | X | X |
| | | | | 1 | Yes | | | | | | | |
| 42 | 0h182A | PID Unit Sel | PID control period unit selection | 0 | % | 0:% | O | O | O | O | X | X |
| | | | | 1 | Bar | | | | | | | |
| | | | | 2 | mBar | | | | | | | |
| | | | | 3 | Pa | | | | | | | |

Table of Functions

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----|-------------------------------|-------------------|---------------------------------------|---------------|---------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| | | | | 4 KPa | | | | | | | |
| | | | | 5 Hz | | | | | | | |
| | | | | 6 rpm | | | | | | | |
| | | | | 7 V | | | | | | | |
| | | | | 8 l | | | | | | | |
| | | | | 9 kW | | | | | | | |
| | | | | 10 HP | | | | | | | |
| | | | | 11 °C | | | | | | | |
| | | | | 12 °F | | | | | | | |
| | | | | 13 CUST | | | | | | | |
| | | | | 14 PSI | | | | | | | |
| | | | | 15 ln/WC | | | | | | | |
| | | | | 16 gl/m | | | | | | | |
| 43 | 0h182B | PID Unit Gain | PID unit gain | 0-300 (%) | 100.00 | O | O | O | O | X | X |
| | | | | 0 X 0.01 | | | | | | | |
| | | | | 1 X 0.1 | | | | | | | |
| 44 | 0h182C | PID Unit Scale | PID unit scale | 2 X 1 | 2:x 1 | O | O | O | O | X | X |
| | | | | 3 X 0.1 | | | | | | | |
| | | | | 4 X 0.01 | | | | | | | |
| 45 | 0h182D | PID P2-Gain | PID 2 nd proportional gain | 0-1000 (%) | 100.0 | X | O | O | O | X | X |

Note³¹⁾ APP 16-45 codes are displayed only when APP-01 (App Mode) is set as "Proc PID" or APP-01(App Mode) is set as "MMC" and Reql Bypass (APO-34) is set as "No".

8.9 Parameter Mode – Auto Sequence Operation Group (→AUT)

Auto Sequence Operation Group (PAR → AUT)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|------------------------------|-----------------------|----------------|------------------------------------|-----------------------------|---------------|--------------------|--------------|-----|-----|-------|-------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 00 | - | Jump Code | Jump code | 0-99 | 10 | O | O | O | O | X | X |
| 01 | 0h1901 | Auto Mode | Auto operation type | 0 Auto-A 1 Auto-B | 0:Auto-A | X | O | O | O | X | X |
| 02 <small>Note32)</small> | 0h1902 | Auto Check | Auto operation terminal delay time | 0.02–2.00 (sec) | 0.10 | X | O | O | O | X | X |
| 03 | 0h1903 | Seq Select | Sequence type selection | 1–2 | 1 | O | O | O | O | X | X |
| 04 <small>Note33)</small> | 0h1904 | Step Number 1 | Number of sequence 1 steps | 1–8 | 2 | O | O | O | O | X | X |
| 05 <small>Note34)</small> | 0h1905 | Step Number 2 | Number of sequence 2 steps | 1–8 | 2 | O | O | O | O | X | X |
| 10 <small>Note35)</small> | 0h190A | Seq 1/1 Freq | 1/1 step frequency | 0.01–maximum frequency (Hz) | 11.00 | O | O | O | O | X | X |
| 11 | 0h190B | Seq 1/1 XcelT | 1/1 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 12 | 0h190C | Seq 1/1 SteadT | 1/1 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 13 | 0h190D | Seq 1/1 Dir | 1/1 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 14 | 0h190E | Seq 1/2 Freq | 1/2 step frequency | 0.01–maximum frequency (Hz) | 21.00 | O | O | O | O | X | X |
| 15 | 0h190F | Seq 1/2 XcelT | 1/2 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 16 | 0h1910 | Seq 1/2 SteadT | 1/2 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 17 | 0h1911 | Seq 1/2 Dir | 1/2 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 18 | 0h190E | Seq 1/3 Freq | 1/3 step frequency | 0.01–maximum frequency (Hz) | 31.00 | O | O | O | O | X | X |
| 19 | 0h190F | Seq 1/3 XcelT | 1/3 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 20 | 0h1910 | Seq 1/3 SteadT | 1/3 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 21 | 0h1915 | Seq 1/3 Dir | 1/3 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 22 | 0h1906 | Seq 1/4 Freq | 1/4 step frequency | 0.01–maximum frequency (Hz) | 41.00 | O | O | O | O | X | X |
| 23 | 0h1907 | Seq 1/4 XcelT | 1/4 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 24 | 0h1918 | Seq 1/4 SteadT | 1/4 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 25 | 0h1919 | Seq 1/4 Dir | 1/4 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 26 | 0h191A | Seq 1/5 Freq | 1/5 step frequency | 0.01–maximum frequency (Hz) | 51.00 | O | O | O | O | X | X |
| 27 | 0h191B | Seq 1/5 XcelT | 1/5 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 28 | 0h191C | Seq 1/5 SteadT | 1/5 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 29 | 0h191D | Seq 1/5 Dir | 1/5 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |

Table of Functions

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|------------------------------|-----------------------|----------------|---------------------------------|-----------------------------|---------------|--------------------|--------------|-------|-------|-----------|-----------|
| | | | | | | | V / F | S / L | V / C | S / L / T | V / C / T |
| 30 | 0h191E | Seq 1/6 Freq | 1/6 step frequency | 0.01–maximum frequency (Hz) | 60.00 | O | O | O | O | X | X |
| 31 | 0h191F | Seq 1/6 XcelT | 1/6 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 32 | 0h1920 | Seq 1/6 SteadT | 1/6 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 33 | 0h1921 | Seq 1/6 Dir | 1/6 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 34 | 0h1922 | Seq 1/7 Freq | 1/7 step frequency | 0.01–maximum frequency (Hz) | 51.00 | O | O | O | O | X | X |
| 35 | 0h1923 | Seq 1/7 XcelT | 1/7 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 36 | 0h1924 | Seq 1/7 SteadT | 1/7 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 37 | 0h1925 | Seq 1/7 Dir | 1/7 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 38 | 0h1926 | Seq 1/8 Freq | 1/8 step frequency | 0.01–maximum frequency (Hz) | 21.00 | O | O | O | O | X | X |
| 39 | 0h1927 | Seq 1/8 XcelT | 1/8 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 40 | 0h1928 | Seq 1/8 SteadT | 1/8 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 41 | 0h1929 | Seq 1/8 Dir | 1/8 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 43 <small>Note36)</small> | 0h192B | Seq 2/1 Freq | 2/1 step frequency | 0.01–maximum frequency (Hz) | 12.00 | O | O | O | O | X | X |
| 44 | 0h192C | Seq 2/1 XcelT | 2/1 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 45 | 0h192D | Seq 2/1 SteadT | 2/1 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 46 | 0h192E | Seq 2/1 Dir | 2/1 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 47 | 0h192F | Seq 2/2 Freq | 2/2 step frequency | 0.01–maximum frequency (Hz) | 22.00 | O | O | O | O | X | X |
| 48 | 0h1930 | Seq 2/2 XcelT | 2/2 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 49 | 0h1931 | Seq 2/2 SteadT | 2/2 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 50 | 0h1932 | Seq 2/2 Dir | 2/2 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 51 | 0h1933 | Seq 2/3 Freq | 2/3 step frequency | 0.01–maximum frequency (Hz) | 32.00 | O | O | O | O | X | X |
| 52 | 0h1934 | Seq 2/3 XcelT | 2/3 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 53 | 0h1935 | Seq 2/3 SteadT | 2/3 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 54 | 0h1936 | Seq 2/3 Dir | 2/3 operation direction | 0 Reverse 1 Forward | 1:Forward | - | O | O | O | X | X |
| 52 | 0h1937 | Seq 2/4 Freq | 2/4 step frequency | 0.01–maximum frequency (Hz) | 42.00 | O | O | O | O | X | X |
| 56 | 0h1938 | Seq 2/4 XcelT | 2/4 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 57 | 0h1939 | Seq 2/4 SteadT | 2/4 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | O | X | X |
| 58 | 0h193A | Seq 2/4 Dir | 2/4 operation direction | 0 Reverse 1 Forward | 1:Forward | O | O | O | O | X | X |
| 59 | 0h193B | Seq 2/5 Freq | 2/5 step frequency | 0.01–maximum frequency (Hz) | 52.00 | O | O | O | O | X | X |

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----|-------------------------------|-------------------|------------------------------------|--------------------------------|------------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 60 | 0h193C | Seq 2/5 XcelT | 2/5 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 61 | 0h193D | Seq 2/5 SteadT | 2/5 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 62 | 0h193E | Seq 2/5 Dir | 2/5 operation direction | 0 Reverse | 1:Forward | O | O | O | X | X | |
| | | | | 1 Forward | | | | | | | |
| 63 | 0h193F | Seq 2/6 Freq | 2/6 step frequency | 0.01–maximum frequency (Hz) | 60.00 | O | O | O | X | X | |
| 64 | 0h1940 | Seq 2/6 XcelT | 2/6 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 65 | 0h1941 | Seq 2/6 SteadT | 2/6 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 66 | 0h1942 | Seq 2/6 Dir | 2/6 operation direction | 0 Reverse | 1:Forward | O | O | O | X | X | |
| | | | | 1 Forward | | | | | | | |
| 67 | 0h1943 | Seq 2/7 Freq | 2/7 step frequency | 0.01–maximum frequency (Hz) | 52.00 | O | O | O | X | X | |
| 68 | 0h1944 | Seq 2/7 XcelT | 2/7 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 69 | 0h1945 | Seq 2/7 SteadT | 2/7 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 70 | 0h1946 | Seq 2/7 Dir | 2/8 operation direction | 0 Reverse | 1:Forward | O | O | O | X | X | |
| | | | | 1 Forward | | | | | | | |
| 71 | 0h1947 | Seq 2/8 Freq | 2/8 step frequency | 0.01–maximum frequency (Hz) | 22.00 | O | O | O | X | X | |
| 72 | 0h1948 | Seq 2/8 XcelT | 2/8 Acc/Dec time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 73 | 0h1949 | Seq 2/8 SteadT | 2/8 steady speed operation time | 0.1–600.0 (sec) | 5.0 | O | O | O | X | X | |
| 74 | 0h194A | Seq 2/8 Dir | 2/8 operation direction | 0 Reverse | 1:Forward | O | O | O | X | X | |
| | | | | 1 Forward | | | | | | | |

*  The grey cells indicate a hidden code which is only visible when setting a code.

Note 32) AUT group is displayed only when APP-01(App Mode) is set as “Auto Sequence”.

Note 33) AUT-04 codes are displayed only when AUT-03 Seq Select) is set as “1”.

Note 34) AUT-05 codes are displayed only when AUT-03 (Seq Select) is set as “2”.

Note 35) AUT-10–41 codes are displayed only when AUT-03 (Seq Select) is set as “1”.

Note 36) AUT-43–74 codes are displayed only when AUT-03 (Seq Select) is set as “2”.

8.10 Parameter Mode – Option Module Function Group (→APO)

Option Module Function Group (PAR → APO)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | | |
|------------------------------|-------------------------------|------------------|--|---------------|------------------|----------------------------|--------------|--------|--------|------------------|-------------|---|
| | | | | | | | V / F | S L | V C | S L C T | V C T | |
| 00 | - | Jump Code | Jump code | 0-99 | 20 | O | O | O | O | O | O | |
| 01 <small>Note37)</small> | 0h1A01 | Enc Opt Mode | Encoder function item | 0 | None | 0:None | O | O | O | O | O | O |
| | | | | 1 | Feedback | | | | | | | |
| | | | | 2 | Reference | | | | | | | |
| 04 | 0h1A04 | Enc Type Sel | Encoder type selection | 0 | Line Driver | 0:Line Driver | X | O | O | O | O | O |
| | | | | 1 | Totem or Com | | | | | | | |
| | | | | 2 | Open Collector | | | | | | | |
| 05 | 0h1A05 | Enc Pulse Sel | Encoder pulse direction | 0 | (A+B) | 0: (A+B) | X | O | O | O | O | O |
| | | | | 1 | -(A+B) | | | | | | | |
| | | | | 2 | A | | | | | | | |
| 06 | 0h1A06 | Enc Pulse Num | Number of encoder pulses | 10-5000 | 1024 | X | O | O | O | O | O | |
| 08 | 0h1A08 | Enc Monitor | Feedback monitor | - | - | O | O | O | O | O | O | |
| 09 | 0h1A09 | Pulse Monitor | Reference monitor | - | - | O | O | O | O | O | O | |
| 10 | 0h1A0A | Enc Filter | Encoder input filter | 0-10000 (ms) | 3 | O | O | O | O | O | O | |
| 11 | 0h1A0B | Enc Pulse x1 | Encoder minimum input pulse | 0-100 (kHz) | 0.0 | O | O | X | O | X | O | |
| 12 | 0h1A0C | Enc Perc y1 | Output at encoder minimum pulse (%) | 0-100 (%) | 0.00 | O | O | X | O | X | O | |
| 13 | 0h1A0D | Enc Pulse x2 | Encoder maximum input pulse | 0-200 (kHz) | 100 | O | O | X | O | X | O | |
| 14 | 0h1A0E | Enc Perc y2 | Encoder maximum pulse output (%) | 0-100 (%) | 100 | O | O | X | O | X | O | |
| 20 <small>Note38)</small> | 0h1A14 | Aux Motor Run | Display of number of auxiliary motor movements | 0-4 | 0 | O | O | O | O | X | X | |
| 21 | 0h1A15 | Starting Aux | Starting auxiliary motor selection | 1-4 | 1 | X | O | O | O | X | X | |
| 22 | 0h1A16 | AutoOp Time | Auto change operation time | X:XX (Min) | 0:00 | O | O | O | O | X | X | |
| 23 | 0h1A17 | Start Freq 1 | 1st auxiliary motor starting frequency | 0-60 (Hz) | 49.99 | O | O | O | O | X | X | |
| 24 | 0h1A18 | Start Freq 2 | 2nd auxiliary motor starting frequency | 0-60 (Hz) | 49.99 | O | O | O | O | X | X | |
| 25 | 0h1A19 | Start Freq 3 | 3rd auxiliary motor starting frequency | 0-60 (Hz) | 49.99 | O | O | O | O | X | X | |
| 26 | 0h1A1A | Start Freq 4 | 4th auxiliary motor starting frequency | 0-60 (Hz) | 49.99 | O | O | O | O | X | X | |

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | | |
|---------------|-------------------------------|----------------|---|-----------------|------------------|----------------------------|--------------|--------|--------|-------------|-------------|---|
| | | | | | | | V / F | S L | V C | S L T | V C T | |
| 27 | 0h1A1B | Stop Freq 1 | 1st auxiliary motor stop frequency | 0-60 (Hz) | 15.00 | O | O | O | O | X | X | |
| 28 | 0h1A1C | Stop Freq 2 | 2nd auxiliary motor stop frequency | 0-60 (Hz) | 15.00 | O | O | O | O | X | X | |
| 29 | 0h1A1D | Stop Freq 3 | 3rd auxiliary motor stop frequency | 0-60 (Hz) | 15.00 | O | O | O | O | X | X | |
| 30 | 0h1A1E | Stop Freq 4 | 4th auxiliary motor stop frequency | 0-60 (Hz) | 15.00 | O | O | O | O | X | X | |
| 31 | 0h1A1F | Aux Start DT | Auxiliary motor starting delay time | 0-3600.0 (sec) | 60.0 | O | O | O | O | X | X | |
| 32 | 0h1A20 | Aux Stop DT | Auxiliary motor stop delay time | 0-3600.0 (sec) | 60.0 | O | O | O | O | X | X | |
| 33 | 0h1A21 | Num of Aux | Auxiliary motor number selection | 0-4 | 4 | X | O | O | O | X | X | |
| 34 | 0h1A22 | Regul Bypass | Bypass selection | 0 | No | 0:No | X | O | O | O | X | X |
| | | | | 1 | Yes | | | | | | | |
| 35 | 0h1A23 | Auto Ch Mode | Auto change mode selection | 0 | None | 1: Aux | X | O | O | O | X | X |
| | | | | 1 | Aux | | | | | | | |
| | | | | 2 | Main | | | | | | | |
| 36 | 0h1A24 | Auto Ch Time | Auto change time | 0-99:00 (min) | 72:00 | O | O | O | O | X | X | |
| 38 | 0h1A26 | Interlock | Interlock selection | 0 | No | 0:No | O | O | O | O | X | X |
| | | | | 1 | Yes | | | | | | | |
| 39 | 0h1A27 | Interlock DT | Interlock movement delay time | 0.1-360.0 (sec) | 5.0 | O | O | O | O | X | X | |
| 40 | 0h1A28 | Actual Pr Diff | Auxiliary motor movement pressure difference | 0-100 (%) | 2 | O | O | O | O | X | X | |
| 41 | 0h1A29 | Aux Acc Time | Main motor acceleration time when number of pumps decreases | 0-600.0 (sec) | 2.0 | O | O | O | O | X | X | |
| 42 | 0h1A2A | Aux Dec Time | Main motor deceleration time when number of pumps increases | 0-600.0 (sec) | 2.0 | O | O | O | O | X | X | |
| 58 Note39) | 0h1A3A | PLC LED Status | PLC option LED status | - | - | O | O | O | O | O | O | |
| 59 | 0h1A3B | PLC S/W Ver | PLC option module S/W version | - | 1.X | O | O | O | O | O | O | |
| 60 | 0h1A3C | PLC Wr Data 1 | PLC write data 1 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | O | |
| 61 | 0h1A3D | PLC Wr Data 2 | PLC write data 2 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | O | |
| 62 | 0h1A3E | PLC Wr Data 3 | PLC write data 3 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | O | |
| 63 | 0h1A3F | PLC Wr Data 4 | PLC write data 4 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | O | |
| 64 | 0h1A40 | PLC Wr Data 5 | PLC write data 5 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | O | |
| 65 | 0h1A41 | PLC Wr Data 6 | PLC write data 6 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | O | |

Table of Functions

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----|-------------------------------|---------------|------------------|---------------|------------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 66 | 0h1A42 | PLC Wr Data 7 | PLC write data 7 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 67 | 0h1A43 | PLC Wr Data 8 | PLC write data 8 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 76 | 0h1A4C | PLC Rd Data 1 | PLC read data 1 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 77 | 0h1A4D | PLC Rd Data 2 | PLC read data 2 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 78 | 0h1A4E | PLC Rd Data 3 | PLC read data 3 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 79 | 0h1A4F | PLC Rd Data 4 | PLC read data 4 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 80 | 0h1A50 | PLC Rd Data 5 | PLC read data 5 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 81 | 0h1A51 | PLC Rd Data 6 | PLC read data 6 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 82 | 0h1A52 | PLC Rd Data 7 | PLC read data 7 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |
| 83 | 0h1A53 | PLC Rd Data 8 | PLC read data 8 | 0-FFFF (Hex) | 0000 | O | O | O | O | O | |

*  The grey cells indicate a hidden code which is only visible when setting a code.

Note 37) APO-01-14 codes are displayed only when the encoder module is installed.

Note 38) APO-20-42 codes are displayed only when APP-01 (App Mode) is set as "MMC".

Note 39) APO-58-83 codes are displayed only when the PLC option module is installed.

8.11 Parameter Mode – Protective Function Group (→PRT)

Protective Function Group (PAR → PRT)

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|------------------------------|-----------------------|----------------|---|---|---------------|--------------------|--------------|-------|-------|-------|-------|
| | | | | | | | V / F | S L C | V L T | S L T | V C T |
| 00 | - | Jump Code | Jump code | 0-99 | 40 | O | O | O | O | O | |
| 04 | 0h1B04 | Load Duty | Load amount setting | 0 Normal Duty | 1:Heavy Duty | X | O | O | O | O | |
| | | | | 1 Heavy Duty | | | | | | | |
| 05 | 0h1B05 | Phase Loss Chk | Input/output open-phase protection | Bit 00-11 | 00 | X | O | O | O | O | |
| | | | | 1 Output open phase | | | | | | | |
| | | | | 2 Input open phase | | | | | | | |
| 06 | 0h1B06 | IPO V Band | Input voltage range during open-phase | 1-100 (V) | 40 | X | O | O | O | O | |
| 07 | 0h1B07 | Trip Dec Time | Deceleration time at fault trip | 0-600 (sec) | 3.0 | O | O | O | O | O | |
| 08 | 0h1B08 | RST Restart | Starting selection on trip reset | 0 No | 0:No | O | O | O | O | O | |
| | | | | 1 Yes | | | | | | | |
| 09 | 0h1B09 | Retry Number | Number of automatic restarts | 0-10 | 0 | O | O | O | O | O | |
| 10 <small>Note40)</small> | 0h1B0A | Retry Delay | Automatic restart delay time | 0-60.0 (sec) | 1.0 | O | O | O | O | O | |
| 11 | 0h1B0B | Lost KPD Mode | Keypad command loss operation mode | 0 None | 0:None | O | O | O | O | O | |
| | | | | 1 Warning | | | | | | | |
| | | | | 2 Free-Run | | | | | | | |
| | | | | 3 Dec | | | | | | | |
| 12 | 0h1B0C | Lost Cmd Mode | Speed command loss operation mode | 0 None | 0:None | O | O | O | O | O | |
| | | | | 1 Free-Run | | | | | | | |
| | | | | 2 Dec | | | | | | | |
| | | | | 3 Hold Input | | | | | | | |
| | | | | 4 Hold Output | | | | | | | |
| 5 Lost Preset | | | | | | | | | | | |
| 13 <small>Note41)</small> | 0h1B0D | Lost Cmd Time | Speed command loss judgment time | 0.0-120 (sec) | 1.0 | O | O | O | O | O | |
| 14 | 0h1B0E | Lost Preset F | Operation frequency at speed command loss | Start frequency -maximum frequency (Hz) | 0.00 | O | O | O | O | O | |
| 15 | 0h1B0F | AI Lost Level | Analog input loss judgment level | 0 Half of x1 | 0:Half of x1 | O | O | O | O | O | |
| | | | | 1 Below x1 | | | | | | | |
| 17 | 0h1B11 | OL Warn Select | Overload alarm selection | 0 No | 0:No | O | O | O | O | O | |
| | | | | 1 Yes | | | | | | | |
| 18 | 0h1B12 | OL Warn Level | Overload alarm level | 30-180 (%) | 150 | O | O | O | O | O | |
| 19 | 0h1B13 | OL Warn Time | Overload alarm time | 0-30.0 (sec) | 10.0 | O | O | O | O | O | |
| 20 | 0h1B14 | OL Trip Select | Motion at overload trip | 0 None | 1:Free-Run | O | O | O | O | O | |
| | | | | 1 Free-Run | | | | | | | |
| | | | | 2 Dec | | | | | | | |

Table of Functions

| No. | Communication Address | LCD Display | Name | Setting Range | Initial Value | Shift in Operation | Control Mode | | | | |
|---------------|-----------------------|----------------|--|---|----------------|--------------------|--------------|-------|-------|-------|-------|
| | | | | | | | V / F | S / L | V / C | S / T | V / C |
| 21 | 0h1B15 | OL Trip Level | Overload trip level | 30–200 (%) | 180 | O | O | O | O | O | O |
| 22 | 0h1B16 | OL Trip Time | Overload trip time | 0–60 (sec) | 60.0 | O | O | O | O | O | O |
| 25 | 0h1B19 | UL Warn Sel | Under load alarm selection | 0 No 1 Yes | 0:No | O | O | O | O | O | O |
| 26 | 0h1B1A | UL Warn Time | Under load alarm time | 0–600.0 (sec) | 10.0 | O | O | O | O | O | O |
| 27 | 0h1B1B | UL Trip Sel | Under load trip selection | 0 None 1 Free-Run 2 Dec | 0:None | O | O | O | O | O | O |
| 28 | 0h1B1C | UL Trip Time | Under load trip time | 0–600 (sec) | 30.0 | O | O | O | O | O | O |
| 29 | 0h1B1D | UL LF Level | Under load lower limit level | 10–30 (%) | 30 | O | O | O | O | O | O |
| 30 | 0h1B1E | UL BF Level | Under load upper limit level | 10–100 (%) | 30 | O | O | O | O | O | O |
| 31 | 0h1B1F | No Motor Trip | Operation on no motor trip | 0 None 1 Free-Run | 0: None | O | O | O | O | O | O |
| 32 Note42) | 0h1B20 | No Motor Level | No motor detection current level | 1–100 (%) | 5 | O | O | O | O | O | O |
| 33 | 0h1B21 | No Motor Time | No motor detection delay | 0.1–10.0 (sec) | 3.0 | O | O | O | O | O | O |
| 34 | 0h1B22 | Thermal-T Sel | Operation at motor overheat detection | 0 None 1 Free-Run 2 Dec | 0:None | O | O | O | O | O | O |
| 35 | 0h1B23 | Thermal In Src | Thermal sensor input | 0 None 1 V1 2 I1 3 V2 4 I2 | 0:None | O | O | O | O | O | O |
| 36 | 0h1B24 | Thermal-T Lev | Thermal sensor fault level | 0–100 (%) | 50.0 | O | | | | | |
| 37 | 0h1B25 | Thermal-T Area | Thermal sensor fault area | 0 Low 1 High | 0:Low | O | O | O | O | O | O |
| 40 | 0h1B28 | ETH Trip Sel | Electronic thermal fault trip prevention selection | 0 None 1 Free-Run 2 Dec | 0:None | O | O | O | O | O | O |
| 41 | 0h1B29 | Motor Cooling | Motor cooling fan type | 0 Self-cool 1 Forced-cool | 0:Self-cool | O | O | O | O | O | O |
| 42 | 0h1B2A | ETH 1min | Electronic thermal one minute rating | 120–200 (%) | 150 | O | O | O | O | O | O |
| 43 | 0h1B2B | ETH Cont | Electronic thermal prevention continuous rating | 50–200 (%) | 120 | O | O | O | O | O | O |
| 45 | 0h1B2D | BX Mode | BX mode select | 0 (sec) 0.1–600.0 (sec) Free-run Dec | 0.0 (Free-run) | O | O | O | O | X | X |

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | |
|-----|-------------------------------|-------------------|--|---|------------------|----------------------------|--------------|--------|--------|-------------|-------------|
| | | | | | | | V / F | S L | V C | S L T | V C T |
| 50 | 0h1B32 | Stall Prevent | Stall prevention | Bit 00000~11111 | 00000 | X | O | O | X | O | X |
| | | | | Bit 00001 Accelerating(Mode1) | | | | | | | |
| | | | | Bit 10001 Accelerating(Mode2) | | | | | | | |
| | | | | Bit 00010 Steady speed(Mode1) | | | | | | | |
| | | | | Bit 10010 Steady speed(Mode2) | | | | | | | |
| | | | | Bit #0100 (# : 1 or 0) Decelerating | | | | | | | |
| | | | | Bit #1000 (# : 1 or 0) Flux Braking | | | | | | | |
| | | | | | | | | | | | |
| 51 | 0h1B33 | Stall Freq 1 | Stall frequency 1 | Start frequency -stall frequency 1 (Hz) | 60.00 | O | O | O | X | O | X |
| 52 | 0h1B34 | Stall Level 1 | Stall level 1 | 30~250 (%) | 180 | X | O | O | X | O | X |
| 53 | 0h1B35 | Stall Freq 2 | Stall frequency 2 | Stall frequency 1 -stall frequency 2 (Hz) | 60.00 | O | O | O | X | O | X |
| 54 | 0h1B36 | Stall Level 2 | Stall level 2 | 30~250 (%) | 180 | X | O | O | X | O | X |
| 55 | 0h1B37 | Stall Freq 3 | Stall frequency 3 | Stall frequency 2 -stall frequency 4 (Hz) | 60.00 | O | O | O | X | O | X |
| 56 | 0h1B38 | Stall Level 3 | Stall level 3 | 30~250 (%) | 180 | X | O | O | X | O | X |
| 57 | 0h1B39 | Stall Freq 4 | Stall frequency 4 | Stall frequency 3 -maximum frequency (Hz) | 60.00 | O | O | O | X | O | X |
| 58 | 0h1B3A | Stall Level 4 | Stall level 4 | 30~250 (%) | 180 | X | O | O | X | O | X |
| 66 | 0h1B42 | DB Warn %ED | DB resistance warning level | 0~30 (%) | 0 | O | O | O | O | O | O |
| 70 | 0h1B46 | Over SPD Freq | Overspeed decision frequency | 20~130 (%) | 120.0 | O | X | X | O | X | O |
| 72 | 0h1B48 | Over SPD Time | Overspeed judgment time | 0.01~10.00 (sec) | 0.01 | O | X | X | O | X | O |
| 73 | 0h1B49 | Speed Dev Trip | Speed error failure | 0 No 1 Yes | 0:No | O | X | X | O | X | X |
| 74 | 0h1B4A | Speed Dev Band | Speed error width | 2-maximum frequency (Hz) | 20.00 | O | X | X | O | X | X |
| 75 | 0h1B4B | Speed Dev Time | Speed error judgment time | 0.1~1000.0 (sec) | 1.0 | O | X | X | O | X | X |
| 77 | 0h1B4D | Enc Wire Check | Encoder option connection check | 0 No 1 Yes | 0:No | O | X | X | O | X | O |
| 78 | 0h1B4E | Enc Check Time | Encoder connection check time | 0.1~1000.0 (sec) | 1.0 | O | X | X | O | X | O |
| 79 | 0h1B4F | FAN Trip Mode | Cooling fan fault selection | 0 Trip 1 Warning | 1: Warning | O | O | O | O | O | O |
| 80 | 0h1B50 | Opt Trip Mode | Operation selection on optional module trip | 0 None 1 Free-Run 2 Dec | 1:Free- Run | O | O | O | O | O | O |
| 81 | 0h1B51 | LVT Delay | Low voltage trip decision delay time | 0~60.0 (sec) | 0.0 | X | O | O | O | O | O |
| 82 | 0h1B52 | LV2 Enable | Select 'Low Voltage2' during operation | Bit 00~11 | 0:No | X | O | O | O | O | O |
| | | | | 00 No | | | | | | | |
| | | | | 01 LV2(no saved) | | | | | | | |

| No. | Communi- | LCD Display | Name | Setting Range | | Initial | Shift in | Control Mode | | | | | | |
|-----|----------|-------------|------|---------------|------------|---------|----------|--------------|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
| | | | | 10 | No | | | | | | | | | |
| | | | | 11 | LV2(saved) | | | | | | | | | |

* The grey cells indicate a hidden code which is only visible when setting a code.

Note 40) PRT-10 codes are displayed only when PRT-09(Retry Number) is set above "0".

Note 41) PRT-13-15 codes are displayed only when PRT-12(Lost Cmd Mode) is not "None".

Note 42) PRT-32-33 codes are displayed only when PRT-31(No Motor Trip is set as "Free-Run".

8.12 Parameter Mode – 2nd Motor Function Group (→M2)

2nd Motor Function Group (PAR → M2)

| No. | Communi- cation Address | LCD Display | Name | Setting Range | Initial Value | Shift in Opera- tion | Control Mode | | | | | |
|-----|-------------------------------|-----------------|--------------------------------------|---------------------------|--------------------------------|----------------------------|--------------|--------|-------------|-------------|-------------|---|
| | | | | | | | V / F | S L | V L C | S L T | V C T | |
| 00 | - | Jump Code | Jump code | 0-99 | 14 | O | O | O | X | O | X | |
| 04 | 0h1C04 | M2-Acc Time | Acceleration time | 0-600 (sec) | Below 75 kW | 20.0 | O | O | O | X | O | X |
| | | | | | Above 90 kW | 60.0 | | | | | | |
| 05 | 0h1C05 | M2-Dec Time | Deceleration time | 0-600 (sec) | Below 75 kW | 30.0 | O | O | O | X | O | X |
| | | | | | Above 90 kW | 90.0 | | | | | | |
| 06 | 0h1C06 | M2-Capacity | Motor capacity | 0 0.2 kW 21 185 kW | - | X | O | O | X | O | X | |
| 07 | 0h1C07 | M2-Base Freq | Base frequency | 30-400 (Hz) | 60.00 | X | O | O | X | O | X | |
| 08 | 0h1C08 | M2-Ctrl Mode | Control mode | 0 V/F | 0:V/F | X | O | O | X | O | X | |
| | | | | 1 V/F PG | | | | | | | | |
| | | | | 2 Slip Compen | | | | | | | | |
| | | | | 3 Sensorless-1 | | | | | | | | |
| | | | | 4 Sensorless-2 | | | | | | | | |
| 10 | 0h1C0A | M2-Pole Num | Motor pole | 2-48 | | X | O | O | X | O | X | |
| 11 | 0h1C0B | M2-Rated Slip | Rated slip speed | 0-3000 (rpm) | | X | O | O | X | O | X | |
| 12 | 0h1C0C | M2-Rated Curr | Motor rated current | 1.0-1000.0 (A) | | X | O | O | X | O | X | |
| 13 | 0h1C0D | M2-No-load Curr | Motor no-load current | 0.5-1000.0 (A) | | X | O | O | X | O | X | |
| 14 | 0h1C0E | M2-Rated Volt | Motor rated voltage | 180-480 (V) | | X | O | O | X | O | X | |
| 15 | 0h1C0F | M2-Efficiency | Motor efficiency | 70-100 (%) | Dependent on motor capacity | X | | | | | | |
| 16 | 0h1C10 | M2-Inertia Rt | Load inertia ratio | 0-8 | | X | O | O | X | O | X | |
| 17 | - | M2-Rs | Stator resistance | 0-9.999 (Ω) | | X | | | | | | |
| 18 | - | M2-Lsigma | Leak inductance | 0-99.99 (mH) | | X | | | | | | |
| 19 | - | M2-Ls | Stator inductance | 0-999.9 (mH) | | X | O | O | X | O | X | |
| 20 | - | M2-Tr | Rotor time constant | 25-5000 (ms) | | X | O | O | X | O | X | |
| 25 | 0h1C19 | M2-V/F Patt | V/F pattern | 0 Linear | 0:Linear | X | O | O | X | O | X | |
| | | | | 1 Square | | | | | | | | |
| | | | | 2 User V/F | | | | | | | | |
| 26 | 0h1C1A | M2-Fwd Boost | Forward torque boost | 0-15 (%) | Below 75 kW: 2.0 | X | O | O | X | O | X | |
| 27 | 0h1C1B | M2-Rev Boost | Reverse torque boost | 0-15 (%) | Above 90 kW: 1.0 | X | O | O | X | O | X | |
| 28 | 0h1C1C | M2-Stall Lev | Stall prevention level | 30-150 (%) | 150 | X | O | O | X | O | X | |
| 29 | 0h1C1D | M2-ETH 1min | Electronic thermal one minute rating | 100-200 (%) | 150 | X | O | O | X | O | X | |
| 30 | 0h1C1E | M2-ETH Cont | Electronic thermal continuous rating | 50-150 (%) | 100 | X | O | O | X | O | X | |

| No. | Communi- | LCD Display | Name | Setting Range | Initial Value | Shift in | Control Mode |
|--------------|----------|----------------|--------------------------|--------------------|---------------|----------|--------------|
| 40 | 0h1C28 | M2-LoadSpdGain | Revolution display gain | 0.1–6000.0 (%) | 100.0 | 0 | 0 0 0 0 0 |
| 41 | 0h1C29 | M2-LoadSpdScal | Revolution display scale | 0 x 1 | 0:x 1 | 0 | 0 0 0 0 0 |
| | | | | 1 x 0.1 | | | |
| | | | | 2 x 0.01 | | | |
| | | | | 3 x 0.001 | | | |
| 4 x 0.0001 | | | | | | | |
| 42 | 0h1C2A | M2-LoadSpdUnit | Revolution display unit | 0 Rpm 1 Mpm | 0:rpm | 0 | 0 0 0 0 0 |

8.13 Trip Mode (TRP Current (or Last-x))

Trip Mode (TRP Last-x)

| No. | LCD Display | Name | Setting Range | Initial Value |
|-----|----------------|---------------------------------|---------------|---------------|
| 00 | Trip Name (x) | Trip type display | - | - |
| 01 | Output Freq | Output frequency at trip | - | - |
| 02 | Output Current | Output current at trip | - | - |
| 03 | Inverter State | Acc/Dec status at trip | - | - |
| 04 | DCLink Voltage | DC voltage | - | - |
| 05 | Temperature | NTC temperature | - | - |
| 06 | DI State | Status of input terminals | - | 0000 0000 |
| 07 | DO State | Status of output terminals | - | 000 |
| 08 | Trip On Time | Trip time since power on | - | 0/00/00 00:00 |
| 09 | Trip Run Time | Trip time since operation start | - | 0/00/00 00:00 |
| 10 | Trip Delete | Delete trip history | 0 No | 0:No |
| | | | 1 Yes | |

8.14 Config Mode (CNF)

Config Mode (CNF)

| No. | LCD Display | Name | Setting Range | Initial Value |
|------------|--------------|---------------------------|---------------|---------------|
| 00 | Jump Code | Jump code | 0-99 | 1 |
| 01 | Language Sel | Keypad language selection | 0. English | 0. English |
| | | | 1. Russian | |
| | | | 2. Español | |
| | | | 3. Polski | |
| 4. Turkish | | | | |
| 02 | LCD Contrast | LCD contrast adjustment | - | - |

Table of Functions

| No. | LCD Display | Name | Setting Range | Initial Value |
|------------------------------|----------------|-----------------------------|--------------------|------------------|
| 10 | Inv S/W Ver | Inverter S/W version | - | 1.XX |
| 11 | KeypadS/W Ver | Keypad S/W version | - | 1.XX |
| 12 | KPD Title Ver | Keypad title version | - | 1.XX |
| 20 <small>Note43)</small> | Anytime Para | Status display | 0 Frequency | 0: Frequency |
| 21 | Monitor Line-1 | Monitor mode display 1 | 1 Speed | 0: Frequency |
| 22 | Monitor Line-2 | Monitor mode display 2 | 2 Output Current | 2:Output Current |
| 23 | Monitor Line-3 | Monitor mode display 3 | 3 Output Voltage | 3:Output Voltage |
| | | | 4 Output Power | |
| | | | 5 WHour Counter | |
| | | | 6 DCLink Voltage | |
| | | | 7 DI State | |
| | | | 8 DO State | |
| | | | 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 | | | | |
| 24 | Mon Mode Init | Monitor mode initialization | 0 No | 0:No |
| | | | 1 Yes | |
| 30 | Option-1 Type | Option slot 1 type display | 0 None | 0:None |
| 31 | Option-2 Type | Option slot 2 type display | 1 PLC | 0:None |
| 32 | Option-3 Type | Option slot 3 type display | 2 Profi | 0:None |
| | | | 3 Ext. I/O | |
| | | | 4 Encoder | |
| 40 | Parameter Init | Parameter initialization | 0 No | - |
| | | | 1 All Grp | |
| | | | 2 DRV Grp | |
| | | | 3 BAS Grp | |
| | | | 4 ADV Grp | |
| | | | 5 CON Grp | |
| | | | 6 IN Grp | |
| | | | 7 OUT Grp | |
| 8 COM Grp | | | | |

| No. | LCD Display | Name | Setting Range | Initial Value |
|-----|-----------------|---|---|---------------|
| | | | 9 APP Grp | |
| | | | 10 AUT Grp | |
| | | | 11 APO Grp | |
| | | | 12 PRT Grp | |
| | | | 13 M2 Grp | |
| 41 | Changed Para | Display changed parameter | 0 View All 1 View Changed | 0:View All |
| 42 | Multi Key Sel | Multi-function key item | 0 None 1 JOG Key 2 Local/Remote 3 UserGrp SelKey | 0:None |
| 43 | Macro Select | Macro function item | 0 None 1 Draw App 2 Traverse | 0:None |
| 44 | Erase All Trip | Delete trip history | 0 No 1 Yes | 0:No |
| 45 | UserGrp AllDel | Delete user registration code | 0 No 1 Yes | 0:No |
| 46 | Parameter Read | Read parameters | 0 No 1 Yes | 0:No |
| 47 | Parameter Write | Write parameters | 0 No 1 Yes | 0:No |
| 48 | Parameter Save | Save parameters | 0 No 1 Yes | 0:No |
| 50 | View Lock Set | Hide parameter mode | 0-9999 | Unlocked |
| 51 | View Lock Pw | Password for hiding parameter mode | 0-9999 | Password |
| 52 | Key Lock Set | Lock parameter edit | 0-9999 | Unlocked |
| 53 | Key Lock Pw | Password for locking parameter edit | 0-9999 | Password |
| 60 | Add Title Del | Additional title update | 0 No 1 Yes | 0:No |
| 61 | Easy Start On | Simple parameter setting | 0 No 1 Yes | 0:No |
| 62 | WHCount Reset | Power consumption initialization | 0 No 1 Yes | 0:No |
| 70 | On-time | Accumulated inverter motion time | 0000DAY 00hr:00mm | - |
| 71 | Run-time | Accumulated inverter operation time | 0000DAY 00hr:00mm | - |
| 72 | Time Reset | Accumulated inverter operation time initialization | 0 No 1 Yes | 0:No |
| 74 | Fan Time | Accumulated cooling fan operation time | 0000DAY 00hr:00mm | - |
| 75 | Fan Time Rst | Accumulated cooling fan operation time initialization | 0 No 1 Yes | - |

Note 43) Item 7 and 8 are not in the Anytime Para item.

8.15 User/Macro Mode – Draw Operation Function Group → MC1

U&M → MC1

| No. | LCD Display | Name | Setting Range | Initial Value | |
|-----|----------------|------------------------------------|---------------|---------------|----|
| 00 | Jump Code | Jump code | 0-99 | 1 | |
| 01 | Acc Time | Acceleration time | 0-600 (sec) | Below 75 kW | 20 |
| | | | | Above 90 kW | 60 |
| 02 | Dec Time | Deceleration time | 0-600 (sec) | Below 75 kW | 30 |
| | | | | Above 90 kW | 90 |
| 03 | Cmd Source | Command source | 0-5 | 1:Fx/Rx-1 | |
| 04 | Freq Ref Src | Frequency reference source | 0-9 | 2:V1 | |
| 05 | Control Mode | Control mode | 0-5 | 0:V/F | |
| 06 | Aux Ref Src | Auxiliary reference source | 0-4 | 2:11 | |
| 07 | Aux Calc Type | Auxiliary calculation type | 0-7 | 0 | |
| 08 | Aux Ref Gain | Auxiliary reference gain | -200-200 (%) | 100.0 | |
| 09 | V1 Polarity | V1 input polarity selection | 0-1 | 0:Unipolar | |
| 10 | V1 Filter | V1 input filter time constant | 0-10000 (ms) | 10 | |
| 11 | V1 Volt x1 | V1 minimum input voltage | 0-10 (V) | 0.00 | |
| 12 | V1 Perc y1 | Output at V1 minimum voltage (%) | 0-100 (%) | 0.00 | |
| 13 | V1 Volt x2 | V1 maximum input voltage | 0-10 (V) | 10.00 | |
| 14 | V1 Perc y2 | Output at V1 maximum voltage (%) | 0-100 (%) | 100.00 | |
| 15 | V1 -Volt x1' | V1 -minimum input voltage | -10-0 (V) | 0.00 | |
| 16 | V1 -Perc y1' | Output at V1 -minimum voltage (%) | -100-0 (%) | 0.00 | |
| 17 | V1 -Volt x2' | V1 -maximum input voltage | -10-0 (V) | -10.00 | |
| 18 | V1 -Perc y2' | Output at V1 -maximum voltage (%) | -100-0 (%) | -100.00 | |
| 19 | V1 Inverting | Rotation direction change | 0-1 | 0:No | |
| 20 | I1 Monitor(mA) | I1 input amount display | 0-20 (mA) | 0.00 | |
| 21 | I1 Polarity | I1 polarity display | 0-1 | 0 | |
| 22 | I1 Filter | I1 input filter time constant | 0-10000 (ms) | 10 | |
| 23 | I1 Curr x1 | I1 minimum input current | 0-20 (mA) | 4.00 | |
| 24 | I1 Perc y1 | Output at I1 minimum current (%) | 0-100 (%) | 0.00 | |
| 25 | I1 Curr x2 | I1 maximum input current | 4-20 (mA) | 20.00 | |
| 26 | I1 Perc y2 | Output at I1 maximum current (%) | 0-100 (%) | 100.00 | |
| 27 | I1 Curr x1' | I1 -minimum input current | -20-0 (mA) | 0.00 | |
| 28 | I1 Perc y1' | Output at I1 - minimum current (%) | -100-0 (%) | 0.00 | |
| 29 | I1 Curr x2' | I1 - maximum input current | -20-0 (mA) | -20.00 | |
| 30 | I1 Perc y2' | Output at I1 maximum current (%) | -100-0 (%) | -100.00 | |
| 31 | I1 Inverting | Rotation direction change | 0-1 | 0:No | |
| 32 | P1 Define | P1 terminal function setting | 0-48 | 0:FX | |
| 33 | P2 Define | P2 terminal function setting | 0-48 | 1:RX | |
| 34 | P3 Define | P3 terminal function setting | 0-48 | 5:BX | |

8.16 User/Macro mode – Traverse Operation Function Group (→MC2)

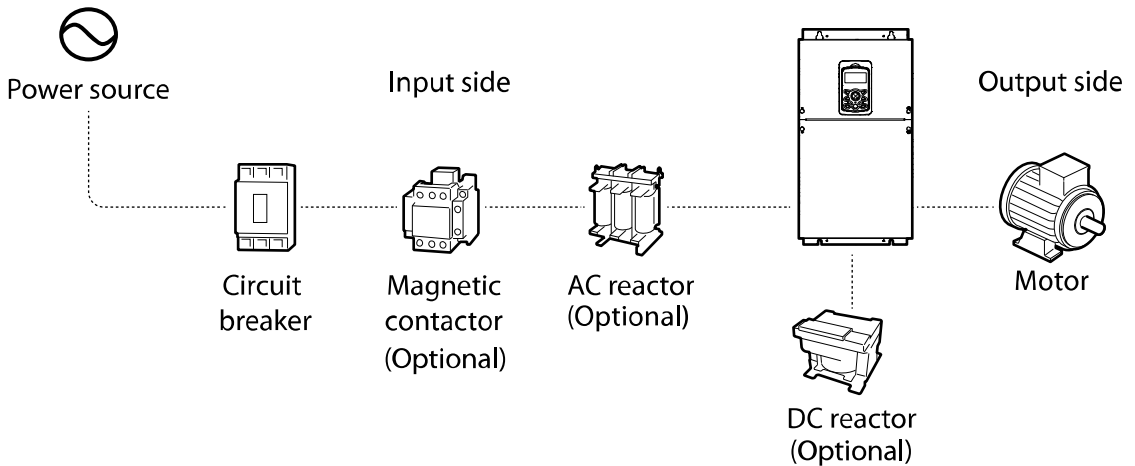
Traverse Operation Function Group (U&M → MC2)

| No. | LCD Display | Name | Setting Range | Initial Value | |
|-----|---------------|------------------------------|---------------|---------------|----|
| 00 | Jump Code | Jump code | 0–99 | 1 | |
| 01 | Acc Time | Acceleration time | 0–600 (sec) | Below 75 kW | 20 |
| | | | | Above 90 kW | 60 |
| 02 | Dec Time | Deceleration time | 0–600 (sec) | Below 75 kW | 30 |
| | | | | Above 90 kW | 90 |
| 03 | Cmd Source | Command source | 0–5 | 1:Fx/Rx-1 | |
| 04 | Freq Ref Src | Frequency reference source | 0–9 | 0:Keypad-1 | |
| 05 | Control Mode | Control mode | 0–5 | 0:V/F | |
| 06 | App Mode | Applied function selection | 0–4 | 1:Traverse | |
| 07 | Trv Apmlit % | Traverse operating range | 0–20 (%) | 0.0 | |
| 08 | Trv Scramb % | Traverse scramble magnitude | 0–50 (%) | 0.0 | |
| 09 | Trv Acc Time | Traverse acceleration time | 0.1–600 (sec) | 2.0 | |
| 10 | Trv Dec Time | Traverse deceleration time | 0.1–600 (sec) | 2.0 | |
| 11 | Trv Offset Hi | Traverse offset upper limit | 0–20 (%) | 0.0 | |
| 12 | Trv Offset lo | Traverse offset lower limit | 0–20 (%) | 0.0 | |
| 13 | P1 Define | P1 terminal function setting | 0–48 | 0:FX | |
| 14 | P2 Define | P2 terminal function setting | 0–48 | 1:RX | |
| 15 | P3 Define | P3 terminal function setting | 0–48 | 5:BX | |
| 16 | P4 Define | P4 terminal function setting | 0–48 | 27:Trv | |
| 17 | P5 Define | P5 terminal function setting | 0–48 | 28:Trv | |

9 Peripheral Devices

The reference diagram below shows a typical system configuration showing the inverter and peripheral devices.

Prior to installing the inverter, ensure that the product is suitable for the application (power rating, capacity, etc.). Also, ensure that all of the required peripherals and optional devices (resistor brakes, contactors, noise filters, etc.) are available.



⚠ Caution

- Figures in this manual are shown with covers or circuit breakers removed to show a more detailed view of the installation arrangements. Install covers and circuit breakers before operating the inverter. Operate the product according to the instructions in this manual.
- Supply input power within the voltage range approved for the inverter's rating.
- Do not start or stop the inverter using a magnetic contactor installed in the input power supply.
- If the inverter is damaged and loses control, the machine may cause a dangerous situation. Install an additional safety device, such as an emergency brake, to prevent these situations.
- High levels of current draw during power-on can affect the system. Ensure that correctly rated circuit breakers are installed to operate safely during power-on situations.
- Reactors can be installed to improve the power factor. Note that reactors may be installed within 32.8 ft (10 m) of the power source if the input power exceeds 1000 kVA.
- 400 V class inverters require a motor with reinforced insulation. Micro surge voltages generated at the motor terminals may deteriorate the motor insulation.

9.1 Wiring Switch, Electronic Contactor, and Reactor Specifications

9.1.1 Wiring Switch, Short Circuit Switch, and Electronic Contactor

| Inverter Capacity | Wiring Switch | | | | Short Circuit Switch | | Electronic Contactor | |
|-------------------|---------------|------------------|--------|------------------|----------------------|------------------|----------------------|------------------|
| | METASOL | | SUSOL | | Model | Rated current[A] | Model | Rated current[A] |
| | Model | Rated current[A] | Model | Rated current[A] | | | | |
| 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 |
| 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 |

| Inverter Capacity | Wiring Switch | | | | Short Circuit Switch | | Electronic Contactor | |
|-------------------|---------------|------------------|---------|------------------|----------------------|------------------|----------------------|------------------|
| | METASOL | | SUSOL | | Model | Rated current[A] | Model | Rated current[A] |
| | Model | Rated current[A] | Model | Rated current[A] | | | | |
| 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 |

⚠ Caution

Only use Class H or RK5 UL listed input fuses and UL listed breakers. See the table above for the voltage and current ratings for the fuses and breakers.

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

Note

- If you install the recommended reactors, you can maintain the power factor above 85%, and keep the THD below 40% for operations at the rated load. Improvements are reduced at lighter loads.
- Cable impedance affects the input power factor and occurrence of harmonic waves. The input power factor and THD improvement of the reactors may be lower depending on the transformer capacity, the transformer impedance, and the cable length.
- Refer to the specifications table and install recommended reactors. Although a higher inductance value (L) of the reactor results in an improvement in the power factor and better suppression of harmonic effects, power loss increases at the same time due to voltage drop.
- The capacity of built-in DC reactors in some iS7 inverter models is based on the normal duty load factor. Therefore, improvements may be reduced during a heavy duty operation.

9.1.2 Reactors

DC Reactor Specifications

The iS7 200 V / 400V 30–75 kW, 400 V/280–375 kW models are not supplied with a built-in DC reactor. Refer to the following specifications tables for different models to choose an appropriate DC reactor for your application.

<200V/30–75kW>

| Inverter capacity | DC reactor specifications | |
|-------------------|---------------------------|-----|
| | 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 |

<400V/30–75kW>

(For Non-DCR products, remove the P1 and P2 shorting pins to install the DC reactor.)

| Inverter capacity | DC reactor specifications | |
|-------------------|---------------------------|-----|
| | mH | A |
| 0300iS7-4 | 0.98 | 75 |
| 0370iS7-4 | 0.87 | 90 |
| 0450iS7-4 | 0.55 | 110 |
| 0550iS7-4 | 0.47 | 150 |
| 0750iS7-4 | 0.48 | 180 |

<400V/280–375 kW>

| Inverter capacity | DC reactor specifications | |
|-------------------|---------------------------|------|
| | mH | A |
| 2800iS7-4 | 0.09 | 836 |
| 3150iS7-4 | 0.076 | 996 |
| 3750iS7-4 | 0.064 | 1195 |

Note

All iS7 models, other than the 200 V/30–75 kW and 400 V/280–375 kW models, may be provided with an optional built-in DC reactor.

AC Reactor Specifications

You can install an AC reactor to prevent the capacitors and generators from overheating or being damaged when the power source voltage is unbalanced.

When you install an AC reactor, connect the AC reactor cables to the R, S, and T terminals on the inverter. Installation of an AC reactor is not necessary if a DC reactor is already installed in the inverter.

To avoid power loss resulting from the incorrect installation of an AC reactor, contact LSELECTRIC Customer Support to ensure that your model type and application requires the installation of an AC reactor.

Refer to the following specifications tables to choose an appropriate AC reactor for your application.

| Inverter capacity | AC reactor specifications | | | |
|-------------------|---------------------------|-----|-------------|-----|
| | 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 |
| 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 |

| Inverter capacity | AC reactor specifications | | | |
|-------------------|---------------------------|-----|-------------|-----|
| | Heavy duty | | Normal duty | |
| | mH | A | mH | A |
| 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 |

9.1.3 Dynamic Braking Unit (DBU) and Resistor

Dynamic Braking Unit Specifications

| UL form | Type | Voltage | Capacity of applied motor | Braking unit | Reference-Terminal arrangement & dimensions | |
|-----------------|---|------------------|---------------------------|--------------------|---|---------|
| UL type | Type A (For resistance of DB resistors, refer to <u>9.1.6 DB Resistors</u> on page 220.) | 200 V | 30–37 kW | SV370DBU-2U | Group 1 | |
| | | | 45–55 kW | SV550DBU-2U | | |
| | | | 75 kW | SV370DBU-2U, 2Set | | |
| | | 400 V | 30–37 kW | SV370DBU-4U | | |
| | | | 45–55 kW | SV550DBU-4U | | |
| | | | 75 kW | SV750DBU-4U | | |
| | | | 90 kW | SV550DBU-4U, 2Set | | |
| | | | 110–132 kW | SV750DBU-4U, 2Set | | |
| | | 160 kW | SV750DBU-4U, 3Set | | | |
| Non UL type | Type B (For resistance of DB resistors, refer to the DB Unit manual) | 200 V | 30–37 kW | SV037DBH-2 | Group 2 | |
| | | 400 V | 30–37 kW | SV037DBH-4 | | |
| | | | 45–55 kW, 75 kW | SV075DBH-4 | | |
| | | | | SV075DB-4 | | Group 3 |
| | | | 185–220 kW | SV2200DB-4 Note 1) | | Group 4 |
| | 280–375 Kw | SV2200DB-4, 2Set | | | | |
| | Type C (For resistance of DB resistors, refer to the DB Unit manual) | 200 V | 30–37 kW | LSLV0370DBU-2LN | Group 5 | |
| | | | | LSLV0370DBU-2HN | Group 6 | |
| | | | 45–55 kW, 75 kW | LSLV0750DBU-2LN | Group 5 | |
| | | | | LSLV0750DBU-2HN | Group 6 | |
| | | 400 V | 30–37 kW | LSLV0370DBU-4LN | Group 5 | |
| | | | | LSLV0370DBU-4HN | Group 6 | |
| 45–55 kW, 75 kW | | | LSLV0750DBU-4LN | Group 5 | | |
| | | | 90 kW | LSLV0900DBU-4HN | Group 6 | |
| 110–132 kW | LSLV1320DBU-4HN | | | | | |
| 160 kW | LSLV1600DBU-4HN | | | | | |
| 185–220 kW | LSLV2200DBU-4HN | | | | | |
| | | 280–375 kW | LSLV2200DBU-4HN, | | | |

| UL form | Type | Voltage | Capacity of applied motor | Braking unit | Reference-Terminal arrangement & dimensions |
|---------|------|---------|---------------------------|--------------|---|
| | | | | 2Set | |

Note 1) For model types with a rated capacity of 180 kW and above, contact LSELECTRIC Customer Support for detailed information.

Note

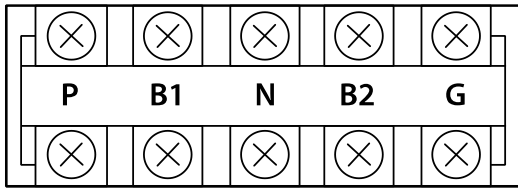
- The 0.75–22kW (200 V/400 V) models are provided with a built-in dynamic braking unit. Installation of additional dynamic braking units is not necessary for these models.
- Refer to the instruction manual provided by the manufacturer before installing a dynamic braking unit. There may be specification changes that are not reflected in the table provided with this manual.
- For detailed specifications of type A DB units, such as resistance/wattage/braking torque/%ED, refer to the table in 9.1.6 DB Resistors on page 220. For type B and type C DB units, refer to the instruction manual provided by the manufacturer.

DBU Terminal Arrangement

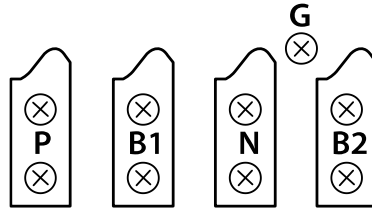
| Group 1 | Group 2 |
|---------------------|-------------------|
| P N G B1 B2 | G N B2 P/B1 |

| Terminal | Description |
|----------|---|
| G | Ground Terminal |
| B2 | Connect to the B2 terminal of a braking resistor. |
| B1 | Connect to the B1 terminal of a braking resistor. |
| N | Connect to the N terminal of an inverter. |
| P | Connect to the P1 terminal of an inverter. |

Group 3 (75 kW DB unit)

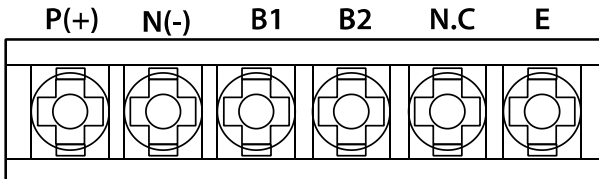


Group 4 (220 kW DB unit)

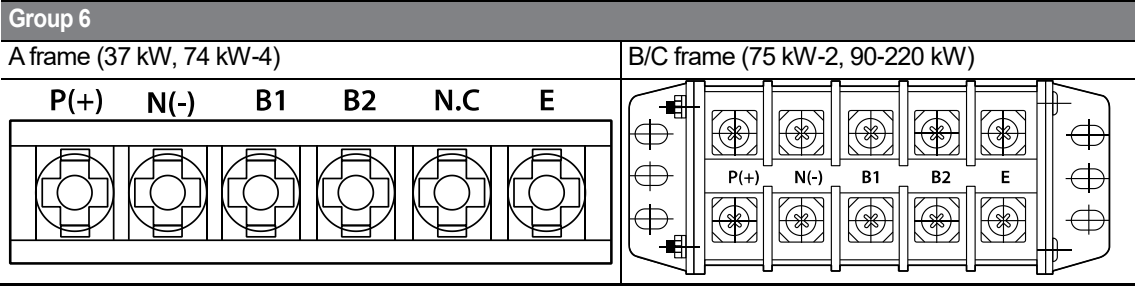


| Terminal | Description |
|----------|---|
| G | Ground Terminal |
| B2 | Connect to the B2 terminal of a braking resistor. |
| B1 | Connect to the B1 terminal of a braking resistor. |
| N | Connect to the N terminal of an inverter. |
| P | Connect to the P terminal of an inverter. |

Group 5



| Terminal | Description |
|----------|---|
| P (+) | Connect to the P terminal of an inverter. |
| N (-) | Connect to the N terminal of an inverter. |
| B1 | Connect to the B1 terminal of a braking resistor. |
| B2 | Connect to the B2 terminal of a braking resistor. |
| N.C | Not used |
| E | Ground terminal |

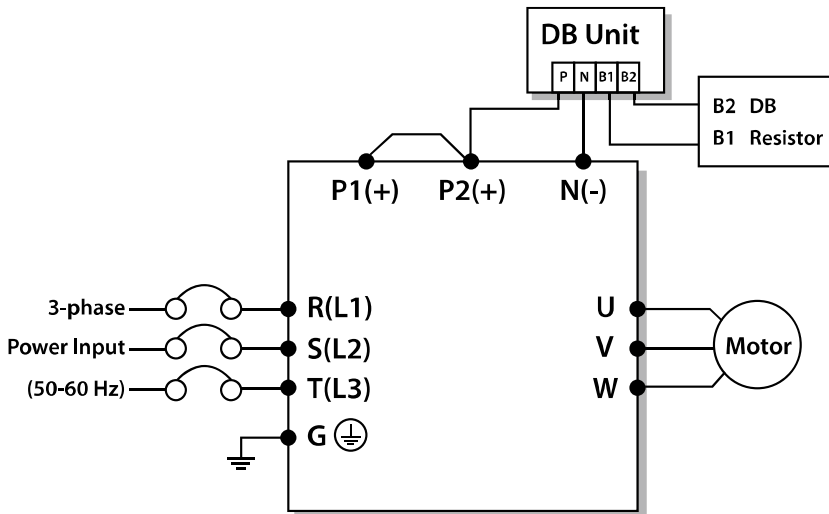


| Terminal | Description |
|----------|---|
| P (+) | Connect to the P terminal of an inverter (DC bus). |
| N (-) | Connect to the N terminal of an inverter (DC bus). |
| B1 | Connect to the B1 terminal of an external braking resistor. |
| B2 | Connect to the B2 terminal of an external braking resistor. |
| N.C | Not used |
| E | Ground terminal |

Note

Refer to the instruction manual that is supplied with the DB unit to choose appropriate DB resistors for installation.

Basic Wiring Connection for the DB Unit and DB Resistor

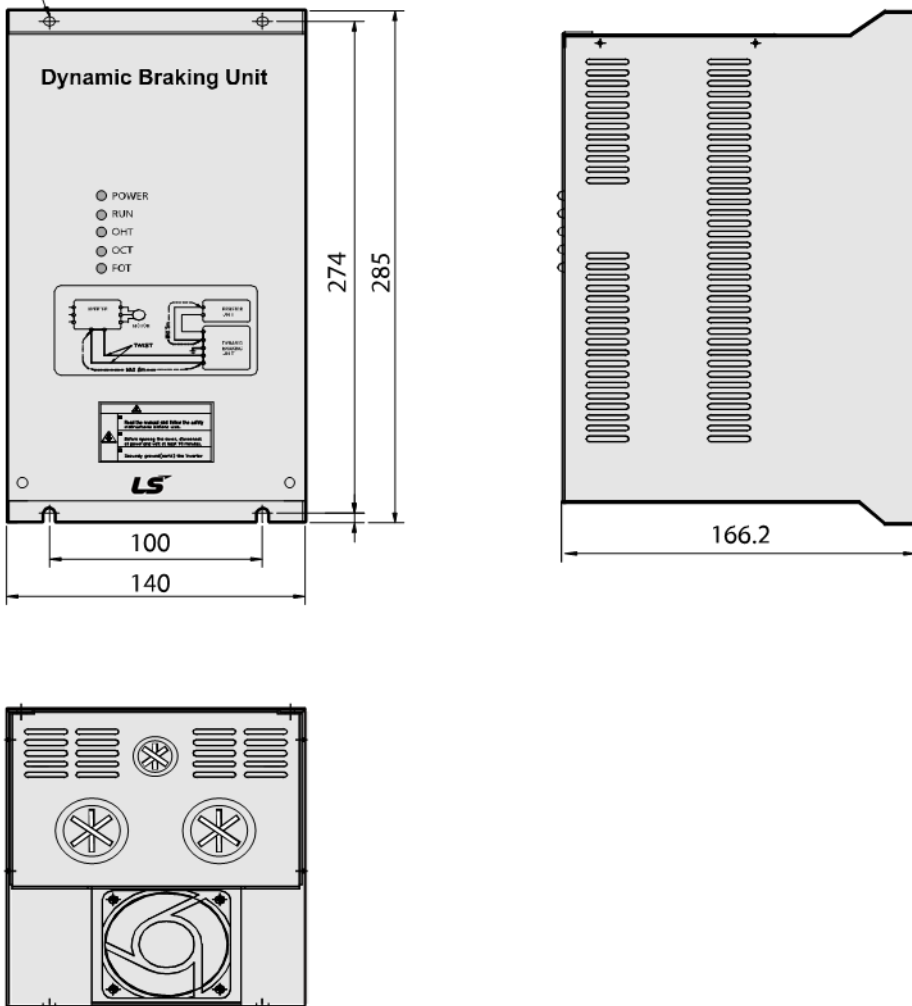


| DB Unit Terminal | Description |
|------------------|--|
| B1 | Connect to the B1 terminal of a DB resistor. |
| B2 | Connect to the B2 terminal of a DB resistor. |

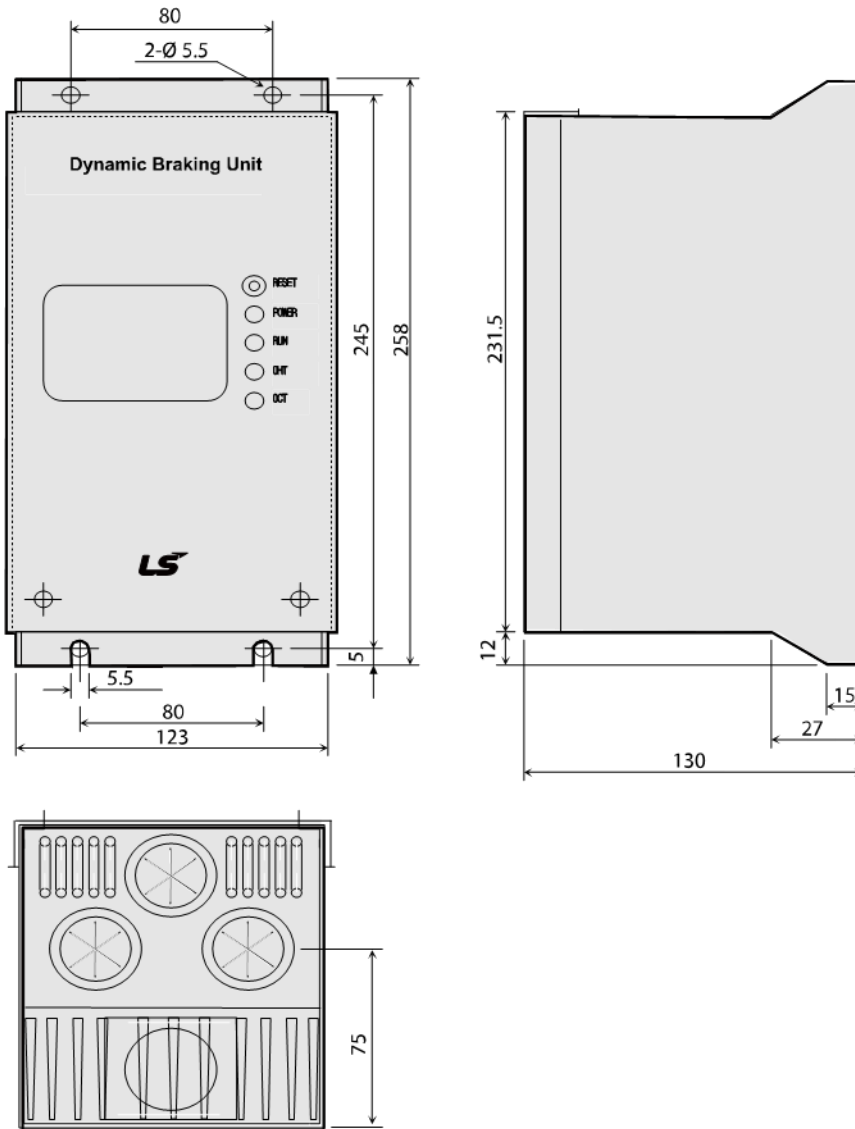
9.1.4 DB Unit Dimensions

Group 1

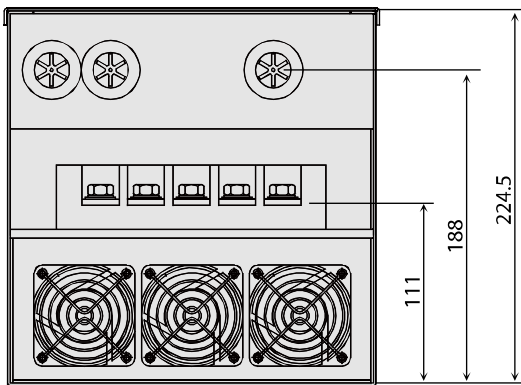
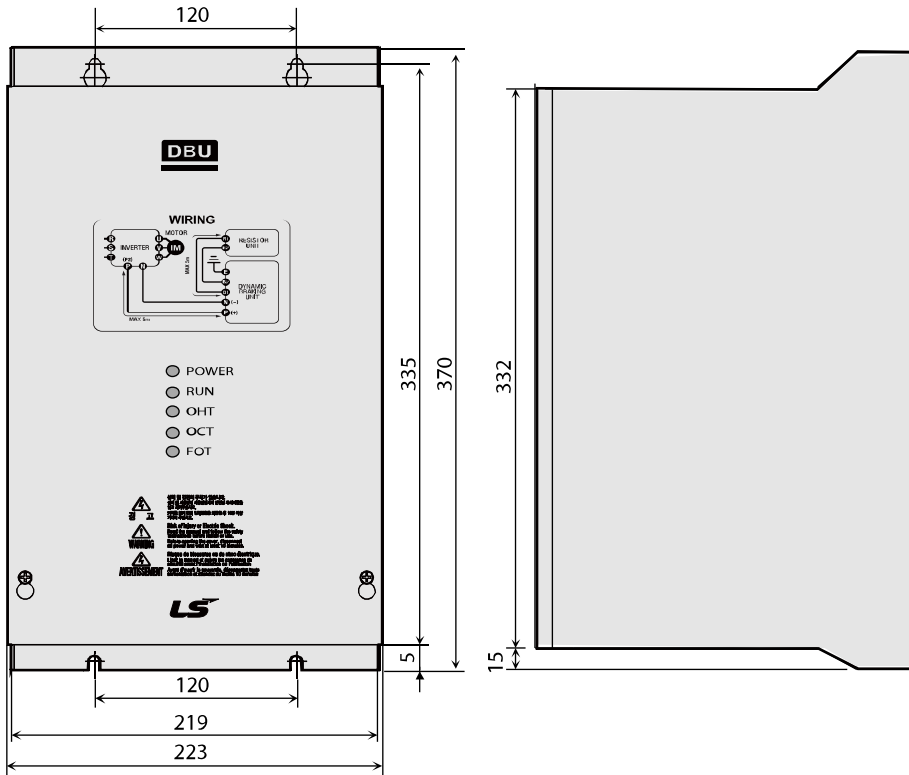
M4–M5 Mounting



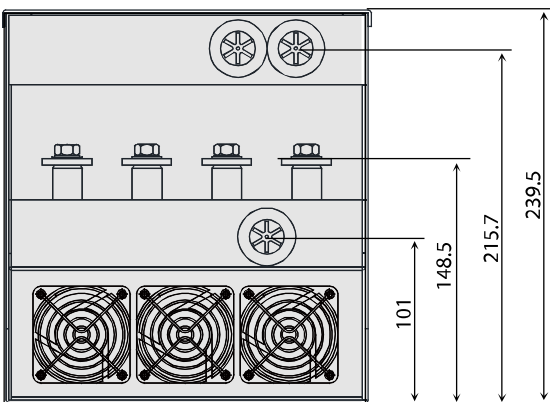
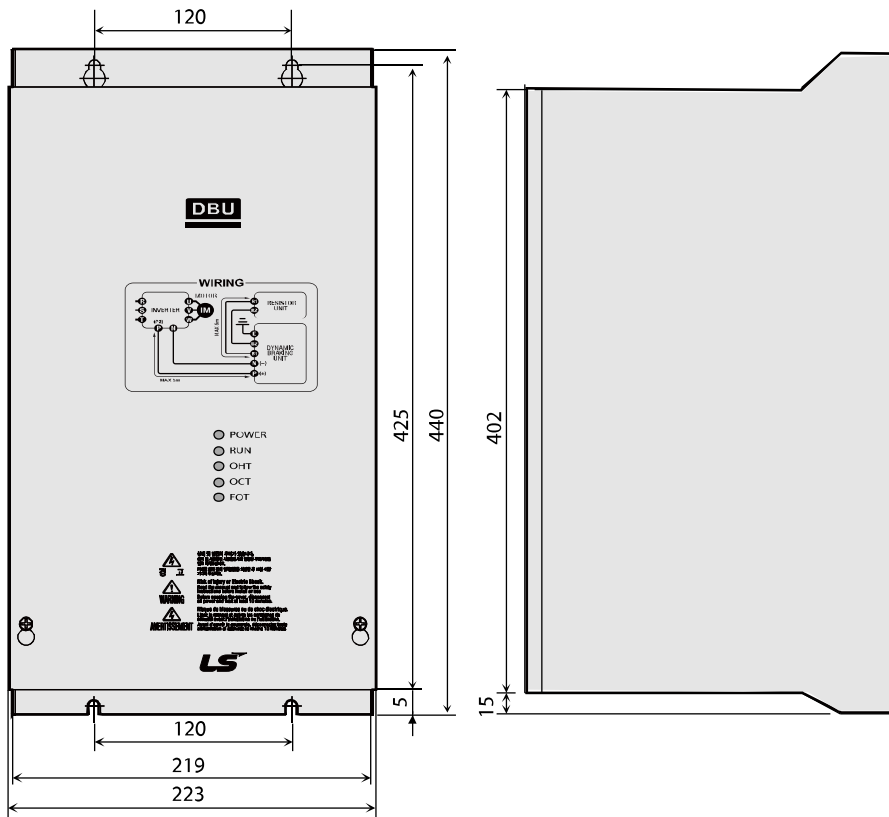
Group 2



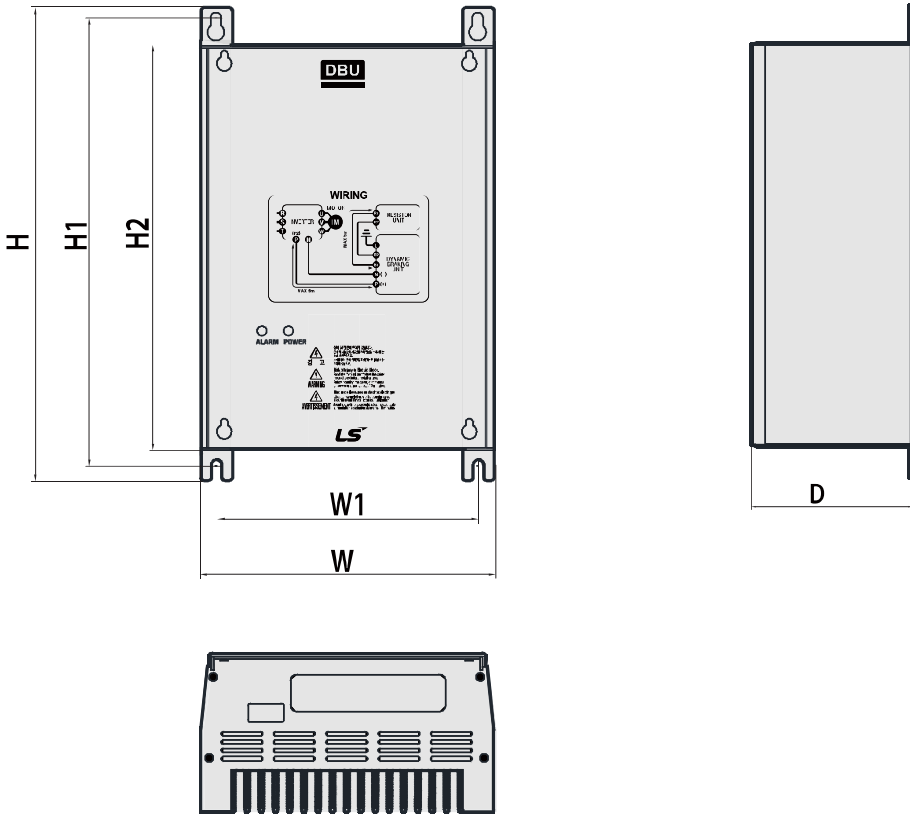
Group 3



Group 4

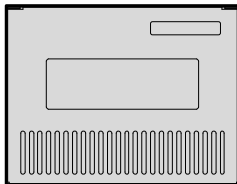
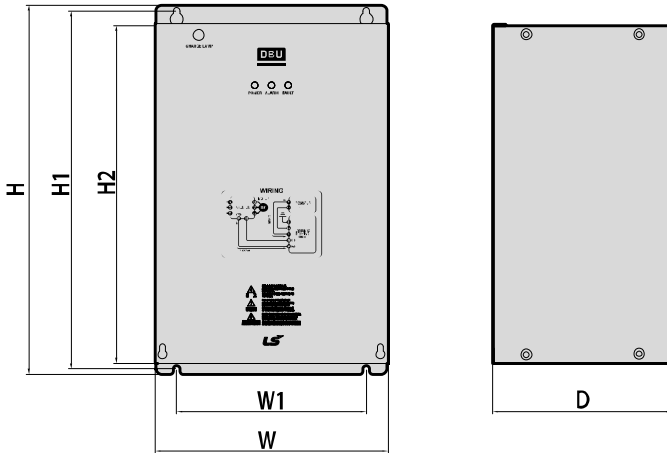
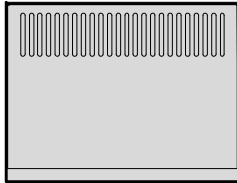


Group 5



| Voltage | Motor capacity | Dimensions (mm) | | | | Hole position | | Weight | Hole size |
|---------|----------------|-----------------|-------|-----|------|---------------|-------|--------|-----------|
| | | W | H | H2 | D | W1 | H1 | | |
| 220 | 15 | 140 | 227.4 | 192 | 76.4 | 125 | 215.4 | 1.50 | M4 |
| | 22 | | | | | | | 1.55 | |
| | 37 | | | | | | | 1.57 | |
| | 75 | | | | | | | 1.84 | |
| 440 | 15 | | | | | | | 1.53 | |
| | 22 | | | | | | | 1.55 | |
| | 37 | | | | | | | 1.56 | |
| | 75 | | | | | | | 1.85 | |

Group 6



| Frame | Voltage | Motor capacity | %ED | Dimensions (mm) | | | | Hole position | | Weight | Hole size |
|-------|---------|----------------|-----|-----------------|-----|-----|-------|---------------|-------|--------|-----------|
| | [V] | | | [kW] | W | H | H2 | D | W1 | | |
| A | 220 | 37 | 50 | 200 | 219 | 190 | 165.2 | 160 | 208.5 | 3.77 | M6 |
| | 440 | 37 | 50 | | | | | | | 3.84 | |
| | | 75 | 50 | | | | | | | 3.98 | |
| B | 220 | 75 | 50 | 215 | 340 | 311 | | 175 | 329.5 | 8.26 | |
| | | 90 | 50 | | | | | | | 8.48 | |
| | 440 | 90 | 50 | | | | | 8.30 | | | |
| | | 132 | 50 | | | | | 8.40 | | | |
| C | 440 | 160 | 50 | 240 | 380 | 351 | | 200 | 369.5 | 9.40 | |
| | | 220 | 50 | | | | | | | 9.70 | |

9.1.5 Indicators on the DB unit

On a DB unit, there are three LED indicators (one red and two green indicators) that indicate the operating condition of the DB unit.

| Indicator name | Color | Location | Description |
|-----------------|-------|----------|--|
| Power indicator | Red | Middle | Turns on when the main power is supplied to the unit (if a DB unit is connected to an inverter, the power indicator is turned on when the main power is supplied to the inverter). |
| RUN indicator | Green | Right | Turns on when the DB unit is regenerating. |
| OHT indicator | Green | Left | Turns on when the overheating protection function is enabled. If the DB unit temperature exceeds the maximum allowed operating temperature, the overheating protection function is activated to cut off the input to the DB unit (the power indicator on the DB unit is turned off). |

9.1.6 DB Resistors

The following table lists type A DB unit specifications for your reference. For type B and type C DB unit specifications, refer to the instruction manuals that are supplied with the DB units.

Before installing a DB resistor, refer to the instruction manuals provided by the manufacturer to choose an appropriate type of DB resistor.

Note

When you double the duty cycle (%ED) of a DB unit, the wattage ratings of the optional DB resistor must be doubled accordingly.

| | Inverter capacity (kW) | Resistance [ohm] | Wattage [W] | Type | Reference | Wiring [mm ²] | Model Type | |
|------------|------------------------|------------------|-------------|--------|---------------------------|----------------------------|----------------|---|
| 200V Class | 0.75 | 150 | 150 | - | 150% braking torque, 5%ED | 1.25 | - | |
| | 1.5 | 60 | 300 | - | | 1.25 | - | |
| | 2.2 | 50 | 400 | TYPE 1 | | 2.5 | MCRF400W50 | |
| | 3.7 | 33 | 600 | TYPE 2 | | 2.5 | MCRF600W33 | |
| | 5.5 | 20 | 800 | TYPE 3 | | 2.5 | MCRF800W20 | |
| | 7.5 | 15 | 1200 | TYPE 5 | | 4 | MCRF1200W15 | |
| | 11 | 10 | 2400 | TYPE 6 | | 4 | MCRF-ST2400W10 | |
| | 15 | 8 | 2400 | TYPE 6 | | 10 | MCRF-ST2400W8 | |
| | 18.5 | 5 | 3600 | TYPE 7 | | 20 | MCRF-ST3600W5 | |
| | 22 | 5 | 3600 | TYPE 7 | | 20 | MCRF-ST3600W5 | |
| | 30 | 5 | 5000 | - | | - | - | |
| | 37 | 4.5 | 7000 | - | | 100% braking torque, 10%ED | - | - |
| | 45 | 3.5 | 10000 | - | | | - | - |
| | 55 | 3.0 | 15000 | - | | | - | - |
| 75 | 2.5 | 20000 | - | - | - | | | |
| 400V Class | 0.75 | 600 | 150 | - | 150% braking torque, 5%ED | 1.25 | - | |
| | 1.5 | 300 | 300 | - | | 2 | - | |
| | 2.2 | 200 | 400 | TYPE 1 | | 2.5 | MCRF400W200 | |
| | 3.7 | 130 | 600 | TYPE 2 | | 2.5 | MCRF600W130 | |
| | 5.5 | 85 | 1000 | TYPE 4 | | 2.5 | MCRF1000W85 | |
| | 7.5 | 60 | 1200 | TYPE 5 | | 2.5 | MCRF1200W60 | |
| | 11 | 40 | 2000 | TYPE 6 | | 2.5 | MCRF-ST2000W40 | |
| | 15 | 30 | 2400 | TYPE 6 | | 4 | MCRF-ST2400W30 | |
| | 18.5 | 20 | 3600 | TYPE 7 | | 6 | MCRF-ST3600W20 | |
| | 22 | 20 | 3600 | TYPE 7 | | 6 | MCRF-ST3600W20 | |
| | 30 | 16.9 | 6,400 | - | | 100% braking torque, 10%ED | - | - |
| | 37 | 16.9 | 6,400 | - | | | - | - |
| | 45 | 11.4 | 9,600 | - | | | - | - |
| | 55 | 11.4 | 9,600 | - | | | - | - |
| 75 | 8.4 | 12,800 | - | - | - | | | |
| 90 | 4.5 | 15,000 | - | - | - | | | |
| 110 | 3.5 | 17,000 | - | - | - | | | |
| 132 | 3.0 | 20,000 | - | - | - | | | |
| 160 | 2.5 | 25,000 | - | - | - | | | |
| 185 | 2 | 30,000 | - | - | - | | | |
| 220 | 2 | 30,000 | - | - | - | | | |
| 280 | 1.5 | 40,000 | - | - | - | | | |
| 315 | 1 | 60,000 | - | - | - | | | |

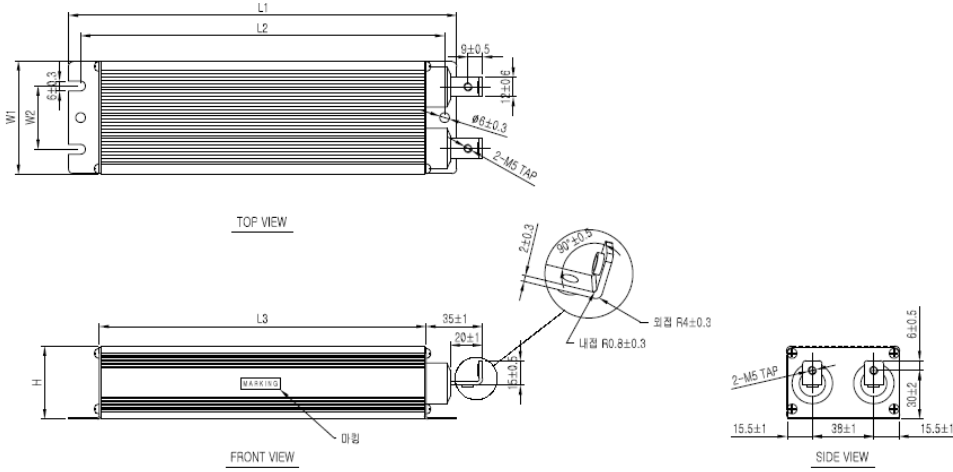
| Inverter capacity (kW) | Resistance [ohm] | Wattage [W] | Type | Reference | Wiring [mm ²] | Model Type |
|------------------------|------------------|-------------|------|-----------|---------------------------|------------|
| 375 | 1 | 60,000 | - | | - | - |

ⓘ Caution

- If you install multiple DB units in parallel, the combined resistance value must match the resistance value in the table above.
- If an appropriate braking resistor type is not listed in the table, find a braking resistor with equivalent resistance and wattage values that are suggested in the table above.

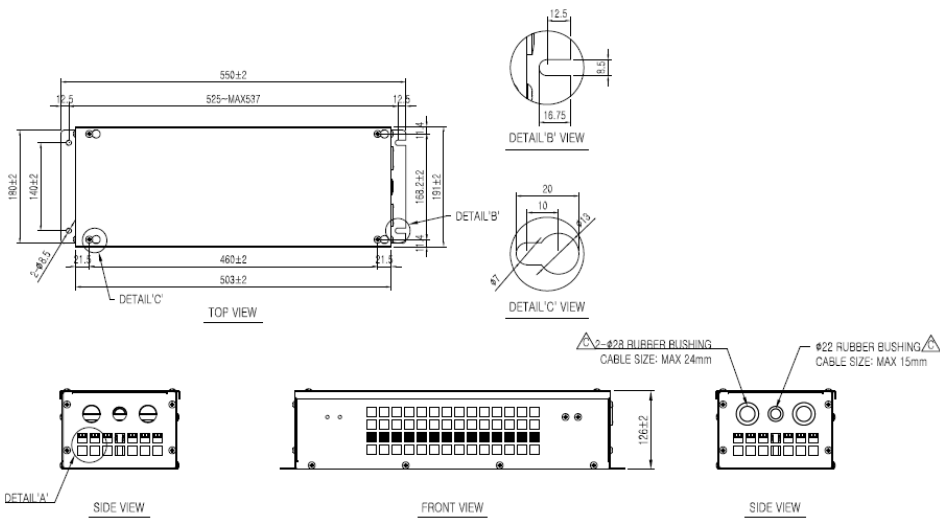
9.1.7 DB Resistor Dimensions

TYPE 1,2,3,4,5 (Maximum 1200 Watts)

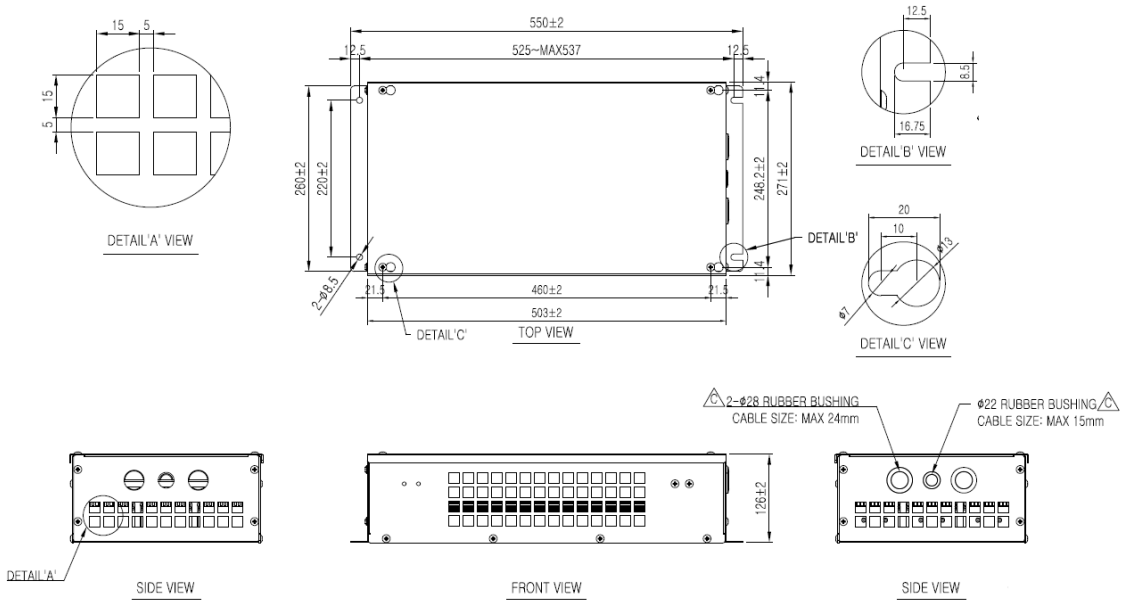


| TYPE | Size [mm] | | | | | |
|------|-----------|-----|-----|----|----|----|
| | W | H | D | A | B | C |
| 1 | 220 | 175 | 152 | 70 | 39 | 45 |
| 2 | 260 | 245 | 222 | 70 | 39 | 45 |
| 3 | 300 | 285 | 262 | 70 | 39 | 45 |
| 4 | 340 | 325 | 302 | 70 | 39 | 45 |
| 5 | 400 | 385 | 362 | 70 | 39 | 45 |

TYPE 6 (Maximum 2400 Watts)

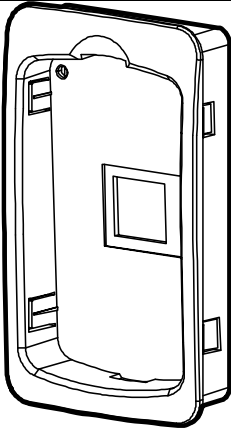
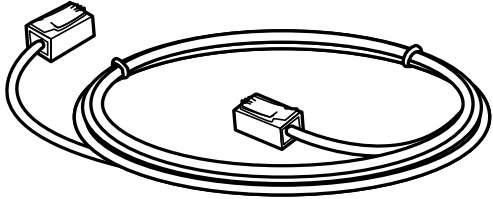


TYPE 7 (Maximum 3600 Watts)

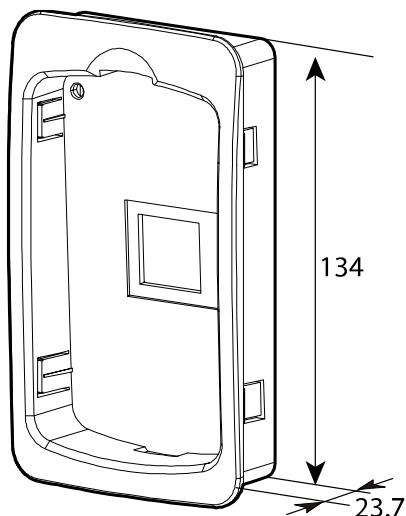


9.1.8 Keypad Extension Cable for Remote Control (Optional)

Included items

| Items | |
|---|--|
|  <p>Keypad bracket</p> |  <p>Remote cable (2 m/3 m)</p> |

Keypad Bracket Dimensions

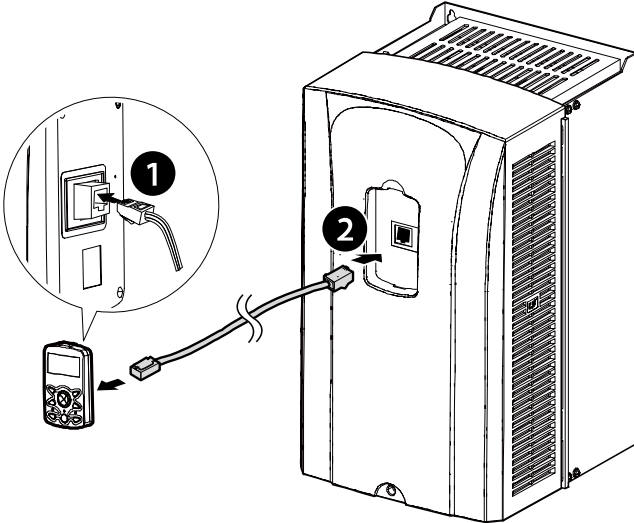


Remote Cable Specifications

| Model type | Part name |
|------------|-----------------------------|
| 64110009 | INV, iS7 REMOTE CABLE (2 M) |
| 64110010 | INV, iS7 REMOTE CABLE (3 M) |

Installing the Remote Cable

Refer to the following figure to install the remote cable to extend the keypad cable length.



If a “Line Check” message is displayed on the keypad display and the keypad is not operating correctly after installing the remote cable, check the cable connection on both sides.

⚠ Caution

Do not extend the keypad cable using a third-party extension cable. The keypad may not operate correctly due to voltage drop and electromagnetic interference.

Note

- 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.
- Install a ferrite clamp to protect signal cables from electromagnetic interference (Ex. Würth Electronics ferrite clamp PN742732).

10 Safety Function STO(Safe Torque Off)

The iS7 Inverter series provides resilient safety features via optional safety expansion module. When an emergency arises, it instantly blocks inverter output to protect the operator and reduce the risk.

10.1 Safety Standard Product

The performance levels for the safety function are as follows.

EN ISO 13849-1: Category 3, PL Class d

EN 61508: SIL 2 (EN 60204-1, Stop Category 0)

⚠ Caution

When using the safety function, perform a risk assessment for the system and ensure that it meets the safety requirements.

Note

When wiring the inverter or performing maintenance, the inverter must be turned off. The safety function is not used to block the power supply to the motor or insulate the inverter electrically.

10.2 About the Safety Function

The safety function is a safety torque off (STO) function used to prevent a torque and to block the power supply to the motor by interrupting the gate using hard wires.

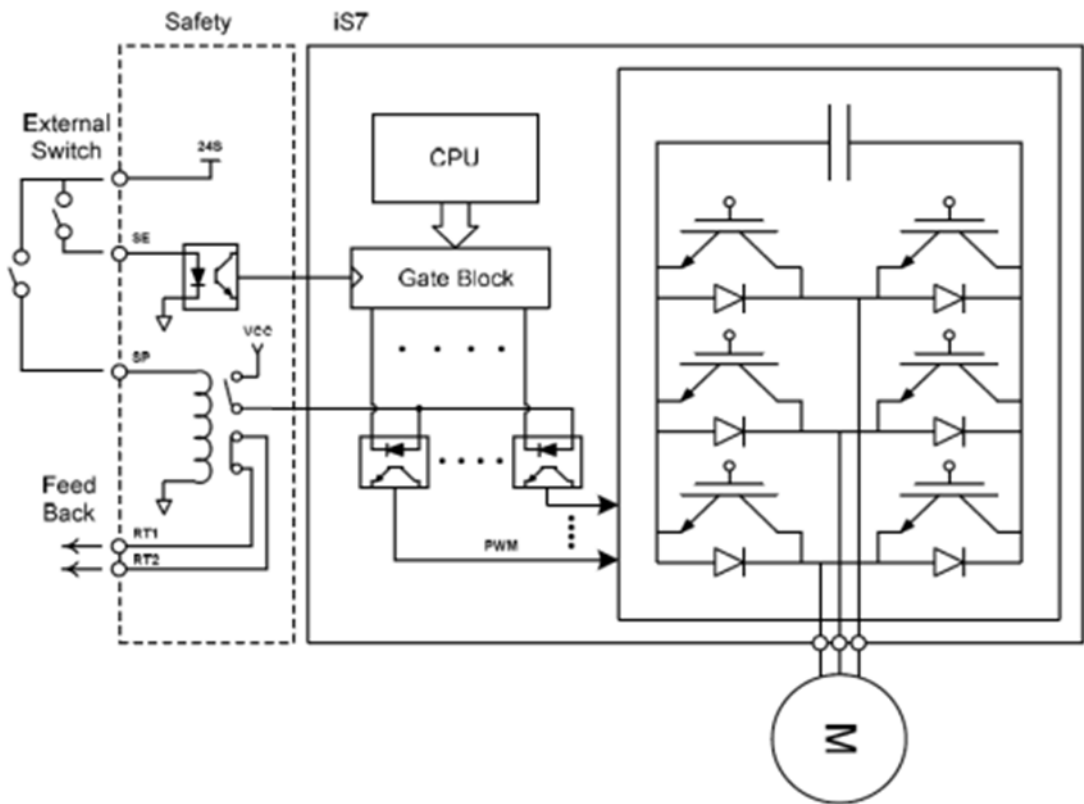
STO (Safety Torque Off): IEC61800-5-2

The STO function is independently connected to each input signal for 2 channels (SE(SFT11) and SP(SFT2)). The connected circuit cuts off the operation signal for the inverter output and turns off the power modules.

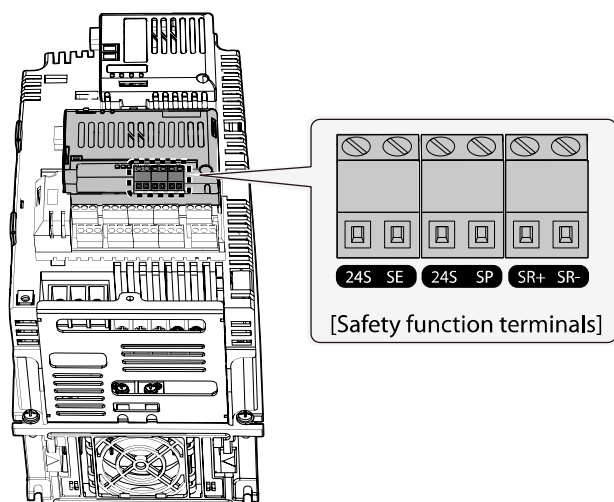
If the safety function is activated during operation, the inverter blocks the output and the motor enters Free Run mode. Also, the “Safety Opt Err” message is displayed on the keypad.

To release the fault trip, short-circuit terminal block to return to the normal operation status and press the [STOP/RESET] key.

10.2.1 Safety Function Wiring Diagram



10.2.2 Installing the Safety Board to 0.75–160 kW Product

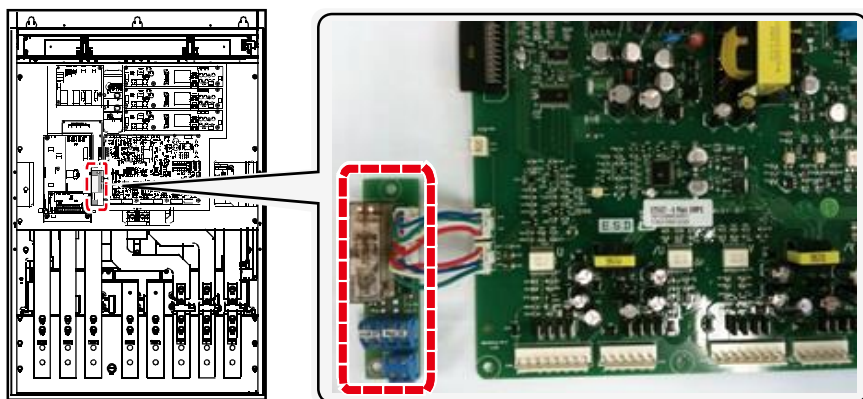


⚠ Caution

Because 0.75-160kW products provide safety purpose product, therefore please use this product with safety option.
Safety options are not available for general products.

10.2.3 Installing the Safety Board to 185–375 kW Product

Please buy safety option and apply to standard products because there is no safety product for 185-375kW.



Refer to the following figure and install the safety board to the main SMPS board of the inverter using cable connectors.

10.2.4 Safety Function Terminal Description

| 24S – SE (SFT1) | 24S – SP (SFT2) | SR + SR- |
|--------------------------------------|-------------------------------------|---------------------------------|
| Short: Normal operation | Short: Normal operation | B Contact relay output terminal |
| Open: Safety Trip (output blockage) | Open: Safety Trip (output blockage) | |

10.2.5 Cable Specification for Signal Terminal Block Wiring

| Terminal | | Wire Thickness | | Electrical Standard |
|----------|--|---|-----|---|
| Variety | Name | mm ² | AWG | |
| 24S | Safety Input power | 0.33–1.25mm ² (16–22 AWG) Shield type twisted-pair wire | | 24 VDC, Max. 10 mA |
| SE | Safety Input 1 (SFT1) | | | Short: Safety function stop (24S-SE or SP) Open: Safety function operation (24S- SP or SP) |
| SP | Safety Input 2 (SFT2) | | | |
| SR+,SR- | Safety function completion output relay | | | DC 24 V, 5 A below (B contact) |

⚠ Caution

The length of the safety wiring at the input terminal must be less than 30 m.
Using over 30M may cause malfunctions because of noise.

11 Marine Certification

Marine classification is that the structure and equipment of the ship has been estimated from the test with the certain standards for certificate issued and given by classification society.

SV-IS7 Series is certificated with product testing, process, production equipment and test equipment to install on the shipping.

11.1 DNV (Det Norske Veritas) Marine Certification Details

| | |
|-------------------------|---|
| Certification Institute | DNV (Det Norske Veritas) |
| Certificate Number | TAE00001S1 |
| Certified Model Types | Frequency Converter for Asynchronous Motors SV series (Range: 0.75 kW–375 kW 200–400 VAC supply) |
| Compliance | Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft Det Norske Veritas' Offshore Standards |

11.2 Bureau Veritas (Marine & Offshore Division) Marine Certification Details

| | |
|-------------------------|---|
| Certification Institute | Bureau Veritas (Marine&Off shore Division) |
| Certificate Number | 40183/AO BV |
| Certified Model Types | SV-iS7 series (Range: 0.75 kW–75 kW, 200V / 0.75 kW–375 kW, 400V) |
| Compliance | Bureau Veritas Rules for the Classification of Steel Ships |

11.3 ABS Marine Certification Details

| | |
|-------------------------|--|
| Certification institute | ABS (American Bureau of Shipping) |
| Certificate Number | 14-BK1291913-PDA |
| Certified Model Types | SV-iS7 series (Range: 0.75 kW–75 kW, 200V / 0.75 kW–90 kW, 400V) |
| Compliance | Installation of the product on an ABS class vessel, MODU or facility |

11.4 KR Marine Certification Details

| | |
|-------------------------|---|
| Certification institute | KR (Korean Resister) |
| Certificate Number | PTD25585-AC003 |
| Certified Model Types | SV-iS7 series (Range: 0.75 kW–75 kW, 200V / 0.75 kW–375 kW, 400V) |
| Compliance | Korean Resister's Rules for Classification of Steel Ships |

11.5 Marine Certification Models for SV-iS7 Products

| Type | | DNV | BV | ABS | KR |
|------------------|------------------|-----|----|-----|----|
| 3-Phase 200V | SV0008iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0015iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0022iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0037iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0055iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0075iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0110iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0150iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0185iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0220iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0300iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0370iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0450iS7-2□□□□V | ○ | ○ | ○ | ○ |
| | SV0550iS7-2□□□□V | ○ | ○ | ○ | ○ |
| SV0750iS7-2□□□□V | ○ | ○ | ○ | ○ | |
| 3-Phase 400V | SV0008iS7-4□□□□V | ○ | ○ | ○ | ○ |
| | SV0015iS7-4□□□□V | ○ | ○ | ○ | ○ |
| | SV0022iS7-4□□□□V | ○ | ○ | ○ | ○ |
| | SV0037iS7-4□□□□V | ○ | ○ | ○ | ○ |
| | SV0055iS7-4□□□□V | ○ | ○ | ○ | ○ |
| | SV0075iS7-4□□□□V | ○ | ○ | ○ | ○ |
| | SV0110iS7-4□□□□V | ○ | ○ | ○ | ○ |

| Type | DNV | BV | ABS | KR |
|------------------|-----|----|-----|----|
| SV0150iS7-4□□□□V | O | O | O | O |
| SV0185iS7-4□□□□V | O | O | O | O |
| SV0220iS7-4□□□□V | O | O | O | O |
| SV0300iS7-4□□□□V | O | O | O | O |
| SV0370iS7-4□□□□V | O | O | O | O |
| SV0450iS7-4□□□□V | O | O | O | O |
| SV0550iS7-4□□□□V | O | O | O | O |
| SV0750iS7-4□□□□V | O | O | O | O |
| SV0900iS7-4□□□□V | O | O | O | O |
| SV1100iS7-4□□□□V | O | O | X | O |
| SV1320iS7-4□□□□V | O | O | X | O |
| SV1600iS7-4□□□□V | O | O | X | O |
| SV1850iS7-4□□□□V | O | O | X | O |
| SV2200iS7-4□□□□V | O | O | X | O |
| SV2800iS7-4□□□□V | O | O | X | O |
| SV3150iS7-4□□□□V | O | O | X | O |
| SV3750iS7-4□□□□V | O | O | X | O |

Classified Product

12 Using a Single Phase Power Source

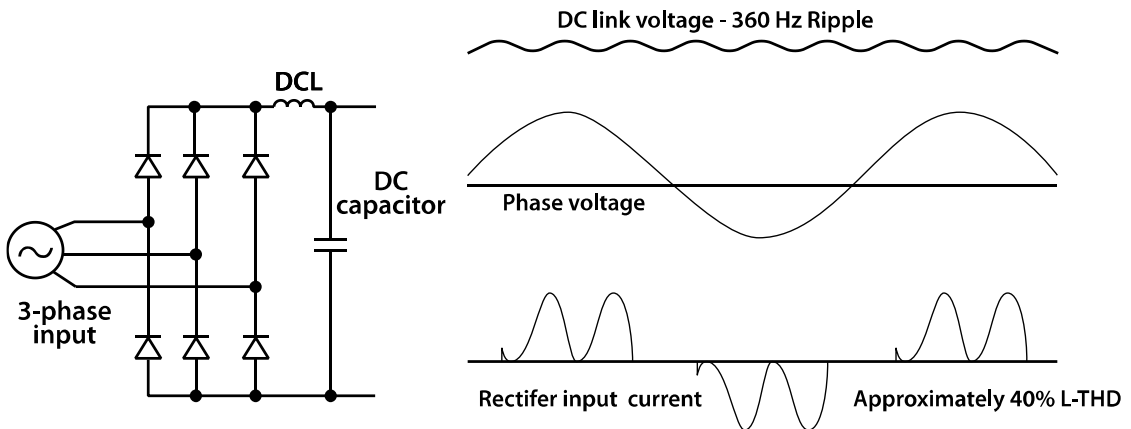
12.1 Single Phase Rating

The SV-iS7 series inverter is a three-phase variable frequency drive (VFD). When applying single-phase power to a three-phase VFD, there are several limitations that need to be considered.

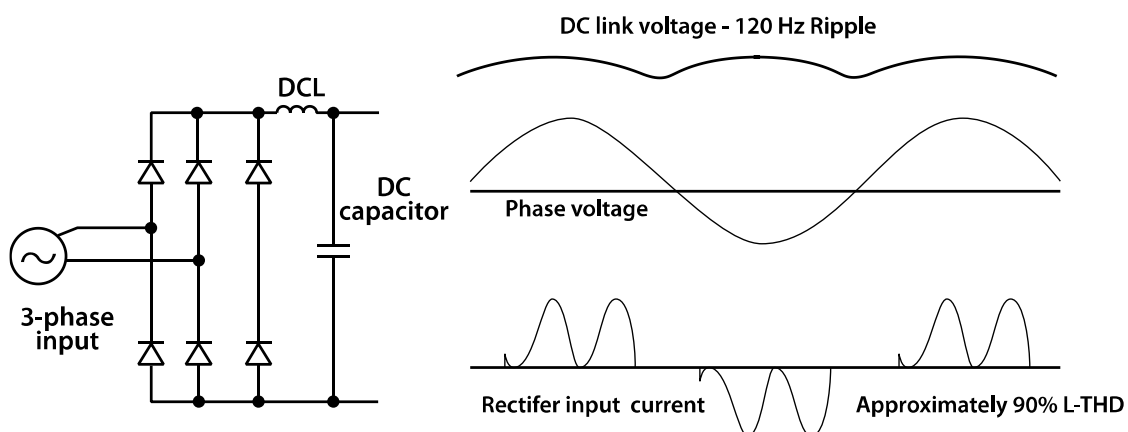
The standard pulse-width-modulated (PWM) VFDs use a 6-pulse diode rectifier. The 6-pulse rectification results in 360 Hz (or 300 Hz) DC bus ripple when using a three-phase 60 Hz (or 50 Hz) power supply. However, when using a single-phase power source, the DC bus ripple becomes 120 Hz (or 100 Hz). The input current and harmonics increase, and the VFDs DC bus circuit is subject to higher stress in order to deliver equivalent power.

Input current distortion of 90% THD and greater can be expected under single-phase input, compared to approximately 40% with three-phase input as indicated in Figure 2.

Therefore, use of a single-phase requires the three-phase VFD power rating to be reduced (derated) to avoid over stressing the rectifier and the DC link components.



<Figure-1 Typical 60 Hz Three-Phase Configuration>



<Figure-2 Typical 60 Hz Single-Phase Configuration>

12.2 Power(HP), Input Current and Output Current

When using a three-phase VFD with single-phase input, derating the drive's output current and horsepower will be necessary due to the increase in DC bus ripple voltage and current. In addition, the input current through the remaining two phases on the diode bridge converter will approximately double, creating another derating consideration for the VFD. Input current harmonic distortion will increase, making the overall input power factor low.

Input current distortion over 100% is likely under single-phase conditions without a reactor. Therefore, the reactor is always required for such applications.

Using a motor that is selected by the three-phase drive ratings with single-phase input may result in poor performance and premature drive failure.

The selected drive of single-phase current ratings must meet or exceed the motor current ratings as indicated in the following table.

12.3 Input Frequency and Voltage Tolerance

The AC supply voltage must be within the required voltage range of 240/480 VAC +10% to -5% to maximize motor power production.

The standard product with three-phase voltage input has an allowable range of +10% to -15%. A stricter input voltage tolerance of +10 to -5% applies when using the drive with a single-phase supply. The average bus voltage with single-phase input is lower than the equivalent of a three-phase input. Therefore, the maximum output voltage (motor voltage) will be lower with a single-phase input.

The minimum input voltage must be no less than 228 VAC for 240 volt models and 456 VAC for 480 V models, to ensure motor voltage production of 207 VAC and 415 VAC, respectively.

If full motor torque must be developed near the base speed (full power) it will be necessary to maintain a rigid incoming line voltage so that adequate motor voltage can be produced.

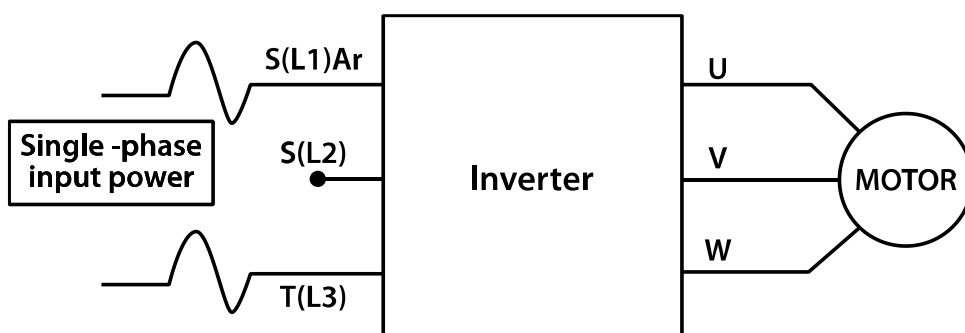
Operating a motor at reduced speed (reduced power), or using a motor with a base voltage that is lower than the incoming AC supply rating (ex. 208 VAC motor with a 240 VAC supply) will also minimize the effect of voltage deprivation (240 VAC Input for 208 V motor, 480 VAC Input for 400 V motor).

12.4 Wiring and Peripheral Device

It is important that input wiring and branch circuit protection be selected based on the drive's single-phase input current rating indicated in Table 1–2.

The single-phase input current after derating differs from the three-phase input indicated on the VFD nameplate.

Refer to the following figure and connect the single-phase AC input wiring to the inverter's R[L1] and T[L3] terminals.



<Figure-3 Terminal Wiring Diagram>

| Single-Phase Rating (240 V / 50~60 Hz Input) | | | | | | | | | | | | | | |
|--|------|-----------------------------|--------|-----------|--------|----------------|-------|------|------|---------------|-------------|---------------------|----------------------|---------|
| [kW] | [HP] | Single-Phase Current Rating | | | | Wire Selection | | FUSE | | DC Link Choke | | MCCB | Electronic Contactor | |
| | | Output Amp | | Input Amp | | AWG | | [A] | [V] | [mH] | [A] | LSELECTRIC(UL Type) | | |
| | | HD [A] | ND [A] | HD [A] | ND [A] | R,S,T | U,V,W | | | | | | | |
| 0.75kW | 1 | 2.6 | 4.1 | 4.3 | 6.8 | 14 | 14 | 10 | 500V | Built-in | UTE100/15A | MC-9b | | |
| 1.5kW | 2 | 4.0 | 6.0 | 6.9 | 10.6 | 14 | 14 | 15 | | | UTE100/15A | MC-12b | | |
| 2.2kW | 3 | 6.2 | 8.2 | 11.2 | 14.9 | 14 | 14 | 20 | | | UTE100/30A | MC-18b | | |
| 3.7kW | 5 | 8.1 | 12 | 14.9 | 21.3 | 12 | 12 | 32 | | | UTE100/30A | MC-32a | | |
| 5.5kW | 7.5 | 12 | 16 | 22.1 | 28.6 | 10 | 10 | 50 | | | UTS150/50A | MC-40a | | |
| 7.5kW | 10 | 16 | 23 | 28.6 | 41.2 | 8 | 8 | 63 | | | UTS150/60A | MC-50a | | |
| 11kW | 15 | 24 | 31 | 44.3 | 54.7 | 6 | 6 | 80 | | | UTS150/100A | MC-65a | | |
| 15kW | 20 | 31 | 38 | 55.9 | 69.7 | 4 | 4 | 100 | | | UTS150/125A | MC-100a | | |
| 18.5kW | 25 | 38 | 45 | 70.8 | 82.9 | 2 | 2 | 125 | | | UTS150/150A | MC-130a | | |
| 22kW | 30 | 45 | 64 | 85.3 | 116.1 | 1 | 1 | 160 | | | UTS250/175A | MC-150a | | |
| 30kW | 40 | 60 | 75 | 121.0 | 152.0 | 1/0 | 1/0 | 200 | | | 0.24 | 200 | UTS250/225A | MC-150a |
| 37kW | 50 | 75 | 93 | 154.0 | 190.0 | 2/0 | 2/0 | 250 | | | 0.2 | 240 | UTS400/300A | MC-225a |
| 45kW | 60 | 93 | 114 | 191.0 | 231.0 | 2/0 | 2/0 | 350 | | | 0.17 | 280 | UTS400/350A | MC-330a |
| 55kW | 75 | 114 | 149 | 233.0 | 302.0 | 3/0 | 3/0 | 400 | | | 0.12 | 360 | UTS600/500A | MC-400a |
| 75kW | 100 | 149 | 178 | 305.0 | 362.0 | 4/0 | 4/0 | 450 | 0.1 | 500 | UTS600/600A | MC-630a | | |

Table 1. Single-Phase Rating(240 V Type)

| Single-Phase Rating (480 V / 50~60 Hz Input) | | | | | | | | | | | | | |
|--|------|-----------------------------|--------|-----------|--------|----------------|-------|------|-------------|---------------|-------------|---------------------|----------------------|
| [kW] | [HP] | Single-Phase Current Rating | | | | Wire Selection | | FUSE | | DC Link Choke | | MCCB | Electronic Contactor |
| | | Output Amp | | Input Amp | | AWG | | | | | | | |
| | | HD [A] | ND [A] | HD [A] | ND [A] | R,S,T | U,V,W | [A] | [V] | [mH] | [A] | LSELECTRIC(UL Type) | |
| 0.75kW | 1 | 1.4 | 2.2 | 2.2 | 3.7 | 14 | 14 | 10 | 500V | Built-in | UTE100/15A | MC-9b | |
| 1.5kW | 2 | 2.1 | 3.2 | 3.6 | 5.7 | 14 | 14 | 10 | | | UTE100/15A | MC-9b | |
| 2.2kW | 3 | 2.8 | 4.1 | 5.5 | 7.7 | 14 | 14 | 15 | | | UTE100/15A | MC-12b | |
| 3.7kW | 5 | 4.1 | 6.1 | 7.5 | 11.1 | 14 | 14 | 20 | | | UTE100/15A | MC-18b | |
| 5.5kW | 7.5 | 6.1 | 8.0 | 11.0 | 14.7 | 12 | 12 | 32 | | | UTE100/30A | MC-22b | |
| 7.5kW | 10 | 8.1 | 12 | 14.4 | 21.9 | 12 | 12 | 35 | | | UTE100/30A | MC-32a | |
| 11kW | 15 | 12 | 16 | 22.0 | 26.4 | 10 | 10 | 50 | | | UTS150/50A | MC-40a | |
| 15kW | 20 | 16 | 20 | 26.6 | 35.5 | 8 | 8 | 63 | | | UTS150/60A | MC-50a | |
| 18.5kW | 25 | 20 | 23 | 35.6 | 41.1 | 6 | 6 | 70 | | | UTS150/80A | MC-65a | |
| 22kW | 30 | 23 | 31 | 41.6 | 55.7 | 4 | 4 | 100 | | | UTS150/100A | MC-65a | |
| 30kW | 40 | 32 | 39 | 55.5 | 67.5 | 4 | 4 | 125 | | | UTS150/125A | MC-100a | |
| 37kW | 50 | 39 | 47 | 67.9 | 81.7 | 4 | 2 | 125 | | | UTS150/150A | MC-130a | |
| 45kW | 60 | 47 | 57 | 82.4 | 101.8 | 1 | 1 | 160 | | | UTS250/175A | MC-150a | |
| 55kW | 75 | 57 | 78 | 102.6 | 143.6 | 1/0 | 1/0 | 200 | | | UTS250/225A | MC-185a | |
| 75kW | 100 | 78 | 94 | 143.4 | 173.4 | 2/0 | 2/0 | 250 | | | UTS400/300A | MC-225a | |
| 90kW | 120 | 95 | 116 | 174.7 | 212.9 | 4/0 | 4/0 | 350 | | | UTS400/400A | MC-330a | |
| 110kW | 150 | 116 | 138 | 213.5 | 254.2 | 4/0 | 4/0 | 400 | | | UTS600/500A | MC-400a | |
| 132kW | 180 | 134 | 165 | 255.6 | 315.3 | 300 | 300 | 450 | UTS600/600A | MC-400a | | | |
| 160kW | 225 | 166 | 189 | 316.3 | 359.3 | 400 | 400 | 450 | UTS600/600A | MC-630a | | | |

Table 2. Single-Phase Rating (480 V Type)

12.5 Other Considerations

The following lists other precautions that need to be considered when using a three-phase VFD using single-phase power source.

- Depending on the increased DC ripple, sensorless mode may result in poor performance when operating a three-phase inverter using single-phase power supply.
- If a phase open trip occurs, cancel the input phase open protection bit setting (PRT-05: Phase Loss Chk).
- Do not allow the current to exceed the single-phase rating. Motor capacity, motor overload trip, and E-thermal functions must be set to protect motor.
- A reactor is always required. Use a model type that comes with built-in DC reactor. The iS7 200 V 30–75kW and 400 V 280–375 kW products do not have built-in DC reactors. Install an external AC reactor separately for these model types (Do not install DC reactors externally).



EC DECLARATION OF CONFORMITY

We, the undersigned,

Representative: **LS ELECTRIC Co., Ltd.**
 Address: **LS Tower, 127, LS-ro, Dongan-gu,
 Anyang-si, Gyeonggi-do,
 Korea**

Manufacturer: **LS ELECTRIC Co., Ltd.**
 Address: **56, Samseong 4-gil, Mokcheon-eup,
 Dongnam-gu, Cheonan-si, Chungcheongnam-do,
 Korea**

Certify and declare under our sole responsibility that the following apparatus:

Type of Equipment: **Inverter (Power Conversion Equipment)**

Model Name: **STARVERT-/S7 series**

Trade Mark: **LS ELECTRIC Co., Ltd.**

Conforms with the essential requirements of the directives:

2014/35/EU Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

2014/30/EU Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

Based on the following specifications applied:

**EN IEC 61800-3:2018
 EN 61800-5-1:2007**

and therefore complies with the essential requirements and provisions of the 2014/35/CE and 2014/30/CE Directives.

Place: **Cheonan, Chungnam,
Korea**

박창근 2021. 5. 20 (Signature / Date)
Mr. PARK CHANGKEUN / Senior Manager
(Full Name / Position)

EMI / RFI POWER LINE FILTERS

LS ELECTRIC inverters, iS7 series



RFI FILTERS

THE LS RANGE OF POWER LINE FILTERS **FEP (Standard)** SERIES, HAVE BEEN SPECIFICALLY DESIGNED WITH HIGH FREQUENCY **LS ELECTRIC INVERTERS**. THE USE OF LS FILTERS, WITH THE INSTALLATION ADVICE OVERLEAF HELP TO ENSURE TROUBLE FREE USE ALONG SIDE SENSITIVE DEVICES AND COMPLIANCE TO CONDUCTED EMISSION AND IMMUNITY STANDARDS TO EN 50081.

CAUTION

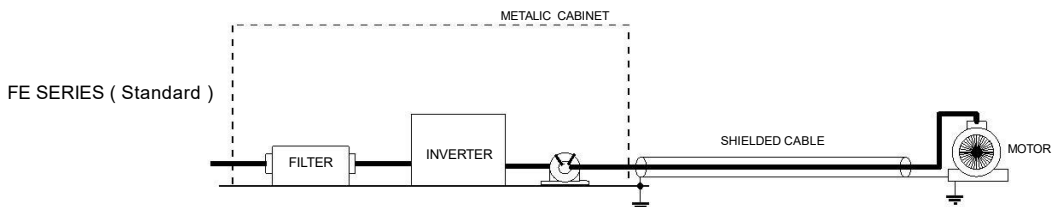
**IN CASE OF A LEAKAGE CURRENT PROTECTIVE DEVICES IS USED ON POWER SUPPLY, IT MAY BE FAULT AT POWER-ON OR OFF.
IN AVOID THIS CASE, THE SENSE CURRENT OF PROTECTIVE DEVICE SHOULD BE LARGER**

RECOMMENDED INSTALLATION INSTRUCTIONS

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

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

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



PR0062

| iS7 series / Standard Filters | | | | | | | | | | | |
|-------------------------------|-------|----------|---------|------------|-----------------|------------------|--------------|---------|-------|------|---------------|
| INVERTER | POWER | CODE | CURRENT | VOLTAGE | LEAKAGE CURRENT | DIMENSIONS L W H | MOUNTING Y X | WEIGHT | MOUNT | FIG. | OUTPUT CHOKES |
| THREE PHASE | | | | | | | | | | | |
| SV0300iS7-2 | 30kW | FEP-T180 | 180A | 220-480VAC | 0.7mA 80mA | 332 x 170 x 120 | 115 x 155 | 8.4 Kg | - | B | FS-3 |
| SV0370iS7-2 | 37kW | FEP-T250 | 250A | 220-480VAC | 0.7mA 80mA | 392 x 190 x 116 | 240 x 165 | 9.1 Kg | - | B | FS-3 |
| SV0450iS7-2 | 45kW | FEP-T320 | 320A | 220-480VAC | 0.7mA 80mA | 392 x 260 x 116 | 240 x 235 | 9.8 Kg | - | B | FS-4 |
| SV0550iS7-2 | 55kW | FEP-T320 | 320A | 220-480VAC | 0.7mA 80mA | 392 x 260 x 116 | 240 x 235 | 9.8 Kg | - | B | FS-4 |
| SV0750iS7-2 | 75kW | FEP-T400 | 400A | 220-480VAC | 0.7mA 80mA | 392 x 260 x 116 | 240 x 235 | 10.3 Kg | - | B | FS-4 |

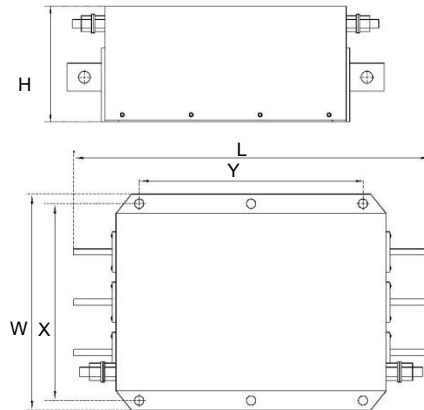
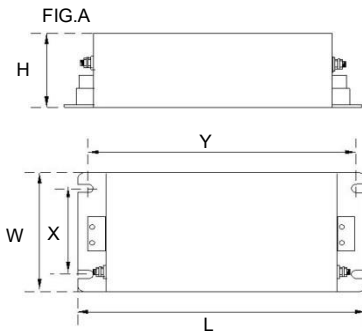
SV0300~0750iS7 EN 55011 CLASS A GROUP 2 IEC/EN 61800-3 C3

| iS7 series / Standard Filters | | | | | | | | | | | |
|-------------------------------|-------|-----------|---------|------------|-----------------|------------------|--------------|---------|-------|------|---------------|
| INVERTER | POWER | CODE | CURRENT | VOLTAGE | LEAKAGE CURRENT | DIMENSIONS L W H | MOUNTING Y X | WEIGHT | MOUNT | FIG. | OUTPUT CHOKES |
| THREE PHASE | | | | | | | | | | | |
| SV0300iS7-4 | 30kW | FE-T100-2 | 100A | 220-480VAC | 1.3mA 150mA | 420 x 200 x 130 | 408 x 166 | 13.8 Kg | - | A | FS-3 |
| SV0370iS7-4 | 37kW | FE-T100-2 | 100A | 220-480VAC | 1.3mA 150mA | 420 x 200 x 130 | 408 x 166 | 13.8 Kg | - | B | FS-3 |
| SV0450iS7-4 | 45kW | FEP-T150 | 150A | 220-480VAC | 1.3mA 150mA | 332 x 170 x 120 | 115 x 155 | 8 Kg | - | B | FS-3 |
| SV0550iS7-4 | 55kW | FEP-T150 | 150A | 220-480VAC | 1.3mA 150mA | 332 x 170 x 120 | 115 x 155 | 8 Kg | - | B | FS-3 |
| SV0750iS7-4 | 75kW | FEP-T180 | 180A | 220-480VAC | 1.3mA 150mA | 332 x 170 x 120 | 115 x 155 | 8.4 Kg | - | B | FS-3 |
| SV0900iS7-4 | 90kW | FEP-T250 | 250A | 220-480VAC | 1.3mA 150mA | 392 x 190 x 116 | 240 x 165 | 9.1 Kg | - | B | FS-4 |
| SV1100iS7-4 | 110KW | FEP-T400 | 400A | 220-480VAC | 1.3mA 150mA | 392 x 260 x 116 | 240 x 235 | 10.3 Kg | - | B | FS-4 |
| SV1320iS7-4 | 132KW | FEP-T400 | 400A | 220-480VAC | 1.3mA 150mA | 392 x 260 x 116 | 240 x 235 | 10.3 Kg | - | B | FS-4 |
| SV1600iS7-4 | 160KW | FEP-T600 | 600A | 220-480VAC | 1.3mA 150mA | 392 x 260 x 116 | 240 x 235 | 11 Kg | - | B | FS-4 |
| SV1850iS7-4 | 185KW | FEP-T600 | 600A | 220-480VAC | 1.3mA 150mA | 392 x 260 x 116 | 240 x 235 | 11 Kg | - | B | FS-4 |
| SV2200iS7-4 | 220KW | FEP-T1000 | 1000A | 220-480VAC | 1.3mA 150mA | 460 x 280 x 166 | 290 x 255 | 18 Kg | - | B | FS-4 |
| SV2800iS7-4 | 280KW | FEP-T1000 | 1000A | 220-480VAC | 1.3mA 150mA | 460 x 280 x 166 | 290 x 255 | 18 Kg | - | B | FS-4 |
| SV3150iS7-4 | 315KW | FEP-T1000 | 1000A | 220-480VAC | 1.3mA 150mA | 460 x 280 x 166 | 290 x 255 | 18 Kg | - | B | FS-4 |
| SV3750iS7-4 | 375KW | FEP-T1600 | 1600A | 220-480VAC | 1.3mA 150mA | 592 x 300 x 166 | 340 x 275 | 27 Kg | - | B | FS-4 |

SV0300~2200 iS7-4 EN 55011 CLASS A GROUP 2 IEC/EN 61800-3 C3
 SV2800~3750 iS7-4 CLASS A IEC/EN 61800-3 C4
 EN 55011

FE SERIES (Standard)

FIG.B

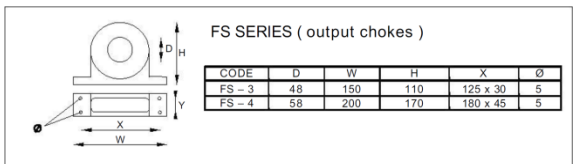


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 (BARCELONA) ESPAÑA
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 Fax (+34) 935 748 248
 info@vmc.es www.vmc.es



FS SERIES (output chokes)

| CODE | D | W | H | X | Ø |
|--------|----|-----|-----|----------|---|
| FS - 3 | 48 | 150 | 110 | 125 x 30 | 5 |
| FS - 4 | 58 | 200 | 170 | 180 x 45 | 5 |



Product 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 | LS ELECTRIC 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 LS ELECTRIC 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 LS ELECTRIC rating plates
- expired warranty period

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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.

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 requirements stated for drives.

EAC mark



The EurAsian Conformity mark (EAC) indicates that the product conforms to all technical regulations of the Eurasian Customs Union assessment procedures. This means that it meets all requirements and technical regulations applicable to the product, and that it can be serviced in all service centers of the producer in the territory of all Customs Union member countries.

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