



Industrial Inverter for Fan and Pump  
**STARVERT iP5A**

0.75~30kW (1~40HP) 3Phase 200~230Volts  
0.75~450kW (1~600HP) 3Phase 380~480Volts  
5.5~110kW (7.5~150HP) 3Phase 525~600Volts

**LS** IS



# STARVERT iP5A

LS Starvert SV-iP5A has been specifically designed and created to provide competitive solutions for fan and pump applications



Specialized Functions for Fan and Pump

Marine Type Certification From DNV

Energy Saving and High Efficiency

**STARVERT iP5A**

User-friendly Interface and Easy Maintenance

Intelligent Control Mechanism

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# Specialized Functions for Fan and Pump

The iP5A, specifically designed for HVAC application, provides stable and cost-effective system performance.

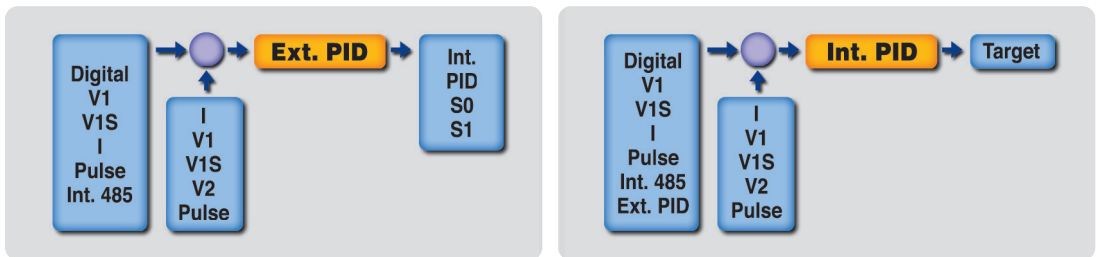


## PID Control

In the centrifugal fan and pump field, PID control is provided as a standard function in order to maintain a constant control of pressure, flow and oil level. This function includes Pre-PID, Sleep and Wake up and output inverse sub-functions.

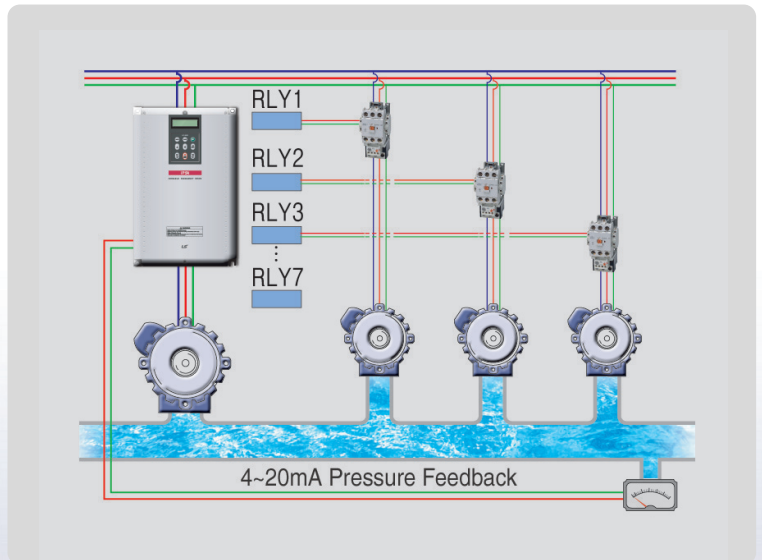
## Dual PID

Where external or cascaded PID control is required, the built-in dual PID algorithm of the iP5A can be utilized to satisfy various system requirements.



## Multi Motor Control (0.75~450kW)

The iP5A MMC function provides cost-effective, simultaneous control of up to eight motors, without requiring external controllers.



### Marine Type Certification From DNV

The iP5A has been tested and certified by DNV to comply with International Marine requirements



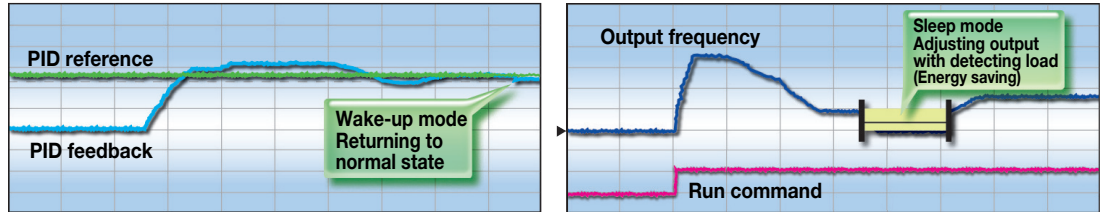
# Energy Saving and High Efficiency

The iP5A, specifically designed for fan and pump applications, guarantees energy savings by optimizing the system.



## Sleep and Wake-up Function

Energy savings are obtained through the Sleep and Wake-Up functions of the iP5A, which enable the drive to automatically switch off during user-programmed low-load conditions and then to start up again when process demand increases.



## Pre Heating Function

When using the inverter in damp conditions, this function protects both the motor and the inverter's output



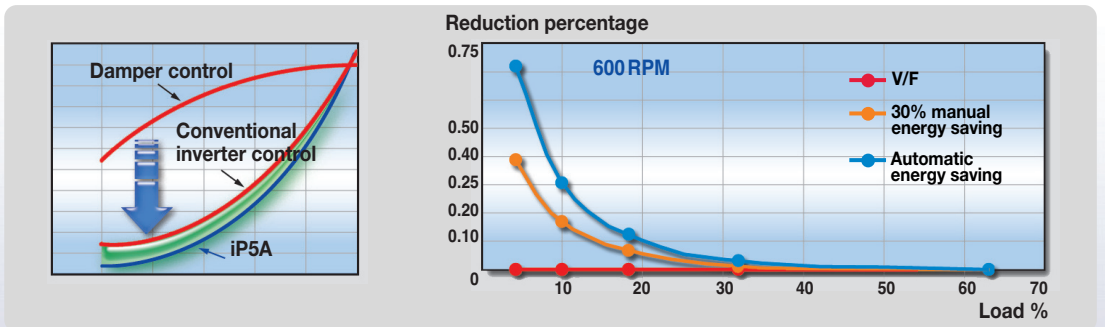
## Flying Start Function

When 2 or more fans, or a high inertia load are connected to the inverter, the iP5A detects the motor speed after a momentary power failure, enabling the motors to be smoothly reaccelerated without mechanical and electrical shock-loading to the system.



## Automatic Energy Saving

Load change may incur energy losses but the optimized flux control of iP5A results in more outstanding energy saving compared to previous models.



# Intelligent Control

Because of effectual functions and protection algorithms, the iP5A provides constant performance, in spite of external power fluctuations.



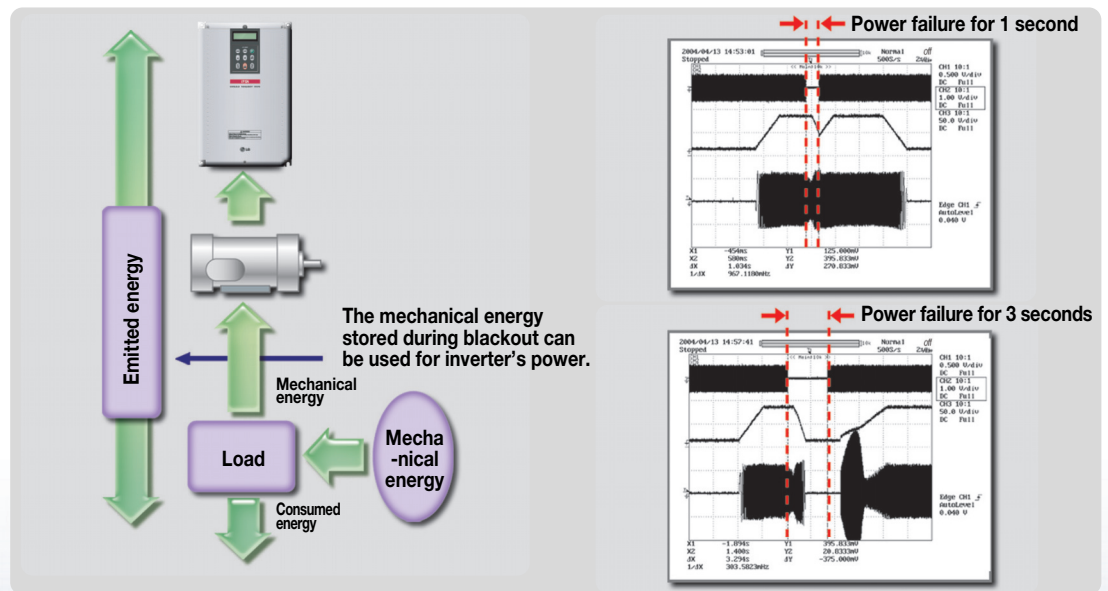
## Constant and Stable Performance

In spite of external voltage fluctuations and lightning surges, the iP5A optimizes motor performance.



## Improved System Management during Power Dips and Momentary Power Outages

During Power Dips or Momentary Power Outage, the inverter output can be maintained by utilizing the residual mechanical energy in the load as a regenerative source. The duration of the power-dip ride-through depends on the load characteristics.



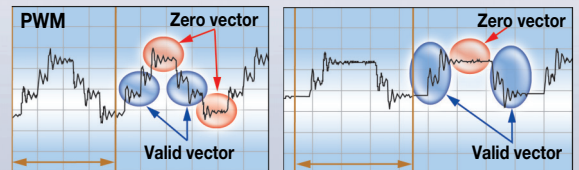
## Safety Stop

During unexpected power failure conditions, the iP5A can bring the load to a controlled stop, by utilizing the inertial energy. This can prevent further process problems or accidents.



## Current Leakage Reduction Algorithm

Under damp conditions, leakage currents can occur when using inverters. These currents can cause a system failure. The iP5A low-leakage PWM algorithm reduces these leakage currents to ensure reliability of operation.



## Flux Braking Algorithm

This algorithm reduces deceleration time, thereby improving system efficiency.



## Automatic Carrier Frequency Change

By taking ambient temperature into account, the iP5A can automatically adjust the Carrier (Modulation) Frequency.

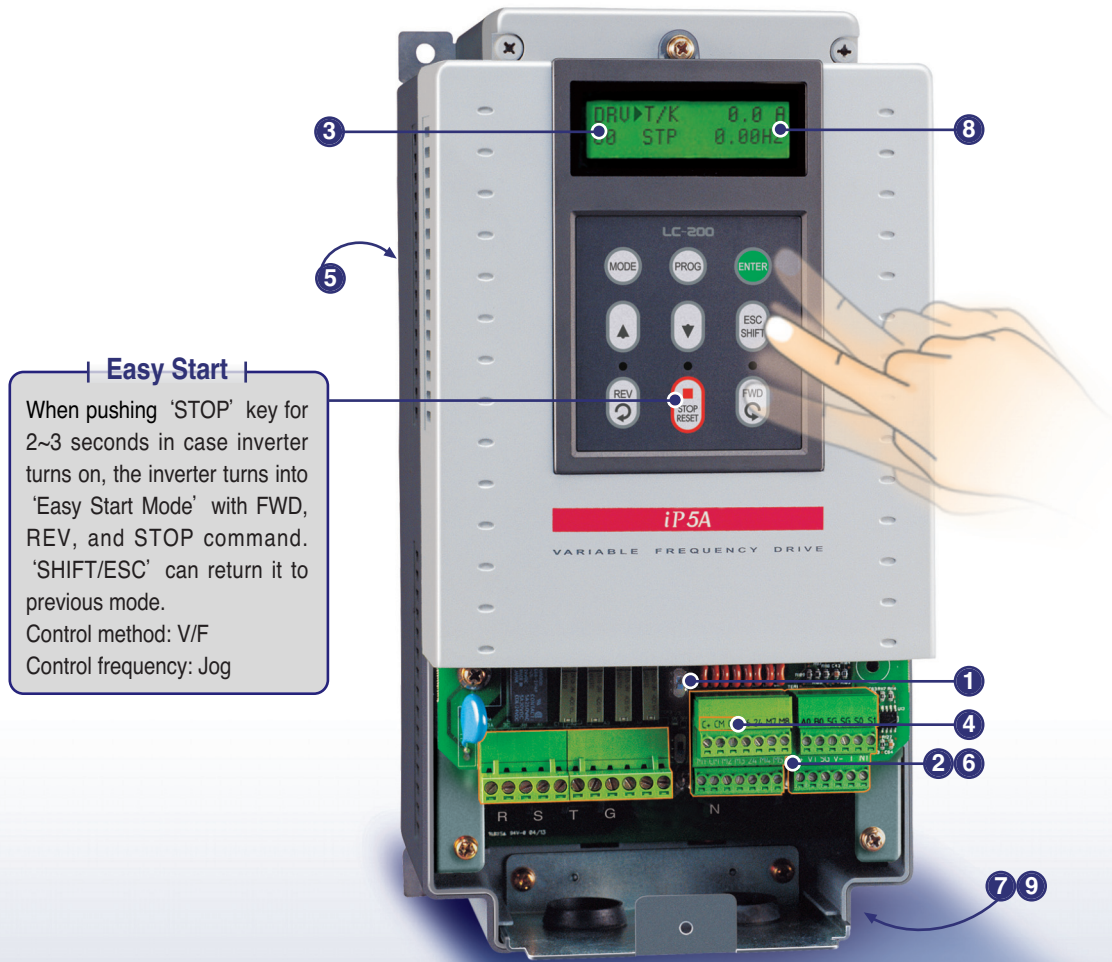


## Protection

The iP5A has optimized protective functions, such as safety stop and pre-excitation of the motor, amongst others.

# User-friendly Keypad & Easy Maintenance

The iP5A construction allows for easy maintenance, with ease-of-access to all components.



### Easy Start

When pushing 'STOP' key for 2~3 seconds in case inverter turns on, the inverter turns into 'Easy Start Mode' with FWD, REV, and STOP command. 'SHIFT/ESC' can return it to previous mode.  
Control method: V/F  
Control frequency: Jog

### 1 NPN/PNP Input

iP5A has both NPN and PNP input, and you can select one of them easily.

### 2 Abundant I/O Suggestion

iP5A serves abundant I/O.

|   |                        |
|---|------------------------|
| Digital Input/Output                    | 8 points / 4 points    |
| Analog Input (Voltage + Current)/Output | (1+1) points /4 points |
| Pulse Input                             | 1 point                |
| NTC/PTC Input                           | 1 point                |

### 3 Various Units of I/O Display

The iP5A display can be calibrated in many different types of process units.

|                                    |                                    |
|------------------------------------|------------------------------------|
| DRV_REF 500.0mBa<br>15 FBK 82.1mBa | DRV_REF 500.0kPa<br>15 FBK 82.1kPa |
|------------------------------------|------------------------------------|

### 4 Built-in RS485 and Optional Communication

The built-In RS485 allows for communication without external option. However, the optional communication boards enable the iP5A to talk to BMS and most Industrial Systems

### 5 Long-life Condenser and Simple Framework

iP5A adopts long-life condenser and enables easy maintenance in simple framework.

### 6 Consumption Time Display

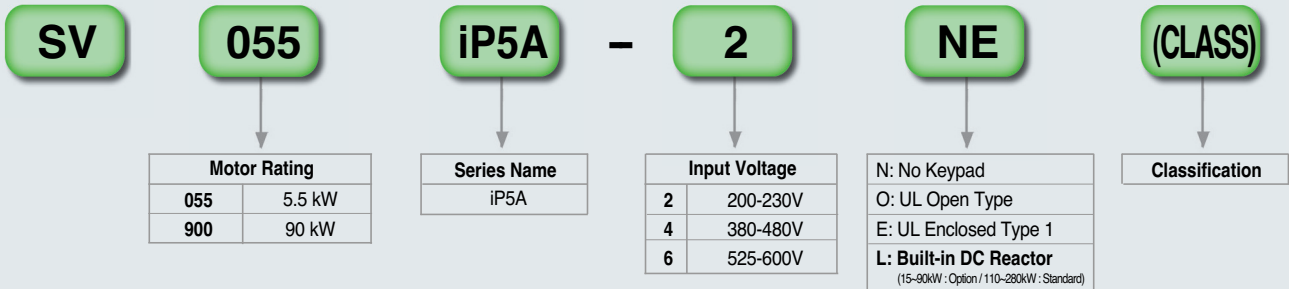
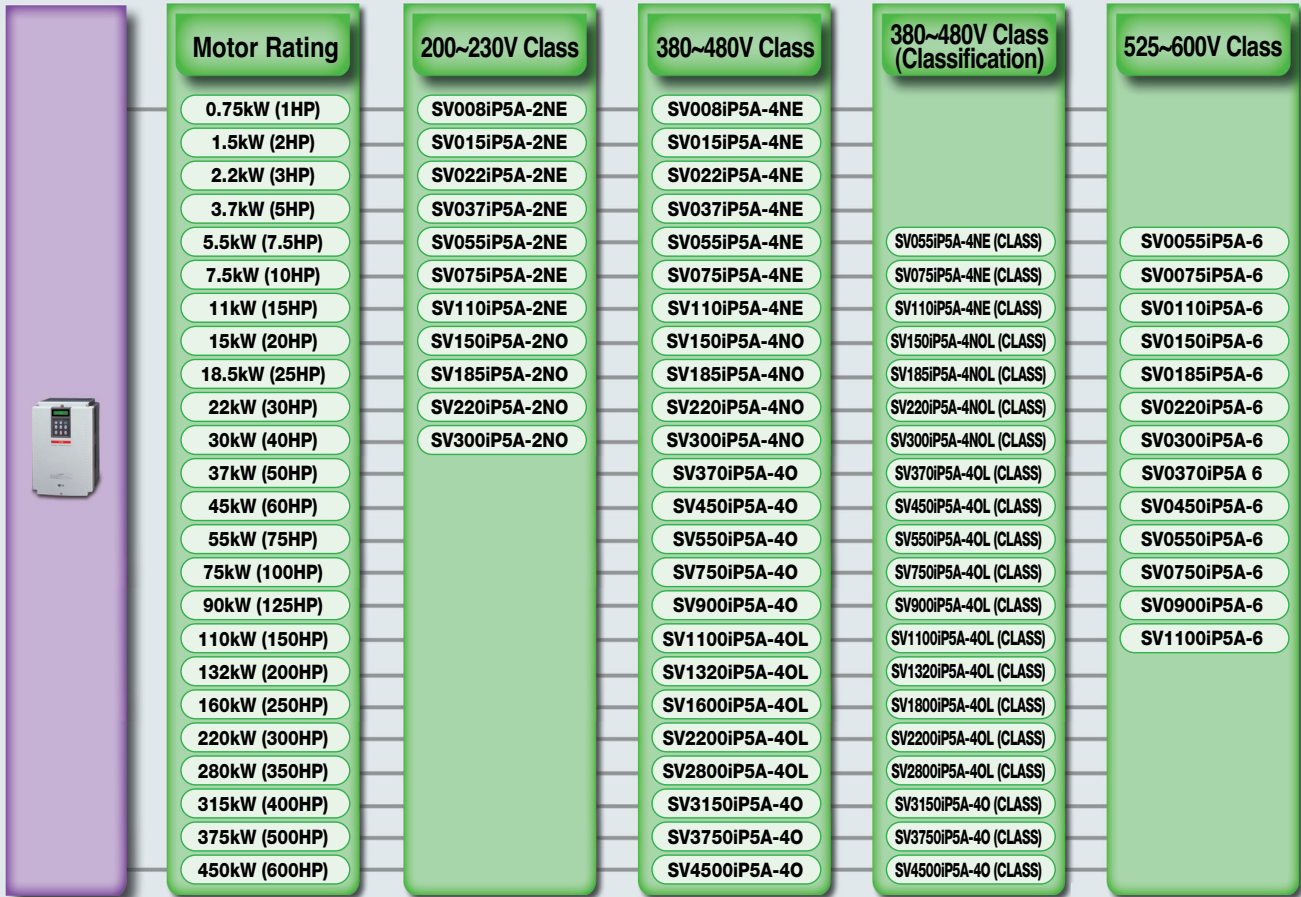
iP5A displays consumption time of components so that users can replace them in time.

### 7 Others

- Removable terminal board
- External fan available
- Cooling fan on/off control



# Model & Type



SV055iP5A-2NE

← Model Number

---

INPUT 200-230 V 3 Phase  
25A 50/60HZ

← Input Rating

---

OUTPUT 0-Input V 3 Phase  
24A 0.01-120HZ

← Output Rating

---

9.1KVA, Enclosed Type 1

← Protection Degree

---

  
 90204000408

← Bar Cord

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90204000408

← Serial Number

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LS Industrial Systems Co., Ltd.      Made in Korea

 Marine Approved Drives needs additional ordering.

# Standard Specifications

## ●● 200~230V Class (0.75~30kW / 1~40HP)

| Model Number (SV□□□ iP5A-2)      |                                | 008                        | 015                         | 022      | 037       | 055       | 075     | 110     | 150                        | 185        | 220                              | 300      |      |    |
|----------------------------------|--------------------------------|----------------------------|-----------------------------|----------|-----------|-----------|---------|---------|----------------------------|------------|----------------------------------|----------|------|----|
| Capacity [kVA] <sup>Note1)</sup> |                                | 1.9                        | 3.0                         | 4.6      | 6.1       | 9.1       | 12.2    | 17.5    | 22.9                       | 28.2       | 33.5                             | 43.8     |      |    |
| Fan or pump load                 | Motor rating <sup>Note2)</sup> | (HP)                       | 1                           | 2        | 3         | 5         | 7.5     | 10      | 15                         | 20         | 25                               | 30       | 40   |    |
|                                  |                                | (kW)                       | 0.75                        | 1.5      | 2.2       | 3.7       | 5.5     | 7.5     | 11                         | 15         | 18.5                             | 22       | 30   |    |
|                                  | Current [A]                    |                            | 5                           | 8        | 12        | 16        | 24      | 32      | 46                         | 60         | 74                               | 88       | 115  |    |
|                                  | (110% over current)            |                            | 110% 1 Minute (Normal Duty) |          |           |           |         |         |                            |            |                                  |          |      |    |
| Output ratings                   | General load                   | Motor rating               | (HP)                        | 0.5      | 1         | 2         | 3       | 5.5     | 7.5                        | 10         | 15                               | 20       | 25   | 30 |
|                                  |                                |                            | (kW)                        | 0.4      | 0.75      | 1.5       | 2.2     | 3.7     | 5.5                        | 7.5        | 11                               | 15       | 18.5 | 22 |
|                                  |                                | Current [A]                |                             | 2.5      | 5         | 8         | 12      | 17      | 23                         | 33         | 44                               | 54       | 68   | 84 |
|                                  | (150% over current)            |                            | 110% 1 Minute (Normal Duty) |          |           |           |         |         | 150% 1 Minute (Heavy Duty) |            |                                  |          |      |    |
|                                  | Frequency                      |                            | 0.01~120 Hz                 |          |           |           |         |         |                            |            |                                  |          |      |    |
| Voltage                          |                                | 200~230V <sup>Note3)</sup> |                             |          |           |           |         |         |                            |            |                                  |          |      |    |
| Input ratings                    | Voltage                        |                            | 3 φ 200~230V (-15%~+10%)    |          |           |           |         |         |                            |            |                                  |          |      |    |
|                                  | Frequency                      |                            | 50/60 Hz (± 5%)             |          |           |           |         |         |                            |            |                                  |          |      |    |
| Protection degree                |                                | IP20 / UL Type1            |                             |          |           |           |         |         |                            |            | IP00 / UL Open <sup>Note4)</sup> |          |      |    |
| Weight [kg (lbs.)]               |                                | 4.1(9.0)                   | 4.2(9.3)                    | 4.2(9.3) | 4.9(10.8) | 4.9(10.8) | 6(13.2) | 6(13.2) | 13(28.7)                   | 13.5(29.8) | 20(44.1)                         | 20(44.1) |      |    |

## ●● 380~480V Class (0.75~90kW / 1~125HP)

| Model Number (SV□□□ iP5A-4)      |                                | 008                        | 015                         | 022      | 037      | 055       | 075       | 110     | 150                        | 185        | 220                              | 300        | 370        | 450      | 550      | 750      | 900       |           |     |
|----------------------------------|--------------------------------|----------------------------|-----------------------------|----------|----------|-----------|-----------|---------|----------------------------|------------|----------------------------------|------------|------------|----------|----------|----------|-----------|-----------|-----|
| Capacity [kVA] <sup>Note1)</sup> |                                | 2.0                        | 3.0                         | 4.8      | 6.4      | 9.6       | 12.7      | 19.1    | 23.9                       | 31.1       | 35.9                             | 48.6       | 59.8       | 72.5     | 87.6     | 121.1    | 145.8     |           |     |
| Fan or pump load                 | Motor rating <sup>Note2)</sup> | (HP)                       | 1                           | 2        | 3        | 5         | 7.5       | 10      | 15                         | 20         | 25                               | 30         | 40         | 50       | 60       | 75       | 100       | 125       |     |
|                                  |                                | (kW)                       | 0.75                        | 1.5      | 2.2      | 3.7       | 5.5       | 7.5     | 11                         | 15         | 18.5                             | 22         | 30         | 37       | 45       | 55       | 75        | 90        |     |
|                                  | Current [A]                    |                            | 2.5                         | 4        | 6        | 8         | 12        | 16      | 24                         | 30         | 39                               | 45         | 61         | 75       | 91       | 110      | 152       | 183       |     |
|                                  | (110% over current)            |                            | 110% 1 Minute (Normal Duty) |          |          |           |           |         |                            |            |                                  |            |            |          |          |          |           |           |     |
| Output ratings                   | General load                   | Motor rating               | (HP)                        | 0.5      | 1        | 2         | 3         | 5.5     | 7.5                        | 10         | 15                               | 20         | 25         | 30       | 40       | 50       | 60        | 75        | 100 |
|                                  |                                |                            | (kW)                        | 0.4      | 0.75     | 1.5       | 2.2       | 3.7     | 5.5                        | 7.5        | 11                               | 15         | 18.5       | 22       | 30       | 37       | 45        | 55        | 75  |
|                                  |                                | Current [A]                |                             | 1.25     | 2.5      | 4         | 6         | 8.8     | 12                         | 16         | 22/24                            | 28/30      | 34/39      | 44/45    | -        | -        | -         | -         | -   |
|                                  | (150% over current)            |                            | 110% 1 Minute (Normal Duty) |          |          |           |           |         | 150% 1 Minute (Heavy Duty) |            |                                  |            |            |          |          |          |           |           |     |
|                                  | Frequency                      |                            | 0.01~120 Hz                 |          |          |           |           |         |                            |            |                                  |            |            |          |          |          |           |           |     |
| Voltage                          |                                | 380~480V <sup>Note3)</sup> |                             |          |          |           |           |         |                            |            |                                  |            |            |          |          |          |           |           |     |
| Input ratings                    | Voltage                        |                            | 3 φ 380~480V (-15%~+10%)    |          |          |           |           |         |                            |            |                                  |            |            |          |          |          |           |           |     |
|                                  | Frequency                      |                            | 50/60 Hz (± 5%)             |          |          |           |           |         |                            |            |                                  |            |            |          |          |          |           |           |     |
| Protection degree                |                                | IP20 / UL Type1            |                             |          |          |           |           |         |                            |            | IP00 / UL Open <sup>Note4)</sup> |            |            |          |          |          |           |           |     |
| Weight [kg (lbs.)]               | Standard Type                  |                            | 4.1(9.0)                    | 4.2(9.3) | 4.2(9.3) | 4.9(10.8) | 4.9(10.8) | 6(13.2) | 6(13.2)                    | 12.5(27.6) | 13(28.7)                         | 20(44.1)   | 20(44.1)   | 27(59.5) | 27(59.5) | 29(64)   | 42(92.6)  | 43(94.8)  |     |
|                                  | Built-in DCL Type              |                            | -                           | -        | -        | -         | -         | -       | -                          | 19.5(43.9) | 19.5(42.9)                       | 26.5(58.3) | 26.5(58.3) | 39(86)   | 40(88.2) | 42(92.6) | 67(147.4) | 68(149.9) |     |

<sup>Note 1)</sup> Rated capacity (v 3 × V × I) is based on 220V for 200V class and 460V for 400V class.

<sup>2)</sup> Indicates the maximum applicable capacity when using a 4-Pole LS motor.

<sup>3)</sup> Maximum output voltage will not exceed the input voltage. An output voltage less than the input voltage may be programmed if necessary.

<sup>4)</sup> IP20/UL Type1 with optional conduit, it can be modified to UL Type1.

# Standard Specifications

## ●● 380~480V Class (110~450kW / 50~125HP)

| Model Number (SV□□□ iP5A-4)      |                  |                                | 1100                             | 1320                        | 1600        | 2200        | 2800        | 3150            | 3750        | 4500        |     |  |
|----------------------------------|------------------|--------------------------------|----------------------------------|-----------------------------|-------------|-------------|-------------|-----------------|-------------|-------------|-----|--|
| Capacity [kVA] <sup>Note1)</sup> |                  |                                | 178                              | 210                         | 259         | 344         | 436         | 488             | 582         | 699         |     |  |
| Output ratings                   | Fan or pump load | Motor rating <sup>Note2)</sup> | (HP)                             | 150                         | 200         | 250         | 300         | 350             | 400         | 500         | 600 |  |
|                                  |                  |                                | (kW)                             | 110                         | 132         | 160         | 220         | 280             | 315         | 375         | 450 |  |
|                                  |                  | Current [A]                    |                                  | 223                         | 264         | 325         | 432         | 547             | 613         | 731         | 877 |  |
|                                  |                  | (110% over current)            |                                  | 110% 1 Minute (Normal Duty) |             |             |             |                 |             |             |     |  |
|                                  | General load     | Motor rating                   | (HP)                             | 125                         | 150         | 200         | 250         | 300             | 350         | 400         | 500 |  |
|                                  |                  |                                | (kW)                             | 90                          | 10          | 132         | 160         | 220             | 280         | 315         | 375 |  |
|                                  |                  | Current [A]                    |                                  | 183                         | 223         | 264         | 325         | 432             | 547         | 613         | 731 |  |
|                                  |                  | (150% over current)            |                                  | 150% 1 Minute (Heavy Duty)  |             |             |             |                 |             |             |     |  |
|                                  | Frequency        |                                |                                  | 0.01~120 Hz                 |             |             |             |                 |             |             |     |  |
|                                  | Voltage          |                                |                                  | 380~480V <sup>Note3)</sup>  |             |             |             |                 |             |             |     |  |
| Input ratings                    | Voltage          |                                |                                  | 3 φ 380~480V (-15%~+10%)    |             |             |             |                 |             |             |     |  |
|                                  | Frequency        |                                |                                  | 50/60 Hz (± 5%)             |             |             |             |                 |             |             |     |  |
| Protection degree                |                  |                                | IP00 / UL Open <sup>Note4)</sup> |                             |             |             |             |                 |             |             |     |  |
| DCL                              |                  |                                | Built-in                         |                             |             |             |             | External Option |             |             |     |  |
| Weight [kg (lbs.)]               |                  |                                | 101 (222.7)                      | 101 (222.7)                 | 114 (251.3) | 200 (441.9) | 200 (441.9) | 243 (535.7)     | 380 (837.7) | 380 (837.7) |     |  |

## ●● 525~600V Class (5.5~110kW / 7.5~150HP)

| Model Number (SV□□□ iP5A-6) |                  |                     | 0055   | 0075                          | 0110   | 0150   | 0185   | 0220   | 0300   | 0370    | 0450    | 0550    | 0750    | 0900    | 1100  |     |
|-----------------------------|------------------|---------------------|--|-------------------------------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|-------|-----|
| Capacity [kVA]              |                  |                     | 9.6  | 12.7                          | 19.1   | 23.9   | 31.1   | 35.9   | 48.6   | 59.8    | 72.5    | 87.6    | 121.1   | 145.8   | 178   |     |
| Output ratings              | Fan or pump load | Motor rating        | (HP)   | 7.5                           | 10     | 15     | 20     | 25     | 30     | 40      | 50      | 60      | 75      | 100     | 125   | 150 |
|                             |                  |                     | (kW)   | 5.5                           | 7.5    | 11     | 15     | 18.5   | 22     | 30      | 37      | 45      | 55      | 75      | 90    | 110 |
|                             |                  | Current [A]         |  | 9                             | 12     | 17     | 23     | 27     | 34     | 43      | 55      | 64      | 80      | 104     | 128   | 150 |
|                             |                  | (110% over current) |  | 110% 1Minute (Normal Duty)    |        |        |        |        |        |         |         |         |         |         |       |     |
|                             | General load     | Motor rating        | (HP)   | 5.5                           | 7.5    | 10     | 15     | 20     | 25     | 30      | 40      | 50      | 60      | 75      | 100   | 125 |
|                             |                  |                     | (kW)   | 3.7                           | 5.5    | 7.5    | 11     | 15     | 18.5   | 22      | 43      | 55      | 64      | 80      | 104   | 128 |
|                             |                  | Current [A]         |  | 6.1                           | 9      | 12     | 17     | 23     | 27     | 34      | -       | -       | -       | -       | -     | -   |
|                             |                  | (150% over current) |  | 150% 1 Minute (Heavy Duty)    |        |        |        |        |        |         |         |         |         |         |       |     |
|                             | Frequency        |                     |  | 0.01 ~ 120 Hz                 |        |        |        |        |        |         |         |         |         |         |       |     |
|                             | Voltage          |                     |  | 525 ~ 600V <sup>Note3)</sup>  |        |        |        |        |        |         |         |         |         |         |       |     |
| Input ratings               | Voltage          |                     |  | 3 φ 525 ~ 600V (-15% ~ +10 %) |        |        |        |        |        |         |         |         |         |         |       |     |
|                             | Frequency        |                     |  | 50/60 Hz (± 5 %)              |        |        |        |        |        |         |         |         |         |         |       |     |
| Protection degree           |                  |                     | IP20 / UL Type1 IP00 / UL Open <sup>Note4)</sup> |                               |        |        |        |        |        |         |         |         |         |         |       |     |
| Weight [kg (lbs.)]          | Standard Type    |                     | 6.5  | 7.0                           | 7.0    | 11.7   | 11.7   | 18.9   | 18.9   | 32      | 32      | 32      | 46      | 46      | 101   |     |
|                             |                  |                     | (14.4)   | (15.5)                        | (15.5) | (25.8) | (25.8) | (41.7) | (41.7) | (70.65) | (70.65) | (70.65) | (101.5) | (101.5) | (223) |     |

<sup>Note 1)</sup> Rated capacity (v 3 × V × I) is based on 220V for 200V class and 460V for 400V class.

<sup>2)</sup> Indicates the maximum applicable capacity when using a 4-Pole LS motor.

<sup>3)</sup> Maximum output voltage will not exceed the input voltage. An output voltage less than the input voltage may be programmed if necessary.

<sup>4)</sup> IP20/UL Type1 with optional conduit, it can be modified to UL Type1.



## Common Specifications

|                           |                                     |  |  |
|---------------------------|-------------------------------------|--|--|
| <b>Cooling method</b>     |                                     | Forced air cooling (Self-cooling for below 1.5kW-2, 2.2kW-4)   |  |
| <b>Control</b>            | <b>Control Method</b>               | V/F, Sensorless Vector, Slip Compensation, Easy Start Selectable   |  |
|                           | <b>Frequency Setting Resolution</b> | Digital Reference: 0.01 Hz (Below 100 Hz), 0.1 Hz (Over 100 Hz)<br>Analog Reference: 0.01 Hz / 60 Hz   |  |
|                           | <b>Frequency Accuracy</b>           | Digital : 0.01% of the max frequency<br>Analog : 0.1% of the max frequency   |  |
|                           | <b>V/F Pattern</b>                  | Linear, Squared Pattern, User V/F  |  |
|                           | <b>Overload Capacity</b>            | 110 % per 1 min, 120% per 1 min <sup>Note5)</sup>  |  |
|                           | <b>Torque Boost</b>                 | Manual Torque Boost (0 ~ 15 %), Auto Torque Boost  |  |
|                           | <b>Operation Method</b>             | Keypad / Terminal / Communication Operation  |  |
| <b>Operatio</b>           | <b>Frequency Setting</b>            | Analog: 0 ~ 12V / -12V ~ 12V / 0~20mA/ Pulse / Ext-PID<br>Digital: Keypad  |  |
|                           | <b>Input Signal</b>                 | <b>Start Signal</b>  | Forward, Reverse   |
|                           |                                     | <b>Multi-Step</b>  | Up to 18 Speeds can be set including Jog (Use Programmable Digital Input Terminal, Including Jog/Dwell )   |
|                           |                                     | <b>Multi Step Accel/Decel Time</b>   | 0.1~ 6,000 sec, Max 4 types can be set via Multi- Function Terminal. Accel/Decel Pattern: Linear, U-Curve, S-Curve Selectable  |
|                           |                                     | <b>Emergency Stop</b>  | Interrupts the Output of Inverter  |
|                           |                                     | <b>Jog</b>   | Jog Operation  |
|                           |                                     | <b>Fault Reset</b>   | Fault Reset  |
|                           | <b>Output signal</b>                | <b>Operating Status</b>  | Frequency Detection Level, Overload Alarm, Stalling, Over Voltage, Low Voltage, Inverter Overheating/ Running/ Stopping/ Constant running, Inverter By-Pass, Speed Searching |
|                           |                                     | <b>Fault Output</b>  | Contact Output (3A, 3C, 3B) - AC 250V 1A, DC 30V 1A  |
|                           |                                     | <b>Indicator</b>   | Choose 2 from Output Frequency, Output Current, Output Voltage, DC Link Voltage (Output Voltage: 0 ~ 10V)  |
| <b>Operation Function</b> |                                     | DC Braking, Frequency Limit, Frequency Jump, 2 <sup>nd</sup> Function, Slip Compensation, Reverse Rotation Prevention, Auto Restart, Invert By-Pass Auto-Tuning PID Control Start Stop Braking leakage Pre-PID Dual-PID MMC Start Prer By Pass, Auto Tuning, Control, Flying Start, Safety Stop, Flux Braking, Low leakage, Pre PID, Dual PID, MMC, Easy Start, e-heater |  |
| <b>Protection</b>         | <b>Inverter Trip</b>                | Over Voltage, Low Voltage, Over Current, Ground Fault, Inverter Overheat, Motor Overheat, Output Phase Open, Overload Protection, External Fault 1, 2, Communication Error, Loss of Speed Command, Hardware Fault, Option Fault etc  |  |
|                           | <b>Inverter Alarm</b>               | Stall Prevention, Overload Alarm, Thermal Sensor Fault   |  |
| <b>Display</b>            | <b>Keypad</b>                       | <b>Operation Information</b>   | Output Frequency, Output Current, Output Voltage, Frequency Set Value, Operating Speed, DC Voltage, Integrating Wattmeter, Fan ON time, Run-time, Last Trip Time             |
|                           |                                     | <b>Trip Information</b>  | Trips Indication when the Protection Function activates.<br>Max. 5 Faults are saved.<br>Last Trip Time.  |
| <b>Environment</b>        | <b>Ambient Temperature</b>          |  | -10°C ~ 50°C (14°F ~ 122°F)<br>Decrease 2% of rated current for every 1°C increase in above 40°C   |
|                           | <b>Storage Temperature</b>          |  | -20°C ~ 65°C (14°F~ 149°F)   |
|                           | <b>Ambient Humidity</b>             |  | Below 90 % RH Max. (Non-Condensing)  |
|                           | <b>Altitude-Vibration</b>           |  | Below 1,000m (3,300ft), Below 5.9m/sec <sup>2</sup> (0.6g)   |
|                           | <b>Application Site</b>             |  | Pollution degree 2, No Corrosive Gas, Combustible Gas, Oil Mist, or Dust   |

(1) Rated capacity (r<sup>3</sup>×V×I) is based on 220V for 200V class and 460V for 400V class.

(3) IP20 or UL Enclosed Type1 can be provided by the option.

(5) Overload rating 120%, 1 min is based on ambient 25°C

(2) Indicates the maximum applicable capacity when using a 4-Pole standard motor.

(4) IP20 or UL Enclosed Type1 is not provided.

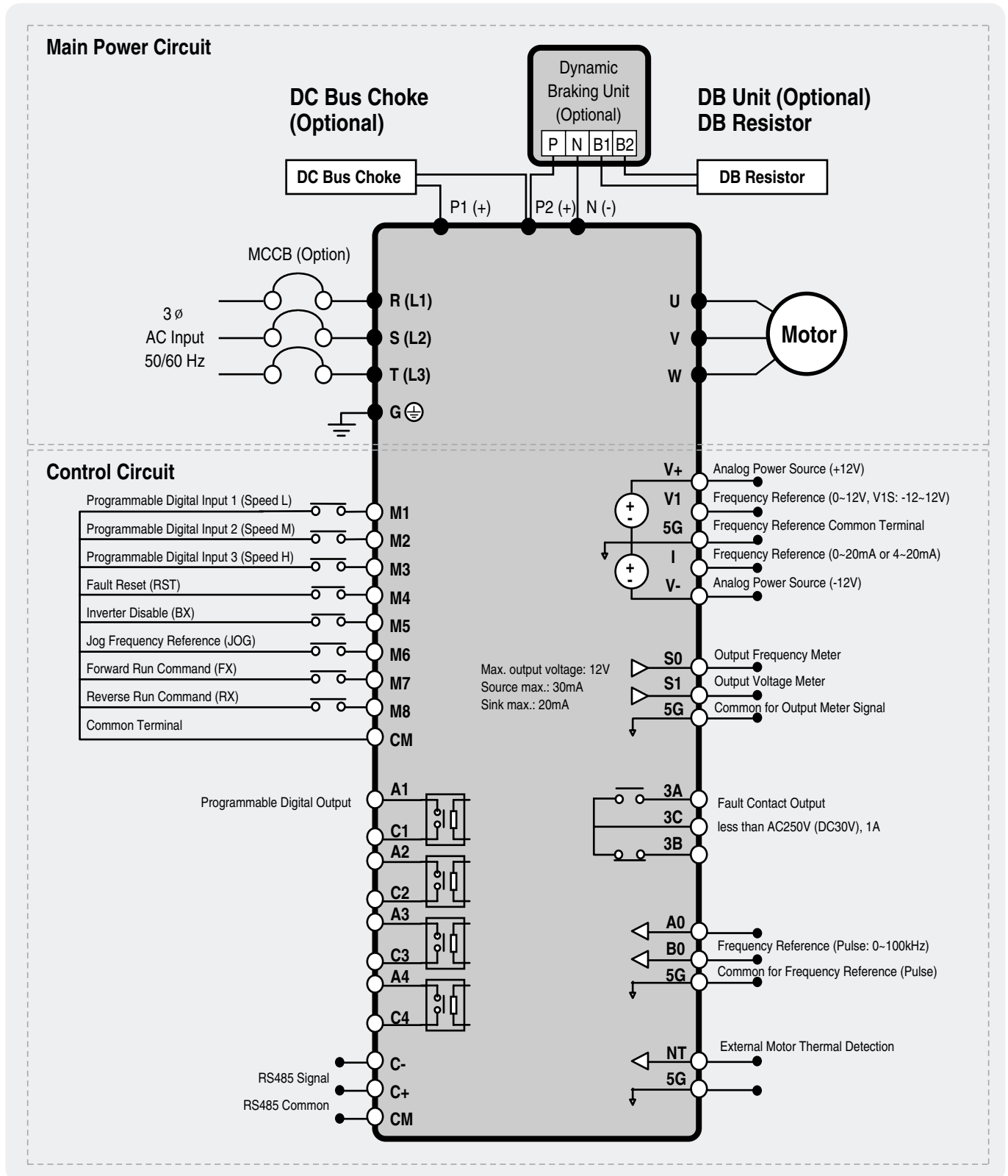
# Standard Specifications

## Common Specifications (External)

|                                  |                         |   |                                |
|----------------------------------|-------------------------|---|--------------------------------|
| <b>Keypad</b>                    | LCD                     | 32 character display<br>Keypad Download and Upload available  | All units                      |
| <b>Remote</b>                    | Remote cable            | 2m, 3m and 5m long keypad cable enables users to control the inverter from a distant area               | Optional                       |
| <b>Dynamic braking</b>           | DB resistor             | To enhance the regenerative braking performance, it makes the inverter to accelerate/decelerate rapidly | According to inverter capacity |
|                                  | DB unit                 | If it need a regenerative braking, it is used with DB resistor  |                                |
| <b>Conduit option</b>            | Conduit for NEMA TYPE 1 | Install it to fit for NEMA TYPE 1 Enclosure or IP20   | 15~90kW<br>(20~125HP)          |
| <b>Communication option card</b> | DEVICENET               | DEVICENET optional communication card   | All series<br>(Above S/W V10)  |
|                                  | PROFIBUS                | PROFIBUS optional communication card  | All series<br>(Above S/W V10)  |
|                                  | LS485/MODBUS_RTU        | LS485/MODBUS_RTU optional communication card  | All series<br>(Above S/W V10)  |
|                                  | LonWorks                | Lonworks optional communication card  | All series<br>(Above S/W V10)  |
|                                  | BACNet                  | BACNet optional communication card  | All series<br>(Above S/W V10)  |
|                                  | MODBUS_TCP              | MODBUS_TCP optional communication card  | All series<br>(Above S/W V10)  |
|                                  | Metasys_N2              | Metasys_N2 optional communication card  | All series<br>(Above S/W V10)  |
|                                  | CCLink                  | CCLink optional communication card  | All series<br>(Above S/W V10)  |
|                                  | CANopen                 | CANopen optional communication card   | All series<br>(Above S/W V10)  |

# Wiring

⚡ For 0.75~30kW (1~40HP)

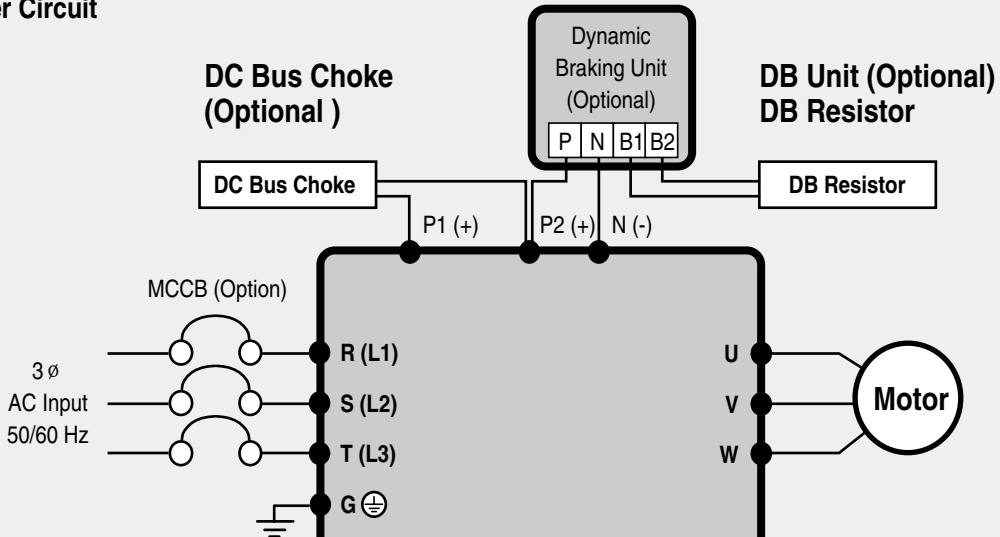


Note 1) 5G is Common Ground for Analog Input / Output.  
2) Use terminal V1 for V1, V1S (0~12V, -12~12V) input.

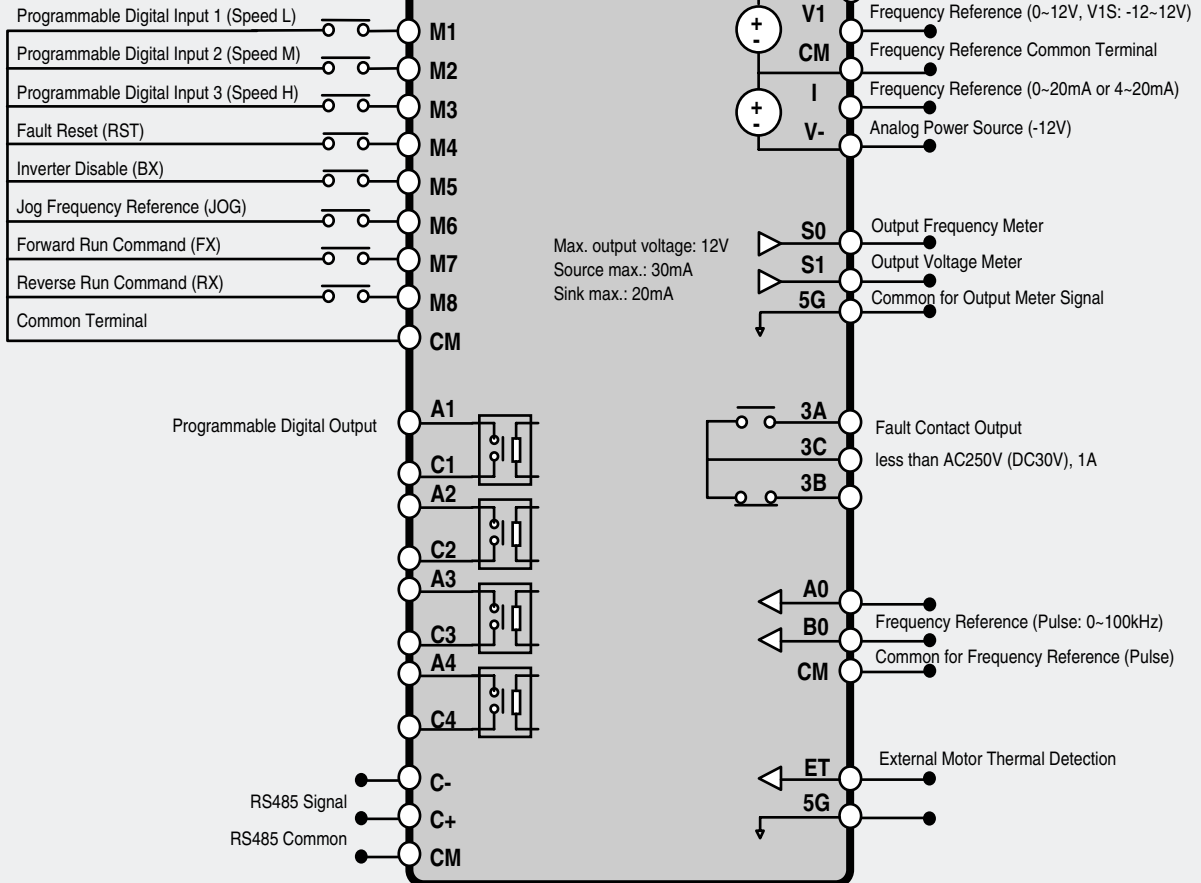


For 37~90kW (50~125HP) / 315~450kW (400~600HP)

### Main Power Circuit

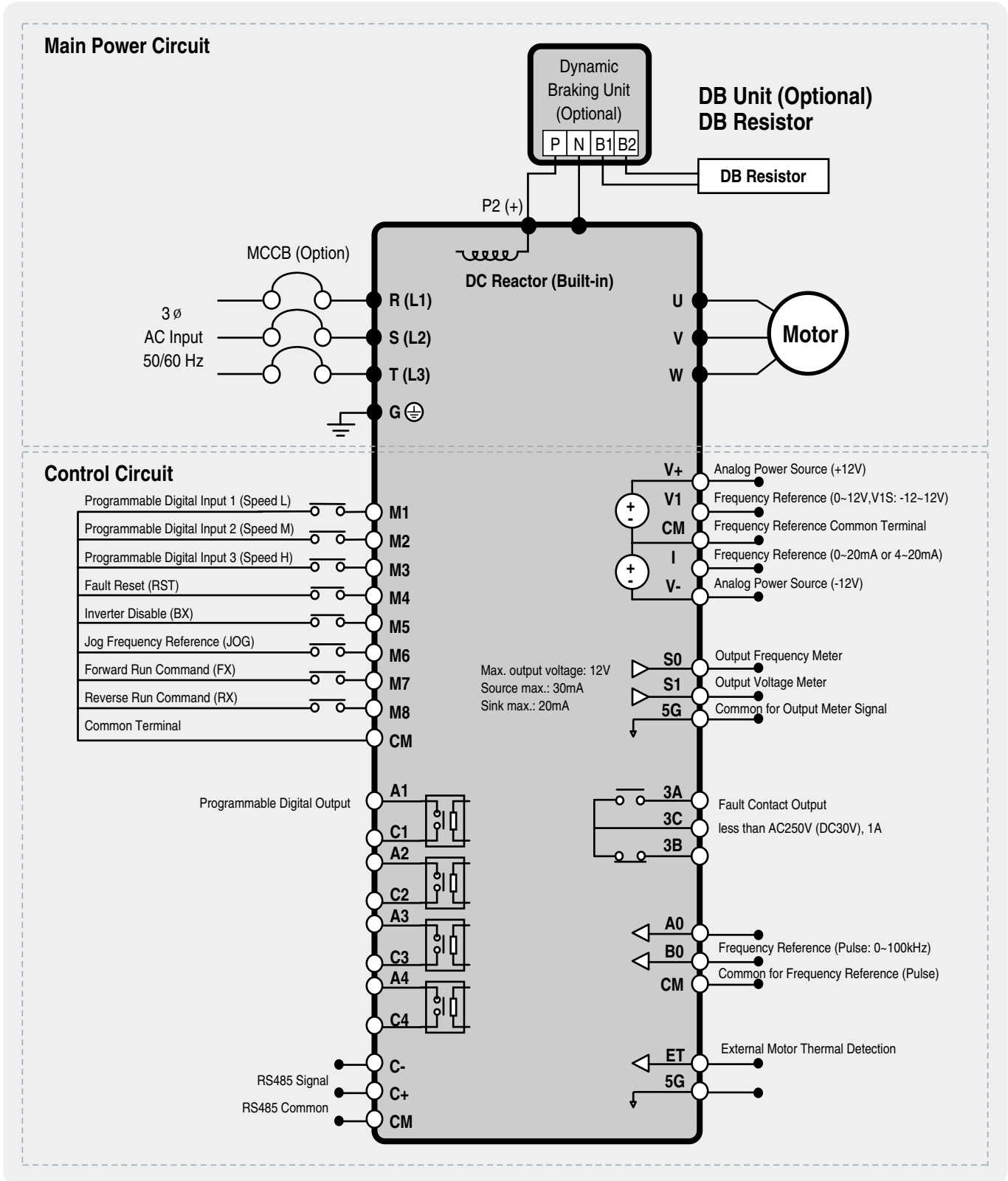


### Control Circuit



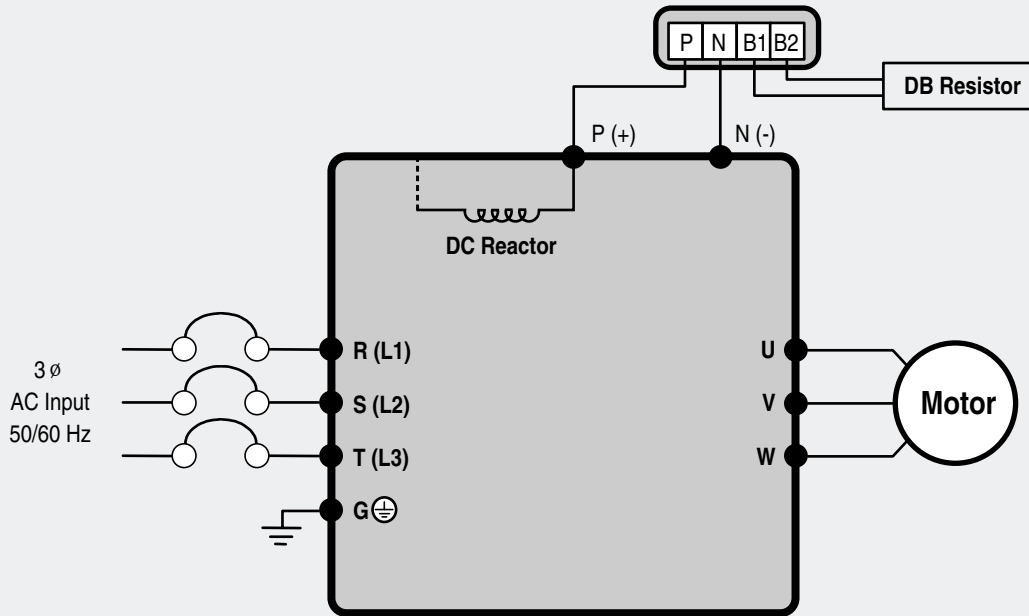
Note 1) 5G is Common Ground for Analog Meter Output (S0, S1) and External motor thermal detection (ET).  
2) Use terminal V1 for V1, V1S (0-12V, -12-12V) input.  
3) DC Reactor is built basically in inverters for 15-280kW.

⚡ For 110~280kW (150~350HP)

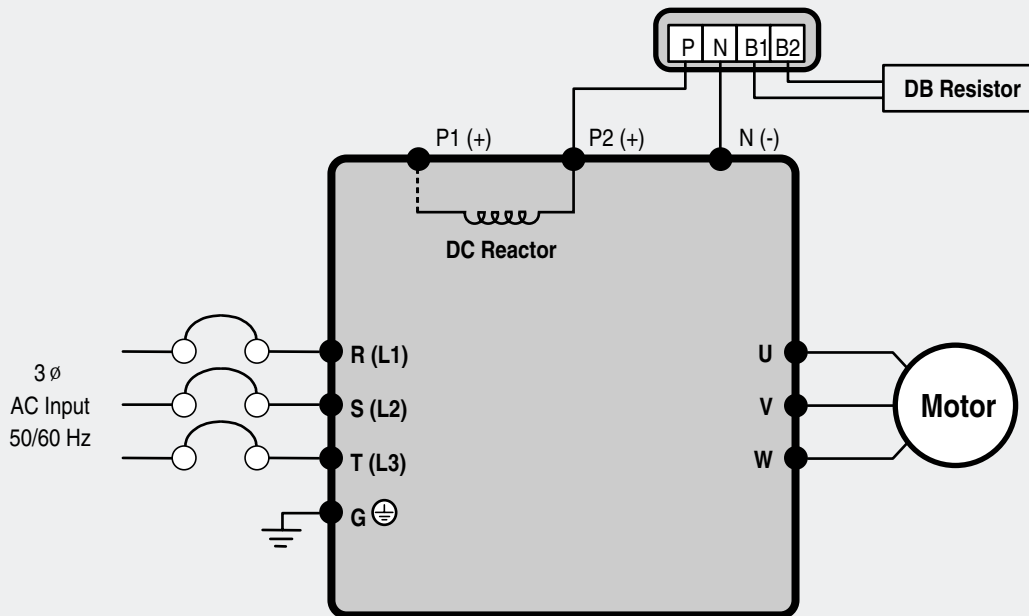


Note 1) 5G is Common Ground for Analog Meter Output (S0, S1) and External motor thermal detection (ET).  
 2) Use terminal V1 for V1, V1S (0~12V, -12~12V) input.  
 3) DC Reactor is built basically in inverters for 15~280kW.

⚡ For 15~30kW (20~40HP) Built-in DCL Type



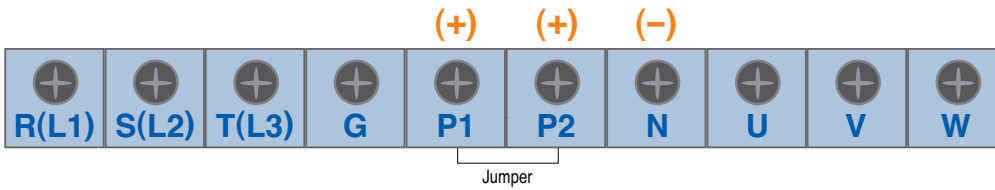
⚡ For 37~90kW (50~125HP) Built-in DCL Type



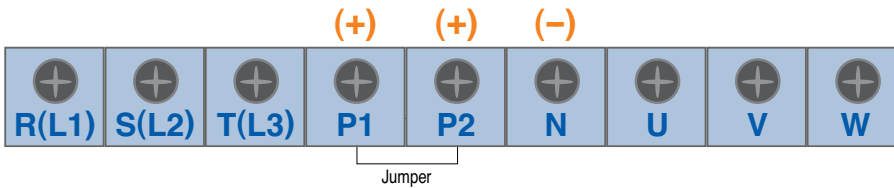
Note) P1 (+) is not provided for wiring.

# Terminal Configurations (Power Circuit Terminal)

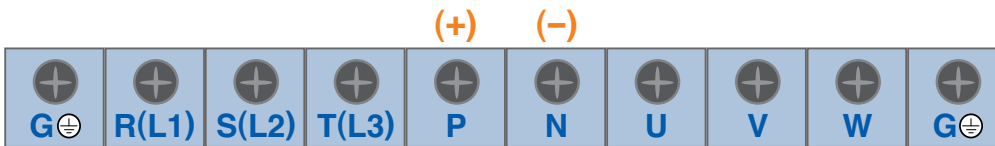
●● 0.75~30kW (1~40HP) <200V/400V Class>



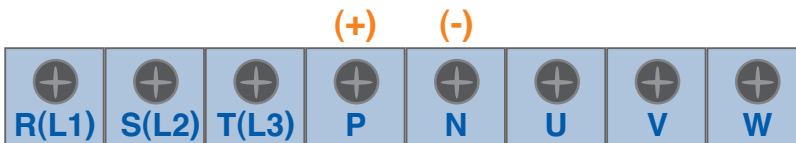
●● 37~90kW (50~125HP) / 315~450kW (400~600HP) <400V/600V Class>



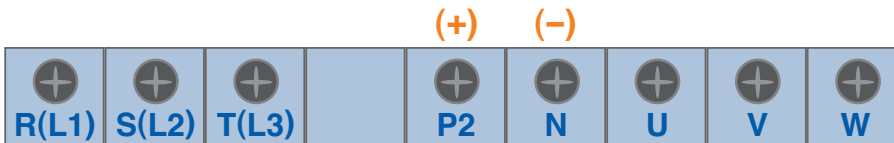
●● 15~18.5kW (20~25HP) <Built-in DC Reactor Type, 400V Class>



●● 22~30kW (30~40HP) <Built-in DC Reactor Type, 400V Class>



●● 37~90kW (50~125HP) / 110~280kW (150~350HP) <Built-in DC Reactor Type, 400V Class>



Note) P1 (+) is not provided for wiring.

| Symbol                        | Description  |
|-------------------------------|--|
| R, S, T (L1, L2, L3)          | AC Line Voltage Input  |
| G                             | Earth Ground   |
| P1 (+), P2 (+)                | External DC Reactor [P1 (+)-P2 (+)] Connection Terminals (Jumper must be removed). |
| P2 (+), N (-) or P (+), N (-) | DB Unit [P2 (+)-N (-)] Connection Terminals  |
| U, V, W                       | 3 Phase Power Output Terminals to Motor  |

# Terminal Configurations (Power Circuit Terminal)

## Grounding

| Inverter Capacity |           | Grounding wire Sizes, kcmil (mm <sup>2</sup> ) |            |
|-------------------|-----------|--|------------|
| kW                | HP        | 200V Class                                     | 400V Class |
| 0.75 ~ 3.7 kW     | 1 ~ 5     | 4  | 2.5        |
| 5.5 ~ 7.5         | 7.5 ~ 10  | 6  | 4          |
| 11 ~ 15           | 15 ~ 20   | 16   | 10         |
| 18.5 ~ 30         | 25 ~ 40   | 25   | 16         |
| 37 ~ 55           | 50 ~ 75   | -  | 25         |
| 75 ~ 90           | 100 ~ 125 | -  | 35         |
| 110 ~ 132         | 150 ~ 200 | -  | 70         |
| 160 ~ 280         | 250 ~ 350 | -  | 95         |
| 315 ~ 375         | 400 ~ 600 | -  | 150        |
| 450               | 700       | -  | 240        |

## Wires & Terminal lugs

Refer to below for wires, terminal lugs, and screws used to connect the inverter power input and output.

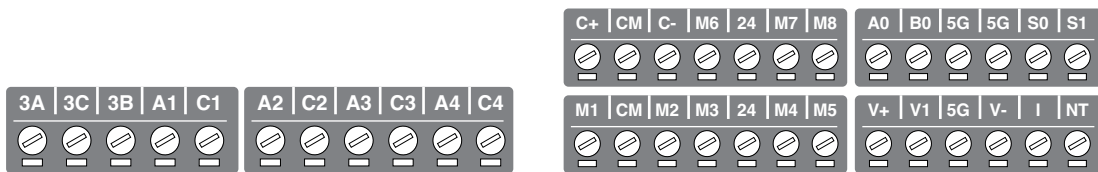
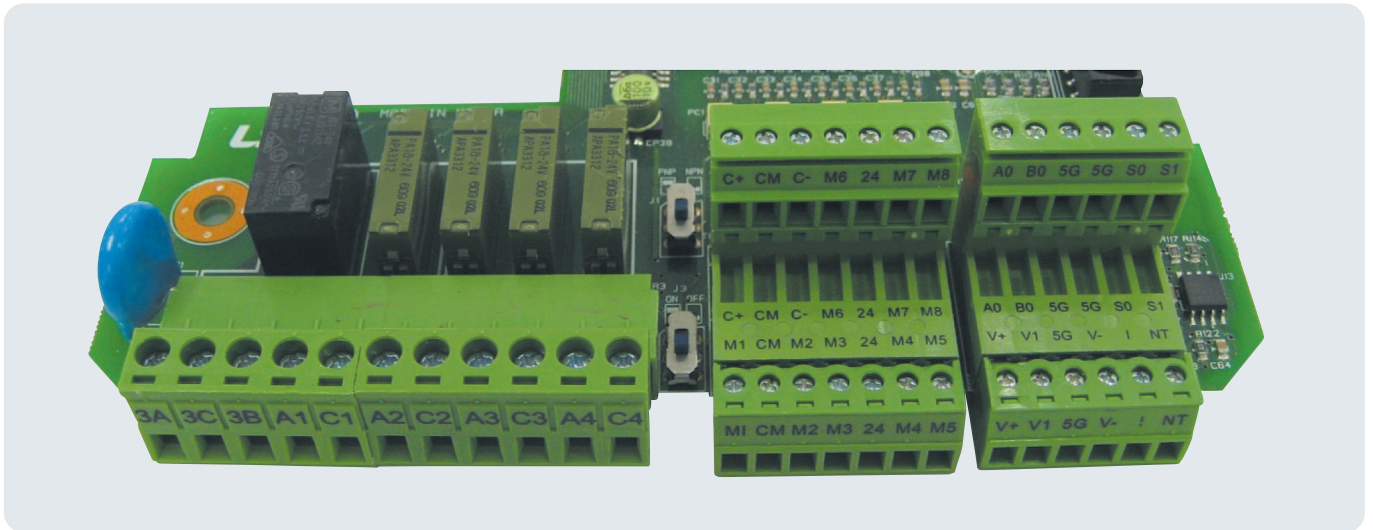
| Inverter capacity | Terminal screw size  | Screw torque |             | Wire size           |              |                 |              |     |
|-------------------|----------------------|--------------|-------------|---------------------|--------------|-----------------|--------------|-----|
|                   |                      |              |             | R(L1), S(L2), T(L3) |              | U, V, W         |              |     |
|                   |                      | Kgf · cm     | lb · in     | mm <sup>2</sup>     | AWG or kcmil | mm <sup>2</sup> | AWG or kcmil |     |
| 200V Class        | 0.75kW(1HP)          | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 2.5          | 14              | 2.5          | 14  |
|                   | 1.5kW(2HP)           | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 2.5          | 14              | 2.5          | 14  |
|                   | 2.2kW(3HP)           | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 2.5          | 14              | 2.5          | 14  |
|                   | 3.7kW(5HP)           | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 4            | 12              | 4            | 12  |
|                   | 5.5kW(7.5HP)         | M4           | 7.1 ~12.2   | 6.2~10.6            | 5.5          | 10              | 5.5          | 10  |
|                   | 7.5kW(10HP)          | M5           | 24.5 ~31.8  | 21.2~27.6           | 8            | 8               | 8            | 8   |
|                   | 11kW(15HP)           | M5           |             |                     | 14           | 6               | 14           | 6   |
|                   | 15kW(20HP)           | M6           | 30.6 ~38.2  | 26.6~33.2           | 22           | 4               | 22           | 4   |
|                   | 18.5kW(25HP)         | M6           |             |                     | 38           | 2               | 38           | 2   |
|                   | 22kW(30HP)           | M8           | 61.2 ~91.8  | 53.1~79.7           | 38           | 2               | 38           | 2   |
| 30kW(40HP)        | M8                   | 60           |             |                     | 1/0          | 60              | 1/0          |     |
| 400V Class        | 0.75kW(1HP)          | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 2.5          | 14              | 2.5          | 14  |
|                   | 1.5kW(2HP)           | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 2.5          | 14              | 2.5          | 14  |
|                   | 2.2kW(3HP)           | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 2.5          | 14              | 2.5          | 14  |
|                   | 3.7kW(5HP)           | M4           | 7.1 ~12.2   | 6.2 ~10.6           | 2.5          | 14              | 2.5          | 14  |
|                   | 5.5kW(7.5HP)         | M4           | 7.1 ~12.2   | 6.2~10.6            | 3.5          | 12              | 3.5          | 12  |
|                   | 7.5Kw(10HP)          | M4           |             |                     | 3.5          | 12              | 3.5          | 12  |
|                   | 11 kW(15HP)          | M4           |             |                     | 5.5          | 10              | 5.5          | 10  |
|                   | 15 kW(20HP)          | M6           | 30.6~38.2   | 26.6~33.2           | 8            | 8               | 8            | 8   |
|                   | 18.5kW(25HP)         | M6           |             |                     | 14           | 6               | 14           | 6   |
|                   | 22~30kW(30~40HP)     | M8           | 61.2~91.8   | 53.1~79.7           | 22           | 4               | 22           | 4   |
|                   | 37~55kW(50~75HP)     | M8           |             |                     | 38           | 2               | 38           | 2   |
|                   | 75~90kW(100~125HP)   | M10          | 89.7~122.0  | 77.9~105.9          | 60           | 1/0             | 60           | 1/0 |
|                   | 110~132kW(150~200HP) | M12          | 182.4~215.0 | 158.3~186.6         | 100          | 4/0             | 100          | 4/0 |
|                   | 160kW(250HP)         | M12          |             |                     | 150          | 300             | 150          | 300 |
|                   | 220kW(300HP)         | M12          |             |                     | 200          | 400             | 200          | 400 |
|                   | 280kW(350HP)         | M12          |             |                     | 250          | 500             | 250          | 500 |
| 315kW(400HP)      | M12                  | 325          |             |                     | 700          | 325             | 700          |     |
| 375kW(500HP)      | M12                  | 2×200        |             |                     | 2×400        | 2×200           | 2×400        |     |
| 450kW(600HP)      | M12                  | 2×250        |             |                     | 2×500        | 2×250           | 2×500        |     |
| 5.5kW(7.5HP)      | M4                   | 7.1 ~12.2    |             |                     | 6.2~10.6     | 3.5             | 12           | 3.5 |
| 7.5Kw(10HP)       | M4                   |              | 3.5         | 12                  |              | 3.5             | 12           |     |
| 11 kW(15HP)       | M4                   | 30.6~38.2    | 26.6~33.2   | 5.5                 | 10           | 5.5             | 10           |     |
| 15 kW(20HP)       | M6                   |              |             | 8                   | 8            | 8               | 8            |     |
| 18.5kW(25HP)      | M6                   |              |             | 14                  | 6            | 14              | 6            |     |
| 22~30kW(30~40HP)  | M8                   | 61.2~91.8    | 53.1~79.7   | 22                  | 4            | 22              | 4            |     |
| 37~55kW(50~75HP)  | M8                   |              |             | 38                  | 2            | 38              | 2            |     |

\* Apply the rated torque to terminal screws. \* Loose screws can cause of short circuit or malfunction. Tightening the screw too much can damage the terminals and cause a short circuit or malfunction.  
 \* Use copper wires only with 600V, 75°C ratings. For 7.5~11kW 240V type inverters, R(L1), S(L2), T(L3) and U, V, W terminals are only for use with insulated ring type connector.

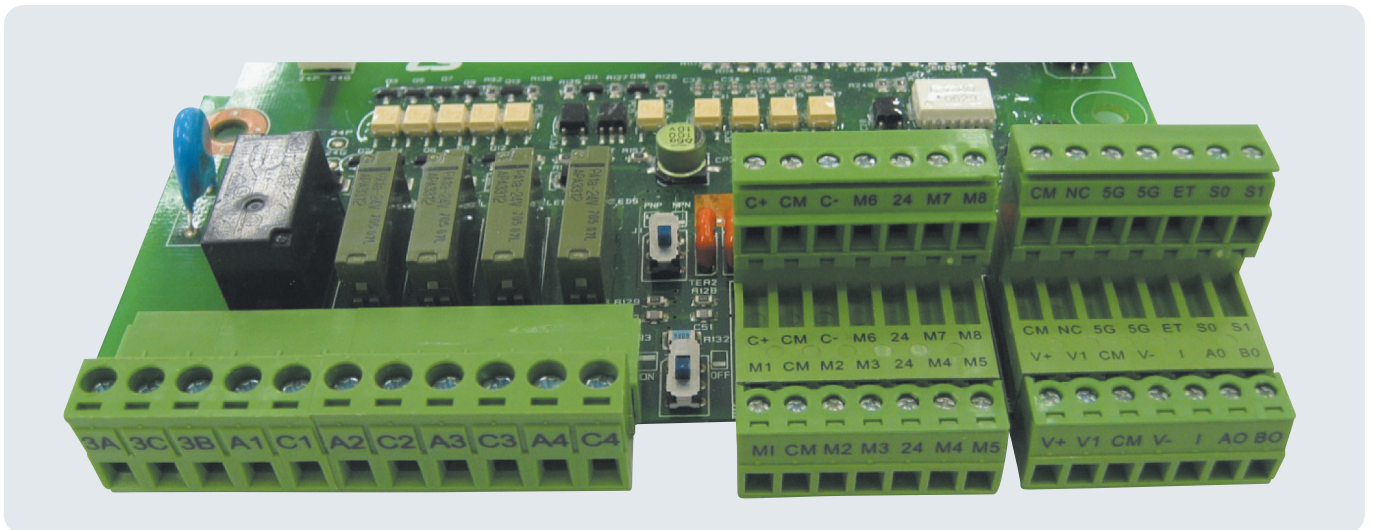


# Terminal Configurations (Control Circuit Terminal)

●● 0.75~30kW / 1~40HP (200V/400V Class)



●● 37~450 kW/50~600HP (400V Class)



# Terminal Configurations (Control Circuit Terminal)

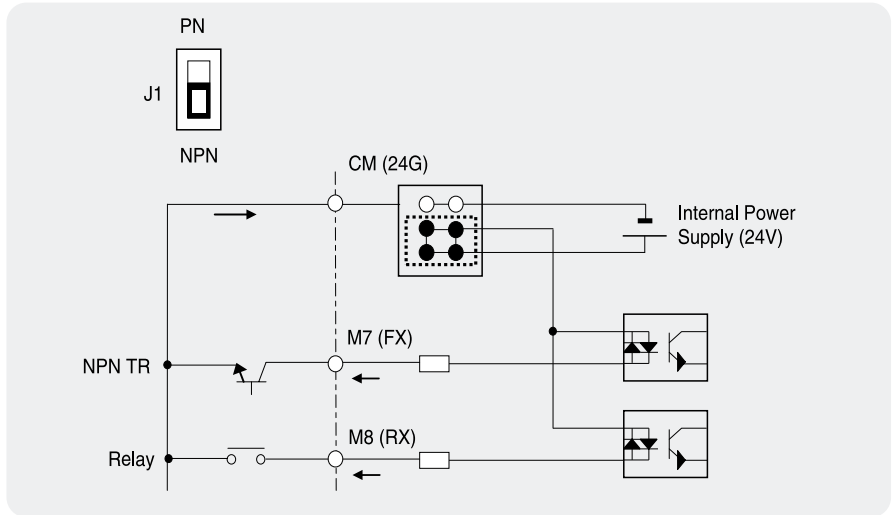
| Type         | Symbol                           | Name                               | Description   |   |
|--------------|----------------------------------|------------------------------------|---|---|
| Input Signal | M1, M2, M3                       | Programmable Digital Input 1, 2, 3 | Defines programmable digital inputs<br>(Factory setting : Multi-step frequency 1,2,3)   |   |
|              | FX [M7]                          | Forward Run Command                | Forward run when closed and stopped when open   |   |
|              | RX [M8]                          | Reverse Run Command                | Reverse run when closed and stopped when open   |   |
|              | JOG [M6]                         | Jog Frequency Reference            | Runs at jog frequency when the jog signal is on.<br>The direction is set by the FX (or RX) signal   |   |
|              | BX [M5]                          | Emergency Stop                     | When the BX signal is ON, the output of the inverter is turned off.<br>When motor uses an electrical brake to stop, BX is used to turned off the output signal.<br>Take caution when BX signal is off (Not turned off by latching) and FX signal (or RX signal) is on.<br>Under these conditions, the motor will run! |   |
|              | RST [M4]                         | Fault Reset                        | Used for fault reset.   |   |
|              | CM                               | Sequence Common (NPN)              | Common terminal for NPN contact   |   |
|              | 24                               | Sequence Common (PNP)              | Common 24V terminal for PNP contact input.<br>Maximum output : +24V, 100mA  |   |
|              | Analog Frequency Setting         | V+, V-                             | Analog Power Source (+12V, -12V)  | Power supply for analog frequency setting.<br>Maximum output : +12V, 100mA, -12V, 100mA   |
|              |                                  | V1                                 | Frequency Reference (Voltage)   | Used by a DC 0~12V or -12~12V input to set the frequency reference.<br>(Input impedance is 20k $\Omega$ )   |
|              |                                  | I                                  | Frequency Reference (Current)   | Used by a 0-20mA input to set the frequency reference.<br>(Input impedance is 249 $\Omega$ )  |
|              |                                  | A0, B0                             | Frequency Reference (Pulse)   | Used by a pulse input to set the frequency reference.   |
|              |                                  | 5G (~30kW)<br>CM (37kW~)           | Frequency Reference Common Terminal   | Common terminal for analog frequency reference signal   |
|              | External Motor Thermal Detection | NT (~30kW)<br>ET (37kW~)           | External Motor Thermal Detection  | Motor thermal sensor input. Used to prevent motor from overheating by using a NTC or PTC thermal sensor.  |
|              |                                  | 5G                                 | Common for NT (or ET)   | Common terminal for external motor thermal detection  |
|              | Built-in RS485 Terminal          | C+, C-                             | RS485 signal High, Low  | RS485 signal (See RS485 communication in manual for more details.)  |
|              |                                  | CM                                 | RS485 common  | Common ground. Terminal for RS485 interface.  |
|              | Output Signal                    | Analog Output                      | S0, S1,   | Programmable Voltage Output<br>Voltage output for one of the following : Output frequency, output current, output voltage, DC link voltage.<br>Default is set to output frequency.<br>(Maximum output voltage and output current are 0-12V and 1mA) |
|              |                                  |                                    | 5G  | Analog Common Terminal<br>Common terminal for analog output (S0, S1)  |
|              |                                  | Contact                            | 3A, 3C, 3B  | Fault Contact Output<br>Energizes when a fault is present. (AC250V, 1A; DC30V, 1A)<br>Fault : 3A-3C closed (3B-3C open)<br>Normal : 3B-3C Closed (3A-3C open)   |
| A1~4, C1~4   |                                  |                                    | Programmable Digital Output<br>Defined by programmable digital output terminal settings<br>(AC250V, 1A or less; DC30V, 1A or less)  |   |

Note) NC terminal is unavailable

iP5A provides Sink/Source (NPN/PNP) modes for sequence input terminal on the control circuit. The logic of the input terminal is settable to Sink mode (NPN mode)/Source mode (NPN mode) by using the J1 switch. Connection method is shown below.

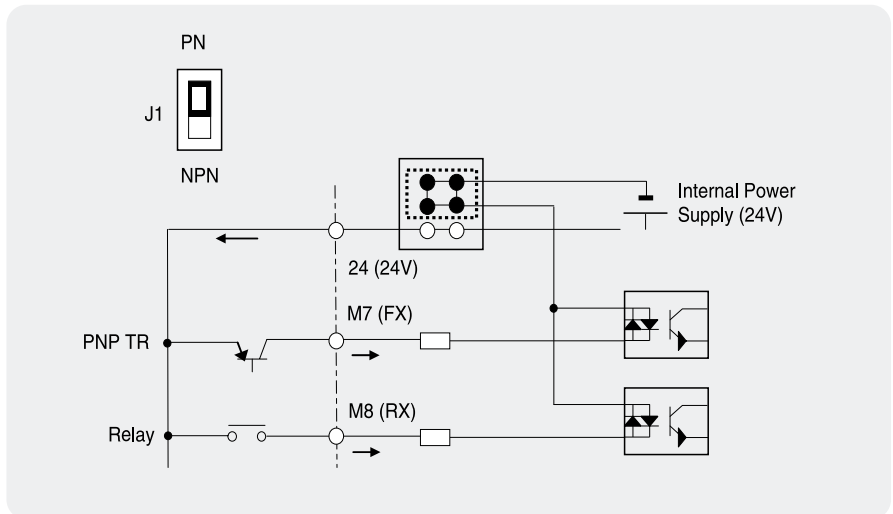
**Sink mode (NPN mode)**

- Put J1 switch down to set to Sink mode (NPN mode). CM terminal (24V GND) is common terminal for contact signal input.
- The factory default is Sink mode (NPN mode).



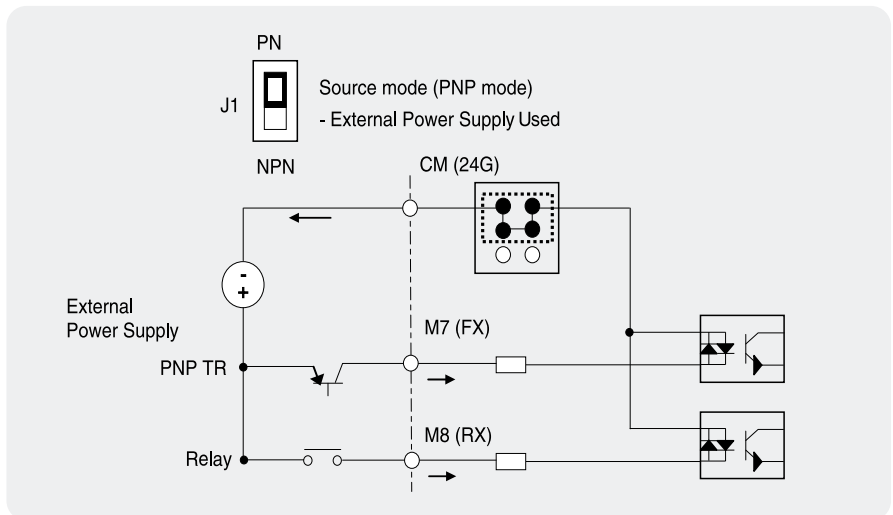
**Source mode (PNP mode)  
Internal Power Supply Used**

- Put J1 switch up to set to Source mode (PNP mode). Terminal 24 (24V Power Supply) is common terminal for contact input signal.



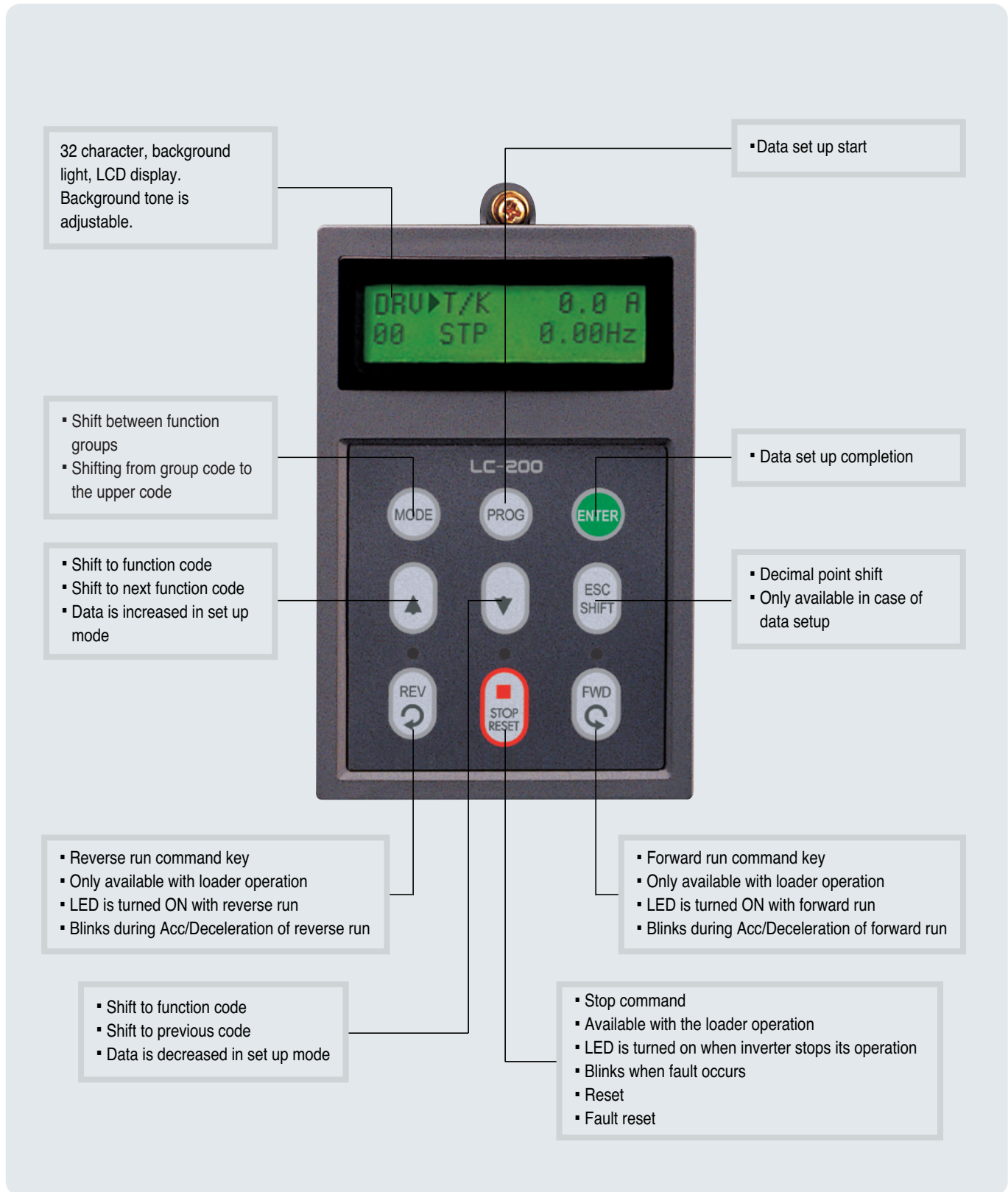
**Source mode (PNP mode)  
External Power Supply Used**

- Put J1 switch up to set to Source mode (PNP mode).
- To use external 24V Power Supply, make a sequence between external Power Supply (-) terminal and CM (24V GND) terminal.



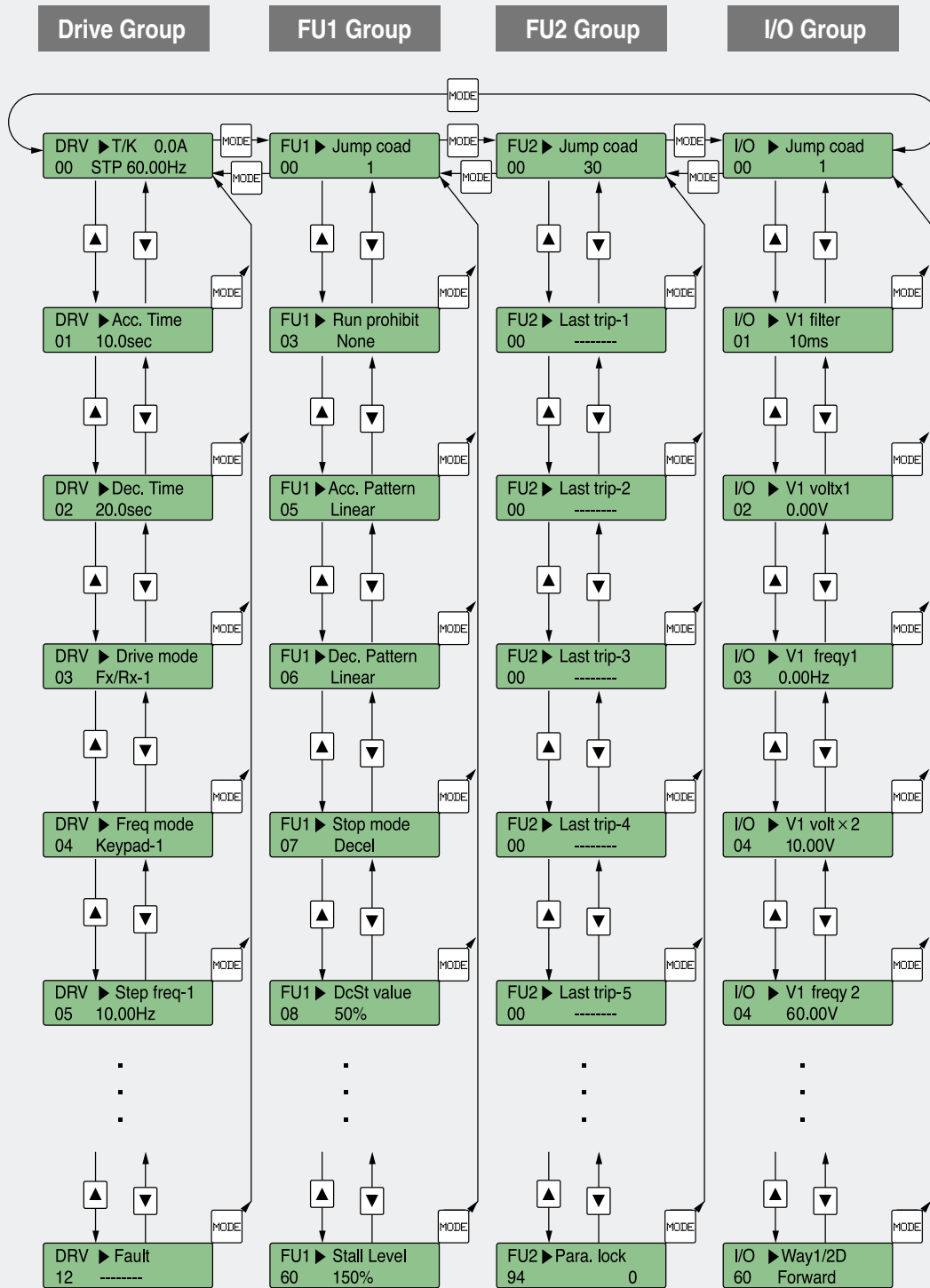
# Programming Keypad

## ●● LCD Loader



# Programming Keypad (Parameter Navigation)

Parameter group moves directly to DRV group by pressing [SHIFT] key in any parameter code.



Note) This figure shows group and code navigation through LCD display keypad. It can be different from actual display due to the group addition or code change.



# Parameter Description

## DRV Group

| CODE                               | Comm. Addr | Description   | LCD Keypad Display | Setting Range   | Factory Default      | Adj. During Run |
|------------------------------------|------------|---|--------------------|---|----------------------|-----------------|
| <b>DRV-00</b> <small>Note1</small> | 9100       | Command Frequency<br>(Output Frequency during motor run, Reference Frequency during motor stop), Output Current (LCD) | Cmd. freq          | 0 to FU1-30[Hz]   | 0 [Hz]               | ○               |
| <b>DRV-01</b>                      | 9101       | Acceleration Time   | Acc. Time          | 0 to 6000 [sec]   | 20 [sec]<br>60 [sec] | ○               |
| <b>DRV-02</b>                      | 9102       | Deceleration Time   | Dec. time          | 0 to 6000 [sec]   | 30 [sec]<br>90 [sec] | ○               |
| <b>DRV-03</b>                      | 9103       | Drive Mode<br>(Run/Stop Method)   | Drive mode         | 0 (Keypad)<br>1 (Fx/Rx-1)<br>2 (Fx/Rx-2)<br>3 (Int. 485)  | 1<br>(Fx/Rx-1)       | ×               |
| <b>DRV-04</b>                      | 9104       | Frequency Mode (Frequency setting method)   | Freq mode          | 0 (Keypad-1)<br>1 (Keypad-2)<br>2 (V1)<br>3 (V1S)<br>4 (I)<br>5 (V1+I)<br>6 (Pulse)<br>7 (Int. 485)<br>8 (Ext. PID) | 0<br>(Keypad-1)      | ×               |
| <b>DRV-05</b>                      | 9105       | Step Frequency 1  | Step freq-1        | 0 to FU1-30[Hz]   | 10 [Hz]              | ○               |
| <b>DRV-06</b>                      | 9106       | Step Frequency 2  | Step freq-2        |   | 20 [Hz]              | ○               |
| <b>DRV-07</b>                      | 9107       | Step Frequency 3  | Step freq-3        |   | 30 [Hz]              | ○               |
| <b>DRV-08</b>                      | 9108       | Output Current  | Current            | * [A]   | * [A]                | *               |
| <b>DRV-09</b>                      | 9109       | Motor Speed   | Speed              | * [rpm]   | * [rpm]              | *               |
| <b>DRV-10</b>                      | 910A       | DC link Voltage   | DC link Vtg        | * [V]   | * [V]                | *               |
| <b>DRV-11</b>                      | 910B       | User Display Selection  | User disp          |   | Output voltage [V]   | *               |
| <b>DRV-12</b>                      | 910C       | Current Trip Display  | Fault              | *   | *                    | *               |
| <b>DRV-14</b> <small>Note2</small> | 910E       | Target/Output Frequency Display   | Tar. Out. Freq.    | * [Hz]  | * [Hz]               | *               |
| <b>DRV-15</b> <small>Note2</small> | 910F       | Reference/Feedback Frequency Display  | Ref. Fbk. Freq.    | * [Hz]  | * [Hz]               | *               |
| <b>DRV-16</b>                      | 9110       | Speed Unit Selection  | Hz/Rpm Disp        | Hz or Rpm   | Hz                   | ○               |
| <b>DRV-18</b> <small>Note2</small> | 9112       | PID Parameter   | R T F O            | * [Hz]  | * [Hz]               | ×               |
| <b>DRV-19</b>                      | 9113       | AD Parameter  | V1 V2 V1S I        | *   | *                    | ×               |
| <b>DRV-20</b> <small>Note3</small> | 9114       | EXT-PID Parameter   | R T F O            | %   | %                    | ×               |
| <b>DRV-22</b>                      | 9116       | Local/Remote Key  | LocalRemKey        | 1 (Cntl&RefStop)<br>2 (Control Stop)<br>3 (Ref Only)<br>4 (Cntl&Ref Run)<br>5 (Control Run)<br>6 (Disable)          | Cntl&RefStop         | ○               |
| <b>DRV-23</b>                      | 9117       | Keypad Mode Key   | Ref Mode           | 1 (Minimum Spd)<br>2 (Last Spd)<br>3 (Preset Spd 1)<br>4 (Stop)<br>5 (Fault)<br>6 (Disable)                         | Disable              | ○               |
| <b>DRV-91</b> <small>Note4</small> | 915B       | Drive mode 2  | Drive mode2        | 0 (Keypad)<br>1 (Fx/Rx-1)<br>2 (Fx/Rx-2)  | 1<br>(Fx/Rx-1)       | ×               |
| <b>DRV-92</b>                      | 915C       | Frequency mode 2  | Freq mode2         | 0 (Keypad-1)<br>1 (Keypad-2)<br>2 (V1)<br>3 (V1S)<br>4 (I)<br>5 (V1+I)<br>6 (Pulse)                                 | 0<br>(Keypad-1)      | ×               |

  The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

**Note 1** The speed unit is changed from [Hz] to [%] when DRV-16 is set to [Rpm]. Only User Unit will be displayed when APP-02 is set to [Yes] and when APP-06 is set to either I, V1 or Pulse and when one of I/O-86- I/O-88 is set to either [Speed] (Hz or Rpm), [Percent], [Bar], [mBar], [kPa] or [Pa]. Output Frequency (Hz or Rpm; Unit of output speed) is displayed in DRV-00 during the Inverter is running. User Unit reference (Unit of PID controller selected) is displayed in DRV-00 during the Inverter is not running. **2** DRV-15, DRV-18 will appear when APP-02 [Process PI Mode] is set to "Yes". Also User Unit is displayed when one of I/O-86- I/O-88 is set to either [Speed](Hz or Rpm), [Percent], [Bar], [mBar], [kPa] or [Pa]. **3** DRV-20 will appear when APP-80 [ExtProcess PI Mode] is set to "Yes". **4** DRV-91/92 will appear only when DRV-22 is set to [2nd Source].

## ●● FU1 GROUP

| CODE                         | Comm. Addr | Description                                 | LCD Keypad Display | Setting Range                    | Factory Default | Adj. During Run |   |
|------------------------------|------------|---|--------------------|----------------------------------|-----------------|-----------------|---|
| FU1-00                       | 9200       | Jump to Desired Code #                      | Jump code          | 1 to 74<br>(Use Only LCD Keypad) | 1               | ○               |   |
| FU1-01                       | 9201       | Run Prevention                              | Run prevent        | 0                                | (None)          | 0 (None)        | × |
|                              |            |   |                    | 1                                | (Fwd prev)      |                 |   |
|                              |            |   |                    | 2                                | (Rev prev)      |                 |   |
| FU1-02                       | 9202       | Acceleration Pattern                        | Acc. Pattern       | 0                                | (Linear)        | 0 (Linear)      | × |
|                              |            |   |                    | 1                                | (S-curve)       |                 |   |
|                              |            |   |                    | 2                                | (U-curve)       |                 |   |
| FU1-03                       | 9203       | Deceleration Pattern                        | Dec. Pattern       | 0                                | (Linear)        | 0 (Linear)      | × |
|                              |            |   |                    | 1                                | (S-curve)       |                 |   |
|                              |            |   |                    | 2                                | (U-curve)       |                 |   |
| FU1-04 <small>Note5)</small> | 9204       | Start Curve for S-Curve Accel/Decel Pattern | Start Curve        | 0 to 100[%]                      | 50 [%]          | ×               |   |
| FU1-05                       | 9205       | End Curve for S-Curve Accel/Decel Pattern   | End Curve          | 0 to 100[%]                      | 50 [%]          | ×               |   |
| FU1-10                       | 920A       | Pre-Heat                                    | Pre-Heat mode      | 0                                | (No)            | 0 (No)          | × |
|                              |            |   |                    | 1                                | (Yes)           |                 |   |
| FU1-11                       | 920B       | Pre-Heat Value                              | Pre Heat level     | 1 to 50[%]                       | 30 (%)          | ×               |   |
| FU1-12                       | 920C       | Pre-Heat Duty                               | Pre Heat Perc      | 1 to 100 [%]                     | 50 (%)          | ×               |   |
| FU1-20                       | 9214       | Start Mode                                  | Start mode         | 0                                | (Accel)         | 0 (Accel)       | × |
|                              |            |   |                    | 1                                | (Dc-start)      |                 |   |
|                              |            |   |                    | 2                                | (Flying-start)  |                 |   |
| FU1-21 <small>Note6)</small> | 9215       | Starting DC Injection Braking Time          | DcSt time          | 0 to 60 [sec]                    | 0.1 [sec]       | ×               |   |
| FU1-22                       | 9216       | Starting DC Injection Braking Value         | DcSt value         | 0 to 150 [%]                     | 50 [%]          | ×               |   |
| FU1-23                       | 9217       | Stop Mode                                   | Stop mode          | 0                                | (Decel)         | 0 (Decel)       | × |
|                              |            |   |                    | 1                                | (Dc-brake)      |                 |   |
|                              |            |   |                    | 2                                | (Free-run)      |                 |   |
|                              |            |   |                    | 3                                | (Flux-brake)    |                 |   |
| FU1-24 <small>Note7)</small> | 9218       | DC Injection Braking On-delay Time          | DcBlk Time         | 0.1 to 60 [sec]                  | 0.1 [sec]       | ×               |   |
| FU1-25                       | 9219       | DC Injection Braking Frequency              | DcBrk freq         | 0.1 to 60 [Hz]                   | 5 [Hz]          | ×               |   |
| FU1-26                       | 921A       | DC Injection Braking Time                   | DcBr time          | 0 to 60 [sec]                    | 1 [sec]         | ×               |   |
| FU1-27                       | 921B       | DC Injection Braking Value                  | DcBr value         | 0 to 200 [%]                     | 50 [%]          | ×               |   |
| FU1-28                       | 921C       | Safety Stop                                 | Safety Stop        | 0                                | (No)            | 0 (No)          | × |
|                              |            |   |                    | 1                                | (Yes)           |                 |   |
| FU1-29                       | 921D       | Power Source Freq                           | Line Freq          | 40 to 120 [Hz]                   | 60.00 [Hz]      | ×               |   |
| FU1-30                       | 921F       | Maximum Frequency                           | Max Freq           | 40 to 120 [Hz]                   | 60.00 [Hz]      | ×               |   |
| FU1-31                       | 9220       | Base Frequency                              | Base Freq          | 30 to 120 [Hz]                   | 60.00 [Hz]      | ×               |   |
| FU1-32                       | 9220       | Starting Frequency                          | Start Freq         | 0.01 to 10 [Hz]                  | 0.50 [Hz]       | ×               |   |
| FU1-33                       | 9221       | Frequency Limit selection                   | Freq limit         | 0                                | (No)            | 0 (No)          | × |
|                              |            |   |                    | 1                                | (Yes)           |                 |   |
| FU1-34 <small>Note8)</small> | 9222       | Freq Lower Limit                            | Lim Lo Freq        | 0 - FU1-35                       | 0.50 [Hz]       | ○               |   |
| FU1-35                       | 9223       | Freq Upper Limit                            | Lim Hi Freq FU     | 1-34 - FU1-30                    | 60.00 [Hz]      | ×               |   |
| FU1-40                       | 9228       | Volts/Hz Pattern                            | V/F Pattern        | 0                                | (Linear)        | 0 (Linear)      | × |
|                              |            |   |                    | 1                                | (Square)        |                 |   |
|                              |            |   |                    | 2                                | (User V/F)      |                 |   |

  The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 5) Only displayed when FU1-02, FU1-03 is set to [S-Curve].

6) Only displayed when FU1-20 is set to [DC-start].

7) Only displayed when FU1-23 is set to [DC-break].

8) Only displayed when FU1-33 is set to [Yes].

## ❖ FU1 GROUP

| CODE                          | Comm. Addr | Description                                | LCD Keypad Display | Setting Range              | Factory Default | Adj. During Run |   |
|-------------------------------|------------|--|--------------------|----------------------------|-----------------|-----------------|---|
| FU1-41 <small>Note9)</small>  | 9229       | User V/F – Frequency 1                     | User freq 1        | 0 to FU1-30                | 15.00 [Hz]      | ×               |   |
| FU1-42                        | 922A       | User V/F – Voltage 1                       | User volt 1        | 0 to 100 [%]               | 25 [%]          | ×               |   |
| FU1-43                        | 922B       | User V/F – Frequency 2                     | User freq 2        | 0 to FU1-30                | 30.00 [Hz]      | ×               |   |
| FU1-44                        | 922C       | User V/F – Voltage 2                       | User volt 2        | 0 to 100 [%]               | 50 [%]          | ×               |   |
| FU1-45                        | 922D       | User V/F – Frequency 3                     | User freq 3        | 0 to FU1-30                | 45.00 [Hz]      | ×               |   |
| FU1-46                        | 922E       | User V/F – Voltage 3                       | User volt 3        | 0 to 100 [%]               | 75 [%]          | ×               |   |
| FU1-47                        | 922F       | User V/F – Frequency 4                     | User freq 4        | 0 to FU1-30                | 60.00 [Hz]      | ×               |   |
| FU1-48                        | 9230       | User V/F – Voltage 4                       | User volt 4        | 0 to 100 [%] 1             | 00[%]           | ×               |   |
| FU1-49                        | 9231       | Input voltage adjustment                   | VAC 380.0V         | 73 to 115.0 [%]            | 86.4 [%]        | ×               |   |
| FU1-50                        | 9232       | Motor Rated Voltage                        | Motor Volt         | 0 to 600 [V]               | 380 [V]         | ×               |   |
| FU1-51                        | 9233       | Energy Save                                | Energy save        | 0                          | (None)          | 0 (None)        | × |
|                               |            |  |                    | 1                          | (Manual)        |                 |   |
|                               |            |  |                    | 2                          | (Auto)          |                 |   |
| FU1-52 <small>Note10)</small> | 9234       | Energy Save %                              | Manual save%       | 0 to 30 [%]                | 0 [%]           | ○               |   |
| FU1-54                        | 9236       | Integrating Wattmeter                      | KiloWattHour       | M kWh                      | *               | ×               |   |
| FU1-55                        | 9237       | Inverter Temperature                       | Inv. Temp.         | 0 to 160 [degree]          | *               | ×               |   |
| FU1-56                        | 9238       | Motor Temperature                          | Motor Temp.        | 0 to 160 [degree]          | *               | ×               |   |
| FU1-57                        | 9239       | No Motor Selection                         | No Motor Sel       | 0                          | (No)            | 0 (No)          | × |
|                               |            |  |                    | 1                          | (Yes)           |                 |   |
| FU1-58                        | 923A       | Trip Current Level                         | No Motor Level     | 5 to 100 [%]               | 5 [%]           | ×               |   |
| FU1-59                        | 923B       | Trip Time Setting                          | No Motor Time      | 0.5 to 10.0 [sec]          | 3.0 [sec]       | ×               |   |
| FU1-60                        | 923C       | Electronic Thermal Selection               | ETH select         | 0                          | (No)            | 1 (Yes)         | ○ |
|                               |            |  |                    | 1                          | (Yes)           |                 |   |
| FU1-61                        | 923D       | Electronic Thermal Level for 1 Minute      | ETH 1min           | FU1-62 to 200 [%]          | 150 [%]         | ○               |   |
| FU1-62                        | 923E       | Electronic Thermal Level for Continuous    | ETH Cont           | 50 to FU1-61(Maximum 150%) | 120 [%]         | ○               |   |
| FU1-63                        | 923F       | Characteristic Selection<br>(Motor Type)   | Motor type         | 0                          | (Self-cool)     | 0 (Self-cool)   | ○ |
|                               |            |  |                    | 1                          | (Forced-cool)   |                 |   |
| FU1-64                        | 9240       | Overload Warning Level                     | OL level           | 30 to 110 [%]              | 110 [%]         | ○               |   |
| FU1-65                        | 9241       | Overload Warning Time                      | OL time            | 0 to 30 [sec]              | 10 [sec]        | ○               |   |
| FU1-66                        | 9242       | Overload Trip Selection                    | OLT select         | 0                          | (No)            | 0 (No)          | ○ |
|                               |            |  |                    | 1                          | (Yes)           |                 |   |
| FU1-67 <small>Note11)</small> | 9243       | Overload Trip Level                        | OLT level          | 30 to 150 [%]              | 120[%]          | ○               |   |
| FU1-68                        | 9244       | Overload Trip Delay Time                   | OLT time           | 0 to 60 [sec]              | 60 [sec]        | ○               |   |
| FU1-69                        | 9245       | Input/Output Phase Loss Protection         | Trip select        | 000 to 111 (Bit Set)       | 100             | ○               |   |
| FU1-70                        | 9246       | Stall Prevention Selection                 | Stall Mode.        | No/Yes                     | No              | ×               |   |
| FU1-71                        | 9247       | Stall Prevention Level                     | Stall level        | 30 to 200 [%]              | 120[%]          | ○               |   |
| FU1-72                        | 9248       | Accel/Decel Change Frequency               | Acc/Dec ch F       | 0 to FU1-30                | 0 [Hz]          | ×               |   |
| FU1-73                        | 9249       | Reference Frequency for<br>Accel and Decel | Acc/Dec freq       | 0                          | (Max freq)      | 0 (Max freq)    | × |
|                               |            |  |                    | 1                          | (Delta freq)    |                 |   |
| FU1-74                        | 924A       | Accel/Decel Time Scale                     | Time scale         | 0                          | (0.01 sec)      | 1 (0.1 sec)     | ○ |
|                               |            |  |                    | 1                          | (0.1 sec)       |                 |   |
|                               |            |  |                    | 2                          | (1 sec)         |                 |   |
| FU1-75                        | 924B       | Up Down Save Mode                          | UpDnSaveMode       | 0                          | (No)            | 0 (No)          | × |
|                               |            |  |                    | 1                          | (Yes)           |                 |   |
| FU1-76 <small>Note31)</small> | 924C       | Up Down Save Freq                          | UpDnSaveFreq       | 0 to 120[Hz]               | 0.00Hz          | ○               |   |

□ The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 9) FU1-41~48 only displayed when FU1-40 is set to 'User V/F'.

10) Only displayed when FU1-51 is set to 'Manual'.

11) Only displayed when FU1-66 is set to 'Yes'.

31) Only displayed when FU1-75 is set to 'Yes'.

## ●● FU2 GROUP

| CODE  | Comm. Addr | Description                                     | LCD Keypad Display          | Setting Range  | Factory Default                      | Adj. During Run |
|---|------------|---|-----------------------------|--|--------------------------------------|-----------------|
| <b>FU2-00</b>   | 9300       | Jump to desired code #                          | Jump code                   | 1 to 95<br>(Use Only LCD Keypad)   | 40                                   | ○               |
| <b>FU2-01</b>   | 9301       | Last trip 1                                     | Last trip-1                 | By pressing [ENTER] and [SEL] key, the frequency, current, and operational status at the time of fault can be seen.  | 0 (None)                             | ×               |
| <b>FU2-02</b>   | 9302       | Last trip 2                                     | Last trip-2                 |  | 0 (None)                             | ×               |
| <b>FU2-03</b>   | 9303       | Last trip 3                                     | Last trip-3                 |  | 0 (None)                             | ×               |
| <b>FU2-04</b>   | 9304       | Last trip 4                                     | Last trip-4                 |  | 0 (None)                             | ×               |
| <b>FU2-05</b>   | 9305       | Last trip 5                                     | Last trip-5                 |  | 0 (None)                             | ×               |
| <b>FU2-06</b>   | 9306       | Erase trips                                     | Erase trips                 | 0 (No)<br>1 (Yes)  | 0 (No)                               | ○               |
| <b>FU2-07</b>   | 9307       | Dwell Frequency                                 | Dwell time                  | 0 to 10 [sec]  | 0 [sec]                              | ×               |
| <b>FU2-08</b> <small>Note12</small>   | 9308       | Dwell Frequency                                 | Dwell freq                  | FU1-32 to FU1-30   | 5.00[Hz]                             | ×               |
| <b>FU2-10</b>   | 930A       | Frequency Jump Selection                        | Jump Freq                   | 0 (No)<br>1 (Yes)  | 0 (No)                               | ×               |
| <b>FU2-11</b> <small>Note13</small>   | 930B       | Jump Frequency 1 Low                            | jump lo 1                   | 0 to FU2-12  | 10.00[Hz]                            | ○               |
| <b>FU2-12</b>   | 930C       | Jump Frequency 1 High                           | jump Hi 1                   | FU2-11 to FU1-30   | 15.00[Hz]                            | ○               |
| <b>FU2-13</b>   | 930D       | Jump Frequency 2 Low                            | jump lo 2                   | 0 to FU2-14  | 20.00[Hz]                            | ○               |
| <b>FU2-14</b>   | 930E       | Jump Frequency 2 High                           | jump Hi 2                   | FU2-13 to FU1-30   | 25.00[Hz]                            | ○               |
| <b>FU2-15</b>   | 930F       | Jump Frequency 3 Low                            | jump lo 3                   | 0 to FU2-16  | 30.00[Hz]                            | ○               |
| <b>FU2-16</b>   | 9310       | Jump Frequency 3 High                           | jump Hi 3                   | FU2-15 to FU1-30   | 35.00[Hz]                            | ○               |
| <b>FU2-20</b>   | 9314       | Power ON Start Selection                        | Power-on run<br>RST restart | 0 (No)<br>1 (Yes)  | 0 (No)                               | ○               |
| <b>FU2-21</b>   | 9315       | Restart after Fault Reset                       | RST restart                 | 0 (No)<br>1 (Yes)  | 0 (No)                               | ○               |
| <b>FU2-22</b>   | 9316       | Start After Interrupt Power                     | IPF Mode<br>Fault Selection | 0 (No)<br>1 (Yes)  | 0(No)                                | ×               |
| <b>FU2-23</b>   | 9317       | Speed Search Type Selection                     | Search Type                 | Estimated SS<br>Real SS  | estimated SS                         | ○               |
| <b>FU2-24</b>   | 9318       | Selection of Auto Retry                         | Retry Mode                  | No<br>Yes  | No                                   | ○               |
| <b>FU2-25</b>   | 9319       | Number of Auto Retry                            | Retry number                | 0 to 10  | 0                                    | ○               |
| <b>FU2-26</b> <small>Note15</small>   | 931A       | Delay Time Before Auto Retry                    | Retry delay                 | 0 to 60 [sec]  | 1 [sec]                              | ×               |
| <b>FU2-27</b>   | 931B       | Speed Search Current Limit                      | Flying Perc                 | 30 to 160  | 70%                                  | ×               |
| <b>FU2-40</b>   | 9328       | Rated Motor Selection for inverter (0.75~450kW) | Motor select                | 0 (0.75kW)<br>1 (1.5kW)<br>2 (2.2kW)<br>3 (3.7kW)<br>4 (5.5kW)<br>5 (7.5kW)<br>6 (11.0kW)<br>7 (15.0kW)<br>8 (18.5kW)<br>9 (22.0kW)<br>10 (30.0kW)<br>11 (37.0kW)<br>12 (45.0kW)<br>13 (55.0kW)<br>14 (75.0kW)<br>15 (90.0kW)<br>16 (110.0kW)<br>17 (132.0 kW)<br>18 (160.0 kW)<br>18 (220.0 kW)<br>20 (280.0 kW)<br>21 (315.0 kW)<br>22 (375.0 kW)<br>23 (450.0 kW) | * Depending on the inverter capacity | ×               |
| * A motor rating same as inverter capacity is automatically set. If different, set the correct value. |            |   |                             |  |                                      |                 |
| <b>FU2-41</b>   | 9329       | Number of Motor Poles                           | Pole number                 | 2 to 12  | 4                                    | ×               |
| <b>FU2-42</b>   | 932A       | Rated Motor Slip                                | Rate-Slip                   | 0 to 10 [Hz]   | Depending on the motor capacity      | ×               |
| <b>FU2-43</b>   | 932B       | Rated Motor Current (RMS)                       | Rated-Curr                  | 1.0 to 999.9 [A]   | Depending on the motor capacity      | ×               |

□ The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 12 Only displayed when FU2-07 is set to [1~10 sec].

13 FU2-11 is displayed when FU2-10 is set to [Yes].

14 FU2-26 is displayed when FU2-25 [Retry number] is set to [1~10].

15 FU2-64 is displayed when FU2-60 is set to [Sensorless].

## ●● FU2 GROUP

| CODE                          | Comm. Addr | Description                        | LCD Keypad Display | Setting Range                 | Factory Default                 | Adj. During Run |   |
|-------------------------------|------------|------------------------------------|--------------------|-------------------------------|---------------------------------|-----------------|---|
| FU2-44                        | 932C       | No Load Motor Current(rms)         | Noload-Curr        | 0.1 to 999.9 [A]              | Depending on the motor capacity | ×               |   |
| FU2-46                        | 932E       | Load Inertia                       | Inertia rate       | 0 to 40                       | 10                              | ×               |   |
| FU2-47                        | 932F       | Gain for Motor Speed Display       | RPM DisplayGn      | 1 to 1000 [%]                 | 100 [%]                         | ○               |   |
| FU2-48                        | 9330       | Carrier Frequency                  | Carrier freq       | 0.75~22kW                     | 0.7~15[kHz]                     | 5.0 [kHz]       | ○ |
|                               |            |                                    |                    | 30kW                          | 0.7~10[kHz]                     |                 |   |
|                               |            |                                    |                    | 37~75kW                       | 0.7~4[kHz]                      |                 |   |
|                               |            |                                    |                    | 90~280kW                      | 0.7~3[kHz]                      |                 |   |
|                               |            |                                    |                    | 315~450kW                     | 0.7~2[kHz]                      |                 |   |
| FU2-49                        | 9331       | PWM Type Selection                 | PWM Select         | 0 (Normal)<br>1 (Low leakage) | 0 (Normal)                      | ×               |   |
| FU2-52                        | 9334       | Safety Stop Dec. Rate              | Dec Rate           | 1.0 to 100.0 [sec]            | 100.0 [sec]                     |                 |   |
| FU2-53                        | 9335       | Safety Stop Output Dec. Rate       | safety_perc        | 2 to 500                      | 21                              |                 |   |
| FU2-60                        | 933C       | Control Mode Selection             | Control Mode       | 0 (V/F)                       | 0 (V/F)                         | ×               |   |
|                               |            |                                    |                    | 1 (Slip compen)               |                                 |                 |   |
|                               |            |                                    |                    | 2 (Sensorless)                |                                 |                 |   |
| FU2-61                        | 933D       | Auto Tuning Selection              | Auto Tuning        | 0 (No)<br>1 (Static)          | 0 (No)                          | ×               |   |
| FU2-62                        | 933E       | Stator Resistance of Motor         | %Rs                | 0.01 to 20 [%]                | 4[%]                            | ×               |   |
| FU2-63                        | 933F       | Leakage Inductance of Motor        | %Lsigma            | 0.01 to 100 [%]               | 12[%]                           | ×               |   |
| FU2-64 <small>Note16)</small> | 9340       | Pre-excitation Time                | PreEx time         | 0 to 60 [sec]                 | 1 [sec]                         | ×               |   |
| FU2-67                        | 9343       | Manual/Auto Torque Boost Selection | Torque boost       | 0 (Manual)                    | 0 (Manual)                      | ×               |   |
|                               |            |                                    |                    | 1 (Auto)                      |                                 |                 |   |
| FU2-68                        | 9344       | Torque Boost in Forward Direction  | Fwd boost          | 0.75~90kW                     | 0 to 15 [%]                     | ×               |   |
|                               |            |                                    |                    | 110~450kW                     |                                 |                 |   |
| FU2-69                        | 9345       | Torque Boost in Reverse Direction  | Rev boost          | 0.75~90kW                     | 0 to 15 [%]                     | ×               |   |
|                               |            |                                    |                    | 110~450kW                     |                                 |                 |   |
| FU2-80                        | 9350       | Power On display                   | PowerOn Disp       | 0 to 12                       | 0                               | ○               |   |
| FU2-81                        | 9351       | User Select                        | User Disp          | Voltage Watt                  | Voltage                         | ○               |   |
| FU2-82                        | 9352       | Software Version                   | iP5A S/W Ver       | Ver X.X Ver                   | X.X                             | *               |   |
| FU2-83                        | 9353       | Last Trip Time                     | LastTripTime       | X:XX:XX:XX:XX:X               | *                               | ×               |   |
| FU2-84                        | 9354       | Power On Time                      | On-time            | X:XX:XX:XX:XX:X               | *                               | ×               |   |
| FU2-85                        | 9355       | Run-time                           | Run-time           | X:XX:XX:XX:XX:X               | *                               | ×               |   |
| FU2-87                        | 9357       | Power Set                          | Power Set          | 0.01 to 400 [%]               | 100                             | ○               |   |
| FU2-90                        | 935A       | Parameter Display                  | Para. disp         | 0 Default                     | 0 (Default)                     | ○               |   |
|                               |            |                                    |                    | 1 (All Para)                  |                                 |                 |   |
|                               |            |                                    |                    | 2 (Diff Para)                 |                                 |                 |   |
| FU2-91                        | 935B       | Read Parameter                     | Para. Read         | 0 (No)                        | 0 (No)                          | ×               |   |
|                               |            |                                    |                    | 1 (Yes)                       |                                 |                 |   |
| FU2-92                        | 935C       | Write Parameter                    | Para. Write        | 0 (No)                        | 0 (No)                          | ×               |   |
|                               |            |                                    |                    | 1 (Yes)                       |                                 |                 |   |
| FU2-93                        | 935D       | Initialize Parameters              | Para. Init         | 0 (No)                        | 0 (No)                          | ×               |   |
|                               |            |                                    |                    | 1 (All Groups)                |                                 |                 |   |
|                               |            |                                    |                    | 2 (BAS)                       |                                 |                 |   |
|                               |            |                                    |                    | 3 (DRV)                       |                                 |                 |   |
|                               |            |                                    |                    | 4 (FU1)                       |                                 |                 |   |
|                               |            |                                    |                    | 5 (FU2)                       |                                 |                 |   |
|                               |            |                                    |                    | 6 (I/O)                       |                                 |                 |   |
|                               |            |                                    |                    | 7 (EXT)                       |                                 |                 |   |
|                               |            |                                    |                    | 8 (COM)                       |                                 |                 |   |
| 9 (APP)                       |            |                                    |                    |                               |                                 |                 |   |
| FU2-94                        | 935E       | Parameter Write Protection         | Para. Lock         | 0 to 9999                     | 0                               | ○               |   |
| FU2-95                        | 935F       | Parameter Save                     | Para. Save         | 0 (No)                        | 0 (No)                          | ×               |   |
|                               |            |                                    |                    | 1 (Yes)                       |                                 |                 |   |

□ The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 16) FU2-64 is displayed when FU2-60 is set to [Sensorless].

Table 1) Switching frequency and factory default value for each inverter capacity

| Inverter Capacity | Setting Range  | Factory Default |
|-------------------|----------------|-----------------|
| 0.75 ~ 22 kW      | 0.7 ~ 15 [kHz] | 5.0 [kHz]       |
| 30 kW             | 0.7 ~ 10 [kHz] |                 |
| 37 ~ 75 kW        | 0.7 ~ 4 [kHz]  |                 |
| 90 ~ 280 kW       | 0.7 ~ 3 [kHz]  |                 |
| 315 ~ 450 kW      | 0.7 ~ 2 [kHz]  |                 |



## I/O GROUP

| CODE                          | Comm. Addr | Description   | LCD Keypad Display | Setting Range  | Factory Default | Adj. During Run |
|-------------------------------|------------|---|--------------------|--|-----------------|-----------------|
| I/O-00                        | 9400       | Jump to Desired Code #  | Jump code          | 1 to 98  | 1               | ○               |
| I/O-01 <small>Note17)</small> | 9401       | Filtering Time Constant for V1 Signal Input                     | V1 Filter          | 0 to 9999 [msec]   | 10 [msec]       | ○               |
| I/O-02                        | 9402       | V1 Input Minimum Voltage  | V1 volt x1         | 0 to 12[V]   | 0.00 [V]        | ○               |
| I/O-03                        | 9403       | Frequency Corresponding to V1 Input Minimum Voltage             | V1 Freq y1         | 0 to FU1-30 [Hz]<br>0 to 100.00 [**] <small>Note18)</small>  | 0.00 [Hz]       | ○               |
| I/O-04                        | 9404       | V1 Input Minimum Voltage  | V1 volt x2         | 0 to 12[V]   | 10 [V]          | ○               |
| I/O-05                        | 9405       | V1 Input Maximum Voltage  | V1 Freq y2         | 0 to FU1-30 [Hz]<br>0 to 100.00 [**] <small>Note18)</small>  | 60.00 [Hz]      | ○               |
| I/O-06                        | 9406       | Filtering Time Constant for I Signal Input                      | I Filter           | 0 to 9999 [msec]   | 10 [msec]       | ○               |
| I/O-07                        | 9407       | I Input Minimum Current   | I curr x1          | 0 to 20 [mA]   | 4 [mA]          | ○               |
| I/O-08                        | 9408       | Frequency Corresponding to I Input Minimum Current              | I Freq y1          | 0 to FU1-30 [Hz]<br>0 to 100.00 [**] <small>Note18)</small>  | 0.00 [Hz]       | ○               |
| I/O-09                        | 9409       | Filtering Time Constant for I Signal Input                      | I curr x2          | 0 to 20 [mA]   | 20 [mA]         | ○               |
| I/O-10                        | 940A       | Frequency Corresponding to I Input Maximum Current              | I Freq y2          | 0 to FU1-30 [Hz]<br>0 to 100.00 [**] <small>Note18)</small>  | 60.00 [Hz]      | ○               |
| I/O-11                        | 940B       | Pulse Input Method  | P Pulse set        | 0 (A+B)<br>1 (A)   | 1 (A)           | ○               |
| I/O-12                        | 940C       | Pulse Input Filter  | P filter           | 0 to 9999 [msec]   | 10 [msec]       | ○               |
| I/O-13                        | 940D       | Pulse Input Minimum Frequency                                   | P pulse x1         | 0 to 10 [kHz]  | 0 [kHz]         | ○               |
| I/O-14                        | 940E       | Frequency Corresponding to I/O-13 Pulse Input Minimum Frequency | P freq y1          | 0 to FU1-30 [Hz]<br>0 to 100.00 [**] <small>Note18)</small>  | 0 [Hz]          | ○               |
| I/O-15                        | 940F       | Pulse Input Maximum Frequency                                   | P pulse x2         | 0 to 100 [kHz]   | 10 [kHz]        | ○               |
| I/O-16                        | 9410       | Frequency Corresponding to I/O-15 Pulse Input Maximum Frequency | P freq y2          | 0 to FU1-30 [Hz]<br>0 to 100.00 [**] <small>Note18)</small>  | 60.00 [Hz]      | ○               |
| I/O-17                        | 9411       | Criteria for Analog Input Signal Loss                           | Wire broken        | 0 (None)<br>1 (half of x1)<br>2 (below x1)   | 0 (None)        | ○               |
| I/O-18                        | 9412       | Operating selection at Loss of Freq. Reference                  | Lost command       | 0 (None)<br>1 (FreeRun)<br>2 (Stop)<br>3 (Protection)  | 0 (None)        | ○               |
| I/O-19                        | 9413       | Waiting Time after Loss of Freq. Reference                      | Time out           | 0.1 to 120 [sec]   | 1.0 [sec]       | ○               |
| I/O-20                        | 9414       | Programmable Digital Input Terminal 'M1' Define                 | M1 Define          | 0 (Speed-L)<br>1 (Speed-M)<br>2 (Speed-H)<br>3 (XCEL-L)<br>4 (XCEL-M)<br>5 (XCEL-H)<br>6 (Dc-brake)<br>7 (2nd Func)<br>8 (Exchange)<br>9 (- Reserved -)<br>10 (Up)<br>11 (Down)<br>13 (Ext Trip) | 0 (Speed-L)     | ○               |

Gray The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 17) When DRV-04 is set to either V1, V1S, I or V1+I or Pulse, only selected item codes are displayed in I/O-1~I/O-19.

18) I/O-3,5,8,10,14,16 is displayed 0~100.00 [\*\*] when App-02 is set to [proc PI mode] or APP-80 is set to [Ext PI mode] and APP-06 PID Feedback Signal Selection is set to one of I, V, Pulse, after then, one of I/O-86 ~I/O-88 is set to percentage, Bar, mBar, kPa, Pa except for Speed. Unit will be changed to selected unit. Only user unit displayed when APP-02 or APP-80 is set to [Yes], after APP-06 is set to one of I, V, Pulse, after then one of I/O-86 ~I/O-88 is set to either speed, percentage, Bar, mBar, kPa, Pa..

## I/O GROUP

| CODE                          | Comm. Addr    | Description  | LCD Keypad Display | Setting Range         | Factory Default  | Adj. During Run |   |
|-------------------------------|---------------|--|--------------------|-----------------------|------------------|-----------------|---|
| I/O-20                        | 9414          | Programmable Digital Input Terminal 'M1' Define                  | M1 Define          | 14                    | (Pre-Heat)       | 0 (Speed-L)     | ○ |
|                               |               |  |                    | 15                    | (iTerm Clear)    |                 |   |
|                               |               |  |                    | 16                    | (Open-loop)      |                 |   |
|                               |               |  |                    | 17                    | (LOC/REM)        |                 |   |
|                               |               |  |                    | 18                    | (Analog hold)    |                 |   |
|                               |               |  |                    | 19                    | (XCEL stop)      |                 |   |
|                               |               |  |                    | 20                    | (P Gain2)        |                 |   |
|                               |               |  |                    | 21                    | -Reserved-       |                 |   |
|                               |               |  |                    | 22                    | (Interlock1)     |                 |   |
|                               |               |  |                    | 23                    | (Interlock2)     |                 |   |
|                               |               |  |                    | 24                    | (Interlock3)     |                 |   |
|                               |               |  |                    | 25                    | (Interlock4)     |                 |   |
|                               |               |  |                    | 26                    | (Speed_X)        |                 |   |
|                               |               |  |                    | 27                    | (RST)            |                 |   |
|                               |               |  |                    | 28                    | (BX)             |                 |   |
|                               |               |  |                    | 29                    | (JOG)            |                 |   |
|                               |               |  |                    | 30                    | (FX)             |                 |   |
| 31                            | (RX)          |  |                    |                       |                  |                 |   |
| 32                            | (ANA_CHG)     |  |                    |                       |                  |                 |   |
| 33                            | (Pre-Excite)  |  |                    |                       |                  |                 |   |
| 34                            | (Ext PID Run) |  |                    |                       |                  |                 |   |
| 35                            | (Up/Dn Clr)   |  |                    |                       |                  |                 |   |
| I/O-21                        | 9415          | Programmable Digital Input Terminal 'M2' Define                  | M2 define          | Same as I/O-20        | 1 (Speed-M)      | ○               |   |
| I/O-22                        | 9416          | Programmable Digital Input Terminal 'M3' Define                  | M3 define          | Same as I/O-20        | 2 (Speed-H)      | ○               |   |
| I/O-23                        | 9417          | Programmable Digital Input Terminal 'M4' Define                  | M4 define          | Same as I/O-20        | 27 (RST)         | ○               |   |
| I/O-24                        | 9418          | Programmable Digital Input Terminal 'M5' Define                  | M5 define          | Same as I/O-20        | 12 (Stop/3-wire) | ○               |   |
| I/O-25                        | 9419          | Programmable Digital Input Terminal 'M6' Define                  | M6 define          | Same as I/O-20        | 29 (JOG)         | ○               |   |
| I/O-26                        | 941A          | Programmable Digital Input Terminal 'M7' Define                  | M7 define          | Same as I/O-20        | 30 (FX)          | ○               |   |
| I/O-27                        | 941B          | Programmable Digital Input Terminal 'M8' Define                  | M8 define          | Same as I/O-20        | 31 (RX)          | ○               |   |
| I/O-28                        | 941C          | Terminal Input Status  | In status          | 0000000000/1111111111 | 0000000000       | *               |   |
| I/O-29                        | 941D          | Filtering Time Constant for Programmable Digital Input Terminals | Ti Filt Num        | 2 to 1000 [msec]      | 15               | ○               |   |
| I/O-30 <small>Note19)</small> | 941E          | Jog Frequency Setting  | Jog Freq           | 0 to FU1-30           | 10 [Hz]          | ○               |   |
| I/O-31                        | 941F          | Step Frequency 4   | Step Freq-4        |                       | 40 [Hz]          | ○               |   |
| I/O-32                        | 9420          | Step Frequency 5   | Step Freq-5        |                       | 50 [Hz]          | ○               |   |
| I/O-33                        | 9421          | Step Frequency 6   | Step Freq -6       |                       | 40 [Hz]          | ○               |   |
| I/O-34                        | 9422          | Step Frequency 7   | Step Freq-7        |                       | 30 [Hz]          | ○               |   |
| I/O-35                        | 9423          | Step Frequency 8   | Step Freq -8       |                       | 20 [Hz]          | ○               |   |
| I/O-36                        | 9424          | Step Frequency 9   | Step Freq -9       |                       | 10 [Hz]          | ○               |   |
| I/O-37                        | 9425          | Step Frequency 10  | Step Freq -10      |                       | 20 [Hz]          | ○               |   |
| I/O-38                        | 9426          | Step Frequency 11  | Step Freq -11      |                       | 30 [Hz]          | ○               |   |

The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 19) I/O-30 ~ I/O-34 displayed only when one of I/O-20 ~ I/O-27 is set to either JOG, Speed\_L, Speed\_M, Speed\_H. I/O-35 ~ I/O-42 displayed only when one of I/O-20 ~ I/O-27 is set to Speed\_X.

| CODE                          | Comm. Addr | Description   | LCD Keypad Display | Setting Range    | Factory Default | Adj. During Run  |   |
|-------------------------------|------------|---|--------------------|------------------|-----------------|------------------|---|
| I/O-39                        | 9427       | Step Frequency 12   | Step Freq-12       | 0 to FU1-30      | 40 [Hz]         | ○                |   |
| I/O-40                        | 9428       | Step Frequency 13   | Step Freq-13       |                  | 50 [Hz]         | ○                |   |
| I/O-41                        | 9429       | Step Frequency 14   | Step Freq-14       |                  | 40 [Hz]         | ○                |   |
| I/O-42                        | 942A       | Step Frequency 15   | Step Freq-15       |                  | 30 [Hz]         | ○                |   |
| I/O-50                        | 9432       | Acceleration Time 1<br>(for Step speed)                       | Acc time-1         | 0 to 6000 [sec]  | 20 [sec]        | ○                |   |
| I/O-51                        | 9433       | Deceleration Time 1<br>(for Step speed)                       | Dec time-1         | 0 to 6000 [sec]  | 20 [sec]        | ○                |   |
| I/O-52 <small>Note20)</small> | 9434       | Acceleration Time 1<br>(for Step speed)                       | Acc time-2         | 0 to 6000 [sec]  | 30 [sec]        | ○                |   |
| I/O-53                        | 9435       | Deceleration Time 2   | Dec time-2         | 0 to 6000 [sec]  | 30 [sec]        | ○                |   |
| I/O-54                        | 9436       | Acceleration Time 3   | Acc time-3         | 0 to 6000 [sec]  | 40 [sec]        | ○                |   |
| I/O-55                        | 9437       | Deceleration Time 3   | Dec time-3         | 0 to 6000 [sec]  | 40 [sec]        | ○                |   |
| I/O-56                        | 9438       | Acceleration Time 4   | Acc time-4         | 0 to 6000 [sec]  | 50 [sec]        | ○                |   |
| I/O-57                        | 9439       | Deceleration Time 4   | Dec time-4         | 0 to 6000 [sec]  | 50 [sec]        | ○                |   |
| I/O-58                        | 943A       | Acceleration Time 5   | Acc time-5         | 0 to 6000 [sec]  | 40 [sec]        | ○                |   |
| I/O-59                        | 943B       | Deceleration Time 5   | Dec time-5         | 0 to 6000 [sec]  | 40 [sec]        | ○                |   |
| I/O-60                        | 943C       | Acceleration Time 6   | Acc time-6         | 0 to 6000 [sec]  | 30 [sec]        | ○                |   |
| I/O-61                        | 943D       | Deceleration Time 6   | Dec time-6         | 0 to 6000 [sec]  | 30 [sec]        | ○                |   |
| I/O-62                        | 943E       | Acceleration Time 7   | Acc time-7         | 0 to 6000 [sec]  | 20 [sec]        | ○                |   |
| I/O-63                        | 943F       | Deceleration Time 7   | Dec time-7         | 0 to 6000 [sec]  | 20 [sec]        | ○                |   |
| I/O-70                        | 9446       | S0 Output Selection   | S0 mode            | 0                | (Frequency)     | 0<br>(Frequency) | ○ |
|                               |            |   |                    | 1                | (Current)       |                  |   |
|                               |            |   |                    | 2                | (Voltage)       |                  |   |
|                               |            |   |                    | 3                | (DC link Vtg)   |                  |   |
|                               |            |   |                    | 4                | (Ext PID Out)   |                  |   |
| I/O-71                        | 9447       | S0 Output Adjustment  | S0 adjust          | 10 to 200 [%]    | 100 [%]         | ○                |   |
| I/O-72                        | 9448       | S1 Output Selection   | S1 mode            | Same as I/O-70   | 2 (Voltage)     | ○                |   |
| I/O-73                        | 9449       | S1 Output Adjustment  | S1 adjust          | 10 to 200 [%]    | 100 [%]         | ○                |   |
| I/O-74 <small>Note21)</small> | 944A       | Frequency Detection Level                                     | FDT freq           | 0 to FU1-30 [Hz] | 30.00 [Hz]      | ○                |   |
| I/O-75                        | 944B       | Frequency Detection Bandwidth                                 | FDT band           | 0 to FU1-30 [Hz] | 10.00 [Hz]      | ○                |   |
| I/O-76                        | 944C       | Programmable Digital Output Terminal Define<br>(Aux terminal) | Aux Mode1          | 0                | (NONE)          | 0 (NONE)         | ○ |
|                               |            |   |                    | 1                | (FDT-1)         |                  |   |
|                               |            |   |                    | 2                | (FDT-2)         |                  |   |
|                               |            |   |                    | 3                | (FDT-3)         |                  |   |
|                               |            |   |                    | 4                | (FDT-4)         |                  |   |
|                               |            |   |                    | 5                | (FDT-5)         |                  |   |
|                               |            |   |                    | 6                | (OL)            |                  |   |
|                               |            |   |                    | 7                | (IOL)           |                  |   |
|                               |            |   |                    | 8                | (Stall)         |                  |   |
|                               |            |   |                    | 9                | (OV)            |                  |   |
|                               |            |   |                    | 10               | (LV)            |                  |   |
|                               |            |   |                    | 11               | (OH)            |                  |   |
|                               |            |   |                    | 12               | (Lost Command)  |                  |   |
|                               |            |   |                    | 13               | (Run)           |                  |   |
|                               |            |   |                    | 14               | (Stop)          |                  |   |
| 15                            | (Steady)   |   |                    |                  |                 |                  |   |

Gray The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.  
Note 20) I/O-52 ~ I/O-63 displayed only when one of I/O-20 ~ I/O-27 is set to either XCEL\_L, XCEL\_M, XCEL\_H.  
21) I/O-74 ~ I/O-75 displayed only when one of I/O-76 ~ I/O-79 is set to either FDT-1~FDT5

## I/O GROUP

| CODE                      | Comm. Addr | Description                                 | LCD Keypad Display | Setting Range         | Factory Default | Adj. During Run  |   |
|---------------------------|------------|---|--------------------|-----------------------|-----------------|------------------|---|
| I/O-76                    | 944C       | Output Terminal Define                      | Aux Mode1          | 16                    | (INV line)      | 0 (NONE)         | ○ |
|                           |            |   |                    | 17                    | (COMM line)     |                  |   |
|                           |            |   |                    | 18                    | (SpeedSearch)   |                  |   |
|                           |            |   |                    | 19                    | (Ready)         |                  |   |
|                           |            |   |                    | 20                    | (MMC)           |                  |   |
|                           |            |   |                    | 21                    | (CriticalTrip)  |                  |   |
| I/O-77                    | 944D       | Programmable Digital Output Terminal Define | Aux mode2          | Same as I/O-76        | 0 (NONE)        | ○                |   |
| I/O-78                    | 944E       | Programmable Digital Output Terminal Define | Aux mode3          | Same as I/O-76        | 0 (NONE)        | ○                |   |
| I/O-79                    | 944F       | Programmable Digital Output Terminal Define | Aux mode4          | Same as I/O-76        | 0 (NONE)        | ○                |   |
| I/O-80                    | 9450       | Fault Output Relay Setting (3A, 3B, 3C)     | Relay mode         | 000 to 111 [bit]      | 010 [bit]       | ○                |   |
| I/O-81                    | 9451       | Terminal Output Status                      | Out status         | 00000000/11111111     | 00000000        | *                |   |
| I/O-82                    | 9452       | Waiting Time after Fault Output Relay On    | Relay On           | 0 to 9999             | 0               | ×                |   |
| I/O-83                    | 9453       | Waiting Time after Fault Output Relay Off   | Relay Off          | 0 to 9999             | 0               | ×                |   |
| I/O-84                    | 9454       | Fan Con Sel (37 ~ 90kW)                     | Fan Con. Sel       | 0                     | (Power On Fan)  | 0 (Power On Fan) | × |
|                           |            |   |                    | 1                     | (Run Fan)       |                  |   |
|                           |            |   |                    | 2                     | (Temper-Fan)    |                  |   |
| I/O-85                    | 9455       | Fan Temp (37 ~ 90kW)                        | Fan Temp           | 0 to 70 [°C]          | 70 [°C]         | ○                |   |
| I/O-86                    | 9456       | Input User Unit Selection                   | Unit Sel           | 0                     | (Percent)       | 0 (Percent)      | × |
|                           |            |   |                    | 1                     | (Bar)           |                  |   |
|                           |            |   |                    | 2                     | (mBar)          |                  |   |
|                           |            |   |                    | 3                     | (kPa)           |                  |   |
|                           |            |   |                    | 4                     | (PSI)           |                  |   |
|                           |            |   |                    | 5                     | (Pa)            |                  |   |
| I/O-87                    | 9457       | Unit Maximum Selection                      | Unit Max Val       | 1.0 to 999.9[%]       | 100[%]          | ×                |   |
| I/O-90                    | 945A       | Inverter Number                             | Inv No.            | 1 to 250              | 1               | ○                |   |
| I/O-91 <sup>Note22)</sup> | 945B       | Baud Rate Selection                         | Baud rate          | 0                     | (1200 bps)      | 3 (9600 bps)     | ○ |
|                           |            |   |                    | 1                     | (2400 bps)      |                  |   |
|                           |            |   |                    | 2                     | (4800 bps)      |                  |   |
|                           |            |   |                    | 3                     | (9600 bps)      |                  |   |
|                           |            |   |                    | 4                     | (19200 bps)     |                  |   |
|                           |            |   |                    | 5                     | (38400 bps)     |                  |   |
| I/O-92 <sup>Note23)</sup> | 945C       | Operating Method at Loss of Freq. Reference | COM Lost Cmd       | 0                     | (None)          | 0 (None)         | ○ |
|                           |            |   |                    | 1                     | (FreeRun)       |                  |   |
|                           |            |   |                    | 2                     | (Stop)          |                  |   |
| I/O-93                    | 945D       | Waiting Time after Loss of Freq. Reference  | COM Time Out       | 0.1 to 120 [sec]      | 1.0 [sec]       | ○                |   |
| I/O-94                    | 945E       | Communication Response Delay time           | Delay Time         | 2 to 1000 [msec]      | 5 [msec]        | ○                |   |
| I/O-95                    | 945F       | A or B contact                              | In No/Nc Set       | 0000000000/1111111111 | 0000000000      | ×                |   |
| I/O-96                    | 9460       | Input time                                  | In CheckTime       | 1 to 1000             | 1 [msec]        | ×                |   |
| I/O-97                    | 9461       | Overheat Trip Selection                     | OH Trip Sel        | 000 to 111 [bit]      | 010 [bit]       | ×                |   |
| I/O-98                    | 9462       | Motor Overheat Trip Temperature             | MO Trip Temp       | 0 to 255 [°C]         | 110 [°C]        | ×                |   |

□ The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 22) 38400 bps can be set only when the external communication option card is installed.

23) Only I/O-92 ~ I/O-93 displayed when DRV-03/04 is set to [int485].

## APP GROUP

| CODE                         | Comm. Addr | Description                               | LCD Keypad Display | Setting Range   | Factory Default | Adj. During Run |
|------------------------------|------------|---|--------------------|---|-----------------|-----------------|
| APP-00                       | 9700       | Jump to Desired Code #                    | Jump code          | 1 to 80   | 1               | ○               |
| APP-01                       | 9701       | Application Mode Selection                | App mode           | 0 (None)<br>1 (MMC)   | 0 (None)        | ×               |
| APP-02                       | 9702       | PID Operation Selection                   | Proc PI mode       | 0 (No)<br>1 (Yes)   | 0 (No)          | ×               |
| APP-03 <small>Note25</small> | 9703       | PID F Gain Selection                      | PID F-Gain         | 0 to 999.9[%]   | 0.0 [%]         | ○               |
| APP-04 <small>Note26</small> | 9704       | PID Auxiliary Reference Mode Selection    | Aux Ref Enbl       | 0 (No)<br>1 (Yes)   | 0 (No)          | ×               |
| APP-05 <small>Note27</small> | 9705       | PID Auxiliary Reference Signal Selection  | Aux Ref Sel        | 0 (Keypad-1)<br>1 (Keypad-2)<br>2 (V1)<br>3 (V1S)<br>4 (I)<br>5 (V1+I)<br>6 (Pulse)<br>7 (Int. 485)<br>8 (Ext. PID) | 2 (V1)          | ×               |
| APP-06                       | 9706       | PID Feedback Signal Selection             | PID F/B            | 0 (I)<br>1 (V1)<br>2 (Pulse)  | 0 (I)           | ×               |
| APP-07                       | 9707       | Meter I Maximum Value                     | Meter I Max        | 0 to 20.00 mA   | 20.00 mA        | ○               |
| APP-08                       | 9708       | Meter V Maximum Value                     | Meter V Max        | 0 to 12.00 V  | 10.00V          | ○               |
| APP-09                       | 9709       | Meter P Maximum Value                     | Meter P Max        | 0 to 100.0kHz   | 100.0kHz        | ○               |
| APP-11                       | 970B       | P Gain for PID Control                    | PID P Gain         | 0 to 999.9 [%]  | 1.0 [%]         | ○               |
| APP-12                       | 970C       | I Time for PID Control                    | PID I Time         | 0 to 32.0 [sec]   | 10.0 [sec]      | ○               |
| APP-13                       | 970D       | D Time for PID Control                    | PID D Time         | 0 to 100 [msec]   | 0.0 [msec]      | ○               |
| APP-14                       | 970E       | High Limit Frequency for PID Control      | PID Hi Limit       | 0.00 to FN1-30  | 60.00[Hz]       | ○               |
| APP-15                       | 970F       | Low Limit Frequency for PID Control       | PID LowLimit       | FN1-32 to APP-10  | 0.5 [Hz]        | ○               |
| APP-16                       | 9710       | PID Output Gain                           | PID OutScale       | 0.0 to 999.9 [%]  | 100.0 [%]       | ×               |
| APP-17                       | 9711       | PID P2 Gain                               | PID P2 Gain        | 0.0 to 999.9 [%]  | 100.0 [%]       | ×               |
| APP-18                       | 9712       | P Gain Scale                              | P Gain Scale       | 0.0 to 100.0 [%]  | 100.0 [%]       | ×               |
| APP-19                       | 9713       | PID Output Inverse                        | PID OutInv.        | 0 (No)<br>1 (Yes)   | 0 (No)          | ×               |
| APP-20                       | 9714       | PID U Curve Feedback Select               | PID U Fbk          | 0 (No)<br>1 (Yes)   | 0 (No)          | ×               |
| APP-23                       | 9717       | PrePID Reference Frequency                | PrePID Freq        | 0 to FU1-30   | 0               | ○               |
| APP-24                       | 9718       | PrePID Exit Level                         | PrePID Exit        | 0 to 100.0%   | 0               | ○               |
| APP-25                       | 9719       | PrePID Stop delay                         | PrePID Dly         | 0 to 9999   | 600             | ○               |
| APP-26                       | 971A       | Pipe Broken                               | Pipe Broken        | 0 (No)<br>1 (Yes)   | 0 (No)          | ×               |
| APP-27                       | 971B       | Sleep Delay Time                          | Sleep Delay        | 0.0 to 9999 [sec]   | 60.0 [sec]      | ○               |
| APP-28                       | 971C       | Sleep Frequency                           | Sleep Freq         | 0 to FU1-30 [Hz]  | 0.00 [Hz]       | ○               |
| APP-29                       | 971D       | Wake-Up Level                             | WakeUp level       | 0.0 to 100.0 [%]  | 2.0[%]          | ○               |
| APP-30 <small>Note28</small> | 971E       | 2nd Acceleration Time                     | 2nd Acc Time       | 0 to 6000 [sec]   | 5 [sec]         | ○               |
| APP-31                       | 971F       | 2nd Deceleration Time                     | 2nd Dec Time       | 0 to 6000 [sec]   | 10 [sec]        | ○               |
| APP-32                       | 9720       | 2nd Base Frequency                        | 2nd BaseFreq       | 30 to FN1-30 [Hz]   | 60 [Hz]         | ×               |
| APP-33                       | 9721       | 2nd V/F Pattern                           | 2nd V/F            | 0 (Linear)<br>1 (Square)<br>2 (User V/F)  | 0 (Linear)      | ×               |
| APP-34                       | 9722       | 2nd Forward Torque Boost                  | 2nd F-Boost        | 0.0 to 15.0 [%]   | 2.0 [%]         | ×               |
| APP-35                       | 9723       | 2nd Reverse Torque Boost                  | 2nd R-Boost        | 0.0 to 15.0 [%]   | 2.0 [%]         | ×               |
| APP-36                       | 9724       | 2nd Stall Prevention Level                | 2nd Stall          | 30 to 150 [%]   | 100 [%]         | ×               |
| APP-37                       | 9725       | 2nd Electronic Thermal Level for 1 Minute | 2nd ETH 1min       | FU2-28 to 200 [%]   | 130[%]          | ○               |

  The gray highlighted codes are hidden parameters and will appear when the related functions are to be set.

**Note 25)** Only APP-03 ~ APP-17 displayed when APP-02 is set to [Yes]. Only APP-03 ~ APP-17 and APP-63 ~ APP-65 displayed when APP-2 is set to [Yes].

**26)** If APP-04 Aux Ref Mode is no set, DRV-04 setting will be reference of process PID. And APP -05 setting will be ignored

**27)** If APP-04 is set, APP-04 will appear. And APP -05 setting value will be reference of process PID, DRV-04 setting will be ignored.

**28)** Only APP-20 ~ APP-29 displayed only when one of I/O-20 ~ I/O-27 is set to either "2nd Func".

## APP GROUP

| CODE                          | Comm. Addr | Description                                  | LCD Keypad Display | Setting Range           | Factory Default | Adj. During Run |   |
|-------------------------------|------------|--|--------------------|-------------------------|-----------------|-----------------|---|
| APP-38                        | 9726       | 2nd Electronic Thermal Level for Continuous  | 2nd ETH Cont       | 50 to FU2-27 (Max 150%) | 120[%]          | ○               |   |
| APP-39                        | 9727       | 2nd Rated Motor Current                      | 2nd R-Curr         | 1 to 200 [A]            | 3.6[A]          | ×               |   |
| APP-40 <small>Note29)</small> | 9728       | Number of Auxiliary Motor Run Display        | Aux Mot Run        | *                       | *               | *               |   |
| APP-41                        | 9729       | Aux. Motor Start Selection                   | Starting Aux       | 1 to 4                  | 1               | ○               |   |
| APP-42                        | 972A       | Operation Time Display on Auto Change        | Auto Op Time       | *                       | *               | *               |   |
| APP-43                        | 972B       | The Number of Aux Motor                      | Nbr Aux's          | 0 to 7                  | 4               | ○               |   |
| APP-44                        | 972C       | Aux. Motor Stop Sequence                     | F-in L-Out         | 0                       | (No)            | 1 (Yes)         | × |
|                               |            |  |                    | 1                       | (Yes)           |                 |   |
| APP-45                        | 972D       | How to stop Aux. Motor                       | ALL Stop           | 0                       | (No)            | 1 (Yes)         | × |
|                               |            |  |                    | 1                       | (Yes)           |                 |   |
| APP-47                        | 972F       | Start Frequency of Aux. Motor 1              | Start freq 1       | 0 to FU1-30             | 49.99 [Hz]      | ○               |   |
| APP-48                        | 9730       | Start Frequency of Aux. Motor 2              | Start freq 2       | 0 to FU1-30             | 49.99 [Hz]      | ○               |   |
| APP-49                        | 9731       | Start Frequency of Aux. Motor 3              | Start freq 3       | 0 to FU1-30             | 49.99 [Hz]      | ○               |   |
| APP-50                        | 9732       | Start Frequency of Aux. Motor 4              | Start freq 4       | 0 to FU1-30             | 49.99 [Hz]      | ○               |   |
| APP-51                        | 9733       | Stop Frequency of Aux. Motor 1               | Stop freq 1        | 0 to FU1-30             | 20.00 [Hz]      | ○               |   |
| APP-52                        | 9734       | Stop Frequency of Aux. Motor 2               | Stop freq 2        | 0 to FU1-30             | 20.00 [Hz]      | ○               |   |
| APP-53                        | 9735       | Stop Frequency of Aux. Motor 3               | Stop freq 3        | 0 to FU1-30             | 20.00 [Hz]      | ○               |   |
| APP-54                        | 9736       | Stop Frequency of Aux. Motor 4               | Stop freq 4        | 0 to FU1-30             | 20.00 [Hz]      | ○               |   |
| APP-58                        | 973A       | Delay Time before Operating Aux Motor        | Aux start DT       | 0.0 to 999.9 [sec]      | 5.0 [sec]       | ○               |   |
| APP-59                        | 973B       | Delay Time before Stopping Aux Motor         | Aux stop DT        | 0.0 to 999.9 [sec]      | 5.0 [sec]       | ○               |   |
| APP-60                        | 973C       | Accel Time when the Number of Pump Decreases | Pid AccTime        | 0 to 600.0 [sec]        | 2.0 [sec]       | ○               |   |
| APP-61                        | 973D       | Decel Time when the Number of Pump Increases | Pid DecTime        | 0 to 600.0 [sec]        | 2.0 [sec]       | ○               |   |
| APP-62                        | 973E       | PID Bypass Selection                         | Regul Bypass       | 0                       | (No)            | 0 (No)          | × |
|                               |            |  |                    | 1                       | (Yes)           |                 |   |
| APP-66                        | 9742       | Auto Change Mode Selection                   | AutoCh_Mode        | 0                       | (EXCH_NONE),    | 0(EXCH_NONE)    | ○ |
|                               |            |  |                    | 1                       | (AUX_EXCH),     |                 |   |
|                               |            |  |                    | 2                       | (MAIN_EXCH)     |                 |   |
| APP-67                        | 9743       | Auto Change Time                             | AutoEx-intv        | 00:00 to 99:00          | 72:00           | ○               |   |
| APP-68                        | 9744       | Auto Change Freq                             | AutoEx-Freq        | FN1-32 to FN1-30[Hz]    | 20.0 [Hz]       | ○               |   |
| APP-69                        | 9745       | Inter-Lock Selection                         | Inter-lock         | 0 (No)                  | 0 (No)          | ○               |   |
| APP-71                        | 9747       | Pressure difference for Aux motor Start      | Aux Stt Diff       | 0 to100%                | 2[%]            | ○               |   |
| APP-72                        | 9748       | Pressure difference for Aux motor Stop       | Aux Stp Diff       | 0 to100%                | 2[%]            | ○               |   |
| APP-80                        | 9750       | Ext PID Operation Selection                  | Ext PI Mode        | 0                       | (No)            | 0 (No)          | × |
|                               |            |  |                    | 1                       | (Yes)           |                 |   |
| APP-81 <small>Note30)</small> | 9751       | Ext PID Reference Signal Selection           | ExtPI RefSel       | 0                       | (I)             | 3(Keypad)       | × |
|                               |            |  |                    | 1                       | (V1)            |                 |   |
|                               |            |  |                    | 2                       | (Pulse)         |                 |   |
|                               |            |  |                    | 3                       | (Keypad)        |                 |   |
| APP-82                        | 9752       | Ext PID Reference Level                      | Ext PI Ref %       | 0 to 100.00 [%]         | 50.00 [%]       | ×               |   |
| APP-83                        | 9753       | Ext PID Feedback Signal Selection            | ExtPI FbkSel       | 0                       | (I)             | 0 (I)           | × |
|                               |            |  |                    | 1                       | (V1)            |                 |   |
|                               |            |  |                    | 2                       | (Pulse)         |                 |   |
| APP-85                        | 9755       | P Gain for ExtPID                            | ExtPID Pgain       | 0 to 999.9 [%]          | 1.0 [%]         | ×               |   |
| APP-86                        | 9756       | I Time for ExtPID                            | ExtPID ltime       | 0 to 32.0 [sec]         | 10.0 [sec]      | ×               |   |
| APP-87                        | 9757       | D Time for ExtPID                            | ExtPID Dtime       | 0 to 2000 [msec]        | 0 [msec]        | ×               |   |
| APP-88                        | 9758       | High Limit Frequency for ExtPID Control      | ExtPID Lmt-H       | 0 to 100.00 [%]         | 100.00 [%]      | ×               |   |
| APP-89                        | 9759       | Low Limit Frequency for ExtPID Control       | ExtPID Lmt-L       | 0 to 30.00 [%]          | 0 [%]           | ×               |   |
| APP-90                        | 975A       | ExtPID Output Scale                          | ExtPID Scale       | 0 to 999.9              | 100.0 [%]       | ×               |   |
| APP-91                        | 975B       | ExtPID P2 Gain                               | ExtPI P2Gain       | 0 to 999.9              | 100.0 [%]       | ×               |   |
| APP-92                        | 975C       | ExtPID P Gain Scale                          | ExtPI PScale       | 0 to 100.0              | 100.0 [%]       | ×               |   |
| APP-93                        | 975D       | ExtPID F Gain                                | ExtPID F-gain      | 0 to 999.9 [%]          | 0.0 [%]         | ○               |   |
| APP-95                        | 975F       | ExtPID Output Inverse                        | ExtPI OutInv       | 0                       | (No)            | 0 (No)          | × |
|                               |            |  |                    | 1                       | (Yes)           |                 |   |
| APP-97                        | 9761       | ExtPID Loop Time                             | ExtPI LoopTm       | 50 to 200 [msec]        | 100 [msec]      | ×               |   |

□ The gray-highlighted codes are hidden parameters and will appear when the related functions are to be set.

Note 29) Only APP-40 ~ APP-71 displayed when APP-01 is set to [MMC].

30) Only APP-81 ~ APP-97 displayed when APP-80 Ext PI mode is set to [Yes].



## EXT GROUP

| CODE   | Comm. Addr | Description                                     | LCD Keypad Display | Setting Range | Factory Default | Adj. During Run |
|--------|------------|---|--------------------|---------------|-----------------|-----------------|
| EXT-00 | 9500       | Jump to Desired Code #                          | Jump code          | 1 to 45       | 1               | ○               |
| EXT-01 | 9501       | Type of SUB Board                               | Sub B/D            | Sub-E         | *               | *               |
|        |            |   |                    | Frequency     |                 |                 |
|        |            |   |                    | Current       |                 |                 |
| EXT-40 | 9528       | Current Output Terminal 1(CO1) Selection        | AM1 mode           | Voltage       | Frequency       | ○               |
|        |            |   |                    | DC link Vtg   |                 |                 |
|        |            |   |                    | Ext PID Out   |                 |                 |
| EXT-41 | 9529       | Adjust Gain of Current Output Terminal 1(CO1)   | AM1 adjust         | 10-200 [%]    | 100 [%]         | ○               |
| EXT-42 | 952A       | Adjust Offset of Current Output Terminal 1(CO1) | AM1 Offset         | 0-100 [%]     | 0 [%]           | ○               |
|        |            |   |                    | Frequency     |                 |                 |
|        |            |   |                    | Current       |                 |                 |
| EXT-43 | 952B       | Current Output Terminal 2(CO2) Selection        | AM2 mode           | Voltage       | DC link Vtg     | ○               |
|        |            |   |                    | DC link Vtg   |                 |                 |
|        |            |   |                    | Ext PID Out   |                 |                 |
| EXT-44 | 952C       | Adjust Gain of Current Output Terminal 2(CO2)   | AM2 adjust         | 10-200 [%]    | 100 [%]         | ○               |
| EXT-45 | 952D       | Adjust Offset of Current Output Terminal 2(CO2) | AM2 Offset         | 0-100 [%]     | 0 [%]           | ○               |

\* Only the above EXT group displayed when the corresponding option board is installed.  
 \* Refer to the SUB board option manual for details.

## COM GROUP

| CODE   | Comm. Addr | Description               | LCD Keypad Display | Setting Range   | Factory Default | Adj. During Run |
|--------|------------|---------------------------|--------------------|-----------------|-----------------|-----------------|
| COM-00 | 9600       | Jump to Desired Code #    | Jump code          | 1 to 60         | 1               | ○               |
| COM-01 | 9601       | Type of SUB Board         | Opt B/D            | RS485           | *               | *               |
|        |            |                           |                    | DeviceNet       |                 |                 |
|        |            |                           |                    | Profibus        |                 |                 |
|        |            |                           |                    | BACnet          |                 |                 |
|        |            |                           |                    | LonWork         |                 |                 |
| COM-02 | 9602       | Option Mode               | Opt mode           | None            | None            | ×               |
|        |            |                           |                    | Command         |                 |                 |
|        |            |                           |                    | Freq            |                 |                 |
|        |            |                           |                    | Cmd + Freq      |                 |                 |
| COM-03 | 9603       | Option Version            | Opt Version        | Ver X.X         | Ver X.X         | *               |
| COM-13 | 960D       | Device Net Input Instance | In Instance        | 70              | 70              | ×               |
|        |            |                           |                    | 71              |                 |                 |
|        |            |                           |                    | 110             |                 |                 |
|        |            |                           |                    | 111             |                 |                 |
| COM-17 | 9611       | PLC Station ID            | Station ID         | 0 to 63         | 1               | ○               |
| COM-20 | 9614       | Profi MAC ID              | Profi MAC ID       | 1 to 127        | 1               | ○               |
| COM-30 | 961E       | Output Num                | Output Num         | 0 to 8          | 3               | ○               |
| COM-31 | 961F       | Output 1                  | Output 1           | 0000-FFFF (HEX) | 000A(HEX)       | ○               |

# Parameter Description

## COM GROUP

| CODE   | Comm. Addr | Description | LCD Keypad Display | Setting Range   | Factory Default | Adj. During Run |
|--------|------------|-------------|--------------------|-----------------|-----------------|-----------------|
| COM-32 | 9620       | Output 2    | Output 2           | 0000-FFFF (HEX) | 000E(HEX)       | ○               |
| COM-33 | 9621       | Output 3    | Output 3           | 0000-FFFF (HEX) | 000F(HEX)       | ○               |
| COM-34 | 9622       | Output 4    | Output 4           | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-35 | 9623       | Output 5    | Output 5           | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-36 | 9624       | Output 6    | Output 6           | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-37 | 9625       | Output 7    | Output 7           | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-38 | 9626       | Output 8    | Output 8           | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-40 | 9628       | Input Num   | Input Num          | 0 - 8           | 2               | ○               |
| COM-41 | 9629       | Input 1     | Input 1            | 0000-FFFF (HEX) | 0005(HEX)       | ○               |
| COM-42 | 962A       | Input 2     | Input 2            | 0000-FFFF (HEX) | 0006(HEX)       | ○               |
| COM-43 | 962B       | Input 3     | Input 3            | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-44 | 962C       | Input 4     | Input 4            | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-45 | 962D       | Input 5     | Input 5            | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-46 | 962E       | Input 6     | Input 6            | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-47 | 962F       | Input 7     | Input 7            | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-48 | 9630       | Input 8     | Input 8            | 0000-FFFF (HEX) | 0000(HEX)       | ○               |
| COM-60 | 963C       | Parity/Stop | Parity/Stop 8      | None/1Stop      | 8None/1Stop     | ○               |
|        |            |             |                    | 8None/2Stop     |                 |                 |
|        |            |             |                    | 8Even/1Stop     |                 |                 |
|        |            |             |                    | 8Odd/1Stop      |                 |                 |
| COM-61 | 963D       | Opt Para-1  | Opt Para-1         | 0 to FFFF       | 0               | ○               |
| COM-62 | 963E       | Opt Para-2  | Opt Para-2         | 0 to FFFF       | 0               | ○               |
| COM-63 | 963F       | Opt Para-3  | Opt Para-3         | 0 to FFFF       | 0               | ○               |
| COM-64 | 9640       | Opt Para-4  | Opt Para-4         | 0 to FFFF       | 0               | ○               |
| COM-65 | 9641       | Opt Para-5  | Opt Para-5         | 0 to FFFF       | 0               | ○               |
| COM-66 | 9742       | Opt Para-6  | Opt Para-6         | 0 to FFFF       | 0               | ○               |
| COM-67 | 9743       | Comm UpDate | Comm UpDate        | 0               | (No)            | 0 (No)          |
|        |            |             |                    | 1               | (Yes)           |                 |

\* Only the above COM group displayed when the corresponding option board is installed.  
 \* COM-61~66 parameter is used to LonWorks and BACnet communication.

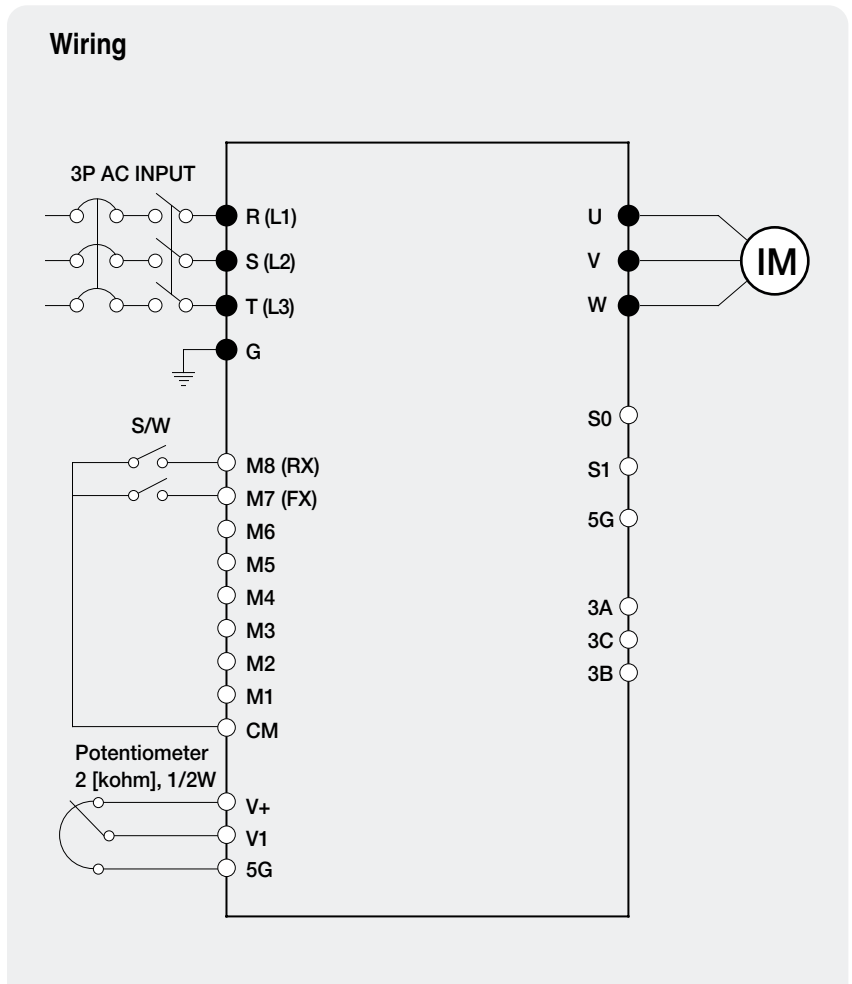
# Trial Run

## ⚙️ Operation Example (1)

V/F Control + Analog Voltage Input (V1)  
+ Operation via Terminal (FX/RX)

### Operation condition

- Control mode: V/F control
- Frequency command:  
50 [Hz] analog input via V1 terminal
- Accel/Decel time: Accel – 15 [sec],  
Decel – 25 [sec]
- Drive mode: Run/Stop via FX/RX terminal,  
Control terminal: NPN mode



| Step | Parameter setting               | Code           | Description   |
|------|---------------------------------|----------------|---|
| 1    | Control Mode Selection          | FU2-60         | Set it to 0 (V/F).  |
| 2    | Drive Mode                      | DRV-3          | Set it to Fx/Rx-1.  |
| 3    | Frequency Mode                  | DRV-4          | Set V1 Analog input value in frequency mode.  |
| 4    | 50 [Hz] Freq<br>Command Setting | DRV-0          | Set freq command 50 [Hz] via V1 (Potentiometer).  |
| 5    | Accel/Decel Time                | DRV-1<br>DRV-2 | Set Accel time to 15 [sec] in DRV-2.<br>Set Decel time to 25 [sec] in DRV-3.  |
| 6    | Terminal FX                     | I/O-26         | Motor starts to rotate in forward direction at 50Hz with Accel time 15 [sec] when FX terminal is turned ON.<br>Motor decelerates to stop with Decel time 25 [sec] when FX terminal is turned OFF. |
| 7    | Terminal RX                     | I/O-27         | When RX terminal is turned ON motor starts to rotate in Reverse direction at 50 [Hz] with Accel time 15 [sec].<br>When it is OFF, motor decelerates to stop with Decel time 25 [sec].             |

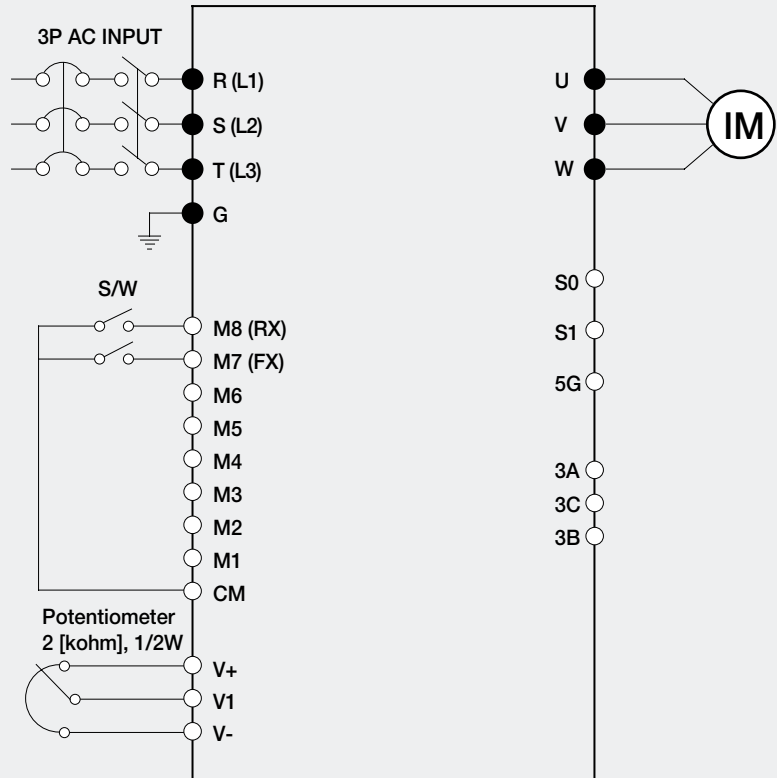
## ❖ Operation Example (2)

V/F control + Analog input (V1S)  
+ Operation via terminal FX/RX

### Operation condition

- Control mode: V/F control
- Frequency command: Setting 50 [Hz] via Analog input (V1S)
- Accel/Decel time: Accel time 15 [sec], Decel time 25 [sec]
- Drive mode: Run/Stop via FX/RX, Control terminal: NPN mode

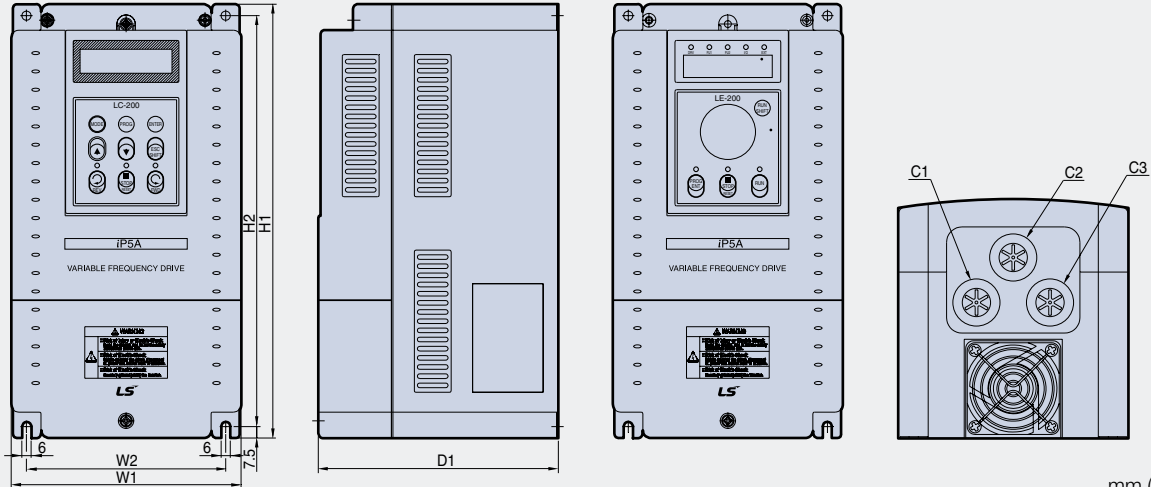
### Wiring



| Step | Parameter setting                           | Code           | Description   |
|------|---|----------------|---|
| 1    | Control Mode Selection                      | FU2-60         | Set it to 0 (V/F).  |
| 2    | Drive Mode                                  | DRV-3          | Set it to 1 (Fx/Rx-1).  |
| 3    | Frequency Mode                              | DRV-4          | Set it to 3 (V1S).  |
| 4    | Operating Frequency Command 50 [Hz] Setting | DRV-0          | Set 50 [Hz] via potentiometer (V1S).  |
| 5    | Accel/Decel Time Setting                    | DRV-1<br>DRV-2 | Set accel time to 15 [sec] in DRV-1 with decal time to 25 [sec] in DRV-2.   |
| 6    | FX Terminal (M7)                            | IO-26          | When FX terminal is turned ON, motor rotating in forward direction starts running at 50 [Hz] for 15 [sec].<br>When FX terminal is turned OFF, motor decelerates to stop for 25 [sec]. |
| 7    | RX Terminal (M8)                            | IO-27          | When RX terminal is turned ON, motor rotating in reverse direction starts running at 50 [Hz] for 15 [sec].<br>When RX terminal is turned OFF, motor decelerates to stop for 25 [sec]. |

# Dimensions

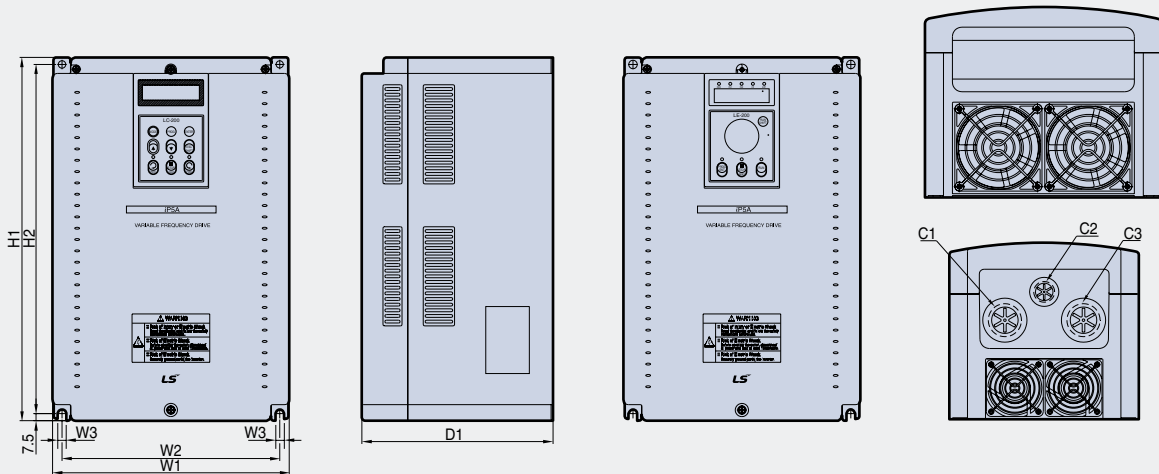
## SV008~055iP5A (200/400V Class) & SV0055~0110iP5A (600V Class)



mm (inches)

| Model         | W1         | W2         | H1          | H2          | D1           | C1         | C2        | C3         | Enclosure Type  |
|---------------|------------|------------|-------------|-------------|--------------|------------|-----------|------------|-----------------|
| SV008iP5A-2/4 | 150 (5.91) | 130 (5.12) | 284 (11.18) | 269 (10.69) | 156.5 (6.16) | 24 (0.98)  | 24 (0.98) | 24 (0.98)  | IP20 UL Type 1  |
| SV015iP5A-2/4 | 150 (5.91) | 130 (5.12) | 284 (11.18) | 269 (10.69) | 156.5 (6.16) | 24 (0.98)  | 24 (0.98) | 24 (0.98)  | IP20 UL Type 1  |
| SV022iP5A-2/4 | 150 (5.91) | 130 (5.12) | 284 (11.18) | 269 (10.69) | 156.5 (6.16) | 24 (0.98)  | 24 (0.98) | 24 (0.98)  | IP20 UL Type 1  |
| SV037iP5A-2/4 | 150 (5.91) | 130 (5.12) | 284 (11.18) | 269 (10.69) | 156.5 (6.16) | 24 (0.98)  | 24 (0.98) | 24 (0.98)  | IP20 UL Type 1  |
| SV055iP5A-2/4 | 150 (5.91) | 130 (5.12) | 284 (11.18) | 269 (10.69) | 156.5 (6.16) | 24 (0.98)  | 24 (0.98) | 24 (0.98)  | IP20 UL Type 1  |
| SV0055iP5A-6  | 7.87(200)  | 7.09(180)  | 13.98(355)  | 13.39(340)  | 7.19(182.5)  | 1.12(28.5) | 0.94(24)  | 1.12(28.5) | IP 20 UL Type 1 |
| SV0075iP5A-6  | 7.87(200)  | 7.09(180)  | 13.98(355)  | 13.39(340)  | 7.19(182.5)  | 1.12(28.5) | 0.94(24)  | 1.12(28.5) | IP 20 UL Type 1 |
| SV0110iP5A-6  | 7.87(200)  | 7.09(180)  | 13.98(355)  | 13.39(340)  | 7.19(182.5)  | 1.12(28.5) | 0.94(24)  | 1.12(28.5) | IP 20 UL Type 1 |

## SV075~300iP5A (200/400V Class) & SV0150~0300iP5A (600V Class)

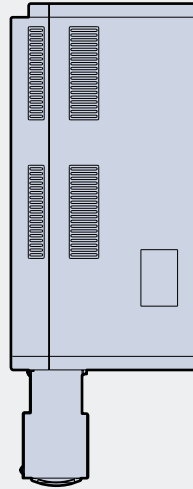
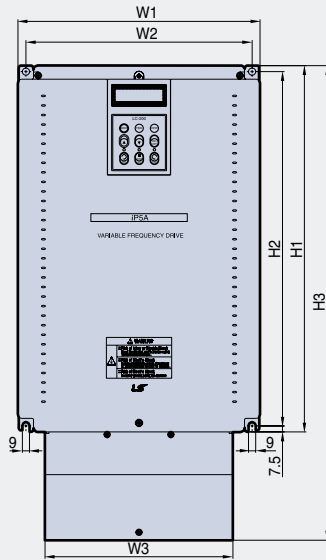


mm (inches)

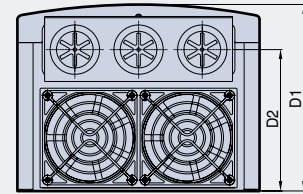
| Model           | W1          | W2          | W3       | H1          | H2          | D1         | C1        | C2        | C3        | Enclosure Type |
|-----------------|-------------|-------------|----------|-------------|-------------|------------|-----------|-----------|-----------|----------------|
| SV075iP5A-2/4   | 200 (7.87)  | 180 (7.09)  | 6 (0.23) | 284 (11.18) | 269 (10.69) | 182 (7.16) | 35 (1.37) | 24 (0.98) | 35 (1.37) | IP20 UL Type 1 |
| SV110iP5A-2/4   | 200 (7.87)  | 180 (7.09)  | 6 (0.23) | 284 (11.18) | 269 (10.69) | 182 (7.16) | 35 (1.37) | 24 (0.98) | 35 (1.37) | IP20 UL Type 1 |
| SV150iP5A-2/4/6 | 250 (9.84)  | 230 (9.06)  | 9 (0.35) | 385 (15.16) | 370 (14.57) | 201 (7.91) | -         | -         | -         | IP00 UL Open   |
| SV185iP5A-2/4/6 | 250 (9.84)  | 230 (9.06)  | 9 (0.35) | 385 (15.16) | 370 (14.57) | 201 (7.91) | -         | -         | -         | IP00 UL Open   |
| SV220iP5A-2/4/6 | 304 (11.97) | 284 (11.18) | 9 (0.35) | 460 (18.11) | 445 (17.52) | 234 (9.21) | -         | -         | -         | IP00 UL Open   |
| SV300iP5A-2/4/6 | 304 (11.97) | 284 (11.18) | 9 (0.35) | 460 (18.11) | 445 (17.52) | 234 (9.21) | -         | -         | -         | IP00 UL Open   |

# Dimensions

## SV150~300iP5A (UL Type 1 or UL Open Type with Conduit Option used, 200V/400V Class)



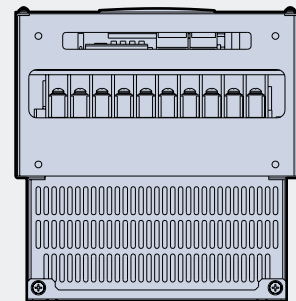
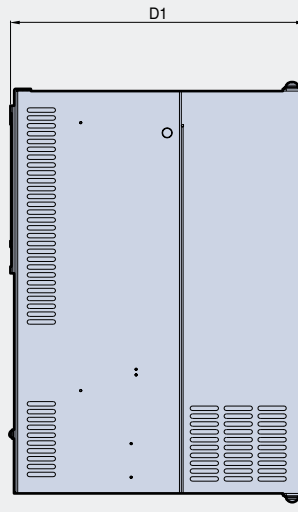
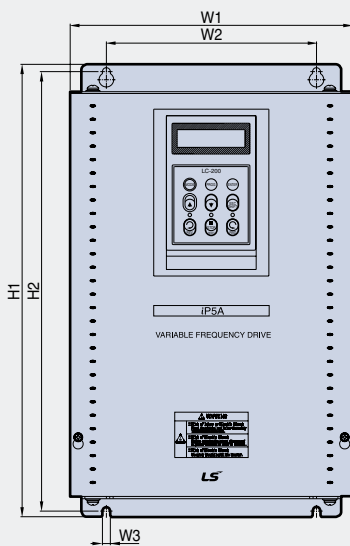
**Note)** Mounting NEMA 1 conduit option to the 15~90kW (20~125HP) Open Type meets NEMA 1 but does not comply with UL Enclosed Type 1. To that end, please purchase UL Type 1 product.



mm (inches)

| Model         | W1          | W2          | H1          | H2          | H3          | D1            | D2         | C3           | Enclosure Type |
|---------------|-------------|-------------|-------------|-------------|-------------|---------------|------------|--------------|----------------|
| SV150iP5A-2/4 | 250 (9.84)  | 230 (9.06)  | 200.8 (7.9) | 385 (15.16) | 370 (14.57) | 454.2 (17.88) | 201 (7.91) | 146 (5.74)   | IP20 UL Type 1 |
| SV185iP5A-2/4 | 250 (9.84)  | 230 (9.06)  | 200.8 (7.9) | 385 (15.16) | 370 (14.57) | 454.2 (17.88) | 201 (7.91) | 146 (5.74)   | IP20 UL Type 1 |
| SV220iP5A-2/4 | 304 (11.97) | 284 (11.18) | 236 (9.29)  | 460 (18.11) | 445 (17.52) | 599.2 (23.59) | 234 (9.21) | 177.5 (6.98) | IP20 UL Type 1 |
| SV300iP5A-2/4 | 304 (11.97) | 284 (11.18) | 236 (9.29)  | 460 (18.11) | 445 (17.52) | 599.2 (23.59) | 234 (9.21) | 177.5 (6.98) | IP20 UL Type 1 |

## SV150~SV300 iP5A (400V Class)-Built-in DCL Type

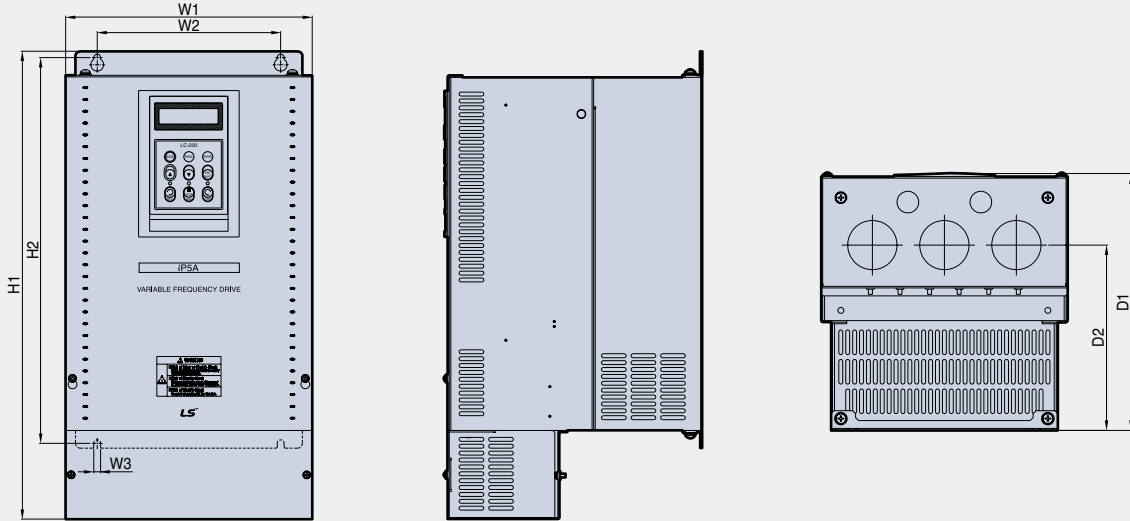


mm (inches)

| Model             | W1          | W2         | W3       | H1            | H2            | D1            | Enclosure Type |
|-------------------|-------------|------------|----------|---------------|---------------|---------------|----------------|
| SV150, 185iP5A-4L | 250 (9.84)  | 186 (7.32) | 7 (0.28) | 403.5 (15.88) | 392 (15.43)   | 261.2 (10.28) | IP00 UL Type 1 |
| SV220, 300iP5A-4L | 260 (10.23) | 220 (8.66) | 7 (0.28) | 480 (18.89)   | 468.5 (18.44) | 268.6 (10.57) | IP20 UL Type 1 |

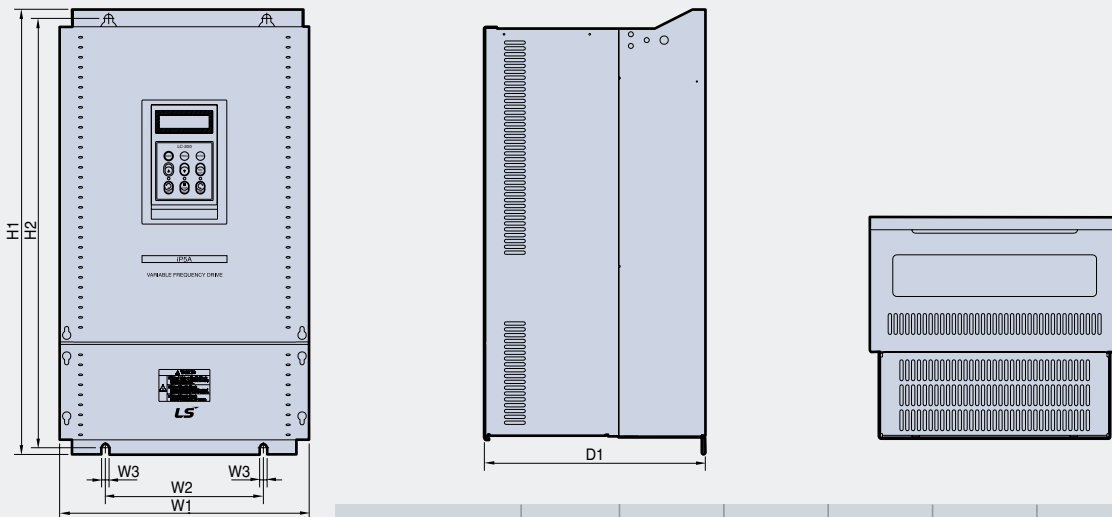


●● SV150~SV300 iP5A (Built-in DCL Type, UL Type 1 or UL Open Type with Conduit Option used, 400V Class)



| mm (inches)       |             |            |          |               |               |               |              |                |
|-------------------|-------------|------------|----------|---------------|---------------|---------------|--------------|----------------|
| Model             | W1          | W2         | W3       | H1            | H2            | D1            | D2           | Enclosure Type |
| SV150, 185iP5A-4L | 250 (9.84)  | 186 (7.32) | 7 (0.28) | 475.5 (18.72) | 392 (15.43)   | 261.2 (10.28) | 188.4 (7.42) | IP20 UL Type 1 |
| SV220, 300iP5A-4L | 260 (10.23) | 220 (8.66) | 7 (0.28) | 552 (21.73)   | 468.5 (18.44) | 268.6 (10.57) | 188.8 (7.43) | IP20 UL Type 1 |

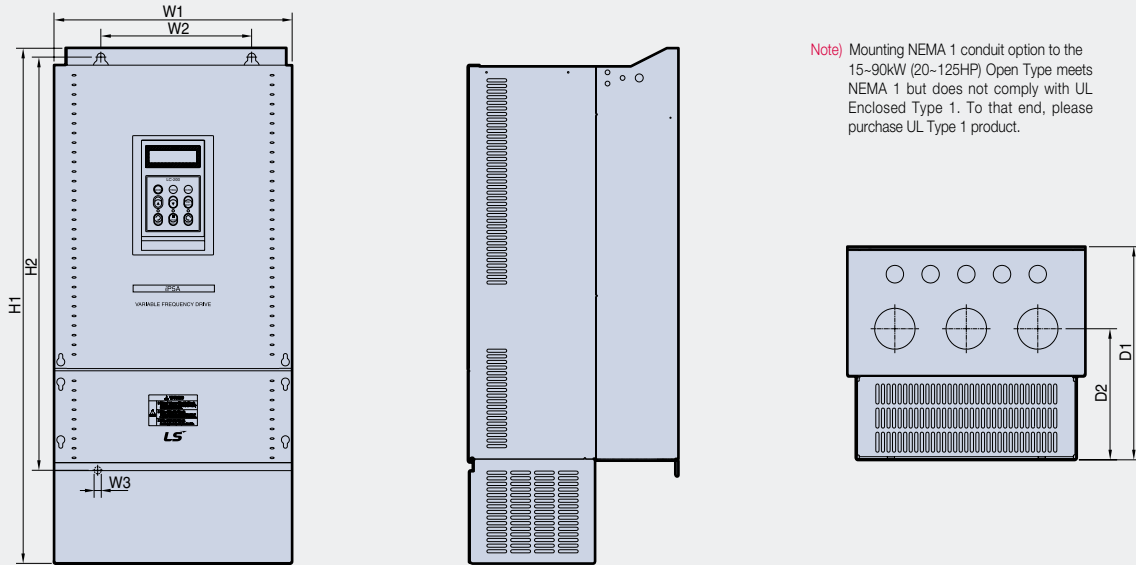
●● SV370~SV550iP5A (400V Class) & SV0370~0550iP5A (600V Class)



| mm (inches)                              |             |            |          |             |             |               |                |  |
|--|-------------|------------|----------|-------------|-------------|---------------|----------------|--|
| Model                                    | W1          | W2         | W3       | H1          | H2          | D1            | Enclosure Type |  |
| SV370, 450iP5A-4                         | 300 (11.81) | 190 (7.48) | 9 (0.35) | 534 (21.02) | 515 (20.28) | 265.6 (10.46) | IP00 UL Open   |  |
| SV550iP5A-4, SV0370<br>0450, 0550iP5A-6  | 300 (11.81) | 190 (7.48) | 9 (0.35) | 534 (21.02) | 515 (20.28) | 292.6 (11.52) | IP00 UL Open   |  |
| SV370, 450iP5A-4L<br>(Built-in DCL Type) | 300 (11.81) | 190 (7.48) | 9 (0.35) | 684 (26.92) | 665 (26.18) | 265.6 (10.46) | IP00 UL Open   |  |
| SV550iP5A-4L<br>(Built-in DCL Type)      | 300 (11.81) | 190 (7.48) | 9 (0.35) | 684 (26.92) | 665 (26.18) | 292.6 (11.52) | IP00 UL Open   |  |

# Dimensions

## SV370~550iP5A (UL Type 1 or UL Open Type with Conduit Option Used, 400V Class)

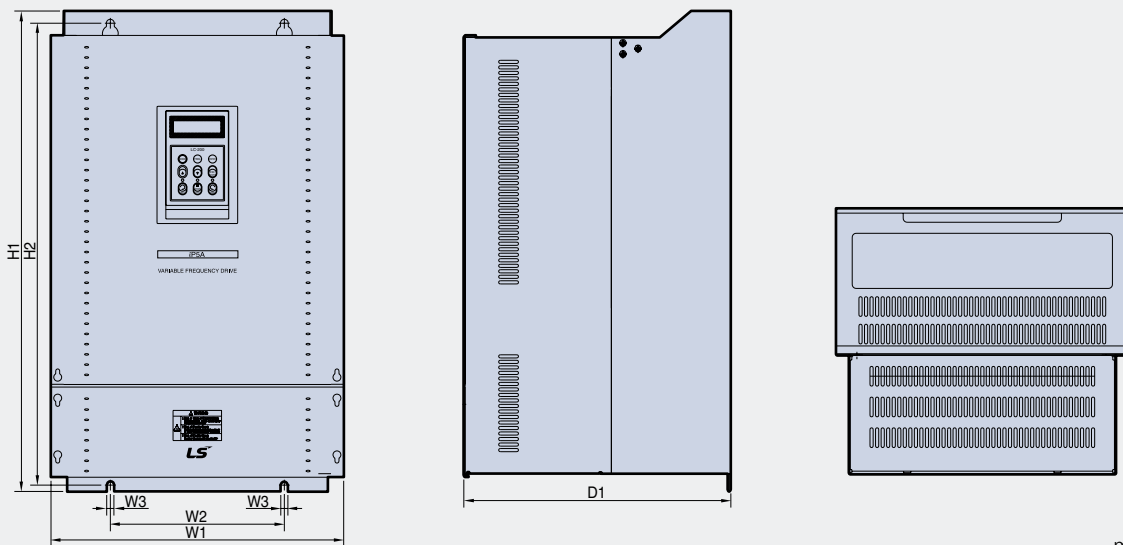


Note) Mounting NEMA 1 conduit option to the 15~90kW (20~125HP) Open Type meets NEMA 1 but does not comply with UL Enclosed Type 1. To that end, please purchase UL Type 1 product.

mm (inches)

| Model             | W1          | W2         | W3       | H1          | H2          | D1            | D2           | Enclosure Type |
|-------------------|-------------|------------|----------|-------------|-------------|---------------|--------------|----------------|
| SV370, 450iP5A-4  | 300 (11.81) | 190 (7.48) | 9 (0.35) | 642 (25.28) | 515 (20.28) | 265.6 (10.46) | 163.4 (6.43) | IP20 UL Type 1 |
| SV550iP5A-4       | 300 (11.81) | 190 (7.48) | 9 (0.35) | 642 (25.28) | 515 (20.28) | 292.6 (11.52) | 190.4 (7.5)  | IP20 UL Type 1 |
| SV370, 450iP5A-4L | 300 (11.81) | 190 (7.48) | 9 (0.35) | 792 (31.18) | 665 (26.18) | 265.6 (10.46) | 163.4 (6.43) | IP20 UL Type 1 |
| SV550iP5A-4L      | 300 (11.81) | 190 (7.48) | 9 (0.35) | 792 (31.18) | 665 (26.18) | 292.6 (11.52) | 190.4 (7.5)  | IP20 UL Type 1 |

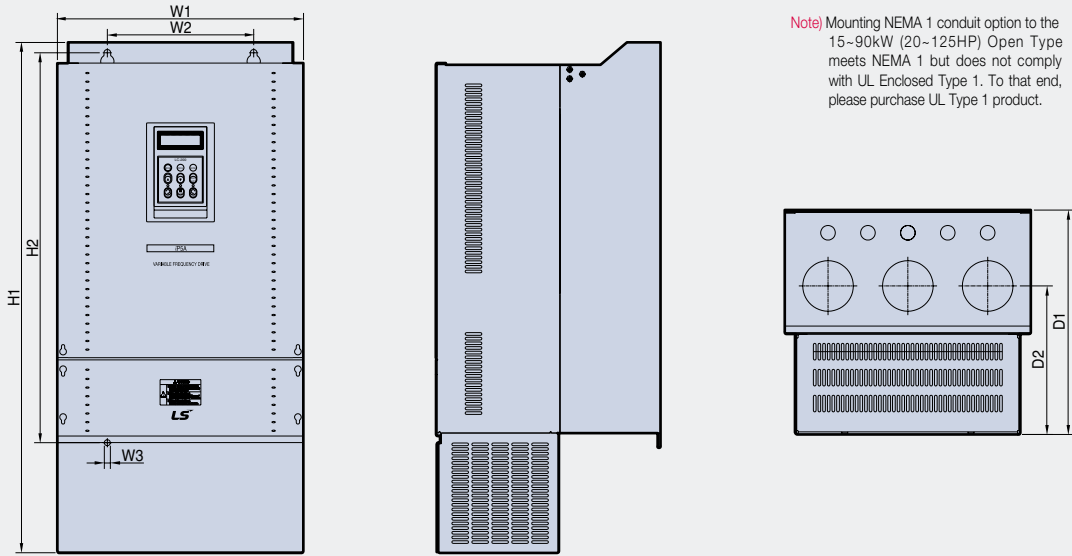
## SV750, 900iP5A (400V Class) & SV0750~0900iP5A (600V Class)



mm (inches)

| Model                                 | W1          | W2         | W3       | H1          | H2            | D1            | Enclosure Type |
|---------------------------------------|-------------|------------|----------|-------------|---------------|---------------|----------------|
| SV750, 900iP5A-4                      | 370 (14.57) | 220 (8.66) | 9 (0.35) | 610 (24.02) | 586.5 (23.09) | 337.6 (13.29) | IP00 UL Open   |
| SV0750, 0900iP5A-6                    | 370 (14.57) | 220 (8.66) | 9 (0.35) | 610 (24.02) | 586.5 (23.09) | 337.6 (13.29) | IP00 UL Open   |
| SV750, 900iP5A-4L (Built-in DCL Type) | 370 (14.57) | 220 (8.66) | 9 (0.35) | 760 (29.92) | 736.6 (28.99) | 337.6 (13.29) | IP00 UL Open   |

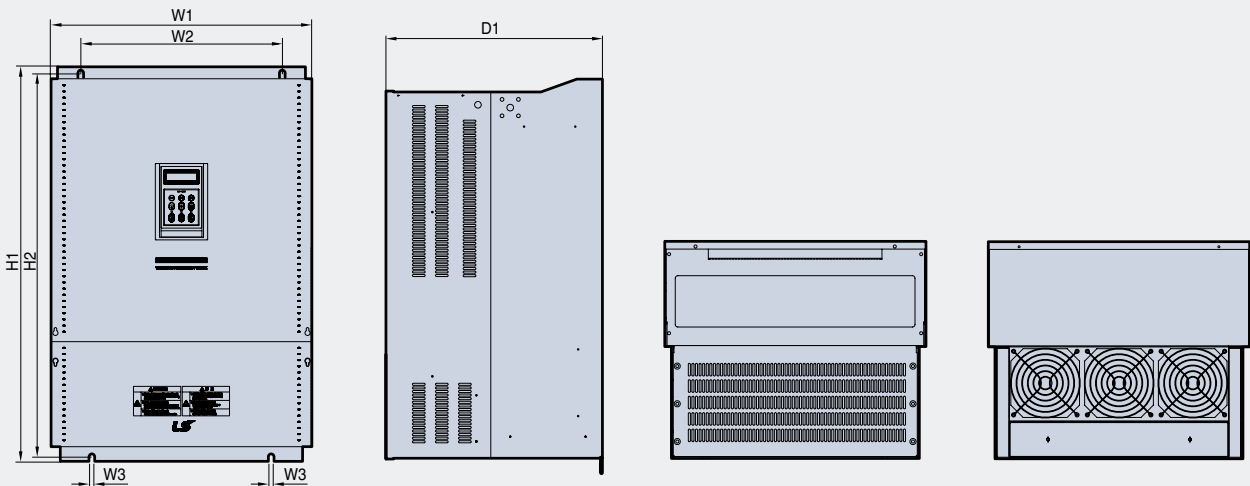
●● SV750, 900iP5A (UL Type 1 or UL Open Type with Conduit Option used, 400V Class)



mm (inches)

| Model                                 | W1          | W2         | W3       | H1            | H2            | D1            | D2          | Enclosure Type |
|---------------------------------------|-------------|------------|----------|---------------|---------------|---------------|-------------|----------------|
| SV750, 900iP5A-4                      | 370 (14.57) | 220 (8.66) | 9 (0.35) | 767.5 (30.22) | 586.5 (23.09) | 337.6 (13.29) | 223.4 (8.8) | IP20 UL Type 1 |
| SV750, 900iP5A-4L (Built-in DCL Type) | 370 (14.57) | 220 (8.66) | 9 (0.35) | 917.5 (36.12) | 736.5 (28.99) | 337.6 (13.29) | 223.4 (8.8) | IP20 UL Type 1 |

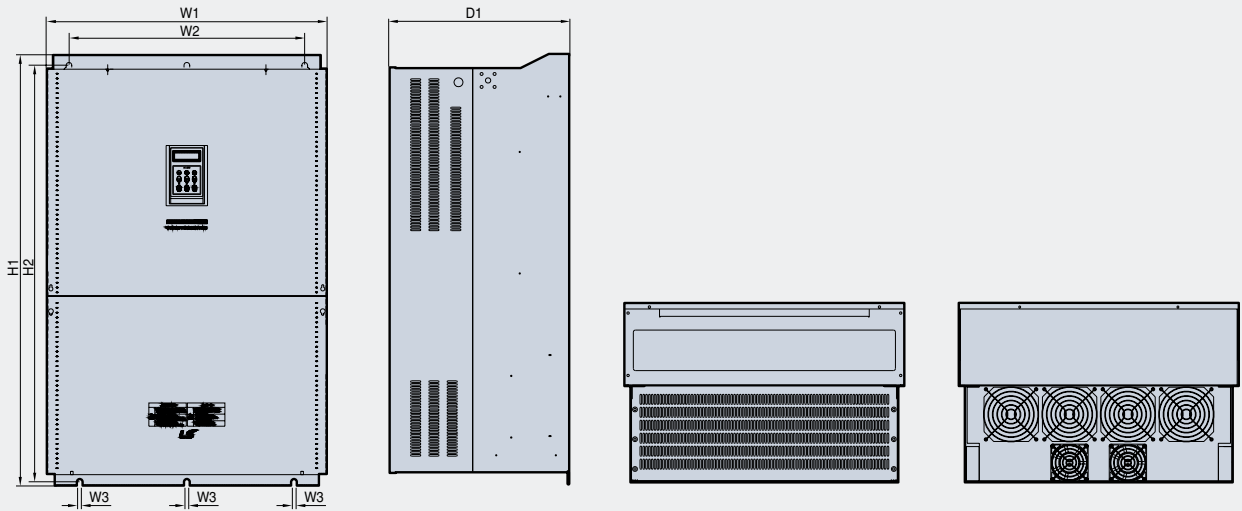
●● SV1100, 1600iP5A (400V Class) & SV1100iP5A (600V Class)



mm (inches)

| Model                                | W1          | W2          | W3        | H1           | H2           | D1            | Enclosure Type |
|--------------------------------------|-------------|-------------|-----------|--------------|--------------|---------------|----------------|
| SV1100, 1320iP5A-4L<br>SV1100iP5A-6L | 510 (20.08) | 381 (15.00) | 11 (0.43) | 783.5(30.85) | 759(29.88)   | 422.6 (16.64) | IP00 UL Open   |
| SV1600iP5A-4L                        | 510 (20.08) | 381 (15.00) | 11 (0.43) | 861(33.90)   | 836.5(32.93) | 422.6 (16.64) | IP00 UL Open   |

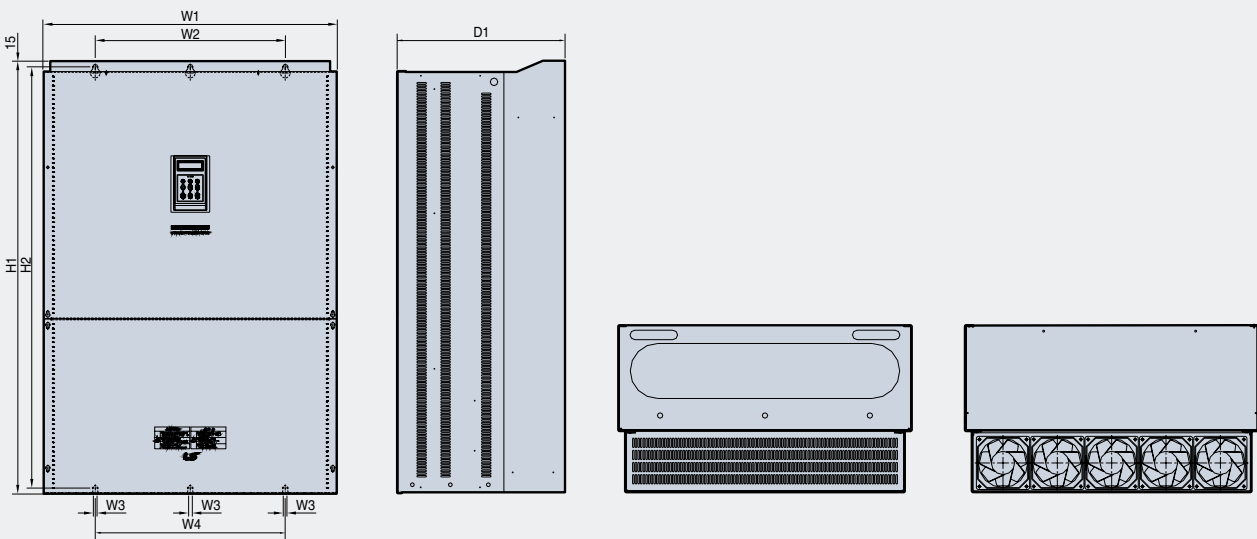
●● SV2200, 2800iP5A (400V Class)



mm (inches)

| Model               | W1          | W2          | W3        | H1           | H2             | D1            | Enclosure Type |
|---------------------|-------------|-------------|-----------|--------------|----------------|---------------|----------------|
| SV2200, 2800iP5A-4L | 690 (27.17) | 581 (22.87) | 14 (0.55) | 1063 (41.85) | 1043.5 (41.08) | 449.6 (17.70) | IP00 UL Open   |

●● SV3150, 4500iP5A (400V Class)



mm (inches)

| Model               | W1          | W2          | W3        | H1             | H2             | D1          | Enclosure Type |
|---------------------|-------------|-------------|-----------|----------------|----------------|-------------|----------------|
| SV3150, iP5A-4L     | 772 (30.39) | 500 (19.69) | 13 (0.51) | 1140.5 (44.90) | 1110 (43.70)   | 442 (17.40) | IP00 UL Open   |
| SV3750, 4500iP5A-4L | 922 (36.30) | 580 (22.83) | 14 (0.55) | 1302.5 (51.28) | 1271.5 (50.06) | 495 (19.49) | IP00 UL Open   |

# DB (Dynamic Braking) Unit

## DBU Models

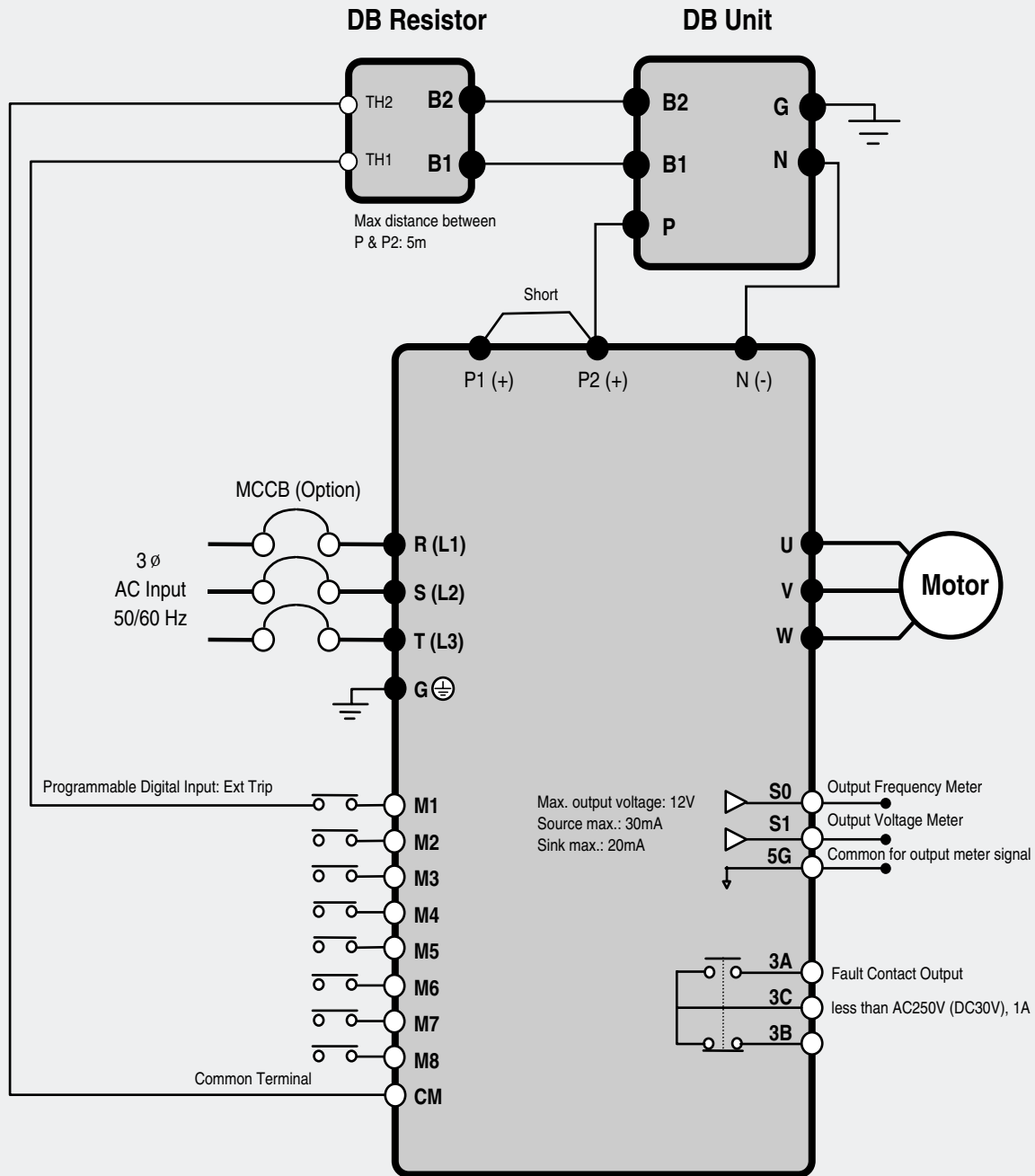
| UL                    | Inverter   | Applicable motor rating | DB Unit             | Dimension   |
|-----------------------|------------|-------------------------|---------------------|-------------|
| Non UL type           | 200V class | 11~15 kW (15~20 HP)     | SV150DBU-2          | Group 1.    |
|                       |            | 18.5~22 kW (25~30 HP)   | SV220DBU-2          |             |
|                       |            | 30~37 kW (40~50 HP)     | SV037DBH-2          | Group 2.    |
|                       |            | 45~55 kW (60~75 HP)     | SV037DBH-2, 2set    |             |
|                       | 400V class | 11~15 kW (15~20 HP)     | SV150DBU-4          | Group 1.    |
|                       |            | 18.5~22 kW (25~30 HP)   | SV220DBU-4          |             |
|                       |            | 30~37 kW (40~50 HP)     | SV037DBH-4          | Group 2.    |
|                       |            | 45~55 kW (60~75 HP)     | SV075DBH-4          |             |
|                       |            | 75 kW (100 HP)          |                     |             |
|                       | UL type    | 200V class              | 11~15 kW (15~20 HP) | SV150DBU-2U |
| 18.5~22 kW (25~30 HP) |            |                         | SV220DBU-2U         |             |
| 30~37 kW (40~50 HP)   |            |                         | SV370DBU-2U         |             |
| 45~55 kW (60~75 HP)   |            |                         | SV550DBU-2U         |             |
| 400V class            |            | 11~15 kW (15~20 HP)     | SV150DBU-4U         |             |
|                       |            | 18.5~22 kW (25~30 HP)   | SV220DBU-4U         |             |
|                       |            | 30~37 kW (40~50 HP)     | SV370DBU-4U         |             |
|                       |            | 45~55 kW (60~75 HP)     | SV550DBU-4U         |             |
|                       |            | 75 kW (100 HP)          | SV750DBU-4U         |             |
|                       |            | 90~110 kW (125~150 HP)  | SV550DBU-4, 2set    |             |
|                       |            | 132~160 kW (200~250 HP) | SV750DBU-4, 2set    |             |
|                       |            | 220 kW (300 HP)         | SV750DBU-4, 3set    |             |
|                       |            | 280~315 kW (350~400 HP) | -                   |             |
|                       |            | 375~450 kW (500~600 HP) | -                   |             |

## Terminal Configuration

- Group 1 - **CM** **OH** **G** **B2** **B1** **N** **P**
- Group 2 - **G** **N** **B2** **P/B1**
- Group 3 - **P** **N** **G** **B1** **B2**

| Terminals | Description                     | Terminals  | Description   |
|-----------|---------------------------------|------------|---|
| <b>G</b>  | Ground terminal                 | <b>N</b>   | Connect to inverter terminal N  |
| <b>B2</b> | Connect to DB Resistor's B2     | <b>P</b>   | Connect to inverter terminal P1   |
| <b>B1</b> | Connect to DB Resistor's B1     | <b>CM</b>  | OH common   |
| <b>N</b>  | Connect to inverter terminal N  | <b>OH*</b> | Over Heat Trip output terminal<br>(Open Collector output: 20mA, 27V DC) |
| <b>P</b>  | Connect to inverter terminal P1 |            |   |

●● Wiring for DB unit and DB resistor (For 5.5~90kW/7.5~125HP inverters)



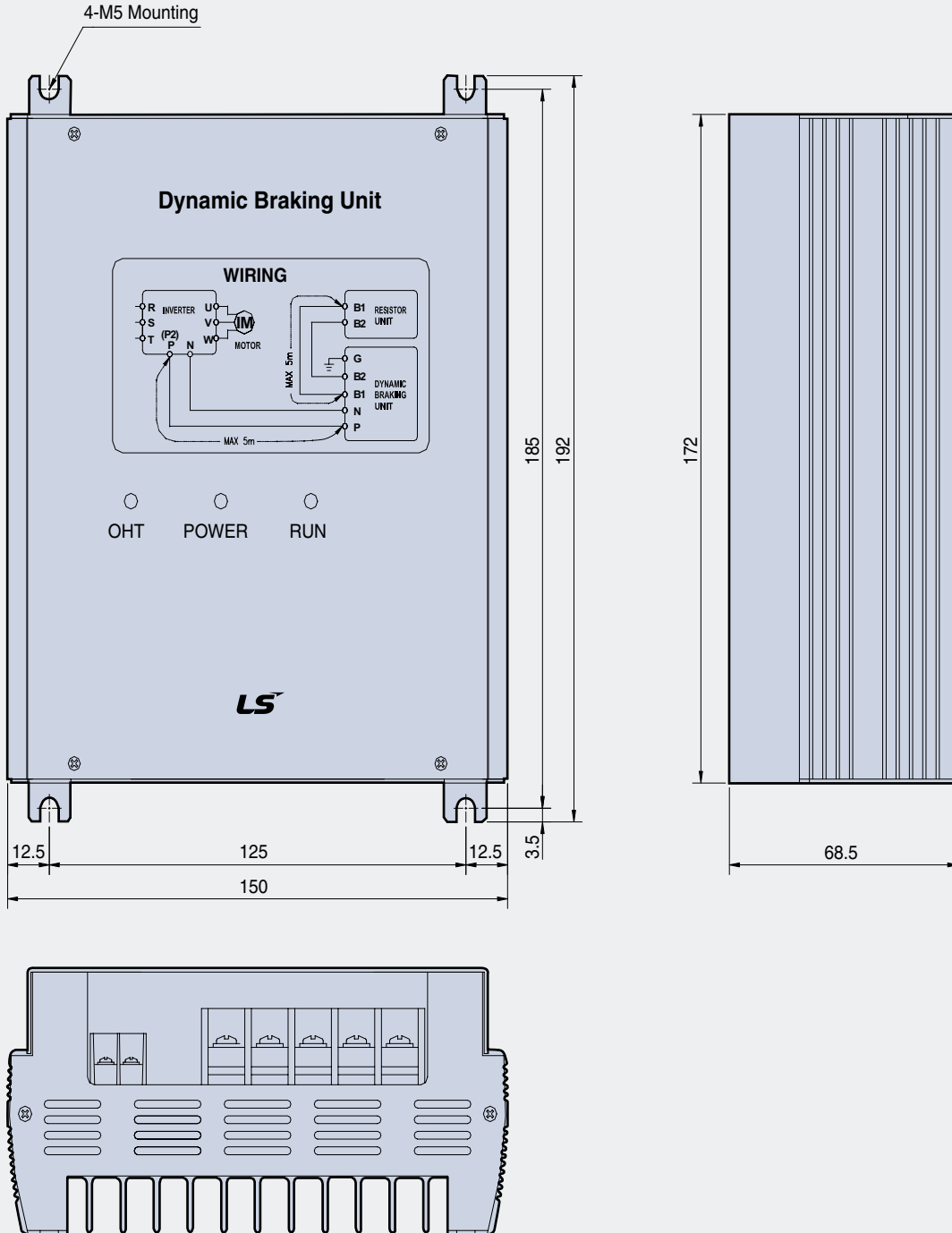
| DB resistor terminal | Description   |
|----------------------|---|
| B1, B2               | Wire terminal properly based on wiring block diagram.<br>Connect a DB resistor to the DB Unit's B1, B2 terminals.   |
| TH1, TH2             | Thermal sensor terminal of DB resistor.<br>Normal temperature (Ambient): Contact ON (TH1-TH2 closed)<br>DB resistor overheated: Contact OFF (TH1-TH2 Open).<br>Wire it to the inverter terminal defined as External Trip. |



# DB (Dynamic Braking) Unit

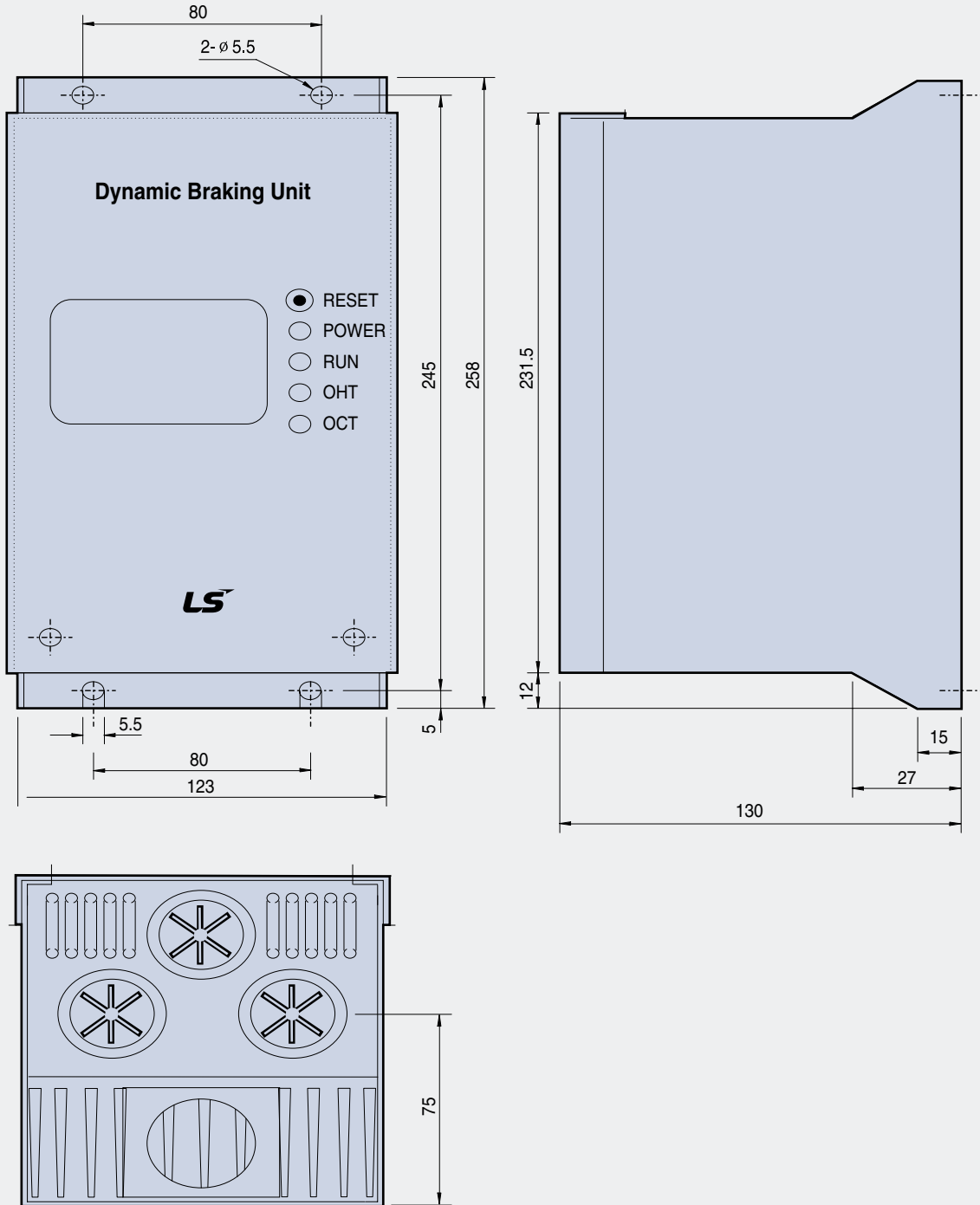
●● Group 1

(Unit: mm)



Group 2

(Unit: mm)

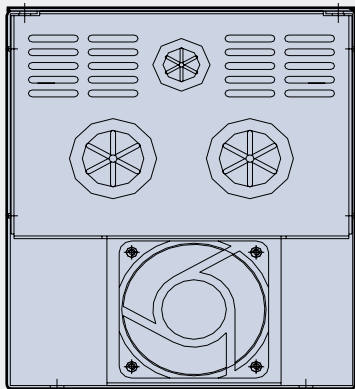
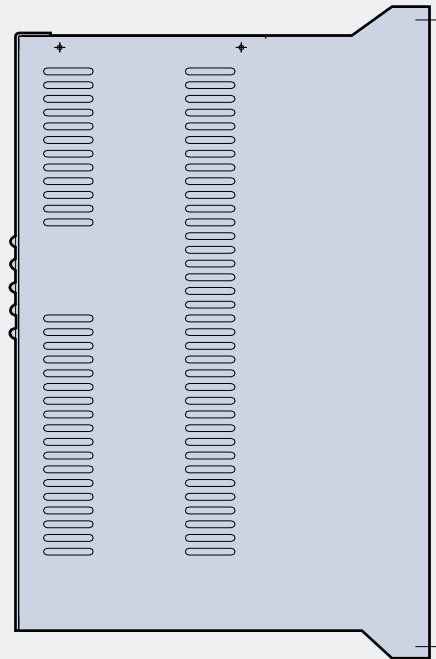
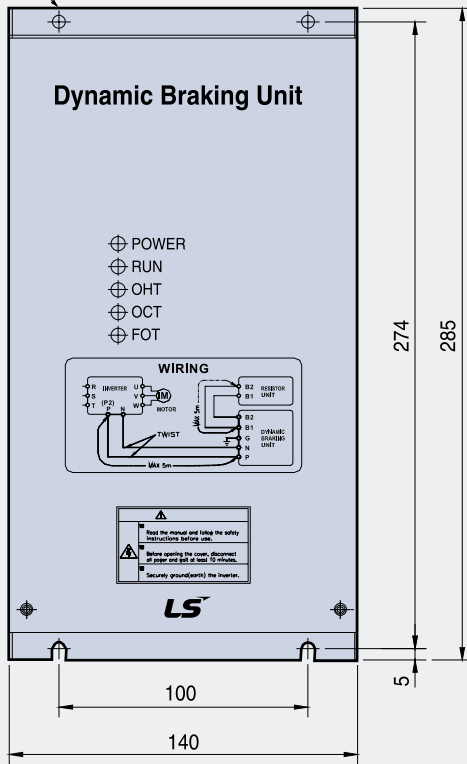


# DB (Dynamic Braking) Unit

●● Group 3

(Unit: mm)

4-M5 Mounting



# External DB Resistor

iP5A do not have built-in DB resistor on power stack as factory installation. External DB Unit and Resistor (Optional) should be installed. See the following table for more details (ED: 5%, Continuous Braking Time: 15 sec). If Enable duty (%ED) is increased to 10%, use external DB resistor having twice Wattage rating.

|        | Applied motor capacity (kW/HP) | Operating rate (ED/Continuous Braking Time) | 100 % Braking Torque |      |        | 150% Braking Torque |      |        |
|--------|--------------------------------|---|----------------------|------|--------|---------------------|------|--------|
|        |                                |   | [ohm]                | [W]  | Type   | [ohm]               | [W]  | Type   |
| 200V   | 0.75/1                         | 5%/15 sec                                   | 200                  | 100  | TYPE 1 | 150                 | 150  | TYPE 1 |
|        | 1.5/2                          | 5%/15 sec                                   | 100                  | 200  | TYPE 1 | 60                  | 300  | TYPE 1 |
|        | 2.2/3                          | 5%/15 sec                                   | 60                   | 300  | TYPE 1 | 50                  | 400  | TYPE 1 |
|        | 3.7/5                          | 5%/15 sec                                   | 40                   | 500  | TYPE 2 | 33                  | 600  | TYPE 2 |
|        | 5.5/7.5                        | 5%/15 sec                                   | 30                   | 700  | Type3  | 20                  | 800  | Type 3 |
|        | 7.5/10                         | 5%/15 sec                                   | 20                   | 1000 | Type 3 | 15                  | 1200 | Type 3 |
|        | 11/15                          | 5%/15 sec                                   | 15                   | 1400 | Type 3 | 10                  | 2400 | Type 3 |
|        | 15/20                          | 5%/15 sec                                   | 11                   | 2000 | Type 3 | 8                   | 2400 | Type 3 |
|        | 18.5/25                        | 5%/15 sec                                   | 9                    | 2400 | Type 3 | 5                   | 3600 | Type 3 |
|        | 22/30                          | 5%/15 sec                                   | 8                    | 2800 | Type 3 | 5                   | 3600 | Type 3 |
| 30/40  | 10%/6 sec                      | 4.2   | 6400                 | -    | -      | -                   | -    |        |
| 400V   | 0.75/1                         | 5%/15 sec                                   | 900                  | 100  | TYPE 1 | 600                 | 150  | TYPE 1 |
|        | 1.5/2                          | 5%/15 sec                                   | 450                  | 200  | TYPE 1 | 300                 | 300  | TYPE 1 |
|        | 2.2/3                          | 5%/15 sec                                   | 300                  | 300  | TYPE 1 | 200                 | 400  | TYPE 1 |
|        | 3.7/5                          | 5%/15 sec                                   | 200                  | 500  | TYPE 2 | 130                 | 600  | TYPE 2 |
|        | 5.5/7.5                        | 5%/15 sec                                   | 120                  | 700  | Type 3 | 85                  | 1000 | Type 3 |
|        | 7.5/10                         | 5%/15 sec                                   | 90                   | 1000 | Type 3 | 60                  | 1200 | Type 3 |
|        | 11/15                          | 5%/15 sec                                   | 60                   | 1400 | Type 3 | 40                  | 2000 | Type 3 |
|        | 15/20                          | 5%/15 sec                                   | 45                   | 2000 | Type 3 | 30                  | 2400 | Type 3 |
|        | 18.5/25                        | 5%/15 sec                                   | 35                   | 2400 | Type 3 | 20                  | 3600 | Type 3 |
|        | 22/30                          | 5%/15 sec                                   | 30                   | 2800 | Type 3 | 20                  | 3600 | Type 3 |
|        | 30/40                          | 10%/6 sec                                   | 16.9                 | 6400 | -      | -                   | -    | -      |
|        | 37/50                          | 10%/6 sec                                   | 16.9                 | 6400 | -      | -                   | -    | -      |
|        | 45/60                          | 10%/6 sec                                   | 11.4                 | 9600 | -      | -                   | -    | -      |
|        | 55/75                          | 10%/6 sec                                   | 11.4                 | 9600 | -      | -                   | -    | -      |
| 75/100 | 10%/6 sec                      | 8.4   | 12800                | -    | -      | -                   | -    |        |
| 90/125 | 10%/6 sec                      | 8.4   | 12800                | -    | -      | -                   | -    |        |

## Peripheral Device

### ⚡ MCCB (Molded Case Circuit Breaker) and MC (Magnetic Contactor)

| Voltage       | Motor [kW]  | Inverter Model | MCCB<br>(LS Industrial Systems) | MC<br>(LS Industrial Systems) |
|---------------|-------------|----------------|---------------------------------|-------------------------------|
| 200V<br>Class | 0.75        | SV008iP5A-2    | -                               | -                             |
|               | 1.5         | SV015iP5A-2    | -                               | -                             |
|               | 2.2         | SV022iP5A-2    | -                               | -                             |
|               | 3.7         | SV037iP5A-2    | -                               | -                             |
|               | 5.5         | SV055iP5A-2    | ABS53b/50A                      | GMC-40                        |
|               | 7.5         | SV075iP5A-2    | ABS63b/60A                      | GMC-40                        |
|               | 11          | SV110iP5A-2    | ABS103b/100A                    | GMC-50                        |
|               | 15          | SV150iP5A-2    | ABS103b/100A                    | GMC-85                        |
|               | 18.5        | SV185iP5A-2    | ABS203b/125A                    | GMC-100                       |
|               | 22          | SV220iP5A-2    | ABS203b/150A                    | GMC-100                       |
| 30            | SV300iP5A-2 | ABS203b/175A   | GMC-150                         |                               |

# Peripheral Device

## ●● MCCB (Molded Case Circuit Breaker) and MC (Magnetic Contactor)

| Voltage               | Motor [kW]   | Inverter Model | MCCB<br>(LS Industrial Systems) | MC<br>(LS Industrial Systems) |
|-----------------------|--------------|----------------|---------------------------------|-------------------------------|
| <b>400V<br/>Class</b> | 0.75         | SV008iP5A-4    | -                               | -                             |
|                       | 1.5          | SV015iP5A-4    | -                               | -                             |
|                       | 2.2          | SV022iP5A-4    | -                               | -                             |
|                       | 3.7          | SV037iP5A-4    | -                               | -                             |
|                       | 5.5          | SV055iP5A-4    | ABS33b/30A                      | GMC-22                        |
|                       | 7.5          | SV075iP5A-4    | ABS33b/30A                      | GMC-22                        |
|                       | 11           | SV110iP5A-4    | ABS53b/50A                      | GMC-40                        |
|                       | 15           | SV150iP5A-4    | ABS63b/60A                      | GMC-50                        |
|                       | 18.5         | SV185iP5A-4    | ABS63b/60A                      | GMC-50                        |
|                       | 22           | SV220iP5A-4    | ABS103b/100A                    | GMC-65                        |
|                       | 30           | SV300iP5A-4    | ABS103b/100A                    | GMC-75                        |
|                       | 37           | SV370iP5A-4    | ABS203b/125A                    | GMC-100                       |
|                       | 45           | SV450iP5A-4    | ABS203b/150A                    | GMC-125                       |
|                       | 55           | SV550iP5A-4    | ABS203b/175A                    | GMC-150                       |
|                       | 75           | SV750iP5A-4    | ABS203b/225A                    | GMC-180                       |
|                       | 90           | SV900iP5A-4    | ABS403b/300A                    | GMC-220                       |
|                       | 110          | SV1100iP5A-4   | ABS403b/400A                    | GMC-300                       |
|                       | 132          | SV1300iP5A-4   | ABS603b/500A                    | GMC-300                       |
|                       | 160          | SV1600iP5A-4   | ABS603b/600A                    | GMC-400                       |
|                       | 220          | SV2200iP5A-4   | ABS803b/700A                    | GMC-600                       |
| 280                   | SV2800iP5A-4 | ABS803b/800A   | GMC-600                         |                               |
| 315                   | SV3150iP5A-4 | ABS1003/1000A  | GMC-800                         |                               |
| 375                   | SV3750iP5A-4 | ABS1203/1200A  | 900A                            |                               |
| 450                   | SV4500iP5A-4 | ABS1203/1200A  | 1000A                           |                               |
| <b>600V<br/>Class</b> | 5.5          | SV055iP5A-4    | ABS33b/30A                      | GMC-22                        |
|                       | 7.5          | SV075iP5A-4    | ABS33b/30A                      | GMC-22                        |
|                       | 11           | SV110iP5A-4    | ABS53b/50A                      | GMC-40                        |
|                       | 15           | SV150iP5A-4    | ABS63b/60A                      | GMC-50                        |
|                       | 18.5         | SV185iP5A-4    | ABS63b/60A                      | GMC-50                        |
|                       | 22           | SV220iP5A-4    | ABS103b/100A                    | GMC-65                        |
|                       | 30           | SV300iP5A-4    | ABS103b/100A                    | GMC-75                        |
|                       | 37           | SV370iP5A-4    | ABS203b/125A                    | GMC-100                       |
|                       | 45           | SV450iP5A-4    | ABS203b/150A                    | GMC-125                       |
|                       | 55           | SV550iP5A-4    | ABS203b/175A                    | GMC-150                       |
|                       | 75           | SV750iP5A-4    | ABS203b/225A                    | GMC-180                       |
|                       | 90           | SV900iP5A-4    | ABS403b/300A                    | GMC-220                       |

●● AC Input Fuse

| Voltage    | Motor [kW]   | Inverter Model | AC Input Fuse [A] | AC Reactor |          | DC Reactor |     |
|------------|--------------|----------------|-------------------|------------|----------|------------|-----|
|            |              |                |                   | [mH]       | [A]      | [mH]       | [A] |
| 200V Class | 0.75         | SV008iP5A-2    | 10                | 2.13       | 5.7      | -          | -   |
|            | 1.5          | SV015iP5A-2    | 15                | 1.2        | 10       | -          | -   |
|            | 2.2          | SV022iP5A-2    | 20                | 0.88       | 14       | -          | -   |
|            | 3.7          | SV037iP5A-2    | 30                | 0.56       | 20       | -          | -   |
|            | 5.5          | SV055iP5A-2    | 40                | 0.39       | 30       | 1.37       | 29  |
|            | 7.5          | SV075iP5A-2    | 60                | 0.28       | 40       | 1.05       | 38  |
|            | 11           | SV110iP5A-2    | 80                | 0.20       | 59       | 0.74       | 56  |
|            | 15           | SV150iP5A-2    | 100               | 0.15       | 75       | 0.57       | 71  |
|            | 18.5         | SV185iP5A-2    | 125               | 0.12       | 96       | 0.49       | 91  |
|            | 22           | SV220iP5A-2    | 150               | 0.10       | 112      | 0.42       | 107 |
|            | 30           | SV300iP5A-2    | 200               | 0.07       | 160      | 0.34       | 152 |
| 400V Class | 0.75         | SV008iP5A-4    | 10                | 8.63       | 2.8      | -          | -   |
|            | 1.5          | SV015iP5A-4    | 10                | 4.81       | 4.8      | -          | -   |
|            | 2.2          | SV022iP5A-4    | 10                | 3.23       | 7.5      | -          | -   |
|            | 3.7          | SV037iP5A-4    | 15                | 2.34       | 10       | -          | -   |
|            | 5.5          | SV055iP5A-4    | 20                | 1.22       | 15       | 5.34       | 14  |
|            | 7.5          | SV075iP5A-4    | 30                | 1.14       | 20       | 4.04       | 19  |
|            | 11           | SV110iP5A-4    | 40                | 0.81       | 30       | 2.76       | 29  |
|            | 15           | SV150iP5A-4    | 60                | 0.61       | 38       | 2.18       | 36  |
|            | 18.5         | SV185iP5A-4    | 70                | 0.45       | 50       | 1.79       | 48  |
|            | 22           | SV220iP5A-4    | 80                | 0.39       | 58       | 1.54       | 55  |
|            | 30           | SV300iP5A-4    | 100               | 0.287      | 80       | 1.191      | 76  |
|            | 37           | SV370iP5A-4    | 125               | 0.232      | 98       | 0.975      | 93  |
|            | 45           | SV450iP5A-4    | 150               | 0.195      | 118      | 0.886      | 112 |
|            | 55           | SV550iP5A-4    | 175               | 0.157      | 142      | 0.753      | 135 |
|            | 75           | SV750iP5A-4    | 250               | 0.122      | 196      | 0.436      | 187 |
|            | 90           | SV900iP5A-4    | 300               | 0.096      | 237      | 0.352      | 225 |
|            | 110          | SV1100iP5A-4   | 350               | 0.081      | 289      | Built-in   |     |
|            | 132          | SV1300iP5A-4   | 400               | 0.069      | 341      | Built-in   |     |
|            | 160          | SV1600iP5A-4   | 450               | 0.057      | 420      | Built-in   |     |
|            | 220          | SV2200iP5A-4   | 700               | 0.042      | 558      | Built-in   |     |
| 280        | SV2800iP5A-4 | 800            | 0.029             | 799        | Built-in |            |     |
| 315        | SV3150iP5A-4 | 900            | 0.029             | 799        | 0.090    | 836        |     |
| 375        | SV3750iP5A-4 | 1000           | 0.024             | 952        | 0.076    | 996        |     |
| 450        | SV4500iP5A-4 | 1200           | 0.024             | 952        | 0.064    | 1195       |     |





# MEMO

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