

LSLV
G100

General AC Drive

3-phase 200~240V 0.4~22kW (0.5~30HP)
3-phase 380~480V 0.4~22kW (0.5~30HP)

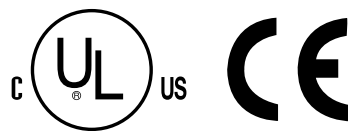


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General Drive **new** G100





The G100 is the solution for general drives applications because of its high performance sensorless operation, premium quality and high reliability.

Great Reliability

- Meets UL 61800-5-1
- Military (MIL 217Plus) design based methodology
- Enhanced materials and manufacturing processes

Great Performance

- Enhanced motor control-sensorless & V/F performance
- User-friendly-easy tuning sensorless control
- Suitable for most applications

User Friendly

- Easy to install, use and maintain
- Various options



Great Reliability

G100 is designed to meet global standards through upgraded design, materials and manufacturing improving its endurance for harsh environments.

UL 61800-5-1¹⁾ Design

Satisfied the new UL certification

^{*1)} After February 2020 all of system, product have to satisfy new UL certification

Robust Design

Construction of the air flow design minimizes exposure of critical components (IGBT, PCB, etc.) from outside contaminants.

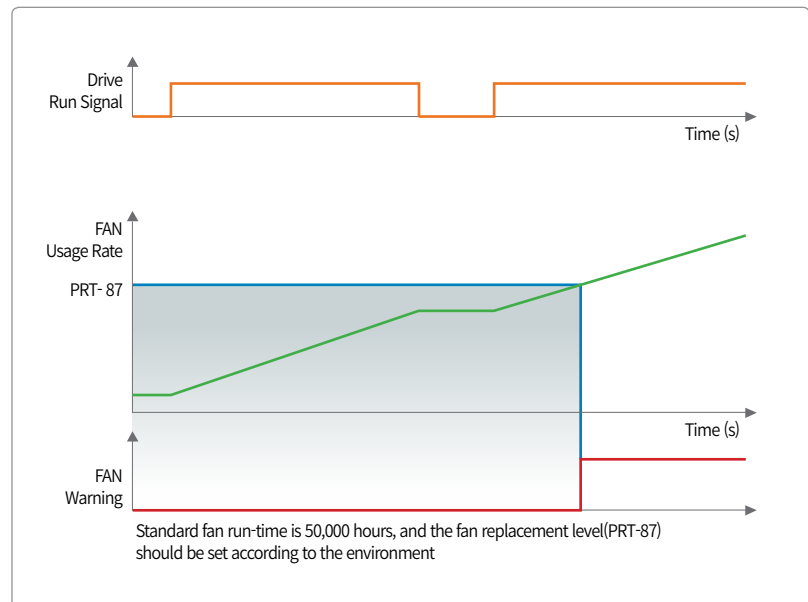
Built-in EMC Filter

Embedded C3 EMC filter to meet EN618000-3 standards and provide noise reduction



Fan Lifecycle Diagnosis

Display fan replacement warning message with digital output or keypad



MIL217Plus based Design

- Reliability design basis tool (PSA, Fr-FMEA, FTA, RBD, PBS)
- Improved circuit robustness through strict quality margins

| Category | G100 |
|-------------------------|---|
| Estimated Life Cycle | 240,455 hrs(27 yrs) (Accelerated life test result : 295,951 hrs) |
| Reliability Test Method | MTTF |
| Standard | MIL-HDBK-217F RIAC HDBK 217Plus |
| Ambient Temperature | 30°C (86°F) |

Material Design

- Enhanced thermal resistance and intensity through upgraded materials
- Increased thickness to prevent damage

Features



Great Performance

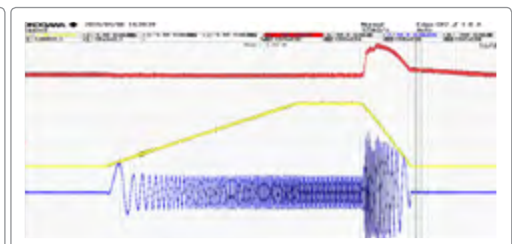
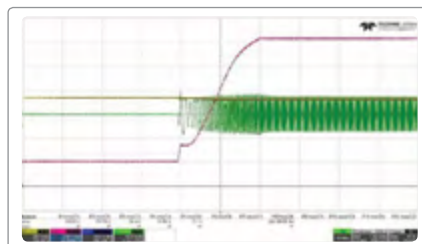
The G100 has an advanced sensorless vector mode along with a highly adaptable V/F mode making it one of the most versatile drives on the market.

Application Adaptability

Dual ratings enable use in most applications

V/F Accelerate and Decelerate Function

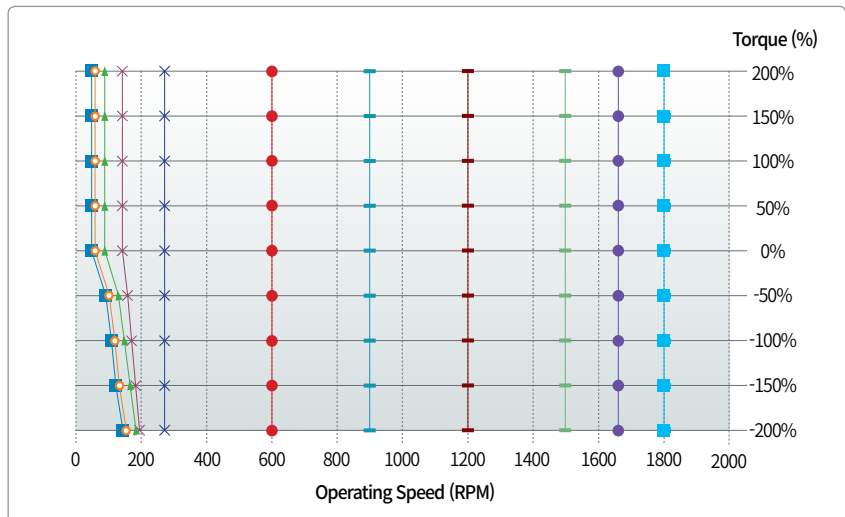
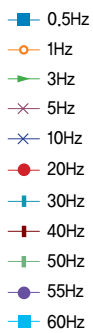
Applied ATB & Flux braking function





Sensorless Performance

- Low speed/High torque
- Tight speed regulation +/- 1%
- 0.5Hz 200% peak torque

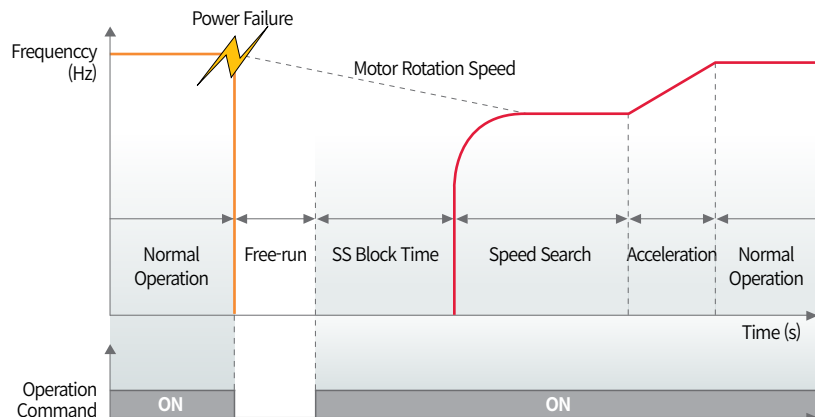


KEB (Kinetic Energy Buffering)

- KEB for a stable system stop in case of power loss or failure.
- Select KEB operation function for different speeds and purposes

Flying Start

Select optimal flying start operation for different applications



Features



User-friendly Design

G100 is convenient to install, control, perform maintenance and many other functions.

1 Built-in Potentiometer

Easy operation with built-in potentiometer

2 Smart Copier

Copy parameter (Read/Write) and download firmware without supplying power to drive

2 Remote Keypad

Copy parameter (Read/Write) using remote keypads



2 Fieldbus Options

Provides various communication options with simple mounting structure

- Dual Port EtherNet/IP
- Profibus-DP
- CANopen



2 PC Tools (DriveView 9)

New version of PC tool

2 Easy Modbus Communication Connection

2 type of connection of Modbus communication

- RJ45 Port
- I/O (S+, S-)

3 QR Code



View manuals and various information from the QR code printed on the front cover.



4 Built-in 2 Relay

Cost efficient and easy to compose system with two embedded relays.



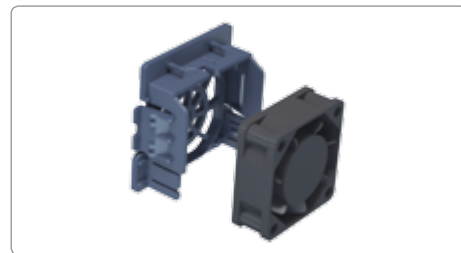
5 DIN rail Mount (Below 4kW)

Install using DIN rails (Side-by-side)



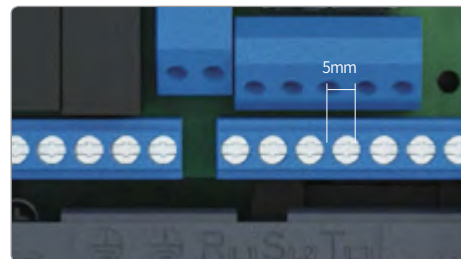
6 Fan Replacement

Simple cooling fan replacement procedure



7 I/O Terminal (5mm)

Easy wiring with 5mm I/O pitch



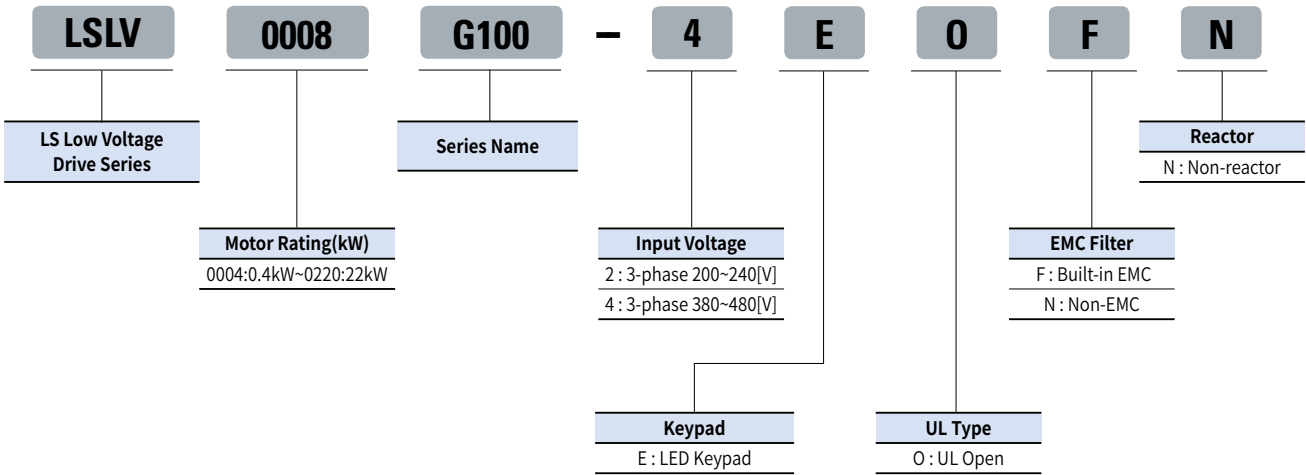
8 Operation Group

- Access commonly used parameters in the operation group
- Identical Parameter group structure for all 100 series

8 100 Series Parameter Group Configuration Applied

| Motor rating | 3-Phase 200V | 3-Phase 400V |
|--------------|--------------------|----------------------|
| 0.4 kW | LSLV0004G100-2E0NN | LSLV0004G100-4E0(F)N |
| 0.75 kW | LSLV0008G100-2E0NN | LSLV0008G100-4E0(F)N |
| 1.5 kW | LSLV0015G100-2E0NN | LSLV0015G100-4E0(F)N |
| 2.2 kW | LSLV0022G100-2E0NN | LSLV0022G100-4E0(F)N |
| 4.0 kW | LSLV0040G100-2E0NN | LSLV0040G100-4E0(F)N |
| 5.5 kW | LSLV0055G100-2E0NN | LSLV0055G100-4E0(F)N |
| 7.5 kW | LSLV0075G100-2E0NN | LSLV0075G100-4E0(F)N |
| 11 kW | | |
| 15 kW | | |
| 18.5 kW | | |
| 22 kW | | |

※ (F): Built-in EMC or Non-EMC type
 ※ 200V/400V 11~22kW TBA



3-Phase 200V Class (0.4~7.5kW)

| □□□□ G100-2 | | | 0004 | 0008 | 0015 | 0022 | 0040 | 0055 | 0075 | |
|------------------|-----------------------------------|----------------------------------|------|------|------|------|------|------|------|--|
| Motor Rating | Heavy Duty (HD) | (HP) | 0.5 | 1.0 | 2.0 | 3.0 | 5.4 | 7.5 | 10 | |
| | | (kW) | 0.4 | 0.75 | 1.5 | 2.2 | 4.0 | 5.5 | 7.5 | |
| | Normal Duty (ND) | (HP) | 1.0 | 2.0 | 3.0 | 5.4 | 7.5 | 10 | 15 | |
| | | (kW) | 0.75 | 1.5 | 2.2 | 4.0 | 5.5 | 7.5 | 11 | |
| Output Rating | Capacity [kVA] | Heavy Duty (HD) | 1.0 | 1.9 | 3.0 | 4.2 | 6.5 | 9.1 | 12.2 | |
| | | Normal Duty (ND) | 1.2 | 2.3 | 3.8 | 4.6 | 6.9 | 11.4 | 15.2 | |
| | Rated Current (3-Phase Input) [A] | Heavy Duty (HD) | 2.5 | 5.0 | 8.0 | 11.0 | 17.0 | 24.0 | 32.0 | |
| | | Normal Duty (ND) | 3.1 | 6.0 | 9.6 | 12.0 | 18.0 | 30.0 | 40.0 | |
| | Rated Current (1-Phase Input) [A] | Heavy Duty (HD) | 1.5 | 2.8 | 4.6 | 6.1 | 9.3 | 12.8 | 17.4 | |
| | | Normal Duty (ND) | 2.0 | 3.6 | 5.9 | 6.7 | 9.8 | 16.3 | 22.0 | |
| | Frequency [Hz] | 0~400Hz (IM sensorless: 0~120Hz) | | | | | | | | |
| Voltage [V] | 3-Phase 200~240V | | | | | | | | | |
| Input Rating | Voltage [V] | 3-Phase 200~240VAC (-15%~+10%) | | | | | | | | |
| | Frequency [Hz] | 50~60Hz (±5%) | | | | | | | | |
| | Rated Current [A] | Heavy Duty (HD) | 2.2 | 4.9 | 8.4 | 11.8 | 18.5 | 25.8 | 34.9 | |
| Normal Duty (ND) | | 3.0 | 6.3 | 10.8 | 13.1 | 19.4 | 32.7 | 44.2 | | |
| Weight [kg] | | | 1.04 | 1.06 | 1.36 | 1.4 | 1.89 | 3.08 | 3.21 | |

3-Phase 400V Class (0.4~7.5kW)

| □□□□ G100-4 | | | 0004 | 0008 | 0015 | 0022 | 0040 | 0055 | 0075 | |
|------------------|-----------------------------------|----------------------------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|--|
| Motor Rating | Heavy Duty (HD) | (HP) | 0.5 | 1.0 | 2.0 | 3.0 | 5.4 | 7.5 | 10 | |
| | | (kW) | 0.4 | 0.75 | 1.5 | 2.2 | 4.0 | 5.5 | 7.5 | |
| | Normal Duty (ND) | (HP) | 1.0 | 2.0 | 3.0 | 5.4 | 7.5 | 10 | 15 | |
| | | (kW) | 0.75 | 1.5 | 2.2 | 4.0 | 5.5 | 7.5 | 11 | |
| Output Rating | Capacity [kVA] | Heavy Duty (HD) | 1.0 | 1.9 | 3.0 | 4.2 | 6.5 | 9.1 | 12.2 | |
| | | Normal Duty (ND) | 1.5 | 2.4 | 3.9 | 5.3 | 7.6 | 12.2 | 17.5 | |
| | Rated Current (3-Phase Input) [A] | Heavy Duty (HD) | 1.3 | 2.5 | 4.0 | 5.5 | 9.0 | 12.0 | 16.0 | |
| | | Normal Duty (ND) | 2.0 | 3.1 | 5.1 | 6.9 | 10.0 | 16.0 | 23.0 | |
| | Rated Current (1-Phase Input) [A] | Heavy Duty (HD) | 0.7 | 1.4 | 2.1 | 2.8 | 4.9 | 6.4 | 8.7 | |
| | | Normal Duty (ND) | 1.3 | 1.9 | 2.8 | 3.6 | 5.4 | 8.7 | 12.6 | |
| | Frequency [Hz] | 0~400Hz (IM sensorless: 0~120Hz) | | | | | | | | |
| Voltage [V] | 3-Phase 380~480V | | | | | | | | | |
| Input Rating | Voltage [V] | 3-Phase 380~480VAC (-15%~+10%) | | | | | | | | |
| | Frequency [Hz] | 50~60Hz (±5%) | | | | | | | | |
| | Rated Current [A] | Heavy Duty (HD) | 1.1 | 2.4 | 4.2 | 5.9 | 9.8 | 12.9 | 17.5 | |
| Normal Duty (ND) | | 2.0 | 3.3 | 5.5 | 7.5 | 10.8 | 17.5 | 25.4 | | |
| Weight [kg] | | | 1.02 (1.04) | 1.06 (1.08) | 1.4 (1.44) | 1.42 (1.46) | 1.92 (1.98) | 3.08 (3.24) | 3.12 (3.28) | |

- Maximum applicable capacity is indicated in case of using a 4-pole standard motor
- For the rated capacity, 200 and 400V class input capacities are based on 220 and 440V, respectively.
- The rated output current is limited based on the carrier frequency set at Cn.04.
- The output voltage becomes 20-40 % lower during no-load operations to protect the inverter from the impact of the motor closing and opening (0.4-4.0 kW models only).

Control

| | |
|------------------------------|---|
| Control Method | V/F, Slip Compensation, Sensorless Vector |
| Frequency Setting Resolution | Digital command: 0.01Hz Analog command: 0.06Hz(maximum frequency: 60 Hz) |
| Frequency Accuracy | 1% of the maximum output frequency |
| V/F Pattern | Linear, squared, user V/F |
| Overload Capacity | HD: 150% 1 minute, ND: 120% 1minute |
| Torque Boost | Manual/Automatic torque boost |

Operation

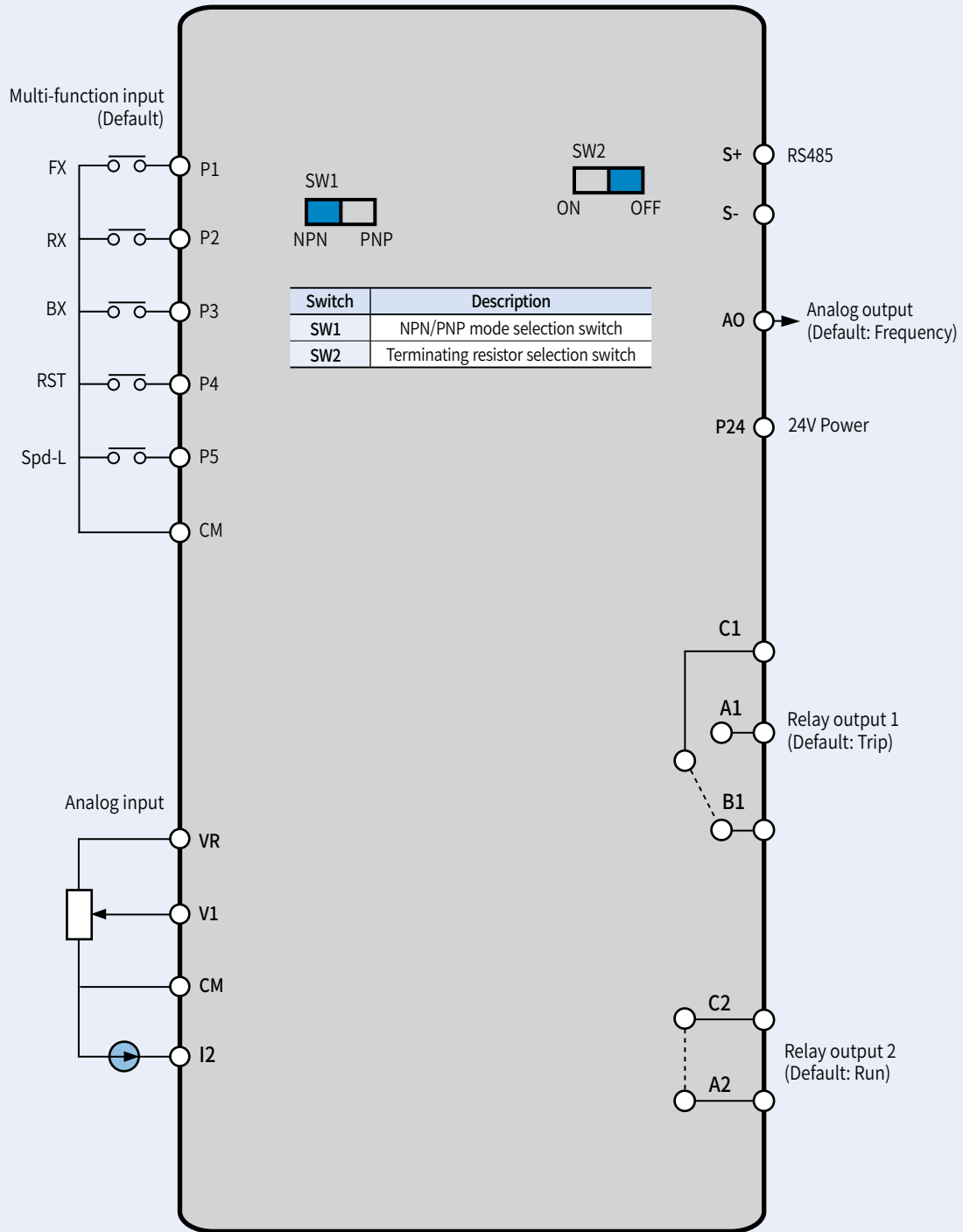
| | | |
|--------------------|---|--|
| Operation Mode | Select key pad, terminal strip, or communication operation | |
| Frequency Setting | Analog: -10~10[V], 0~10[V], 4~20[mA] Digital: Keypad | |
| Operation Function | PID control, 3-wire operation, Frequency limit, Second function, Anti-forward and reverse direction rotation, Commercial transition, Speed search, Power braking, Leakage reduction, Up-down operation, DC braking, Frequency jump, Slip compensation, Automatic restart, Automatic tuning, Energy buffering, Flux braking, Fire mode | |
| Input | Multi-Function Terminal (5 Points) | NPN (Sink) / PNP (Source) Selectable Function: Forward run, Reverse run, Reset, External trip, Emergency stop, Jog operation, Multi-step frequency-high, middle, low, Multi-step acceleration/ deceleration-high, middle, low, DC braking at stop, 2nd motor select, Frequency up/down, 3-wire operation, Change into normal operation during PID operation, Change into main body operation during option operation, Analog command frequency fixing, Acceleration/deceleration stop etc. Selectable |
| | Analog Input | V1: -10~10V, I2 4~20mA |
| Output | Multi-function Relay Terminal | Fault output and drive operation status output (N.O., N.C.) less than AC 250V 1A, less than DC 30V 1A |
| | Analog Output | 0~12Vdc: Frequency, Output current, Output voltage, DC stage voltage etc. selectable |

Protective Function

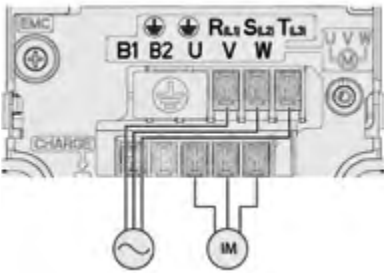
| | | |
|----------------------|---|--|
| Trip | Over current trip, external signal trip, ARM short current fault trip, over heat trip, input imaging trip, ground trip, motor over heat trip, I/O board link trip, no motor trip, parameter writing trip, emergency stop trip, command loss trip, external memory error, CPU watchdog trip, motor light load trip | Over voltage trip, temperature sensor trip, inverter over heat, option trip, output image trip, inverter overload trip, fan trip, pre-PID operation failure external brake trip, low voltage trip during operation, low voltage trip, analog input error, motor overload trip, over torque trip, under torque trip |
| Alarm | Command loss trip warning, overload warning, light load warning, inverter overload warning, fan operation warning, braking resistance braking rate warning, rotor time constant tuning error, inverter pre-overheat warning, over torque warning, under torque warning | |
| Momentary Power Loss | HD below 15ms (ND below 8ms): Continuous operation (To be within rated input voltage, rated output) HD above 15ms (ND above 8ms): Automatic restart operation enable | |

Environment

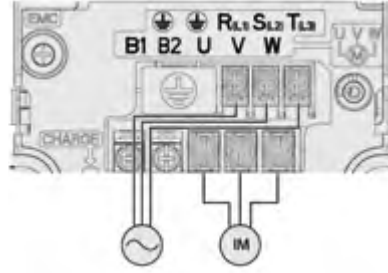
| | |
|---------------------|--|
| Cooling Type | Forced fan cooling structure |
| Protection Degree | IP20/UL Open (Default), UL Enclosed type 1 (Option) |
| Ambient Temperature | Ambient temperature under the condition of no ice or frost. HD: -10~50°C(14~122°F) / ND: -10~40°C(14~104°F) [However, recommended to use load below 80% when using at 50°C under light load] |
| Humidity | Relative humidity below 95% RH (no dew formation) |
| Storage Temperature | -20~65°C(-4~149°F) |
| Location | No corrosive gas, flammable gas, oil mist and dust etc. indoors (Pollution degree 2 environment) |
| Altitude, Vibration | Below 1,000m (From 1000 to 4000m, the rated input voltage and rated output current of the drive must be derated by 1% for every 100m.), below 9.8m/sec ² (1G) |
| Pressure | 70~106kPa |



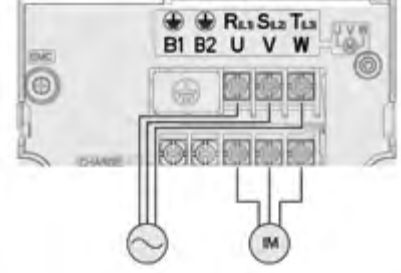
0.4/0.75kW



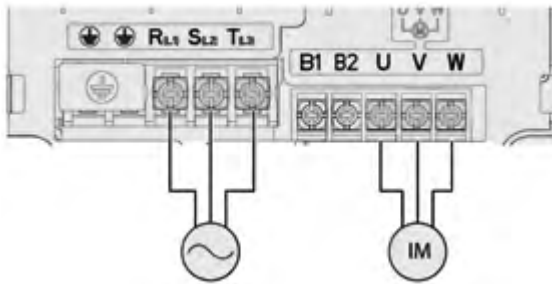
1.5/2.2kW



4kW



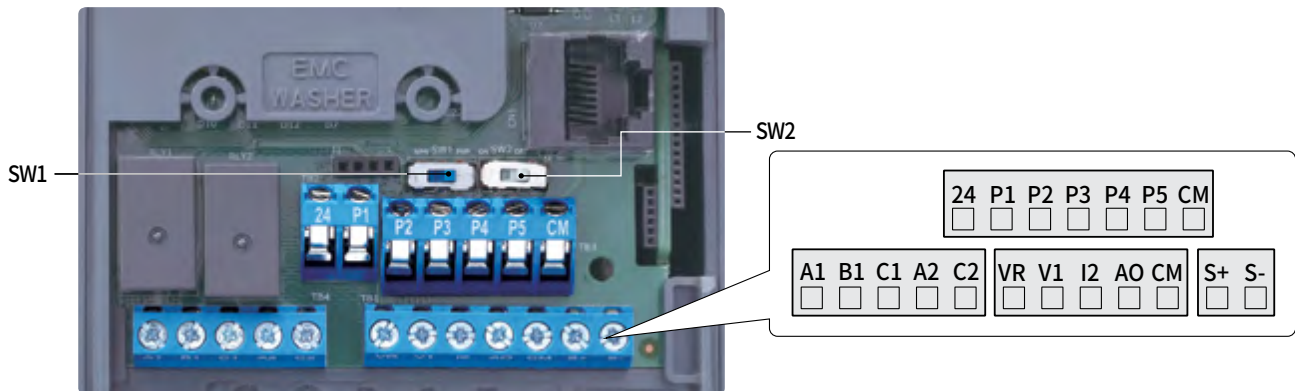
5.5/7.5kW



| Terminal Labels | Name | Description |
|-------------------|--------------------------|---|
| ⊕ | Ground terminal | Connect earth grounding. |
| R(L1)/S(L2)/T(L3) | AC power input terminal | Mains supply AC power connections. |
| B1/B2 | Brake resistor terminals | Brake resistor wiring connection. |
| U/V/W | Motor output terminals | 3-phase induction motor wiring connections. |

| Capacity (kW) | | Terminal Screw Size | Rated Screw Torque (Kgf·cm/Nm) |
|-----------------------|------|---------------------|--------------------------------------|
| 3-Phase 200V Class | 0.4 | R/S/T, U/V/W : M3 | R/S/T, U/V/W : 5.1/0.5 |
| | 0.75 | | |
| | 1.5 | R/S/T, U/V/W : M4 | R/S/T, U/V/W : 12.1/1.2 |
| | 2.2 | | |
| | 4 | R/S/T, U/V/W : M4 | R/S/T : 24.0/2.4 U/V/W : 15.0/1.5 |
| | 5.5 | | |
| 7.5 | | | |
| 3-Phase 400V Class | 0.4 | R/S/T, U/V/W : M3.5 | R/S/T, U/V/W : 10.3/1.0 |
| | 0.75 | | |
| | 1.5 | | |
| | 2.2 | R/S/T, U/V/W : M4 | R/S/T, U/V/W : 18.4/1.8 |
| | 4 | | |
| | 5.5 | R/S/T, U/V/W : M4 | R/S/T : 14.3/1.4 U/V/W : 18.4/1.8 |
| 7.5 | | | |

- Only use the specified torque on the screw heads otherwise damage could occur. Loose screws can cause overheating and damage.
- Use copper wires with 600V, 75°C specification.

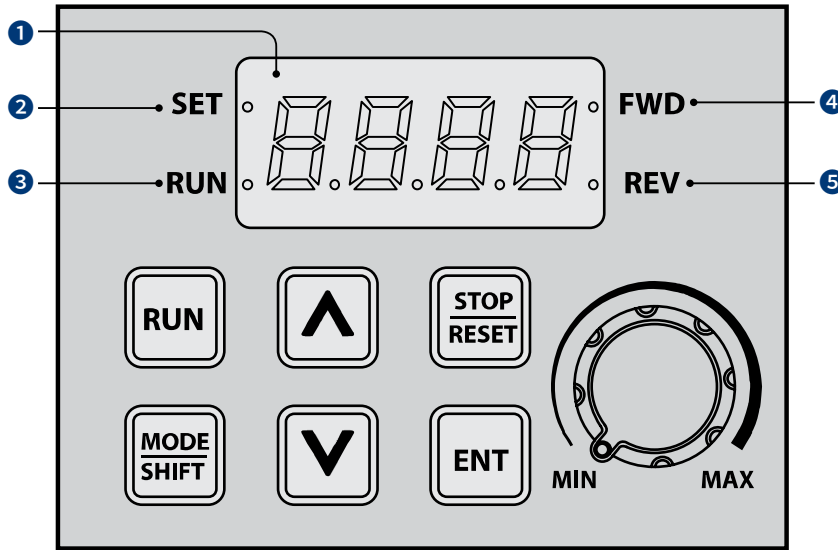


| Terminals | Terminal Screw Size | Screw Torque (Kgf·cm/Nm) |
|-------------------------------|---------------------|--------------------------|
| P1~P5/CM/VR/V1/I2/AO/24/S+/S- | M2 | 2.2~2.5/0.22~0.25 |
| A1/B1/C1, A2/C2 | M2.6 | 4.0/0.4 |

• Only use the specified torque on the screw heads otherwise damage could occur.
Loose screws can cause overheating and damage.

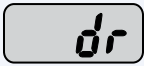


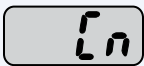
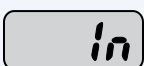

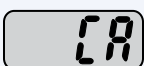

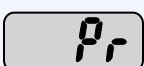

| Category | Terminal Labels | Name | Description |
|---------------------------------------|-----------------|--|---|
| Multi-function Terminal Configuration | P1~P5 | Multi-function Input 1-5 | Configurable for multi-function input terminals. Factory default terminals and setup are as follows. <ul style="list-style-type: none"> • P1: Fx • P2: Rx • P3: BX • P4: RST • P5: Speed-L |
| | CM | Sequence common terminal | Common terminal for analog terminal inputs and outputs. |
| Analog Input | VR | Potentiometer frequency reference input | Used to setup or modify a frequency reference via analog voltage or current input. <ul style="list-style-type: none"> • Maximum voltage output: 12 V • Maximum current output: 100mA • Potentiometer: 1/5 kΩ |
| | V1 | Voltage input for frequency reference input | Used to setup or modify a frequency reference via analog voltage input terminal. <ul style="list-style-type: none"> • Unipolar: 0-10V (12V Max.) • Bipolar: -10-10V (±12V Max.) |
| | I2 | Current input for frequency reference input terminal | Used to setup or modify a frequency reference via current input terminal. <ul style="list-style-type: none"> • Input current: 4-20 mA • Maximum Input current: 24mA • Input resistance: 249 Ω |
| Analog Output | AO | Voltage output terminal | Used to send inverter output information to external devices: Output frequency, output current, output voltage, or a DC voltage. <ul style="list-style-type: none"> • Output voltage: 0-10 V • Maximum output voltage/Current: 12 V, 10 mA • Factory default output: Frequency |
| | 24 | External 24V power source | Maximum current output: 100mA |
| | A1/C1/B1 | Fault signal output 1 | Sends out alarm signals when the inverter's safety features are activated (AC 250V 1A, DC 30V 1A). <ul style="list-style-type: none"> • Fault condition: A1 and C1 contacts are connected (B1 and C1 open connection) • Normal operation: B1 and C1 contacts are connected (A1 and C1 open connection) |
| | A2/C2 | Fault signal output 2 | Sends out alarm signals when the inverter's safety features are activated (AC 250V 1A, DC 30V 1A). <ul style="list-style-type: none"> • Fault condition: A2 and C2 contacts are open connection • Normal operation: A2 and C2 contacts are connected |
| RS-485 Communication | S+/S- | RS-485 signal line | Used to send or receive RS-485 signals. |

Keypad Functions



| No. | Name | Function |
|-----|-------------------|---|
| ① | 7-Segment Display | Displays current operational status and parameter information. |
| ② | SET Indicator | LED flashes during parameter configuration and when the ESC key operates as the multi-function key. |
| ③ | RUN Indicator | LED turns on (Steady) during an operation, and flashes during acceleration or deceleration. |
| ④ | FWD Indicator | LED turns on (Steady) during forward operation. |
| ⑤ | REV Indicator | LED turns on (Steady) during reverse operation. |

| Key | Name | Function |
|-----|------------------|---|
| | [RUN] Key | Used to run the inverter (Inputs a RUN command). |
| | [STOP/RESET] Key | STOP: Stops the inverter. RESET: Resets the inverter if a fault or failure occurs. |
| | [▲] Key, [▼] Key | Switches between codes, or increases or decreases parameter values. |
| | [MODE/SHIFT] Key | Moves between groups or moves to the digit on the left when setting the parameter. Press the MODE/SHIFT key once again on the maximum number of digits to move to the minimum number of digits. |
| | [ENTER] Key | Switches from the selected state of parameter to the input state. Edits parameter and apply change. Accesses the operation information screen during failure on the failure screen. |
| | [ESC] | ESC to the initial display. |
| | [VOLUME] | Used to set the operation frequency. |

| Group | Keypad Display | Description |
|---------------------------------|---|--|
| Operation | - | Configures basic parameters for inverter operation. |
| Drive |  | Configures parameters for basic operations. These include jog operation, motor capacity evaluation, torque boost, and other keypad related parameters. |
| Basic |  | Configures basic operation parameters. These parameters include motor parameters and multi-step frequency parameters. |
| Advanced |  | Configures acceleration or deceleration patterns, frequency limits, etc. |
| Control |  | Configures sensorless vector-related features. |
| Input Terminal |  | Configures input terminal-related features, including digital multi-functional inputs and analog inputs. |
| Output Terminal |  | Configures output terminal-related features such as relays and analog outputs. |
| Communication |  | Configures communication features for RS-485 or other communication options. |
| Application |  | Configures functions related to PID control. |
| Protection |  | Configures motor and inverter protection features |
| Motor 2 (Secondary Motor) |  | Configures secondary motor related features. The secondary motor (M2) group appears on the keypad only when one of the multi-function input terminals (In.65–In.69) has been set to 26 (Secondary motor). |

Group & Code selection

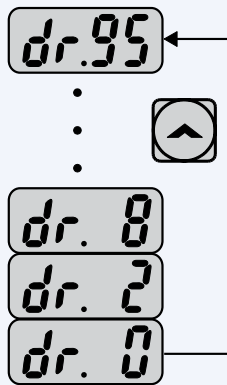
| Step | Instruction | Keypad Display |
|------|--|----------------|
| 1 | Move to the group you want using the [MODE] keys. Press the [MODE] key for longer than 1 second to move in the opposite direction. | |
| 2 | Move up and down through the codes using the [▲] and [▼] keys until you locate the code that you require. | |
| 3 | Press the [ENT] key to save the change. | - |

When moving up and down through the codes using the [▲] and [▼] keys in each group, there are cases where the code number does not increase or decrease. This is because the number was left blank in the inverter program by expecting additional features or the program was set up to not display the unused features.

Navigating Directly to Different Codes




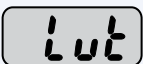
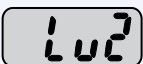



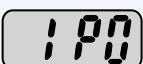






The following example details navigating to code dr. 95, from the initial code in the drive group (dr. 0). This example applies to all groups whenever you would like to navigate to a specific code number.

| Step | Instruction | Keypad Display |
|------|--|----------------|
| 1 | Ensure that you are currently at the first code of the drive group (dr.0). | |
| 2 | Press the [ENT] key. Number "9" will flash. | |
| 3 | Press the [▼] key and change the ones' place of the code "95" to "5." | |
| 4 | Press the [MODE] to move to the tens' place. The cursor will move to the left and "05" will be displayed. At this time, the number "0" will be flashing. | |
| 5 | Press the [▲] key to change the tens' place number from "0" to "9," so the designated code is "95." | |
| 6 | Press the [ENT] key. Code dr.95 is displayed. | |



Fault Trips

Protection functions for output current and input voltage

| Keypad Display | Name | Type | Description |
|---|---------------------|-------|--|
|  | Over Load | Latch | Displayed when the motor overload trip is activated and the actual load level exceeds the set level. Operates when Pr.20 is set to a value other than 0. |
|  | Under Load | Latch | Displayed when the motor underload trip is activated and the actual load level is less than the set level. Operates when Pr.27 is set to a value other than 0. |
|  | Over Current 1 | Latch | Displayed when inverter output current exceeds 200% of the rated current. |
|  | Over Voltage | Latch | Displayed when internal DC circuit voltage exceeds the specified value. |
|  | Low Voltage | Level | Displayed when internal DC circuit voltage is less than the specified value. |
|  | Low Voltage 2 | Latch | Displayed when internal DC circuit voltage is less than the specified value during inverter operation. Operates when Pr.82 is set to 1. |
|  | Ground Trip* | Latch | Displayed when a ground fault trip occurs on the output side of the inverter and causes the current to exceed the specified value. The specified value varies depending on inverter capacity. |
|  | E-Thermal | Latch | Displayed based on inverse time-limit thermal characteristics to prevent motor overheating. Operates when Pr.40 is set to a value other than 0. |
|  | Out Phase Open | Latch | Displayed when a 3-phase inverter output has one or more phases in an open circuit condition. Operates when bit 1 of Pr.05 is set to 1. |
|  | In Phase Open | Latch | Displayed when a 3-phase inverter input has one or more phases in an open circuit condition. Operates only when bit 2 of Pr.05 is set to 1. |
|  | Inverter OLT | Latch | Displayed when the inverter has been protected from overload and resultant overheating, based on inverse time-limit thermal characteristics. Allowable overload rates for the inverter are 150% for 1 min and 200% for 4 sec. Protection is based on inverter rated capacity, and may vary depending on the device's capacity. |
|  | No Motor Trip | Latch | Displayed when the motor is not connected during inverter operation. Operates when Pr.31 is set to 1. |
|  | Relay Open Trip | Latch | Occurs when the DC voltage relay is not operating when power the is input. The Pr-90 code must be set to 1 to operate. |
|  | Over Torque Trip 1 | Latch | Occurs when the output current is higher than the level set in Ou-68. Operates when OU-67 is set to 3, 4. |
|  | Over Torque Trip 2 | Latch | Occurs when the output current is higher than the level set in OU-71. Operates when OU-70 is set to 3, 4. |
|  | Under Torque Trip 1 | Latch | Occurs when the output current is lower than the level set in OU-68. Operates when OU-67 is set to 7, 8. |
|  | Under Torque Trip 2 | Latch | Occurs when the output current is lower than the level set in OU-71. Operates when OU-70 is set to 7, 8. |

* Ground Trip (GFT) feature is not provided in the products under 4.0 kW. Over current trip (OCT) or over voltage trip (OVT) may occur during low resistance grounding.

Fault Trips




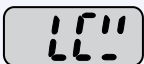
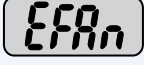
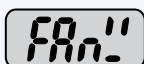
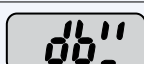
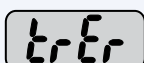

Protection functions using abnormal internal circuit conditions and external signals

| Keypad Display | Name | Type | Description |
|----------------|--------------------|-------|---|
| | Over Heat | Latch | Displayed when the temperature of the inverter heat sink exceeds the specified value. |
| | Over Current 2 | Latch | Displayed when the DC circuit in the inverter detects a specified level of excessive, short circuit current. |
| | External Trip | Latch | Displayed when an external fault signal is provided by the multi-function terminal. Set one of the multi-function input terminals at In.65-69 to 4 (External trip) to enable external trip. |
| | BX | Level | Displayed when the inverter output is blocked by a signal provided from the multi-function terminal. Set one of the multi-function input terminals at In. 65-69 to 5 (BX) to enable input block function. |
| | H/W-Diag | Fatal | Displayed when an error is detected in the memory (EEPROM), analog-digital converter output (ADC Off Set), or CPU watchdog (Watch Dog-1, Watch Dog-2). • EEP Err: An error in reading/Writing parameters due to keypad or memory (EEPROM) fault. • ADC Off Set: An error in the current sensing circuit (U/V/W terminal, current sensor, etc.). |
| | NTC Open | Latch | Displayed when an error is detected in the temperature sensor of the insulated Gate Bipolar Transistor (IGBT). |
| | Fan Trip | Latch | Displayed when an error is detected in the cooling fan. Set Pr.79 to 0 to activate fan trip (for models below 22kW capacity). |
| | Pre-PID Fail | Latch | Displayed when pre-PID is operating with functions set at AP.34–AP.36. A fault trip occurs when a controlled variable (PID feedback) is measured below the set value and the low feedback continues, as it is treated as a load fault. |
| | Ext-Brake | Latch | Operates when the external brake signal is provided by the multi-function terminal. Occurs when the inverter output starting current remains below the set value at Ad.41. Set either OU.31 or OU.32 to 35 (BR Control). |
| | Overheat Pre Alarm | Latch | When the user has set Pr-78 to 2: Free-Run or 3: Dec, pre-overheating warning trip of inverter occurs if the inverter temperature exceeds the temperature set by the user in Pr-77. |

Protection functions for communication options

| Keypad Display | Name | Type | Description |
|----------------|----------------|-------|---|
| | Lost Command | Level | Displayed when a frequency or operation command error is detected during inverter operation by controllers other than the keypad (e.g., using a terminal block and a communication mode). Operates when Pr.12 is set to a value other than 0. |
| | IO Board Trip | Latch | Displayed when the I/O board or external communication card is not connected to the inverter or there is a bad connection. |
| | | | Displayed when the error code continues for more than 5 sec. (‘Errc’ -> ‘-rrc’ -> ‘-Er-c’ -> ‘-Er-c’ -> ‘-Err-’ -> ‘-rc’ -> ‘-Er-’ -> ‘-r-c’ -> ‘-r-c’ -> ‘-Errc’ -> ...) |
| | Option Trip -1 | Latch | Displayed when a communication error is detected between the inverter and the communication board. Occurs when the communication option card is installed. |

Warning Messages

| Keypad Display | Name | Description |
|---|--------------------|--|
|  | Over Load | Displayed when the motor is overloaded. Operates when Pr.17 is set to 1. To operate, select 5. Set the digital output terminal or relay (OU.31 or OU.33) to 5 (Over load) to receive overload warning output signals. |
|  | Under Load | Displayed when the motor is underloaded. Operates when Pr.25 is set to 1. Set the digital output terminal or relay (OU.31 or OU.33) to 7 (Under load) to receive underload warning output signals. |
|  | INV Over Load | Displayed when the overload time equivalent to 60 % of the inverter overheat protection (inverter IOLT) level, is accumulated. Set the digital output terminal or relay (OU.31 or OU.33) to 6 (IOL) to receive inverter overload warning output signals. |
|  | Lost Command | Lost command warning alarm occurs even with Pr.12 set to 0. The warning alarm occurs based on the condition set at Pr.13- 15. Set the digital output terminal or relay (OU.31 or OU.33) to 13 (Lost command) to receive lost command warning output signals. If the communication settings and status are not suitable for P2P, a lost command alarm occurs. |
|  | Fan Exchange | An alarm occurs when the value set at PRT-86 is less than the value set at PRT-87. To receive fan exchange output signals, set the digital output terminal or relay (OUT-31 or OUT-33) to 38 (Fan exchange). |
|  | Fan Warning | Displayed when an error is detected from the cooling fan while Pr.79 is set to 1. Set the digital output terminal or relay (OU.31 or OU.33) to 8 (Fan warning) to receive fan warning output signals. |
|  | DB Warn %ED | Displayed when the DB resistor usage rate exceeds the set value. Set the detection level at Pr.66. |
|  | Retry Tr Tune | Operates when dr.9 is set to 4. The warning alarm occurs when the motor's rotor time constant (Tr) is either too low or too high. |
|  | Overheat Pre Alarm | When the user has set Pr-78 to 1: Warning, pre-overheating warning of inverter occurs if the inverter temperature exceeds the temperature set by the user in Pr-77. |

| Code | Comm. Address | Name | Keypad Display | Setting Range | | Initial Value | Property* | V/F | SL |
|------|---------------|------------------------------|----------------|-----------------------------|-----------------------------|---------------|-----------|-----|----|
| - | 0h1D00 | Target frequency | 0.00 | 0-Maximum frequency(Hz) | | 0.00 | 0 | 0 | 0 |
| - | 0h1D01 | Acceleration time | ACC | 0.0-600.0(s) | | 5.0 | 0 | 0 | 0 |
| - | 0h1D02 | Deceleration time | dEC | 0.0-600.0(s) | | 10.0 | 0 | 0 | 0 |
| - | 0h1D03 | Command source | drv | 0 | Keypad | 1: Fx / Rx-1 | X | 0 | 0 |
| | | | | 1 | Fx / Rx-1 | | | | |
| | | | | 2 | Fx / Rx-2 | | | | |
| | | | | 3 | Int 485 | | | | |
| | | | | 4 | Fieldbus ¹⁾ | | | | |
| - | 0h1D04 | Frequency reference source | Frq | 0 | Keypad-1 | 0: Keypad-1 | X | 0 | 0 |
| | | | | 1 | Keypad-2 | | | | |
| | | | | 2 | V1 | | | | |
| | | | | 4 | V0 (Built-in volume) | | | | |
| | | | | 5 | I2 | | | | |
| | | | | 6 | Int 485 | | | | |
| | | | | 8 | Fiedbus ¹⁾ | | | | |
| - | 0h1D05 | Multi-step speed frequency 1 | St1 | 0.00-Maximum frequency (Hz) | | 10.00 | 0 | 0 | 0 |
| - | 0h1D06 | Multi-step speed frequency 2 | St2 | 0.00-Maximum frequency (Hz) | | 20.00 | 0 | 0 | 0 |
| - | 0h1D07 | Multi-step speed frequency 3 | St3 | 0.00-Maximum frequency (Hz) | | 30.00 | 0 | 0 | 0 |
| - | 0h1D08 | Output current | CUr | | | - | - | 0 | 0 |
| - | 0h1D09 | Motor revolutions per minute | Rpm | | | | - | 0 | 0 |
| - | 0h1D0A | Inverter DC voltage | dCL | - | | - | - | 0 | 0 |
| - | 0h1D0B | Inverter output voltage | vOL | | | | - | 0 | 0 |
| - | 0h1D0C | Out of order signal | nOn | | | | - | 0 | 0 |
| - | 0h1D0D | Select rotation direction | drC | F | Forward direction operation | F | 0 | 0 | 0 |
| | | | | r | Reverse run | | | | |

* SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

¹⁾ Table of options are provided separately in the option manual.

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|---------------------|----------------------|-------------------------------------|---|------------------------------|------------------------|-----|----|
| dr-00 | - | Jump code | 1-99 | 9 | O | O | O |
| dr-09 | 0h1109 | Control mode | 0 | V / F | 0: V / F | X | O |
| | | | 2 | Slip compen | | | |
| | | | 4 | IM sensorless | | | |
| dr-11 | 0h110B | Jog frequency | 0.00, Start frequency-Maximum frequency(Hz) | 10.00 | O | O | O |
| dr-12 | 0h110C | Jog run acceleration time | 0.0-600.0(s) | 20.0 | O | O | O |
| dr-13 | 0h110D | Jog run deceleration time | 0.0-600.0(s) | 30.0 | O | O | O |
| dr-14 | 0h110E | Motor capacity | 0: 0.2kW 1: 0.4kW 2: 0.75kW 3: 1.1kW 4: 1.5kW 5: 2.2kW 6: 3.0kW 7: 3.7kW 8: 4.0kW 9: 5.5kW 10: 7.5kW 11:11.0kW | Varies by motor capacity | X | O | O |
| dr-15 | 0h110F | Torque boost mode | 0 | Manual | 0: Manual | X | O |
| | | | 1 | Auto | | | |
| dr-16 | 0h1110 | Forward torque boost | 0.0-15.0(%) | 2.0 | X | O | X |
| dr-17 | 0h1111 | Reverse torque boost | 0.0-15.0(%) | 2.0 | X | O | X |
| dr-18 | 0h1112 | Base frequency | 30.00-400.00(Hz) [V / F, Slip compen] 40.00-120.00(Hz) [IM sensorless] | 60.00 | X | O | O |
| dr-19 | 0h1113 | Start frequency | 0.01-10.00(Hz) | 0.50 | X | O | O |
| dr-20 | 0h1114 | Maximum frequency | 40.00-400.00(Hz) [V / F, Slip compen] 40.00-120.00(Hz) [IM sensorless] | 60.00 | X | O | O |
| dr-26 ²⁾ | 0h111A | Auto torque boost filter gain | 1~1000 | 2 | O | O | X |
| dr-27 ²⁾ | 0h111B | Auto torque boost motoring gain | 0.0-300.0[%] | 50.0 | O | O | X |
| dr-28 ²⁾ | 0h111C | Auto torque boost regeneration gain | 0.0-300.0[%] | 50.0 | O | O | X |
| dr-80 | 0h1150 | Select ranges at power input | Select ranges inverter displays at power input | | 0: Operation frequency | O | O |
| | | | 0 | Operation frequency | | | |
| | | | 1 | Acceleration time | | | |
| | | | 2 | Deceleration time | | | |
| | | | 3 | Command source | | | |
| | | | 4 | Frequency reference source | | | |
| | | | 5 | Multi-step speed frequency 1 | | | |
| | | | 6 | Multi-step speed frequency 2 | | | |
| | | | 7 | Multi-step speed frequency 3 | | | |
| | | | 8 | Output current | | | |
| | | | 9 | Motor RPM | | | |
| | | | 10 | Inverter DC voltage | | | |
| | | | 11 | User select signal (dr.81) | | | |
| | | | 12 | Currently out of order | | | |
| 13 | Select run direction | | | | | | |

* SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

²⁾ Appears when Dr15 is 1 (automatic torque boost).

| Code | Comm. Address | Name | Setting Range | | Initial Value | Property* | V/F | SL |
|-------|---------------|-----------------------------------|-----------------------------|-----------------------------|------------------------|-----------|-----|----|
| dr-80 | 0h1150 | Select ranges at power input | 14 | Output current 2 | 0: Operation frequency | - | - | - |
| | | | 15 | Motor RPM 2 | | | | |
| | | | 16 | Inverter DC voltage 2 | | | | |
| | | | 17 | User select signal 2(dr.81) | | | | |
| dr-81 | 0h1151 | Select monitor code | Monitors user selected code | | 0: Output voltage | 0 | 0 | 0 |
| | | | 0 | Output voltage(V) | | | | |
| | | | 1 | Output power(kW) | | | | |
| | | | 2 | Torque(kgf·m) | | | | |
| dr-89 | 0h03E3 | Display changed parameter display | 0 | View all | 0: View All | 0 | 0 | 0 |
| | | | 1 | View changed | | | | |
| dr-91 | 0h115B | Smart copy | 0 | None | 0: None | X | 0 | 0 |
| | | | 1 | Smartdownload | | | | |
| | | | 3 | Smartupload | | | | |
| | | | 4 | Remoteupload | | | | |
| | | | 5 | Remotedownload | | | | |
| dr-92 | 0h115C | Parameter save | 0 | None | 0: None | X | 0 | 0 |
| | | | 1 | Parameter save | | | | |
| dr-93 | 0h115D | Parameter initialization | 0 | No | 0: No | X | 0 | 0 |
| | | | 1 | All grp | | | | |
| | | | 2 | dr grp | | | | |
| | | | 3 | bA grp | | | | |
| | | | 4 | Ad grp | | | | |
| | | | 5 | Cn grp | | | | |
| | | | 6 | In grp | | | | |
| | | | 7 | OU grp | | | | |
| | | | 8 | CM grp | | | | |
| | | | 9 | AP grp | | | | |
| | | | 11 | AO grp | | | | |
| | | | 12 | Pr grp | | | | |
| | | | 13 | M2 grp | | | | |
| | | | 14 | run grp | | | | |
| dr-94 | 0h115E | Password registration | 0~9999 | | | 0 | 0 | 0 |
| dr-95 | 0h115F | Parameter lock settings | 0~9999 | | | 0 | 0 | 0 |
| dr-97 | 0h1161 | Software version | | | | - | 0 | 0 |
| dr-98 | 0h1162 | Display I / O board version | | | | - | 0 | 0 |

* SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|---------------------|---------------|------------------------------------|-----------------|----------------------------|--------------|-----|----|---|
| bA-00 | - | Jump code | 1~99 | 20 | O | O | O | |
| bA-01 | 0h1201 | Auxiliary reference source | 0 | None | 0: None | X | O | O |
| | | | 1 | V1 | | | | |
| | | | 3 | V0 | | | | |
| | | | 4 | I2 | | | | |
| bA-02 ³⁾ | 0h1202 | Auxiliary command calculation type | 0 | M+(G*A) | 0: M+(GA) | X | O | O |
| | | | 1 | Mx (G*A) | | | | |
| | | | 2 | M / (G*A) | | | | |
| | | | 3 | M+[M*(G*A)] | | | | |
| | | | 4 | M+G*2(A-50%) | | | | |
| | | | 5 | Mx[G*2(A-50%) | | | | |
| | | | 6 | M / [G*2(A-50%)] | | | | |
| | | | 7 | M+M*G*2(A-50%) | | | | |
| bA-03 ³⁾ | 0h1203 | Auxiliary frequency reference gain | -200.0~200.0(%) | 100.0 | O | O | O | |
| bA-04 | 0h1204 | 2nd command source | 0 | Keypad | 1: Fx / Rx-1 | X | O | O |
| | | | 1 | Fx / Rx-1 | | | | |
| | | | 2 | Fx / Rx-2 | | | | |
| | | | 3 | Int 485 | | | | |
| | | | 4 | FieldBus ⁴⁾ | | | | |
| bA-05 | 0h1205 | 2nd frequency source | 0 | Keypad-1 | 0: Keypad-1 | O | O | O |
| | | | 1 | Keypad-2 | | | | |
| | | | 2 | V1 | | | | |
| | | | 4 | V0 | | | | |
| | | | 5 | I2 | | | | |
| | | | 6 | Int 485 | | | | |
| | | | 8 | FieldBus ⁴⁾ | | | | |
| bA-07 | 0h1207 | V / F pattern | 0 | Linear | 0: Linear | X | O | X |
| | | | 1 | Square | | | | |
| | | | 2 | User V / F | | | | |
| | | | 3 | Square 2 | | | | |
| bA-08 | 0h1208 | Acc / Dec reference | 0 | Max freq | 0: Max freq | X | O | O |
| | | | 1 | Delta freq | | | | |
| bA-09 | 0h1209 | Time scale setting | 0 | 0.01 sec | 1: 0.1 sec | X | O | O |
| | | | 1 | 0.1 sec | | | | |
| | | | 2 | 1 sec | | | | |
| bA-10 | 0h120A | input power frequency | 0 | 60Hz | 0: 60Hz | X | O | O |
| | | | 1 | 50Hz | | | | |
| bA-11 | 0h120B | Number of motor poles | 2~48 | Dependent on motor setting | X | O | O | |
| bA-12 | 0h120C | Rated slip speed | 0~3000(Rpm) | | X | O | O | |
| bA-13 | 0h120D | Motor rated current | 1.0~1000.0(A) | | X | O | O | |
| bA-14 | 0h120E | Motor noload current | 0.0~1000.0(A) | | X | O | O | |
| bA-15 | 0h120F | Motor rated voltage | 0, 100~480(V) | | 0 | X | O | O |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

³⁾ Displayed if bA.01 is not set to 0 (None).

⁴⁾ Table of options are provided separately in the option manual.

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|---------------------|---------------|--------------------------------|----------------------------|----------------------------|-----------|-----|----|---|
| bA-16 | 0h1210 | Motor efficiency | 64~100(%) | Dependent on motor setting | X | O | O | |
| bA-17 | 0h1211 | Load inertia rate | 0~8 | 0 | X | O | O | |
| bA-18 | 0h1212 | Trim power display | 70~130(%) | 100% | O | O | O | |
| bA-19 | 0h1213 | Input power voltage | 170~480V | 220 / 380V | O | O | O | |
| bA-20 | - | Auto tuning | 0 | None | 0: None | X | X | O |
| | | | 1 | All(Rotation type) | | | | |
| | | | 2 | All(Static type) | | | | |
| | | | 3 | Rs+Lsigma(Rotation type) | | | | |
| | | | 6 | Tr(Static type) | | | | |
| bA-21 | - | Stator resistance | Dependent on motor setting | Dependent on motor setting | X | X | O | |
| bA-22 | - | Leakage inductance | | | X | X | O | |
| bA-23 | - | Stator inductance | | | X | X | O | |
| bA-24 ⁵⁾ | - | Rotor time constant | 25~5000(ms) | - | X | X | O | |
| bA-41 ⁶⁾ | 0h1229 | User frequency 1 | 0.00-Maximum frequency(Hz) | 15.00 | X | O | X | |
| bA-42 ⁶⁾ | 0h122A | User voltage 1 | 0~100(%) | 25 | X | O | X | |
| bA-43 ⁶⁾ | 0h122B | User frequency 2 | 0.00-Maximum frequency(Hz) | 30.00 | X | O | X | |
| bA-44 ⁶⁾ | 0h122C | User voltage 2 | 0~100(%) | 50 | X | O | X | |
| bA-45 ⁶⁾ | 0h122D | User frequency 3 | 0.00-Maximum frequency(Hz) | 45.00 | X | O | X | |
| bA-46 ⁶⁾ | 0h122E | User voltage 3 | 0~100(%) | 75 | X | O | X | |
| bA-47 ⁶⁾ | 0h122F | User frequency 4 | 0.00-Maximum frequency(Hz) | Maximum frequency | X | O | X | |
| bA-48 ⁶⁾ | 0h1230 | User voltage 4 | 0~100(%) | 100 | X | O | X | |
| bA-53 ⁷⁾ | 0h1235 | Multi-step speed frequency 4 | 0.00-Maximum frequency(Hz) | 40.00 | O | O | O | |
| bA-54 ⁷⁾ | 0h1236 | Multi-step speed frequency 5 | 0.00-Maximum frequency(Hz) | 50.00 | O | O | O | |
| bA-55 ⁷⁾ | 0h1237 | Multi-step speed frequency 6 | 0.00-Maximum frequency(Hz) | Maximum frequency | O | O | O | |
| bA-56 ⁷⁾ | 0h1238 | Multi-step speed frequency 7 | 0.00-Maximum frequency(Hz) | Maximum frequency | O | O | O | |
| bA-70 | 0h1246 | Multi-step acceleration time 1 | 0.0~600.0(s) | 20.0 | O | O | O | |
| bA-71 | 0h1247 | Multi-step deceleration time 1 | 0.0~600.0(s) | 20.0 | O | O | O | |
| bA-72 ⁸⁾ | 0h1248 | Multi-step acceleration time 2 | 0.0~600.0(s) | 30.0 | O | O | O | |
| bA-73 ⁸⁾ | 0h1249 | Multi-step deceleration time 2 | 0.0~600.0(s) | 30.0 | O | O | O | |
| bA-74 ⁸⁾ | 0h124A | Multi-step acceleration time 3 | 0.0~600.0(s) | 40.0 | O | O | O | |
| bA-75 ⁸⁾ | 0h124B | Multi-step deceleration time 3 | 0.0~600.0(s) | 40.0 | O | O | O | |
| bA-76 ⁸⁾ | 0h124C | Multi-step acceleration time 4 | 0.0~600.0(s) | 50.0 | O | O | O | |
| bA-77 ⁸⁾ | 0h124D | Multi-step deceleration time 4 | 0.0~600.0(s) | 50.0 | O | O | O | |
| bA-78 ⁸⁾ | 0h124E | Multi-step acceleration time 5 | 0.0~600.0(s) | 40.0 | O | O | O | |
| bA-79 ⁸⁾ | 0h124F | Multi-step deceleration time 5 | 0.0~600.0(s) | 40.0 | O | O | O | |
| bA-80 ⁸⁾ | 0h1250 | Multi-step acceleration time 6 | 0.0~600.0(s) | 30.0 | O | O | O | |
| bA-81 ⁸⁾ | 0h1251 | Multi-step deceleration time 6 | 0.0~600.0(s) | 30.0 | O | O | O | |
| bA-82 ⁸⁾ | 0h1252 | Multi-step acceleration time 7 | 0.0~600.0(s) | 20.0 | O | O | O | |
| bA-83 ⁸⁾ | 0h1253 | Multi-step deceleration time 7 | 0.0~600.0(s) | 20.0 | O | O | O | |

* In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

⁵⁾ Displayed when dr.09 is set to 4(IM sensorless).

⁶⁾ Displayed if either bA.07 or M2.25 is set to 2 (User V / F).

⁷⁾ Displayed if one of In.65-71 is set to speed-L / M / H.

⁸⁾ Displayed one of In.65-71 is set to Xcel-L / M / H.

Expanded Function Group (PAR → Ad)

General Drive

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|----------------------|---------------|---|--|-------------------|-----------|-----|----|
| Ad-00 | - | Jump code | 1~99 | 24 | O | O | O |
| Ad-01 | 0h1301 | Acceleration pattern | 0 Linear | 0: Linear | X | O | O |
| Ad-02 | 0h1302 | Deceleration pattern | 1 S-curve | | X | O | O |
| Ad-03 ⁹⁾ | 0h1303 | S-curve acceleration start point gradient | 1~100(%) | 40 | X | O | O |
| Ad-04 ⁹⁾ | 0h 1304 | S-curve acceleration end point gradient | 1~100(%) | 40 | X | O | O |
| Ad-05 ¹⁰⁾ | 0h1305 | S-curve deceleration start point gradient | 1~100(%) | 40 | X | O | O |
| Ad-06 ¹⁰⁾ | 0h1306 | S-curve deceleration end point gradient | 1~100(%) | 40 | X | O | O |
| Ad-07 | 0h1307 | Start mode | 0 Acc | 0: Acc | X | O | O |
| | | | 1 Dc-start | | | | |
| Ad-08 | 0h1308 | Stop mode | 0 Dec | 0: Dec | X | O | O |
| | | | 1 Dc-brake | | | | |
| | | | 2 Free-run | | | | |
| | | | 4 Power braking | | | | |
| Ad-09 | 0h1309 | Run prevention options | 0 None | 0: None | X | O | O |
| | | | 1 Forward prev | | | | |
| | | | 2 Reverse prev | | | | |
| Ad-10 | 0h130A | Starting with power on | 0 No | 0: No | O | O | O |
| | | | 1 Yes | | | | |
| Ad-12 ¹¹⁾ | 0h130C | Start DC braking time | 0.00~60.00(s) | 0.00 | X | O | X |
| Ad-13 | 0h130D | Amount of applied DC | 0-inverter rated current(%) | 50 | X | O | X |
| Ad-14 ¹²⁾ | 0h130E | Output blocking time before DC braking | 0.00~60.00(s) | 0.10 | X | O | O |
| Ad-15 ¹²⁾ | 0h130F | DC braking time | 0.00~60.00(s) | 1.00 | X | O | O |
| Ad-16 ¹²⁾ | 0h1310 | DC braking rate | 0 - inverter rated current / motor rated current x 100 (%) | 50 | X | O | O |
| Ad-17 ¹²⁾ | 0h1311 | DC braking frequency | Start frequency-60Hz | 5.00 | X | O | O |
| Ad-20 | 0h1314 | Dwell frequency on acceleration | Start frequency-maximum frequency(Hz) | 5.00 | X | O | O |
| Ad-21 | 0h1315 | Dwell operation time on acceleration | 0.0~60.0(s) | 0.0 | X | O | O |
| Ad-22 | 0h1316 | Dwell frequency during deceleration | Start frequency-maximum frequency(Hz) | 5.00 | X | O | O |
| Ad-23 | 0h1317 | Operation time during deceleration | 0.0~60.0(s) | 0.0 | X | O | O |
| Ad-24 | 0h1318 | Frequency limit | 0 No | 0: No | X | O | O |
| | | | 1 Yes | | | | |
| Ad-25 ¹³⁾ | 0h1319 | Frequency lower limit value | 0.00-Upper limit frequency(Hz) | 0.50 | O | O | O |
| Ad-26 ¹³⁾ | 0h131A | Frequency upper limit value | Lower limit frequency-maximum frequency(Hz) | Maximum frequency | X | O | O |
| Ad-27 | 0h131B | Frequency jump | 0 No | 0: No | X | O | O |
| | | | 1 Yes | | | | |
| Ad-28 ¹⁴⁾ | 0h131C | Jump frequency lower limit 1 | 0.00-Jump frequency upper limit1(Hz) | 10.00 | O | O | O |
| Ad-29 ¹⁴⁾ | 0h131D | Jump frequency upper limit 1 | Jump frequency lower limit1-maximum frequency(Hz) | 15.00 | O | O | O |
| Ad-30 ¹⁴⁾ | 0h131E | Jump frequency lower limit 2 | 00-Jump frequency upper limit2(Hz) | 20.00 | O | O | O |
| Ad-31 ¹⁴⁾ | 0h131F | Jump frequency upper limit 2 | Jump frequency lower limit2-maximum frequency(Hz) | 25.00 | O | O | O |

* In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

⁹⁾ Displayed when Ad. 01 is set to 1 (S-curve).

¹⁰⁾ Displayed when the Ad. 02 code is set to 1 (S-curve).

¹¹⁾ Displayed when Ad. 07 is set to 1 (DC-start).

¹²⁾ Displayed when Ad. 08 is set to 1 (DC-brake).

¹³⁾ Displayed when the Ad.24 code is set to 1 (Yes).

¹⁴⁾ Displayed when the Ad.27 code is set to 1 (Yes).

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|----------------------|---------------|---|---|---------------|------------------|-----|----|---|
| Ad-32 ¹⁴⁾ | 0h1320 | Jump frequency lower limit 3 | 0.00-Jump frequency upper limit3(Hz) | 30.00 | O | O | O | |
| Ad-33 ¹⁴⁾ | 0h1321 | Jump frequency upper limit 3 | Jump frequency lower limit3-maximum frequency(Hz) | 35.00 | O | O | O | |
| Ad-41 ¹⁵⁾ | 0h1329 | Brake release current | 0.0-180.0(%) | 50.0 | O | O | O | |
| Ad-42 ¹⁵⁾ | 0h132A | Brake release delay time | 0.00-10.00(s) | 1.00 | X | O | O | |
| Ad-44 ¹⁵⁾ | 0h132C | Brake release forward frequency | 0.00-Maximum frequency(Hz) | 1.00 | X | O | O | |
| Ad-45 ¹⁵⁾ | 0h132D | Brake release reverse frequency | 0.00-Maximum frequency(Hz) | 1.00 | X | O | O | |
| Ad-46 ¹⁵⁾ | 0h132E | Brake engage delay time | 0.00-10.00(s) | 1.00 | X | O | O | |
| Ad-47 ¹⁵⁾ | 0h132F | Brake engage frequency | 0.00-Maximum frequency(Hz) | 2.00 | X | O | O | |
| Ad-50 | 0h1332 | Energy saving operation | 0 | None | 0: None | X | O | X |
| | | | 1 | Manual | | | | |
| | | | 2 | Auto | | | | |
| Ad-51 ¹⁶⁾ | 0h1333 | Energy saving amount | 0-30(%) | 0 | O | O | X | |
| Ad-60 | 0h133C | Acc / Dec time transition frequency | 0.00-Maximum frequency(Hz) | 0.00 | X | O | O | |
| Ad-61 | 0h133D | Rotation count speed gain | 0.1-6000.0[%] | 100.0 | O | O | O | |
| Ad-62 | 0h133E | Rotation count speed scale | 0 | x 1 | 0: x 1 | O | O | O |
| | | | 1 | x 0.1 | | | | |
| | | | 2 | x 0.01 | | | | |
| | | | 3 | x 0.001 | | | | |
| | | | 4 | x 0.0001 | | | | |
| Ad-63 | 0h133F | Rotation count speed unit | 0 | Rpm | 0: rpm | O | O | O |
| | | | 1 | mpm | | | | |
| Ad-64 | 0h1340 | Cooling fan control | 0 | During run | 0: During run | O | O | O |
| | | | 1 | Always on | | | | |
| | | | 2 | Temp control | | | | |
| Ad-65 | 0h1341 | Up / Down operation frequency save | 0 | No | 0: No | O | O | O |
| | | | 1 | Yes | | | | |
| Ad-66 | 0h1342 | Output contact on / Off control options | 0 | None | 0: None | X | O | O |
| | | | 1 | V1 | | | | |
| | | | 3 | V0 | | | | |
| | | | 4 | I2 | | | | |
| Ad-67 | 0h1343 | Output contact on level | Output contact off level-100.00 % | 90.00 | X | O | O | |
| Ad-68 | 0h1344 | Output contact off level | -100.00-output contact on level (%) | 10.00 | X | O | O | |
| Ad-70 | 0h1346 | Safe operation selection | 0 | Always enable | 0: Always enable | X | O | O |
| | | | 1 | DI Dependent | | | | |
| Ad-71 ¹⁷⁾ | 0h1347 | Safe operation stop options | 0 | Free-run | 0: Free-run | X | O | O |
| | | | 1 | Q-Stop | | | | |
| | | | 2 | Q-Stop resume | | | | |
| Ad-72 ¹⁷⁾ | 0h1348 | Safe operation deceleration time | 0.0~600.0(s) | 5.0 | O | O | O | |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

¹⁴⁾ Displayed when the Ad.27 code is set to 1 (Yes).

¹⁵⁾ Displayed if either OU.31 or OU.33 is set to 35 (BR Control).

¹⁶⁾ Displayed if Ad.50 is not set to 0 (None).

¹⁷⁾ Displayed when Ad.70 is set to 1 (DI Dependent).

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|----------------------|---------------|--|--|----------------|------------|-----|----|
| Ad-74 | 0h134A | Selection of regeneration evasion function for press | 0 | No | 0: No | X | O |
| | | | 1 | Yes | | | |
| Ad-75 | 0h134B | Voltage level of regeneration evasion motion for press | 200V : 300-400V | | 350 | X | O |
| | | | 400V : 600-800V | | 700 | | |
| Ad-76 ¹⁸⁾ | 0h134C | Compensation frequency limit of regeneration evasion for press | 0.00-10.00 Hz | | 1.00 | X | O |
| Ad-77 ¹⁸⁾ | 0h134D | Regeneration evasion for press P gain | 0.0-100.0% | | 50.0 | O | O |
| Ad-78 ¹⁸⁾ | 0h134E | Regeneration evasion for press I gain | 20-30000(ms) | | 500 | O | O |
| Ad-79 | 0h134F | DB Unit turn on voltage level | 200V: Min ¹⁹⁾ 400[V] | | 390[V] | X | O |
| | | | 400V: Min ¹⁹⁾ 800[V] | | 780[V] | | |
| Ad-80 | 0h1350 | Fire Mode selection | 0 | None | 0: None | X | O |
| | | | 1 | Fire mode | | | |
| | | | 2 | Fire mode test | | | |
| Ad-81 ²⁰⁾ | 0h1351 | Fire mode operation frequency | Start frequency-maximum frequency [Hz] | | 60.00 | X | O |
| Ad-82 ²⁰⁾ | 0h1352 | Fire mode run direction | 0 | Forward | 0: Forward | X | O |
| | | | 1 | Reverse | | | |
| Ad-83 ²⁰⁾ | | Fire mode operation count | Not configurable | | - | - | - |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

¹⁸⁾ Displayed when the Ad.74 code is set to 1 (Yes).

¹⁹⁾ Voltage type which DC converted the bA.19 AC input voltage: +20V (200Vtype), +40V (400V type). 200V type is limited to 350V and 400V type is limited to 600V.

²⁰⁾ Displayed if Ad.80 is not set to 0 (None).

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|----------------------|---------------|--|----------------|--|---------------------|-----|----|---|
| Cn-00 | - | Jump code | 1~99 | 4 | O | O | O | |
| Cn-04 ²¹⁾ | 0h1404 | Carrier frequency | Heavy duty | V / F: 1.0~15.0(kHz) IM: 2.0~15.0(kHz) | 3.0 | X | O | O |
| | | | Normal duty | V / F: 1.0~ 5.0(kHz) IM: 2.0~5.0(kHz) | 2.0 | | | |
| Cn-05 | 0h1405 | Switching mode | 0 Normal PWM | 0: Normal PWM | X | O | O | |
| Cn-09 | 0h1409 | Initial excitation time | 0.00~60.00(s) | 1.00 | X | X | O | |
| Cn-10 | 0h140A | Initial excitation amount | 100.0~300.0(%) | 100.0 | X | X | O | |
| Cn-11 | 0h140B | Continued operation duration | 0.00~60.00(s) | 0.00 | X | X | O | |
| Cn-21 | 0h1415 | Low - speed torque compensation gain | 50~300(%) | Varies by motor capacity | X | X | O | |
| Cn-22 | 0h1416 | Output torque compensation gain | 50~300(%) | Varies by motor capacity | X | X | O | |
| Cn-23 | 0h1417 | Speed deviation sub compensation gain | 50~300(%) | Varies by motor capacity | X | X | O | |
| Cn-24 | 0h1418 | Speed deviation main compensation gain | 50~300(%) | Varies by motor capacity | X | X | O | |
| Cn-29 | 0h141D | No-load speed deviation compensation gain | 0.50~2.00 | 1.06 | O | X | O | |
| Cn-30 | 0h141E | Speed controller adjustment gain | 2.0~10.0 | 4.0 | O | X | O | |
| Cn-53 | 0h1435 | Torque limit setting | 0 | Keypad-1 | 0: Keypad-1 | X | X | O |
| | | | 1 | Keypad-2 | | | | |
| | | | 2 | V1 | | | | |
| | | | 4 | V0 | | | | |
| | | | 5 | I2 | | | | |
| | | | 6 | Int 485 | | | | |
| | | | 8 | FieldBus | | | | |
| Cn-54 ²²⁾ | 0h1436 | Positive-direction reverse torque limit | 0.0~200.0(%) | 180 | O | X | O | |
| Cn-55 ²²⁾ | 0h1437 | Positive-direction regeneration torque limit | 0.0~200.0(%) | 180 | O | X | O | |
| Cn-56 ²²⁾ | 0h1438 | Negative-direction regeneration torque limit | 0.0~200.0(%) | 180 | O | X | O | |
| Cn-57 ²²⁾ | 0h1439 | Negative-direction reverse torque limit | 0.0~200.0(%) | 180 | O | X | O | |
| Cn-70 | 0h 1446 | Speed search mode selection | 0 | Flying start-1 ²³⁾ | 0: Flying start-1 | X | O | O |
| | | | 1 | Flying start-2 | | | | |
| Cn-71 | 0h1447 | Speed search operation selection | bit | 0000~1111 | 0000 ²⁴⁾ | X | O | O |
| | | | 0001 | Selects the speed search function at acceleration. | | | | |
| | | | 0010 | Initialization after a fault trip | | | | |
| | | | 0100 | Restart after instantaneous power interruption | | | | |
| | | | 1000 | Starting with power-on | | | | |

* In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

²¹⁾ It is for 5.5~7.5kW.

²²⁾ Displayed when dr.09 is set to 4 (IM Sensorless). This will change the initial value of the parameter at Ad.74 (Torque limit) to 150%.

²³⁾ Will not be displayed if dr.09 is set to 4 (IM Sensorless).

²⁴⁾ The initial value 0000 will be displayed on the keypad as .

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|----------------------|---------------|---------------------------------------|----------------|------------------------------------|-----------|-----|----|
| Cn-72 ²⁵⁾ | 0h1448 | Speed search reference current | 80~200(%) | 150 | O | O | O |
| Cn-73 ²⁶⁾ | 0h1449 | Speed search proportional gain | 0~9999 | Flying start-1: 100 | O | O | O |
| | | | | Flying start-2: 600 ²⁷⁾ | | | |
| Cn-74 ²⁶⁾ | 0h144A | Speed search integral gain | 0~9999 | Flying start-1: 200 | O | O | O |
| | | | | Flying start-2: 1000 | | | |
| Cn-75 ²⁶⁾ | 0h144B | Output block time before speed search | 0.0~60.0(s) | 1.0 | X | O | O |
| Cn-76 ²⁶⁾ | 0h144C | Speed search estimator gain | 50~150(%) | 100 | O | O | O |
| Cn-77 | 0h144D | Energy buffering selection | 0 | No | 0: No | X | O |
| | | | 1 | KEB-1 | | | |
| | | | 2 | KEB-2 | | | |
| Cn-78 ²⁸⁾ | 0h144E | Energy buffering start level | 110.0~200.0(%) | 125.0 | X | O | O |
| Cn-79 ²⁸⁾ | 0h144F | Energy buffering stop level | Cn78~210.0(%) | 130.0 | X | O | O |
| Cn-80 ²⁸⁾ | 0h1450 | Energy buffering P gain | 0~20000 | 1000 | O | O | O |
| Cn-81 ²⁸⁾ | 0h1451 | Energy buffering I gain | 1~20000 | 500 | O | O | O |
| Cn-82 ²⁸⁾ | 0h1452 | Energy buffering slip gain | 0~2000.0% | 30.0 | O | O | O |
| Cn-83 ²⁸⁾ | 0h1453 | Energy buffering acceleration time | 0.0~600.0(s) | 10.0 | O | O | O |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

²⁵⁾ Displayed when any of the Cn.71 code bits are set to 1 and Cn70 is set to 0 (Flying start-1).

²⁶⁾ Displayed when any of the Cn.71 code bits are set to 1.

²⁷⁾ The initial value is 1200 when the motor-rated capacity is less than 7.5 kW

²⁸⁾ Displayed when Cn.77 is not set to 0 (No).

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|----------------------|---------------|------------------------------------|---------------------------------------|-------------------|-------------|-----|----|
| In-00 | - | Jump code | 1~99 | 65 | O | O | O |
| In-01 | 0h1501 | Frequency for maximum analog input | Start frequency-maximum frequency(Hz) | Maximum frequency | O | O | O |
| In-02 | 0h1502 | Torque at maximum analog input | 0.0~200.0(%) | 100.0 | O | X | X |
| In-05 | 0h1505 | V1 input voltage display | -12.00~12.00(V) | 0.00 | - | O | O |
| In-06 | 0h1506 | V1 input polarity selection | 0 | Unipolar | 0: Unipolar | X | O |
| | | | 1 | Bipolar | | | |
| In-07 | 0h1507 | Time constant of V1 input filter | 0~10000(ms) | 100 | O | O | O |
| In-08 | 0h1508 | V1 Minimum input voltage | 0.00~10.00(V) | 0.00 | O | O | O |
| In-09 | 0h1509 | V1 output at Minimum voltage(%) | 0.00~100.00(%) | 0.00 | O | O | O |
| In-10 | 0h150A | V1 Maximum input voltage | 0.00~12.00(V) | 10.00 | O | O | O |
| In-11 | 0h150B | V1 output at Maximum voltage(%) | 0.00~100.00(%) | 100.00 | O | O | O |
| In-12 ²⁹⁾ | 0h150C | V1 Minimum input voltage | -10.00~ 0.00(V) | 0.00 | O | O | O |
| In-13 ²⁹⁾ | 0h150D | V1 output at Minimum voltage(%) | -100.00~0.00(%) | 0.00 | O | O | O |
| In-14 ²⁹⁾ | 0h150E | V1 Maximum input voltage | -12.00~ 0.00(V) | -10.00 | O | O | O |
| In-15 ²⁹⁾ | 0h150F | V1 output at Maximum voltage(%) | -100.00~0.00(%) | -100.00 | O | O | O |
| In-16 | 0h1510 | Changing rotation direction of V1 | 0 | No | 0: No | O | O |
| | | | 1 | Yes | | | |
| In-17 | 0h1511 | V1 quantization level | 0.00 ³⁰⁾ , 0.04~10.00(%) | 0.04 | X | O | O |
| In-35 | 0h1523 | V0 input voltage display | 0.00~5.00(V) | 0.00 | - | O | O |
| In-37 | 0h1525 | Time constant of V0 input filter | 0~10000(ms) | 100 | O | O | O |
| In-38 | 0h1526 | V0 Minimum input voltage | 0.00~5.00(V) | 0.00 | O | X | O |
| In-39 | 0h1527 | V0 output at minimum voltage(%) | 0.00~100.00(%) | 0.00 | O | O | O |
| In-40 | 0h1528 | V0 Maximum input voltage | 0.00~5.00(V) | 5.00 | O | X | O |
| In-41 | 0h1529 | V0 output at maximum voltage(%) | 0.00~100.00(%) | 100.00 | O | O | O |
| In-46 | 0h152E | Changing rotation direction of V0 | 0 | No | 0: No | O | O |
| | | | 1 | Yes | | | |
| In-47 | 0h152F | V0 quantization level | 0.00 ³⁰⁾ , 0.04~10.00(%) | 0.04 | O | O | O |
| In-50 | 0h1532 | I2 input voltage display | 0~24(mA) | 0.00 | - | O | O |
| In-52 | 0h1534 | I2 input filter time constant | 0~10000(ms) | 100 | O | O | O |
| In-53 | 0h1535 | I2 minimum input current | 0.00~20.00(mA) | 4.00 | O | O | O |
| In-54 | 0h1536 | I2 output at minimum current(%) | 0.00~100.00(%) | 0.00 | O | O | O |
| In-55 | 0h1537 | I2 maximum input current | 0.00~24.00(mA) | 20.00 | O | O | O |
| In-56 | 0h1538 | I2 output at maximum current(%) | 0.00~100.00(%) | 100.00 | O | O | O |
| In-61 | 0h153D | Changing rotation direction of I2 | 0 | No | 0: No | O | O |
| | | | 1 | Yes | | | |
| In-62 | 0h153E | I2 quantization level | 0.00 ²⁹⁾ , 0.04~10.00(%) | 0.04 | O | O | O |
| In-65 | 0h1541 | P1 terminal function setting | 0 | None | 1: Fx | X | O |
| | | | 1 | Fx | | | |
| In-66 | 0h1542 | P2 terminal function setting | 2 | Rx | 2: Rx | X | O |
| | | | 3 | RST | | | |
| In-67 | 0h1543 | P3 terminal function setting | 4 | External trip | 5: BX | X | O |
| | | | 5 | BX | | | |
| In-68 | 0h1544 | P4 terminal function setting | 6 | JOG | 3: RST | X | O |
| | | | 7 | Speed-L | | | |
| In-69 | 0h1545 | P5 terminal function setting | 8 | Speed-M | 7: Sp-L | X | O |
| | | | 9 | Speed-H | | | |

• In the following table, data shaded in blue will be displayed when the related code has been selected.


• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation


²⁹⁾ Displayed when In.06 is set to 1 (Bipolar).

³⁰⁾ Quantizing is not used when set to 0.

| Code | Comm. Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|-------|---------------|---|---------------|-----------------|-----------------------|-----|----|
| - | - | - | 11 | XCEL-L | - | - | - |
| | | | 12 | XCEL-M | | | |
| | | | 13 | RUN enable | | | |
| | | | 14 | 3-Wire | | | |
| | | | 15 | 2nd source | | | |
| | | | 16 | Exchange | | | |
| | | | 17 | Up | | | |
| | | | 18 | Down | | | |
| | | | 20 | U / D Clear | | | |
| | | | 21 | Analog hold | | | |
| | | | 22 | I-Term clear | | | |
| | | | 23 | PID Openloop | | | |
| | | | 24 | P Gain2 | | | |
| | | | 25 | XCEL stop | | | |
| | | | 26 | 2nd motor | | | |
| | | | 27 | U / D Enable | | | |
| | | | 33 | Baseblock | | | |
| | | | 34 | Pre excite | | | |
| | | | 38 | Timer in | | | |
| | | | 40 | dis Aux ref | | | |
| | | | 46 | FWD JOG | | | |
| | | | 47 | REV JOG | | | |
| | | | 49 | XCEL-H | | | |
| 51 | Fire mode | | | | | | |
| 52 | KEB-1 Select | | | | | | |
| In-84 | 0h1554 | Multi-function input terminal on filter selection | P5 - P1 | | 1 1111 ³¹⁾ | O | O |
| | | | 0 | Disable(Off) | | | |
| | | | 1 | Enable(On) | | | |
| In-85 | 0h1555 | Multi-function input terminal on filter | 0~10000(ms) | | 10 | O | O |
| In-86 | 0h1556 | Multi-function input terminal off filter | 0~10000(ms) | | 3 | O | O |
| In-87 | 0h1557 | Multi-function input terminal selection | P5 - P1 | | 0 0000 ³²⁾ | X | O |
| | | | 0 | A contact (NO) | | | |
| | | | 1 | B contact (NC) | | | |
| In-88 | 0h1558 | Selects the NO / NC operation command | 0 | NO | 0 | X | O |
| | | | 1 | NO/NC | | | |
| In-89 | 0h1559 | Multi-step command delay time | 1-5000(ms) | | 1 | X | O |
| In-90 | 0h155A | Multi-function input terminal status | P5 - P1 | | 0 0000 | - | O |
| | | | 0 | release(Off) | | | |
| | | | 1 | Connection (On) | | | |
| In-99 | 0h1563 | SW1(NPN/PNP), status | Bit | 0~1 | 0 | - | O |
| | | | 0 | NPN | | | |
| | | | 1 | PNP | | | |


• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

³¹⁾ The initial value 11111 will be displayed on the keypad as .

³²⁾ The initial value 0000 will be displayed on the keypad as .

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|-------|--------------|-----------------------------|-------------------|------------------------------------|--------------------|-----|----|---|
| OU-00 | - | Jump code | 1~99 | 30 | 0 | 0 | 0 | |
| OU-01 | 0h1601 | Analog output 1 item | 0 | Frequency | 0: Frequency | 0 | 0 | 0 |
| | | | 1 | Output current | | | | |
| | | | 2 | Output voltage | | | | |
| | | | 3 | DCLink voltage | | | | |
| | | | 4 | Torque | | | | |
| | | | 5 | Output power | | | | |
| | | | 6 | Idse | | | | |
| | | | 7 | Iqse | | | | |
| | | | 8 | Target freq | | | | |
| | | | 9 | Ramp freq | | | | |
| | | | 10 | Speed fdb | | | | |
| | | | 12 | PID ref value | | | | |
| | | | 13 | PID fdb value | | | | |
| | | | 14 | PID output | | | | |
| | | | 15 | Constant | | | | |
| OU-02 | 0h1602 | Analog output 1 gain | -1000.0~1000.0(%) | 100.0 | 0 | 0 | 0 | |
| OU-03 | 0h1603 | Analog output 1 bias | -100~100(%) | 0 | 0 | 0 | 0 | |
| OU-04 | 0h1604 | Analog output 1 filter | 0~10000(ms) | 5 | 0 | 0 | 0 | |
| OU-05 | 0h1606 | Analog constant output 1 | 0.0~100.0(%) | 0.0 | 0 | 0 | 0 | |
| OU-06 | 0h1606 | Analog output 1 monitor | 0.0~1000.0(%) | 0.0 | - | 0 | 0 | |
| OU-30 | 0h161E | Fault output item | bit | 000~111 | 010 ³³⁾ | 0 | 0 | 0 |
| | | | 1 | Low voltage | | | | |
| | | | 2 | Any faults other than low voltage | | | | |
| | | | 3 | Final failure of automatic restart | | | | |
| OU-31 | 0h161F | Multi-function relay 1 item | 0 | None | 29: Trip | 0 | 0 | 0 |
| | | | 1 | FDT-1 | | | | |
| | | | 2 | FDT-2 | | | | |
| | | | 3 | FDT-3 | | | | |
| | | | 4 | FDT-4 | | | | |
| | | | 5 | Over load | | | | |
| | | | 6 | IOL | | | | |
| | | | 7 | Under load | | | | |
| | | | 8 | Fan warning | | | | |
| | | | 9 | Stall | | | | |
| | | | 10 | Over voltage | | | | |
| | | | 11 | Low voltage | | | | |
| | | | 12 | Over heat | | | | |
| | | | 13 | Lost command | | | | |
| | | | 14 | Run | | | | |
| 15 | Stop | | | | | | | |

* SL: Sensorless vector control (dr.09), Property: Write-enabled during operation


³³⁾ The initial value 0000 will be displayed on the keypad as .

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|-------|-----------------|-----------------------------|---------------|------------------|-----------|-----|----|---|
| OU-31 | 0h161F | Multi-function relay 1 item | 16 | Steady | 29: Trip | 0 | 0 | 0 |
| | | | 17 | Inverter line | | | | |
| | | | 18 | Comm line | | | | |
| | | | 19 | Speed search | | | | |
| | | | 21 | Regeneration | | | | |
| | | | 22 | Ready | | | | |
| | | | 23 | Zero speed | | | | |
| | | | 28 | Timer out | | | | |
| | | | 29 | Trip | | | | |
| | | | 31 | DB Warn%ED | | | | |
| | | | 34 | On / Off control | | | | |
| | | | 35 | BR control | | | | |
| | | | 36 | Reserved | | | | |
| | | | 37 | FAN exchange | | | | |
| | | | 38 | Fire mode | | | | |
| | | | 40 | KEB operating | | | | |
| | | | 41 | Pre overheat | | | | |
| 42 | Minor fault | | | | | | | |
| 43 | Torque detect 1 | | | | | | | |
| 44 | Torque detect 2 | | | | | | | |
| OU-33 | 0h1621 | Multi-function relay 2 item | 0 | None | 14: Run | 0 | 0 | 0 |
| | | | 1 | FDT-1 | | | | |
| | | | 2 | FDT-2 | | | | |
| | | | 3 | FDT-3 | | | | |
| | | | 4 | FDT-4 | | | | |
| | | | 5 | Over load | | | | |
| | | | 6 | IOL | | | | |
| | | | 7 | Under load | | | | |
| | | | 8 | Fan warning | | | | |
| | | | 9 | Stall | | | | |
| | | | 10 | Over voltage | | | | |
| | | | 11 | Low voltage | | | | |
| | | | 12 | Over heat | | | | |
| | | | 13 | Lost command | | | | |
| | | | 14 | Run | | | | |
| | | | 15 | Stop | | | | |
| | | | 16 | Steady | | | | |
| | | | 17 | Inverter line | | | | |
| | | | 18 | Comm line | | | | |
| | | | 19 | Speed search | | | | |
| 21 | Regeneration | | | | | | | |
| 22 | Ready | | | | | | | |
| 23 | Zero speed | | | | | | | |

* SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|----------------------|-----------------|---|----------------------------|------------------|-------------------|-----|----|---|
| OU-33 | 0h1621 | Multi-function relay 2 item | 28 | Timer out | 14: Run | O | O | O |
| | | | 29 | Trip | | | | |
| | | | 31 | DB Warn%ED | | | | |
| | | | 34 | On / Off control | | | | |
| | | | 35 | BR Control | | | | |
| | | | 36 | Reserved | | | | |
| | | | 37 | FAN Exchange | | | | |
| | | | 38 | Fire mode | | | | |
| | | | 40 | KEB Operating | | | | |
| | | | 41 | Pre overheat | | | | |
| | | | 42 | Minor fault | | | | |
| | | | 43 | Torque detect 1 | | | | |
| 44 | Torque detect 2 | | | | | | | |
| OU-41 | 0h1629 | Multi-function output monitor | - | 00 | - | - | - | |
| OU-50 | 0h1632 | Multi-function output on delay | 0.00~100.00(s) | 0.00 | O | O | O | |
| OU-51 | 0h1633 | Multi-function output off delay | 0.00~100.00(s) | 0.00 | O | O | O | |
| OU-52 | 0h1634 | Multi-function output contact selection | Relay2, Relay1 | | 00 ³⁴⁾ | X | O | O |
| | | | 0 | A contact (NO) | | | | |
| | | | 1 | B contact (NC) | | | | |
| OU-53 | 0h1635 | Fault output on delay | 0.00~100.00(s) | 0.00 | O | O | O | |
| OU-54 | 0h1636 | Fault output off delay | 0.00~100.00(s) | 0.00 | O | O | O | |
| OU-55 | 0h1637 | Timer on delay | 0.00~100.00(s) | 0.00 | O | O | O | |
| OU-56 | 0h1638 | Timer off delay | 0.00~100.00(s) | 0.00 | O | O | O | |
| OU-57 | 0h1639 | Detection frequency | 0.00-Maximum frequency(Hz) | 30.00 | O | O | O | |
| OU-58 | 0h163A | Detection frequency band | 0.00-Maximum frequency(Hz) | 10.00 | O | O | O | |
| OU-67 ³⁵⁾ | 0h1643 | Torque detection 1 setting | 0 | None | 0 | X | O | O |
| | | | 1 | OT cmdspd warn | | | | |
| | | | 2 | OT warning | | | | |
| | | | 3 | OT cmdspdtrip | | | | |
| | | | 4 | OT trip | | | | |
| | | | 5 | UT cmdspd warn | | | | |
| | | | 6 | UT warning | | | | |
| | | | 7 | UT cmdspd trip | | | | |
| 8 | UT trip | | | | | | | |
| OU-68 | 0h1644 | Torque detection 1 level | 0~200.0 (%) | 100 | X | O | O | |
| OU-69 | 0h1645 | Torque detection 1 delay time | 0.0~10.0 (s) | 0.1 | X | O | O | |
| OU-70 ³⁶⁾ | 0h1646 | Torque detection 1 setting | 0 | None | 0 | X | O | O |
| | | | 1 | OT cmdspd warn | | | | |
| | | | 2 | OT warning | | | | |
| | | | 3 | OT cmdspdtrip | | | | |
| | | | 4 | OT trip | | | | |
| | | | 5 | UT cmdspd warn | | | | |
| | | | 6 | UT warning | | | | |
| | | | 7 | UT cmdspd trip | | | | |
| 8 | UT trip | | | | | | | |
| OU-71 | 0h1647 | Torque detection 2 level | 0~200.0 (%) | 100 | X | O | O | |
| OU-72 | 0h1648 | Torque detection 2 delay time | 0.0~10.0 (s) | 0.1 | X | O | O | |

* SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

³⁴⁾ The initial value 0000 will be displayed on the keypad as .

³⁵⁾ Displayed when OU.31,33 is set to 43 (Prt Trq Det1).

³⁶⁾ Displayed when OU.31,33 is set to 44 (Prt Trq Det2).

Communication Function Group (PAR → CM)

General Drive

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|----------------------|--------------|--------------------------------------|---------------|---------------|-----------------|-----|----|
| CM-00 | - | Jump code | 1~99 | 20 | 0 | 0 | 0 |
| CM-01 | 0h1701 | Built-in communication inverter ID | 1~250 | 1 | 0 | 0 | 0 |
| CM-02 | 0h1702 | Built-in communication protocol | 0 | Modbus RTU | 0: Modbus RTU | 0 | 0 |
| | | | 2 | LS Inv 485 | | | |
| CM-03 | 0h1703 | Built-in communication speed | 0 | 1200 bps | 3: 9600 bps | 0 | 0 |
| | | | 1 | 2400 bps | | | |
| | | | 2 | 4800 bps | | | |
| | | | 3 | 9600 bps | | | |
| | | | 4 | 19200 bps | | | |
| | | | 5 | 38400 bps | | | |
| | | | 6 | 56 Kbps | | | |
| CM-04 | 0h1704 | Built-in communication frame setting | 0 | D8 / PN / S1 | 0: D8 / PN / S1 | 0 | 0 |
| | | | 1 | D8 / PN / S2 | | | |
| | | | 2 | D8 / PE / S1 | | | |
| | | | 3 | D8 / PO / S1 | | | |
| CM-05 | 0h1705 | Transmission delay after reception | 0~1000(ms) | 5ms | 0 | 0 | 0 |
| CM-06 ³⁸⁾ | 0h1706 | Communication option S/W version | - | 0.00 | 0 | 0 | 0 |
| CM-07 ³⁸⁾ | 0h1707 | Communication option inverter ID | 0~255 | 1 | 0 | 0 | 0 |
| CM-08 ³⁸⁾ | 0h1708 | Field bus communication speed | - | 12Mbps | - | 0 | 0 |
| CM-09 ³⁸⁾ | 0h1709 | Communication option LED status | - | - | 0 | 0 | 0 |
| CM-30 | 0h171E | Number of output parameters | 0~8 | 3 | 0 | 0 | 0 |
| CM-31 | 0h171F | Output communication address 1 | 0000~FFFF Hex | 000A | 0 | 0 | 0 |
| CM-32 | 0h1720 | Output communication address 2 | 0000~FFFF Hex | 000E | 0 | 0 | 0 |
| CM-33 | 0h1721 | Output communication address 3 | 0000~FFFF Hex | 000F | 0 | 0 | 0 |
| CM-34 | 0h1722 | Output communication address 4 | 0000~FFFF Hex | 0000 | 0 | 0 | 0 |
| CM-35 | 0h1723 | Output communication address 5 | 0000~FFFF Hex | 0000 | 0 | 0 | 0 |
| CM-36 | 0h1724 | Output communication address 6 | 0000~FFFF Hex | 0000 | 0 | 0 | 0 |
| CM-37 | 0h1725 | Output communication address 7 | 0000~FFFF Hex | 0000 | 0 | 0 | 0 |
| CM-38 | 0h1726 | Output communication address 8 | 0000~FFFF Hex | 0000 | 0 | 0 | 0 |
| CM-50 | 0h1732 | Number of input parameters | 0~8 | 2 | 0 | 0 | 0 |
| CM-51 | 0h1733 | Input communication address 1 | 0000~FFFF Hex | 0005 | X | 0 | 0 |
| CM-52 | 0h1734 | Input communication address 2 | 0000~FFFF Hex | 0006 | X | 0 | 0 |
| CM-53 | 0h1735 | Input communication address 3 | 0000~FFFF Hex | 0000 | X | 0 | 0 |
| CM-54 | 0h1736 | Input communication address 4 | 0000~FFFF Hex | 0000 | X | 0 | 0 |
| CM-55 | 0h1737 | Input communication address 5 | 0000~FFFF Hex | 0000 | X | 0 | 0 |
| CM-56 | 0h1738 | Input communication address 6 | 0000~FFFF Hex | 0000 | X | 0 | 0 |
| CM-57 | 0h1739 | Input communication address 7 | 0000~FFFF Hex | 0000 | X | 0 | 0 |
| CM-58 | 0h173A | Input communication address 8 | 0000~FFFF Hex | 0000 | X | 0 | 0 |
| CM-68 | 0h1744 | Field bus data swap | 0 | No | 0 | X | 0 |
| | | | 1 | Yes | | | |
| CM-70 | 0h1746 | Communication multi-function input 1 | 0 | None | 0: None | 0 | 0 |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

³⁷⁾ 115200bps

³⁸⁾ Displayed only when a communication option card is installed.

| Code | Comm.Address | Name | Setting Range | | Initial Value | Property* | V/F | SL |
|----------------------|--------------|---|---------------|---------------|---------------|-----------|-----|----|
| CM-71 | 0h1747 | Communication multi-function input 2 | 1 | Fx | 0: None | 0 | 0 | 0 |
| CM-72 | 0h1748 | Communication multi-function input 3 | 2 | Rx | 0: None | 0 | 0 | 0 |
| CM-73 | 0h1749 | Communication multi-function input 4 | 3 | RST | 0: None | 0 | 0 | 0 |
| CM-74 | 0h174A | Communication multi-function input 5 | 4 | External trip | 0: None | 0 | 0 | 0 |
| CM-75 | 0h174B | Communication multi-function input 6 | 5 | BX | 0: None | 0 | 0 | 0 |
| CM-76 | 0h174C | Communication multi-function input 7 | 6 | JOG | 0: None | 0 | 0 | 0 |
| CM-77 | 0h174D | Communication multi-function input 8 | 7 | Speed-L | 0: None | 0 | 0 | 0 |
| | | | 8 | Speed-M | | | | |
| | | | 9 | Speed-H | | | | |
| | | | 11 | XCEL-L | | | | |
| | | | 12 | XCEL-M | | | | |
| | | | 13 | Run enable | | | | |
| | | | 14 | 3-wire | | | | |
| | | | 15 | 2nd source | | | | |
| | | | 16 | Exchange | | | | |
| | | | 17 | Up | | | | |
| | | | 18 | Down | | | | |
| | | | 20 | U / D clear | | | | |
| | | | 21 | Analog hold | | | | |
| | | | 22 | I-term clear | | | | |
| | | | 23 | PID openloop | | | | |
| | | | 24 | P gain2 | | | | |
| | | | 25 | XCEL stop | | | | |
| | | | 26 | 2nd motor | | | | |
| | | | 27 | U / D enable | | | | |
| | | | 33 | Baseblock | | | | |
| 34 | Pre excite | | | | | | | |
| 38 | Timer in | | | | | | | |
| 40 | Dis Aux ref | | | | | | | |
| 46 | FWD JOG | | | | | | | |
| 47 | REV JOG | | | | | | | |
| 49 | XCEL-H | | | | | | | |
| 51 | Fire mode | | | | | | | |
| 52 | KEB-1 select | | | | | | | |
| CM-86 | 0h1756 | Communication multi-function input monitoring | - | | 0 | X | 0 | 0 |
| CM-90 | 0h175A | Selection of data frame communication monitor | 0 | Int485 | 0 | 0 | 0 | 0 |
| | | | 1 | Keypad | | | | |
| CM-91 | 0h175B | Rev data frame count | 0~65535 | | - | X | 0 | 0 |
| CM-92 | 0h175C | Err data frame count | 0~65535 | | - | X | 0 | 0 |
| CM-93 | 0h175D | NAK data frame count | 0~65535 | | - | X | 0 | 0 |
| CM-94 ³⁹⁾ | - | Communication data upload | 0 | No | 0: No | X | 0 | 0 |
| | | | 1 | Yes | | | | |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

³⁹⁾ Displayed only when a communication option card is installed.

Application Function Group (PAR → AP)

General Drive

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|----------------------|--------------|---|---------------------------------------|---------------|----------------|-----|----|---|
| AP-00 | - | Jump code | 1~99 | 20 | O | O | O | |
| AP-01 | 0h1801 | Application function selection | 0 | None | 0: None | X | O | O |
| | | | 1 | - | | | | |
| | | | 2 | Proc PID | | | | |
| AP-16 ⁴⁰⁾ | 0h1810 | PID output monitor | (%) | 0.00 | - | O | O | |
| AP-17 ⁴⁰⁾ | 0h1811 | PID reference monitor | (%) | 50.00 | - | O | O | |
| AP-18 ⁴⁰⁾ | 0h1812 | PID feedback monitor | (%) | 0.00 | - | O | O | |
| AP-19 ⁴⁰⁾ | 0h1813 | PID reference setting | -100.00~100.00(%) | 50.00 | O | O | O | |
| AP-20 ⁴⁰⁾ | 0h1814 | PID reference source | 0 | Keypad | 0: Keypad | X | O | O |
| | | | 1 | V1 | | | | |
| | | | 3 | V0 | | | | |
| | | | 4 | I2 | | | | |
| | | | 5 | Int 485 | | | | |
| | | | 6 | Fieldbus | | | | |
| AP-21 ⁴⁰⁾ | 0h1815 | PID feedback source | 0 | V1 | 0: V1 | X | O | O |
| | | | 2 | V0 | | | | |
| | | | 3 | I2 | | | | |
| | | | 4 | Int 485 | | | | |
| | | | 6 | Fieldbus | | | | |
| AP-22 ⁴⁰⁾ | 0h1816 | PID controller proportional gain | 0.0~1000.0(%) | 50.0 | O | O | O | |
| AP-23 ⁴⁰⁾ | 0h1817 | PID controller integral time | 0.0~200.0(s) | 10.0 | O | O | O | |
| AP-24 ⁴⁰⁾ | 0h1818 | PID controller differentiation time | 0~1000(ms) | 0 | O | O | O | |
| AP-25 ⁴⁰⁾ | 0h1819 | PID controller feed-forward compensation gain | 0.0~1000.0(%) | 0.0 | O | O | O | |
| AP-26 ⁴⁰⁾ | 0h181A | Proportional gain scale | 0.0~100.0(%) | 100.0 | X | O | O | |
| AP-27 ⁴⁰⁾ | 0h181B | PID output filter | 0~10000(ms) | 0 | O | O | O | |
| AP-28 ⁴⁰⁾ | 0h181C | PID Mode | 0 | Process PID | 0 | X | O | O |
| | | | 1 | Normal PID | | | | |
| AP-29 ⁴⁰⁾ | 0h181D | PID upper limit frequency | PID lower limit frequency-300.00(Hz) | 60.00 | O | O | O | |
| AP-30 ⁴⁰⁾ | 0h181E | PID lower limit frequency | -300.00-PID upper limit frequency(Hz) | -60.00 | O | O | O | |
| AP-32 ⁴⁰⁾ | 0h1820 | PID output scale | 0.1~1000.0(%) | 100.0 | X | O | O | |
| AP-33 ⁴⁰⁾ | 0h181F | PID output inverse | 0 | No | 0: No | X | O | O |
| | | | 1 | Yes | | | | |
| AP-34 ⁴⁰⁾ | 0h1822 | PID controller motion frequency | 0.00-Maximum frequency(Hz) | 0.00 | X | O | O | |
| AP-35 ⁴⁰⁾ | 0h1823 | PID controller motion level | 0.0~100.0(%) | 0.0 | X | O | O | |
| AP-36 ⁴⁰⁾ | 0h1824 | PID controller motion delay time | 0~9999(s) | 600 | O | O | O | |
| AP-37 ⁴⁰⁾ | 0h1825 | PID sleep mode delay time | 0.0~999.9(s) | 60.0 | O | O | O | |
| AP-38 ⁴⁰⁾ | 0h1826 | PID sleep mode frequency | 0.00-Maximum frequency(Hz) | 0.00 | O | O | O | |
| AP-39 ⁴⁰⁾ | 0h1827 | PID wake-up level | 0~100(%) | 35 | O | O | O | |
| AP-40 ⁴⁰⁾ | 0h1828 | PID wake-up mode setting | 0 | Below level | 0: Below level | O | O | O |
| | | | 1 | Above level | | | | |
| | | | 2 | Beyond level | | | | |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

⁴⁰⁾ Displayed when AP.01 is set to 2 (Proc PID).

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|----------------------|--------------|-------------------------------|----------------|---------------|-----------|-----|----|---|
| AP-42 ⁴⁰⁾ | 0h182A | PID controller unit selection | 0 | % | 0: % | O | O | O |
| | | | 1 | Bar | | | | |
| | | | 2 | mBar | | | | |
| | | | 3 | Pa | | | | |
| | | | 4 | kPa | | | | |
| | | | 5 | Hz | | | | |
| | | | 6 | Rpm | | | | |
| | | | 7 | V | | | | |
| | | | 8 | I | | | | |
| | | | 9 | kW | | | | |
| | | | 10 | HP | | | | |
| | | | 11 | °C | | | | |
| | | | 12 | °F | | | | |
| AP-43 ⁴⁰⁾ | 0h182B | PID unit gain | 0.00~300.00(%) | 100.00 | O | O | O | |
| AP-44 ⁴⁰⁾ | 0h182C | PID unit scale | 0 | x100 | 2: x 1 | O | O | O |
| | | | 1 | x10 | | | | |
| | | | 2 | x 1 | | | | |
| | | | 3 | x 0.1 | | | | |
| | | | 4 | x 0.01 | | | | |
| AP-45 ⁴⁰⁾ | 0h182D | PID 2nd proportional gain | 0.0~1000.0(%) | 100.0 | X | O | O | |

• In the following table, data shaded in blue will be displayed when the related code has been selected.


• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

⁴⁰⁾ Displayed when AP.01 is set to 2 (Proc PID).

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|----------------------|--------------|---|--|-------------------|-------------------|-----|----|---|
| Pr-00 | - | Jump code | 1~99 | 40 | O | O | O | |
| Pr-04 | 0h1B04 | Load level setting | 0 | Normal duty | 1: Heavy duty | X | O | O |
| | | | 1 | Heavy duty | | | | |
| Pr-05 | 0h1B05 | Input / Output open-phase protection | bit | 00~11 | 00 ⁴¹⁾ | X | O | O |
| | | | 01 | Output open phase | | | | |
| | | | 10 | Input open phase | | | | |
| Pr-06 | 0h1B06 | Input voltage range during open-phase | 1~100(V) | 15 | X | O | O | |
| Pr-07 | 0h1B07 | Deceleration time at fault trip | 0.0~600.0(s) | 3.0 | O | O | O | |
| Pr-08 | 0h1B08 | Selection of startup on trip reset | 0 | No | 0: No | O | O | O |
| | | | 1 | Yes | | | | |
| Pr-09 | 0h1B09 | Number of automatic restarts | 0~10 | 0 | O | O | O | |
| Pr-10 ⁴²⁾ | 0h1B0A | Automatic restart delay time | 0.0~60.0(s) | 1.0 | O | O | O | |
| Pr-12 | 0h1B0C | Motion at speed command loss | 0 | None | 0: None | O | O | O |
| | | | 1 | Free-run | | | | |
| | | | 2 | Dec | | | | |
| | | | 3 | Hold input | | | | |
| | | | 4 | Hold output | | | | |
| | | | 5 | Lost preset | | | | |
| Pr-13 ⁴³⁾ | 0h1B0D | Time to determine speed command loss | 0.1~120(s) | 1.0 | O | O | O | |
| Pr-14 ⁴³⁾ | 0h1B0E | Operation frequency at speed command loss | 0, Start frequency-maximum frequency(Hz) | 0.00 | O | O | O | |
| Pr-15 ⁴³⁾ | 0h1B0F | Analog input loss decision level | 0 | Half of x1 | 0: Half of x1 | O | O | O |
| | | | 1 | Below x1 | | | | |
| Pr-17 | 0h1B11 | Overload warning selection | 0 | No | 0: No | O | O | O |
| | | | 1 | Yes | | | | |
| Pr-18 | 0h1B12 | Overload warning level | 30~180(%) | 150 | O | O | O | |
| Pr-19 | 0h1B13 | Overload warning time | 0.0~30.0(s) | 10.0 | O | O | O | |
| Pr-20 | 0h1B14 | Motion at overload fault | 0 | None | 1: Free-run | O | O | O |
| | | | 1 | Free-run | | | | |
| | | | 2 | Dec | | | | |
| Pr-21 | 0h1B15 | Overload fault level | 30~200(%) | 180 | O | O | O | |
| Pr-22 | 0h1B16 | Overload fault time | 0.0~60.0(s) | 60.0 | O | O | O | |
| Pr-25 | 0h1B19 | Under load warning selection | 0 | No | 0: No | O | O | O |
| | | | 1 | Yes | | | | |
| Pr-26 | 0h1B1A | Under load warning time | 0.0~600.0(s) | 10.0 | O | O | O | |
| Pr-27 | 0h1B1B | Under load fault selection | 0 | None | 0: None | O | O | O |
| | | | 1 | Free-run | | | | |
| | | | 2 | Dec | | | | |
| Pr-28 | 0h1B1C | Under load fault time | 0.0~600.0(s) | 30.0 | O | O | O | |
| Pr-29 | 0h1B1D | Under load lower limit level | 10~100(%) | 30 | O | O | O | |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

⁴¹⁾ The initial value 0000 will be displayed on the keypad as .

⁴²⁾ Displayed when Pr.09 is set higher than 0.

⁴³⁾ Displayed when Pr.12 is not set to 0 (NONE).

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|-------|--------------|--|--|-------------------|--------------|-----|----|
| Pr-30 | 0h1B1E | Under load upper limit level | 10~100(%) | 30 | O | O | O |
| Pr-31 | 0h1B1F | No motor motion at detection | 0 | None | 0: None | O | O |
| | | | 1 | Free-run | | | |
| Pr-32 | 0h1B20 | No motor detection current level | 1~100(%) | 5 | O | O | O |
| Pr-33 | 0h1B21 | No motor detection time | 0.1~10.0(s) | 3.0 | O | O | O |
| Pr-40 | 0h1B28 | Electronic thermal fault selection | 0 | None | 0: None | O | O |
| | | | 1 | Free-run | | | |
| | | | 2 | Dec | | | |
| Pr-41 | 0h1B29 | Motor cooling fan type | 0 | Self-cool | 0: Self-cool | O | O |
| | | | 1 | Forced-cool | | | |
| Pr-42 | 0h1B2A | Electronic thermal 1 minute rating | 120~200(%) | 150 | O | O | O |
| Pr-43 | 0h1B2B | Electronic thermal continuous rating | 50~150(%) | 120 | O | O | O |
| Pr-45 | 0h1B2D | BX trip mode | 0 | Free-run | 0 | X | O |
| | | | 1 | Dec | | | |
| Pr-50 | 0h1B32 | Stall prevention motion and flux braking | bit | 0000~1111 | 0000 | X | O |
| | | | 0001 | Accelerating | | | |
| | | | 0010 | At constant speed | | | |
| | | | 0100 | Decelerating | | | |
| | | | 1000 | Fluxbraking | | | |
| Pr-51 | 0h1B33 | Stall frequency 1 | Start frequency-stall frequency2(Hz) | 60.00 | O | O | X |
| Pr-52 | 0h1B34 | Stall level 1 | 30~250(%) | 180 | X | O | X |
| Pr-53 | 0h1B35 | Stall frequency 2 | Start frequency1-stall frequency2(Hz) | 60.00 | O | O | X |
| Pr-54 | 0h1B36 | Stall level 2 | 30~250(%) | 180 | X | O | X |
| Pr-55 | 0h1B37 | Stall frequency 3 | Start frequency2-stall frequency4(Hz) | 60.00 | O | O | X |
| Pr-56 | 0h1B38 | Stall level 3 | 30~250(%) | 180 | X | O | X |
| Pr-57 | 0h1B39 | Stall frequency 4 | Stall frequency3-maximum frequency(Hz) | 60.00 | O | O | X |
| Pr-58 | 0h1B3A | Stall level 4 | 30~250(%) | 180 | X | O | X |
| Pr-59 | 0h1B3B | Flux braking gain value | 0~150[%] | 0 | O | O | O |
| Pr-66 | 0h1B42 | DB resistor warning level | 0~30(%) | 10 | O | O | O |
| Pr-77 | 0h1B4D | Pre-overheat warning temperature | 90~110 | 90 | O | O | O |
| Pr-78 | 0h1B4E | Pre-overheat warning operation selection | 0 | None | 0 | O | O |
| | | | 1 | Warning | | | |
| | | | 2 | Freerun | | | |
| | | | 3 | Dec | | | |
| Pr-79 | 0h1B4F | Cooling fan fault selection | 0 | Trip | 1: Warning | O | O |
| | | | 1 | Warning | | | |
| Pr-80 | 0h1B50 | Motion selection at option trip | 0 | None | 1: Free-run | O | O |
| | | | 1 | Free-run | | | |
| | | | 2 | Dec | | | |
| Pr-81 | 0h1B51 | Low voltage fault decision delay time | 0.0~60.0(s) | 0.0 | X | O | O |
| Pr-82 | 0h1B52 | LV2 Selection | 0 | No | 0 | X | O |
| | | | 1 | Yes | | | |
| Pr-86 | 0h1B56 | Accumulated percent of fan usage | 0.0~100.0[%] | 0.0 | - | O | O |
| Pr-87 | 0h1B57 | Fan exchange warning level | 0.0~100.0[%] | 90.0 | O | O | O |

* SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

| Code | Comm.Address | Name | Setting Range | | Initial Value | Property* | V/F | SL |
|-------|--------------|---------------------------|---------------|--------------|---------------|-----------|-----|----|
| Pr-88 | 0h1B58 | Fan reset time | 0 | No | 0 | X | 0 | 0 |
| | | | 1 | Yes | | | | |
| Pr-89 | 0h1B59 | Fan status | Bit | 00~01 | 0 | - | 0 | 0 |
| | | | 00 | - | | | | |
| | | | 01 | Fan exchange | | | | |
| Pr-90 | 0h1B5A | Relay open trip selection | - | | - | X | 0 | 0 |
| Pr-91 | 0h1B5B | Fault history 1 | - | | - | - | 0 | 0 |
| Pr-92 | 0h1B5C | Fault history 2 | - | | - | - | 0 | 0 |
| Pr-93 | 0h1B5D | Fault history 3 | - | | - | - | 0 | 0 |
| Pr-94 | 0h1B5E | Fault history 4 | - | | - | - | 0 | 0 |
| Pr-95 | 0h1B5F | Fault history 5 | - | | - | - | 0 | 0 |
| Pr-96 | 0h1B60 | Fault history deletion | 0 | No | 0: No | 0 | 0 | 0 |
| | | | 1 | Yes | | | | |

*SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL | |
|----------------------|--------------|--------------------------------------|---------------------------------------|----------------------------|-------------|-----|----|---|
| M2-00 | - | Jump code | 1~99 | 14 | O | O | O | |
| M2-04 | 0h1C04 | Acceleration time | 0.0~600.0(s) | 20.0 | O | O | O | |
| M2-05 | 0h1C05 | Deceleration time | 0.0~600.0(s) | 30.0 | O | O | O | |
| M2-06 | 0h1C06 | Motor capacity | 0 | 0.2 kW | - | X | O | O |
| | | | 1 | 0.4 kW | | | | |
| | | | 2 | 0.75 kW | | | | |
| | | | 3 | 1.1 kW | | | | |
| | | | 4 | 1.5 kW | | | | |
| | | | 5 | 2.2 kW | | | | |
| | | | 6 | 3.0 kW | | | | |
| | | | 7 | 3.7 kW | | | | |
| | | | 8 | 4.0 kW | | | | |
| | | | 9 | 5.5 kW | | | | |
| | | | 10 | 7.5 kW | | | | |
| 11 | 11.0kW | | | | | | | |
| M2-07 | 0h1C07 | Base frequency | 30.00~400.00(Hz) | 60.00 | X | O | O | |
| M2-08 | 0h1C08 | Control mode | 0 | V / F | 0: V / F | X | O | O |
| | | | 2 | Slip compen | | | | |
| | | | 4 | IM sensorless | | | | |
| M2-10 | 0h1C0A | Number of motor poles | 2~48 | Dependent on motor setting | X | O | O | |
| M2-11 | 0h1C0B | Rated slip speed | 0~3000(Rpm) | | X | O | O | |
| M2-12 | 0h1C0C | Motor rated current | 1.0~1000.0(A) | | X | O | O | |
| M2-13 | 0h1C0D | Motor no-load current | 0.5~1000.0(A) | | X | O | O | |
| M2-14 | 0h1C0E | Motor rated voltage | 170~480(V) | | X | O | O | |
| M2-15 | 0h1C0F | Motor efficiency | 64~100(%) | | X | O | O | |
| M2-16 | 0h1C10 | Load inertia rate | 0~8 | | X | O | O | |
| M2-17 | - | Stator resistance | Dependent on motor setting | | X | O | O | |
| M2-18 | - | Leakage inductance | | | X | O | O | |
| M2-19 | - | Stator inductance | | | X | O | O | |
| M2-20 ⁴⁴⁾ | - | Rotor time constant | | | 25~5000(ms) | X | O | O |
| M2-25 | 0h1C19 | V / F pattern | 0 | Linear | 0: Linear | X | O | O |
| | | | 1 | Square | | | | |
| | | | 2 | User V / F | | | | |
| M2-26 | 0h1C1A | Forward torque boost | 0.0~15.0(%) | 2.0 | X | O | O | |
| M2-27 | 0h1C1B | Reverse torque boost | 0.0~15.0(%) | | X | O | O | |
| M2-28 | 0h1C1C | Stall prevention level | 30~150(%) | 150 | X | O | O | |
| M2-29 | 0h1C1D | Electronic thermal 1 minute rating | 100~200(%) | 150 | X | O | O | |
| M2-30 | 0h1C1E | Electronic thermal continuous rating | 50-Electronic thermal 1 minute rating | 100 | X | O | O | |
| M2-31 | 0h1C1F | Low-speed torque compensation gain | 50~300(%) | Varies by motor capacity | X | X | O | |

• In the following table, data shaded in blue will be displayed when the related code has been selected.

• The 2nd Motor function group will be displayed if any of In.65-71 is set to 26 (2nd motor).

• SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

⁴⁴⁾ Displayed when M2.08 is set to 4(IM Sensorless).

| Code | Comm.Address | Name | Setting Range | Initial Value | Property* | V/F | SL |
|-------|--------------|--|---------------|--------------------------|-----------|-----|----|
| M2-32 | 0h1C20 | Output torque compensation gain | 50~300(%) | Varies by motor capacity | X | X | O |
| M2-33 | 0h1C21 | Speed deviation sub compensation gain | 50~300(%) | Varies by motor capacity | X | X | O |
| M2-34 | 0h1C12 | Speed deviation main compensation gain | 50~300(%) | Varies by motor capacity | X | X | O |
| M2-40 | 0h1C28 | Rotation count speed gain | 0.1~6000.0[%] | 100.0 | O | O | O |
| M2-41 | 0h1C29 | Rotation count speed scale | 0 | x 1 | 0: x 1 | O | O |
| | | | 1 | x 0.1 | | | |
| | | | 2 | x 0.01 | | | |
| | | | 3 | x 0.001 | | | |
| | | | 4 | x 0.0001 | | | |
| M2-42 | 0h1C2A | Rotation count speed unit | 0 | Rpm | 0: rpm | O | O |
| | | | 1 | mpm | | | |

- The 2nd Motor function group will be displayed if any of In.65-71 is set to 26 (2nd motor).
- SL: Sensorless vector control (dr.09), Property: Write-enabled during operation

Braking Resistor Specification

| Capacity(kW) | | Resistance(Ω) | Rated Capacity(W) |
|-----------------------|------|---------------|-------------------|
| 3-Phase 200V Class | 0.4 | 300 | 100 |
| | 0.75 | 150 | 150 |
| | 1.5 | 60 | 300 |
| | 2.2 | 50 | 400 |
| | 3.7 | 33 | 600 |
| | 4 | 33 | 600 |
| | 5.5 | 20 | 800 |
| | 7.5 | 15 | 1200 |
| 3-Phase 400V Class | 0.4 | 1200 | 100 |
| | 0.75 | 600 | 150 |
| | 1.5 | 300 | 300 |
| | 2.2 | 200 | 400 |
| | 3.7 | 130 | 600 |
| | 4 | 130 | 600 |
| | 5.5 | 85 | 1000 |
| | 7.5 | 60 | 1200 |

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

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

| Capacity(kW) | Circuit Breaker | | | Leakage Breaker | | Magnetic Contactor | |
|--------------------------|-----------------|------------|-----------------------|-----------------|----------------|--------------------|------------|
| | Model | Current(A) | Specific Model Name | Model | Current(A) | Model | Current(A) |
| 3-Phase 200V Class | 0.4 | UTE100H | UTE100-H·FTU·15·3P·UL | EBS33c | 5 | MC-6a | 9 |
| | 0.75 | | | | 10 | MC-9a, MC-9b | 11 |
| | 1.5 | | | | 15 | MC-18a, MC-18b | 18 |
| | 2.2 | 20 | UTE100-H·FTU·20·3P·UL | 20 | MC-22b | 22 | |
| | 4.0 | 30 | UTE100-H·FTU·30·3P·UL | 30 | MC-32a | 32 | |
| | 5.5 | UTS150H | 50 | EBS53c | 50 | MC-50a | 55 |
| 7.5 | 60 | | EBS63c | 60 | MC-65a | 65 | |
| 3-Phase 400V Class | 0.4 | UTE100E | UTE100-E·FTU·15·3P·UL | EBS33c | 5 | MC-6a | 7 |
| | 0.75 | | | | MC-6a | | |
| | 1.5 | | | | 10 | MC-9a, MC-9b | 9 |
| | 2.2 | 20 | UTE100-E·FTU·20·3P·UL | 20 | MC-12a, MC-12b | 12 | |
| | 4.0 | 30 | UTE100-E·FTU·30·3P·UL | 30 | MC-18a, MC-18b | 18 | |
| | 5.5 | 30 | UTE100-E·FTU·30·3P·UL | 30 | MC-22b | 22 | |
| 7.5 | | | | 30 | MC-32a | 32 | |

Fuse and Reactor Specifications

| Capacity (kW) | AC Input Fuse | | | AC Reactor | | | |
|--------------------------|---------------|-------------|-------------|-----------------|-------------|------|-----|
| | Model | Current (A) | Voltage (V) | Inductance (mH) | Current (A) | | |
| 3-Phase 200V Class | 0.4 | DFJ-10 1) | 600 | | 1.20 | 10 | |
| | 0.75 | | | | | | |
| | 1.5 | DFJ-15 | | | 15 | 0.88 | 14 |
| | 2.2 | DFJ-20 | | | 20 | 0.56 | 20 |
| | 4.0 | DFJ-30 | | | 30 | 0.39 | 30 |
| | 5.5 | DFJ-50 | | | 50 | 0.30 | 34 |
| | 7.5 | DFJ-60 | | | 60 | 0.22 | 45 |
| 3-Phase 400V Class | 0.4 | DFJ-10 | 600 | | 4.81 | 4.8 | |
| | 0.75 | | | | | | |
| | 1.5 | DFJ-15 | | | 15 | 3.23 | 7.5 |
| | 2.2 | DFJ-20 | | | 20 | 2.34 | 10 |
| | 4.0 | DFJ-30 | | | 30 | 1.22 | 15 |
| | 5.5 | DFJ-35 | | | 35 | 1.12 | 19 |
| 7.5 | | | 0.78 | 27 | | | |

Note1) DFJ is class J / 600V level model name of the bussmann company.

Caution Use class CC, G, J, L, R or T UL listed Input fuse and UL listed breaker only. See the table above for the voltage and current rating of the fuse and the breaker.

| Voltage | Model Number | Rated Power (kW) | HD | | | | ND | | | |
|---------|----------------|------------------|-------------------------|-----------------|--------------------|--------------------|-------------------------|-----------------|--------------------|--------------------|
| | | | Rated Output Current(A) | Total Losses(W) | Internal Losses(W) | Heat Losses (Kcal) | Rated Output Current(A) | Total Losses(W) | Internal Losses(W) | Heat Losses (Kcal) |
| 220 | LSLV0004G100-2 | 0.4 | 2.5 | 19 | 16.8 | 2 | 3.1 | 24 | 16.8 | 7 |
| 220 | LSLV0008G100-2 | 0.75 | 5.0 | 34 | 16.8 | 14 | 6.0 | 37 | 16.8 | 17 |
| 220 | LSLV0015G100-2 | 1.5 | 8.0 | 50 | 17.4 | 28 | 9.6 | 59 | 17.4 | 35 |
| 220 | LSLV0022G100-2 | 2.2 | 11.0 | 80 | 17.4 | 54 | 12.0 | 89 | 17.4 | 62 |
| 220 | LSLV0037G100-2 | 4.0 | 17.0 | 127 | 17.7 | 94 | 18.0 | 160 | 17.7 | 122 |
| 220 | LSLV0055G100-2 | 5.5 | 24.0 | 173 | 18.7 | 132 | 30.0 | 267 | 18.7 | 214 |
| 220 | LSLV0075G100-2 | 7.5 | 32.0 | 247 | 18.7 | 197 | 40.0 | 398 | 18.7 | 326 |
| 440 | LSLV0004G100-4 | 0.4 | 1.3 | 21 | 17.4 | 3 | 2.0 | 22 | 17.4 | 4 |
| 440 | LSLV0008G100-4 | 0.75 | 2.5 | 25 | 17.4 | 7 | 3.1 | 31 | 17.4 | 12 |
| 440 | LSLV0015G100-4 | 1.5 | 4.0 | 40 | 17.7 | 19 | 5.1 | 47 | 17.7 | 25 |
| 440 | LSLV0022G100-4 | 2.2 | 5.5 | 54 | 17.7 | 31 | 6.9 | 57 | 17.7 | 33 |
| 440 | LSLV0037G100-4 | 4.0 | 9.0 | 93 | 18.7 | 64 | 10.0 | 125 | 18.7 | 91 |
| 440 | LSLV0055G100-4 | 5.5 | 12.0 | 170 | 19.7 | 129 | 16.0 | 153 | 19.7 | 115 |
| 440 | LSLV0075G100-4 | 7.5 | 16.0 | 194 | 19.7 | 149 | 23.0 | 225 | 19.7 | 177 |

Total losses

Capacity(kW) x (1-Efficiency/100) x 1000 = W
 ex) 0.4kW x (1- 95.3/100) x 1000 = 18.8W
 Total losses = Internal loss + External loss

Internal losses

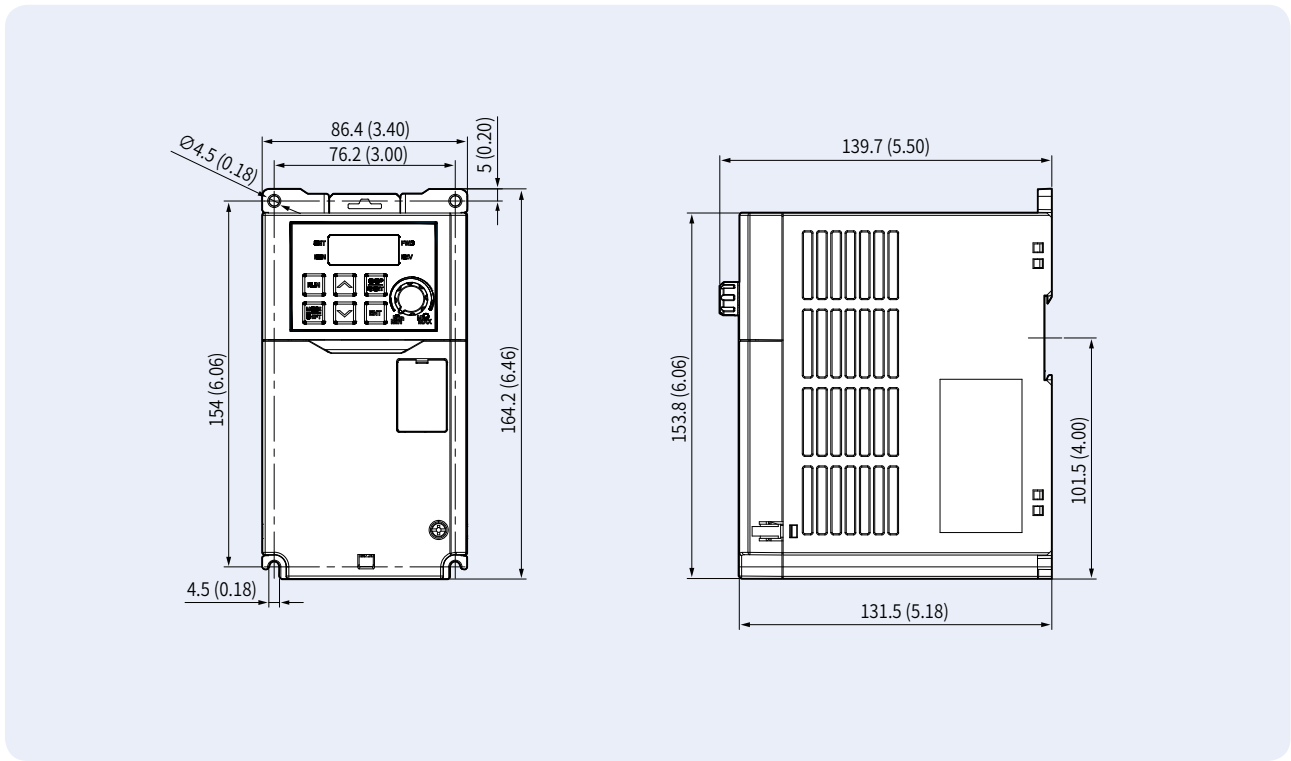
Based on design standard such as SMPS Rated Capacity, Fan and so forth

External(Heat) losses

1wh = 3,600J, 1kcal = 4,186 J
 Efficiency= Output/(Output+Loss)*100=Output/Input*100
 Loss*0.9=Heat Loss
 -> Other Loss 0.1
 Σ(The number of installed drive at each capacity*Heat) = Total amount of Heat

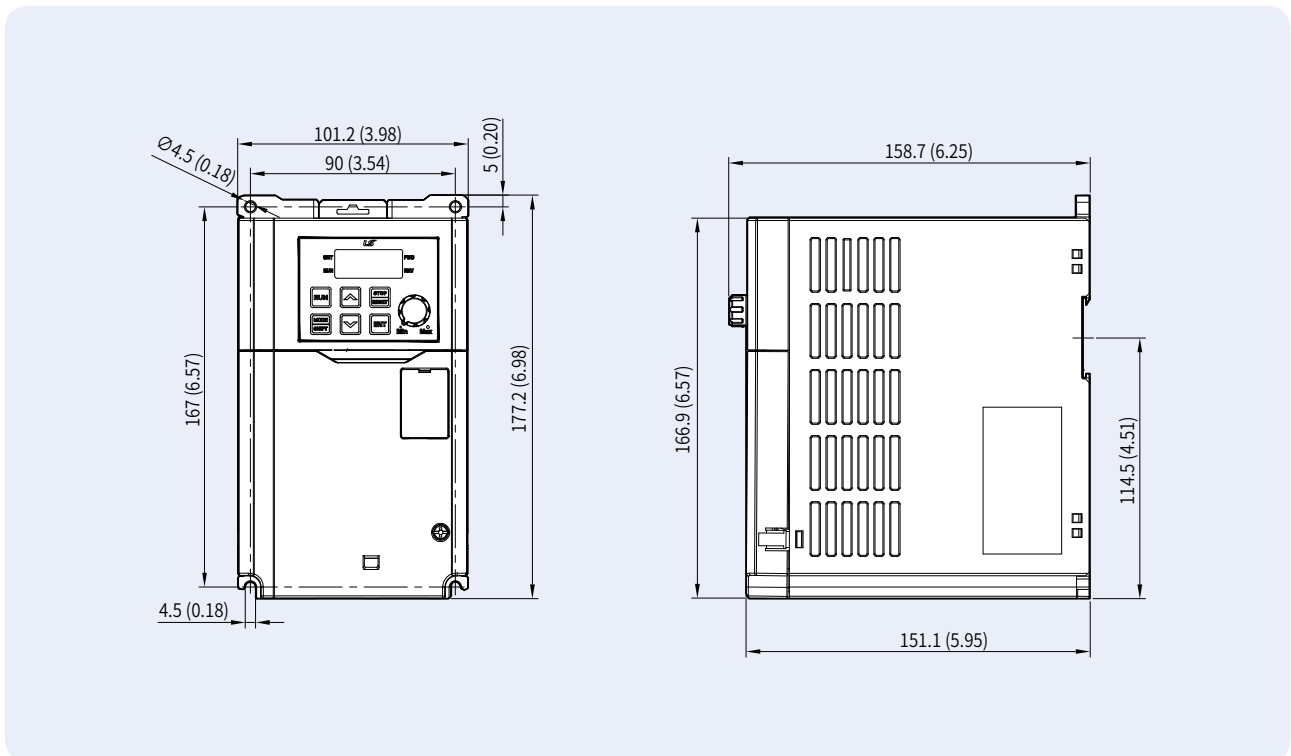
0.4~0.75kW (0004G100-2, 0008G100-2, 0004G100-4, 0008G100-4)

Units: mm(Inches)



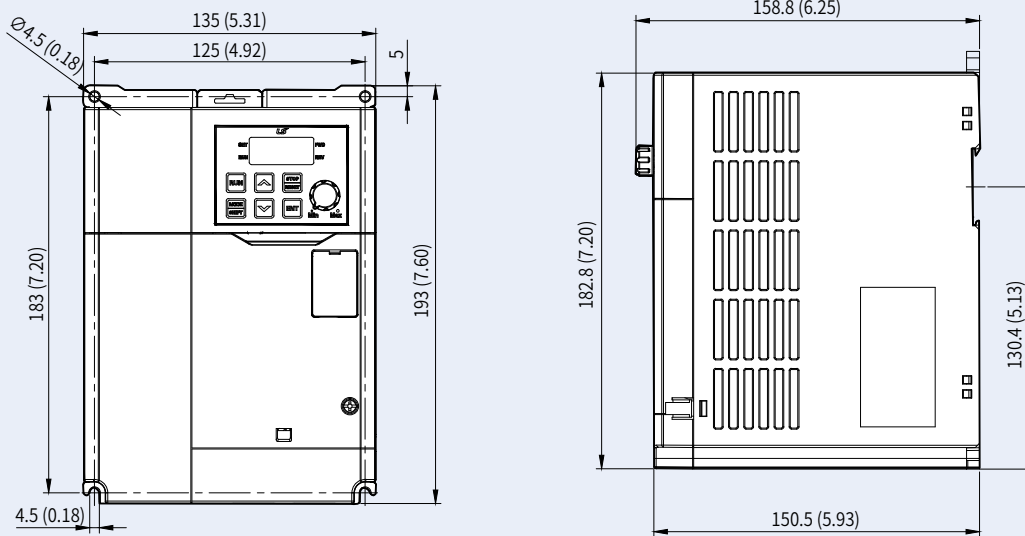
1.5~2.2kW (0015G100-2, 0022G100-2, 0015G100-4, 0022G100-4)

Units: mm(Inches)



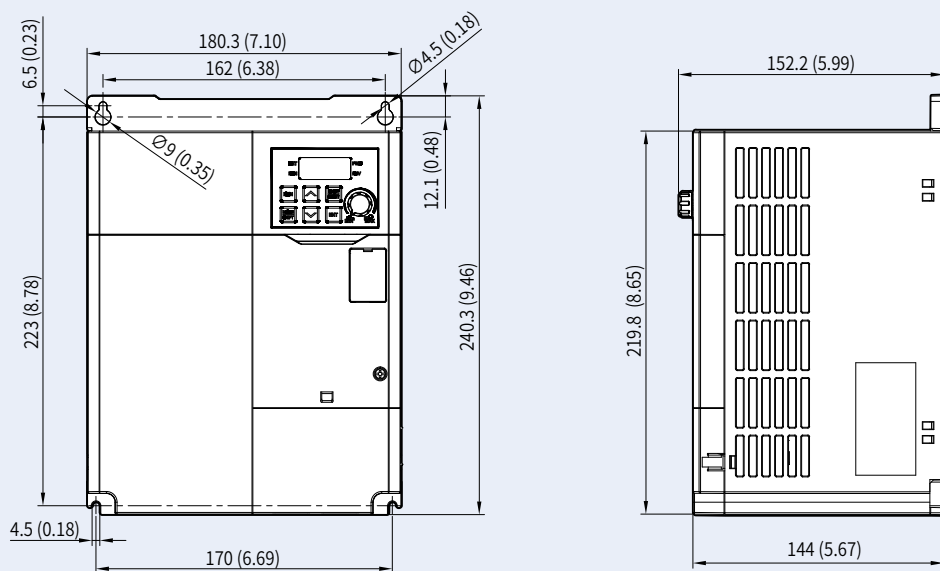
4.0kW (0040G100-2, 0040G100-4)

Units: mm(Inches)



5.5~7.5kW (0055G100-2, 0075G100-2, 0055G100-4, 0075G100-4)

Units: mm(Inches)



Global Network

LSIS is engaged in business all over the world.
 LSIS global network includes 7 overseas corporations, 12 overseas branches, and 224 clients in 77 countries.



► R&D



R&D Campus

Focuses on gaining competitive advantages through development of next generation platforms



Power Device R&D Center

Leading technology in electric industry and continuously developing future-growth dynamic engines



Automation R&D Center

Serves as the main research institute for LSIS



PT&T (Testing laboratory)

Internationally-renowned testing center that has formed partnerships with the UL, CE, KEMA and CESI



Cheongju Factory (Korea)

Electric products, mold TR, MV/LV switchgear, HV GIS

► Factory



Cheonan Factory (Korea)

PLC, AC drive, HMI, DCS,
PV module



Busan Factory (Korea)

HV TR, HVDC, FACTS



Wuxi Factory (China)

Electric products



Dalian Factory (China)

MV/LV switchgear, MV contactor



Hanoi Factory (Vietnam)

MV/LV switchgear, Mold TR



Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance. Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.



- According to The WEEE Directive, please do not discard the device with your household waste.



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