



New micro size drive
of LS Industrial Systems

STARVERT **iE5**

Optimum solution for small size motor control

0.1~0.4kW 1Phase 200~230Volts
0.1~0.4kW 3Phase 200~230Volts

Experience the power!



04 Key features of product

06 Model and Specifications

07 Standard Specification

08 Wiring

09 Terminal and loader functions

10 Shifts between each code and group

12 Function code table

18 Protections

19 Check & Remedy

20 Peripheral device Specifications

21 Dimension

Small but Powerful!

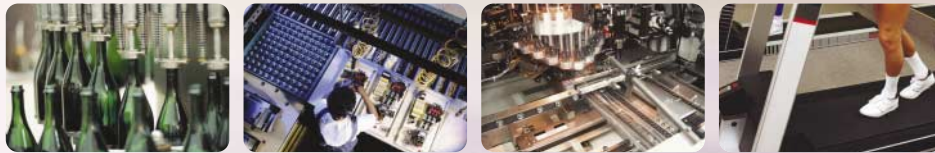
We have created the Micro class drive to provide the optimal solution for small size motor controls.

You will be experiencing amazing power with this slim size.



Slim and variety!

Our iE5 is best fit for small machineries
such as packing machines, small conveyers, treadmills and etc...



Smaller micro size

Our iE5 realizes 5% smaller micro size comparing to previous product.



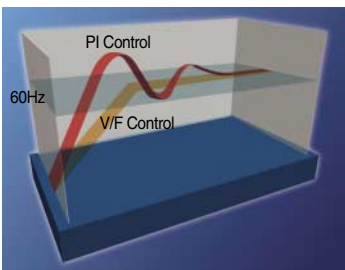
Easy operation and control

The operation became easy by adopting the 6 keys and volume resistor types on the loader. Besides, convenience is guaranteed by limiting the total number of parameters as 100 parameters.



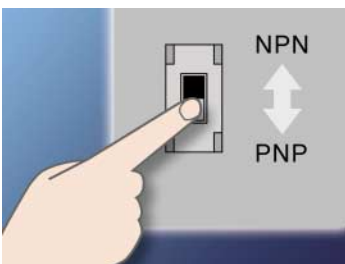


PI Control



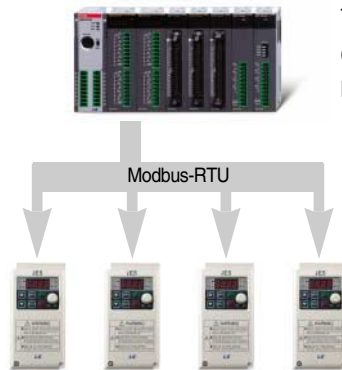
The PI Control is used to control the oil level, temperature and pressure of plant and process. This drive speed control function compares between drive setting value and signal values gauged from sensors and actual control is made through Proportion and Integral.

PNP, NPN dual control Signal



iE5 provides both PNP and NPN minor signal powers so that no matter what signal type the external controller adopts, +24V power can be applied.

Modbus communication interface (optional)



The optional modbus communication enables controlling drives through PLC and other controlling devices.

Parameter copy function (Under development)



The parameters inputted to a drive can be duplicated and copied to other drives by this parameter copy unit.



Model and Specifications

| Motor | 220V(Single phase) | 220V(3 phase) |
|--------------|--------------------|---------------|
| 0.1kW(1/8HP) | SV001 iE5-1 | SV001 iE5-2 |
| 0.2kW(1/4HP) | SV002 iE5-1 | SV002 iE5-2 |
| 0.4kW(0.5HP) | SV004 iE5-1 | SV004 iE5-2 |

C : RS-485 communication is available as option
 - : RS-485 communication is not available


Input voltage 1 : Single 220V class
 2 : 3Phase 220V class

SV 004 iE5 1 C

LS Inverter Starvert series

Maximum motor capacity(kW)
 (001 : 0.1kW ~ 004 : 0.4kW)

LS Inverter series name

| | | |
|--|---|---|
| SV004iE5-1 | | Inverter model |
| INPUT | 200 ~ 230V 1phase 5.5A 50/60Hz | Input voltage specification |
| OUTPUT | 0 ~ INPUT V 3phase 2.5A 0.1~200Hz 0.5HP/0.4kW (D) | Output voltage, Rated output current, Frequency, Inverter capacity |
|  0010222100155 | | Barcode and serial number |
| LS Industrial Systems Co., Ltd. Made in Korea | | |

Standard Specification

Basic specification

| Model : SV□□□ iE5-□ | | 001-1 | 002-1 | 004-1 | 001-2 | 002-2 | 004-2 |
|---------------------|------------------------|------------------------------|-------|-------|------------------------------|-------|-------|
| Applicable motor | [HP] | 1/8 | 1/4 | 1/2 | 1/8 | 1/4 | 1/2 |
| | [kW] | 0.1 | 0.2 | 0.4 | 0.1 | 0.2 | 0.4 |
| Rated output | Rated capacity [kVA] | 0.3 | 0.6 | 0.95 | 0.3 | 0.6 | 1.14 |
| | Rated current [A] | 0.8 | 1.4 | 2.5 | 0.8 | 1.6 | 3.0 |
| | Output frequency [Hz] | 0 ~ 200 [Hz] | | | | | |
| | Output voltage [V] | 3 phase 200 ~ 230V | | | | | |
| Rated input | Applicable voltage [V] | 1 phase 200 ~ 230 VAC (±10%) | | | 3 phase 200 ~ 230 VAC (±10%) | | |
| | Input frequency[Hz] | 50 ~ 60 [Hz] (±5%) | | | | | |
| | Rated current [A] | 2.0 | 3.5 | 5.5 | 1.2 | 2.0 | 3.5 |

Control

| | |
|--------------------------|--|
| Control type | V/F Control |
| Frequency set resolution | Digital command : 0.01Hz Analog command : 0.06Hz (Max.frq : 60Hz) |
| Frequency accuracy | Digital command : 0.01% of Max. Output frequency Analog command : 0.1% of Max. Output frequency |
| V/F pattern | Linear, Squared, User V/F |
| Overload capacity | 150% / 1Min |
| Torque boost | Manual / Auto torque boost |

*Note1) The standard of rated capacity is 220V.

*Note2) The maximum output voltage does not increase over input voltage and the output voltage can be set below input voltage level.

Operation

| | | |
|--------------------|---|--|
| Operation method | Operation method can be selected between loader, terminal and communication operation | |
| Frequency set | Analog method : 0~10(V), 0~20(mA), Loader volume Digital method : Loader | |
| Operation function | PI Control, Up-Down , 3-wire operation | |
| Input | Multi-function terminal (5 points) P1,P2,P3, P4,P5 | NPN / PNP Selectable FWD/REV operation, Fault reset, Jog operation, Multi-step frequency(up/down), DC braking in stop mode, Frequency increase, Frequency decrease, 3 wire-operation external trip A and B, Shift to general operation from PI operation. Analogue command frequency set, Up/down save frequency delete |
| | Multi-function relay terminal | Fault and drive operation condition output (N.) N.C) AC250V below 0.3A and below DC 30V 1A |
| | Analogue output | 0~10Vdc(below 10mA) : can be selected among frequency, current, voltage, DC voltage |

Protection

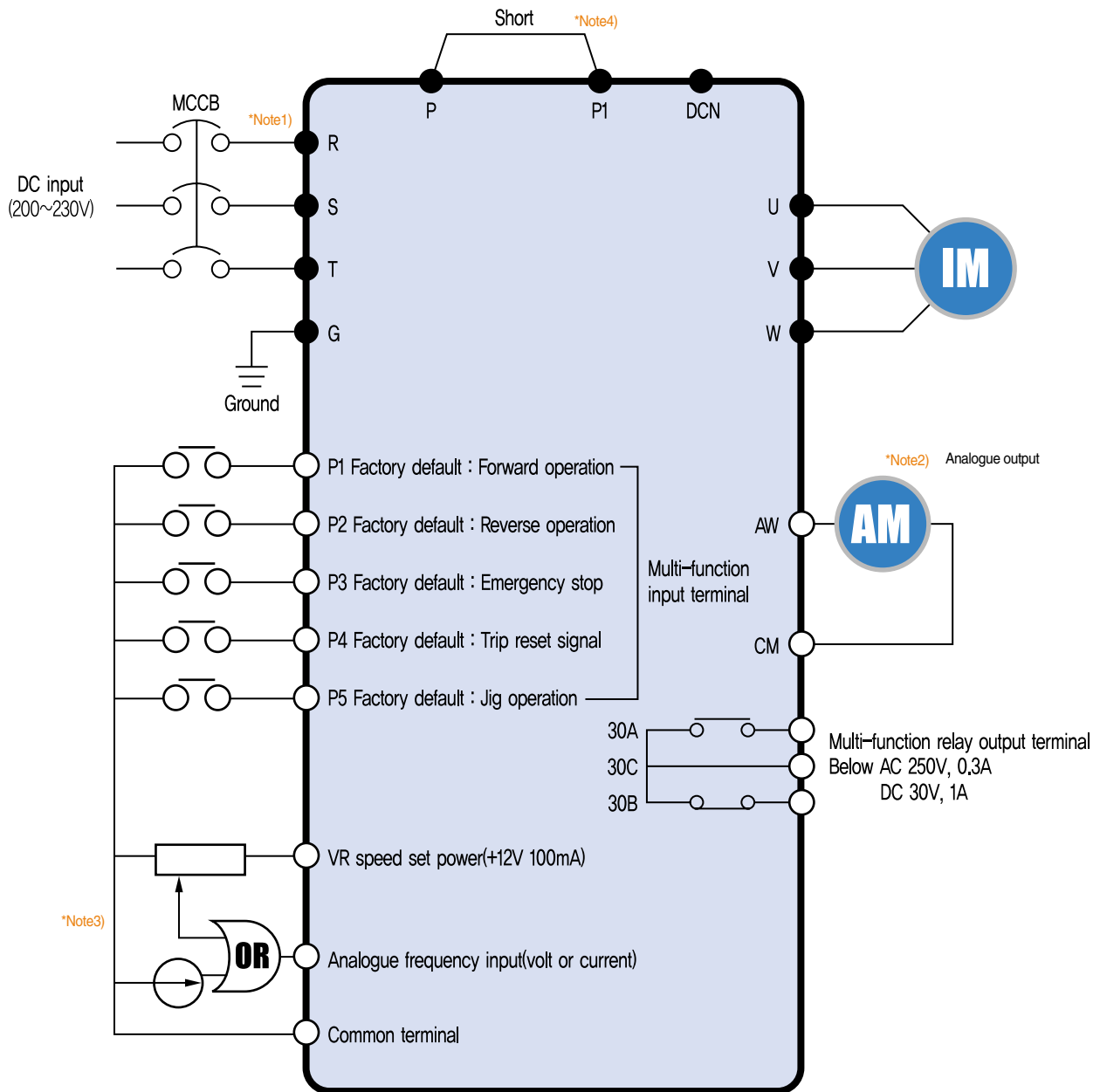
| | |
|----------------------|--|
| Trip | Over voltage, Under voltage, Over current, Ground fault, Drive overload, Overload trip, Overheat, Condensor overload, Phase loss overload protection, Frequency command loss, Hardware fault |
| Alarm | Stall prevention |
| Momentary power loss | Below 15msec : Operation continued (should be within rated input voltage and rated output) Over 15msec : Auto re-ignition operation. |

Guaranteed operation condition

| | |
|------------------------|--|
| Cooling | Open cooling |
| Enclosure | IP20 (open type) |
| Ambient temperature | -10°C ~ 65°C |
| Protection temperature | -20°C ~ 65°C |
| Humidity | Below 90% RH (non-condensation) |
| Altitude/Vibration | Below 1000m, 5.9m/sec square (0.6G) |
| Installation condition | No corrosive gas, No flammable gas, No oil mist, No dust |



Wiring



*Note1) "●" and "○" means the main circuit and the control circuit respectively.

Please connect to the R and S terminals in case of single phase use.

*Note2) The analogue output is from zero to 10V.

*Note3) The voltage current and loader volume is possible for the external speed command.

*Note4) The P and P1 terminals for DC reactor are connected as short circuit.

Terminal Function



| | Terminal signal | Terminal name | Description |
|--------------|-----------------|-----------------------|-------------------------------|
| Main circuit | R, S, T | DC input | Connect 3 phase AC power |
| | U, V, W | Inverter output | Connect 3 phase induced motor |
| | P, P1 | DC reactor connection | Connect DC reactor. |
| | G | Ground | Ground connection terminal |

*Note) Please connect to the R and S terminals for single phase drive.



| Classification | Terminal signal | Terminal name | Description |
|----------------|--------------------|-------------------------------|---|
| Input signal | P1, P2, P3, P4, P5 | Multifunction input terminal | Factory default value P1 (FX : forward operation) P2 (RX : Reverse operation) P3 (EST : Emergency stop) P4 (RST : Trip clear signal) P5 (JOG : Jog frequency operation) |
| | VR | Frequency set power | Analog frequency set power. Max, output is +12V 100mA. |
| | AI | Frequency set(Volt/Current) | DC 0~10V and DC 4~20mA can be set as basic frequency. |
| | CM | Frequency set common terminal | Analog frequency set signal and AM common terminal. |
| Output signal | AM-CM | Display | Among output frequency, output current and output voltage, one item can be selected as output. Factory set is output frequency. Max output voltage is 0~10V. (Below 10mA) |
| | 30A, 30C, 30B | Multifunctional relay | Inverter protection function is activated as blocking the output and releasing multifunction signal. AC 250V below 0.3A and below DC 30V 1A. |

Loader Function

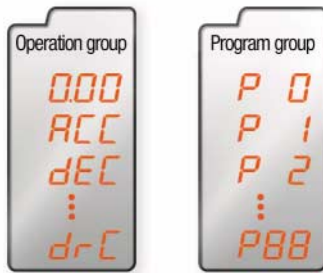


| Classification | Display | Function | Function description | |
|----------------|----------------------------------|---------------|--|--|
| LED | FWD | Forward | Light is on with forward operation. | |
| | REV | Reverse | Light is on with reverse operation. | |
| | SET | On setting | Light is on when parameter is being set. | |
| | RUN | On operation | Light is off when the inverter is on Acc/Dcc and on with normal speed operation. | |
| KEY | ▲ | Up key | For code shift or increasing parameter set value. | |
| | ▼ | Down key | For code shift or decreasing parameter set value. | |
| | RUN | Operation key | For inverter operation | |
| | STOP | Stop/Reset | Stop command key during operation and also used as fault clear key. | |
| | FUNC | Function key | Used for changing parameter set value and saving its value | |
| | SHFT | Shift key | Shift between groups and parameter setting or moving digit number to the left. | |
| | Volume resistor | | For changing operation frequency. | |
| | NPN/PNP selection switch | | Turning to either NPN or PNP mode. | |
| | Current/Voltage selection switch | | Switch for transforming the analog switch inputs into current or voltage. | |



Shifts between each code and group

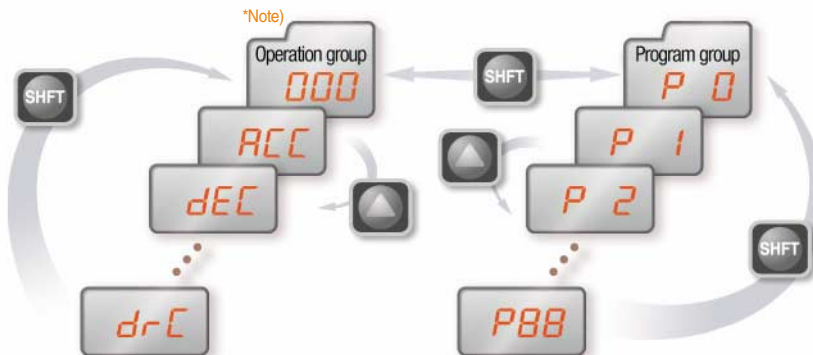
■ Diagram of function code shift method



The parameter group of iE5 consists of below two groups

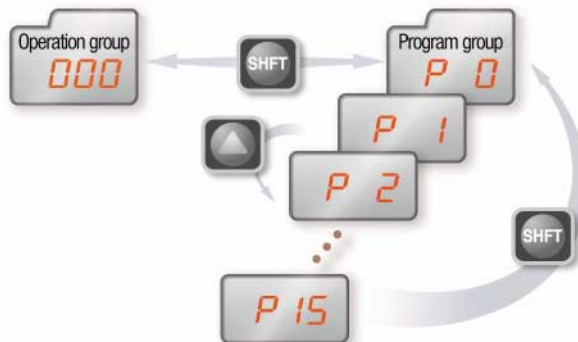
| Group name | Content |
|-----------------|--|
| Operation group | Basic parameters for operation such as the Target frequency, Acc/Dec time and etc. |
| Program group | Additional function set parameter |

- Shifts between groups can be enabled pressing the shift key at the zero code of the operation and program groups.



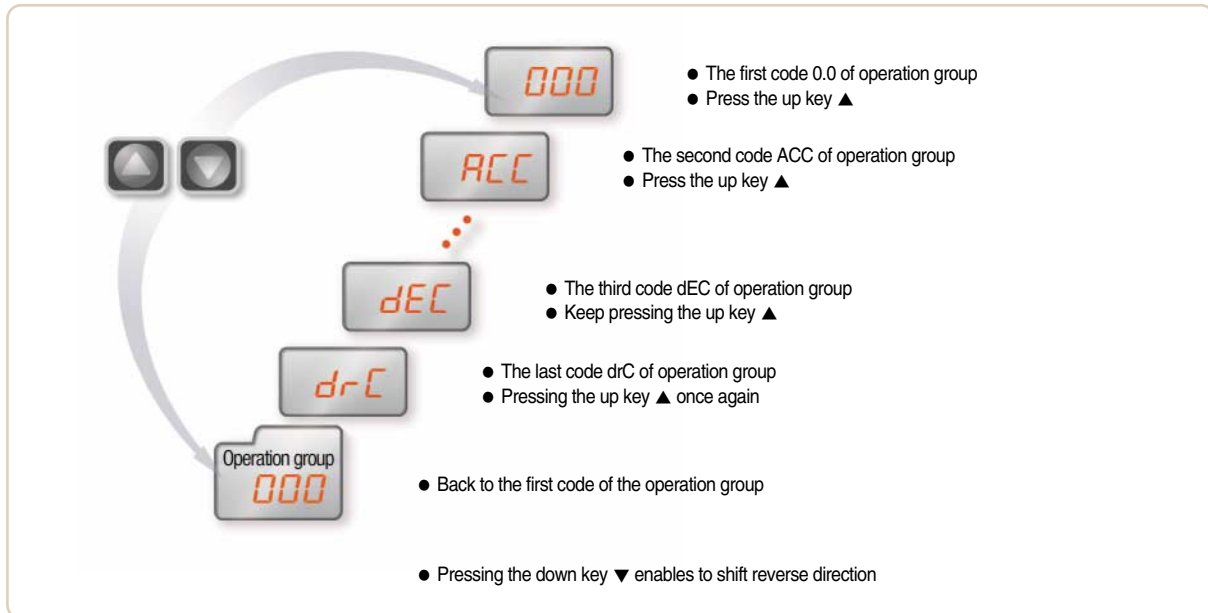
*Note) The target frequency can be set at the first group of operation group so that the factory default value has been set as 0.0 yet in case of frequency change, the changed frequency is displayed.

- If a user presses the shift key out of number 0, the activating parameter shifts to 0 and if the user presses once more the shift key can be shifted between groups.

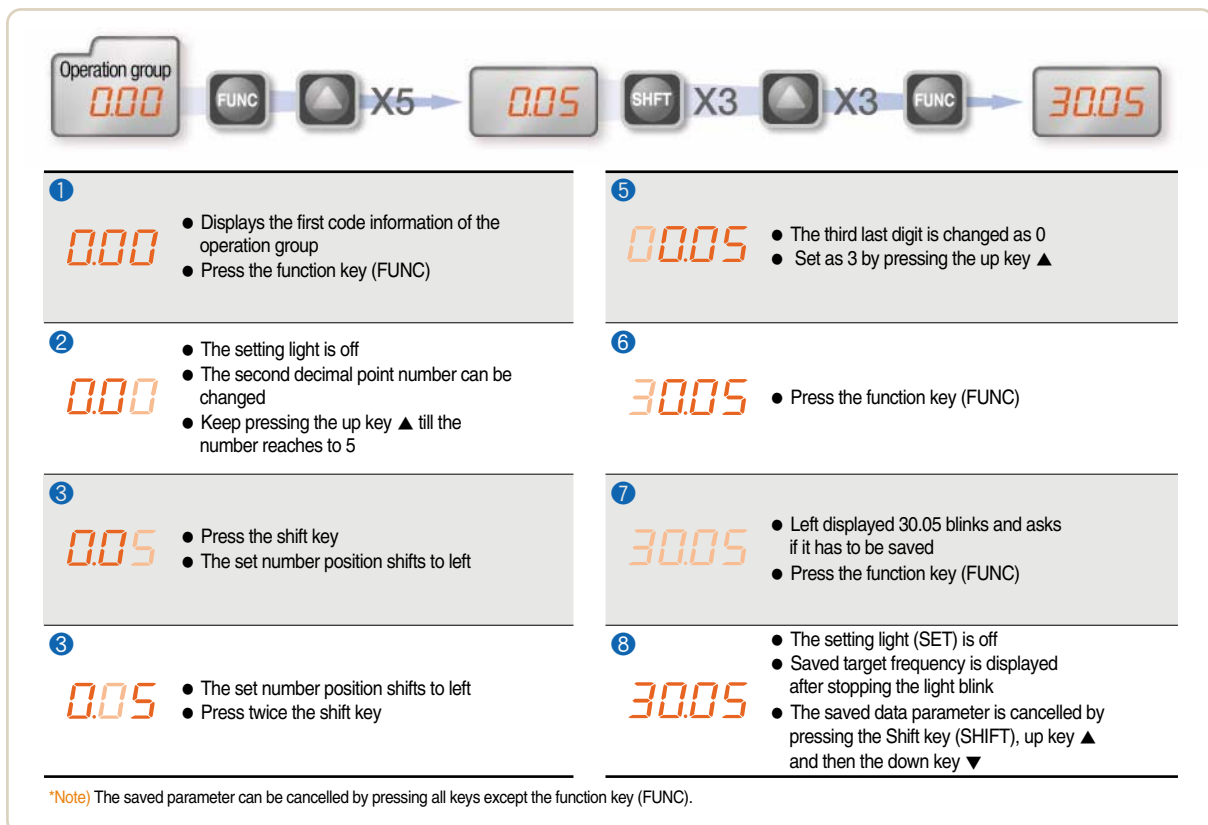


Shifts between each code and group

Operation group code shifts



Setting the operation group frequency to 30.05Hz (Keypad operation)





Parameter Descriptions

■ Operation group

| Display | Function | Setting range | Description | Factory default | Mode change during run | | |
|---------|---|----------------|--|--|------------------------------------|---|---|
| 0.0 | Command frequency | 0 ~ 200 [Hz] | Operation frequency set. Displays the command frequency during stop mode and displays the output frequency during run. In case of multi-speed operation, the frequency will be zero speed. The frequency setting can not be set over the maximum frequency(P16). | 0.0 | ○ | | |
| ACC | Acceleration time | 0 ~ 6000 [sec] | Zero times acc/dec time in case of multi-step speed acc/dec. | 5.0 | ○ | | |
| dEC | Acceleration time | | | 10.0 | ○ | | |
| drv | Operation command method | 0 ~ 3 | 0 | Operation using the RUN key and the STOP key of loader | | | |
| | | | 1 | Terminal operation | FX : Forward operation command | 1 | × |
| | | | | | RX : Reverse operation command | | |
| | | | 2 | FX : Operation and Stop command | | | |
| 3 | Communication operation: Operation by communication | | | | | | |
| Frq | Frequency setting method | 0 ~ 4 | 0 | Digital | Loader digital frequency setting 1 | 0 | × |
| | | | 1 | | Loader digital frequency setting 2 | | |
| | | | 2 | Analog | Terminal AI input | | |
| | | | 3 | | Loader volume resistor | | |
| | | | 4 | | Communication option | | |
| St1 | Multi step frequency 1 | 0 ~ 200 [Hz] | Speed 1 frequency set in case of multi step operation | 10.0 | ○ | | |
| St2 | Multi step frequency 2 | | Speed 2 frequency set in case of multi step operation | 20.0 | ○ | | |
| St3 | Multi step frequency 3 | | Speed 3 frequency set in case of multi step operation | 30.0 | ○ | | |
| CUr | Output current | - | Output current display | - | - | | |
| rPM | No of times of motor spin | - | Displaying no of time of motor spin(RPM) | - | - | | |
| dCL | Inverter DC voltage | - | Displaying the DC link voltage of inverter inside | - | - | | |
| vOL | Output voltage | - | Displaying output voltage | vOL | - | | |
| nOn | Fault status | - | Displaying the trip type, frequency, current and operation condition of trip | - | - | | |
| drC | Spin direction selection | F, r | Setting the operation command method as 0 | | P | ○ | |
| | | | F | Forward operation | | | |
| | | | r | Reverse operation | | | |

■ Program group

| Display | Function | Setting range | Description | Factory default | Mode change during run | |
|---------|-----------------------------|---------------|---|--------------------------------------|------------------------|---|
| P0 | Jump code | 0 ~ 88 | Shifting code number set | 1 | ○ | |
| P1 | Fault history 1 | - | Fault type and frequency, current, acc/dec and stop condition of fault. The latest fault is saved as fault history no 1. | nOn | - | |
| P2 | Fault history 2 | - | | nOn | - | |
| P3 | Fault history 3 | - | | nOn | - | |
| P4 | Fault history delete | 0 ~ 1 | Deleting the fault history P1~P3 | 0 | ○ | |
| P5 | Forward/Reverse not allowed | 0 ~ 2 | 0 | Forward/Reverse spinning is possible | 0 | × |
| | | | 1 | Forward spinning not allowed | | |
| | | | 2 | Reverse spinning not allowed | | |
| P6 | Acceleration pattern | 0 ~ 1 | 0 | Liner pattern operation | 0 | × |
| P7 | Deceleration pattern | | 1 | S shape pattern operation | | |
| P8 | Stop mode selection | 0 ~ 2 | 0 | Deceleration stop | 0 | × |
| | | | 1 | DC braking stop | | |
| | | | 2 | Free run stop | | |
| P9 | DC braking frequency | 0.1 ~ 60 [Hz] | DC braking start frequency. DC braking frequency can not be set below the starting frequency P18. | 5.0 | × | |

*Note1)

Parameter Descriptions

■ Program group

*Note1)

| Display | Function | Setting range | Description | Factory default | Mode change during run | | | |
|---------|-------------------------------------|----------------|--|--------------------------------------|---|---|---|---|
| P10 | Output block time before DC braking | 0 ~ 60 [sec] | Output is blocked for set up time and starts DC braking. | 0.1 | × | | | |
| P11 | DC braking volume | 0 ~ 200 [%] | DC current size that flows to motor. The standard is motor rated current (P43). | 50 | × | | | |
| P12 | DC braking time | 0 ~ 60 [sec] | DC time that flows to motor. | 1.0 | × | | | |
| P13 | DC braking volume at ignition | 0 ~ 200 [%] | DC current volume that flows to motor before it spins. Motor rated current (P43). | 50 | × | | | |
| P14 | DC braking time of ignition | 0 ~ 60 [sec] | DC current flows to motor for scheduled time at ignition. | 0 | × | | | |
| P15 | Jog frequency | 0 ~ 200 [Hz] | Jog operation frequency can be set. The frequency can not be set over maximum frequency(P16). | 10.0 | ○ | | | |
| P16 | Maximum frequency | 40 ~ 200 [Hz] | Frequency setting related maximum value of parameters. The standard frequency of Acc/Dec lean. ☞ Note : Once the maximum frequency value is changed, all parameter values other than P17(standard frequency) are changed as the maximum frequencies that are all over the maximum frequencies. | 60.0 | × | | | |
| P17 | Standard frequency | 30 ~ 200 [Hz] | The output frequency within which the inverter output equals to the rated voltage of motor. | 60.0 | × | | | |
| P18 | Starting frequency | 0.1 ~ 10 [Hz] | The minimum parameter value of frequency level. | 0.5 | × | | | |
| P19 | Torque boost selection | 0 ~ 1 | 0 | Manual torque boost | 0 | × | | |
| | | | 1 | Automatic torque boost | | | | |
| P20 | Forward operation torque boost | 0 ~ 15 [%] | The boost volume, in case of forward operation, that flows to motor. In case of maximum output voltage. | 5 | × | | | |
| P21 | Reverse operation torque boost | 0 ~ 15 [%] | The boost volume, in case of reverse operation, that flows to motor. The maximum output voltage is standard. | 5 | × | | | |
| P22 | V/F pattern | 0 ~ 1 | 0 | Liner | 0 | × | | |
| | | | 1 | Square | | | | |
| P23 | Output voltage control | 40 ~ 110 [%] | Output voltage size control. The input voltage is standard. | 100 | × | | | |
| P24 | Overload trip selection | 0 ~ 1 | Blocking the inverter output in case of overload. The overload protection function is activated if user sets as number 1. | 1 | ○ | | | |
| P25 | Overload trip level | 50 ~ 200 [%] | Overload current size setting. Motor rated current (P43) is standard. | 180 | ○ | | | |
| P26 | Overload trip time | 0 ~ 60 [sec] | Inverter blocks output if the overload trip level(P25) current flows for the overload trip time. | 60 | ○ | | | |
| P27 | Stall prevention selection | 0 ~ 7 | Decelerating in acceleration or normal operation. Deceleration is stopped during deceleration operation. | | | 0 | × | |
| | | | | Stall prevention during deceleration | Stall prevention during normal deceleration | | | Stall prevention during acceleration deceleration |
| | | | | bit 2 | bit 1 | | | bit 0 |
| | | | 0 | - | - | | | - |
| | | | 1 | - | - | | | v |
| | | | 2 | - | v | | | - |
| | | | 3 | - | v | | | v |
| | | | 4 | v | - | | | - |
| 5 | v | - | v | | | | | |
| 6 | v | v | - | | | | | |
| 7 | v | v | v | | | | | |
| P28 | Stall prevention level | 30 ~ 150 [%] | Displaying the stall prevention current size during acceleration or normal operation in terms of percent(%). The motor rated current(P43) is standard. | 150 | × | | | |
| P29 | Up/Down frequency save selection | 0 ~ 1 | Selecting the set frequency for up/down operation. If user chooses number 1, it is saved onto up/down frequency(P30). | 0 | × | | | |
| P30 | Up/Down frequency save | - | Displaying up/down operation stop or before acceleration frequency. | 0.00 | - | | | |
| P31 | Dwell frequency | 0.1 ~ 200 [Hz] | Once operation command is inputted, first outputs the dwell frequency during dwell time(P32) and then starts acceleration. Dwell value can be set between the maximum frequency P16 and starting frequency P18. | 5.0 | × | | | |
| P32 | Dwell time | 0~10 [sec] | Dwell operation time setting | 0.0 | × | | | |

*Note1) The P8 has to be set as 1 (DC braking stop)



Parameter Descriptions

Program group

| Display | Function | Setting range | Description | Factory default | Mode change during run | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|--|---------------|--|-----------------|------------------------|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------|----------------------|-------|-------|-------|-------|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|---|---|---|----|---|---|---|---|----|---|---|---|---|----|---|---|---|---|----|---|---|---|---|----|---|---|---|---|
| P33 | User selection fault detect | 0 ~ 7 [bit] | Setting the fault detect item as per user selection. The input/output phase loss, ground detect during run can be selected. | 0 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>User selection fault detect [Trip]</th> <th>Ground detect during run GCt</th> <th>Input phase loss detect CoL</th> <th>Output phase loss detect(Pot)</th> </tr> <tr> <th></th> <th>bit 2</th> <th>bit 1</th> <th>bit 0</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>1</td> <td></td> <td></td> <td>v</td> </tr> <tr> <td>2</td> <td></td> <td>v</td> <td></td> </tr> <tr> <td>3</td> <td></td> <td>v</td> <td>v</td> </tr> <tr> <td>4</td> <td>v</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>v</td> <td></td> <td>v</td> </tr> <tr> <td>6</td> <td>v</td> <td>v</td> <td></td> </tr> <tr> <td>7</td> <td>v</td> <td>v</td> <td>v</td> </tr> </tbody> </table> | | | User selection fault detect [Trip] | Ground detect during run GCt | Input phase loss detect CoL | Output phase loss detect(Pot) | | bit 2 | bit 1 | bit 0 | 0 | - | - | - | 1 | | | v | 2 | | v | | 3 | | v | v | 4 | v | | | 5 | v | | v | 6 | v | v | | 7 | v | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | User selection fault detect [Trip] | | | Ground detect during run GCt | Input phase loss detect CoL | Output phase loss detect(Pot) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | bit 2 | bit 1 | bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0 | | | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | | | | | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 2 | | | | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 | | | | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 4 | | | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | v | | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | v | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P34 | Selecting start with power input | 0 ~ 1 | P34 is only used in case the operation command method is selected. Either terminal number 1 or 2. Acceleration is getting started when the FX or RX terminal is on with power input. | 0 | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P35 | Selecting start after trip | 0 ~ 1 | P34 is only used in case the operation command method is selected either terminal number 1 or 2. In the condition that the FX and RX terminals are on, after trip, resetting starts acceleration. | 0 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P36 | Speed search selection | 0 ~ 15 [bit] | While motor is on spining, this function prevents the probable faults. | 0 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th></th> <th>Starting with power input(P34)</th> <th>Restart after instant power failure</th> <th>Operation after trip (P35)</th> <th>General Acceleration</th> </tr> <tr> <th></th> <th>bit 3</th> <th>bit 2</th> <th>bit 1</th> <th>bit 0</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>1</td> <td>-</td> <td>-</td> <td>-</td> <td>v</td> </tr> <tr> <td>2</td> <td>-</td> <td>-</td> <td>v</td> <td>-</td> </tr> <tr> <td>3</td> <td>-</td> <td>-</td> <td>v</td> <td>v</td> </tr> <tr> <td>4</td> <td>-</td> <td>v</td> <td>-</td> <td>-</td> </tr> <tr> <td>5</td> <td>-</td> <td>v</td> <td>-</td> <td>v</td> </tr> <tr> <td>6</td> <td>-</td> <td>v</td> <td>v</td> <td>-</td> </tr> <tr> <td>7</td> <td>-</td> <td>v</td> <td>v</td> <td>v</td> </tr> <tr> <td>8</td> <td>v</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>9</td> <td>v</td> <td>-</td> <td>-</td> <td>v</td> </tr> <tr> <td>10</td> <td>v</td> <td>-</td> <td>v</td> <td>-</td> </tr> <tr> <td>11</td> <td>v</td> <td>-</td> <td>v</td> <td>v</td> </tr> <tr> <td>12</td> <td>v</td> <td>v</td> <td>-</td> <td>-</td> </tr> <tr> <td>13</td> <td>v</td> <td>v</td> <td>-</td> <td>v</td> </tr> <tr> <td>14</td> <td>v</td> <td>v</td> <td>v</td> <td>-</td> </tr> <tr> <td>15</td> <td>v</td> <td>v</td> <td>v</td> <td>v</td> </tr> </tbody> </table> | | | | Starting with power input(P34) | Restart after instant power failure | Operation after trip (P35) | General Acceleration | | bit 3 | bit 2 | bit 1 | bit 0 | 0 | - | - | - | - | 1 | - | - | - | v | 2 | - | - | v | - | 3 | - | - | v | v | 4 | - | v | - | - | 5 | - | v | - | v | 6 | - | v | v | - | 7 | - | v | v | v | 8 | v | - | - | - | 9 | v | - | - | v | 10 | v | - | v | - | 11 | v | - | v | v | 12 | v | v | - | - | 13 | v | v | - | v | 14 | v | v | v | - | 15 | v | v | v | v |
| | | | | | | Starting with power input(P34) | Restart after instant power failure | Operation after trip (P35) | General Acceleration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | bit 3 | bit 2 | bit 1 | bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0 | | | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | | | - | - | - | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 2 | | | - | - | v | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 | | | - | - | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 4 | | | - | v | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 5 | | | - | v | - | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 6 | | | - | v | v | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 7 | | | - | v | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 8 | | | v | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 9 | | | v | - | - | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 10 | | | v | - | v | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 11 | | | v | - | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | v | v | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | v | v | - | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | v | v | v | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | v | v | v | v | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P37 | Speed search current level | 80 ~ 200 [%] | The current size during speed search operation is limited. Motor rated current(P43) is standard. | 100 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P38 | Number of times of Auto-restart | 0 ~ 10 | Setting number of times that drive can operate automatically after trip. If trips exceed the set times, drive does not restart automatically. Only use when the operation command method(drv) of operation group is selected either terminal number 1 or 2 and the operation command is inputted. However, the Auto-restart does not work in case the protective functions such as OHT, LVT, EST and HWT are in active. | 0 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P39 | Auto re-start stand by time after trip | 0 ~ 60 [sec] | Re-start is operated after the auto re-start stand-by time of trip. | 1.0 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P40 | Motor capacity selection | 0.1 ~ 0.4 | | - *Note2) | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P41 | Number of poles of motor | 2 ~ 12 | Used for number of spining times of motor of the operation group. | 4 | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*Note2) The initial value of P40 is set for the drive capacity.

Parameter Descriptions

■ Program group

| Display | Function | Setting range | Description | Factory default | Mode change during run | |
|---------|---|----------------|--|------------------------------------|------------------------|---|
| P42 | Motor rating Slip frequency | 0 ~ 10 [Hz] | The difference value between input power frequency and motor name plate displayed rated spin times(rpm) is inputted. | - *Note3) | × | |
| P43 | Motor rated current | 0.0 ~ 25.5 [A] | The printed rated current value of name plate is inputted. | - | × | |
| P44 | Non-load current of motor | 0.0 ~ 25.5 [A] | After taking out load from motor, the current value which was measured in operation condition of rated spin times is inputted. | - | × | |
| P45 | Carrier frequency selection | 1 ~ 10 [kHz] | As the set carrier value is larger the noise is smaller but the leaking current is bigger. | 3 | ○ | |
| P46 | Control type selection | 0 ~ 2 | 0 | V/F control | 0 | × |
| | | | 1 | Slip compensation control | | |
| | | | 2 | PI control | | |
| P47 | PI control P gain | 0 ~ 999.9 [%] | Gain setting for PI control response. | 300.0 | ○ | |
| P48 | PI control I time | 0.1~32.0 [sec] | | 1.0 | ○ | |
| P50 | PI control F gain | 0 ~ 99.99 [%] | Feed forward of PI control | 0.0 | ○ | |
| P51 | PI frequency highest limit | 0.1 ~ 200 [Hz] | Limits the frequency size that comes from PI calculation. | 60.0 | ○ | |
| P52 | PI frequency lowest limit | 0.1 ~ 200 [Hz] | The setting value can be between the maximum frequency(P16) and starting frequency(18). | 5.0 | ○ | |
| P53 | Power input display selection | 0 ~ 15 | First displayed items on the loader with power input. | | 0 | ○ |
| | | | 0 | Operation frequency | | |
| | | | 1 | Acceleration time | | |
| | | | 2 | Deceleration time | | |
| | | | 3 | Operation command method | | |
| | | | 4 | Frequency command method | | |
| | | | 5 | Multi-step frequency 1 | | |
| | | | 6 | Multi-step frequency 2 | | |
| | | | 7 | Multi-step frequency 3 | | |
| | | | 8 | Output current (Cur) | | |
| | | | 9 | Number of times of motor spin(rpm) | | |
| | | | 10 | Drive DC voltage (DCL) | | |
| | | | 11 | User selection (vOL) | | |
| | | | 12 | Fault status 1 | | |
| | | | 13 | Operation direction selection | | |
| | | | 14 | Output current display | | |
| 15 | Displaying number of times of motor spin | | | | | |
| P54 | Gain of number of times of motor | 1 ~ 1000 [%] | By calculating the gear rate of load system, displays the number of times of motor. Monitoring is possible at the (rPM) code. | 100 | ○ | |
| P55 | Constant number of AI filter input | 0 ~ 9999 | Controlling the analog input response. | 10 | ○ | |
| P56 | Minimum input of AI | 0 ~ 100 [%] | Minimum analog input value can be set as % of total input. | 0 | ○ | |
| P57 | AI input maximum voltage matching | 0 ~ 200 | Analog input minimum case frequency. | 0.0 | ○ | |
| P58 | AI maximum input | 0 ~ 100 [%] | The maximum analog input value can be set as all input percent(%). | 100 | ○ | |
| P59 | AI input maximum voltage matching frequency | 0 ~ 200 [Hz] | The maximum frequency value of analog input. | 60.0 | ○ | |
| P60 | Volume input filter constant | 0 ~ 9999 | Response speed control of volume input operation. | 10 | ○ | |
| P61 | Volume input minimum value | 0 ~ 100 [%] | The volume input minimum spin value can be set as all input percent(%). | 0 | ○ | |
| P62 | Volume input maximum voltage matching frequency | 0 ~ 200 [Hz] | Volume input minimum value frequency. | 0.0 | ○ | |
| P63 | Volume input maximum value | 0 ~ 100 [%] | The volume input maximum value can be set as all input percent(%). | 100 | ○ | |
| P64 | Volume input maximum voltage machine frequency | 0 ~ 200 [Hz] | The volume input maximum value frequency. | 60.0 | ○ | |
| P65 | Phase loss standard selection of analog speed command | 0 ~ 2 | 0 | No operation | 0 | ○ |
| | | | 1 | Operation below half value of set | | |
| | | | 2 | Operation below set value | | |

*Note3) All the values from P42 and P44 are modified to adopt the motor capacity P40.



Parameter Descriptions

■ Program group

| Display | Function | Setting range | Description | | | | | Factory default | Mode change during run | | |
|---------|---|---------------|---|--|-----------------------|------|---|-----------------|------------------------|---|--|
| P66 | Multi-function input terminal P1 function | 0 ~ 24 | 0 | Forward operation command(FX) | | | | | 0 | ○ | |
| | | | 1 | Reverse operation command(RX) | | | | | | | |
| P67 | Multi-function input terminal P2 function | | 2 | Emergency stop(EST-Emergency stop trip) : Temporal output block. | | | | | 1 | ○ | |
| P68 | Multi-function input terminal P3 function | | 3 | Fault reset (RST) | | | | | 2 | ○ | |
| | | | 4 | Jog operation command (JOG) | | | | | | | |
| P69 | Multi-function input terminal P4 function | | 5 | Multi-step frequency-up | | | | | 3 | ○ | |
| | | | 6 | Multi-step frequency-down | | | | | | | |
| P70 | Multi-function input terminal P5 functions | | 7 | - | | | | | 4 | ○ | |
| | | | 8 | - | | | | | | | |
| | | | 9 | - | | | | | | | |
| | | | 10 | - | | | | | | | |
| | | | 11 | DC braking command | | | | | | | |
| | | | 12 | - | | | | | | | |
| | | | 13 | - | | | | | | | |
| | | | 14 | - | | | | | | | |
| | | | 15 | Up-down operation function | Frequency up | | | Frequency down | | | |
| | | | 16 | 3-wire operation. | | | | | | | |
| | | | 17 | External trip signal input : A contact (EtA) | | | | | | | |
| | | | 18 | External signal input : B contact (EtB) | | | | | | | |
| | | | 19 | Changing operation mode from PI to normal operation. | | | | | | | |
| | | | 20 | Changing operation mode from option operation to master operation. | | | | | | | |
| 21 | Analog command frequency fix | | | | | | | | | | |
| 22 | Acc/Dec stop command | | | | | | | | | | |
| 23 | Up/Down frequency delete | | | | | | | | | | |
| P71 | Input terminal status display | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 | - | - | | | |
| | | P5 | P4 | P3 | P2 | P1 | | | | | |
| P72 | Multi-function input filter constant | 1 ~ 20 | Bigger setting value resets in slower response speed. | | | | | 15 | ○ | | |
| P73 | Analog output item selection | 0 ~ 3 | | Output item | Matching output 10[V] | | | 0 | ○ | | |
| | | | 0 | Output frequency | Maximum frequency | | | | | | |
| | | | 1 | Output current | 150% | | | | | | |
| | | | 2 | Output voltage | 282V | | | | | | |
| P74 | Analog output level control | 10 ~ 200 [%] | 10V is standard | | | | | 100 | ○ | | |
| | | | | | | | | | | | |
| P75 | Detected frequency | 0 ~ 200 [Hz] | Please use when the output terminal function of relay output(P77) is chosen from 0~4. | | | | | 30.0 | ○ | | |
| P76 | Detectable frequency range | | No more than the maximum frequency(P16) can be set. | | | | | 10.0 | ○ | | |
| P77 | Multifunctional relay terminal function selection | 0 ~ 17 | 0 | FDT-1 | | | | | 17 | ○ | |
| | | | 1 | FDT-2 | | | | | | | |
| | | | 2 | FDT-3 | | | | | | | |
| | | | 3 | FDT-4 | | | | | | | |
| | | | 4 | FDT-5 | | | | | | | |
| | | | 5 | Overload (OL) | | | | | | | |
| | | | 6 | Drive overload (IOlt) | | | | | | | |
| | | | 7 | Motor stall (STALL) | | | | | | | |
| | | | 8 | Overvoltage fault (OVt) | | | | | | | |
| | | | 9 | Low voltage fault (LVt) | | | | | | | |
| | | | 10 | Cooling pin overheat (OHt) | | | | | | | |
| | | | 11 | Command loss | | | | | | | |
| | | | 12 | On operation | | | | | | | |
| | | | 13 | On stop | | | | | | | |
| | | | 14 | On normal operation | | | | | | | |
| | | | 15 | Speed search function is on | | | | | | | |
| | | | 16 | Operation command is ready | | | | | | | |
| 17 | Fault output selection | | | | | | | | | | |

Parameter Descriptions

■ Program group


| Display | Function | Setting range | Description | | | Factory default | Mode change during run | |
|---------|---|-----------------|--|--|--|--|------------------------|---|
| P78 | Fault output selection | 0 ~ 7 [bit] | | After trip, when the number of Auto restart is set, P38 is activated | Except low voltage trip, in all other cases this function is activated | This function is activated with low voltage trip | 2 | ○ |
| | | | | bit 2 | bit 1 | bit 0 | | |
| | | | 0 | - | - | - | | |
| | | | 1 | - | - | v | | |
| | | | 2 | - | v | - | | |
| | | | 3 | - | v | v | | |
| | | | 4 | v | - | - | | |
| | | | 5 | v | - | v | | |
| 6 | v | v | - | | | | | |
| 7 | v | v | v | | | | | |
| P79 | Drive channel | 1 ~ 250 | Use with communication option | | | 1 | ○ | |
| P80 | Communication speed | 0 ~ 2 | Communication speed set | | | 2 | ○ | |
| | | | 0 | 2400 [bps] | | | | |
| | | | 1 | 4800 [bps] | | | | |
| | | | 2 | 9600 [bps] | | | | |
| P81 | Operation type selection when the speed command is lost | 0 ~ 2 | This function is used when the analog signal of terminal (Volume or AI) or communication are operated by frequency command. | | | 0 | ○ | |
| | | | 0 | Operating before command loss frequency | | | | |
| | | | 1 | Free run stop (Blocking output) | | | | |
| | | | 2 | Deceleration stop | | | | |
| P82 | Speed command loss determination time | 0.1 ~ 120 [sec] | If the frequency command is not inputted during speed command loss determination time the drive is operated by P81 selected operation way. | | | 1.0 | - | |
| P83 | Communication stand-by time | 2 ~ 100 [ms] | In case of RS 485 communication, setting the stand-by time to the next TX output after TX signal. | | | 5 | | |
| P84 | Parity/STOP setting | 0 ~ 3 | Communication parity and STOP bit are set like following. | | | 0 | | |
| | | | | Parity bit | Stop bit | | | |
| | | | 0 | - | 1 Stop bit | | | |
| | | | 1 | - | 2 Stop bit | | | |
| | | | 2 | Odd Parity | 1 Stop bit | | | |
| 3 | Even Parity | 1 Stop bit | | | | | | |
| P85 | Parameter Initializing | 0 ~ 3 | User modified parameters can be initialized as factory default values. | | | 0 | × | |
| | | | 0 | - | | | | |
| | | | 1 | 2 Groups' parameters initialization | | | | |
| | | | 2 | Operation groups' parameters initialization | | | | |
| 3 | Program group parameters initialization | | | | | | | |
| P86 | Password registration | 0 ~ FFFF | Password inputted to prohibit the parameter change and values are set as HEXA. | | | 0 | ○ | |
| P87 | Parameter change prohibition | 0 ~ FFFF | The parameter change prohibition can be executed or cleared by the password. | | | 0 | ○ | |
| | | | UL(Unlock) | Parameter change is allowed | | | | |
| | | | L(Lock) | Parameter change is prohibited | | | | |
| P88 | Version of Software | - | Displays the SW version of drive. Please refer to the manual version. | | | - | × | |



Protections

| Display | Protections | Descriptions |
|---------|------------------------------|---|
| OCt | Over current | Drive output is blocked in case the output current is over 200% of rated current. |
| GFt | Ground current | In case the ground protection of starting point is used, the drive output is blocked if ground current flows that is generated from the drive output side. |
| GCE | Ground current | Drive blocks its output if the over current is flowed to any phase of between U.V.W phase. In this case the over current is generally generated by unbalancing from ground fault. |
| IOl | Overload | If the output current of drive is over 150% of rated current for more than one minute, the output is blocked. The protection time is shortened as output current is increased |
| OLt | Overload trip | If output current is bigger than motor rated current(P25) the output is blocked |
| OHt | Cooling fan overheat | If the drive cooling fan is overheated, and if the ambient temperature of drive reaches to over recommended degree, the output of drive is blocked. |
| COL | Condenser overload | This fault is generated in case of single phase loss of three phase product or if DC voltage fluctuation level becomes big as the main condenser is aged. Yet the condenser overload detection time can be varied depend on the output current size. |
| POt | Output loss | More than one phase becomes loss among U.V.W, the drive output is blocked. |
| Ovt | Over voltage | If the main circuit DC voltage of drive inside goes over 400V, the output is blocked. This over voltage is generated if the deceleration time is too short or the input voltage goes over recommended level. |
| Lvt | Low voltage | If drive inside main circuit voltage goes below 180V, drive blocks its output. |
| EEP | Parameter save fault | When the changed parameter is inputted to drive, if some faults are generated, this fault is displayed. This is displayed with power input. |
| HOt | Hardware fault | This is displayed with CPU or OS fault. This is not cleared by the STOP/RST key of loader or by the reset terminal. Fault is not cleared by STOP/RST keys of the keypad or reset terminal. Please re-input power after off the drive power and the keypad display power is completely off. |
| EST | Output instant blocking | Drive output is blocked when the EST terminal is on.  Caution : with the "ON" of terminal operation command signal FX or RX, if the EST terminal is off drive restart its operation. |
| EtA | A Contact fault signal input | Once the multi-function input terminal selection(P66~P70) is selected as number 18(External trip signal input : A contact) and if this selected becomes "OFF" the drive blocks output. |
| EtB | A Contact fault signal input | Once the multi-function input terminal selection(P66~P70) is selected as number 19(External trip signal input : B contact) and if this selected becomes "OFF" the drive blocks output. |
| ---L | Frequency phase loss | Displays fault status of frequency command. In case the analog input(0~10V), 0~20mA and option(RS485)operation, if the operational signal is not inputted, the operation is carried out by P81 that is selected from the speed command phase loss operation. |

Check and Remedy

| Protections | Fault reason | Remedy |
|--|---|--|
|  Caution The fault caused by over current may damage drive inside power semiconductor parts so that the reason of over current has to be cleared first and then start operation. | | |
| OCt Over current | <ul style="list-style-type: none"> • Acc/Dec time is too fast comparing to the load inertia(GD2) • Load is bigger than rated value. • Drive output is released during free run of motor. • Output terminal and ground fault. • Motor breaking is too speedy. | <ul style="list-style-type: none"> ▶ Please set the Acc/Dec time with higher margin. ▶ Please replace bigger capacity drive. ▶ Try to operate after stopping motor or please use the speed search function(H22) of function group 2. ▶ Please check the output wiring. ▶ Please check the mechanical break. |
| GFt GCt Ground current | <ul style="list-style-type: none"> • Drive output cable is on ground fault. • Motor insulation is heated. | <ul style="list-style-type: none"> ▶ Please check the output terminal wiring. ▶ Please replace the motor. |
| IOt OIt Drive overload Overload trip | <ul style="list-style-type: none"> • Load is bigger than rated value. • Torque boost volume is too big. | <ul style="list-style-type: none"> ▶ Please use higher capacity motor and drive. ▶ Please reduce the torque boost volume. |
| OHt Cooling fan overheat | <ul style="list-style-type: none"> • Cooling system fault. • Cooling fan lifetime is over. • High ambient temperature. | <ul style="list-style-type: none"> ▶ Please check the vents. ▶ Please replace cooling fan. ▶ Please keep the ambient temperature to 40°C . |
| COL Condenser overload | <ul style="list-style-type: none"> • 1 phase is loss of three phase product. • Internal condenser life is over. | <ul style="list-style-type: none"> ▶ Please check input power wiring. ▶ Please check the input power. ▶ Replacement may need please ask after sales service. |
| POt Output phase loss | <ul style="list-style-type: none"> • Electronic contactor fault of output part. • Output wiring fault. | <ul style="list-style-type: none"> ▶ Please check the electronic contactor of output part. ▶ Please check the output part wiring. |
| OVt Over voltage | <ul style="list-style-type: none"> • Dec time is too short comparing to the load inertia(GD2). • Regenerative load is located at the output part. • Main power is to high. | <ul style="list-style-type: none"> ▶ Please set the deceleration time with higher margin. ▶ Please down the main power below rated value. |
| LVt Low voltage | <ul style="list-style-type: none"> • Main power is too low. • Bigger than power capacity load is contacted to the main power part. • Electronic contactor fault of power part. | <ul style="list-style-type: none"> ▶ Please use over rated value power. ▶ Please use higher power. ▶ Please replace the electronic contactor. |
| EA A contact fault signal input EB B contact fault signal input | <ul style="list-style-type: none"> • When the multi-function input terminal selection of the program group(P66~P70) is set as number 18 or 19 if these terminals are "ON" these fault messages are displayed. | <ul style="list-style-type: none"> ▶ Circuit fault and external faults. |
| --- Frequency command loss | <ul style="list-style-type: none"> • No command at the V1 and I terminals. • No signal input of communication option. | <ul style="list-style-type: none"> ▶ Please check the wiring and command level of V1 and I terminals. ▶ Please check the communication cable of the master device. |
| EEP Parameter save fault | Ht Hardware fault | <ul style="list-style-type: none"> ▶ After software upgrade when the power is inputted as first time, these messages are displayed. In this case, please "OFF" the power first and then re-input the power. This is normal operation after software upgrade. |



Peripheral device specifications

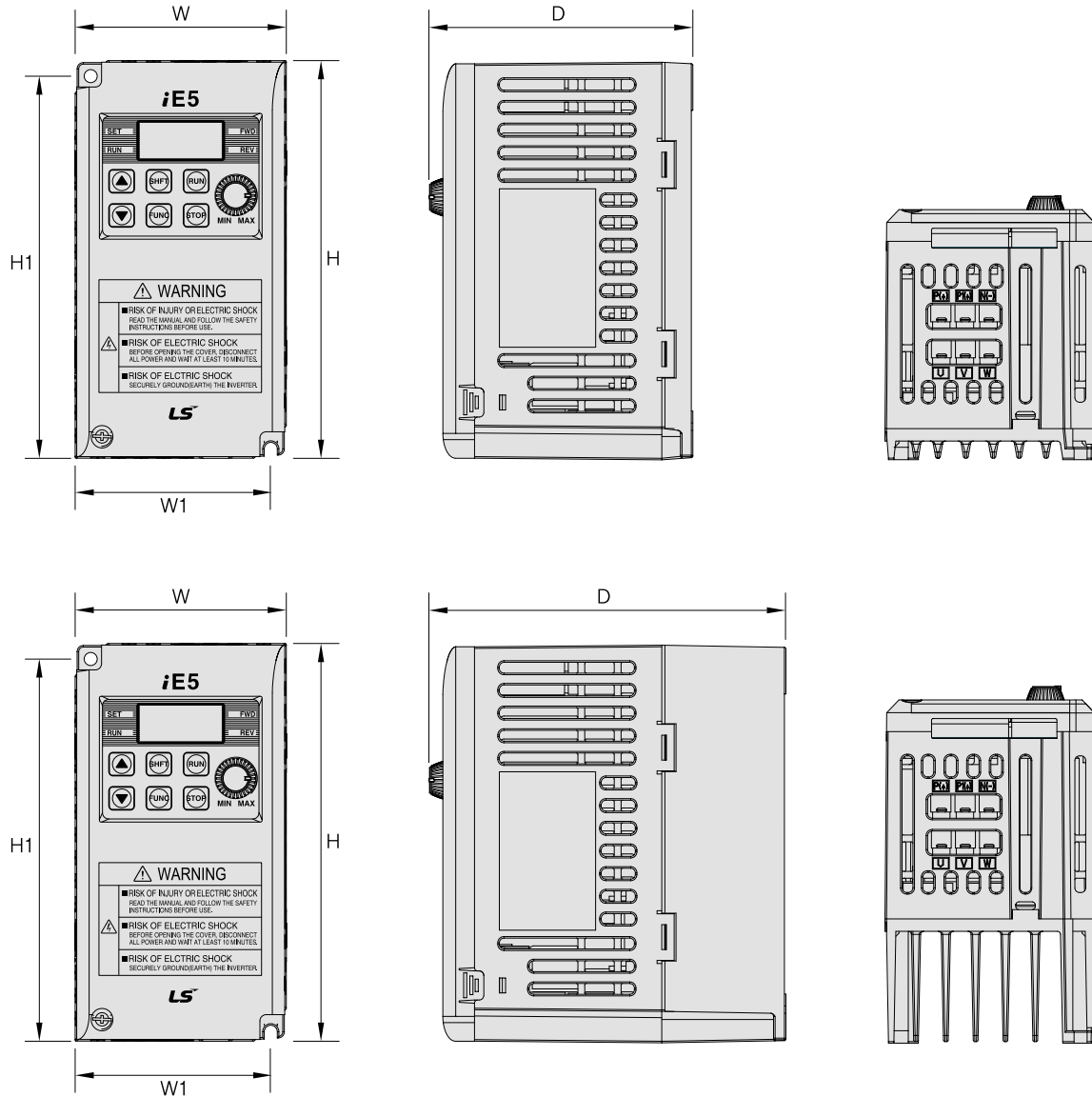
■ MCCB and MC standards

| Drive capacity | MCCB(LSIS) | | ELCB(LSIS) | | MC(LSIS) | |
|----------------|------------|-----|------------|-----|----------|-----|
| 001 IE5-1 | ABS33b | 5A | EBS33b | 5A | GMC-9 | 7A |
| 002 IE5-1 | | 10A | | 10A | GMC-12 | 9A |
| 004 IE5-1 | | 15A | | 15A | GMC-18 | 13A |
| 001 IE5-2 | | 3A | | 3A | GMC-9 | 7A |
| 002 IE5-2 | | 5A | | 5A | GMC-9 | 7A |
| 004 IE5-2 | | 10A | | 10A | GMC-12 | 9A |

■ Reactor specification

| Drive capacity | AC input fuse | AC reactor | DC reactor |
|----------------|---------------|-------------|------------|
| 001 IE5-1 | 5A | 4.2mH, 3.5A | 10mH, 3A |
| 002 IE5-1 | 5A | 4.2mH, 3.5A | 10mH, 3A |
| 004 IE5-1 | 10A | 5.1mH, 5.4A | 7mH, 5A |
| 001 IE5-2 | 5A | 4.2mH, 3.5A | 10mH, 3A |
| 002 IE5-2 | 5A | 4.2mH, 3.5A | 10mH, 3A |
| 004 IE5-2 | 5A | 4.2mH, 3.5A | 7mH, 5A |

Dimension



| Measure | 001 iE5-1 | 002 iE5-1 | 004 iE5-1 | 001 iE5-2 | 002 iE5-2 | 004 iE5-2 |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| W | 68 | 68 | 68 | 68 | 68 | 68 |
| H | 128 | 128 | 128 | 128 | 128 | 128 |
| D | 85 | 85 | 115 | 85 | 85 | 115 |
| H1 | 124 | 124 | 124 | 124 | 124 | 124 |
| W1 | 64 | 64 | 64 | 64 | 64 | 64 |
| φ | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |

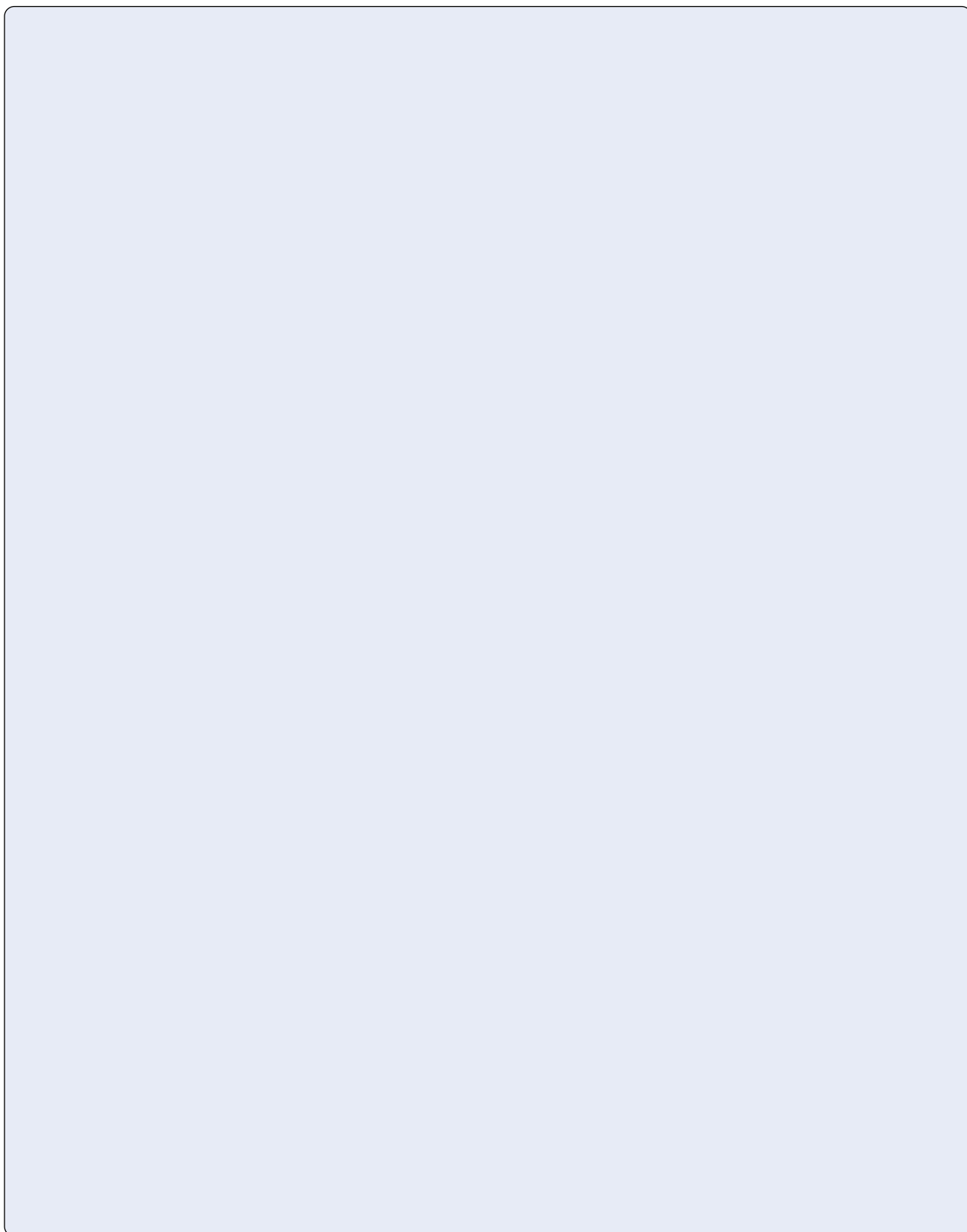
*Note) Please use the M4 bolt in case this drive is installed into the panels.



Memo

A large, empty rectangular area with a light blue gradient background, intended for writing a memo.

Memo



Green Innovators of Innovation



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 a 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.

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Specifications in this catalog are subject to change without notice due to continuous product development and improvement.

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