# 10 Selection and installation of peripheral devices

In this chapter, the selection and installation methods of peripheral devices for this inverter are described.

| WARNING | |
|---|---|
| Mandatory action | • All options to be used must be those specified by Toshiba.<br>The use of options other than those specified by Toshiba will result in an accident.<br>• In using a power distribution device and options for the inverter, they must be installed in a cabinet.<br>When they are not installed in the cabinet, this will result in electric shock. |
| Be sure to connect the grounding wire. | • The grounding wire must be connected securely.<br>If the grounding wire is not securely connected, when the inverter has failure or earth leakage, this will result in electric shock or fire. |

## 10. 1 Selection of wire size

According to the voltage class and capacity of the inverter, perform wiring using appropriate wires as shown in the table below. When connecting peripheral devices to the inverter also, perform wiring according to the wire size for a wire location shown in the table below.

- The wire size is a value when using a 600 V HIV insulation wire (copper wire with the maximum allowable temperature 75 °C of an insulator) with 50 °C ambient temperature and 30 m or less the length of each wire.
- For the wire of the control circuit, use a shielded wire with 0.75 $mm^2$ or more.

■**Wire size for HD rating**

| Voltage class | Applicable motor (kW) | Inverter type-form | | Wire size ($mm^2$) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Power circuit | | DC wire | Braking resistor (Optional) | Grounding wire |
| | | | | Input | Output | | | |
| 3-phase 240 V | 0.4 | VFAS3- | 2004P | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 0.75 | | 2007P | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 1.5 | | 2015P | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 2.2 | | 2022P | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 4.0 | | 2037P | 2.5 | 4 | 2.5 | 1.5 | 4 |
| | 5.5 | | 2055P | 4 | 6 | 4 | 1.5 | 6 |
| | 7.5 | | 2075P | 6 | 10 | 6 | 2.5 | 10 |
| | 11 | | 2110P | 10 | 16 | 10 | 4 | 16 |
| | 15 | | 2150P | 16 | 25 | 16 | 6 | 16 |
| | 18.5 | | 2185P | 25 | 35 | 25 | 10 | 16 |
| | 22 | | 2220P | 35 | 50 | 35 | 16 | 25 |
| | 30 | | 2300P | 50 | 70 | 50 | 25 | 35 |
| | 37 | | 2370P | 70 | 95 | 70 | 35 | 50 |
| | 45 | | 2450P | 95 | 120 | 95 | 50 | 70 |
| | 55 | | 2550P | 120 | 70x2 | 120 | 50 | 95 |
| 3-phase 480 V | 0.4 | VFAS3- | 4004PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 0.75 | | 4007PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 1.5 | | 4015PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 2.2 | | 4022PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 4.0 | | 4037PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 5.5 | | 4055PC | 1.5 | 2.5 | 2.5 | 1.5 | 2.5 |
| | 7.5 | | 4075PC | 2.5 | 4 | 2.5 | 1.5 | 2.5 |
| | 11 | | 4110PC | 4 | 6 | 4 | 1.5 | 4 |
| | 15 | | 4150PC | 6 | 10 | 6 | 2.5 | 10 |
| | 18.5 | | 4185PC | 10 | 10 | 10 | 2.5 | 10 |
| | 22 | | 4220PC | 16 | 16 | 10 | 4 | 16 |
| | 30 | | 4300PC | 25 | 25 | 16 | 6 | 16 |
| | 37 | | 4370PC | 25 | 35 | 25 | 10 | 16 |
| | 45 | | 4450PC | 35 | 35 | 35 | 16 | 16 |
| | 55 | | 4550PC | 50 | 50 | 50 | 16 | 25 |
| | 75 | | 4750PC | 95 | 95 | 70 | 35 | 50 |
| | 90 | | 4900PC | 120 | 120 | 95 | 35 | 70 |
| | 110 | | 4110KPC | 70x2 | 70x2 | 70x2 | 50 | 95 |
| | 132 | | 4132KPC | 70x2 | 70x2 | 70x2 | 70 | 95 |
| | 160 | | 4160KPC | 120x2 | 95x2 | 150x2 | 95 | 120 |
| | 200 | | 4200KPC | 150x2 | 120x2 | 150x3 | 150 | 150 |
| | 220 | | 4220KPC | 150x3 | 120x2 | 150x3 | 150 | 150 |
| | 280 | | 4280KPC | 150x3 | 185x2 | 150x4 | 150 | 120x2 |

■**Wire size for ND rating**

| Voltage class | Applicable motor (kW) | Inverter type-form | | Wire size ($mm^2$) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Power circuit | | DC wire | Braking resistor (Optional) | Grounding wire |
| | | | | Input | Output | | | |
| 3-phase 240 V | 0.75 | VFAS3- | 2004P | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 1.5 | | 2007P | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 2.2 | | 2015P | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 4.0 | | 2022P | 2.5 | 4 | 2.5 | 1.5 | 4 |
| | 5.5 | | 2037P | 4 | 6 | 4 | 1.5 | 6 |
| | 7.5 | | 2055P | 6 | 10 | 6 | 2.5 | 10 |
| | 11 | | 2075P | 10 | 16 | 10 | 4 | 16 |
| | 15 | | 2110P | 16 | 25 | 16 | 6 | 16 |
| | 18.5 | | 2150P | 25 | 35 | 25 | 10 | 16 |
| | 22 | | 2185P | 35 | 50 | 35 | 16 | 25 |
| | 30 | | 2220P | 50 | 70 | 50 | 25 | 35 |
| | 37 | | 2300P | 70 | 95 | 70 | 35 | 50 |
| | 45 | | 2370P | 95 | 120 | 95 | 50 | 70 |
| | 55 | | 2450P | 70x2 | 70x2 | 50x2 | 50 | 95 |
| | 75 | | 2550P | 95x2 | 95x2 | 70x2 | 70 | 120 |
| 3-phase 480 V | 0.75 | VFAS3- | 4004PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 1.5 | | 4007PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 2.2 | | 4015PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 4.0 | | 4022PC | 1.5 | 1.5 | 2.5 | 1.5 | 2.5 |
| | 5.5 | | 4037PC | 1.5 | 2.5 | 2.5 | 1.5 | 2.5 |
| | 7.5 | | 4055PC | 2.5 | 4 | 2.5 | 1.5 | 2.5 |
| | 11 | | 4075PC | 4 | 6 | 4 | 1.5 | 4 |
| | 15 | | 4110PC | 6 | 10 | 6 | 2.5 | 10 |
| | 18.5 | | 4150PC | 10 | 10 | 10 | 2.5 | 10 |
| | 22 | | 4185PC | 10 | 16 | 10 | 4 | 16 |
| | 30 | | 4220PC | 16 | 25 | 16 | 6 | 16 |
| | 37 | | 4300PC | 25 | 35 | 25 | 10 | 16 |
| | 45 | | 4370PC | 35 | 35 | 35 | 16 | 16 |
| | 55 | | 4450PC | 50 | 50 | 50 | 16 | 25 |
| | 75 | | 4550PC | 70 | 95 | 70 | 35 | 50 |
| | 90 | | 4750PC | 95 | 120 | 95 | 35 | 70 |
| | 110 | | 4900PC | 50x2 | 50x2 | 70x2 | 35 | 95 |
| | 132 | | 4110KPC | 70x2 | 70x2 | 70x2 | 50 | 95 |
| | 160 | | 4132KPC | 95x2 | 95x2 | 95x2 | 70 | 120 |
| | 220 | | 4160KPC | 150x2 | 150x2 | 150x2 | 95 | 150 |
| | 250 | | 4200KPC | 150x2 | 150x2 | 185x2 | 150 | 150 |
| | 280 | | 4220KPC | 150x3 | 120x3 | 150x3 | 150 | 120x2 |
| | 315 | | 4280KPC | 150x3 | 150x3 | 150x3 | 150 | 120x2 |

**Memo**

- The wire size of this chapter comply with IEC60364-5-52 (Grounding wire: IEC60364-5-54). It does not comply with UL Standard.
- For the wire size to comply with UL Standard, refer to [9. 2. 3].

# 10. 2 Selection of a wiring device

According to the table [10. 2. 1], select an appropriate wiring device depending on the voltage class and capacity of the inverter.

## 10. 2. 1 Selection table of a wiring device

Select a wiring device depending on the inverter type and input current in the table next.

■ **Wiring devices for HD rating**

| Voltage class | Applicable motor (kW) | Inverter type-form | | Input current (A) | Rated current (A) | |
|---|---|---|---|---|---|---|
| | | | | | Molded-case circuit breaker (MCCB) Earth leakage circuit breaker (ELCB) | Magnetic contactor (MC) |
| 3-phase 240 V | 0.4 | VFAS3- | 2004P | 1.7 | 3 | 20 |
| | 0.75 | | 2007P | 3.3 | 5 | 20 |
| | 1.5 | | 2015P | 6.0 | 10 | 20 |
| | 2.2 | | 2022P | 9.0 | 15 | 20 |
| | 4.0 | | 2037P | 15.1 | 20 | 20 |
| | 5.5 | | 2055P | 20.1 | 30 | 32 |
| | 7.5 | | 2075P | 27.3 | 40 | 32 |
| | 11 | | 2110P | 40.0 | 50 | 50 |
| | 15 | | 2150P | 53.2 | 75 | 60 |
| | 18.5 | | 2185P | 64.8 | 100 | 80 |
| | 22 | | 2220P | 78.3 | 100 | 80 |
| | 30 | | 2300P | 104.7 | 150 | 150 |
| | 37 | | 2370P | 128.4 | 175 | 200 |
| | 45 | | 2450P | 157.6 | 200 | 260 |
| | 55 | | 2550P | 189.0 | 250 | 260 |

| Voltage class | Applicable motor (kW) | Inverter type-form | | Input current (A) | Rated current (A) | |
|---|---|---|---|---|---|---|
| | | | | | Molded-case circuit breaker (MCCB) Earth leakage circuit breaker (ELCB) | Magnetic contactor (MC) |
| 3-phase 480 V | 0.4 | VFAS3- | 4004PC | 0.9 | 3 | 20 |
| | 0.75 | | 4007PC | 1.8 | 3 | 20 |
| | 1.5 | | 4015PC | 3.2 | 5 | 20 |
| | 2.2 | | 4022PC | 4.9 | 10 | 20 |
| | 4.0 | | 4037PC | 8.3 | 10 | 20 |
| | 5.5 | | 4055PC | 10.9 | 15 | 20 |
| | 7.5 | | 4075PC | 14.7 | 20 | 20 |
| | 11 | | 4110PC | 21.4 | 30 | 32 |
| | 15 | | 4150PC | 28.9 | 40 | 32 |
| | 18.5 | | 4185PC | 35.4 | 50 | 50 |
| | 22 | | 4220PC | 42.1 | 60 | 50 |
| | 30 | | 4300PC | 57.1 | 75 | 60 |
| | 37 | | 4370PC | 69.9 | 100 | 80 |
| | 45 | | 4450PC | 84.8 | 125 | 100 |
| | 55 | | 4550PC | 103.3 | 125 | 135 |
| | 75 | | 4750PC | 139.8 | 175 | 200 |
| | 90 | | 4900PC | 170.2 | 225 | 260 |
| | 110 | | 4110KPC | 203.5 | 250 | 260 |
| | 132 | | 4132KPC | 240.3 | 300 | 260 |
| | 160 | | 4160KPC | 290.0 | 350 | 350 |
| | 200 | | 4200KPC | 360.0 | 500 | 450 |
| | 220 | | 4220KPC | 395.0 | 500 | 450 |
| | 280 | | 4280KPC | 495.0 | 700 | 660 |

■**Wiring devices for ND rating**

| Voltage class | Applicable motor (kW) | Inverter type-form | | Input current (A) | Rated current (A) | |
|---|---|---|---|---|---|---|
| | | | | | Molded-case circuit breaker (MCCB) Earth leakage circuit breaker (ELCB) | Magnetic contactor (MC) |
| 3-phase 240 V | 0.75 | VFAS3- | 2004P | 3.0 | 5 | 20 |
| | 1.5 | | 2007P | 5.9 | 10 | 20 |
| | 2.2 | | 2015P | 8.5 | 15 | 20 |
| | 4.0 | | 2022P | 15.1 | 20 | 20 |
| | 5.5 | | 2037P | 20.2 | 30 | 32 |
| | 7.5 | | 2055P | 27.1 | 40 | 32 |
| | 11 | | 2075P | 39.3 | 50 | 50 |
| | 15 | | 2110P | 53.0 | 75 | 60 |
| | 18.5 | | 2150P | 65.1 | 100 | 80 |
| | 22 | | 2185P | 76.0 | 100 | 80 |
| | 30 | | 2220P | 104.7 | 150 | 150 |
| | 37 | | 2300P | 128.0 | 175 | 200 |
| | 45 | | 2370P | 154.7 | 200 | 260 |
| | 55 | | 2450P | 191.9 | 250 | 260 |
| | 75 | | 2550P | 256.0 | 350 | 350 |
| 3-phase 480 V | 0.75 | VFAS3- | 4004PC | 1.6 | 3 | 20 |
| | 1.5 | | 4007PC | 3.1 | 5 | 20 |
| | 2.2 | | 4015PC | 4.5 | 10 | 20 |
| | 4.0 | | 4022PC | 8.0 | 10 | 20 |
| | 5.5 | | 4037PC | 10.8 | 15 | 20 |
| | 7.5 | | 4055PC | 14.4 | 20 | 20 |
| | 11 | | 4075PC | 20.8 | 30 | 32 |
| | 15 | | 4110PC | 28.3 | 40 | 32 |
| | 18.5 | | 4150PC | 34.9 | 50 | 50 |
| | 22 | | 4185PC | 41.4 | 50 | 50 |
| | 30 | | 4220PC | 55.9 | 75 | 60 |
| | 37 | | 4300PC | 69.0 | 100 | 80 |
| | 45 | | 4370PC | 83.4 | 125 | 100 |
| | 55 | | 4450PC | 101.9 | 125 | 135 |
| | 75 | | 4550PC | 138.0 | 175 | 200 |
| | 90 | | 4750PC | 165.1 | 200 | 260 |
| | 110 | | 4900PC | 203.5 | 250 | 260 |
| | 132 | | 4110KPC | 240.3 | 300 | 260 |
| | 160 | | 4132KPC | 284.2 | 350 | 350 |
| | 220 | | 4160KPC | 395.0 | 500 | 450 |
| | 250 | | 4200KPC | 444.0 | 500 | 450 |
| | 280 | | 4220KPC | 495.0 | 700 | 660 |
| | 315 | | 4280KPC | 555.0 | 1000 | 660 |

- Install a surge absorber on the exciting coil of a magnetic contactor (MC) and relays.
- When using an auxiliary contacts 2a type magnetic contactor (MC), use the 2a contacts in parallel to increase the liability of the contacts.
- Selection is for assuming a normal power supply capacity and using a Toshiba 4-pole standard motor with input power 200 V/400 V-50 Hz.
- For the influence of the leakage current, refer to [2. 4. 3].

## 10. 2. 2 Installation of a molded-case circuit breaker (MCCB) and earth leakage circuit breaker (ELCB)

For protection of the wiring system, install a molded-case circuit breaker (MCCB) between the power supply and the inverter (primary side).
An earth leakage circuit breaker (ELCB) that is equipped with a function to shut off by detecting leakage current can be also installed. However, be cautious that an ELCB may operate improperly, because the leakage current becomes large due to the influence of a wiring method, a built-in noise filter, etc.
Because the short-circuit current is different with power supply capacity and wiring system conditions, select MCCB or ELCB depending on the inverter type and input current in the table [10. 2. 1].

| Memo | • When complying with UL Standard and CSA Standard, a fuse needs to be installed on the primary side of the inverter. For details, refer to [9. 2. 3]. |
|---|---|

## 10. 2. 3 Installation of a magnetic contactor (MC)

When installing a magnetic contactor (MC) on the primary or secondary side of the inverter, select following the below.

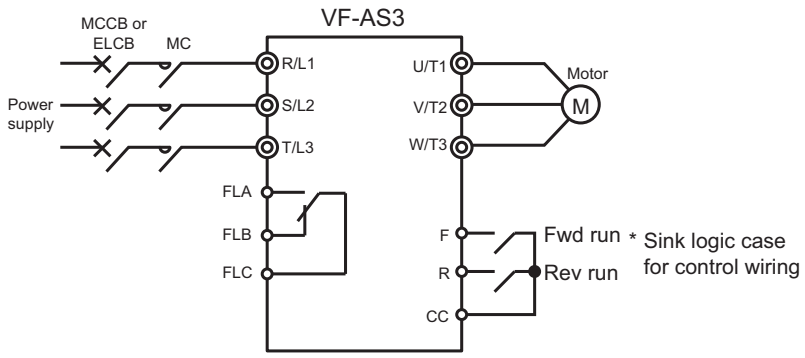
### ■ Installation on the primary side

When the power side and the inverter need to be detached in the following cases, install a magnetic contactor (MC) between the power supply and the inverter (primary side).
Select a magnetic contactor (MC) depending on the inverter type and input current in the table [10. 2. 1].

- Thermal relay on the motor is activated
- Protection detection relay (FL) inside the inverter is activated
- Not to automatically restart at restoration of power after power failure
- When using the braking resistor (option), the thermal relay of the braking resistor is activated

To open the power circuit (primary side) when the protective function detection relay inside the inverter is activated, the molded-case circuit breaker (MCCB) with a power cutoff device can be installed instead of magnetic contactors (MC). Make sure the molded-case circuit breaker (MCCB) trips at the contact of protection detection relay. If earth leakage detector is not installed, earth leakage circuit breaker (ELCB) should be installed instead of MCCB.

A connection example for installing the primary-side magnetic contactor (MC) is shown next.




Important

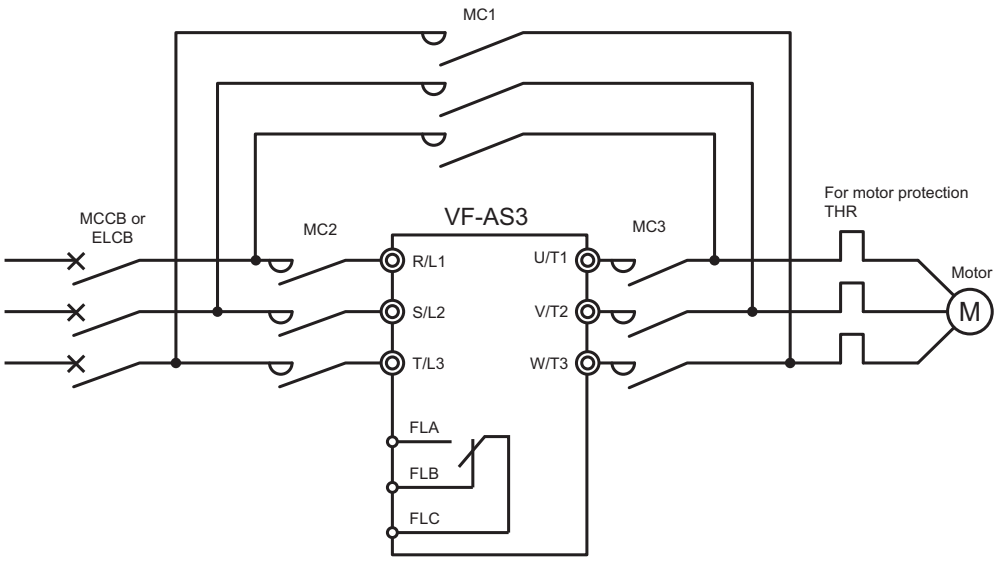
- Do not run/stop the inverter by turning the magnetic contactor (MC) installed on the primary side ON/OFF. When run/stop the inverter, set the terminal [F] (forward) or terminal [R] (reverse) of the control terminal ON/OFF.
- Install a surge absorber on the exciting coil of a magnetic contactor (MC).

## ■ Installation on the secondary side

To switch the motor during the inverter is stopped, and change the motor power, a magnetic contactor (MC) can be installed between the inverter and motor (secondary side).
When operating the motor with commercial power supply by switching the circuit and not through the inverter, select a magnetic contactor (MC) with AC-3 Class and confirming to the motor rated current.

A connection example for installing the secondary-side magnetic contactor (MC) is shown next.

10



Important

- Be sure to have interlock for the commercial power supply is applied to the inverter output terminal.
- Do not turn the magnetic contactor (MC) in the secondary circuit ON/OFF during run. It can cause failure due to rush current flowing to the inverter.
- Install a surge absorber on the exciting coil of a magnetic contactor (MC).

## 10. 2. 4 Installation of a thermal relay (THR)

Use an electronic thermal protector of the inverter for motor overload protection. Set a motor overload protection level with a parameter according to the motor rating.
However, in the following cases, install a thermal relay (THR) between the inverter and motor (secondary side).

- Running multiple motors simultaneously with one inverter.
  In this case, install a thermal relay on each motor.
- Running a motor with smaller output than applicable motor output of the standard specification
  (When the motor capacity is too small to set with a parameter of the motor overload protection level).

For details on motor overload protection level, refer to [5. 3. 5].

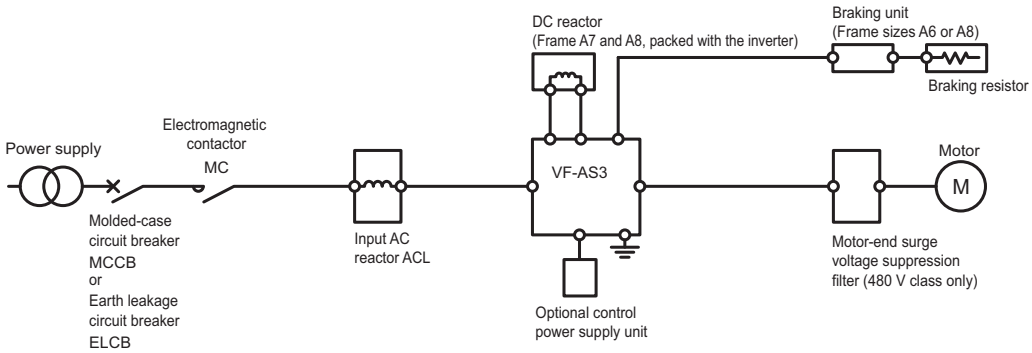
To give sufficient protection for the motor running in a low-speed range, the use of a motor with motor winding embedded type thermal relay is recommended.

Important

- "Thermal overload relay" is recommended, install it for each motor to be protected. "Thermal relay with CT" is not available.

# 10. 3 External options

This inverter provides external options shown in the next figure.




Functions, purposes, notes, etc. of individual external option are explained next.
External options are shown in [10. 3. 9].

## 10. 3. 1 Input AC reactor, (DC reactor)

Input AC reactor is used for improving input power factor on the inverter power side (primary side), reducing harmonics or restriction of surge voltage.
It is also installed when the power supply capacity is 500 kVA or more and is 10 times or more of the inverter capacity, and when devices that cause distorted waves (a device with thyristor, etc.) and a large capacity inverter is connected on the same power distribution line. Install an input AC reactor between the power supply and the inverter (primary side).

10

A DC reactor is a reactor to connect with the DC terminal, and used for improving input power factor and reducing harmonics. It has better power factor improvement effect than an input AC reactor. When a facility applying the inverter requires high reliability, it is recommended to use with an input AC reactor that has surge voltage restriction effect.
However, the frame size A1 to A6 of the inverter has a built-in DC reactor as standard, and the frame size A7 and A8 attached with a DC reactor, no option is available.

| Type | Effect | | |
|---|---|---|---|
| | Power factor improvement | Harmonics reduction | Surge voltage restriction |
| Input AC reactor | Enabled | Enabled | Enabled |
| DC reactor | Enabled (large) | Enabled (large) | Disabled |

## 10. 3. 2 Braking resistor, Braking unit

It is a resistor to consume regenerative energy from a motor.
When making frequent rapid deceleration and stop, it is used to shorten deceleration time with load in large inertia.
A braking unit is necessary in addition to a braking resistor for the frame size A6 and A8.

For details on using a braking resistor, refer to [6. 15. 4].

## 10. 3. 3 Motor-end surge voltage suppression filter

When operating a 480 V class general purpose motor with a voltage type PWM control inverter that uses high speed switching element (IGBT, etc.), surge voltage exceeding the insulation level of motor winding is generated depending on power supply voltage, motor wire length and its laying method, and type. When the condition is repeatedly applied for a long time, it may cause deterioration of insulation on the motor.
Such measures as installation of an AC reactor, surge voltage suppression filter on the inverter output side (secondary side), and use of a high insulation strength motor are necessity.

- To be installed floor horizontal mounting.
- To be used that carrier frequency is 15kHz or less, and output frequency is 60Hz or less.

For details of carrier frequency, refer to [6. 14].

## 10. 3. 4 Optional control power supply

This inverter supplies control power supply from the power supply inside the inverter. When control power supply is backed up with this option, display and output signal can be maintained in case of power supply shut off.

- It is common with 240 V/480 V class.
- Type-form: CPS002Z

## 10. 3. 5 LED extension panel option

It is an extension panel for LED display. A specific cable is used to connect between the inverter and LED panel.
When using this panel, remove the standard operation panel, and connect to the RS485 communication connector 1.

- Panel type-form: RKP002Z
  Specific cable type-form: CAB0011 (1 m), CAB0013 (3 m), CAB0015 (5 m)
- Panel type-form: RKP007Z
  Specific calbe type-form: CAB0071 (1 m), CAB0073 (3 m), CAB0075 (5 m)

## 10. 3. 6 USB communication conversion unit

It enables to set and manage parameters on a personal computer.
Connect between the RS485 communication connector 1 of the inverter and a personal computer. Use the specific cable for the inverter side, and a commercial USB cable (USB 1.1/2.0 compatible A-B connection type) for a personal computer side. Software PCM002Z for parameter management is required.

- Type-form: USB001Z
- Specific cable type-form: CAB0011 (1 m), CAB0013 (3 m), CAB0015 (5 m)

## 10. 3. 7 Flange mounting kit

It reduces heat rising up inside the cabinet.

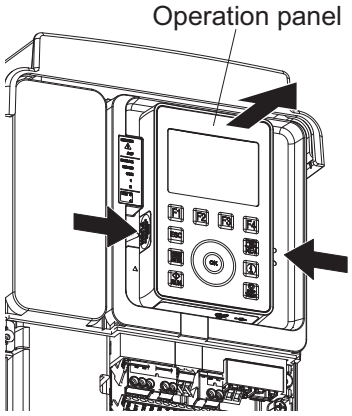
## 10. 3. 8 Door mounting kit

It enables to mount operation panel on the cabinet door. Use the exclusive cable for interconnection between this kit and the inverter. For detail, refer to “Door mounting kit instruction manual” (E6582159).

- Type-form: SBP010Z
- Specific cable type-form: CAB0071 (1 m), CAB0073 (3 m), CAB0075 (5 m) , CAB00710 (10 m)

**How to remove operation panel**
While pressing the PUSH part located on both right and left sides of the operation panel, pull the operation panel straight upward.

**How to mount operation panel again**
Push the operation panel with fixing the connector back side on RS485 communication connector 1 on control block.




10

## 10. 3. 9 External option list

External options are shown in the next table.

| Category | Product name | Specification / Ranges | Type-form | Remarks |
|---|---|---|---|---|
| Control option | Door mounting kit | Door mounting kit for operation panel | SBP010Z | Coming soon |
| | Option adapter | For Safety option & For using case of 3 options | SBP011Z | Coming soon |

| Category | Product name | Specification / Ranges | Type-form | Remarks |
|---|---|---|---|---|
| Power option | Flange mounting kit | For Frame size A1 to A5 | FOT018Z to FOT022Z | |
| | Flange mounting kit | For Frame size A6 | FOT023Z | Coming soon |
| | Flange mounting kit | For Frame size A7 | FOT013Z | |
| | Flange mounting kit | For Frame size A8 | FOT014Z | |
| | Braking unit | For Frame size A6 | PB7-4132K | Coming soon |
| | Braking unit | For Frame size A8 | PB7-4200K | |
| | Braking resistor | All ranges | PBR-xxxx*1 | |
| | Input reactor | All ranges | PFL-xxxxS*1 | |
| | Motor end surge suppression filter | 480 V all ranges | MSF-4xxxZ*1 | |
| Others | LED extension panel | Big LED keypad | RKP002Z | |
| | LED extension panel | Small LED keypad | RKP007Z | |
| | Control power supply unit | DC24V backup option | CPS002Z | |
| | USB communication conversion unit | Converter between RS485 (Inverter) and USB (PC) | USB001Z | |

*1 xxx (number) varies depending on capacity.

# 10. 4 Insert type options

This inverter is equipped with two option slots (A, B) as standard. The option adapter (option) can be mounted for an extended slot.

## 10. 4. 1 Insert type options and functions

Cassette options are available as shown in the next table.

### ■ Cassette options

| Name | Specification | Type-form | Slot availability | Remarks |
|---|---|---|---|---|
| I/O extension 1 | 6x digital input<br>2x digital output<br>2x analog input | ETB013Z | A, B, C | Refer to E6582128 |
| I/O extension 2 | 3x 1a relay | ETB014Z | A, B ,C | Refer to E6582129 |
| Digital encoder | RS422 Line receiver | VEC008Z | B | Refer to E6582140 and E6582148 |
| Resolver | Resolver | VEC010Z | B | Coming soon |
| Safety module | SS1, SS2, SOS, SBC, SMS, SLS, SDI, SSM | SFT001Z | C | Coming soon |
| PROFINET | PROFINET interface | PNE001Z | A | |
| EtherCAT | EtherCAT interface | IPE003Z | A | Coming soon |
| PROFIBUS-DP | PROFIBUS-DP interface | PDP003Z | A | |
| DeveceNet | DeviceNet interface | DEV003Z | A | |
| CANopen | CANopen interface RJ45<br>D-sub<br>Open style | CAN001Z<br>CAN002Z<br>CAN003Z | A | Coming soon |

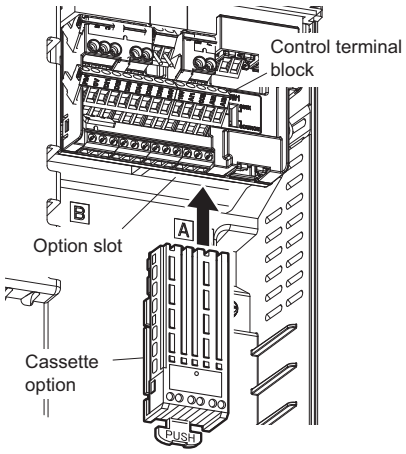
## 10. 4. 2 Mounting/removing insert type options

| ⚠ WARNING | |
|---|---|
| Prohibited | • Do not connect any communication options other than supported by option slots.<br>It can cause failure and accident. |
| Mandatory action | • Mounting/removing options should be performed 15 minutes or more after the power is shut off, and checking the charge lamp of the inverter is OFF.<br>The inverter and options may be damaged.<br>• Do not use tools for mounting/removing options.<br>The inverter and options may be damaged. |

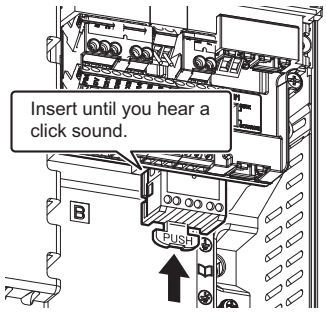
Mounting/removing methods of a cassette option to the option slot A, B are as follows.
When using the option slot 3, refer to [10. 4. 3].

### ■ Mounting (Option slot A, B)

1 Remove the front cover and other parts.
Covers to be removed at the time of wiring vary depending on the frame size.
For how to remove, refer to [2. 2].




2 Insert a cassette option to the option slot A, B until you hear a click sound.




3 Perform wiring to the cassette option.

4 When wiring is complete, mount the removed cover.
For how to mount them, refer to [2. 2].

### ■ Removing (Option slot A, B)

1 Remove the front cover and other parts.
Covers to be removed vary depending on the frame size.
For how to remove, refer to [2. 2].

2 Remove wiring to the cassette option.

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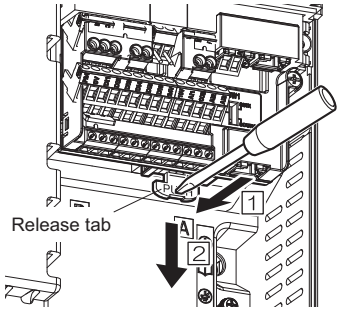
3 While pressing the release tab down, pull the cassette option to remove from the option slot.




4 Mount the removed covers.
For how to mount them, refer to [2. 2].

| | |
|---|---|
| Important | • Do not use excessive force to press a cassette option to the option slot, or the connector pin may be damaged. Along the guide, insert straight slowly.<br>• Depending on a cassette option, insertion to the option slot A, B may not be possible. Refer to [10. 4. 1].<br>• In the case of frame size A7 or A8, remove the wire-holding fitting mounted at the lower part of the option slot A, B before inserting/removing the cassette option. |

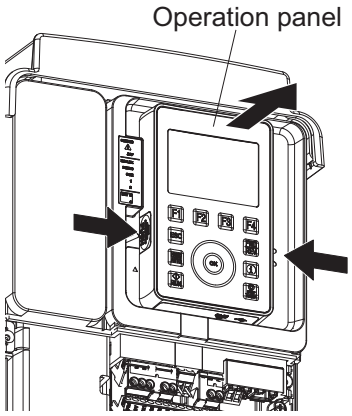
## 10. 4. 3 Mounting/removing the option adapter

Mounting/removing methods of the option 3 slot adapter are as follows.
Mounting and removing methods of a cassette option is the same with option slot A, B. For details, refer to [10. 4. 2].

### ■ Mounting of option

1 Remove the front covers and other parts in advance. Covers to be removed at the time of wiring vary depending on the frame size of inverter.

2 While pressing the PUSH part located on both right and left sides of the operation panel, pull the operation panel straight upward.
The operation panel is connected to the unit with the connector on the center of back side.

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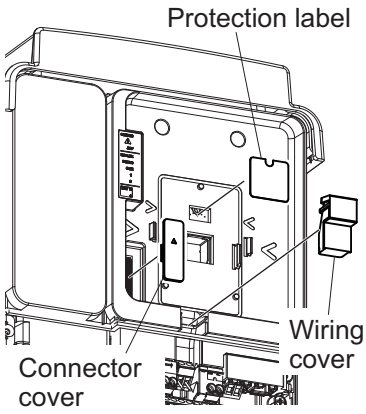
3 Remove the protection label.

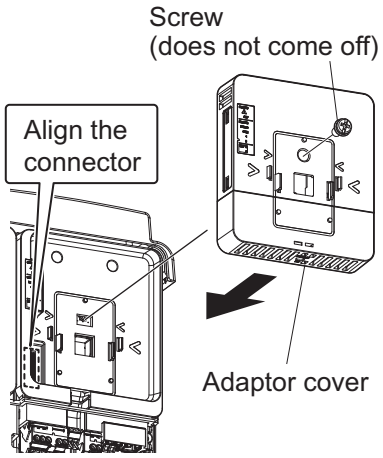
4 Remove the connector cover.
Store the removed parts so as not to be lost.

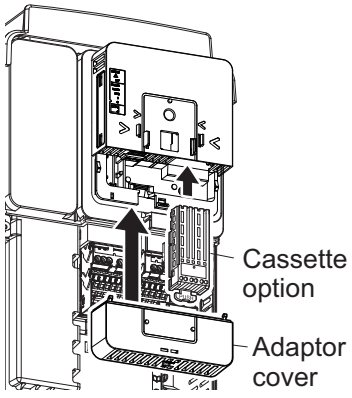
5 Remove the option wiring cover.
The option wiring cover can be removed by fingers.
Store the removed parts so as not to be lost.




6 Match the position of the Option adaptor connector with the inverter, and mount the Option adaptor.
Store the removed parts so as not to be lost.

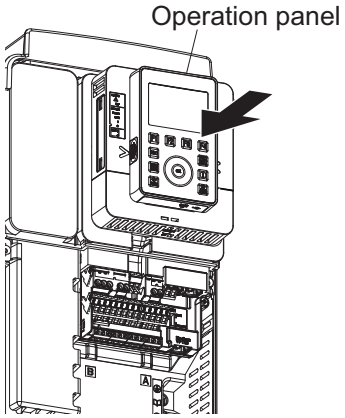
7 Tighten the screw.
This screw is used to connect ground for option.




8 Insert a screwdriver, etc. to the lock removal hole of the adaptor cover to push and unlock, and remove the adaptor cover upward. In this state, a cassette option can be inserted to slot C.
Using the groove of removed wiring cover, perform wiring of the cassette option before inserting the option, and fix the wiring by the attached cable tie.

9 After wiring is complete, mount the adaptor cover on the Option adaptor.
Be cautious that the wiring of the cassette option does not get pinched by the adaptor cover.
The removed operation panel can be installed on top surface of the Option adaptor.

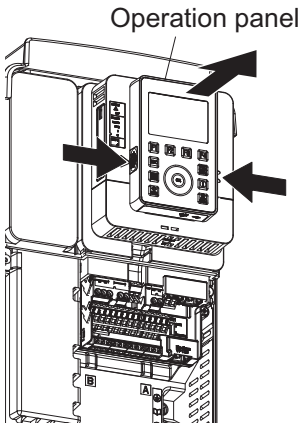



10 Mount the removed front covers.

## ■ Removing of option

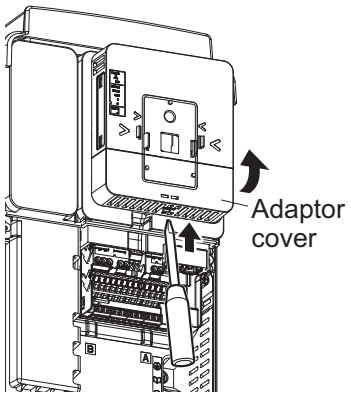
1 Remove the front covers and other parts in advance. Covers to be removed at the time of wiring vary depending on the frame size of inverter.

2 While pressing the PUSH part located on both right and left sides of the operation panel, pull the operation panel straight upward.
The operation panel is connected to the unit with the connector on the center of back side.




3 Insert a screwdriver, etc. to the lock removal hole of the Option adaptor cover to push and unlock, and remove the adaptor cover of the Option adaptor.

4 Remove wiring to the cassette option.

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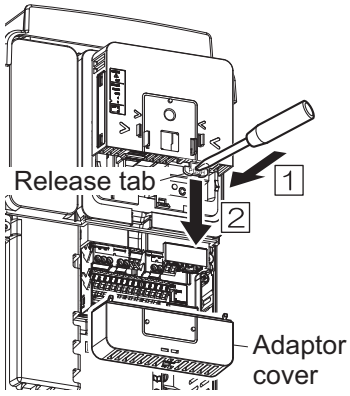
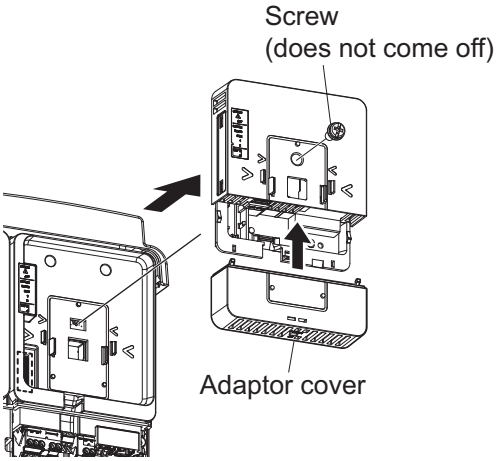
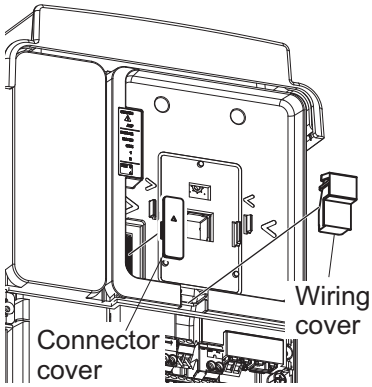
5 While pressing the release tab down, pull the cassette option to remove from slot C.




6 Remove the Option adaptor.
Mount the adaptor cover removed before.




7 While pressing the PUSH part located on both right and left sides of the operation panel, pull the operation panel straight upward.
The operation panel is connected to the unit with the connector on the center of back side.

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