

# ***TOSVERT VF-AS3***

Braking unit Option Instruction Manual

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PB7-4132K

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**TOSHIBA INDUSTRIAL PRODUCTS AND SYSTEMS CORPORATION**

NOTICE

1. Make sure that this instruction manual is delivered to the end user of Braking unit option.
2. Read this manual before attaching the Braking unit option. Keep it in a safe place for reference.
3. All information contained in this manual will be changed without notice.



\*QGH15809REV03\*

I. Safety precautions





The items described on the inverter, the braking unit and their instruction manuals are very important so that you can use safely the inverter and braking unit, prevent injury to yourself and other people around you as well as to prevent damage to property in the area.

Read the instruction manual (E6582062) attached to the inverter to understand the safety precautions, thoroughly familiarize yourself with the symbols and the indications completely and then continue to read the manual. Make sure that you observe all warnings given.

■ Limits in purpose

- This braking unit is used for following VF-AS3 series inverter as additional braking function.
- VFAS3-4900PC, VFAS3-4110KPC, VFAS3-4132KPC
  - VFAS3-2450P, VFAS3-2550P



■ General Operation

 Warning	
 Disassembly inhibited	<ul style="list-style-type: none"><li>• Never disassemble, modify or repair. This can result in electric shock, fire and other injury. Please call your Toshiba distributor for repairs.</li></ul>
 Prohibited	<ul style="list-style-type: none"><li>• Never remove the front cover when the power is on. The braking unit contains high voltage parts and contact with them will result in electric shock.</li><li>• Do not stick your fingers into openings such as cable wiring holes. The braking unit contains high voltage parts and contact with them will result in electric shock.</li><li>• Do not place or insert any kind of object (electrical wire cuttings, rods, wires etc.) inside the braking unit. This will cause a short circuit and result in electric shock or fire.</li><li>• Do not allow water or any other fluids to come in contact with braking unit. This will cause a short circuit and result in electric shock or fire.</li></ul>
 Mandatory action	<ul style="list-style-type: none"><li>• Turn the power on only after attaching the front cover. If you turn the power on without attaching the front cover, this will result in electric shock or other injury.</li><li>• Immediately turn the power off if the inverter or braking unit begins to emit smoke or an unusual odor, or unusual sounds. Continuous use of braking unit in such a state will cause fire. If the inverter is left to be turned on in that state, it can cause fire. Please call your Toshiba distributor for repairs.</li></ul>

## ■ Transportation & installation





### Warning

 Prohibited	<ul style="list-style-type: none"> <li>Do not install and operate the braking unit if it is damaged or any of its components is missing. This will result in electric shock or fire. Please call your Toshiba distributor for repairs.</li> <li>Do not place any inflammable object near the braking unit. If flame is emitted due to failure in the braking unit, this will lead to fire.</li> <li>Do not install the braking unit in any location where the braking unit could come into contact with water or other fluids. This will result in electric shock or fire.</li> </ul>
 Mandatory action	<ul style="list-style-type: none"> <li>Install the braking unit by connecting it directly to inverter according to this manual. Connecting braking unit and inverter by cable will result in failure and fire.</li> <li>Do not use other accessories than attached in the braking unit. Using other accessories will result in failure and fire.</li> <li>Install the braking unit under the environmental conditions prescribed in this manual. Operations under any other conditions will result in failure.</li> <li>Install the braking unit after verifying that the inverter power is OFF and passed 15 minutes or more after turning off the power, In case that an electric charge remains in capacitors inside the inverter, touching the electrical parts in the braking unit will result in electric shock.</li> <li>Connect the ground of braking unit with the inverter ground in accordance with this manual. If the ground is not securely connected, when the braking unit has failure or earth leakage, this will result in electric shock or fire.</li> </ul>





### Caution

 Prohibited	<ul style="list-style-type: none"> <li>For transporting or carrying the braking unit, do not hold by the front cover. The cover will come off and the braking unit will drop, resulting in injury.</li> <li>Do not install the braking unit in any place with large vibration. The braking unit will fall due to the vibration, resulting in injury.</li> </ul>
 Mandatory action	<ul style="list-style-type: none"> <li>Carry the braking unit by two people or more. If you carry the unit alone, this will result in injury.</li> <li>Install the braking unit in accordance with the procedure in this manual. Irregular installation can cause braking unit drop and can result in injury.</li> <li>Install the thermal protection for braking resistor (eg. thermal fuse). Use braking resistor without thermal protection can cause fire or injury.</li> <li>Install the mechanical brake when it is necessary to hold a motor shaft. A brake function of this unit cannot perform mechanical hold, and it can result in injury.</li> </ul>



## ■ Wiring

### Warning


 Prohibited	<ul style="list-style-type: none"> <li>Do not touch wires of equipments that are connected to the inverter or braking unit power side at least 15 minutes after turning off the power. If an electric charge remains in a capacitor in the inverter, touching the wires before the indicated time will result in electric shock.</li> </ul>
 Mandatory action	<ul style="list-style-type: none"> <li>Electrical construction work must be done by a qualified expert. Erroneous connection of power supply by someone who does not have that expert knowledge will result in fire or electric shock.</li> <li>Wiring must be done after installation. Wiring prior to installation will result in electric shock or other injury.</li> <li>Verify that the power is turned off and the charge lamp of inverter is off before starting wiring. Wiring without their verification will result in electric shock.</li> <li>Connect a braking resistor between [PA] and [PB] terminal inside the braking unit. Wrong connection of the resistor will result in fire.</li> <li>Tighten the screws on the terminal block to specified torque. If the screws are not tightened sufficiently to the specified torque, this will result in fire.</li> </ul>

## ■ Operations

### Warning


 Prohibited	<ul style="list-style-type: none"> <li>Do not touch terminals when the power of inverter and braking unit is on even if the motor is stopped. Touching the terminals while voltage is applied will result in electric shock.</li> </ul>
 Mandatory action	<ul style="list-style-type: none"> <li>Mount the front cover before the power ON. If you turn the power on without attaching the front cover, this will result in electric shock or other injury.</li> </ul>

### Caution

 Mandatory action	<ul style="list-style-type: none"> <li>Make sure to set the parameter correctly. Incorrect parameter can cause the inverter and braking unit to perform unexpected behavior and can result in an accident.</li> <li>Use the mechanical brake when it is necessary to hold a motor shaft. A brake function operation without mechanical hold can result in injury.</li> </ul>
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## ■ Disposal

### Caution

 Mandatory action	<ul style="list-style-type: none"> <li>If you dispose of the braking unit, have it done by a specialist in industry waste disposal<sup>*1</sup>. If you dispose of the braking unit by yourself, this can result in production of noxious gases, resulting in injury.</li> </ul>
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<sup>\*1</sup> Persons who specialize in the processing of waste and known as "industrial waste product collectors and transporters" or "industrial waste disposal persons". Please observe any applicable law, regulation, rule or ordinance for industrial waste disposal.

## **II. Introduction**

Thank you for purchasing the braking unit option for Toshiba's industrial inverter "TOSVERT VF-AS3".

This manual explains how to install and wire the braking unit.

Refer to VF-AS3 instruction manual (E6582062) for the operation procedure, parameters, measures for protective functions (when an alarm/trip occurs), etc.

This braking unit is used for following VF-AS3 series inverter as additional braking function.

- VFAS3-4900PC, VFAS3-4110KPC, VFAS3-4132KPC
- VFAS3-2450P, VFAS3-2550P

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## 1. Read first

### ■ Check product purchase

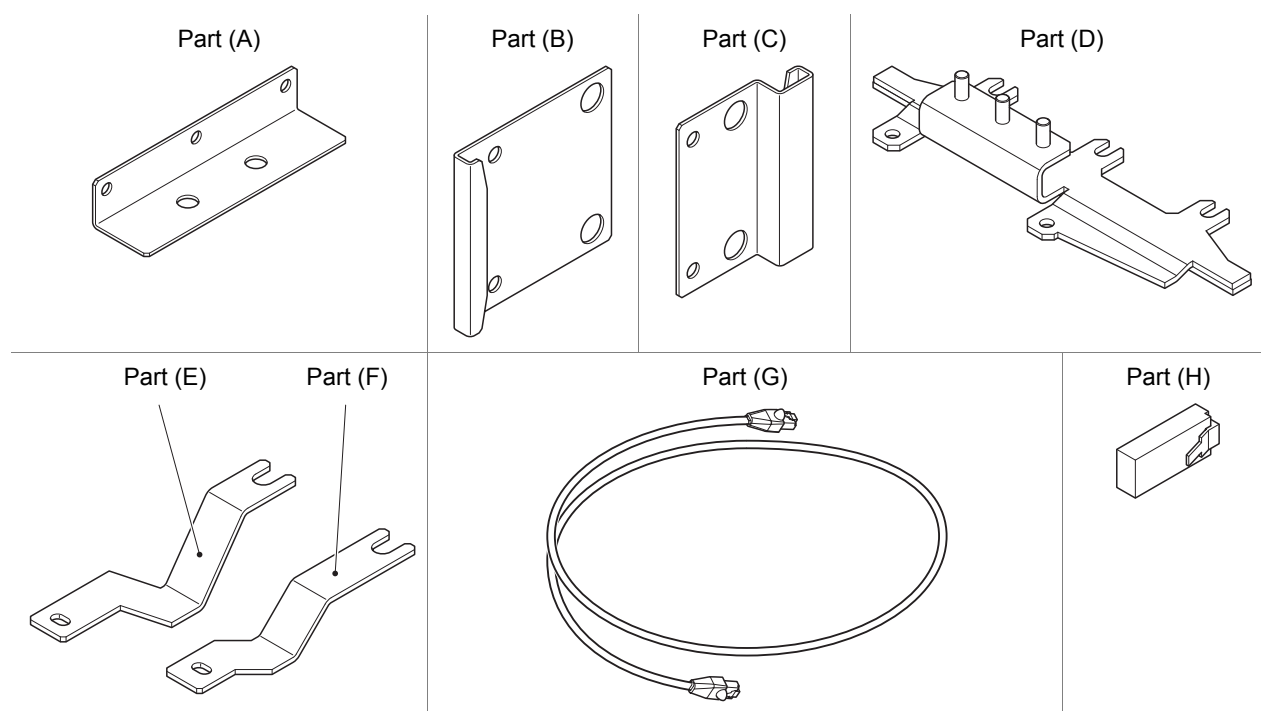
Before using the product you have purchased, check to make sure that it is exactly what you ordered.

#### [Check the accessories]

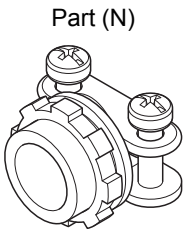
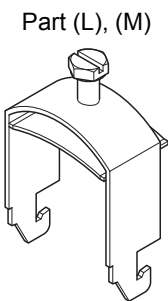
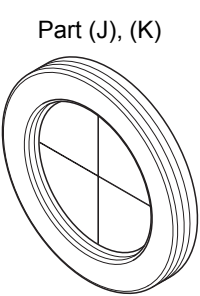
This braking unit option is composed of the unit and following accessories.

Unpack a parcel and check to make sure the contents.

- Installation manual: This manual
- Part (A): Braking unit support (2pcs), see page 11 in this manual
- Part (B): Hanging metal Inverter (2pcs), see page 11 in this manual
- Part (C): Hanging metal Braking unit (2pcs), see page 11 in this manual
- Part (D): Grounding bar with gasket, see page 12 in this manual
- Part (E): DC bar for PA, see page 13 in this manual
- Part (F): DC bar for PC, see page 13 in this manual
- Part (G): Interconnection cable, see page 14 in this manual
- Part (H): Termination plug, see page 14 in this manual

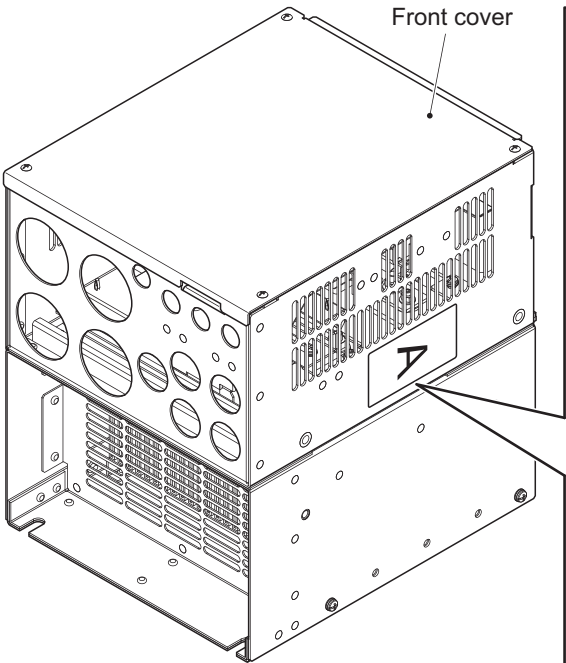


- Part (J): Cable grommets Large (4pcs), see page 14 in this manual
- Part (K): Cable grommets Small (5pcs), see page 14 in this manual
- Part (L): Cable clamps Large (4pcs), see page 15 in this manual
- Part (M): Cable clamps Small (4pcs), see page 15 in this manual
- Part (N): Cable clamps ROMEX 6 (4pcs), see page 15 in this manual
- Screw for connecting PB unit: M8x16 bolt (8pcs), M8 nut (5pcs), and M6x14 screw (8pcs)



[Check the name plate]

The name plate is put on the right-hand side of the braking unit on the position of figure below.



Braking unit Type →

Input Voltage (DC) →


Trigger Voltage →

Maximum braking power →




Maximum continuous power →

Minimum allowable resistance →

TOSHIBA BRAKING UNIT		
PB7-4132K (1)		
Inverter model	for 200V	for 400V
Input Voltage max.(VDC)	415	820
Trigger Voltage(VDC)	379	758
P max. (kW)	93	220
P cont. (kW)	93	220
R min. (Ω)	1.0	1.9

  
Serial No. 9640 09003424 0001 (1)

Manufactured in China  
from foreign and  
domestic components



LISTED 170M  
IND.CONT.EQ.  
E204788

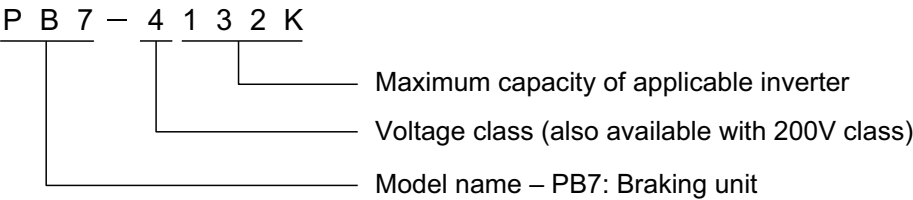
TOSHIBA INDUSTRIAL PRODUCTS  
AND SYSTEMS CORPORATION

580, Horikawa-cho, Kawasaki, 212-0013, Japan

TSIJ

■ Indication of product type

Explanation of the indication of the braking unit type





## ■ Applicable inverter / Braking resistor & wire selection

Following table shows the applicable inverter, each minimum allowable resistance of a braking resistor and the wire size. Use the braking resistor with a resistance value greater than the minimum allowable resistance.

Applicable inverter Type form	Minimum allowable resistance	Wire size (HD)		Wire size (ND)	
		AWG (*1)	mm <sup>2</sup> (*2)	AWG (*1)	mm <sup>2</sup> (*2)
VFAS3-4900PC	1.9Ω	1/0	35	1/0	35
VFAS3-4110KPC		1/0	50	1/0	50
VFAS3-4132KPC		4/0	70	4/0	70
VFAS3-2450P	1Ω	2	50	1/0	50
VFAS3-2550P		1/0	50	1/0	70

\*1: This cable size is conformity to UL508C.

\*2: This cable size is conformity to IEC60364-5-52.



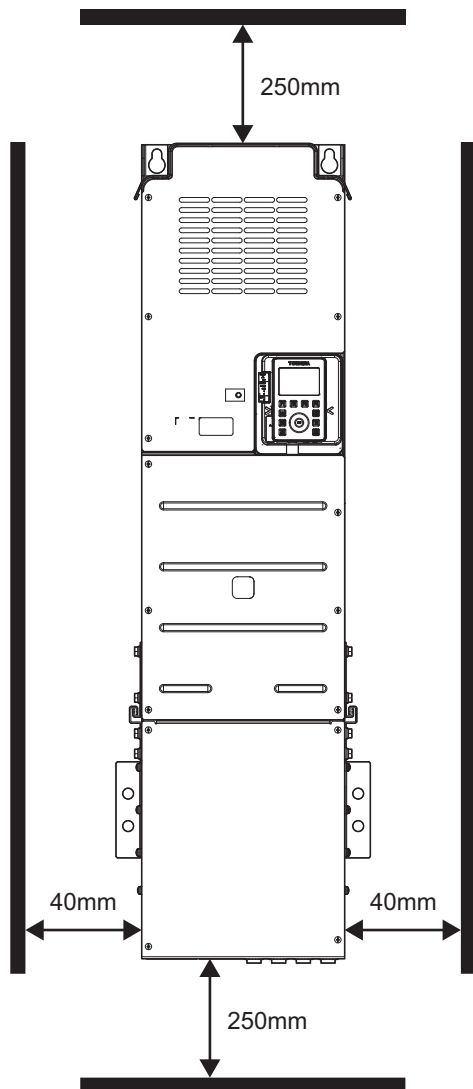
Important

- 600V HIV insulation wire (copper wire with the maximum allowable temperature 90°C of an insulator) must be connected to VF-AS3 for Input and Output cables when Braking unit is mounted with 50°C ambient temperature.
- Tightening torque (M8 nut) for connecting wire: 11.8Nm (104.4lbin)

## 2. Installation and wiring

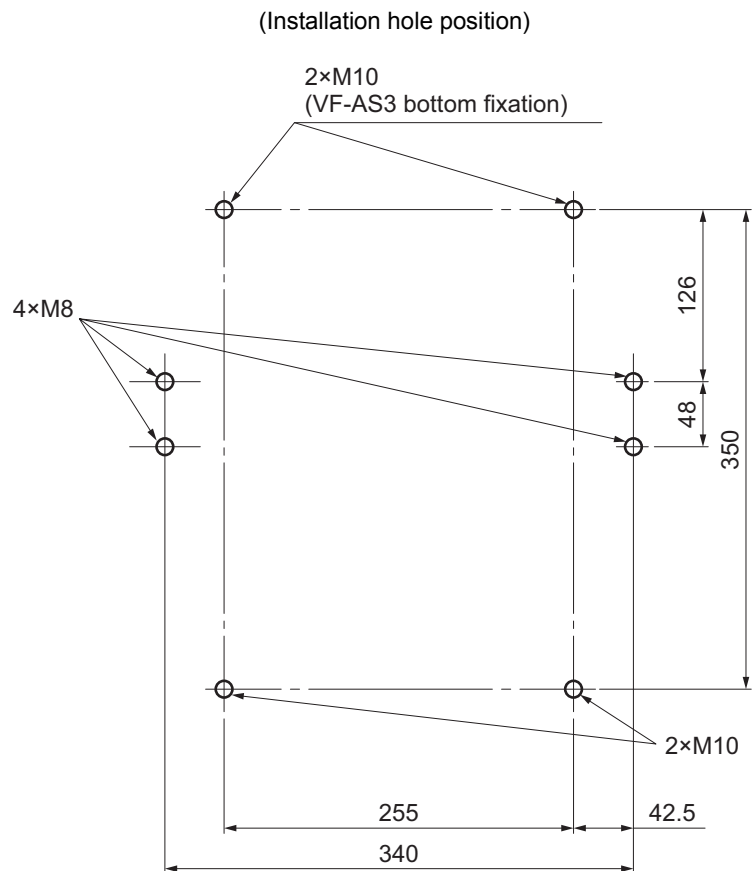
This chapter explains installation of the braking unit, how to remove the covers, how to connect with the inverter and wire to braking resistor.

### ■ Installation environment



Install the Braking unit with the inverter in a well-ntilated indoor place and mount in portrait orientation.

As the Braking unit is cooled by the built-in fan inside the inverter unit, keep a space of 250mm or more above the inverter and below the Braking unit.



## ⚠ Caution



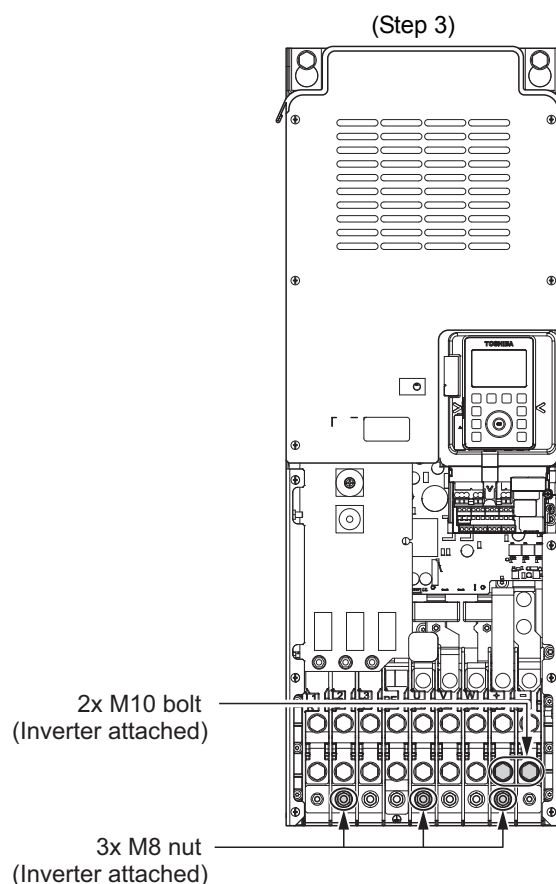
Mandatory  
action

- Install the braking unit under the environmental conditions prescribed in this manual. Operations under any other conditions will result in failure.

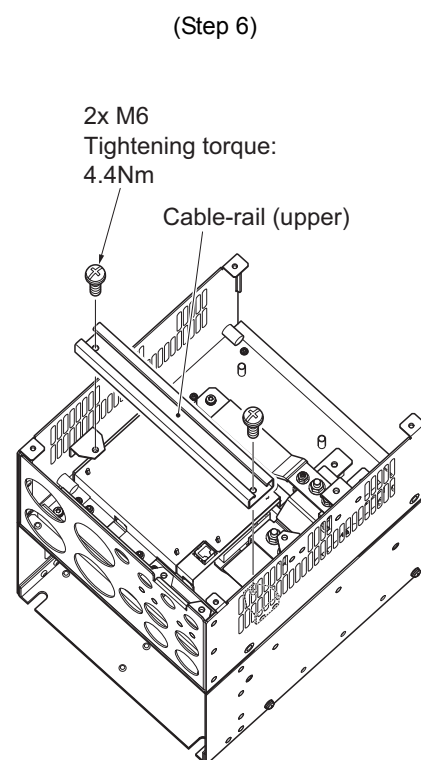
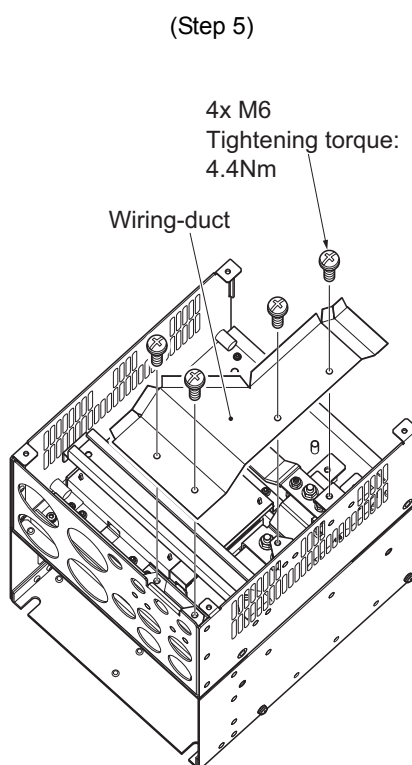
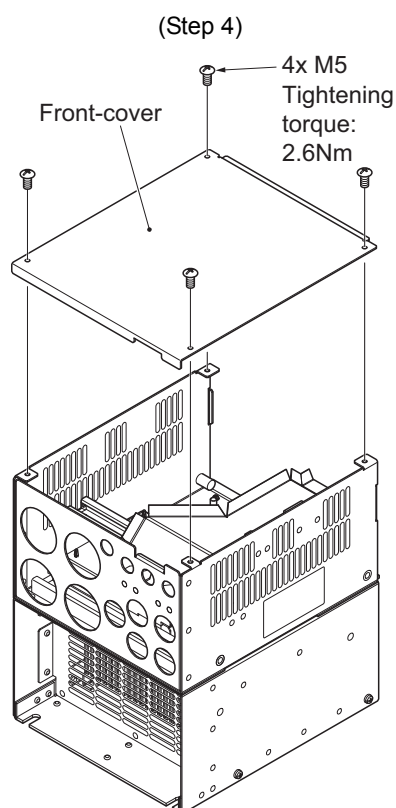
## ■ How to install

- Step 1. Mechanically install the Inverter
- Step 2. Remove front-cover, transparent-cover, and wiring duct of Inverter by referring to [2.2.4.] of E6582062.
- Step 3. Remove 3pcs M8 nuts from bottom grounding bar and remove 2pcs M10 bolts from terminal block in the Inverter.

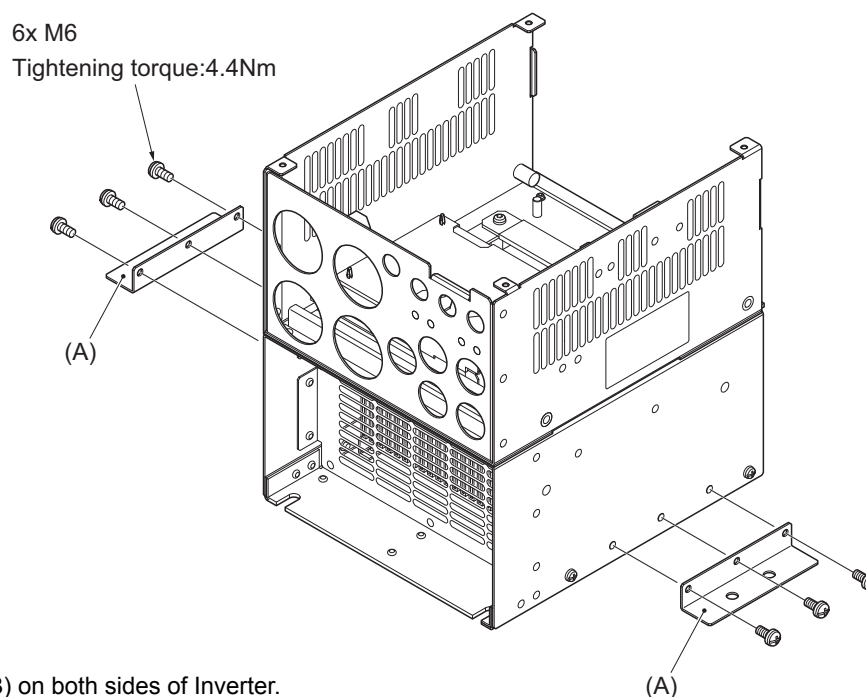
- Step 4. Remove Front-cover from Braking unit.
- Step 5. Remove Wiring-duct from Braking unit.
- Step 6. Remove Cable-rail (upper) from Braking unit.



Mount these parts in the reverse procedure when wiring.

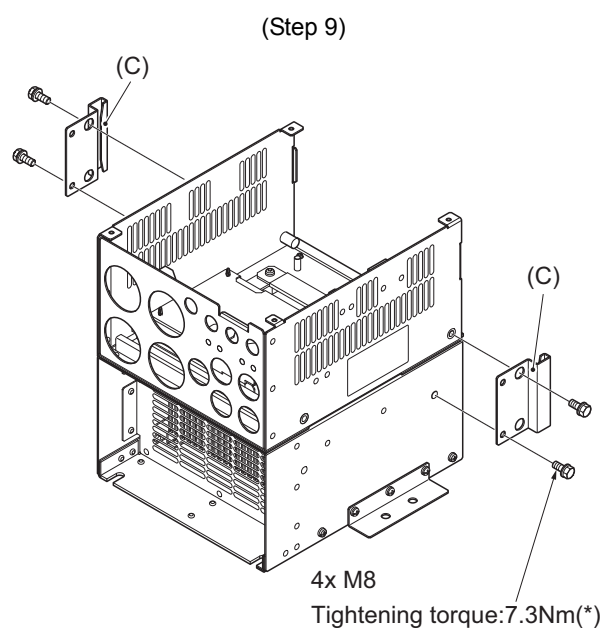
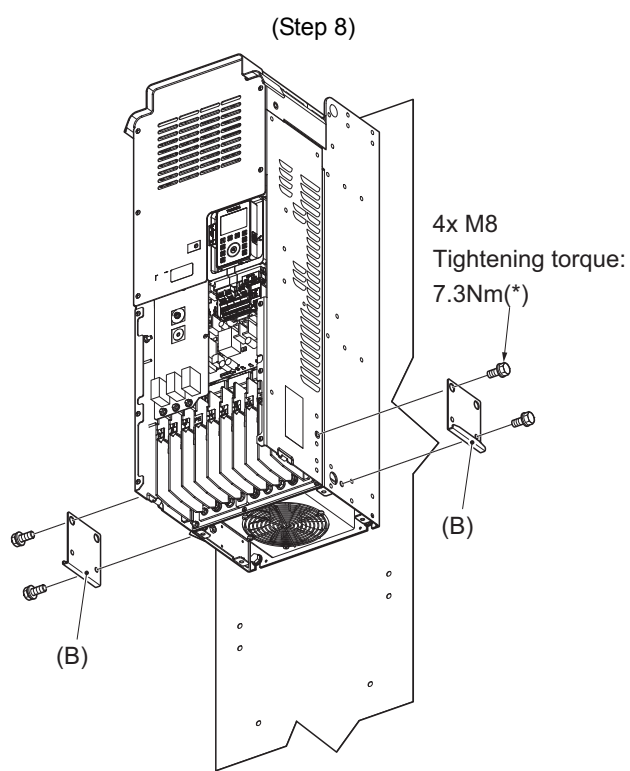


Step 7. Fix Part (A) on both sides of Braking unit.



Step 8. Fix Part (B) on both sides of Inverter.

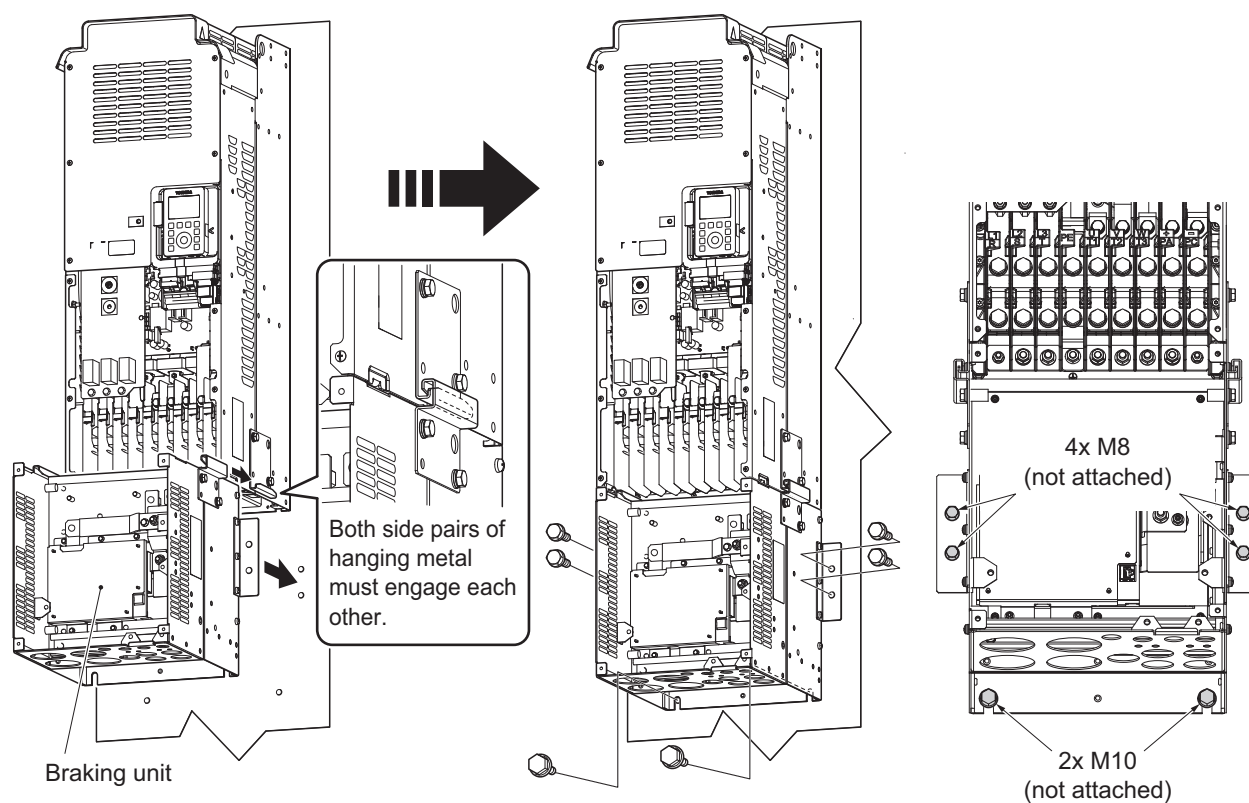
Step 9. Fix Part (C) on both sides of Braking unit.



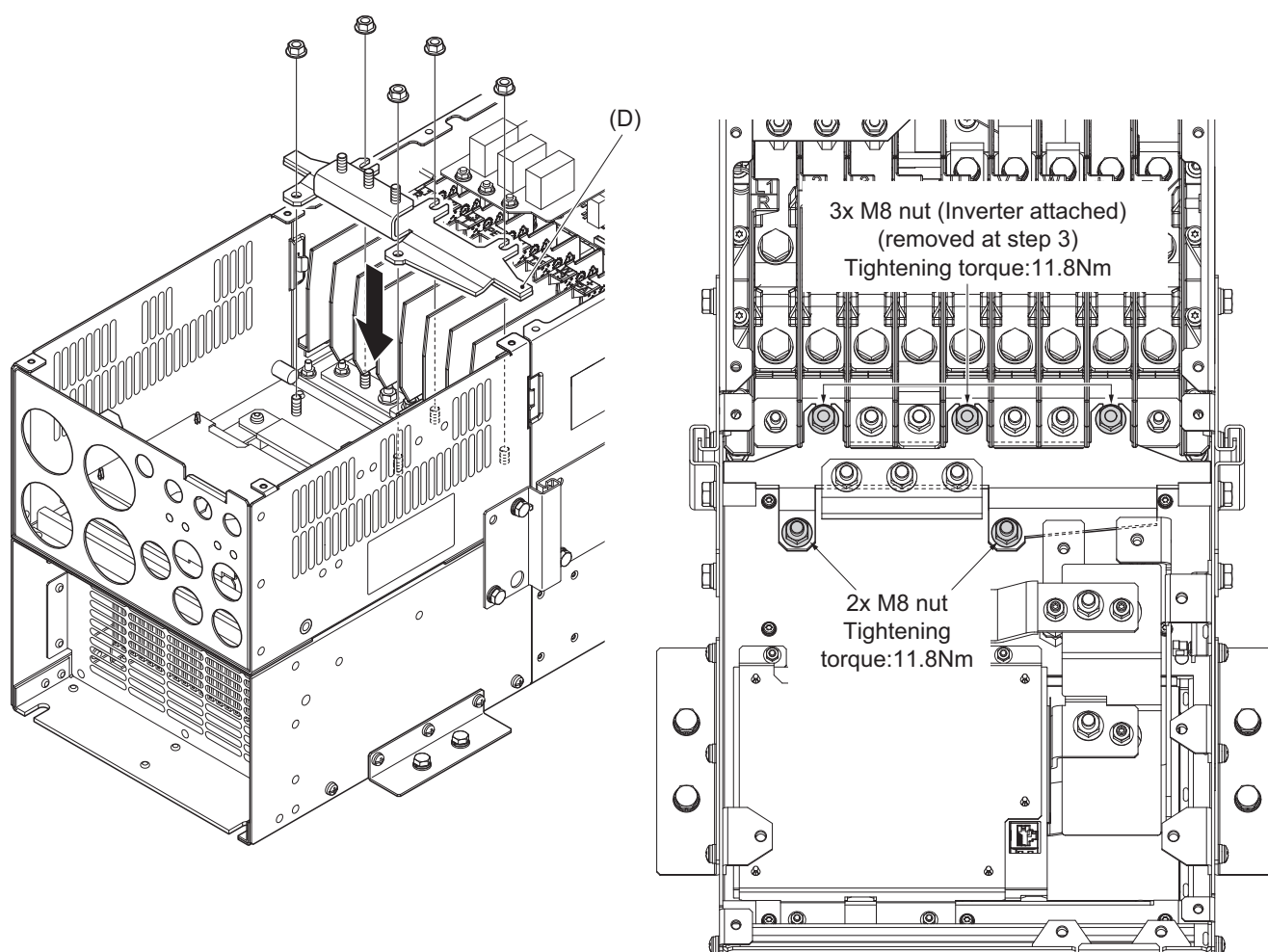
(\*) Do not tighten overloaded torque in order to enable to remove easily.

Remove these parts in the reverse procedure after mounting Braking unit.

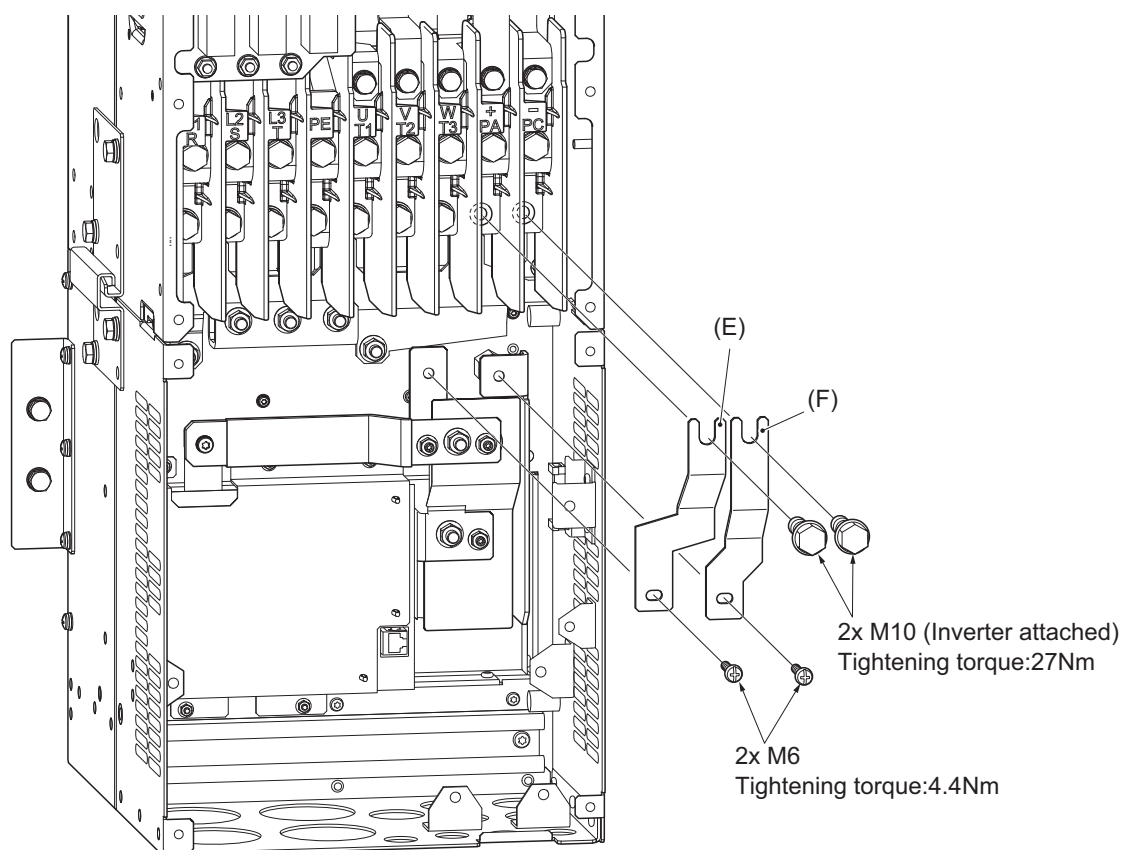
Step 10. Mount Braking unit on the wall.



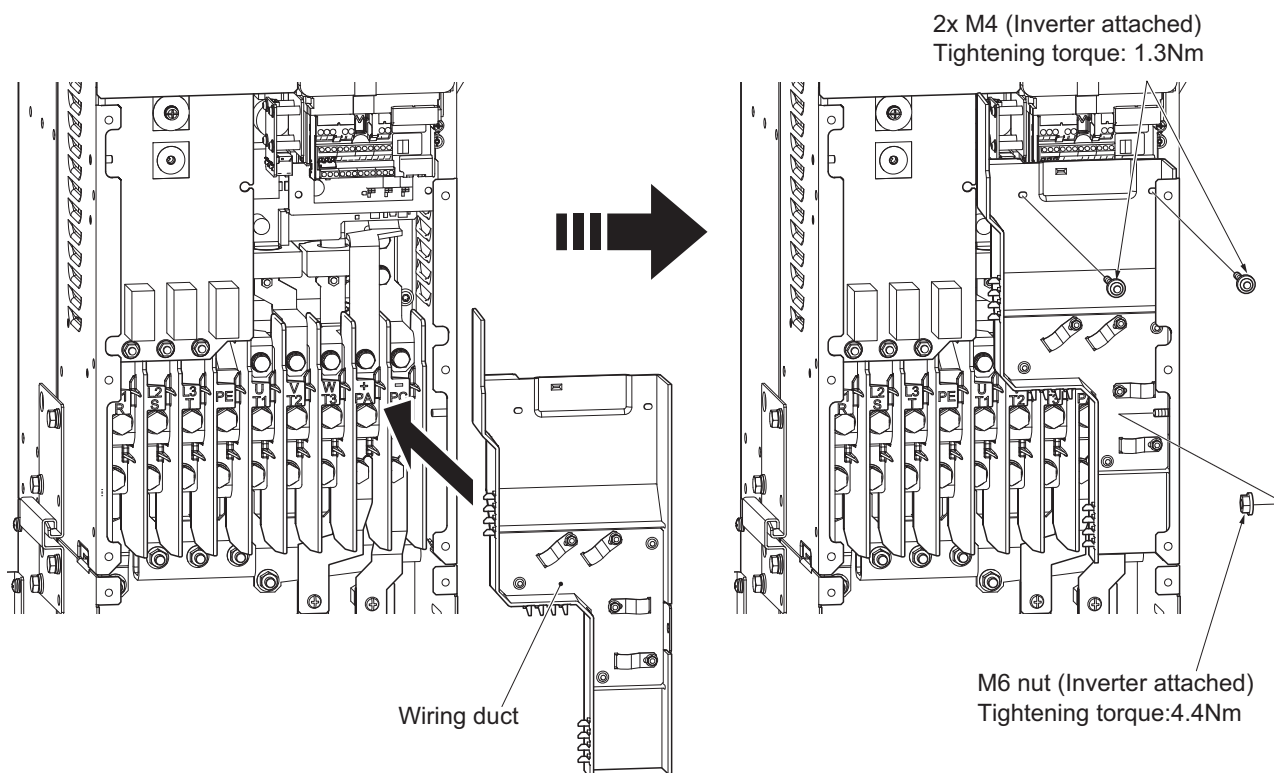
Step 11. Fix and connect Part (D) between Inverter and Braking unit.



Step 12. Fix and connect Part (E) and (F) between Inverter and Braking unit.

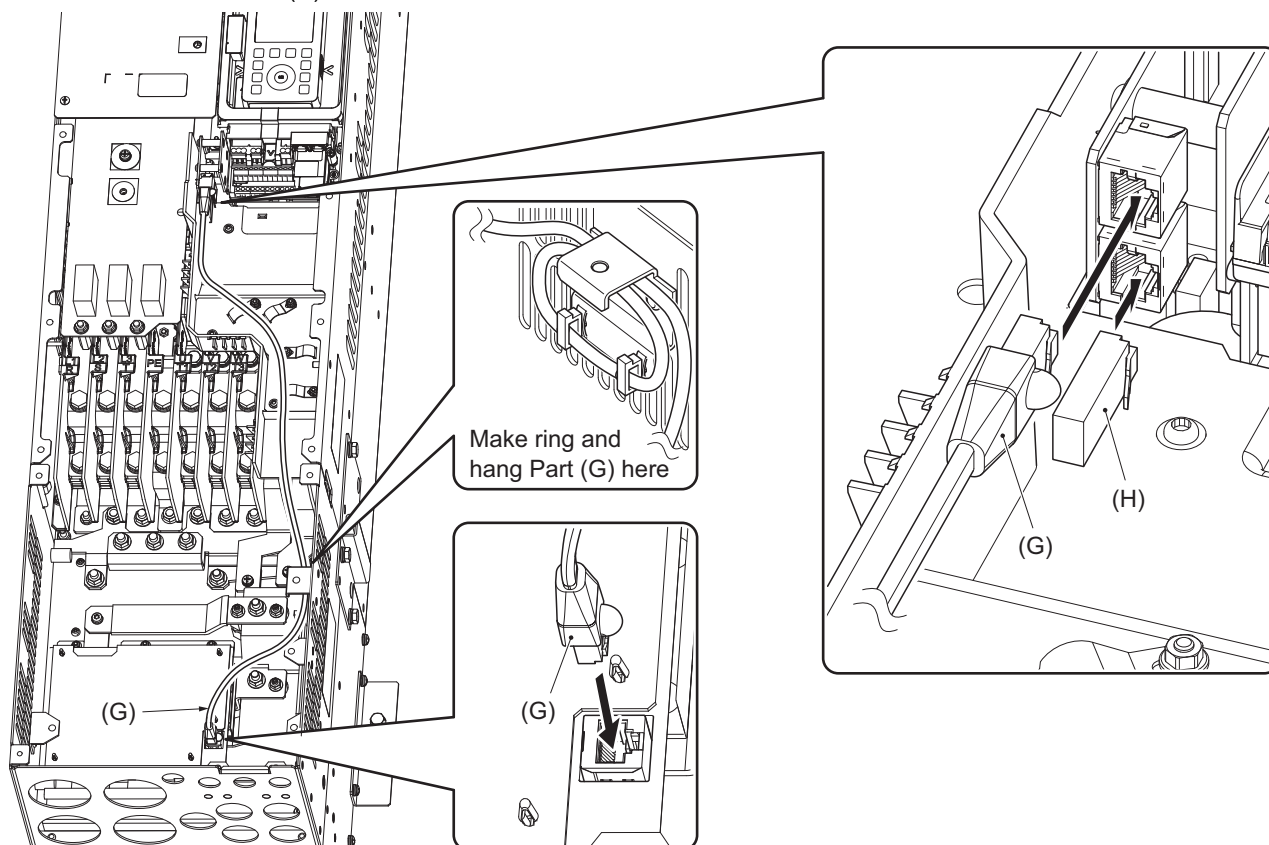


Step13. Fix wiring-duct to Inverter





Step 14. Connect Part (G) to connector in both Inverter and Braking unit.  
Connect Part (H) to connector in Inverter.



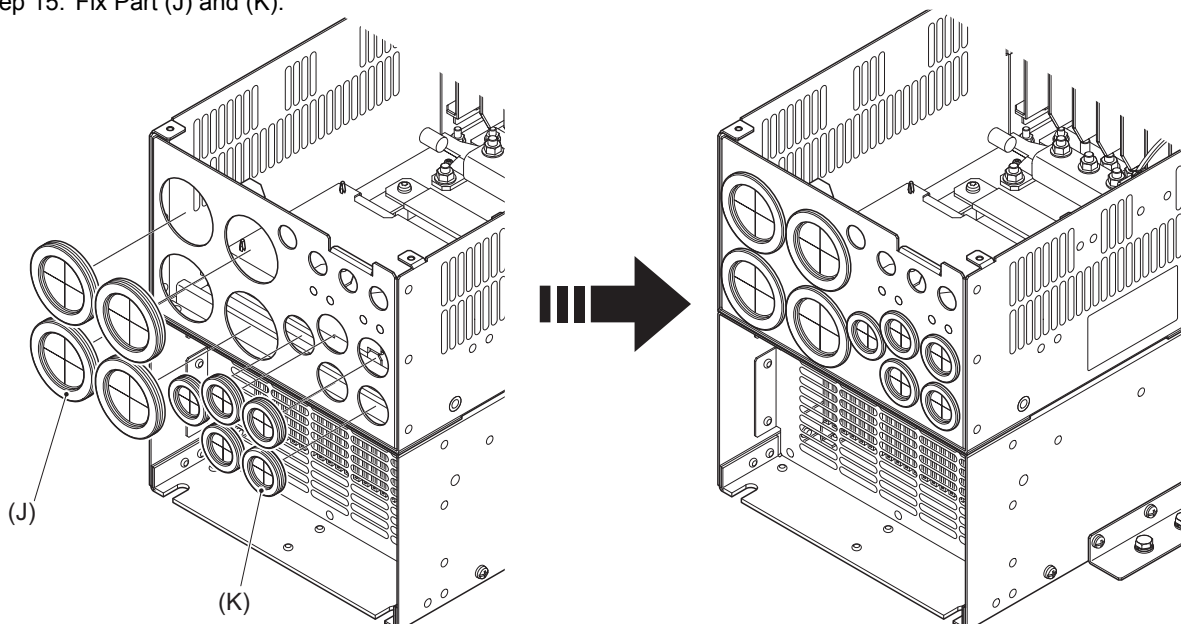
## ⚠ Caution



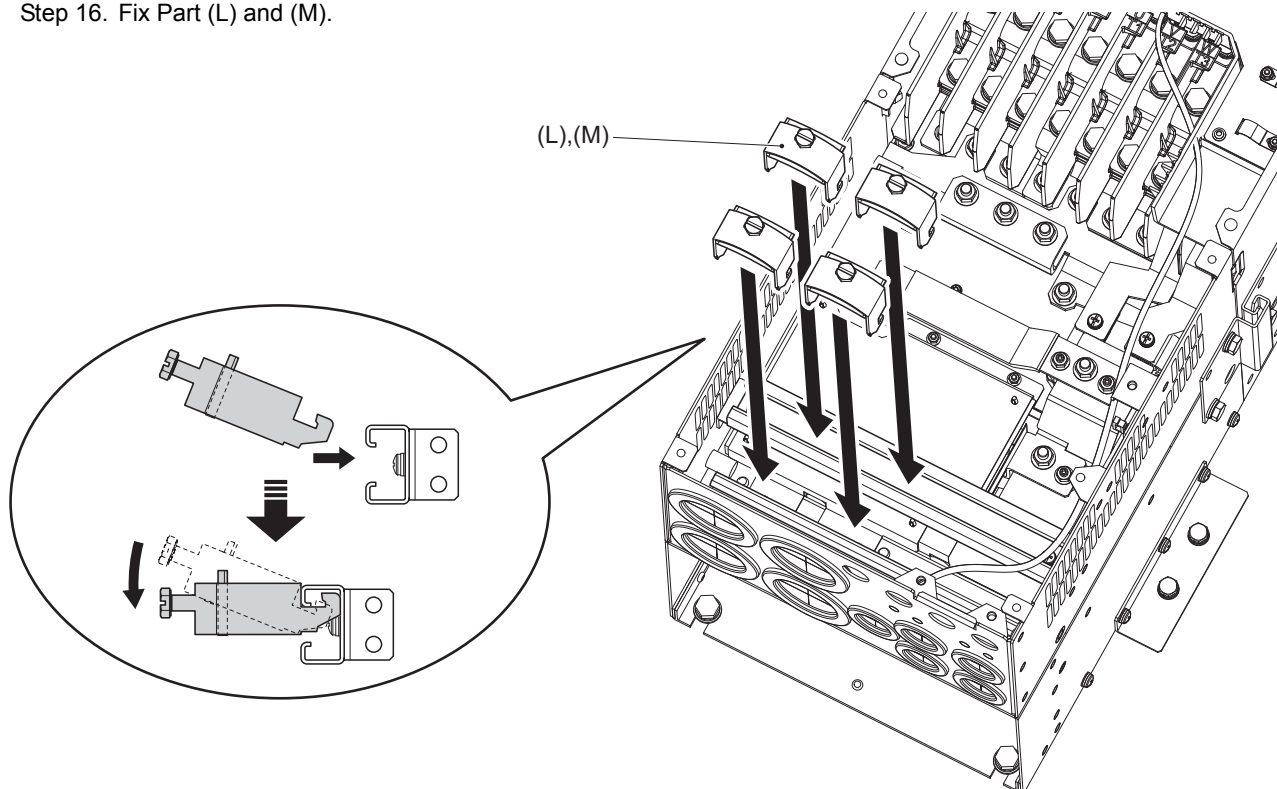
Mandatory  
action

- Fix the interconnection cable in the unit according to the figure above.  
Unfixed cable will be disturbed by noise from power cables and can cause malfunction of braking unit.

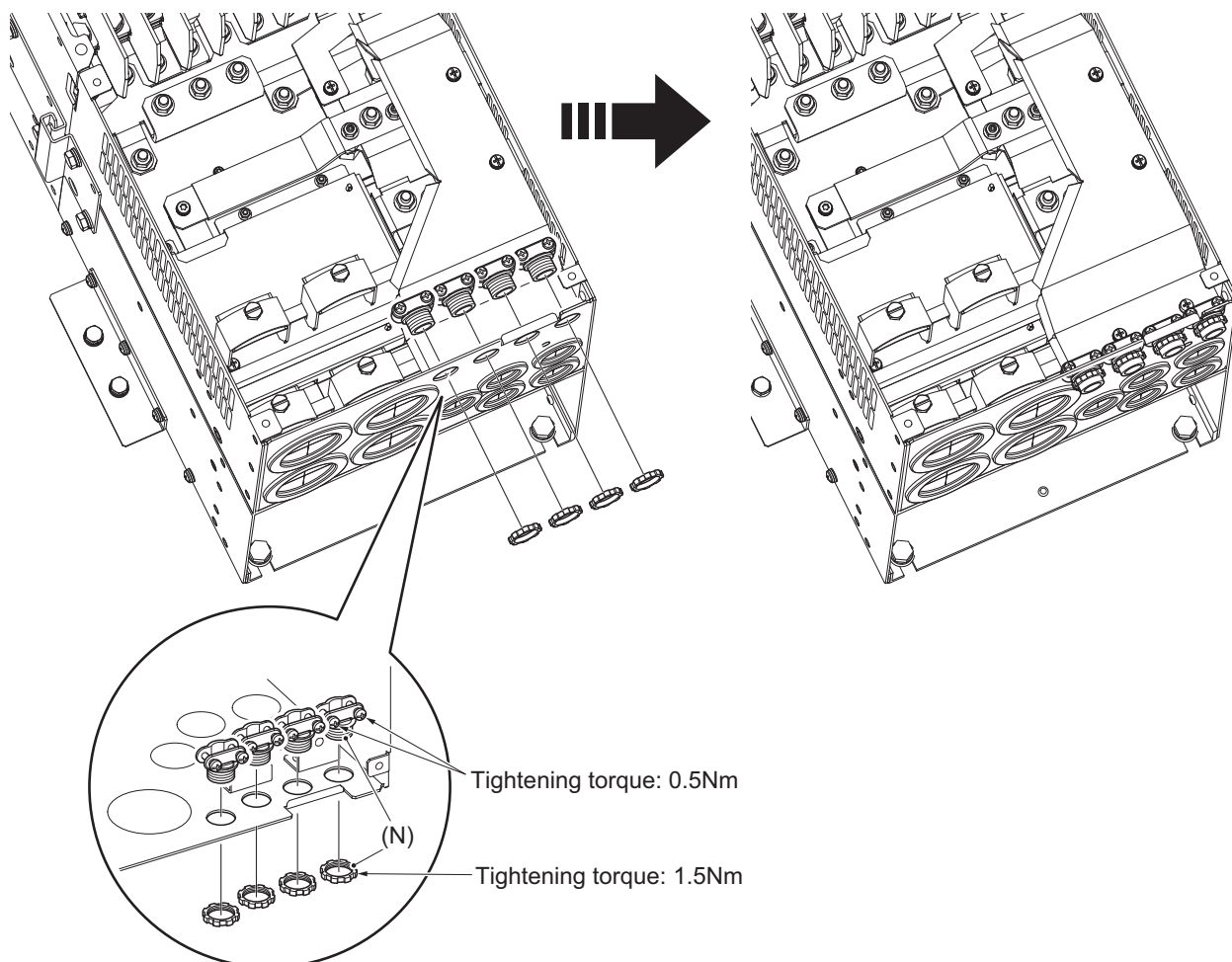
Step 15. Fix Part (J) and (K).



Step 16. Fix Part (L) and (M).



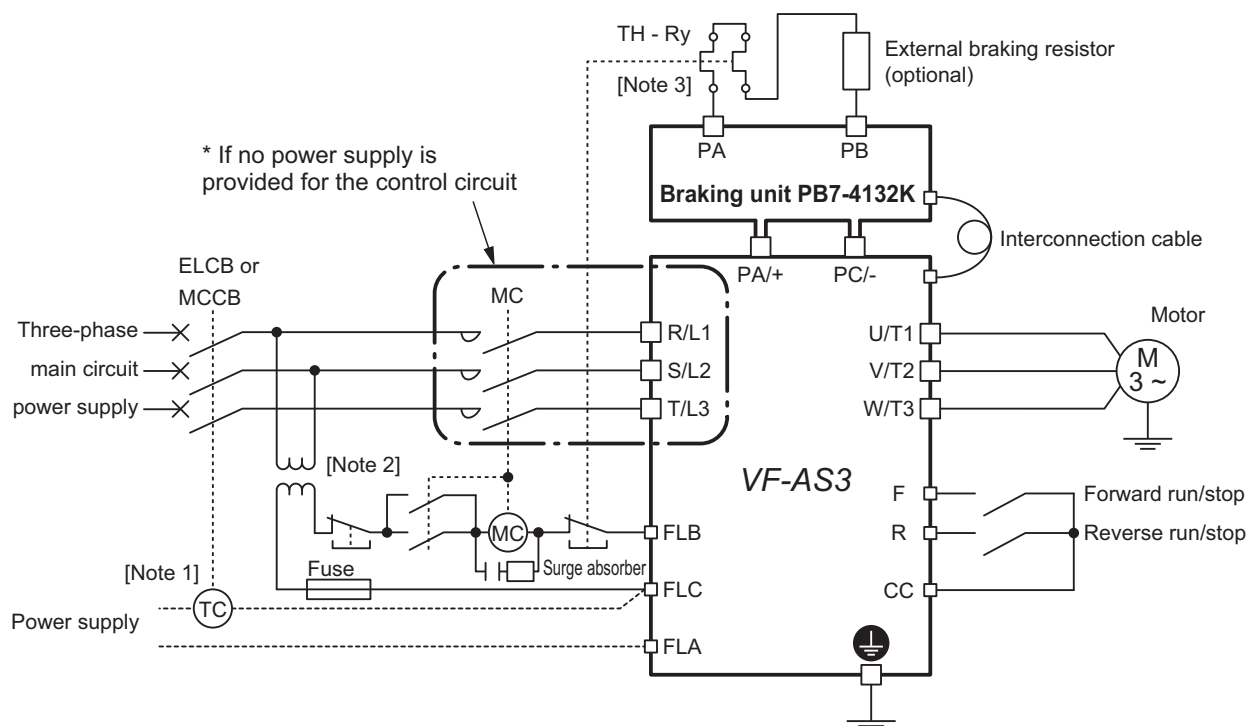
Step17. Fix Part (N).



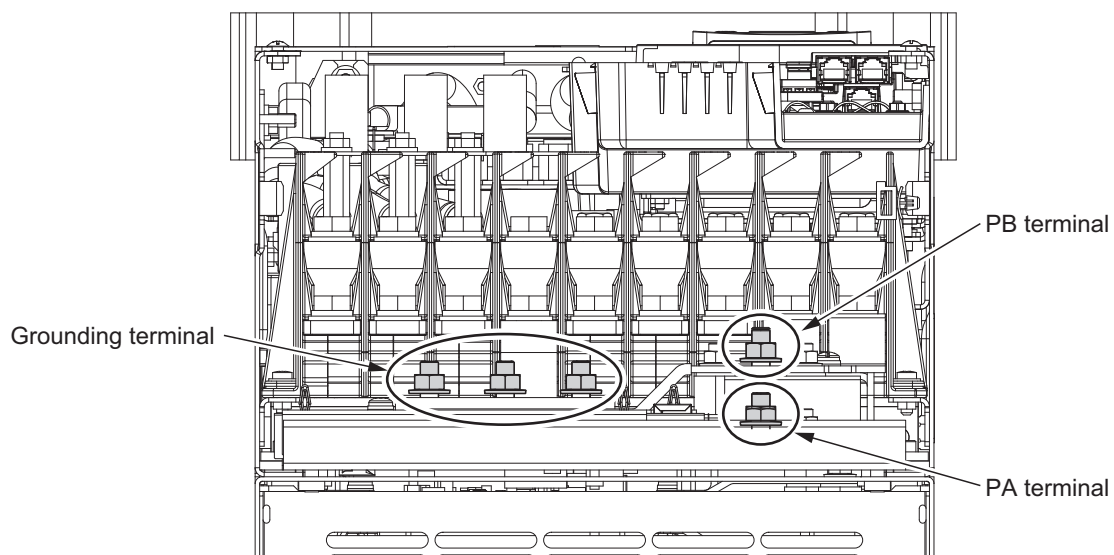
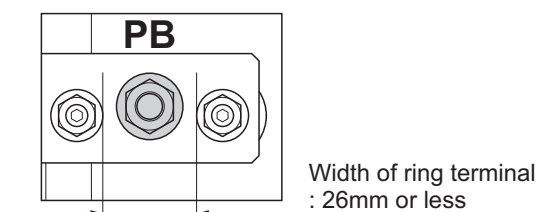
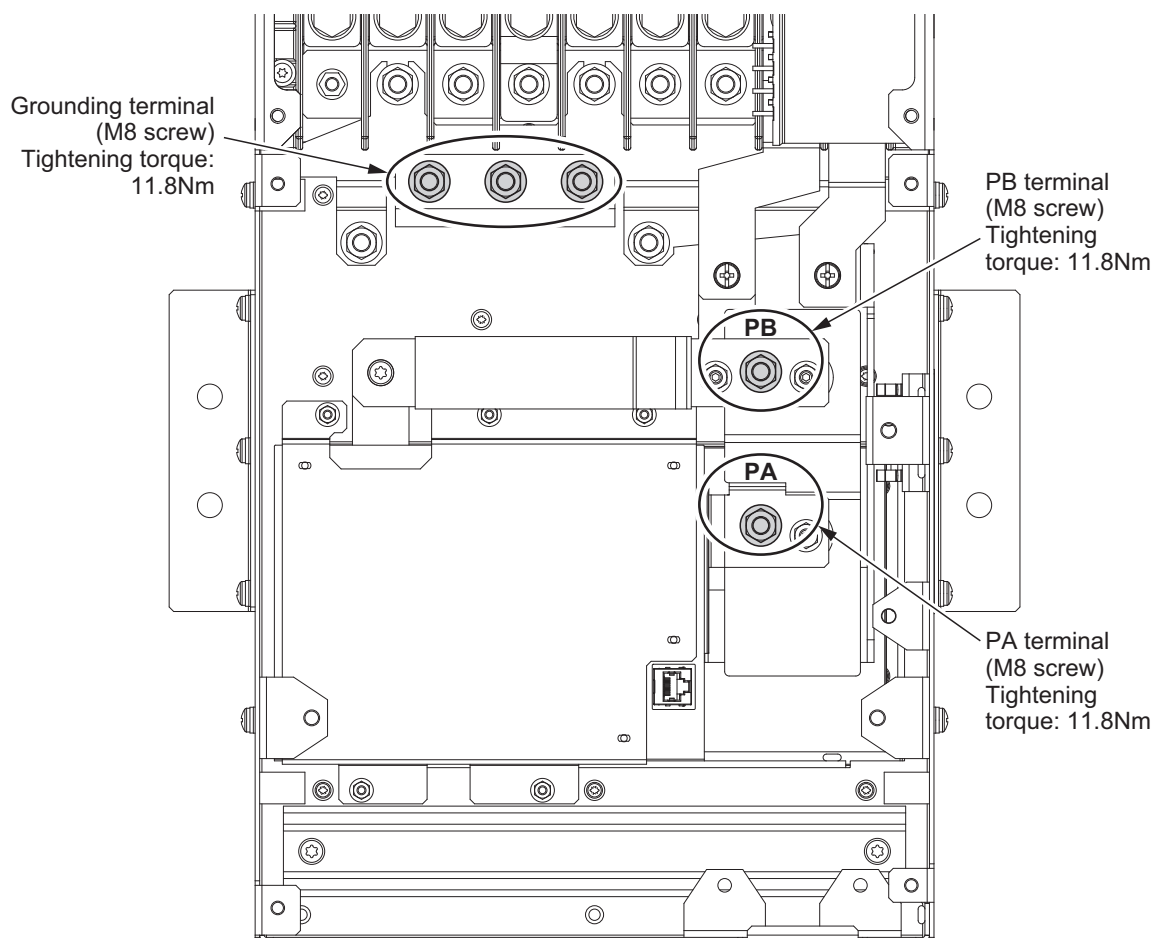


## ■ Standard connection diagram

Standard connection diagram is shown below.



## ■ Terminals



### 3. Specifications

#### ■ Main specifications

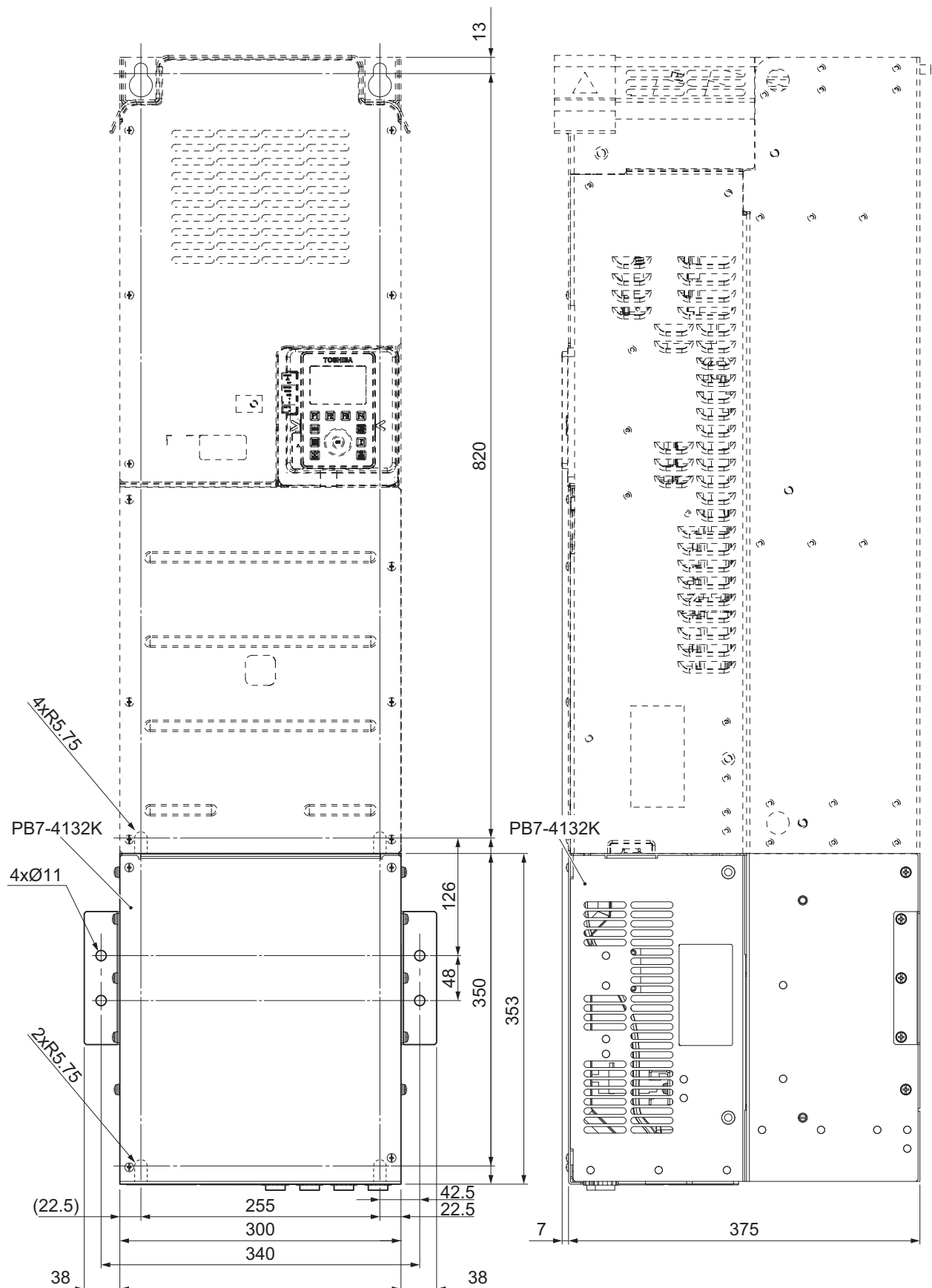
Type form	PB7-4132K	
Applicable model of inverter	VFAS3-4900PC VFAS3-4110KPC VFAS3-4132KPC	VFAS3-2450P VFAS3-2550P
Threshold voltage (default) (*1)	758V	379V
Maximum DC bus voltage	820V	415V
Maximum braking power at threshold voltage (continuous power)	220kW	93kW
Minimum allowable resistor	1.9Ω	1Ω
Calorific values	688W	532W
Cooling method	Forced air cooled	
Protective function (*2)	Overheat protection, short-circuit protection, overload protection	
Degree of protection (IEC60529)	IP20	
Operation environment	Operating temperature: Inverter operating temperature should be restricted to -15 to 50°C when using this option. In accordance with inverter for other environment.	
Storage temperature	-25 to 70°C	
Color	RAL7035	
Mounting position	Lower side of inverter (directly connected to inverter)	
Weight	Approx. 23kg	

\*1: Threshold voltage can be adjusted using the inverter parameter F626

\*2: When each protective function activated, the alarm is outputted from the inverter main unit.

## ■ Outline drawing

The figure below shows the braking unit (PB7-4132K) with applicable inverter.



## 4. Maintenance and inspection

See VF-AS3 instruction manual (E6582062) for maintenance and inspection.



### Warning



Prohibited

- Do not replace parts.

This will result in electric shock, fire and other injury. Please call your Toshiba distributor for repairs.

## **5. Warranty**

Any part of the Braking unit that proves defective will be repaired and adjusted free of charge under the following conditions:

1. This warranty applies only to the Braking unit.
2. Any part of the Braking unit which fails or is damaged under normal installation and use within twelve months from the date of delivery shall be repaired free of charge.
3. For the following kinds of failure or damage, the repair cost shall be borne by the customer even within the warranty period.
  - i) Failure or damage caused by improper or incorrect use or handling, or unauthorized repair or modification of the Braking unit
  - ii) Failure or damage caused by the Braking unit falling or an accident during transportation after the purchase
  - iii) Failure or damage caused by fire, salty damage, corrosive gas, earthquake, storm or flood, lightning, abnormal voltage supply, or other natural disasters
  - iv) Failure or damage caused by the use of the Braking unit for any purpose or application other than the intended one
4. All expenses incurred by Toshiba for on-site services shall be charged to the customer, unless a service contract is signed beforehand between the customer and Toshiba, in which case the service contract has priority over this warranty.

## 6. Disposal



### Caution



Mandatory  
action

- If you dispose of the Braking unit option, have it done by a specialist in industry waste disposal.\*1  
If you dispose of the Braking unit option by yourself, this can result in production of noxious gases, resulting in injury.

\*1 Persons who specialize in the processing of waste and known as "industrial waste product collectors and transporters" or "industrial waste disposal persons". Please observe any applicable law, regulation, rule or ordinance for industrial waste disposal.

When you dispose of your old Braking unit option, ask a specialist in industry waste disposal. Failure to do so results in injuries due to generation of noxious gas.