

TECO INVERTER Speecon 7200PA 7200GA BRAKING UNIT



INSTRUCTION MANUAL

This instruction manual will be of great help for daily maintenance, inspection and troubleshooting.



Before using the braking unit, a thorough understanding of this manual is recommended for daily maintenance, troubleshooting and inspection.

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1. RECEIVING

The braking unit has been put through demanding tests at the factory before shipment. If any problems (see below) are found after unpacking, please contact TECO representatives.

- (1) The nameplate does not meet your demands (please refer to page 12);
- (2) Transit damage.

Besides, please tighten the loose screws.

2. STORAGE

The braking unit must be stored at places where the following conditions are met:

- (1) Protected from rain;
- (2) Free from airborne dust and metallic particles;
- (3) Free from corrosive gases or liquids;
- (4) Keep clean and dry;
- (5) Ambient temperature : $-10\sim+40^{\circ}\text{C}$ ($+14\sim 104^{\circ}\text{F}$);
- (6) Free from vibration.

CAUTION

- (1) No withstand voltage tests to the braking unit.
- (2) No unnecessary adjustments to the calibration resistor (RV1).
- (3) Ground the grounding terminal (E) .
- (4) Be sure to close the cover when the braking unit is applied internally to high voltage. Once the cover is open, please turn off the inverter main circuit power supply and check the "CHARGE" LED has been extinguished.
- (5) Make sure the power has been truned off before changing the INPUT VOLTAGE SELECTOR (CP1) or MASTER/SLAVE SELECTOR (CP2).

3. INSTALLATION

Location of the braking unit is important to achieve proper performance. please install the braking unit to comply with the requirements below. Fig. 1 shows the size of braking unit and mounting space needed.

- (1) Provide the mounting space shown in Fig 1.
- (2) Devices sensitive to heat should be kept away from the braking resistor generating heat.
- (3) The braking unit must be installed at places meeting the requirements in Par. 2. STORAGE.
- (4) Install the braking unit in the direction shown in Fig. 1 to avoid ventilation problems.

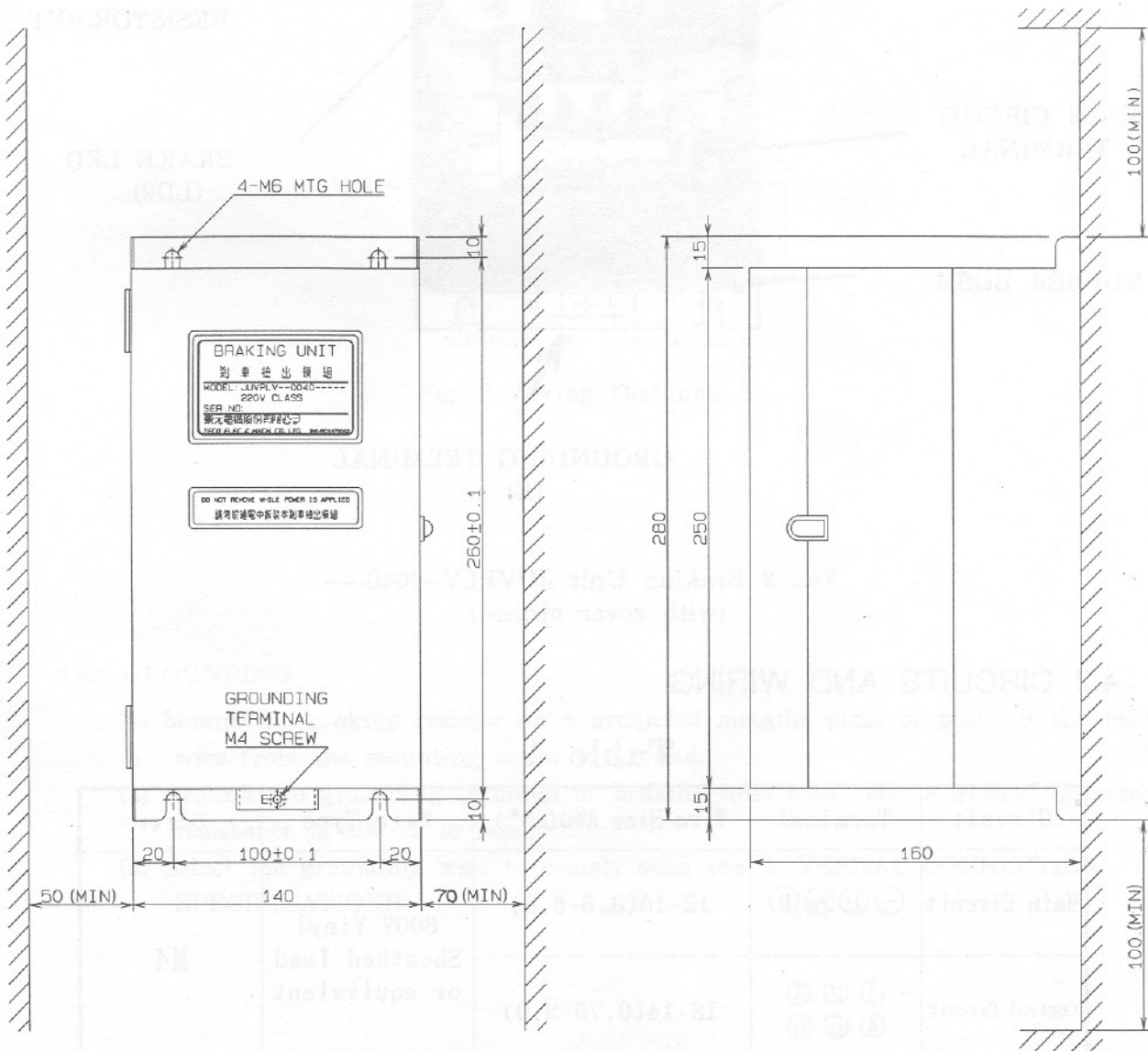


Fig. 1 Braking Unit Dimensions in mm

4. WIRING

4.1 PART NAMES

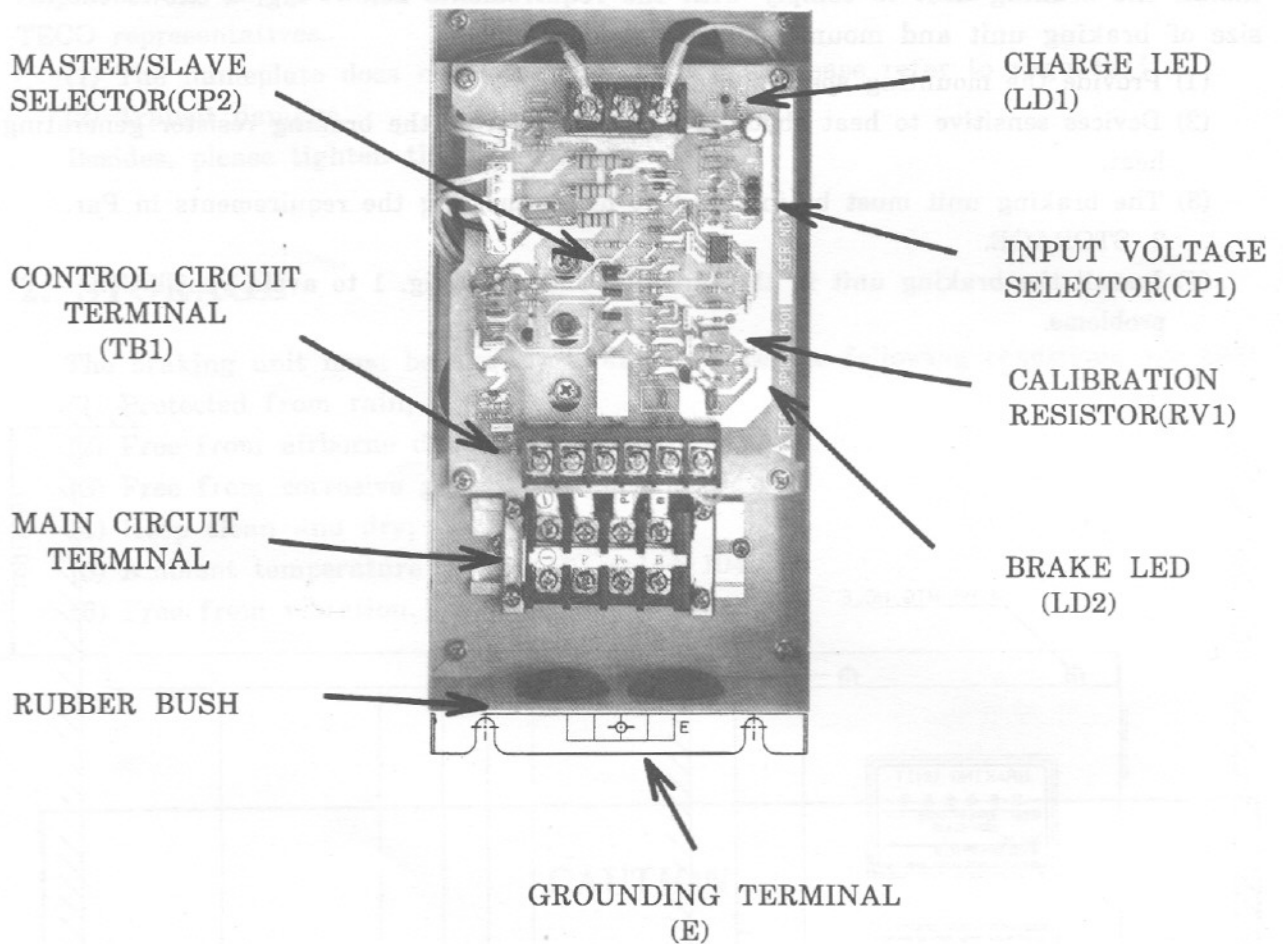


Fig. 2 Braking Unit JUVPLV--0040-----
(with cover opened)

4.2 CIRCUITS AND WIRING

Table 1

| Circuit | Terminal | Wire Size AWG(mm ²) | Wire Type | Screw |
|-----------------|----------------|---------------------------------|--|-------|
| Main Circuit | ⊖ (P) (Po) (B) | 12-10(3.5-5.5) | 600V Vinyl Sheathed lead or equivalent | M4 |
| Control Circuit | ① ② ③ ④ ⑤ ⑥ | 18-14(0.75-2.0) | | |

4.3 WIRING PRECAUTIONS

4.3.1 RUBBER BUSH

Lead in the wire through the rubber bush on the bottom of the braking unit to get better insulation.

4.3.2 SEPARATION FROM SIGNAL LINES

Separating the braking unit and braking resistor from signal lines can reduce the noise interference to signal lines.

4.3.3 WIRING DISTANCE

Connect the braking resistor, braking unit and inverter to comply with the requirement shown in Fig. 3

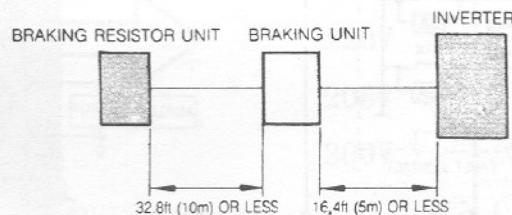


Fig. 3 Wiring Distance

4.3.4 GROUNDING

- (1) Mount the braking resistor on a grounded metallic plate or pull out the lead wire from the mounting screw to ground.
- (2) Ground the grounding terminal of braking unit with class 3 ground (ground resistance is 100Ω or less).
- (3) Select the grounding wire to comply with the "INTERNAL CONNECTION SPECIFICATIONS".

4.4 WIRING DIAGRAM

Fig. 4 shows the interconnection between the braking unit, braking resistor and 7200G3+. In Fig. 4 the braking unit JUVPLV--0040 ----- is taken for example.

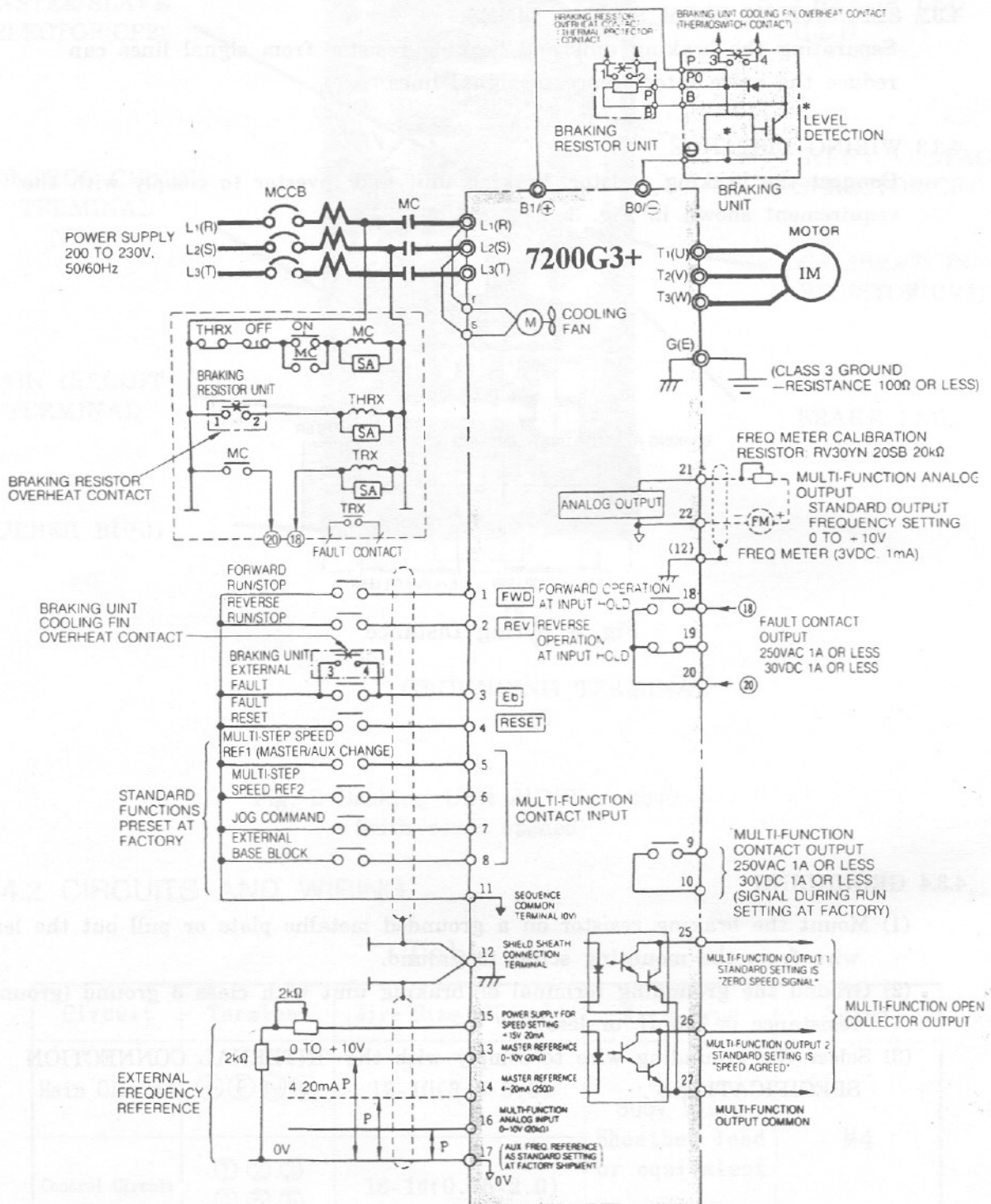


Fig. 4 Wiring Diagram for JUVPLV--0040-----

5. OPERATION

5.1 ADJUSTMENT

Except for the cases described in Sec. 5.2 INPUT VOLTAGE SETTING and Sec. 5.3 MASTER/SLAVE SETTING, no adjustment is necessary for the braking unit.

5.2 INPUT VOLTAGE SETTING

Please set the CP1 (INPUT VOLTAGE SELECTOR, see Fig. 5) according to the power supply voltage for inverter. The relationship between the input voltage and braking start voltage is shown in Table 2. The factory setting of CP1 is : 220V for 220V class and 440V for 440V class.

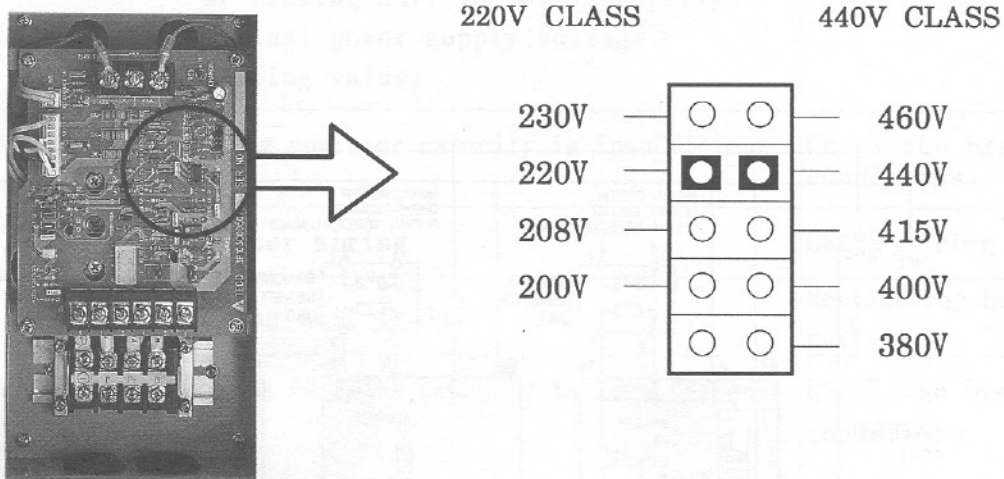


Fig. 5 INPUT VOLTAGE SELECTOR CP1

Table 2

| | | | | | |
|---------------------------|-----------|-----------|-----------|-----------|-----------|
| *Input Voltage 220V Class | 230V | 220V | 208V | 200V | — |
| Braking Start Voltage | 380V(TYP) | 365V(TYP) | 345(TYP) | 330V(TYP) | — |
| *Input Voltage 440V Class | 460V | 440V | 415V | 440V | 380V |
| Braking Start Voltage | 760V(TYP) | 730V(TYP) | 690V(TYP) | 660V(TYP) | 630V(TYP) |

* Allowable voltage fluctuation is $\pm 10\%$

5.3 MASTER/SLAVE SETTING

The factory setting for CP2 (MASTER/SLAVE SELECTOR) is on MASTER side. Only when more than one braking unit is used and the braking start voltage must coincide, CP2 has to be set on SLAVE side. Refer to Sec. 5.4 PARALLEL USAGE OF BRAKING UNITS for details.

5.4 PARALLEL USAGE OF BRAKING UNITS

For parallel using more than one braking unit, please check the following conditions.(see Fig. 6)

- (1) Check the CP2 (MASTER/SLAVE SELECTOR) on each braking unit pcb (see Fig. 2). Only the CP2 of braking unit 1 is set on MASTER side and others are set on SLAVE side for braking units 2 and 3.
 - (2) Refer to Fig. 4 for proper wiring.
 - (3) Set the CP1 (INPUT VOLTAGE SELECTOR) according to the power supply voltage.
 - (4) Use twisted-pair leads for connection between ⑤ ⑥ and ① ② of the braking units.
 - (5) Maximal quantity of parallel-connected braking units is 10. Refer to Par. 7.
- APPLICATION LIST OF BRAKING UNITS for details. (see page 10)

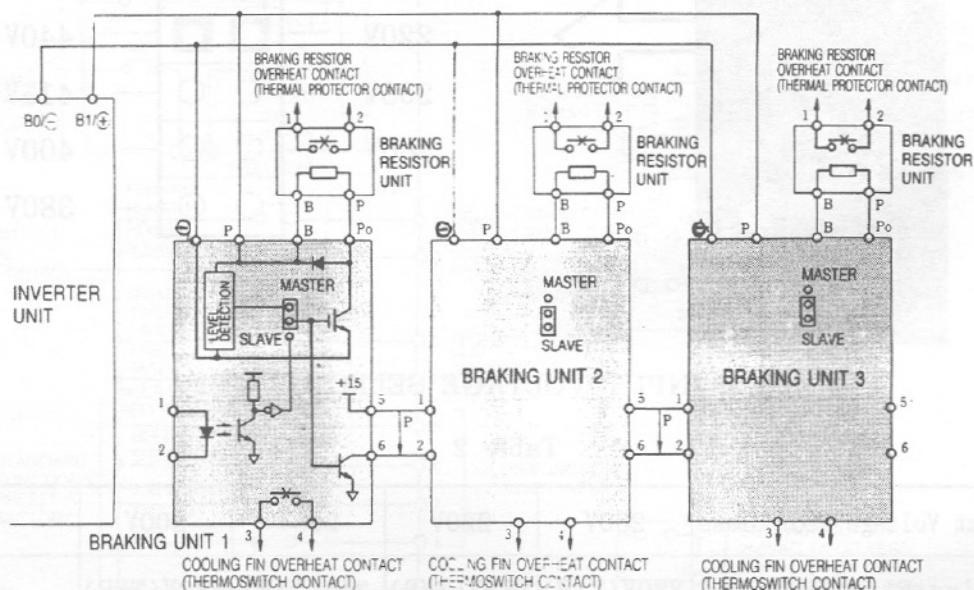


Fig. 6 Example of Parallel Connection of Three Braking Units.

5.5 Operation

Check the required decelerating performance can be achieved.



DANGER

High voltage is applied to the braking unit. DO NOT operate the braking unit with cover opened.

6. TROUBLE-SHOOTING

| No. | Failure Mode | Causes | Action to be taken |
|-----|---|---|-------------------------------|
| 1. | The overload relay or thermal protector(option) for braking resistor trips when motor doesn't decelerate. | * Without braking unit : The built-in main circuit braking transistor of inverter is short-circuited. | Replace the inverter |
| | | * With braking unit : The main circuit braking transistor of braking unit is short-circuited. | Replace the braking unit |
| | | * The INPUT VOLTAGE SELECTOR(CP1) of braking unit is set improperly. (Actual power supply voltage > setting value) | Set CP1 again |
| 2. | The inverter trips and displays OV (Over Voltage). | Braking resistor capacity is insufficient. | Check the braking conditions. |
| | | Improper wiring | Check wiring |
| | | Braking unit faults | Replace the braking unit |
| 3. | The overload relay or thermal protector(option) for braking resistor trips sometimes. | Braking resistor capacity is insufficient. | Check the braking conditions |
| 4. | The braking unit trips by the overheated heat sink. | Excessive START/STOP switching frequency | Check the working conditions |
| | | Excessive load inertia | |
| | | Improper combination of braking unit and braking resistor. | Select again |
| | | Ambient temperature is higher than 104°F (40°C) | Reduce temperature |

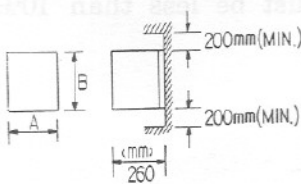
7. BRAKING UNIT APPLICATION LIST

| INVERTER | | INVERTER-MOUNTED TYPE | | | | SEPARATELY-INSTALLED TYPE | | | | | | | |
|------------|----------------------------|-----------------------|--------------------|----------|------------------------|---------------------------|--------------------|----------|--------------------|-----------------------|----------|---------------------------|-------------------------|
| Voltage | Max. Applicable Motor (HP) | Resistor | | | Braking Torque (3%ED)% | Braking Unit | | | Resistor | | | Max. Connectable Quantity | Braking Torque (10%ED)% |
| | | Resistance (150W) | Code No. 3H3330001 | Quantity | | Model No. JVP----- | Code No. 3H3330003 | Quantity | Code No. 3H3330002 | Resistance (per unit) | Quantity | | |
| 220V CLASS | 0.5 | 200Ω | 0013 | 1 | 220 | — | — | — | 0019 | 70W 200Ω | 1 | 4 | 220 |
| | 1 | 200Ω | 0013 | 1 | 125 | — | — | — | 0019 | 70W 200Ω | 1 | 4 | 125 |
| | 2 | 100Ω | 0021 | 1 | 125 | — | — | — | 0027 | 260W 100Ω | 1 | 5 | 125 |
| | 3 | 70Ω | 0030 | 1 | 120 | — | — | — | 0035 | 260W 70Ω | 1 | 4 | 120 |
| | 5 | 62Ω | 0048 | 1 | 100 | — | — | — | 0043 | 390W 40Ω | 1 | 2 | 125 |
| | 7.5 | — | — | — | — | — | — | — | 0051 | 520W 30Ω | 1 | 3 | 115 |
| | 10 | — | — | — | — | — | — | — | 0060 | 780W 20Ω | 1 | 2 | 125 |
| | 15 | — | — | — | — | LV--0040 | 0014 | 1 | 0078 | 2400W 13.6Ω | 1 | 1 | 125 |
| | 20 | — | — | — | — | LV--0040 | 0014 | 1 | 0086 | 3000W 10Ω | 1 | 1 | 125 |
| | 25 | — | — | — | — | LV--0060 | 0022 | 1 | 0094 | 4800W 8Ω | 1 | 1 | 125 |
| | 30 | — | — | — | — | LV--0060 | 0022 | 1 | 0108 | 4800W 6.8Ω | 1 | 1 | 125 |
| | 40 | — | — | — | — | LV--0040 | 0014 | 2 | 0086 | 3000W 10Ω | 2 | 1 | 125 |
| | 50 | — | — | — | — | LV--0040 | 0014 | 2 | 0086 | 3000W 10Ω | 2 | 1 | 100 |
| | 60 | — | — | — | — | LV--0060 | 0022 | 2 | 0094 | 4800W 6.8Ω | 2 | 1 | 120 |
| | 75 | — | — | — | — | LV--0060 | 0022 | 2 | 0094 | 4800W 6.8Ω | 2 | 1 | 100 |
| 100 | — | — | — | — | LV--0060 | 0022 | 3 | 0094 | 4800W 6.8Ω | 3 | 1 | 110 | |
| 440V CLASS | 0.5 | 750Ω | 0056 | 1 | 230 | — | — | — | 0116 | 75W 750Ω | 1 | 7 | 230 |
| | 1 | 750Ω | 0056 | 1 | 130 | — | — | — | 0116 | 75W 750Ω | 1 | 7 | 130 |
| | 2 | 400Ω | 0064 | 1 | 125 | — | — | — | 0124 | 260W 400Ω | 1 | 6 | 125 |
| | 3 | 300Ω | 0072 | 1 | 115 | — | — | — | 0132 | 260W 250Ω | 1 | 3 | 135 |
| | 5 | — | — | — | — | — | — | — | 0141 | 390W 150Ω | 1 | 4 | 135 |
| | 7.5 | — | — | — | — | — | — | — | 0159 | 520W 100Ω | 1 | 3 | 135 |
| | 10 | — | — | — | — | — | — | — | 0167 | 780W 75Ω | 1 | 2 | 130 |
| | 15 | — | — | — | — | — | — | — | 0175 | 1040W 50Ω | 1 | 2 | 135 |
| | 20 | — | — | — | — | — | — | — | 0183 | 1560W 40Ω | 1 | 2 | 125 |
| | 25 | — | — | — | — | HV--0040 | 0031 | 1 | 0191 | 4800W 32Ω | 1 | 1 | 125 |
| | 30 | — | — | — | — | HV--0040 | 0031 | 1 | 0205 | 4800W 27.2Ω | 1 | 1 | 125 |
| | 40 | — | — | — | — | HV--0040 | 0031 | 1 | 0213 | 6000W 20Ω | 1 | 1 | 125 |
| | 50 | — | — | — | — | HV--0060 | 0049 | 1 | 0221 | 9600W 16Ω | 1 | 1 | 125 |
| | 60 | — | — | — | — | HV--0060 | 0049 | 1 | 0230 | 9600W 13.6Ω | 1 | 1 | 125 |
| | 75 | — | — | — | — | HV--0040 | 0031 | 2 | 0213 | 6000W 20Ω | 2 | 1 | 135 |
| | 100 | — | — | — | — | HV--0060 | 0049 | 2 | 0230 | 9600W 13.6Ω | 2 | 1 | 145 |
| | 150 | — | — | — | — | HV--0040 | 0031 | 3 | 0213 | 6000W 20Ω | 3 | 1 | 100 |
| | 215 | — | — | — | — | HV--0060 | 0049 | 4 | 0230 | 9600W 13.6Ω | 4 | 1 | 140 |
| 250 | — | — | — | — | HV--0060 | 0049 | 4 | 0230 | 9600W 13.6Ω | 4 | 1 | 120 | |
| 300 | — | — | — | — | HV--0060 | 0049 | 5 | 0230 | 9600W 13.6Ω | 5 | 1 | 125 | |
| 400 | — | — | — | — | HV--0060 | 0049 | 6 | 0230 | 9600W 13.6Ω | 6 | 1 | 110 | |

8. SEPARATELY-INSTALLED TYPE BRAKING RESISTOR

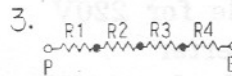
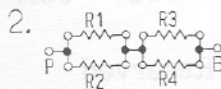
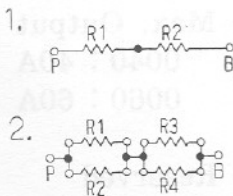
| Applicable voltage | Code No. | Size (mm) | | | Resistor Spec. (per unit) | Resistor no. (per unit) | Wiring diagram | Applicable HP |
|--------------------|---------------|-----------|-----|-------|---------------------------|-------------------------|----------------|---------------|
| | | A | B | screw | | | | |
| 220V class | 3H333C0020019 | 120 | 180 | M5×2 | 70W 200Ω | 1 | — | 1 |
| | 3H333C0020027 | 120 | 260 | M5×4 | 260W 100Ω | 2 | 1 | 2 |
| | 3H333C0020035 | 120 | 260 | M5×4 | 260W 70Ω | 2 | 1 | 3 |
| | 3H333C0020043 | 120 | 320 | M5×4 | 390W 40Ω | 2 | 1 | 5 |
| | 3H333C0020051 | 155 | 340 | M9×4 | 520W 30Ω | 2 | 1 | 7.5 |
| | 3H333C0020060 | 155 | 415 | M9×4 | 780W 20Ω | 2 | 1 | 10 |
| | 3H333C0020078 | 340 | 425 | M9×8 | 2400W13.6Ω | 4 | 2 | 15 |
| | 3H333C0020086 | 380 | 425 | M9×8 | 3000W 10Ω | 4 | 2 | 20 |
| | 3H333C0020094 | 380 | 485 | M9×8 | 4800W 8Ω | 4 | 2 | 25 |
| | 3H333C0020108 | 380 | 485 | M9×8 | 4800W 6.8Ω | 4 | 2 | 30 |
| 440V class | 3H333C0020116 | 80 | 140 | M5×4 | 70W 750Ω | 2 | 1 | 1 |
| | 3H333C0020124 | 120 | 260 | M5×4 | 260W 400Ω | 2 | 1 | 2 |
| | 3H333C0020132 | 120 | 260 | M5×4 | 260W 250Ω | 2 | 1 | 3 |
| | 3H333C0020141 | 120 | 320 | M5×4 | 390W 150Ω | 2 | 1 | 5 |
| | 3H333C0020159 | 150 | 340 | M9×4 | 520W 100Ω | 2 | 1 | 7.5 |
| | 3H333C0020167 | 150 | 415 | M9×4 | 780W 75Ω | 2 | 1 | 10 |
| | 3H333C0020175 | 150 | 425 | M9×4 | 1040W 50Ω | 2 | 1 | 15 |
| | 3H333C0020183 | 170 | 425 | M9×4 | 1560W 40Ω | 2 | 1 | 20 |
| | 3H333C0020191 | 380 | 485 | M9×8 | 4800W 32Ω | 4 | 3 | 25 |
| | 3H333C0020205 | 380 | 485 | M9×8 | 4800W27.2Ω | 4 | 3 | 30 |
| | 3H333C0020213 | 440 | 640 | M9×8 | 6000W 20Ω | 4 | 2 | 40 |
| | 3H333C0020221 | 440 | 790 | M9×8 | 9600W 16Ω | 4 | 2 | 50 |
| | 3H333C0020230 | 440 | 790 | M9×8 | 9600W13.6Ω | 4 | 2 | 60 |

* Mounting Space



note : A and B are the approximate length for the resistor unit.

* Wiring Diagram



9. SPECIFICATIONS

| Braking Unit Model No. JUVP <input type="text"/> - - - - - | | 200~230VAC | | 380~460VAC | |
|---|--|--|----------|---------------------------|----------|
| | | LV--0040 | LV--0060 | HV--0040 | HV--0060 |
| Code No. 3H333C003 <input type="text"/> | | 0014 | 0022 | 0031 | 0049 |
| Max. Applicable Motor Output HP | | 20 | 30 | 40 | 60 |
| Output Characteristics | Max. Braking Current(A) (Peak Value)* | 40 | 60 | 40 | 60 |
| | Rated Braking Current(A) | 15 | 20 | 15 | 18 |
| | Braking Start Voltage | 330/345/365/380V ± 3V | | 630/660/690/730/760V ± 6V | |
| | Max. Hysteresis Error | about 8V | | about 16V | |
| DC Power Supply | | 243~400VDC | | 460~800VDC | |
| Cooling Fin Overheat Protection | | Protected by thermoswitch | | | |
| Power Charge Indication | | Charge lamp stays ON until main circuit DC voltage drops below 50V | | | |
| Environmental Conditions | Location | Indoor(Protected from corrosive gases and dust) | | | |
| | Ambient Temperature | +14 to 104°F (-10 to 40°C)(not frozen) | | | |
| | Storage Temperature | -4 to 140°F (-20 to 60°C) | | | |
| | Humidity | 90% RH or less (non-condensing) | | | |
| | Vibration | Up to 9.8 m/S ² (1G) at less than 20 Hz Up to 2 m/S ² (0.2G) at 20 to 50 Hz | | | |
| Protective Configuration | | Enclosed wall-mounted type | | | |

* The loading time rate at max. braking current must be less than 10%ED (max. 10 sec.)

10. MODEL DESCRIPTION

