Brake Unit Overview

Outline of Brake Unit

- These units are electric brakes that can stop motor immediately.
- These brake units are divided into the contact (separate) type and contactless (48 mm sq.(1.89 inch sq.)) type.
- Separate type brake units can be used with 3-phase motor.
- The contactless 48 mm sq.(1.89 inch sq.) type brake units can be used with induction motor, reversible motor and electromagnetic brake motor.

Product designation

- Separate type

<table>
<thead>
<tr>
<th>DZ9</th>
<th>1</th>
<th>02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>SD type</td>
<td>EX type</td>
<td></td>
</tr>
<tr>
<td>1: Single-phase 100 VAC</td>
<td>2: Single-phase 200 VAC</td>
<td>3: 3-phase 200 VAC</td>
</tr>
</tbody>
</table>

- Sq.48 mm contactless brake unit

<table>
<thead>
<tr>
<th>DVM</th>
<th>48</th>
<th>1</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake unit</td>
<td>Output</td>
<td>Voltage</td>
<td></td>
</tr>
<tr>
<td>48 mm sq. (1.89 inch sq.)</td>
<td>L: 100 V</td>
<td>Y: 200 V</td>
<td></td>
</tr>
<tr>
<td>1: For induction motor</td>
<td>2: For reversible motor</td>
<td>3: For electromagnetic brake motor</td>
<td></td>
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Brake Unit

- These brake units are electric brakes used to instantaneously stop motors.
- These electric brakes have longer life expectancy and can perform inching operation.

Features

<SD type>
1. Compact 8P plug-in configuration.
2. Can be used in combination with other commercially available SSR (contactless relay).
3. The electric brake operates for approx. 0.5 sec.

<EX type>
1. Can be controlled using electrical signal.
2. Operation time of the electric brake is adjustable. Operation time is set to a suitable value within the range from 0.1 to 2 sec
3. “Run” and “Instantaneous stop” lamps are provided.

Names and functions

- Braking time control
  Adjusts the time up to 2 sec (standard).
  Since longer braking current increases motor temperature, the shortest time necessary to stop the motor is the recommended setting.

- Brake lamp
  Lights in red while the braking current is flowing.

- Run lamp
  Lights in green while the motor is running.

* Please read your User’s manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.
**Brake Unit Options Index**

- **Models and applicable motors**
  - Induction motor
  - Reversible motor
  - Rating voltage
    - Single-phase 100 V
    - Single-phase 200 V
    - 3-phase 200 V
  - SW1 NFB
  - T1

- **Contacting type**

<table>
<thead>
<tr>
<th>Item</th>
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<th>EX type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>DZ9102</td>
<td>DZ9202</td>
</tr>
<tr>
<td></td>
<td>DZ9302</td>
<td>DZ9113</td>
</tr>
<tr>
<td></td>
<td>DZ9213</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td></td>
<td></td>
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- **Contacting SD type**

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<td>DZ9113</td>
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<tr>
<td></td>
<td>DZ9213</td>
<td></td>
</tr>
</tbody>
</table>

- **Specification**

  - **Rated voltage**
    - Single-phase 100 V
    - Single-phase 200 V
    - 3-phase 200 V
  - **Power frequency**
    - 50/60 Hz
  - **Permissible current**
    - Operation current 3 A
  - **Applicable motor**
    - 3 to 90 W
  - **Braking method**
    - Feeds electric braking current for a specified time
  - **Operating temperature**
    - –10 to 50°C
  - **Storage temperature**
    - –10 to 60°C

- **Outline drawing**

  - **SD type**
  - **EX type**

- **Accessories**

  - **Socket (common to SD and EX)**
  - **External resistor for braking (for DZ9302 only)**

**[Notes]**

1. Electric braking system has no holding torque.
2. For application requiring holding force, use Panasonic electromechanical brake motor.
3. When braking a load with excessively large inertia, related issues are strength and life of motor shaft and gear. For these subjects, consult us.
4. When using motor other than compact geared motor, consult us.

**[Control signal]**

- When using power relay
- When using contactless relay (SSR)

**[Details]**

- Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

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**[Brake Unit]**

The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm².
The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

- **DZ9102 and DZ9202 fundamental electrical wiring diagram (induction motor)**

**[Notes]**

1. When SW2 and SW3 are switched from RUN to BRAKE, electric brake is applied for approx. 0.5 sec (T1) causing the motor to stop quickly.
2. When using power relay
3. When using contactless relay (SSR)

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**[Control signal]**

- When using power relay
- When using contactless relay (SSR)

**[Details]**

- Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.
Brake Unit

The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm². The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

- **DZ9102 and DZ9202 standard electrical diagram (reversible motor)**

- **DZ9302 fundamental electrical wiring diagram (3-phase motor)**

**Control signal**

- **When using power relay**

**When using contactless relay (SSR)** (Cannot be used for DZ9202)

**[Notes]**

1. Use 0.5 R5 when Vcc is below 6 VDC. When Vcc is 6 VDC or higher, determine the value of R5 according to the equation shown in description for induction motor. Ripple of Vcc should be 5% or below. (Internal resistance 220 Ω)

2. Ry4 and Ry5 should be relay or electromagnetic contactor with the rated voltage two or more times the power supply voltage and the rated current 3 A or more.

3. Do not place Vocw and Voccw in RUN at the same time.

4. Be sure to use resistor R6 to protect relay, SSR and capacitor. Current will flow through R6: 2 A 90 W; 1.7 A 60 W; 1 A 40 W; 0.625 A 15 W. 5. Also refer to SSR handling precaution (see contactless relay catalog).

**Control signal**

- **When using power relay**

**[Notes]**

1. Use 0 A R5 when Vcc is below 6 VDC. When Vcc is 6 VDC or higher, determine the value of R5 according to the equation shown below. Ripple of Vcc should be 5% or below. (Internal resistance 220 Ω)

- **Resistance of R5**
  
  \[ R5 = \frac{Vcc - 6}{I_f} \]

- **Example**
  
  \[ Vcc = 24 V, I_f = 20 mA \]

  \[ R5 = \frac{24 - 6}{20 \times 10^{-3}} = 900 \Omega \times 1 k\Omega \]

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Brake Unit Options Index

The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm². The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

- **DZ9113/DZ9213 fundamental electrical wiring diagram (unidirectional rotation and braking)**

  - When wired as shown left, the motor turns clockwise when viewed from the shaft end. To turn it counterclockwise, exchange brown and gray leads.

  - Connection for DZ9213
    - SW1 100 V supply system 5 A or more at 125 VAC
    - 200 V supply system 5 A or more at 250 VAC
    - Motor 25 W or smaller 40 W or larger

  - When wired as shown left, the motor turns clockwise when viewed from the shaft end. To turn it counterclockwise, exchange brown and gray leads.

  - Connection for DZ9113
    - SW1 100 V supply system 0 Ω 30 Ω (approx. 100 W)
    - 200 V supply system 0 Ω 150 Ω (approx. 100 W)

  - When wired as shown left, the motor turns clockwise when viewed from the shaft end. To turn it counterclockwise, exchange brown and gray leads.

  - Connection for DZ9113
    - SW1 100 V supply system 0 Ω 30 Ω (approx. 100 W)
    - 200 V supply system 0 Ω 150 Ω (approx. 100 W)

  - When wired as shown left, the motor turns clockwise when viewed from the shaft end. To turn it counterclockwise, exchange brown and gray leads.

  - Connection for DZ9113
    - SW1 100 V supply system 0 Ω 30 Ω (approx. 100 W)
    - 200 V supply system 0 Ω 150 Ω (approx. 100 W)

- **DZ9113 application wiring diagram (normal/reverse rotation and braking)**

  - Connection for DZ9213
    - SW1 100 V supply system 5 A or more at 125 VAC
    - 200 V supply system 5 A or more at 250 VAC
    - Motor 25 W or smaller 40 W or larger

  - Connection for DZ9113
    - SW1 100 V supply system 0 Ω 30 Ω (approx. 100 W)
    - 200 V supply system 0 Ω 150 Ω (approx. 100 W)

  - When wired as shown left, the motor turns clockwise when viewed from the shaft end. To turn it counterclockwise, exchange brown and gray leads.

- **Brake Unit**

  - Stopping coasting DZ9113/DZ9213
    - • Coast stopping circuit wiring diagram

  - Operation
    - Pin No.
      - 5 6 7 8 9 10
      - Run FREE RUN RUN STOP RUN RUN BRAKE
    - Operation
      - RUN STOP STOP RUN STOP BRAKE
      - Free run
        - Electric braking applied

  - Wattage of fixed resistor (R2)
    - With 100 VAC power supply
      - 20 W (Recommended of 100 VAC)
      - 50 W (Recommended of 100 VAC)

  - [Notes]
    - 1. Turning on and off of input voltage V1 on pin 6 causes coasting and braking, respectively.
    - 2. For the resistance value of R7, refer to basic electric wiring diagram (negative direction rotation and braking) of DZ9113/DZ9213.
    - 3. For the remaining wiring connections, refer to respective electric wiring diagrams.

  - [Notes]
    - 1. When 100 VAC supply WR = 476/(Toff + 1)
    - 2. When 200 VAC supply WR = 571/(Toff + 1)
    - Example: 10 sec run; 5 sec stop; 1 sec braking; under 100 VAC WR = 476 / [(10 + 5 + 1) + 1] = 31.7 W

- **Contacting EX type**

  - Wattage of fixed resistor (R2)
    - With 100 VAC power supply
      - 20 W (Recommended of 100 VAC)
      - 50 W (Recommended of 100 VAC)

  - [Notes]
    - The curves shown above are required wattage of electric power resistor R2 to maintain the surface temperature of it at 200°C or below when it is driven with WR (average on/off cycle power) and 35% load factor. Load factor = 35% ON duration (braking time) = 1 sec (fixed)

  - [Notes]
    - Please read your User’s manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

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