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1 Overview

This document details common connection diagrams for DR motor. This is not a replacement for the Operating Instructions. Always refer to the Operating Instructions for safety and installation information. Additional resources and information for DR motor “BE” brakes can be found at www.seweurodrive.com under the Technical Notes tab.

There are specific instances when the brake voltage can be tapped directly from the motor's terminal block. The advantage of brake systems wired in this way is when power is applied to the motor, the brake releases (requiring no additional brake supply wiring).

The brake can be wired to the motor terminal block under the following conditions: a single speed motor, the motor is started and run across the line, and the brake voltage is equal to either the low or high motor voltage.

The brake must be powered separately if the brake voltage does not equal the low or high motor voltage, the motor is powered by an inverter, or electronic soft start.
2 Important notes

2.1 Safety notes

Refer to the Operating Instructions for safety and installation information. The latest version can be found at www.seweurodrive.com.

Installation, startup and service work may only be performed by trained personnel observing applicable accident prevention regulations and operating instructions.

2.2 Motor nameplate

Refer to the motor nameplate for information that describes the motor data. Some of the important fields related to the connection are listed below.

![Motor Nameplate Diagram]


[2] **Connection Type** - Lists the basic type of connection indicating the type of internal motor windings, γγ, γ, △, etc. Example: R76. This value may also be followed by a series of letters and/or numbers.

[3] **Brake Voltage** - Lists the brake voltage required to operate the brake. Example: 460V.

[4] **Brake Control** - Lists the brake control type. Example: BG, BGE, BSR, etc. These maybe followed by additional characters.
2.3 Connecting the brake from the terminal block

2.3.1 BGE/BG

When connecting the supply power from the motor terminal block to the brake rectifier, follow the specifications below.

Connecting wire is to be AWG14, MTW, 600V, 105°C temperature rating and black color.

The recommended ring terminals are manufactured by Thomas & Betts or equivalent. Follow the manufacturer’s recommendations for installation procedures.

<table>
<thead>
<tr>
<th>DR Motor Frame Size</th>
<th>Wire Length</th>
<th>Thomas &amp; Betts Ring Terminal</th>
<th>Thomas &amp; Betts Crimp Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR.71-100</td>
<td>8”</td>
<td>RB14-8</td>
<td></td>
</tr>
<tr>
<td>DR.112-132</td>
<td>8”</td>
<td>RB14-10</td>
<td>WT2000</td>
</tr>
<tr>
<td>DR.160</td>
<td>10”</td>
<td>RB 14-14</td>
<td></td>
</tr>
<tr>
<td>DR.180-225</td>
<td>12”</td>
<td>RB 14-516</td>
<td></td>
</tr>
</tbody>
</table>

2.3.2 BSR (R76 only)

When connecting the jumper wire between the 2-pole terminal block for the SR relay and the motor terminal block, follow the specifications below.

Connecting wire is to be MTW, 600V, 105°C temperature rating and black color. Maximum length 8”, trimmed to fit.

The recommended ring terminals are manufactured by Thomas & Betts or equivalent. Follow the manufacturers recommendations for installation procedures.

<table>
<thead>
<tr>
<th>DR Motor Frame Size</th>
<th>AWG</th>
<th>Thomas &amp; Betts Ring Terminal</th>
<th>Thomas &amp; Betts Crimp Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR.71-100</td>
<td>14</td>
<td>RB14-8</td>
<td></td>
</tr>
<tr>
<td>DR.112-132</td>
<td>14</td>
<td>RB14-10</td>
<td>WT2000</td>
</tr>
<tr>
<td>DR.160</td>
<td>12</td>
<td>RB 10-14</td>
<td></td>
</tr>
</tbody>
</table>
Connection Type R76
Single Speed, Dual Voltage
Example: 230V ∆ / 460V ∆

**Low Voltage**

- U1 (T1)
- V1 (T2)
- W1 (T3)
- U3 (T7)
- V3 (T8)
- W3 (T9)

**High Voltage**

- U1 (T1)
- V1 (T2)
- W1 (T3)
- U3 (T7)
- V3 (T8)
- W3 (T9)

**VOLTAGE CHANGE**

Three wires must be relocated and terminal links added to change from high to low voltage.

The wires designated U3 (T7), V3 (T8) and W3 (T9) must be reconnected and terminal links added as shown in the diagram.

Changing from low to high voltage is carried out in reverse order.

In both cases, the supply voltage is connected to U1 (T1), V1 (T2) and W1 (T3). The direction of rotation is changed by exchanging two wires.
3.1 Brake Voltage Supplied from the Motor

3.1.3 BGE/BG - Motor = 230V; Brake = 230V

Brake Control: BGE/BG. Motor configured for low voltage. Brake voltage matches the low motor voltage.

- Example: 230V \( \gamma \gamma \) / 460V \( \gamma \gamma \) supply voltage
- Brake voltage is 230V (normal reaction time)*

* BGE/BG Rapid Reaction Time

---


BU - blue  RD - red  WH - white
3.1.4 BGE/BG - Motor = 460V; Brake = 230V

Brake Control: BGE/BG. Motor configured for high voltage. Brake voltage matches the low motor voltage.

- Example: 230V / 460V \( \gamma \) motor configured for 460V \( \gamma \) supply voltage
- Brake voltage is 230V (normal reaction time)*

* BGE/BG Rapid Reaction Time

---

**Diagram:**

![Diagram of BGE/BG motor connection](image)

- BGE/BG
- Motor terminal board
- Customer supplied contacts
- Brake coil
- Brake supply voltage

**Labels:**

- BU - blue
- RD - red
- WH - white
3.1.5  **BGE/BG - Motor = 460V; Brake = 460V**

Brake Control: BGE/BG. Motor configured for high voltage. Brake voltage matches the high motor voltage.

- Example: 230V / 460V / 460V motor configured for 460V (\(\gamma\)) supply voltage
- Brake voltage is 460V (normal reaction time)*

* BGE/BG Rapid Reaction Time

**Diagram:**

- BGE
- BG
- WH
- RD
- BU

- L1
- L2
- L3

- U1 (T1)
- U2 (T4)
- U3 (T7)
- V1 (T2)
- V2 (T5)
- V3 (T8)
- W1 (T3)
- W2 (T6)
- W3 (T9)

- AC
- DC

**Legend:**

- BU - blue
- RD - red
- WH - white

**Notes:**

- [1] Motor terminal board
- [2] Brake coil
- [3] Customer supplied contacts
- [4] Brake supply voltage
3.1.6 **BSR - Motor = 230V; Brake = 230V**

Brake Control: BSR. Motor configured for low voltage. Brake voltage matches the low motor voltage.

- Example: 230V \( \gamma \gamma \) / 460V \( \gamma \gamma \) motor configured for 230V \( \gamma \gamma \)
- Brake voltage is 230V

---

**Diagram:**

- [1] Motor terminal board
- [2] Supply leads
- [3] Brake coil
- [4] SR current relay
- [5] Terminal strip
- [6] Wire end from stator winding

*BU - blue  RD - red  WH - white*

---

*refer to section 1.3.2*
3.1.7 BSR - Motor = 460V; Brake = 230V

Brake Control: BSR. Motor configured for high voltage. Brake voltage matches the low motor voltage.

- Example: 230V / 460V motor configured for 460V (Y)
- Brake voltage is 230V

Example: 460V

*refer to section 1.3.2


BU - blue  RD - red  WH - white
3.1.8  BSR - Motor = 460V; Brake = 460V

Brake Control: BSR. Motor configured for high voltage. Brake voltage matches the high motor voltage.

- Example: 230V / 460V motor configured for 460V (Y)
- Brake voltage is 460V

Example: 460V

*refer to section 1.3.2


BU - blue  RD - red  WH - white
4 R72

Connection Type R72
Single Speed, Dual Voltage
Example Voltage: 230V △△ / 460V △

Low voltage

High voltage

Example: 230V

Example: 460V

Arrangement of terminal links for △△ connection

Arrangement of terminal links for △ connection

[1] Terminal link
[2] Terminal stud
[3] Flange nut
[5] Voltage supply (Customer connection)
4.1 Brake Voltage Supplied from the Motor

4.1.9 BGE/BG - Motor = 460V; Brake = 230V

Brake Control: BGE/BG. Motor configured for high voltage. Brake voltage matches the low motor voltage.

- Example: 230V \(\triangle\) / 460V \(\triangle\) motor configured for 460V \(\triangle\)
- Brake voltage is 230V (normal reaction time)*

* BGE/BG Rapid Reaction Time

---

[1] Motor terminal board
[2] Supply leads
[3] Customer supplied contacts
[4] Brake supply voltage

BU - blue
RD - red
WH - white
4.1.10 BGE/BG - Motor = 460V; Brake = 460V

Brake Control: BGE/BG. Motor configured for high voltage. Brake voltage matches the high motor voltage.

- Example: 230V △ / 460V △ motor configured for 460V (△)
- Brake voltage is 460V (normal reaction time)*

* BGE/BG Rapid Reaction Time


BU - blue  RD - red  WH - white
4.1.11 BSR - Motor = 460V; Brake = 230V

Brake Control: BSR. Motor configured for high voltage. Brake voltage matches the low motor voltage.

- Example: 230V △ / 460V △ motor configured for 460V (△)
- Brake voltage is 230V

Example: 460V


BU - blue  RD - red  WH - white
4.1.12  BSR - Motor = 460V; Brake = 460V

Brake Control: BSR. Motor configured for high voltage. Brake voltage matches the high motor voltage.

- Example: 230V \(\triangle\)/460V \(\triangle\) motor configured for 460V (\(\triangle\))
- Brake voltage is 460V

Example: 460V

[1] Motor terminal board
[2] Supply leads
[3] SR current relay

BU - blue  RD - red  WH - white
Connection Type R13
Single Speed, Dual Voltage

Example voltages:

<table>
<thead>
<tr>
<th>Low voltage</th>
<th>High voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>208V</td>
<td>360V</td>
</tr>
<tr>
<td>220V</td>
<td>380V</td>
</tr>
<tr>
<td>230V</td>
<td>400V</td>
</tr>
<tr>
<td>266V</td>
<td>460V</td>
</tr>
<tr>
<td>330V</td>
<td>575V</td>
</tr>
</tbody>
</table>

Arrangement of terminal links with Δ connection
Motor size DR.71-DR.225:

- [1] Terminal link
- [2] Terminal stud
- [3] Flange nut

Arrangement of terminal links with Y connection

- [4] Terminal board
- [5] Voltage supply (Customer connection)
5.1 Brake Voltage Supplied from the Motor

5.1.13 BGE/BG - Motor = low (△) voltage; Brake = low (△) voltage

Brake Control: BGE/BG. Motor configured for low voltage. Brake voltage matches the low motor voltage.

- Example: 230V △ / 400V √ motor configured for 230V (△)
- Brake voltage is 230V (normal reaction time)

* BGE/BG Rapid Reaction Time

[1] Brake coil
[2] Terminal board
[3] Customer supplied contacts
[4] Brake supply voltage

BU - blue  RD - red  WH - white
5.1.14 **BGE/BG - Motor = high (\(\gamma\)) voltage; Brake = low (\(\Delta\)) voltage**

Brake Control: BGE/BG. Motor configured for high voltage. Brake voltage matches the low motor voltage.

- Example: 330V \(\Delta\) / 575V \(\gamma\) motor configured for 575V \(\gamma\)
- Brake voltage is 330V (normal reaction time)

* BGE/BG Rapid Reaction Time

---

[Diagram showing connections and labels]

---


BU - blue, RD - red, WH - white
5.1.15 BGE/BG - Motor = high (γ) voltage; Brake = high (γ) voltage

Brake Control: BGE/BG. Motor configured for high voltage. Brake voltage matches the high motor voltage.

- Example: 266V ∆ / 460V γ motor configured for 460V (γ)
- Brake voltage is 460V (normal reaction time)

* BGE/BG Rapid Reaction Time


BU - blue  RD - red  WH - white
5.1.16  BSR - Motor = low (△) voltage; Brake = low (△) voltage
Brake Control: BSR. Motor configured for low voltage. Brake voltage matches the low motor voltage.
- Example: 230V △ / 400V  Y motor configured for 230V (△)
- Brake voltage is 230V


BU - blue  RD - red  WH - white
5.1.17  **BSR - Motor = high (γ) voltage; Brake = low (Δ) voltage**

Brake Control: BSR. Motor configured for high voltage. Brake voltage matches the low motor voltage.

- Example: 330V Δ / 575V γ motor configured for 575V (γ)
- Brake voltage is 330V

---

**Diagram: BGE to BG Connection**

- [1] Brake coil
- [2] SR Current relay
- [3] Terminal board

BU - blue  RD - red  WH - white
5.1.18  BSR - Motor = high (△) voltage; Brake = high (Y) voltage

Brake Control: BSR. Motor configured for high voltage. Brake voltage matches the high motor voltage.

- Example: 266V △ / 460V Y motor configured for 460V (Y)
- Brake voltage is 460V

| 1 | Brake coil |
| 2 | SR Current relay |
| 3 | Terminal board |

BU - blue  RD - red  WH - white
6 BSG and BUR brake connection

Brake control system BSG

Brake control system BUR

Connecting to the terminal board of the motor is not permitted.

[1] Brake coil
[3] UR11 (42-150V) = BN
   UR15 (150-500V) = BK
[4] Brake voltage supply

BU - blue  RD - red  WH - white
BK - black  BN - brown

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