Switching Devices – Contactors and Contactor Assemblies
Power Contactors for Switching Motors

Introduction

Overview

<table>
<thead>
<tr>
<th>Size</th>
<th>Type</th>
<th>3RT201</th>
<th>3RT202</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3RT20 contactors

<table>
<thead>
<tr>
<th>Type</th>
<th>3RT2015</th>
<th>3RT2016</th>
<th>3RT2017</th>
<th>3RT2018</th>
<th>3RT2023</th>
<th>3RT2024</th>
<th>3RT2025</th>
<th>3RT2026</th>
<th>3RT2027</th>
<th>3RT2028</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC-3</td>
<td>400 V</td>
<td>230 V</td>
<td>690 V</td>
<td>1 000 V</td>
<td>400 V</td>
<td>230 V</td>
<td>690 V</td>
<td>1 000 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ie</td>
<td>A 7</td>
<td>4.5</td>
<td>5.5</td>
<td>7.5</td>
<td>4.5</td>
<td>5.5</td>
<td>7.5</td>
<td>7.5</td>
<td>25</td>
<td>32</td>
</tr>
<tr>
<td>AC-4</td>
<td>400 V</td>
<td>1 150 V</td>
<td>2 000 V</td>
<td>2 000 V</td>
<td>400 V</td>
<td>1 150 V</td>
<td>2 000 V</td>
<td>2 000 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ie</td>
<td>A 4</td>
<td>3</td>
<td>4</td>
<td>5.5</td>
<td>4</td>
<td>5.5</td>
<td>7.5</td>
<td>7.5</td>
<td>11</td>
<td>15</td>
</tr>
</tbody>
</table>

### Accessories for contactors

- **Auxiliary switch blocks**: On front 3RH2911 (p. 3/64), 3RH2911 (p. 3/66)
- **Function modules (timing relays)**: 3RA281. (p. 3/196), 3RA281. (p. 3/196)
- **Function modules (IO-Link, AS-i)**: 3RA271.- AA00 (p. 3/201, 3/206), 3RA271.- AA00 (p. 3/201, 3/206)
- **Surge suppressors**: 3RT2916 (p. 3/71), 3RT2926 (p. 3/71)

### 3RU2 and 3RB3 overload relays

- **3RU thermal overload relays**
  - Type: 3RU2116 0.11 ... 16 A, 3RU2126 1.8 ... 40 A

- **3RB electronic overload relays**
  - For standard applications: 3RB3016 0.1 ... 16 A, 3RB3113 0.1 ... 16 A
  - For High-Feature applications: 3RB22, 3RB22 and 3RB24 with 3RB2906-2.G1 current measuring module

- **3RV20 motor starter protectors**
  - Type: 3RV2011 0.11 ... 16 A, 3RV2021 0.45 ... 40 A

### 3RA23 reversing contactor assemblies

- **Complete units**: 3RA2315 3RA2361 3RA2317 3RA2318
  - Type: 3RA2315 3RA2361 3RA2317 3RA2318

- **Assembly kits/wiring modules**: 3RA2913-2AA. (p. 3/168), 3RA2923-2AA. (p. 3/168)

### 3RA24 contactor assemblies for wye-delta starting

- **Complete units**: 3RA2415 3RA2416 3RA2417
  - Type: 3RA2415 3RA2416 3RA2417

- **Function modules**: 3RA271.- BA00 (p. 3/187), 3RA271.- BA00 (p. 3/187)

**Note:**
Safety characteristics for contactors, see Chap. 16, "Appendix" ➞ "Standards and Approvals" ➞ "Overview".
## Power Contactors for Switching Motors

### SIRIUS 3RT20 contactors, 3-pole, up to 37 kW

#### Type and Size

<table>
<thead>
<tr>
<th>Type</th>
<th>3RT2015, 3RT2016</th>
<th>3RT2017, 3RT2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>S00</td>
<td>S00</td>
</tr>
</tbody>
</table>

#### Dimensions (W x H x D)\(^1\)

- With mounted auxiliary switch block
- With mounted function module

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions (mm)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45 x 57.5 x 73</td>
<td>45 x 57.5 x 73</td>
</tr>
<tr>
<td></td>
<td>45 x 57.5 x 116</td>
<td>45 x 57.5 x 121</td>
</tr>
<tr>
<td></td>
<td>45 x 57.5 x 142</td>
<td>45 x 70 x 142</td>
</tr>
</tbody>
</table>

#### General Technical Specifications

**Permissible Mounting Position**

The contactors are designed for operation on a vertical mounting surface.

**Upright Mounting Position**

Special version required

**Mechanical Endurance**

- Basic units
- Basic units with snap-on auxiliary switch block
- Solid-state compatible auxiliary switch block

<table>
<thead>
<tr>
<th>Specification</th>
<th>Operating Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic units</td>
<td>30 million</td>
</tr>
<tr>
<td>Basic units with snap-on</td>
<td>10 million</td>
</tr>
<tr>
<td>auxiliary switch block</td>
<td>5 million</td>
</tr>
</tbody>
</table>

**Electrical Endurance**

For contact endurance of the main contacts, see page 3/17.

<table>
<thead>
<tr>
<th>Specification</th>
<th>V (Pollution Degree 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Insulation Voltage (U_i)</td>
<td>690</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specification</th>
<th>kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Impulse Withstand Voltage (U_{imp})</td>
<td>6</td>
</tr>
</tbody>
</table>

**Protective Separation**

<table>
<thead>
<tr>
<th>Specification</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between the coil and the main contacts</td>
<td>400</td>
</tr>
</tbody>
</table>

**Mirror Contacts**

- A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.
- 3RT201., 3RT231. (removable auxiliary switch block)
- 3RT201., 3RT231. (permanently mounted auxiliary switch block)
- 3RH2919-.NF. solid-state compatible auxiliary switch blocks

**Ambient Temperature**

- During operation: °C
- During storage: °C

<table>
<thead>
<tr>
<th>Specification</th>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>During operation</td>
<td>-25 ... +60</td>
</tr>
<tr>
<td>During storage</td>
<td>-55 ... +80</td>
</tr>
</tbody>
</table>

**Degree of Protection** acc. to IEC 60947-1, Appendix C

- IP20

**Touch Protection** acc. to EN 50274

- Finger-safe

**Shock Resistance Rectangular Pulse**

<table>
<thead>
<tr>
<th>Specification</th>
<th>g/ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC operation</td>
<td>6.7/5 and 4.2/10</td>
</tr>
<tr>
<td>DC operation</td>
<td>6.7/5 and 4.2/10</td>
</tr>
</tbody>
</table>

**Shock Resistance Sine Pulse**

<table>
<thead>
<tr>
<th>Specification</th>
<th>g/ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC operation</td>
<td>10.5/5 and 6.6/10</td>
</tr>
<tr>
<td>DC operation</td>
<td>10.5/5 and 6.6/10</td>
</tr>
</tbody>
</table>

**Conductor Cross-Sections**

For conductor cross-sections, see page 3/23.

### Short-Circuit Protection

#### Main Circuit

- Fuse links, operational class gG:
  - LV HRC, type 3NA: DIAZED, type 5SB; NEOZED, type 5SE
  - according to IEC 60947-4-1/EN 60947-4-1
  - Type of coordination "1" A: 35, 50
  - Type of coordination "2" A: 20, 25
  - Weld-free\(^2\) A: 10, 10
- Miniature circuit breakers (up to 230 V) with C characteristic
  - Short-circuit current 1 kA, type of coordination "1" A: 10, 10

#### Auxiliary Circuit

Short-circuit test acc. to IEC 60947-5-1/EN 60947-5-1

- with fuse links of operational class gG:
  - DIAZED, type SS8; NEOZED, type SSE
  - with short-circuit current \(I_{sc}\) = 1 kA A: 10
- with 230 V miniature circuit breakers, C characteristic
  - with short-circuit current \(I_{sc}\) = 400 A A: 6

**Short-Circuit Protection for Contactors with Overload Relays**

See Configuration Manual "Configuring SIRIUS Innovations".

**Short-Circuit Protection for Fuseless Load Feeders**

See Chapter 8 "Load Feeders and Motor Starters for Use in the Control Cabinet" ➞ "SIRIUS 3RA2 Load Feeders"

1) Dimensions for devices with screw terminals / spring-type terminals.

2) Test conditions according to IEC 60947-4-1.
Power Contactors for Switching Motors

SIRIUS 3RT20 contactors, 3-pole, up to 37 kW

<table>
<thead>
<tr>
<th>Type</th>
<th>3RT2015, 3RT2016</th>
<th>3RT2017, 3RT2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>S00</td>
<td>S00</td>
</tr>
</tbody>
</table>

**Control**

<table>
<thead>
<tr>
<th>Solenoid coil operating range</th>
<th>50 Hz</th>
<th>60 Hz</th>
<th>60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC operation</td>
<td>0.8 ... 1.1 x $U_s$</td>
<td>0.85 ... 1.1 x $U_s$</td>
<td>0.8 ... 1.1 x $U_s$</td>
</tr>
<tr>
<td>DC operation</td>
<td>0.8 ... 1.1 x $U_s$</td>
<td>0.85 ... 1.1 x $U_s$</td>
<td>0.8 ... 1.1 x $U_s$</td>
</tr>
</tbody>
</table>

**Power consumption of the solenoid coils (for cold coil and 1.0 x $U_s$)**

<table>
<thead>
<tr>
<th>AC operation, 50/60 Hz, standard version</th>
<th>VA</th>
<th>VA</th>
<th>VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Closing</td>
<td>27/24.3</td>
<td>37/33</td>
<td>37/33</td>
</tr>
<tr>
<td>- P.f.</td>
<td>4.2/3.3</td>
<td>5.7/4.4</td>
<td>5.7/4.4</td>
</tr>
<tr>
<td>- Closed</td>
<td>0.25/0.25</td>
<td>0.25/0.25</td>
<td>0.25/0.25</td>
</tr>
<tr>
<td>AC operation, 50 Hz, for USA/Canada</td>
<td>VA</td>
<td>VA</td>
<td>VA</td>
</tr>
<tr>
<td>- Closing</td>
<td>26.4</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>- P.f. for closing</td>
<td>0.81</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>- Closed</td>
<td>4.4</td>
<td>5.9</td>
<td>5.9</td>
</tr>
<tr>
<td>- P.f. for closed</td>
<td>0.24</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>AC operation, 60 Hz, for USA/Canada</td>
<td>VA</td>
<td>VA</td>
<td>VA</td>
</tr>
<tr>
<td>- Closing</td>
<td>31.7</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>- P.f. for closing</td>
<td>0.81</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>- Closed</td>
<td>4.8</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>- P.f. for closed</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>DC operation (closing = closed)</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>- Power consumption</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

**Permissible residual current of the electronics (with 0 signal)**

<table>
<thead>
<tr>
<th>AC operation</th>
<th>&lt; 3 mA x (230 V/$U_s$)</th>
<th>&lt; 4 mA x (230 V/$U_s$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC operation</td>
<td>&lt; 10 mA x (24 V/$U_s$)</td>
<td>&lt; 10 mA x (24 V/$U_s$)</td>
</tr>
</tbody>
</table>

**Operating times**

Total break time = Opening delay + Arcing time

<table>
<thead>
<tr>
<th>AC operation for 0.8 ... 1.1 x $U_s$</th>
<th>Closing delay ms</th>
<th>Opening delay ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 ... 35</td>
<td>8 ... 33</td>
<td></td>
</tr>
<tr>
<td>3.5 ... 14</td>
<td>4 ... 15</td>
<td></td>
</tr>
<tr>
<td>DC operation for 0.85 ... 1.1 x $U_s$</td>
<td>Closing delay ms</td>
<td>Opening delay ms</td>
</tr>
<tr>
<td>30 ... 100</td>
<td>30 ... 100</td>
<td></td>
</tr>
<tr>
<td>7 ... 13</td>
<td>7 ... 13</td>
<td></td>
</tr>
<tr>
<td>Arcing time</td>
<td>10 ... 15</td>
<td></td>
</tr>
</tbody>
</table>

**Operating times for 1.0 x $U_s$**

<table>
<thead>
<tr>
<th>AC operation</th>
<th>Closing delay ms</th>
<th>Opening delay ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5 ... 24</td>
<td>9 ... 22</td>
<td></td>
</tr>
<tr>
<td>4 ... 14</td>
<td>4.5 ... 15</td>
<td></td>
</tr>
<tr>
<td>DC operation</td>
<td>Closing delay ms</td>
<td>Opening delay ms</td>
</tr>
<tr>
<td>35 ... 50</td>
<td>35 ... 50</td>
<td></td>
</tr>
<tr>
<td>7 ... 12</td>
<td>7 ... 12</td>
<td></td>
</tr>
</tbody>
</table>

1) The 3RT2916-1GA00 additional load module is recommended for higher residual currents.

2) The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assembly 2 to 6 times, suppressor diode +1 ms to 5 ms; varistor +2 ms to 5 ms).
### Power Contactors for Switching Motors

**SIRIUS 3RT20 contactors, 3-pole, up to 37 kW**

<table>
<thead>
<tr>
<th>Type</th>
<th>3RT2015</th>
<th>3RT2016</th>
<th>3RT2017</th>
<th>3RT2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>S00</td>
<td>S00</td>
<td>S00</td>
<td>S00</td>
</tr>
</tbody>
</table>

#### Main circuit

**Load rating with AC**

**Utilization category AC-1,**
**Switching resistive loads**

- Rated operational current $I_e$
  - At 40 °C up to 690 V A
  - At 60 °C up to 690 V A
  - Rated power for AC loads$^{1)}$
P.f. = 0.95 (at 60 °C)
  - 230 V kW
  - 400 V kW
  - 690 V kW
- Minimum conductor cross-section
  - At 40 °C mm$^2$
  - At 60 °C mm$^2$

**Utilization categories AC-2 and AC-3**

- Rated operational currents $I_e$
  - Up to 400 V A
  - 440 V A
  - 500 V A
  - 690 V A
- Rated power for slipring or squirrel-cage motors at 50 and 60 Hz
  - At 230 V kW
  - 400 V kW
  - 690 V kW

**Thermal load capacity**

- 10 s current$^{2)}$ A
- Power loss per conducting path

**Utilization category AC-4** (for $I_a = 6 \times I_e$)$^{3)}$

- Maximum values:
  - Rated operational current $I_e$
    - Up to 400 V A
    - 690 V A
  - Rated power for squirrel-cage motors
    - With 50 Hz and 60 Hz
  - The following applies to a contact endurance of about 200 000 operating cycles:
    - Rated operational currents $I_e$
      - Up to 400 V A
      - 690 V A
    - Rated power for squirrel-cage motors with 50 Hz and 60 Hz

$^{1)}$ Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

$^{2)}$ According to IEC 60947-4-1. Rated values for various start-up conditions, see Chapter 7, “Protection Equipment” ➔ “Overload Relays”.

$^{3)}$ These data also apply to 3RT2516 and 3RT2517 (2 NO + 2 NC) up to a rated operational voltage of 400 V.
# Power Contactors for Switching Motors

## SIRIUS 3RT20 contactors, 3-pole, up to 37 kW

### Main circuit

#### Load rating with DC

**Utilization category DC-1,**

- **Switching resistive loads** \( L/R \leq 1 \text{ ms} \)
  - Rated operational currents \( I_e \) (at 60 °C)
    - **1 conducting path**
      - Up to 24 V A: 15, 20
      - 60 V A: 15, 20
      - 110 V A: 1.5, 2.1
      - 220 V A: 0.6, 0.8
      - 440 V A: 0.42, 0.6
      - 600 V A: 0.42, 0.6
    - **2 conducting paths in series**
      - Up to 24 V A: 15, 20
      - 60 V A: 15, 20
      - 110 V A: 8.4, 12
      - 220 V A: 1.2, 1.6
      - 440 V A: 0.6, 0.8
      - 600 V A: 0.5, 0.7
    - **3 conducting paths in series**
      - Up to 24 V A: 15, 20
      - 60 V A: 15, 20
      - 110 V A: 15, 20
      - 220 V A: 15, 20
      - 440 V A: 0.9, 1.3
      - 600 V A: 0.7, 1

**Utilization category DC-3/DC-5,**

- **Shunt-wound and series-wound motors** \( L/R \leq 15 \text{ ms} \)
  - Rated operational currents \( I_e \) (at 60 °C)
    - **1 conducting path**
      - Up to 24 V A: 15, 20
      - 60 V A: 0.35, 0.5
      - 110 V A: 0.1, 0.15
      - 220 V A: --
      - 440 V A: --
      - 600 V A: --
    - **2 conducting paths in series**
      - Up to 24 V A: 15, 20
      - 60 V A: 3.5, 5
      - 110 V A: 0.25, 0.35
      - 220 V A: --
      - 440 V A: --
      - 600 V A: --
    - **3 conducting paths in series**
      - Up to 24 V A: 15, 20
      - 60 V A: 15, 20
      - 110 V A: 15, 20
      - 220 V A: 1.2, 1.5
      - 440 V A: 0.14, 0.2
      - 600 V A: 0.14, 0.2

### Switching frequency

**Switching frequency** \( z \) in operating cycles/hour

- **Contactors without overload relays**
  - No-load switching frequency
    - AC/DC \( h^{-1} \): 10 000
  - Switching frequency \( z \) during rated operation
    - \( I_e/AC-1 \)
      - At 400 V \( h^{-1} \): 1 000
    - \( I_e/AC-2 \)
      - At 400 V \( h^{-1} \): 750
    - \( I_e/AC-3 \)
      - At 400 V \( h^{-1} \): 750
    - \( I_e/AC-4 \)
      - At 400 V \( h^{-1} \): 250

- **Contactors with overload relays**
  - Mean value
    - AC/DC \( h^{-1} \): 15

1) Dependence of the switching frequency \( z' \) on the operational current \( I' \) and operational voltage \( U' \):

\[
z' = z \times \left( \frac{I_e}{I'} \right) \times \left( \frac{400 \text{ V}}{U'} \right)^{0.6} \times 1/h
\]
### Power Contactors for Switching Motors

**SIRIUS 3RT20 contactors, 3-pole, up to 37 kW**

#### Type
- 3RT2023... S0
- 3RT2025... S0
- 3RT2026... S0
- 3RT202... -NB3 S0
- 3RT202... -NF3... S0
- 3RT202... -NP3 S0

#### Control
- **Type of operating mechanism**: AC or DC
- **Type of operating mechanism**: UC (AC/DC)
- **Type of operating mechanism**: Standard version
- **Type of operating mechanism**: USA/Canada

#### Solenoid coil operating range
- AC (0.8 ... 1.1 x U_{s})
- DC (0.7 ... 1.3 x U_{s})

#### Power consumption of the solenoid coils

<table>
<thead>
<tr>
<th>Feature</th>
<th>3RT2023...</th>
<th>3RT2025...</th>
<th>3RT2026...</th>
<th>3RT202... -NB3</th>
<th>3RT202... -NF3...</th>
<th>3RT202... -NP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA</td>
<td>65</td>
<td>77</td>
<td>6.6</td>
<td>11.9</td>
<td>12.7</td>
<td>6.6</td>
</tr>
<tr>
<td>P.f.</td>
<td>0.82</td>
<td>0.82</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>Closed</td>
<td>7.6</td>
<td>9.8</td>
<td>1.9</td>
<td>1.6</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>P.f.</td>
<td>0.25</td>
<td>0.25</td>
<td>0.86</td>
<td>0.79</td>
<td>0.51</td>
<td></td>
</tr>
</tbody>
</table>

#### Additional Information
- **Type of operating mechanism**: AC or DC
- **Type of operating mechanism**: Standard version
- **Type of operating mechanism**: USA/Canada

#### Power consumption of the solenoid coils

- **Type of operating mechanism**: AC or DC
- **Type of operating mechanism**: Standard version
- **Type of operating mechanism**: USA/Canada

#### Operating times for 0.8 ... 1.1 x U_{s}

<table>
<thead>
<tr>
<th>Feature</th>
<th>3RT2023...</th>
<th>3RT2025...</th>
<th>3RT2026...</th>
<th>3RT202... -NB3</th>
<th>3RT202... -NF3...</th>
<th>3RT202... -NP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing delay ms</td>
<td>9 ... 38</td>
<td>8 ... 40</td>
<td>60 ... 80</td>
<td>50 ... 70</td>
<td>60 ... 80</td>
<td></td>
</tr>
<tr>
<td>Opening delay ms</td>
<td>4 ... 16</td>
<td>4 ... 16</td>
<td>30 ... 45</td>
<td>35 ... 45</td>
<td>35 ... 45</td>
<td></td>
</tr>
</tbody>
</table>

#### Operating times for 1.0 x U_{s}

<table>
<thead>
<tr>
<th>Feature</th>
<th>3RT2023...</th>
<th>3RT2025...</th>
<th>3RT2026...</th>
<th>3RT202... -NB3</th>
<th>3RT202... -NF3...</th>
<th>3RT202... -NP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing delay ms</td>
<td>10 ... 18</td>
<td>10 ... 17</td>
<td>65 ... 80</td>
<td>50 ... 70</td>
<td>60 ... 80</td>
<td></td>
</tr>
<tr>
<td>Opening delay ms</td>
<td>4 ... 16</td>
<td>4 ... 16</td>
<td>30 ... 45</td>
<td>35 ... 45</td>
<td>35 ... 45</td>
<td></td>
</tr>
</tbody>
</table>

#### Permissible residual current of the electronics (with 0 signal)

<table>
<thead>
<tr>
<th>Feature</th>
<th>mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC operation</td>
<td>&lt;6 mA x (230 V/U_{s})</td>
</tr>
<tr>
<td>DC operation</td>
<td>&lt;16 mA x (24 V/U_{s})</td>
</tr>
</tbody>
</table>

#### Additional Information

1) The following applies to U_{s, max} = 280 V: Upper limit = 1.1 x U_{s, max}.
2) The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (vanstov = 2 ms to 5 ms, diode assembly: 2 to 6 times).
Power Contactors for Switching Motors

SIRIUS 3RT20 contactors, 3-pole, up to 37 kW

<table>
<thead>
<tr>
<th>Type</th>
<th>3RT2035</th>
<th>3RT2036</th>
<th>3RT2037</th>
<th>3RT2038</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>S2</td>
<td>S2</td>
<td>S2</td>
<td>S2</td>
</tr>
</tbody>
</table>

Conductor cross-sections (1 or 2 conductors connectable)

Main conductors
- Solid or stranded mm²: 2 x (1 ... 35); 1 x (1 ... 50)
- Finely stranded with end sleeve mm²: 2 x (1 ... 25); 1 x (1 ... 35)
- AWG cables, solid or stranded AWG: 2 x (18 ... 2); 1 x (18 ... 1)
- Terminal screws Nm: Pozidriv size 2; Ø 5 ... 6
- Tightening torque Nm: 3 ... 4.5 (27 ... 40 lb.in)

Auxiliary and control conductors
- Solid or stranded mm²: 2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)
- Finely stranded with end sleeve mm²: 2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)
- AWG cables: 2 x (20 ... 16); 2 x (18 ... 14)
- Terminal screws Nm: M3 (for Pozidriv size 2, Ø 5 ... 6)
- Tightening torque Nm: 0.8 ... 1.2 (7 ... 10.3 lb.in)

Auxiliary and control conductors
- Operating devices mm: 3.0 x 0.5
- Solid or stranded mm²: 2 x (0.5 ... 2.5)
- Finely stranded with end sleeve mm²: 2 x (0.5 ... 1.5)
- Finely stranded without end sleeve mm²: 2 x (0.5 ... 2.5)
- AWG cables, solid or stranded AWG: 2 x (20 ... 14)

Data for North America

<table>
<thead>
<tr>
<th>Type</th>
<th>3RT2015</th>
<th>3RT2016</th>
<th>3RT2017</th>
<th>3RT2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>S00</td>
<td>S00</td>
<td>S00</td>
<td>S00</td>
</tr>
</tbody>
</table>

Rated insulation voltage V AC: 600
Uninterrupted current, at 40 °C, open and enclosed A: 20

Maximum horsepower ratings (from 3 and 5 approved values)
- Rated power for three-phase motors at 60 Hz
  - At 200 V hp: 1.5, 2, 3, 3
  - At 230 V hp: 2, 3, 3, 5
  - At 460 V hp: 5, 5, 7.5, 10
  - At 575 V hp: 7.5, 10, 10

Short-circuit protection
- Contactor or overload relay At 600 V kA: 5
- Fuse CLASS J
- Circuit breakers with overload protection acc. to UL 489 A: 40
- Combination motor controllers type E according to UL 508 and UL 60947-4-1 A: 50

Overload relays
- Type
- Setting range

1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.
2) Max. external diameter of the cable insulation: 3.6 mm.
On spring-type terminals with conductor cross-sections ≤ 1 mm², an insulation stop must be used, see Accessories, page 3/76.
3) Tool for opening the spring-type terminals; see "Accessories", page 3/76.

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### Power Contactors for Switching Motors

**SIRIUS 3RT20 contactors, 3-pole, up to 37 kW**

<table>
<thead>
<tr>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>and © rated data</th>
<th>3RT2023</th>
<th>3RT2024</th>
<th>3RT2025</th>
<th>3RT2026</th>
<th>3RT2027</th>
<th>3RT2028</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated insulation voltage</td>
<td>V AC</td>
<td>600</td>
<td>600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninterrupted current, at 40 °C, open and enclosed</td>
<td>A</td>
<td>35</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Maximum horsepower ratings (from © and © approved values)**

- **Rated power for three-phase motors at 60 Hz**
  - At 200 V hp: 2, 3, 3, 5, 10, 10
  - At 230 V hp: 3, 3, 5, 7.5, 10, 10
  - At 460 V hp: 5, 7.5, 10, 15, 20, 25
  - At 575 V hp: 7.5, 10, 15, 20, 25, 25

**Short-circuit protection**

- **At 600 V kA**
  - Values on request.

**Overload relays**

- **Type**: 3RU212 / 3RB302
- **Setting range**: 1.8 ... 40 / 0.1 ... 40

**Integrated or mountable auxiliary switch block**

<table>
<thead>
<tr>
<th>and © rated data of the auxiliary contacts</th>
<th>3RT201</th>
<th>3RT202, 3RT203</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>S0</td>
<td>S0, S2</td>
</tr>
<tr>
<td>Rated voltage V AC</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Switching capacity A</td>
<td>A 600, Q 600</td>
<td>A 600, P 600</td>
</tr>
<tr>
<td>Uninterrupted current At 240 V AC A</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

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1) For more information about short-circuit values, e.g. for protection against short-circuit currents, see the UL reports on the individual devices, www.siemens.com/sirius/manuals.

2) Values for RK5 fuses on request.

Power Contactors for Switching Motors

SIRIUS 3RT20 contactors, 3-pole, up to 37 kW

AC/DC operation (50/60 Hz and DC)
- Extended operating range of solenoid coil 0.8 ... 1.1 \times U_s
- Reduced power consumption when closing and in the closed state

PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41B

Illustrations are approximate

For online configurator, see www.siemens.com/sirius/configurators.

1) Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be switched must be considered when selecting the units.

2) Coil operating range: 0.8 \times U_{s_{min}} ... 1.1 \times U_{s_{max}}.

3) Article number for the auxiliary switch block (removable): 3RH2911-.. HA11.