Industrial Control Panels for North America

Interactive animation on the subject
The animation is based on 2 Control Panels (control cabinets), one built conforming to the IEC standard and the other conforming to the UL standard. The user will be able to navigate through the animation interactively, thus gaining a better understanding of UL specifics in the context of Industrial Control Panels.

**PROCEDURE:**

Click one of the devices installed in the Panels (either the IEC or the UL Panel) to display both information about that device and the corresponding device in the other Panel.

Click the device again to display both detailed information (technical data, for example) and the UL specifics.

Use the buttons to scroll through the animation. The button takes you back to the start page from any page in the animation.

Click the button for general information about the UL market.
General information about UL

Device selection

Open the doors
# Device selection

## Protection devices
- 3VL circuit breaker
- 3RV1 circuit breaker
- 3RV2 circuit breaker
- Miniature circuit breaker
- SITOR fuse
- Fuse system class CC
- NEOZED fuse system comfort base
- 3NP1 fuse switch disconnector
- NEOZED fuse system bus-mounting base
- DIAZED fuse system bus-mounting base
- 3RB overload relay

## Switching devices/load feeders
- 3RT contactor
- 3RW soft starter
- 3RF solid-state contactor
- 3RA motor feeder
- 3RA6 compact starter
- ET 200S motor starter

## Monitoring devices and control devices
- 3RR monitoring relay
- SIMOCODE 3UF7

## Safety systems
- 3TK28 safety relay
- 3RK3 modular safety system
- 3SE5 position switch

## Other devices and accessories
- 8US busbar system
- 8US19 infeed system
- 3RV29 infeed system
- 3RA68 infeed system
- 8US busbar adapter
- Receptacle
- ALPHA FIX terminal blocks
- Expansion module for SIMOCODE 3UF7
- SITOP power supply
- 7km PAC measuring instrument
- 8UC7 rotary operating mechanism
# General information about UL

<table>
<thead>
<tr>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line system configurations</td>
</tr>
<tr>
<td>Organizations and standards</td>
</tr>
<tr>
<td>Branch Circuit – Feeder Circuit</td>
</tr>
<tr>
<td>UL marks</td>
</tr>
<tr>
<td>SCCR (short-circuit current rating)</td>
</tr>
<tr>
<td>Degrees of protection</td>
</tr>
<tr>
<td>Control circuits</td>
</tr>
<tr>
<td>Lines/cables</td>
</tr>
<tr>
<td>Commissioning/acceptance</td>
</tr>
</tbody>
</table>
Line system configurations

**IEC** (a grounded wye system is usually present)

→ TT system, TN system (grounded wye)
→ IT system (ungrounded wye)

**UL** (various line system configurations exist)

→ Some line system configurations not used in the context of IEC
→ Information about all voltages present in the system, e.g. 480Y/277 V (slash rating) or 480 V (straight rating)
→ When selecting short-circuit devices, it is sufficient to differentiate simply between slash and straight rating
Line system configurations

Grounded wye

- **Slash rating**: e.g. 480Y/277V
- Devices with the following ratings are permitted: 480/277V, 600/347V, 600V, 480V

Corner grounded delta

- **Straight rating**: e.g. 480V, 600V
- Devices with the following ratings are permitted: 480V, 600V
- Devices with the following ratings are not permitted: 480/277V, 600/347V

Residential

- **Single-phase**/2-pole transformer with central tap
  - e.g.: 240/120V; single-phase
  - Devices with 240V, if the devices are connected between the line conductors
  - Devices with 120V, if the devices are connected between the line conductors and central tap
Line system configurations

### Ungrounded wye

- **Straight rating**: e.g. 480V, 600V
- Devices with the following ratings are permitted: 600V, 480V
- Devices with the following ratings are not permitted: 600/377V, 480/277V

### Ungrounded delta

- **Straight rating**: e.g. 480V, 600V
- Devices with the following ratings are permitted: 480V, 600V
- Devices with the following ratings are not permitted: 480/277V, 600/347V
Organizations and standards

**NFPA - National Fire Protection Association**
Organization active in the fire protection sector with members from fire departments, authoritative bodies, test laboratories, insurers, and consumer organizations. Issues various regulations and guidelines including NEC, NFPA79, etc.

**UL - Underwriter Laboratories**
Underwriter Laboratories publishes standards and approves products in accordance with its own and third-party standards (CSA, IEC, EN, etc.).

**CSA – Canadian Standard Association**
The Canadian Standard Association publishes standards and approves products in accordance with its own and third-party standards (UL, IEC, etc).

**NRTL – National Recognized Testing Laboratories**
A test center recognized by the US government’s OSHA (Occupational Safety and Health Administration) e.g. UL, CSA, TÜV Rheinland of North America and many more.
Branch and Feeder Circuit

**Feeder Circuit**

Starting from the load, all devices and components upstream of the first **overcurrent protective device** in the branch (Branch Circuit Protective Device)

➔ See the next slide for clearances and creepage distances

**Branch Circuit**

Starting from the load, all devices and components up to the first **overcurrent protective device** in the branch (Branch Circuit Protective Device)

➔ See the next slide for clearances and creepage distances
The new edition of **UL 508A** defines the required clearances and creepage distances for the Feeder and Branch Circuit in detail for the first time.

### Spacings required in infeed and distribution (Feeder Circuit) according to UL 508A Table 10.2 (extract)

<table>
<thead>
<tr>
<th></th>
<th>0-125 V</th>
<th>126-250 V</th>
<th>251-600 V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inch</td>
<td>mm</td>
<td>inch</td>
</tr>
<tr>
<td>Through air</td>
<td>1/2</td>
<td>12.7</td>
<td>3/4</td>
</tr>
<tr>
<td>Over surface</td>
<td>3/4</td>
<td>19.1</td>
<td>1-1/4</td>
</tr>
<tr>
<td>Between uninsulated live parts and enclosure</td>
<td>1/2</td>
<td>12.7</td>
<td>1/2</td>
</tr>
</tbody>
</table>

### Spacings in branch circuits according to UL 508A Table 10.1 (extract)

<table>
<thead>
<tr>
<th></th>
<th>0-50 V</th>
<th>51-150 V</th>
<th>151-300 V</th>
<th>301-600 V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inch</td>
<td>mm</td>
<td>inch</td>
<td>mm</td>
</tr>
<tr>
<td>Through air</td>
<td>1/16</td>
<td>1.6</td>
<td>1/8</td>
<td>3.2</td>
</tr>
<tr>
<td>Over surface</td>
<td>1/16</td>
<td>1.6</td>
<td>1/4</td>
<td>6.4</td>
</tr>
<tr>
<td>Between uninsulated live parts and enclosure</td>
<td>1/4</td>
<td>6.4</td>
<td>1/2</td>
<td>12.7</td>
</tr>
</tbody>
</table>
### UL marks

#### UL listing test symbol
Any devices or appliances bearing this mark meet all UL safety regulations and can be universally installed without any restriction of their usability and without any additional instructions.

#### C-UL listing test symbol
This mark is applied to products tested for compliance with Canadian UL safety requirements.

#### C-UL listing test symbol
This symbol identifies devices that comply with both CSA regulations for the Canadian market and UL regulations for the USA.

#### Recognized Component test symbol
This symbol is for components or devices used in machines and systems. These components may have restrictions on their performance or may be incomplete in construction. Only specialists working in compliance with the condition of acceptability are permitted to install such components and devices.

#### Canadian Recognized Component test symbol
Components bearing this symbol have been approved for the Canadian market and are subject to similar restrictions as components with the Recognized Component test symbol.

#### Recognized Component test symbol for Canada and the United States
Components bearing this mark meet the requirements of both the Canadian and US markets for Recognized Components.
Requirement from **NEC 2011 Art. 409.110** and **UL 508A, Art. 52**:  
- Among the requirements to be met is that the SCCR (short-circuit current rating) of the entire Control Panel must be marked on each Industrial Control Panel.  
  - The SCCR value shall ensure that the Panel is only connected to systems where the prospective short-circuit current will be less than or equal to the value on the rating plate.

Based on **NEC 2011 Art. 409.110**, there are essentially 3 different ways in which the SCCR value of a Panel can be determined:

**Option 1:**  
The SCCR value of each individual Panel or Panel unit is officially listed by a laboratory in the presence of UL test engineers from UL.

**Option 2:**  
Using pre-tested versions or buying such pre-tested Standard Industrial Control Panels.

**Option 3:**  
Complete analysis of the Industrial Control Panel in accordance with **UL 508A SB4**.  
- This method is the one used most often.  
- It is described below.
Determination of the short-circuit current (SCCR) in accordance with NEC 409.110 (4)

**Step 1 (mandatory):**
- Listing of the SCCR values of the devices (values on the device or in the UL report)
- The smallest value determines the total short-circuit rating of the Panel!

**Step 2 (mandatory):**
- Listing of the SCCR values of the devices from UL 508A Table SB 4.1 (if an SCCR value has not been specified)

**Step 3 (optional):**
- Listing of the SCCR values of switchgear assemblies
  - Series Rating Tests (series connection of at least 2 devices which can respond to a short circuit instantaneously)
  - Combination tests (series connection of devices of any type)
### Degrees of protection

**Enclosure types (UL) ↔ IP degree of protection (IEC)**

- "Enclosure type" degree of protection is associated with specific protection properties.
- Some UL enclosure ratings can be transposed to IP degrees of protection, but IP degrees of protection cannot be transposed to UL enclosure ratings.
- According to UL, an enclosure with only IP ratings is automatically given enclosure rating 1

<table>
<thead>
<tr>
<th>UL/NEMA Type</th>
<th>Installation site (typical application)</th>
<th>Protection against</th>
<th>Comparable IP degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General use</td>
<td>Indoors</td>
<td>Accidental contact with live parts and ingress of falling dirt</td>
</tr>
<tr>
<td>2</td>
<td>Protection against dripping water</td>
<td>Indoors</td>
<td>Ingress of dripping water and falling dirt</td>
</tr>
<tr>
<td>3R</td>
<td>Rain, hail, ice</td>
<td>Outdoors (starters for pump)</td>
<td>Ingress of dust and rain blown by the wind, and protection from icing over</td>
</tr>
<tr>
<td>4</td>
<td>Dustproof, waterproof</td>
<td>Indoors, outdoors (food industry)</td>
<td>Ingress of falling rain, splash water and jet water, no damage should ice form</td>
</tr>
<tr>
<td>4x</td>
<td>Dustproof, waterproof, resistant to corrosion</td>
<td>Indoors, outdoors (sewage treatment plants)</td>
<td>Ingress of falling rain, splash water and jet water, no damage should ice form, anti-corrosion protection</td>
</tr>
<tr>
<td>12</td>
<td>Protection against dripping water, dustproof, oil and cooling-water proof</td>
<td>Indoors (machine tools)</td>
<td>Ingress of dripping water, dust, oil and cooling liquid</td>
</tr>
<tr>
<td>13</td>
<td>Protection against dripping water, dustproof, oil and cooling-water proof</td>
<td>Indoors (command devices on machine tools)</td>
<td>Ingress of dripping water, dust, spraying oil and cooling liquid</td>
</tr>
</tbody>
</table>

**Æ** "Enclosure type" degree of protection is associated with specific protection properties.

**Æ** Some UL enclosure ratings can be transposed to IP degrees of protection, but IP degrees of protection cannot be transposed to UL enclosure ratings.

**Æ** According to UL, an enclosure with only IP ratings is automatically given enclosure rating 1.
Control circuits

Class 1 Control Circuit

Class 2 Control Circuit

Class 1 Control Circuit
Control circuits - Definition

Class 1 Control Circuit (UL 508A § 2.6) ⇒ general control circuits

- A control circuit connected to the load side of a BCPD (branch circuit protection device)
  - Maximum voltage: 600 V
  - Maximum current/power: Unrestricted (usually limited to 15 A)
- Control circuits connected to the outgoing side of a load transformer
- Control circuits connected at the outgoing side of a control transformer/power supply
Control circuits - Definition

Class 2 Control Circuit (UL 508A § 2.7) = control circuits with limited power

- Devices approved "...for use with class 2..." may only be used in these control circuits with limited power
- Control circuit supplied with power by an energy source (power supply devices certified acc. to UL1310, UL5085-1 & 3, UL60950-1, UL1950) with max. 30 V\text{rms}
- Devices that are used entirely in a "Class 2 circuit" do not have to be checked via the AHJ → Unlisted components can be used

Low –Voltage Limited Energy Circuit (UL 508A § 2.32)

- Control circuit with a "protected" extra-low-voltage
  - Control circuit with max. 30 V\text{rms} or 42 V peak voltage or DC direct voltage
  - with a max. power of 100 VA (5 A at 20 V or less)
  - Devices that are used entirely in a "Limited circuit" do not have to be checked via the AHJ → Unlisted components can be used
Lines/cables

Basic requirements

All wires and busbars must be made of copper. (UL 508A Art. 29)
EXCEPTION: Busbars in the Panel can also be made of aluminum.

Internal wires

All internal wires must be approved for at least 90 °C and correspond to one of the following types (UL 508A Art. 29/NFPA 79, Chapter 13):

1. Machine tool wire (MTW) according to UL 1063
2. Rubber insulated wire according to UL 44
3. Thermoplastic insulation according to UL 62
4. Appliance wiring material (acc. to NFPA 79 the line must be suitable for the application □ observe the style number)
5. Welding cable/diesel-locomotive wire

Wiring methods

See NFPA 79, Art. 13 and UL 508A, Art. 28, 29, 38

Wire sizes

Acc. to UL 508A wires in the main circuit must not be any smaller than 14 AWG (2.1 mm²). Wire size data is listed in the table on the next slide.
### Wire sizes and current carrying capacity - UL 508A, Table 28.1 (extract)

<table>
<thead>
<tr>
<th>Wire size</th>
<th>[mm²]</th>
<th>60°C (140°F)</th>
<th>75°C (167°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>(2.1)</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>(3.3)</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>(5.3)</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>(8.4)</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>(13.3)</td>
<td>55</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>(21.2)</td>
<td>70</td>
<td>55</td>
</tr>
<tr>
<td>3</td>
<td>(26.7)</td>
<td>85</td>
<td>65</td>
</tr>
<tr>
<td>2</td>
<td>(33.6)</td>
<td>95</td>
<td>75</td>
</tr>
<tr>
<td>1</td>
<td>(42.4)</td>
<td>110</td>
<td>85</td>
</tr>
<tr>
<td>1/0</td>
<td>(53.3)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2/0</td>
<td>(67.4)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3/0</td>
<td>(85.0)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4/0</td>
<td>(107.2)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>250 (kcmil)</td>
<td>(127)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>300</td>
<td>(152)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>350</td>
<td>(177)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>400</td>
<td>(203)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>500</td>
<td>(253)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>600</td>
<td>(304)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>700</td>
<td>(355)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>750</td>
<td>(380)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>800</td>
<td>(405)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>900</td>
<td>(456)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Every electrical machine or system in the USA is checked by an inspector known as the AHJ (Authority Having Jurisdiction) before it can be commissioned.

Acceptance is based on the NEC (National Electrical Code, also known as NFPA 70), the relevant application-specific guidelines such as NFPA 79, as well as any local standards or specifications.

→ In the USA, acceptance is a legal requirement.

The next graphic (see next slide) outlines four possible ways of arranging acceptance.
Commissioning/Acceptance

Acceptance options for OEMs

- Panel listed with label by NRTL
- Certified control manufacturer
- Preliminary acceptance by UL inspector at his/her premises
- On-site field inspection by AHJ in USA

On-site acceptance by AHJ

- Costs involved
- Time involved in on-site acceptance
- Modification possible
- Recommendation

End-customer precondition for commissioning

- Operating permission from AHJ

- Recommendation: Modification possible
- Time involved in on-site acceptance:
  - Not possible
  - Possible, together with manufacturer
  - Possible, field inspection required
  - Possible, repeat field inspection
- Modification possible:
  - Very high quantities
  - Many different systems
  - Little UL knowledge
  - Good UL knowledge
- Operating permission from AHJ
Miniature circuit breaker
Miniature circuit breaker

<table>
<thead>
<tr>
<th>Technical data</th>
<th>Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device selection</strong></td>
<td></td>
</tr>
<tr>
<td><strong>To IEC standard:</strong></td>
<td></td>
</tr>
<tr>
<td>5SY4 miniature circuit breaker</td>
<td></td>
</tr>
<tr>
<td><strong>To UL standard:</strong></td>
<td></td>
</tr>
<tr>
<td>5SJ4 miniature circuit breaker</td>
<td></td>
</tr>
</tbody>
</table>
## Miniature circuit breaker

### Technical data

#### 5SY4 miniature circuit breaker

- Rated current from 0.3 to 63 A
- Rated switching capacity 10 kA to 15 kA according to EN 60898-1
- Rated switching capacity 25 kA according to EN 60947-2
- Rated voltage up to 440 V DC/up to 400 V AC

#### 5SJ4 miniature circuit breaker

- Circuit breaker according to UL 489
- Rated current from 0.3 to 63 A
- Rated switching capacity up to 14 kA acc. to UL 489
- Rated switching capacity up to 15 kA according to IEC 60947-2
- Rated voltage 480Y/277 V AC
- Rated voltage DC: up to 125 V (UL 489) up to 60 V (IEC 60898 -1)
## Miniature circuit breaker

**Approvals**

### 5SY4 miniature circuit breaker

- Approval to IEC 60898-1 and IEC 60947-2
- Approval to CSA C22.2 No. 235
- Approval to UL 1077 for use as supplementary protector
  - Can be used for the protection of control circuits if:
    - On the primary side: Control circuit is branched downstream of the BCPD
    - On the secondary side: Control circuit remains in Panel

### 5SJ4 miniature circuit breaker

- Approval to IEC 60898-1 and IEC 60947-2
- Approval to CSA C22.2 No. 5-02
- Approval to UL 489 as circuit breaker
  - Use as branch circuit protection

See UL report (UL File No. E243414) for further information
3VL circuit breaker

Main switch (3VL circuit breaker)
3VL circuit breaker

Device selection

To IEC standard:

3VL circuit breaker

To UL standard:

3VL circuit breaker
3VL circuit breaker
Technical data

→ Rated current from 16 A to 1,600 A
→ Rated voltage
  up to max. 690 V AC/max. 600 V DC
→ Rated switching capacity at 400 V 100 kA
→ 3- and 4-pole device versions
→ The set value $I_R$ for the overcurrent release in ampere

→ Rated current from 16 A to 1,600 A
→ Rated voltage
  up to max. 600 V AC/max. 500 V DC
→ Rated switching capacity at 400 V 100 kA
→ 3-pole device version
→ The set value $I_R$ for the overcurrent release in ampere
### 3VL circuit breaker

**Approvals**

- Approval to IEC 60947–2
  - Main and emergency off switch
  - System and generator protection
  - Starter combinations
  - Non-automatic circuit breakers
  - Motor protection

See UL report (UL File No. E10848) for further information
3RV2 circuit breaker

3RV2 circuit breaker as system protection
3RV2 circuit breaker

Device selection

To IEC standard:

3RV2 circuit breaker as system protection

To UL standard:

3RV27/28 circuit breaker as system protection
### 3RV2 circuit breaker
**Technical data**

<table>
<thead>
<tr>
<th>3RV20 circuit breaker</th>
<th>3RV27/28 circuit breaker</th>
</tr>
</thead>
</table>

- **Rated current up to 40 A** (depending on the size)
- **Rated voltage up to**
  - max. 690 V AC (IEC)/600 V AC (UL, CSA)
- **Short-circuit strength up to 100 kA** (depending on the voltage)
- **Screw terminal connections** (up to 40 A), spring-loaded connection system and ring cable lug connection (up to 32 A)
- **Use of practical conductor cross-sections possible:**
  - size S00 max. 4 mm²/
  - size S0 max. 10 mm²

- **Rated current up to 22 A**
- **Rated voltage IEC:**
  - max. 690 V AC
- **Rated voltage UL:**
  - max. 600Y/477 V (slash rating only)
- **Short-circuit strength up to 65 kA** (at 480 Y/277 V to UL)
- **Screw terminal connections**
- **Size S00 and S0**

For further information, go to [www.siemens.de/sirius](http://www.siemens.de/sirius)
### 3RV2 circuit breaker

Approvals

<table>
<thead>
<tr>
<th>3RV20 circuit breaker</th>
<th>3RV27/28 circuit breaker</th>
</tr>
</thead>
</table>
| - Approval to IEC 60947-1, IEC 60947-2 and IEC 60947-4-1 as:  
  - Short-circuit and motor protection  
  - System and transformer protection  
  - Main and emergency off protection  
  - Also approved to UL 508 as motor circuit breaker:  
    - "Manual Motor Controller"  
    - "Self Protected Combination Motor Controller" when using 3RV29 28-1H terminal block or 3RV29 28-1K phase barriers | - Approval to IEC 60947-1 and IEC 60947-2  
- Approval to CSA C22.2 No.5-02  
- Approval to UL 489 as circuit breaker  
  - System and transformer protection |
3RV1 circuit breaker
3RV1 circuit breaker

To IEC standard:

3RV10 circuit breaker

To UL standard:

3RV17 circuit breaker
### 3RV1 circuit breaker

**Technical data**

- Rated current up to 100 A (depending on the size)
- Rated voltage up to max. 690 V AC (IEC)/600 V AC (UL, CSA)
- Short-circuit strength up to 100 kA (depending on the voltage)
- Screw terminal connections
- Use of practical conductor cross-sections possible: size S2 max. 35 mm²
  size S3 max. 70 mm²

### 3RV10 circuit breaker

- Rated current up to 100 A
- Rated voltage up to max. 690 V AC (IEC)/600 V AC (UL, CSA)
- Short-circuit strength up to 100 kA (depending on the voltage)
- Screw terminal connections
- Use of practical conductor cross-sections possible:
  - size S2 max. AWG 2/0

### 3RV17 circuit breaker

- Rated current up to 100 A
- Rated voltage max. 690 V AC (IEC)/600 V AC (UL, CSA)
- Short-circuit strength up to 65 kA at 480 Y/277 V and 480 V
- Screw terminal connections
- Use of practical conductor cross-sections possible: size S2 max. AWG 2/0

For further information, go to www.siemens.de/sirius
# 3RV1 circuit breaker

**Approvals**

## 3RV10 circuit breaker

- Approval to IEC 60947-1, IEC 60947-2 and IEC 60947-4-1
  - Short-circuit and motor protection (also with overload function)
  - System and transformer protection
  - Main and emergency off protection
- Approval to CSA C22.2 No. 14 and UL 508 as:
  - „Manual Motor Controller“
  - "Self-Protected Combination Motor Controller" when using terminal block 3RT 1946-4GA07

## 3RV17 circuit breaker

- Approval to IEC 60947-1 and IEC 60947-2
- Approval to CSA C22.2 No. 5-02
- Approval to UL 489 as circuit breaker
  - System and transformer protection

See UL report (UL File No. E47705) for further information

---

© Siemens AG 2015. All rights reserved.

Industry Sector
5TE6 socket

Technical data

Approvals

Device selection

To IEC standard:

5TE6 800 socket

To UL standard:

5TE6 804 socket
### 5TE6 800 socket

- **Rated operational voltage**: 230 V AC
- **Rated operational current**: 16 A
- **Conductor cross-sections**: up to 6 mm²
- **Ambient temperature**: from -10 °C to +55 °C
- **Degree of protection**: IP 20

### 5TE6 804 socket

- **Rated operational voltage**: 125 V AC
- **Rated operational current**: 15 A
- **Conductor cross-sections**: up to AWG 10
- **Ambient temperature**: from -10 °C to +55 °C

For further information, go to [www.siemens.de/sirius](http://www.siemens.de/sirius)
<table>
<thead>
<tr>
<th>5TE6 socket Approvals</th>
</tr>
</thead>
</table>

**5TE6 800 socket**

- Approval to IEC 60204-1
- Suitable for mounting in distribution boards acc. to DIN 43880
- Suitable for installation on DIN rails in switchboards and distribution boards acc. to DIN 60715
- Connection of plug-and-play communication devices in switchboards

**5TE6 804 socket**

- Approval to UL 498
- Approval to CSA C22.2 No.182.3M
  - Connection of plug-and-play communication devices in switchboards

See UL report (UL File No. E258598) for further information
Busbar system
Busbar system

To IEC standard:
8US busbar system (40 mm)

To UL standard:
8US busbar system (60 mm)
### Busbar system

**Technical data**

#### 8US busbar system (40 mm busbar center-to-center spacing)

- **Rated insulation voltage**
  - $U_i \ 1,000 \ 	ext{V AC}$

- **Rated current**
  - up to 400 A (40 mm)

- **Short-circuit strength**
  - to IEC see characteristics

For further information, go to [www.siemens.de/lowvoltage](http://www.siemens.de/lowvoltage)

#### SC characteristics (IEC)

### 8US busbar system (60 mm busbar center-to-center spacing)

- **Rated insulation voltage**
  - $U_i \ 1,000 \ 	ext{V AC}$

- **Rated current**
  - up to 630 A (60 mm, basic profile)

- **Rated current**
  - up to 1,600 A (60 mm, special profile)

- **Short-circuit strength**
  - to IEC see characteristics

For further information, go to [www.siemens.de/lowvoltage](http://www.siemens.de/lowvoltage)
Busbar system

Approvals

8US busbar system (40 mm busbar center-to-center spacing)

- Approval to EN 13601
- Approval to IEC 60439-1 and IEC 61439-2
- Approval to UL 508 only for use in the branch circuit

8US busbar system (60 mm busbar center-to-center spacing)

- Approval to IEC 60439-1 and IEC 61439-2
- Approval to CSA C22.2 No.14/No.39
- Approval to UL 508:
  - Use in feeder and branch circuit

See UL report (UL File No. E148698) for further information
Busbar system
Characteristics for rated peak withstand current

40 mm busbar system

60 mm busbar system

⇒ The characteristics are only applicable for IEC applications!
⇒ They must not be used for UL applications!!
3RT2 contactor
3RT2 contactor
Technical data

3RT2 contactor

→ Sizes S00 and S0
→ Screw terminal, spring-loaded, ring cable lug, and solder pin (S00) connections

IEC – ratings
→ Rated operational current up to max. 50 A (depending on the size and operating temperature)
→ Rated operational voltage up to max. 690 V AC
→ Rated frequency 50/60 Hz

CSA and UL – ratings
→ Rated operational current up to max. 42 A (depending on the size and operating temperature)
→ Rated operational voltage up to max. 600 V AC
→ Rated frequency 60 Hz
→ Horsepower rating up to max. 25 hp (depending on the size and operating voltage)

For further information, go to www.siemens.de/sirius
3RT2 contactor
Approvals

- Approval to IEC 60947-1 and DIN EN 60947-1
- Approval to IEC 60947-4-1 and DIN EN 60947-4-1
- Approval to IEC 60947-5-1 and DIN EN 60947-5-1 (auxiliary switch)
- Approval to CSA C22.2 No. 14
- Approval to UL 508

See UL report (UL File No. E31519) for further information
3RA2 load feeder with 3RV29 infeed system

3RA2 load feeder
(3RV2 motor starter protector + 3RT2 contactor)
with 3RV29 infeed system
3RA2 load feeder with 3RV29 infeed system
3RA2 load feeder

Technical data

Approvals

Device selection

3RA2 load feeder
3RV29 infeed system
3RA2 load feeder
Technical data

3RA2 load feeder

→ Fuseless load feeder consisting of 3RV2 circuit breaker and 3RT2 contactor
→ Rated current up to max. 32 A (depending on the size)
  → For rated currents > 32 A up to 100 A, 3RA1 load feeders can be used
→ Available as a pre-assembled complete unit or for customer assembly (up to 40 A)
→ Rated voltage up to max. 690 V AC
→ Short-circuit strength up to 150 kA at 400 V AC 50/60 Hz
→ Screw terminal and spring loaded connections (customer assembly)
→ Sizes S00 and S0

For further information, go to www.siemens.de/sirius
3RA2 load feeder

Approvals

- Approval to IEC 60947-1, IEC 60947-2, and IEC 60947-4-1
  - Exhibits isolating features conforming to IEC 60947-2
    and can be used as a main switch according to DIN EN 60204
- Approval to CSA C22.2 No. 14
- Approval to UL 508 as:
  - Combination Motor Controller Type F

See UL report (UL File No. E156943) for further information
3RV29 infeed system

Technical data

- High flexibility for installation and expansion
- Compact design saves space
- Infeed either on the left or right with conductor cross-section up to 25 mm²
- Spring-loaded and screw terminal connections
- Sizes S00 and S0
- Current carrying capacity up to max. 63 A

For further information, go to www.siemens.de/sirius
3RV29 infeed system

Approvals

→ Approval to IEC 60947-1, IEC 60947-2, IEC 60947-4-1
→ Approval to UL 508 for the installation of:
  → Self Protected Combination Motor Controller Type E
  → Self Protected Combination Motor Controller Type F
     (corresponds to type E + contactor)

See UL report (UL File No. E148698) for further information
ALPHA Fix terminal blocks
ALPHA FIX terminal blocks

Technical data

Approvals

Device selection
ALPHA Fix terminal blocks
Technical data

ALPHA Fix terminal blocks

→ Space-saving connection of incoming and outgoing lines in switchboards and Control Panels
→ Connection method: Screw terminal and spring-loaded connections, in-push-out terminal, combination plug-in terminal, and insulation displacement termination
→ Quick installation saving time with high contact reliability
→ Rated uninterrupted current up to 192 A
→ Rated insulation voltage up to 800 V
  → Ratings may vary (IEC/UL)!!

For further information, go to www.siemens.de/lowvoltage/support
8WA1 screw-type terminal

→ The tried-and-tested screw-type connection system features double insulation and is closed on both sides. These terminals are particularly stable and offer a high mechanical and thermal resistance.

→ Available as through-type, PE and PEN terminals in various terminal sizes
  → 2.5 mm², 4 mm², 6 mm², 16 mm², 35 mm², 70 mm²

8WH1 screw-type terminal

→ The screw-type connection system offers a convincing compact design and optimum ease of handling. The clamping body's plasticity prevents clamped wires from slipping.

→ Support of applications up to 1,000 V DC

→ Available as through-type and PE terminals in various terminal sizes
  → 2.5 mm², 4 mm², 6 mm², 10 mm², 16 mm², 35 mm²

For further information, see www.siemens.com/lowvoltage
ALPHA FIX Terminal Blocks
Technical Data

8WA2 spring-loaded terminal

→ With the spring-loaded connection system, constant pressure is applied to the conductor by the tension spring, which results in outstanding contact reliability – also with vibration-sensitive applications.

→ Available as through-type and PE terminals in various terminal sizes (2.5 mm², 4 mm², 6 mm², 16 mm², 35 mm²)

→ Accessories for 8WA and 8WH
Various accessories for terminal blocks, 8WH labeling accessories and mounting accessories, labeling plates with inscription, 8WA mounting accessories

For further information, see www.siemens.com/lowvoltage
ALPHA Fix terminal blocks

Approvals

ALPHA Fix terminal blocks

→ Approval to IEC 60947-7-1
→ Approval to UL 1059 (UL recognized)
   → Conditions of acceptability must be observed when using the components
→ Approval to CSA 6228-01

See UL report (UL File No. E80027) for further information
3RA6 compact starter with 3RA68 infeed system
3RA6 compact starter with 3RA68 infeed system
3RA6 compact starter

Technical data

Approvals

Device selection

3RA6 compact starter
3RA6 compact starter

Technical data

3RA6 compact starter

- **Universal fuseless motor feeder**
  - Combines the functions of a circuit breaker, a contactor, and an overload relay in a single enclosure

- **Rated voltage up to 690 V**

- **Rated current up to 32 A**
  - For load feeders > 32 A up to 100 A 3RA1 series
  - For load feeders > 100 A, 3VL circuit breakers and 3RT contactors can be used

- **Rated frequency 50/60 Hz**

- **Rated short-circuit breaking capacity at AC 50/60 Hz**
  - 400 V up to 53 kA

- **Connection method: Screw terminal connection, spring-loaded connection**

For further information, go to www.siemens.de/sirius
3RA6 compact starter

Approvals

- Approval to IEC 60947-6-2 and IEC 60947-2
  - Exhibits isolating features conforming to IEC 60947-2
    and can be used as a main switch according to
    DIN EN 60204

- Approval to UL 508 (when using the corresponding infeed system
  e.g. 3RA68 12 - 8AB/8AC) as:
  - Manual Motor Controller
  - Self Protected Combination Motor Controller Type E
  - Group Application
  - Suitable for Tap Conductor Protection

See UL report (UL File No. E47705) for further information
3RA68 infeed system for 3RA6 compact starter

3RA6 compact starter with 3RA68 infeed system
3RA68 infeed system for 3RA6 compact starter

Technical data

High flexibility for installation and expansion
Compact design saves space
Devices are mounted simply by clicking them into place
No need for complex wiring
Spring-loaded and screw terminal connections
Current carrying capacity up to max. 100 A

Component | Maximum rated operational current in A
--- | ---
Screw-type infeed 50/70 mm² | 100
Screw-type infeed 25/35 mm² | 63
Spring-loaded infeed 25/35 mm² | 63
Expansion plug | 63

For further information, go to www.siemens.de/sirius
Approval according to UL 508 for the installation of:
- Self-protected combination motor controller type E
- Manual motor controller
- Group application
- Suitable for tap conductor protection

Approval according to CAN/CSA-C22.2 No. 0.4-04
- Bonding of electrical equipment

Approval according to CSA-C22.2 No. 14-10
- Industrial control equipment

See UL report (UL File No. E148698) for further information
3RA2 load feeder on busbar with infeed

3RA2 load feeder
(3RV2 motor starter protector + 3RT2 contactor) on busbar with infeed
3RA2 load feeder on busbar with infeed

3RA2 load feeder on 8US busbar with 8US19 infeed
8US19 infeed

Device selection
3RA2 load feeder with 8US busbar adapter
3RA2 load feeder

3RA2 load feeder
3RV2 circuit breaker + 3RT2 contactor
3RV20 circuit breaker

3RV20 circuit breaker as motor circuit breaker
### 3RV20 Circuit Breaker as Motor Circuit Breaker

#### Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated current</td>
<td>up to 40 A (depending on the size)</td>
</tr>
<tr>
<td></td>
<td>Up to 32 A: Assembly as feeder with connecting module and contactor or available as 3RA2 feeder</td>
</tr>
<tr>
<td>Rated operational voltage</td>
<td>up to max. 690 V AC (IEC)</td>
</tr>
<tr>
<td></td>
<td>up to max. 600 V AC (UL, CSA)</td>
</tr>
<tr>
<td>Short-circuit strength</td>
<td>up to 100 kA (depending on the voltage)</td>
</tr>
<tr>
<td>Screw-type connection system</td>
<td>(up to 40 A), spring-loaded connection system and ring cable lug connection system (up to 32 A)</td>
</tr>
<tr>
<td>Support of practical conductor cross-sections</td>
<td>Size S00 max. 4 mm² / size S0 max. 10 mm²</td>
</tr>
</tbody>
</table>

For UL applications: 3RV29 28-1H terminal block

For further information, see www.siemens.com/sirius
3RV20 circuit breaker as motor circuit breaker

Approvals

- Approval to IEC 60947-1, IEC 60947-2 and IEC 60947-4-1 as:
  - Short-circuit and motor protection
  - System and transformer protection
  - Main and emergency off protection

- Approval to CSA C22.2 No. 14

- Approval to UL 508
  - “Manual Motor Controller”
  - "Self Protected Combination Motor Controller" when using 3RV29 28-1H terminal block or 3RV29 28-1K phase barriers

See UL report (UL File No. E47705) for further information
8US busbar adapter

Device selection

8US busbar adapter
3RW44 soft starter

© Siemens AG 2015. All rights reserved.
Industry Sector
3RW44 soft starter
3RW44 soft starter

The soft starter for High Feature applications

- Rated operational current up to 1,214 A (depending on the size and temperature)
- Rated operational voltage up to 690 V AC
- Rated frequency 50 to 60 Hz
- Screw terminal and spring-loaded connections
- Inside-delta circuit to reduce size and device costs (smaller size for higher power possible)
- Easy to install and integrate in motor feeders
- Numerous additional functions

For further information, go to www.siemens.de/sirius
3RW44 soft starter
Approvals

- Approval to IEC 60947- 4 - 2
- Approval to UL 508
- Approval to CSA C22.2 No. 14

See UL report (UL File No. E143112) for further information
SITOR semiconductor fuse

Technical data

Approvals

Device selection

SITOR semiconductor fuse
SITOR semiconductor fuse

Technical data

SITOR semiconductor fuse

→ Fuses to protect power semiconductors against the effects of a short circuit
→ High-speed switch-off characteristic
→ Available with various types of connection and in different designs: LV HRC, cylindrical fuse, and SILIZED

Cylindrical fuse design

→ Rated current up to 100 A (depending on the size)
→ Rated voltage up to max. 690 V AC
→ Rated conditional short-circuit current at 400 V up to 100 kA (depending on the size)
→ Conductor cross-section up to 50 mm²/ AWG 1/0 (depending on the size)

For further information, go to www.siemens.de/sirius
### SITOR semiconductor fuse

#### Approvals

<table>
<thead>
<tr>
<th>Cylindrical fuse links:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval to IEC 60269-4</td>
</tr>
<tr>
<td>Approval to UL 248-13 and CSA C22.2 No. 248.13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cylindrical fuse holders:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval to IEC 60269-2 and IEC 60947-3</td>
</tr>
<tr>
<td>Approval to UL 512 and CSA C22.2 No. 39-M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cylindrical fuse bases:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval to IEC 60269-2 and IEC 60947-3</td>
</tr>
<tr>
<td>Approval to UL 512 and CSA C22.2 No. 39-M</td>
</tr>
</tbody>
</table>

See UL report (UL File No. E167357) for further information
Class CC fuse system
Class CC fuse system

Technical data

Approvals

Device selection

Class CC fuse system
Class CC fuse system

Technical data

Class CC fuse system

- Class CC fuse system for use as branch circuit protection
- Rated operational current up to 30 A
  - In uninterrupted duty, only 80% of the rated current is permitted (acc. to NEC 210.20(A))
- Rated operational voltage 600 V AC (fuse holder and fuse links)
- Conductor cross-sections up to 25 mm²/AWG 4
- Rated breaking capacity 200 kA (fuse links)

For further information, go to www.siemens.de/lowvoltage
Class CC fuse system

Approvals

- Approval to UL 512 (fuse holders)
- Approval to UL 248-4 (fuse links)
- Approval to CSA C22.2 No. 14
- No IEC approval!!

See UL report (UL File No. E258218) for further information
Distributed IO ET 200S motor starter
Distributed IO ET 200S motor starter

Technical data
Approvals

Device selection

Distributed IO
ET 200S motor starter
Distributed IO ET 200S motor starter

Technical data

→ Multifunctional motor starter for distributed drive solutions
→ Functional scope depends on the motor version:
  → Standard motor starter
  → High Feature motor starter
  → Fail-safe motor starter
→ Interface modules (IM) are used to connect to PROFINET and PROFIBUS DP bus systems
→ Rated operational current for terminal modules TM-D up to 50 A
→ Rated operational current for motor starter up to 16 A
→ Rated operational voltage up to 500 V (IEC)
→ Rated operational voltage up to 600 V (UL/CSA)
→ Rated breaking capacity at 400 V up to 50 kA
→ Power of three-phase motors at 500 V up to 7.5 kW
→ Conductor cross-sections up to 10 mm²/AWG 10

For further information, go to www.siemens.de/ET200S
Distributed IO ET 200S motor starter

Approvals

- Approval to IEC 60947-4-2 and IEC 60947-4-1
- SIL 3 to IEC 62061 (ET 200S fail-safe version)
- Approval to UL 508
- Approval to CSA C22.2 No. 14

See UL report (UL File No. E31519) for further information
NEOZED fuse system (comfort base)
NEOZED fuse system (comfort base)

Technical data

→ Fuse system for use in distribution systems and in industrial switchboards
→ Compact design saving space in the Panel
→ Rated operational current up to 100 A (fuse links)
→ Rated operational current up to 63 A (comfort base)
→ Rated operational voltage 400 V AC/250 V DC
→ Rated breaking capacity 50 kA AC/8 kA DC
→ Operating class gG
→ Conductor cross-sections up to 35 mm²
→ 1- and 3-pole device versions

For further information, go to www.siemens.de/lowvoltage
NEOZED fuse system (comfort base)

Approvals

- **Fuse links:**
  - Approval to IEC 60269-3
  - Approval to DIN VDE 0636-3

- **Comfort base:**
  - Approval to IEC 60269-3
  - Approval to DIN VDE 0636-3

- No UL/CSA approval!
3TK28 safety relay

Technical data
Approvals
Device selection

3TK28 safety relay

© Siemens AG 2015. All rights reserved.
Industry Sector
3TK28 safety relay

Technical data

3TK28 safety relay

→ Safety relay with solid-state, relay or contactor relay enabling circuit plus special functions
→ Evaluation unit of an end-to-end safety chain (sensing, evaluating, switching off)
→ Can be used in all safety applications thanks to compliance with the most exacting safety requirements
→ Compact and space-saving SIRIUS design
→ Highly flexible where connection and expansion are concerned, making subsequent modification easy
→ Screw terminal and spring-loaded connections

For further information, go to www.siemens.de/sicherheitsschaltgeraete
### 3TK28 safety relay

**Approvals**

- **Meets the most exacting safety requirements**
- **Approval to EN ISO 13849-1**
  - Performance Level (PL) e
- **Approval to IEC 61508**
  - Safety Integrity Level (SIL) 3
- **Approval to UL/CSA**

See UL report (UL File No. E44653) for further information
3RK3 modular safety system

Modular safety system 3RK3
3RK3 modular safety system

Technical data

Approvals

Device selection

3RK3 modular safety system
3RK3 Modular Safety System

Technical Data

3RK3 modular safety system

- The MSS 3RK3 is a freely parameterizable modular safety relay comprising:
  - Central unit (in Basic or Advanced design)
  - Expansion module (I/O module)
  - Interface module (PROFIBUS DP interface)
  - Operating and monitoring module (diagnostics module)
- High flexibility and reliability in terms of planning thanks to modular design
- Compact and space-saving SIRIUS design
- Screw-type and spring-loaded connection system
- Direct-data exchange between multiple MSS units
- Distribution of sensors and actuators possible via AS-Interface

For further information, see www.siemens.com/sirius-mms
3TK28 safety relay
Approvals

3RK3 modular safety system

- Meets the most exacting safety requirements
- Approval to ISO 13849-1
  - Performance Level (PL) e
- Approval to IEC 61508
  - Safety Integrity Level (SIL) 3
- Approval to UL/CSA

See UL report (UL File No. ?????) for further information
SIMOCODE motor management system with current/voltage measuring module
SIMOCODE 3UF7 motor management system

Technical data
Approvals
Device selection

SIMOCODE 3UF7 motor management system
SIMOCODE 3UF7 Motor Management System

Technical Data

SIMOCODE 3UF7 motor management system

→ Modular motor management system for fixed-speed motors
→ Multifunctional and electronic full motor protection, independent of the automation system
→ Integrated control functions for motor control (instead of hardware)
→ Detailed diagnostic, service and operating data
→ Comprehensive communication via PROFIBUS or PROFINET / OPC UA / web server

For further information, see www.siemens.com/simocode
SIMOCODE 3UF7 motor management system

Approvals

<table>
<thead>
<tr>
<th>Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ Meets the most exacting safety requirements</td>
</tr>
<tr>
<td>→ Performance Level (PL) e to ISO</td>
</tr>
<tr>
<td>→ Safety Integrity Level (SIL) 3 to IEC</td>
</tr>
<tr>
<td>→ Approval to EN 13849-1</td>
</tr>
<tr>
<td>→ Approval to IEC 61508</td>
</tr>
<tr>
<td>→ Approval to CSA C22.2 No. 14</td>
</tr>
<tr>
<td>→ Approval to UL 508</td>
</tr>
</tbody>
</table>

See UL report (UL File No. E44653) for further information
3NP1 LV HRC fuse switch disconnector
3NP1 LV HRC fuse switch disconnector

Technical data

Approvals

Device selection

3NP1 LV HRC fuse switch disconnector
3NP1 LV HRC fuse switch disconnector

Technical data

- Fuse switch disconnector for the protection and switching of many different types of load including:
  - Combination motor controllers
  - In conjunction with SITOR fuses for the protection of frequency converters and soft starters
  - Protection of communication modules
  - Group protection of small loads
- Rated operational current up to 630 A
- Rated operational voltage up to 690 V AC
- Rated frequency 50/60 Hz
- Short-circuit strength at 690 V up to 120 kA

For further information, go to www.siemens.de/lowvoltage
3NP1 LV HRC fuse switch disconnector 3NP1

3NP1 LV HRC fuse switch disconnector

- Approval to IEC 60947-1 and IEC 60947-1
- Approval to EN 60947-1 and EN 60947-3
- Approval to CSA C22.2 No. 39-M
- Approval to UL 512

See UL report (UL File No. ????) for further information
3RF solid-state switching device
3RF solid-state switching device

Technical data

Approvals

Device selection

3RF solid-state switching device
# 3RF solid-state switching device

**Technical data**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid-state switching device used for the frequent switching of motors, small drives, and valves</td>
<td></td>
</tr>
<tr>
<td>Long service life: More than 100 million operating cycles</td>
<td></td>
</tr>
<tr>
<td>Wear-free and noiseless switching for high system availability</td>
<td></td>
</tr>
<tr>
<td>Rated operational current up to</td>
<td>16 A</td>
</tr>
<tr>
<td>Rated operational voltage</td>
<td>48 to 600 V AC</td>
</tr>
<tr>
<td>Rated control voltage</td>
<td>24 V DC/110 V AC up to 230 AC</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz ± 10%</td>
</tr>
<tr>
<td>Screw terminal and spring-loaded connections</td>
<td></td>
</tr>
<tr>
<td>Conductor cross-sections up to</td>
<td>10 mm²/AWG 10</td>
</tr>
</tbody>
</table>

For further information, go to [www.siemens.de/halbleiterschaltgeraete](http://www.siemens.de/halbleiterschaltgeraete)
3RF solid-state switching device

Approvals

| Approval to IEC 60947-4-2 |
| Approval to CSA C22.2 No. 14 |
| Approval to UL 508 |

See UL report (UL File No. E143112) for further information
3RB3 overload relay
3RB3 overload relay

Technical data
Approvals
Device selection

3RB3 overload relay
3RB3 overload relay
Technical data

- Solid-state overload relay for inverse-time delayed overload protection of three-phase motors
- Not suitable for protecting single-phase AC or DC loads
- Rated operational current from 0.4 to 40 A
- Rated operational voltage up to 690 V AC
- Available in sizes S00 and S0
- Optional direct mounting on contactor or stand-alone assembly
- Large wide setting range of 1:4
- Spring-loaded and screw terminal connections
- Conductor cross-sections up to 10 mm²/AWG 6

For further information, go to www.siemens.de/lowvoltage
3RB3 overload relay

Approvals

- Approval to IEC 60947-4-1, IEC 60947-5-1
- Approval to CSA C22.2 No. 14
- Approval to UL 508

See UL report (UL File No. E44653) for further information
3RR2 monitoring relay
**3RR2 Monitoring Relay**

**Technical Data**

---

<table>
<thead>
<tr>
<th>3RR2 monitoring relay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring relay for optimum protection of machines and systems</td>
</tr>
<tr>
<td>One device for overload and underload monitoring</td>
</tr>
<tr>
<td>Direct mounting on RT2 contactor</td>
</tr>
<tr>
<td>Display for indication of values</td>
</tr>
<tr>
<td>Rated operational current from 1.6 to 40 A</td>
</tr>
<tr>
<td>Rated operational voltage up to 690 V AC</td>
</tr>
<tr>
<td>Rated control supply voltage from 24 to 240 V AC/DC</td>
</tr>
<tr>
<td>Screw-type and spring-loaded connection system</td>
</tr>
<tr>
<td>Short-circuit strength up to 100 kA with 690 V (in combination with suitable protective device)</td>
</tr>
</tbody>
</table>

For further information, see [link](#)
3RR2 monitoring relay
Approvals

→ Approval to IEC 60947-4-1
→ Approval to CSA C22.2 No.14
→ Approval to UL 508

See UL report (UL File No. E44653) for further information
NEOZED bus-mounting base
NEOZED bus-mounting base
# NEOZED bus-mounting base

## Technical data

- **NEOZED bus-mounting base for 3-pole 60 mm busbar systems**
- Available in sizes D01 and D02
- Rated operational current up to 63 A
- Rated operational voltage 400 V AC/250 V DC
- Rated operating frequency 50 Hz
- Conditional short-circuit current 50 kA AC/8 kA DC

For further information, go to www.siemens.de/sentron
NEOZED bus-mounting base

Approvals

- Approval to IEC 60269-3
- No CSA or UL approval!!
DIAZED bus-mounting base
DIAZED bus-mounting base
DIAZED bus-mounting base

Technical data

- DIAZED bus-mounting base for 3-pole 60 mm busbar systems
- Suitable for the use of DIAZED adapter rings and DIAZED adapter screws
- Available in sizes DII and DIII
- Rated operational current up to 63 A
- Rated operational voltage 500 V AC/DC (size DII), 690 V AC/600 V DC (size DIII)
- Rated frequency 50 Hz
- Conditional short-circuit current 50 kA AC/8 kA DC

For further information, go to www.siemens.de/lowvoltage
DIAZED bus-mounting base

Approvals

- Approval to IEC 60269-3
- No CSA or UL approval!!
SIRIUS 3SE5 position switch
SIRIUS 3SE5 position switch
### Technical data

**SIRIUS 3SE5 position switch**

- Position switch with tumbler to prevent protective doors opening at random or accidentally when there might still be a prevailing risk due to the operating status of the machine or system
- Plastic and metal enclosure
- Wide range of actuators
- Devices with ASIsafe electronics integrated in the enclosure
- Rated operational voltage 50/60 Hz 230 V AC/24 V DC
- Rated operational current up to 50/60 Hz 6 A AC/3 A DC

For further information, go to [www.siemens.de/sirius-erfassen](http://www.siemens.de/sirius-erfassen)
3SE5 SIRIUS position switch

Approvals

SIRIUS 3SE5 position switch

- Approval to IEC 60947-1 and IEC 60947-5-1
- Approval to CSA C22.2 No. 14
- UL 508, UL 50, and UL 746-C approval

See UL report (UL File No. E44653) for further information
SITOP power supply
SITOP power supply

Technical data

Primary switched-mode power supplies convert 1-, 2-, or 3-phase line voltages and direct voltages into stabilized 24 V voltages (SITOP smart).

Versions for other output voltages including 5, 12, and 48 V DC are available (SITOP compact, modular, etc.).

- High overload capability
- Rated output current from 2 to 40 A
- Rated output voltage 24 V DC (±3%)
- Rated input voltage up to 550 V AC

For further information, go to www.siemens.de/sirius-versorgen
SITOP power supply
Approvals

SITOP power supply

→ Approval to IEC 60950-1
→ Approval to CSA C22.2 No. 60950-1-3
→ Approval to UL 508
→ Certified in accordance with ATEX guidelines

See UL report (UL File No. E197259) for further information
7KM PAC measuring instrument
7KM PAC measuring instrument
7KM PAC measuring instrument

Technical data

7KM PAC measuring instrument

- 7KM PAC measuring instrument for measuring and displaying all relevant line system parameters in low-voltage power distribution
- Can be used to take measurements in 3- and 4-wire systems (TN, TT, IT)
- Can be used in 50/60 Hz systems with up to 690/400 V
- Integrated communications interfaces
  - Optional expansion module for additional interfaces
- Front mounting or standard rail mounting

For further information, go to www.siemens.de/lowvoltage
7KM PAC measuring instrument

Approvals

- Approval to IEC 61010-1
- Approval to CSA C22.2 No. 61010.1
- Approval to UL 61010-1
  - Enclosure Type 5 acc. to UL 50

See UL report (UL File No. E314880) for further information
EMERGENCY STOP PUSHBUTTON (3SB3 commanding and signaling device)
EMERGENCY STOP PUSHBUTTON (3SB3 commanding and signaling device)
EMERGENCY STOP PUSHBUTTON (3SB3 commanding and signaling device)

Technical data

| Modular design commanding and signaling device range for front panel mounting and rear conductor connection |
| Modern industrial design and quick mounting |
| Supplied in plastic or metal enclosure |
| Spring-loaded, solder pin, and screw terminal connections |

IEC ratings

| Rated operational current up to 10 A |
| Rated operational voltage up to 400 V AC/230 V DC |

UL/CSA ratings

| Rated operational current up to 10 A |
| Rated operational voltage up to 300 V AC |

For further information, go to www.siemens.de/sirius
EMERGENCY STOP PUSHBUTTON (3SB3 commanding and signaling device)

Approvals

- Approval to IEC 60947-5-1 and IEC 60947-5-5
- Approval to CSA C22.2 No. 14
- Approval to UL 508

See UL report (UL File No. E44653) for further information
Main and emergency off switch
Main and emergency off switch

8UC7 rotary operating mechanism with 3VL circuit breaker

8UC7 rotary operating mechanism with 3VL circuit breaker and 8UC94 00 interlocking module
Main switch (3VL circuit breaker)
8UC7 rotary operating mechanism

8UC7 rotary operating mechanism with 3VL circuit breaker

8UC7 rotary operating mechanism with 3VL circuit breaker and 8UC94 00 interlocking module
8UC7 rotary operating mechanism

Technical data

Approvals

Device selection

8UC7 rotary operating mechanism

EMERGENCY OFF version

STANDARD version
# 8UC7 rotary operating mechanism

## Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotary actuators</td>
<td>for operating switchgear with panel doors closed</td>
</tr>
<tr>
<td>Available in</td>
<td>STANDARD and EMERGENCY OFF versions</td>
</tr>
<tr>
<td>Can be connected to</td>
<td>circuit breakers and switch disconnectors with or without fuses</td>
</tr>
<tr>
<td>Rated operational current</td>
<td>up to 1,600 A</td>
</tr>
<tr>
<td>Available in various sizes</td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 65 when mounted</td>
</tr>
<tr>
<td>For compliance with UL</td>
<td>must always be used in conjunction with 8UC94 00 interlocking module</td>
</tr>
<tr>
<td>For compliance with UL</td>
<td>the rotary operating mechanism and the interlocking module remain on the circuit breaker even when the door is open</td>
</tr>
</tbody>
</table>

For further information, go to www.siemens.de/lowvoltage
# 8UC7 rotary operating mechanism

## Approvals

| Approval to IEC 60204-1, IEC 30439-1, and 60947-3 |
| Approval to CSA |
| Approval to UL |
| 8UC94 00 interlocking module must be used to meet the door interlocking requirement set out in UL 508A Art. 65-67!! |

[EMERGENCY OFF version](#)

[STANDARD version](#)
Lines/cables
Applications consulting from Siemens AG is a free-of-charge service for our customers. Information, recommendations or instructions (hereinafter referred to as "information") from Siemens AG are intended to assist the customer and represent descriptions of performance or performance features of the respective products. Customers are themselves responsible for proper operation of the products within the scope of the applicable regulations.

According to statutory regulations, Siemens AG is liable for the free-of-charge information only in the event of intent or gross negligence. Beyond this scope, liability on the part of Siemens AG is excluded. This shall not apply in cases where statutory liability is cogent, e.g. under the terms of product liability law.