Power electronics

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<td>Power solid-state relays - Overview</td>
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<td>Power solid-state relays</td>
<td>C.4</td>
</tr>
</tbody>
</table>
Power solid state relays

Switch high AC loads up to 75 A completely wear-free and noiseless

Due to their high shock and vibration resistance, the large switching current and the option of simple fusing, our power solid state relays outperform by far any electromagnetic relays, especially in the process industry.

The compact modules have low power drive requirements, fast response times and operate odourless. The optional 1PH-Control-Unit allows the current monitoring of up to five parallel connected loads.

Our new power solid state relays are ideally suited for a multitude of diverse tasks: switching pipe trace heating, phase controls for infrared heating, and permanent current monitoring.

High current load integral
The high current load integral $I^2t$ of 6,000 A²s allows affordable conductor protection using standard circuit breakers for variants with 35 A load current.
Simple current monitoring
The optional, plug-on monitoring module warns when current drops by 16% or more. Short-circuit, line-break and defective loads are detected.

High output current
Ideal for controlling pipe trace heating due to the high output current of 50 or 75 A. The compact design allows direct mounting at application site.
### Technical data

#### Control side
- Rated control voltage: 3.5...32 V DC
- Power rating: < 500 mW
- Cut-in / dropout voltage: 3 V / 2 V DC
- Input frequency: 10 Hz
- Status indicator: LED yellow
- Protective circuit: Suppressor diode

#### Load side
- Solid-state type: Triac (zero-cross switch)
-Rated switching voltage: 12...275 V AC
-Min. switching current: 17 A (AC 51) at 40 °C, 3.5 A (AC 53)
-Max. switching current: 25 A
-Voltage drop at max. load: ≤ 1.25 V
-Leakage current: ≤ 1 mA
-Short-circuit-proof / Protective circuit, load side: No / Varistor
-Switch-on delay / Switch-off delay: ≤ 10 ms / ≤ 10 ms
-Output voltage frequency range: 50...60 Hz
-Pulse load, max. current: 250 A (10 ms), non-recurrent
-AC 51, AC 53

#### General data
- Ambient temperature (operational): -55 °C...100 °C
- Storage temperature: -55 °C...125 °C
- Humidity: 40...85 % (inden) no condensation
- Approvals: CE, cURus, EAC
- Standards:
  - EN 60947-4-3, EN 60950, IEC 60335-1
  - 4 kV (1.2/50 µs)
  - ≥ 6.5 mm

#### Insulation coordinates
- Impulse withstand voltage:
  - Load current [A]: 340 A
- Clearance and creepage distances for control side - load side:
- Overvoltage category: III
- Pollution degree:

#### Dimensions
- Clamping range (rated / min. / max.) control side: 1.5 / 0.13 / 3.3 mm²
- Clamping range (rated / min. / max.) load side: 6 / 1.5 / 6 mm²

#### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSSR 24VDC/1PH AC 25A</td>
<td>1</td>
<td>1406200000</td>
</tr>
</tbody>
</table>

#### Accessories
- Accessories and dimensioned drawings refer to the Power Solid-state Relay Accessories page.
### Technical data

#### Control side
- Rated control voltage
- Power rating
- Cut-in / dropout voltage
- Input frequency
- Status indicator
- Protective circuit

#### Load side
- Solid-state type
- Rated switching voltage
- Continuous current
- Min. switching current
- Max. switching current
- Voltage drop at max. load
- Leakage current
- Short-circuit-proof / Protective circuit, load side
- Switch-on delay / Switch-off delay
- Output voltage frequency range
- Pulse load, max. current
- Load category
- Load limit integral (I²t) <10 ms

#### General data
- Ambient temperature (operational)
- Storage temperature
- Humidity
- Approvals
- Standards
- Insulation coordinates
- Impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Overvoltage category
- Pollution degree

### Dimensions
- Clamping range (rated / min. / max.) control side mm²
- Clamping range (rated / min. / max.) load side mm²

### Ordering data
- Screw connection

### Accessories
- Note

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**PSSR 230 V AC / 1 PH AC 25 A**

- **Rated switching voltage:** 120...275 V AC
- **Continuous current:** 17 A (AC51) at 40 °C, 3.5 A (AC53)
- **Min. switching current:** 5 mA
- **Max. switching current:** 25 A
- **Max. switching current:** 25 A
- **Voltage drop at max. load:** ≤ 1.25 V
- **Leakage current:** ≤ 1 mA
- **Switch-on delay:** ≤ 30 ms / ≤ 30 ms
- **Switch-off delay:** ≤ 30 ms / ≤ 30 ms
- **Output voltage frequency range:** 50...60 Hz
- **Load current (AC51, AC53):** 340 A
- **Overvoltage category:** III
- **Pollution degree:** 2
- **Dimensions:** 115.9 / 22.5 / 98
- **Note:**

**Accessories and dimensioned drawings:** refer to the Power Solid-state Relay Accessories page.
PSSR - 1-phase

- Single-phase load circuit: 24–510 V AC / 35 A
- Ready-to-use: snap on-connect-ready
- Zero-cross switch
- Noiseless, wear-free switching
- Attachable monitoring module
- High capacity for handling surge currents
  \[ I^2t = 6000 \text{ A}^2\text{s} \] (10 ms)
- Fusing with B circuit breaker possible

Technical data

Control side
- Rated control voltage
  - 3.5...32 V DC
- Power rating
  - ≤ 280 mW
- Cut-in / dropout voltage
  - 3 V / 2 V DC
- Input frequency
  - 10 Hz
- Status indicator
  - LED yellow
- Protective circuit
  - Suppressor diode
  - Thyristor (zero-cross switch)
- Load side
  - Solid-state type
  - 24...510 V AC
  - 23 A (AUS) at 40 °C, 12 A (AC 53)
  - 5 mA
  - 50 A
  - ≤ 1.35 V
  - ≤ 1 mA
  - No / Varistor
  - ≤ 10 ms / ≤ 10 ms
  - ≤ 1 mA
  - ≤ 1.35 V
  - ≤ 1 mA

General data

- Ambient temperature (operational)
  - -55 °C...100 °C
- Storage temperature
  - -55 °C...125 °C
- Humidity
  - 40...85 % (indoor) no condensation
- Approvals
  - CE; cURus; EAC
- Standards
  - EN 60947-4-3, EN 60950, IEC 60335-1
- Insulation coordinates
  - ≥ 6,5 mm
- Overvoltage category
  - III
- Pollution degree
- 2

Dimensions

- Clamping range (rated / min. / max.) control side: 1.5 / 0.13 / 3.3
- Clamping range (rated / min. / max.) load side: 6 / 1.5 / 6

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSSR 24VDC/1PH AC 35A</td>
<td>1</td>
<td>1468210000</td>
</tr>
</tbody>
</table>

Note

Accessories

Accessories and dimensioned drawings refer to the Power Solid-state Relay Accessories page.
**PSSR - 1-phase**

- Load circuit 1-phase 24…510 V AC, 22 A at 40°C ambient temperature
- Ready-to-use: snap-on-connect-ready
- Instantaneous-switching output
- Wear-free & silent switching
- Plug-in monitoring module

**Technical data**

<table>
<thead>
<tr>
<th>Control side</th>
<th>Load side</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated control voltage</strong></td>
<td><strong>Solid-state type</strong></td>
</tr>
<tr>
<td>3,5...32 V DC</td>
<td><strong>Rated switching voltage</strong></td>
</tr>
<tr>
<td>&lt; 500 mW</td>
<td>24…510 V AC - Pulsed switching (AC 51) at 40 °C, 7 A (AC 53)</td>
</tr>
<tr>
<td>&lt; 1 V DC</td>
<td>5 mA</td>
</tr>
<tr>
<td>10 Hz</td>
<td>50 A</td>
</tr>
<tr>
<td>LED yellow</td>
<td>≤1.25 V</td>
</tr>
<tr>
<td>Suppresser diode</td>
<td>≤ 1 mA</td>
</tr>
<tr>
<td>Thyristor (instantaneous-switching)</td>
<td>No / Varistor</td>
</tr>
<tr>
<td>24…510 V AC</td>
<td>≤0,1 ms / ≤ 10 ms</td>
</tr>
<tr>
<td>22 A (AGS) at 40 °C, 7 A (AC 53)</td>
<td>50…60 Hz</td>
</tr>
<tr>
<td>5 mA</td>
<td>530 A (10 ms), non-recurrent</td>
</tr>
<tr>
<td>≤ 1.25 V</td>
<td>AC 51, AC 53</td>
</tr>
<tr>
<td>≤ 0.5 V</td>
<td>1400 kV</td>
</tr>
<tr>
<td>≤ 0.5 V</td>
<td>-55 °C...100 °C</td>
</tr>
<tr>
<td>≤ 0.5 V</td>
<td>-55 °C...125 °C</td>
</tr>
<tr>
<td>≤ 0.5 V</td>
<td>48...85 % (indoor) no condensation</td>
</tr>
<tr>
<td>≤ 0.5 V</td>
<td>4 kV (1.2/50 µs)</td>
</tr>
<tr>
<td>≤ 0.5 V</td>
<td>≥ 6.5 mm</td>
</tr>
<tr>
<td>≤ 0.5 V</td>
<td><strong>Insulation coordinates</strong></td>
</tr>
<tr>
<td>4 kV (1.2/50 µs)</td>
<td><strong>Overvoltage category</strong></td>
</tr>
<tr>
<td>4 kV (1.2/50 µs)</td>
<td><strong>Pollution degree</strong></td>
</tr>
<tr>
<td>2</td>
<td>III</td>
</tr>
</tbody>
</table>

**General data**

- Ambient temperature (operational)
- Storage temperature
- Humidity
- Approvals
- Standards

**Insulation coordinates**

- Impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Overvoltage category
- Pollution degree

**Dimensions**

- Clamping range (rated / min. / max.) control side mm²
- Clamping range (rated / min. / max.) load side mm²

**Note**

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSSR 24VDC/1PH AC 22A I</td>
<td>1</td>
<td>2531050000</td>
</tr>
</tbody>
</table>

**Accessories**

- Screw connecion

**Note**

Accessories and dimensioned drawings refer to the Power Solid-state Relay Accessories page.
### PSSR control unit

- Monitoring of up to 5 consumers connected in parallel
- Can be attached to the single-phase PSSRs
- Error message feedback output
- Undercurrent switching threshold: 0.84 \( I_{\text{teach}} \)
- Teach button on the module and external teach input

### Technical data

#### Control side
- Rated control voltage
- Rated control current
- Cut-in / dropout voltage
- Rated control voltage (external teach input)
- Nominal control current (external teach input)

#### Supply
- Supply voltage
- Current consumption

#### Feedback output
- Solid-state type
- Nominal switching voltage
- Continuous current
- Undercurrent switching threshold
- Current measurement range AC, min.
- Current measurement range AC, max.
- Switch-on delay
- Switch-off delay

#### Control output to the PSSR
- Nominal switching voltage
- Solid-state type
- Switch-on delay
- Switch-off delay

#### General data
- Ambient temperature (operational)
- Storage temperature
- Current sensor hole diameter
- Approvals
- Standards
- Insulation coordinates
- Impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Overvoltage category
- Pollution degree
- Dimensions
  - Clamping range (nominal / min. / max.) mm²
  - Depth x width x height mm

### Ordering data

<table>
<thead>
<tr>
<th>Screw connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type Qty. Order No.</td>
</tr>
<tr>
<td>PSSR 1PH CONTROL UNIT 1 1406230000</td>
</tr>
</tbody>
</table>

### Accessories

Accessories and dimensional drawings refer to the Power Solid-state Relay Accessories page.
PSSR - 1-phase

- Single-phase load circuit: 24–600 V AC / 50 A
- Compact design
- Zero-cross switch
- Noiseless, wear-free switching

Technical data

<table>
<thead>
<tr>
<th>Control side</th>
<th>Load side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated control voltage</td>
<td>Solid-state type</td>
</tr>
<tr>
<td>Power rating</td>
<td>Rated switching voltage</td>
</tr>
<tr>
<td>Cut-in / dropout voltage</td>
<td>Continuous current</td>
</tr>
<tr>
<td>Input frequency</td>
<td>Min. switching current</td>
</tr>
<tr>
<td>Status indicator</td>
<td>Max. switching current</td>
</tr>
<tr>
<td>Protective circuit</td>
<td>Voltage drop at max. load</td>
</tr>
<tr>
<td>Leakage current</td>
<td>Short-circuit-proof / Protective circuit, load side</td>
</tr>
<tr>
<td>Switch-on delay / Switch-off delay</td>
<td>Switch-on delay / Switch-off delay</td>
</tr>
<tr>
<td>Output voltage frequency range</td>
<td>Pulse load, max. current</td>
</tr>
<tr>
<td>Status indicator</td>
<td>Load category</td>
</tr>
<tr>
<td>Protective circuit</td>
<td>Load limit integral (I²t) &lt;10 ms</td>
</tr>
</tbody>
</table>

General data

- Ambient temperature (operational): -55 °C...100 °C
- Storage temperature: -55 °C...125 °C
- Humidity: 40...85 % (indoor) no condensation
- Approvals: CE, cURus, EAC
- Standards: EN 60947-4-3, EN 60950, IEC 60335-1

Insulation coordinates

- Impulse withstand voltage: 4 kV (1.2/50 µs)
- Clearance and creepage distances for control side - load side: ≥ 8 mm
- Pollution degree: III

Dimensions

- Clamping range (rated / min. / max.) control side: 1.5 / 0.75 / 2.5
- Clamping range (rated / min. / max.) load side: 10 / 1.5 / 10

Note

- Screw connection

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSSR 24VDC/1PH AC50A HP</td>
<td>2</td>
<td>1406240000</td>
</tr>
</tbody>
</table>

Accessories

- Accessories and dimensioned drawings: refer to the Power Solid-state Relay Accessories page.
### Technical data

#### Control side
- Rated control voltage
- Power rating
- Cut-in / dropout voltage
- Input frequency
- Status indicator
- Protective circuit

#### Load side
- Solid-state type
- Rated switching voltage
- Continuous current
- Min. switching current
- Max. switching current
- Voltage drop at max. load
- Leakage current
- Short-circuit-proof / Protective circuit, load side
- Switch-on delay / Switch-off delay
- Output voltage frequency range
- Pulse load, max. current
- Load category
- Load limit integral (I²t) < 10 ms

#### General data
- Ambient temperature (operational)
- Storage temperature
- Humidity
- Approvals
- Standards

#### Insulation coordinates
- Impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Overvoltage category
- Pollution degree

### Dimensions
- Clamping range (rated / min. / max.) control side mm²
- Clamping range (rated / min. / max.) load side mm²
- Note

### Ordering data
- Screw connection
- Type
- Qty.
- Order No.

### Accessories
- Note
- Accessory and dimensioned drawings: refer to the Power Solid-state Relay Accessories page.
Power loss and selection of heat sink

Order No. 1406240000

Order No. 1406250000
Power solid-state relays

PSSR - 3-phase
- Three-phase load circuit 24...520 V AC / 20 A at 55°C
- Ready-to-use: snap on - connect - ready
- Zero-cross switch
- Wear-free and noiseless switching

PSSR 24 V DC / 3 PH AC 20 A

Technical data

Control side
- Rated control voltage
- Power rating
- Cut-in / dropout voltage
- Input frequency
- Status indicator
- Protective circuit

Load side
- Solid-state type
- Rated switching voltage
- Continuous current
- Min. switching current
- Max. switching current
- Voltage drop at max. load
- Leakage current
- Short-circuit-proof / Protective circuit
- Switch-on delay / Switch-off delay
- Output voltage frequency range
- Pulse load, max. current / Cartridge fuse
- Load category
- Load limit integral (I²t)<10 ms

General data
- Ambient temperature (operational)
- Storage temperature
- Humidity
- Approvals
- Standards
- Insulation coordination
- Rated voltage
- Impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Overvoltage category
- Pollution degree

Dimensions
- Clamping range (rated / min. / max.) control side mm²
- Clamping range (rated / min. / max.) load side mm²

Note

Ordering data

Screw connection

Note

Accessories

Note

Accessories and dimensioned drawings: refer to the Power Solid-state Relay Accessories page.
PSSR - 3-phase

- Three-phase load circuit 24...520 V AC / 20 A at 55°C
- Ready-to-use: snap on - connect - ready
- Zero-cross switch
- Wear-free and noiseless switching

Technical data

Control side
- Rated control voltage
- Power rating
- Cut-in / dropout voltage
- Input frequency
- Status indicator
- Protective circuit

Load side
- Solid-state type
- Rated switching voltage
- Continuous current
- Min. switching current
- Max. switching current
- Voltage drop at max. load
- Leakage current
- Short-circuit-proof / Protective circuit
- Switch-on delay / Switch-off delay
- Output voltage frequency range
- Pulse load, max. current / Cartridge fuse
- Load category
- Load limit integral (I²t) <10 ms

General data
- Ambient temperature (operational)
- Storage temperature
- Humidity
- Approvals
- Standards
- Insulation coordination
- Rated voltage
- Impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Overvoltage category
- Pollution degree

Dimensions
- Clamping range (rated / min. / max.) control side mm²
- Clamping range (rated / min. / max.) load side mm²

Note

Ordering data

- Screw connection

Note

Accessories

Note

Type | Qty. | Order No.
---|---|---
PSSR 230VAC/3PH AC 20A | 1 | 8952140000

Accessories and dimensioned drawings refer to the Power Solid-state Relay Accessories page.
Uninsulated screwdriver

Weidmüller SoftFinish screwdriver for general uses. Blade made from fully hardened, high-alloy chromium-vanadium-molybdenum steel, matt chrome finish.

<table>
<thead>
<tr>
<th>Type</th>
<th>Size / AF</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS</td>
<td>0.6x3.5x100</td>
<td>0.6</td>
<td>3.5</td>
<td>100</td>
<td>9008330000</td>
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<td>SDK PZ</td>
<td></td>
<td>2</td>
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<td>9008540000</td>
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