Solid State Relays

**Tempco’s Solid State Relays** are a highly reliable alternative to mechanical or mercury contactors in high amperage or harsh environments. They offer years of trouble-free service and millions of cycles with no moving parts to wear out.

- **1-phase normally open models – current ratings from 10 Amp through 75 Amp**
- **Zero-cross outputs for general applications**
- **UL/cUL Recognized, CE Compliant**
- **Back-to-back SCR output stage**
- **AC or DC control inputs**
- **240 or 480 Volt Outputs**

- Select a **DC control** input relay to work with a temperature control having an **SSR drive output**.
- Choose an **AC control** input relay to work with a temperature control having a **mechanical relay output**.

### Standard Stock Single-Phase Relays

<table>
<thead>
<tr>
<th>Nominal Output Voltage</th>
<th>Control Input</th>
<th>Load Current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DC</td>
<td>AC</td>
</tr>
<tr>
<td>Part Number</td>
<td>RLS02110</td>
<td>RLS02115</td>
</tr>
<tr>
<td></td>
<td>RLS02125</td>
<td>RLS02125</td>
</tr>
<tr>
<td></td>
<td>RLS02145</td>
<td>RLS02245</td>
</tr>
<tr>
<td></td>
<td>RLS02175</td>
<td>RLS02275</td>
</tr>
<tr>
<td>Min. Control Input Current (mA)</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Max. Line Voltage (VAC, rms)</td>
<td>280</td>
<td>280</td>
</tr>
<tr>
<td>Min. Line Voltage (VAC, rms)</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Max. Off-State Voltage (Vpeak)</td>
<td>±600</td>
<td>±600</td>
</tr>
<tr>
<td>Max. Off-State Leakage (mA rms)</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>On-State Voltage Drop (Vpeak)</td>
<td>1.35</td>
<td></td>
</tr>
<tr>
<td>Static (Off-State) Aw/M (V/μS)</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Operating Temp. Range (°C)</td>
<td>-20 to +80</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. DC control input = 3-32 VDC
2. AC control input = 90-280 VAC
3. Adequate heat sinking, including consideration of air temperature and flow, is essential to the proper operation of a solid state relay.

**De-Rating Curves for Single Phase Solid State Relays**

Solid state relay de-rating curves are used to determine the actual current the relay is capable of carrying vs. the ambient temperature in the enclosure. It also indicates the heat sink required to dissipate the heat the relay produces at the ambient temperature. Failure to dissipate the internally generated heat will result in solid state relay failure.

**WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.
Three-Phase Solid State Relays (SSRs)

Tempco’s Three-phase Solid State Relays are a highly reliable alternative to mechanical or mercury contactors in high amperage or harsh environments. They offer years of trouble-free service and millions of cycles with no moving parts to wear out.

✴ 3-phase normally open models—current ratings
25 Amp and 50 Amp
✴ Zero-cross outputs for general applications
✴ UL recognized, CSA certified and CE compliant
✴ Back-to-back SCR output stages
✴ AC or DC control inputs
✴ Single output type for 48 through 530 VAC

➤ Select a DC control input relay to work with a temperature control having an SSR drive output.
➤ Choose an AC control input relay to work with a temperature control having a mechanical relay output.

Standard Stock Heat Sinks for Solid State Relays

Part Number: RLS90017  
Size: 1.77"W × 3.19"L × 3.15"H  
Rating: 2.0°C/W  
Pre-drilled for 1-phase SSR (8-32)  
DIN rail or panel mount

Part Number: RLS90018  
Size: 1.77"W × 3.19"L × 3.74"H  
Rating: 1.5°C/W  
Pre-drilled for 1-phase SSR (8-32)  
DIN rail or panel mount

Part Number: RLS90019  
Size: 4.75"W × 5.50"L × 2.63"H  
Rating: 0.7°C/W  
Pre-drilled for one or two 1-phase SSR (8-32)  
Panel mount 4.50" × 4.42" centers

Part Number: RLS90020  
Size: 3.00"W × 5.20"L × 2.37"H  
Rating: 1.0°C/W  
Pre-drilled for one 3-phase SSR (8-32)  
DIN rail mount

Note: Adequate heat sinking, including consideration of air temperature and flow, is essential to the proper operation of a solid state relay.

CONTINUED

13-89
Solid state relay de-rating curves are used to determine the actual current the relay is capable of carrying vs. the ambient temperature in the enclosure. It also indicates the heat sink required to dissipate the heat the relay produces at the ambient temperature. Failure to dissipate the internally generated heat will result in solid state relay failure.

**De-Rating Curves for 3-Phase Solid State Relays**

Solid state relay de-rating curves are used to determine the actual current the relay is capable of carrying vs. the ambient temperature in the enclosure. It also indicates the heat sink required to dissipate the heat the relay produces at the ambient temperature. Failure to dissipate the internally generated heat will result in solid state relay failure.

The **Power Pack** combines in one easy-to-use compact package the traditional hockey puck style solid state relay and required heat sink. This combination eliminates having to mount the SSR to a separate heat sink. It also incorporates the finger-safe cover into the housing’s design. Each Power Pack takes up much less room than the standard SSR and heat sink combination.

### Design Features

- **Self-Contained Solid State Relay and Heat Sink**
- **Standard 35mm DIN Rail or Panel Mount**
- **1-phase Units with Zero-Cross Firing Output**
- **3-Phase Units Control All 3 Phases**
- **Current Ratings from 12 through 45 Amp**
- **3 Compact Sizes: 22.5mm, 45.0mm, and 90.0mm**
- **Triac or Back-to-Back SCR Outputs**
- **UL, cUL Recognized**

### Standard Stock DIN Rail Relays

<table>
<thead>
<tr>
<th>Size</th>
<th>Output Current</th>
<th>Output Voltage</th>
<th>Control Input</th>
<th>Output Type</th>
<th>Max. Turn On Time</th>
<th>Max. Turn Off Time</th>
<th>Min. On State Cur.</th>
<th>Peak On Vol. drop</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One-Phase Models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.5 mm</td>
<td>10A</td>
<td>24-280 VAC</td>
<td>4-32 VDC, 180-280 VAC</td>
<td>B/B SCR</td>
<td>20 mS</td>
<td>20 mS</td>
<td>19 mA</td>
<td>1.5 Vpk</td>
<td>RLS80001</td>
</tr>
<tr>
<td></td>
<td>20A</td>
<td>48-600 VAC</td>
<td>4-32 VDC, 180-280 VAC</td>
<td>B/B SCR</td>
<td>20 mS</td>
<td>20 mS</td>
<td>19 mA</td>
<td>1.5 Vpk</td>
<td>RLS80003</td>
</tr>
<tr>
<td></td>
<td>30A</td>
<td>48-600 VAC</td>
<td>4-32 VDC, 180-280 VAC</td>
<td>B/B SCR</td>
<td>20 mS</td>
<td>20 mS</td>
<td>19 mA</td>
<td>1.5 Vpk</td>
<td>RLS80005</td>
</tr>
<tr>
<td></td>
<td>45A</td>
<td>48-660 VAC</td>
<td>4-32 VDC, 180-280 VAC</td>
<td>B/B SCR</td>
<td>20 mS</td>
<td>20 mS</td>
<td>19 mA</td>
<td>1.5 Vpk</td>
<td>RLS80007</td>
</tr>
<tr>
<td><strong>Three-Phase Models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.0 mm</td>
<td>25A</td>
<td>48-660 VAC</td>
<td>4-32 VDC, 180-280 VAC</td>
<td>B/B SCR</td>
<td>20 mS</td>
<td>20 mS</td>
<td>19 mA</td>
<td>1.5 Vpk</td>
<td>RLS80201</td>
</tr>
</tbody>
</table>

**Available from Stock**

View Product Inventory @ www.tempco.com
Ordering Information

Choose the Part Number of the relay from the table above that matches the needs for your application. Tempco also offers a complete line of SCR Power Controls, Mechanical Relays, and Mercury Relays for your power handling needs. Standard lead time is stock to 3 weeks.

⚠️ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

(800) 323-6859 • Email: sales@tempco.com
Mercury Displacement Relays — 35 & 60 Amp Resistive Loads

Tempco’s Mercury Displacement Relays are specifically designed for resistive loads typical of heating and process equipment. These mercury relays are available in 35 and 60 amp models with single, double and triple pole configurations. Coil voltages range from 24 to 480 Volts AC at 50/60 Hz and 24 Volts DC.

Features

Mercury contact action relays are superior to open contact electro-mechanical relays. Mercury relays do not contain springs or button contacts, which tend to wear, weld and burn out. Mercury contacts are capable of rapid on-off cycling in excess of 6 times per minute under resistive loads. This provides more precise process temperature control, and eliminates the noise from the on-off operating cycles of electro-mechanical relays and contactors.

Typical Applications

- Industrial Process Equipment Utilizing Resistive Loads
- Plastic Injection and Extrusion Machinery
- Industrial Ovens
- Food Processing Equipment
- Duct Heaters

Mercury Displacement Relays — 35 & 60 Amp Resistive Loads

Typical Applications

- Industrial Process Equipment Utilizing Resistive Loads
- Plastic Injection and Extrusion Machinery
- Industrial Ovens
- Food Processing Equipment
- Duct Heaters

Standard (Non-Stock) and Stock Mercury Relay Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>35 AMP RELAYS</th>
<th>60 AMP RELAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coil Volts</td>
<td>Current</td>
</tr>
<tr>
<td>1 Pole Normally Open</td>
<td>24 VDC</td>
<td>136 mA</td>
</tr>
<tr>
<td></td>
<td>24 VAC</td>
<td>242 mA</td>
</tr>
<tr>
<td></td>
<td>120 VAC</td>
<td>53 mA</td>
</tr>
<tr>
<td></td>
<td>220 VAC</td>
<td>28 mA</td>
</tr>
<tr>
<td></td>
<td>277 VAC</td>
<td>20 mA</td>
</tr>
<tr>
<td></td>
<td>480 VAC</td>
<td>12 mA</td>
</tr>
<tr>
<td>2 Poles Normally Open</td>
<td>24 VDC</td>
<td>272 mA</td>
</tr>
<tr>
<td></td>
<td>24 VAC</td>
<td>484 mA</td>
</tr>
<tr>
<td></td>
<td>120 VAC</td>
<td>106 mA</td>
</tr>
<tr>
<td></td>
<td>220 VAC</td>
<td>56 mA</td>
</tr>
<tr>
<td></td>
<td>277 VAC</td>
<td>40 mA</td>
</tr>
<tr>
<td></td>
<td>480 VAC</td>
<td>24 mA</td>
</tr>
<tr>
<td>3 Poles Normally Open</td>
<td>24 VDC</td>
<td>408 mA</td>
</tr>
<tr>
<td></td>
<td>24 VAC</td>
<td>726 mA</td>
</tr>
<tr>
<td></td>
<td>120 VAC</td>
<td>159 mA</td>
</tr>
<tr>
<td></td>
<td>220 VAC</td>
<td>84 mA</td>
</tr>
<tr>
<td></td>
<td>277 VAC</td>
<td>60 mA</td>
</tr>
<tr>
<td></td>
<td>480 VAC</td>
<td>36 mA</td>
</tr>
</tbody>
</table>

NOTE: The 220 VAC coil is used from 208 to 240 VAC.

Specifications

- Operate Time: 50 mSec
- Release Time: 80 mSec
- Contact Rating: 35 Amp – 600 VAC, 60 Amp – 480 VAC
- Contact Resistance: 35 Amp – .003Ω, 60 Amp – .002Ω
- Temperature Range: -31 to 185°F (-35 to 85°C)
- Dielectric Strength: 2500 VAC RMS
- Agency Approvals: UL, CSA

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

Ordering Information

Choose the Part Number of the relay from the table above that matches the needs for your application. We also offer other styles of Mercury Relays — consult Tempco with your requirements.

Standard lead time is stock to 5 days.
Mercury Displacement Relays — 100 Amp Resistive Loads

**Specifications**

- **Operate Time:** 50 mSec
- **Release Time:** 80 mSec
- **Contact Rating:**
  - 240 VAC – 100 Amp
  - 480 VAC – 80 Amp
- **Contact Resistance:** .001Ω
- **Temperature Range:** -31 to 185°F (-35 to 85°C)
- **Dielectric Strength:** 2500 VAC RMS
- **Agency Approvals:** UL, CSA

**Ordering Information**

Choose the **Part Number** of the relay from the table above that matches the needs for your application. We also offer other styles of Mercury Relays—consult Tempco with your requirements.

**Standard lead time is stock to 5 days.**

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**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)
The 30 Amp model is designed to save space and simplify mounting methods. It is also extremely economical due to the use of a single coil for 1-, 2- or 3-pole relays. The universal mounting bracket used on the 2- and 3-pole relays has various mounting holes and keyhole slots to meet a variety of mounting centers.

The 30 Amp Series is a more compact line with a well-proven switch, which is the heart of mercury relays. It is the same switch design that drives our 35 and 60 Amp encapsulated Mercury Displacement Relays, which have withstood the test of time and millions of cycles in many different applications.

### Specifications

- **Pull In Voltage:** 90% of nominal (Min. AC)
- **Operate (pull in) Time:** 50 mSec
- **Release Time:** 80 mSec
- **Operating Ambient Temperature Range:** -35 to 85°C (-31 to 185°F)
- **Typical Contact Resistance:** 3 mΩ
- **Contact Rating:** 30 Amps
- **Dielectric Breakdown:** 2500 V AC RMS
- **Mount:** Vertical ±10°
- **Coil terminals:** #6 binding head screws
- **Load terminals:** #8 binding head screws
- **Agency Approvals:** UL, CSA

### Ordering Information

Choose the Part Number of the relay from the table above that matches the needs for your application. **Standard lead time is stock to 5 days.**

Note: The 220 VAC coil is used from 208 to 240 VAC.
DIN Rail Mounted Mechanical Relays

Design Features
- 10 and 15 Amp Models with 24 VDC, 120 and 240 VAC Coils
- Sockets Mount on Standard 35 mm DIN Track
- Silver-Cadmium Oxide Contacts
- Socket and Relay Separation Fast and Easy
- UL and CSA Component Recognition
- Compact for Easy DIN Rail Installation
- Contact Arrangement Up to 3PDT
- Enclosed to Prevent Contamination

Standard DIN Rail Mount Relay Specifications

<table>
<thead>
<tr>
<th>Common Usage @ 240VAC</th>
<th>Coil Voltage</th>
<th>Poles</th>
<th>Potter &amp; Brumfield Cross Reference Number</th>
<th>TEMPCO Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>10A</td>
<td>24 VDC</td>
<td>1</td>
<td>KUP-5D15-24</td>
<td>RLM01103</td>
</tr>
<tr>
<td>10A</td>
<td>120 VAC</td>
<td>1</td>
<td>KUP-5A15-120</td>
<td>RLM10101</td>
</tr>
<tr>
<td>10A</td>
<td>240 VAC</td>
<td>1</td>
<td>KUP-5A15-240</td>
<td>RLM10102</td>
</tr>
<tr>
<td>10A</td>
<td>24 VDC</td>
<td>2</td>
<td>KUP-11D15-24</td>
<td>RLM02103</td>
</tr>
<tr>
<td>10A</td>
<td>120 VAC</td>
<td>2</td>
<td>KUP-11A15-120</td>
<td>RLM02101</td>
</tr>
<tr>
<td>10A</td>
<td>24 VDC</td>
<td>3</td>
<td>KUP-14D15-24</td>
<td>RLM03103</td>
</tr>
<tr>
<td>10A</td>
<td>120 VAC</td>
<td>3</td>
<td>KUP-14A15-120</td>
<td>RLM03101</td>
</tr>
<tr>
<td>15A</td>
<td>24 VDC</td>
<td>2</td>
<td>KUMP-11D18-24</td>
<td>RLM02153</td>
</tr>
<tr>
<td>15A</td>
<td>120 VAC</td>
<td>2</td>
<td>KUMP-11A18-120</td>
<td>RLM02151</td>
</tr>
<tr>
<td>15A</td>
<td>240 VAC</td>
<td>2</td>
<td>KUMP-11A18-240</td>
<td>RLM02152</td>
</tr>
<tr>
<td>15A</td>
<td>24 VDC</td>
<td>3</td>
<td>KUMP-14D18-24</td>
<td>RLM03153</td>
</tr>
<tr>
<td>15A</td>
<td>120 VAC</td>
<td>3</td>
<td>KUMP-14A18-120</td>
<td>RLM03151</td>
</tr>
</tbody>
</table>

Electrical Contact Ratings

<table>
<thead>
<tr>
<th>Type</th>
<th>UL/CSA Ratings</th>
<th>Exp. Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 Pole</td>
<td>10 Amps @ 28 VDC or 240 VAC, 80% PF</td>
<td>100,000 cycles</td>
</tr>
<tr>
<td>KUP</td>
<td>PF 5 Amp tungsten @ 120 VAC, 3A</td>
<td></td>
</tr>
<tr>
<td>KUMP</td>
<td>1/3 HP @ 120 VAC, 1/2 HP @ 240, 480, and 600 VAC, 10 FLA 30LRA @ 120 VAC, 5 FLA, 15 LRA @ 250 VAC (FLA ratings covered by 30,000 operations)</td>
<td>100,000 cycles</td>
</tr>
<tr>
<td>3-Pole</td>
<td>15 Amp @ 277 VAC, 80% PF KUM</td>
<td>100,000 cycles</td>
</tr>
<tr>
<td>KUMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KUP</td>
<td>10 Amp @ 28 VDC or 120 VAC, 80% PF, 6-2/3 Amp @ 240 VAC, 80% PF</td>
<td>100,000 cycles</td>
</tr>
</tbody>
</table>

DIN Rail Mounted Mechanical Relay Accessories

Universal Rail Mounted Socket

Universal socket for mounting 1- to 3-pole relays to a 35mm DIN rail track or surface mounted directly to a panel. A spring-loaded latch allows for easy installation or removal from a DIN mounting track. High strength, durable plastic body with 3/16" quick connect/solder; silver-cadmium oxide terminals for relay mounting.

Dimensions with Relay (approximate): 3" x 1-1/2" x 3"

Part Number: RLM90001
Part Number: RLM90004 — Relay Hold Down Spring

Universal 35 mm DIN Rail Track

Made out of extruded aluminum with holes on 6" centers. Holes accept #8 screws and the rail accepts the offered socket as a simple clip-on mount.

Dimensions: 36" (914mm) long
Part Number: EHD-134-102

Ordering Information

Choose the Part Number of the Relays and accessories that best fit the needs of your application. Standard lead time is stock to 5 days.

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

(800) 323-6859 • Email: sales@tempco.com
Contactors

IEC Style Enclosed Contactors - 3 pole, 25A to 100A

Design Features

- Regular and alternate coil termination locations
- Contactors supplied with auxiliary contacts as standard
- Mounting - DIN rail or back panel
- Coil Voltage Limits: Pick up - 85% to 110%
  Drop-out - 30% to 60%
- Operating Time: Closing - 12 to 22 mSec
  Opening - 4 to 19 mSec
- Contactors listed have screw clamp wiring terminals
- Approvals: UL, cUL, CE
- Auxiliary Switch Rating: 120VAC/6A, 240VAC/3A

Resistive Amperage | Coil Voltage | Auxiliary Contacts | Carlo Gavassi Part Number | TEMPCO Part Number
---|---|---|---|---
25 | 24 VAC | 1-NO, 1-NC | CC12SA24 | RLM30001
25 | 120 VAC | 1-NO, 1-NC | CC12SA120 | RLM30002
25 | 220 VAC | 1-NO, 1-NC | CC12SA220 | RLM30003
40 | 24 VAC | 1-NO, 1-NC | CC22SA24 | RLM30004
40 | 120 VAC | 1-NO, 1-NC | CC22SA120 | RLM30005
40 | 220 VAC | 1-NO, 1-NC | CC22SA220 | RLM30006
70 | 24 VAC | 2-NO, 2-NC | CC50SA24 | RLM30007
70 | 120 VAC | 2-NO, 2-NC | CC50SA120 | RLM30008
70 | 220 VAC | 2-NO, 2-NC | CC50SA220 | RLM30009
100 | 24 VAC | 2-NO, 2-NC | CC65SA24 | RLM30010
100 | 120 VAC | 2-NO, 2-NC | CC65SA120 | RLM30011
100 | 220 VAC | 2-NO, 2-NC | CC65SA220 | RLM30012

Ordering Information

Order by Part Number. 
Standard lead time is stock to 2 weeks.

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.