The MICROOPTO line of solid-state relays provides several options for switching and protecting signals. The line features pluggable cross connections and industrial standard marking options, all in a standard terminal block footprint of 6.1mm.

By using opto-coupler technology, this line of devices will have a very long service life without failure or issues such as switching noise and contact bounce. These units are resistant to shock and vibration and, during operation, do not emit electromagnetic noise or switching related sparks.

The MICROOPTO solid-state relays are CE and cULus approved.
For high switching frequency up to 100kHz

- Proper load signal up to 100kHz
- Switching delay time < 3µs
- Extensive protection circuitry

**Technical data**

**Control side**
- Rated voltage
- Power rating
- Making voltage
- Dropout voltage
- Max. input frequency
- Status indicator
- Protective circuit

**Load side**
- Solid-state type
- Nominal switching voltage
- Nominal switching current
- Voltage drop at max. load
- Leakage current
- Short-circuit proof/Protective circuit
- Switch-on delay/Switch-off delay
- Continuous current
- Pulse loading, max. current
- Load category

**General data**
- Ambient temperature (operational)
- Storage temperature
- UL 94 flammability class
- Humidity

**Approvals**
- Standards
- Insulation coordination (EN 50 178)
- Rated voltage
- Rated impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Surge category
- Pollution severity

**Dimensions**
- Clamping range (rating - / min. / max.) mm²
- Length x width x height mm

**Ordering data**

**Connection system**
- Screw connection

**Note**

**Accessories**
- Note

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**MOS 12...28VDC 100 kHz**

A special integrated circuit in the opto module MICROOPTO 100 kHz ensures that rapidly transmitted signals are isolated from one another and that they can be transferred practically without delay. This allows switching frequencies up to 100 kHz to be achieved. Comprehensive suppressor circuits safeguard the module against line-borne transients and voltage spikes.

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**For example rotational speed measurement**

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**Type**
- MOS 12-28VDC 100kHz

**Qty.**
- 1

**Part No.**
- 8937990000
The solid-state relay **MICROOPTO 300VDC** has been developed as a switching amplifier for high inductive loads up to 300VDC and 1A in motor brakes and contactors.

A power boost in the load circuit compensates transient overloads (20A for 20 ms / 5A for 1 s) such as making or breaking spikes. Additional protective circuits protect from higher overloads.

### Technical data

**Control side**
- Rated voltage: 24VDC ±20%
- Power rating: 0.36 W
- Making voltage: >18.8V
- Dropout voltage: < 14.7V
- Max. input frequency: 50 Hz
- Status indicator: LED green
- Protective circuit: Varistor, reverse polarity protection

**Load side**
- Solid-state type: MOS-FET
- Nominal switching voltage: 12…300VDC
- Nominal switching current: 1A @ 55°C
- Voltage drop at max. load: ≤ 0.5V
- Leakage current: < 1µA
- Short-circuit-proof/Protective circuit: Powerboost, 10A / 20 ms, 5A / 1 sec, varistor
- Switch-on delay/Switch-off delay: < 0.1 ms / < 0.1 ms
- Continuous current: 1A
- Pulse loading, max. current: 27A (10 ms)
- Load category: LC A

### General data
- Ambient temperature (operational): -20 °C…See Derating Curve
- Storage temperature: -40 °C…+80 °C
- UL 94 flammability class: V-0
- Humidity: 5…95 % RH
- Approvals: CE; cULus
- Standards: EN 50178, IEC 62314, UL508
- Insulation coordination (EN 50 178)
- Rated voltage: 300V
- Rated impulse withstand voltage: 4 kV (1.2 / 50 µs)
- Clearance and creepage distances for control side - load side: > 3mm
- Surge category: III
- Pollution severity: 2

### Dimensions
- Clamping range (rating- / min. / max.): mm²
- Length x width x height: mm

### Ordering data

**Connection system**
- Screw connection

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOS 24VDC/12-300VDC 1A</td>
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### Note

**Accessories**

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
</table>

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MOS 12…300VDC 1A

**For DC loads up to 300VDC and 1A**

- Load circuit: 12-300VDC 1A
- Power Boost: 20A / 20 ms, 5A / 1 sec
- Extensive protection circuitry

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**Example: motor brake**
The solid-state relay MICROOPTO ACTOR has been especially designed as a switching amplifier for actuators up to 24VDC and 2A with inductive loads such as solenoid valves and contactors. 3-wire actuators can be connected directly to the module. This is short-circuit proof and protected against application-related transients and spikes by extensive protective circuitry.

### Technical data

**Control side**
- Rated voltage
- Power rating
- Making voltage
- Dropout voltage
- Max. input frequency
- Status indicator
- Protective circuit

**Load side**
- Solid-state type
- Nominal switching voltage
- Nominal switching current
- Voltage drop at max. load
- Leakage current
- Protective circuit
- Switch-on delay/Switch-off delay
- Continuous current
- Load category

**General data**
- Ambient temperature (operational)
- Storage temperature
- UL 94 flammability class
- Humidity
- Approvals
- Standards
- Insulation coordination (EN 50 178)
- Rated voltage
- Rated impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Surge category
- Pollution severity

**Dimensions**
- Clamping range (rating- / min. / max.) mm²
- Length x width x height mm

**Screw connection**
- 2.5 / 0.5 / 4
- 90 x 6.1 x 98

**Ordering data**
- Connection system
- Screw connection

**Accessories**
- Note

### Ordering example

#### Type
- MOS 24VDC/8-30VDC 2A

#### Qty.
- 1

#### Part No.
- 8937970000
**OPTO Modules**

For switching valves up to 24VDC, 10A

- Load circuit 24VDC/10A, short circuit protected
- Status indicator and error message contact in case of failures on the output

**MOS 24VDC / 5-33 VDC 10A**

- **Technical data**
  - **Control side**
    - Rated voltage
    - Power rating
    - Making voltage
    - Dropout voltage
    - Max. input frequency
    - Status indicator
    - Protective circuit
  - **Load side**
    - Solid-state type
    - Nominal switching voltage
    - Nominal switching current
    - Voltage drop at max. load
    - Leakage current
    - Short-circuit-proof/Protective circuit
  - **Switch-on delay/Switch-off delay**
  - Continuous current
  - Load category
  - **General data**
    - Alarm contact
    - Ambient temperature (operational)
    - Storage temperature
    - UL 94 flammability class
    - Humidity
    - Approvals
    - Standards
  - **Insulation coordination (EN 50 178)**
    - Rated voltage
    - Rated impulse withstand voltage
    - Clearance and creepage distances for control side - load side
    - Surge category
    - Pollution severity
  - **Dimensions**
    - Clamping range (rating - / min. / max.) mm²
    - Length x width x height mm
  - **Note**

**Ordering data**

- **Connection system**
  - Screw connection
- **Accessories**
  - Note

**Example: pneumatic valve**

The MICROOPTO SOLENOID solid-state relay is used especially as switching amplifier for actuators up to 24VDC and 10A with inductive loads such as solenoid valves and contactors. A potential-free signalling contact transmits errors, such as short circuit, to the controller.

The MICROOPTO SOLENOID solid-state relay is short-circuit-proof and protected against power-related transients and voltage peaks by extensive protective circuits. The closed housing also offers a high level of protection against contact.
### Technical data

**Control side**
- Rated voltage
- Power rating
- Making voltage
- Dropout voltage
- Max. input frequency
- Status indicator
- Protective circuit

**Load side**
- Solid-state type
- Nominal switching voltage
- Nominal switching current
- Voltage drop at max. load
- Leakage current
- Protective circuit
- Switch-on delay/switch-off delay
- Continuous current
- Pulse loading, max. current
- Load category

**General data**
- Ambient temperature (operational)
- Storage temperature
- UL 94 flammability class
- Humidity
- Approvals
- Standards

**Insulation coordination (EN 50 178)**
- Rated voltage
- Rated impulse withstand voltage
- Clearances and creepage distances for control side - load side
- Surge category
- Pollution severity

**Dimensions**
- Clamping range (rating- / min. / max.) mm²
- Length x width x height mm

**Screw connection**
- 2.5 / 0.5 / 4
- 90 x 6.1 x 98

**Ordering data**
- Type: MOS 24VDC/5-48VDC 0.5A
- Qty: 1
- Part No: 8937980000

### For electronically switching or inverting signals
- High switching frequency up to 1kHz
- Integrated inverter
- Extensive protection circuits

Electronic CO contacts are used anywhere output signals need to be changed over. For this purpose, the input signal is directly switched through to the output side and inverted; as a result, the opto module can also be used as a pure inverter. The advantage over electromechanical relays lies in the wear-free switching and the possibility of realizing high switching frequencies.

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**Example: inverter**

![Diagram of an inverter circuit](image_url)

**Power supply 24VDC**

![Diagram of a power supply circuit](image_url)
**OPTO Modules**

**For adjusting TTL signals**
- High switching frequency up to 100kHz
- TTL signal conversion from 5V TTL to 24VDC
- Extensive protection circuits

**MOS 5V TTL/24VDC 0.1A**

The MICROOPTO TTL modules are used in industrial automation applications to adjust sensitive TTL signals to the typical voltage level of 24VDC. For the protection of the electronics, the sensitive TTL signals require electrical isolation from the 24V environment. Separate auxiliary power is required to control the optical coupler circuit via the 5V TTL signal.

### Technical data

#### Control side
- Rated voltage
- Power rating
- Making voltage
- Dropout voltage
- Max. input frequency
- Status indicator
- Protective circuit
- Rated auxiliary voltage

#### Load side
- Solid-state type
- Nominal switching voltage
- Nominal switching current
- Voltage drop at max. load
- Leakage current
- Short-circuit-proof
- Protective circuit
- Switch-on delay
- Switch-off delay
- Pulse loading, max. current

#### General data
- Ambient temperature (operational)
- Storage temperature
- UL 94 flammability class
- Humidity
- Approvals
- Standards

#### Insulation coordination (EN 50 178)
- Rated voltage
- Rated impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Surge category
- Pollution severity

#### Dimensions
- Clamping range (rating- / min. / max.) mm²
- Length x width x height mm

#### Ordering data
- Connection system
- Screw connection

### Note

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOS 5V TTL/24VDC 0.1A</td>
<td>1</td>
<td>8937920000</td>
</tr>
</tbody>
</table>

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Example: printer interface

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For adjusting TTL signals

- High switching frequency up to 100kHz
- TTL signal conversion from 12-28VDC to 5V TTL
- Extensive protection circuits

The MICROOPTO TTL modules are used in industrial automation applications to adjust sensitive TTL signals to the typical voltage level of 24VDC. For the protection of the electronics, the sensitive TTL signals require electrical isolation from the 24V environment. Separate auxiliary power is required to control the optical coupler circuit via the 5V TTL signal.

### Technical data

**Control side**
- Rated voltage
- Power rating
- Making voltage
- Dropout voltage
- Max. input frequency
- Status indicator
- Protective circuit

**Load side**
- Solid-state type
- Rated switching voltage
- Rated switching current
- Voltage drop at max. load
- Leakage current
- Short-circuit proof/Protective circuit
- Switch-on delay/Switch-off delay
- Continuous current
- Pulse loading, max. current
- Load category
- Rated auxiliary voltage

### General data
- Ambient temperature (operational)
- Storage temperature
- UL 94 flammability class
- Humidity
- Approvals
- Standards

### Insulation coordination (EN 50 178)
- Rated voltage
- Rated impulse withstand voltage
- Clearance and creepage distances for control side - load side
- Surge category
- Pollution severity

### Dimensions
- Clamping range (rating- / min. / max.) mm²
- Length x width x height mm

### Ordering data
- Connection system
  - Screw connection

### Accessories
- Note

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### MOS 12-28 VDC/5V TTL

- 12VDC...28VDC
- 150 mW
- > 10.7V
- < 10.6V
- 100 kHz
- Green status LED
- Varistor, reverse polarity protection
- TTL gate
- TTL level
- 50 mA
- 50 mV
- No / Varistor
- typical. < 1 µs / typical. < 4 µs
- max. 50 mA
- LC A
- 5VDC ±5 %
- -25 °C...+60 °C
- -40 °C...+80 °C
- V-0
- 40°C / 93% rel. humidity, no condensation
- GL: UL508, CE: cULus
- EN 50178, GL 2003-Vl-Abs. 9, IEC 62314, UL508

### Example: printer interface