

Sensor isolation

Compact and powerful solid-state relays for isolation sensor signals

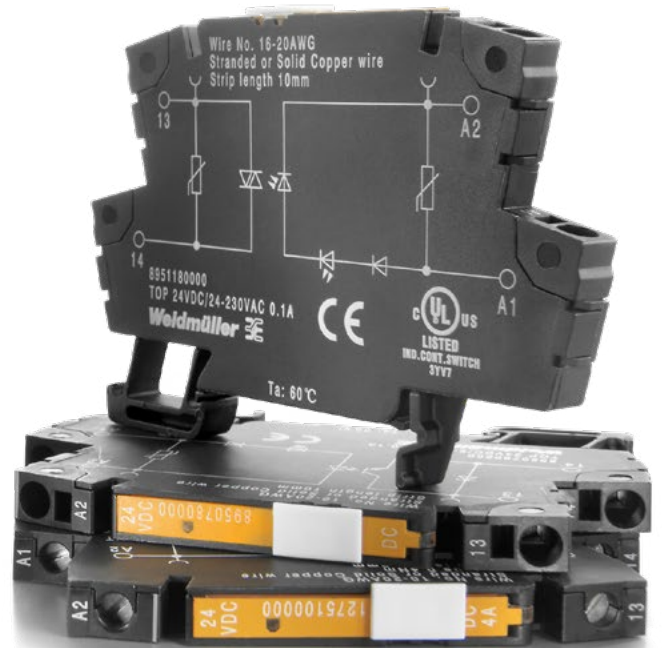
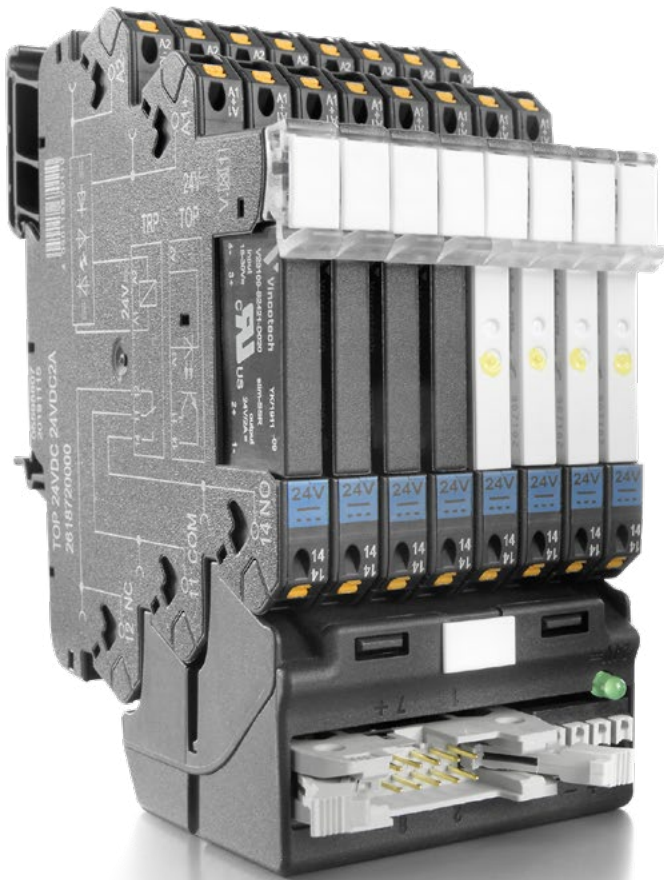
C In order to reliably decouple sensor signals from the field, space-saving and fast-switching coupling elements are required. We offer special solid-state relays for sensor isolation, as well as relay modules with gold-plated contacts for reliable switching of small currents and voltages, as they typically occur when switching sensor signals.

Solid-state relay for sensor isolation

As there is often a high number of switching cycles in sensor isolation, it makes sense to use solid-state relays. They have no mechanical wear and therefore work reliably in the long term. Our solid-state relays are extremely compact and, thanks to suitable accessories, enable quick installation. By using TERMSERIES interface adapters in conjunction with pre-assembled cables, the wiring time can be reduced further.

Electromechanical relays with gold contacts

In applications where sensor isolation is only carried out at longer intervals and with low power (< 30 V/10 mA), oxide layers can form on the contacts. This usually occurs in applications where signals are forwarded to control inputs or PLC systems. Due to the low loads, there is not enough light arcing at the contacts to remove the oxide layer during switching. Therefore, relay modules with oxidation-resistant gold contacts are used.

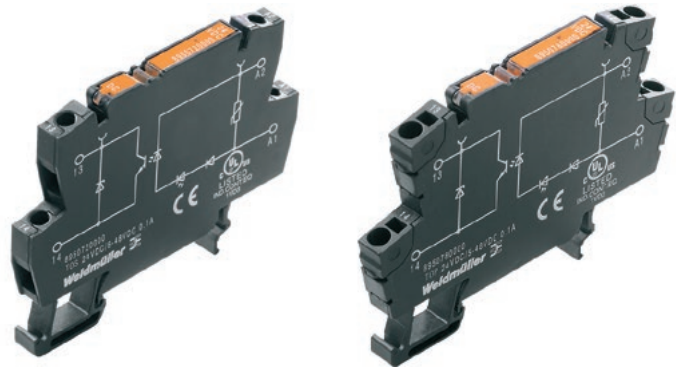


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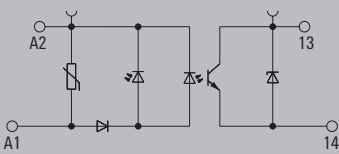
Solid-state relays 5...48 V DC / 100 mA

Output versions

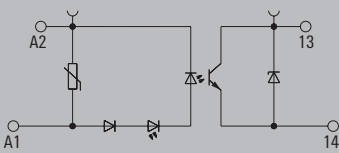
- Space-saving 6.1 mm width
- Plug-in cross-connections
- Screw and PUSH IN wire connection
- Enclosed design



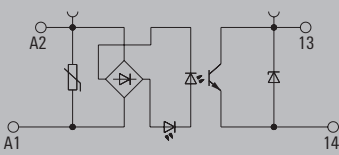
5 V DC



12...220 DC



24...230 V AC



Technical data

Load side	
Rated switching voltage	5...48 V DC
Continuous current	100 mA
Inrush current	
Solid-state type	Transistor
Voltage drop at max. load	< 1 V
Leakage current	< 10 µA
Protective circuit, load side	Free-wheeling diode
Short-circuit-proof / Protective circuit, load side	No / Free-wheeling diode
General data	
Ambient temperature (operational)	-20 °C...60 °C
Storage temperature	-40 °C...80 °C
Humidity	5-95% relative humidity, T ₀ = 40°C, without condensation
Approvals	CE, cULus, EAC
Insulation coordinates	
Rated voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Dielectric strength for control side - load side	1.2 kV _{eff} / 1 min.
Dielectric strength to mounting rail	
Clearance and creepage distances for control side - load side	> 3 mm
Overvoltage category	III
Pollution degree	2

Dimensions	Screw connection	PUSH IN connection
Clamping range (nominal / min. / max.)	mm ² 2.5 / 0.5 / 4	1.5 / 0.5 / 2.5
Depth x width x height	mm 55 / 6.1 / 74.4	55 / 6.1 / 79.4

Note Accessories and dimensioned drawings: refer to the TERMOPTO Accessories page.

Applications

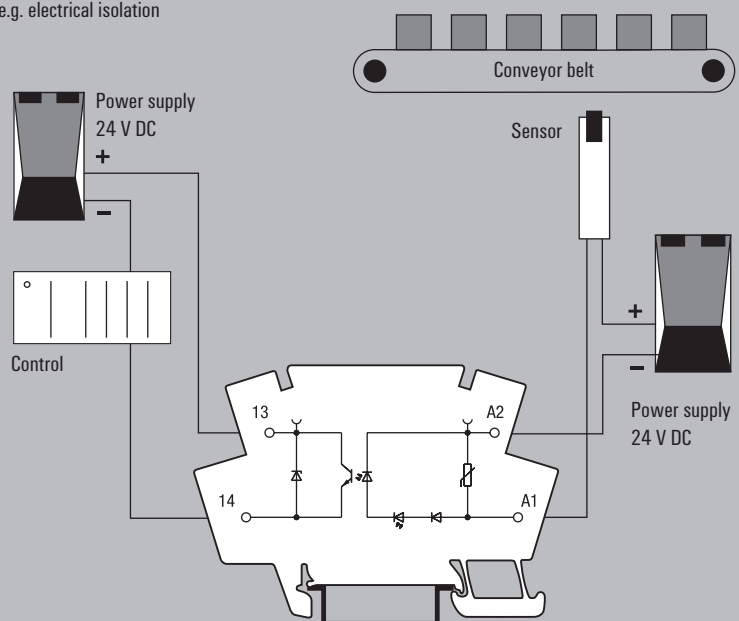
The **TERMOPTO** opto module is used in industrial applications in which electrical isolation and signal conditioning without switching amplification is sufficient.

The compact design in terminal-block format saves space on the rail and offers the option of a pluggable cross connection.

The choice between 10 input voltages and 3 output voltages, as well as screw or PUSH IN connection technology, gives 60 variations for different applications.

The integrated protective circuit ensures sufficient protection in applications with resistive, as well as slightly inductive and capacitive loads. For purely inductive, capacitive or comparable loads with high switch-on and switch-off peaks, such as solenoid valves or filament lamps, ensure that the module is dimensioned appropriately or an additional safeguard is used.

e.g. electrical isolation



Solid-state relays 5...48 V DC / 100 mA

Output versions

Ordering data

	5 V DC	12 V DC	24 V DC	48...60 V DC	110 V DC
Control side					
Rated control voltage	5 V DC $\pm 20\%$	12 V DC $\pm 20\%$	24 V DC $\pm 20\%$	48...60 V DC $\pm 20\%$	110 V DC $\pm 20\%$
Nominal control current	7.7 mA DC	7.8 mA DC	7 mA DC	4.3 mA DC	2.6 mA DC
Power rating	< 40 mW	< 95 mW	≤ 170 mW	< 200 mW	< 280 mW
max. switching frequency (DC control voltage)	3000 Hz	3000 Hz	3000 Hz	500 Hz	500 Hz
max. switching frequency (AC control voltage)					
Status indicator	Green LED	Green LED	Green LED	Green LED	Green LED
Protective circuit	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection

Ordering data

Screw connection	Type	TOS 5VDC/48VDC 0,1A	TOS 12VDC/48VDC 0,1A	TOS 24VDC/48VDC 0,1A	TOS 48-60VDC/48VDC 0,1A	TOS 110VDC/48VDC 0,1A
	Order No.	8950700000	8950710000	8950720000	8950730000	8950740000
PUSH IN connection	Type	TOP 5VDC/48VDC 0,1A	TOP 12VDC/48VDC 0,1A	TOP 24VDC/48VDC 0,1A	TOP 48-60VDC/48VDC 0,1A	TOP 110VDC/48VDC 0,1A
	Order No.	8950760000	8950770000	8950780000	8950790000	8950800000
Note						

Ordering data

	220 V DC	24 V AC	48...60 V AC	120 V AC	230 V AC
Control side					
Rated control voltage	220 V DC $+10\%$ / -15%	24 V AC $\pm 20\%$	48...60 V AC $\pm 20\%$	120 V AC $\pm 20\%$	230 V AC $+10\%$ / -20%
Nominal control current	1.65 mA DC	7.4 mA AC	4.3 mA AC	2.9 mA AC	1.75 mA AC
Power rating	≤ 360 mW	< 0.18 VA	≤ 0.2 VA	≤ 0.3 VA	≤ 0.4 VA
max. switching frequency (DC control voltage)	500 Hz				
max. switching frequency (AC control voltage)		10 Hz	10 Hz	10 Hz	10 Hz
Status indicator	Green LED	Green LED	Green LED	Green LED	Green LED
Protective circuit	Varistor, Reverse polarity protection	Varistor	Varistor	Varistor	Varistor

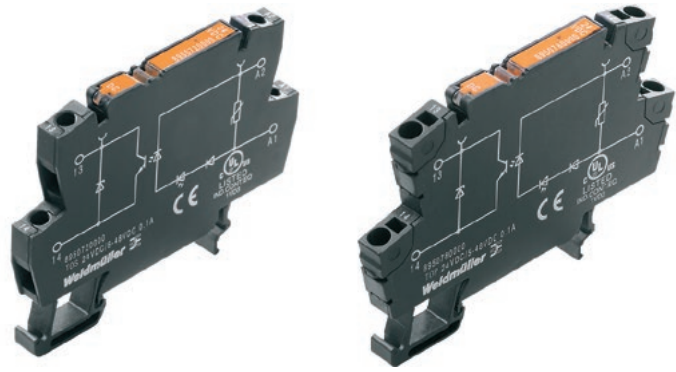
Ordering data

Screw connection	Type	TOS 220VDC/48VDC 0,1A	TOS 24VAC/48VDC 0,1A	TOS 48-60VAC/48VDC 0,1A	TOS 120VAC/48VDC 0,1A	TOS 230VAC/48VDC 0,1A
	Order No.	8950750000	8950820000	8950830000	8950840000	8950850000
PUSH IN connection	Type	TOP 220VDC/48VDC 0,1A	TOP 24VAC/48VDC 0,1A	TOP 48-60VAC/48VDC 0,1A	TOP 120VAC/48VDC 0,1A	TOP 230VAC/48VDC 0,1A
	Order No.	8950810000	8950860000	8950870000	8950880000	8950890000
Note						

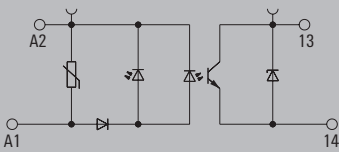
Solid-state relays, 5...48 V DC / 500 mA

Output versions

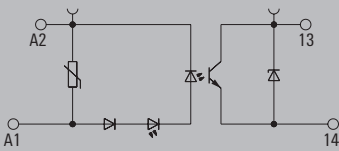
- Space-saving 6.1 mm width
- Plug-in cross-connections
- Screw and PUSH IN wire connection
- Enclosed design



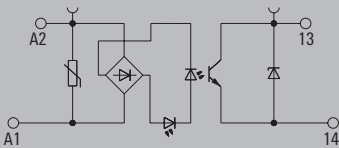
5 V DC



12...220 DC



24...230 V AC



Technical data

Load side	
Rated switching voltage	5...48 V DC
Continuous current	500 mA
Inrush current	
Solid-state type	Transistor
Voltage drop at max. load	< 1 V
Leakage current	< 10 µA
Protective circuit, load side	Free-wheeling diode
Short-circuit-proof / Protective circuit, load side	No / Free-wheeling diode
General data	
Ambient temperature (operational)	-20 °C...60 °C
Storage temperature	-40 °C...80 °C
Humidity	5-95% relative humidity, T ₀ = 40°C, without condensation
Approvals	CE, cULus, EAC
Insulation coordinates	
Rated voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Dielectric strength for control side - load side	1.2 kV _{eff} / 1 min.
Dielectric strength to mounting rail	
Clearance and creepage distances for control side - load side	> 3 mm
Overvoltage category	III
Pollution degree	2

Dimensions	Screw connection	PUSH IN connection
Clamping range (nominal / min. / max.)	mm ² 2.5 / 0.5 / 4	1.5 / 0.5 / 2.5
Depth x width x height	mm 55 / 6.1 / 74.4	55 / 6.1 / 79.4

Note Accessories and dimensioned drawings: refer to the TERMOPTO Accessories page.

Applications

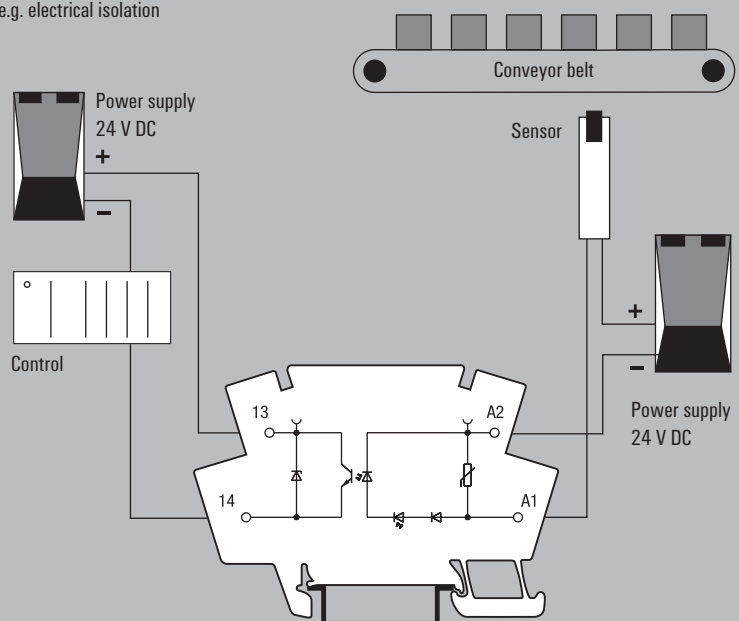
The **TERMOPTO** opto module is used in industrial applications in which electrical isolation and signal conditioning without switching amplification is sufficient.

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The choice between 10 input voltages and 3 output voltages, as well as screw or PUSH IN connection technology, gives 60 variations for different applications.

The integrated protective circuit ensures sufficient protection in applications with resistive, as well as slightly inductive and capacitive loads. For purely inductive, capacitive or comparable loads with high switch-on and switch-off peaks, such as solenoid valves or filament lamps, ensure that the module is dimensioned appropriately or an additional safeguard is used.

e.g. electrical isolation



Solid-state relays, 5...48 V DC / 500 mA

Output versions

Ordering data

	5 V DC	12 V DC	24 V DC	48...60 V DC	110 V DC
Control side					
Rated control voltage	5 V DC $\pm 20\%$	12 V DC $\pm 20\%$	24 V DC $\pm 20\%$	48...60 V DC $\pm 20\%$	110 V DC $\pm 20\%$
Nominal control current	7.7 mA DC	7.8 mA DC	7 mA DC	4.3 mA DC	2.6 mA DC
Power rating	< 40 mW	< 95 mW	≤ 170 mW	≤ 200 mW	≤ 280 mW
max. switching frequency (DC control voltage)	200 Hz	200 Hz	200 Hz	200 Hz	200 Hz
max. switching frequency (AC control voltage)					
Status indicator	Green LED	Green LED	Green LED	Green LED	Green LED
Protective circuit	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection

Ordering data

Screw connection	Type	TOS 5VDC/48VDC 0,5A	TOS 12VDC/48VDC 0,5A	TOS 24VDC/48VDC 0,5A	TOS 48-60VDC/48VDC 0,5A	TOS 110VDC/48VDC 0,5A
	Order No.	8950900000	8950910000	8950920000	8950930000	8950940000
PUSH IN connection	Type	TOP 5VDC/48VDC 0,5A	TOP 12VDC/48VDC 0,5A	TOP 24VDC/48VDC 0,5A	TOP 48-60VDC/48VDC 0,5A	TOP 110VDC/48VDC 0,5A
	Order No.	8950960000	8950970000	8950980000	8950990000	8951000000
Note						

Ordering data

	220 V DC	24 V AC	48...60 V AC	120 V AC	230 V AC
Control side					
Rated control voltage	220 V DC $+10\%$ / -15%	24 V AC $\pm 20\%$	48...60 V AC $\pm 20\%$	120 V AC $\pm 20\%$	230 V AC $+10\%$ / -20%
Nominal control current	1.65 mA DC	7.4 mA AC	4.3 mA AC	2.9 mA AC	1.75 mA AC
Power rating	≤ 360 mW	< 0.18 VA	≤ 0.2 VA	≤ 0.3 VA	≤ 0.4 VA
max. switching frequency (DC control voltage)	200 Hz				
max. switching frequency (AC control voltage)		10 Hz	10 Hz	10 Hz	10 Hz
Status indicator	Green LED	Green LED	Green LED	Green LED	Green LED
Protective circuit	Varistor, Reverse polarity protection	Varistor	Varistor	Varistor	Varistor

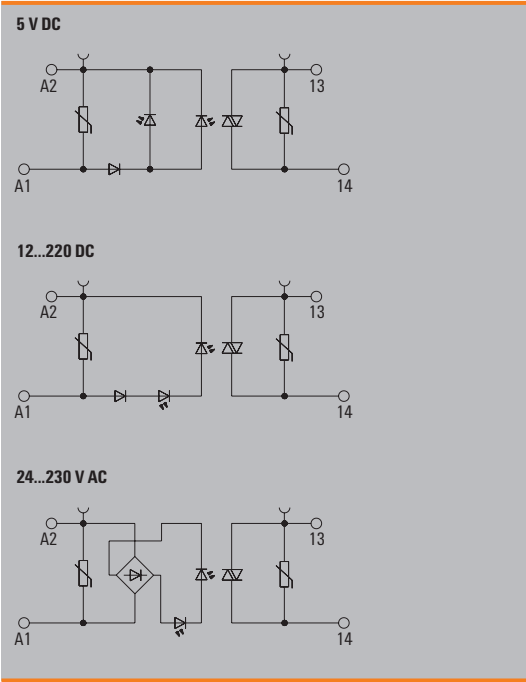
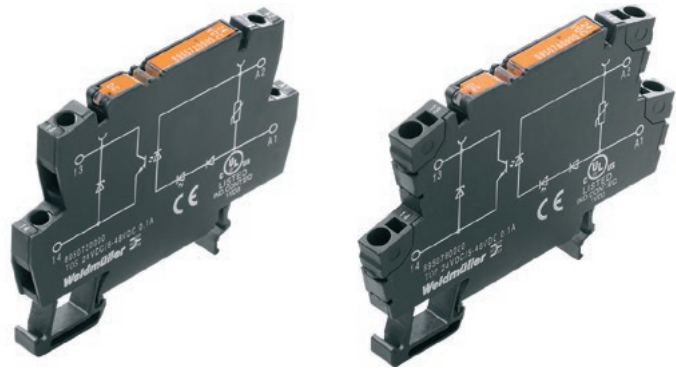
Ordering data

Screw connection	Type	TOS 220VDC/48VDC 0,5A	TOS 24VAC/48VDC 0,5A	TOS 48-60VAC/48VDC 0,5A	TOS 120VAC/48VDC 0,5A	TOS 230VAC/48VDC 0,5A
	Order No.	8950950000	8951020000	8951030000	8951040000	8951050000
PUSH IN connection	Type	TOP 220VDC/48VDC 0,5A	TOP 24VAC/48VDC 0,5A	TOP 48-60VAC/48VDC 0,5A	TOP 120VAC/48VDC 0,5A	TOP 230VAC/48VDC 0,5A
	Order No.	8951010000	8951060000	8951070000	8951080000	8951090000
Note						

Solid-state relays 24...230 V AC / 100 mA

Output versions

- Space-saving 6.1 mm width
- Plug-in cross-connections
- Screw and PUSH IN wire connection
- Enclosed design



Technical data

Load side		
Rated switching voltage	24...230 V AC	
Continuous current	100 mA	
Inrush current		
Solid-state type	Triac (zero-cross switch)	
Voltage drop at max. load	< 1.8 V	
Leakage current	< 1 mA	
Protective circuit, load side	Varistor, RC element	
Short-circuit-proof / Protective circuit, load side	No / Varistor, RC element	
General data		
Ambient temperature (operational)	-20 °C...60 °C	
Storage temperature	-40 °C...80 °C	
Humidity	5-95% relative humidity, T ₀ = 40°C, without condensation	
Approvals	CE, cULus, EAC	
Insulation coordinates		
Rated voltage	300 V	
Impulse withstand voltage	4 kV (1.2/50 µs)	
Dielectric strength for control side - load side	1.2 kV _{eff} / 1 min.	
Dielectric strength to mounting rail		
Clearance and creepage distances for control side - load side	> 3 mm	
Overvoltage category	III	
Pollution degree	2	
Dimensions		
Clamping range (nominal / min. / max.)	mm ²	2.5 / 0.5 / 4
	mm	55 / 6.1 / 74.4
Depth x width x height		55 / 6.1 / 79.4
Note	Accessories and dimensioned drawings: refer to the TERMOPTO Accessories page.	

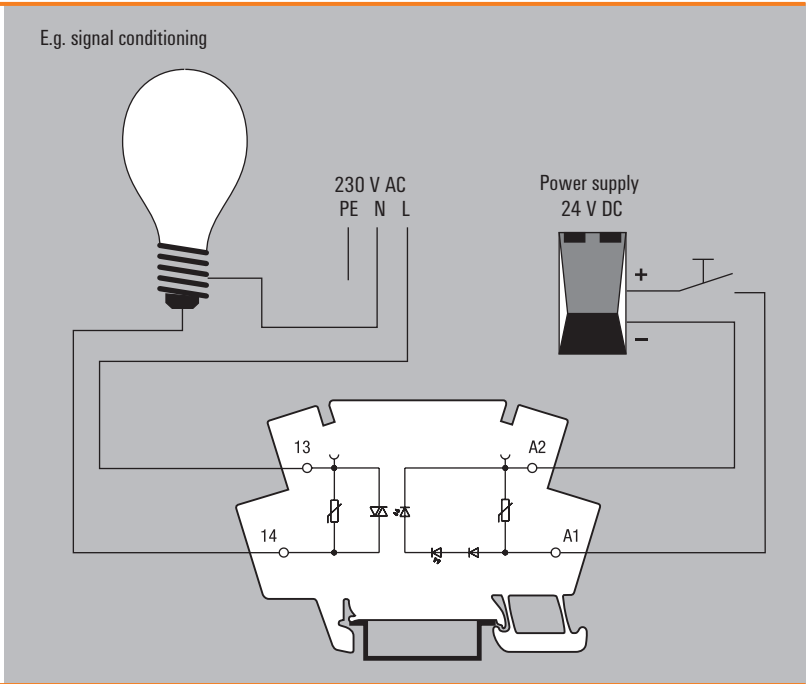
Applications

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The integrated protective circuit ensures sufficient protection in applications with resistive as well as slightly inductive and capacitive loads. For purely inductive, capacitive or comparable loads with high switch-on and switch-off peaks, such as solenoid valves or filament lamps, ensure that the module is dimensioned appropriately or an additional safeguard is used.



Solid-state relays 24...230 V AC / 100 mA

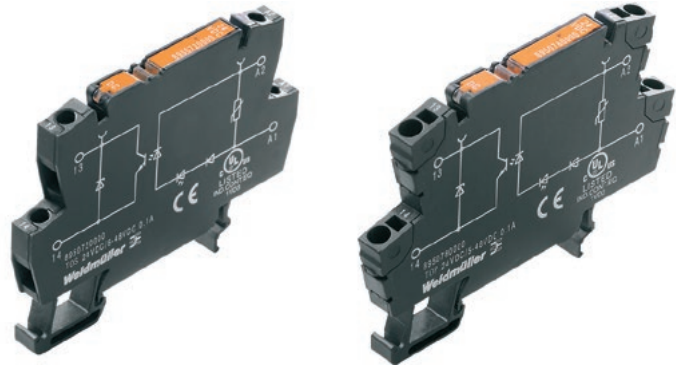
Output versions

Ordering data	5 V DC	12 V DC	24 V DC	48...60 V DC	110 V DC
Control side					
Rated control voltage	5 V DC $\pm 20\%$	12 V DC $\pm 20\%$	24 V DC $\pm 20\%$	48...60 V DC $\pm 20\%$	110 V DC $\pm 20\%$
Nominal control current	7.8 mA DC	3.6 mA DC	3.6 mA DC	3.7 mA DC	3.6 mA DC
Power rating	< 40 mW	< 45 mW	≤ 80 mW	≤ 170 mW	≤ 360 mW
max. switching frequency (DC control voltage)	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
max. switching frequency (AC control voltage)					
Status indicator	Green LED	Green LED	Green LED	Green LED	Green LED
Protective circuit	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection	Varistor, Reverse polarity protection
Ordering data					
Screw connection Type	TOS 5VDC/230VAC 0,1A	TOS 12VDC/230VAC 0,1A	TOS 24VDC/230VAC 0,1A	TOS 48-60VDC/230VAC 0,1A	TOS 110VDC/230VAC 0,1A
Order No.	8951100000	8951110000	8951120000	8951130000	8951140000
PUSH IN connection Type	TOP 5VDC/230VAC 0,1A	TOP 12VDC/230VAC 0,1A	TOP 24VDC/230VAC 0,1A	TOP 48-60VDC/230VAC 0,1A	TOP 110VDC/230VAC 0,1A
Order No.	8951160000	8951170000	8951180000	8951190000	8951200000
Note					
Ordering data	220 V DC	24 V AC	48...60 V AC	120 V AC	230 V AC
Control side					
Rated control voltage	220 V DC $+10\%$ / -15%	24 V AC $\pm 20\%$	48...60 V AC $\pm 20\%$	120 V AC $\pm 20\%$	230 V AC $+10\%$ / -20%
Nominal control current	2.9 mA DC	8.8 mA AC	6.4 mA AC	8.5 mA AC	7.7 mA AC
Power rating	≤ 640 mW	≤ 0.2 VA	≤ 0.3 VA	≤ 1 VA	≤ 1.7 VA
max. switching frequency (DC control voltage)	10 Hz				
max. switching frequency (AC control voltage)		10 Hz	10 Hz	10 Hz	10 Hz
Status indicator	Green LED	Green LED	Green LED	Green LED	Green LED
Protective circuit	Varistor, Reverse polarity protection	Varistor	Varistor	Varistor	Varistor
Ordering data					
Screw connection Type	TOS 220VDC/230VAC 0,1A	TOS 24VAC/230VAC 0,1A	TOS 48-60VAC/230VAC 0,1A	TOS 120VAC/230VAC 0,1A	TOS 230VAC/230VAC 0,1A
Order No.	8951150000	8951220000	8951230000	8951240000	8951250000
PUSH IN connection Type	TOP 220VDC/230VAC 0,1A	TOP 24VAC/230VAC 0,1A	TOP 48-60VAC/230VAC 0,1A	TOP 120VAC/230VAC 0,1A	TOP 230VAC/230VAC 0,1A
Order No.	8951210000	8951260000	8951270000	8951280000	8951290000
Note					

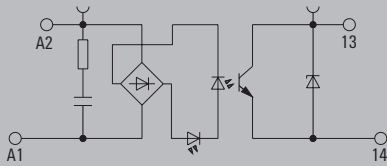
Solid-state relays, 5...48 V DC / 500 mA

Output versions with RC element

- Space-saving 6.1 mm width
- Plug-in cross-connections
- Screw and PUSH IN wire connection
- Enclosed design
- RC input circuitry for improved interference immunity



120 V...230 V AC



Technical data

Load side	
Rated switching voltage	5...48 V DC
Continuous current	500 mA
Inrush current	
Solid-state type	Transistor
Voltage drop at max. load	< 1 V
Leakage current	< 10 µA
Protective circuit, load side	Diode circuit
Short-circuit-proof / Protective circuit, load side	No / Diode circuit
General data	
Ambient temperature (operational)	-20 °C...60 °C
Storage temperature	-40 °C...80 °C
Humidity	5-95% relative humidity, T ₀ = 40°C, without condensation
Approvals	CE, cULus, EAC
Insulation coordinates	
Rated voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Dielectric strength for control side - load side	1.2 kV _{eff} / 1 min.
Dielectric strength to mounting rail	
Clearance and creepage distances for control side - load side	> 3 mm
Overvoltage category	III
Pollution degree	2

Dimensions	Screw connection	PUSH IN connection
Clamping range (nominal / min. / max.)	mm ² 2.5 / 0.5 / 4	1.5 / 0.5 / 2.5
Depth x width x height	mm 55 / 6.1 / 74.4	55 / 6.1 / 79.4

Note Accessories and dimensioned drawings: refer to the TERMOPTO Accessories page.

Ordering data

	120 V AC	230 V AC
Control side		
Rated control voltage	120 V AC ±20 %	230 V AC +10 %/-15 %
Nominal control current	6.4 mA AC	6.4 mA AC
Power rating	≤ 0.61 VA	≤ 1.5 VA
max. switching frequency (DC control voltage)		
max. switching frequency (AC control voltage)	10 Hz	10 Hz
Status indicator	Green LED	Green LED
Protective circuit	RC element	RC element

Ordering data			
Screw connection	Type	TOS 120VAC/48VDC 0.5A RC	TOS 230VAC/48VDC 0.5A RC
	Order No.	1180290000	1189270000
PUSH IN connection	Type	TOP 120VAC/48VDC 0.5A RC	TOP 230VAC/48VDC 0.5A RC
	Order No.	1188830000	1189260000
Note			