

MICROOPTO OPTO Modules

NEW



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.

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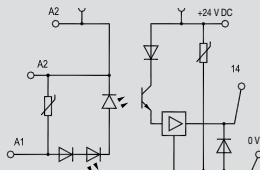
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Weidmüller 

For high switching frequency up to 100kHz

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

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.

Technical data

Control side	
Rated voltage	12VDC...28VDC
Power rating	0.08...0.3 W
Making voltage	> 5.6V
Dropout voltage	< 5.1V
Max. input frequency	100 kHz
Status indicator	LED green
Protective circuit	Varistor, reverse polarity protection
Load side	
Solid-state type	Bipolar transistor
Nominal switching voltage	24VDC ±20%
Nominal switching current	50 mA
Voltage drop at max. load	≤ 2V
Leakage current	< 20 µA
Short-circuit-proof/Protective circuit	no /varistor, reverse polarity protection
Switch-on delay/Switch-off delay	< 200ns/<400ns
Continuous current	Max. 50 mA
Pulse loading, max. current	0.6A (20 ms)
Load category	LC A
General data	
Ambient temperature (operational)	-20 °C...+60 °C
Storage temperature	-40 °C...+80 °C
UL 94 flammability class	V-0
Humidity	5...95 % RH
$T_u = 55^\circ\text{C}$, no condensation	
CE; cULus	
EN 50178, IEC 62314, UL508	
Rated voltage	300V
Rated impulse withstand voltage	4kV (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.)	mm ²
Length x width x height	mm
90 x 6.1 x 98	
Screw connection	
2.5 / 0.5 / 4	

Ordering data

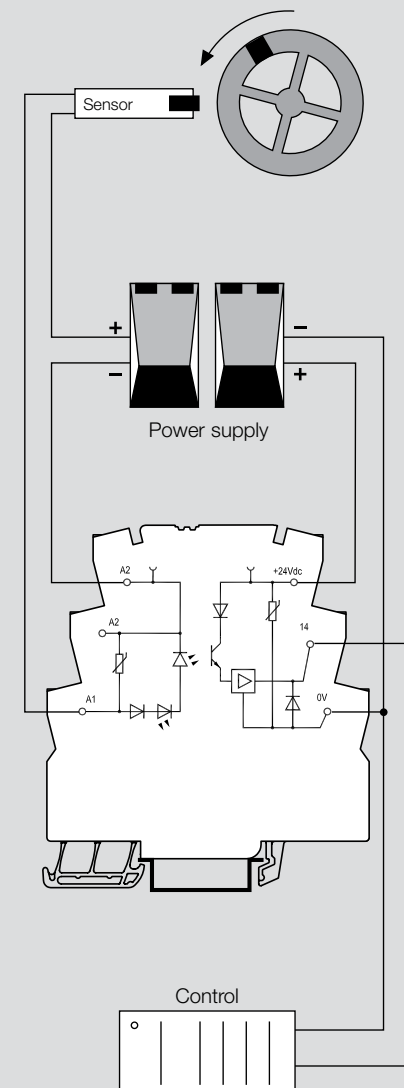
Connection system	Type	Qty.	Part No.
Screw connection	MOS 12-28VDC 100kHz	1	8937990000

Note

Accessories

Note

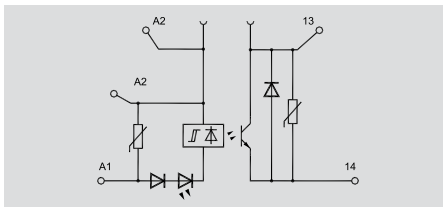
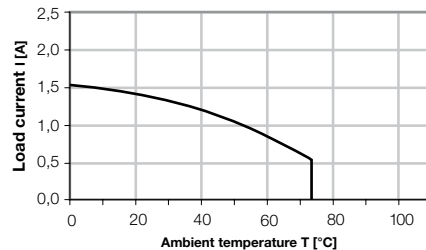
For example rotational speed measurement



For DC loads up to 300VDC and 1A

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

MOS 12...300VDC 1A



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

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

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
	T _v = 55°C, no condensation

Ambient temperature (operational)	-20 °C... See Derating Curve
Storage temperature	-40 °C...+80 °C
UL 94 flammability class	V-0
Humidity	5...95 % RH
	T _v = 55°C, no condensation

Approvals	CE; cULus
Standards	EN 50178, IEC 62314, UL508

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

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.)	mm ²
Length x width x height	mm

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

Ordering data

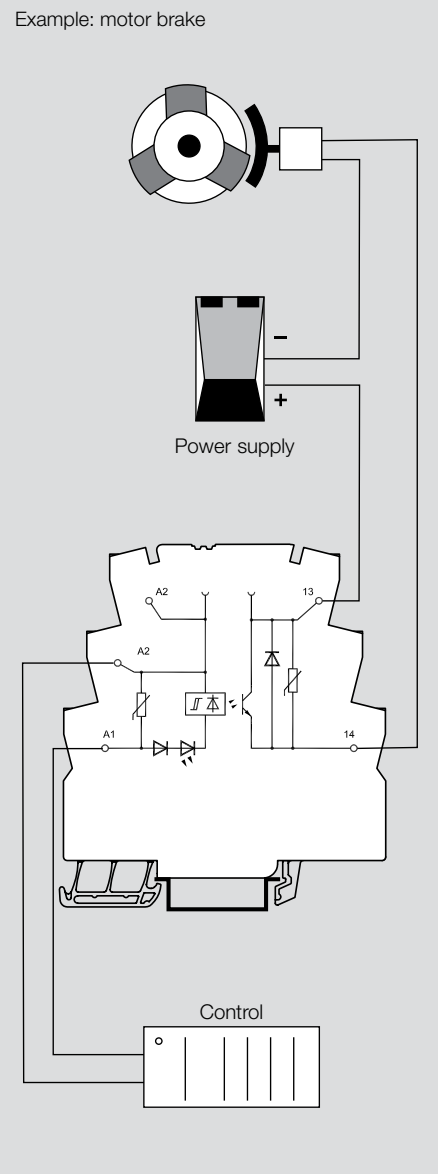
Connection system	
	Screw connection

Type	Qty.	Part No.
MOS 24VDC/12-300VDC 1A	1	8937830000

Note	
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Accessories

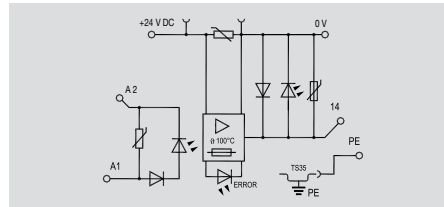
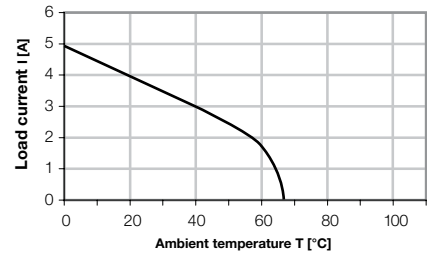
Note	
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For direct connection of actuators up to 24VDC, 2A

- Load circuit: 24VDC / 2A, short circuit protected
- Direct connection of 3-wire actuators
- Integrated Protective ground connection for easy DIN-rail snap on
- Fault indication via LED

MOS 8...30VDC 2A



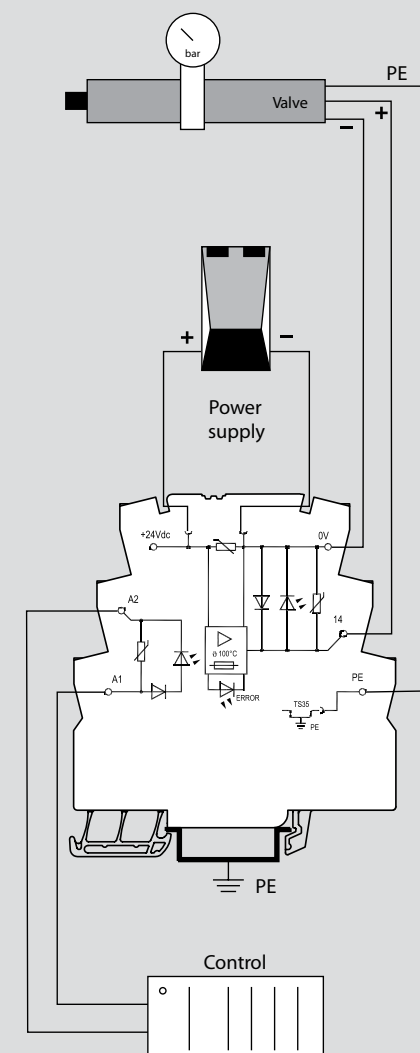
The solid-state relay **MICROOPTO ACTOR** has been especially designed as a switching amplifier for actuators up to 24VDC and 2A with inductive loads such as solenoid valves and contactors. 3-wire actuators can be connected directly to the module.

This is short-circuit proof and protected against application-related transients and spikes by extensive protective circuitry.

Technical data

Control side			
Rated voltage	24VDC ±20 %		
Power rating	0.1...2 W		
Making voltage	> 13.8 V		
Dropout voltage	< 13.6 V		
Max. input frequency	100 Hz		
Status indicator	Fault indication LED red, status LED green		
Protective circuit	Varistor, reverse polarity protection		
Load side			
Solid-state type	Intelligent POWER MOS-FET		
Nominal switching voltage	8...30VDC		
Nominal switching current	2A @ 55°C		
Voltage drop at max. load	≤ 50 mV		
Leakage current	< 50 µA		
Short-circuit-proof/Protective circuit	yes (12 h) /varistor		
Switch-on delay/Switch-off delay	< 0.1 ms / < 0.5 ms		
Continuous current	2A		
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		
	T _v = 55°C, no condensation		
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.)	mm ² 2.5 / 0.5 / 4		
Length x width x height	mm 90 x 6.1 x 98		
Note			
Ordering data			
Connection system	Type	Qty.	Part No.
Screw connection	MOS 24VDC/8-30VDC 2A	1	8937970000
Note			
Accessories			
Note			

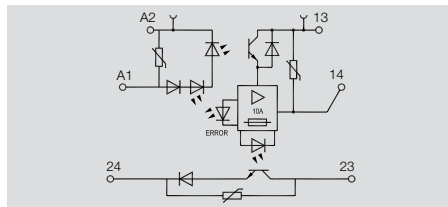
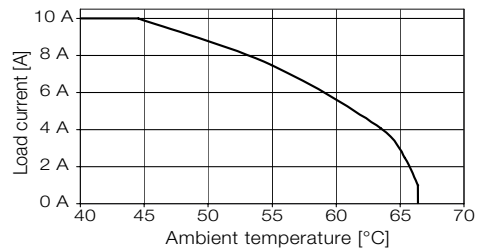
Example: pneumatic valve



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



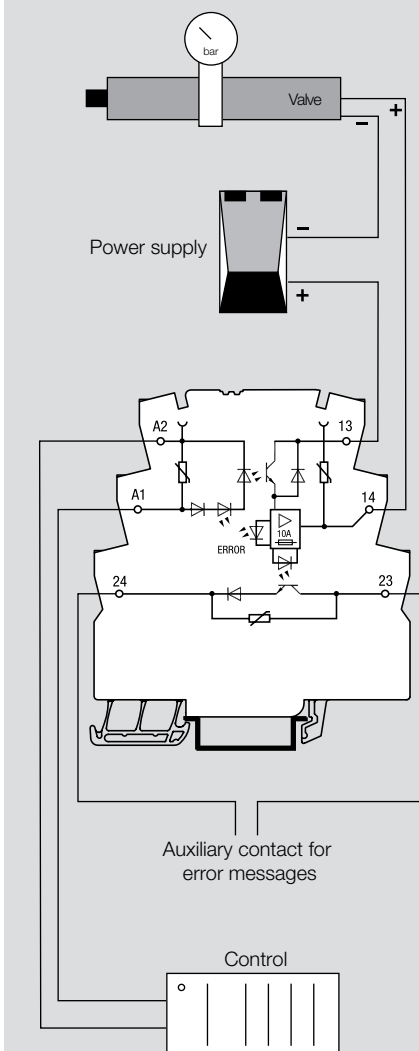
The **MICROOPTO SOLENOID** solid-state relay is used especially as switching amplifier for actuators up to 24VDC and 10A with inductive loads such as solenoid valves and contactors. A potential-free signalling contact transmits errors, such as short circuit, to the controller.

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	24VDC ±20 %
Power rating	400 mW
Making voltage	> 18V
Dropout voltage	< 13V
Max. input frequency	50 Hz
Status indicator	Error LED red; Status LED green
Protective circuit	Varistor, reverse polarity protection
Load side	
Solid-state type	POWER-MOS-FET transistor
Nominal switching voltage	5...33VDC
Nominal switching current	10A
Voltage drop at max. load	approx. 100 mV
Leakage current	< 1 mA
Short-circuit-proof/Protective circuit	Yes (conditional 4h / current limiting < 200 A) / Varistor, Current sensor
Switch-on delay/Switch-off delay	typical. 250 µs / typical. 700 µs
Continuous current	10A
Load category	LC A
General data	
Alarm contact	5...48VDC / 0.1A
Ambient temperature (operational)	-25 °C...+60 °C
Storage temperature	-40 °C...+80 °C
UL 94 flammability class	V-0
Humidity	40°C / 93% rel. humidity, no condensation
Approvals	GL; GOSTME25; CE; cULus
Standards	EN 50178, GL 2003-VI-Abs. 9, 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	> 3 mm
Surge category	III
Pollution severity	2
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4
Length x width x height	mm 90 x 6.1 x 98
Screw connection	
Suppressor circuitry for inductive loads, 10 cm installation clearance to inductive switching devices	

Example: pneumatic valve



Ordering data

Connection system	Type	Qty.	Part No.
Screw connection	MOS 24VDC/5-33VDC 10A	1	8937940000

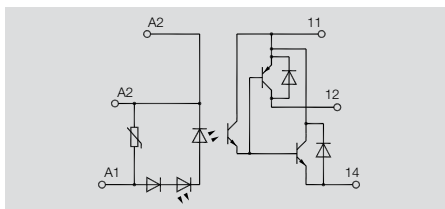
Accessories

Note

For electronically switching or inverting signals

- High switching frequency up to 1kHz
- Integrated inverter
- Extensive protection circuits

MOS 24VDC/5-48VDC 0.5A



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.

Technical data

Control side		
Rated voltage	24VDC ±20 %	
Power rating	160 mW	
Making voltage	> 80 % U _{Nom}	
Dropout voltage	< 50 % U _{Nom}	
Max. input frequency	1 kHz	
Status indicator	Green status LED	
Protective circuit	Varistor, reverse polarity protection	
Load side		
Solid-state type	Bipolar transistor	
Nominal switching voltage	5...48VDC	
Nominal switching current	500 mA	
Voltage drop at max. load	Max. 1V	
Leakage current	< 2 µA	
Short-circuit-proof/Protective circuit	No / Integrated free-wheel diode	
Switch-on delay/Switch-off delay	< 40 µs / < 50 µs	
Continuous current	500 mA	
Pulse loading, max. current		
Load category	LC A	
General data		
Ambient temperature (operational)	-25 °C...+60 °C	
Storage temperature	-40 °C...+80 °C	
UL 94 flammability class	V-0	
Humidity	40°C / 93% rel. humidity, no condensation	
Approvals	GL: GOSTME25; CE: cULus	
Standards	EN 50178, GL 2003-VI-Abs. 9, 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	> 3 mm	
Surge category	III	
Pollution severity	2	
Dimensions		
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4	
Length x width x height	mm 90 x 6.1 x 98	
Note		
Screw connection		
Type	Qty.	Part No.
MOS 24VDC/5-48VDC 0.5A	1	8937980000

Ordering data

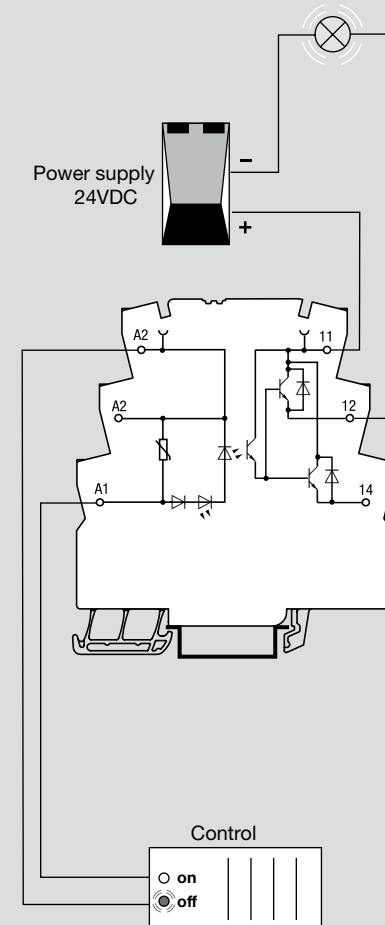
Connection system	Screw connection
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Note

Accessories

Note

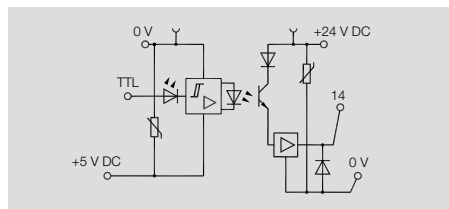
Example: inverter



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	5V TTL
Power rating	< 0.5 mW
Making voltage	approx. 2V
Dropout voltage	ca. 1V
Max. input frequency	100 kHz
Status indicator	Green status LED
Protective circuit	Varistor, reverse polarity protection
Rated auxiliary voltage	5VDC ±5 %
Load side	
Solid-state type	Bipolar transistor
Nominal switching voltage	19.6...28.8 V
Nominal switching current	100 mA
Voltage drop at max. load	< 1V
Leakage current	< 20 µA
Short-circuit-proof/Protective circuit	No / Integrated free-wheel diode
Switch-on delay/Switch-off delay	< 300 µs / < 2 µs
Continuous current	100 mA
Pulse loading, max. current	
Load category	LC A
General data	
Ambient temperature (operational)	-25 °C...+60 °C
Storage temperature	-40 °C...+80 °C
UL 94 flammability class	V-0
Humidity	40°C / 93% rel. humidity, no condensation
Approvals	GL; GOSTME25; CE; cULus
Standards	EN 50178, GL 2003-VI-Abs. 9, 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	> 3 mm
Surge category	III
Pollution severity	2
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Control side		
Rated voltage	5V TTL	
Power rating	< 0.5 mW	
Making voltage	approx. 2V	
Dropout voltage	ca. 1V	
Max. input frequency	100 kHz	
Status indicator	Green status LED	
Protective circuit	Varistor, reverse polarity protection	
Rated auxiliary voltage	5VDC ±5 %	
Load side		
Solid-state type	Bipolar transistor	
Nominal switching voltage	19.6...28.8 V	
Nominal switching current	100 mA	
Voltage drop at max. load	< 1V	
Leakage current	< 20 µA	
Short-circuit-proof/Protective circuit	No / Integrated free-wheel diode	
Switch-on delay/Switch-off delay	< 300 µs / < 2 µs	
Continuous current	100 mA	
Pulse loading, max. current		
Load category	LC A	
General data		
Ambient temperature (operational)	-25 °C...+60 °C	
Storage temperature	-40 °C...+80 °C	
UL 94 flammability class	V-0	
Humidity	40°C / 93% rel. humidity, no condensation	
Approvals	GL; GOSTME25; CE; cULus	
Standards	EN 50178, GL 2003-VI-Abs. 9, 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	> 3 mm	
Surge category	III	
Pollution severity	2	
Dimensions		
Clamping range (rating- / min. / max.)	mm ²	
Length x width x height	mm	
Note		
Screw connection		
Type	Qty.	Part No.
MOS 5VTTL/24VDC 0.1A	1	8937920000

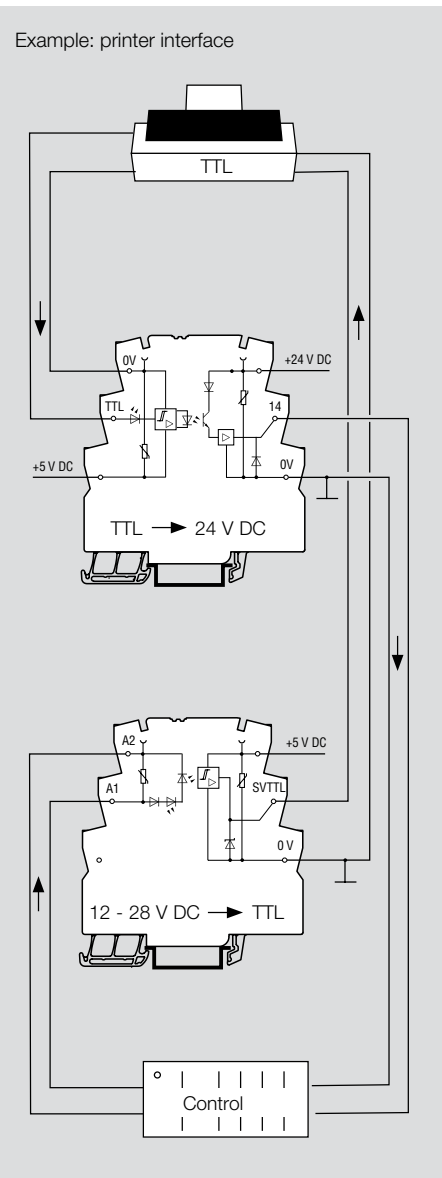
Ordering data

Connection system	Screw connection
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Accessories

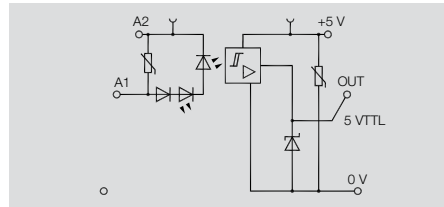
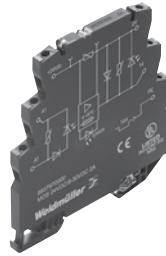
Note



For adjusting TTL signals

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

MOS 12-28 VDC/5V TTL



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	12VDC...28VDC	
Power rating	150 mW	
Making voltage	> 10.7V	
Dropout voltage	< 10.6V	
Max. input frequency	100 kHz	
Status indicator	Green status LED	
Protective circuit	Varistor, reverse polarity protection	
Load side		
Solid-state type	TTL gate	
Rated switching voltage	TTL level	
Rated switching current	50 mA	
Voltage drop at max. load	50 mV	
Leakage current		
Short-circuit-proof/Protective circuit	No / Varistor	
Switch-on delay/Switch-off delay	typical. < 1 µs / typical. < 4 µs	
Continuous current	max. 50 mA	
Pulse loading, max. current		
Load category	LC A	
Rated auxiliary voltage	5VDC ±5 %	
General data		
Ambient temperature (operational)	-25 °C...+60 °C	
Storage temperature	-40 °C...+80 °C	
UL 94 flammability class	V-0	
Humidity	40°C / 93% rel. humidity, no condensation	
Approvals	GL; GOSTME25; CE; cULus	
Standards	EN 50178, GL 2003-VI-Abs. 9, 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	> 3 mm	
Surge category	III	
Pollution severity	2	
Dimensions		
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4	
Length x width x height	mm 90 x 6.1 x 98	
Note		
Screw connection		
Type	Qty.	Part No.
MOS 12-28VDC/5VTTL	1	8937930000

Example: printer interface

