

**TOS 48-60VDC/230VAC 0,1A****Weidmüller Interface GmbH & Co. KG**

Klingenbergstraße 26

D-32758 Detmold

Germany

[www.weidmueller.com](http://www.weidmueller.com)

Similar to illustration

- 1 NO contact (Triac (zero-cross switch))
- Ensures wear- and maintenance-free potential separation in compact terminal block format
- Suitable accessories from the cross-connection to the marker
- Integrated protective circuit for inputs and outputs

**General ordering data**

Version	TERMOPTO, Solid-state relay, Rated control voltage: 48...60 V DC $\pm 20\%$ , Rated switching voltage: 24...230 V AC, Continuous current: 100 mA, Screw connection
Order No.	<a href="#">8951130000</a>
Type	TOS 48-60VDC/230VAC 0,1A
GTIN (EAN)	4032248741908
Qty.	10 pc(s).

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## Technical data

## Dimensions and weights

Depth	55 mm	Depth (inches)	2.165 inch
Height	74.4 mm	Height (inches)	2.929 inch
Width	6.1 mm	Width (inches)	0.24 inch
Net weight	20.5 g		

## Temperatures

Storage temperature	-40 °C...80 °C	Operating temperature	-20 °C...60 °C
Humidity	5-95% relative humidity, T <sub>u</sub> = 40°C, without condensation		

## Probability of failure

MTTF	2,500 a
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## Control side

Rated control voltage	48...60 V DC $\pm 20\%$	Nominal control current	3.7 mA DC
Power rating	$\leq 170$ mW	Status indicator	Green LED
Protective circuit	Varistor, Reverse polarity protection	Input frequency	10 Hz

## Load side

Rated switching voltage	24...230 V AC	Continuous current	0.1 A (AC1)
Rated switching current	100 mA	Load category	AC1
Max. switching voltage, AC	230 V	Switch-on delay	$\leq 10$ ms
Switch-off delay	$< 12$ ms	Voltage drop at max. load	$< 1.8$ V
Leakage current	$< 1$ mA	Min. switching current	2 mA
Short-circuit-proof	No	Protective circuit, load side	Varistor, RC element
Contact type	1 NO contact (Triac (zero-cross switch))	max. switching frequency (DC control voltage)	10 Hz

## General data

Rail	TS 35	
Test button available	No	
Colour	black	
UL94 flammability rating component	Component	Housing
	UL94 flammability rating	V-0

## Insulation coordination

Rated voltage	300 V	Pollution severity	2
Surge voltage category	III	Clearance and creepage distances for control side - load side	$> 3$ mm
Dielectric strength for control side - load side	1.2 kV <sub>eff</sub> / 1 min.	Impulse withstand voltage	4 kV (1.2/50 $\mu$ s)
Protection degree	IP20		

## Further details of approvals / standards

Certificate no. (cULus)	E223474
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## Connection data

Wire connection method	Screw connection	Stripping length, rated connection	9 mm
Tightening torque, min.	0.4 Nm	Tightening torque, max.	0.6 Nm
Clamping range, rated connection	2.5 mm <sup>2</sup>	Clamping range, min.	0.5 mm <sup>2</sup>
Clamping range, max.	4 mm <sup>2</sup>	Wire connection cross section AWG, min.	AWG 20
Wire connection cross section AWG, max.	AWG 12	Wire cross-section, solid, min.	0.5 mm <sup>2</sup>
Wire cross-section, solid, max.	4 mm <sup>2</sup>	Wire connection cross section, finely stranded, min.	0.5 mm <sup>2</sup>
Wire connection cross section, finely stranded, max.	2.5 mm <sup>2</sup>	Wire cross-section, finely stranded, min. (AWG)	AWG 20
Wire cross-section, finely stranded, max. (AWG)	AWG 12	Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/4, min.	0.5 mm <sup>2</sup>
Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/4, max.	1.5 mm <sup>2</sup>	Conductor cross-section, flexible, AEH (DIN 46228-1), min.	0.5 mm <sup>2</sup>
Conductor cross-section, flexible, AEH (DIN 46228-1), max.	1.5 mm <sup>2</sup>	Blade size	0.6 x 3.5 mm

## Classifications

ETIM 6.0	EC001504	ETIM 7.0	EC001504
ETIM 8.0	EC001504	ETIM 9.0	EC001504
ECLASS 9.0	27-37-16-04	ECLASS 9.1	27-37-16-04
ECLASS 10.0	27-37-16-04	ECLASS 11.0	27-37-16-04
ECLASS 12.0	27-37-16-04	ECLASS 13.0	27-37-16-04

## Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
SCIP	9e2cbc49-76d9-4611-b8ec-5b4f549a0aa9

## Approvals

Approvals



ROHS	Conform
UL File Number Search	UL Website
Certificate no. (cULus)	E223474

## Downloads

Approval/Certificate/Document of Conformity	<a href="#">EU Konformitätserklärung / EU Declaration of Conformity</a>
Engineering Data	<a href="#">CAD data – STEP</a>
User Documentation	<a href="#">Beipackzettel / Package Insert – multilingual</a>
Catalogues	<a href="#">Catalogues in PDF-format</a>
Brochures	

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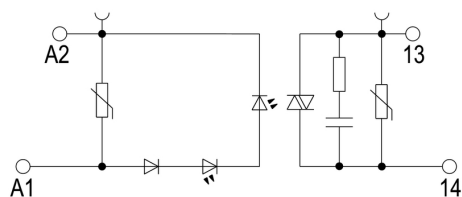
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## Drawings

### Wiring diagram

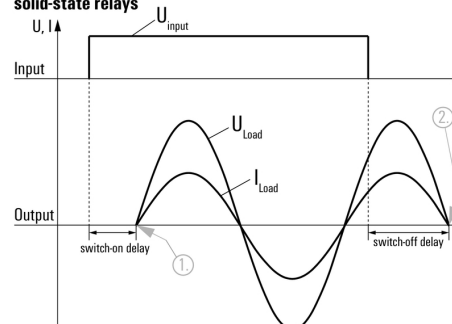


Schaltsymbol

### Dimensional drawing



### Signal characteristics of zero cross switching solid-state relays



Shown at an example with resistive load.

1. Switches on at first zero cross of mains voltage while control input gets signal.
2. Switches off at next zero cross of mains current after control input signal was switched off.

Switching DC voltages is not possible with this solid-state relays.

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## Accessories

4 mm<sup>2</sup>

The plug-in cross-connections feature easy handling and quick installation. This saves a great deal of time during installation in comparison with screwed solutions.

## General ordering data

Type	ZQV 4N/2	Version
Order No.	<a href="#">1527930000</a>	Cross-connector (terminal), Plugged, Number of poles: 2, Pitch in mm
GTIN (EAN)	4050118332766	(P): 6.10, Insulated: Yes, 32 A, orange
Qty.	60 pc(s).	
Type	ZQV 4N/4 RD	Version
Order No.	<a href="#">2460800000</a>	Cross-connector (terminal), Plugged, Number of poles: 4, Pitch in mm
GTIN (EAN)	4050118476224	(P): 6.10, Insulated: Yes, 32 A, red
Qty.	60 pc(s).	
Type	ZQV 4N/2 RD	Version
Order No.	<a href="#">2460450000</a>	Cross-connector (terminal), Plugged, Number of poles: 2, Pitch in mm
GTIN (EAN)	4050118476149	(P): 6.10, 32 A, red
Qty.	60 pc(s).	
Type	ZQV 4N/10	Version
Order No.	<a href="#">1528090000</a>	Cross-connector (terminal), Plugged, Number of poles: 10, Pitch in mm
GTIN (EAN)	4050118332896	(P): 6.10, Insulated: Yes, 32 A, orange
Qty.	20 pc(s).	
Type	ZQV 4N/4 BL	Version
Order No.	<a href="#">1528120000</a>	Cross-connector (terminal), Plugged, Number of poles: 4, Pitch in mm
GTIN (EAN)	4050118332872	(P): 6.10, Insulated: Yes, 32 A, blue
Qty.	60 pc(s).	
Type	ZQV 4N/4	Version
Order No.	<a href="#">1527970000</a>	Cross-connector (terminal), Plugged, Number of poles: 4, Pitch in mm
GTIN (EAN)	4050118332889	(P): 6.10, Insulated: Yes, 32 A, orange
Qty.	60 pc(s).	
Type	ZQV 4N/3 RD	Version
Order No.	<a href="#">2460810000</a>	Cross-connector (terminal), Plugged, Number of poles: 3, Pitch in mm
GTIN (EAN)	4050118476231	(P): 6.10, 32 A, red
Qty.	60 pc(s).	
Type	ZQV 4N/10 RD	Version
Order No.	<a href="#">2460740000</a>	Cross-connector (terminal), Plugged, Number of poles: 10, Pitch in mm
GTIN (EAN)	4050118476163	(P): 6.10, 32 A, red
Qty.	20 pc(s).	
Type	ZQV 4N/3	Version
Order No.	<a href="#">1527940000</a>	Cross-connector (terminal), Plugged, Number of poles: 3, Pitch in mm
GTIN (EAN)	4050118332865	(P): 6.10, Insulated: Yes, 32 A, orange
Qty.	60 pc(s).	
Type	ZQV 4N/3 BL	Version
Order No.	<a href="#">1528080000</a>	Cross-connector (terminal), Plugged, Number of poles: 3, Pitch in mm
GTIN (EAN)	4050118333008	(P): 6.10, Insulated: Yes, 32 A, blue
Qty.	60 pc(s).	

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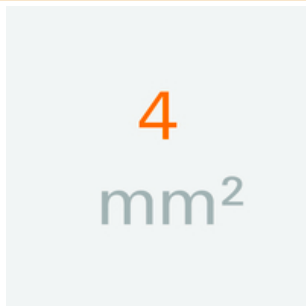
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## Accessories

Type	ZQV 4N/10 BL	Version
Order No.	<a href="#">1528230000</a>	Cross-connector (terminal), Plugged, Number of poles: 10, Pitch in mm
GTIN (EAN)	4050118333138	(P): 6.10, Insulated: Yes, 32 A, blue
Qty.	20 pc(s).	
Type	ZQV 4N/2 BL	Version
Order No.	<a href="#">1528040000</a>	Cross-connector (terminal), Plugged, Number of poles: 2, Pitch in mm
GTIN (EAN)	4050118332773	(P): 6.10, Insulated: Yes, 32 A, blue
Qty.	60 pc(s).	

4 mm<sup>2</sup>

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## General ordering data

Type	ZQV 4N/10 SW	Version
Order No.	<a href="#">1794060000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248234059	
Qty.	20 pc(s).	
Type	ZQV 4N/3 SW	Version
Order No.	<a href="#">1794000000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248233793	
Qty.	60 pc(s).	
Type	ZQV 4N/4 SW	Version
Order No.	<a href="#">1794030000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248233915	
Qty.	60 pc(s).	
Type	ZQV 4N/20 BL	Version
Order No.	<a href="#">1909100000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248535774	
Qty.	20 pc(s).	
Type	ZQV 4N/20 SW	Version
Order No.	<a href="#">1909120000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248535804	
Qty.	20 pc(s).	
Type	ZQV 4N/20 GE	Version
Order No.	<a href="#">1909020000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248535644	
Qty.	20 pc(s).	
Type	ZQV 4N/20 RT	Version
Order No.	<a href="#">1909150000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248535934	
Qty.	20 pc(s).	

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## Accessories

Type	ZQV 4N/2 SW	Version
Order No.	<a href="#">1793970000</a>	W-Series, Cross-connector, 32 A
GTIN (EAN)	4032248233762	
Qty.	60 pc(s).	

## Blank



WS markers are the perfect match for the W-series connectors. Thanks to their system compatibility, the WS tags can also be used with the I-series and the Z-series. The large marking surfaces do not only permit long character strings but also multi-line text. WS markers are ideal for labels with long, customised character strings. Thanks to the proven MultiCard format, printing with PrintJet CONNECT oder/or Plotter is possible.

- Can be fitted in strips or individually
- Markers in proven MultiCard format

**For custom printing:** Please send us a file of our labeling software M-Print PRO or M-Print PRO Online (without installation) for your labeling specifications.

## General ordering data

Type	WS 12/6 MC NE WS	Version
Order No.	<a href="#">1609900000</a>	WS, Terminal marker, 12 x 6 mm, Pitch in mm (P): 6.00 Weidmueller,
GTIN (EAN)	4008190203467	Allen-Bradley, white
Qty.	600 pc(s).	

## Slotted screwdriver



Slotted screwdriver with rounded blade SD DIN 5265, ISO 2380/2, output to DIN 5264, ISO 2380/1. ChromTop tip, SoftFinish grip

## General ordering data

Type	SDS 0.6X3.5X100	Version
Order No.	<a href="#">2749340000</a>	Screwdriver, Blade width (B): 3.5 mm, Blade length: 100 mm, Blade
GTIN (EAN)	4050118895568	thickness (A): 0.6 mm
Qty.	1 pc(s).	

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[www.weidmueller.com](http://www.weidmueller.com)**Accessories****Slotted screwdriver**

VDE insulated slot-head screwdriver, SDI DIN 7437, ISO 2380/2, drive output acc. to DIN 5264, ISO 2380/1. SoftFinish grip

**General ordering data**

Type	SDIS 0.6X3.5X100	Version
Order No.	<a href="#">2749810000</a>	Screwdriver, Blade width (B): 3.5 mm, Blade length: 100 mm, Blade
GTIN (EAN)	4050118897012	thickness (A): 0.6 mm
Qty.	1 pc(s).	

**Slotted screwdriver**

VDE insulated screwdriver sets, for working on live parts up to 1000 V AC and 1500 V DC, DIN EN 60900. IEC 900. Each piece is "GS" safety tested. Blade made from fully hardened, high-alloy chromium-vanadium-molybdenum steel, gun-metal finish.

**General ordering data**

Type	SDIS SLIM 0.6X3.5X100	Version
Order No.	<a href="#">2749610000</a>	Mounting tool, Blade width (B): 3.5 mm, Blade length: 100 mm, Blade
GTIN (EAN)	4050118896350	thickness (A): 0.6 mm
Qty.	1 pc(s).	



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## Drawings

## Miscellaneous



Type codes