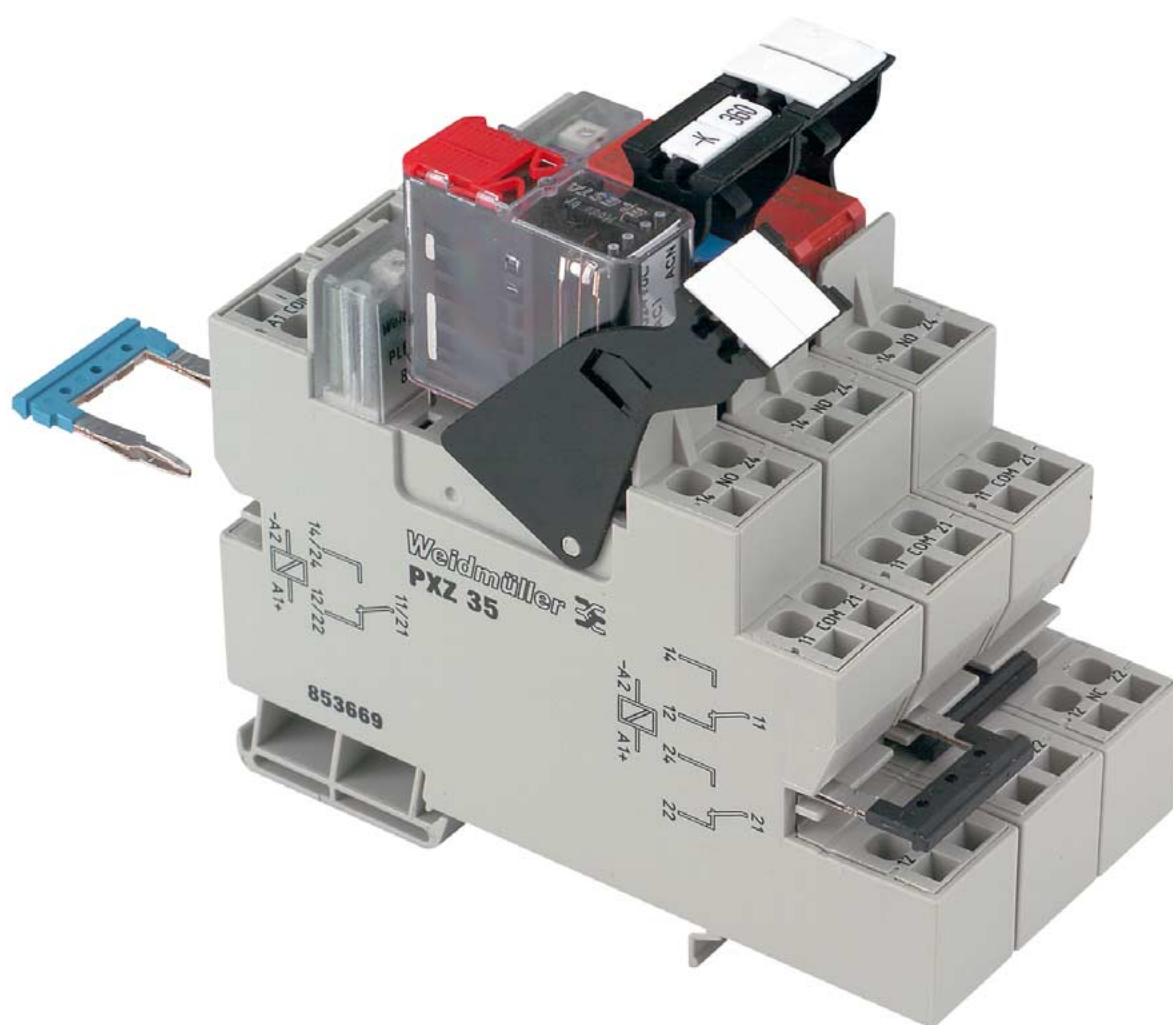




## Relay Coupler



The universal foot of the Weidmüller **relay modules** allow them to be assembled on TS 32, TS 35 x 7.5 and TS 35 x 15 mounting rails in accordance with European standards EN 50 035 and EN 50 022.

An LED status indicator in the coil of the relay coupler indicates the relay switching status.

| Contact material                                | Properties                                                                                                                        | Application                               | U/I                       |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------|
| <b>Fine silver</b><br>AG 99 %                   | - inexpensive<br>- average tendency to weld and average resistance to burn-off<br>- subject to corrosion in sulphurous atmosphere | universal use<br>up to medium-size loads  | 1 V...250 V<br>1 mA...5 A |
| <b>Silver nickel</b><br>● AgNi 0.15             | - high mechanical stability<br>- low tendency to weld<br>- low contact resistance<br>- high resistance to burn-off                | universal use<br>at medium-size loads     | ≥ 12 V<br>5 mA...10 A     |
| <b>Hard silver</b><br>AgCu3                     | - mechanical stability > AgNi<br>- tendency to weld < AgNi<br>- resistance to burn-off > AgNi<br>- contact resistance > AgNi      | for use with medium-size loads            | ≥ 12 V<br>10 mA...10 A    |
| <b>Silver cadmium oxide</b><br>● AgCdO          | - very low tendency to weld<br>- resistance to burn-off > AgCu3/Ni                                                                | suitable for switching inductive loads    | ≥ 12 V<br>≥ 100 mA        |
| <b>Silver-tin-oxide</b><br>● AgSnO <sub>2</sub> | - high thermal decomposition temperature<br>- more arc-resistant with low material transfer                                       | suitable for switching inductive loads    | ≥ 12 V<br>≥ 100 mA        |
| <b>Tungsten</b><br>W                            | - very high resistance to burn-off<br>- high switching rate with short closed times                                               | circuits with extremely high on/off loads | ≥ 60 V<br>≥ 1 A           |
| <b>Hard gold</b><br>● AuNi                      | - < lowest contact resistance<br>- best resistance to corrosion                                                                   | dry circuits in damp atmospheres          | µV...60 V<br>µA...0.2 V   |

● = preferred materials

### Types of contact

The standard range comprises numerous types and combinations of contacts.

- 1 NC (EGR EG2, EGR EG7, RS 30)
- 1 NO (EGR EG2, EGR EG7, DKR, RS 30)
- 1 NC and 1 NO (EGR EG2, WRS)
- 2 NO (WRS)
- 3 NO (WRS)
- 1 Changeover (EGR EG2, EGR/RST EG7, WRS DKR PRS/PRZ MCZ R, RS 30, RS 31)
- 2 Changeover (EGR EG2, WRS, RS 32, PRS/PRZ)
- 4/8/16 Changeover (RSM)

### Contact material

The all-round capability of Weidmüller relay modules is achieved by the choice of the contact material.

The contact is responsible for both the reliable transmission of the control signals and for switching power contactors. Weidmüller uses gold-plated or gold-flashed AgNi contacts for most applications. Gold-plated contacts permit the switching of the low-power applications up to 40 µW with a gold-plating thicker than 2 µm. For switching higher ratings we use AgSnO<sub>2</sub> or AgCdO contacts (RS 31).

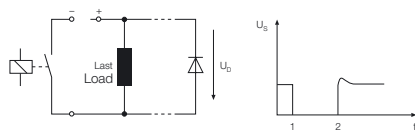


## Protective circuits of the contacts

Switching sparks may occur when switching inductive or capacitive loads that affect the operational life of the relay.

The following protective circuits offer the possibility of reducing contact wear:

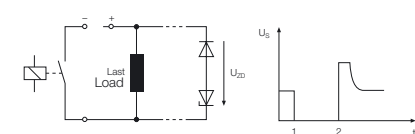
### Diode:



Advantage: can be used for all ratings, low overvoltage, minimum space requirements, economic

Disadvantage: very long drop-out delay

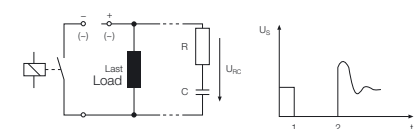
### Diode and Z-diode:



Advantage: low overvoltage (determined by Z-diode), low drop-out delay

Disadvantage: not usable for high power ratings

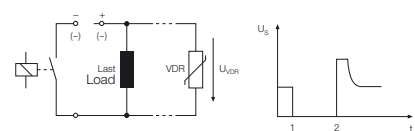
### RC combination:



Advantage: low overvoltage, low drop-out delay

Disadvantage: higher current loading on contacts at switch-on, complex and expensive for increased power rating

### Varistor:



Advantage: low drop-out delay, economic

Disadvantage: not for all operating voltages and power ratings

U<sub>S</sub> Voltage curve  
1 Close  
2 Open

## Switching of small and large power ratings

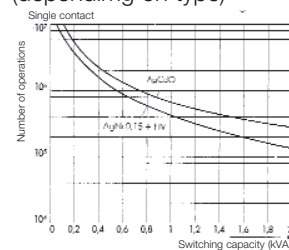
For automation technology, Weidmüller offers the EGR EGR 7 relay coupler to switch ratings up to 40  $\mu$ W under resistive loads. This allows signals to be reliably relayed to control devices.

The switching of higher power ratings in power supply technology is achieved by the RS 31 relay coupler, which guarantees switching capacity up to 3.5 kVA under resistive loads.

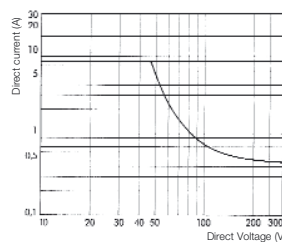
## Switching times of the relay modules

pick-up delay typ. < 10 ms  
drop-out delay typ. < 12 ms

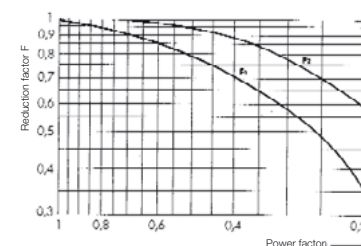
## Switching behaviour/load limit curve (depending on type)



Contact life with resistive load



DC-limit with resistive load



Reduction factor with inductive load  $\cos j < 1$   
Switching no. eff. = switching no. (at  $\cos j = 1$ ) x red. Factor F

## Relay couplers with plugged relays

Relay couplers with plugged relays are only conditionally suitable for use in applications subject to heavy vibrations. Relay couplers with soldered relays are to be preferred.

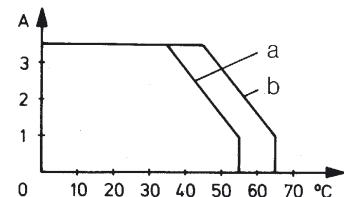
## Derating curves

The contact resistance is largely responsible for heat development within the relay. This link is demonstrated by a derating curve as a function of the permissible current subject to the ambient temperature.

We determine the current (curve a) for the following operating conditions:

- continuous operation
- rated input voltage + 10 %
- several relay modules operating under load, mounted horizontally in a row without spacing on mounting rail

A higher load is applicable when modules are mounted with a gap of 20 mm as shown in curve "b". In addition, the function of curve "b" shows the max. values for a switching or short-time operation when assembled horizontally on the mounting rail.



## Notes for usage

The characteristic data of the actuation are to be meticulously observed when using UC variants in DC circuitry. UC variants have a higher current input at the moment of switching due to their series circuitry. The internal current limiter of commercially available initiators can result in the operated relay coupler not being switched through.

## RC combination

Long supply cables are particularly open to electrical and electro-mechanical influences. These can lead to disturbances of the function or even failure of the relay module. A remedy for this problem is an RC combination in series that filters out unwanted disturbances. RC combinations are available for all customary relay couplers: pluggable (PLUGSERIES) or as terminal block (WDU 12C and DKU 12C).

### Protective separation

All equipment required to guarantee "protective separation" must be constructed in such a way that, for example, a mechanical defect cannot reduce the level of insulation. In the case of a relay, this means that if a mechanical defect occurs (bent solder pin, break in winding conductor or broken spring), "protective separation" must be guaranteed.

Relays are specified and tested according to IEC 255 and VDE 0435. Neither standard contains any reference to EN 50 178 (Equipping power installations with electronic equipment) nor is "protective separation" defined. To compound matters the test voltages quoted for the relays are based on different measurement conditions. The test voltages cannot be applied to EN 50 178 or DIN VDE 0106 Part 101. As more and more users employ only equipment that guarantees "protective separation", a lot of manufacturers of relays refer to DIN VDE 0106 and test their products accordingly. Consequently, the quoted values correspond to the requirements for "protective separation".

### Standards

The following standards are fulfilled:  
EN 50 178

Equipping power installations with electronic equipment

DIN VDE 0106 Part 101

Protection against flow of dangerous currents through the human body; basic requirements for protective separation within electrical equipment.

DIN VDE 0109

Insulation co-ordination within low-voltage system including clearance and creepage distances for assembled PCBs.

DIN VDE 0435

Electrical relays, all-or-nothing relays

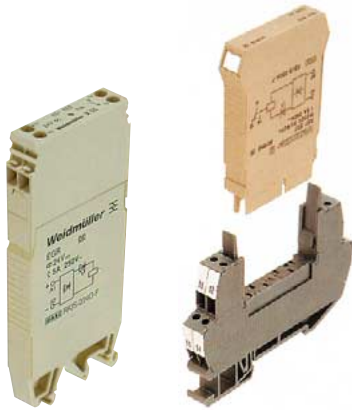
### Input circuit

|                                       |                                                                                                                                                                                  |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input voltage [V]</b>              | Reference voltage at which the relay coupler operates.<br>Typical reference voltages:<br>=> 5 V DC, 12, 24, 48, 60, 115, 230 V AC/DC                                             |
| <b>Input current [mA]</b>             | Quotient resulting from input voltage and input resistance.<br>Input resistance<br>=> coil resistance + resistance of drive (R, LED, rect. ...)                                  |
| <b>Rated power consumption [W/VA]</b> | Input voltage x input current AC/DC<br>with tolerance of +/- 10% or +/-15%<br>Typical range for relay coupler:<br>250 mW > P <sub>v</sub> > 1 W 0.4 VA > P <sub>v</sub> > 1.2 VA |
| <b>Pull-in voltage [V]</b>            | Smallest input voltage that relay coupler requires in order to respond<br>(T <sub>amb</sub> = 293 K)                                                                             |
| <b>Pick-up current [mA]</b>           | Smallest input current required to switch relay from inoperative to operating position<br>(T <sub>amb</sub> = 293 K)                                                             |
| <b>Pull-in power [W/VA]</b>           | Product of pull-in voltage and pick-up current                                                                                                                                   |
| <b>Drop-out voltage [V]</b>           | Voltage level at which relay has definitely released                                                                                                                             |
| <b>Self reset current [mA]</b>        | Input current level at which relay has definitely released                                                                                                                       |

### Output circuit

|                                  |                                                                                                                                                                                                                                 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Output voltage [V]</b>        | Max. voltage that can be applied to relay contact                                                                                                                                                                               |
| <b>Switching current [A]</b>     | Current that can flow for max. of 4 sec. after relay contact has closed                                                                                                                                                         |
| <b>Continuous current [A]</b>    | Current that flows continuously after contact has closed                                                                                                                                                                        |
| <b>Switching power [W/VA]</b>    | Product of output voltage and switching current with resistive, inductive and capacitive load                                                                                                                                   |
| <b>Min. switching power [mW]</b> | Smallest amount of power that can be switched via contact                                                                                                                                                                       |
| <b>Service life</b>              | Number of switching operations before contact fails<br>- mechanical => with no electric load<br>- electrical => with resistive or inductive AC/DC load                                                                          |
| <b>Pick-up lag [ms]</b>          | Length of time from application of energizing voltage until contact closes/opens                                                                                                                                                |
| <b>Drop-out lag [ms]</b>         | Length of time from breaking the energizing circuit until contact closes/opens                                                                                                                                                  |
| <b>Contact bounce time [ms]</b>  | Length of time between first and last closing/opening of contact when relay picks up or drops out                                                                                                                               |
| <b>Switching frequency [Hz]</b>  | Switching operations per sec.<br>with a duty factor of 1 : 2 (t <sub>on</sub> = t <sub>off</sub> )                                                                                                                              |
| <b>Withstand voltage [kV]</b>    | Max. test voltage between input and output circuits which does not cause any discharge                                                                                                                                          |
| <b>Reliable separation</b>       | Feature of relay coupler that conform to VDE 0160 and VDE 0106 Part 101                                                                                                                                                         |
| <b>Electric arc</b>              | Current flow between contact surfaces as they open, caused by ionization                                                                                                                                                        |
| <b>Contact wear</b>              | Switching inductive loads leads to considerable changes in the composition of the materials used.<br>The results are:<br>=> formation of pits or peaks on the surface of contacts<br>=> failure due to interlocking of contacts |
| <b>Spark absorption</b>          | Limitation of transient overvoltages by connecting supplementary circuit across inductive loads<br>=> RC combinations<br>=> Z-diodes/suppressor diodes<br>=> varistors                                                          |
| <b>Reduction factor</b>          | Factor by which service life is reduced when switching inductive loads                                                                                                                                                          |

## Types of Housings for Relay Coupler



### Component housing EG

Weidmüller coupling modules are enclosed in housings appropriate for industrial applications. The housings are suitable for fitting onto mounting rails TS 32, TS 35 x 7.5 or TS 35 x 15 in accordance with European standards EN 50 035 and EN 50 022.

Weidmüller component housings **EG 1** and **EG 2** are 18 mm wide.

The fully enclosed EG housings are equipped with clamping yoke screw connections or push-on connections to connect conductors. Conductors with the following cross-sections can be connected: solid core: 0.5...4 mm<sup>2</sup> or flexible: 0.5...2.5 mm<sup>2</sup>.

The component housing **EG 7** has a special status. It has been specifically designed to accommodate 10-mm slim relays and optocouplers.

**EG 7** relay couplers can be optionally mounted onto TS 32 or TS 35 rails.

The RST EG 7 locking socket is also available for use with the pluggable relays couplers.

The enclosed EG 7 housing are equipped with clamping yoke screw connections. The following conductor cross-sections can be connected: NO/NC: 0.5...1.5 mm<sup>2</sup> Changeover (RST): 0.5...2.5 mm<sup>2</sup>.



### Component housing WAVEBOX

It is important to provide modern electronics components with housings suitable for the function. Setting and operating functions must be guaranteed; technical requirements with respect to heat dissipation and EMC properties are to be supported.

An ideal design saves space and wiring costs in the switchgear cabinet. In addition, ergonomics and design are becoming increasingly important for high-quality relay coupler interfaces.

The WAVEBOX fulfils these criteria and is further distinguished by the following:

- Optimal width for any application (12.5 mm, 17.5 mm, **22.5 mm**)
- Large component assembly surface; SMDs mountable on solder side
- No tools required for assembly
- Pluggable PCBs
- Pluggable cross-connection via ZQV 2.5 N
- Hinged, transparent cover
- Screw/plug and socket connector BLZ 5.08
- Optional tension clamp/plug and socket connector BLFZ 5.08
- Marking option with WS tags
- Mount onto TS 35

#### Connection systems

BLZ screw/plug-in connectors and BLZF tension clamp/plug-in systems for flexible conductors up to 2.5 mm<sup>2</sup>, to guarantee maximum wiring flexibility.

#### Removing printed circuit boards

Accomplished by depressing the locking clips at the side of the headpiece, and withdrawing the terminal level and PCB from the housing. This is not permitted when the supply is connected.

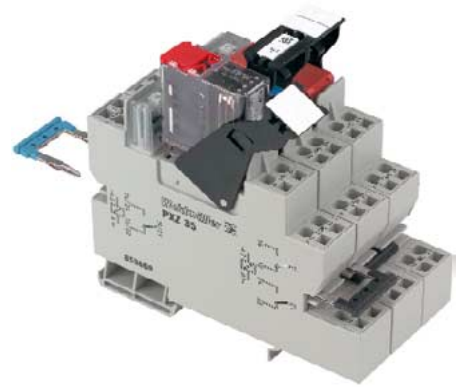
#### Cross-connection

The ZQV 2.5 N/2 cross-connector can connect housings of the same family at the base of the housing. The cross-connection can be loaded with a current of up to 8 A. This allows the supply voltage to be cross-connected from one electronics module to another.

The voltage at the cross-connection must not exceed 50 V.

#### Ventilation vents

Ventilation vents, arranged at an angle, temper and ventilate the lower side of the housings.



### Modular system PLUGSERIES/PLUGRELAY

is a new generation of pluggable relay couplers. The core of this system is an innovative relay socket **PXS** or **PXZ**. Weidmüller has combined the functionality and experience from its relay and terminal block business in this product.

The PLUGRELAY is the ideal connection technology between the relay and the application.

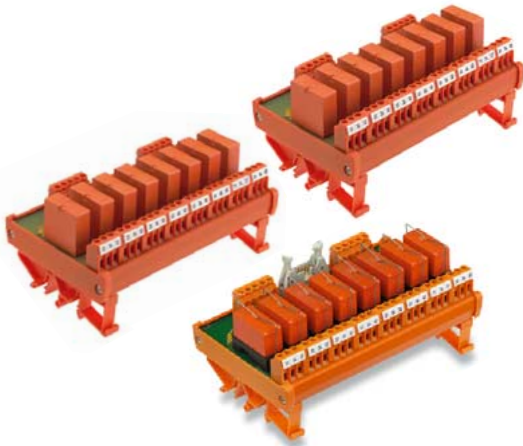
#### Modular system principle

The PLUGSERIES is particularly service friendly.

Commercially available relays are plugged; retainer and release clips ensure stability, LED indicators with free-wheeling diodes can be easily plugged.

- Relays can be easily plugged
  - suitable for small electric circuits standard design and BGD
- Independent connection technology: screw or tension clamp rated cross-section 0.5...2.5 mm<sup>2</sup>
- Robust design of retainer / release clip
- One or two changeover contacts Max. current switched 16 A
- Low wiring costs thanks to ZQV 25N cross-connectors (pluggable)
- Service-friendly modular system
  - relay socket, LED indicators, retainer clips and relays
  - mount onto TS 35
  - marking options with WS markers on retainer clips
- Pluggable LED indicator with free-wheeling diode

## Types of Housings for Relay Coupler



### Weidmüller RS locking socket

Locking sockets with relays RS 30, 31, 32 are either 11.2 mm or 25 mm wide depending on version. The open profile makes the use of pluggable relays possible.

Modules mounted onto the locking sockets are provided with clamping yoke screw connections or push-on connectors for wiring conductors.

Conductors with the following cross-sections can be connected:

solid core: 0.5...4 mm<sup>2</sup>  
flexible: 0.5...2.5 mm<sup>2</sup>.

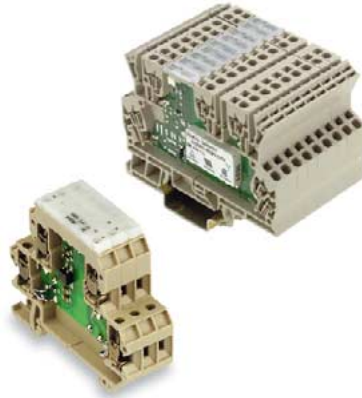
### Locking sockets with multiple interfaces

RSM multiple interfaces can be optionally assembled with 4, 8 or 16 relays.

To save wiring costs on the input side, variants are offered with joint positive and negative potentials.

The PCB connectors are provided with clamping yoke screw connections for conductors with the following cross-sections:  
solid core: 0.5...4 mm<sup>2</sup>  
flexible: 0.5...2.5 mm<sup>2</sup>.

Some versions of the RSM coupler have a male connector block available for connecting pre-assembled cables on the input side in accordance with IEC 603-1/DIN 41 651.



### Minicoupler DK

All DKR mini coupler components fulfil demands for slimmest possible design. The sensational width of only 6 mm is achieved by using state-of-the-art surface mountable components SMDs. 4 and 5 screw-connections are offered for 0.5...4 mm<sup>2</sup> conductor cross-sections. The mini couplers offer a wide spectrum for coupling digital sensor/actuator signals between automation devices and the field process. DKR relay couplers can receive and standardise signals with varying voltages from the field.

### Miniconditioner MCZ

The 6-mm MCZ housing is one of the slimmest of its kind. It has the following distinguishing features:

- Z-spring reduces mounting costs
- integrated cross-connection options in the input and outputs minimise wiring costs

MCZR miniconditioner (relay coupler) are available with 4 or 5 Z-spring connections. The clampable conductor cross-section is 0.5...1.5 mm<sup>2</sup>.



### MICROSERIES

The relay coupler and optocoupler variants from the **MICROSERIES** are used in applications in industrial automation to isolate and couple digital input and output signals. Their compact design means that they are particularly suitable for use on sub-distribution boards as well as in switchgear cabinets where they help the user to make optimum use of valuable switching space. With its compact design, the **MICROSERIES** elegantly combines the functionality of the classic coupling level and the terminal level.

- 6.1-mm mounting width
- Pluggable cross-connections of four potentials in the inputs and outputs
- Proven cross-connection system ZQV 4 N
- Wide input voltage spectrum from 5 ... 230 V
- LED-indicator reverse-connect protection free-wheeling diode
- Housing material: WEMID  
Flammability class: V0 in accordance with UL 94
- Innovative retaining and release system
- Marking surfaces for fitting standard WS 12/6 markers

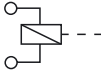
### CE-marking

Weidmüller relay couplers are marked with the CE symbol and comply with the requirements of EN 50 081 Part 1 and EN 50 082 Part 2. They can therefore be used for both industrial as well as for applications in residential, commercial and light industry.

Appropriate ESD measures should be taken during installation. If supply cables are particularly long, overvoltage protection should be provided to prevent interference from electrical disturbance in the atmosphere.

# Relay Coupler

## Electromechanical switching

| Output                                                                                 |        |                                                                                                         |                                                                                                         |                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
|----------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 24 V  |        |                        |                        |                        |  |  |  |      |                                                      |                                      |
|                                                                                        |        |                                                                                                         |                                                                                                         | 2 x                                                                                                     |                                                                                   | 3 x                                                                               |                                                                                   | 2 x                                                                                     | 4 x                                                                                                                                     | 8 x 16 x                                                                                                                |
| Housing                                                                                | EG     | ● 0133660000<br>Page 72                                                                                 | ● 0133560000<br>Page 72                                                                                 |                                                                                                         |                                                                                   |                                                                                   |                                                                                   | ● 0160260000<br>Page 73                                                                 |                                                                                                                                         |                                                                                                                         |
|                                                                                        |        | ● 0536260000<br>Page 72                                                                                 | ● 0542660000<br>Page 72                                                                                 |                                                                                                         |                                                                                   |                                                                                   |                                                                                   | ● 0123060000<br>Page 73                                                                 |                                                                                                                                         |                                                                                                                         |
| WAVESERIES<br>WRS                                                                      |        |                                                                                                         |                                                                                                         | ● 8275350000<br>● 8286280000<br>● 8416210000<br>● 8418220000<br>● 8418230000<br>Page 74                 | ● 8418240000<br>● 8418250000<br>Page 76                                           | ● 8418270000<br>● 8418280000<br>Page 77                                           | ● 8418330000<br>Page 79                                                           | ● 8418300000<br>● 8418310000<br>● 8418320000<br>Page 78                                 |                                                                                                                                         |                                                                                                                         |
|                                                                                        | EG 7*  | ● 8216520000<br>● 8147120000<br>● 8092340000<br>Page 80                                                 | ● 8216530000<br>● 8147140000<br>● 8092350000<br>Page 80                                                 | ● 8216570000<br>● 8216560000<br>● 8216580000<br>Page 80                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
| PLUGSERIES<br>PRS / PRZ                                                                |        |                                                                                                         |                                                                                                         | ● 8530621001<br>● 8530691001<br>● 8536530000<br>● 8536650000<br>Page 82                                 |                                                                                   |                                                                                   |                                                                                   | ● 8530631001<br>● 8530701001<br>● 8536560000<br>● 8536680000<br>Page 82                 |                                                                                                                                         |                                                                                                                         |
|                                                                                        | RS 30  | ● 1101661001<br>● 1101611001<br>● 1101621001<br>● 1101761001<br>● 1101711001<br>● 1101721001<br>Page 91 | ● 1100961001<br>● 1100911001<br>● 1100921001<br>● 1101061001<br>● 1101011001<br>● 1101021001<br>Page 91 | ● 1181511001<br>● 1181521001<br>● 1100260000<br>● 1100210000<br>● 1100220000<br>● 1100360000<br>Page 91 |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
| RS 31                                                                                  |        |                                                                                                         |                                                                                                         | ● 1128361001<br>● 1128331001<br>● 1128311001<br>Page 92                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
|                                                                                        | RS 32  |                                                                                                         |                                                                                                         |                                                                                                         |                                                                                   |                                                                                   |                                                                                   | ● 9406121001<br>● 9406221001<br>Page 94                                                 |                                                                                                                                         |                                                                                                                         |
| RSM                                                                                    |        |                                                                                                         |                                                                                                         |                                                                                                         |                                                                                   |                                                                                   |                                                                                   | ● 1173461001<br>● 1113361001<br>● 1113461001<br>● 1112361001<br>● 1112761001<br>Page 97 | ● 1113161001<br>● 1100061001<br>● 1113561001<br>● 1113661001<br>● 1107761001<br>● 1112661001<br>● 1113861001<br>● 1173561001<br>Page 97 | ● 1113261001<br>● 1100161001<br>● 1113761001<br>● 8018221001<br>● 1107861001<br>● 1113061001<br>● 1173661001<br>Page 97 |
|                                                                                        | DKR 32 | ● 8016620000<br>● 8008110000<br>Page 70                                                                 |                                                                                                         |                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
| DKR 35                                                                                 |        | ● 8016610000<br>● 8008170000<br>Page 70                                                                 |                                                                                                         | ● 8181980000<br>● 8181970000<br>Page 71                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
|                                                                                        |        | ● 8215620000<br>Page 71                                                                                 |                                                                                                         |                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
| DKR 35/32                                                                              |        |                                                                                                         |                                                                                                         | ● 9454910000<br>Page 71                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
|                                                                                        | MCZ R  |                                                                                                         |                                                                                                         | ● 8365980000<br>● 8442960000<br>● 8390590000<br>Page 68                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |
| MICROSERIES<br>MRS / MRZ                                                               |        |                                                                                                         |                                                                                                         | ● 8533640000<br>● 8533660000<br>● 8556050000<br>● 8556120000<br>Page 87                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                         |                                                                                                                                         |                                                                                                                         |

\* Approval by Germanischer Lloyd

Reliable  
separation

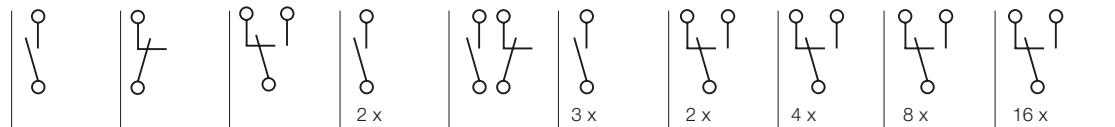
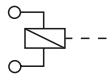
● 24 V dc  
● 24 V<sub>uc</sub>/ac

# Relay Coupler

## Electromechanical switching

### Output

48 V



### Housing

|                                 |                                                                                                         |                                                                                                         |                                                                         |                         |                         |  |                                                                         |                                         |                                         |  |
|---------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------|-------------------------|--|-------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|--|
| <b>EG</b>                       | ● 0662660000<br>Page 72                                                                                 | ● 0662460000<br>Page 72                                                                                 |                                                                         |                         |                         |  | ● 0160360000<br>● 0123260000<br>Page 73                                 |                                         |                                         |  |
| <b>WAVESERIES</b><br>WRS        |                                                                                                         |                                                                                                         | ● 8286280000<br>Page 74                                                 | ● 8418250000<br>Page 76 | ● 8418280000<br>Page 77 |  | ● 8418310000<br>Page 78                                                 |                                         |                                         |  |
| <b>EG 7*</b>                    | ● 8092370000<br>Page 81                                                                                 | ● 8092380000<br>Page 81                                                                                 | ● 8216590000<br>Page 81                                                 |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>RS 30</b>                    | ● 1101861001<br>● 1101811001<br>● 1101821001<br>● 1101961001<br>● 1101911001<br>● 1101921001<br>Page 91 | ● 1101161001<br>● 1101111001<br>● 1101121001<br>● 1101261001<br>● 1101211001<br>● 1101221001<br>Page 91 | ● 1100460000<br>● 1100410000<br>● 1100420000<br>● 1100560000<br>Page 91 |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>RS 31</b>                    |                                                                                                         |                                                                                                         | ● 1150761001<br>Page 92                                                 |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>RS 32</b>                    |                                                                                                         |                                                                                                         |                                                                         |                         |                         |  | ● 9406321001<br>Page 94<br>● 9406421001<br>● 1122661001<br>Page 95      |                                         |                                         |  |
| <b>RSM</b>                      |                                                                                                         |                                                                                                         |                                                                         |                         |                         |  | ● 1114061001<br>● 1113961001<br>● 1112461001<br>● 1173761001<br>Page 97 | ● 1114161001<br>● 1114261001<br>Page 97 | ● 1114361001<br>● 1114461001<br>Page 97 |  |
| <b>MICROSERIES</b><br>MRS / MRZ |                                                                                                         |                                                                                                         | ● 8556040000<br>● 8556110000<br>Page 87                                 |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>115 V</b>                    |                                                                                                         |                                                                                                         |                                                                         |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>EG</b>                       |                                                                                                         |                                                                                                         |                                                                         |                         |                         |  | ● 0141360000<br>● 0160460000<br>Page 73                                 |                                         |                                         |  |
| <b>WAVESERIES</b><br>WRS        |                                                                                                         |                                                                                                         | ● 8418220000<br>Page 75                                                 | ● 8418260000<br>Page 76 | ● 8418290000<br>Page 77 |  |                                                                         |                                         |                                         |  |
| <b>EG 7*</b>                    | ● 8092430000<br>Page 81                                                                                 | ● 8092440000<br>Page 81                                                                                 | ● 8216610000<br>Page 81                                                 |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>PLUGSERIES</b><br>PRS / PRZ  |                                                                                                         |                                                                                                         | ● 8536510000<br>● 8536610000<br>● 8530640000<br>● 8530790000<br>Page 82 |                         |                         |  | ● 8536520000<br>● 8536630000<br>● 8530660000<br>● 8530720000<br>Page 82 |                                         |                                         |  |
| <b>RS 30</b>                    | ● 1155161001<br>● 1155111001<br>● 1155121001<br>● 1102161001<br>● 1102111001<br>● 1102121001<br>Page 91 | ● 1155211001<br>● 1155261001<br>● 1155221001<br>● 1101461001<br>● 1101411001<br>● 1101421001<br>Page 91 |                                                                         |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>RS 31</b>                    |                                                                                                         |                                                                                                         | ● 1150361001<br>● 1150461001<br>Page 92                                 |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>RS 32</b>                    |                                                                                                         |                                                                                                         |                                                                         |                         |                         |  | ● 1122761001<br>● 9406621001<br>Page 95                                 |                                         |                                         |  |
| <b>RSM</b>                      |                                                                                                         |                                                                                                         |                                                                         |                         |                         |  | ● 1114561001<br>Page 97                                                 | ● 1114661001<br>Page 97                 | ● 1114761001<br>Page 97                 |  |
| <b>MCZ R</b>                    |                                                                                                         |                                                                                                         | ● 8420880000<br>● 8467470000<br>Page 61                                 |                         |                         |  |                                                                         |                                         |                                         |  |
| <b>MICROSERIES</b><br>MRS / MRZ |                                                                                                         |                                                                                                         | ● 8556030000<br>● 8556100000<br>Page 87                                 |                         |                         |  |                                                                         |                                         |                                         |  |

\* Approval by Germanischer Lloyd

Reliable  
separation

● Vdc  
● Vuc/ac

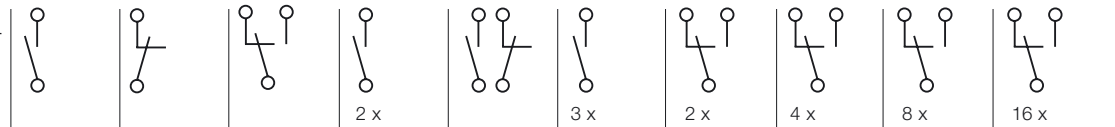
Digital signal  
processing

# Relay Coupler

## Electromechanical switching

### Output

230 V



### Housing

|                                 |                         |                         |                         |                         |                         |                         |                         |                         |                         |
|---------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <b>EG</b>                       | ● 0543860000<br>Page 72 | ● 0543660000<br>Page 72 |                         |                         |                         |                         | ● 0142460000<br>Page 73 |                         |                         |
| <b>WAVESERIES</b><br>WRS        |                         |                         | ● 8418230000<br>Page 75 | ● 8418260000<br>Page 76 | ● 8418290000<br>Page 77 | ● 8418340000<br>Page 79 | ● 8418320000<br>Page 78 |                         |                         |
| <b>EG 7*</b>                    | ● 8092460000<br>Page 81 | ● 8092470000<br>Page 81 | ● 8216620000<br>Page 81 |                         |                         |                         |                         |                         |                         |
| <b>PLUGSERIES</b><br>PRS / PRZ  |                         |                         | ● 8530671001<br>Page 82 |                         |                         |                         | ● 8530681001<br>Page 82 |                         |                         |
| <b>RS 30</b>                    | ● 1102261001<br>Page 91 | ● 1101561001<br>Page 91 | ● 1100860000<br>Page 91 |                         |                         |                         |                         |                         |                         |
| <b>RS 31</b>                    |                         |                         | ● 1128461001<br>Page 93 |                         |                         |                         |                         |                         |                         |
| <b>RS 32</b>                    |                         |                         |                         |                         |                         |                         | ● 9406721001<br>Page 95 |                         |                         |
| <b>RSM</b>                      |                         |                         |                         |                         |                         |                         | ● 1114861001<br>Page 97 | ● 1114961001<br>Page 97 | ● 1115061001<br>Page 97 |
| <b>MCZ R</b>                    |                         |                         | ● 8237710000<br>Page 69 |                         |                         |                         |                         |                         |                         |
| <b>MICROSERIES</b><br>MRS / MRZ |                         |                         | ● 8556020000<br>Page 87 |                         |                         |                         |                         |                         |                         |
| <b>240 V</b>                    |                         |                         |                         |                         |                         |                         |                         |                         |                         |
| <b>RS 30</b>                    | ● 1128561001<br>Page 91 | ● 1128661001<br>Page 91 |                         |                         |                         |                         |                         |                         |                         |

\* Approval by Germanischer Lloyd

Reliable  
separation

● 230 Vuc/ac

# Relay Coupler

## Electromechanical switching

|                          |  | Output                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     |                                         |                                                                                     |     |                                                                                     |     |                                                                                     |      |
|--------------------------|--|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|------|
| 12 V                     |  |  |  |  |  |  | 2 x |  |  | 3 x |  | 2 x                                     |  | 4 x |  | 8 x |  | 16 x |
| Housing                  |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     |                                         |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| EG                       |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     | ● 0160160000<br>Page 73                 |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| WAVESERIES<br>WRS        |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 8418240000<br>Page 76                                                           |     | ● 8418270000<br>Page 77                                                           |                                                                                   |     |                                                                                     | ● 8418300000<br>Page 78                 |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| EG 7*                    |  | ● 8092310000<br>Page 80                                                           | ● 8092320000<br>Page 80                                                           | ● 8216550000<br>Page 80                                                           |                                                                                   |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     |                                         |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| PLUGSERIES<br>PRS / PRZ  |  |                                                                                   |                                                                                   |                                                                                   | ● 8536471001<br>● 8536571001<br>Page 82                                           |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     | ● 8536501001<br>● 8536591001<br>Page 82 |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| RS 30                    |  | ● 1129421001<br>Page 91                                                           | ● 1129521001<br>Page 91                                                           | ● 1129660000<br>Page 91                                                           |                                                                                   |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     |                                         |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| RS 32                    |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     | ● 9406021001<br>Page 94                 |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| DKR 35                   |  | ● 8171100000<br>Page 70                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     |                                         |                                                                                     |     |                                                                                     |     |                                                                                     |      |
| MICROSERIES<br>MRS / MRZ |  |                                                                                   |                                                                                   |                                                                                   | ● 8556070000<br>● 8556140000<br>Page 86                                           |                                                                                   |     |                                                                                   |                                                                                   |     |                                                                                     |                                         |                                                                                     |     |                                                                                     |     |                                                                                     |      |

|                                |  | Output                                                                              |                                                                                     |                                                                                     |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
|--------------------------------|--|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------|------|
| 4...60 V                       |  |  |  |  |  | 2 x |  | 3 x |  | 2 x                     |  | 4 x |  | 8 x |  | 16 x |
| Housing                        |  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| WAVESERIES<br>WRS 2, 4...24 V  |  |                                                                                     |                                                                                     | ● 8275320000<br>Page 74                                                             |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| WAVESERIES<br>WRS 60 V         |  |                                                                                     |                                                                                     | ● 8418210000<br>Page 74                                                             |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| EG 7*, 60 V                    |  | ● 8092400000<br>Page 81                                                             | ● 8092410000<br>Page 81                                                             | ● 8216600000<br>Page 81                                                             |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| RS 30, 60 V                    |  | ● 1102061001<br>● 1102011001<br>● 1102021001<br>Page 91                             |                                                                                     | ● 1100660000<br>● 1100610000<br>● 1100620000<br>Page 91                             |                                                                                     |     |                                                                                     |     |                                                                                       | ● 9406521001<br>Page 94 |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| DKR 32, 5 V                    |  | ● 8019600000<br>Page 70                                                             |                                                                                     |                                                                                     |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| DKR 35, 5 V                    |  | ● 8019610000<br>Page 70                                                             |                                                                                     |                                                                                     |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| MCZ R, 60 V                    |  |                                                                                     |                                                                                     | ● 8470380000<br>Page 68                                                             |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| MICROSERIES<br>MRS / MRZ, 5 V  |  |                                                                                     |                                                                                     | ● 8556080000<br>● 8556150000<br>Page 86                                             |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |
| MICROSERIES<br>MRS / MRZ, 60 V |  |                                                                                     |                                                                                     | ● 8556060000<br>● 8556130000<br>Page 87                                             |                                                                                     |     |                                                                                     |     |                                                                                       |                         |                                                                                       |     |                                                                                       |     |                                                                                       |      |

\* Approval by Germanischer Lloyd

Reliable  
separation

● Vdc  
● Vuc/ac

Digital signal  
processing

# Relay Couplers in Component Housings

## Miniconditioners MCZ R

## MCZ R 24 Vdc

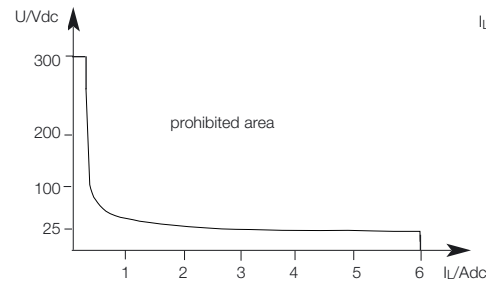
## MCZ R 24 Vdc/Au

## MCZ R 24 Vac/dc

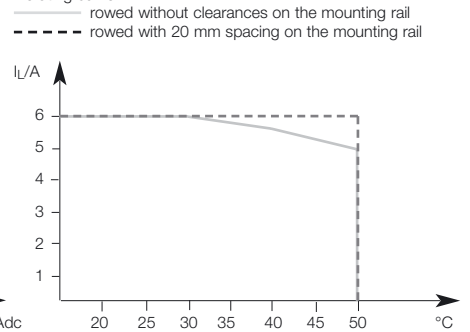
## MCZ R 60 Vdc



Limit diagram



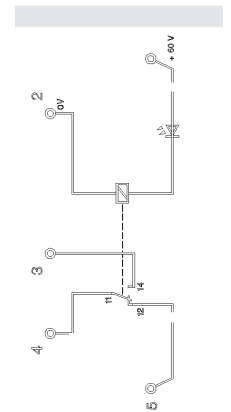
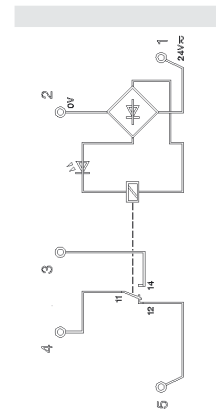
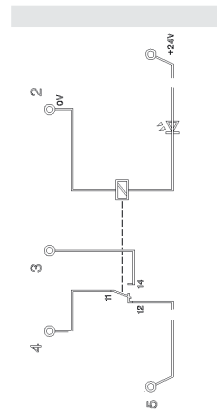
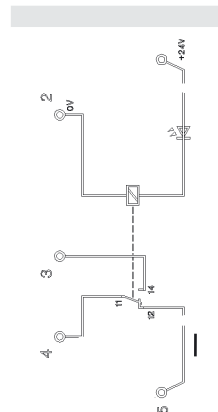
Derating curve



### Schematic circuit diagram

This module can be used as a universal interface between the controller and actuator for switching medium-sized loads.

- Reduces installation and commissioning times by use of the proven Z-spring connection technology
- Pluggable cross-connections in input and output minimise wiring costs
- 6-mm width



| Ordering data                                                    | Type                                                                        | Cat. No.   | Type                                                                        | Cat. No.   | Type                                                                           | Cat. No.   | Type                                                                        | Cat. No.   |
|------------------------------------------------------------------|-----------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------|------------|
| for TS 35                                                        | MCZ R 24 Vdc                                                                | 8365980000 | MCZ R 24 Vdc/Au                                                             | 8442960000 | MCZ R 24 Vac/dc                                                                | 8390590000 | MCZ R 60 Vdc                                                                | 8470380000 |
| Technical data                                                   |                                                                             |            |                                                                             |            |                                                                                |            |                                                                             |            |
| <b>Input</b>                                                     |                                                                             |            |                                                                             |            |                                                                                |            |                                                                             |            |
| Input voltage                                                    | 24 Vdc $\pm 20\%$ (19.2...28.8 V)                                           |            | 24 Vdc $\pm 20\%$ (19.2...28.8 V)                                           |            | 24 Vac/dc $\pm 10\%$ (21.6...26.4 V)                                           |            | 60 Vdc $\pm 20\%$ (48...72 V)                                               |            |
| Input current at $U_N$                                           | 6.3 mA $\pm 10\%$ (5.7...6.9 mA)                                            |            | 6.3 mA $\pm 10\%$ (5.7...6.9 mA)                                            |            | ac: 10.8 mA $\pm 15\%$ (9.2...12.4 mA)<br>dc: 6.1 mA $\pm 15\%$ (5.2...7.1 mA) |            | 3 mA $\pm 20\%$ (12.4...3.6 mA)                                             |            |
| Max. input power                                                 | 156 mW $\pm 10\%$                                                           |            | 156 mW $\pm 10\%$                                                           |            | ac: 160 mVA $\pm 10\%$<br>dc: 151 mW $\pm 10\%$                                |            | 180 mW $\pm 45\%$                                                           |            |
| Making threshold                                                 | 12 V...19 V                                                                 |            | 12 V...19 V                                                                 |            | ac: ca. 17 V / dc: ca. 19 V                                                    |            | ca. 38 V                                                                    |            |
| Cut-out threshold                                                | 4 V...5.5 V                                                                 |            | 4 V...5.5 V                                                                 |            | ac: ca. 7 V / dc: ca. 4 V                                                      |            | ca. 14 V                                                                    |            |
| Reaction time at $U_N$ (typ.)                                    | 4.5 ms                                                                      |            | 4.5 ms                                                                      |            | 5 ms                                                                           |            | 4.5 ms                                                                      |            |
| Release at $U_N$ (typ.)                                          | 10 ms                                                                       |            | 10 ms                                                                       |            | 30 ms                                                                          |            | 10 ms                                                                       |            |
| Capacity working resistance to reduction at dissipated energy    | no                                                                          |            | no                                                                          |            | no                                                                             |            | no                                                                          |            |
| Functionality                                                    | operating indication<br>reverse polarity protect. diode<br>free wheel diode |            | operating indication<br>reverse polarity protect. diode<br>free wheel diode |            | operating indication<br>bridge rectifier                                       |            | operating indication<br>reverse polarity protect. diode<br>free wheel diode |            |
| Cross-connection on pin                                          | 2, 3, 4                                                                     |            | 2, 3, 4                                                                     |            | 2, 3, 4                                                                        |            | 2, 3, 4                                                                     |            |
| <b>Output</b>                                                    |                                                                             |            |                                                                             |            |                                                                                |            |                                                                             |            |
| Switching voltage                                                | 1 changeo. cont. (AgSnO <sub>2</sub> )<br>max. 300 Vdc / 400 Vac            |            | 1 changeo. cont. (5 $\mu$ Au)<br>max. 300 Vdc / 400 Vac                     |            | 1 changeo. cont. (AgSnO <sub>2</sub> )<br>max. 300 Vdc / 400 Vac               |            | 1 changeo. cont. (AgSnO <sub>2</sub> )<br>max. 300 Vdc / 400 Vac            |            |
| ac: continuous current/switching power (see derating diagram)    | max. 6 A / max. 1500 VA                                                     |            | max. 6 A* / max. 1500 VA                                                    |            | max. 6 A / max. 1500 VA                                                        |            | max. 6 A / max. 1500 VA                                                     |            |
| Min. switching current                                           | 100 mA (at U = 10 V)                                                        |            | 1) 0.1 mA                                                                   |            | 100 mA (at U = 10 V)                                                           |            | 100 mA (at U = 10 V)                                                        |            |
| Switch-on current                                                | max. 6 A                                                                    |            | max. 6 A*                                                                   |            | max. 6 A                                                                       |            | max. 6 A                                                                    |            |
| dc: Continuous current/switching power                           | see limit diagram                                                           |            | see limit diagram                                                           |            | see limit diagram                                                              |            | see limit diagram                                                           |            |
| Mechanical service life                                          | 20 x 10 <sup>6</sup> switching operations                                   |            | 20 x 10 <sup>6</sup> switching operations                                   |            | 20 x 10 <sup>6</sup> switching operations                                      |            | 20 x 10 <sup>6</sup> switching operations                                   |            |
| Max. switching frequency at nominal load                         | 0.1 Hz                                                                      |            | 0.1 Hz                                                                      |            | 0.1 Hz                                                                         |            | 0.1 Hz                                                                      |            |
| <b>Insulation coordination acc. to EN 50178</b>                  |                                                                             |            |                                                                             |            |                                                                                |            |                                                                             |            |
| Rated voltage                                                    | 300 V                                                                       |            | 300 V                                                                       |            | 300 V                                                                          |            | 300 V                                                                       |            |
| Rated impulse voltage                                            | 4 kV                                                                        |            | 4 kV                                                                        |            | 4 kV                                                                           |            | 4 kV                                                                        |            |
| Overvoltage category                                             | III                                                                         |            | III                                                                         |            | III                                                                            |            | III                                                                         |            |
| Pollution severity                                               | 2                                                                           |            | 2                                                                           |            | 2                                                                              |            | 2                                                                           |            |
| Clearances and creepage distances                                | $\geq 5.5$ mm                                                               |            | $\geq 5.5$ mm                                                               |            | $\geq 5.5$ mm                                                                  |            | $\geq 5.5$ mm                                                               |            |
| Insulation coord.- and voltage proof, input/output mounting rail | 4 kV <sub>eff</sub> / 1 min                                                 |            | 4 kV <sub>eff</sub> / 1 min                                                 |            | 4 kV <sub>eff</sub> / 1 min                                                    |            | 4 kV <sub>eff</sub> / 1 min                                                 |            |
| Ambient temperature                                              | -25 °C...+50 °C                                                             |            | -25 °C...+50 °C                                                             |            | -25 °C...+50 °C                                                                |            | -25 °C...+50 °C                                                             |            |
| Storage temperature                                              | -40 °C...+60 °C                                                             |            | -40 °C...+60 °C                                                             |            | -40 °C...+60 °C                                                                |            | -40 °C...+60 °C                                                             |            |
| Conductor                                                        | AWG 22...12                                                                 |            | AWG 22...12                                                                 |            | AWG 22...12                                                                    |            | AWG 22...12                                                                 |            |
| Conductor cross-section                                          | 1.5 mm <sup>2</sup>                                                         |            | 1.5 mm <sup>2</sup>                                                         |            | 1.5 mm <sup>2</sup>                                                            |            | 1.5 mm <sup>2</sup>                                                         |            |
| Approvals                                                        | CE, UL, CSA, GL                                                             |            | CE, UL, CSA, GL                                                             |            | CE, UL, CSA, GL                                                                |            | CE, UL, CSA                                                                 |            |
| Overall width                                                    | 6 mm                                                                        |            | 6 mm                                                                        |            | 6 mm                                                                           |            | 6 mm                                                                        |            |
| <b>Accessories</b>                                               | Type                                                                        | Cat. No.   | Type                                                                        | Cat. No.   | Type                                                                           | Cat. No.   | Type                                                                        | Cat. No.   |
| End plate                                                        | AP MCZ 1.5                                                                  | 8389030000 | AP MCZ 1.5                                                                  | 8389030000 | AP MCZ 1.5                                                                     | 8389030000 | AP MCZ 1.5                                                                  | 8389030000 |
| Further accessories, dimensions and connection data see          | Page 305                                                                    |            | Page 305                                                                    |            | Page 305                                                                       |            | Page 305                                                                    |            |

<sup>1)</sup> depends on load conditions

\* the hard-gold plating is resistant for parameters 36 Vdc, 50 mA with 10<sup>6</sup> cycles

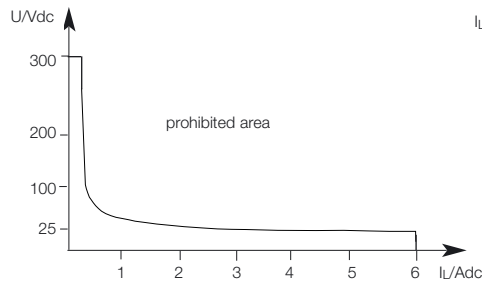
# Relay Couplers in Component Housings

## MCZ R 110 Vdc

## MCZ R 120 Vac

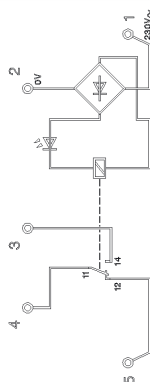
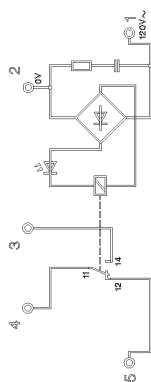
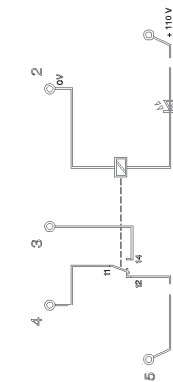
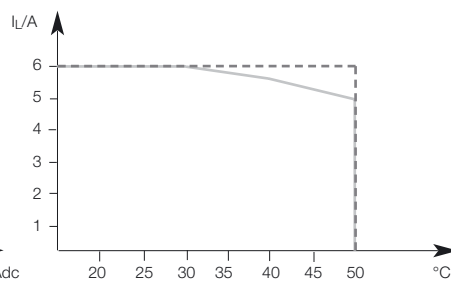
## MCZ R 230 Vac

Limit diagram



Derating curve

— rowed without clearances on the mounting rail  
- - - rowed with 20 mm spacing



| Type                                      | Cat. No.          | Type                                      | Cat. No.          | Type                                      | Cat. No.          |
|-------------------------------------------|-------------------|-------------------------------------------|-------------------|-------------------------------------------|-------------------|
| MCZ R 110 Vdc                             | <b>8467470000</b> | MCZ R 120 Vac                             | <b>8420880000</b> | MCZ R 230 Vac                             | <b>8237710000</b> |
| 110 Vdc ±10%                              |                   | 120 Vac -15 %/+10 %                       |                   | 230 Vac ±10%                              |                   |
| 2.85 mA ±25%                              |                   | 7 mA ±15 %                                |                   | 9.5 mA ±15 % (8...11mA)                   |                   |
| 340 mW ±25%                               |                   | 0.85 VA ±15 %<br>(380 mW ±15 %)           |                   | 2.1 VA ±15 %                              |                   |
| ca. 68 V / 1.6 mA                         |                   | ca. 70 V / 4 mA                           |                   | ca. 115 V / 5 mA                          |                   |
| ca. 19 V / 0.4 mA                         |                   | ca. 22 V / 1.3 mA                         |                   | ca. 60 V / 2.5 mA                         |                   |
| 4.5 ms                                    |                   | 8 ms                                      |                   | 8 ms                                      |                   |
| 10 ms                                     |                   | 30 ms                                     |                   | 30 ms                                     |                   |
| no                                        |                   | yes                                       |                   | no                                        |                   |
| operating indication                      |                   | operating indication                      |                   | operating indication                      |                   |
| bridge rectifier                          |                   | bridge rectifier                          |                   | bridge rectifier                          |                   |
| 2, 3, 4                                   |                   | 2,3, 4                                    |                   | 2,3, 4                                    |                   |
| 1 changeo. cont. (AgSnO <sub>2</sub> )    |                   | 1 changeo. cont. (AgSnO <sub>2</sub> )    |                   | 1 changeo. cont. (AgSnO <sub>2</sub> )    |                   |
| max. 300 Vdc / 400 Vac                    |                   | max. 300 Vdc / 400 Vac                    |                   | max. 300 Vdc / 400 Vac                    |                   |
| max. 6 A / max. 1500 VA                   |                   | max. 6 mA / max. 1500 VA                  |                   | max. 6 A / max. 1500 VA                   |                   |
| 100 mA (at U = 10 V)                      |                   | 100 mA (at U = 10 V)                      |                   | 100 mA (at U = 10 V)                      |                   |
| max. 6 A                                  |                   | max. 6 A                                  |                   | max. 6 A                                  |                   |
| see limit diagram                         |                   | see limit diagram                         |                   | see limit diagram                         |                   |
| 20 x 10 <sup>6</sup> switching operations |                   | 20 x 10 <sup>6</sup> switching operations |                   | 20 x 10 <sup>6</sup> switching operations |                   |
| 0.1 Hz                                    |                   | 0.1 Hz                                    |                   | 0.1 Hz                                    |                   |
| 300 V                                     |                   | 300 V                                     |                   | 300 V                                     |                   |
| 4 kV                                      |                   | 4 kV                                      |                   | 4 kV                                      |                   |
| III                                       |                   | III                                       |                   | III                                       |                   |
| 2                                         |                   | 2                                         |                   | 2                                         |                   |
| ≥ 5.5 mm                                  |                   | ≥ 5.5 mm                                  |                   | ≥ 5.5 mm                                  |                   |
| 4 kV <sub>eff</sub> / 1 min               |                   | 4 kV <sub>eff</sub> / 1 min               |                   | 4 kV <sub>eff</sub> / 1 min               |                   |
| -25 °C...+50 °C                           |                   | -25 °C...+50 °C                           |                   | -25 °C...+50 °C                           |                   |
| -40 °C...+60 °C                           |                   | -40 °C...+60 °C                           |                   | -40 °C...+60 °C                           |                   |
| AWG 22...12                               |                   | AWG 22...12                               |                   | AWG 22...12                               |                   |
| 1.5 mm <sup>2</sup>                       |                   | 1.5 mm <sup>2</sup>                       |                   | 1.5 mm <sup>2</sup>                       |                   |
| CE, UL, CSA                               |                   | CE, UL, CSA                               |                   | CE, UL, CSA                               |                   |
| 6 mm                                      |                   | 6 mm                                      |                   | 6 mm                                      |                   |
| Type                                      | Cat. No.          | Type                                      | Cat. No.          | Type                                      | Cat. No.          |
| AP MCZ 1.5                                | <b>8389030000</b> | AP MCZ 1.5                                | <b>8389030000</b> | AP MCZ 1.5                                | <b>8389030000</b> |
| Page 305                                  |                   | Page 305                                  |                   | Page 305                                  |                   |

## Relay Couplers in Component Housings Mini coupler DKR

These modules are used for protective separation of input signals and adjustment of signal levels

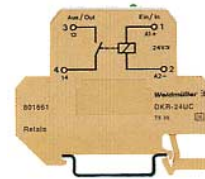
- Cost-effective solution for adjustment of power and potential
- Low input power
- Screw connection technology
- 6-mm width

DKR 5 Vdc

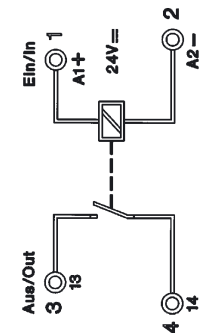
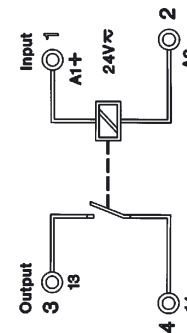
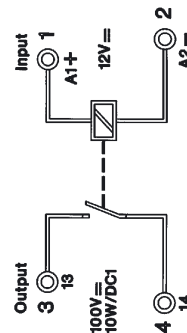
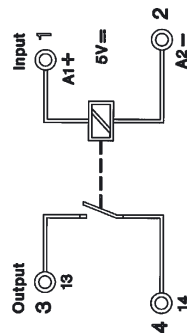
DKR 12 Vdc

DKR 24 Vac/dc

DKR 24 Vdc



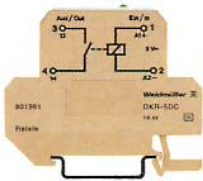
Schematic circuit diagram



| Ordering data                                           |                           | Type                                     | Cat. No.   | Type                                     | Cat. No.   | Type                                     | Cat. No.   | Type                                     | Cat. No.   |
|---------------------------------------------------------|---------------------------|------------------------------------------|------------|------------------------------------------|------------|------------------------------------------|------------|------------------------------------------|------------|
| for TS 32                                               | Y                         | DKR 5 Vdc                                | 8019600000 |                                          |            | DKR 24 Vac/dc                            | 8008110000 | DKR 24 Vdc                               | 8016620000 |
| for TS 35                                               | W                         | DKR 5 Vdc                                | 8019610000 | DKR 12 Vdc                               | 8171100000 | DKR 24 Vac/dc                            | 8016610000 | DKR 24 Vdc                               | 8008170000 |
| With combination foot TS 32/TS 35                       |                           |                                          |            |                                          |            |                                          |            |                                          |            |
| Technical data                                          |                           | Input: bottom                            |            | Input: bottom                            |            | Input: bottom                            |            | Input: bottom                            |            |
| Input voltage                                           |                           | 5 Vdc $\pm 5\%$                          |            | 12 Vdc $\pm 10\%$                        |            | 24 Vac/dc $\pm 20\%$                     |            | 24 Vdc $\pm 20\%$                        |            |
| Input current                                           |                           | 12.5 mA                                  |            | 12 mA                                    |            | 11.5 mAac/9 mAac                         |            | 9.3 mA                                   |            |
| Input current, limited = SPS able                       |                           |                                          |            |                                          |            |                                          |            |                                          |            |
| Input power                                             |                           | 65 mW                                    |            | 144 mW                                   |            | 300 mVA/220 mW                           |            | 225 mW                                   |            |
| Pick-up lag                                             |                           | typ. 0.7...2.5 ms                        |            | typ. 0.7...2.5 ms                        |            | 0.6...4.5 ms ac/0.9...1.3 ms dc          |            | typ. 0.7...2.5 ms                        |            |
| Turn off delay                                          |                           | typ. 0.2...2.0 ms                        |            | typ. 0.2...2.0 ms                        |            | 12.7...25 ms ac/14.4...16.4 ms dc        |            | typ. 0.2...2.0 ms                        |            |
| Max. switch-on current                                  |                           | 500 mA                                   |            | 500 mA                                   |            | 500 mA                                   |            | 500 mA                                   |            |
| Max. switching capacity                                 |                           | 10 W/10 VA                               |            | 10 W/10 VA                               |            | 10 W/10 VA                               |            | 10 W/10 VA                               |            |
| Max. output voltage                                     |                           | 100 V                                    |            | 175 V                                    |            | 170 V                                    |            | 100 V                                    |            |
| Max. output current                                     |                           | 500 mA                                   |            | 500 mA                                   |            | 500 mA                                   |            | 500 mA                                   |            |
| Min. output current                                     |                           |                                          |            |                                          |            |                                          |            |                                          |            |
| Max. switching frequency                                |                           | 200 Hz                                   |            | 25 Hz                                    |            | 5 Hz                                     |            | 20 Hz                                    |            |
| Contact material                                        |                           | RH/RU                                    |            | RH/RU                                    |            | RH/RU                                    |            | RH/RU                                    |            |
| Contacts                                                |                           | 1 normally-open contact                  |            | 1 normally-open contact                  |            | 1 normally-open contact                  |            | 1 normally-open contact                  |            |
| Service life                                            | mechanical                | 10 <sup>9</sup> switching operations     |            | 10 <sup>9</sup> switching operations     |            | 10 <sup>9</sup> switching operations     |            | 10 <sup>9</sup> switching operations     |            |
|                                                         | at I <sub>L</sub> = 10 mA | 5 x 10 <sup>8</sup> switching operations |            | 5 x 10 <sup>8</sup> switching operations |            | 5 x 10 <sup>8</sup> switching operations |            | 5 x 10 <sup>8</sup> switching operations |            |
| Insulation coordination acc. to EN 50178                |                           |                                          |            |                                          |            |                                          |            |                                          |            |
| Rated voltage                                           |                           | 150 V                                    |            | 150 V                                    |            | 150 V                                    |            | 150 V                                    |            |
| Rated impulse voltage                                   |                           | 1.5 kV                                   |            | 1.5 kV                                   |            | 1.5 kV                                   |            | 1.5 kV                                   |            |
| Overvoltage category                                    |                           | III                                      |            | III                                      |            | III                                      |            | III                                      |            |
| Pollution severity                                      |                           | 2                                        |            | 2                                        |            | 2                                        |            | 2                                        |            |
| Clearances and creepage distances                       |                           | $\geq 3$ mm                              |            | $\geq 3$ mm                              |            | $\geq 3$ mm                              |            | $\geq 3$ mm                              |            |
| Operating temperature                                   | without clearance         | -25 °C...+40 °C                          |            | -25 °C...+40 °C                          |            | -25 °C...+40 °C                          |            | -25 °C...+40 °C                          |            |
|                                                         | with clearance            | -25 °C...+50 °C                          |            | -25 °C...+50 °C                          |            | -25 °C...+50 °C                          |            | -25 °C...+50 °C                          |            |
| Storage temperature                                     |                           | -40 °C...+60 °C                          |            | -40 °C...+60 °C                          |            | -40 °C...+60 °C                          |            | -40 °C...+60 °C                          |            |
| Conductor                                               |                           | AWG 22...12                              |            | AWG 22...12                              |            | AWG 22...12                              |            | AWG 22...12                              |            |
| Conductor cross-section                                 |                           | 0.5...4 mm <sup>2</sup>                  |            | 0.5...4 mm <sup>2</sup>                  |            | 0.5...4 mm <sup>2</sup>                  |            | 0.5...4 mm <sup>2</sup>                  |            |
| Overall width                                           |                           | 6 mm                                     |            | 6 mm                                     |            | 6 mm                                     |            | 6 mm                                     |            |
| Accessories                                             |                           | Type                                     | Cat. No.   | Type                                     | Cat. No.   | Type                                     | Cat. No.   | Type                                     | Cat. No.   |
| End plate                                               |                           | AP DKT4                                  | 0687560000 | AP DKT4                                  | 0687560000 | AP DKT4                                  | 0687560000 | AP DKT4                                  | 0687560000 |
| Further accessories, dimensions and connection data see |                           | Page 305                                 |            | Page 305                                 |            | Page 305                                 |            | Page 305                                 |            |

## Relay Couplers in Component Housings Mini coupler DKR

DKR 24 Vac/dc



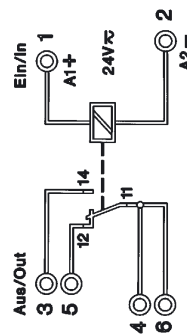
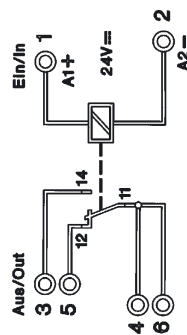
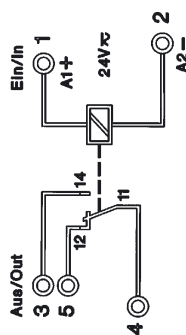
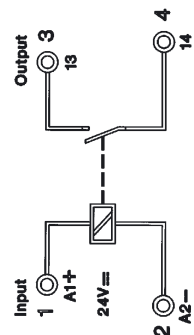
DK5R-1U



DKR 24 Vdc



DKR 24 Vac/dc



| Type                                     | Cat. No.          | Type                                   | Cat. No.          | Type                                      | Cat. No.          | Type                                      | Cat. No.          |
|------------------------------------------|-------------------|----------------------------------------|-------------------|-------------------------------------------|-------------------|-------------------------------------------|-------------------|
| DKR 24 Vdc                               | <b>8215620000</b> | DK5R-1U                                | <b>9454910000</b> | DKR 24 Vdc                                | <b>8181980000</b> | DKR 24 Vac/dc                             | <b>8181970000</b> |
| Input: top                               |                   | Input: bottom                          |                   | Input: bottom                             |                   | Input: bottom                             |                   |
| 24 Vdc ±20 %                             |                   | 24 Vac/dc ±20 %                        |                   | 24 Vdc ±20 %                              |                   | 24 Vac/dc ±20 %                           |                   |
| 9.3 mA                                   |                   | 9 mAac/7 mAdc                          |                   | 11.5 mA                                   |                   | 20 mAac/16 mAdc                           |                   |
|                                          |                   | max. 240 mA                            |                   |                                           |                   | max. 100 mA                               |                   |
| 225 mW                                   |                   | 6 ms                                   |                   | 384 mW                                    |                   | 480 mWac/400 mWdc                         |                   |
| typ. 0.7...2.5 ms                        |                   | 15 ms ac/dc                            |                   |                                           |                   |                                           |                   |
| typ. 0.2...2.0 ms                        |                   |                                        |                   |                                           |                   |                                           |                   |
| 500 mA                                   |                   | 4 A                                    |                   | 5 A                                       |                   | 5 A                                       |                   |
| 10 W/10 VA                               |                   | 1.5 kVA/140 W                          |                   | 2 kVA/192 W                               |                   | 2 kVA/192 W                               |                   |
| 175 Vac/dc                               |                   | 250 Vac/dc                             |                   | 250 Vac/dc                                |                   | 250 Vac/dc                                |                   |
| 500 mA                                   |                   | <b>6 A</b>                             |                   | 8 A                                       |                   | 8 A                                       |                   |
| 25 Hz                                    |                   | 20 Hz                                  |                   | 100 mA                                    |                   | 100 mA                                    |                   |
| RH/RU                                    |                   | Ag Ni                                  |                   | 25 Hz                                     |                   | ac: 5 Hz dc: 25 Hz                        |                   |
| 1 normally-open contact                  |                   | 1 changeover contact                   |                   | AgCdO                                     |                   | 1 changeover contact                      |                   |
| 10 <sup>9</sup> switching operations     |                   | 2x10 <sup>7</sup> switching operations |                   | 1 changeover contact                      |                   | ≥10 <sup>7</sup> switching operations     |                   |
| 5 x 10 <sup>8</sup> switching operations |                   |                                        |                   | ≥10 <sup>7</sup> switching operations     |                   | ≥3 x 10 <sup>6</sup> switching operations |                   |
|                                          |                   |                                        |                   | ≥3 x 10 <sup>6</sup> switching operations |                   |                                           |                   |
| 150 V                                    |                   | 300 V                                  |                   | 300 V                                     |                   | 300 V                                     |                   |
| 1.5 kV                                   |                   | 4 kV                                   |                   | 6 kV                                      |                   | 6 kV                                      |                   |
| III                                      |                   | III                                    |                   | IV                                        |                   | IV                                        |                   |
| 2                                        |                   | 2                                      |                   | 2                                         |                   | 2                                         |                   |
| ≥3 mm                                    |                   | ≥8 mm                                  |                   | ≥8 mm                                     |                   | ≥8 mm                                     |                   |
| -25 °C...+40 °C                          |                   | -40 °C...+60 °C                        |                   | -25 °C...+40 °C                           |                   | -25 °C...+40 °C                           |                   |
| -25 °C...+50 °C                          |                   | -40 °C...+60 °C                        |                   | -25 °C...+50 °C                           |                   | -25 °C...+50 °C                           |                   |
| -40 °C...+60 °C                          |                   | -40 °C...+60 °C                        |                   | -40 °C...+60 °C                           |                   | -40 °C...+60 °C                           |                   |
| AWG 22...12                              |                   | AWG 22...12                            |                   | AWG 22...12                               |                   | AWG 22...12                               |                   |
| 0.5...4 mm <sup>2</sup>                  |                   | 0.5...4 mm <sup>2</sup>                |                   | 0.5...4 mm <sup>2</sup>                   |                   | 0.5...4 mm <sup>2</sup>                   |                   |
| 6 mm                                     |                   | 6 mm                                   |                   | 18 mm                                     |                   | 18 mm                                     |                   |

| Type     | Cat. No.          | Type     | Cat. No.          | Type     | Cat. No.          | Type     | Cat. No.          |
|----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|
| AP DKT4  | <b>0687560000</b> | AP DK5   | <b>8268870000</b> | AP DKT4  | <b>0687560000</b> | AP DKT4  | <b>0687560000</b> |
| Page 305 |                   | Page 305 |                   | Page 305 |                   | Page 305 |                   |

## Relay Coupler in Component Housings EG 2

with 1 NO or 1 NC

**EGR EG 2** 24 V

AC/DC voltage



**EGR EG 2** 24 V

Direct and alternating voltage



**EGR EG 2** 48 V

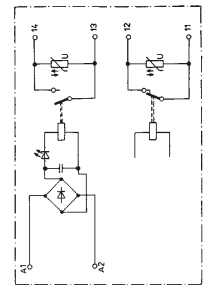
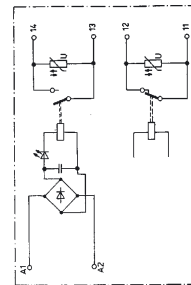
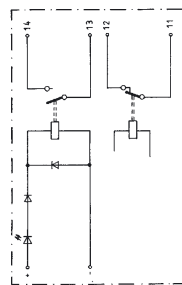


**EGR EG 2** 230 V

AC voltage



### Schematic circuit diagram



### Ordering data

| Type | Cat. No.                       |
|------|--------------------------------|
| NC   | <b>0133560000<sup>1)</sup></b> |
| NO   | <b>0133660000<sup>1)</sup></b> |

| Type | Cat. No.          |
|------|-------------------|
| NC   | <b>0542660000</b> |
| NO   | <b>0536260000</b> |

| Type | Cat. No.          |
|------|-------------------|
| NC   | <b>0662460000</b> |
| NO   | <b>0662660000</b> |

| Type | Cat. No.          |
|------|-------------------|
| NC   | <b>0543660000</b> |
| NO   | <b>0543860000</b> |

### Rated data

#### Input voltage

Rated consumption – (W)

Rated consumption ~ (VA)

Drop-out current of the relay\*\* (at 20 °C)

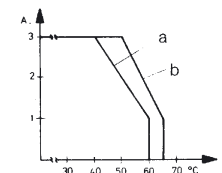
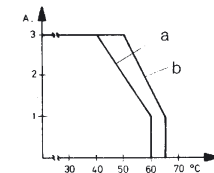
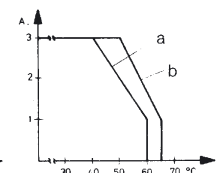
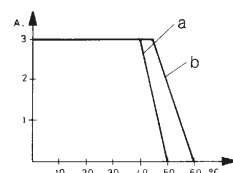
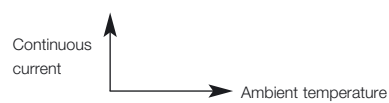
Max. output voltage

Continuous current

Derating curve

a = mounted horizontally on rail without clearance

b = mounted horizontally on rail with clearance x 20 mm



Switch-on current

Max. switching capacity with resistor load

Min. switching capacity/switching current

Bounce times

Switching times, typical

–, pick-up lag

–, turn off delay

Max. switching frequency

Contact material

Service life, mechanical

–, 24 V–, 1 A, resistive load

–, 230 V–, 3 A, resistive load

Status indicator

Storage temperature

Ambient temperature

–, mounted on rail without clearance

–, mounted on rail with clearance ≥ 20 mm

Approvals

### Insulation coordination acc. to EN 50178

Overvoltage category

Pollution severity

Accessories, dimensions and connection data see

\*\* Larger values on request

|                                            |
|--------------------------------------------|
| 5 A                                        |
| 600 VA/120 W                               |
| 40 µW                                      |
| < 2 ms                                     |
| < 5.3 ms                                   |
| < 8.3 ms                                   |
| 50 Hz                                      |
| AgNi, gold-plated                          |
| > 10 <sup>7</sup> switching operations     |
| > 6 x 10 <sup>5</sup> switching operations |
| > 10 <sup>5</sup> switching operations     |
| Green LED                                  |
| –40 °C...+60 °C                            |
| –25 °C...+40 °C                            |
| –25 °C...+50 °C                            |
| CSA (013366)                               |

|                                            |
|--------------------------------------------|
| 5 A                                        |
| 600 VA/120 W                               |
| 40 µW                                      |
| < 2 ms                                     |
| < 8 ms                                     |
| < 22 ms                                    |
| 30 Hz                                      |
| AgNi, gold-plated                          |
| > 10 <sup>7</sup> switching operations     |
| > 6 x 10 <sup>5</sup> switching operations |
| > 10 <sup>5</sup> switching operations     |
| Green LED                                  |
| –40 °C...+60 °C                            |
| –25 °C...+40 °C                            |
| –25 °C...+50 °C                            |

|                                            |
|--------------------------------------------|
| 5 A                                        |
| 600 VA/120 W                               |
| 40 µW                                      |
| < 2 ms                                     |
| < 9 ms                                     |
| < 12 ms                                    |
| 37 Hz                                      |
| AgNi, gold-plated                          |
| > 10 <sup>7</sup> switching operations     |
| > 6 x 10 <sup>5</sup> switching operations |
| > 10 <sup>5</sup> switching operations     |
| Green LED                                  |
| –40 °C...+60 °C                            |
| –25 °C...+40 °C                            |
| –25 °C...+50 °C                            |

|                                            |
|--------------------------------------------|
| 5 A                                        |
| 600 VA/120 W                               |
| 40 µW                                      |
| < 2 ms                                     |
| < 5 ms                                     |
| < 7 ms                                     |
| 40 Hz                                      |
| AgNi, gold-plated                          |
| > 10 <sup>7</sup> switching operations     |
| > 6 x 10 <sup>5</sup> switching operations |
| > 10 <sup>5</sup> switching operations     |
| Green LED                                  |
| –40 °C...+60 °C                            |
| –25 °C...+40 °C                            |
| –25 °C...+50 °C                            |

|                   |
|-------------------|
| III               |
| 3                 |
| Page 306, Fig. II |

|                   |
|-------------------|
| III               |
| 3                 |
| Page 306, Fig. II |

|                   |
|-------------------|
| III               |
| 2                 |
| Page 306, Fig. II |

|                   |
|-------------------|
| III               |
| 2                 |
| Page 306, Fig. II |

<sup>1)</sup> no output varistor

# Relay Coupler in Component Housings EG 2

with 2.8-mm tab connection

## EGR EG 2

DC voltage  
2 changeover contacts

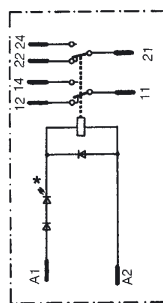


## EGR EG 2

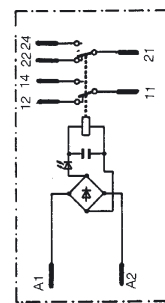
AC/DC voltage  
2 changeover contacts



Schematic circuit diagram



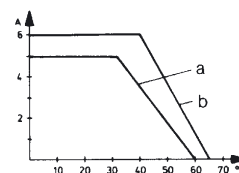
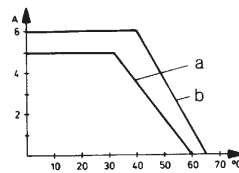
LED is parallel  
to coil in 12 V DC  
and 24 V DC  
versions



### Ordering data

### Rated data

|                                            |                                                                                                               |              |              |               |              |              |               |               |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------|--------------|---------------|--------------|--------------|---------------|---------------|
| <b>Input voltage</b>                       | <b>12 V~</b>                                                                                                  | <b>24 V~</b> | <b>48 V~</b> | <b>115 V~</b> | <b>24 V0</b> | <b>48 V0</b> | <b>115 V0</b> | <b>230 V0</b> |
| Rated consumption – (W)                    | 0.61 W                                                                                                        | 0.54 W       | 0.65 W       | 0.6 W         | 0.7 W        | 0.7 W        | 0.6 W         | 1.2 W         |
| Rated consumption ~ (VA)                   | –                                                                                                             | –            | –            | –             | 1 VA         | 0.9 VA       | 0.6 VA        | 1.2 VA        |
| Drop-out current of the relay** (at 20 °C) | 12 mA                                                                                                         | 5.5 mA       | 2.5 mA       | 1 mA          | 3.5 mA/8 mA~ | 2 mA/3.5 mA~ | 1 mA/1 mA~    | 1 mA          |
| Max. output voltage                        | 250 V                                                                                                         | 250 V        | 250 V        | 250 V         | 250 V        | 250 V        | 250 V         | 250 V         |
| Continuous current                         | 5 A                                                                                                           | 5 A          | 5 A          | 5 A           | 5 A          | 5 A          | 5 A           | 5 A           |
| Derating curve                             | a = mounted horizontally on rail without clearance<br>b = mounted horizontally on rail with clearance x 20 mm |              |              |               |              |              |               |               |



014246

|                                            |                                      |                                      |                                      |                                      |
|--------------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Switch-on current                          | 15 A/200 ms                          | 15 A/200 ms                          | 15 A/200 ms                          | 15 A/200 ms                          |
| Max. switching capacity with resistor load | 1100 VA/144 W                        | 1100 VA/144 W                        | 1100 VA/144 W                        | 1100 VA/144 W                        |
| Min. braking capacity/switching current    | 5 A                                  | 5 A                                  | 5 A                                  | 5 A                                  |
| Bounce times                               | 4 ms                                 | 4 ms                                 | 4 ms                                 | 4 ms                                 |
| Switching times, typical                   |                                      |                                      |                                      |                                      |
| –, pick-up lag                             | 16 ms                                | 22 ms                                | 18 ms                                | 14 ms                                |
| –, turn off delay                          | 20 ms                                | 15 ms                                | 16 ms                                | 23 ms                                |
| Max. switching frequency                   | 20 Hz                                | 20 Hz                                | 27 Hz                                | 24 Hz                                |
| Contact material                           | Ag, gold-flashed                     | Ag, gold-flashed                     | Ag, gold-flashed                     | Ag, gold-flashed                     |
| Service life, mechanical                   | 30 x 10 <sup>6</sup>                 | 30 x 10 <sup>6</sup>                 | 30 x 10 <sup>6</sup>                 | 30 x 10 <sup>6</sup>                 |
| –, 24 V~, 1 A, resistive load              | 10 <sup>5</sup> (1100 VA, cos φ = 1) | 10 <sup>5</sup> (1100 VA, cos φ = 1) | 10 <sup>5</sup> (1100 VA, cos φ = 1) | 10 <sup>5</sup> (1100 VA, cos φ = 1) |
| –, 230 V~, 3 A, resistive load             |                                      |                                      |                                      |                                      |
| Status indicator                           | Red LED                              | Red LED                              | Red LED                              | Red LED                              |
| Storage temperature                        | –40 °C...+85 °C                      | –40 °C...+85 °C                      | –40 °C...+85 °C                      | –40 °C...+85 °C                      |
| Ambient temperature                        |                                      |                                      |                                      |                                      |
| –, mounted on rail without clearance       | –25 °C...+40 °C                      | –25 °C...+40 °C                      | –25 °C...+40 °C                      | –25 °C...+40 °C                      |
| –, mounted on rail with clearance ≥ 20 mm  |                                      |                                      |                                      |                                      |

### Insulation coordination acc. to EN 50178

|                                                 |                    |                    |                    |                    |
|-------------------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Overvoltage category                            | III                | III                | III                | III                |
| Pollution severity                              | 2                  | 2                  | 2                  | 2                  |
| Accessories, dimensions and connection data see | Page 306, Fig. III | Page 306, Fig. III | Page 306, Fig. III | Page 306, Fig. III |

\*\* Larger values on request

# WAVESERIES Relay Coupler in Component Housings

## With 1 changeover contact

Relay couplers in the WAVEBOX

- Independent connection technology
  - pluggable connection unit
  - screw or tension clamp technology
- Fast commissioning and after-sales-service service
  - pluggable PCBs
- Save wiring tasks
  - cross-connections possible at input and output

## WRS 1 2.4-24 VDC



## WRS 1 24 VDC



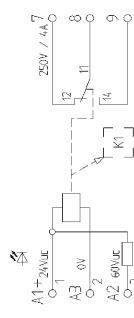
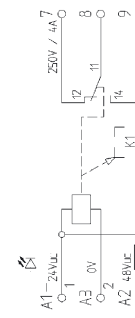
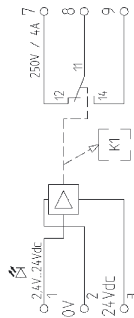
## WRS 1 24/48 VUC



## WRS 1 24/60 VUC



### Schematic circuit diagram

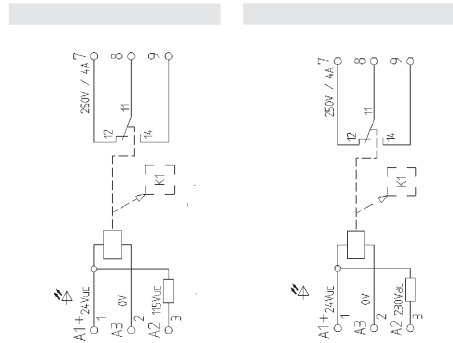


| Ordering data                                                      | Type                                             | Cat. No.   | Type                                       | Cat. No.   | Type                                            | Cat. No.   | Type                                               | Cat. No.   |
|--------------------------------------------------------------------|--------------------------------------------------|------------|--------------------------------------------|------------|-------------------------------------------------|------------|----------------------------------------------------|------------|
| Screw connection                                                   | WRS 1 2.4-24 Vdc                                 | 8275320000 | WRS 1 24 Vdc                               | 8275350000 | WRS 1 24/48 Vuc                                 | 8286280000 | WRS 1 24/60 Vuc                                    | 8418210000 |
| Tension clamp connection                                           | WRZ 1                                            | 8430170000 | WRZ 1                                      | 8430180000 | WRZ 1                                           | 8430190000 | WRZ 1                                              | 8430200000 |
| <b>Input</b>                                                       |                                                  |            |                                            |            |                                                 |            |                                                    |            |
| Input voltage                                                      | 2.4...24 Vdc +10 %                               |            | 24 Vdc±10 %                                |            | 24 Vuc±10 % / 48 Vuc±10%                        |            | 24 Vuc±10% / 60 Vuc±10%                            |            |
| Input current                                                      | 4.6 mA <sub>dc</sub> ±15% at U <sub>e</sub> 12 V |            | 9 mA <sub>dc</sub> ±15%                    |            | 14 mA <sub>uc</sub> ±15% at U <sub>e</sub> 24 V |            | 11 mA <sub>ac</sub> ±15% at U <sub>e</sub> =60 V   |            |
|                                                                    |                                                  |            |                                            |            | 14 mA <sub>uc</sub> ±15% at U <sub>e</sub> 48V  |            | 10 mA <sub>dc</sub> ±15% at U <sub>e</sub> =60 V   |            |
|                                                                    |                                                  |            |                                            |            |                                                 |            | 10.2 mA <sub>ac</sub> ±15% at U <sub>e</sub> =24 V |            |
|                                                                    |                                                  |            |                                            |            |                                                 |            | 9 mA <sub>dc</sub> ±15% at U <sub>e</sub> =24 V    |            |
| Input power                                                        | 6 mW ±15% at U <sub>e</sub> 2.4 V                |            | 220 mW±15%                                 |            | 0.5 VA (W)±15% at U <sub>e</sub> =48V           |            | 0.7 VA ±15% at U <sub>e</sub> =60 V                |            |
|                                                                    |                                                  |            |                                            |            | 0.35 VA (W)±15% at U <sub>e</sub> =24V          |            | 0.34 VA±15% at U <sub>e</sub> =24 V                |            |
|                                                                    |                                                  |            |                                            |            |                                                 |            | 0.6 W ±15% at U <sub>e</sub> =60 V                 |            |
|                                                                    |                                                  |            |                                            |            |                                                 |            | 0.22 W±15% at U <sub>e</sub> =24 V                 |            |
| <b>Output</b>                                                      |                                                  |            |                                            |            |                                                 |            |                                                    |            |
| Switching voltage                                                  | max. 150 Vdc /250 Vac                            |            | max. 150 Vdc /250 Vac                      |            | max. 150 Vdc /250 Vac                           |            | max. 150 Vdc/250 Vac                               |            |
| Continuous current AC / Switching power AC                         | max. 5 A /max. 1250 VA*                          |            | max. 5 A /max. 1250 VA*                    |            | max. 5A /max. 1250 VA*                          |            | max. 5 A/max. 1250 VA*                             |            |
| Switch-on current                                                  | max. 10 A                                        |            | max. 10 A                                  |            | max. 10 A                                       |            | max. 10 A                                          |            |
| Min. switching                                                     | 100 mA/5 Vdc                                     |            | 100 mA/5 Vdc                               |            | 100 mA/5Vdc                                     |            | 100 mA/5 Vdc                                       |            |
| Contact material                                                   | Ag-alloy                                         |            | Ag-alloy                                   |            | Ag-alloy                                        |            | Ag-alloy                                           |            |
| Contact resistance (when new)                                      | max. 30 mΩ/max. 100 mΩ at 1 A/6 Vdc              |            | max. 30 mΩ/max. 100 mΩ at 1 A/6 Vdc        |            | max. 30 mΩ/max. 100 mΩ at 1 A/6 Vdc             |            | max. 30 mΩ/max. 100 mΩ at 1 A / 6 Vdc              |            |
| Pick-up delay at nominal voltage                                   | typ. 7 ms (NO) / 4.5 ms (NC)                     |            | typ. 7 ms (NO) / 4.5 ms (NC)               |            | typ. 7 ms (NO) / 4.5 ms (NC)                    |            | typ. 5.4 ms (NO) / 4.2 ms (NC)                     |            |
| Turn off delay                                                     | typ. 6.3 ms (NO) / 5.5 ms (NC)                   |            | typ. 6.3 ms (NO) / 5.5 ms (NC)             |            | typ. 6.3 ms (NO) / 5.5 ms (NC)                  |            | typ. 4.4 ms (NO) / 5.4 ms (NC)                     |            |
| Mechanical service life                                            | 20 x 10 <sup>6</sup> switching operations        |            | 20 x 10 <sup>6</sup> switching operations  |            | 20 x 10 <sup>6</sup> switching operations       |            | 20 x 10 <sup>6</sup> switching operations          |            |
| Electrical service life                                            | 150 x 10 <sup>3</sup> switching operations       |            | 150 x 10 <sup>3</sup> switching operations |            | 1.5 x 10 <sup>5</sup> switching operations      |            | 150 x 10 <sup>3</sup> switching operations         |            |
| Max. switching frequency at nominal voltage                        | 0.1 Hz                                           |            | 0.1 Hz                                     |            | 0.1 Hz                                          |            | 0.1 Hz                                             |            |
| Ambient temperature                                                | -25 °C...+50 °C                                  |            | -25 °C...+50 °C                            |            | -25 °C...+50 °C                                 |            | -25 °C...+50 °C                                    |            |
| Storage temperature                                                | -40 °C...+60 °C                                  |            | -40 °C...+60 °C                            |            | -40 °C...+60 °C                                 |            | -40 °C...+60 °C                                    |            |
| Approvals                                                          | UL/CSA                                           |            | UL/CSA                                     |            | UL/CSA                                          |            | UL/CSA                                             |            |
| <b>Insulation coordination acc. to EN 50178</b>                    |                                                  |            |                                            |            |                                                 |            |                                                    |            |
| Rated voltage                                                      | 300 V                                            |            | 300 V                                      |            | 300 V                                           |            | 300 V                                              |            |
| Rated impulse voltage                                              | 4 kV (1.2/50 μ)                                  |            | 4 kV (1.2/50 μ)                            |            | 4 kV (1.2/50 μ)                                 |            | 4 kV (1.2/50 μ)                                    |            |
| Overvoltage category                                               | III                                              |            | III                                        |            | III                                             |            | III                                                |            |
| Pollution severity                                                 | 2                                                |            | 2                                          |            | 2                                               |            | 2                                                  |            |
| Implemented clearance and creepage path                            | ≥ 5.5 mm                                         |            | ≥ 5.5 mm                                   |            | ≥ 5.5 mm                                        |            | ≥ 5.5 mm                                           |            |
| <b>Insulation and voltage strength</b>                             |                                                  |            |                                            |            |                                                 |            |                                                    |            |
| Insulation and voltage strength of entire circuit to mounting rail | 4 kV <sub>eff</sub> 1 min                        |            | 4 kV <sub>eff</sub> 1 min                  |            | 4 kV <sub>eff</sub> 1 min                       |            | 4 kV <sub>eff</sub> 1 min                          |            |
| <b>Testing</b>                                                     |                                                  |            |                                            |            |                                                 |            |                                                    |            |
| Input/output high voltage test                                     | 4 kV <sub>eff</sub> 1 s                          |            | 4 kV <sub>eff</sub> 1 s                    |            | 4 kV <sub>eff</sub> 1 s                         |            | 4 kV <sub>eff</sub> 1 s                            |            |
| Accessories, dimensions and connection data see                    | Page 298 + 308                                   |            | Page 298 + 308                             |            | Page 298 + 308                                  |            | Page 298 + 308                                     |            |

\* at ambient temperature 20°C

# WAVESERIES Relay Coupler in Component Housings

## WRS 1 24/115 VUC WRS 1 24 VUC 230 VAC



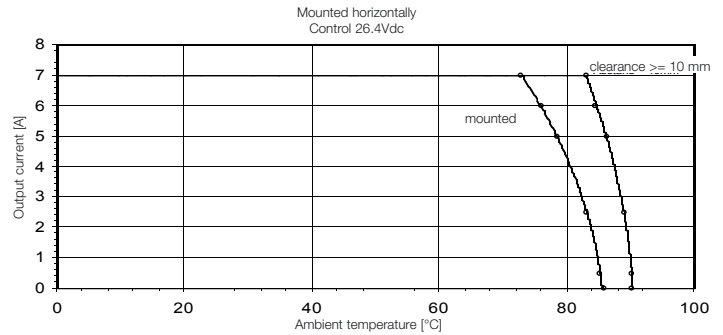
| Type             | Cat. No.          | Type                 | Cat. No.          |
|------------------|-------------------|----------------------|-------------------|
| WRS 1 24/115 Vuc | <b>8418220000</b> | WRS 1 24 Vuc/230 Vac | <b>8418230000</b> |
| WRZ 1            | <b>8430210000</b> | WRZ 1                | <b>8430220000</b> |

|                          |                          |
|--------------------------|--------------------------|
| 24 Vuc±10% / 115 Vuc±10% | 24 Vuc±10% / 230 Vac±10% |
| 11 mAac±15% at Ue=115 V  | 15 mAac±15% at Ue=230 V  |
| 10.5mAac±15% at Ue=115 V | 14 mAac±15% at Ue=24 V   |
| 10.2 mAac±15% at Ue=24 V | 13 mAac±15% at Ue=24 V   |
| 9 mAac±15% at Ue=24 V    |                          |
| 1.3 VA ±15% at Ue=115 V  | 3.5 VA ±15% at Ue=230 V  |
| 0.34 VA±15% at Ue=24 V   | 0.34 VA±15% at Ue=24 V   |
| 1.2 W ±15% at Ue=115 V   | 0.32 W±15% at Ue=24 V    |
| 0.22 W±15% at Ue=24 V    |                          |

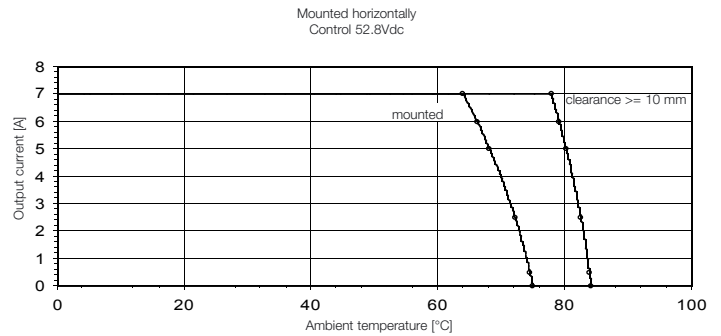
|                                            |                                            |
|--------------------------------------------|--------------------------------------------|
| max. 150 Vdc/250 Vac                       | max. 150 Vdc/250 Vac                       |
| max. 5 A/max. 1250 VA*                     | max. 5 A/max. 1250 VA*                     |
| max. 10 A                                  | max. 10 A                                  |
| 100 mA/5 Vdc                               | 100 mA/5 Vdc                               |
| Ag-alloy                                   | Ag-alloy                                   |
| max. 30 mΩ/max. 100 mΩ                     | max. 30 mΩ/max. 100 mΩ                     |
| at 1 A / 6 Vdc                             | at 1 A / 6 Vdc                             |
| typ. 5.4 ms (NO) /                         | typ. 5.4 ms (NO) /                         |
| 4.2 ms (NC)                                | 4.2 ms (NC)                                |
| typ. 4.4 ms (NO) /                         | typ. 4.4 ms (NO) /                         |
| 5.4 ms (NC)                                | 5.4 ms (NC)                                |
| 20 x 10 <sup>6</sup> switching operations  | 20 x 10 <sup>6</sup> switching operations  |
| 150 x 10 <sup>3</sup> switching operations | 150 x 10 <sup>3</sup> switching operations |
| 0.1 Hz                                     | 0.1 Hz                                     |
| -25 °C...+50 °C                            | -25 °C...+50 °C                            |
| -40 °C...+60 °C                            | -40 °C...+60 °C                            |
| UL/CSA                                     | UL/CSA                                     |

|                           |                           |
|---------------------------|---------------------------|
| 300 V                     | 300 V                     |
| 4 kV (1.2/50 μ)           | 4 kV (1.2/50 μ)           |
| III                       | III                       |
| 2                         | 2                         |
| ≥ 5.5 mm                  | ≥ 5.5 mm                  |
| 4 kV <sub>eff</sub> 1 min | 4 kV <sub>eff</sub> 1 min |

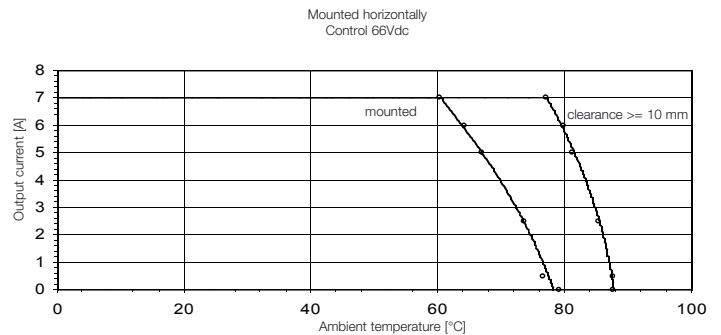
|                         |                         |
|-------------------------|-------------------------|
| 4 kV <sub>eff</sub> 1 s | 4 kV <sub>eff</sub> 1 s |
| Page 298 + 308          | Page 298 + 308          |



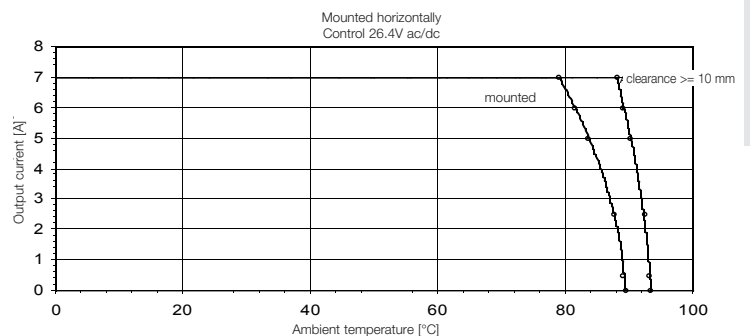
WRS 1 2.4-24 VDC • 8275320000



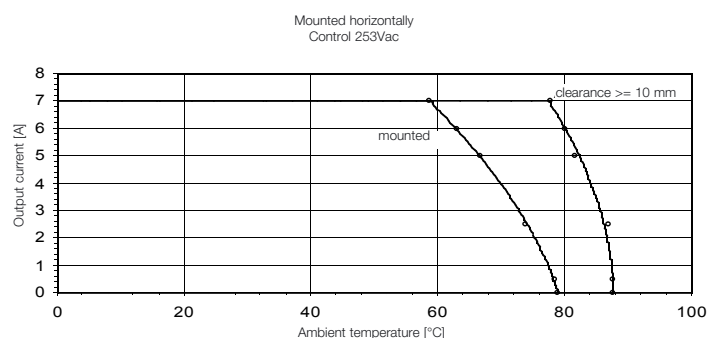
WRS 1 24/48 VUC • 8286280000



WRS 1 24/60 VUC • 8418210000



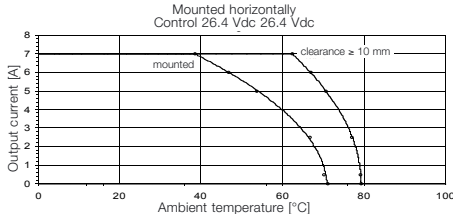
WRS 1 24/115 VUC • 8418220000



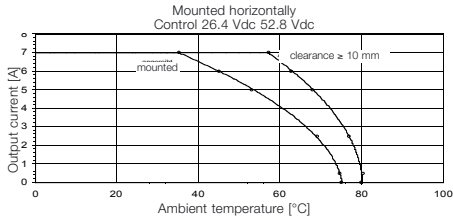
WRS 1 24 VUC/230 VAC • 8418230000

# WAVESERIES Relay Coupler in Component Housings

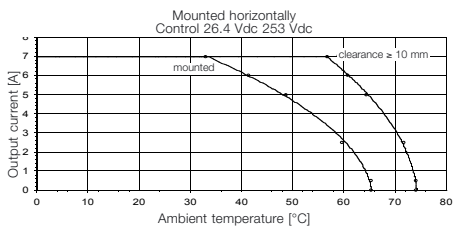
## with 2 NO contacts



WRS 2 12/24 VDC • 8418240000



WRS 2 24/48 VUC • 8418250000



WRS 2 115 VUC/ 230 VAC • 8418260000

### Ordering data

Screw connection

Tension clamp connection

### Input

Input voltage

Input current

Input power

### Output

Switching voltage

Continuous current AC / Switching power AC

Switch-on current

Min. switching

Contact material

Contact resistance (when new)

Pick-up delay at nominal voltage

Turn off delay

Mechanical service life

Electrical service life

Max. switching frequency at nominal voltage

Ambient temperature

Storage temperature

Approvals

### Insulation coordination acc. to EN 50178

Rated voltage

Rated impulse voltage

Overtoltage category

Pollution severity

Implemented clearance and creepage path

### Insulation and voltage strength

Insulation and voltage strength of entire circuit to mounting rail

### Testing

Input/output high voltage test

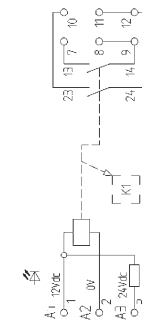
Accessories, dimensions and connection data see

\* at ambient temperature 20°C

## WRS 2 12/24 VDC



### Schematic circuit diagram



Type Cat. No.

WRS 2 12/24 Vdc

8418240000

WRZ 2 8430230000

12 Vdc±10 % / 24 Vdc±10 %  
21 mAac±15% at Ue=24 V  
20 mAac±15%bei Ue=12 V

0.5 W±15% at Ue=24 V  
0.24 W±15% at Ue=12 V

max. 250 Vdc / 250 Vac  
(UL → 13300/12300)

max. 5 A / max. 1250 VA\*

max. 8 A

100 mA / 5 Vdc

AgSnO<sub>2</sub>

max. 30 mΩ/max. 100 mΩ

at 1 A/6 Vdc

typ. 5 ms

typ. 6.3 ms (NO) /

5.5 ms (NC)

50 x 10<sup>6</sup> switching operations

1 x 10<sup>5</sup> switching operations

0.1 Hz

-25 °C...+50 °C

-40 °C...+60 °C

UL/CSA

300 V

4 kV (1.2/50 μ)

III

2

≥ 8 mm

4 kVeff 1 min

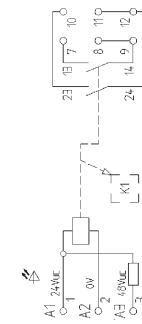
4 kVeff 1 s

Page 298 + 308

## WRS 2 24/48 VUC



### Schematic circuit diagram



Type Cat. No.

WRS 2 24/48 Vuc

8418250000

WRZ 2 8430240000

24 Vuc±10 % / 48 Vuc±10 %  
10 mAac±15% at Ue=48 V  
11.5 mAac±15% at Ue=24 V  
8.5 mAac±15% at Ue=48 V  
7.2 mAac±15% at Ue=24 V

0.48 VA±15% at Ue=48 V  
0.21 VA±15% at Ue=24 V  
0.4 W±15% at Ue=48 V  
0.17 W±15% at Ue=24 V

max. 250 Vdc / 250 Vac  
(UL → 13300/12300)

max. 5 A / max. 1250 VA\*

max. 8 A

100 mA / 5 Vdc

AgSnO<sub>2</sub>

max. 30 mΩ/max. 100 mΩ

at 1 A/6 Vdc

typ. 5 ms

---

50 x 10<sup>6</sup> switching operations

1 x 10<sup>5</sup> switching operations

0.1 Hz

-25 °C...+50 °C

-40 °C...+60 °C

UL/CSA

300 V

4 kV (1.2/50 μ)

III

2

≥ 8 mm

4 kVeff 1 min

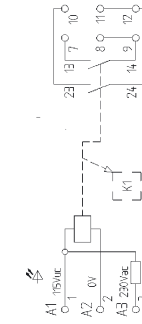
4 kVeff 1 s

Page 298 + 308

## WRS 2 115 VUC/ 230 VAC



### Schematic circuit diagram



Type Cat. No.

WRS 2 115 Vuc/230 Vac

8418260000

WRZ 2 8430250000

115 Vuc±10%/ 230 Vac±10 %  
11 mAac±15% at Ue=230 V  
8.5 mAac±15% at Ue=115 V  
8 mAac±15% at Ue=115 V

2.5 VA±15% at Ue=230 V  
1 VA±15% at Ue=115 V  
0.9 W±15% at Ue=115 V

max. 250 Vdc / 250 Vac  
(UL → 13300/12300)

max. 5 A / max. 1250 VA\*

max. 8 A

100 mA / 5 Vdc

AgSnO<sub>2</sub>

max. 30 mΩ/max. 100 mΩ

at 1 A/6 Vdc

---

---

50 x 10<sup>6</sup> switching operations

1 x 10<sup>5</sup> switching operations

0.1 Hz

-25 °C...+50 °C

-40 °C...+60 °C

UL/CSA (nur 115 Vuc)

300 V

4 kV (1.2/50 μ)

III

2

≥ 8 mm

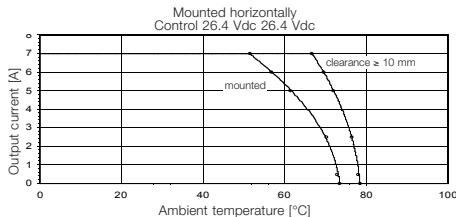
4 kVeff 1 min

4 kVeff 1 s

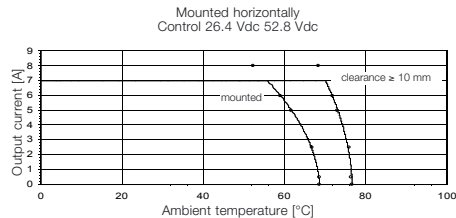
Page 298 + 308

# WAVESERIES Relay Coupler in Component Housings

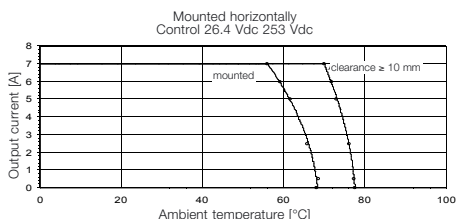
## with 1NC / 1 NO



WRS 2 12/24 VDC • 8418270000



WRS 2 24/48 VUC • 8418280000



WRS 2 115 VUC/230 VAC • 8418290000

## WRS 2 12/24 VDC



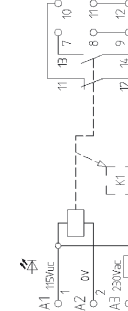
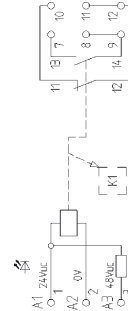
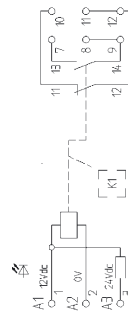
## WRS 2 24/48 VUC



## WRS 2 115 VUC/230 VAC



### Schematic circuit diagram



### Ordering data

Screw connection

Tension clamp connection

### Input

Input voltage

Input current

Input power

### Output

Switching voltage

Continuous current AC / Switching power AC

Switch-on current

Min. switching

Contact material

Contact resistance (when new)

Pick-up delay at nominal voltage

Turn off delay

Mechanical service life

Electrical service life

Max. switching frequency at nominal voltage

Ambient temperature

Storage temperature

Approvals

### Insulation coordination acc. to EN 50178

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Implemented clearance and creepage path

### Insulation and voltage strength

Insulation and voltage strength of entire circuit to mounting rail

### Testing

Input/output high voltage test

Accessories, dimensions and connection data see

\* at ambient temperature 20°C

Type Cat. No.

WRS 2 12/24 Vdc

8418270000

WRZ 2 8430260000

12 Vdc±10% / 24 Vdc±10%  
19.7 mAac±15% at Ue=12 V  
20.5 mAac±15% at Ue=24 V

0.5 W±15% at Ue=24 V  
0.24 W±15% at Ue=12 V

max. 250 Vdc/250 Vac  
max. 5 A/max. 1250 VA\*  
max. 8 A  
100 mA/5 V  
AgSnO<sub>2</sub>  
max. 30 mΩ/max. 100 mΩ  
at 1 A/6 Vdc  
typ. 5ms  
---

50 x 10<sup>6</sup> switching operations  
1 x 10<sup>5</sup> switching operations  
0.1 Hz  
-25 °C...+50 °C  
-40 °C...+60 °C  
UL/CSA

300 V

4 kV (1.2/50 μ)

III

2

≥ 8 mm

4 kVeff 1 min

4 kVeff 1 s

Page 298 + 308

Type Cat. No.

WRS 2 24/48 Vuc

8418280000

WRZ 2 8430270000

24 Vuc±10% / 48 Vuc±10%  
10 mAac±15% at Ue=48 V  
11.5 mAac±15% at Ue=24 V  
8.5 mAac±15% at Ue=48 V  
7.2 mAac±15% bei Ue=24 V  
0.48 VA±15% at Ue=48 V  
0.21 VA±15% at Ue=24 V  
0.4 W±15% at Ue=48 V  
0.17 W±15% at Ue=24 V

max. 250 Vdc/250 Vac  
max. 5 A/max. 1250 VA\*  
max. 8 A  
100 mA/5 V  
AgSnO<sub>2</sub>  
max. 30 mΩ/max. 100 mΩ  
at 1 A/6 Vdc  
---

50 x 10<sup>6</sup> switching operations  
1 x 10<sup>5</sup> switching operations  
0.1 Hz  
-25 °C...+50 °C  
-40 °C...+60 °C  
UL/CSA

300 V

4 kV (1.2/50 μ)

III

2

≥ 8 mm

4 kVeff 1 min

4 kVeff 1 s

Page 298 + 308

Type Cat. No.

WRS 2 115 Vuc/230 Vac

8418290000

WRZ 2 8430280000

115 Vuc±10% / 230 Vac±10%  
11 mAac±15% at Ue=230 V  
10 mAac±15% at Ue=115 V  
8 mAac±15% at Ue=115 V

2.5 VA±15% at Ue=230 V  
1 VA±15% at Ue=115 V  
0.9 W±15% at Ue=115 V

max. 250 Vdc/250 Vac  
max. 5 A/max. 1250 VA\*  
max. 8 A  
100 mA/5 V  
AgSnO<sub>2</sub>  
max. 30 mΩ/max. 100 mΩ  
at 1 A/6 Vdc  
---

50 x 10<sup>6</sup> switching operations  
1 x 10<sup>5</sup> switching operations  
0.1 Hz  
-25 °C...+50 °C  
-40 °C...+60 °C  
UL/CSA (nur 115 Vuc)

300 V

4 kV (1.2/50 μ)

III

2

≥ 8 mm

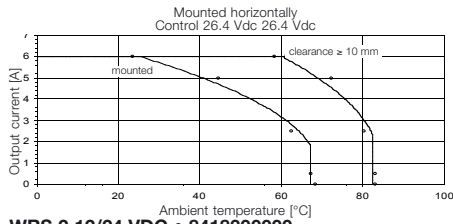
4 kVeff 1 min

4 kVeff 1 s

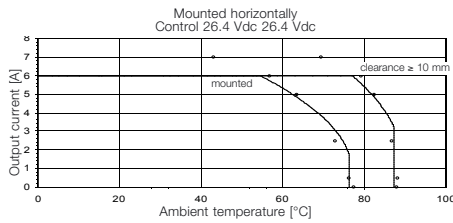
Page 298 + 308

# WAVESERIES Relay Coupler in Component Housings

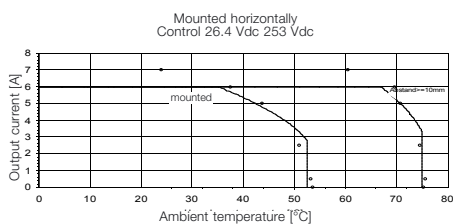
## with 2 changeover contacts



WRS 2 12/24 VDC • 8418300000



WRS 2 24/48 VUC • 8418310000



WRS 2 24 VUC/ 230 VAC • 8418320000

### Ordering data

Screw connection

Tension clamp connection

### Input

Input voltage

Input current

Input power

### Output

Switching voltage

Continuous current AC / Switching power AC

Switch-on current

Min. switching

Contact material

Contact resistance (when new)

Pick-up delay at nominal voltage

Turn off delay

Mechanical service life

Electrical service life

Max. switching frequency at nominal voltage

Ambient temperature

Storage temperature

Approvals

### Insulation coordination acc. to EN 50178

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Implemented clearance and creepage path

### Insulation and voltage strength

Insulation and voltage strength of entire circuit to mounting rail

### Testing

Input/output high voltage test

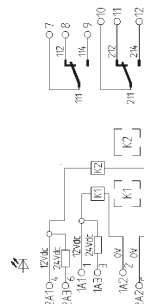
Accessories, dimensions and connection data see

\* at ambient temperature 20°C

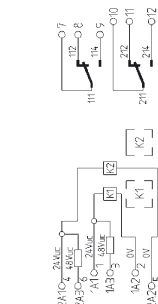
## WRS 2 12/24 VDC



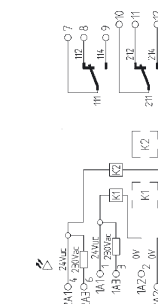
### Schematic circuit diagram



## WRS 2 24/48 VUC



## WRS 2 24 VUC/ 230 VAC



| Type            | Cat. No.          |
|-----------------|-------------------|
| WRS 2 12/24 Vdc | <b>8418300000</b> |
| WRZ 2           | <b>8430290000</b> |

| Type            | Cat. No.          |
|-----------------|-------------------|
| WRS 2 24/48 Vuc | <b>8418310000</b> |
| WRZ 2           | <b>8430300000</b> |

| Type                 | Cat. No.          |
|----------------------|-------------------|
| WRS 2 24 VUC/230 Vac | <b>8418320000</b> |
| WRZ 2                | <b>8430310000</b> |

|                         |
|-------------------------|
| 12 Vdc±10% /24 Vdc±10 % |
| 21 mA±15% at Ue=12 V    |
| 22 mA±15% at Ue=24 V    |

|                       |
|-----------------------|
| 0.26 W±15% at Ue=12 V |
| 0.53 W±15% at Ue=24 V |

|                                            |
|--------------------------------------------|
| max. 150 Vdc /250 Vac                      |
| max. 5 A/max. 1250 VA*                     |
| max. 10 A                                  |
| 100 mA/5 Vdc                               |
| Ag-alloy                                   |
| max. 30 mΩ / max. 100 mΩ                   |
| at 1 A / 6 Vdc                             |
| typ. 6.5 ms (NO) /                         |
| 4.5 ms (NC)                                |
| typ. 8 ms (NO) /                           |
| 11 ms (NC)                                 |
| 20 x 10 <sup>6</sup> switching operations  |
| 1.5 x 10 <sup>5</sup> switching operations |
| 0.1 Hz                                     |
| -25 °C...+50 °C                            |
| -40 °C...+60 °C                            |
| UL/CSA                                     |

|                         |
|-------------------------|
| 24 Vuc±10% /48 Vuc±10 % |
| 14 mA±15% at Ue=48 V    |
| 14 mA±15% at Ue=24 V    |

|                           |
|---------------------------|
| 0.7 VA(W)±15% at Ue=48 V  |
| 0.35 VA(W)±15% at Ue=24 V |

|                                            |
|--------------------------------------------|
| max. 150 Vdc /250 Vac                      |
| max. 5 A/max. 1250 VA*                     |
| max. 10 A                                  |
| 100 mA/5 Vdc                               |
| Ag-alloy                                   |
| max. 30 mΩ / max. 100 mΩ                   |
| at 1 A / 6 Vdc                             |
| typ. 6.5 ms (NO) /                         |
| 4.5 ms (NC)                                |
| typ. 8 ms (NO)/                            |
| 11 ms (NC)                                 |
| 20 x 10 <sup>6</sup> switching operations  |
| 1.5 x 10 <sup>5</sup> switching operations |
| 0.1 Hz                                     |
| -25 °C...+50 °C                            |
| -40 °C...+60 °C                            |
| UL/CSA                                     |

|                         |
|-------------------------|
| 24 Vuc±10% /230 Vac±10% |
| 15 mA±15% at Ue=230 V   |
| 14 mA±15% at Ue=24 V    |

|                          |
|--------------------------|
| 0.35 W±15% at Ue=24 V    |
| 3.45 VA ±15% at Ue=230 V |

|                                            |
|--------------------------------------------|
| max. 150 Vdc /250 Vac                      |
| max. 5 A/max. 1250 VA*                     |
| max. 10 A                                  |
| 100 mA / 5 Vdc                             |
| Ag-alloy                                   |
| max. 30 mΩ / max. 100 mΩ                   |
| at 1 A / 6 Vdc                             |
| typ. 6 ms (NO)/4.2 ms                      |
| (NO)/Eingang: 24 Vuc/230 Vac               |
| typ. 4.4 ms (NO)/                          |
| 5.4 ms (NC)                                |
| 20 x 10 <sup>6</sup> switching operations  |
| 150 x 10 <sup>3</sup> switching operations |
| 0.1 Hz                                     |
| -25 °C...+50 °C                            |
| -40 °C...+60 °C                            |

|                 |
|-----------------|
| 300 V           |
| 4 kV (1.2/50 μ) |
| III             |
| 2               |
| ≥ 5.5 mm        |

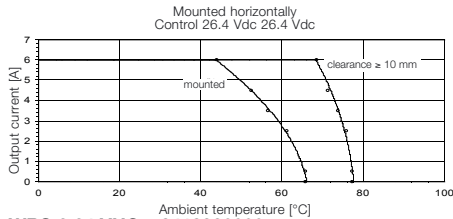
|               |
|---------------|
| 4 kVeff 1 min |
|---------------|

|             |
|-------------|
| 4 kVeff 1 s |
|-------------|

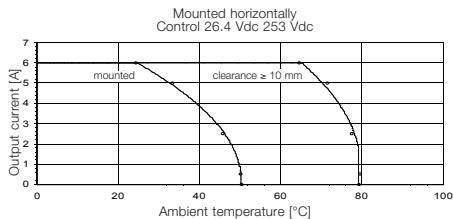
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# WAVESERIES Relay Coupler in Component Housings

## with 3 NO contacts



WRS 2 24 VUC • 8418330000



WRS 2 230 VAC • 8418340000

## WRS 2 24 VUC



### Schematic circuit diagram



## WRS 2 230 VAC



| Ordering data                                                      | Type                                                 | Cat. No.   | Type                                                 | Cat. No.   |
|--------------------------------------------------------------------|------------------------------------------------------|------------|------------------------------------------------------|------------|
| Screw connection                                                   | WRS 2 24 Vuc                                         | 8418330000 | WRS 2 230 Vac                                        | 8418340000 |
| Tension clamp connection                                           | WRZ 2                                                | 8430320000 | WRZ 2                                                | 8430330000 |
| Input                                                              |                                                      |            |                                                      |            |
| Input voltage                                                      | 3fach 24 Vac ±10 %                                   |            | 3 x 230 Vac ±10 %                                    |            |
| Input current                                                      | 10.5 mAac ±15 % at U <sub>nom</sub><br>(per channel) |            | 10.3 mAac ±15 % at U <sub>nom</sub><br>(per channel) |            |
| Input power                                                        | 0.3 VA ±15 % (per channel)<br>0.25 W ±15 %           |            | 2.4 VA ±15 % (per channel)                           |            |
| Output                                                             |                                                      |            |                                                      |            |
| Switching voltage                                                  | max. 250 Vdc /250 Vac                                |            | max. 250 Vdc / 250 Vac                               |            |
| Continuous current AC / Switching power AC                         | max. 4 A/max. 1500 VA*                               |            | max. 4 A/max. 1500 VA*                               |            |
| Switch-on current                                                  | max. 6 A                                             |            | max. 6 A                                             |            |
| Min. switching                                                     | 12 V/10 mA                                           |            | 12 V/10 mA                                           |            |
| Contact material                                                   | AgSnO <sub>2</sub>                                   |            | AgSnO <sub>2</sub>                                   |            |
| Contact resistance (when new)                                      | max. 100 mΩ<br>at 1 A/24 Vdc                         |            | max. 100 mΩ<br>at 1 A/24 Vdc                         |            |
| Pick-up delay at nominal voltage                                   | typ. 5 ms                                            |            | typ. 8 ms                                            |            |
| Turn off delay                                                     | typ. 21 ms                                           |            | typ.11 ms                                            |            |
| Mechanical service life                                            | 20 x 10 <sup>6</sup> switching operations            |            | 20 x 10 <sup>6</sup> switching operations            |            |
| Electrical service life                                            | 1 x 10 <sup>6</sup> switching operations             |            | 1 x 10 <sup>6</sup> switching operations             |            |
| Max. switching frequency at nominal voltage                        | 0.1 Hz                                               |            | 0.1 Hz                                               |            |
| Ambient temperature                                                | -25 °C...+50 °C                                      |            | -25 °C...+50 °C                                      |            |
| Storage temperature                                                | -40 °C...+60 °C                                      |            | -40 °C...+60 °C                                      |            |
| Approvals                                                          | UL/CSA                                               |            |                                                      |            |
| Insulation coordination acc. to EN 50178                           |                                                      |            |                                                      |            |
| Rated voltage                                                      | 300 V                                                |            | 300 V                                                |            |
| Rated impulse voltage                                              | 4 kV (1.2/50 μ)                                      |            | 4 kV (1.2/50 μ)                                      |            |
| Overvoltage category                                               | III                                                  |            | III                                                  |            |
| Pollution severity                                                 | 2                                                    |            | 2                                                    |            |
| Implemented clearance and creepage path                            | ≥ 5.5 mm                                             |            | ≥ 5.5 mm                                             |            |
| Insulation and voltage strength                                    |                                                      |            |                                                      |            |
| Insulation and voltage strength of entire circuit to mounting rail | 4 kVeff 1 min                                        |            | 4 kVeff 1 min                                        |            |
| Testing                                                            |                                                      |            |                                                      |            |
| Input/output high voltage test                                     | 4 kVeff 1 s                                          |            | 4 kVeff 1 s                                          |            |
| Accessories, dimensions and connection data see                    | Page 298 + 308                                       |            | Page 298 + 308                                       |            |

\* at ambient temperature 20°C

## Relay Couplers in Components Housings EG 7

- Plugs on to locking socket RS EG 7 with combination foot TS 32, 35
- Overall width: 10 mm
- With combination foot for TS 15, TS 32 or TS 35
- Versions with 12 V, 24 V and 48 V full protective separation in accordance with VDE 0160, Part 101
- All EGR EG 7 and RST EG 7 are approved by Germanischer Lloyd. Approval No. 35962 HH**

### EGR EG 7 RST EG 7 RS EG 7

EGR EG 7



RST EG 7



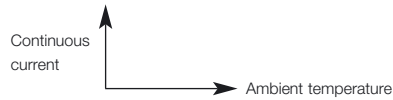
RS EG 7

#### Schematic circuit diagram

Derating curve

a = mounted horizontally on rail without clearance

b = mounted horizontally on rail, rowed with clearances

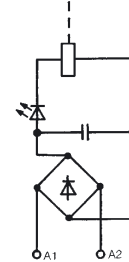
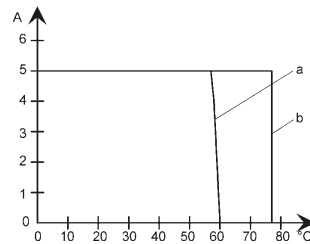


12 V0

24 V-

24 V-

24 V0



#### Ordering data

|                                                                 |      |
|-----------------------------------------------------------------|------|
| Combination foot for TS 15, TS 32, TS 35                        | 1 NO |
|                                                                 | 1 NC |
| EGR EG 7 spare relays, without connection unit                  |      |
| Plug-in relay-coupl., without engagem. socket, 1 changeo. cont. |      |
| Engage.socket f. plug-in relay coupler w. combin.foot TS 32, 35 |      |

#### Rated data of the coil

|                                   |                          |
|-----------------------------------|--------------------------|
| <b>Input voltage</b>              | <b>12 V0 +15 % -10 %</b> |
| Rated consumption                 | 320 mW +20 % -10 %       |
| Max. switch-on current            | 120 mA                   |
| Combination foot for drop current | ≤ 3 mA                   |
| Connection                        | - NO and NC              |
|                                   | - changeover contacts    |

#### Rated data der Contacts

|                                           |                                                                  |
|-------------------------------------------|------------------------------------------------------------------|
| Max. output voltage                       | 250 V                                                            |
| Continuous current                        | 5 A                                                              |
| Max. switch-on current                    | 8 A                                                              |
| Min. switching capacity/switching current | 100 mW/10 mA                                                     |
| Bounce times                              | ≤ 1 ms                                                           |
| Contact material <sup>2)</sup>            | AgNi 0.15 gold-flashed                                           |
| Bounce times                              | ≤ 1 ms                                                           |
| Switching times                           |                                                                  |
| pick up delay                             | ≤ 8 ms                                                           |
| drop-out delay                            | ≤ 6 ms                                                           |
| Service life, mechanical                  | > 15 x 10 <sup>6</sup> switching operations                      |
| -, 24 V-, 1.1 A, inductive load           | ≥ 2 x 10 <sup>6</sup> switching operations with free wheel diode |
| -, 230 V-, 5 A, resistive load            | > 2 x 10 <sup>5</sup> switching operations                       |
| Status indicator                          | Green LED                                                        |
| Storage temperature                       | -40 °C...+60 °C                                                  |
| Ambient temperature                       | -25 °C...+60 °C                                                  |

#### Insulation coordination acc. to EN 50178

|                                               |              |
|-----------------------------------------------|--------------|
| Safe isolation according to VDE 0106 part 101 | DIN VDE 0106 |
| Rated impulse voltage                         | 8 kV         |
| Clearances and creepage distances             | ≥ 8 mm       |
| Overvoltage category                          | III          |
| Pollution severity                            | 2            |

#### Accessories

|                                                 |             |
|-------------------------------------------------|-------------|
| Cross-connection comb. 16fold                   | QB 16/10.16 |
| Accessories, dimensions and connection data see | Page 304    |

1) Serves only as a spare part for NO and NC

| Type    | Cat. No.                       |
|---------|--------------------------------|
| EGR EG7 | <b>8092310000</b>              |
| EGR EG7 | <b>8092320000</b>              |
| EGR EG7 | <b>8092330000<sup>1)</sup></b> |
| RST EG7 | <b>8216550000</b>              |
| RS EG7  | <b>8193830000</b>              |

|                           |
|---------------------------|
| <b>12 V0 +15 % -10 %</b>  |
| 280 mW +20 % -10 %        |
| 12 mA                     |
| ≤ 3 mA                    |
| Screw connection          |
| 0.5...1.5 mm <sup>2</sup> |
| AWG-Conductor 26...16     |
| 0.5...2.5 mm <sup>2</sup> |

|                                                                  |
|------------------------------------------------------------------|
| 250 V                                                            |
| 5 A                                                              |
| 8 A                                                              |
| 100 mW/10 mA                                                     |
| ≤ 1 ms                                                           |
| AgNi 0.15 gold-flashed                                           |
| ≤ 1 ms                                                           |
| ≤ 8 ms                                                           |
| ≤ 6 ms                                                           |
| > 15 x 10 <sup>6</sup> switching operations                      |
| ≥ 2 x 10 <sup>6</sup> switching operations with free wheel diode |
| > 2 x 10 <sup>5</sup> switching operations                       |
| Green LED                                                        |
| -40 °C...+60 °C                                                  |
| -25 °C...+60 °C                                                  |

|              |
|--------------|
| DIN VDE 0106 |
| 8 kV         |
| ≥ 8 mm       |
| III          |
| 2            |

|             |                   |
|-------------|-------------------|
| QB 16/10.16 | <b>1650330000</b> |
| Page 304    |                   |

| Type    | Cat. No.                       |
|---------|--------------------------------|
| EGR EG7 | <b>8216520000</b>              |
| EGR EG7 | <b>8216530000</b>              |
| EGR EG7 | <b>8218200000<sup>1)</sup></b> |
| RST EG7 | <b>8216570000</b>              |
| RS EG7  | <b>8193830000</b>              |

|                           |
|---------------------------|
| <b>24 V- +15 % -10 %</b>  |
| 280 mW +20 % -10 %        |
| 12 mA                     |
| ≤ 3 mA                    |
| Screw connection          |
| 0.5...1.5 mm <sup>2</sup> |
| AWG-Conductor 26...16     |
| 0.5...2.5 mm <sup>2</sup> |

|                                                                  |
|------------------------------------------------------------------|
| 250 V                                                            |
| 5 A                                                              |
| 8 A                                                              |
| 100 mW/10 mA                                                     |
| ≤ 1 ms                                                           |
| AgNi 0.15 gold-flashed                                           |
| ≤ 1 ms                                                           |
| ≤ 8 ms                                                           |
| ≤ 6 ms                                                           |
| > 15 x 10 <sup>6</sup> switching operations                      |
| ≥ 2 x 10 <sup>6</sup> switching operations with free wheel diode |
| > 2 x 10 <sup>5</sup> switching operations                       |
| Green LED                                                        |
| -40 °C...+60 °C                                                  |
| -25 °C...+60 °C                                                  |

|              |
|--------------|
| DIN VDE 0106 |
| 8 kV         |
| ≥ 8 mm       |
| III          |
| 2            |

|             |                   |
|-------------|-------------------|
| QB 16/10.16 | <b>1650330000</b> |
| Page 304    |                   |

| Type    | Cat. No.                       |
|---------|--------------------------------|
| EGR EG7 | <b>8147120000</b>              |
| EGR EG7 | <b>8147140000</b>              |
| EGR EG7 | <b>8160030000<sup>1)</sup></b> |
| RST EG7 | <b>8216560000</b>              |
| RS EG7  | <b>8193830000</b>              |

|                           |
|---------------------------|
| <b>24 V- +15 % -10 %</b>  |
| 280 mW +20 % -10 %        |
| 12 mA                     |
| ≤ 3 mA                    |
| Screw connection          |
| 0.5...1.5 mm <sup>2</sup> |
| AWG-Conductor 26...16     |
| 0.5...2.5 mm <sup>2</sup> |

|                                                                  |
|------------------------------------------------------------------|
| 250 V                                                            |
| 5 A                                                              |
| 8 A                                                              |
| 40 μW <sup>2)</sup>                                              |
| ≤ 1 ms                                                           |
| AgNi 0.15 <b>5 μ Au</b>                                          |
| ≤ 1 ms                                                           |
| ≤ 8 ms                                                           |
| ≤ 6 ms                                                           |
| > 15 x 10 <sup>6</sup> switching operations                      |
| ≥ 2 x 10 <sup>6</sup> switching operations with free wheel diode |
| > 2 x 10 <sup>5</sup> switching operations                       |
| Green LED                                                        |
| -40 °C...+60 °C                                                  |
| -25 °C...+60 °C                                                  |

|              |
|--------------|
| DIN VDE 0106 |
| 8 kV         |
| ≥ 8 mm       |
| III          |
| 2            |

|             |                   |
|-------------|-------------------|
| QB 16/10.16 | <b>1650330000</b> |
| Page 304    |                   |

| Type    | Cat. No.                       |
|---------|--------------------------------|
| EGR EG7 | <b>8092340000</b>              |
| EGR EG7 | <b>8092350000</b>              |
| EGR EG7 | <b>8092360000<sup>1)</sup></b> |
| RST EG7 | <b>8216580000</b>              |
| RS EG7  | <b>8193830000</b>              |

|                           |
|---------------------------|
| <b>24 V0 +15 % -10 %</b>  |
| 280 mW +20 % -10 %        |
| 240 mA                    |
| ≤ 3 mA                    |
| Screw connection          |
| 0.5...1.5 mm <sup>2</sup> |
| AWG-Conductor 26...16     |
| 0.5...2.5 mm <sup>2</sup> |

|                                                                  |
|------------------------------------------------------------------|
| 250 V                                                            |
| 5 A                                                              |
| 8 A                                                              |
| 100 mW/10 mA                                                     |
| ≤ 1 ms                                                           |
| AgNi 0.15 gold-flashed                                           |
| ≤ 2.4 ms                                                         |
| ≤ 11 ms                                                          |
| ≤ 10 ms                                                          |
| > 15 x 10 <sup>6</sup> switching operations                      |
| ≥ 2 x 10 <sup>6</sup> switching operations with free wheel diode |
| > 2 x 10 <sup>5</sup> switching operations                       |
| Green LED                                                        |
| -40 °C...+60 °C                                                  |
| -25 °C...+60 °C                                                  |

|              |
|--------------|
| DIN VDE 0106 |
| 8 kV         |
| ≥ 8 mm       |
| III          |
| 2            |

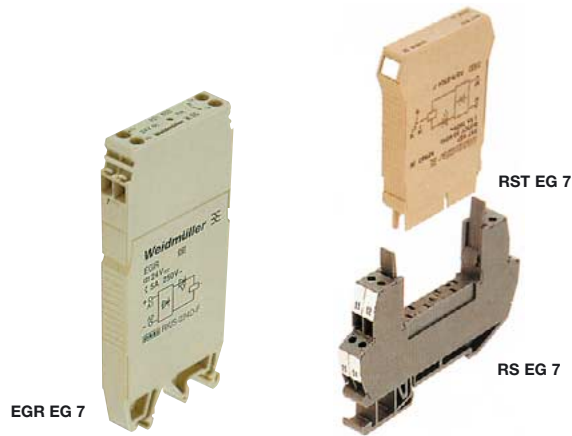
|             |                   |
|-------------|-------------------|
| QB 16/10.16 | <b>1650330000</b> |
| Page 304    |                   |

<sup>2)</sup> The following ratings can safely be switched:  
a) 100 mV...60 V ac/dc/100 μA...300 mA

b) 5 V... 24 V dc/10 mA... 1.2 A  
c) 24 V... 60 V dc/10 mA... 500 mA  
d) 10 V...250 V ac/10 mA... 5 A

After switching higher powers (b...d) lower powers (a) can no longer be switched.

## Relay Couplers in Components Housings EG 7



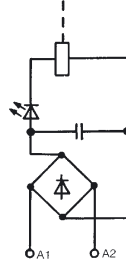
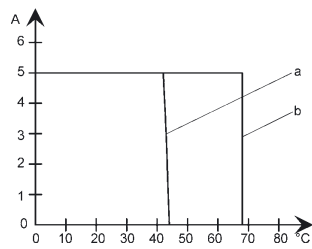
48 V0

60 V~

115 V0

230 V~

230 V~



| Type                                        | Cat. No.                       | Type                                        | Cat. No.                       | Type                                        | Cat. No.                       | Type                                        | Cat. No.                       | Type                                        | Cat. No.          |
|---------------------------------------------|--------------------------------|---------------------------------------------|--------------------------------|---------------------------------------------|--------------------------------|---------------------------------------------|--------------------------------|---------------------------------------------|-------------------|
| EGR EG7                                     | <b>8092370000</b>              | EGR EG7                                     | <b>8092400000</b>              | EGR EG7                                     | <b>8092430000</b>              | EGR EG7                                     | <b>8092460000</b>              | EGR EG7                                     | <b>8178200000</b> |
| EGR EG7                                     | <b>8092380000</b>              | EGR EG7                                     | <b>8092410000</b>              | EGR EG7                                     | <b>8092440000</b>              | EGR EG7                                     | <b>8092470000</b>              |                                             |                   |
| EGR EG7                                     | <b>8092390000<sup>1)</sup></b> | EGR EG7                                     | <b>8092420000<sup>1)</sup></b> | EGR EG7                                     | <b>8092450000<sup>1)</sup></b> | EGR EG7                                     | <b>8092480000<sup>1)</sup></b> |                                             |                   |
| RST EG7                                     | <b>8216590000</b>              | RST EG7                                     | <b>8216600000</b>              | RST EG7                                     | <b>8216610000</b>              | RST EG7                                     | <b>8216620000</b>              | RST EG7                                     | <b>8216630000</b> |
| RS EG7                                      | <b>8193830000</b>              | RS EG7                                      | <b>8193830000</b>              | RS EG7                                      | <b>8193830000</b>              | RS EG7                                      | <b>8193830000</b>              | RS EG7                                      | <b>8193830000</b> |
|                                             |                                |                                             |                                |                                             |                                |                                             |                                |                                             |                   |
| <b>48 V0 +15 % -10 %</b>                    |                                | <b>60 V0 +15 % -10 %</b>                    |                                | <b>115 V0 +15 % -10 %</b>                   |                                | <b>230 V~ +15 % -10 %</b>                   |                                | <b>230 V~ +15 % -10 %</b>                   |                   |
| 280 mW +15 % -10 %                          |                                | 280 mW +15 % -10 %                          |                                | 330 mW +15 % -10 %                          |                                | 280 mW +15 % -10 %                          |                                | 280 mW +15 % -10 %                          |                   |
| 480 mA                                      |                                | 600 mA                                      |                                | 160 mA                                      |                                | 185 mA                                      |                                | 185 mA                                      |                   |
| ≤ 3 mA                                      |                                | ≤ 3 mA                                      |                                | ≤ 3 mA                                      |                                | ≤ 3 mA                                      |                                | ≤ 3 mA                                      |                   |
| Screw connection                            |                                | Screw connection                            |                                | Screw connection                            |                                | Screw connection                            |                                | Screw connection                            |                   |
| 0.5...1.5 mm <sup>2</sup>                   |                                | 0.5...1.5 mm <sup>2</sup>                   |                                | 0.5...1.5 mm <sup>2</sup>                   |                                | 0.5...1.5 mm <sup>2</sup>                   |                                | 0.5...1.5 mm <sup>2</sup>                   |                   |
| AWG-Conductor 26...16                       |                                | AWG-Conductor 26...16                       |                                | AWG-Conductor 26...16                       |                                | AWG-Conductor 26...16                       |                                | AWG-Conductor 26...16                       |                   |
| 0.5...2.5 mm <sup>2</sup>                   |                                | 0.5...2.5 mm <sup>2</sup>                   |                                | 0.5...2.5 mm <sup>2</sup>                   |                                | 0.5...2.5 mm <sup>2</sup>                   |                                | 0.5...2.5 mm <sup>2</sup>                   |                   |
|                                             |                                |                                             |                                |                                             |                                |                                             |                                |                                             |                   |
| 250 V                                       |                                | 250 V                                       |                                | 250 V                                       |                                | 250 V                                       |                                | 250 V                                       |                   |
| 5 A                                         |                                | 5 A                                         |                                | 5 A                                         |                                | 5 A                                         |                                | 5 A                                         |                   |
| 8 A                                         |                                | 8 A                                         |                                | 8 A                                         |                                | 8 A                                         |                                | 8 A                                         |                   |
| 100 mW/10 mA                                |                                | 100 mW/10 mA                                |                                | 100 mW/10 mA                                |                                | 100 mW/10 mA                                |                                | 40 μW <sup>2)</sup>                         |                   |
| ≤ 1 ms                                      |                                | ≤ 1 ms                                      |                                | ≤ 1 ms                                      |                                | ≤ 1 ms                                      |                                | ≤ 1 ms                                      |                   |
| AgNi 0.15 gold-flashed                      |                                | AgNi 0.15 gold-flashed                      |                                | AgNi 0.15 gold-flashed                      |                                | AgNi 0.15 gold-flashed                      |                                | AgNi 0.15 <b>5 μ Au</b>                     |                   |
| ≤ 2.5 ms                                    |                                | ≤ 3.8 ms                                    |                                | ≤ 3.8 ms                                    |                                | ≤ 2 ms                                      |                                | ≤ 2 ms                                      |                   |
|                                             |                                |                                             |                                |                                             |                                |                                             |                                |                                             |                   |
| ≤ 12 ms                                     |                                | ≤ 12 ms                                     |                                | ≤ 12 ms                                     |                                | ≤ 12 ms                                     |                                | ≤ 12 ms                                     |                   |
| ≤ 10 ms                                     |                                | ≤ 10 ms                                     |                                | ≤ 10 ms                                     |                                | ≤ 10 ms                                     |                                | ≤ 10 ms                                     |                   |
| > 15 x 10 <sup>6</sup> switching operations |                                | > 15 x 10 <sup>6</sup> switching operations |                                | > 15 x 10 <sup>6</sup> switching operations |                                | > 15 x 10 <sup>6</sup> switching operations |                                | > 15 x 10 <sup>6</sup> switching operations |                   |
| ≥ 2 x 10 <sup>6</sup> switching operations  |                                | ≥ 2 x 10 <sup>6</sup> switching operations  |                                | ≥ 2 x 10 <sup>6</sup> switching operations  |                                | ≥ 2 x 10 <sup>6</sup> switching operations  |                                | ≥ 2 x 10 <sup>6</sup> switching operations  |                   |
| with free wheel diode                       |                                | with free wheel diode                       |                                | with free wheel diode                       |                                | with free wheel diode                       |                                | with free wheel diode                       |                   |
| > 2 x 10 <sup>5</sup> switching operations  |                                | > 2 x 10 <sup>5</sup> switching operations  |                                | > 2 x 10 <sup>5</sup> switching operations  |                                | > 2 x 10 <sup>5</sup> switching operations  |                                | > 2 x 10 <sup>5</sup> switching operations  |                   |
| Green LED                                   |                                | Green LED                                   |                                | Green LED                                   |                                | Green LED                                   |                                | Green LED                                   |                   |
| -40 °C...+60 °C                             |                                | -40 °C...+60 °C                             |                                | -40 °C...+60 °C                             |                                | -40 °C...+60 °C                             |                                | -40 °C...+60 °C                             |                   |
| -25 °C...+60 °C                             |                                | -25 °C...+60 °C                             |                                | -25 °C...+60 °C                             |                                | -25 °C...+60 °C                             |                                | -25 °C...+60 °C                             |                   |
|                                             |                                |                                             |                                |                                             |                                |                                             |                                |                                             |                   |
| DIN VDE 0106                                |                                |                                             |                                |                                             |                                |                                             |                                |                                             |                   |
| 8 kV                                        |                                | 8 kV                                        |                                | 8 kV                                        |                                | 8 kV                                        |                                | 8 kV                                        |                   |
| ≥ 8 mm                                      |                                | ≥ 8 mm                                      |                                | ≥ 8 mm                                      |                                | ≥ 8 mm                                      |                                | ≥ 8 mm                                      |                   |
| III                                         |                                | III                                         |                                | III                                         |                                | III                                         |                                | III                                         |                   |
| 2                                           |                                | 2                                           |                                | 2                                           |                                | 2                                           |                                | 2                                           |                   |
|                                             |                                |                                             |                                |                                             |                                |                                             |                                |                                             |                   |
| QB 16/10.16                                 | <b>1650330000</b>              | QB 16/10.16                                 | <b>1650330000</b>              | QB 16/10.16                                 | <b>1650330000</b>              | QB 16/10.16                                 | <b>1650330000</b>              | QB 16/10.16                                 | <b>1650330000</b> |
| Page 304                                    |                                | Page 304                                    |                                | Page 304                                    |                                | Page 304                                    |                                | Page 304                                    |                   |

## PLUGSERIES Relays on Sockets



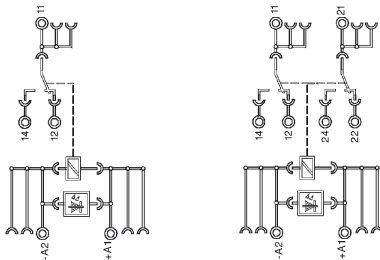
PRZ/PRS



PRZ/PRS



PRS/PRZ xxx 1CO    PRS/PRZ xxx 2CO



- Modular system comprising:
  - Relay socket for mounting rails
  - LED indicator unit / RC combination
  - retainer clip
  - pluggable relays
- Independent connection technology: screw or tension clamp technology
- Compatible with low power relays type RT / Standard with 1 or 2 CO contacts
- Coil and root-contacts cross-connectable with cross-connection type ZQV 2.5 N
- Available as complete module or as spare parts

### DC-Version

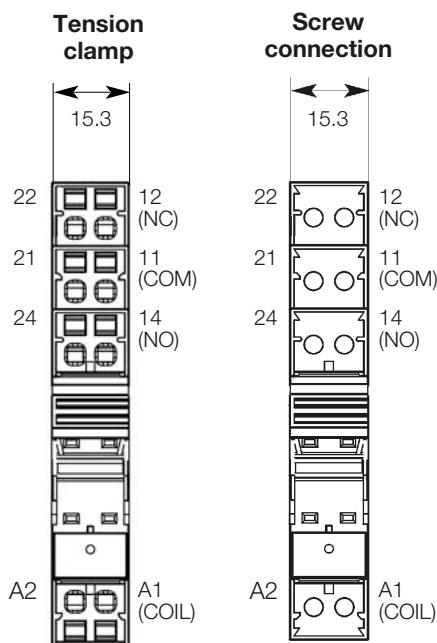
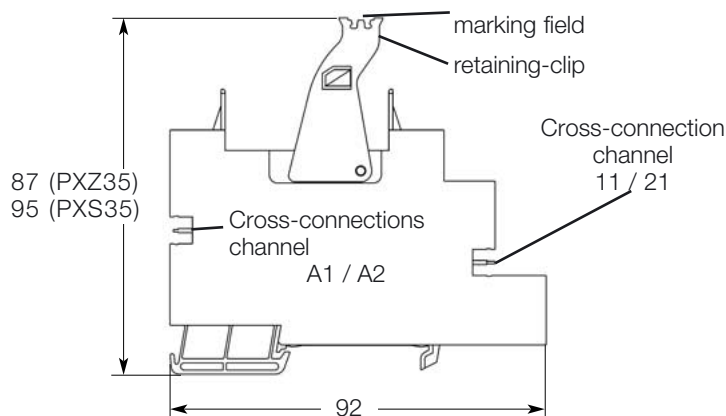
| Type/Version                            | Cat. No.                         | Qty. |
|-----------------------------------------|----------------------------------|------|
| <b>Screw connection</b>                 |                                  |      |
| PRS 12Vdc LD 1CO                        | 8536471001                       | 10   |
| PRS 12Vdc LD 2CO                        | 8536501001                       | 10   |
| PRS 24Vdc LD 1CO                        | 8530621001                       | 10   |
| PRS 24Vdc LD 2CO                        | 8530631001                       | 10   |
| PRS 115Vdc LD 1CO                       | 8536510000                       | 10   |
| PRS 115Vdc LD 2CO                       | 8536520000                       | 10   |
| PRS 24Vdc LD 2CO SGR 282                | 8596000000                       | 10   |
| with gold-plated relay contacts:        |                                  |      |
| PRS 24Vdc LD 2CO AU                     | 8561760000                       | 10   |
|                                         |                                  |      |
| <b>Tension clamp connection</b>         |                                  |      |
| PRZ 12Vdc LD 1CO                        | 8536571001                       | 10   |
| PRZ 12Vdc LD 2CO                        | 8536591001                       | 10   |
| PRZ 24Vdc LD 1CO                        | 8530691001                       | 10   |
| PRZ 24Vdc LD 2CO                        | 8530701001                       | 10   |
| PRZ 115Vdc LD 1CO                       | 8536610000                       | 10   |
| PRZ 115Vdc LD 2CO                       | 8536630000                       | 10   |
| PRZ 24Vdc LD 2CO SGR 282                | 8595970000                       | 10   |
| with gold-plated relay contacts:        |                                  |      |
| PRZ 24Vdc LD 2CO AU                     | 8552440000                       | 10   |
|                                         |                                  |      |
| Other variants on request               |                                  |      |
| <b>Technical data</b>                   |                                  |      |
| Input voltage                           | 12 V dc ... 24Vdc ... 115Vdc     |      |
| Rated consumption, typ                  | 400 mW                           |      |
| Status indicator                        | pluggable LED-housing, green LED |      |
| <b>Output</b>                           | <b>1 CO / 2 CO contacts</b>      |      |
| Contact version                         | 1 x UM / 2 x UM                  |      |
| Max. output voltage                     | 250Vuc                           |      |
| Max. switching current                  | 16A / 2 x 8A                     |      |
| Continuous current                      | 10A                              |      |
| Rated braking capacity                  | 4kVA / 2 x 2kVA                  |      |
| Service life, mech.                     | 30 x 10 <sup>6</sup>             |      |
| <b>Input/output</b>                     |                                  |      |
| Clearance and creepage path             | > 8mm                            |      |
| Protective separation                   | DIN VDE 0106 T. 101              |      |
| Dielectric strength                     | > 4kV eff                        |      |
| Insulation coordinates acc. to EN 50178 | III / 2                          |      |
| <b>Miscellaneous data</b>               |                                  |      |
| Ambient temperature                     | -40°C ... +50°C                  |      |
| Protection class                        | IP 20                            |      |
| Rated cross-section                     | 0.5...2.5mm <sup>2</sup>         |      |
| Flammability                            | V0                               |      |
| Relay type                              | Schrack RT1 / RT2                |      |
| Dimensions WxHxT                        | 15.2 x 91 x 85                   |      |
| Approvals                               | CE, UL recognized, cUL           |      |
| Rail mounted                            | TS 35                            |      |
| <b>Accessories</b>                      |                                  |      |
| Cross-connection                        |                                  |      |
| 2-pole black                            | ZQV 2.5N/4-2 SW1784270000        | 60   |
| 2-pole red                              | ZQV 2.5N/4-2 RT 1784280000       | 60   |
| 2-pole blue                             | ZQV 2.5N/4-2 BL 1784290000       | 60   |
| <b>Marking tags</b>                     |                                  |      |
| WS 10/5                                 | 1060860000                       |      |
| WS 15/5                                 | 1609880000                       |      |

### AC-Version

| Type/Version                            | Cat. No.                         | Qty. |
|-----------------------------------------|----------------------------------|------|
| <b>Screw connection</b>                 |                                  |      |
| PRS 24Vac LD 1CO                        | 8536530000                       | 10   |
| PRS 24Vac LD 2CO                        | 8536560000                       | 10   |
| PRS 120Vac LD 1CO                       | 8530641001                       | 10   |
| PRS 120Vac LD 2CO                       | 8530661001                       | 10   |
| PRS 230Vac LD 1CO                       | 8530671001                       | 10   |
| PRS 230Vac LD 2CO                       | 8530681001                       | 10   |
| with gold-plated relay contacts:        |                                  |      |
| PRS 120Vac LD 2CO AU                    | 8595960000                       | 10   |
| PRS 230Vac LD 2CO AU                    | 8595990000                       | 10   |
|                                         |                                  |      |
| <b>Tension clamp connection</b>         |                                  |      |
| PRZ 24Vac LD 1CO                        | 8536651001                       | 10   |
| PRZ 24Vac LD 2CO                        | 8536681001                       | 10   |
| PRZ 120Vac LD 1CO                       | 8530710000                       | 10   |
| PRZ 120Vac LD 2CO                       | 8530720000                       | 10   |
| PRZ 230Vac LD 1CO                       | 8530731001                       | 10   |
| PRZ 230Vac LD 2CO                       | 8530741001                       | 10   |
| with gold-plated relay contacts:        |                                  |      |
| PRZ 120Vac LD 2CO AU                    | 8575940000                       | 10   |
| PRZ 230Vac LD 2CO AU                    | 8575950000                       | 10   |
| Other variants on request               |                                  |      |
| <b>Technical data</b>                   |                                  |      |
| Input voltage                           | 24Vac ... 120Vac ... 230Vac      |      |
| Rated consumption, typ                  | 760 VA                           |      |
| Status indicator                        | pluggable LED-housing, green LED |      |
| <b>Output</b>                           | <b>1 CO / 2 CO contacts</b>      |      |
| Contact version                         | 1 x UM / 2 x UM                  |      |
| Max. output voltage                     | 250Vuc                           |      |
| Max. switching current                  | 16A / 2 x 8A                     |      |
| Continuous current                      | 10A                              |      |
| Rated braking capacity                  | 4kVA / 2 x 2kVA                  |      |
| Service life, mech.                     | 5 x 10 <sup>6</sup>              |      |
| <b>Input/output</b>                     |                                  |      |
| Clearance and creepage path             | > 8mm                            |      |
| Protective separation                   | DIN VDE 0106 T. 101              |      |
| Dielectric strength                     | > 4kV eff                        |      |
| Insulation coordinates acc. to EN 50178 | III / 2                          |      |
| <b>Miscellaneous data</b>               |                                  |      |
| Ambient temperature                     | -40°C ... +50°C                  |      |
| Protection class                        | IP 20                            |      |
| Rated cross-section 0.5 mm <sup>2</sup> | 0.5...2.5mm <sup>2</sup>         |      |
| Flammability                            | V0                               |      |
| Relay type                              | Schrack RT1 / RT2                |      |
| Dimensions WxHxT                        | 15.2 x 91 x 85                   |      |
| Approvals                               | CE, UL recognized, cUL           |      |
| Rail mounted                            | TS 35                            |      |
| <b>Accessories</b>                      |                                  |      |
| Cross-connection                        |                                  |      |
| 2-pole black                            | ZQV 2.5N/4-2 SW1784270000        | 60   |
| 2-pole red                              | ZQV 2.5N/4-2 RT 1784280000       | 60   |
| 2-pole blue                             | ZQV 2.5N/4-2 BL 1784290000       | 60   |
| <b>Marking tags</b>                     |                                  |      |
| WS 10/5                                 | 1060860000                       |      |
| WS 15/5                                 | 1609880000                       |      |

## PLUGSERIES Relays on Sockets

### Accessories



#### Empty base for rail mounted TS 35

|                          |
|--------------------------|
| Screw connection         |
| Tension clamp connection |

#### Technical data

|                                   |                     |
|-----------------------------------|---------------------|
| Rated current                     | 16 A                |
| Rated voltage                     | 250 V               |
| Dielectric strength coil/contacts | > 4 kV              |
| Protection class                  | IP 20               |
| Rated cross-section               | 2.5 mm <sup>2</sup> |
| Insulation stripping length       |                     |
| - Screw connection                | 8 mm                |
| - Tension clamp connection        | 10 mm               |
| Ambient temperature               | -40°C ... +60°C     |
| Flammability class UL 94          | V0                  |

#### Holding clamp

|      |            |      |
|------|------------|------|
| Type | Cat. No.   | Qty. |
| PRC  | 8536700000 | 100  |

#### Operating indication

LED indicator with free-wheeling diode

|                                 |                  |            |    |
|---------------------------------|------------------|------------|----|
| 6 ... 24 Vdc                    | PLED 24 Vdc      | 8536710000 | 20 |
| 6 ... 24 Vdc                    | PLED 24 Vdc red  | 8611010000 | 20 |
| 48 ... 60 Vdc                   | PLED 48 Vdc      | 8536720000 | 20 |
| 115 Vdc                         | PLED 115 Vdc     | 8536730000 | 20 |
| 12 ... 24 Vac                   | PLED 24 Vac      | 8536750000 | 20 |
| 115 Vac                         | PLED 120 Vac     | 8536760000 | 20 |
| 230 Vac                         | PLED 230 Vac     | 8536780000 | 20 |
| 230 Vac                         | PLED 230 Vac red | 8611000000 | 20 |
| RC combination 120...230 VAC/DC | PLRC 200 nF/200Ω | 8566530000 | 20 |

#### Pluggable cross-connectionen

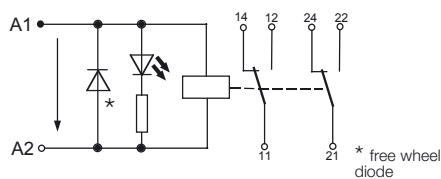
|              |                |            |    |
|--------------|----------------|------------|----|
| 2-pole black | ZQV 2.5N/4-2SW | 1784270000 | 60 |
| 2-pole red   | ZQV 2.5N/4-2RT | 1784280000 | 60 |
| 2-pole blue  | ZQV 2.5N/4-2BL | 1784290000 | 60 |

#### Marking tags

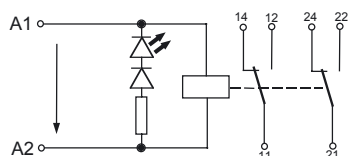
|           |         |            |      |
|-----------|---------|------------|------|
| 10 x 5 mm | Type    | Cat. No.   | Qty. |
|           | WS 10/5 | 1060860000 | 200  |
|           | WS 15/5 | 1609880000 | 96   |

### Operating indication

#### DC-Version



#### AC-Version

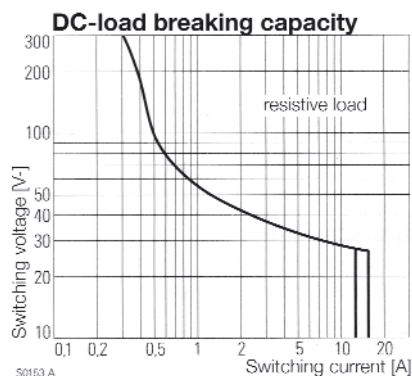
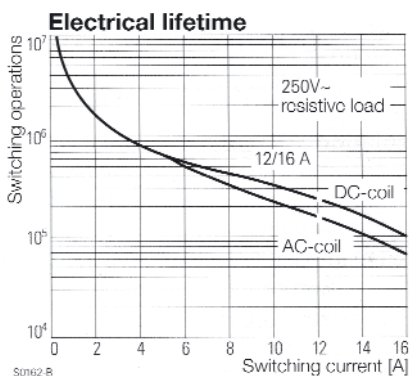
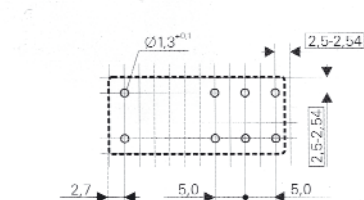


## PLUGSERIES Relays on Sockets

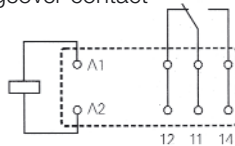
### Pluggable relay types

#### Print figure/circuit diagram Relay type RT/SGR

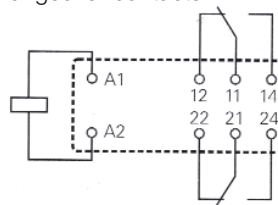
16 A, Pinning 5 mm



1 changeover contact



2 changeover contacts



### SCHRACK RT



#### Pluggable relay

|                                  |
|----------------------------------|
| 12 Vdc 1 changeover contact      |
| 12 Vdc 2 changeover contacts     |
| 24 Vdc 1 changeover contact      |
| 24 Vdc 1 changeover contact AU   |
| 24 Vdc 2 changeover contacts     |
| 24 Vdc 2 changeover contacts AU  |
| 48 Vdc 1 changeover contact      |
| 48 Vdc 2 changeover contacts     |
| 60 Vdc 2 changeover contacts     |
| 110 Vdc 1 changeover contact     |
| 110 Vdc 2 changeover contacts    |
| 24 Vac 1 changeover contact      |
| 24 Vac 2 changeover contacts     |
| 115 Vac 1 changeover contact     |
| 115 Vac 1 changeover contact AU  |
| 115 Vac 2 changeover contacts    |
| 115 Vac 2 changeover contacts AU |
| 230 Vac 1 changeover contact     |
| 230 Vac 1 changeover contact AU  |
| 230 Vac 2 changeover contacts    |
| 230 Vac 2 changeover contacts AU |

#### Technical data

|                                                |
|------------------------------------------------|
| Contact number and type                        |
| Contact material                               |
| Switching current                              |
| Switching voltage                              |
| Braking capacity                               |
| Min. switching current / braking capacity      |
| Min. braking capacity AU contact               |
| Rated consumption                              |
| Dielectric strength Sp./Kont.                  |
| Response / drop out time:                      |
| DC coil                                        |
| AC coil                                        |
| Bounce time NO contact/normally closed contact |
| Mechanical service life:                       |
| DC coil                                        |
| AC coil                                        |
| Braking capacity                               |
| 1-pole DC 13                                   |
| 2-pole DC 13                                   |
| 2-pole AC 15                                   |

#### Miscellaneous data

|                       |
|-----------------------|
| Protection class      |
| Flammability class UL |
| Ambient temperature   |
| DC coil               |
| AC coil               |
| Weight                |
| Approvals             |

| Type Schrack RT | Cat. No.   | Qty. |
|-----------------|------------|------|
| RT 314012       | 4058470000 | 20   |
| RT 424012       | 4058560000 | 20   |
| RT 314024       | 4058480000 | 20   |
| RT 315024       | 4058490000 | 20   |
| RT 424024       | 4058570000 | 20   |
| RT 425024       | 4058580000 | 20   |
| RT 314048       | 4058740000 | 20   |
| RT 424048       | 4058750000 | 20   |
| RT 424060       | 4058760000 | 20   |
| RT 314110       | 4058500000 | 20   |
| RT 424110       | 4058590000 | 20   |
| RT 315524       | 4058510000 | 20   |
| RT 424524       | 4058600000 | 20   |
| RT 314615       | 4058520000 | 20   |
| RT 315625       | 4058530000 | 20   |
| RT 424615       | 4058610000 | 20   |
| RT 425615       | 4058620000 | 20   |
| RT 314730       | 4058540000 | 20   |
| RT 315730       | 4058550000 | 20   |
| RT 424730       | 4058630000 | 20   |
| RT 425730       | 4058640000 | 20   |

|                                               |
|-----------------------------------------------|
| 1 changeover contact or 2 changeover contacts |
| AgNi 90/10, AgNi 0.15 htv                     |
| 16 A 1We/2 x 8 A 2We                          |
| 250 V ac                                      |
| 4 kVA                                         |
| 10 mA /100 mW                                 |
| 40 µW                                         |
| 400 mW dc/0.55 VA ac                          |
| 5 kV                                          |
| typ. 7/3 ms                                   |
| 9/45 ms                                       |
| typ. 1/3 ms                                   |
| > 30 x 10 <sup>6</sup> switching operations   |
| > 30 x 10 <sup>8</sup> switching operations   |
| 1.25A, L/R = 80 ms 2.3 x 10 <sup>5</sup>      |
| 1.25A, L/R = 80 ms 2.8 x 10 <sup>5</sup>      |
| 1.2A, cosL/R = 0.3 6050x                      |

|                   |
|-------------------|
| IP 40             |
| V0                |
| -40°C ... +85°C   |
| -40°C ... +70°C   |
| 14 g              |
| UL, CSA, VDE, ÖVE |

## PLUGSERIES Relays on Sockets

## ELESTA SGR

### Relais with manual operation



| Pluggable relay                                | Type             | ELESTA SGR                                  | Cat. No. | Qty. |
|------------------------------------------------|------------------|---------------------------------------------|----------|------|
| 24 Vdc 1 changeover contact with test button   | SGR 662 24 Vdc T | <b>8550510000</b>                           |          | 10   |
| 24 Vdc 2 changeover contacts with test button  | SGR 282 24 Vdc T | <b>8550520000</b>                           |          | 10   |
| 24 Vdc 1 normally-open contact                 |                  |                                             |          |      |
| <b>Technical data</b>                          |                  |                                             |          |      |
| Contact number and type                        |                  | 2 changeover contacts with test button      |          |      |
| Contact material                               |                  | AgCuNi                                      |          |      |
| Switching current                              |                  | 16 A 1We/2 x 8 A 2We                        |          |      |
| Peak inrush current                            |                  |                                             |          |      |
| Switching voltage                              |                  | 250 Vac                                     |          |      |
| Braking capacity                               |                  | 4 kVA                                       |          |      |
| Min. switching current / braking capacity      |                  | 10 mA /100 mW                               |          |      |
| Rated consumption                              |                  | 500 mW                                      |          |      |
| Dielectric strength Sp./Kont.                  |                  | 5 kV                                        |          |      |
| Response / drop out time:                      | DC coil          | typ. 10/3 ms                                |          |      |
| Bounce time NO contact/normally closed contact |                  | typ. 0.5/5 ms                               |          |      |
| Mechanical service life:                       | DC coil          | > 30 x 10 <sup>6</sup> switching operations |          |      |
| <b>Miscellaneous data</b>                      |                  |                                             |          |      |
| Protection class                               |                  | IP 40                                       |          |      |
| Flammability class UL                          |                  | V1                                          |          |      |
| Ambient temperature                            | DC coil          | -25°C ... +70°C                             |          |      |
| Weight                                         |                  | 20 g                                        |          |      |
| Approvals                                      |                  | SEV, UL, CSA, DEMKO, VDE, PTB               |          |      |

**RP 3SL**  
Relays for high switching currents

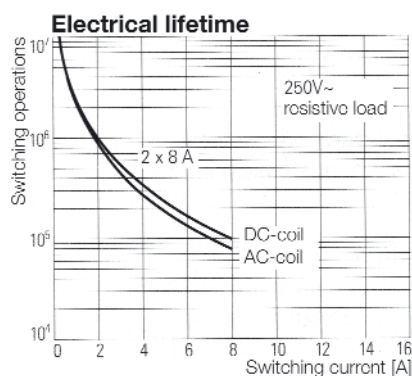


|                                           |                       |          |      |
|-------------------------------------------|-----------------------|----------|------|
| Type                                      | <b>Schrack RP 3SL</b> | Cat. No. | Qty. |
| <hr/>                                     |                       |          |      |
| <hr/>                                     |                       |          |      |
| <hr/>                                     |                       |          |      |
| RP3SL 24 Vdc 1NO                          | <b>8588510000</b>     | 20       |      |
| 1 normally-open contact                   |                       |          |      |
| AgSnO <sub>2</sub>                        |                       |          |      |
| 25 A                                      |                       |          |      |
| 120 A / 20 ms                             |                       |          |      |
| 250 V                                     |                       |          |      |
| 4 kVA                                     |                       |          |      |
| 500 mW                                    |                       |          |      |
| 4 kV                                      |                       |          |      |
| typ. 8/2 ms                               |                       |          |      |
| typ. 2 ms                                 |                       |          |      |
| 30 x 10 <sup>6</sup> switching operations |                       |          |      |
| <hr/>                                     |                       |          |      |
| IP 40                                     |                       |          |      |
| <hr/>                                     |                       |          |      |
| -40°C ... +70°C                           |                       |          |      |
| 18 g                                      |                       |          |      |
| SEV, UL, CSA, VDE                         |                       |          |      |

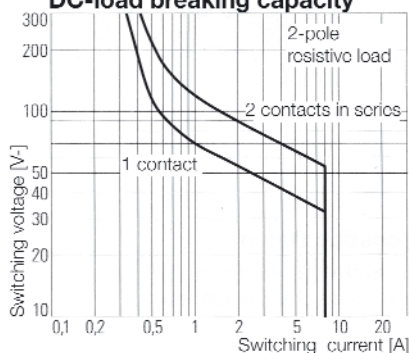
### Contact service life

| Type  | Load                                   | switch. oper.       | Regulation |
|-------|----------------------------------------|---------------------|------------|
| RP3SL | 12 A, 250 V~, cos $\phi$ =1            | 3x10 <sup>5</sup>   |            |
| RP3SL | TV 8                                   | 25x10 <sup>3</sup>  | UL 508     |
| RP3SL | 2500 W, 230 V~, halogene lamps         | >10 <sup>4</sup>    |            |
| RP3SL | 1000 W, 250 V~, glow lamps             | 2.3x10 <sup>5</sup> |            |
| RP3SL | 3000 W, 250 V~, glow lamps             | 3.6x10 <sup>4</sup> |            |
| RP3SL | 1500 VA, fluorescent tubes 163 $\mu$ F | 10 <sup>4</sup>     |            |

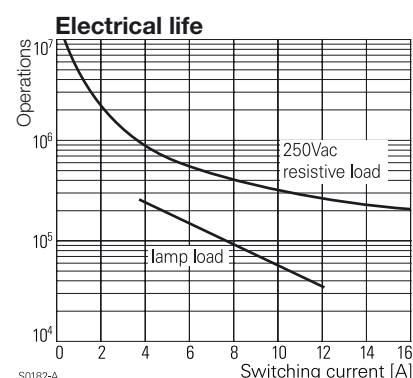
## Leistungsrelais Type RT2 2 changeover contacts



### DC-load breaking capacity

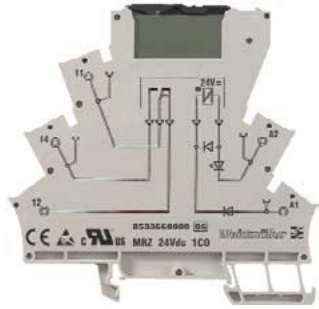


### Power relay RP 3SL



## Relay Couplers on Sockets MICROSERIES in Terminal Format

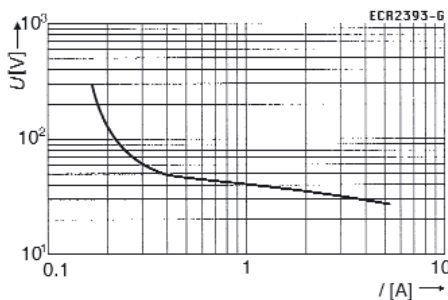
### MICRORELAY MRS/MRZ



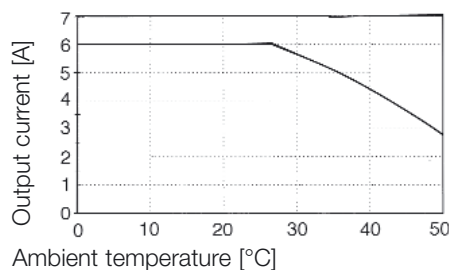
This module can be used as a universal interface between the controller and actuator for switching small to medium-sized loads.

- Pluggable cross-connection in the input and output reduces wiring costs
- 6-mm width
- Flexible thanks to screw and tension clamp connection versions

#### Limit diagram



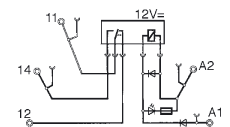
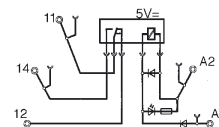
#### Current temperature-rise curve



#### Schematic circuit diagram

MRS 5 Vdc 1CO  
MRZ 5 Vdc 1CO

MRS 12 Vdc 1CO  
MRZ 12 Vdc 1CO



#### Ordering data

for TS 35

Screw connection

Tension clamp connection

#### Technical data

##### Input

Input voltage

Input voltage ac with  $U_{Nenn}$

Input voltage dc with  $U_{Nenn}$

Input power

Making threshold, (typ.)

Cut-out threshold (typ.)

Status indicator

Reaction time at  $U_N$  (typ.)

Release at  $U_N$  (typ.)

Voltage of relay coil

##### Functionality

Operating indication

Reverse polarity protection

Free wheel diode

##### Output

Switching voltage

ac: continuous current/switching power (see derating diagram)

Switch-on current

dc: Continuous current/switching power

Min. braking capacity

Contact material

Mechanical service life

Max. switching frequency at nominal voltage

Ambient temperature

Storage temperature

Climate

Approvals

#### Insulation coordination acc. to EN 50178

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Insulation coord.- and voltage proof, input/output mounting rail

Achieved clearances and creepage distances

Type

Cat. No.

MRS 5 Vdc 1CO 8556080000

MRZ 5 Vdc 1CO 8556150000

Type

Cat. No.

MRS 12 Vdc 1CO 8556070000

MRZ 12 Vdc 1CO 8556140000

5 Vdc  $\pm 20\%$  (4...6 V)

12 Vdc  $\pm 20\%$  (9.6...14.4 V)

38.5 mAdc  $\pm 10\%$

17.2 mAdc  $\pm 10\%$

193 mW  $\pm 10\%$

210 mW  $\pm 10\%$

3.2 V / 21.6 mA

6.4 V / 8.4 mA

1.6 V / 8 mA

2.5 V / 2.4 mA

Green LED

Green LED

6.2 ms

5.8 ms

3.9 ms

6.9 ms

5 V

12 V

yes

yes

yes

yes

yes

yes

1 changeover contact

1 changeover contact

250 Vac acc. to VDE

250 Vac acc. to VDE

240 Vac acc. to UL/CSA

240 Vac acc. to UL/CSA

max. 6 A / max. 1500 VA

max. 6 A / max. 1500 VA

max. 6 A

max. 6 A

see limit diagram

see limit diagram

12 V / 10 mA

12 V / 10 mA

AgSnO

AgSnO

20 x 10<sup>6</sup> switching operations

20 x 10<sup>6</sup> switching operations

0.1 Hz

0.1 Hz

-25 °C...+50 °C

-25 °C...+50 °C

-40 °C...+60 °C

-40 °C...+60 °C

40 °C / 93 % rel. humidity,

40 °C / 93 % rel. humidity,

no condensation

no condensation

CE, cUL

CE, cUL

300 V

300 V

4 kV (1.2 / 50  $\mu$ s)

4 kV

III

III

2

2

4 kV<sub>eff</sub> / 1 min

4 kV<sub>eff</sub> / 1 min

$\geq 5.5$  mm

$\geq 5.5$  mm

## Relay Couplers on Sockets MICROSERIES in Terminal Format

**MRS 24 Vdc 1CO**

**MRS 24 Vuc 1CO**

**MRS 48 Vuc 1CO**

**MRS 60 Vdc 1CO**

**MRS 120 Vuc 1CO**

**MRS 230 Vac 1CO**

**MRZ 24 Vdc 1CO**

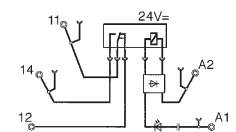
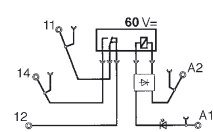
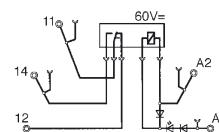
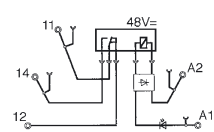
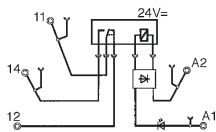
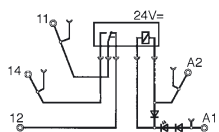
**MRZ 24 Vuc 1CO**

**MRZ 48 Vuc 1CO**

**MRZ 60 Vdc 1CO**

**MRZ 120 Vuc 1CO**

**MRZ 230 Vac 1CO**

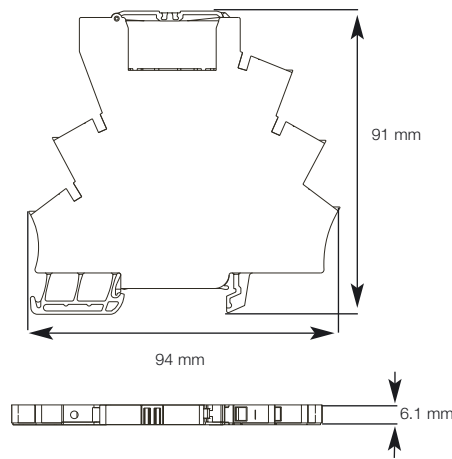


| Type                                        | Cat. No.          | Type                                        | Cat. No.          | Type                                        | Cat. No.          | Type                                        | Cat. No.          | Type                                        | Cat. No.          | Type                                        | Cat. No.          |
|---------------------------------------------|-------------------|---------------------------------------------|-------------------|---------------------------------------------|-------------------|---------------------------------------------|-------------------|---------------------------------------------|-------------------|---------------------------------------------|-------------------|
| MRS 24 Vdc 1CO                              | <b>8533640000</b> | MRS 24 Vuc 1CO                              | <b>8556050000</b> | MRS 48 Vuc 1CO                              | <b>8556040000</b> | MRS 60 Vdc 1CO                              | <b>8556060000</b> | MRS 120 Vuc 1CO                             | <b>8556030000</b> | MRS 230 Vac 1CO                             | <b>8556020000</b> |
| MRZ 24 Vdc 1CO                              | <b>8533660000</b> | MRZ 24 Vuc 1CO                              | <b>8556120000</b> | MRZ 48 Vuc 1CO                              | <b>8556110000</b> | MRZ 60 Vdc 1CO                              | <b>8556130000</b> | MRZ 120 Vuc 1CO                             | <b>8556100000</b> | MRZ 230 Vac 1CO                             | <b>8556090000</b> |
| 24 Vdc ± 20 % (19.2...28.8 V)               |                   | 24 Vuc ±10% (21.6...26.4 V)                 |                   | 48 Vuc ±10% (43.2...52.8 V)                 |                   | 60 Vdc ±20% (48...72 V)                     |                   | 120 Vuc +10%/-15% (102...132 V)             |                   | 230 Vac ±10% (207...253 V)                  |                   |
| 6.6 mAdc ±10 %                              |                   | 11 mA ±10 %                                 |                   | 5 mA ±20 %                                  |                   | 3.3 mAdc ±20 %                              |                   | 3.5 mAac ±15 %                              |                   | 7.6 mA ±15%                                 |                   |
| 160 mW ±10%                                 |                   | 6.4 mA ±20 %                                |                   | 4 mA ±20 %                                  |                   | 200 mW ±10 %                                |                   | 0.42 VA ±15 %                               |                   | 1.55 VA ±15 %                               |                   |
| 15.4 V / 4 mA                               |                   | 154 mW ±10 %                                |                   | 190 mW ±20 %                                |                   | 35 V / 1.6 mA                               |                   | 71 V / 1.8 mA                               |                   | 103 V / 5 mA                                |                   |
| 6.5 V / 1.2 mA                              |                   | 15.8 V / 3.6 mA                             |                   | 29 V / 2.2 mA                               |                   | 11 V / 0.6 mA                               |                   | 22 V / 0.5 mA                               |                   | 49 V / 2.5 mA                               |                   |
| Green LED                                   |                   | 7 V / 1.3 mA                                |                   | 11 V / 1.3 mA                               |                   | Green LED                                   |                   | Green LED                                   |                   | Green LED                                   |                   |
| 6.6 ms                                      |                   | Green LED                                   |                   | Green LED                                   |                   | 5.9 ms                                      |                   | 6.7 ms                                      |                   | 13 ms                                       |                   |
| 5.8 ms                                      |                   | 7.3 ms                                      |                   | 6.1 ms                                      |                   | 6.5 ms                                      |                   | 8.1 ms                                      |                   | 11 ms                                       |                   |
| 24 V                                        |                   | 9 ms                                        |                   | 5.8 ms                                      |                   | 60 V                                        |                   | 60 V                                        |                   | 24 V                                        |                   |
|                                             |                   | 24 V                                        |                   | 48 V                                        |                   |                                             |                   |                                             |                   |                                             |                   |
| yes                                         |                   |                                             |                   |                                             |                   | yes                                         |                   | yes                                         |                   | yes                                         |                   |
| yes                                         |                   | yes                                         |                   | yes                                         |                   | yes                                         |                   | yes                                         |                   | -                                           |                   |
| yes                                         |                   | yes                                         |                   | yes                                         |                   | yes                                         |                   | yes                                         |                   | -                                           |                   |
| 1 changeover contact                        |                   | 1 changeover contact                        |                   | 1 changeover contact                        |                   | 1 changeover contact                        |                   | 1 changeover contact                        |                   | 1 changeover contact                        |                   |
| 250 Vac acc. to VDE                         |                   | 250 V ~ acc. to VDE                         |                   | 250 Vac acc. to VDE                         |                   | 250 Vac acc. to VDE                         |                   | 250 V ~ acc. to VDE                         |                   | 250 V ~ acc. to VDE                         |                   |
| 240 Vac acc. to UL/CSA                      |                   | 240 V ~ acc. to UL/CSA                      |                   | 240 Vac acc. to UL/CSA                      |                   | 240 Vac acc. to UL/CSA                      |                   | 240 V ~ acc. to UL/CSA                      |                   | 240 V ~ acc. to UL/CSA                      |                   |
| max. 6 A / max. 1500 VA                     |                   | max. 6 A / max. 1500 VA                     |                   | max. 6 A / max. 1500 VA                     |                   | max. 6 A / max. 1500 VA                     |                   | max. 6 A / max. 1500 VA                     |                   | max. 6 A / max. 1500 VA                     |                   |
| max. 6 A                                    |                   | max. 6 A                                    |                   | max. 6 A                                    |                   | max. 6 A                                    |                   | max. 6 A                                    |                   | max. 6 A                                    |                   |
| see limit diagram                           |                   | see limit diagram                           |                   | see limit diagram                           |                   | see limit diagram                           |                   | see limit diagram                           |                   | see limit diagram                           |                   |
| 12 V /10 mA                                 |                   | 12 V /10 mA                                 |                   | 12 V /10 mA                                 |                   | 12 V /10 mA                                 |                   | 12 V /10 mA                                 |                   | 12 V /10 mA                                 |                   |
| AgSnO                                       |                   | AgSnO                                       |                   | AgSnO                                       |                   | AgSnO                                       |                   | AgSnO                                       |                   | AgSnO                                       |                   |
| 20 x 10 <sup>6</sup> switching operations   |                   | 20 x 10 <sup>6</sup> switching operations   |                   | 20 x 10 <sup>6</sup> switching operations   |                   | 20 x 10 <sup>6</sup> switching operations   |                   | 20 x 10 <sup>6</sup> switching operations   |                   | 20 x 10 <sup>6</sup> switching operations   |                   |
| 0.1 Hz                                      |                   | 0.1 Hz                                      |                   | 0.1 Hz                                      |                   | 0.1 Hz                                      |                   | 0.1 Hz                                      |                   | 0.1 Hz                                      |                   |
| -25 °C...+50 °C                             |                   | -25 °C...+50 °C                             |                   | -25 °C...+50 °C                             |                   | -25 °C...+50 °C                             |                   | -25 °C...+50 °C                             |                   | -25 °C...+50 °C                             |                   |
| -40 °C...+60 °C                             |                   | -40 °C...+60 °C                             |                   | -40 °C...+60 °C                             |                   | -40 °C...+60 °C                             |                   | -40 °C...+60 °C                             |                   | -40 °C...+60 °C                             |                   |
| 40 °C / 93 % rel. humidity, no condensation |                   | 40 °C / 93 % rel. humidity, no condensation |                   | 40 °C / 93 % rel. humidity, no condensation |                   | 40 °C / 93 % rel. humidity, no condensation |                   | 40 °C / 93 % rel. humidity, no condensation |                   | 40 °C / 93 % rel. humidity, no condensation |                   |
| CE, cUL                                     |                   | CE, cUL                                     |                   | CE, cUL                                     |                   | CE, cUL                                     |                   | CE, cUL                                     |                   | CE, cUL                                     |                   |
| 300 V                                       |                   | 300 V                                       |                   | 300 V                                       |                   | 300 V                                       |                   | 300 V                                       |                   | 300 V                                       |                   |
| 4 kV                                        |                   | 4 kV                                        |                   | 4 kV                                        |                   | 4 kV                                        |                   | 4 kV                                        |                   | 4 kV                                        |                   |
| III                                         |                   | III                                         |                   | III                                         |                   | III                                         |                   | III                                         |                   | III                                         |                   |
| 2                                           |                   | 2                                           |                   | 2                                           |                   | 2                                           |                   | 2                                           |                   | 2                                           |                   |
| 4 kV <sub>eff</sub> / 1 min                 |                   | 4 kV <sub>eff</sub> / 1 min                 |                   | 4 kV <sub>eff</sub> / 1 min                 |                   | 4 kV <sub>eff</sub> / 1 min                 |                   | 4 kV <sub>eff</sub> / 1 min                 |                   | 4 kV <sub>eff</sub> / 1 min                 |                   |
| ≥ 5.5 mm                                    |                   | ≥ 5.5 mm                                    |                   | ≥ 5.5 mm                                    |                   | ≥ 5.5 mm                                    |                   | ≥ 5.5 mm                                    |                   | ≥ 5.5 mm                                    |                   |

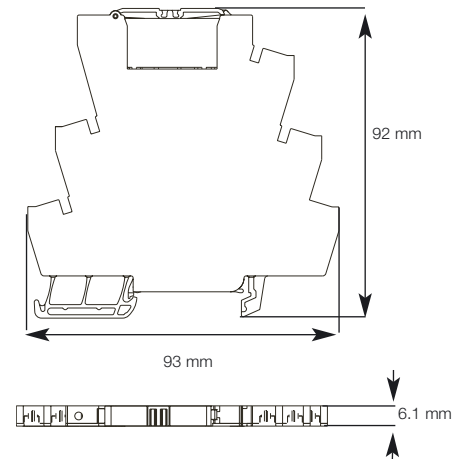
# Relay Couplers on Sockets MICROSERIES in Terminal Format

## Accessories

Tension clamp version MRZ



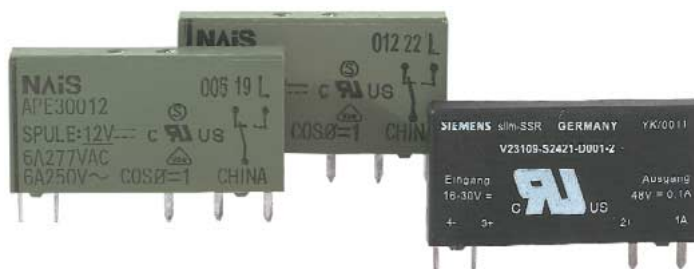
Screw version MRS



| General technical data                                           |        | Tension clamp version |            | Screw version |                    |            |      |
|------------------------------------------------------------------|--------|-----------------------|------------|---------------|--------------------|------------|------|
| Clampable conductor:                                             |        |                       |            |               |                    |            |      |
| Solid H07V-U                                                     | mm²    | 0.5...2.5             |            | 0.5...4       |                    |            |      |
| Fsolid H07V-K                                                    | mm²    | 0.5...2.5             |            | 0.5...2.5     |                    |            |      |
| „f“ with ferrules acc. to DIN 46 228/1*                          | mm²    | 0.5...1.5             |            | 0.5...1.5     |                    |            |      |
| „f“ with ferrules with plastic collar*                           | mm²    | 0.5...1.5             |            | 0.5...1.5     |                    |            |      |
| Max. clampable range in mm² /gauge pin acc. to IEC 60 947-1 Size |        | 0.13...2.5            | A 2        | 0.13...4      | A 3                |            |      |
| Rated torque                                                     |        | -                     |            | 0.6 Nm        |                    |            |      |
| Continuous current of cross-connection 2-pole                    | A      | 10                    |            | 10            |                    |            |      |
| Continuous current of cross-connection multipole                 | A      | 10                    |            | 10            |                    |            |      |
| Insulation stripping length                                      | mm     | 10                    |            | 7             |                    |            |      |
| Protection class                                                 |        | IP 20                 |            | IP 20         |                    |            |      |
| Housing material                                                 |        | Wemid                 |            | Wemid         |                    |            |      |
| Flammability class UL 94                                         |        | V0                    |            | V0            |                    |            |      |
| Rated current                                                    |        | 6 A                   |            | 6 A           |                    |            |      |
| Rated voltage                                                    |        | 250 V                 |            | 250 V         |                    |            |      |
|                                                                  |        |                       |            |               |                    |            |      |
| Cross-connection                                                 |        | Type                  | Cat. No.   | Qty.          | Type               | Cat. No.   | Qty. |
| Pluggable cross-connection                                       |        |                       |            |               |                    |            |      |
| ZQV                                                              | yellow | ZQV 4N / 2 GE         | 1758250000 | 60            | ZQV 4N / 2 GE      | 1758250000 | 60   |
|                                                                  |        | ZQV 4N / 3 GE         | 1762630000 | 60            | ZQV 4N / 3 GE      | 1762630000 | 60   |
|                                                                  |        | ZQV 4N / 4 GE         | 1762620000 | 60            | ZQV 4N / 4 GE      | 1762620000 | 60   |
|                                                                  |        | ZQV 4N / 10 GE        | 1758260000 | 20            | ZQV 4N / 10 GE     | 1758260000 | 20   |
|                                                                  |        | ZQV 4N / 41 GE        | 1758270000 | 10            | ZQV 4N / 41 GE     | 1758270000 | 10   |
|                                                                  |        |                       |            |               |                    |            |      |
|                                                                  | red    | ZQV 4N / 2 RT         | 1793950000 | 60            | ZQV 4N / 2 RT      | 1793950000 | 60   |
|                                                                  |        | ZQV 4N / 3 RT         | 1793980000 | 60            | ZQV 4N / 3 RT      | 1793980000 | 60   |
|                                                                  |        | ZQV 4N / 4 RT         | 1794010000 | 60            | ZQV 4N / 4 RT      | 1794010000 | 60   |
|                                                                  |        | ZQV 4N / 10 RT        | 1794040000 | 20            | ZQV 4N / 10 RT     | 1794040000 | 20   |
|                                                                  |        | ZQV 4N / 41 RT        | 1794070000 | 10            | ZQV 4N / 41 RT     | 1794070000 | 10   |
|                                                                  |        |                       |            |               |                    |            |      |
|                                                                  | blue   | ZQV 4N / 2 BL         | 1793960000 | 60            | ZQV 4N / 2 BL      | 1793960000 | 60   |
|                                                                  |        | ZQV 4N / 3 BL         | 1793990000 | 60            | ZQV 4N / 3 BL      | 1793990000 | 60   |
|                                                                  |        | ZQV 4N / 4 BL         | 1794020000 | 60            | ZQV 4N / 4 BL      | 1794020000 | 60   |
|                                                                  |        | ZQV 4N / 10 BL        | 1794050000 | 20            | ZQV 4N / 10 BL     | 1794050000 | 20   |
|                                                                  |        | ZQV 4N / 41 BL        | 1794080000 | 10            | ZQV 4N / 41 BL     | 1794080000 | 10   |
|                                                                  |        |                       |            |               |                    |            |      |
|                                                                  | black  | ZQV 4N / 2 SW         | 1793970000 | 60            | ZQV 4N / 2 SW      | 1793970000 | 60   |
|                                                                  |        | ZQV 4N / 3 SW         | 1794000000 | 60            | ZQV 4N / 3 SW      | 1794000000 | 60   |
|                                                                  |        | ZQV 4N / 4 SW         | 1794030000 | 60            | ZQV 4N / 4 SW      | 1794030000 | 60   |
|                                                                  |        | ZQV 4N / 10 SW        | 1794060000 | 20            | ZQV 4N / 10 SW     | 1794060000 | 20   |
|                                                                  |        | ZQV 4N / 41 SW        | 1794090000 | 10            | ZQV 4N / 41 SW     | 1794090000 | 10   |
|                                                                  |        |                       |            |               |                    |            |      |
| Markings                                                         |        | Type                  | Cat. No.   | Qty.          | Type               | Cat. No.   | Qty. |
| 12 x 6 mm                                                        |        | WS 10/6               | 1060960000 | 200           | WS 10/6            | 1060960000 | 200  |
|                                                                  |        | WS 12/6               | 1061160000 | 200           | WS 12/6            | 1061160000 | 200  |
|                                                                  |        |                       |            |               |                    |            |      |
| Screwdriver                                                      |        | Type                  | Cat. No.   | Qty.          | Type               | Cat. No.   | Qty. |
|                                                                  |        | SD 0.6 x 3.5 x 100    | 9008330000 | 10            | SD 0.6 x 3.5 x 100 | 9008330000 | 10   |

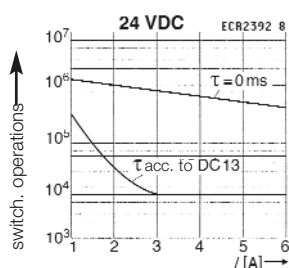
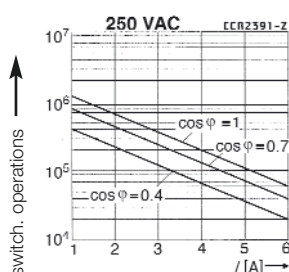
## Relay Couplers on Sockets MICROSERIES in Terminal Format

### Accessories



### Contact service life

Material AgSnO<sub>2</sub>



#### Pluggable relay

|                                                |
|------------------------------------------------|
| Coil voltage 5 V, 1 changeover contact         |
| Coil voltage 12 V, 1 changeover contact        |
| Coil voltage 24 V, 1 changeover contact        |
| Coil voltage 48 V, 1 changeover contact        |
| Coil voltage 60 V, 1 changeover contact        |
| Coil voltage 24 V, 1 changeover contact, 5 μAU |
| Coil voltage 60 V, 1 changeover contact, 5 μAU |

#### Technical data (of relay manufacturer)

|                                            |
|--------------------------------------------|
| Contact number and type                    |
| Contact version                            |
| Switching current                          |
| Switching voltage / max. Switching voltage |
| Braking capacity                           |
| Contact material                           |
| Recommended min. load                      |
| Typ. bounce time NO contact                |
| Typ. bounce time normally closed contact   |

#### Miscellaneous data

|                                                          |
|----------------------------------------------------------|
| Flammability class UL                                    |
| Ambient temperature                                      |
| Max. switching operations with rated load / without load |
| Response / drop out time                                 |
| Bounce time NO contact / normally closed contact         |
| Protection class Housing                                 |

For further data see also

| Type NAIS APE... | Cat. No.          | Qty. |
|------------------|-------------------|------|
| ... 30005V       | <b>4061580000</b> | 20   |
| ... 30012V       | <b>4061610000</b> | 20   |
| ... 30024V       | <b>4060120000</b> | 20   |
| ... 30048V       | <b>4061620000</b> | 20   |
| ... 30060V       | <b>4061630000</b> | 20   |
| ... 30124V       | <b>4061590000</b> | 20   |
| ... 30160V       | <b>4061600000</b> | 20   |

|                      |
|----------------------|
| 1 changeover contact |
| Single contact       |
| 6 A                  |
| 300 Vdc / 400 Vac    |
| 1500 VA              |
| AgSnO <sub>2</sub>   |
| ≥ 100 mA, 12 V       |
| 1 ms                 |
| 5 ms                 |

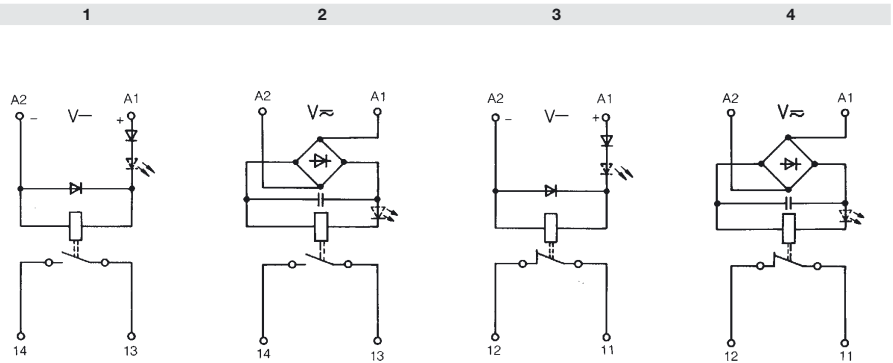
|                                        |
|----------------------------------------|
| V-0                                    |
| -40 ... +85 °C                         |
| 6/1200 switching operations per minute |
| 5 / 2.5 ms                             |
| 1.5 / 5 ms                             |
| IP 67                                  |

[www.matsushita.de](http://www.matsushita.de)

# Relay Couplers on Sockets RS 30

1 NC, 1 NO  
or 1 changeover contact

Schematic circuit diagram



## Rated data

Input voltage 5...60 V ± 10%; 115 V/230 V + 5% – 15%

Rated consumption – (W)

Rated consumption ~ (VA)

Drop-out current of the relay (at 20 °C)

Drop-out current of the relay (at 20 °C)

Pick-up current

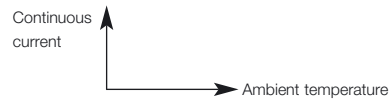
Max. output voltage

Continuous current

Derating curve

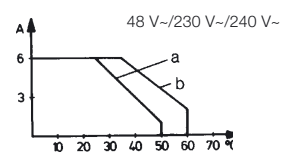
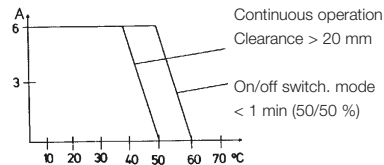
a = mounted horizontally on rail without clearance

b = mounted horizontally on rail with clearance x 20 mm



| 5 VTTL               | 12 V~  | 24 V~  | 24 V0   | 48 V~  | 48 V0   | 60 V~  | 115 V~ | 115 V~ | 230 V~ <sup>2)</sup> | 240 V~  |
|----------------------|--------|--------|---------|--------|---------|--------|--------|--------|----------------------|---------|
| 0.45 W <sup>1)</sup> | 0.45 W | 0.45 W | 0.45 W  | 0.45 W | 0.45 W  | 0.45 W | –      | 0.82 W | –                    | –       |
| –                    | –      | –      | 0.7 VA  | –      | 0.6 VA  | –      | 0.8 VA | –      | 0.8 VA               | 1.2 VA  |
| –                    | 3 mA   | 3 mA   | 2.5 mA~ | 2 mA   | 2.5 mA~ | 1 mA~  | –      | 2 mA~  | –                    | 0.5 mA~ |
| –                    | –      | –      | 3.5 mA~ | –      | 4.5 mA~ | –      | 1 mA~  | –      | 1 mA~                | 1 mA~   |
| –                    | –      | 12 mA  | –       | 10 mA  | –       | –      | 6 mA   | 4.3 mA | –                    | –       |
| 250 V                | 250 V  | 250 V  | 250 V   | 250 V  | 250 V   | 250 V  | 250 V  | 250 V  | 250 V                | 250 V   |
| 5 A                  | 6 A    | 6 A    | 6 A     | 6 A    | 5 A     | 5 A    | 5 A    | 5 A    | 3 A                  | 3 A     |

Continuous current



Switch-on current

Switching capacity with resistive load

Min. switching capacity/switching current

Bounce times

Switching times, typical

–, pick-up lag

–, turn off delay

Max. switching frequency

Contact material

Service life, mechanical

–, 24 V~, 1 A, resistive load

–, 230 V~, 3 A, resistive load

Storage temperature

Ambient temperature

–, mounted on rail without clearance

–, mounted on rail with clearance ≥ 20 mm

8 A

2000 VA/100 W

250 mW/10 mA

≤ 3 ms

|        |        |        |         |         |         |         |        |         |         |         |
|--------|--------|--------|---------|---------|---------|---------|--------|---------|---------|---------|
| ≤ 8 ms | ≤ 8 ms | ≤ 8 ms | ≤ 8 ms  | ≤ 12 ms | ≤ 13 ms | ≤ 12 ms | ≤ 9 ms | ≤ 12 ms | ≤ 10 ms | ≤ 10 ms |
| ≤ 7 ms | ≤ 7 ms | ≤ 7 ms | ≤ 16 ms | ≤ 11 ms | ≤ 12 ms | ≤ 11 ms | ≤ 8 ms | ≤ 11 ms | ≤ 9 ms  | ≤ 9 ms  |

70 Hz

70 Hz

70 Hz

30 Hz

70 Hz

20 Hz

70 Hz

30 Hz

70 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

30 Hz

## Insulation coordination acc. to EN 50178

Overvoltage category

Pollution severity

Dimensions

Mounting width

Length (perpendicular to mounting rail)

Height TS 32/TS 35 x 7.5

III

2

11.2 mm NO/NC, 25 mm changeover contacts

70 mm (74 mm BL/SL version)

56 mm/51.5 mm

<sup>1)</sup> Rated consumption with 24 VDC auxiliary voltage.

<sup>2)</sup> 230 V~ on request

## Relay Couplers on Sockets RS 30

### RS 30

Screw connection

1 NO

1 NC



5

### RS 30

Screw connection

1 changeover contact



6

### RS 30

Disconnect plug with

screw connection

1 changeover contact



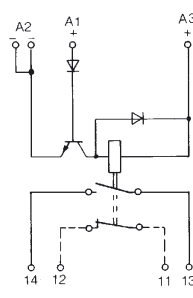
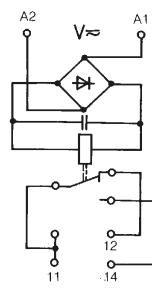
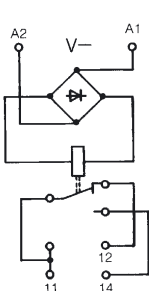
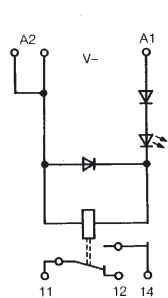
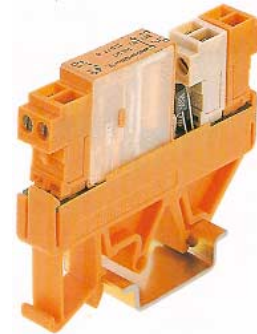
8

### RS 30 TTL

Disconnect plug with

screw connection

1 NO and 1 NC



#### Ordering data

Connection method

Screw connection (LP)

Disconnect plug with screw connection (BL/SL)

Schematic circuit diagram

1 2 3 4 5

6 7 8 8

Contact

NO NO NC NC changeo. c.

changeo. c. changeo. c. NO NC

Input voltage

Function indicator

5 V~

TTL

None

12 V~

None

Red LED

1129421001 1129521001

1101661001 1100961001

24 V~

Green LED

Red LED

1101611001 1100911001 1181511001

1101621001 1100921001 1181521001

24 Vb

None

Green LED

Red LED

1101761001 1101061001

1101711001 1101011001

1101721001 1101021001

48 V~

None

Green LED

Red LED

1101861001 1101161001

1101811001 1101111001

1101821001 1101121001

48 Vb

None

Green LED

Red LED

1101961001 1101261001

1101911001 1101211001

1101921001 1101221001

60 V~

None

Green LED

Red LED

1102061001

1102011001

1102021001

115 V~

None

Green LED

Red LED

1155161001 1155261001

1155111001 1155211001

1155121001 1155221001

115 V~

None

Green LED

Red LED

1102161001 1101461001

1102111001 1101411001

1102121001 1101421001

230 V~

None

Green LED

Red LED

1102261001 1101561001

1102211001 1101511001

1102221001 1101521001

240 V~

None

Green LED

Red LED

1128561001 1128661001

1128511001 1128611001

1128521001 1128621001

1167760000 1167660000

1129660000

1100260000

1100210000

1100220000

1100360000

1100460000

1100410000

1100420000

1100560000

1100660000

1100610000

1100620000

1100760000

1100860000

# Relay Couplers on Sockets RS 30

## 1 changeover contact

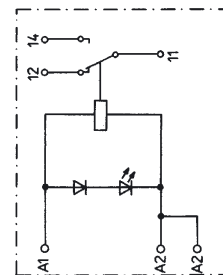
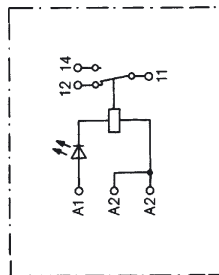
- Usable for high switching-power
- Suitable for switching inductive loads

## RS 31

with power contacts



## Schematic circuit diagram



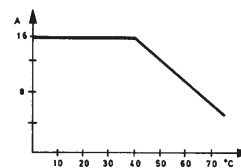
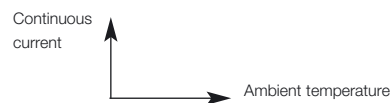
## Ordering data

| Type         | Cat. No.          | Type         | Cat. No.          | Type          | Cat. No.          | Type          | Cat. No.          |
|--------------|-------------------|--------------|-------------------|---------------|-------------------|---------------|-------------------|
| RS 31, 24 V~ | <b>1128361001</b> | RS 31, 48 V~ | <b>1150761001</b> | RS 31, 115 V~ | <b>1150361001</b> | RS 31, 115 V~ | <b>1150461001</b> |
| RS 31, 24 V~ | <b>1128331001</b> |              |                   |               |                   |               |                   |
| RS 31, 24 V~ | <b>1128311001</b> |              |                   |               |                   |               |                   |

## Rated data

| Input voltage                            | 24 V~, ±10 % | 48 V~, ±10 % | 115 V~, +5 % -15 % | 115 V~, +5 % -15 % |
|------------------------------------------|--------------|--------------|--------------------|--------------------|
| Rated consumption – (W)                  | 1 W          | 1 W          | 1 W                | –                  |
| Rated consumption – (VA)                 | –            | –            | –                  | 1 VA               |
| Drop-out current of the relay (at 20 °C) | 11.5 mA~     | 13.5 mA~     | 5.5 mA~            | –                  |
| Drop-out current of the relay (at 20 °C) | –            | –            | –                  | 1.5 mA~            |
| Max. output voltage                      | 250 V        | 250 V        | 250 V              | 250 V              |
| Continuous current                       | 16 A         | 16 A         | 16 A               | 16 A               |

Derating curve  
mounted horizontally on rail without clearance

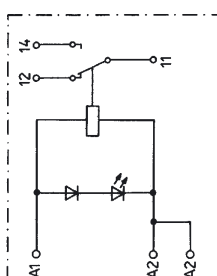


| Switch-on current                               | 60 A/200 ms                                | 60 A/200 ms                                                 | 60 A/200 ms                                | 60 A/200 ms                                |
|-------------------------------------------------|--------------------------------------------|-------------------------------------------------------------|--------------------------------------------|--------------------------------------------|
| Max. switching capacity with resistor load      | 3.5 kVA/480 W                              | 3.5 kVA/480 W                                               | 3.5 kVA/480 W                              | 3.5 kVA/480 W                              |
| Min. switching capacity/switching current       | 1 W/100 mA                                 | 1 W/100 mA                                                  | 1 W/100 mA                                 | 1 W/100 mA                                 |
| Bounce times                                    | < 3 ms                                     | < 6 ms                                                      | < 6 ms                                     | < 6 ms                                     |
| Switching times, typical                        |                                            |                                                             |                                            |                                            |
| –, pick-up lag                                  | < 9 ms                                     | < 12 ms                                                     | < 10 ms                                    | < 4 ms                                     |
| –, turn off delay                               | < 10 ms                                    | < 8 ms                                                      | < 12 ms                                    | < 11 ms                                    |
| Max. switching frequency                        |                                            |                                                             |                                            |                                            |
| Contact material                                | AgCdO                                      | AgCdO                                                       | AgCdO                                      | AgCdO                                      |
| Service life, mechanical                        | 3 x 10 <sup>7</sup> switching operations   | 3 x 10 <sup>7</sup> switching operations                    | 3 x 10 <sup>7</sup> switching operations   | 3 x 10 <sup>7</sup> switching operations   |
| – 230 V, 50 Hz, 3.5 kV A                        | 2.5 x 10 <sup>5</sup> switching operations | 2.5 x 10 <sup>5</sup> switching operations                  | 2.5 x 10 <sup>5</sup> switching operations | 2.5 x 10 <sup>5</sup> switching operations |
| Status indicator                                | Red LED<br>Yellow LED<br>Green LED         | <b>1128361001</b><br><b>1128331001</b><br><b>1128311001</b> | <b>1150761001</b><br><b>1150361001</b>     | <b>1150461001</b>                          |
| Storage temperature                             | –40 °C...+60 °C                            | –40 °C...+60 °C                                             | –40 °C...+60 °C                            | –40 °C...+60 °C                            |
| Ambient temperature                             | –25 °C...+40 °C                            | –25 °C...+40 °C                                             | –25 °C...+40 °C                            | –25 °C...+40 °C                            |
| <b>Insulation coordination acc. to EN 50178</b> |                                            |                                                             |                                            |                                            |
| Overvoltage category                            | III                                        | III                                                         | III                                        | III                                        |
| Pollution severity                              | 2                                          | 2                                                           | 2                                          | 2                                          |
| <b>Dimensions</b>                               |                                            |                                                             |                                            |                                            |
| Mounting width                                  | 25 mm                                      | 25 mm                                                       | 25 mm                                      | 25 mm                                      |
| Length (perpendicular to mounting rail)         | 70 mm                                      | 70 mm                                                       | 70 mm                                      | 70 mm                                      |
| Height with TS 32/TS 35 x 7.5                   | 58 mm/53.5 mm                              | 58 mm/53.5 mm                                               | 58 mm/53.5 mm                              | 58 mm/53.5 mm                              |

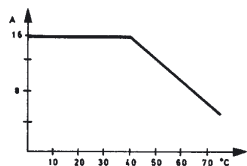
# Relay Coupler on Locking Socket Profile RS 31

## RS 31

with power contacts



| Type                      | Cat. No.          |  |
|---------------------------|-------------------|--|
| RS 31, 230 V~             | <b>1128461001</b> |  |
| RS 31, 230 V~             | <b>1128431001</b> |  |
| RS 31, 230 V~             | <b>1128411001</b> |  |
| <b>230 V~, +5 % -15 %</b> |                   |  |
| -                         |                   |  |
| 1 VA                      |                   |  |
| -                         |                   |  |
| 2.2 mA~                   |                   |  |
| 250 V                     |                   |  |
| 16 A                      |                   |  |

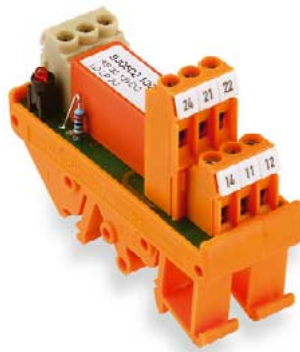


|                                            |  |
|--------------------------------------------|--|
| <b>60 A/200 ms</b>                         |  |
| 3.5 kVA/480 W                              |  |
| 1 W/100 mA                                 |  |
| < 6 ms                                     |  |
| < 10 ms                                    |  |
| < 8 ms                                     |  |
| AgCdO                                      |  |
| 3 x 10 <sup>7</sup> switching operations   |  |
| 2.5 x 10 <sup>5</sup> switching operations |  |
| <b>1128461001</b>                          |  |
| <b>1128431001</b>                          |  |
| <b>1128411001</b>                          |  |
| -40 °C...+60 °C                            |  |
| -25 °C...+40 °C                            |  |
|                                            |  |
| III                                        |  |
| 2                                          |  |
|                                            |  |
| 25 mm                                      |  |
| 70 mm                                      |  |
| 58 mm/53.5 mm                              |  |

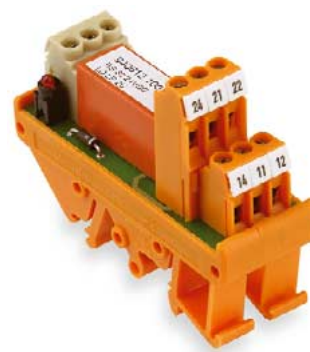
## Relay Couplers on Sockets RS 32

with 2 changeover contacts

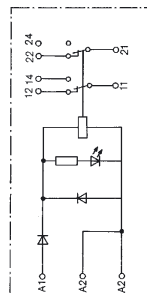
RS 32



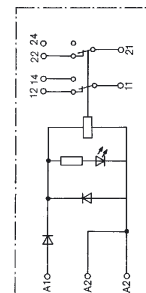
RS 32



### Schematic circuit diagram



9406021001



9406121001

9406321001

9406521001

### Ordering data

| Type | Cat. No. | Type | Cat. No. | Type | Cat. No. | Type | Cat. No. |
|------|----------|------|----------|------|----------|------|----------|
|------|----------|------|----------|------|----------|------|----------|

RS 32 9406021001

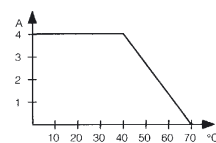
RS 32 9406121001

RS 32 9406221001

RS 32 9406321001

### Rated data

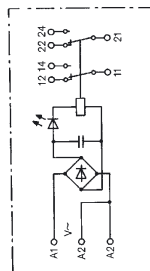
|                                            |                                                |                   |                   |                   |
|--------------------------------------------|------------------------------------------------|-------------------|-------------------|-------------------|
| Input voltage                              | 12 V-, $\pm 10\%$                              | 24 V-, $\pm 10\%$ | 24 V0, $\pm 10\%$ | 48 V-, $\pm 10\%$ |
| Rated consumption - (W)                    | 0.6 W                                          | 0.6 W             | 0.6 W             | 0.6 W             |
| Rated consumption ~ (VA)                   | -                                              | -                 | 0.9 VA            | -                 |
| Drop-out current of the relay** (at 20 °C) | 9.5 mA                                         | 5 mA              | 24 V-: 4.5 mA     | 2 mA              |
| Drop-out current of the relay** (at 20 °C) | -                                              | -                 | 24 V-: 2.5 mA     | -                 |
| Max. output voltage                        | 250 V                                          | 250 V             | 250 V             | 250 V             |
| Continuous current                         | 2 x 4 A                                        | 2 x 4 A           | 2 x 4 A           | 2 x 4 A           |
| Derating curve                             | mounted horizontally on rail without clearance |                   |                   |                   |



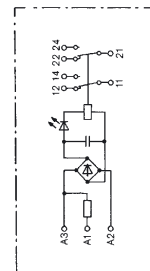
|                                            |                                           |                                           |                                           |                                           |
|--------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| Switch-on current                          | 2 x 6 A                                   | 2 x 6 A                                   | 2 x 6 A                                   | 2 x 6 A                                   |
| Max. switching capacity with resistor load | 1400 VA                                   | 1400 VA                                   | 1400 VA                                   | 1400 VA                                   |
| Min. switching capacity/switching current  | -                                         | -                                         | -                                         | -                                         |
| Bounce times                               | $\leq 4$ ms                               | $\leq 4$ ms                               | $\leq 4$ ms                               | $\leq 4$ ms                               |
| Switching times, typical                   | -                                         | -                                         | -                                         | -                                         |
| - , pick-up lag                            | $\leq 13$ ms                              | $\leq 13$ ms                              | $\leq 13$ ms                              | $\leq 13$ ms                              |
| - , turn off delay                         | $\leq 10$ ms                              | $\leq 10$ ms                              | $\leq 10$ ms                              | $\leq 10$ ms                              |
| Max. switching frequency                   | -                                         | -                                         | -                                         | -                                         |
| Contact material                           | AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    |
| Service life, mechanical                   | > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations |
| - , 24 V-, 1 A, resistive load             | -                                         | -                                         | -                                         | -                                         |
| - , 230 V-, 3 A, resistive load            | -                                         | -                                         | -                                         | -                                         |
| Status indicator                           | Red LED                                   | Red LED                                   | Red LED                                   | Red LED                                   |
| Storage temperature                        | -40 °C...+60 °C                           | -40 °C...+60 °C                           | -40 °C...+60 °C                           | -40 °C...+60 °C                           |
| Ambient temperature                        | -25 °C...+40 °C                           | -25 °C...+40 °C                           | -25 °C...+40 °C                           | -25 °C...+40 °C                           |
| Approvals                                  | -                                         | CSA                                       | -                                         | CSA                                       |
| Insulation coordination acc. to EN 50178   | -                                         | -                                         | -                                         | -                                         |
| Overvoltage category                       | III                                       | III                                       | III                                       | III                                       |
| Pollution severity                         | 2                                         | 2                                         | 2                                         | 2                                         |
| Dimensions                                 | -                                         | -                                         | -                                         | -                                         |
| Mounting width                             | 25 mm                                     | 25 mm                                     | 25 mm                                     | 25 mm                                     |
| Length (perpendicular to mounting rail)    | 70 mm                                     | 70 mm                                     | 70 mm                                     | 70 mm                                     |
| Height with TS 32/TS 35 x 7.5              | 68 mm/63.5 mm                             | 68 mm/63.5 mm                             | 68 mm/63.5 mm                             | 68 mm/63.5 mm                             |

# Relay Couplers on Sockets RS 32

## RS 32

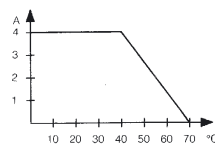


9406221001  
9406421001  
9406621001  
9406721001



1122661001  
1122761001

| Type                      | Cat. No.   | Type                      | Cat. No.   | Type                            | Cat. No.   | Type                            | Cat. No.   | Type                           | Cat. No.   | Type                                  | Cat. No.   |
|---------------------------|------------|---------------------------|------------|---------------------------------|------------|---------------------------------|------------|--------------------------------|------------|---------------------------------------|------------|
| RS 32                     | 9406421001 | RS 32                     | 9406521001 | RS 32                           | 9406621001 | RS 32                           | 9406721001 | RS 32                          | 1122661001 | RS 32                                 | 1122761001 |
| 48 V <sub>0</sub> , ±10 % |            | 60 V <sub>0</sub> , ±10 % |            | 115 V <sub>0</sub> , +5 % -15 % |            | 230 V <sub>0</sub> , +5 % -15 % |            | 24 V/48 V <sub>0</sub> , ±10 % |            | 115 V/230 V <sub>0</sub> , +5 % -15 % |            |
| 0.6 W                     |            | 0.6 W                     |            | 0.5 W                           |            | 1 W                             |            | 0.5 W/0.6 W                    |            | 0.5 W/1 W                             |            |
| 0.9 VA                    |            | —                         |            | 0.6 VA                          |            | 1 VA                            |            | 0.7 VA/0.9 VA                  |            | 0.6 VA/1 VA                           |            |
| 48 V~: 2 mA               |            | 1.5 mA                    |            | 115 V~: 1 mA                    |            | 230 V~: 1.2 mA                  |            | ~: 5 mA/2 mA                   |            | ~: 1 mA/1.2 mA                        |            |
| 48 V~: 4.5 mA             |            | —                         |            | 115 V~: 1.5 mA                  |            | 230 V~: 2 mA                    |            | ~: 3 mA/4.5 mA                 |            | ~: 1.5 mA/2 mA                        |            |
| 250 V                     |            | 250 V                     |            | 250 V                           |            | 250 V                           |            | 250 V                          |            | 250 V                                 |            |
| 2 x 4 A                   |            | 2 x 4 A                   |            | 2 x 4 A                         |            | 2 x 4 A                         |            | 2 x 4 A                        |            | 2 x 4 A                               |            |



|                                           |                                           |                                           |                                           |                                           |                                           |
|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| 2 x 6 A                                   | 2 x 6 A                                   | 2 x 6 A                                   | 2 x 6 A                                   | 2 x 6 A                                   | 2 x 6 A                                   |
| 1400 VA                                   | 1400 VA                                   | 1400 VA                                   | 1400 VA                                   | 1400 VA                                   | 1400 VA                                   |
| ≤ 4 ms                                    | ≤ 4 ms                                    | ≤ 4 ms                                    | ≤ 4 ms                                    | ≤ 4 ms                                    | ≤ 4 ms                                    |
| ≤ 13 ms                                   | ≤ 10 ms                                   | ≤ 13 ms                                   | ≤ 13 ms                                   | ≤ 13 ms                                   | ≤ 13 ms                                   |
| ≤ 10 ms                                   | ≤ 10 ms                                   | ≤ 10 ms                                   | ≤ 10 ms                                   | ≤ 10 ms                                   | ≤ 10 ms                                   |
| AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    | AgNi0.15, gold-flashed                    |
| > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations | > 30x10 <sup>6</sup> switching operations |
| Red LED                                   | Red LED                                   | Red LED                                   | Red LED                                   | Green LED                                 | Green LED                                 |
| -40 °C...+60 °C                           | -40 °C...+60 °C                           | -40 °C...+60 °C                           | -40 °C...+60 °C                           | -40 °C...+60 °C                           | -40 °C...+60 °C                           |
| -25 °C...+40 °C                           | -25 °C...+40 °C                           | -25 °C...+40 °C                           | -25 °C...+40 °C                           | -25 °C...+40 °C                           | -25 °C...+40 °C                           |
| III                                       | III                                       | III                                       | III                                       | III                                       | III                                       |
| 2                                         | 2                                         | 2                                         | 2                                         | 2                                         | 2                                         |
| 25 mm                                     | 25 mm                                     | 25 mm                                     | 25 mm                                     | 25 mm                                     | 25 mm                                     |
| 70 mm                                     | 70 mm                                     | 70 mm                                     | 70 mm                                     | 70 mm                                     | 70 mm                                     |
| 68 mm/63.5 mm                             | 68 mm/63.5 mm                             | 68 mm/63.5 mm                             | 68 mm/63.5 mm                             | 68 mm/63.5 mm                             | 68 mm/63.5 mm                             |

# Multiple Socket Interface RSM

## (Relay Coupler)

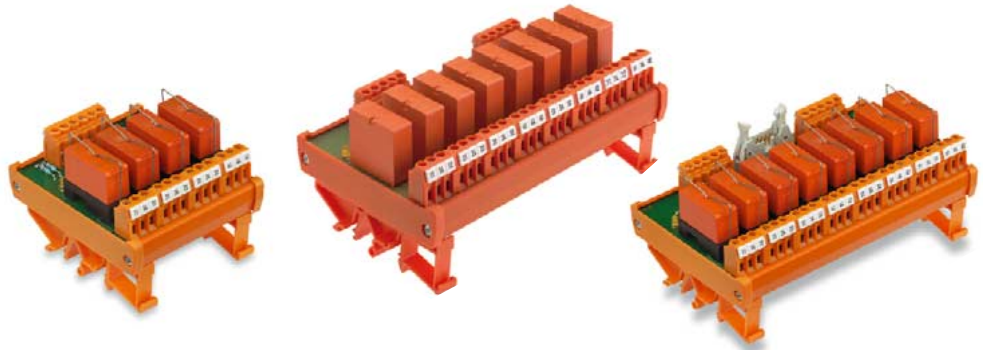
with one changeover contact each

**RSM 4 R** 4 relays, soldered

**RSM 4 RS** 4 relays, plug-in

**RSM 8 R** 8 relays, soldered

**RSM 8 RS** 8 relays, plug-in

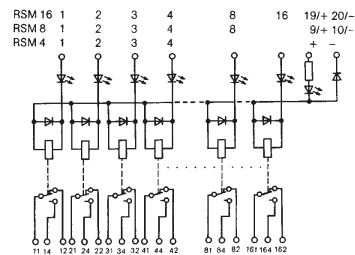


Also available as opto-coupler (max. 48 V),  
See page 120/121

Schematic circuit diagram

Fixing feet can also be mounted turned through 180°

DC voltage, positive switching



### Rated data

|                          |                |
|--------------------------|----------------|
| Input voltage            |                |
| Rated consumption ~ (W)  | soldered relay |
|                          | plug-in relay  |
| Rated consumption ~ (VA) | soldered relay |
|                          | plug-in relay  |
| Pick-up current ~ (mA)   | soldered relay |
|                          | plug-in relay  |
| Pick-up current ~ (mA)   | soldered relay |
|                          | plug-in relay  |

| 24 V~  | 24 V0   | 48 V~  | 48 V0  | 115 V~ | 115 V0 | 230 V~ | 230 V0 |
|--------|---------|--------|--------|--------|--------|--------|--------|
| 0.45 W | 0.45 W  | 0.45 W | 0.45 W | —      | —      | —      | —      |
| 0.55 W | —       | 0.55 W | —      | —      | —      | —      | —      |
| —      | 0.5 VA  | —      | 0.6 VA | 0.6 VA | 0.6 VA | 0.9 VA | 0.9 VA |
| —      | —       | —      | —      | 0.6 VA | 0.6 VA | 1.2 VA | 1.2 VA |
| 12 mA  | —       | 10 mA  | —      | —      | 5 mA   | —      | 3 mA   |
| 23 mA  | 12 mA   | 14 mA  | —      | —      | —      | —      | —      |
| —      | —       | —      | —      | —      | 6 mA   | —      | 3.5 mA |
| —      | 16.5 mA | —      | —      | 5 mA   | —      | 4 mA   | —      |
| 2 mA   | —       | 1.5 mA | —      | 1 mA   | —      | 1 mA   | —      |
| 250 V  | 250 V   | 250 V  | 250 V  | 250 V  | 250 V  | 250 V  | 250 V  |
| 6 A    | 6 A     | 6 A    | 6 A    | 6 A    | 6 A    | 3 A    | 3 A    |

Drop-out current of the relay (at 20 °C)

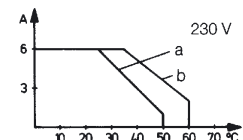
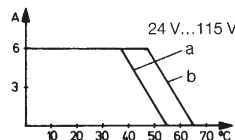
Max. output voltage

Continuous current

Derating-curve

a = mounted horizontally on rail without clearance

b = mounted horizontally on rail with clearance ≥ 20 mm



Switching times, typical

—, pick-up lag (—/—)

—, turn off delay (—/—)

Bounce times

Switch-on current

Switching capacity with resistive load

Min. switching capacity/switching current

Contact material

Service life, mechanical

—, 24 V~, 1 A, resistive load

—, 230 V~, 3 A, resistive load

Storage temperature

Ambient temperature

Insulation coordination acc. to EN 50178

Overvoltage category

Pollution severity

Dimensions

Conductor cross-section (screw connection)

Spare relay (pluggable)

for 24 V-RSM types

for 48 V-RSM types

for 115 V, 230 V-RSM types

|                                            |               |         |               |         |              |         |              |
|--------------------------------------------|---------------|---------|---------------|---------|--------------|---------|--------------|
| ≤ 8 ms                                     | ≤ 10 ms/10 ms | ≤ 12 ms | ≤ 10 ms/12 ms | ≤ 10 ms | ≤ 8 ms/10 ms | ≤ 10 ms | ≤ 8 ms/10 ms |
| ≤ 7 ms                                     | ≤ 15 ms/20 ms | ≤ 11 ms | ≤ 15 ms/20 ms | ≤ 10 ms | ≤ 5 ms/8 ms  | ≤ 10 ms | ≤ 7 ms/8 ms  |
| ≤ 3 ms                                     | ≤ 3 ms        | ≤ 3 ms  | ≤ 3 ms        | ≤ 3 ms  | ≤ 3 ms       | ≤ 3 ms  | ≤ 3 ms       |
| 8 A                                        | 8 A           | 8 A     | 8 A           | 8 A     | 8 A          | 8 A     | 8 A          |
| 2000 VA                                    | 2000 VA       | 2000 VA | 2000 VA       | 2000 VA | 2000 VA      | 2000 VA | 2000 VA      |
| 250 mW/10 mA                               |               |         |               |         |              |         |              |
| AgNi 90/10, AgNiO,15, gold-flashed         |               |         |               |         |              |         |              |
| > 30x10 <sup>6</sup> switching operations  |               |         |               |         |              |         |              |
| > 5 x 10 <sup>5</sup> switching operations |               |         |               |         |              |         |              |
| > 7 x 10 <sup>5</sup> switching operations |               |         |               |         |              |         |              |
| -40 °C...+60 °C                            |               |         |               |         |              |         |              |
| -25 °C...+50 °C                            |               |         |               |         |              |         |              |

III

2

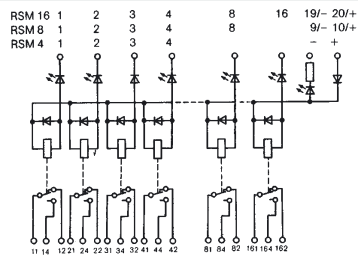
0.5...2.5 mm<sup>2</sup>

| Input voltage | Contact material | Cat. No.   | Notes                       |
|---------------|------------------|------------|-----------------------------|
| 24 V~         | AgNi 90/10       | 8630780000 | RT 314024 with yoke         |
| 24 V~         | AgNi 90/10       | 4058480000 | RT 314024 without yoke      |
| 48 V~         | AgNi 90/10       | 8630790000 | RT 314048 with yoke         |
| 48 V~         | AgNi 90/10       | 4058740000 | RT 314048 without yoke      |
| 115 V~        | AgNi 90/10       | 8630770000 | RT 314110 with yoke         |
| 115 V~        | AgNi 90/10       | 4058500000 | RT 314110 without yoke      |
| 115 V~        | Au 5             | 4156970000 | ZLT input relay KHU/BV 1680 |

16 relays, plug-in



### DC voltage, negative switching



- Output: Screw connection

[illegible]

<sup>3)</sup> Approval by the Germanischer Lloyd

## Relay Socket Module for Industry Relays

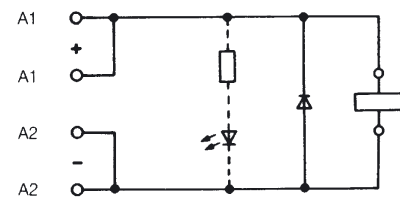
Weidmüller relay sockets for mounting rails enable plug-in relays most commonly used in industry to be mounted; they make possible installations in which the control section and power section are perfectly separated. The coil terminals and the connection terminals are located on opposite sides of the locking socket modules.

The conductors are connected via screw terminals; the securing in the terminal is achieved by a clamping yoke system. This method has been used by Weidmüller for many years, and is the only method that guarantees a reliable connection in industrial applications.

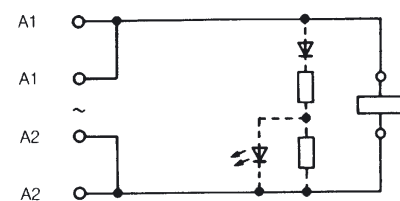
Thanks to their combination foot, these modules can be mounted onto TS 32, TS 35x7.5, TS 35x15 mounting rails in accordance with European standards EN 50035 and EN 50022.

The connections are marked according to European Standard EN 50005. The modules are designed for DC relays (with a damping diode parallel to the coil, as well as a protection diode for reverse polarity protection) and AC relays.

They can be provided with an LED on request.



DC voltage



Ac voltage

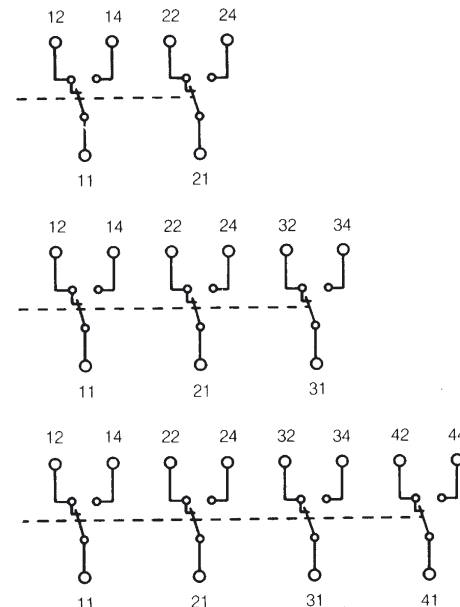
The input terminals are doubled, in order to pick off the poles. Note the following for DC current operation:

A1 = +

A2 = -

The contacts available at the output are: 2, 3 or 4 changeover contacts.

The marking of the contacts in the following diagram corresponds to European standard EN 50005.



The standard range of relay socket modules is divided as follows:

### Group 1:

RS 3 (2 changeover contacts)

RS 4, RS 14 (4 changeover contacts)

For relays of the type "international"

### Group 2:

RS 6 (2 changeover contacts) Size 1

RS 7, 17 (3 changeover cont.) Size 2

RS 8, 18 (4 changeover cont.) Size 2

RS 9 (2 changeover cont.) Size 2

For relays of the type "European".

Relays with 4 changeover contacts (size 2) can be secured to RS 7, RS 17 and RS 9; however, only 3 or 2 changeover contacts are connected to the terminals, which results in space savings.

### Group 3:

RS 21 (2 changeover contacts)

RS 23 (3 changeover contacts)

RS 24 (2 x 3 changeover cont.)

For relays with one socket with 8 or 11 pins.

The table on page 87 offers an overview of the most important manufacturers of relays in groups 2, 3 and 4. The list is provided for information purposes only, and does not claim to be complete

## List of Plug-in Relays for Weidmüller Relay Socket Modules

| Manufacturer       | Group 1                                                                                                                     | Group 2                                                                                                                                                                                                                                   | Group 3                                                                                                                                                                            |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | International relays                                                                                                        | European relays                                                                                                                                                                                                                           | Relays with socket oktal                                                                                                                                                           |
|                    | <ul style="list-style-type: none"> <li>• RS 3 2 changeover contacts</li> <li>• RS 4, RS 14 4 changeover contacts</li> </ul> | <ul style="list-style-type: none"> <li>• RS 6 2 changeover contacts (Size 1)</li> <li>• RS 7, RS 17 3 changeover cont. (Size 2)</li> <li>• RS 8, RS 18 4 changeover cont. (Size 2)</li> <li>• RS 9 2 changeover cont. (Size 2)</li> </ul> | <ul style="list-style-type: none"> <li>• RS 21 2 changeover contacts</li> <li>• RS 23 3 changeover contacts</li> <li>• RS 24 2x3 changeover contacts</li> </ul>                    |
| Relay type         | Relay type                                                                                                                  | Relay type                                                                                                                                                                                                                                | Relay type                                                                                                                                                                         |
| EBERLE             | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• –</li> <li>• Type 40701</li> <li>• Type 40701</li> <li>• –</li> <li>• –</li> <li>• –</li> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                           | <ul style="list-style-type: none"> <li>• –</li> <li>• Type 41454</li> <li>• Type 41454</li> </ul>                                                                                  |
| ELESTA             | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                                                                           | <ul style="list-style-type: none"> <li>• SKR 085</li> <li>• SKR 115</li> </ul>                                                                                                     |
| FEME               | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                                                              | <ul style="list-style-type: none"> <li>• RCP 8</li> <li>• RCP 11</li> <li>• RCP 11</li> </ul>                                                                                      |
| GRUNER             | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• Series 9065 G</li> <li>• Series 9059 G/9066 G</li> <li>• Series 9059 G/9066 G</li> <li>• Series 9059 G/9066 G</li> </ul>                                                                         | <ul style="list-style-type: none"> <li>• Series 668 B 2 changeover contacts</li> <li>• Series 668 A 3 changeover contacts</li> <li>• Series 668 A 3 changeover contacts</li> </ul> |
| HALLER             | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• Series H-561 Size 1</li> <li>• Series H-561 Size 2</li> <li>• Series H-561 Size 2</li> <li>• Series H-561 Size 2</li> </ul>                                                                      | <ul style="list-style-type: none"> <li>• HB-1/1</li> <li>• HB-1/2</li> <li>• HB-1/2</li> </ul>                                                                                     |
| ITT (MTI)          | <ul style="list-style-type: none"> <li>• MAT 2</li> <li>• MAT 4</li> </ul>                                                  | <ul style="list-style-type: none"> <li>• Type 24</li> <li>• Type 25</li> <li>• Type 25</li> <li>• Type 25</li> </ul>                                                                                                                      | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                    |
| FUJITSU            | <ul style="list-style-type: none"> <li>• FRL 263-02</li> <li>• FRL 263-04</li> </ul>                                        | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                                                              | <ul style="list-style-type: none"> <li>• FRL 256-02</li> <li>• FRL 256-04</li> <li>• FRL 256-04</li> </ul>                                                                         |
| KUHNKE             | <ul style="list-style-type: none"> <li>• –</li> <li>• Type 111 A4</li> </ul>                                                | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                                                              | <ul style="list-style-type: none"> <li>• Universal relays-M/-H/-U</li> <li>• Universal relays-M/-H/-U</li> <li>• Universal relays-M/-H/-U</li> </ul>                               |
| KUKE               | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• Miniature relays Type 01</li> <li>• Miniature relays Type 02</li> <li>• Miniature relays Type 02</li> <li>• Miniature relays Type 02</li> </ul>                                                  | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                    |
| NATIONAL           | <ul style="list-style-type: none"> <li>• HC 2</li> <li>• HC 4</li> </ul>                                                    | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                                                              | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> <li>• –</li> </ul>                                                                                                    |
| OMRON              | <ul style="list-style-type: none"> <li>• MY 2</li> <li>• MY 4</li> </ul>                                                    | <ul style="list-style-type: none"> <li>• MHS-2</li> <li>• MHS-4</li> <li>• MHS-4</li> <li>• MHS-4</li> </ul>                                                                                                                              | <ul style="list-style-type: none"> <li>• MK 2</li> <li>• MK 3</li> <li>• MK 3</li> </ul>                                                                                           |
| POTTER & BRUMFIELD | <ul style="list-style-type: none"> <li>• –</li> <li>• Series KH</li> </ul>                                                  | <ul style="list-style-type: none"> <li>• –</li> <li>• Series R 10</li> <li>• Series R 10</li> <li>• Series R 10</li> </ul>                                                                                                                | <ul style="list-style-type: none"> <li>• Series KAP</li> <li>• Series KAP</li> <li>• Series KAP</li> </ul>                                                                         |
| RAPA               | <ul style="list-style-type: none"> <li>• –</li> <li>• –</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• Series 012 Size 1</li> <li>• Series 012 Size 2</li> <li>• Series 012 Size 2</li> <li>• Series 012 Size 2</li> </ul>                                                                              | <ul style="list-style-type: none"> <li>• Series C-Type CKR</li> <li>• Series C-Type CKR</li> <li>• Series C-Type CKR</li> </ul>                                                    |
| Tyco/SCHRACK       | <ul style="list-style-type: none"> <li>• ZT 4</li> <li>• PT 4</li> </ul>                                                    | <ul style="list-style-type: none"> <li>• Relays N, S, W Size 1</li> <li>• Relays N, S, W Size 2</li> <li>• Relays N, S, W Size 2</li> <li>• Relays N, S, W Size 2</li> </ul>                                                              | <ul style="list-style-type: none"> <li>• Series RN/RC</li> <li>• Series RN/RC</li> <li>• Series RN/RC</li> </ul>                                                                   |
| SDS                | <ul style="list-style-type: none"> <li>• HC 2</li> <li>• HC 4</li> </ul>                                                    | <ul style="list-style-type: none"> <li>• K 2</li> <li>• K 4</li> <li>• K 4</li> <li>• K 4</li> </ul>                                                                                                                                      |                                                                                                                                                                                    |
| TEC                | <ul style="list-style-type: none"> <li>• –</li> <li>• Type 1301</li> </ul>                                                  | <ul style="list-style-type: none"> <li>• Type 1350</li> <li>• Type 1360</li> <li>• Type 1360</li> <li>• Type 1360</li> </ul>                                                                                                              | <ul style="list-style-type: none"> <li>• Type 1210</li> <li>• Type 1210</li> <li>• Type 1210</li> </ul>                                                                            |
| ZETTLER            | <ul style="list-style-type: none"> <li>• –</li> <li>• TEC 1401</li> </ul>                                                   | <ul style="list-style-type: none"> <li>• AZ E 20, AZ 420, AZ 420 W</li> <li>• AZ E 21, AZ 421, AZ 421 W</li> <li>• AZ E 21, AZ 421, AZ 421 W</li> <li>• AZ E 21, AZ 421, AZ 421 W</li> </ul>                                              | <ul style="list-style-type: none"> <li>• AZ 1010 – AZ 509 2 C</li> <li>• AZ 1010 – AZ 509 3 C</li> <li>• AZ 1010 – AZ 509 3 C</li> </ul>                                           |

## Relay Sockets for Industry Relays

**PT 4 industry relays**  
4-pole, with test button

4-pole, with test button



| Rated data                           |         |                                                              |
|--------------------------------------|---------|--------------------------------------------------------------|
| Contact data                         |         |                                                              |
| Contact number and type              |         | 4 changeover contacts                                        |
| Contact version                      |         | Single contacts                                              |
| Contact material                     |         | AgNi 90/10, AgNi 90/10 htv                                   |
| Max. braking capacity AC             |         | 1500 VA                                                      |
| Rated voltage                        |         | 250 V~                                                       |
| Continuous current                   |         | 6 A / contact                                                |
| Switch-on current                    |         | 12 A / contact                                               |
| Min. contact rating                  |         | 24V, 10 mA / 20 m, 1 mA htv                                  |
| Mechanical service life              |         | DC coil > 30x10 <sup>6</sup><br>AC coil > 20x10 <sup>6</sup> |
| Response / drop out time             |         | 15/10 ms                                                     |
| Bounce time                          |         | 5 ms                                                         |
| Test voltage                         |         | 2.5 kV <sub>eff</sub> coil / contact                         |
| Isolation acc. to IEC664             |         | B, 60 V~/75 V                                                |
| Rated voltage                        |         | 250 V                                                        |
| Pollution severity                   |         | 2                                                            |
| Overvoltage category                 |         | III                                                          |
| Insulation group / reference voltage |         | B/250                                                        |
| Approvals                            |         | VDE, UL, CSA                                                 |
| Miscellaneous data                   |         |                                                              |
| Protection class                     |         | IP50                                                         |
| Flammability class UL 94             |         | V-0                                                          |
| Ambient temperature                  | DC coil | -40 ... + 70 °C                                              |
|                                      | AC coil | -40 ... + 70 °C                                              |
| Weight                               |         | 30g                                                          |

|                          |                                                                                                                                                  |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Correspond. relay socket | <ul style="list-style-type: none"> <li>• Relay sockets Type RS 3, RS 4 and RS 14</li> <li>• Alternatives to ZT 4 see table on page 99</li> </ul> |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|

| Ordering data                    | Type (ZT 4) | Best.-Nr          |
|----------------------------------|-------------|-------------------|
| 6 V~                             | PT 570006   | <b>8074650000</b> |
| 12 V~                            | PT 570012   | <b>8054360000</b> |
| 24 V~                            | PT 570024   | <b>1180700000</b> |
| 48 V~                            | PT 570048   | <b>8074670000</b> |
| 60 V~                            | PT 570060   | <b>8074680000</b> |
| 115 V~                           | PT 570110   | <b>8074700000</b> |
| 6 V~                             | PT 570506   | <b>8074710000</b> |
| 12 V~                            | PT 570512   | <b>8074730000</b> |
| 24 V~                            | PT 570524   | <b>1181800000</b> |
| 48 V~                            | PT 570548   | <b>1180900000</b> |
| 60 V~                            | PT 570560   | <b>8074760000</b> |
| 115 V~                           | PT 570615   | <b>1180800000</b> |
| 230 V~                           | PT 570730   | <b>1181100000</b> |
|                                  |             |                   |
|                                  |             |                   |
| Retainer clip for SIEMENS-Relays | PT 28800    | <b>8572170000</b> |

## Relay Sockets for Industry Relays

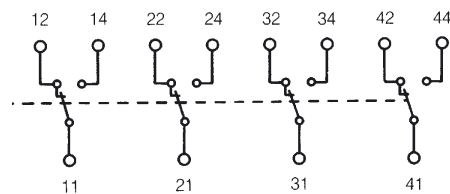
RS 3

RS 4

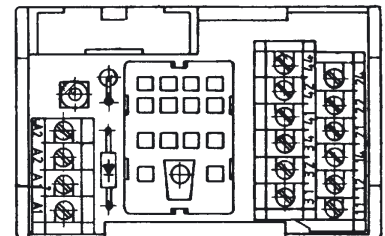
RS 14



Relay sockets for DC and AC voltage relays  
with fixing foot for TS 32/TS 35x7.5 and TS 35x15



0125661001



| Relay type*                                                                                                   | Schrack                   | Schrack                   | Schrack                   |
|---------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------|
|                                                                                                               | Type PT 5                 | Type PT 5                 | Type PT 5                 |
|                                                                                                               | 4-pole                    | 4-pole                    | 4-pole                    |
| Contacts on module                                                                                            | 2 changeover contacts     | 4 changeover contacts     | 4 changeover contacts     |
| Ordering data                                                                                                 | Sockettyp                 | RS 3                      | RS 4                      |
| Relay socket for <b>AC relays</b><br>(without diode)                                                          |                           | <b>0115161001</b>         | <b>0116261001</b>         |
| With red LED (230 V~)                                                                                         |                           |                           |                           |
| Relay socket for <b>DC relays</b><br>with suppressor diode and reserve voltage protection<br>(diode 1 N 4007) |                           | <b>0115061001</b>         | <b>0116161001</b>         |
| With red LED (24 V~)                                                                                          |                           |                           | <b>0116121001</b>         |
| With green LED (24 V~)                                                                                        |                           | <b>0115011001</b>         |                           |
| Dimensions                                                                                                    |                           |                           |                           |
| Relay socket width                                                                                            | 35 mm                     | 65 mm                     | 45 mm                     |
| Insulation stripping length                                                                                   | 7 mm                      | 7 mm                      | 7 mm                      |
| Connection data                                                                                               |                           |                           |                           |
| Screw connection, solid                                                                                       | 0.5...4 mm <sup>2</sup>   | 0.5...4 mm <sup>2</sup>   | 0.5...4 mm <sup>2</sup>   |
| Screw connection, flexible                                                                                    | 0.5...2.5 mm <sup>2</sup> | 0.5...2.5 mm <sup>2</sup> | 0.5...2.5 mm <sup>2</sup> |
| Conductor cross-section                                                                                       | AWG 26...14               | AWG 26...14               | AWG 26...14               |
| Rated data                                                                                                    |                           |                           |                           |
| Coil voltage (types without LED)                                                                              | 250 V <sub>0</sub>        | 250 V <sub>0</sub>        | 250 V <sub>0</sub>        |
| Contact voltage                                                                                               | 250 V~                    | 125 V~                    | 125 V~                    |
| Contact current                                                                                               | 5 A                       | 5 A                       | 5 A                       |
| Accessories                                                                                                   | Type                      | Cat. No.                  | Qty.                      |
| Mounting rail (2 m lengths)                                                                                   | TS 32                     | <b>0122800000</b>         | –                         |
|                                                                                                               | TS 35x7.5                 | <b>0383400000</b>         | –                         |
|                                                                                                               | TS 35x15                  | <b>0498000000</b>         | –                         |
| End bracket (thickness mm)                                                                                    | EWK 2                     | <b>0199360000</b>         | 50                        |
|                                                                                                               | EW 35                     | <b>0383560000</b>         | 50                        |
| Insert tag (blanc)**                                                                                          | ESo 7                     | <b>0515200000</b>         | –                         |
| Protective strip, transparent**                                                                               | SSt 7                     | <b>0515300000</b>         | 100                       |
| Retainer clip for Schrack relays                                                                              | ZG 28800                  | <b>0116000000</b>         | 25                        |

\* Relay not included in delivery

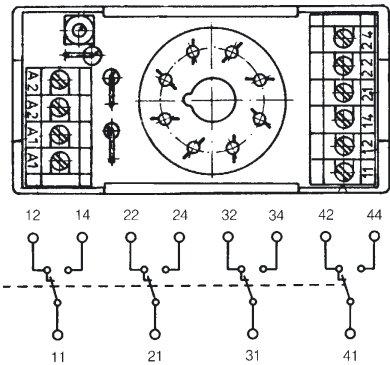


Relay Coupler, Relay Sockets Module for Industry Relays

RS 21      RS 23      RS 24



0167161001



|                                                  |                   |
|--------------------------------------------------|-------------------|
| Plug-in relay for                                | Plug-in relay for |
| Octal socket                                     | submagnal socket  |
| 8-pole                                           | 11-pole           |
| 2 changeov. c. 3 changeov. c. 2 x 3 changeov. c. |                   |

|            |            |            |
|------------|------------|------------|
| RS 21      | RS 23      | RS 24      |
| on request | 8010061001 | on request |
| 0167161001 | 0188661001 | on request |

|                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| 35 mm                     | 40 mm                     | 75.5 mm                   |
| 7 mm                      | 7 mm                      | 7 mm                      |
| 0.5...4 mm <sup>2</sup>   | 0.5...4 mm <sup>2</sup>   | 0.5...4 mm <sup>2</sup>   |
| 0.5...2.5 mm <sup>2</sup> | 0.5...2.5 mm <sup>2</sup> | 0.5...2.5 mm <sup>2</sup> |
| AWG 26...14               | AWG 26...14               | AWG 26...14               |

|           |            |        |
|-----------|------------|--------|
| 250 V0    | 250 V0     | 250 V0 |
| 250 V~    | 250 V~     | 250 V~ |
| 6 A       | 6 A        | 6 A    |
| Type      | Cat. No.   | Qty.   |
| TS 32     | 0122800000 | -      |
| TS 35x7.5 | 0383400000 | -      |
| TS 35x15  | 0498000000 | -      |
| EWK 2     | 0199360000 | 50     |
| EW 35     | 0383560000 | 50     |
| ESo 7     | 0515200000 | -      |
| SSt 7     | 0515300000 | 100    |





With increasing automation, potential separation between the control and field sides of circuits is becoming increasingly important. The control unit being the core of the automation must be electrically safe and free from feedback when coupled with the various sensors and actuators. Opto-coupler are being used in a growing number of applications. They offer the necessary safety and have further advantages such as:

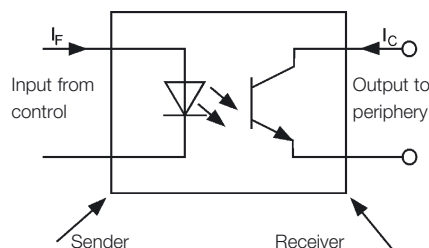
- low power uptake on control side
- high switching frequency
- no contact bounce
- wear-free switching
- insensitive to vibration
- use independent of location
- no mechanical parts
- long life
- high insulation voltage

Because of these features, opto-coupler are an alternative to conventional, mechanical relay interfaces.

For industrial usage, Weidmüller offers modules with various input voltages and housings.

### Basic construction of the opto-coupler interface:

The heart of the system is the opto-electronic component (opto-coupler) that effects the coupling.



An important parameter of this type of modules is the CTR = current transfer rate.

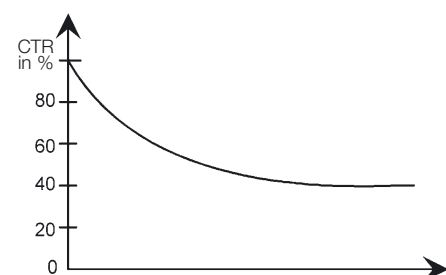
The CTR is given in % and is the ratio between the input current  $I_F$  and the maximum available output current  $I_C$ .

Example:  $I_F = 10 \text{ mA}$ ;  $\text{CTR} = 100\%$   
 $\Rightarrow I_C = 10 \text{ mA}$ .

The CTR is affected by a number of parameters such as:

- Ambient temperature
- efficiency of the luminescence diode
- geometric dimensions within the module

It also drops with time. The result is that the switching levels change due to ageing.



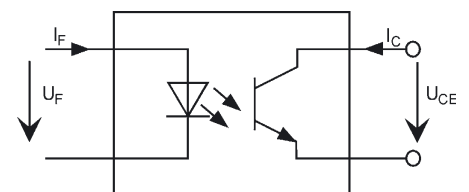
CTR as a function of operating life

To eliminate these effects where possible, Weidmüller opto-coupler use almost exclusively semiconductors which have a long life in terms of CTR.

Moreover, the insulation of a module is highly important, since the actual coupling of the input and output circuits takes place optically. Thus the optical component has to guarantee separation of both circuits even in case of a defect.

Weidmüller opto-coupler comply with DIN VDE 0884 to provide a maximum level of safety.

Appropriate switching circuits need to be included to ensure that the entire component provides reliable separation in accordance with DIN VDE 0106, Part 101.



Circuit diagram of an opto-coupler

### Opto-coupler for protective separation or galvanic isolation

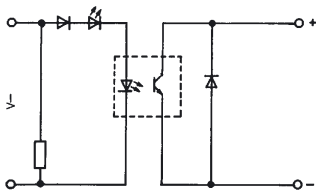
The most important precondition for achieving protective separation with opto-electronic coupling modules is the partial discharge test in accordance with DIN VDE 0884. Double or reinforced insulation for protective separation must be discharge proof. High voltage tests, as are usual with relays, cannot be carried out with semi-conductors, because they could lead to the destruction of the semi-conductor. Safe separation for the given rated voltage is applicable to coupling modules that are integrated into opto-couplers if:

- the opto-couplers are tested according to DIN VDE 0884
- clearance and creepage distances on the PCB and connection elements correspond to EN 50 178, DIN VDE 0106 and 0109.

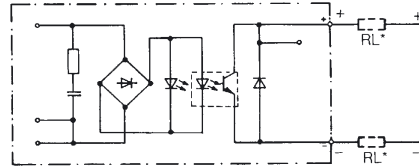
## Control side of the opto-coupler interface

3 basic circuits are to be differentiated on the input side of the opto-coupler's interface:

- as a pure **DC input** with polarity protection diode which prevents the opto-coupler from being destroyed if the input polarity is reversed.

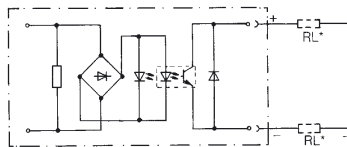


- as an **AC/DC input:**



Wrong polarity of the DC input signal is not possible with this switching. The disadvantage of an AC/DC input circuit (driven by DC signal) is the low switching rate since the charging capacitor (CL, necessary for AC-input signal) lowers the max. switching rate.

- pure **AC-Input:**



\* Sample circuit

Here, too, the charging capacity lowers the max. switching rate considerably. Weidmüller opto-coupler with AC/DC or AC input signals are designed for 40...60 Hz power supply. With AC-signal input the max. switching rate is below half the power supply frequency.

A high switching rate is not possible, otherwise continuous switching in tune with the power frequency would occur.

## Output side of the opto-coupler

Weidmüller opto-coupler are designed and sized for a wide variety of applications. Demands regarding the load side of opto-coupler modules could be:

- power amplification
- signal conditioning
- AC/DC, DC/AC
- short-circuit protection
- interference proof, etc.

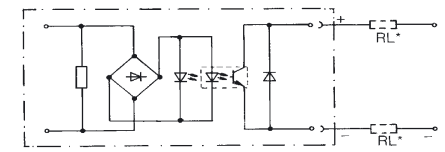
To fulfil these requirements, the opto-coupler must contain additional electronic components which determine the functionality of the opto-coupler.

Thus there are 2 basic output variations for opto-coupler

Output as

- 2 pole and
- 3 pole circuits

## 2-pole DC output



\* Wiring example

The 2-pole DC output is comparable to a conventional switch. With this type it is immaterial where the load is in the output circuit. It is, however, important to provide the necessary output supply voltage with the right polarity.

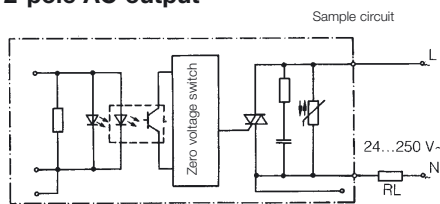


Opto-couplers are normally given with an output voltage supply from 5...48 VDC. These values should not be cut or exceeded on any occasion.

The load current should not be higher than the stated max. output current. Continuously exceeding this value will destroy the output stage.

The derating curve shows the dependency of the output current as a function of the Ambient temperature (see under the respective product on the following pages).

## 2-pole AC output

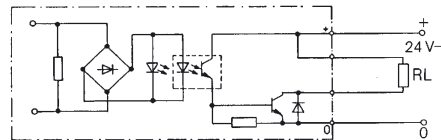


A special semiconductor element (TRIAC) in the output stage of the opto-coupler is used to switch AC voltages.

As for the DC-versions the appropriate parameters (such as voltage, frequency, max. load current, ambient temperature) should be given consideration.

A neutral voltage switch ensures that the load is switched only in the voltage zero. To protect against voltage spikes, the modules are always fitted with appropriate protection elements (varistors, RC-combination).

## 3-pole DC output



This type of output stage requires for safe function a potential-linked output voltage supply with an output that is either positive switching (common reference potential is GND or 0 V) or negative switching (common reference potential is the positive voltage pole).

## Standards

Weidmüller opto-coupler comply with the following standards:

EN 50 178  
Furnishing of power engineering systems with electronic equipment  
DIN VDE 0106 Part 101  
Protection against flow of dangerous currents into the human body; basic requirements for reliable separation within electrical equipment.

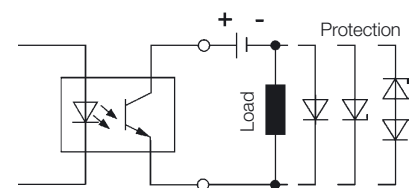
DIN VDE 0884  
Optoelectronic coupling devices for reliable separation

DIN VDE 0109  
Insulation coordination within low-voltage system including clearance and creepage distances for equipment

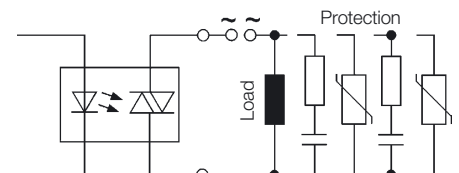
## Protective circuit

All opto-coupler have a protective circuit in the output (generally a free-wheeling diode).

To prevent decoupling of interference signals to other leads the load side should be protected.

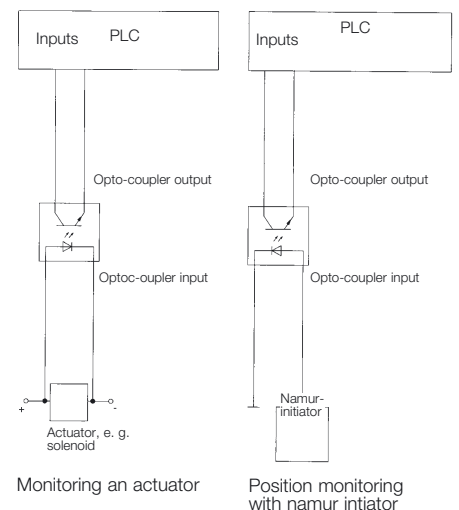


Protective circuit for DC output

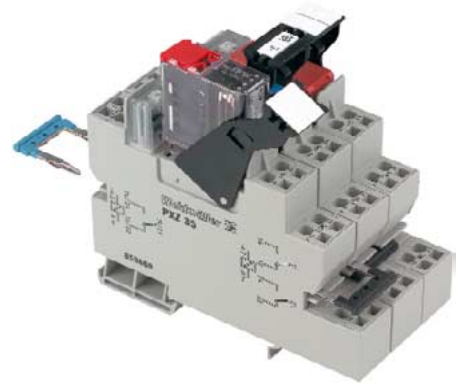


Protective circuit for AC output

## Application example



## Types of housing for opto-coupler



Weidmüller coupler modules are enclosed in housings that are appropriate for industrial applications. The housings are suitable for fitting onto mounting rails TS 32, TS 35 x 7.5 or TS 35 x 15 in accordance with European Standards EN 50 035 and EN 50 022.

### Component housing EG

Weidmüller component housings **EG 1** and **EG 2** are 18 mm wide. The fully enclosed EG housings are fitted with clamping yoke screw connections or push-on blade connectors for attaching wires. Conductors with the following cross-sectional dimensions can be connected:

solid conductors: 0.5...4 mm<sup>2</sup> or  
flexible conductors: 0.5...2.5 mm<sup>2</sup>.

The component housing EG 7 has a special status. It has been specifically designed to accommodate 10-mm slim opto-couplers.

EG 7 opto-coupler modules can be mounted onto TS 32 or TS 35 rails.

The RS EG7 locking socket is also available for the OST opto-couplers.

The fully-enclosed EG 7 housing is fitted with clamping yoke connections.

Conductors with the following cross-sections can be connected:

Component housing EG7: 0.5...1.5 mm<sup>2</sup>  
Locking socket: 0.5...2.5 mm<sup>2</sup>.

### Component Housing WAVEBOX

Component housing WAVEBOX

It is important for modern electronics to create a functional housing. Setting and operating functions must be guaranteed, technical demands regarding heat dissipation and EMC properties are to be supported. The ideal design saves space and mounting costs in the switchgear cabinet. Moreover, ergonomics and the design are gaining in importance for high-quality opto-couplers interfaces. The WAVEBOX fulfils these criteria and has the following distinguishing features:

The WAVEBOX is characterised by:

- Optimal width for any application (12.5 mm, 17.5 mm, **22.5 mm**)
- Large component assembly surface; SMD's can be mounted on the solder side
- No tools required for assembly
- Plug-in printed circuit board
- Plug-in cross-connection via ZQV 2.5 N
- Hinged, transparent cover
- BLZ 5.08 screw/plug and socket connector
- BLZF 5.08 optional tension clamp/plug and socket connector
- Marking option with WS tags
- Suitable for snap-fitting on TS 35

#### Connection systems

Available are BLZ screw-type connectors as well as the BLZF tension clamp system for up to 2.5 mm<sup>2</sup> flexible conductors for maximum wiring flexibility.

#### Printed-circuit board removal

This takes place by pushing in the locking hooks in way of the cover and with drawing of the terminal level and printed circuit board from the housing. This must not take place with the supply connected.

#### Cross-connection

Housings of the same family arranged side by side, can be cross-connected in the base of the housing with the ZQV 2.5 N/2 cross-connector. The cross-connection can be loaded with a current of up to 8 A. By means of this arrangement, the supply voltage can be cross-connected from one electronic module to another. The voltage transferred from the cross-connection to the terminal level must not exceed 50 V.

#### Air vents

Slanted air vents control the temperature and ventilate the housing base.

### Modular system

#### PLUGSERIES/PLUGOpto

is a new generation of pluggable SSR. The core is an innovative relay socket **PXS** or **PXZ**.

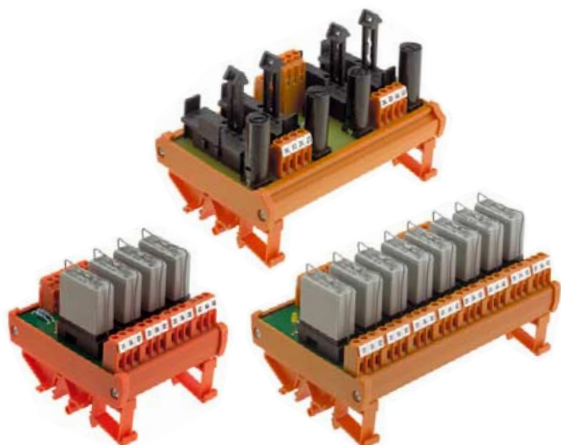
Both products combine Weidmüller functionality and experience gained from the relay and terminal business.

The PLUGOpto is the ideal connection technology between SSR and the application.

### Modular principle

The new PLUGSERIES is particularly service friendly. Commercially available SSRs are simply plugged: holding / dismantling clamps guarantee secure mounting; LED indicators with free-wheeling diode can be simply plugged.

- Easy plugging of SSR
  - suitable for the standard design and RT
- Independent connection technology: screw or tension clamp
- Rated cross-section 0.5 2.5 mm<sup>2</sup>
- Robust holding / dismantling clamp
- Control voltage 24 Vac/Vdc
- Rated switching voltage 24 Vdc, 24 Vac/Vdc, 230 Vac
- Up to 5 A continuous current
- Low wiring costs thanks to ZQV 2.5N (pluggable) cross-connectors
- Service-friendly modular system
  - relay socket, LED indicator
  - holding clamp and SSR
  - mount onto TS 35
  - marking options with WS marking tags and holding clamps
- Pluggable LED indicator with free-wheeling diode



### Weidmüller locking socket RS

The locking socket with opto-couplers RS 40 have a width of 11.2 mm. The modules on locking socket profiles are equipped with clamping yoke (screw connection) units for conductor connection.

Connectable are:

solid conductors: 0.5...4 mm<sup>2</sup>

flexible conductors: 0.5...2.5 mm<sup>2</sup>.

### Locking socket with multiple interfaces

Multiple interfaces RSM are optionally available assembled with 4, 8 or 16 plug-gable opto-couplers. Versions are available with joint positive and negative potentials in order to reduce wiring on the input side.

PCB clamping yoke screw connector elements have clamping yoke units for connecting conductors with the following cross-sections:

solid conductors: 0.5...4 mm<sup>2</sup>

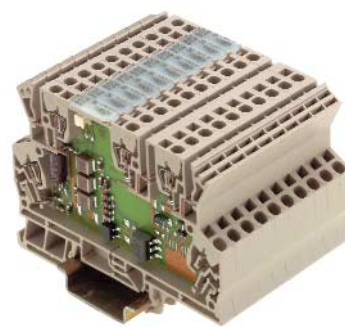
flexible conductors: 0.5...2.5 mm<sup>2</sup>

Variants of the RSM couplers have male connector blocks on the input side for connecting pre-assembled cables, in accordance with IEC 603-1/DIN 41651.



### Mini-coupler

All parts of the mini-coupler DKR and DKO meet the specifications for a design that is as slim as possible. The sensational width of a mere 6 mm can be achieved by employing the latest surface-mounted devices (SMD). There are 4 or 5 screw connections available which accept conductors with cross-sectional dimensions from 0.5...4 mm<sup>2</sup>. The mini-coupler offer a wide range of options for coupling digital sensor/actuator signals between automation devices and the process stage. With DKO opto-coupler, signals from the field with different voltages can be picked up and unified.



### Miniconditioner MCZ

The MCZ-housing is distinguished as one of the slimmest component-housings. A tool width of only 6 mm reduces space requirements in cabinets.

The MCZ is characterized by:

- Tension-clamp connection
  - integrated cross-connection option for input and output minimise wiring costs.
- The mini conditioner MCZO (opto-couplers) have 4 and 5 Z-tension spring connections. The clampable conductor cross-section is 0.5...1.5 mm<sup>2</sup>.

### CE-marking

Weidmüller opto-coupler are marked with the CE symbol and comply with the requirements of EN 50 081 Part 1 and EN 50 082 Part 2. They can therefore be used for both industrial as well as for commercial and light industry.

Appropriate ESD measures should be taken during installation. If connecting wires are particularly long, overvoltage protection should be provided in order to prevent interference from electrical disturbance in the atmosphere.

# Opto-coupler

## Electronic switching

| Output                |  |                                                                                      |                                                          |                                                      |                     |                                                                                                                                                                          |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
|-----------------------|--|--------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24 V                  |  |                                                                                      |                                                          |                                                      |                     |                                                                                                                                                                          |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
|                       |  | 5 - 48 V<br>≤ 20 mA                                                                  | 5 - 48 V<br>≤ 0.1 A                                      | 5 - 48 V<br>≤ 0.5 A                                  | 5 - 48 V<br>≤ 20 mA | 5 - 48 V<br>≤ 2.5 A                                                                                                                                                      | 5 - 48 V<br>≤ 5 A                                                                                        | 24 - 250 V<br>≤ 3.5 A | 5 - 48 V<br>≤ 0.1 A                                                                                                                                      | 5 - 48 V<br>≤ 0.1 A                                                                                                                                                                                      |
| Housing               |  | 5 - 48 V<br>≤ 20 mA                                                                  | 5 - 48 V<br>≤ 0.1 A                                      | 5 - 48 V<br>≤ 0.5 A                                  | 5 - 48 V<br>≤ 20 mA | 5 - 48 V<br>≤ 2.5 A                                                                                                                                                      | 5 - 48 V<br>≤ 5 A                                                                                        | 24 - 250 V<br>≤ 3.5 A | 5 - 48 V<br>≤ 0.1 A                                                                                                                                      | 5 - 48 V<br>≤ 0.1 A                                                                                                                                                                                      |
| EG                    |  | ● 0558160000<br>Page 122                                                             | ● 0609860000<br>Page 123                                 |                                                      |                     |                                                                                                                                                                          | ● 8220870000<br>Page 130                                                                                 |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
| WAVESERIES<br>WOS     |  |                                                                                      |                                                          |                                                      |                     |                                                                                                                                                                          | ● 8275190000<br>Page 126                                                                                 |                       | ● 8237720000<br>Page 128                                                                                                                                 |                                                                                                                                                                                                          |
| EG 7                  |  |                                                                                      |                                                          |                                                      |                     | ● 8269050000<br>Page 131                                                                                                                                                 | ● 8281720000<br>Page 131                                                                                 |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
| RS 40                 |  |                                                                                      | ● 8092530000<br>● 8234580000<br>Page 132                 |                                                      |                     |                                                                                                                                                                          |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
|                       |  | ● 1160961001<br>● 1161761001<br>● 1177860000<br>Page 137                             | ● 1117461001<br>● 8065031001<br>● 1119460000<br>Page 137 |                                                      |                     |                                                                                                                                                                          |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
| RSM                   |  |                                                                                      |                                                          |                                                      |                     |                                                                                                                                                                          |                                                                                                          |                       | ● 1123861001<br>● 1123761001<br>● 1125161001<br>● 8017581001<br>● 1124900000<br>● 1124900000<br>● 1170200000<br>● 1153200000<br>● 1121300000<br>Page 139 | ● 1124261001<br>● 1125261001<br>● 8003671001<br>● 1124900000<br>● 1170200000<br>● 1153200000<br>● 1121300000<br>● 8021391001<br>● 1124900000<br>● 1170200000<br>● 1153200000<br>● 1121300000<br>Page 139 |
| DKO 32                |  | ● 8008090000<br>Page 116                                                             |                                                          | ● 8019580000<br>Page 117                             |                     |                                                                                                                                                                          |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
| DKO 35                |  | ● 8008150000<br>Page 116<br>● 8028300000<br>● 8215640000<br>● 8248790000<br>Page 117 |                                                          | ● 8019590000<br>Page 117<br>● 8215630000<br>Page 118 |                     | ● 8215600000<br>● 8181990000<br>Page 118                                                                                                                                 |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
| DKO 35/32             |  | ● 8228640000<br>Page 119                                                             |                                                          |                                                      |                     | ● 8228630000<br>Page 118                                                                                                                                                 |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
| MCZ O                 |  | ● 8365940000<br>Page 114                                                             | ● 8398940000<br>Page 115                                 |                                                      |                     | ● 8287730000<br>Page 114                                                                                                                                                 |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
| PLUGSERIES<br>POS/POZ |  | ● 8324610000<br>(5 V TTL)<br>Page 115                                                |                                                          |                                                      |                     |                                                                                                                                                                          |                                                                                                          |                       |                                                                                                                                                          |                                                                                                                                                                                                          |
|                       |  |                                                                                      |                                                          |                                                      |                     | ● 8610840000<br>● 8610920000<br>● 8610900000<br>● 8610970000<br>● 8610890000<br>● 8610960000<br>● 8615600000<br>● 8615640000<br>● 8615620000<br>● 8615650000<br>Page 134 | ● 8610860000<br>● 8610930000<br>● 8610910000<br>● 8610980000<br>● 8615590000<br>● 8615630000<br>Page 134 |                       |                                                                                                                                                          |                                                                                                                                                                                                          |

Reliable  
separation

● 24 V dc  
● 24 Vuc/ac

● Replacement opto-coupler dc and ac/dc  
● Empty socket

## Opto-coupler

### Electronic switching

|         |  | Output                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|---------|--|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|         |  |  |  |  |  |  |  |  |  |  |  |
| Housing |  | 5 - 48 V<br>≤ 20 mA                                                               | 5 - 48 V<br>≤ 0.1 A                                                               | 5 - 48 V<br>≤ 0.5 A                                                               | 5 - 48 V<br>≤ 20 mA                                                               | 5 - 48 V<br>≤ 2.5 A                                                               | 5 - 48 V<br>≤ 5 A                                                                 | 24 - 250 V<br>≤ 3.5 A                                                             | 5 - 48 V<br>≤ 0.1 A                                                               | 5 - 48 V<br>≤ 0.1 A                                                                | 5 - 48 V<br>≤ 0.1 A                                                                 |
| EG 7    |  |                                                                                   | ● 8092550000<br>Page 132                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|         |  |                                                                                   | ● 8234590000<br>Page 132                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| RS 40   |  |                                                                                   | ● 1161061001<br>Page 137                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|         |  |                                                                                   | ● 1161860000<br>Page 137                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| DKO 35  |  | ● 8151230000<br>Page 120                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |

|                   |  | Output                                                                            |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
|-------------------|--|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                   |  |  |  |  |  |  |  |  |  |  |  |
| Housing           |  | 5 - 48 V<br>≤ 20 mA                                                               | 5 - 48 V<br>≤ 0.1 A                                                                | 5 - 48 V<br>≤ 0.5 A                                                                | 5 - 48 V<br>≤ 20 mA                                                                | 5 - 48 V<br>≤ 2.5 A                                                                | 5 - 48 V<br>≤ 5 A                                                                  | 24 - 250 V<br>≤ 3.5 A                                                              | 5 - 48 V<br>≤ 0.1 A                                                                | 5 - 48 V<br>≤ 0.1 A                                                                 | 5 - 48 V<br>≤ 0.1 A                                                                  |
| EG                |  |                                                                                   | ● 0131860000<br>Page 123                                                           |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
| WAVESERIES<br>WOS |  |                                                                                   |                                                                                    | ● 8235180000<br>Page 125                                                           |                                                                                    |                                                                                    | ● 8296250000<br>Page 126                                                           | ● 8259950000<br>Page 127                                                           | ● 8275360000<br>Page 128                                                           |                                                                                     |                                                                                      |
| EG 7              |  |                                                                                   | ● 8092570000<br>● 8234600000<br>● 8397420000<br>● 8315590000<br>Page 133           |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
| RS 40             |  |                                                                                   | ● 1161161001<br>● 1161960000<br>Page 137                                           |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
| DKO 32            |  | ● 8027980000<br>Page 119                                                          |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
| DKO 35            |  | ● 8077860000<br>Page 119<br>● 8131660000<br>Page 120                              |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
| MCZ O             |  |                                                                                   | ● 8421060000<br>Page 114                                                           |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |

# Opto-coupler

## Electronic switching

|            |                          | Output                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|------------|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 230 V      |                          |  |  |  |  |  |  |  |  |  |  |  |
| Housing    |                          | 5 - 48 V<br>≤ 20 mA                                                               | 5 - 48 V<br>≤ 0.1 A                                                               | 5 - 48 V<br>≤ 0.5 A                                                               | 5 - 48 V<br>≤ 20 mA                                                               | 5 - 48 V<br>≤ 2.5 A                                                               | 5 - 48 V<br>≤ 5 A                                                                 | 24 - 250 V<br>≤ 3.5 A                                                              | 5 - 48 V<br>≤ 0.1 A                                                                 | 5 - 48 V<br>≤ 0.1 A                                                                 | 5 - 48 V<br>≤ 0.1 A                                                                 |                                                                                     |
| EG         |                          |                                                                                   | ● 0546360000<br>Page 123                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| WAVESERIES |                          |                                                                                   |                                                                                   | ● 8275380000<br>Page 125                                                          |                                                                                   |                                                                                   | ● 8275220000<br>Page 126                                                          | ● 8275400000<br>Page 127                                                           | ● 8275340000<br>Page 128                                                            |                                                                                     |                                                                                     |                                                                                     |
| EG 7       |                          |                                                                                   | ● 8092590000<br>● 8234610000<br>● 8387580000<br>● 8394990000<br>Page 133          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| RS 40      |                          |                                                                                   | ● 1161461001<br>● 1162060000<br>● 8182690000<br>Page 137                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| DKO 32     | ● 8008100000<br>Page 119 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| DKO 35     | ● 8008160000<br>Page 119 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| MCZ O      | ● 8421380000<br>Page 114 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

● 230 V<sub>uc/ac</sub>

# Opto-coupler

## Electronic switching

|                              |  | Output                                   |                                          |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
|------------------------------|--|------------------------------------------|------------------------------------------|------------------------------------------|---------------------|--------------------------|-------------------|--------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 12 V                         |  |                                          |                                          |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| Housing                      |  | 5 - 48 V<br>≤ 20 mA                      | 5 - 48 V<br>≤ 0.1 A                      | 5 - 48 V<br>≤ 0.5 A                      | 5 - 48 V<br>≤ 20 mA | 5 - 48 V<br>≤ 2.5 A      | 5 - 48 V<br>≤ 5 A | 24 - 250 V<br>≤ 3.5 A    | 5 - 48 V<br>≤ 0.1 A                                      | 5 - 48 V<br>≤ 0.1 A                                                                                      | 5 - 48 V<br>≤ 0.1 A                                                                                      |
| EGO                          |  | ● 8011250000<br>Page 122                 | ● 0114260000<br>Page 122                 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| WAVESERIES<br>WOS            |  |                                          |                                          | ● 8275500000<br>Page 124                 |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| EGO 7                        |  |                                          | ● 8092510000<br>● 8234570000<br>Page 132 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| RS 40                        |  |                                          | ● 1118760000<br>● 1161660000<br>Page 137 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| RSM O                        |  |                                          |                                          |                                          |                     |                          |                   |                          | ● 8017581001<br>● 1121200000<br>● 1124800000<br>Page 139 | ● 8003671001<br>● 1121200000<br>● 1124800000<br>● 8021391001<br>● 1121200000<br>● 1124800000<br>Page 139 | ● 8018221001<br>● 1121200000<br>● 1124800000<br>● 8082471001<br>● 1121200000<br>● 1124800000<br>Page 139 |
| DKO 35                       |  |                                          | ● 8184030000<br>Page 116                 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| 3...60 V                     |  |                                          |                                          |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| EGO, 3...5 V                 |  | ● 0266160000<br>Page 122                 |                                          |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| EGO, 3...12 V                |  | ● 8011250000<br>Page 122                 |                                          |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| WAVESERIES<br>WOS 5 V        |  |                                          |                                          |                                          |                     | ● 8275430000<br>Page 124 |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| WAVESERIES<br>WOS 5 V TTL    |  |                                          | ● 8275210000<br>Page 129                 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| WAVESERIES<br>WOS 3.5 - 15 V |  |                                          | ● 8275390000<br>Page 124                 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| WAVESERIES<br>WOS 12 - 28 V  |  |                                          | ● 8275450000<br>Page 129                 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| WAVESERIES<br>WOS 15 - 60 V  |  |                                          | ● 8237730000<br>Page 124                 | ● 8237730000<br>Page 124                 |                     |                          |                   | ● 8275440000<br>Page 127 |                                                          |                                                                                                          |                                                                                                          |
| EGO, 7.5 V                   |  |                                          |                                          | ● 8092490000<br>● 8234560000<br>Page 132 |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| RS 40, 5 V                   |  | ● 1118861001<br>● 1161560000<br>Page 137 |                                          |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| RSM, 5 V                     |  |                                          |                                          |                                          |                     |                          |                   |                          | ● 1123661001<br>● 1121100000<br>Page 139                 | ● 1124061001<br>● 1121100000<br>Page 139                                                                 | ● 1124461001<br>● 1121100000<br>Page 139                                                                 |
| DKO 32                       |  | ● 8018620000<br>Page 116                 |                                          |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| DKO 35                       |  | ● 8018630000<br>Page 116                 | ● 8067100000<br>Page 120                 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |
| DKO 32/35                    |  |                                          | ● 8228650000<br>Page 116                 |                                          |                     |                          |                   |                          |                                                          |                                                                                                          |                                                                                                          |

Reliable  
separation

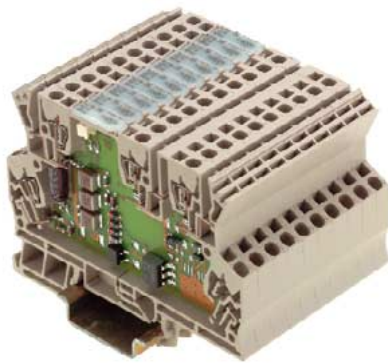
● 12 Vdc  
● 12 Vuc/ac

● Replacement opto-coupler dc and ac/dc  
● Empty socket

Digital signal  
processing

# Opto-coupler in component housing mini coupler MCZ

## Opto-couplers MCZ O



### Schematic circuit diagram

This module can be used:

- between controller and sensor, for feedback of different statuses.
- for direct switching of load currents up to a Adc, but also provides "online" information about the behaviour of the load current.

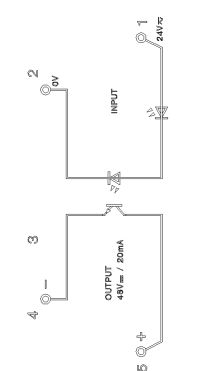
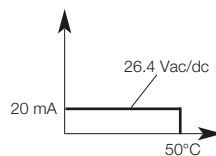
The MCZ-O modules do have following features:

- Reduction of installation- and power-up times by using the proved tension-clamp technology
- Pluggable cross-connection units in the input side reduce wiring costs
- 6 mm width

### MCZ O 24 Vac/dc 20 mA

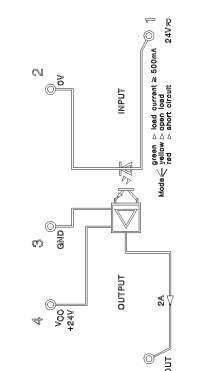
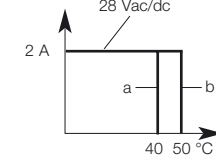
**Derating curve**  
rated to ambient temperature

a = rowed without clearances on the mounting rail  
b = rowed with clearances  $\geq 20$  mm

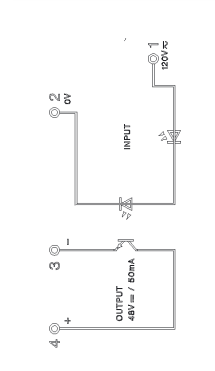
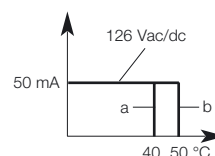


### MCZ O 24 Vac/dc 2 A<sup>2</sup>

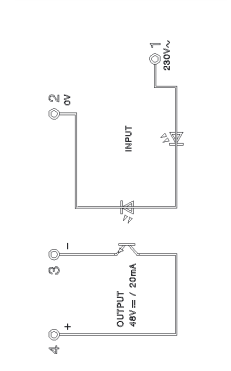
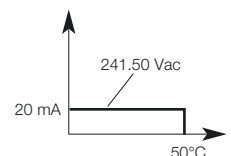
Output current



### MCZ O 120 Vac/dc



### MCZ O 230 Vac



### Ordering data

For TS 35

### Technical data

#### Input

|                            |                                         |
|----------------------------|-----------------------------------------|
| Input voltage              | 24 Vac/dc $\pm 10\%$ (21.6...26.4ac/dc) |
| Making threshold           | ac: 14.1 Vac / dc: 16.8 Vdc             |
| Input current at $U_{nom}$ | ac: 11.4 mA / dc: 9.6 mA                |
| Rated input consumption    |                                         |

Max. input frequency

ac: 5 Hz duty factor 1:2  
dc: 10 Hz duty factor 1:2

Capacity working resistance to reduction at dissipated energy

no

Functionality

operating indication

#### Output

|                                                             |                                     |
|-------------------------------------------------------------|-------------------------------------|
| Supply voltage                                              | 5...48 Vdc                          |
| Max. output current                                         | 20 mA                               |
| Voltage drop at max. load current                           | $\leq 1$ V                          |
| Pulse duration, limiting overload current (not periodic)    | $< 150$ mA / 10 ms                  |
| Reverse current (close-circuit current) at $U_{out} = 48$ V | max. 0.16 mA                        |
| Reverse polarity protection                                 |                                     |
| Free-wheel diode                                            | present                             |
| - typ. Switch-on delay (at ac phase position dependent)     | ac: $\leq 10$ ms / dc: $\leq 20$ ms |
| - typ. Switch-off delay (at ac phase position dependent)    | ac: $\leq 45$ ms / dc: $\leq 40$ ms |

Short-circuit proof

#### Insulation coordin./Reliable separation acc. to EN 50 178

|                                                                    |                             |
|--------------------------------------------------------------------|-----------------------------|
| Rated voltage                                                      | 300 V                       |
| Rated impulse voltage                                              | 6 kV                        |
| Overvoltage category                                               | III                         |
| Pollution severity                                                 | 2                           |
| Clearances and creepage distances                                  | $\geq 5.5$ mm               |
| Insulation coordin.- and voltage proof, input/output mounting rail | 4 kV <sub>eff</sub> / 1 min |
| Opto-coupler                                                       | acc. to VDE 0884            |
| Ambient temperature rowed on mounting rail without clearances      | -25 °C...+50 °C             |
| Ambient temperature rowed with clearances $\geq 20$ mm             | -25 °C...+50 °C             |
| Storage temperature                                                | -40 °C...+85 °C             |
| Conductor                                                          | AWG 22...12                 |
| Conductor cross-section                                            | 1.5 mm <sup>2</sup>         |
| Approvals                                                          | CE, UL, CSA                 |
| Overall width                                                      | 6 mm                        |

#### Accessories

|                                                     |            |            |
|-----------------------------------------------------|------------|------------|
| End plate                                           | AP MCZ 1.5 | 8389030000 |
| Further accessories, dimensions and connection data | Page 305   |            |

### MCZ O 24 Vac/dc

For TS 35

### Technical data

|                            |                                         |
|----------------------------|-----------------------------------------|
| Input voltage              | 24 Vac/dc $\pm 20\%$ (19.2...28.8ac/dc) |
| Making threshold           | approx. 16 Vac/dc                       |
| Input current at $U_{nom}$ | ac: 13 mA / dc: 12 mA                   |
| Rated input consumption    | ac: approx. 220 mW                      |

Max. input frequency

ac:  $\leq 10$  Hz duty factor 1:2  
dc:  $\leq 30$  Hz duty factor 1:2

Capacity working resistance to reduction at dissipated energy

no

Functionality

operating indication

#### Output

|                                                             |                                     |
|-------------------------------------------------------------|-------------------------------------|
| Supply voltage                                              | 24 Vdc $\pm 20\%$ (19.2...28.8 Vdc) |
| Max. output current                                         | 2 A                                 |
| Voltage drop at max. load current                           |                                     |
| Pulse duration, limiting overload current (not periodic)    |                                     |
| Reverse current (close-circuit current) at $U_{out} = 48$ V |                                     |
| Reverse polarity protection                                 | present                             |
| Free-wheel diode                                            | external necessary                  |
| - typ. Switch-on delay (at ac phase position dependent)     |                                     |
| - typ. Switch-off delay (at ac phase position dependent)    |                                     |

Short-circuit proof

yes

|                                                                    |                             |
|--------------------------------------------------------------------|-----------------------------|
| Rated voltage                                                      | 300 V                       |
| Rated impulse voltage                                              | 6 kV                        |
| Overvoltage category                                               | III                         |
| Pollution severity                                                 | 2                           |
| Clearances and creepage distances                                  | $\geq 5.5$ mm               |
| Insulation coordin.- and voltage proof, input/output mounting rail | 4 kV <sub>eff</sub> / 1 min |
| Opto-coupler                                                       | acc. to VDE 0884            |
| Ambient temperature rowed on mounting rail without clearances      | -25 °C...+40 °C             |
| Ambient temperature rowed with clearances $\geq 20$ mm             | -25 °C...+50 °C             |
| Storage temperature                                                | -40 °C...+60 °C             |
| Conductor                                                          | AWG 22...12                 |
| Conductor cross-section                                            | 1.5 mm <sup>2</sup>         |
| Approvals                                                          | CE, UL, CSA                 |
| Overall width                                                      | 6 mm                        |

#### Accessories

|                                                     |            |            |
|-----------------------------------------------------|------------|------------|
| End plate                                           | AP MCZ 1.5 | 8389030000 |
| Further accessories, dimensions and connection data | Page 305   |            |

### MCZ O 120 Vac/dc

For TS 35

### Technical data

|                            |                               |
|----------------------------|-------------------------------|
| Input voltage              | 120 Vac/dc -15 % +5 %         |
| Making threshold           | approx. 65 Vac/approx. 70 Vdc |
| Input current at $U_{nom}$ | approx. 3 mA                  |
| Rated input consumption    |                               |

Max. input frequency

ac: 5 Hz duty factor 1:2  
dc: 20 Hz duty factor 1:2

Capacity working resistance to reduction at dissipated energy

no

Functionality

operating indication

#### Output

|                                                             |                    |
|-------------------------------------------------------------|--------------------|
| Supply voltage                                              | 5...48 Vdc         |
| Max. output current                                         | 50 mA              |
| Voltage drop at max. load current                           | $< 1.6$ V          |
| Pulse duration, limiting overload current (not periodic)    | $< 150$ mA / 10 ms |
| Reverse current (close-circuit current) at $U_{out} = 48$ V | max. 0.16 mA       |
| Reverse polarity protection                                 |                    |
| Free-wheel diode                                            | present            |
| - typ. Switch-on delay (at ac phase position dependent)     | $\leq 30$ ms       |
| - typ. Switch-off delay (at ac phase position dependent)    | $\leq 40$ ms       |

Short-circuit proof

yes

|                                                                    |                             |
|--------------------------------------------------------------------|-----------------------------|
| Rated voltage                                                      | 300 V                       |
| Rated impulse voltage                                              | 6 kV                        |
| Overvoltage category                                               | III                         |
| Pollution severity                                                 | 2                           |
| Clearances and creepage distances                                  | $\geq 5.5$ mm               |
| Insulation coordin.- and voltage proof, input/output mounting rail | 4 kV <sub>eff</sub> / 1 min |
| Opto-coupler                                                       | acc. to VDE 0884            |
| Ambient temperature rowed on mounting rail without clearances      | -25 °C...+40 °C             |
| Ambient temperature rowed with clearances $\geq 20$ mm             | -25 °C...+50 °C             |
| Storage temperature                                                | -40 °C...+60 °C             |
| Conductor                                                          | AWG 22...12                 |
| Conductor cross-section                                            | 1.5 mm <sup>2</sup>         |
| Approvals                                                          | CE, UL, CSA                 |
| Overall width                                                      | 6 mm                        |

#### Accessories

|                                                     |            |            |
|-----------------------------------------------------|------------|------------|
| End plate                                           | AP MCZ 1.5 | 8389030000 |
| Further accessories, dimensions and connection data | Page 305   |            |

### MCZ O 230 Vac

For TS 35

### Technical data

|                            |                    |
|----------------------------|--------------------|
| Input voltage              | 230 Vac -15 % +5 % |
| Making threshold           | approx. 170 Vac    |
| Input current at $U_{nom}$ | ac: 10 mA          |
| Rated input consumption    |                    |

Max. input frequency

ac: 5 Hz duty factor 1:2

Capacity working resistance to reduction at dissipated energy

yes

Functionality

operating indication

#### Output

|                                                             |                    |
|-------------------------------------------------------------|--------------------|
| Supply voltage                                              | 5...48 Vdc         |
| Max. output current                                         | 20 mA              |
| Voltage drop at max. load current                           | $< 1.6$ V          |
| Pulse duration, limiting overload current (not periodic)    | $< 150$ mA / 10 ms |
| Reverse current (close-circuit current) at $U_{out} = 48$ V | max. 0.16 mA       |
| Reverse polarity protection                                 |                    |
| Free-wheel diode                                            | present            |
| - typ. Switch-on delay (at ac phase position dependent)     |                    |
| - typ. Switch-off delay (at ac phase position dependent)    |                    |

Short-circuit proof

yes

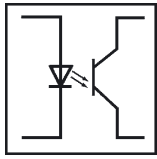
|                                                                    |                             |
|--------------------------------------------------------------------|-----------------------------|
| Rated voltage                                                      | 300 V                       |
| Rated impulse voltage                                              | 6 kV                        |
| Overvoltage category                                               | III                         |
| Pollution severity                                                 | 2                           |
| Clearances and creepage distances                                  | $\geq 3$ mm                 |
| Insulation coordin.- and voltage proof, input/output mounting rail | 4 kV <sub>eff</sub> / 1 min |
| Opto-coupler                                                       | acc. to VDE 0884            |
| Ambient temperature rowed on mounting rail without clearances      | -25 °C...+50 °C             |
| Ambient temperature rowed with clearances $\geq 20$ mm             | -25 °C...+50 °C             |
| Storage temperature                                                | -40 °C...+85 °C             |
| Conductor                                                          | AWG 22...12                 |
| Conductor cross-section                                            | 1.5 mm <sup>2</sup>         |
| Approvals                                                          | CE, UL, CSA                 |
| Overall width                                                      | 6 mm                        |

#### Accessories

|                                                     |            |            |
|-----------------------------------------------------|------------|------------|
| End plate                                           | AP MCZ 1.5 | 8389030000 |
| Further accessories, dimensions and connection data | Page 305   |            |

# Opto-coupler in component housing mini coupler MCZ

## Opto-couplers MCZ O



This module can be used:

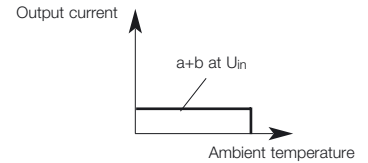
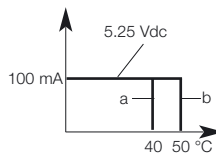
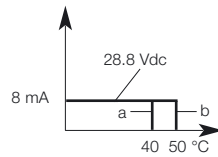
- 1\* - between controller and actuator, for the signal conversion of 24 Vdc to 5 VTTL
- 2\* - between controller and actuator, for the signal conversion of 5 VTTL to 5...48 Vdc

### MCZ O 24 Vdc/5 VTTL<sup>1\*</sup>

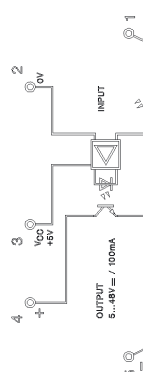
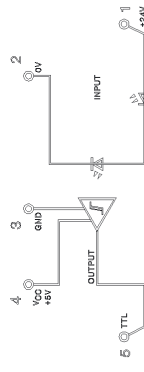
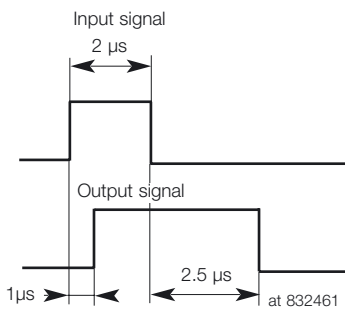
**Derating curve**  
rated to ambient temperature

a = rowed on the mounting rail without clearances  
b = rowed with clearances  $\geq 20$  mm

### MCZ O 5 V TTL/5...48 Vdc<sup>2\*</sup>



## Schematic circuit diagram



## Ordering data

For TS 35

Type Cat. No.  
MCZ O 24 Vdc **8324610000**

Type Cat. No.  
MCZ O 24 Vdc **8398940000**

## Technical data

### Input

|                            |                                                            |
|----------------------------|------------------------------------------------------------|
| Supply voltage             |                                                            |
| Input voltage              | 24 Vdc $\pm 16\%$ (20...28 Vdc)                            |
| Making threshold           | approx. 17 Vdc                                             |
| Input current at $U_{nom}$ | 4.7 mA (2.9...6.5 mA)                                      |
| Rated input consumption    | dc: 112 mW                                                 |
| Max. input frequency       | 100 kHz switching ratio 1:2<br>50 kHz switching ratio 1:10 |
| Min. input impulse width   | 2 µs                                                       |

### Output

|                                                          |                           |
|----------------------------------------------------------|---------------------------|
| Supply voltage                                           | 5 V (4.75...5.25 V)       |
| Output voltage                                           | 5 V TTL (4.75...5.25 V)   |
| Max. output current                                      | 8 mA, Fan Out = 20 LS-TTL |
| Voltage drop at max. load current                        |                           |
| Pulse duration, limiting overload current (not periodic) |                           |
| Reverse current (static current) at $U_{out} = 48$ V     |                           |
| Reverse polarity protection                              |                           |
| Free-wheel diode                                         |                           |
| - typ. switch-on delay                                   | 1 µs (at 20 Vdc)          |
| - typ. switch-off delay                                  | 2.5 µs (at 28 Vdc)        |

|                                       |
|---------------------------------------|
| 5 Vdc $\pm 5\%$                       |
| 5 V TTL                               |
| $I_{LE} = 1 \mu A / I_{HI} = 8 \mu A$ |
| 2.4 kHz                               |
|                                       |
|                                       |
| 5...48 Vdc                            |
| 100 mA                                |
| $\leq 1.8$ V                          |
|                                       |
| present (input)                       |
| present                               |
| approx. 27 µs                         |
| approx. 210 µs                        |

## Insulation coordin./Reliable separation acc. to EN 50178

|                                                               |                              |                              |
|---------------------------------------------------------------|------------------------------|------------------------------|
| Rated voltage                                                 | 300 V                        | 300 V                        |
| Rated impulse voltage                                         | 6 kV                         | 6 kV                         |
| Overvoltage category                                          | III                          | III                          |
| Pollution severity                                            | 2                            | 2                            |
| Clearances and creepage distances                             | $\geq 5.5$ mm                | $\geq 5.5$ mm                |
| Insulation coordination/dielectric strength I/O to TS         | 4 kV <sub>eff</sub> / 1 min  | 4 kV <sub>eff</sub> / 1 min  |
| Opto-coupler                                                  | acc. to VDE 0884             | acc. to VDE 0884             |
| Ambient temperature rowed on mounting rail without clearances | -25 °C...+40 °C              | -25 °C...+50 °C              |
| Ambient temperature rowed with clearances $\geq 20$ mm        | -25 °C...+50 °C              | -25 °C...+50 °C              |
| Storage temperature                                           | -40 °C...+60 °C              | -40 °C...+85 °C              |
| Conductor                                                     | AWG 22...12                  | AWG 22...12                  |
| Conductor cross-section                                       | 1.5 mm <sup>2</sup>          | 1.5 mm <sup>2</sup>          |
| Approvals                                                     | CE, UL, CSA                  | CE, UL, CSA                  |
| Overall width                                                 | 6 mm                         | 6 mm                         |
| <b>Accessories</b>                                            | Type Cat. No.                | Type Cat. No.                |
| End plate                                                     | AP MCZ 1.5 <b>8389030000</b> | AP MCZ 1.5 <b>8389030000</b> |
| Further accessories, dimensions and connection data           | Page 305                     | Page 305                     |

# Opto-coupler in component housing mini coupler DK

## Opto-couplers DKO

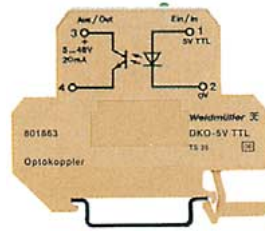
## DKO 5 Vdc

## DKO 5 VTTL

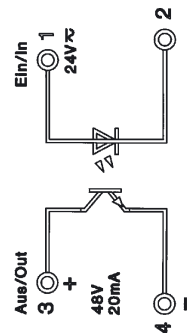
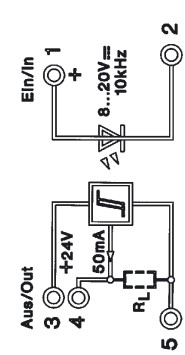
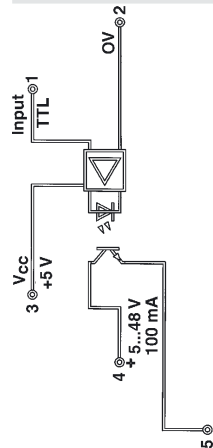
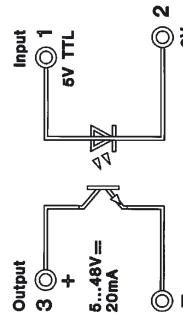
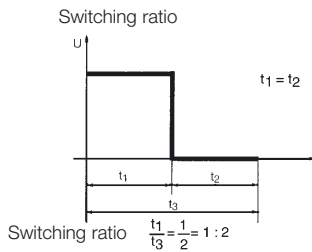
## DKO 12 Vdc

## DKO 24 Vac/dc

- Coupling of digital sensor-/actuator-signals between PLC and process
- Low cost solution for level- and potential-equalization
- Low input power
- Screw clamp connection technology
- 6 mm width



### Schematic circuit diagram



| Ordering data                                       | Type               | Cat. No.                | Type                    | Cat. No.   | Type                    | Cat. No.   | Type                    | Cat. No.   |
|-----------------------------------------------------|--------------------|-------------------------|-------------------------|------------|-------------------------|------------|-------------------------|------------|
| For TS 32                                           | Y                  | DKO 5 Vdc               | 8018620000              |            |                         |            | DKO 24 Vac/dc           | 8008090000 |
| For TS 35                                           | W                  | DKO 5 Vdc               | 8018630000              |            |                         |            | DKO 24 Vac/dc           | 8008150000 |
| With combination foot TS 32/TS 35                   |                    |                         |                         |            |                         |            |                         |            |
| Technical data                                      | Input: bottom      |                         | Input: bottom           |            | Input: bottom           |            | Input: bottom           |            |
| Input voltage                                       | 5 Vdc ±5 %         |                         | 5 VTTL                  |            | 12 Vdc ±20 %            |            | 24 Vac/dc ±10 %         |            |
| Switch-on voltage                                   | 2.4 Vdc            |                         |                         |            | approx.7 V              |            | 112.8 Vac/16.8 Vdc      |            |
| Input current                                       | ≤10 mA             |                         | 1 µA                    |            | 11 mA                   |            | 11.4 mAac/9.6 mAAdc     |            |
| Max. input power                                    | 50 mW              |                         |                         |            | 130 mW                  |            | 280 mVA/230 mW          |            |
| Output voltage                                      | 5...48 Vdc         |                         | 5...48 Vdc              |            | 24 Vdc ±10 %            |            | 5...48 Vdc              |            |
| Max. output current                                 | 20 mA              |                         | 100 mA                  |            | 50 mA                   |            | 20 mA                   |            |
| Min. output current                                 | 50 µA              |                         | 50 µA                   |            | 50 µA                   |            | 50 µA                   |            |
| Max. switching frequency; switching ratio 1: 2      | 20 Hz              |                         | 3 kHz                   |            | 10 kHz                  |            | ac: 5 Hz dc: 10 Hz      |            |
|                                                     |                    |                         |                         |            |                         |            |                         |            |
| Switch-on delay                                     | ≤15 µs             |                         | approx.27 µs            |            | 1 µs                    |            | ≤15 ms at dc            |            |
|                                                     |                    |                         |                         |            |                         |            |                         |            |
| Switch-off delay                                    | ≤70 µs             |                         | approx.35 µs            |            | 2.5 µs                  |            | ≤25 ms at dc            |            |
|                                                     |                    |                         |                         |            |                         |            |                         |            |
| Voltage drop at max. load                           | ≤1.6 V             |                         | ≤1.6 V                  |            | ≤1 V                    |            | ≤1 V                    |            |
|                                                     |                    |                         |                         |            |                         |            |                         |            |
| Insulation coordination to EN 50 178                |                    |                         |                         |            |                         |            |                         |            |
| Rated voltage                                       | 150 V              |                         | 300 V                   |            | 300 V                   |            | 300 V                   |            |
| Rated impulse voltage                               | 4 kV               |                         | 6 kV                    |            | 6 kV                    |            | 4 kV                    |            |
| Overvoltage category                                | IV                 |                         | IV                      |            | IV                      |            | III                     |            |
| Pollution severity                                  | 2                  |                         | 2                       |            | 2                       |            | 2                       |            |
| Clearances and creepage distances                   | ≥4 mm              |                         | ≥5.5 mm                 |            | ≥5.5 mm                 |            | ≥4 mm                   |            |
|                                                     |                    |                         |                         |            |                         |            |                         |            |
| Operating temperature                               | without clearances | -25 °C...+50 °C         | -25 °C...+50 °C         |            | -25 °C...+50 °C         |            | -25 °C...+40 °C         |            |
|                                                     | with clearances    | -25 °C...+50 °C         | -25 °C...+50 °C         |            | -25 °C...+50 °C         |            | -25 °C...+50 °C         |            |
| Storage temperature                                 |                    | -40 °C...+85 °C         | -40 °C...+85 °C         |            | -40 °C...+85 °C         |            | -40 °C...+85 °C         |            |
| Conductor                                           |                    | AWG 22...12             | AWG 22...12             |            | AWG 22...12             |            | AWG 22...12             |            |
| Conductor cross-section                             |                    | 0.5...4 mm <sup>2</sup> | 0.5...4 mm <sup>2</sup> |            | 0.5...4 mm <sup>2</sup> |            | 0.5...4 mm <sup>2</sup> |            |
| Overall width                                       |                    | 6 mm                    | 6 mm                    |            | 12 mm                   |            | 6 mm                    |            |
|                                                     |                    |                         |                         |            |                         |            |                         |            |
| Accessories                                         | Type               | Cat. No.                | Type                    | Cat. No.   | Type                    | Cat. No.   | Type                    | Cat. No.   |
| End plate                                           | AP DKT4            | 0687560000              | AP DK5                  | 8268870000 | AP DKT4                 | 0687560000 | AP DKT4                 | 0687560000 |
| Further accessories, dimensions and connection data |                    |                         |                         |            |                         |            |                         |            |
|                                                     |                    | Page 305                | Page 305                |            | Page 305                |            | Page 305                |            |

# Opto-coupler in component housing mini coupler DK

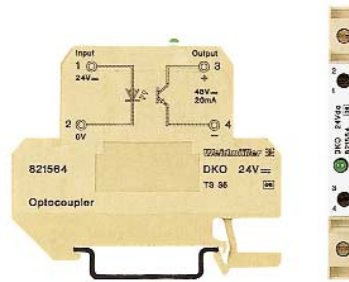
## Opto-couplers DKO

## DKO 24 Vdc

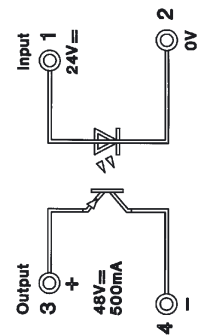
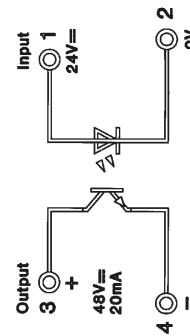
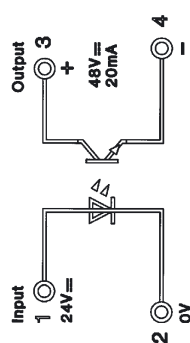
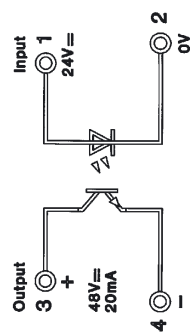
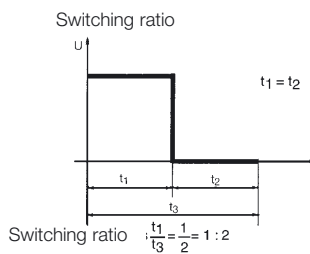
## DKO 24 Vdc

## DKO 24 Vdc

## DKO 24 Vdc



### Schematic circuit diagram



| Ordering data                                       | Type                    | Cat. No.   | Type                    | Cat. No.   | Type                    | Cat. No.   | Type                    | Cat. No.   |
|-----------------------------------------------------|-------------------------|------------|-------------------------|------------|-------------------------|------------|-------------------------|------------|
| For TS 32                                           | Y                       |            |                         |            |                         |            | DKO 24 Vdc              | 8019580000 |
| For TS 35                                           | W                       |            |                         |            |                         |            | DKO 24 Vdc              | 8019590000 |
| <b>Technical data</b>                               |                         |            |                         |            |                         |            |                         |            |
| Input voltage                                       | 24 Vdc ±10 %            |            | 24 Vdc ±10 %            |            | 24 Vdc ±10 %            |            | 24 Vdc ±10 %            |            |
| Switch-on voltage                                   | approx.19 V/7.5 mA      |            | approx.19 V/7.5 mA      |            | approx.19 V/7.5 mA      |            | approx.17 V             |            |
| Input current                                       | ≤15 mA                  |            | ≤15 mA                  |            | ≤8.5 mA                 |            | 6 mA                    |            |
| Max. input power                                    | 360 mW                  |            | 360 mW                  |            | 204 mW                  |            | 145 mW                  |            |
| Output voltage                                      | 5...48 Vdc              |            | 5...48 Vdc              |            | 5...48 Vdc              |            | 5...48 Vdc              |            |
| Max. output current                                 | 20 mA                   |            | 20 mA                   |            | 20 mA                   |            | 500 mA                  |            |
| Min. output current                                 | 50 µA                   |            | 50 µA                   |            | 50 µA                   |            | 50 µA                   |            |
| Max. switching frequency; switching ratio 1: 2      | 3 kHz                   |            | 3 kHz                   |            | 3 kHz                   |            | 200 Hz                  |            |
| Switch-on delay                                     | approx.50 µs            |            | approx.50 µs            |            | approx.50 µs            |            | approx.40 µs            |            |
| Switch-off delay                                    | approx.80 µs            |            | approx.80 µs            |            | approx.80 µs            |            | approx.65 µs            |            |
| Voltage drop at max. load                           | ≤900 mV                 |            | ≤900 mV                 |            | ≤900 mV                 |            | ≤800 mV                 |            |
| <b>Insulation coordination to EN 50 178</b>         |                         |            |                         |            |                         |            |                         |            |
| Rated voltage                                       | 300 V                   |            | 300 V                   |            | 300 V                   |            | 300 V                   |            |
| Rated impulse voltage                               | 4 kV                    |            | 4 kV                    |            | 4 kV                    |            | 4 kV                    |            |
| Overvoltage category                                | II                      |            | II                      |            | III                     |            | II                      |            |
| Pollution severity                                  | 2                       |            | 2                       |            | 2                       |            | 2                       |            |
| Clearances and creepage distances                   | ≥4 mm                   |            | ≥4 mm                   |            | ≥4 mm                   |            | ≥4 mm                   |            |
| Operating temperature                               | without clearances      |            |                         |            |                         |            |                         |            |
|                                                     | with clearances         |            |                         |            |                         |            |                         |            |
| Storage temperature                                 |                         |            |                         |            |                         |            |                         |            |
| Conductor                                           | AWG 22...12             |            | AWG 22...12             |            | AWG 22...12             |            | AWG 22...12             |            |
| Conductor cross-section                             | 0.5...4 mm <sup>2</sup> |            | 0.5...4 mm <sup>2</sup> |            | 0.5...4 mm <sup>2</sup> |            | 0.5...4 mm <sup>2</sup> |            |
| Overall width                                       | 6 mm                    |            | 6 mm                    |            | 6 mm                    |            | 6 mm                    |            |
| <b>Accessories</b>                                  | Type                    | Cat. No.   | Type                    | Cat. No.   | Type                    | Cat. No.   | Type                    | Cat. No.   |
| End plate                                           | AP DKT4                 | 0687560000 | AP DKT4                 | 0687560000 | AP DKT4                 | 0687560000 | AP DKT4                 | 0687560000 |
| Further accessories, dimensions and connection data | Page 305                |            | Page 305                |            | Page 305                |            | Page 305                |            |

# Opto-coupler in component housing mini coupler DK

## Opto-couplers DKO

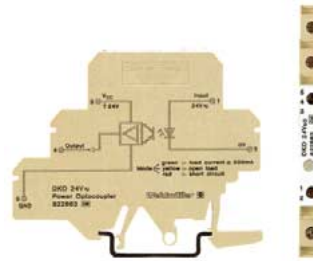
- Coupling of digital sensor-/actuator-signals between PLC and process
- Low cost solution for level- and potential-equalization
- Low input power
- Screw clamp connection technology
- 6 mm width

## DKO 24 Vdc

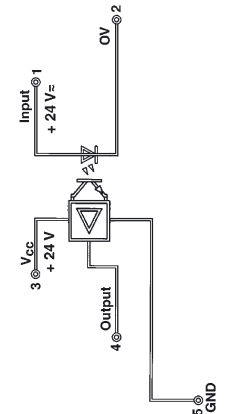
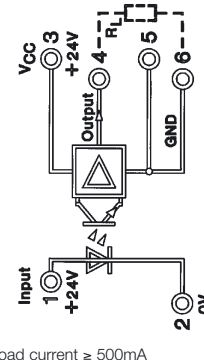
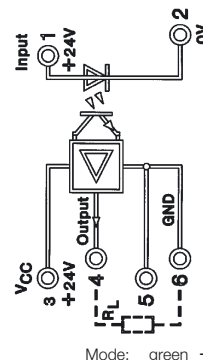
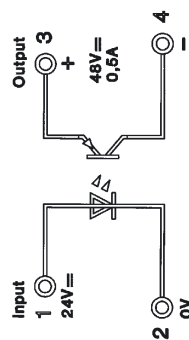
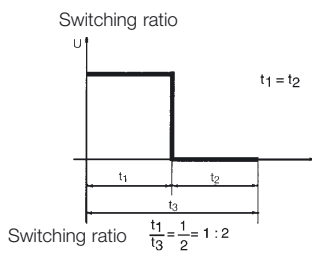
## DKO 24 Vdc

## DKO 24 Vdc

## DKO 24 Vac/dc



### Schematic circuit diagram



Mode: green → Load current  $\geq 500\text{mA}$   
yellow → Idling  
red → Short circuit

| Ordering data                                       | Type                                  | Cat. No.                           | Type                               | Cat. No.                           | Type                               | Cat. No.                           | Type                               | Cat. No.   |
|-----------------------------------------------------|---------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------|
| For TS 32                                           | Y                                     |                                    |                                    |                                    |                                    |                                    |                                    |            |
| For TS 35                                           | W                                     |                                    |                                    |                                    |                                    |                                    |                                    |            |
| With combination foot TS 32 / TS 35                 |                                       |                                    |                                    |                                    |                                    |                                    |                                    |            |
| Technical data                                      |                                       |                                    |                                    |                                    |                                    |                                    |                                    |            |
| Input voltage                                       | 24 Vdc $\pm 10\%$                     |                                    | 24 Vdc $\pm 10\%$                  |                                    | 24 Vdc $\pm 10\%$                  |                                    | 24 Vdc/dc $\pm 20\%$               |            |
| Switch-on voltage                                   | approx. 17 Vdc                        |                                    | approx. 18 Vdc                     |                                    | approx. 18 Vdc                     |                                    | approx. 16 Vdc/dc                  |            |
| Input current                                       | 6 mA                                  |                                    | 12 mA                              |                                    | 12 mA                              |                                    | 13 mAac/12 mAac                    |            |
| Max. input power                                    | 145 mW                                |                                    | 290 mW                             |                                    | 290 mW                             |                                    | 220 mVA/195 mW                     |            |
| Output voltage                                      | 5...48 Vdc                            |                                    | 24 Vdc $\pm 10\%$                  |                                    | 24 Vdc $\pm 10\%$                  |                                    | 24 Vdc $\pm 20\%$                  |            |
| Max. output current                                 | 500 mA                                |                                    | 2 A                                |                                    | 2 A                                |                                    | 2 A                                |            |
| Min. output current                                 | 50 $\mu\text{A}$                      |                                    |                                    |                                    |                                    |                                    |                                    |            |
| Max. switching frequency; switching ratio 1: 2      | 200 Hz                                |                                    | 100 Hz                             |                                    | 100 Hz                             |                                    | ac: 10 Hz dc: $\leq 30\text{ Hz}$  |            |
| Switch-on delay                                     | approx. 40 $\mu\text{s}$              |                                    |                                    |                                    |                                    |                                    | 2 ms                               |            |
| Switch-off delay                                    | approx. 65 $\mu\text{s}$              |                                    |                                    |                                    |                                    |                                    | 7 ms                               |            |
| Voltage drop at max. load                           | $\leq 800\text{ mV}$                  |                                    |                                    |                                    |                                    |                                    |                                    |            |
| Insulation coordination to EN 50 178                |                                       |                                    |                                    |                                    |                                    |                                    |                                    |            |
| Rated voltage                                       | 300 V                                 |                                    | 300 V                              |                                    | 300 V                              |                                    | 300 V                              |            |
| Rated impulse voltage                               | 4 kV                                  |                                    | 4 kV                               |                                    | 4 kV                               |                                    | 6 kV                               |            |
| Overvoltage category                                | III                                   |                                    | III                                |                                    | III                                |                                    | IV                                 |            |
| Pollution severity                                  | 2                                     |                                    | 2                                  |                                    | 2                                  |                                    | 2                                  |            |
| Clearances and creepage distances                   | $\geq 4\text{ mm}$                    |                                    | $\geq 3\text{ mm}$                 |                                    | $\geq 3\text{ mm}$                 |                                    | $\geq 5.5\text{ mm}$               |            |
| Operating temperature                               | without clearances<br>with clearances | -25 °C...+40 °C<br>-25 °C...+50 °C | -25 °C...+40 °C<br>-25 °C...+50 °C | -25 °C...+40 °C<br>-25 °C...+50 °C | -25 °C...+40 °C<br>-25 °C...+50 °C | -25 °C...+40 °C<br>-25 °C...+50 °C | -25 °C...+40 °C<br>-25 °C...+50 °C |            |
| Storage temperature                                 |                                       | -40 °C...+85 °C                    | -40 °C...+85 °C                    | -40 °C...+85 °C                    | -40 °C...+85 °C                    | -40 °C...+85 °C                    | -40 °C...+85 °C                    |            |
| Conductor                                           |                                       | AWG 22...12                        | AWG 22...12                        | AWG 22...12                        | AWG 22...12                        | AWG 22...12                        | AWG 22...12                        |            |
| Conductor cross-section                             |                                       | 0.5...4 mm <sup>2</sup>            | 0.5...4 mm <sup>2</sup>            | 0.5...4 mm <sup>2</sup>            | 0.5...4 mm <sup>2</sup>            | 0.5...4 mm <sup>2</sup>            | 0.5...4 mm <sup>2</sup>            |            |
| Overall width                                       |                                       | 6 mm                               | 12 mm                              | 12 mm                              | 12 mm                              | 6 mm                               | 6 mm                               |            |
| Accessories                                         | Type                                  | Cat. No.                           | Type                               | Cat. No.                           | Type                               | Cat. No.                           | Type                               | Cat. No.   |
| End plate                                           | AP DKT4                               | 0687560000                         | AP DKT4                            | 0687560000                         | AP DKT4                            | 0687560000                         | AP DK 5                            | 8268870000 |
| Further accessories, dimensions and connection data | Page 305                              |                                    | Page 305                           |                                    | Page 305                           |                                    | Page 305                           |            |

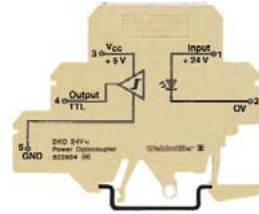
# Opto-coupler in component housing mini coupler DK

## Opto-couplers DKO

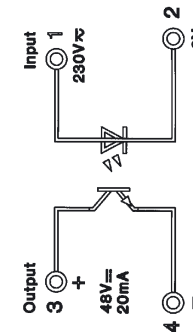
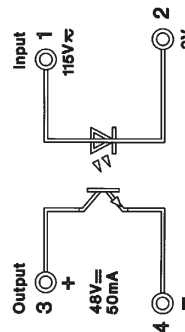
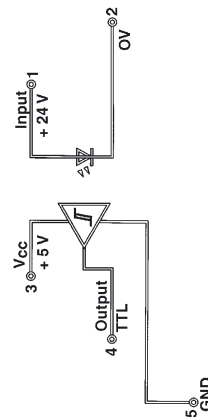
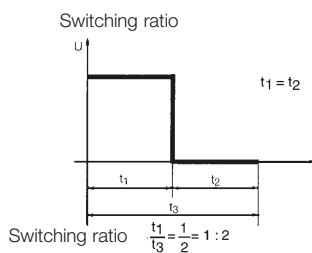
## DKO DK5 24 Vdc

## DKO 115 Vac/dc

## DKO 230 Vac/dc



### Schematic circuit diagram



| Ordering data                                       |                    | Type                      | Cat. No.   | Type                        | Cat. No.   | Type                          | Cat. No.   |
|-----------------------------------------------------|--------------------|---------------------------|------------|-----------------------------|------------|-------------------------------|------------|
| For TS 32                                           | Y                  |                           |            | DKO 115 Vac/dc              | 8027980000 | DKO 230 Vac/dc                | 8008100000 |
| For TS 35                                           | W                  |                           |            | DKO 115 Vac/dc              | 8077860000 | DKO 230 Vac/dc                | 8008160000 |
| With combination foot TS 32/TS 35                   |                    | DKO 24 Vdc                | 8228640000 |                             |            |                               |            |
| Technical data                                      |                    | Input: top                |            | Input: bottom               |            | Input: bottom                 |            |
| Input voltage                                       |                    | 24 Vdc $\pm 20\%$         |            | 115 Vac/dc $\pm 5\%$ -15 %  |            | 230 Vac/dc $\pm 5\%$ -15 %    |            |
| Switch-on voltage                                   |                    | approx.17 Vdc             |            | approx.65 Vac/approx.66 Vdc |            | approx.130 Vac/approx.140 Vdc |            |
| Input current                                       |                    | 4.7 mA                    |            | 2.65 mAac/3 mAac            |            | 1.8 mAac/1.7 mAac             |            |
| Max. input power                                    |                    | 112 mW                    |            | 390 mVA/350 mW              |            | 395 mVA/370 mW                |            |
| Output voltage                                      |                    | 5 VTTL                    |            | 5...48 Vdc                  |            | 5...48 Vdc                    |            |
| Max. output current                                 |                    | 8 mA, Fan Out = 20 LS-TTL |            | 50 mA                       |            | 20 mA                         |            |
| Min. output current                                 |                    |                           |            |                             |            | 50 $\mu$ A                    |            |
| Max. switching frequency; switching ratio 1: 2      |                    | 100 kHz 1:2/50 kHz 1:10   |            | ac: 5 Hz/dc: 20 Hz          |            | ac: 5 Hz/dc: 20 Hz            |            |
| Switch-on delay                                     |                    | 1 $\mu$ s                 |            | 17.4 ms                     |            | 20 ms                         |            |
| Switch-off delay                                    |                    | 2.5 $\mu$ s               |            | 27.4 ms                     |            | 20 ms                         |            |
| Voltage drop at max. load                           |                    |                           |            | <1.6 V                      |            | <1.6 V                        |            |
| Insulation coordination to EN 50 178                |                    |                           |            |                             |            |                               |            |
| Rated voltage                                       |                    | 300 V                     |            | 300 V                       |            | 300 V                         |            |
| Rated impulse voltage                               |                    | 4 kV                      |            | 6 kV                        |            | 4 kV                          |            |
| Overvoltage category                                |                    | III                       |            | IV                          |            | III                           |            |
| Pollution severity                                  |                    | 2                         |            | 2                           |            | 2                             |            |
| Clearances and creepage distances                   |                    | $\geq 5.5$ mm             |            | $\geq 5.5$ mm               |            | $\geq 3$ mm                   |            |
| Operating temperature                               | without clearances | -25 °C...+40 °C           |            | -25 °C...+40 °C             |            | -25 °C...+50 °C               |            |
|                                                     | with clearances    | -25 °C...+50 °C           |            | -25 °C...+50 °C             |            | -25 °C...+50 °C               |            |
| Storage temperature                                 |                    | -25 °C...+85 °C           |            | -40 °C...+85 °C             |            | -40 °C...+85 °C               |            |
| Conductor                                           |                    | AWG 22...12               |            | AWG 22...12                 |            | AWG 22...12                   |            |
| Conductor cross-section                             |                    | 0.5...4 mm <sup>2</sup>   |            | 0.5...4 mm <sup>2</sup>     |            | 0.5...4 mm <sup>2</sup>       |            |
| Overall width                                       |                    | 6 mm                      |            | 6 mm                        |            | 6 mm                          |            |
| Accessories                                         |                    | Type                      | Cat. No.   | Type                        | Cat. No.   | Type                          | Cat. No.   |
| End plate                                           |                    | AP DK5                    | 8268870000 | AP DKT4                     | 0687560000 | AP DKT4                       | 0687560000 |
| Further accessories, dimensions and connection data |                    | Page 305                  |            | Page 305                    |            | Page 305                      |            |

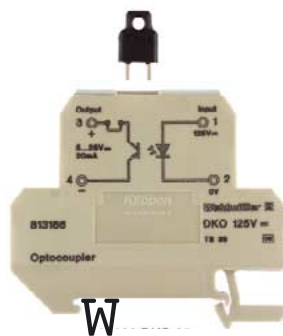
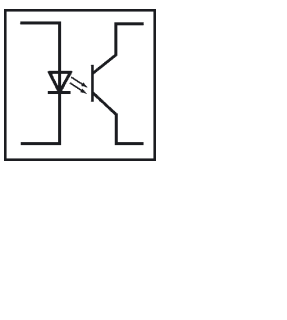
### Opto-coupler in component housing mini coupler DK

## Opto-couplers DKO

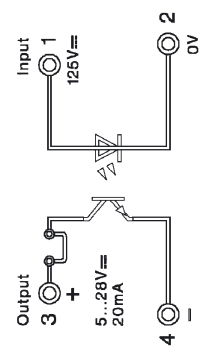
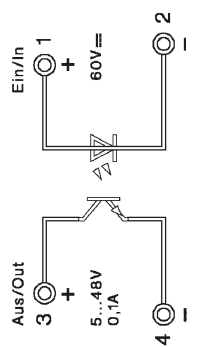
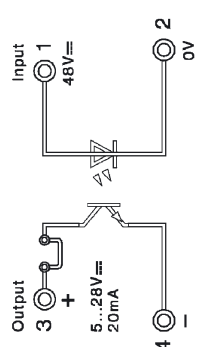
## DKO 35 48 Vdc

## DKO 35 60 Vdc

**DKO 35 125 Vdc**



### Schematic circuit diagram



|                                      |   |                                   |            |                                   |            |                                   |            |
|--------------------------------------|---|-----------------------------------|------------|-----------------------------------|------------|-----------------------------------|------------|
| Ordering data                        |   | Type                              | Cat. No.   | Type                              | Cat. No.   | Type                              | Cat. No.   |
| For TS 32                            | Y |                                   |            |                                   |            |                                   |            |
| For TS 35                            | W | DKO 35 48 Vdc                     | 8151230000 | DKO 35 60 Vdc                     | 8067100000 | DKO 35 125 Vdc                    | 8131660000 |
| With combination foot TS 32 / TS 35  |   |                                   |            |                                   |            |                                   |            |
| Technical data                       |   |                                   |            |                                   |            |                                   |            |
| Input voltage                        |   | 48 Vdc ±10 %                      |            | 60 Vdc ±10 %                      |            | 125 Vdc ±10 %                     |            |
| Input current                        |   | 3.7 mA ±20 %                      |            | 5.6 mA ±20 %                      |            | 1.7 mA ±20 %                      |            |
| Input nominal power                  |   | 178 mW                            |            | 340 mW                            |            | 215 mW                            |            |
| Total power loss                     |   | 400 mW                            |            | 420 mW                            |            | 400 mW                            |            |
| Making threshold                     |   | approx.32 Vdc                     |            | approx.42 Vdc / 5.3 mA            |            | approx.80 Vdc                     |            |
| Input reverse voltage                |   | max. 1 kV                         |            | max. 1 kV                         |            | max. 1 kV                         |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
| Output voltage                       |   | 5...28 Vdc                        |            | 5...48 Vdc                        |            | 5...28 Vdc                        |            |
| Output current                       |   | max. 20 mA                        |            | max. 100 mA                       |            | max. 20 mA                        |            |
| Voltage drop at max. load            |   | 1.6 V                             |            | 0.8 V                             |            | 1.6 V                             |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
| Feature of output circuit            |   | Disconnection plug                |            |                                   |            | Disconnection plug                |            |
| Indication                           |   | LED red                           |            | LED green                         |            | LED red                           |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
| Dielectric strength input/output     |   | 3.75 kV <sub>eff</sub> / 5.3 kVdc |            | 3.75 kV <sub>eff</sub> / 5.3 kVdc |            | 3.75 kV <sub>eff</sub> / 5.3 kVdc |            |
| Dielectric strength to mounting rail |   | 4 kV <sub>eff</sub>               |            | 4 kV <sub>eff</sub>               |            | 4 kV <sub>eff</sub>               |            |
| Clearances and creepage distances    |   | >5 mm                             |            | >4 mm                             |            | >5 mm                             |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
| Operating temperature                |   | -25 °C...+50 °C                   |            | -25 °C...+50 °C                   |            | -25 °C...+50 °C                   |            |
| Storage temperature                  |   | -40 °C...+60 °C                   |            | -40 °C...+60 °C                   |            | -40 °C...+60 °C                   |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
| Conductor                            |   | AWG 22...12                       |            | AWG 22...12                       |            | AWG 22...12                       |            |
| Conductor cross-section              |   | 0.5...4 mm²                       |            | 0.5...4 mm²                       |            | 0.5...4 mm²                       |            |
| Overall width                        |   | 6 mm                              |            | 6 mm                              |            | 6 mm                              |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
|                                      |   |                                   |            |                                   |            |                                   |            |
| Accessories                          |   | Type                              | Cat. No.   | Type                              | Cat. No.   | Type                              | Cat. No.   |
| End plate                            |   | AP DKT4                           | 0687560000 | AP DKT4                           | 0687560000 | AP DKT4                           | 0687560000 |

## Opto-coupler in component housing mini coupler DK

### Opto-couplers DKO S0 signal sensor

Application example:

Signals for consumers are normally transferred via an interface. Generally, this interface must conform with DIN 43867 (interface for signal transmission). There must be a differentiation between the passive interface and active S0 interface. The actual signals, that are correspondingly proportional to the relevant consumption (electrical energy, gas consumption, water, district heating, etc.) are shown at measuring sensors (electric meter, etc.) The interface itself is purely passive (acceptor) and must be supplied via a source. The source for providing the current is built into the active interface. The following threshold values are specified:

$$I_{\max} = 27 \text{ mAdc}$$

$$U_{\max} = 27 \text{ Vdc}$$

$$f_{\max} = 16.66 \text{ Hz}$$

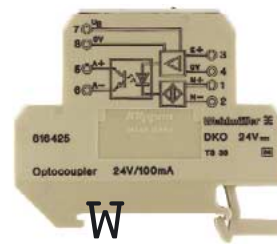
For the recognition of the corresponding consumption signals, the following currents are integrated:

ON (active) -> 10...27 mA  
Off (inactive) -> 0...2 mA

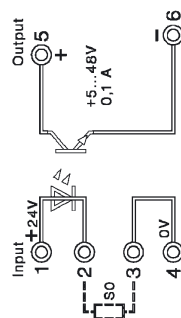
The module accepts the input from the signal sensor and outputs the opto-decoupled output signal, i. e. galvanically isolated.

### DKO switching amplifiers/opto-couplers for Namur initiators

#### DKO DK4 S0

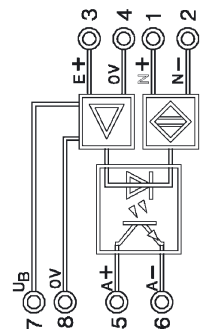


Schematic circuit diagram



#### DKO

Schematic circuit diagram



| Ordering data                                        |                                                                                                         |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| For TS 32                                            | y                                                                                                       |
| For TS 35                                            | w                                                                                                       |
| With combination foot TS 32 / TS 35                  |                                                                                                         |
| Technical data                                       |                                                                                                         |
| Input                                                |                                                                                                         |
| Input voltage                                        | 24 Vdc $\pm 10\%$                                                                                       |
| Input current                                        | $\leq 13 \text{ mA}$                                                                                    |
| Pulse generator                                      | Specification acc. to DIN 43864 (current interface for connection to pulse generator acc. to DIN 43864) |
| Output                                               |                                                                                                         |
| Output voltage                                       | 5...48 Vdc                                                                                              |
| Output current                                       | max. 100 mA                                                                                             |
| Voltage proof input-output/mounting rail             | 4 kV <sub>eff</sub>                                                                                     |
| Insulation coordination to DIN VDE 0160, Draft 11/94 |                                                                                                         |
| Rated voltage                                        | 300 V                                                                                                   |
| Rated impulse voltage                                | 6 kV                                                                                                    |
| Overvoltage category                                 | IV                                                                                                      |
| Pollution severity                                   | 2                                                                                                       |
| Clearances and creepage distances                    | $\geq 5.5 \text{ mm}$                                                                                   |
| Operating temperature                                | without clearances -25 °C...+40 °C<br>with clearances -25 °C...+50 °C                                   |
| Storage temperature                                  | -40 °C...+60 °C                                                                                         |
| Conductor                                            | AWG 22...12                                                                                             |
| Conductor cross-section                              | 0.5...4 mm <sup>2</sup>                                                                                 |
| Overall width                                        | 12 mm                                                                                                   |
| Accessories                                          |                                                                                                         |
| End plate                                            | AP DKT4 0687560000                                                                                      |

| Type                                     | Cat. No.                                                                                                |
|------------------------------------------|---------------------------------------------------------------------------------------------------------|
| DKO DK4 S0                               | 8467030000                                                                                              |
| DKO DK4 S0                               | 8100180000                                                                                              |
| Technical data                           |                                                                                                         |
| Input                                    |                                                                                                         |
| Input voltage                            | 24 Vdc $\pm 10\%$                                                                                       |
| Input current                            | $\leq 13 \text{ mA}$                                                                                    |
| Reverse polarity protection              | Specification acc. to DIN 43864 (current interface for connection to pulse generator acc. to DIN 43864) |
| NAMUR-Input (N+ and N-)                  |                                                                                                         |
| Switching frequency                      |                                                                                                         |
| Switch-on delay                          |                                                                                                         |
| Switch-off delay                         |                                                                                                         |
| Input (E+ and 0)                         |                                                                                                         |
| Switch-on point                          |                                                                                                         |
| Switch off-point                         |                                                                                                         |
| Current consumption                      |                                                                                                         |
| Max. switching frequency                 |                                                                                                         |
| Switch-on delay                          |                                                                                                         |
| Switch-off delay                         |                                                                                                         |
| Output (A+ and A-)                       |                                                                                                         |
| Output voltage                           | 5...30 Vdc                                                                                              |
| Output current                           | max. 100 mA                                                                                             |
| Switching capacity                       | max. 3 W                                                                                                |
| Internal voltage drop                    | max. 1 V                                                                                                |
| Protective measure                       | Free-wheel. diode btwn. A+...A-                                                                         |
| Voltage proof input-output/mounting rail | 4 kV <sub>eff</sub>                                                                                     |
| Operating temperature                    | without clearances -25 °C...+40 °C<br>with clearances -25 °C...+50 °C                                   |
| Storage temperature                      | -40 °C...+60 °C                                                                                         |
| Conductor                                | AWG 22...12                                                                                             |
| Conductor cross-section                  | 0.5...4 mm <sup>2</sup>                                                                                 |
| Overall width                            | 12 mm                                                                                                   |
| Accessories                              |                                                                                                         |
| End plate                                | AP DKT4 0687560000                                                                                      |

| Ordering data                            |                                                                       |
|------------------------------------------|-----------------------------------------------------------------------|
| For TS 32                                | y                                                                     |
| For TS 35                                | w                                                                     |
| With combination foot TS 32 / TS 35      |                                                                       |
| Technical data                           |                                                                       |
| Input                                    |                                                                       |
| Input voltage                            | 24 Vdc $\pm 20\%$                                                     |
| Input current                            | $\leq 35 \text{ mA}$                                                  |
| Reverse polarity protection              | up to 1 kV available                                                  |
| NAMUR-Input (N+ and N-)                  |                                                                       |
| Switching frequency                      | 300 Hz f. pulse duty factor 1:1                                       |
| Switch-on delay                          | approx.45 $\mu\text{s}$                                               |
| Switch-off delay                         | approx.450 $\mu\text{s}$                                              |
| Input (E+ and 0)                         |                                                                       |
| Switch-on point                          | approx.18 V                                                           |
| Switch off-point                         | ca 15 V                                                               |
| Current consumption                      | < 5 mA                                                                |
| Max. switching frequency                 | 300 Hz f. pulse duty factor 1:1                                       |
| Switch-on delay                          | approx.20 $\mu\text{s}$                                               |
| Switch-off delay                         | approx.400 $\mu\text{s}$                                              |
| Output (A+ and A-)                       |                                                                       |
| Output voltage                           | 5...30 Vdc                                                            |
| Output current                           | max. 100 mA                                                           |
| Switching capacity                       | max. 3 W                                                              |
| Internal voltage drop                    | max. 1 V                                                              |
| Protective measure                       | Free-wheel. diode btwn. A+...A-                                       |
| Voltage proof input-output/mounting rail | 4 kV <sub>eff</sub>                                                   |
| Operating temperature                    | without clearances -25 °C...+40 °C<br>with clearances -25 °C...+50 °C |
| Storage temperature                      | -40 °C...+60 °C                                                       |
| Conductor                                | AWG 22...12                                                           |
| Conductor cross-section                  | 0.5...4 mm <sup>2</sup>                                               |
| Overall width                            | 12 mm                                                                 |
| Accessories                              |                                                                       |
| End plate                                | AP DKT4 0687560000                                                    |

| Type                                     | Cat. No.                                                              |
|------------------------------------------|-----------------------------------------------------------------------|
| DKO                                      | 8164250000                                                            |
| Technical data                           |                                                                       |
| Input                                    |                                                                       |
| Input voltage                            | 24 Vdc $\pm 20\%$                                                     |
| Input current                            | $\leq 35 \text{ mA}$                                                  |
| Reverse polarity protection              | up to 1 kV available                                                  |
| NAMUR-Input (N+ and N-)                  |                                                                       |
| Switching frequency                      | 300 Hz f. pulse duty factor 1:1                                       |
| Switch-on delay                          | approx.45 $\mu\text{s}$                                               |
| Switch-off delay                         | approx.450 $\mu\text{s}$                                              |
| Input (E+ and 0)                         |                                                                       |
| Switch-on point                          | approx.18 V                                                           |
| Switch off-point                         | ca 15 V                                                               |
| Current consumption                      | < 5 mA                                                                |
| Max. switching frequency                 | 300 Hz f. pulse duty factor 1:1                                       |
| Switch-on delay                          | approx.20 $\mu\text{s}$                                               |
| Switch-off delay                         | approx.400 $\mu\text{s}$                                              |
| Output (A+ and A-)                       |                                                                       |
| Output voltage                           | 5...30 Vdc                                                            |
| Output current                           | max. 100 mA                                                           |
| Switching capacity                       | max. 3 W                                                              |
| Internal voltage drop                    | max. 1 V                                                              |
| Protective measure                       | Free-wheel. diode btwn. A+...A-                                       |
| Voltage proof input-output/mounting rail | 4 kV <sub>eff</sub>                                                   |
| Operating temperature                    | without clearances -25 °C...+40 °C<br>with clearances -25 °C...+50 °C |
| Storage temperature                      | -40 °C...+60 °C                                                       |
| Conductor                                | AWG 22...12                                                           |
| Conductor cross-section                  | 0.5...4 mm <sup>2</sup>                                               |
| Overall width                            | 12 mm                                                                 |
| Accessories                              |                                                                       |
| End plate                                | AP DKT4 0687560000                                                    |

# Opto-coupler in component housing EG

## Opto-couplers EGO

### EGO 1 5 V

For low voltage  
alternatively positive  
or negative switching

### EGO 1 5 V

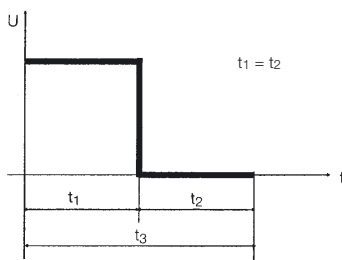
### EGO 1 12 V

### EGO 1 24 V

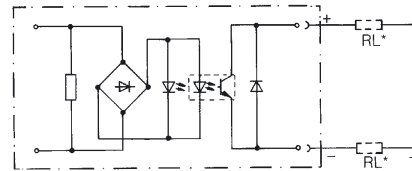


#### Schematic circuit diagram

Switching ratio



Switching ratio  $\frac{t_1}{t_3} = \frac{1}{2} = 1 : 2$



\* Wiring option

#### Ordering data

| Type       | Cat. No.          |
|------------|-------------------|
| EGO 1, 5 V | <b>0266160000</b> |

| Type        | Cat. No.                       |
|-------------|--------------------------------|
| EGO 1, 12 V | <b>8011250000<sup>3)</sup></b> |

| Type        | Cat. No.          |
|-------------|-------------------|
| EGO 1, 12 V | <b>0114260000</b> |

| Type        | Cat. No.          |
|-------------|-------------------|
| EGO 1, 24 V | <b>0558160000</b> |

#### Rated data

##### Input voltage

Rated consumption – (W)

Rated consumption – (VA)

Output supply voltage

Voltage drop at max. load current

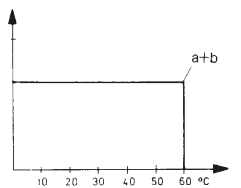
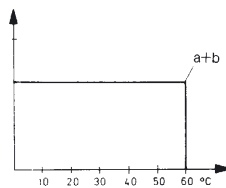
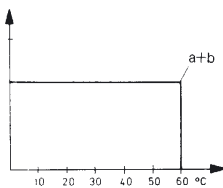
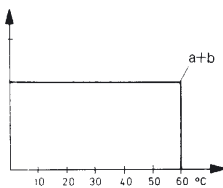
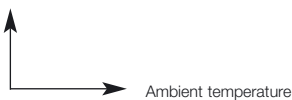
Output current

Derating curve

a = mounted on rail without clearance

b = mounted on rail without clearance  $\geq 20$  mm

Continuous  
current



Impulse loading, max. current (not periodic)

0.2 A/10 ms

0.2 A/10 ms

0.8 A/10 ms

0.2 A/10 ms

Max. reverse current (quiescent current) at  $U = 48$  V

0.16 mA

0.16 mA

0.16 mA

0.16 mA

Switch-on time (cyclic operation)

$\leq 12$   $\mu$ s

22  $\mu$ s

$\leq 6$  ms

$\leq 30$   $\mu$ s

Switching-off time (cyclic operation)

$\leq 180$   $\mu$ s

44  $\mu$ s

$\leq 13$  ms

$\leq 100$   $\mu$ s

Max. switching frequency, DC

100 Hz

**5000 Hz/5000 Hz**

20 Hz

**3000 Hz**

Max. switching frequency, AC

1 : 2

1 : 2/1 : 4

<10 Hz

1 : 2

Switching ratio

1 : 2

50  $\mu$ s

1 : 2

1 : 2

Min. input impulse width

–40 °C...+60 °C

–40 °C...+85 °C

–40 °C...+85 °C

–40 °C...+85 °C

Storage temperature

Ambient temperature

–, rowed on mounting rail without clearances

–, rowed with clearances  $\geq 20$  mm

–25 °C...+60 °C

–25 °C...+60 °C

–25 °C...+60 °C

–25 °C...+60 °C

–25 °C...+60 °C

–25 °C...+60 °C

–25 °C...+60 °C

–25 °C...+60 °C

#### Insulation coordination to EN 50 178

Overvoltage category

III

III

III

III

Pollution severity

2

2

2

2

Accessories, dimensions and connection data see

Page 306, Fig. I

Page 306, Fig. I

Page 306, Fig. I

Page 306, Fig. I

<sup>1)</sup> Not TTL-compatible

<sup>2)</sup> Conditionally level-compatible

<sup>3)</sup> At  $U_e \leq 5$  V, the LED only lights weakly or not at all.  
Output switching function is not affected.

# Opto-coupler in component housing EG

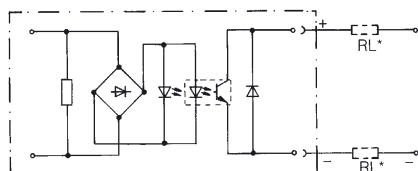
EGO 1 24 V



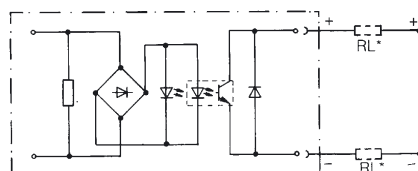
EGO 2 115 V0  
for low voltage



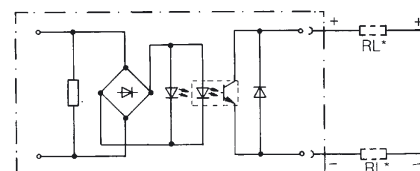
EGO 2 230 V0



\* Wiring option



In the case of inductive or capacitive electrical noise, it is recommended to connect an RC network (DK 4 RC) upstream or to use EGO 3.



| Type        | Cat. No.          |
|-------------|-------------------|
| EGO 1, 24 V | <b>0609860000</b> |

24 V0, ±10 %

0.5 W

0.6 VA

5...48 V<sup>-1</sup>)

<1.6 V

100 mA

| Type          | Cat. No.          |
|---------------|-------------------|
| EGO 2, 115 V0 | <b>0131860000</b> |

117 V0, ±10 %

0.8 W

0.9 VA

5...48 V<sup>-1</sup>)

<1.6 V

100 mA

| Type          | Cat. No.          |
|---------------|-------------------|
| EGO 2, 230 V0 | <b>0546360000</b> |

230 V0, +5 %-15 %

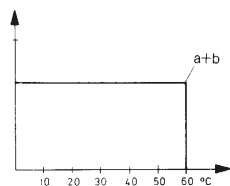
1.2 W

1.4 VA

5...48 V<sup>-1</sup>)

<1.6 V

100 mA



0.8 A/10 ms

0.16 mA

≤ 2 ms

≤ 15 ms

20 Hz

<10 Hz

1 : 2

-40 °C...+85 °C

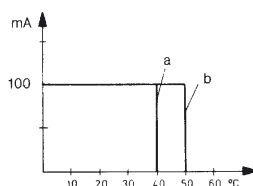
-25 °C...+60 °C

-25 °C...+60 °C

III

2

Page 306, Fig. I



0.8 A/10 ms

0.16 mA

≤ 5 ms

≤ 22 ms

20 Hz

< 10 Hz

1 : 2

-40 °C...+85 °C

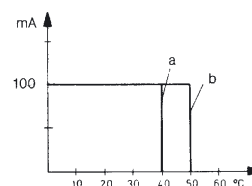
-25 °C...+40 °C

-25 °C...+50 °C

III

2

Page 306, Fig. I



0.8 A/10 ms

0.16 mA

≤ 13 ms

≤ 10 ms

20 Hz

< 10 Hz

1 : 2

-40 °C...+85 °C

-25 °C...+40 °C

-25 °C...+50 °C

III

2

Page 306, Fig. I

Digital signal processing

# Opto-coupler in component housing WAVESERIES

## Opto-couplers WAVESERIES

Opto-coupler in WAVEBOX:

- Independent connection technology
  - pluggable connection unit optionally available with screw or tension clamp connection technology
- Fast commissioning and after-sales service
  - pluggable replacement PCBs
- Save wiring
  - cross-connection option at input / output
- Fast switching
  - high frequency output, up to 100 kHz
- Reliable power output
  - short-circuit and overload proof
- Space-saving components
  - 4-channel opto-couplers

### WOS 1 5 VDC

negative switching



### WOS 1 3.5-15 VDC



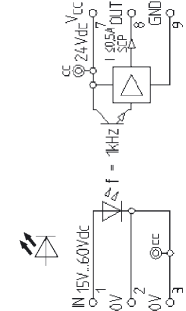
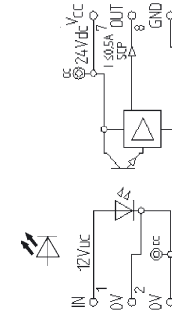
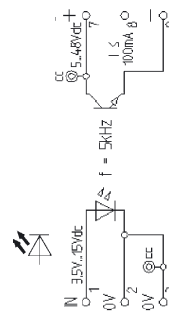
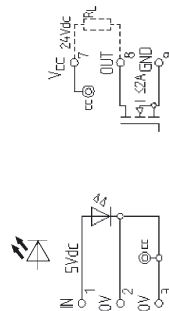
### WOS 1 12 VDC



### WOS 1 15-60 VDC



#### Schematic circuit diagram



| Ordering data                                            | Type                                                    | Cat. No.          | Type                                                      | Cat. No.          | Type                                                   | Cat. No.          | Type                                                       | Cat. No.          |
|----------------------------------------------------------|---------------------------------------------------------|-------------------|-----------------------------------------------------------|-------------------|--------------------------------------------------------|-------------------|------------------------------------------------------------|-------------------|
| Screw connection                                         | WOS 1 5 Vdc                                             | <b>8275430000</b> | WOS 1 3.5-15 Vdc                                          | <b>8275390000</b> | WOS 1 12 Vdc                                           | <b>8275500000</b> | WOS 1 15-60 Vdc                                            | <b>8237730000</b> |
| Tension clamp connection                                 | WOZ 1                                                   | <b>8430030000</b> | WOZ 1                                                     | <b>8430040000</b> | WOZ 1                                                  | <b>8429990000</b> | WOZ 1                                                      | <b>8430090000</b> |
| <b>Input</b>                                             |                                                         |                   |                                                           |                   |                                                        |                   |                                                            |                   |
| Input voltage                                            | 4.0 Vdc... <b>5 Vdc</b> ...6.0 Vdc                      |                   | 3.5 Vdc...15 Vdc                                          |                   | 10 Vdc... <b>12 Vdc</b> ...14 Vdc                      |                   | 15 Vdc...60 Vdc <sup>1)</sup>                              |                   |
| Input current                                            | 7.5 mA at 4.0 V<br>13.5 mA at 5.0 V<br>19.0 mA at 6.0 V |                   | 10.5 mA at 3.5.0 V<br>12.5 mA at 5.0 V<br>25.0 mA at 15 V |                   | 15.3 mA <b>ac</b> at 12 V<br>12.4 mA <b>dc</b> at 12 V |                   | 1.4 mA at 15 V<br>2.5 mA at 24 V<br>4.1 mA at 48 V ...60 V |                   |
| Making threshold                                         | approx.2.2 V                                            |                   | approx.2.5 V                                              |                   | approx.8 V                                             |                   | ca.12 V                                                    |                   |
| Breaking threshold                                       | approx.2.0 V                                            |                   | approx.1.5 V                                              |                   | approx.7 V                                             |                   | approx.9 V                                                 |                   |
| Input frequency                                          | 100 Hz                                                  |                   | 5 kHz                                                     |                   |                                                        |                   | 1 kHz                                                      |                   |
| Switch-on delay                                          | 100 us                                                  |                   | 8 us                                                      |                   | 10 ms <b>ac</b> and 4 ms <b>dc</b>                     |                   | 90 us                                                      |                   |
| Switch-off delay                                         | 1 ms                                                    |                   | 35 us                                                     |                   | 20 ms <b>ac</b> and 18 ms <b>dc</b>                    |                   | 250 us                                                     |                   |
| Status indicator                                         | LED green in input                                      |                   | LED green in input                                        |                   | LED green in output                                    |                   | LED green in output                                        |                   |
| <b>Output</b>                                            | <b>negative switching</b>                               |                   |                                                           |                   | <b>short-circuit protection</b>                        |                   | <b>short-circuit protection</b>                            |                   |
| Output current range                                     |                                                         |                   |                                                           |                   | 10 mA...0.6 A                                          |                   | 10 mA...0.6 A                                              |                   |
| Nominal output current                                   | max. 2 A*                                               |                   | max. 100 mA                                               |                   | max. 500 mA                                            |                   | max. 500 mA                                                |                   |
| Output voltage                                           | 18 Vdc... <b>24 Vdc</b> ...30 Vdc                       |                   | 5 Vdc...48 Vdc                                            |                   | 12 Vdc... <b>24 Vdc</b> ...28 Vdc                      |                   | 12 Vdc... <b>24 Vdc</b> ...28 Vdc                          |                   |
| Response threshold                                       |                                                         |                   |                                                           |                   | typ. 0.7 A ... 1.8 A<br>min. 0.7 A; max. 2.4 A         |                   | typ. 0.7 A ... 1.8 A<br>min.0.7 A; max. 2.4 A              |                   |
| Residual voltage                                         | ≤ 300 mV                                                |                   | ≤ 1.5 V at 100 mA                                         |                   | ≤ 0.5 V, at 500 mA                                     |                   | ≤ 0.5 V at 500 mA                                          |                   |
| Protection circuit                                       | Varistor                                                |                   | Varistor, integr. free-wh. diode                          |                   | Polarity protection, varistor                          |                   | Polarity protection, varistor                              |                   |
| Voltage supply                                           |                                                         |                   |                                                           |                   | 12Vdc... <b>24Vdc</b> ...28Vdc                         |                   | 12 Vdc... <b>24 Vdc</b> ...28 Vdc                          |                   |
| Short-circuit in output                                  | no                                                      |                   | no                                                        |                   | yes / max. 96 h                                        |                   | yes / max. 96 h                                            |                   |
| <b>Temperature</b>                                       |                                                         |                   |                                                           |                   |                                                        |                   |                                                            |                   |
| Operating temperature**                                  | -25 °C...+50 °C rowed                                   |                   | -25 °C...+60 °C rowed                                     |                   | -25 °C...+60 °C rowed                                  |                   | -25 °C...+60 °C rowed                                      |                   |
| Storage temperature                                      | -40 °C...+85 °C                                         |                   | -40 °C...+85 °C                                           |                   | -40 °C...+85 °C                                        |                   | -40 °C...+85 °C                                            |                   |
| <b>Mechanical data</b>                                   |                                                         |                   |                                                           |                   |                                                        |                   |                                                            |                   |
| Overall width                                            | 22.5 mm                                                 |                   | 22.5 mm                                                   |                   | 22.5 mm                                                |                   | 22.5 mm                                                    |                   |
| Housing material                                         | Polyamide PA 66                                         |                   | Polyamide PA 66                                           |                   | Polyamide PA 66                                        |                   | Polyamide PA 66                                            |                   |
| Approvals                                                | UL/CSA                                                  |                   | UL/CSA                                                    |                   | UL/CSA                                                 |                   | UL/CSA                                                     |                   |
| <b>Reliable separation according to EN 50 178</b>        |                                                         |                   |                                                           |                   |                                                        |                   |                                                            |                   |
| <b>Coordination of insulation according to EN 50 178</b> |                                                         |                   |                                                           |                   |                                                        |                   |                                                            |                   |
| <b>Opto-coupler according to VDE 0884</b>                |                                                         |                   |                                                           |                   |                                                        |                   |                                                            |                   |
| Rated voltage                                            | 300 V                                                   |                   | 300 V                                                     |                   | 300 V                                                  |                   | 300 V                                                      |                   |
| Rated impulse voltage                                    | 4 kV                                                    |                   | 4 kV                                                      |                   | 4 kV                                                   |                   | 4 kV                                                       |                   |
| Overvoltage category                                     | III                                                     |                   | III                                                       |                   | III                                                    |                   | III                                                        |                   |
| Pollution severity                                       | 2                                                       |                   | 2                                                         |                   | 2                                                      |                   | 2                                                          |                   |
| Clearance/creepage path                                  | ≥ 5.5 mm                                                |                   | ≥ 5.5 mm                                                  |                   | ≥ 5.5 mm                                               |                   | ≥ 5.5 mm                                                   |                   |
| Accessories, dimensions and connection data see          | Page 298 + 308                                          |                   | Page 298 + 308                                            |                   | Page 298 + 308                                         |                   | Page 298 + 308                                             |                   |

\* at ambient temperature 20 °C/horizontal installation

<sup>1)</sup> **Caution:** Cross-connections may only be used for voltages ≤ **50 Vdc** (extra-low voltage).

# Opto-coupler in component housing WAVESERIES

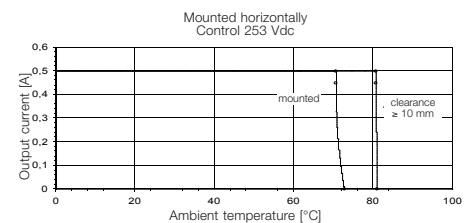
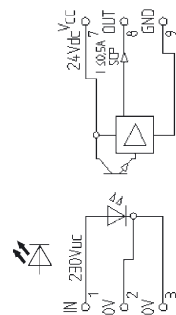
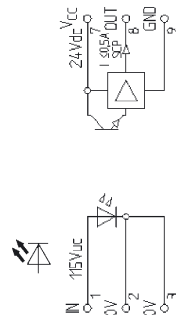
## Opto-couplers WAVESERIES

### WOS 1 115 VUC

### WOS 1 230 VUC



#### Schematic circuit diagram



WOS 1 230 VUC • 8275380000

| Ordering data                                     | Type                               | Cat. No.   | Type                                   | Cat. No.   |
|---------------------------------------------------|------------------------------------|------------|----------------------------------------|------------|
| Screw connection                                  | WOS 1 115 Vuc                      | 8235180000 | WOS 1 230 Vuc                          | 8275380000 |
| Tension clamp connection                          | WOZ 1                              | 8430100000 | WOZ 1                                  | 8430050000 |
| Input                                             |                                    |            |                                        |            |
| Input voltage                                     | 115 Vuc, max. 130 Vuc              |            | 230 V, max. 250 Vuc                    |            |
| Input current                                     | 3.1 mA <b>ac</b> at 115 V          |            | 11.5 mA <b>ac</b> at 230 V             |            |
|                                                   | 2.9 mA <b>dc</b> at 115 V          |            | 1.8 mA <b>dc</b> at 230 V              |            |
| Making threshold                                  | ca.75 V <b>ac</b> and 71 <b>dc</b> |            | ca.170 V <b>ac</b> and 140 V <b>dc</b> |            |
| Breaking threshold                                | ca.70 Vuc                          |            | ca.130 V <b>ac</b> and 135 V <b>dc</b> |            |
| Input frequency                                   | -                                  |            | -                                      |            |
| Switch-on delay                                   | 10 ms <b>ac</b> 10 ms <b>dc</b>    |            | 25 ms <b>ac</b> 15 ms <b>dc</b>        |            |
| Switch-off delay                                  | 15 ms <b>ac</b> 15 ms <b>dc</b>    |            | 25 ms <b>ac</b> 20 ms <b>dc</b>        |            |
| Status indicator                                  | LED green in output                |            | LED green in output                    |            |
| Output                                            |                                    |            |                                        |            |
| Output current range                              | 10 m A...0.6 A                     |            | 10 mA...0.6 A                          |            |
| Nominal output current                            | max. 500 mA                        |            | max. 500 mA                            |            |
| Output voltage                                    | 12 Vdc...24 Vdc...28 Vdc           |            | 12 Vdc...24 Vdc...28 Vdc               |            |
| Response threshold                                | typ. 0.7 A ... 1.8 A               |            | typ. 0.7 A ... 1.8 A                   |            |
|                                                   | min.0.7 A; max. 2.4 A              |            | min.0.7 A; max. 2.4 A                  |            |
| Residual voltage                                  | ≤ 0.5 V at 500 mA                  |            | ≤ 0.5 V at 500 mA                      |            |
| Protection circuit                                | Polarity protection, varistor      |            | Polarity protection, varistor          |            |
| Voltage supply                                    | 12 Vdc...24 Vdc...28 Vdc           |            | 12 Vdc...24 Vdc...28 Vdc               |            |
| Short-circuit in output                           | yes / max. 96 h                    |            | yes / max. 96 h                        |            |
| Temperature                                       |                                    |            |                                        |            |
| Operating temperature**                           | -25 °C...+60 °C rowed              |            | -25 °C...+60 °C rowed                  |            |
| Storage temperature                               | -40 °C...+85 °C                    |            | -40 °C...+85 °C                        |            |
| Mechanical data                                   |                                    |            |                                        |            |
| Overall width                                     | 22.5 mm                            |            | 22.5 mm                                |            |
| Housing material                                  | Polyamide PA 66                    |            | Polyamide PA 66                        |            |
| Approvals                                         | UL/CSA                             |            | UL/CSA                                 |            |
| Reliable separation according to EN 50 178        |                                    |            |                                        |            |
| Coordination of insulation according to EN 50 178 |                                    |            |                                        |            |
| Opto-coupler according to VDE 0884                |                                    |            |                                        |            |
| Rated voltage                                     | 300 V                              |            | 300 V                                  |            |
| Rated impulse voltage                             | 4 kV                               |            | 4 kV                                   |            |
| Overvoltage category                              | III                                |            | III                                    |            |
| Pollution severity                                | 2                                  |            | 2                                      |            |
| Clearance/creepage path                           | ≥ 5.5 mm                           |            | ≥ 5.5 mm                               |            |
| Accessories, dimensions and connection data see   | Page 298 + 308                     |            | Page 298 + 308                         |            |

\* at ambient temperature 20 °C/horizontal installation

## Opto-coupler in component housing WAVESERIES

### Opto-couplers WAVESERIES

with power output  
(short-circuit proof and overload proof)

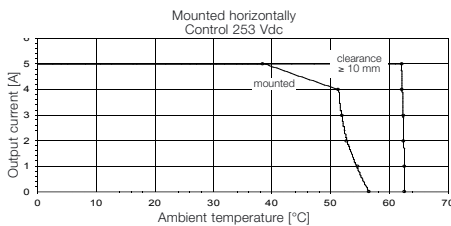
#### WOS 2 24 VUC



#### WOS 2 115 VUC

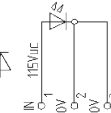
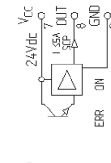
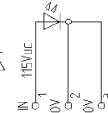
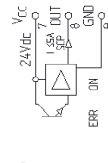
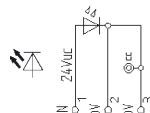
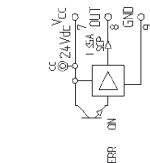


#### WOS 2 230 VUC



WOS 2 230 VUC • 8275220000

#### Schematic circuit diagram



#### Ordering data

Screw connection

Tension clamp connection

| Type         | Cat. No.          |
|--------------|-------------------|
| WOS 2 24 Vuc | <b>8275190000</b> |
| WOZ 2        | <b>8430080000</b> |

| Type          | Cat. No.          |
|---------------|-------------------|
| WOS 2 115 Vuc | <b>8296250000</b> |
| WOZ 2         | <b>8429980000</b> |

| Type          | Cat. No.          |
|---------------|-------------------|
| WOS 2 230 Vuc | <b>8275220000</b> |
| WOZ 2         | <b>8430060000</b> |

#### Input

Input voltage

Input current

21.6 V...**24 V**...26.4 V  
16.3 mA **ac** at 24 V  
13.5 mA **dc** at 24 V

115 V, max. 130 Vuc  
3.1 mA **ac** at 115 V  
2.8 mA **dc** at 115 V

230 V, max. 250 Vuc  
12.0 mA **ac** at 230 V  
1.8 mA **dc** at 230 V

Making threshold

Breaking threshold

Switch-on delay

Switch-off delay

Status indicator normal operation

Status indicator short-circuit, underload, overload

Underload

ca.16 V  
ca.11 V  
**8 ms ac 7 ms dc**  
**25 ms ac 25 ms dc**  
LED green in output  
LED red in output\*<sup>1)</sup>  
min. 2 mA...max. 1.5 A at Tb  
25 °C...150 °C  
min. 2 mA...max. 1.9 A at Tb  
-40 °C...25 °C  
Tb: temperature in module  
direct at output driver  
BTS442

ca.70 V  
ca.55 V  
**10 ms ac 15 ms dc**  
**30 ms ac 30 ms dc**  
LED green in output  
LED red in output\*<sup>1)</sup>  
min. 2 mA...max. 1.5 A at Tb  
25 °C...150 °C  
min. 2 mA...max. 1.9 A at Tb  
-40 °C...25 °C  
Tb: temperature in module  
direct at output driver  
BTS442

ca.140 V ca.100 V  
ca.100 V ca.120 V  
**10 ms ac 15 ms dc**  
**30 ms ac 30 ms dc**  
LED green in output  
LED red in output\*<sup>1)</sup>  
min. 2 mA...max. 1.5 A at Tb  
25 °C...150 °C  
min. 2 mA...max. 1.9 A at Tb  
-40 °C...25 °C  
Tb: temperature in module  
direct at output driver  
BTS442

#### Output

Output current

Closed supply-circuit current (output not switched)

Voltage supply

Residual voltage

Protection circuit

Short-circuit in output

#### short-circuit protection

5 Adc\*  
approx.15 mA at 28.8 V  
19.2 Vdc...**24 Vdc**...28.8 Vdc  
max. 400 mV  
Polarity protection, varistor  
yes / max. 96 h

#### short-circuit protection

5 Adc\*  
approx.15 mA at 28.8 V  
19.2 Vdc...**24 Vdc**...28.8 Vdc  
max. 400 mV  
Polarity protection, varistor  
yes / max. 96 h

#### short-circuit protection

5 Adc\*  
approx.15 mA at 28.8 V  
19.2 Vdc...**24 Vdc**...28.8 Vdc  
max. 400 mV  
Polarity protection, varistor  
yes / max. 96 h

#### Temperature

Operating temperature\*\*

Storage temperature

-25 °C...+50 °C rowed  
-40 °C...+85 °C

-25 °C...+50 °C rowed  
-40 °C...+85 °C

-25 °C...+50 °C rowed  
-40 °C...+85 °C

#### Mechanical data

Overall width

Housing material

Approvals

22.5 mm

Polyamide PA 66

UL/CSA

22.5 mm

Polyamide PA 66

UL/CSA

22.5 mm

Polyamide PA 66

UL/CSA

Reliable separation according to EN 50 178

Coordination of insulation according to EN 50 178

Opto-coupler according to VDE 0884

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Clearance/creepage path

300 V

4 kV

III

2

≥ 5.5 mm

300 V

4 kV

III

2

≥ 5.5 mm

300 V

4 kV

III

2

≥ 5.5 mm

Accessories, dimensions and connection data see

\* at ambient temperature 20 °C/horizontal installation

Page 298 + 308

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#### \*<sup>1)</sup> LED red:

hard short-circuit,  
LED permanently lit.  
The output is switched off and  
does **not** reset itself. To reset,  
the output or input must be  
temporarily disconnected from  
the supply voltage or input  
signal.

**Overload:** LED cycles,  
Rate: approx. 2 sec. on,  
approx. 30 sec. off.

Module resets itself after the  
overload is removed.

**Underload:** LED permanently  
lit.

When an underload reco-  
gnised, both LEDs are lit.  
The output is switched  
through

## Opto-coupler in component housing WAVESERIES

### Opto-coupler WAVESERIES

with AC voltage output and  
zero voltage switch

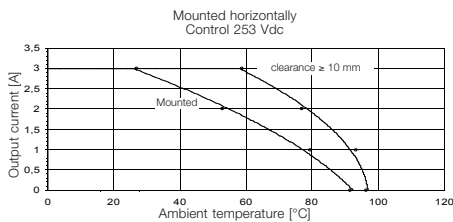
#### WOS 2 15-60 VUC



#### WOS 2 115 VUC

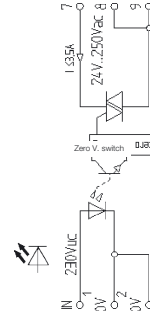
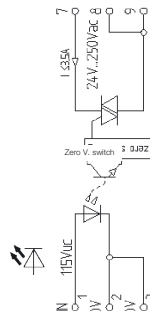
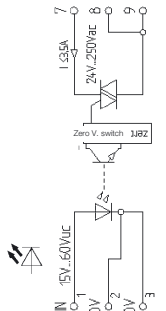


#### WOS 2 230 VUC



WOS 2 15-60 VUC • 8275440000

#### Schematic circuit diagram



#### Ordering data

Screw connection

Tension clamp connection

#### Input

Input voltage

Input current

Making threshold

Breaking threshold

Switch-on delay

Switch-off delay

Status indicator normal operation

Type Cat. No.

WOS 2 15-60 Vuc **8275440000**

WOZ 2 **8430010000**

15 Vuc...60 Vac/66 Vdc

3.3 mA **ac** at 15 V

3.8 mA **dc** at 15 V

4.0 mA **ac** at 24 V

4.6 mA **dc** at 24 V

5.3 mA **ac** at 60 V

5.6 mA **dc** at 60 V

approx.11 V **dc** approx.15 V **ac**

approx.5 V **dc** approx.14 V **ac**

max. 20 ms

max. 20 ms

LED green in input

Type Cat. No.

WOS 2 115 Vuc **8259950000**

WOZ 2 **8430160000**

115 Vuc max. 130 Vuc

7.2 mA **ac** at 115 V

3.8 mA **dc** at 115 V

approx.90 V **dc** approx.90 V **ac**

approx.70 V **dc** approx.70 V **ac**

max. 20 ms

max. 20 ms

LED green in input

Type Cat. No.

WOS 2 230 VUC **8275400000**

WOZ 2 **8430150000**

230 Vuc max. 250 Vuc

11.8 mA **ac** at 230 V

3.3 mA **dc** at 230 V

approx.180 V **dc** approx.200 V **ac**

approx.150 V **dc** approx.140 V **ac**

max. 25 ms

max. 25 ms

LED green in input

#### Output

Output current

Closed supply-circuit current (output not switched)

Voltage supply

Residual voltage

Protection circuit

Short-circuit in output

#### Temperature

Operating temperature\*\*

Storage temperature

#### Mechanical data

Overall width

Housing material

Approvals

Reliable separation according to EN 50 178

Coordination of insulation according to EN 50 178

Opto-coupler according to VDE 0884

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Clearance/creepage path

Accessories, dimensions and connection data see

\* at ambient temperature 20 °C/horizontal installation

#### AC voltage output

max. 230 V/3.5 A ac\*

2 mA

24 Vac...250Vac (50Hz-60Hz)

max. 1.6 V

RC-combination with varistor

-

-25 °C...+50 °C rowed

-40 °C...+85 °C

22.5 mm

Polyamide PA 66

UL/CSA

300 V

4 kV

III

2

$\geq 5.5$  mm

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#### AC voltage output

max. 230 V/3.5 A ac\*

2 mA

24Vac...250 Vac (50Hz-60Hz)

max. 1.6 V

RC-combination with varistor

-

-25 °C...+50 °C rowed

-40 °C...+85 °C

22.5 mm

Polyamide PA 66

UL/CSA

300 V

4 kV

III

2

$\geq 5.5$  mm

Page 298 + 308

#### AC voltage output

max. 230V/3.5A ac\*

2 mA

24 Vac...250 Vac (50Hz-60Hz)

max. 1.6 V

RC-combination with varistor

-

-25 °C...+50 °C rowed

-40 °C...+85 °C

22.5 mm

Polyamide PA 66

UL/CSA

300 V

4 kV

III

2

$\geq 5.5$  mm

Page 298 + 308

# Opto-coupler in component housing WAVESERIES

## Opto-coupler WAVESERIES

(4-channel, short-circuit proof)

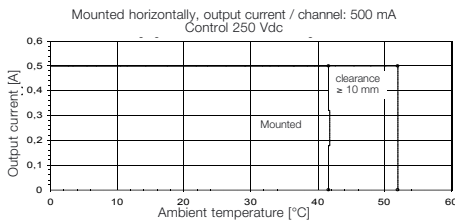
### WOS 2 24 VUC

### WOS 2 115 VUC

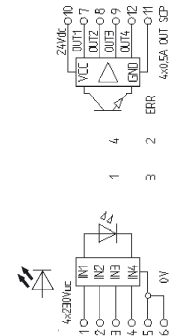
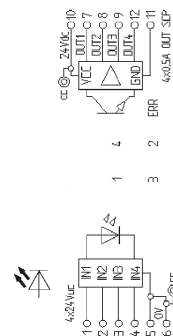
### WOS 2 230 VUC



#### Schematic circuit diagram



WOS 2 230 VUC • 8275340000



| Ordering data            |
|--------------------------|
| Screw connection         |
| Tension clamp connection |

| Type         | Cat. No.          |
|--------------|-------------------|
| WOS 2 24 Vuc | <b>8237720000</b> |
| WOZ 2        | <b>8430110000</b> |

| Type          | Cat. No.          |
|---------------|-------------------|
| WOS 2 115 Vuc | <b>8275360000</b> |
| WOZ 2         | <b>8430130000</b> |

| Type          | Cat. No.          |
|---------------|-------------------|
| WOS 2 230 Vuc | <b>8275340000</b> |
| WOZ 2         | <b>8430140000</b> |

| Input                                               |
|-----------------------------------------------------|
| Input voltage                                       |
| Input current                                       |
| Making threshold                                    |
| Breaking threshold                                  |
| Switch-on delay                                     |
| Switch-off delay                                    |
| Status indicator normal operation                   |
| Status indicator short-circuit, underload, overload |

|                                  |                          |                          |
|----------------------------------|--------------------------|--------------------------|
| 18 Vuc ... 30 Vuc                | 2.8 mA <b>ac</b> at 24 V | 3.7 mA <b>dc</b> at 24 V |
| ca.13 V <b>dc</b>                | ca.14 V <b>ac</b>        |                          |
| ca.10 V <b>dc</b>                | ca.13 V <b>ac</b>        |                          |
| 20 ms <b>ac</b> 7.0 ms <b>dc</b> |                          |                          |
| 46 ms <b>ac</b> 50 ms <b>dc</b>  |                          |                          |
| LED green in output              |                          |                          |
| LED red in output*               |                          |                          |

|                                 |                           |                           |
|---------------------------------|---------------------------|---------------------------|
| 115 Vuc, max. 130 Vuc           | 1.4 mA <b>ac</b> at 115 V | 2.0 mA <b>dc</b> at 115 V |
| ca.60 V <b>dc</b>               | ca.60 V <b>ac</b>         |                           |
| ca.50 V <b>dc</b>               | ca.50 V <b>ac</b>         |                           |
| 40 ms <b>ac</b> 15 ms <b>dc</b> |                           |                           |
| 60 ms <b>ac</b> 70 ms <b>dc</b> |                           |                           |
| LED green in output             |                           |                           |
| LED red in output*              |                           |                           |

|                                     |                           |                           |
|-------------------------------------|---------------------------|---------------------------|
| 230 V, max. 250 V                   | 1.4 mA <b>ac</b> at 230 V | 2.0 mA <b>dc</b> at 230 V |
| ca.150 V <b>dc</b>                  | ca.120 V <b>ac</b>        |                           |
| ca.110 V <b>dc</b>                  | ca.110 V <b>ac</b>        |                           |
| 40 ms <b>ac</b> 14 ms <b>dc</b>     |                           |                           |
| 95 ms <b>ac</b> 140 ms <b>dc</b>    |                           |                           |
| LED green in output                 |                           |                           |
| LED red in output*                  |                           |                           |
| * LED red, one LED for all channels |                           |                           |

| Output <sup>1)</sup>   |
|------------------------|
| Output current         |
| Output total current   |
| Voltage supply         |
| Response threshold     |
| Residual voltage       |
| Protection circuit     |
| Synchronisation factor |
| Lamp load              |

| short-circuit protection                   |
|--------------------------------------------|
| max. 500 mA per channel                    |
| max. 2 A                                   |
| 12 Vdc... <b>24 Vdc</b> ...28 Vdc          |
| typ. 0.9 A                                 |
| min. 0.65 A, max. 1.2 A, R <sub>L</sub> 2Ω |
| ≤ 0.65 V, at 500 mA                        |
| Polarity protection, varistor              |
| 100 %                                      |
| max. 3 W                                   |

| short-circuit protection                   |
|--------------------------------------------|
| max. 500 mA per channel                    |
| max. 2 A                                   |
| 12 Vdc... <b>24 Vdc</b> ...28 Vdc          |
| typ. 0.9 A                                 |
| min. 0.65 A, max. 1.2 A, R <sub>L</sub> 2Ω |
| ≤ 0.65 V, at 500 mA                        |
| Polarity protection, varistor              |
| 100 %                                      |
| max. 3 W                                   |

| short-circuit protection                   |
|--------------------------------------------|
| max. 500 mA per channel                    |
| max. 2 A                                   |
| 12 Vdc... <b>24 Vdc</b> ...28 Vdc          |
| typ. 0.9 A                                 |
| min. 0.65 A, max. 1.2 A, R <sub>L</sub> 2Ω |
| ≤ 0.65 V, at 500 mA                        |
| Polarity protection, varistor              |
| 100 %                                      |
| max. 3 W                                   |

| Temperature           |
|-----------------------|
| Operating temperature |
| Storage temperature   |

|                       |
|-----------------------|
| -25 °C...+50 °C rowed |
| -40 °C...+85 °C       |

|                       |
|-----------------------|
| -25 °C...+50 °C rowed |
| -40 °C...+85 °C       |

|                       |
|-----------------------|
| -25 °C...+50 °C rowed |
| -40 °C...+85 °C       |

| Mechanical data  |
|------------------|
| Overall width    |
| Housing material |
| Approvals        |

|                 |
|-----------------|
| 22.5 mm         |
| Polyamide PA 66 |
| UL/CSA          |

|                 |
|-----------------|
| 22.5 mm         |
| Polyamide PA 66 |
| UL/CSA          |

|                 |
|-----------------|
| 22.5 mm         |
| Polyamide PA 66 |
| UL/CSA          |

Reliable separation according to EN 50 178

Coordination of insulation according to EN 50 178

Opto-coupler according to VDE 0884

|                         |
|-------------------------|
| Rated voltage           |
| Rated impulse voltage   |
| Overvoltage category    |
| Pollution severity      |
| Clearance/creepage path |

|        |
|--------|
| 150 V  |
| 2.5 kV |
| III    |
| 2      |
| ≥ 3 mm |

|        |
|--------|
| 150 V  |
| 2.5 kV |
| III    |
| 2      |
| ≥ 3 mm |

|          |
|----------|
| 300 V    |
| 4 kV     |
| III      |
| 2        |
| ≥ 5.5 mm |

Accessories, dimensions and connection data see

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Page 298 + 308

<sup>1)</sup> Protection circuit for output load necessary, page 107

## Opto-coupler in component housing WAVESERIES

### Opto-coupler WAVESERIES

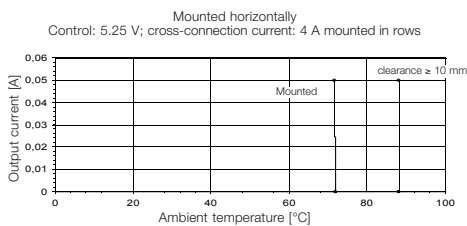
with high switching frequency

**WOS 1 5 VTTL**  
50 kHz

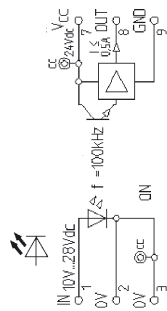
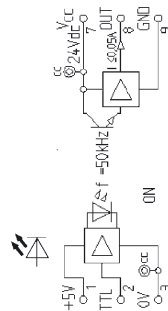
**WOS 1 12-28 VDC**  
100 kHz



Schematic circuit diagram



**WOS 1 5 VTTL 50 kHz • 8275210000**



| Ordering data                                            | Type                                     | Cat. No.          | Type                                      | Cat. No.          |
|----------------------------------------------------------|------------------------------------------|-------------------|-------------------------------------------|-------------------|
| Screw connection                                         | WOS 1 5 VTTL 50 kHz                      | <b>8275210000</b> | WOS 1 12-28 Vdc/100 kHz                   | <b>8275450000</b> |
| Tension clamp connection                                 | WOZ 2                                    | <b>8430070000</b> | WOZ 2                                     | <b>8430000000</b> |
| Input                                                    |                                          |                   |                                           |                   |
| Input voltage                                            | 5 VTTL                                   |                   | 12V dc...28 Vdc                           |                   |
| Input current                                            | 11.8 mA at 4.75 V                        |                   | 5.5 mA at 12 Vdc                          |                   |
|                                                          | 13.6 mA at 5 Vdc                         |                   | 7.9 mA at 24 Vdc                          |                   |
|                                                          | 15.5 mA at 5.25 Vdc                      |                   | 8.8 mA at 28 Vdc                          |                   |
| Supply voltage                                           | 4.75 Vdc ... 5.25 Vdc                    |                   |                                           |                   |
| Input resistance                                         | 110 KΩ                                   |                   |                                           |                   |
| Making threshold                                         |                                          |                   | approx. 5 V dc                            |                   |
| Breaking threshold                                       |                                          |                   | approx. 4 V dc                            |                   |
| Input frequency                                          | <b>50 kHz</b> at $R_{load} = 470 \Omega$ |                   | <b>100 kHz</b> at $R_{load} = 470 \Omega$ |                   |
| Switch-on delay                                          | 1 μs                                     |                   | 1 μs                                      |                   |
| Switch-off delay                                         | 7 μs                                     |                   | 3 μs                                      |                   |
| Status indicator normal operation                        | LED green in input circuit               |                   | LED green in input circuit                |                   |
| Output                                                   |                                          |                   |                                           |                   |
| Voltage supply                                           | 21.6 Vdc... <b>24 Vdc</b> ...26.4 Vdc    |                   | 21.6 Vdc... <b>24 Vdc</b> ...26.4 Vdc     |                   |
| Supply nominal current                                   | approx. 5.4 mA, output not switched      |                   | approx. 5.4 mA, output not switched       |                   |
| Output current                                           | ≤ 50 mA                                  |                   | ≤ 50 mA                                   |                   |
| Residual voltage                                         | ≤ 1.5 V at 50 mA                         |                   | ≤ 1.5 V at 50 mA                          |                   |
| Protection circuit                                       | Polarity protection, varistor            |                   | Polarity protection, varistor             |                   |
| Temperature                                              |                                          |                   |                                           |                   |
| Operating temperature                                    | -25 °C...+60 °C rowed                    |                   | -25 °C...+60 °C rowed                     |                   |
| Storage temperature                                      | -40 °C...+85 °C                          |                   | -40 °C...+85 °C                           |                   |
| Mechanical data                                          |                                          |                   |                                           |                   |
| Overall width                                            | 22.5 mm                                  |                   | 22.5 mm                                   |                   |
| Housing material                                         | Polyamide PA 66                          |                   | Polyamide PA 66                           |                   |
| Approvals                                                | UL/CSA                                   |                   | UL/CSA                                    |                   |
| <b>Reliable separation according to EN 50 178</b>        |                                          |                   |                                           |                   |
| <b>Coordination of insulation according to EN 50 178</b> |                                          |                   |                                           |                   |
| <b>Opto-coupler according to VDE 0884</b>                |                                          |                   |                                           |                   |
| Rated voltage                                            | 300 V                                    |                   | 300 V                                     |                   |
| Rated impulse voltage                                    | 4 kV                                     |                   | 4 kV                                      |                   |
| Overvoltage category                                     | III                                      |                   | III                                       |                   |
| Pollution severity                                       | 2                                        |                   | 2                                         |                   |
| Clearance/creepage path                                  | ≥ 5.5 mm                                 |                   | ≥ 5.5 mm                                  |                   |
| Accessories, dimensions and connection data see          | Page 298 + 308                           |                   | Page 298 + 308                            |                   |

## Opto-coupler in component housing EG5

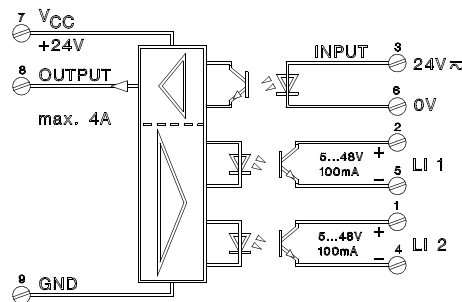
### power opto-couplers

With "online" check-back indication of the load ratio

- Power opto-couplers for load currents up to 4 A.
- Short-circuit proof
- Patented "online" load indication and check-back indication
  - optical indication
  - status indication via 3-coloured LEDs
  - electrical indication
  - 2-bit "online" data signal for check-back indication of the load performance to a PLC or similar
- Module fulfils protective separation in accordance with VDE 0106 Part 101 and EN 50 178 (rated voltage 300 V)
- Internal opto-coupler according to with DIN VDE 0884
- Insulation voltage 4 kV<sub>eff</sub>
- Clearance and creepage distances  $\geq 8$  mm

#### Schematic circuit diagram

### EGO 5 PKR 24 Vac/dc



#### Indication and check-back indication of load ratio

| Input | Load Indication         | LI 1 | LI 2 | LED    | Output |
|-------|-------------------------|------|------|--------|--------|
| Low   | x x x                   | L    | L    | off    | low    |
| High  | Normal                  | L    | H    | green  | high   |
| High  | Error <sup>1)</sup>     | H    | L    | red    | low    |
| High  | Open Load <sup>2)</sup> | H    | H    | yellow | high   |

#### Ordering data

| Type      | Cat. No.   |
|-----------|------------|
| EGO 5 PKR | 8220870000 |

#### Rated data

|                                                 |                                                                                                         |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>Input</b>                                    | Screw connection 0.5...4 mm <sup>2</sup>                                                                |
| Input voltage                                   | 24 Vac/dc, min 20 Vac/dc, max 30 Vac/dc                                                                 |
| Input current (at U <sub>N</sub> )              | 12 mA (24 Vdc)<br>13 mA (24 Vac)                                                                        |
| Rated input consumption                         | 195 mW, 220 mVA                                                                                         |
| Max. input frequency dc                         | $\leq 30$ Hz, switching ratio 1 : 2                                                                     |
| Typ. switch-on delay                            | 2 ms                                                                                                    |
| Typ. switch-off delay                           | 7 ms                                                                                                    |
| Max. input frequency ac                         | $\leq 10$ Hz                                                                                            |
| <b>Output</b>                                   | Screw connection 0.5...4 mm <sup>2</sup>                                                                |
| Supply voltage                                  | 20...30 Vdc                                                                                             |
| Max. output current                             | 4 A                                                                                                     |
| Reverse polarity protection                     | present                                                                                                 |
| Short-circuit conditions                        | short-circuit-protected (switches output off immediately; auto switch-on when short-circuit eliminated) |
| Thermal short-circuit                           | $\leq 12$ A, output switches off and on again automatically after certain time.                         |
| <b>Load Indication LI 1, LI 2</b>               |                                                                                                         |
| Supply voltage                                  | 5...48 Vdc                                                                                              |
| Max. current                                    | 100 mA                                                                                                  |
| Max. voltage drop                               | 1.6 V                                                                                                   |
| Storage temperature                             | -40 °C...+60 °C                                                                                         |
| Ambient temperature                             |                                                                                                         |
| - rowed on mounting rail without clearances     | -20 °C...+40 °C                                                                                         |
| - rowed with clearances                         | -20 °C...+50 °C                                                                                         |
| <b>Insulation coordination EN 50 178</b>        |                                                                                                         |
| Overvoltage category                            | IV                                                                                                      |
| Pollution severity                              | 2                                                                                                       |
| Accessories, dimensions and connection data see | Page 307, Fig. VII                                                                                      |

<sup>1)</sup> Error: short-circuit, overload, over- or under voltage at output, overtemperature in the module

<sup>2)</sup> Open load: Underload recognition at active input: type 500 mA (max. 1.5 A) at 25 °C. Open load will be indicated at I<sub>Load</sub>  $\geq 500$  mA depending on switching status.

## Opto-coupler in component housing EG7

### power opto-couplers

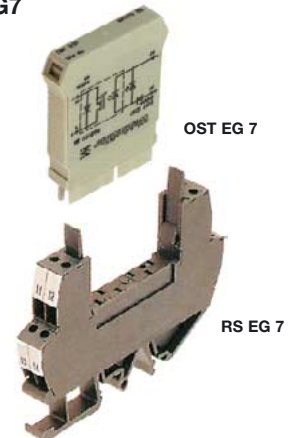
- Pluggable on socket RS EG 7 with combination foot TS 32, 35
- Overall width **10 mm**

#### OST EG7 2 A

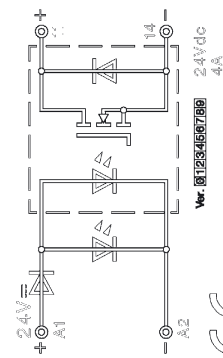
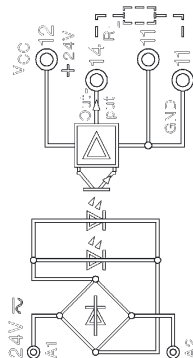
- Short circuit protected and over load-safe output
- 3-colour status-LED for output current indication
- Reliable separation acc. to DIN VDE 0884



#### OST EG7 4 A



#### Schematic circuit diagram



| Ordering data                                                 |  | Type                                                 | Cat. No.   | Type                                                         | Cat. No.   |
|---------------------------------------------------------------|--|------------------------------------------------------|------------|--------------------------------------------------------------|------------|
| Puggable opto-coupler, without socket                         |  | OST EG7 2 A                                          | 8269050000 | OST EG7 4 A                                                  | 8281720000 |
| socket for pluggable opto-coupler with combin. foot TS 32, 35 |  | RS EG7                                               | 8193830000 | RS EG7                                                       | 8193830000 |
| Rated data                                                    |  | Cat. No.                                             |            | Cat. No.                                                     |            |
| Conductor connection                                          |  | Lugs for socket RS EG7                               |            | Lugs for socket RS EG7                                       |            |
|                                                               |  | 8193830000                                           |            | 8193830000                                                   |            |
| Input voltage                                                 |  | 24 Vac/dc $\pm 20\%$                                 |            | 21.6 Vdc                                                     |            |
| Input current                                                 |  | dc: 5.5 mA ac: 6 mA                                  |            | 10.5 mA                                                      |            |
| Input power                                                   |  | dc: 132 mW ac: 145 mW                                |            | 230 mW                                                       |            |
| Relaiably switched on                                         |  | 19.2 V                                               |            | 21.6 V                                                       |            |
| Relaiably switched off                                        |  | 2.4 V                                                |            | 2 V                                                          |            |
| Status indicator                                              |  | LED green, yellow, red                               |            | LED green                                                    |            |
| Reverse polarity protection                                   |  | -                                                    |            | present                                                      |            |
| Switch-on delay                                               |  | 12 ms                                                |            | typ. 10 $\mu$ s                                              |            |
| Switch-off delay                                              |  | 17 ms                                                |            | typ. 45 $\mu$ s                                              |            |
| Max. Switching frequency                                      |  | 100 Hz (resistive load/2 A/ Switching ratio 1 : 2)   |            | 100 Hz (resistive load/4 A/ Switching ratio 1 : 2)           |            |
| Output supply voltage                                         |  | 24 Vdc $\pm 30\%$                                    |            | 21.6...26.4 Vdc                                              |            |
| Switching current                                             |  | 2 A                                                  |            | 4 A                                                          |            |
| Voltage drop at max. load current                             |  | $\leq 0.2$ V, short-circuit proof and overload proof |            | $\leq 0.2$ V, not short-circuit proof and not overload proof |            |
| Status indicator:                                             |  | Green LED output set                                 |            | output set                                                   |            |
|                                                               |  | Yellow LED output set, normal function, 500 mA...2 A |            | normal function                                              |            |
|                                                               |  | Red LED output set, no activity, < 500 mA            |            |                                                              |            |
|                                                               |  | LED off output set, short-circuit                    |            |                                                              |            |
|                                                               |  |                                                      |            |                                                              |            |
| Storage temperature                                           |  | - 25...+ 60 °C                                       |            | - 25...+ 60 °C                                               |            |
| Operating temperature                                         |  | 0...+ 40 °C                                          |            | 0...+ 40 °C                                                  |            |
| - rowed on mounting rail without clearances                   |  | 0...+ 50 °C                                          |            | 0...+ 50 °C                                                  |            |
| - rowed with clearances                                       |  |                                                      |            |                                                              |            |
| Insulation coordination to EN 50 178                          |  |                                                      |            |                                                              |            |
| Reliable separation                                           |  | according to DIN VDE 0884                            |            | -                                                            |            |
| Overvoltage category                                          |  | III                                                  |            | III                                                          |            |
| Pollution severity                                            |  | 2                                                    |            | 2                                                            |            |
| Accessories, dimensions and connection data see               |  | Page 304                                             |            | Page 304                                                     |            |

## Opto-coupler in component housing EG7

### Opto-couplers

- With combination foot for TS 15, TS 32 or TS 35
- Pluggable on socket RS EG 7 with combination foot TS 32, 35
- Overall width **10 mm**
- **Reliable separation according to DIN VDE 0884**

### EGO EG 7 OST EG 7 RS EG 7

EGO EG 7



OST EG 7



RS EG 7

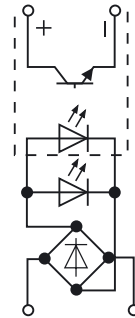
#### Schematic circuit diagram

5 V~

12 V0

24 V0

48 V0

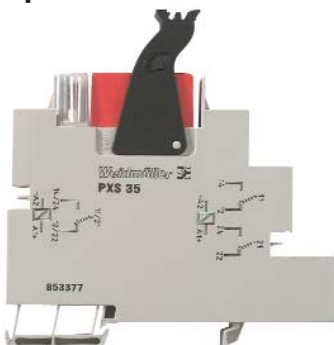


| Ordering data                                               | Type                            | Cat. No.   | Type                             | Cat. No.   | Type                             | Best.-EGO  | Type                             | Cat. No.   |
|-------------------------------------------------------------|---------------------------------|------------|----------------------------------|------------|----------------------------------|------------|----------------------------------|------------|
| Combination foot for TS 15, TS 32, TS 35                    | EGO EG7                         | 8092490000 | EGO EG7                          | 8092510000 | EGO EG7                          | 8092530000 | EGO EG7                          | 8092550000 |
| Plug-in opto-coupler, without engagement socket             | OST EG7                         | 8234560000 | OST EG7                          | 8234570000 | OST EG7                          | 8234580000 | OST EG7                          | 8234590000 |
| Engage. socket for opto-coupler with combin. foot TS 32, 35 | RS EG7                          | 8193830000 | RS EG7                           | 8193830000 | RS EG7                           | 8193830000 | RS EG7                           | 8193830000 |
| Rated data                                                  | 5 V~ ±20 %                      |            | 12 V0 ±20 %                      |            | 24 V0 ±20 %                      |            | 48 V0 ±20 %                      |            |
| Input voltage                                               | 5 V~ ±20 %                      |            | 12 V0 ±20 %                      |            | 24 V0 ±20 %                      |            | 48 V0 ±20 %                      |            |
| Switch-on current                                           | 3 V~                            |            | 12 V/4.5 mA for max. 10 ms       |            | 12 V/4.5 mA for max. 10 ms       |            | 12 V/4.5 mA for max. 10 ms       |            |
| Making threshold, typical                                   | 6.5 V~                          |            | 6.5 V~                           |            | 15.5 V~                          |            | 31.5 V~                          |            |
|                                                             | 7.5 V~                          |            | 7.5 V~                           |            | 16.5 V~                          |            | 45 V~                            |            |
| Rated input current DC                                      | 3 mA                            |            | 3 mA                             |            | 2.8 mA                           |            | 2.8 mA                           |            |
| Rated input current AC                                      | 33.5 mA                         |            | 33.5 mA                          |            | 3.4 mA                           |            | 3.2 mA                           |            |
| Rated input consumption                                     | 40 mW/50 mVA                    |            | 40 mW/50 mVA                     |            | 70 mW/90 mVA                     |            | 135 mW/155 mVA                   |            |
| Output supply voltage                                       | 5...48 V~                       |            | 5...48 V~                        |            | 5...48 V~                        |            | 5...48 V~                        |            |
| Output current                                              | 100 mA                          |            | 100 mA                           |            | 100 mA                           |            | 100 mA                           |            |
| Max. output current                                         | 300 mA                          |            | 300 mA                           |            | 300 mA                           |            | 300 mA                           |            |
| Switch-on time (first time)                                 | 6 ms for U <sub>N</sub> = 5 V~  |            | 6 ms for U <sub>N</sub> = 12 V~  |            | 5 ms for U <sub>N</sub> = 24 V~  |            | 5 ms for U <sub>N</sub> = 48 V~  |            |
| Switch-off time                                             | 12 ms for U <sub>N</sub> = 5 V~ |            | 12 ms for U <sub>N</sub> = 12 V~ |            | 15 ms for U <sub>N</sub> = 24 V~ |            | 15 ms for U <sub>N</sub> = 48 V~ |            |
| Switching frequency                                         | 15 Hzdc                         |            | 15 Hzdc                          |            | 15 Hzdc                          |            | 15 Hzdc                          |            |
| Storage temperature                                         | -40...+60 °C                    |            | -40...+60 °C                     |            | -40...+60 °C                     |            | -40...+60 °C                     |            |
| Ambient temperature                                         | -25...+60 °C                    |            | -25...+60 °C                     |            | -25...+60 °C                     |            | -25...+60 °C                     |            |
| Connection                                                  |                                 |            |                                  |            |                                  |            |                                  |            |
| Insulation coordination to EN 50 178                        |                                 |            |                                  |            |                                  |            |                                  |            |
| Protective separation                                       | acc. to DIN VDE 0884            |            | acc. to DIN VDE 0884             |            | acc. to DIN VDE 0884             |            | acc. to DIN VDE 0884             |            |
| Clearances and creepage distances                           | ≥ 5.5 mm                        |            | ≥ 5.5 mm                         |            | ≥ 5.5 mm                         |            | ≥ 5.5 mm                         |            |
| Rated impulse voltage                                       | 6 kV                            |            | 6 kV                             |            | 6 kV                             |            | 6 kV                             |            |
| Overvoltage category                                        | III                             |            | III                              |            | III                              |            | III                              |            |
| Pollution severity                                          | 2                               |            | 2                                |            | 2                                |            | 2                                |            |
| Accessories                                                 | Type                            | Cat. No.   | Type                             | Cat. No.   | Type                             | Cat. No.   | Type                             | Cat. No.   |
| Cross connection comb 16-pole                               | QB 16/10.16                     | 1650330000 | QB 16/10.16                      | 1650330000 | QB 16/10.16                      | 1650330000 | QB 16/10.16                      | 1650330000 |
| Further accessories, dimensions and connection data see     | Page 304                        |            | Page 304                         |            | Page 304                         |            | Page 304                         |            |



# Solid State relay on locking socket PLUGSERIES

## Complete module

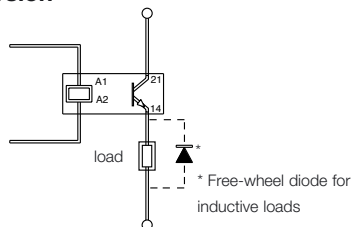


## Accessories SSR Standard

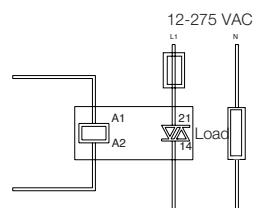


- Compact dimensions (29 x 25.4 x 12.7)
- Combines with PLUGSERIES socket PXS / PXZ, LED indicator PLED and PRC holding clamp to a complete functioning unit.
- Fully compatible with electromechanical relays in standard design
- Control voltage 24 VAC / DC
- Rated switching current 24 VDC, 24 VAC/DC, or 230 VAC
- Up to 5 A continuous current
- Mounts onto PCB or socket
- High mounting density possible

## DC version



## AC version



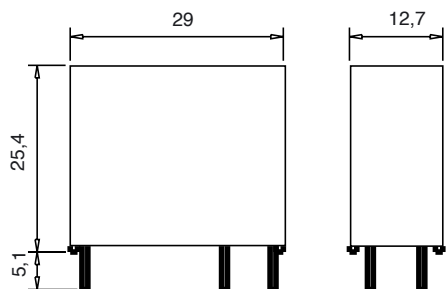
## DC version

| Type/Version                    | Cat. No.   |
|---------------------------------|------------|
| <b>Screw connection</b>         |            |
| POS 24Vdc/24Vdc 2.5A            | 8610840000 |
| POS 24Vdc/230Vac 2A             | 8610860000 |
| POS 24Vdc/24Vdc 1A              | 8610890000 |
| POS 24Vdc/24Vdc 5A              | 8610900000 |
| POS 24Vdc/230Vac 4A             | 8610910000 |
| <b>Tension clamp connection</b> |            |
| POZ 24Vdc/24Vdc 2.5A            | 8610920000 |
| POZ 24Vdc/230Vac 2A             | 8610930000 |
| POZ 24Vdc/24Vdc 1A              | 8610960000 |
| POZ 24Vdc/24Vdc 5A              | 8610970000 |
| POZ 24Vdc/230Vac 4A             | 8610980000 |

## AC version

| Type/Version                    | Cat. No.   |
|---------------------------------|------------|
| <b>Screw connection</b>         |            |
| POS 24Vac/24Vdc 2.5A            | 8615600000 |
| POS 24Vac/24Vdc 5A              | 8615620000 |
| POS 24Vac/230Vac 4A             | 8615590000 |
| <b>Tension clamp connection</b> |            |
| POZ 24Vac/24Vdc 2.5A            | 8615640000 |
| POZ 24Vac/24Vdc 5A              | 8615650000 |
| POZ 24Vac/230Vac 4A             | 8615630000 |

## Dimensions



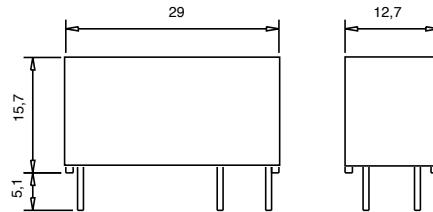
| Ordering data                                           | Type                  | Cat. No.   | Type                      | Cat. No.   |
|---------------------------------------------------------|-----------------------|------------|---------------------------|------------|
|                                                         | SSR 24 VUC/24VDC 5A   | 8576350000 | SSR 24 VUC/230VAC 4A      | 8576360000 |
| <b>Technical data</b>                                   | <b>DC Version</b>     |            | <b>AC Version</b>         |            |
| <b>Input</b> (typical values at 20 °C)                  |                       |            |                           |            |
| Input voltage min. AC/DC                                | 15 V                  |            | 15 V                      |            |
| Input voltage max. AC/DC                                | 30 V                  |            | 30 V                      |            |
| Input current min. AC/DC                                | 6.1 mA                |            | 6.1 mA                    |            |
| Input current max. AC/DC                                | 12 mA                 |            | 12 mA                     |            |
| Drop-out voltage AC/DC                                  | 2.5 V                 |            | 2.5 V                     |            |
| Resistance                                              | 2.100 Ω               |            | 2.100 Ω                   |            |
| <b>Output</b>                                           |                       |            |                           |            |
| max. switching current DC                               | <b>5 A</b>            |            | <b>3 A (4 A at 20 °C)</b> |            |
| max. switching current AC                               |                       |            |                           |            |
| min. switching current DC                               | 1 mA                  |            | 50 mA                     |            |
| min. switching current AC                               |                       |            |                           |            |
| Rated switching voltage DC                              | 24 V                  |            | 230 V ~                   |            |
| Rated switching voltage AC                              |                       |            |                           |            |
| Switch voltage range DC                                 | 0...30 V              |            | 12...275 V                |            |
| Switch voltage range AC                                 |                       |            |                           |            |
| max. forward anode voltage at max. switching current DC | 0.3 V                 |            | 1.1 V                     |            |
| max. forward anode voltage at max. switching current AC |                       |            |                           |            |
| max. switch-on time DC                                  | 2 ms                  |            | 12 ms                     |            |
| max. switch-on time AC (50 Hz)                          |                       |            |                           |            |
| max. switch-off time DC                                 | 18 ms                 |            | 20 ms                     |            |
| max. switch-off time AC (50 Hz)                         |                       |            |                           |            |
| <b>Insulation</b>                                       |                       |            |                           |            |
| Test voltage control circuit - switching circuit DC     | 2.5 kV <sub>eff</sub> |            | 4 kV <sub>eff</sub>       |            |
| Test voltage control circuit - switching circuit AC     |                       |            |                           |            |
| <b>Further data</b>                                     |                       |            |                           |            |
| Operating temperature range                             | -40 °C...+50 °C       |            | -40 °C...+50 °C           |            |
| Weight                                                  | approx. 18 g          |            | approx. 18 g              |            |
| Approvals                                               | cUL, UL recognized    |            | cUL, UL recognized        |            |
| Celduc                                                  | SPD07505              |            | SPA07420                  |            |
| Further accessories, dimensions and connection data     | see page 83           |            | see page 83               |            |

## Solid State relay on locking socket PLUGSERIES

### Accessories SSR / RT

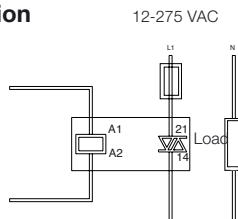


### Dimensions

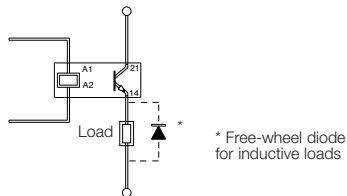


- Compact dimensions (29 x 15.7 x 12.7)
- Combines with PLUGSERIES socket PXS / PXZ, LED indicator PLED and PRC holding clamp to a complete functioning unit.
- Fully compatible with standard electromechanical relays RT
- Control voltage 24 VAC / DC
- Rated switching current 24 VDC, 24 VAC/DC, or 230 VAC
- Up to 5 A continuous current
- Mounts onto PCB or socket
- High mounting density possible

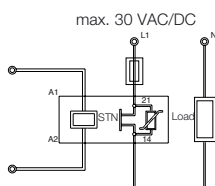
#### AC version



#### DC version



#### AC/DC version

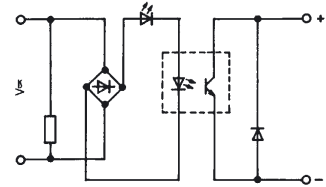
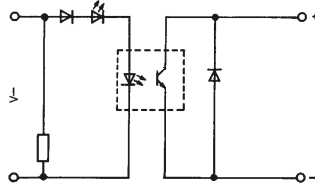


| Ordering data                                              | Type                  | Cat. No.            | Type                 | Cat. No.   | Type                | Cat. No.   |
|------------------------------------------------------------|-----------------------|---------------------|----------------------|------------|---------------------|------------|
|                                                            | SSR 24 VUC/24VDC 2.5A | 8576340000          | SSR 24 VUC/230VAC 2A | 8576370000 | SSR 24 VUC/24VUC 1A | 8576380000 |
| Technical data                                             | DC Version            | AC Version          | AC/DC Version        |            |                     |            |
| Input                                                      |                       |                     |                      |            |                     |            |
| (typical values at 20 °C)                                  |                       |                     |                      |            |                     |            |
| Input voltage min. AC/DC                                   | 15 V                  | 15 V                | 15 V                 |            |                     |            |
| Input voltage max. AC/DC                                   | 30 V                  | 30 V                | 30 V                 |            |                     |            |
| Input current min. AC/DC                                   | 6.1 mA                | 6.1 mA              | 6.1 mA               |            |                     |            |
| Input current max. AC/DC                                   | 12 mA                 | 12 mA               | 12 mA                |            |                     |            |
| Drop-out voltage AC/DC                                     | 2.5 V                 | 2.5 V               | 2.5 V                |            |                     |            |
| Resistances                                                | 2.100 Ω               | 2.100 Ω             | 2.100 Ω              |            |                     |            |
| Output                                                     |                       |                     |                      |            |                     |            |
| max. switching current DC                                  | 2.5 A                 |                     |                      |            |                     |            |
| max. switching current AC                                  |                       | 2A                  |                      |            |                     |            |
| max. switching current AC/DC                               |                       |                     | 1A                   |            |                     |            |
| min. switching current DC                                  | 1mA                   |                     |                      |            |                     |            |
| min. switching current AC                                  |                       | 50mA                |                      |            |                     |            |
| min. switching current AC/DC                               |                       |                     | 1mA                  |            |                     |            |
| Rated switching voltage DC                                 | 24 V                  |                     |                      |            |                     |            |
| Rated switching voltage AC                                 |                       | 230 V               |                      |            |                     |            |
| Rated switching voltage AC/DC                              |                       |                     | 24 V                 |            |                     |            |
| Switch voltage range DC                                    | 0...30 V              |                     |                      |            |                     |            |
| Switch voltage range AC                                    |                       | 12...275 V          |                      |            |                     |            |
| Switch voltage range AC/DC                                 |                       |                     | 0...30 V             |            |                     |            |
| max. forward anode voltage at max. switching current DC    | 0.5 V                 |                     |                      |            |                     |            |
| max. forward anode voltage at max. switching current AC    |                       | 1 V                 |                      |            |                     |            |
| max. forward anode voltage at max. switching current AC/DC |                       |                     | 0.9 V                |            |                     |            |
| max. switch-on time DC                                     | 2 ms                  |                     |                      |            |                     |            |
| max. switch-on time AC (50 Hz)                             |                       | 12 ms               |                      |            |                     |            |
| max. switch-on time AC/DC (50 Hz)                          |                       |                     | 5 ms                 |            |                     |            |
| max. switch-off time DC                                    | 18 ms                 |                     |                      |            |                     |            |
| max. switch-off time AC (50 Hz)                            |                       | 20 ms               |                      |            |                     |            |
| max. switch-off time AC/DC (50 Hz)                         |                       |                     | 12 ms                |            |                     |            |
| Insulation                                                 |                       |                     |                      |            |                     |            |
| Test voltage control circuit - switching circuit DC        | 2.5 kV <sub>eff</sub> |                     |                      |            |                     |            |
| Test voltage control circuit - switching circuit AC        |                       | 4 kV <sub>eff</sub> |                      |            |                     |            |
| Test voltage control circuit - switching circuit AC/DC     |                       |                     | 4 kV <sub>eff</sub>  |            |                     |            |
| Further data                                               |                       |                     |                      |            |                     |            |
| Operating temperature range                                | -40 °C...+50 °C       | -40 °C...+50 °C     | -40 °C...+50 °C      |            |                     |            |
| Weight                                                     | approx.11 g           | approx.11 g         | approx.11 g          |            |                     |            |
| Approvals                                                  | cUL, UL recognized    | cUL, UL recognized  | cUL, UL recognized   |            |                     |            |
| Celduc                                                     | STD07205              | STA07220            | STN07105             |            |                     |            |
| Further accessories, dimensions and connection data        | see page 83           | see page 83         | see page 83          |            |                     |            |

# Opto-coupler on locking socket profile RS 40

## Opto-couplers for signal input

## RS 40



### Rated data

#### Input voltage

Rated consumption ~ (W)

Rated consumption ~ (VA)

Output supply voltage

Voltage drop at max. load current

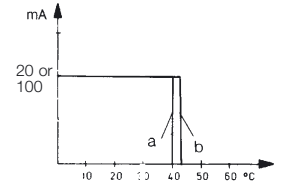
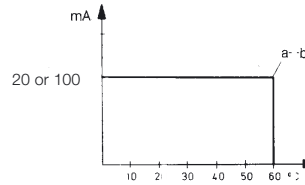
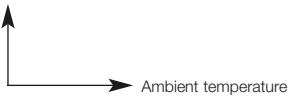
Output current

Derating curve

a = rowed on mounting rail without clearances

b = rowed with clearances  $\geq 20$  mm

Continuous  
current



Pulse duration, limiting overload current (not periodic)

Sperrstrom (Ruhestrom), max. at  $U = 48$  V

Switch-on time (cyclic operation)

Switch-off time (cyclic operation)

Max. switching frequency DC voltage

Max. switching frequency AC voltage

Switching ratio

| 5 V <sup>2)</sup>       | 12 V <sub>0</sub> $\pm 10$ % | 24 V <sub>0</sub> $\pm 10$ % | 24 V <sub>0</sub> $\pm 10$ % | 48 V <sub>0</sub> $\pm 10$ % | 115 V <sub>0</sub> , +5%-15% | 230 V <sub>0</sub> , +5%-15% |
|-------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 0.045 W                 | 0.25 W                       | 0.51 W                       | 0.34 W                       | 0.55 W                       | 0.33 W                       |                              |
|                         | 0.32 VA                      |                              | 0.5 VA                       | 0.65 VA                      | 0.65 VA                      | 0.52 VA                      |
| 5...48 V <sup>-1)</sup> | 5...48 V <sup>-1)</sup>      | 5...48 V <sup>-1)</sup>      | 5...48 V <sup>-1)</sup>      | 5...48 V <sup>-1)</sup>      | 5...48 V <sup>-1)</sup>      | 5...48 V <sup>-1)</sup>      |
| < 0.9 V                 | < 1.6 V                      | < 0.9 V                      | < 1.6 V                      | < 1.6 V                      | < 1.5 V                      | < 1.5 V                      |
| 20 mA                   | 100 mA                       | 20 mA                        | 100 mA                       | 100 mA                       | 100 mA                       | 100 mA                       |

|                   |              |                   |              |              |              |              |
|-------------------|--------------|-------------------|--------------|--------------|--------------|--------------|
| 0.2 A/10 ms       | 0.8 A/10 ms  | 0.2 A/10 ms       | 0.8 A/10 ms  | 0.8 A/10 ms  | 0.8 A/10 ms  | 0.8 A/10 ms  |
| 0.16 mA           | 0.16 mA      | 0.16 mA           | 0.16 mA      | 0.16 mA      | 0.16 mA      | 0.16 mA      |
| $\leq 12$ $\mu$ s | $\leq 6$ ms  | $\leq 30$ $\mu$ s | $\leq 2$ ms  | $\leq 5$ ms  | $\leq 10$ ms | $\leq 6$ ms  |
| $\leq 15$ $\mu$ s | $\leq 13$ ms | $\leq 60$ $\mu$ s | $\leq 15$ ms | $\leq 20$ ms | $\leq 23$ ms | $\leq 18$ ms |
| 3 kHz             | 20 Hz        | 3 kHz             | 20 Hz        | < 20 Hz      | 10 Hz        |              |
|                   | < 10 Hz      |                   |              | < 10 Hz      |              |              |
| 1 : 2             | 10 Hz 1 : 2  | 1 : 2             | 10 Hz 1 : 1  | 10 Hz 1 : 1  | 10 Hz 1 : 1  | 10 Hz 1 : 1  |

### Insulation coordination to EN 50 178

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Clearances and creepage distances

Opto-coupler

Test voltage (corresponds 100% module test)

Module is immune to interference

Insulation voltage

Input – output/mounting rail

Storage temperature

Ambient temperature

–, rowed on mounting rail without clearances

–, rowed with clearances  $\geq 20$  mm

|                                 |                                 |                                 |                                 |                                 |                                 |                                 |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 300 V                           | 300 V                           | 300 V                           | 300 V                           | 300 V                           | 300 V                           | 300 V                           |
| 6 kV                            | 6 kV                            | 6 kV                            | 6 kV                            | 6 kV                            | 6 kV                            | 6 kV                            |
| IV                              | IV                              | IV                              | III                             | IV                              | IV                              | IV                              |
| 2                               | 2                               | 2                               | 2                               | 2                               | 2                               | 2                               |
| $\geq 5.5$ mm                   | $\geq 5.5$ mm                   | $\geq 5.5$ mm                   | $\geq 5.5$ mm                   | $\geq 5.5$ mm                   | $\geq 5.5$ mm                   | $\geq 5.5$ mm                   |
| according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    |
| according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    | according to<br>DIN VDE 0884    |
| non-destructive<br>test 1 kV    | non-destructive<br>test 1 kV    | non-destructive<br>test 1 kV    | non-destructive<br>test 1 kV    | non-destructive<br>test 1 kV    | non-destructive<br>test 1 kV    | non-destructive<br>test 1 kV    |
| acc. to IEC 801-4<br>severity 4 | acc. to IEC 801-4<br>severity 4 | acc. to IEC 801-4<br>severity 4 | acc. to IEC 801-4<br>severity 4 | acc. to IEC 801-4<br>severity 4 | acc. to IEC 801-4<br>severity 4 | acc. to IEC 801-4<br>severity 4 |
|                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| 4 kV-eff 1 min.                 |                                 |                                 |                                 |                                 | 4 kV-eff 1 min.                 |                                 |
|                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| –40 °C...+85 °C                 |                                 |                                 |                                 |                                 | –40 °C...+70 °C                 |                                 |
|                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| –25 °C...+60 °C                 |                                 |                                 |                                 |                                 | –25 °C...+40 °C                 |                                 |
| –25 °C...+60 °C                 |                                 |                                 |                                 |                                 | –25 °C...+45 °C                 |                                 |

<sup>1)</sup> Not TTL-compatible

<sup>2)</sup> Conditionally level-compatible

## Opto-coupler on locking socket profile RS 40

RS 40



| Ordering data     |                    |                    |                        |                                               |
|-------------------|--------------------|--------------------|------------------------|-----------------------------------------------|
| Connection method | Input voltage      | Function indicator | Screw connection (GSE) | Disconnect plug with screw connection (BL/SL) |
|                   | 5 V <sup>2)</sup>  | Yellow LED         | 1118861001             | 1161560000                                    |
|                   |                    |                    |                        |                                               |
|                   | 12 V <sub>0</sub>  | Green LED          | 1118761001             | 1161660000                                    |
|                   |                    |                    |                        |                                               |
|                   | 24 V <sub>-</sub>  | Yellow LED         | 1160961001             | 1161760000                                    |
|                   |                    |                    |                        | 1177860000 <sup>1)</sup>                      |
|                   | 24 V <sub>0</sub>  | Yellow LED         | 1117461001             | 1119460000                                    |
|                   |                    | Green LED          | 8065031001             |                                               |
|                   |                    |                    |                        |                                               |
|                   | 48 V <sub>0</sub>  | Green LED          | 1161061001             | 1161860000                                    |
|                   |                    |                    |                        |                                               |
|                   | 115 V <sub>0</sub> | Green LED          | 1161161001             | 1161960000                                    |
|                   |                    |                    |                        |                                               |
|                   | 230 V <sub>-</sub> | Green LED          | 1161461001             | 1162060000                                    |
|                   |                    |                    |                        |                                               |
|                   | 230 V <sub>-</sub> | Red LED            |                        | 8182690000                                    |
|                   |                    |                    |                        |                                               |

| Connection data                         |  |                           |                           |               |
|-----------------------------------------|--|---------------------------|---------------------------|---------------|
| Insulation stripping length             |  |                           | 7 mm                      | 6 mm          |
| Conductor cross-section                 |  | 0.5...2.5 mm <sup>2</sup> | 0.5...1.5 mm <sup>2</sup> |               |
|                                         |  |                           | AWG 26...14               | AWG 26...16   |
|                                         |  |                           |                           |               |
| Dimensions                              |  |                           |                           |               |
| Mounting width                          |  |                           | 11.2 mm                   | 11.2 mm       |
| Length (perpendicular to mounting rail) |  |                           | 70 mm                     | 74 mm         |
| Height TS/TS 35 x 7.5                   |  |                           | 56 mm/51.5 mm             | 56 mm/51.5 mm |
|                                         |  |                           |                           |               |
|                                         |  |                           |                           |               |

<sup>1)</sup> Output 5 VTTL-compatible

<sup>2)</sup> Conditionally level-compatible

# Opto coupler on locking socket with multiple interface RSM

## (Opto-couplers)

### RSM 4 OS

4 opto-couplers

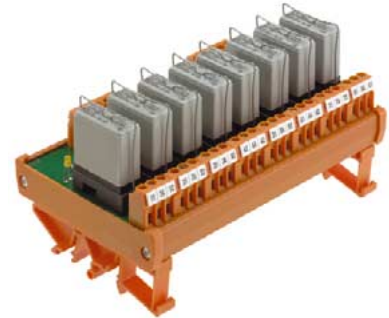
### RSM 8 OS

8 opto-couplers

#### Note!

During operation and maintenance please observe the relevant ESD measures.

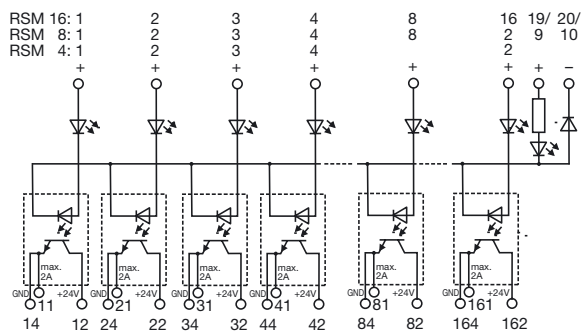
(ESD endangered area)



Also available as relay coupler, see page 84/85

#### Schematic circuit diagram

Opto coupler 24 Vdc / 2 A

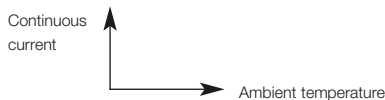


| Rated data                        |                         |
|-----------------------------------|-------------------------|
| Input voltage                     | 5 V <sup>-1</sup> ±10 % |
| Rated consumption ~ (W)           | 60 mW                   |
| Rated consumption ~ (VA)          | –                       |
| Output operating voltage          | 5...48 V <sup>1)</sup>  |
| Voltage drop at max. load current | <1.6 V                  |
| Output current                    | 0.1 A                   |

Derating curve

a = Continuous operation

b = Switching mode

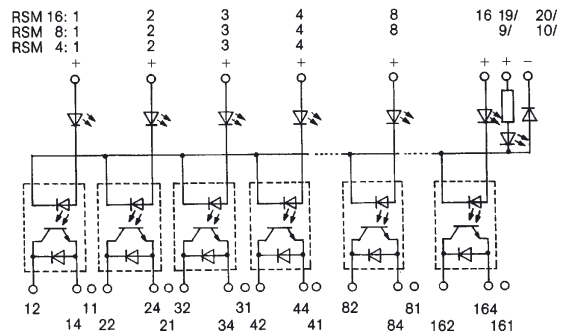


|                                                          |                 |
|----------------------------------------------------------|-----------------|
| Pulse duration, limiting overload current (not periodic) | 0.8 A/10 ms     |
| Max. reverse current (static current), at U              | 0.16 mA         |
| Switching frequency                                      | 100 Hz          |
| Storage temperature                                      | –40 °C...+85 °C |
| Ambient temperature                                      | –25 °C...+60 °C |
| –, rowed on mounting rail without clearances             | –25 °C...+60 °C |
| –, rowed with clearances x 20 mm                         | –25 °C...+60 °C |

| Dimensions                              |        |
|-----------------------------------------|--------|
| Mounting width                          |        |
| RSM 4                                   | 75 mm  |
| RSM 8                                   | 145 mm |
| RSM 16                                  | 285 mm |
| Length (perpendicular to mounting rail) | 87 mm  |

#### DC voltage/positive switching (joint negative)

Standard Opto coupler 5...48 Vdc / 100 mA

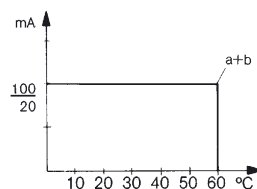


| Rated data                        |                         |
|-----------------------------------|-------------------------|
| Input voltage                     | 24 V <sup>-</sup> ±10 % |
| Rated consumption ~ (W)           | 400 mW                  |
| Rated consumption ~ (VA)          | –                       |
| Output operating voltage          | 5...48 V <sup>1)</sup>  |
| Voltage drop at max. load current | <1.6 V                  |
| Output current                    | 0.1 A                   |

Derating curve

a = Continuous operation

b = Switching mode



|                                                          |                 |
|----------------------------------------------------------|-----------------|
| Pulse duration, limiting overload current (not periodic) | 0.8 A/10 ms     |
| Max. reverse current (static current), at U              | 0.16 mA         |
| Switching frequency                                      | 100 Hz          |
| Storage temperature                                      | –40 °C...+85 °C |
| Ambient temperature                                      | –25 °C...+60 °C |
| –, rowed on mounting rail without clearances             | –25 °C...+60 °C |
| –, rowed with clearances x 20 mm                         | –25 °C...+60 °C |

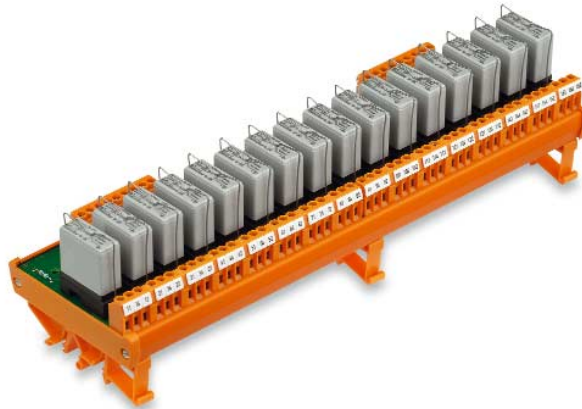
| Dimensions                              |        |
|-----------------------------------------|--------|
| Mounting width                          |        |
| RSM 4                                   | 75 mm  |
| RSM 8                                   | 145 mm |
| RSM 16                                  | 285 mm |
| Length (perpendicular to mounting rail) | 87 mm  |

<sup>1)</sup> Not TTL-compatible

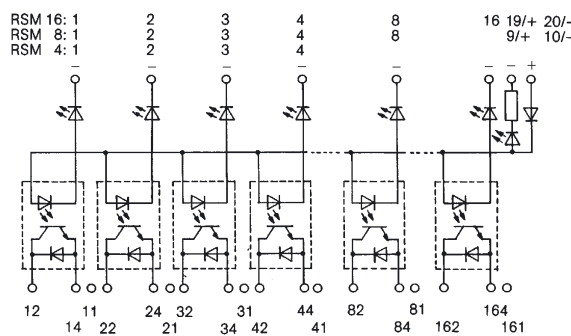
# Opto coupler on locking socket with multiple interface RSM

## RSM 16 OS

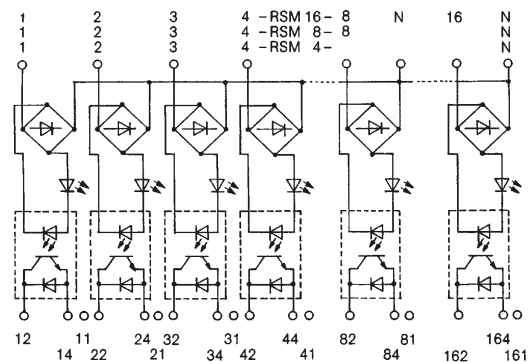
16 Opto couplers



### DC/negative switching (common positive)



### DC/AC voltage



| Ordering data |                    |                          |              |                          |              |                           |               |                                  |                                  |            |
|---------------|--------------------|--------------------------|--------------|--------------------------|--------------|---------------------------|---------------|----------------------------------|----------------------------------|------------|
| Conn. method  | Input voltage      | RSM 4 OS w/o. optocoupl. | 4 optocoupl. | RSM 8 OS w/o. optocoupl. | 8 optocoupl. | RSM 16 OS w/o. optocoupl. | 16 optocoupl. | Positive switching <sup>3)</sup> | Negative switching <sup>4)</sup> | Cat. No.   |
| Screw/        | 5 V <sup>-2)</sup> |                          | •            |                          | •            |                           | •             | •                                |                                  | 1123661001 |
|               |                    |                          |              |                          |              |                           | •             | •                                |                                  | 1124061001 |
|               |                    |                          |              |                          |              |                           | •             | •                                |                                  | 1124461001 |
|               |                    | •                        |              |                          |              |                           |               | •                                |                                  | 8017581001 |
|               |                    |                          | •*           |                          |              |                           |               | •                                |                                  | 1123861001 |
|               |                    |                          | •*           |                          |              |                           |               |                                  | •                                | 1123761001 |
|               | 24 V-              |                          |              | •                        |              |                           |               | •                                |                                  | 8003671001 |
|               |                    |                          |              | •                        |              |                           |               |                                  | •                                | 8021391001 |
|               |                    |                          |              |                          | •*           |                           |               | •                                |                                  | 1124261001 |
|               |                    |                          |              |                          |              | •                         |               | •                                |                                  | 8018221001 |
|               |                    |                          |              |                          |              | •                         |               |                                  | •                                | 8082471001 |
|               |                    |                          |              |                          |              |                           | •*            | •                                |                                  | 1124661001 |
|               | 24 V0              |                          | •*           |                          |              |                           |               |                                  |                                  | 1125161001 |
|               |                    |                          |              |                          | •*           |                           |               |                                  |                                  | 1125261001 |

\* equipped as standard with opto-coupler 5...48 Vdc / 100 mA

### Connection data

| Insulation stripping length | 7 mm                                   |                           |                |                |            |  |  |  |  |  |
|-----------------------------|----------------------------------------|---------------------------|----------------|----------------|------------|--|--|--|--|--|
| Conductor cross-section     | 0.5...2.5 mm <sup>2</sup> /AWG 26...14 |                           |                |                |            |  |  |  |  |  |
| Replacement opto-c.         | Type                                   | Input voltage             | Output voltage | Output current | Cat. No.   |  |  |  |  |  |
|                             | OS                                     | 5 V <sup>-5)</sup> ±10 %  | 24 V- ±20 %    | 0.1 A          | 1121100000 |  |  |  |  |  |
|                             | OS                                     | 12 V <sup>-5)</sup> ±10 % | 5...48 V-      | 0.1 A          | 1124800000 |  |  |  |  |  |
|                             | OS                                     | 12 V0 ±10 %               | 5...48 V-      | 0.1 A          | 1121200000 |  |  |  |  |  |
|                             | OS                                     | 24 V <sup>-5)</sup> ±10 % | 5...48 V-      | 0.1 A          | 1124900000 |  |  |  |  |  |
|                             | OS                                     | 24 V <sup>-5)</sup> ±10 % | 24 V- +10 %    | 2.0 A          | 1170200000 |  |  |  |  |  |
|                             | OS                                     | 24 V <sup>-5)</sup> ±10 % | 250 V~         | 0.1 A          | 1153200000 |  |  |  |  |  |
|                             | OS                                     | 24 V0 ±10 %               | 5...48 V-      | 0.1 A          | 1121300000 |  |  |  |  |  |

<sup>2)</sup> 5 V TTL Input voltage on request

<sup>3)</sup> Common negative potential, positive is switched

<sup>4)</sup> Common positive potential, negative is switched

<sup>5)</sup> Not suitable for DC/AC version

## Opto coupler, locking socket for semi-conductor relays

### Single and multiple socket interface-unit

Advantages of semiconductor relays:

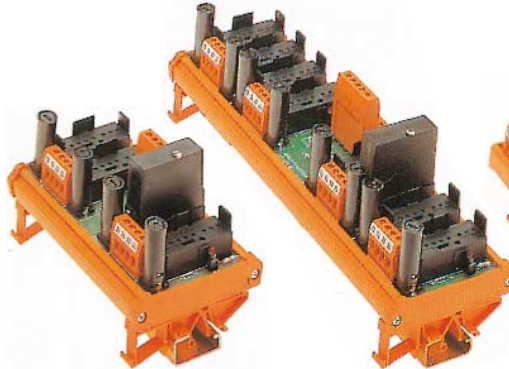
- Wear-free switching also with high switching frequencies
- Bounce-free switching
- No electromagnetic interferences
- High insulation-voltage between load and control circuit

**Note!**  
The relevant ESD measures are to be observed during commissioning and maintenance (ESD endangered area)

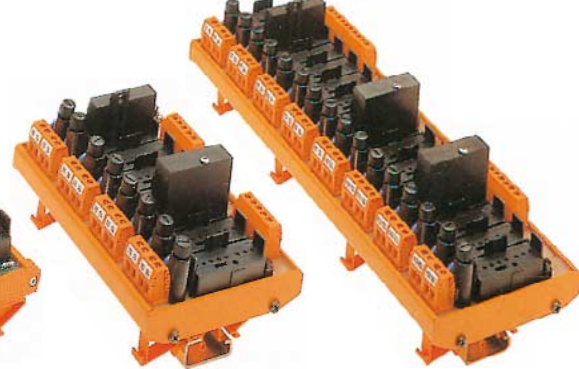
RS 1 HR



RSM 4 HR



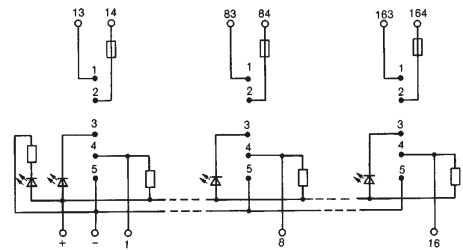
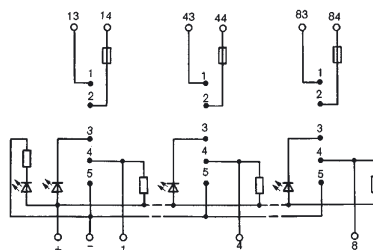
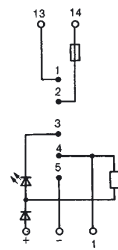
RSM 8 HR



RSM 8 HR-100

RSM 16 HR-100

Schematic circuit diagram



| Ordering data                                       | Type                                  | Cat. No.   | Type                                  | Cat. No.                 | Type                                  | Cat. No.                 | Type                                  | Cat. No.                 | Type                                  | Cat. No.                 |
|-----------------------------------------------------|---------------------------------------|------------|---------------------------------------|--------------------------|---------------------------------------|--------------------------|---------------------------------------|--------------------------|---------------------------------------|--------------------------|
|                                                     | RS 1 HR                               | 1166961001 | RSM 4 HR                              | 1167061001 <sup>3)</sup> | RSM 8 HR                              | 1167161001 <sup>3)</sup> | RSM 8 HR-100                          | 1166261001 <sup>3)</sup> | RSM 16 HR-100*                        | 1167261001 <sup>3)</sup> |
| <b>Rated data (with input module)<sup>1)</sup></b>  |                                       |            |                                       |                          |                                       |                          |                                       |                          |                                       |                          |
| Input voltage, max.                                 | 250 V~                                |            | 250 V~                                |                          | 250 V~                                |                          | 250 V~                                |                          | 250 V~                                |                          |
| Input current (per channel)                         | 25 mA                                 |            | 25 mA                                 |                          | 25 mA                                 |                          | 25 mA                                 |                          | 25 mA                                 |                          |
| Max. output voltage                                 | 24 V0                                 |            | 24 V0                                 |                          | 24 V0                                 |                          | 24 V0                                 |                          | 24 V0                                 |                          |
| Output current (per channel), max.                  | Depending on module                   |            | Depending on module                   |                          | Depending on module                   |                          | Depending on module                   |                          | Depending on module                   |                          |
| <b>Rated data (with output module)<sup>1)</sup></b> |                                       |            |                                       |                          |                                       |                          |                                       |                          |                                       |                          |
| Input voltage, max.:                                | 24 V0                                 |            | 24 V0                                 |                          | 24 V0                                 |                          | 24 V0                                 |                          | 24 V0                                 |                          |
| Input current (per channel)                         | Depending on module                   |            | Depending on module                   |                          | Depending on module                   |                          | Depending on module                   |                          | Depending on module                   |                          |
| Max. output supply voltage                          | 250 V                                 |            | 250 V                                 |                          | 250 V                                 |                          | 250 V                                 |                          | 250 V                                 |                          |
| Max. output current (per channel)                   | Depending on module                   |            | Depending on module                   |                          | Depending on module                   |                          | Depending on module                   |                          | Depending on module                   |                          |
| Auxiliary voltage                                   | 24 V- ±10 %                           |            | 24 V- ±10 %                           |                          | 24 V- ±10 %                           |                          | 24 V- ±10 %                           |                          | 24 V- ±10 %                           |                          |
| Status indicator                                    | LED red                               |            | LED red                               |                          | LED red                               |                          | LED red                               |                          | LED red                               |                          |
| Fuse                                                | 5x20, 5 A quick                       |            | 5x20, 5 A quick                       |                          | 5x20, 5 A quick                       |                          | 5x20, 5 A quick                       |                          | 5x20, 5 A quick                       |                          |
| Storage temperature                                 | -40 °C...+70 °C                       |            | -40 °C...+70 °C                       |                          | -40 °C...+70 °C                       |                          | -40 °C...+70 °C                       |                          | -40 °C...+70 °C                       |                          |
| Ambient temperature                                 | -25 °C...+70 °C                       |            | -25 °C...+70 °C                       |                          | -25 °C...+70 °C                       |                          | -25 °C...+70 °C                       |                          | -25 °C...+70 °C                       |                          |
|                                                     | Dependent on semiconductor relay used |            | Dependent on semiconductor relay used |                          | Dependent on semiconductor relay used |                          | Dependent on semiconductor relay used |                          | Dependent on semiconductor relay used |                          |
| <b>Connection data</b>                              |                                       |            |                                       |                          |                                       |                          |                                       |                          |                                       |                          |
| Conductor cross-section                             | 0.5...2.5 mm <sup>2</sup>             |            | 0.5...2.5 mm <sup>2</sup>             |                          | 0.5...2.5 mm <sup>2</sup>             |                          | 0.5...2.5 mm <sup>2</sup>             |                          | 0.5...2.5 mm <sup>2</sup>             |                          |
| Screw connection                                    | –                                     |            | –                                     |                          | 10-pole                               |                          | 10-pole                               |                          | 20-pole                               |                          |
| Male connect. block DIN 41651 <sup>2)</sup>         | –                                     |            | –                                     |                          | 15-pole                               |                          | 15-pole                               |                          | 25-pole                               |                          |
| „Sub-D“-connection <sup>2)</sup>                    | –                                     |            | –                                     |                          |                                       |                          |                                       |                          |                                       |                          |
| <b>Dimensions</b>                                   |                                       |            |                                       |                          |                                       |                          |                                       |                          |                                       |                          |
| Mounting width                                      | 35 mm                                 |            | 130 mm                                |                          | 249 mm                                |                          | 156 mm                                |                          | 305 mm                                |                          |
| Length (perpendicular to mounting rail)             | 87 mm                                 |            | 87 mm                                 |                          | 87 mm                                 |                          | 109 mm                                |                          | 109 mm                                |                          |

<sup>1)</sup> The rating data depend on the used module  
<sup>2)</sup> on request

<sup>3)</sup> Mixed placement of input and output modules is not valid.

## Semi-conductor relays

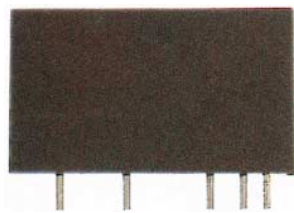
**Solid state relays  
for signal input  
and output**

**Input module  
HRE 24**  
DC/DC

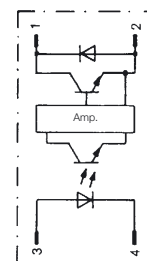
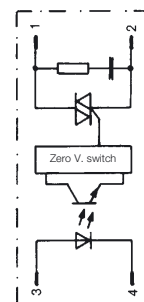
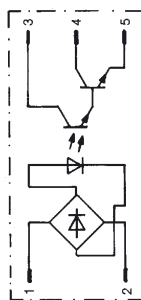
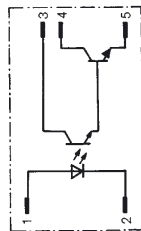
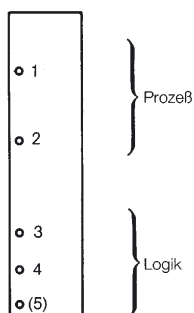
**Input module HRE 115/HRE 230**  
AC/DC

**Output module  
HRA 230**  
DC/AC

**Output module  
HRA 60**  
DC/DC



**Schematic circuit diagram**



| Ordering data                                          | Type                            | Cat. No.  | Type                              | Cat. No.   | Type                                 | Cat. No.   | Type                                  | Cat. No.   | Type                                 | Cat. No.   |
|--------------------------------------------------------|---------------------------------|-----------|-----------------------------------|------------|--------------------------------------|------------|---------------------------------------|------------|--------------------------------------|------------|
|                                                        | HRE 24                          | 117440000 | HRE 115                           | 1174500000 | HRE 230                              | 1174600000 | HRA 230                               | 1174100000 | HRA 60                               | 1174300000 |
| Rated data                                             |                                 |           |                                   |            |                                      |            |                                       |            |                                      |            |
| Input voltage                                          | 10...32 V– (process)            |           | 90...140 V <sub>0</sub> (process) |            | 180 V...280 V <sub>0</sub> (process) |            | 18...32 V– (Logic)                    |            | 18...32 V– (Logic)                   |            |
| Input current at max. V                                | 21.33 mA                        |           | 10 mA                             |            | 6.4 mA                               |            | –                                     |            | –                                    |            |
| Input resistance                                       | 1.5 kΩ                          |           | 14 kΩ                             |            | 44 kΩ                                |            | 2.2 kΩ                                |            | 2.2 kΩ                               |            |
| Switch-on voltage                                      | –                               |           | –                                 |            | –                                    |            | 3 V                                   |            | 3 V                                  |            |
| Switch-off voltage                                     | –                               |           | –                                 |            | –                                    |            | 1 V                                   |            | 1 V                                  |            |
| Max. output operating voltage                          | 18...32 V (Logic) <sup>1)</sup> |           | 18...32 V (Logic) <sup>1)</sup>   |            | 18...32 V (Logic) <sup>1)</sup>      |            | 24...250 V– <sup>1)2)</sup> (process) |            | 5...60 V– <sup>1)2)</sup> ( process) |            |
| Voltage drop at max. load current                      | 0.4 V                           |           | 0.4 V                             |            | 0.4 V                                |            | –                                     |            | –                                    |            |
| Max. output current (Continuous test)                  | 100 mA                          |           | 100 mA                            |            | 100 mA                               |            | 3 A                                   |            | 3 A, resistive load                  |            |
| Derating curve                                         |                                 |           |                                   |            |                                      |            |                                       |            |                                      |            |
| a = self-cooling                                       |                                 |           |                                   |            |                                      |            |                                       |            |                                      |            |
| b = mounted on                                         |                                 |           |                                   |            |                                      |            |                                       |            |                                      |            |
| 2 kW heat sink                                         |                                 |           |                                   |            |                                      |            |                                       |            |                                      |            |
| Continuous current                                     |                                 |           |                                   |            |                                      |            |                                       |            |                                      |            |
| Ambient temperature                                    |                                 |           |                                   |            |                                      |            |                                       |            |                                      |            |
| Min. Load current                                      | –                               |           | –                                 |            | –                                    |            | 20 mA                                 |            | –                                    |            |
| Leakage current in off-condition at rated load voltage | max. 100 µA                     |           | max. 100 µA                       |            | max. 100 µA                          |            | 6 mA                                  |            | 1 mA                                 |            |
| Surge current                                          | –                               |           | –                                 |            | –                                    |            | 75 A/20 ms                            |            | 5 A/1 s                              |            |
| Switch-on time                                         | 5 ms                            |           | 20 ms                             |            | 20 ms                                |            | ≤ 1/2 Period                          |            | 100 µs                               |            |
| Switch-off time                                        | 5 ms                            |           | 20 ms                             |            | 20 ms                                |            | ≤ 1/2 Period                          |            | 750 µs                               |            |
| Input impulse                                          | –                               |           | –                                 |            | –                                    |            | unlimited, t <sub>min</sub> 100 µs    |            | unlimited, t <sub>min</sub> 100 µs   |            |
| Storage temperature                                    | –40 °C...+100 °C                |           | –40 °C...+100 °C                  |            | –40 °C...+100 °C                     |            | –40 °C...+100 °C                      |            | –40 °C...+100 °C                     |            |
| Ambient temperature                                    | –20 °C...+ 70 °C                |           | –25 °C...+ 70 °C                  |            | –25 °C...+ 70 °C                     |            | –25 °C...+ 70 °C                      |            | –25 °C...+ 70 °C                     |            |

| Ambient Temperature (°C) | Current (A) |
|--------------------------|-------------|
| 0                        | 3           |
| 50                       | 3           |
| 80                       | 1           |
| 100                      | 1           |

<sup>1)</sup> 250 V max. in connection with HR modules.  
Only negative-switching when used on HR-socket!

<sup>2)</sup> For inductive loads the module must be protected with diode or varistor.



## Timers

The IT product family of electronic delay timers from Weidmüller are the optimum solution for industrial tasks.

### The product family IT offers:

- Response delay (ITR)
- Wiping contact without control input (ITWo)
- Wiping contact with control input (ITWw)
- Turn-off delay without control input (ITTo)
- Turn off delay without control input (ITTW)
- Pulse generator (ITTT)
- Multifunction (ITM)
- Multifunction (ITMF)

### Designation of types:

**I** = Industry

**T** = Timer

**R** = Response Delay

**Wo** = Wiping contact relay without control input

**Ww** = Wiping contact relay with control input

**To** = Turn -off delay without control input

**Tw** = Turn-off delay with control input

**TT** = Two Times

**M** = Multifunction

**MF** = Multifunction Four

### Time ranges and supply voltages of delay timer relays

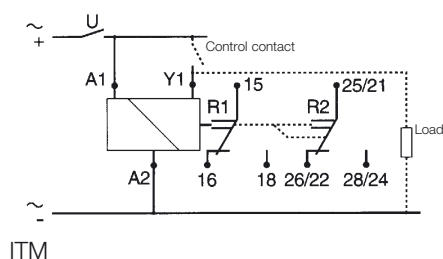
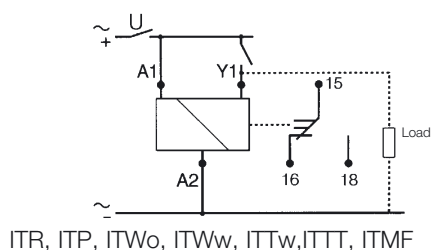
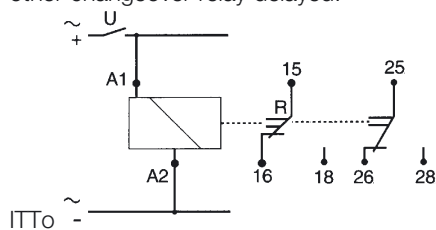
The modules' functions for 4 or 7 time can be precisely selected via the rotary button.

The multiple voltage ranges of the supply voltage allow for a wide area of use in industry (see table).

| Product    | Time           | Range           | Voltage supply      |
|------------|----------------|-----------------|---------------------|
| ITR        | 0.1 s - 100 h  | 0.1 s - 1 s     | 24 VDC/24...240 VAC |
| ITWo, ITTT |                | 1 s - 10 s      |                     |
| ITTW       |                | 0.1 min - 1 min |                     |
| ITWw       |                | 1 h - 10 h      |                     |
| ITMF, ITM  |                | 10 h - 100 h    |                     |
| ITTo       | 0.06 s - 160 s | 0.06 s - 0.6 s  | 24 V - 240 VAC      |
|            |                | 0.25 s - 2.5 s  | 24 VDC              |

### Output of the timing relays

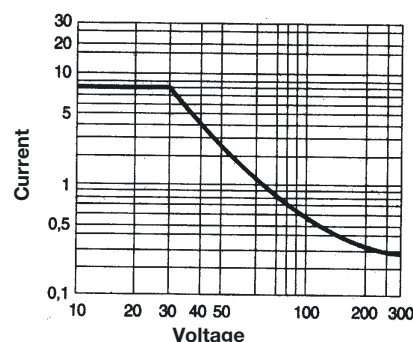
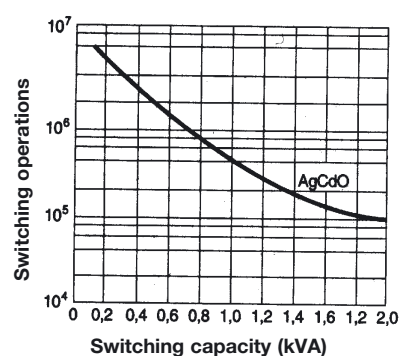
The load in every module is switched by a changeover relay (250 V, 8 A). The multifunction module (ITM) switches both changeover relays immediately or, one changeover relay immediately and the other changeover relay delayed.



### Characteristic data of output contacts

#### Limit values by resistive load

Service life of contacts by resistive load



# Functions of the Timers

## Response delay ITR timer relay

As soon as the operating voltage is applied, the preset delay period T begins. After time period T has expired, output R connects the load.



## Wiping contact timer relay without control input ITWo

When the operating voltage is applied, output R connects the load immediately. After the preset delay period T has expired, output R disconnects the load.



## Wiping contact timer relay with control input ITWw

As soon as the operating voltage is applied, a pulse (e. g. 50 ms) or a voltage is applied to control input Y1. Output R connects the load immediately. After the preset delay period T has expired, output R disconnects the load.



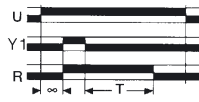
## Turn-off delay timer relay without control input ITTo

As soon as the operating voltage is applied, output R connects the load. Delay period T does not begin until the operating voltage is switched off. After delay period T has expired, output R disconnects the load.



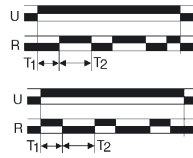
## Turn-off delay timer relay with control input ITTw

After the operating voltage has been applied and control input Y1 has been activated, output R connects the load for an indefinite period of time. When the control input is opened and after the preset time period T has expired, the output disconnects the load.



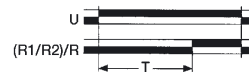
## Pulse generator ITTT

The repeat cycles starts with two individually adjustable times after applying the supply voltage. There is a different starting state for each delay.



## Multifunction ITM/ITMF

### Function A: Response delay



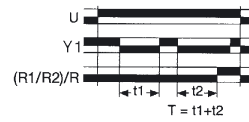
As soon as the operating voltage is applied, the preset delay period T begins. After time period T has expired, output R connects the load.

### Function Ac: Response delay and turn-off delay



As soon as operating voltage has been applied and control input Y1 has closed, delay period T begins. After time period T has expired, output R connects the load (delayed response). When control input Y1 is opened, the output disconnects the load after the preset time period has expired (delayed turn-off).

### Function At: Additive response delay



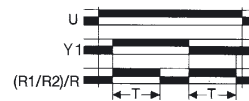
As soon as the operating voltage has been applied and delay period T has expired, output R connects the load. At control input Y1 the contact break intervals are accumulated (additive process). As soon as the operating voltage is switched off, the load at output R is disconnected.

### Function B: Wiping contact with control input



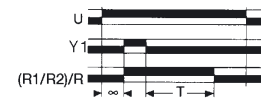
As soon as the operating voltage has been applied, a pulse (min 50 ms) or a voltage can be applied to control input Y1. Output R connects the load immediately. After delay period T has expired, output R disconnects the load.

### Function Bw: Wiping function



The operating voltage must be applied. As soon as a voltage is applied to control input Y1, output R connects the load for the preset time T. After time period T has expired, output R disconnects the load. As soon as the control input is opened, output R once more connects the load for the duration of time period T. After time period T has expired, output R disconnects the load.

### Function C: Turn-off delay with control input



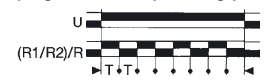
As soon as the operating voltage has been applied and control input Y1 has been activated, output R connects the load for an indefinite period of time. When the control input is opened and after the preset time period T has expired, the output disconnects the load.

### Function D: Pulse generator (begins in the zero position)



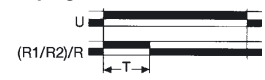
As soon as the operating voltage has been applied, output R simultaneously switches the load alternately between the zero position and operating position for the period of the preset time T. With this function, the cycle begins at the zero position.

### Function Di: Pulse generator (begins in the operating position)



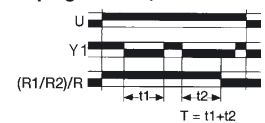
As soon as the operating voltage has been applied, output R simultaneously switches the load alternately between the zero position and operating position for the period of the preset time T. With this function, the cycle begins at the operating position.

### Function H: Wiping contact without control input



As soon as the operating voltage is applied, output R connects the load immediately. After delay period T has expired, output R disconnects the load.

### Function Ht: Wiping contact, additive



As soon as the operating voltage is applied, output R connects the load immediately. At control input Y1 the contact break intervals are accumulated (additive process) and when the preset delay period has expired, output R disconnects the load.

U = Operating voltage

R = Output relay or load

T = Delay

Y1 = Control input

## Timers

### Status LED

Two LED's show the status of the modules:

- green LED = supply voltage connected
- yellow LED = relay output active (not for ITTO)

### Marking

Marking is done on a removable tag or on the marking area. The function is printed on the **front** of the module.

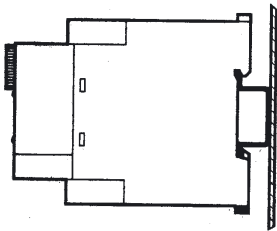
### Control lamp for verifying contact

A control lamp can be wired parallel to input Y1 to show the status of control input.

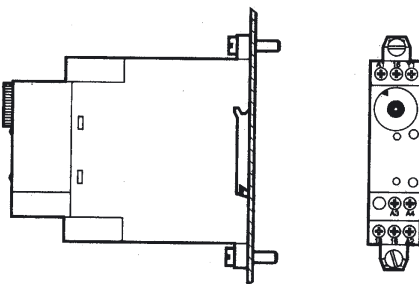
### Assembly

Mount direct onto DIN TS 35 mounting rails.

on DIN rail



on panel using M4 screws



### Approvals and standards

This relay has a high resistance to interference. The housing material is self-extinguishing (UL94/V0).

Manufacturing to IEC/VDE and UL/CSA approvals permit worldwide usage.

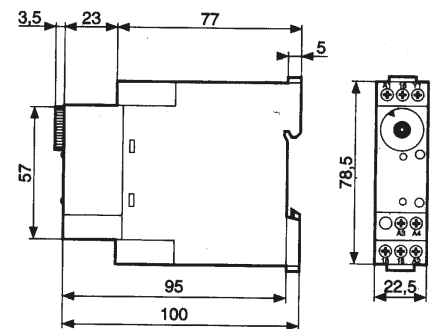
- IEC 255 static measuring relays
- IEC529 testers and test procedures
- IEC 664 regulations for high-voltage fuses for motor circuits
- IEC 801 EMC compatibility
- VDE 0110 insulation coordination for low-voltage electrical equipment
- VDE 0435 relays with fixed times

### Connection technology

Clamping yoke has the following capacities:

- 2 x 1.5 mm<sup>2</sup> with ferrule
- 2 x 2.5 mm<sup>2</sup> without ferrule
- 1 x 4 mm<sup>2</sup> without ferrule

### Dimensions IT



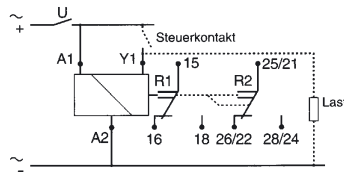
## Multifunctional Timers

- Response delay
- Response delay and turn-off delay
- Additive response delay
- Wiping contact with control input
- Wiping function
- Turn-off delay with control input
- Pulse generator (begins in the zero position)
- Pulse generator (begins in the operating position)
- Wiping contact without control input
- Wiping contact, additive

### Schematic circuit diagram

### ITM

Multifunctional timer relay



### Ordering data

|                                           |  |
|-------------------------------------------|--|
| Contact                                   |  |
| Time periods                              |  |
| Repeat accuracy (const. parameter)        |  |
| Accuracy of indication acc. to IEC 1812-1 |  |
| <b>Input</b>                              |  |
| Input voltage                             |  |
| Voltage tolerance                         |  |
| Duty factor                               |  |
| Rated power consumption                   |  |
| Min pulse duration type                   |  |
| Max. reset time at voltage interruption   |  |
| Protection against voltage interruption   |  |

### Output

|                   |              |
|-------------------|--------------|
| Contact           |              |
| Contact material  |              |
| Service life      | - mechanical |
|                   | - electrical |
| Switching current | - max.       |
|                   | - min.       |

Max. switching voltage

Switching current

### Status indicators

|                     |  |
|---------------------|--|
| Voltage applied     |  |
| Relay output active |  |
| Approvals           |  |
| Standards           |  |

|             |                         |
|-------------|-------------------------|
| Temperature | - Storage temperature   |
|             | - Operating temperature |

Clearance/creepage path. acc. to IEC 664/VDE 0110

Protection category IEC 529 - Terminal block

- Front

Mounting

Installation category to IEC 664

### Connection

|                   |  |
|-------------------|--|
| - with ferrule    |  |
| - without ferrule |  |

Enclosure material

Weight, typ.

|      |            |
|------|------------|
| Type | Cat. No.   |
| ITM  | 8362550000 |

|                  |  |
|------------------|--|
| changeover       |  |
| 0.1 s - 100 h    |  |
| 1 s, 10 s, 1 min |  |
| 1 h, 10 h, 100 h |  |

± 0.5%

± 10% (25 °C)

**12 V...240 Vac/dc / 50...60 Hz**

85 - 110% U<sub>N</sub>

100 %

7 VA / 230 V~

≥ 50 ms

≤ 100 ms

> 10 ms

**Relay output**

2 changeover

AgCdO

5 x 10<sup>6</sup> switching operations

10<sup>5</sup> switching operations at 2000 VA resistive load

8 A<sub>0</sub> / changeover contact

100 mA<sub>0</sub>

250 V<sub>0</sub>

2000 VA / 80 W

green LED

yellow LED

UL / CSA

IEC 529/IEC 664/IEC 801/IEC 255

VDE 0435/VDE 0110

-30°C...+70°C

-20°C...+60°C

4 kV

IP 20

IP 50

DIN rail 35 mm

Category III

2 x 1.5 mm<sup>2</sup>

2 x 2.5 mm<sup>2</sup> / 1 x 4 mm<sup>2</sup>

self extinguishing

110 g

### Function A: Response delay



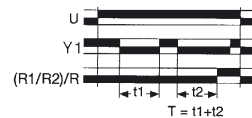
As soon as the operating voltage is applied, the preset delay period T begins. After time period T has expired, output R connects the load.

### Function Ac: Response delay and turn-off delay



As soon as operating voltage has been applied and control input Y1 has closed, delay period T begins. After time period T has expired, output R connects the load (delayed response). When control input Y1 is opened, the output disconnects the load after the preset time period has expired (delayed turn-off).

### Function At: Additive response delay



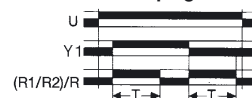
As soon as the operating voltage has been applied and delay period T has expired, output R connects the load. At control input Y1 the contact break intervals are accumulated (additive process). As soon as the operating voltage is switched off, the load at output R is disconnected.

### Function B: Wiping contact with control input



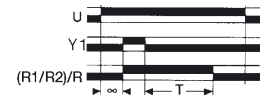
As soon as the operating voltage has been applied, a pulse (min 50 ms) or a voltage can be applied to control input Y1. Output R connects the load immediately. After delay period T has expired, output R disconnects the load.

### Function Bw: Wiping function



The operating voltage must be applied. As soon as a voltage is applied to control input Y1, output R connects the load for the preset time T. After time period T has expired, output R disconnects the load. As soon as the control input is opened, output R once more connects the load for the duration of time period T. After time period T has expired, output R disconnects the load.

### Function C: Turn-off delay with control input



As soon as the operating voltage has been applied and control input Y1 has been activated, output R connects the load for an indefinite period of time. When the control input is opened and after the preset time period T has expired, the output disconnects the load.

### Function D: Pulse generator (begins in the zero position)



As soon as the operating voltage has been applied, output R simultaneously switches the load alternately between the zero position and operating position for the period of the preset time T. With this function, the cycle begins at the zero position.

### Function Di: Pulse generator (begins in the operating position)



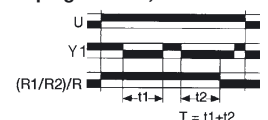
As soon as the operating voltage has been applied, output R simultaneously switches the load alternately between the zero position and operating position for the period of the preset time T. With this function, the cycle begins at the operating position.

### Function H: Wiping contact without control input



As soon as the operating voltage is applied, output R connects the load immediately. After delay period T has expired, output R disconnects the load.

### Function Ht: Wiping contact, additive



As soon as the operating voltage is applied, output R connects the load immediately. At control input Y1 the contact break intervals are accumulated (additive process) and when the preset delay period has expired, output R disconnects the load.

U = Operating voltage

R = Output relay or load

T = Delay

Y1 = Control input

## Timers

### ITTo

Turn-off delay timer relay **without** control input

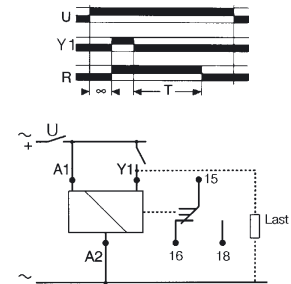
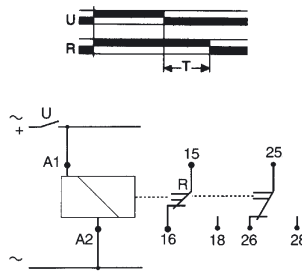


### ITTW

Turn-off delay timer relay **with** control input



#### Schematic circuit diagram



| Ordering data                                     | Type                                                           | Cat. No.         | Type                                                           | Cat. No.          |
|---------------------------------------------------|----------------------------------------------------------------|------------------|----------------------------------------------------------------|-------------------|
| Contact                                           | <b>ITTo</b>                                                    | <b>836260000</b> | <b>ITTW</b>                                                    | <b>8362610000</b> |
| Time periods                                      | Changeover                                                     |                  | Changeover                                                     |                   |
|                                                   | 0.6 s - 160 s                                                  |                  | 0.1 s - 100 h                                                  |                   |
|                                                   | (0.06 s - 0.6 s, 0.25 s - 2.5 s,                               |                  | (0.1 s - 1 s, 1 s - 10 s, 0.1 min - 1 min,                     |                   |
|                                                   | 2 s - 20 s, 16 s - 160 s)                                      |                  | 1 min - 10 min, 0.1 h - 1 h, 1 h - 10h)                        |                   |
| Repeat accuracy (const. parameter)                | ± 0.5%                                                         |                  | ± 0.5%                                                         |                   |
| Anzeigegegenauigkeit gemäß IEC 1812-1             | ± 10% (25 °C)                                                  |                  | ± 10% (25 °C)                                                  |                   |
| <b>Input</b>                                      |                                                                |                  |                                                                |                   |
| Input voltage                                     | <b>24 Vdc/ 24...240 Vac / 50...60 Hz</b>                       |                  | <b>24 Vdc/ 24...240 Vac / 50...60 Hz</b>                       |                   |
| Voltage tolerance                                 | 85 - 110% U <sub>N</sub>                                       |                  | 85 - 115% U <sub>N</sub> (110% for 240 V)                      |                   |
| Duty factor                                       | 100 %                                                          |                  | 100 %                                                          |                   |
| Rated power consumption                           | 0.5 W / 30 VA / 230 V~                                         |                  | 0.5 W / 24 V- / 1 W / 48 V- / 2 VA / 48 V~                     |                   |
| Min. switch-on time for the supply                | -                                                              |                  | 1.5 VA / 24 V~                                                 |                   |
|                                                   |                                                                |                  | 12 VA / 230 V~                                                 |                   |
| Min pulse duration type                           | ≥ 50 ms                                                        |                  | ≥ 50 ms                                                        |                   |
| Max. reset time at voltage interruption           | ≤ 100 ms                                                       |                  | ≤ 100 ms                                                       |                   |
| Protection against voltage interruption           | > 10 ms                                                        |                  | > 10 ms                                                        |                   |
| <b>Output</b>                                     | <b>Relay output</b>                                            |                  | <b>Relay output</b>                                            |                   |
| Contact                                           | 2 changeover                                                   |                  | 1 changeover                                                   |                   |
| Contact material                                  | AgCdO                                                          |                  | AgCdO                                                          |                   |
| Service life                                      | 5 x 10 <sup>6</sup> switching operations                       |                  | 5 x 10 <sup>6</sup> switching operations                       |                   |
|                                                   | 10 <sup>5</sup> switching operations at 1250 VA resistive load |                  | 10 <sup>5</sup> switching operations at 2000 VA resistive load |                   |
| Switching current                                 | 8 A <sub>0</sub> / changeover contact                          |                  | 8 A <sub>0</sub>                                               |                   |
|                                                   | 100 mA <sub>0</sub>                                            |                  | 100 mA <sub>0</sub>                                            |                   |
| Max. switching voltage                            | 250 V <sub>0</sub>                                             |                  | 250 V <sub>0</sub>                                             |                   |
| Switching current                                 | 1250 VA / 80 W                                                 |                  | 2000 VA / 80 W                                                 |                   |
| <b>Status indicators</b>                          |                                                                |                  |                                                                |                   |
| Voltage applied                                   | green LED                                                      |                  | green LED                                                      |                   |
| Relay output active                               |                                                                |                  | yellow LED                                                     |                   |
| Approvals                                         | UL / CSA                                                       |                  | UL / CSA                                                       |                   |
| Standards                                         | IEC 529/IEC 664/IEC 801/IEC 255                                |                  | IEC 529/IEC 664/IEC 801/IEC 255                                |                   |
|                                                   | VDE 0435/VDE 0110                                              |                  | VDE 0435/VDE 0110                                              |                   |
| Temperature                                       | -30°C...+70°C                                                  |                  | -30°C...+70°C                                                  |                   |
|                                                   | -20°C...+60°C                                                  |                  | -20°C...+60°C                                                  |                   |
| Clearance/creepage path. acc. to IEC 664/VDE 0110 | 4 kV / 2                                                       |                  | 4 kV / 2                                                       |                   |
| Protection category IEC 529 - Terminal block      | IP 20                                                          |                  | IP 20                                                          |                   |
|                                                   | IP 50                                                          |                  | IP 50                                                          |                   |
| Mounting                                          | DIN rail 35 mm                                                 |                  | DIN rail 35 mm                                                 |                   |
| Installation category to IEC 664                  | Category III                                                   |                  | Category III                                                   |                   |
| <b>Connection</b>                                 |                                                                |                  |                                                                |                   |
| - with ferrule                                    | 2 x 1.5 mm <sup>2</sup>                                        |                  | 2 x 1.5 mm <sup>2</sup>                                        |                   |
| - without ferrule                                 | 2 x 2.5 mm <sup>2</sup> / 1 x 4 mm <sup>2</sup>                |                  | 2 x 2.5 mm <sup>2</sup> / 1 x 4 mm <sup>2</sup>                |                   |
| Enclosure material                                | self extinguishing                                             |                  | self extinguishing                                             |                   |
| Weight, typ.                                      | 100 g                                                          |                  | 100 g                                                          |                   |

## Timers

### ITWo

Wiping contact timer relay **without** control input

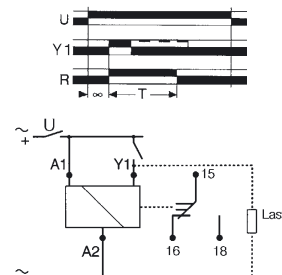
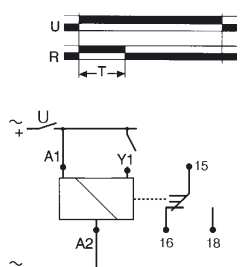


### ITWw

Wiping contact timer relay **with** control input



#### Schematic circuit diagram



| Ordering data                                     | Type                                                           | Cat. No.          | Type                                                           | Cat. No.          |
|---------------------------------------------------|----------------------------------------------------------------|-------------------|----------------------------------------------------------------|-------------------|
| Contact                                           | <b>ITWo</b>                                                    | <b>8362580000</b> | <b>ITWw</b>                                                    | <b>8362590000</b> |
| Time periods                                      | Changeover                                                     |                   | Changeover                                                     |                   |
|                                                   | 0.1 s - 100 h                                                  |                   | 0.1 s - 100 h                                                  |                   |
|                                                   | (0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,                     |                   | (0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,                     |                   |
|                                                   | 1 min. - 10 min., 0.1 h - 1 h, 1 h - 10 h, 100 h)              |                   | 1 min. - 10 min., 0.1 h - 1 h, 1 h - 10 h, 100 h)              |                   |
| Repeat accuracy (const. parameter)                | ± 0.5%                                                         |                   | ± 0.5%                                                         |                   |
| Accuracy of indication acc. to IEC 1812-1         | ± 10% (25 °C)                                                  |                   | ± 10% (25 °C)                                                  |                   |
| <b>Input</b>                                      |                                                                |                   |                                                                |                   |
| Input voltage                                     | <b>24 Vdc/ 24...240 Vac / 50...60 Hz</b>                       |                   | <b>24 Vdc/ 24...240 Vac / 50...60 Hz</b>                       |                   |
| Voltage tolerance                                 | 85 - 115% U <sub>N</sub> (110% for 240 V)                      |                   | 85 - 115% U <sub>N</sub> (110% for 240 V)                      |                   |
| Duty factor                                       | 100 %                                                          |                   | 100 %                                                          |                   |
| Rated power consumption                           | 0.5 W / 24 V-                                                  |                   | 0.5 W / 24 V- / 1 W / 48 V- / 2 VA / 48 V~                     |                   |
|                                                   | 1.5 VA / 24 V~                                                 |                   | 1.5 VA / 24 V~                                                 |                   |
|                                                   | 12 VA / 230 V~                                                 |                   | 12 VA / 230 V~                                                 |                   |
| Min pulse duration type                           | ≥ 50 ms                                                        |                   | ≥ 50 ms                                                        |                   |
| Max. reset time at voltage interruption           | ≤ 100 ms                                                       |                   | ≤ 100 ms                                                       |                   |
| Protection against voltage interruption           | > 10 ms                                                        |                   | > 10 ms                                                        |                   |
| <b>Output</b>                                     | <b>Relay output</b>                                            |                   | <b>Relay output</b>                                            |                   |
| Contact                                           | 1 changeover                                                   |                   | 1 changeover                                                   |                   |
| Contact material                                  | AgCdO                                                          |                   | AgCdO                                                          |                   |
| Service life                                      | 5 x 10 <sup>6</sup> switching operations                       |                   | 5 x 10 <sup>6</sup> switching operations                       |                   |
|                                                   | 10 <sup>5</sup> switching operations at 2000 VA resistive load |                   | 10 <sup>5</sup> switching operations at 2000 VA resistive load |                   |
| Switching current                                 | 8 A <sub>0</sub>                                               |                   | 8 A <sub>0</sub>                                               |                   |
|                                                   | 100 mA <sub>0</sub>                                            |                   | 100 mA <sub>0</sub>                                            |                   |
| Max. switching voltage                            | 250 V <sub>0</sub>                                             |                   | 250 V <sub>0</sub>                                             |                   |
| Switching current                                 | 2000 VA / 80 W                                                 |                   | 2000 VA / 80 W                                                 |                   |
| <b>Status indicators</b>                          |                                                                |                   |                                                                |                   |
| Voltage applied                                   | green LED                                                      |                   | green LED                                                      |                   |
| Relay output active                               | yellow LED                                                     |                   | yellow LED                                                     |                   |
| Approvals                                         | UL / CSA                                                       |                   | UL / CSA                                                       |                   |
| Standards                                         | IEC 529/IEC 664/IEC 801/IEC 255                                |                   | IEC 529/IEC 664/IEC 801/IEC 255                                |                   |
|                                                   | VDE 0435/VDE 0110                                              |                   | VDE 0435/VDE 0110                                              |                   |
| Temperature                                       | -30°C...+70°C                                                  |                   | -30°C...+70°C                                                  |                   |
|                                                   | -20°C...+60°C                                                  |                   | -20°C...+60°C                                                  |                   |
| Clearance/creepage path. acc. to IEC 664/VDE 0110 | 4 kV / 2                                                       |                   | 4 kV / 2                                                       |                   |
| Protection category IEC 529                       | IP 20                                                          |                   | IP 20                                                          |                   |
|                                                   | IP 50                                                          |                   | IP 50                                                          |                   |
| Mounting                                          | DIN rail 35 mm                                                 |                   | DIN rail 35 mm                                                 |                   |
| Installation category to IEC 664                  | Category III                                                   |                   | Category III                                                   |                   |
| <b>Connection</b>                                 |                                                                |                   |                                                                |                   |
| - with ferrule                                    | 2 x 1.5 mm <sup>2</sup>                                        |                   | 2 x 1.5 mm <sup>2</sup>                                        |                   |
| - without ferrule                                 | 2 x 2.5 mm <sup>2</sup> / 1 x 4 mm <sup>2</sup>                |                   | 2 x 2.5 mm <sup>2</sup> / 1 x 4 mm <sup>2</sup>                |                   |
| Enclosure material                                | self extinguishing                                             |                   | self extinguishing                                             |                   |
| Weight, typ.                                      | 100 g                                                          |                   | 100 g                                                          |                   |

## Timers

### ITTT

Pulse generator

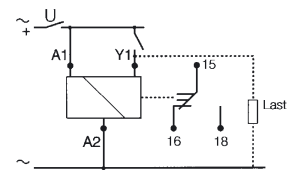
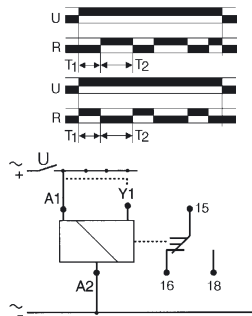


### ITMF

Multifunction - timer relay



#### Schematic circuit diagram



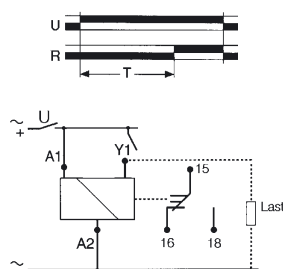
| Ordering data                                     | Type                                                           | Cat. No.          | Type                                                           | Cat. No.          |
|---------------------------------------------------|----------------------------------------------------------------|-------------------|----------------------------------------------------------------|-------------------|
| Contact                                           | <b>ITTT</b>                                                    | <b>8324050000</b> | <b>ITMF</b>                                                    | <b>8287770000</b> |
| Time periods                                      | Changeover                                                     |                   | Changeover                                                     |                   |
|                                                   | 0.1 s - 100 h                                                  |                   | 0.1 s - 100 h                                                  |                   |
|                                                   | (0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,                     |                   | (0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,                     |                   |
|                                                   | 1 min. - 10 min., 0.1 h - 1 h, 1 h - 10 h, 100 h)              |                   | 1 min. - 10 min., 0.1 h - 1 h, 1 h - 10 h, 100 h)              |                   |
| Repeat accuracy (const. parameter)                | ± 0.5%                                                         |                   | ± 0.5%                                                         |                   |
| Accuracy of indication acc. to IEC 1812-1         | ± 10% (25 °C)                                                  |                   | ± 10% (25 °C)                                                  |                   |
| <b>Input</b>                                      |                                                                |                   |                                                                |                   |
| Input voltage                                     | <b>24 Vdc/ 24...240 Vac / 50...60 Hz</b>                       |                   | <b>24 Vdc/ 24...240 Vac / 50...60 Hz</b>                       |                   |
| Voltage tolerance                                 | 85 - 115% U <sub>N</sub> (110% for 240 V)                      |                   | 85 - 115% U <sub>N</sub> (110% for 240 V)                      |                   |
| Duty factor                                       | 100 %                                                          |                   | 100 %                                                          |                   |
| Rated power consumption                           | 0.5 W / 24 V-                                                  |                   | 0.5 W / 24 V- / 1 W / 48 V-                                    |                   |
|                                                   | 1.5 VA / 24 V~                                                 |                   | 1.5 VA / 24 V~ / 2 VA / 48 V~                                  |                   |
|                                                   | 12 VA / 230 V~                                                 |                   | 12 VA / 230 V~                                                 |                   |
| Min pulse duration type                           | ≥ 50 ms                                                        |                   | ≥ 50 ms                                                        |                   |
| Max. reset time at voltage interruption           | ≤ 100 ms                                                       |                   | ≤ 100 ms                                                       |                   |
| Protection against voltage interruption           | > 10 ms                                                        |                   | > 10 ms                                                        |                   |
| <b>Output</b>                                     | <b>Relay output</b>                                            |                   | <b>Relay output</b>                                            |                   |
| Contact                                           | 1 changeover                                                   |                   | 1 changeover                                                   |                   |
| Contact material                                  | AgCdO                                                          |                   | AgCdO                                                          |                   |
| Service life                                      | 5 x 10 <sup>6</sup> switching operations                       |                   | 5 x 10 <sup>6</sup> switching operations                       |                   |
|                                                   | 10 <sup>5</sup> switching operations at 2000 VA resistive load |                   | 10 <sup>5</sup> switching operations at 2000 VA resistive load |                   |
| Switching current                                 | 8 A <sub>0</sub>                                               |                   | 8 A <sub>0</sub>                                               |                   |
|                                                   | 100 mA <sub>0</sub>                                            |                   | 100 mA <sub>0</sub>                                            |                   |
| Max. switching voltage                            | 250 V <sub>0</sub>                                             |                   | 250 V <sub>0</sub>                                             |                   |
| Switching current                                 | 2000 VA / 80 W                                                 |                   | 2000 VA / 80 W                                                 |                   |
| <b>Status indicators</b>                          |                                                                |                   |                                                                |                   |
| Voltage applied                                   | green LED                                                      |                   | green LED                                                      |                   |
| Relay output active                               | yellow LED                                                     |                   | yellow LED                                                     |                   |
| Approvals                                         | UL / CSA                                                       |                   | UL / CSA                                                       |                   |
| Standards                                         | IEC 529/IEC 664/IEC 801/IEC 255                                |                   | IEC 529/IEC 664/IEC 801/IEC 255                                |                   |
|                                                   | VDE 0435/VDE 0110                                              |                   | VDE 0435/VDE 0110                                              |                   |
| Temperature                                       | -30°C...+70°C                                                  |                   | -30°C...+70°C                                                  |                   |
|                                                   | -20°C...+60°C                                                  |                   | -20°C...+60°C                                                  |                   |
| Clearance/creepage path. acc. to IEC 664/VDE 0110 | 4 kV / 2                                                       |                   | 4 kV / 2                                                       |                   |
| Protection category IEC 529 - Terminal block      | IP 20                                                          |                   | IP 20                                                          |                   |
|                                                   | IP 50                                                          |                   | IP 50                                                          |                   |
| Mounting                                          | DIN rail 35 mm                                                 |                   | DIN rail 35 mm                                                 |                   |
| Installation category to IEC 664                  | Category III                                                   |                   | Category III                                                   |                   |
| <b>Connection</b>                                 |                                                                |                   |                                                                |                   |
| - with ferrule                                    | 2 x 1.5 mm <sup>2</sup>                                        |                   | 2 x 1.5 mm <sup>2</sup>                                        |                   |
| - without ferrule                                 | 2 x 2.5 mm <sup>2</sup> / 1 x 4 mm <sup>2</sup>                |                   | 2 x 2.5 mm <sup>2</sup> / 1 x 4 mm <sup>2</sup>                |                   |
| Enclosure material                                | self extinguishing                                             |                   | self extinguishing                                             |                   |
| Weight, typ.                                      | 100 g                                                          |                   | 100 g                                                          |                   |

## ITR

Response delay timer relay



### Schematic circuit diagram



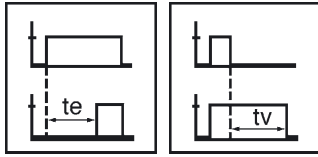
### Ordering data

| Ordering data                                     | Type                                                           | Cat. No.          |
|---------------------------------------------------|----------------------------------------------------------------|-------------------|
| Contact                                           | <b>ITR</b>                                                     | <b>8362570000</b> |
| Time periods                                      | Changeover                                                     |                   |
|                                                   | 0.1 s - 100 h                                                  |                   |
|                                                   | (0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,                     |                   |
|                                                   | 1 min. - 10 min., 0.1 h - 1 h, 1 h - 10 h, 100 h)              |                   |
| Repeat accuracy (const. parameter)                | ± 0.5%                                                         |                   |
| Accuracy of indication acc. to IEC 1812-1         | ± 10% (25 °C)                                                  |                   |
| Input                                             | 24 Vdc/ 24...240 Vac / 50...60 Hz                              |                   |
| Input voltage                                     | 85 - 115% U <sub>N</sub> (110% for 240 V)                      |                   |
| Voltage tolerance                                 | 100 %                                                          |                   |
| Duty factor                                       | 0.5 W / 24 V-                                                  |                   |
| Rated power consumption                           | 1.5 VA / 24 V~                                                 |                   |
|                                                   | 12 VA / 230 V~                                                 |                   |
| Min pulse duration type                           | ≥ 50 ms                                                        |                   |
| Max. reset time at voltage interruption           | ≤ 100 ms                                                       |                   |
| Protection against voltage interruption           | > 10 ms                                                        |                   |
| Output                                            | Relay output                                                   |                   |
| Contact                                           | 1 changeover                                                   |                   |
| Contact material                                  | AgCdO                                                          |                   |
| Service life                                      | 5 x 10 <sup>6</sup> switching operations                       |                   |
|                                                   | 10 <sup>5</sup> switching operations at 2000 VA resistive load |                   |
| Switching current                                 | 8 A <sub>0</sub>                                               |                   |
|                                                   | 100 mA <sub>0</sub>                                            |                   |
| Max. switching voltage                            | 250 V <sub>0</sub>                                             |                   |
| Switching current                                 | 2000 VA / 80 W                                                 |                   |
| Status indicators                                 |                                                                |                   |
| Voltage applied                                   | green LED                                                      |                   |
| Relay output active                               | yellow LED                                                     |                   |
| Approvals                                         | UL / CSA                                                       |                   |
| Standards                                         | IEC 529/IEC 664/IEC 801/IEC 255                                |                   |
|                                                   | VDE 0435/VDE 0110                                              |                   |
| Temperature                                       | -30°C...+70°C                                                  |                   |
|                                                   | -20°C...+60°C                                                  |                   |
| Clearance/creepage path. acc. to IEC 664/VDE 0110 | 4 kV / 2                                                       |                   |
| Protection category IEC 529 - Terminal block      | IP 20                                                          |                   |
|                                                   | IP 50                                                          |                   |
| Mounting                                          | DIN rail 35 mm                                                 |                   |
| Installation category to IEC 664                  | Category III                                                   |                   |
| Connection                                        |                                                                |                   |
| - with ferrule                                    | 2 x 1.5 mm <sup>2</sup>                                        |                   |
| - without ferrule                                 | 2 x 2.5 mm <sup>2</sup> / 1 x 4 mm <sup>2</sup>                |                   |
| Enclosure material                                | self extinguishing                                             |                   |
| Weight, typ.                                      | 100 g                                                          |                   |

## Timers

### Signal conditioning

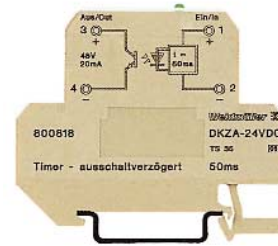
#### DKZ/DKZA timer modules



DKZ

DKZA

- Components for extending short pulses
- Provides PLC versions with switch-on/off delay
- Fixed times

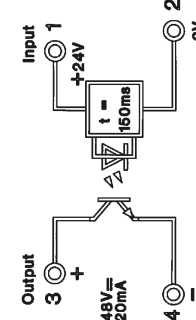
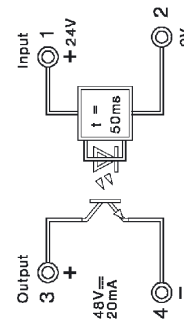
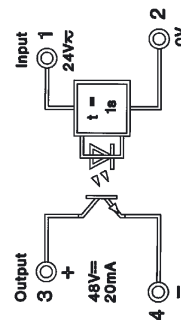


#### DKZ 24 Vac/dc

#### DKZA 24 Vac/dc

#### DKZA 24 Vac/dc

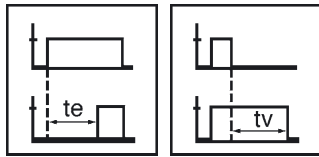
#### Schematic circuit diagram



| Ordering data                                          |                    | Type                         | Cat. No.          | Type                    | Cat. No.          | Type                    | Cat. No.          |
|--------------------------------------------------------|--------------------|------------------------------|-------------------|-------------------------|-------------------|-------------------------|-------------------|
| For TS 32                                              | Y                  | DKZ 24 Vac/dc 32             | <b>8008130000</b> | DKZA 24 Vdc 32          | <b>8008120000</b> | DKZA 24 Vdc 32          | <b>8020990000</b> |
| For TS 35                                              | W                  | DKZ 24 Vac/dc 35             | <b>8008190000</b> | DKZA 24 Vdc 35          | <b>8008180000</b> | DKZA 24 Vdc 35          | <b>8022110000</b> |
| Technical data                                         |                    |                              |                   |                         |                   |                         |                   |
| Input                                                  |                    |                              |                   |                         |                   |                         |                   |
| Input voltage                                          |                    | 24 Vac/dc ±10 %              |                   | 24 Vdc ±18 %            |                   | 24 Vdc ±10 %            |                   |
| Input nominal current                                  |                    | 5.1 mAdc/6.1 mAac ±10 %      |                   | 6.7 mA ±10 %            |                   | 6.7 mA ±10 %            |                   |
| Input current (at first-time power-up)                 |                    |                              |                   | 200 mA ±10 %            |                   | 200 mA ±10 %            |                   |
| Input power                                            |                    | 130 mW ±10 % / 150 mVA ±10 % |                   | 160 mW ±10 %            |                   | 160 mW                  |                   |
| Switch-on delay                                        |                    | 1s                           |                   |                         |                   |                         |                   |
| Switch-off delay                                       |                    | ≤ 0.7 ms                     |                   | 50 ms                   |                   | 150 ms                  |                   |
| Min. pulse duration of input voltage                   |                    |                              |                   | 2 ms                    |                   | 2.5 ms                  |                   |
| Output                                                 |                    |                              |                   |                         |                   |                         |                   |
| Max. output voltage                                    |                    | 5...48 Vdc                   |                   | 5...48 Vdc              |                   | 5...48 Vdc              |                   |
| Max. output current                                    |                    | 20 mA                        |                   | 20 mA                   |                   | 20 mA                   |                   |
| Reverse current, max. (closed-circuit current)         |                    | ≤ 0.16 mA (at 48 V)          |                   | ≤ 0.16 mA (at 48 V)     |                   | ≤ 0.16 mA (at 48 V)     |                   |
| Max. voltage drop at max. load current                 |                    | ≤ 1 V                        |                   | ≤ 1.6 V                 |                   | ≤ 1.6 V                 |                   |
| Max. switching frequency                               |                    | 0.9 Hz                       |                   | 20 Hz                   |                   | 20 Hz                   |                   |
| Isolation coordinates acc. to DIN VDE 0160, Draft11/94 |                    |                              |                   |                         |                   |                         |                   |
| Rated voltage                                          |                    | 300 V                        |                   | 300 V                   |                   | 300 V                   |                   |
| Rated impulse voltage                                  |                    | 4 kV                         |                   | 4 kV                    |                   | 4 kV                    |                   |
| Overvoltage category                                   |                    | III                          |                   | III                     |                   | III                     |                   |
| Pollution severity                                     |                    | 2                            |                   | 2                       |                   | 2                       |                   |
| Clearance and creepage distances                       |                    | ≥4 mm                        |                   | ≥4 mm                   |                   | ≥4 mm                   |                   |
| Voltage proof, input/output-TS                         |                    | 4 kVeff                      |                   | 4 kVeff                 |                   | 4 kVeff                 |                   |
| Operating temperature                                  | without clearances | -25 °C...+50 °C              |                   | -25 °C...+50 °C         |                   | -25 °C...+50 °C         |                   |
|                                                        | with clearances    | -25 °C...+50 °C              |                   | -25 °C...+50 °C         |                   | -25 °C...+50 °C         |                   |
| Storage temperature                                    |                    | -40 °C...+85 °C              |                   | -40 °C...+85 °C         |                   | -40 °C...+85 °C         |                   |
| Total width                                            |                    | 6 mm                         |                   | 6 mm                    |                   | 6 mm                    |                   |
| Conductor                                              |                    | AWG 22...12                  |                   | AWG 22...12             |                   | AWG 22...12             |                   |
| Conductor cross-section                                |                    | 0.5...4 mm <sup>2</sup>      |                   | 0.5...4 mm <sup>2</sup> |                   | 0.5...4 mm <sup>2</sup> |                   |
| Reverse polarity protection                            |                    | ja                           |                   | ja                      |                   | ja                      |                   |
| Accessories                                            |                    | Type                         | Cat. No.          | Type                    | Cat. No.          | Type                    | Cat. No.          |
| End plate                                              |                    | AP DKT4                      | <b>0687560000</b> | AP DKT4                 | <b>0687560000</b> | AP DKT4                 | <b>0687560000</b> |
| Dimensions see                                         |                    | Page 305                     |                   | Page 305                |                   | Page 305                |                   |

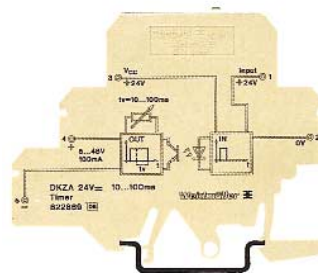
## Timers

### Pulse conditioning DKZ/DKZA timer modules



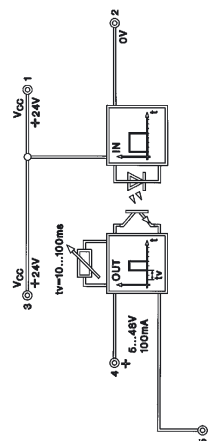
DKZ

DKZA

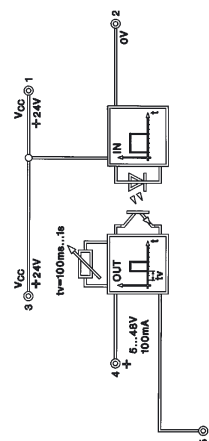


#### Schematic circuit diagram

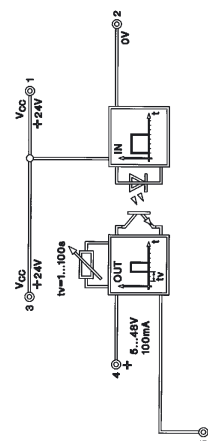
#### DKZ DK5



#### DKZ DK5



#### DKZ DK5



#### Ordering data

For TS 32

For TS 35

With combi foot TS32/TS 35

#### Technical data

Input

Supply voltage

Supply current

Control voltage

Control input current

Output

Output voltage

Max. output current

Internal voltage drop

Range of switch-on delay

Type Cat. No.

DKZ DK5 8228680000

Type Cat. No.

DKZ DK5 8243780000

Type Cat. No.

DKZ DK5 8019650000

#### Isolation coordinates acc. to DIN VDE 0160, Draft11/94

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Clearance and creepage distances

Voltage proof, input/output-TS

Operating temperature without clearances

with clearances

Storage temperature

Total width

Conductor

Conductor cross-section

300 V

6 kV

IV

2

≥ 5.5 mm

4 kVeff

-25 °C...+40 °C

-25 °C...+50 °C

-40 °C...+85 °C

6 mm

AWG 22...12

0.5...4 mm²

300 V

6 kV

IV

2

≥ 5.5 mm

4 kVeff

-25 °C...+40 °C

-25 °C...+50 °C

-40 °C...+85 °C

6 mm

AWG 22...12

0.5...4 mm²

300 V

6 kV

IV

2

≥ 5.5 mm

4 kVeff

-25 °C...+40 °C

-25 °C...+50 °C

-40 °C...+85 °C

6 mm

AWG 22...12

0.5...4 mm²

#### Accessories

End plate

Dimensions see

Type Cat. No.

AP DK5 8268870000

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Type Cat. No.

AP DK5 8268870000

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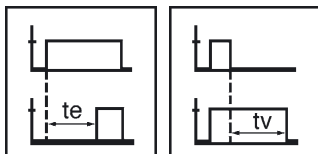
Type Cat. No.

AP DK5 8268870000

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# Timers

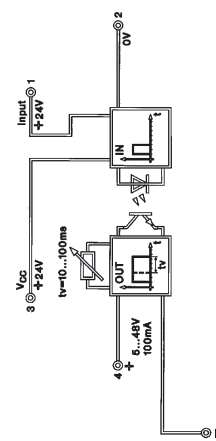
## Signal conditioning DKZA timer modules



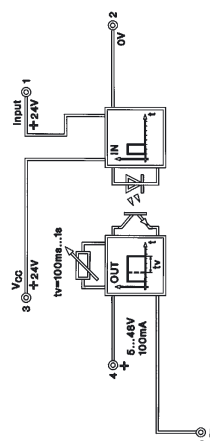
- Components for extending short pulses
- Provides PLC versions with switch-on/off delay
- Fixed times

Schematic circuit diagram

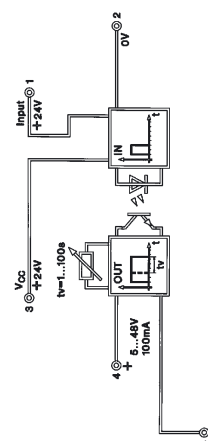
### DKZA DK5



### DKA DK5



### DKZA DK5



#### Ordering data

For TS 32

For TS 35

With combi foot TS 32/TS 35

#### Technical data

Input:

Supply voltage

Supply current

Control voltage

Control input current

Min. pulse duration of input voltage

Output:

Output voltage

Max. output current

Internal voltage drop

Range of switch-off delay

Type Cat. No.

DKZA DK5 8228690000

Type Cat. No.

DKZA DK5 8243770000

Type Cat. No.

DKZA DK5 8019630000

#### Isolation coordinates acc. to DIN VDE 0160, Draft11/94

Rated voltage

Rated impulse voltage

Overvoltage category

Pollution severity

Clearance and creepage distances

Voltage proof input/output-TS

Storage temperature

Operating temperature without clearances

with clearances

Total width

Conductor

Conductor cross-section

300 V

6 kV

IV

2

≥ 5.5 mm

4 kV<sub>eff</sub>

-25 °C...+40 °C

-25 °C...+50 °C

-40 °C...+85 °C

6 mm

AWG 22...12

0.5...4 mm<sup>2</sup>

300 V

4 kV<sub>eff</sub>

IV

2

≥ 5.5 mm

6 kV

-40...+85 °C

-25...+40 °C

-25...+50 °C

6 mm

AWG 22...12

0.5...4 mm<sup>2</sup>

300 V

4 kV<sub>eff</sub>

IV

2

≥ 5.5 mm

6 kV

-40...+85 °C

-25...+40 °C

-25...+50 °C

6 mm

AWG 22...12

0.5...4 mm<sup>2</sup>

#### Accessories

End plate

Dimensions see

Type Cat. No.

AP DK5 8268870000

Type Cat. No.

AP DK5 8268870000

Type Cat. No.

AP DK5 8268870000

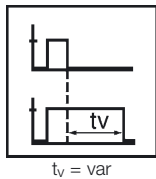
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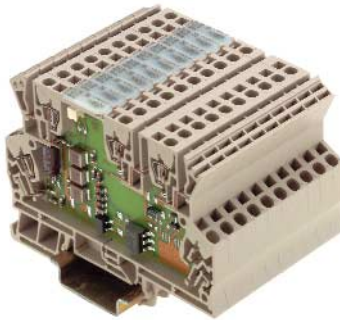
## Timers

### Turn off delay module MCZ TO



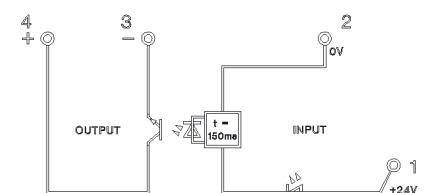
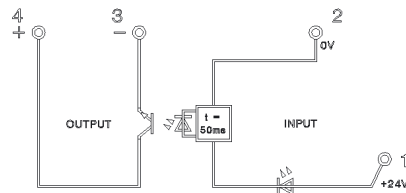
The timer module can be used for extending short pulses and fixed times. Provides PLC versions with switch off delay.

### MCZ TO 24 Vdc turn-off delay 50 ms



### MCZ TO 24 Vdc turn-off delay 150 ms

#### Schematic circuit diagram



#### Ordering data

For TS 35

#### Type

MCZ TO 24 Vdc turn-off delay 50 ms

#### Cat. No.

**8324590000**

#### Type

MCZ TO 24 Vdc turn-off delay 150 ms

#### Cat. No.

**8286410000**

#### Technical data

##### Input

|                                      |                   |
|--------------------------------------|-------------------|
| Input voltage                        | 24 Vdc $\pm 10\%$ |
| Min. pulse duration                  | 2 ms              |
| Power consumption                    | 6.7 mA $\pm 10\%$ |
| Input power                          | 160 mW            |
| Power consumption when pulse applied | 200 mA            |

##### Output

|                                           |              |
|-------------------------------------------|--------------|
| Output voltage                            | 5...48 Vdc   |
| Max. output current                       | 20 mA        |
| Max. voltage drop at max. load            | $\leq 1.6$ V |
| Impulse loading/limiting overload current | 200 mA       |
| Reverse current at 48 V (static current)  | max. 0,16 mA |
| Switch-off delay                          | 50 ms        |
| Switching frequency dc                    | 20 Hz        |

|                   |
|-------------------|
| 24 Vdc $\pm 10\%$ |
| 2.5 ms            |
| 6.7 mA $\pm 10\%$ |
| 160 mW            |
| 200 mA            |

|              |
|--------------|
| 5...48 Vdc   |
| 20 mA        |
| $\leq 1.6$ V |
| 200 mA       |
| max. 0,16 mA |
| 150 ms       |
| 5 Hz         |

#### Insulation coordination/safe disconnection to EN 50178

|                                           |                 |
|-------------------------------------------|-----------------|
| Rated voltage                             | 300 V           |
| Rated impulse voltage                     | 6 kV            |
| Overvoltage category                      | III             |
| Pollution severity                        | 2               |
| Clearance and creepage distances          | $\geq 5.5$ mm   |
| Voltage proof, input/output mounting rail | 4 kVeff / 1 min |

#### Opto coupler

to VDE 0884

|                         |                     |
|-------------------------|---------------------|
| Ambient temperature     | -25 °C...+50 °C     |
| Storage temperature     | -40 °C...+85 °C     |
| Conductor               | AWG 22...12         |
| Conductor cross-section | 1.5 mm <sup>2</sup> |
| Approvals               | CE, UL, CSA         |
| Total width             | 6 mm                |

|                 |
|-----------------|
| 300 V           |
| 6 kV            |
| III             |
| 2               |
| $\geq 5.5$ mm   |
| 4 kVeff / 1 min |

to VDE 0884

|                     |
|---------------------|
| -25 °C...+50 °C     |
| -40 °C...+85 °C     |
| AWG 22...12         |
| 1.5 mm <sup>2</sup> |
| CE, UL, CSA         |
| 6 mm                |

